2012 | March

MITSUBISHI ELECTRIC

Changes for the Better

for a greener tomorrow eco Changes

Open Field Network
CC-Link Compatible Product databook

CC-Link

CC-Link/LT

CC-Link Safety

Strategic Network, CC-Link, CC-Link/LT & CC-Link Safety.

Strong Manufacturers
Stay One Step Ahead of Others with
CC-Link, CC-Link/LT & CC-Link Safety.

CC-Link
CC-Link/LT
CC-Link Safety

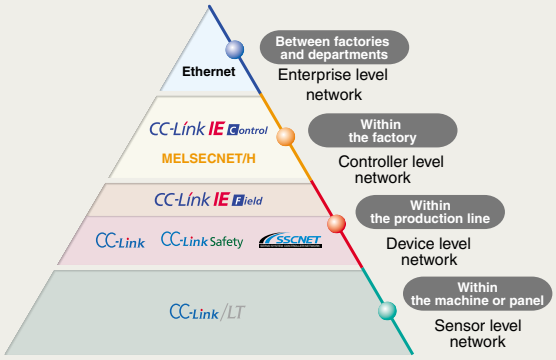
Let's Start Powerful Factory Automation.
Let's Connect with Powerful Networks.

INDEX

Opening up the Future of FA Networks and Focusing on what's

We provide total support in constructing seamless networks in all scenes, from offices to production sites, under a consistent design philosophy. With flexible approaches backed by "Ethernet," "MELSECNET/H" and "CC-Link", a SEMI-certified, world standard field network originated in Japan, and "CC-Link/LT", a sensor level network adhering to the design concept of CC-Link, we propose a network-based FA environment, fit for your needs.

Seamless integration of the network over all layers



[Within line] Device level network CC-Link

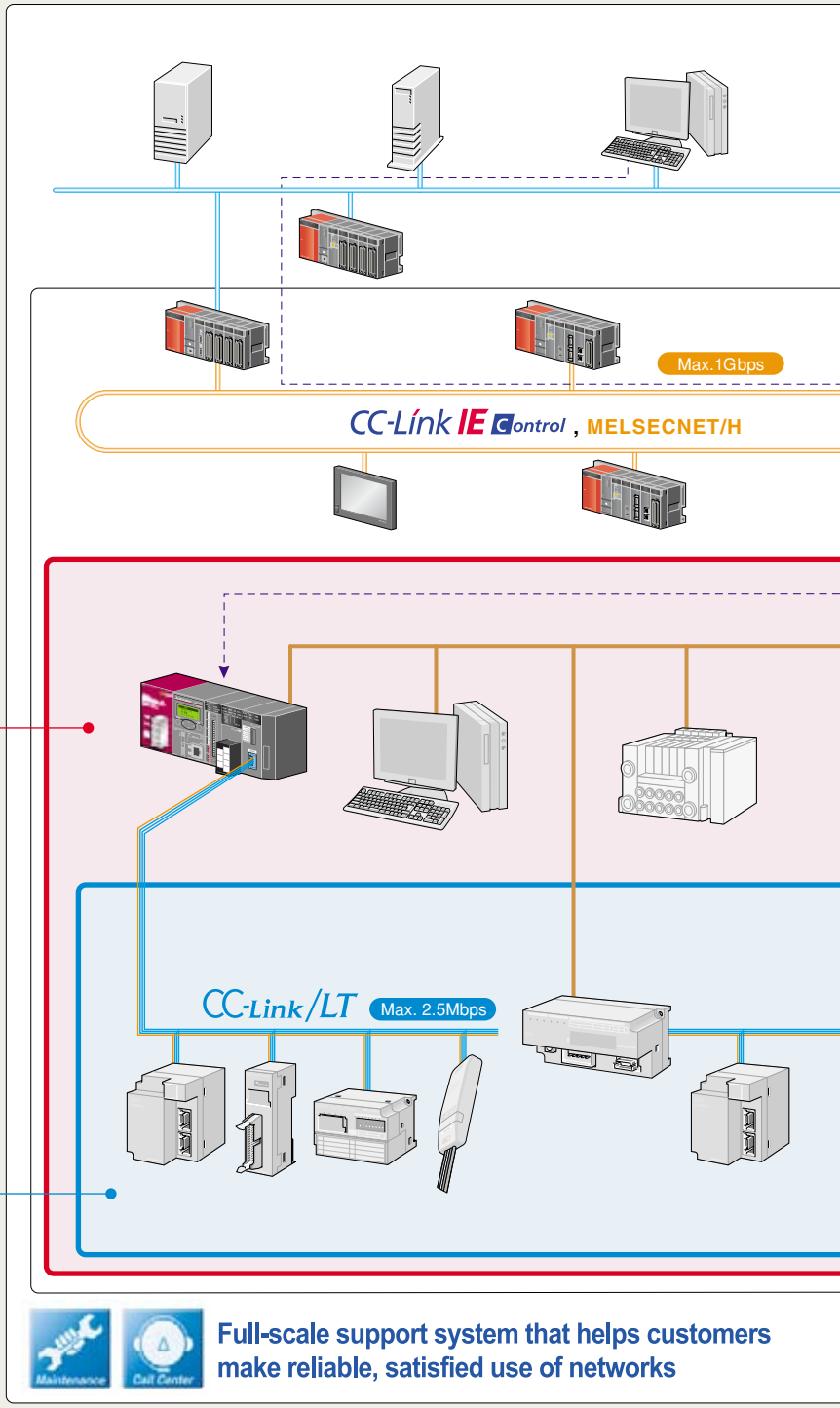
CC-Link is a high-speed field network capable of controlling the system and handling information at the same time, and offers high-speed, reliable input/output response and highly flexible expandability. This distinguished performance the network earned SEMI certification. A Japanese-origin, world standard open field network, CC-Link holds a large market share and has been winning the confidence of customers.

- High-speed communication at a maximum baud rate of 10 Mbps
- Remote input/output (RX, RY): 8,192 points each
  Remote register (RWw) : 2,048 words
  (RWr) : 2,048 words
  (when CC-Link Ver. 2.0 is used)
- Integration with 3rd party manufacture products

[Within panel and devices] Sensor level network CC-Link/LT

CC-Link/LT is a sensor level network designed so that all production sites are free from complicated wiring or incorrect wiring. It inherits openness, high speed, and noise resistance from the CC-Link family and at the same time ensures reduced wiring because of its simple setting and easy installation.

- Easy installation using dedicated connectors
- The adoption of point number modes (four points, eight points, 16 points) permits effective use of I/O points.
- The maximum number of link points is 1,024 in 16-point mode.



Full-scale support system that helps customers make reliable, satisfied use of networks

to come. Changes for the better - Mitsubishi Electric

[Between factory departments] Ethernet
Enterprise level network

The top layer of the Network hierarchy. It contributes to higher production efficiency through the collection and management of various production information around a plant.

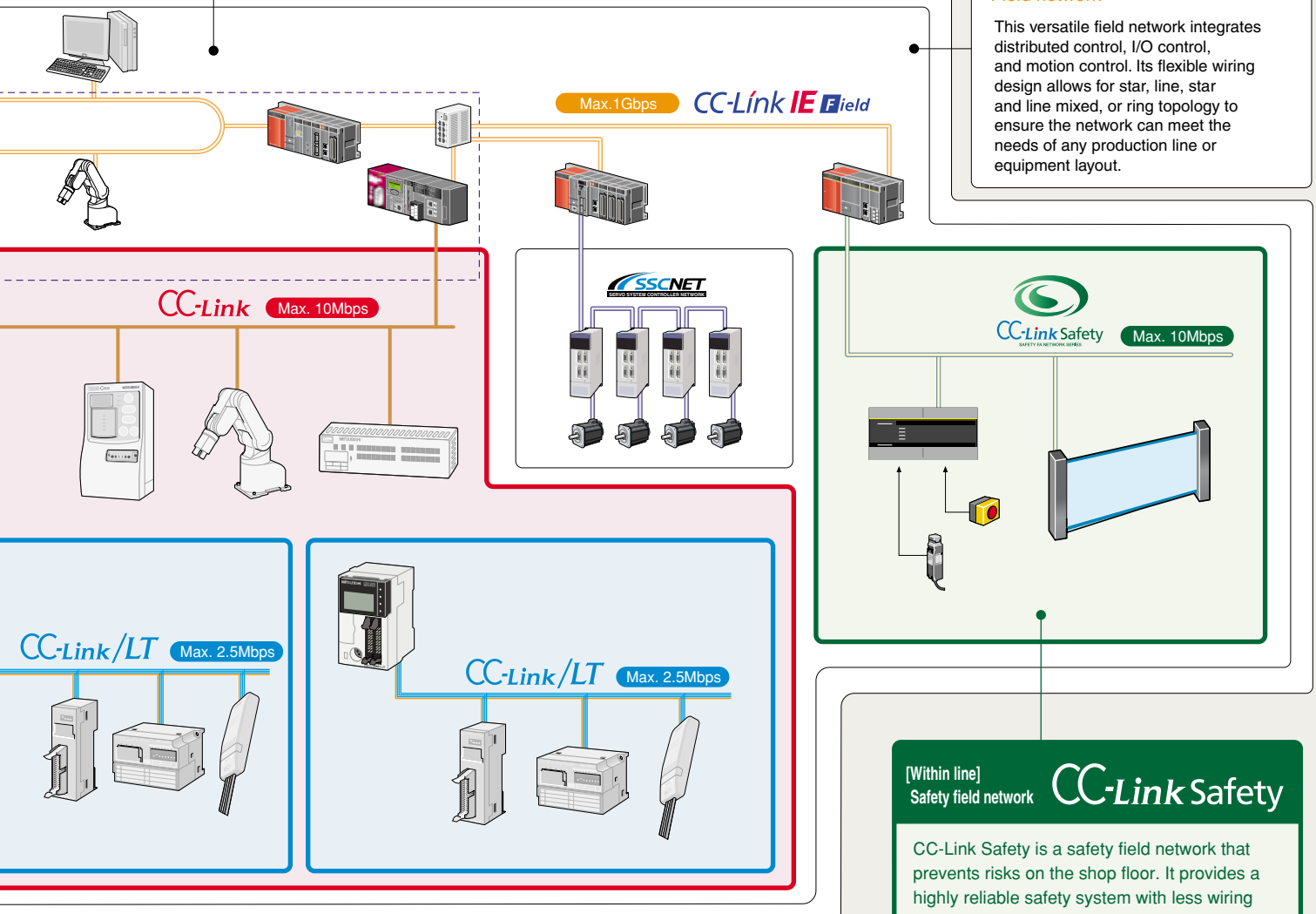
[Within factory]
Controller network

This highly-reliable control network is designed to transfer large amounts of data at real-time speeds between PLCs. The CC-Link IE Control network includes a variety of functions and allows seamless communications among other CC-Link networks.

100/10Mbps
Ethernet

[Within factory]
Field network

This versatile field network integrates distributed control, I/O control, and motion control. Its flexible wiring design allows for star, line, star and line mixed, or ring topology to ensure the network can meet the needs of any production line or equipment layout.



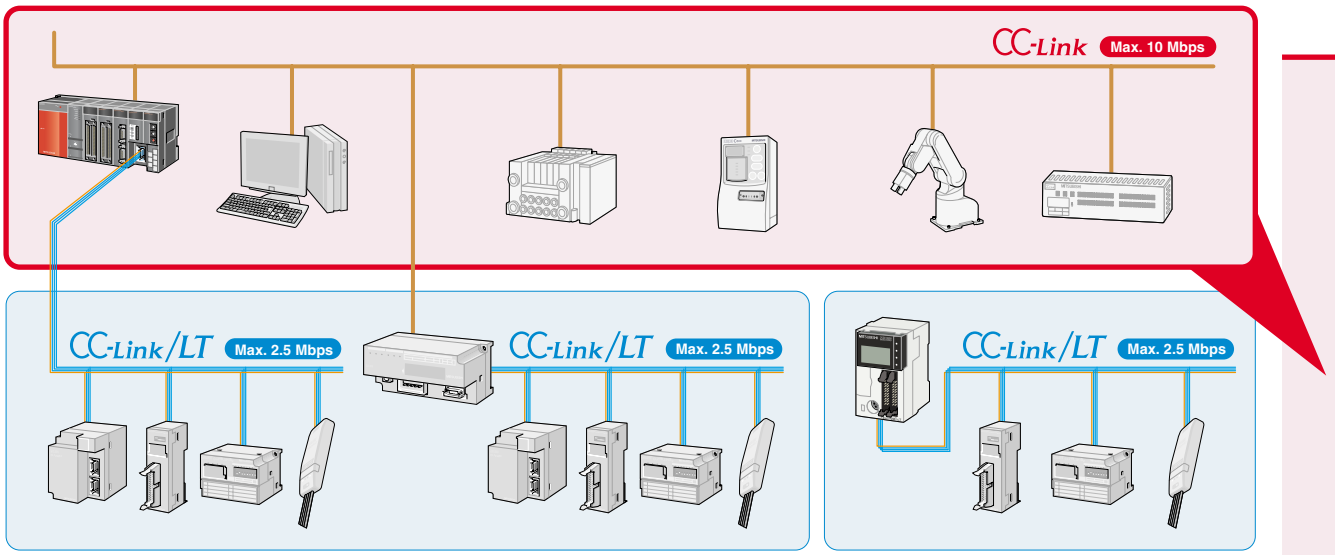
We provide customers all over the world total support for FA networks, including CC-Link and CC-Link/LT, through our "Mitsubishi Global FA Center"s for overseas production support.

[Within line]
Safety field network

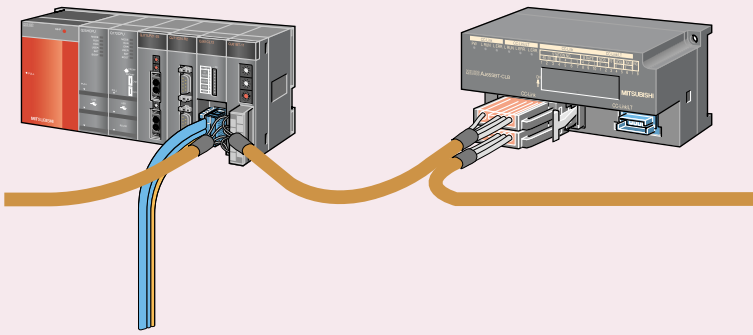
CC-Link Safety

CC-Link Safety is a safety field network that prevents risks on the shop floor. It provides a highly reliable safety system with less wiring and realizes a maximum of 10 Mbps high-speed communication while enhancing transmission reliability with RAS functions.

CC-Link - Proceeding toward a World Standard Network

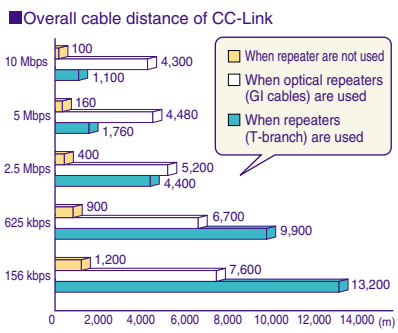


	CC-Link	CC-Link/LT
Control methods	I/O control + intelligent distribution	I/O control
Cable	Dedicated fixed cable, dedicated flexible cable, built-in power cable	Dedicated flat cable, VCTF (Vinyl Cabtire Code), dedicated flexible cable
Maximum number of link points	RX,RY: 8192 points each, RWr: 2048 words, RWw: 2048 words (Ver2.0)	RX,RY: 1024 points each
I/O Module Line-up	Screw terminal block, spring terminal block, e-CON, Push-in connector, waterproof connector, 40-pin connector	Screw terminal block, spring terminal block, e-CON, MIL connector, cable connector
Max. cable distance	1200 m (at 156 kbps) Extendable up to 13.2 km when repeater is used	Trunk: 500 m Branch: 200 m (at 156 kbps)
Parameter setup	GX Developer, GX Works2	Not required
Number of link points per station	<Ver1.0> RX,RY: 32 points each, RWr: 4 words, RWw: 4 words <Ver2.0> RX,RY: 128 points each, RWr: 32 words, RWw: 32 words	Max, 16 points (in 16-point mode)
Network topology	Bus topology T-branch topology Star topology	T-branch topology



Large-scale applications from Factory Automation through building management [Max. cable length of 13.2 km]

The total distance covered by the CC-Link network can be increased up to 1.2km (at 156 kbps). Additionally, the transmission distance can be further extended through the use of T-branch repeater modules. Optical repeaters can also be used so that CC-Link deal with various large-scale facilities.



For improved setup efficiency [Simple parameter setup]

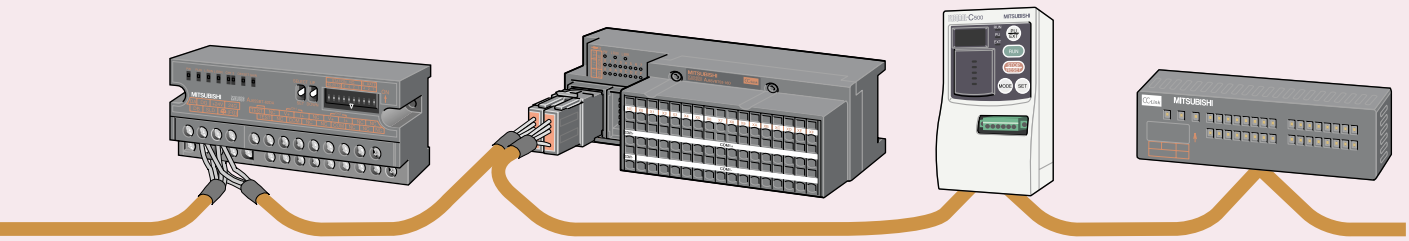
You can set parameters on CC-Link using only the MELSEC total programming tool "GX Developer." You can significantly reduce program size and efficiently set parameters.

For achieving complex control, high-mix low-volume production [High-speed, high-capacity transmission]

CC-Link is a high-performance network that utilizes high-speed communications (10 Mbps -top level in the industry-), in order to allow transmission of bit data and word data at high-speed and maximum capacity.

For a simple and cost effective network [Reduced-wiring network]

CC-link realizes simple and cost-effective network, and it is designed to relieve production lines from complicated wiring.



CC-Link Max. 10 Mbps

A diverse range of products from partner manufacturers [Multi-vendor system]

More than 900 types of products are supplied from more than 1000 companies worldwide.

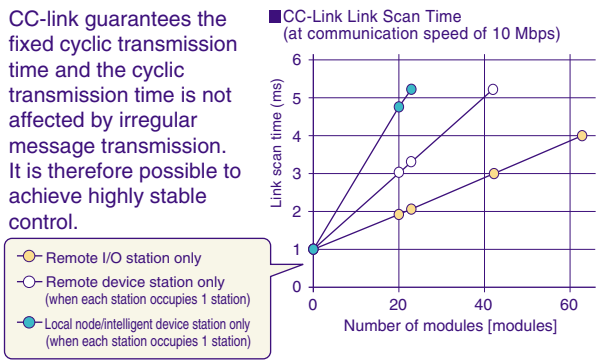
For non-stop operation [RAS functions]

CC-Link equips full RAS functionality by functions like Standby Master, Automatic Return, Slave Station Isolation and Diagnostics/Link Status Confirmation.

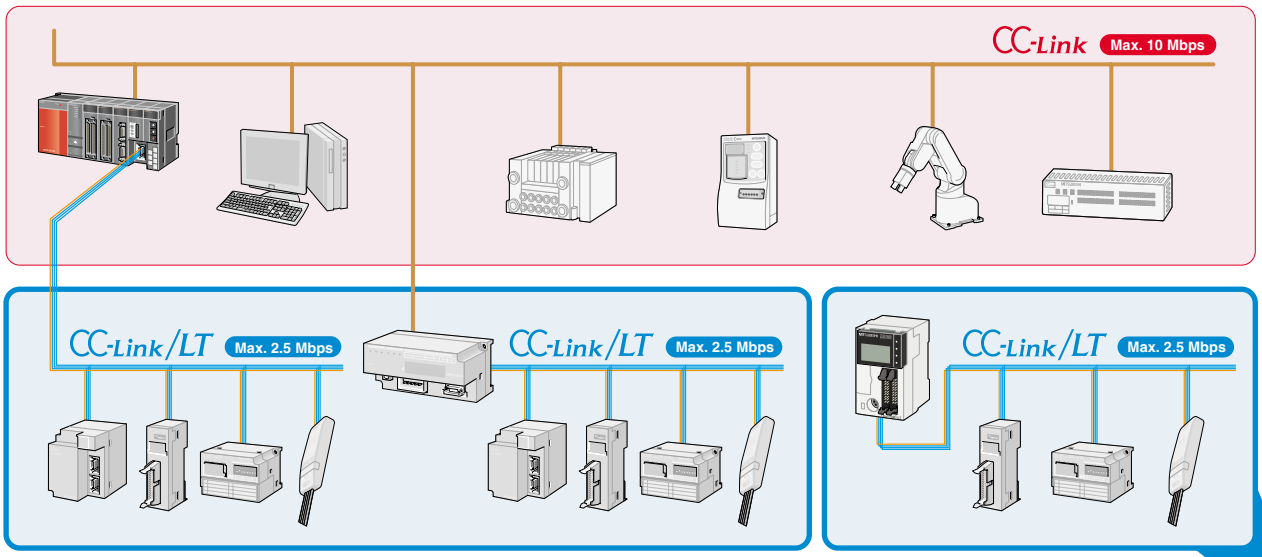
* RAS: Reliability, Availability, Serviceability

For improved network reliability [Consistent network communication time]

CC-link guarantees the fixed cyclic transmission time and the cyclic transmission time is not affected by irregular message transmission. It is therefore possible to achieve highly stable control.



CC-Link/LT - in pursuit of benefits through wire saving.



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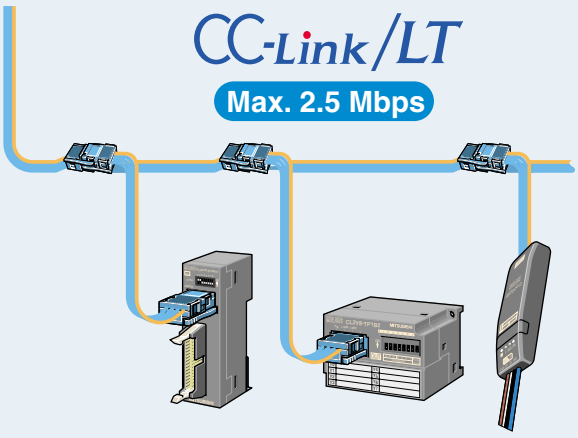
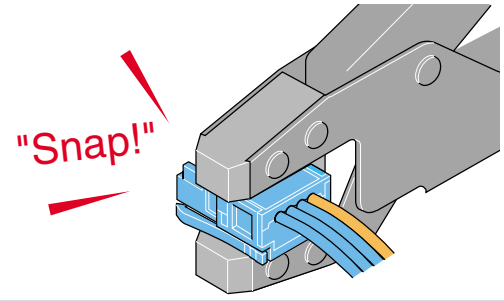


For rapid startup of systems [easy installation]

◎Using dedicated connectors and cables can reduce wiring works.
◎Communication connectors are a male/female integrated type and available for all trunk and branch lines.



For Easy usage [No need of parameter settings]

Troublesome network parameter setting is unnecessary.
The communication speed setting is required for the master module only.

For High noise-resistance [Complying with EMC Directives]

CC-Link/LT also inherits the feature of CC-Link, complies with EMC directives for noise-resistance.

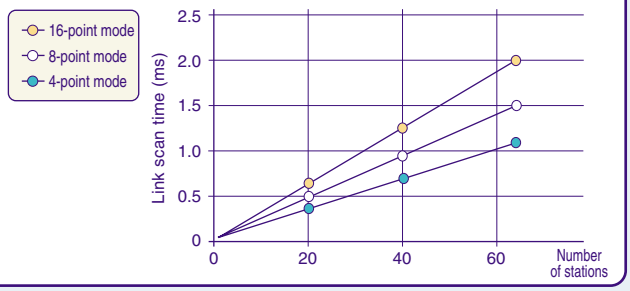
For Efficient use of I/O points [No wasting surplus I/O points]

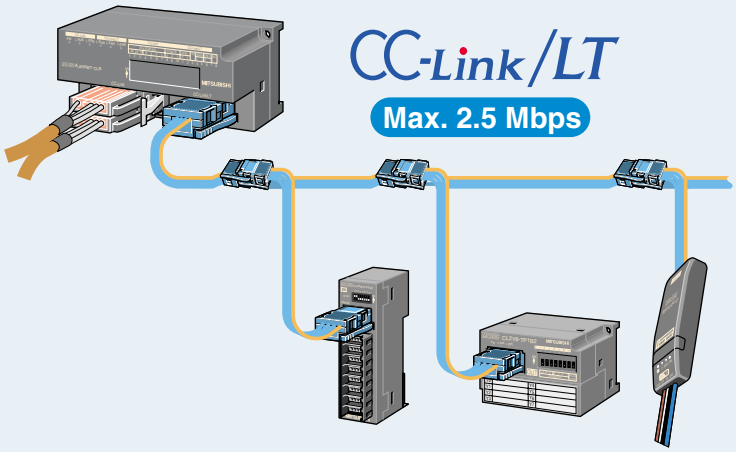
The adoption of the point mode (4, 8, 16 points) enables I/O assignment that makes full utilization of the available number of points.

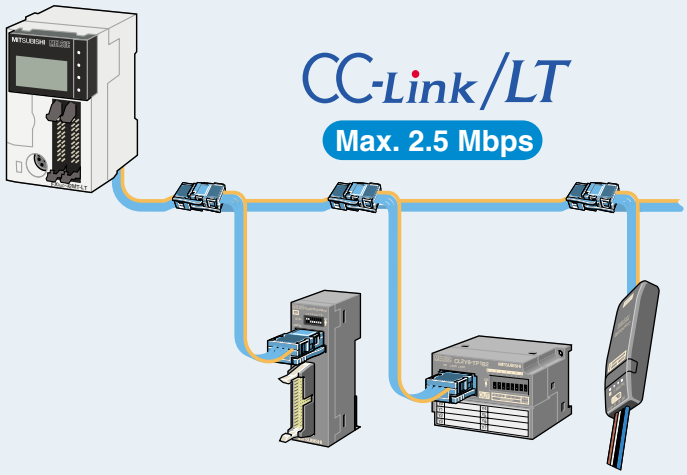
For high-speed control [fast response]

When 64 stations are connected, link scan time is a maximum of 1.2 ms(at 2.5Mbps), achieving excellent fast response performance.

■CC-Link/LT Link Scan Time (at communication speed of 2.5 Mbps)

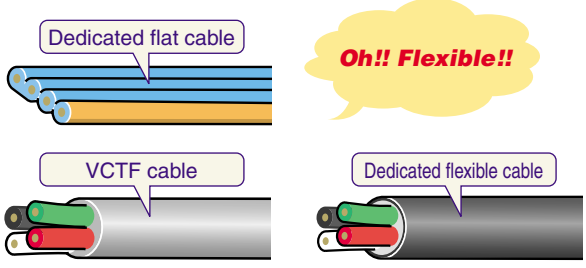






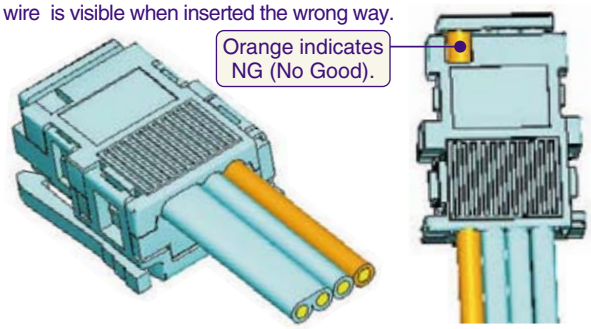
Cable specific to application requirements [extensive lineup of cables]

Dedicated flat cable, VCTF cable and Dedicated flexible cable.



Improving reliability [prevention of miswiring]

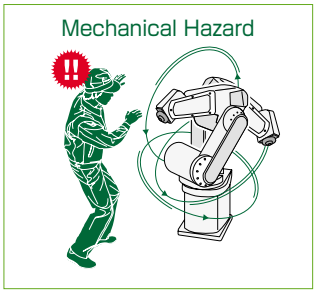
Dedicated cable shape is designed to prevent miswiring. The orange wire is visible when inserted the wrong way.

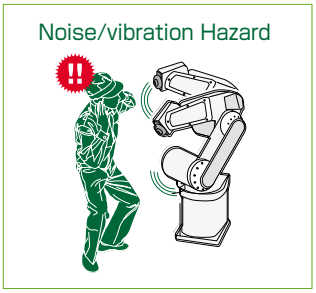


Innovation in shop floor safety, CC-Link Safety

A safety field network "CC-Link Safety" has been developed to reduce risks on the shop floor and to realize a safe work environment. By connecting "safety devices," which detect errors in the production line, and the "safety programmable controller," which stops the production line by signals from the safety devices, with simple wiring, accidents can be prevented during operation. In addition, CC-Link Safety can greatly reduce wiring for the safety system.

Hazards of production lines





Enclosing hazards in a safety guard is not good enough. Also, worker mistakes and machine failures are unpredictable. That is why configuring a system with a "safety solution" which always prevents accidents is necessary.

Safety solution example

World wide safety
[International safety standards compliant]

Conforms to the international safety standards IEC61508 SIL3 and EN954-1/ISO13849-1 Category 4 to meet safety needs at global production sites.

Safety assurance and wiring reduction
[Inherited CC-Link functions]

Transmission speed of 10 Mbps equivalent to CC-Link is realized, allowing use of the same CC-Link cables and connection of standard CC-Link stations.

Reliable safety control
[Enhanced RAS functions]

Detects communication errors such as communication delays and lost of messages and then stops the system completely.

Centralized error/failure information management
[Error/failure logs]

With the RAS functions, the safety master station logs error information of safety remote stations, enabling effective troubleshooting. The system is completely stopped upon communication error detection.

Provision for troubles
[Identifying the communication target station]

By setting the model name or product information of safety remote stations with the network parameters, the system can detect mismatch communication targets.

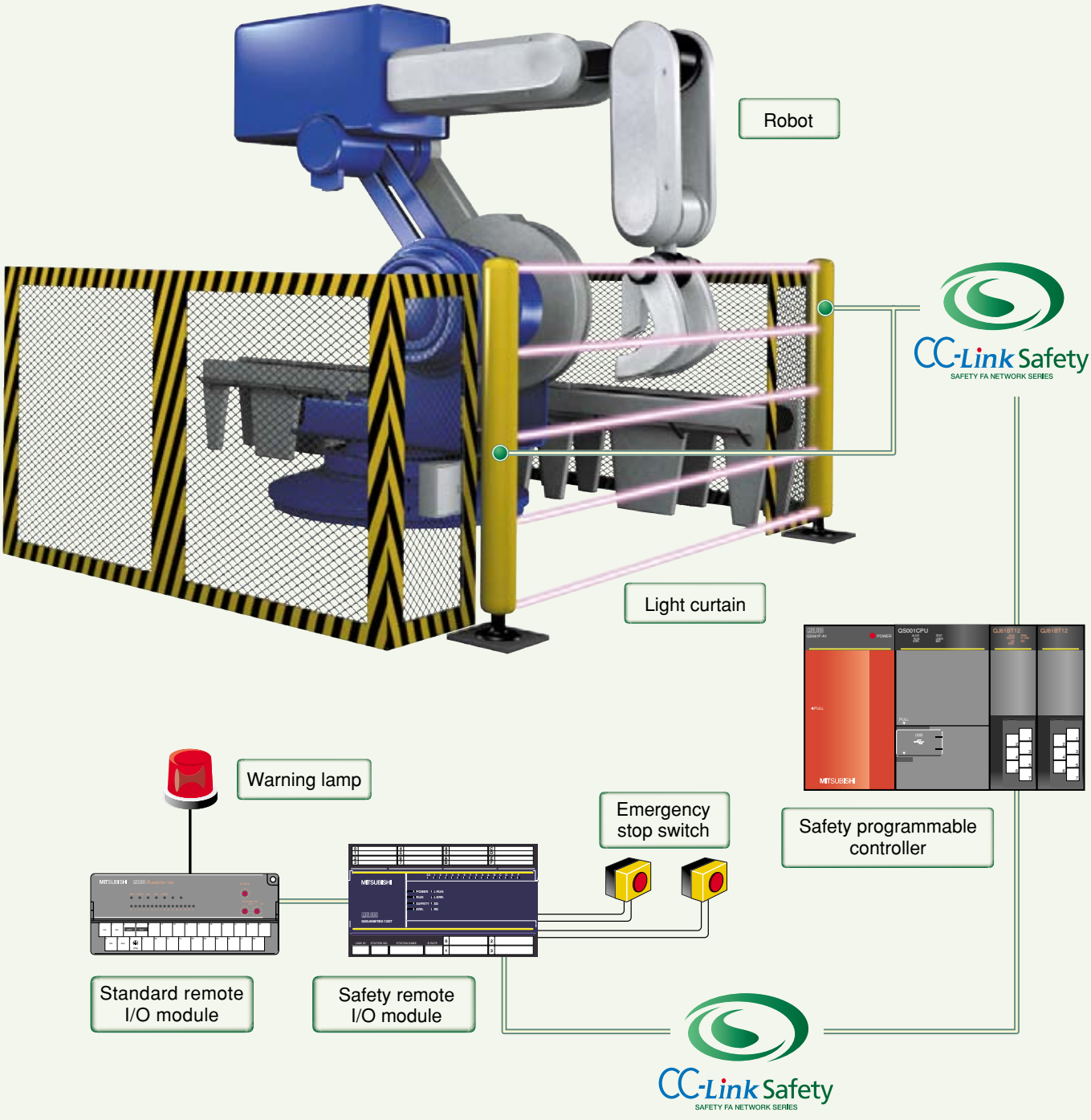
Flexible system configuration and wiring
[Distributed safety remote stations]

Safety remote I/O stations can be spread out, minimizing wiring for I/O. Expanding I/O is also easy.

A large choice of safety system configuration
[Various compatible products]

Mitubishi Electric and many other CLPA partners provide a variety of compatible products including a programmable controller, light curtains, and warning lamps. Moreover, the same CC-Link cables and standard CC-Link stations can be used.

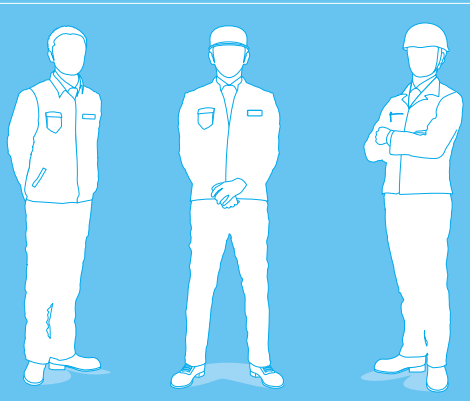
■CC-Link Safety system configuration example
（Automotive welding line）



For hose in design, production and maintenance

CC-Link & CC-Link/LT Responds

CC-Link & CC-Link/LT
provide solutions
for each challenge in the field.



Each person in charge of engineering, production and maintenance has his/her own challenge.
CC-Link and CC-Link/LT responds to each challenge with a solution.
CC-Link is an establishined open field network originated from Japan.
Fully inheriting the CC-Link concept, CC-Link/LT is specifically designed as a sensor level network.
"I want this."
"I need this."
CC-Link & CC/Link/LT provides a function for each challenge on the network.

More functions...

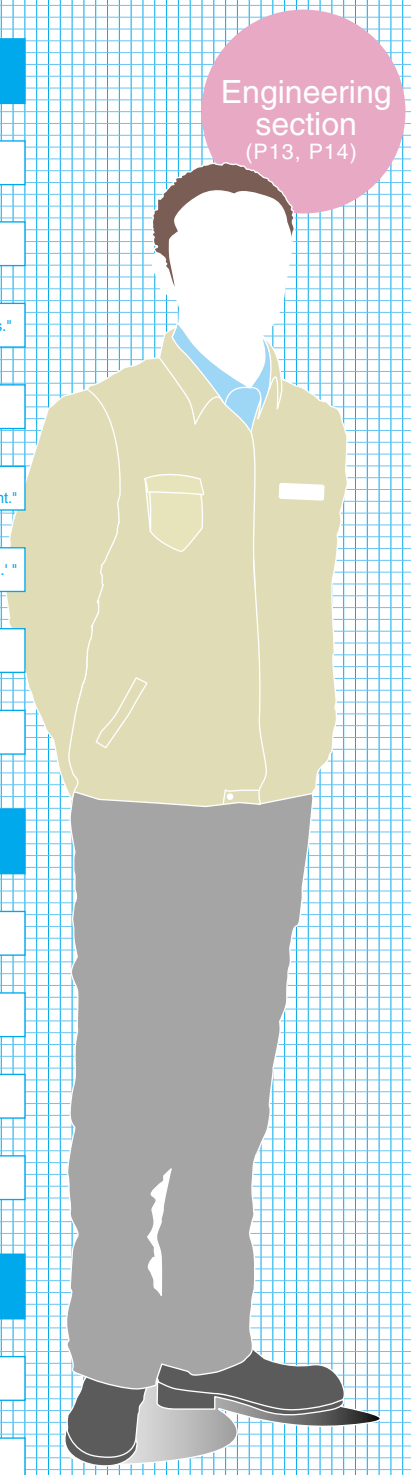
- CC-Link: "I want a flexible production system."
- CC-Link: "I need complex control features."
- CC-Link: "I want to connect lots of analog devices."
- CC-Link: "I want a distributed control system."
- CC-Link: "I want to connect between lines." "I want a network for building management."
- CC-Link: "I want to connect HMIs and 'ANDONs.' "
- CC-Link: "I want to connect drives and servos."
- CC-Link/LT: "I need high-speed sensor inputs."

More simple...

- CC-Link: "I want to connect lots of devices."
- CC-Link: "I need an easy network."
- CC-Link/LT: "I want to use remote I/O."
- CC-Link/LT: "I need widely used cables."

More secure...

- CC-Link: "I need high noise resistance."
- CC-Link: "I need various devices on a single network."
- CC-Link: "I want to export our facilities and machinery overseas."



to Your Requests

At assembly...

CC-Link CC-Link/LT
"I want to arrange devices as I desire."

CC-Link CC-Link/LT
"I need assembly/ disassembly to be easy."

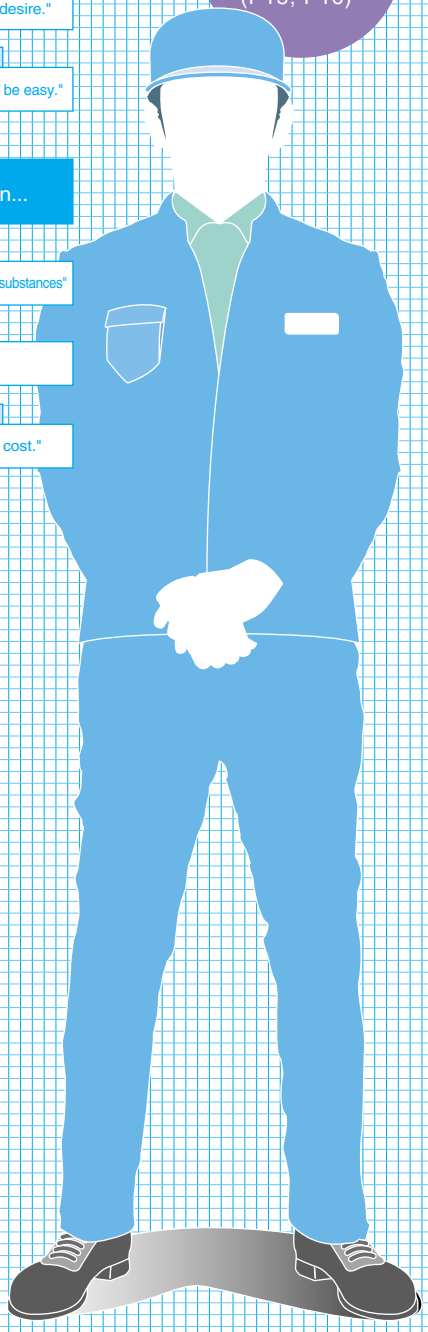
At testing/operation...

CC-Link
"I want to prevent trouble from foreign substances"

CC-Link
"I need quick check-up."

CC-Link CC-Link/LT
"I want to save wiring time and cost."

Production section
(P15, P16)



Preventing trouble

CC-Link CC-Link/LT
"I need network testing for preventive maintenance."

CC-Link
"I want to do network maintenance from sites away from the PLC master."

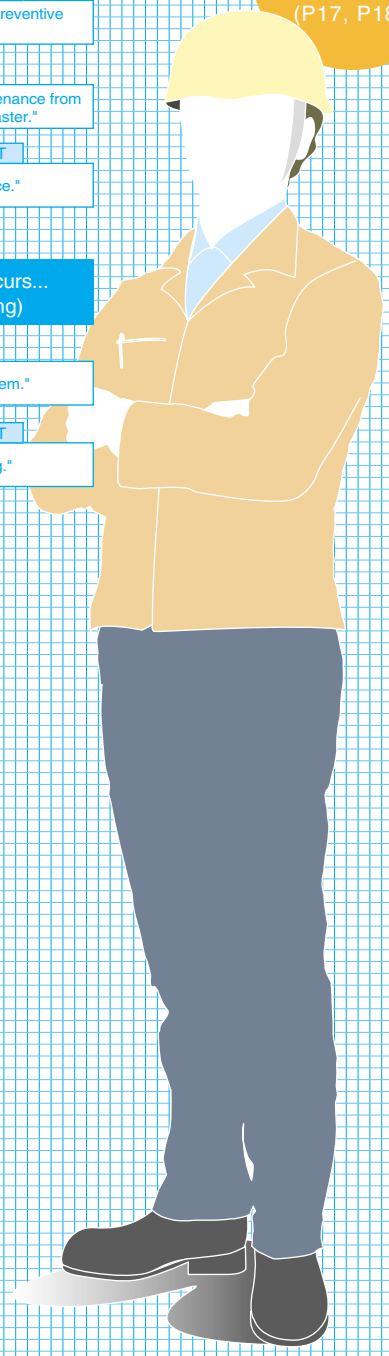
CC-Link CC-Link/LT
"I need high noise resistance."

When trouble occurs... (troubleshooting)

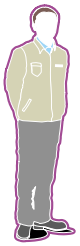
CC-Link
"I don't want to stop my system."

CC-Link CC-Link/LT
"I need easy troubleshooting."

Maintenance section
(P17, P18)



The solutions provided by CC-Link & CC-Link/LT begin from here.



Requests from the Engineering section: "Want to CC-Link & CC-Link/LT meets even more requests

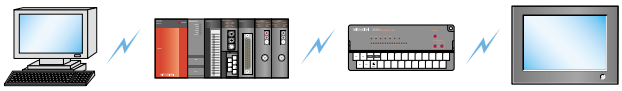
CC-Link ensures...

"I want a flexible production system."

▶CC-Link is a high-speed and high-capacity network.

CC-Link is a high speed field network that can handle both control and information together.

■High-speed/High-capacity data transmission



<High-capacity Cyclic Transmission Data>

Data capacity

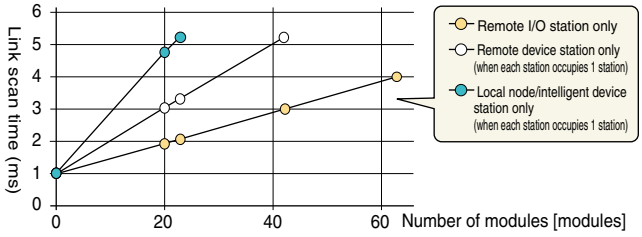
Remote I/O (RX, RY)=8192 points each
Remote register (RWw)=2048 words
(RWr)=2048 words (when Ver2.0 is used)

"I need complex control features."

▶CC-Link guarantee consistent communication time.

The cyclic transmission time is not affected by irregular message transmission to the HMI products. It is possible to achieve highly stable control.

■CC-Link Link Scan Time (at communication speed of 10 Mbps)



"I want to connect lots of analog devices."

▶CC-Link V2 supports an extra broader range of needs.

CC-Link Ver.2 can control maximum eight times the data capacity compared with earlier CC-Link compatible products. CC-Link Ver.2 compatible analog modules are applicable to process control.

■CC-Link Ver2.0-compatible analog module

CC-Link Ver 1.0 — Up to 21 modules can be connected.

CC-Link V2 has double the module connection capacity

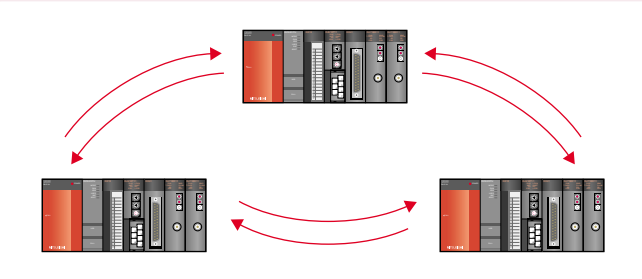
CC-Link V2 — Up to 42 modules can be connected.

"I want a distributed control system."

▶CC-Link realizes simple distributed control.

CC-Link provides highly stable cyclic transmission, which enables N:N communication between controller masters or local stations. This N:N communication method between controllers realizes a distributed control system for each system.

■Simple controller communication



CC-Link/LT ensures...

"I need high-speed sensor inputs."

▶CC-Link/LT provides fast response.

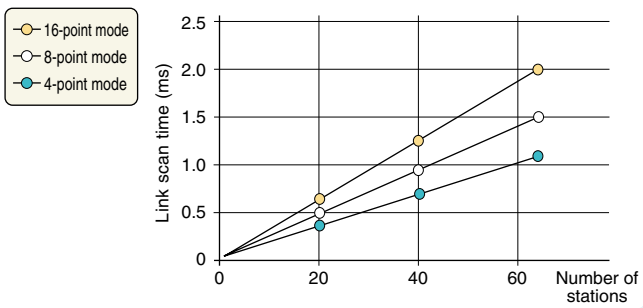
When 64 stations are connected, the link scan time is a maximum of 1.2ms (at 2.5Mbps). Select 2.5Mbps, 625kbps or 156kbps depending on the transmission distance.

"I want to use remote I/O."

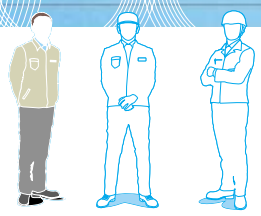
▶CC-Link/LT is not required to make parameter setting.

Troublesome network parameter setting is unnecessary. The communication speed setting is required for the master module only. There is no need to set the communication speed on the remote station.

■CC-Link/LT Link Scan Time (at communication speed of 2.5 Mbps)



develop a flexible manufacturing system!" from engineers



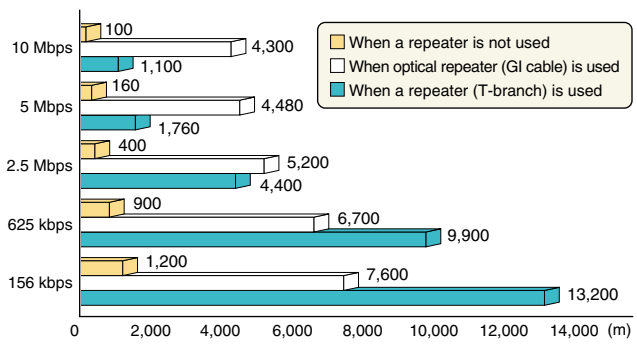
"I want to connect between lines."
"I want a network for building management."

▶ The total extended distance of the CC-Link cable is 1,200 m, and can be extended up to 13.2 km when repeaters are used.

CC-Link total extended distance can be as long as 1.2 km*. The transmission distance can be extended up to 13.2 km* when T-branch repeaters are used.

* Maximum transmission distance when transmission speed is set to 156 kbps.

■Overall cable distance of CC-Link



"I want to connect lots of devices."

▶ CC-Link V2 can control up to 8192 points and 4096 words.

CC-Link Ver2.0 can transmit a maximum of eight times the data capacity compared with earlier CC-Link compatible products.

■Comparison of communication data

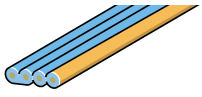
CC-Link Ver 1.0	Remote I/O ····· (RX, RY) = 2048 points each Remote register ····· (RWw) = 256 words (RWr) = 256 words
CC-Link V2	Remote I/O ····· (RX, RY) = 8192 points each Remote register ····· (RWw) = 2048 words (RWr) = 2048 words

"I need widely used cables."

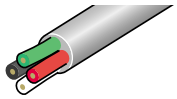
▶ CC-Link/LT specifies cables to application requirements.

Dedicated flat cable, VCTF cable and dedicated flexible cable are available.

Dedicated flat cable



VCTF cable



Dedicated flexible cable

"I want to connect HMIs and 'ANDONs.' "

▶ CC-Link can connect HMIs and ANDONs by transient transmission.

CC-Link simplifies data transfer to HMIs and ANDON with transient transmission (up to 960 bytes) and cyclic transmission.

"I need an easy network."

▶ CC-Link parameter setting can be done with only GX Developer.

The total programming tool "GX Developer" with improved operability. Makes full use of the advantages of Windows® and enables you to set CC-Link parameters without a program.

"I need a reliable network."

▶ CC-Link achieves high reliability with dedicated cables.

CC-Link uses dedicated cables that support high-speed transmission up to 10 Mbps. These cables are also highly noise-resistant.

■CC-Link dedicated cable

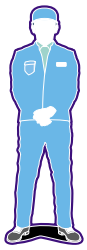
CC-Link also lets you...

"I want to connect drives and servos."
▶ CC-Link allows GX Configurator-CC to read and write drives and servo parameters without a program, and perform monitoring and testing.

"I need various devices on a single network."
▶ Diverse range of products supplied from many partner manufacturers.

"I want to export our facilities and machinery overseas."
▶ CC-Link complies with various safety standards including UL standards.

* For details, refer to MELFANSweb.

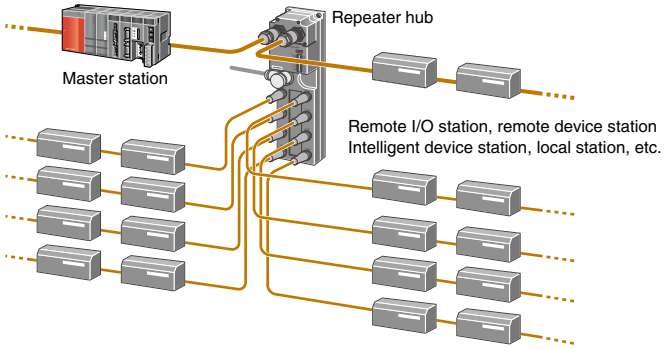


Requests from the production section: "Want to improve CC-Link & CC-Link/LT provide various useful functions.

I want to arrange devices as I desire.

▶CC-Link allows flexible installation.

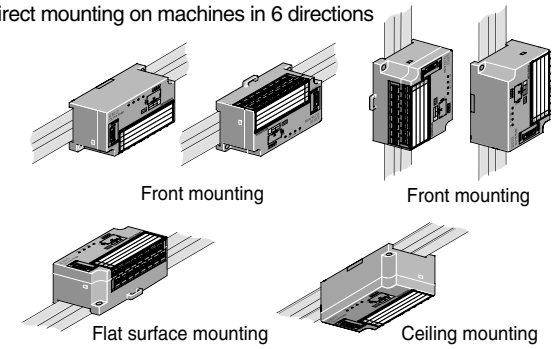
T-branch repeaters, wireless optical repeaters, optical repeaters, and repeater hubs are available with CC-Link. They enhance the freedom of application even at 10 Mbps.



▶CC-Link family remote I/O modules occupy a small footprint.

Compact type remote I/O modules with 32, 16, 8, 4, and 2 I/O points are available. They can be mounted in six different directions, including ceiling mounting, front mounting, and flat surface mounting, and selected according to the environment where they are to be mounted and the application.

■Direct mounting on machines in 6 directions

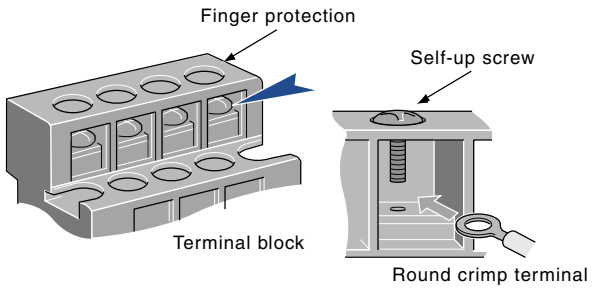


I want to save wiring time and cost.

Dedicated connectors of CC-Link family are designed to reduce wiring works, cost and wiring mistakes.

Screw terminal block type

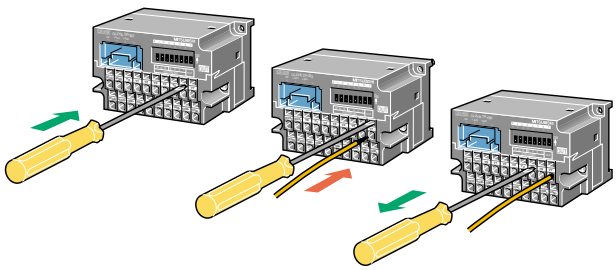
CC-Link CC-Link/LT



The round crimp terminal can be directly connected with the self-up screw by simply unfastening the terminal block screw.
* The specifications depend upon a product.

Spring clamp terminal block type

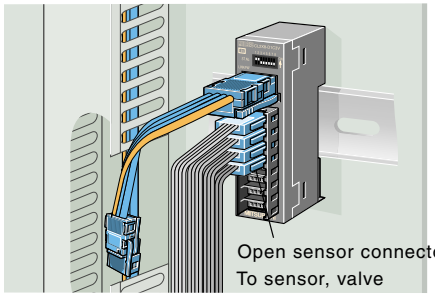
CC-Link CC-Link/LT



Spring clamps allows for quick and easy connectivity.

Sensor connector (e-CON) type

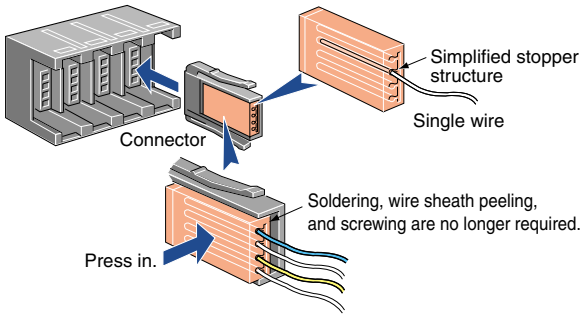
CC-Link CC-Link/LT



Utilizing the industry-standard e-CON, sensors can be replaced individually.

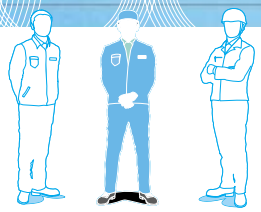
Push-in connector type

CC-Link



This connector adopts a lock mechanism that is easy to lock and unlock. You can connect single wires by simply pushing in the connector.

and increase productivity!"

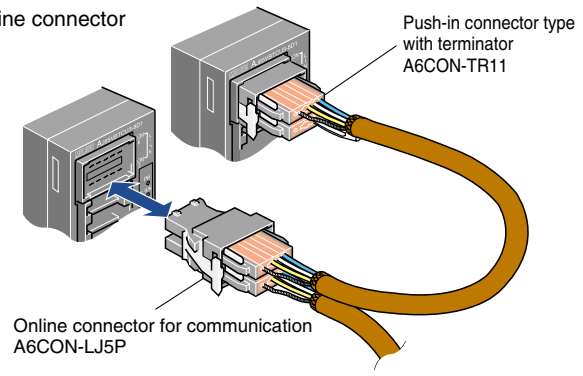


I need assembly/ disassembly to be easy.

▶CC-Link family products allows easy connection.

By using online connectors for communication and power supply, it is possible to replace modules without stopping the communication.

■Online connector



I want to prevent trouble from foreign substances

▶CC-Link protective cover protects I/O terminals.

The protective cover can be easily attached and removed. The transparent material allows you to check the LEDs and wiring conditions.

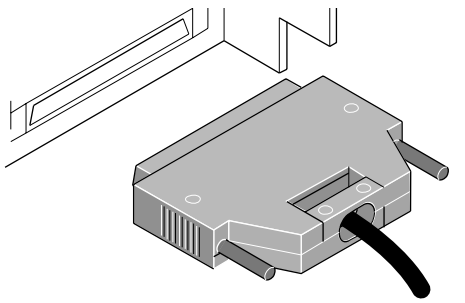
I need quick check-up.

▶CC-Link ensures easy setup and startup.

CC-Link's auto-startup function allows you to start up the network without the need to set network parameters.

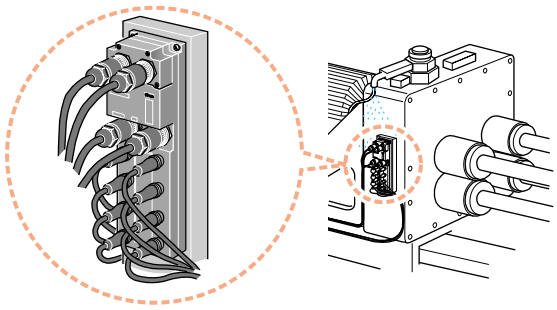
▶Specific connection to application requirements

40-pin connector type



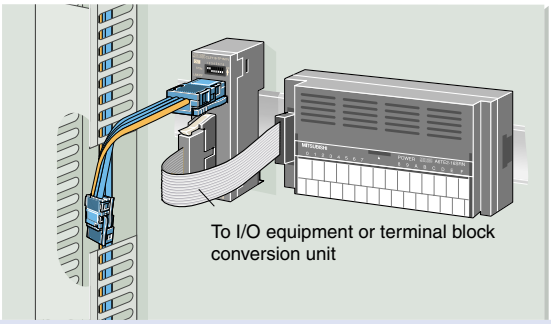
This type provides an easy and economical way of wiring.

Waterproof connector type (M12)



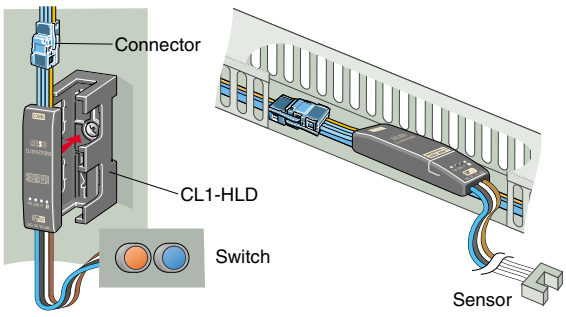
The waterproof type remote I/O module is housed in a protective structure conforming IP67. therefore it can be used without worry in an environment where water is present.

MIL connector type



This is the industry's smallest connector in its class, and can be easily connected to a relay terminal or terminal block conversion module.

Cable type



This is the industry's smallest connector in its class. Suited to fit compactly into main trunking ducts.

Requests from the maintenance section: "Don't want to stop CC-Link & CC-Link/LT supports the maintenance work with

Before trouble occurs... (preventive maintenance)

"I need network testing for preventive maintenance."

▶ CC-Link family products provides one-step-ahead preventive maintenance.

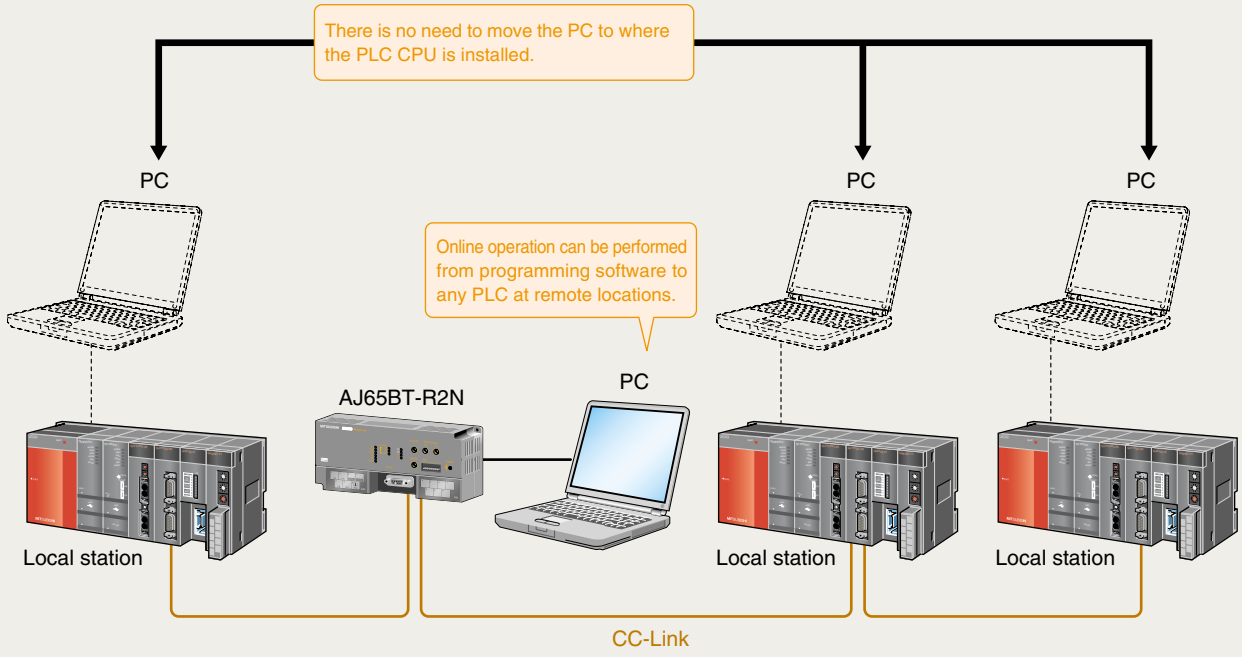
It is possible to check the data link status using special relays and registers. Hardware and line connection can be tested via offline tests.

"I want to do network maintenance from sites away from the PLC master."

▶ CC-Link provides remote operation functions.

By using the RS-232 interface module (AJ65BT-R2N) into the CC-Link system, it is possible to do network maintenance from sites away from PLC master.

■Network maintenance from sites away from PLC master.

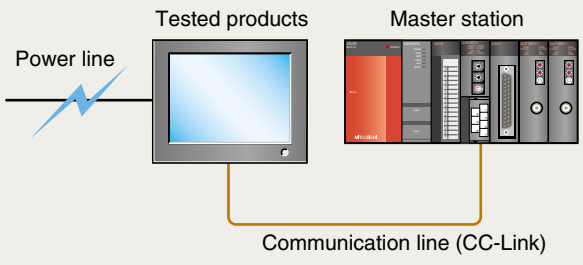


"I need high noise resistance."

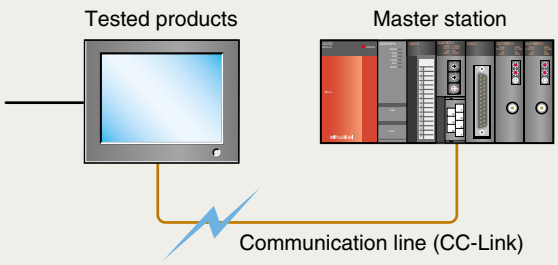
▶ CC-Link family compatible products are highly noise resistant guaranteed by conformance testing.

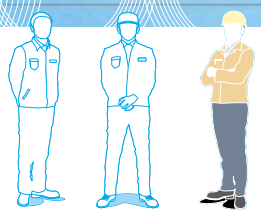
A conformance test is conducted for all products sold by CLPA partners. the test includes a power supply noise test and a bundle noise test.

■Power supply noise test (AC/DC)



■Bundle noise test





system and keep high operating rates!!" secure functions.

When trouble occurs... (troubleshooting)

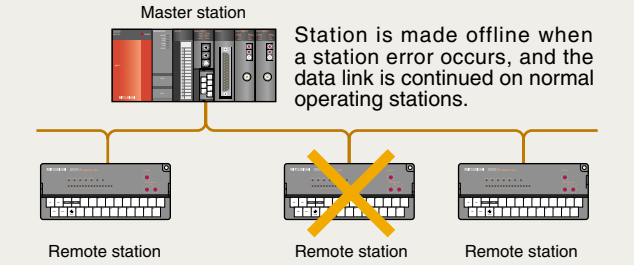
"I don't want to stop my system."

▶ CC-Link provides enhanced RAS functions.

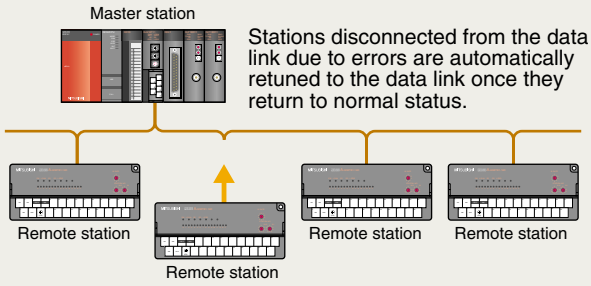
CC-link realizes minimal system shutdowns by "error invalid station setting," "slave station isolation," "automatic return," "standby master station," and "2-piece terminal block".

<Error invalid station setting>
In the online mode, this setting temporarily prevents modules specified on GX Developer from being treated as data link faulty stations.

■Slave station isolation

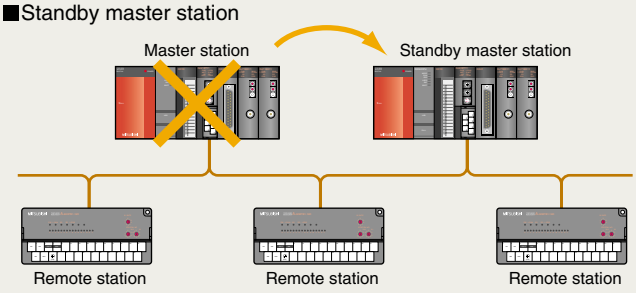


■Automatic return



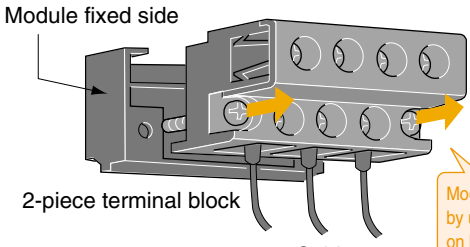
* When connecting offline stations on CC-Link/LT, make sure that the PLC CPU is in a STOP status.

■Standby master station



By setting a local station as a standby master station, the data link can be continued even if an error occurs in the master station.

■The "2-piece terminal block" allows modules to be replaced without stopping the CC-Link system.

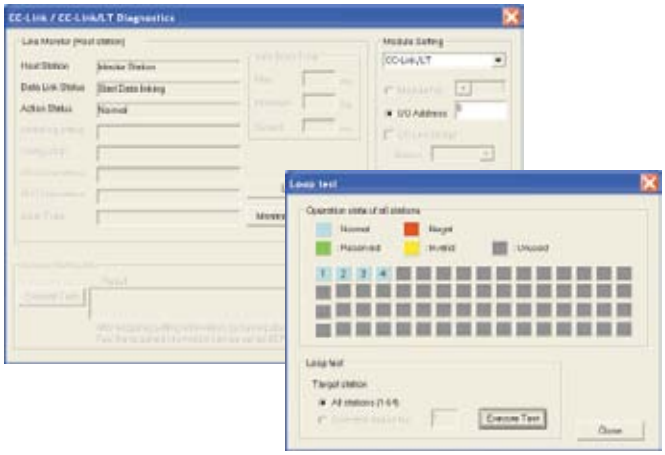


Modules can be separated by unfastening the screws on both edges of the terminal block with the cable still connected.

"I need easy troubleshooting."

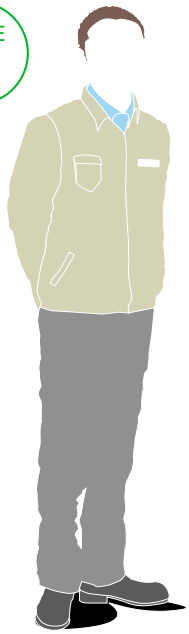
▶ CC-Link family Networks can be easily checked by GX Developer or GX Works2.

The status of the CC-Link and CC-Link/LT networks can be monitored by GX Developer or GX Works2.



Case Study "CC-Link is superior to existing networks" Realize the advantages of CC-Link.

CASE 1



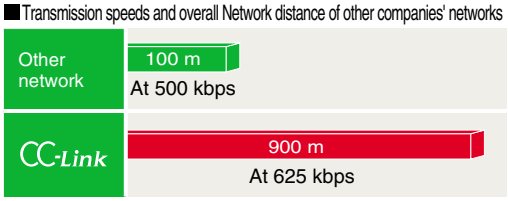
Mr. A from the engineering section

"My current network distance is limited to 100m, and the transmission speed is unstable."

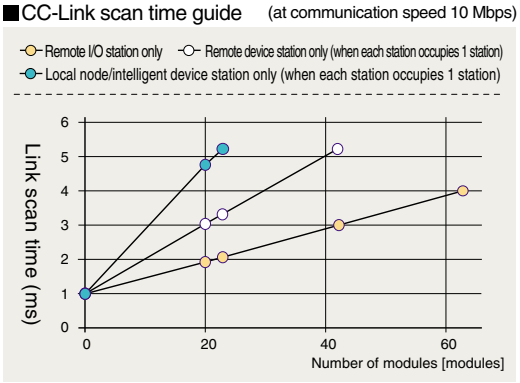
Mr. A plans to expand his factory. The first challenge is total cable distance and communication stability. What interested him is that the network distance covered by the CC-Link network can be increased up to 900m at 625kbps, and transmission time is stable as well.

Feature 1 CC-Link is high-speed network and total cable distance is long distance.
Feature 2 CC-Link is a consistent network.

■Transmission speeds and overall Network distance of other companies' networks



■CC-Link scan time guide (at communication speed 10 Mbps)



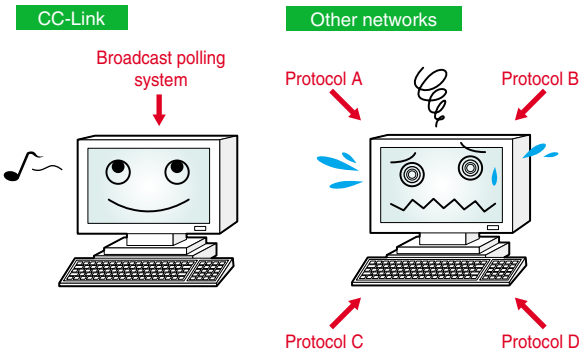
"Our factory's networks are complex because they use various protocols. How about CC-Link?"

CC-Link eliminates the need to use different protocols.

Feature 3

CC-link is a single protocol.

■Protocol comparison



"It takes too long to reconnect network stations."

Regarding this issue, Mr. A learned that CC-Link compatible products quickly return to the network, and began to feel more attraction to CC-Link.

Feature 4

CC-Link offers quick return to the network system.

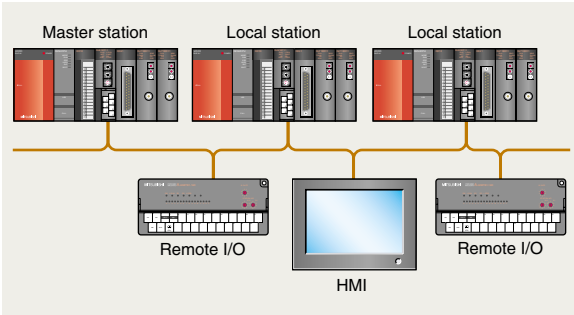
"I also need distributed control."

Also, using CC-Link, he easily realized "distributed control by establishing communication between controllers".

Feature 5

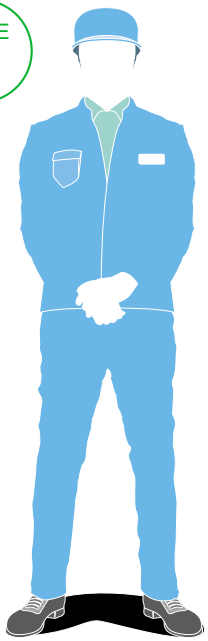
CC-Link is simple control level network.

■Distributed control by simple inter-controller network



"That's why we

CASE 2



Mr. B from the production section

"Trunk cables and branch cables in the current network are different. Furthermore, trunk cables are expensive."

Mr. B is in charge of production engineering. He has been worried about utilization and high cost of the existing network. Therefore, he collected CC-Link information and compared it with other networks.

Feature 1 CC-Link is flexible to install.

Feature 2 CC-Link is reasonably priced.

■Cable comparison

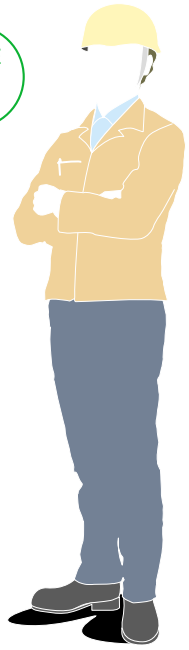
Item	CC-Link	Other network	
Cable diameter	7 mm	Thick cable: 12 mm	Thin cable: 7 mm
Trunk/ Branch	Trunk and branch	Trunk	Branch
Total cable length (no repeater)	Max. 1200 m (156 kbps)	Max. 500 m (125 kbps)	Max. 100 m (125 kbps) (250 kbps) (500 kbps)

"It is stressful to design the necessary power supply capacity of a network."

Mr. B used to be bothered by complicated calculations for the required power capacity.
He soon learned that such bothersome calculation was not necessary.

Feature 3 CC-Link frees you from the need of calculation of the power supply capacity.

CASE 3

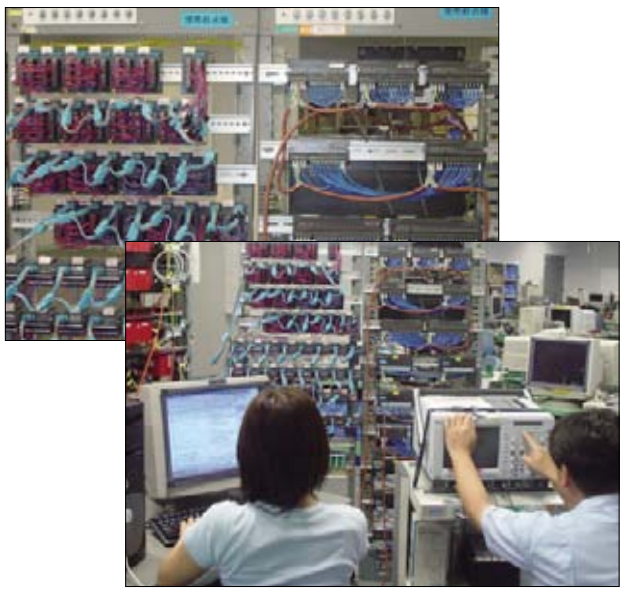


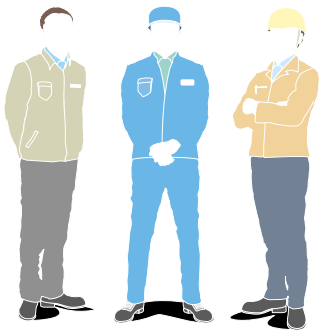
Mr. C from the maintenance section

"It concerns me that conformance testing is not mandatory in my current network."

Reliability is the most important for him. He was pleased that the conformance test guaranteed the high noise resistance of CC-Link.

CC-Link is reliable because the conformance test is mandatory.



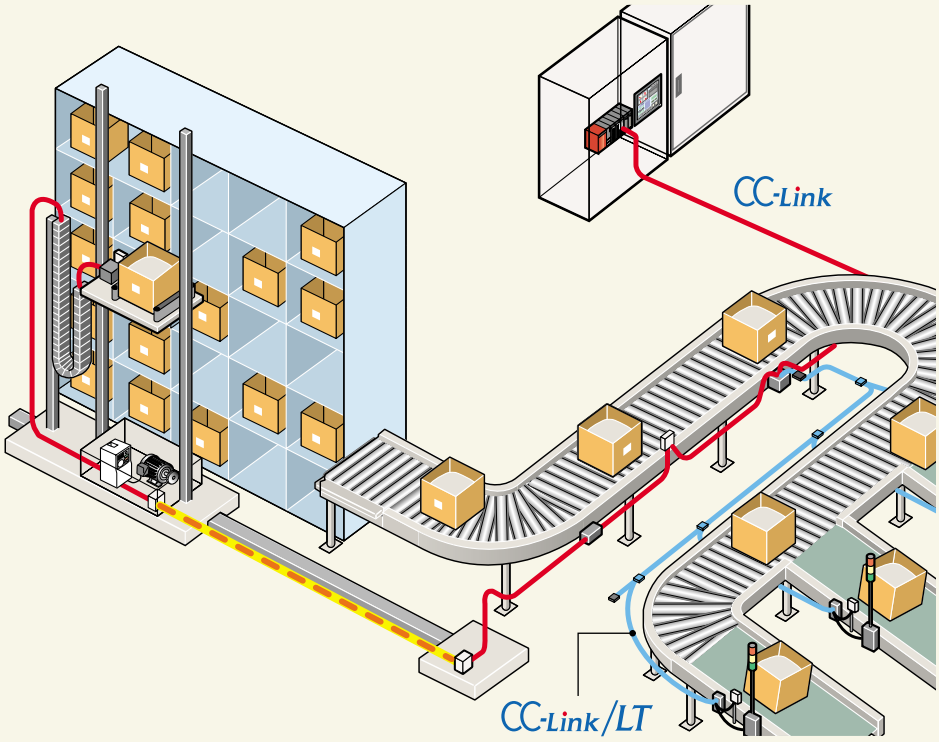


chose CC-Link!"

Networks is a key factor in various business applications.

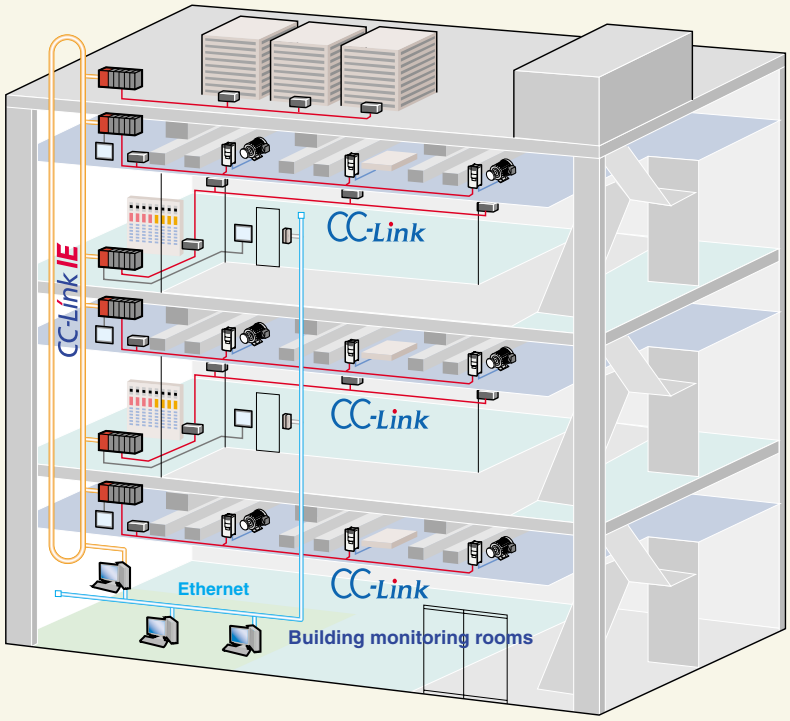
Material handling application

- Improved workability by repeaters — CC-Link
- Connection of various devices (Inverter, HMI) — CC-Link
- Cable specific to the application requirement. — CC-Link, CC-Link/LT
- Seamless communication using bridges — CC-Link/LT



Building management application

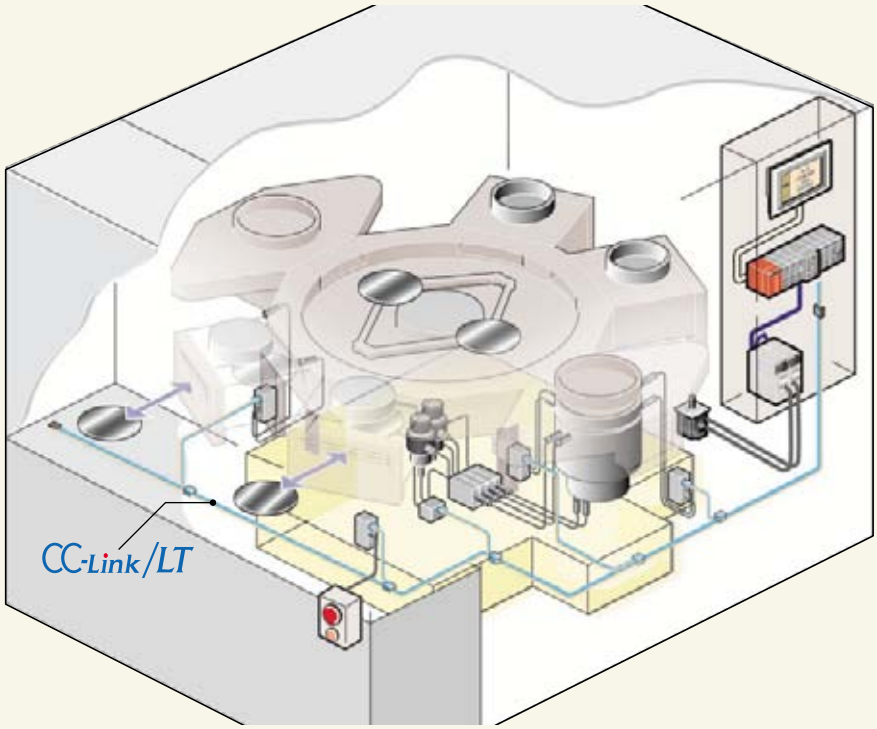
- The total cable distance up to 13.2 km by using repeaters — CC-Link
- Distributed control — CC-Link
- Seamless communication between Ethernet, CC-Link IE Controller Network and CC-Link — CC-Link



The CC-Link family is the best solution.

Semiconductor production application

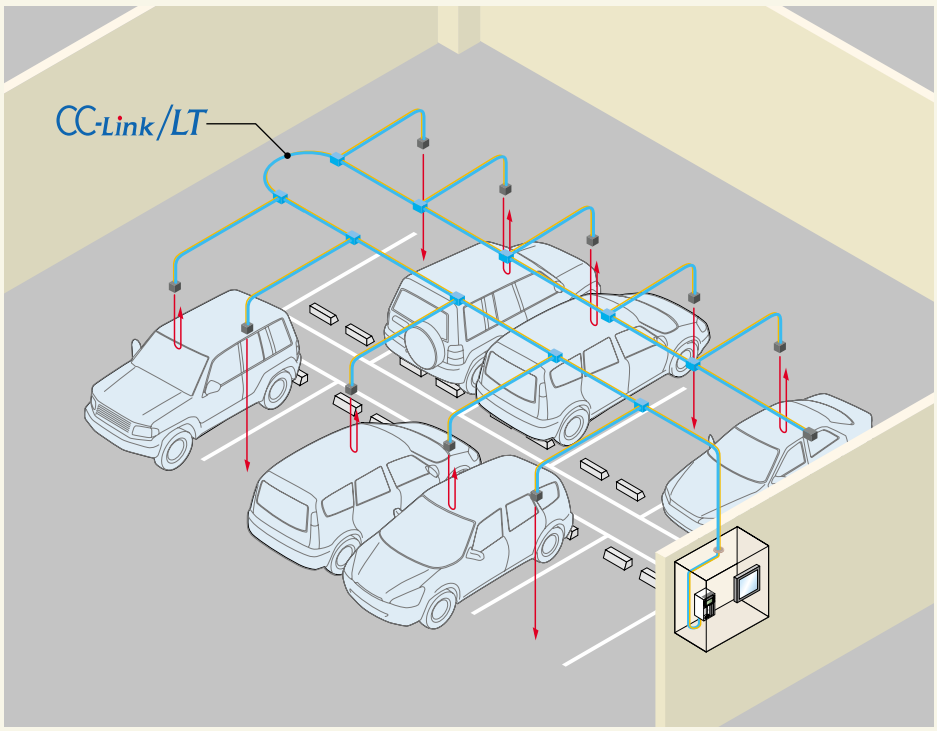
- High-speed transmission — CC-Link/LT
- High noise resistance — CC-Link
- Wire saving Small footprint — CC-Link/LT
- Compliant to EES. — CC-Link



Parking lot application

<FX3UC and CC-Link/LT combination>

- High speed transmission — CC-Link/LT
- Wire saving Small footprint — CC-Link/LT
- Parameter-free setup work — CC-Link/LT
- Easy installation and setting up — CC-Link/LT



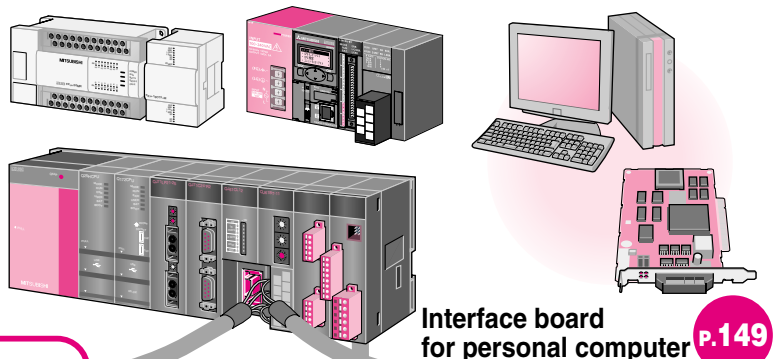
Memo

CC-Link

System Configuration Example

Master/Local modules

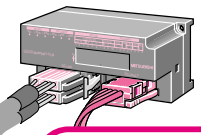
P.27



Interface board for personal computer P.149

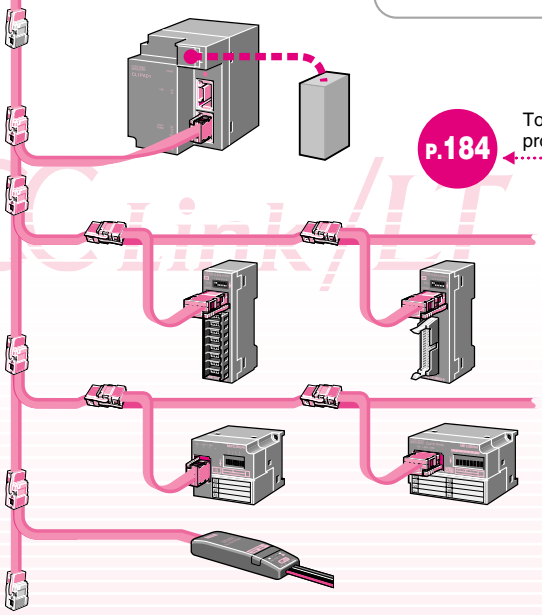
CC-Link-CC-Link/LT bridge module

P.197



CC-Link/LT

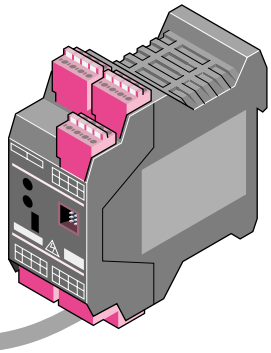
CC-Link



P.184 To CC-Link/LT products pages

Safety relay modules

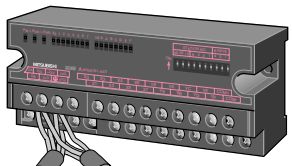
P.115

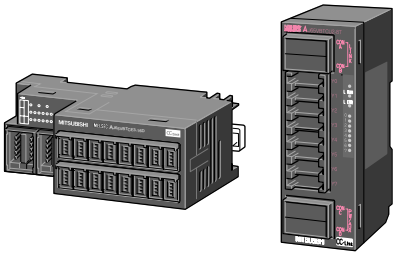


Remote I/O modules

P.35

A lineup of products supporting various applications

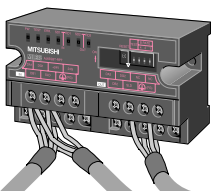




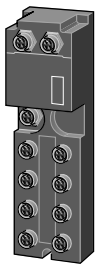
Repeater modules

P.155

Supporting various types of wiring such as T-branching or cable extension

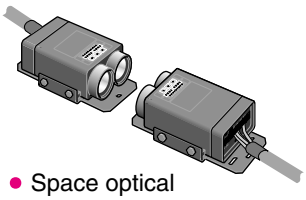


- Repeater module (T-branch)

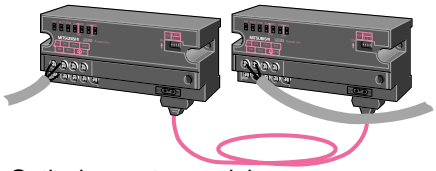


- Thin, waterproof type repeater hub module

- Spring clamp terminal block type repeater hub module



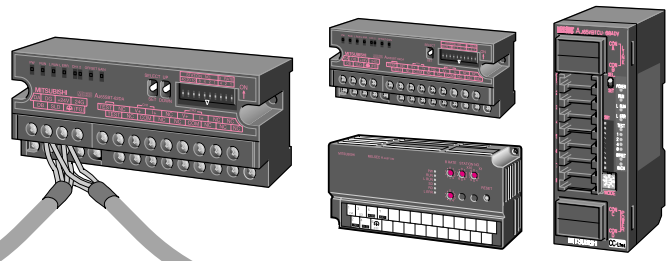
- Space optical repeater module



- Optical repeater module

Analog modules

P.121



Partner product

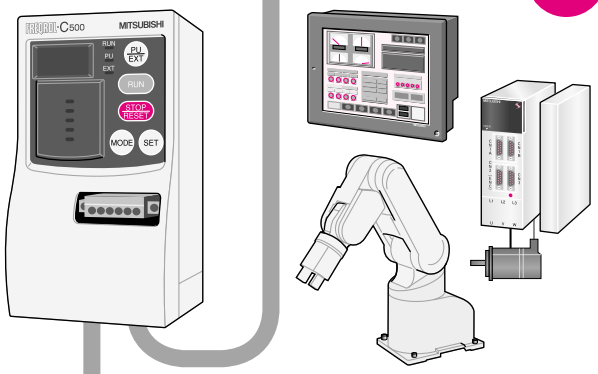
CC-Link Partner Association

Refer to the CC-Link Partner Association catalog

- Cables
- Robots
- Solenoid valves
- HMI
- Thermostats
- ID controllers and others

Other

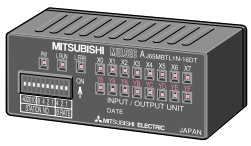
P.249



- Communication LSI dedicated to CC-Link P.247
- FX Series interface block P.251
- AC servo amplifier/Interface modules P.252
- Inverters P.253
- GOT P.255
- CNC (Computerized Numerical Control) P.257
- Industrial robots P.258
- Breaker P.259
- Energy measurement modules P.260
- Power measurement modules P.261
- Multi-circuit power measuring module P.262
- Protective relays P.263

Embedded modules

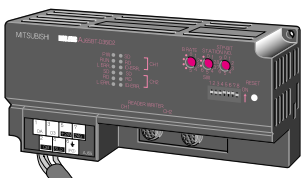
P.241



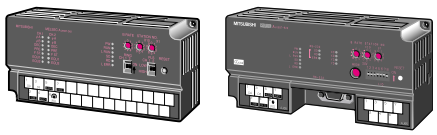
- Embedded I/O module P.241
- Interface board P.245

Special function modules

P.141



- High-speed counter modules P.141
- Positioning module P.143
- RS-232 interface module P.147



Optional parts P.169

Software P.249

Master/Local modules

Overview

Master modules applicable to various MELSEC CPU modules are available.

● For Q series
QJ61BT11N

Q master

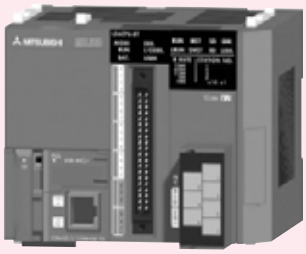
P.28

CC-Link V2

● For L series
L26CPU-BT(Sink output type)
L26CPU-PBT(Source output type)

L master

P.29



CC-Link V2

● For L series
LJ61BT11

L master

P.30

CC-Link V2

● For FX series
FX2N-16CCL-M

FX master

P.31

● For QnAS series
A1SJ61QBT11

QnAS master

P.32

● For AnS series
A1SJ61BT11

AnS master

P.33

Models

Product name	Model	Related manual
Master/local module for Q series	QJ61BT11N	User's Manual SH-080394E (13JR64)
CPU with master/local function for L series	L26CPU-BT	User's Manual SH-080895ENG (13JZ41)
CPU with master/local function for L series	L26CPU-PBT	User's Manual SH-080895ENG (13JZ41)
Master/local module for L series	LJ61BT11	User's Manual SH-080895ENG (13JZ41)
Master/local module for FX series	FX2N-16CCL-M	User's Manual JY992D93101 (09R710)
Master/local module for QnAS series	A1SJ61QBT11	User's Manual SH-66722 (13J873)
Master/local module for AnS series	A1SJ61BT11	User's Manual IB-66721 (13J872)

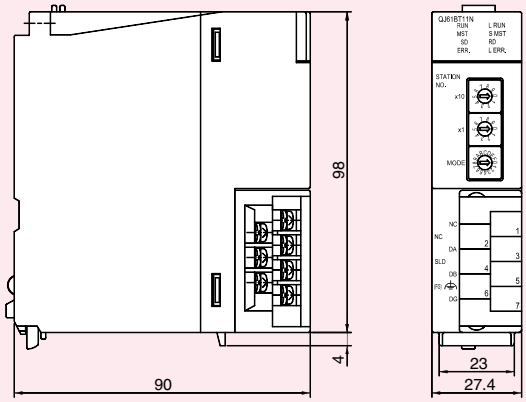
Q master

QJ61BT11N Master/local module (For Q series)

CC-Link V2

- Internal current consumption: 0.46A
- Weight: 0.12kg

■External dimensions

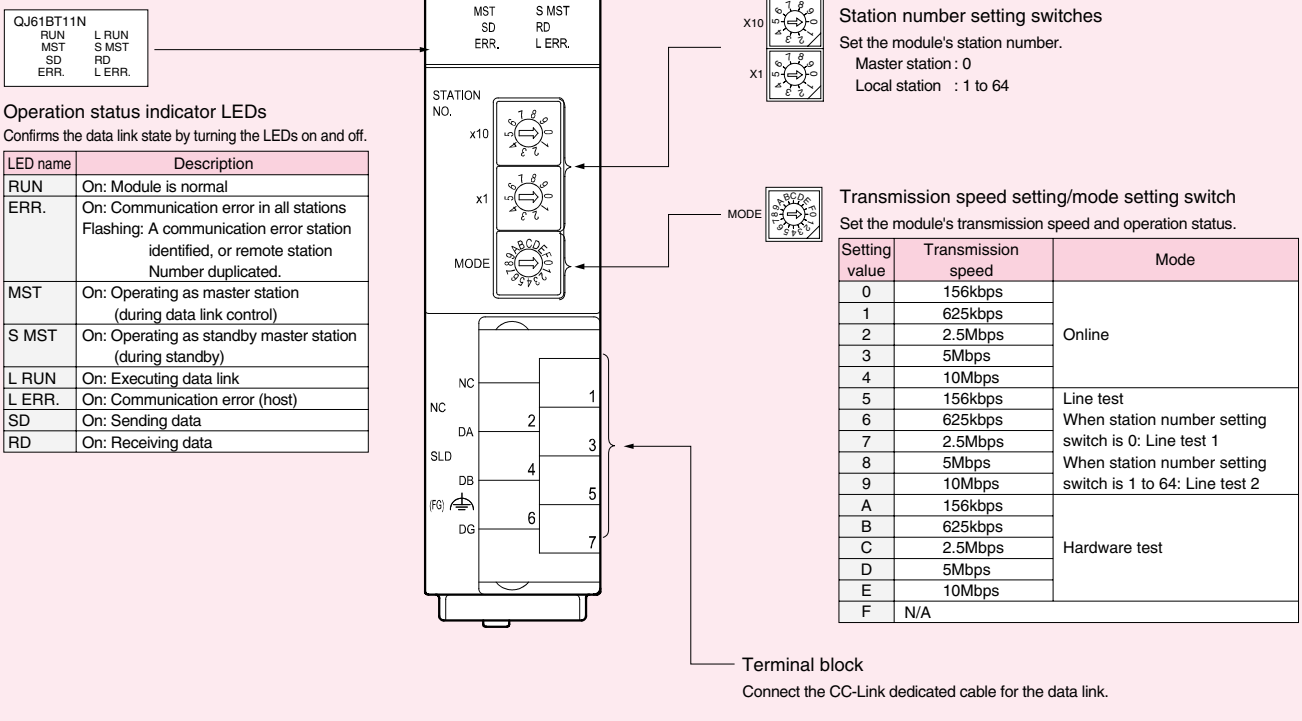


Unit:mm

■Applicable CPU module

		Mountable CPU model
CPU module	Basic model QCPU	Q00JCPU, Q00CPU, Q01CPU
	High Performance model QCPU	Q02CPU, Q02HCPU, Q06HCPU, Q12HCPU, Q25HCPU
	Process CPU	Q02PHCPU, Q06PHCPU, Q12PHCPU, Q25PHCPU
	Redundant CPU	Q12PRHCPU, Q25PRHCPU
	Universal model CPU	Q00UJCPU, Q00UCPU, Q01UCPU Q02UCPU, Q03UDCPU, Q04UDHCPU, Q06UDHCPU, Q10UDHCPU Q13UDHCPU, Q20UDHCPU, Q26UDHCPU, Q03UDECPU, Q04UDEHCPU Q06UDEHCPU, Q10UDEHCPU, Q13UDEHCPU, Q20UDEHCPU, Q26UDEHCPU, Q50UDEHCPU, Q100UDEHCPU
	C Controller Module	Q06CCPU-V, Q06CCPU-V-B, Q12DCCPU-V
Network module		QJ72LP25-25, QJ72LP25G, QJ72BR15

Part names and settings



Operation status indicator LEDs

Confirms the data link state by turning the LEDs on and off.

LED name	Description
RUN	On: Module is normal
ERR.	On: Communication error in all stations Flashing: A communication error station identified, or remote station Number duplicated.
MST	On: Operating as master station (during data link control)
S MST	On: Operating as standby master station (during standby)
L RUN	On: Executing data link
L ERR.	On: Communication error (host)
SD	On: Sending data
RD	On: Receiving data

Station number setting switches

Set the module's station number.

Master station : 0

Local station : 1 to 64

Transmission speed setting/mode setting switch

Set the module's transmission speed and operation status.

Setting value	Transmission speed	Mode
0	156kbps	Online
1	625kbps	
2	2.5Mbps	
3	5Mbps	
4	10Mbps	
5	156kbps	Line test
6	625kbps	When station number setting switch is 0: Line test 1
7	2.5Mbps	
8	5Mbps	When station number setting switch is 1 to 64: Line test 2
9	10Mbps	
A	156kbps	Hardware test
B	625kbps	
C	2.5Mbps	
D	5Mbps	
E	10Mbps	
F	N/A	

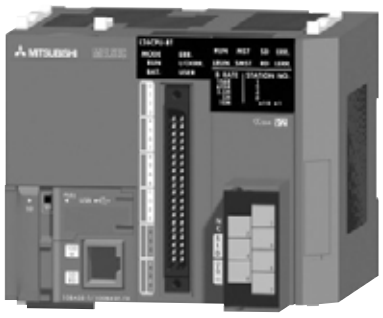
Terminal block

Connect the CC-Link dedicated cable for the data link.

Master/Local modules

L master

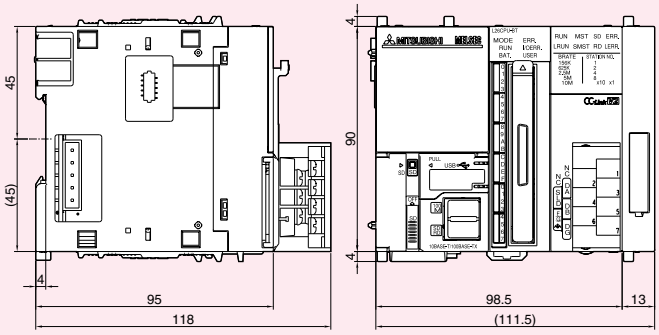
L26CPU-BT(Sink output type)/L26CPU-PBT(Source output type) CPU with master/local function (For L series)



CC-Link V2

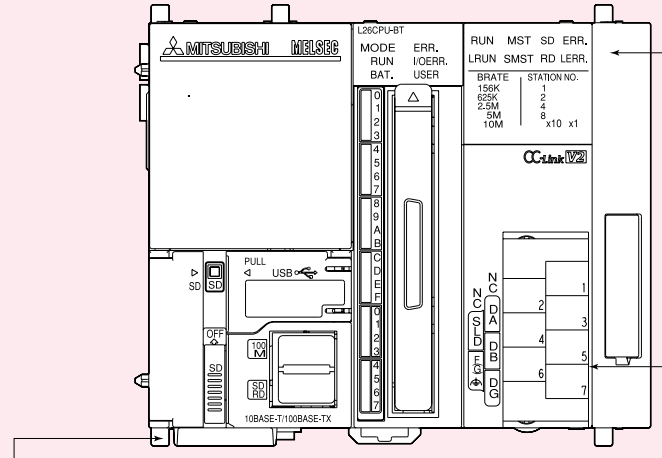
●Internal current consumption: 1.37A(Display unit not included)
●Weight: 0.53kg(END cover included)

■External dimensions



Unit:mm

Part names and settings



LED indicators
The data link status can be checked with each ON/OFF status.

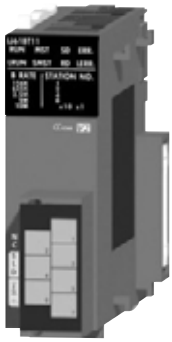
LED name	Description
RUN	On : Operating normally Off : Watchdog timer error
L RUN	On: Data link is being executed
MST	On: Operating as a master station. (in data link control)
S MST	On: Operating as a standby master station. (in standby status)
SD	On: Data being sent
RD	On: Data being received
ERR.	On: All stations have a communication error Flashing: A communication error station identified, or remote station No. duplicated.
L ERR.	On : Communication error (host) Flashing: The terminating resistor is not attached. The module or CC-Link Ver.1.10 compatible cable is affected by noise.
B RATE	On : Operating at the indicated transmission speed. All off: Transmission speed auto following up (When succeeded, the LED of the followed transmission speed lights up.)
STATION NO.	The module station number setting is indicated.

Serial No. display part

Terminal block
Connect the CC-Link dedicated cable for the data link.

L master

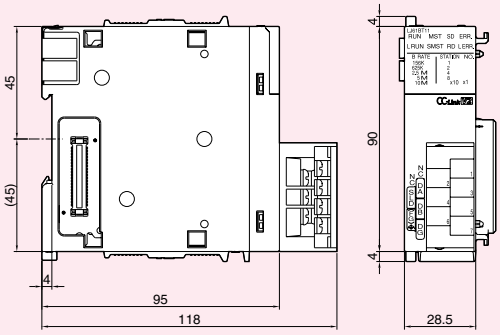
LJ61BT11 Master/local module (For L series)



CC-Link V2

●Internal current consumption: 0.46A
●Weight: 0.15kg

■External dimensions

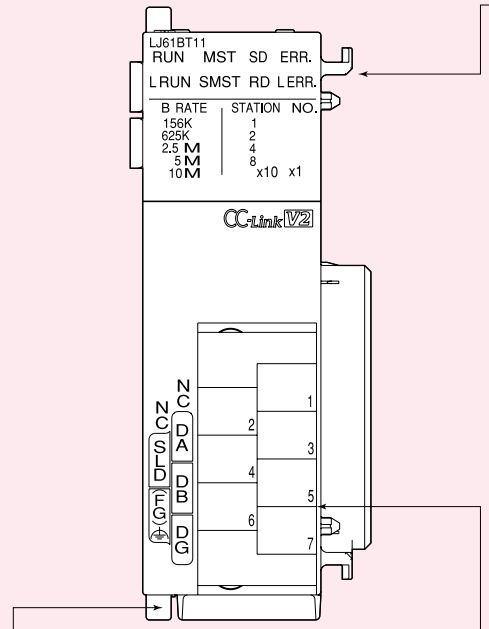


Unit:mm

■Applicable CPU module

Mountable CPU model	
CPU module	L02CPU, L26CPU-BT

Part names and settings



LED indicators
The data link status can be checked with each ON/OFF status.

LED name	Description
RUN	On : Operating normally Off : Watchdog timer error
L RUN	On: Data link is being executed
MST	On: Operating as a master station. (in data link control)
S MST	On: Operating as a standby master station. (in standby status)
SD	On: Data being sent
RD	On: Data being received
ERR.	On: All stations have a communication error Flashing: A communication error station identified, or remote station No. duplicated.
L ERR.	On : Communication error (host) Flashing: The terminating resistor is not attached. The module or CC-Link Ver.1.10 compatible cable is affected by noise.
B RATE	On : Operating at the indicated transmission speed. All off: Transmission speed auto following up (When succeeded, the LED of the followed transmission speed lights up.)
STATION NO.	The module station number setting is indicated.

Serial No. display part

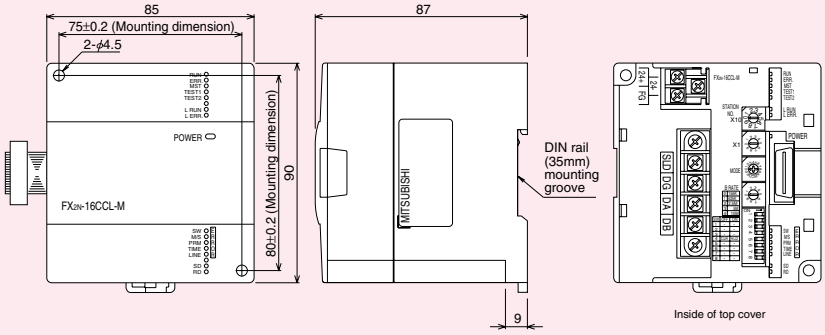
Terminal block
Connect the CC-Link dedicated cable for the data link.

Master/Local modules

FX master

FX2N-16CCL-M Master block (for FX series)

■External dimensions



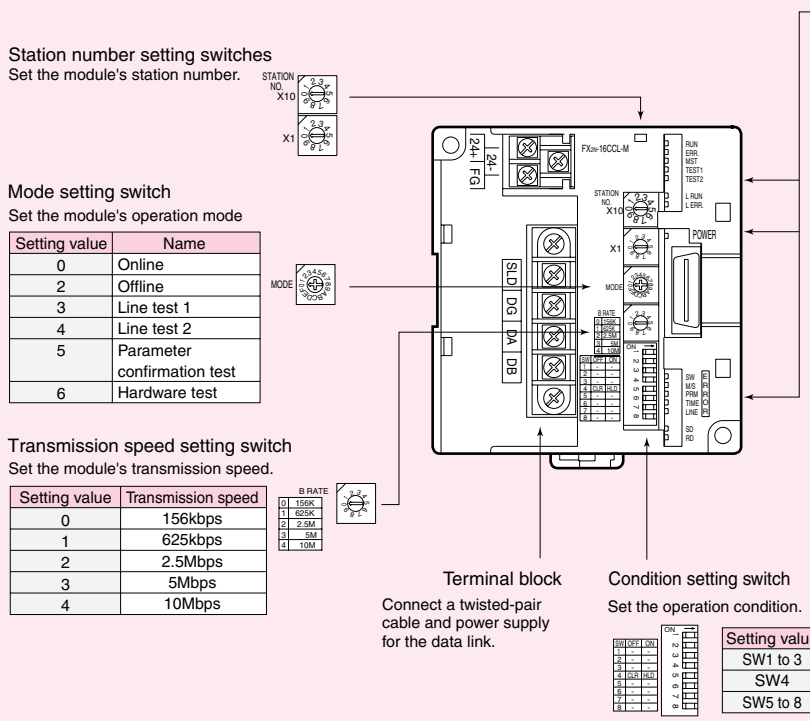
Unit: mm

●Internal current consumption: 5VDC supplied by the module itself
(The 5VDC supply of the programmable controller is not used.)
●External current consumption: 150mA (24VDC)
●Weight: 0.4kg

■Applicable CPU module

Mountable CPU model	
CPU module	FX1N, FX2N, FX3U, FX3G Series FX1NC, FX2NC, FX3UC Series (FX2NC-CNV-IF required)

Part names and settings



Station number setting switches
Set the module's station number.

Mode setting switch
Set the module's operation mode

Setting value	Name
0	Online
2	Offline
3	Line test 1
4	Line test 2
5	Parameter confirmation test
6	Hardware test

Transmission speed setting switch
Set the module's transmission speed.

Setting value	Transmission speed
0	156kbps
1	625kbps
2	2.5Mbps
3	5Mbps
4	10Mbps

Terminal block
Connect a twisted-pair cable and power supply for the data link.

Condition setting switch
Set the operation condition.

Setting value	Setting
SW1 to 3	(Not used)
SW4	Input data status of data link error station
SW5 to 8	(Not used)

Operation status indicator LEDs
The data link state can be checked by the LED states.

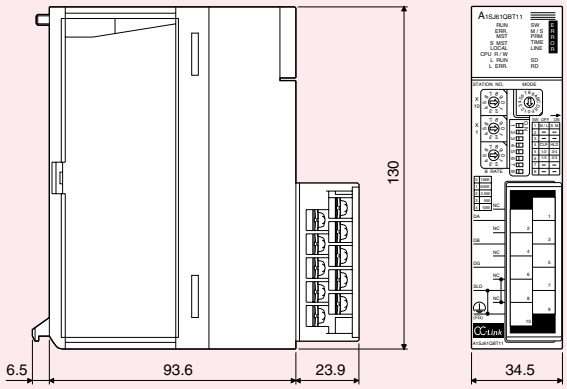
LED name		Description
RUN		On: The module is normal Off: Watch dog timer error
ERR.		Indicates the status of the communication with the station specified by the parameter. On: Communication errors at all stations Flashing: Data link error occurred at some station
MST		On: Set as master station
TEST1		Indicates the test result.
TEST2		Indicates the test result.
L RUN		On: Performing data link (its own station)
L ERR.		On: Communication error (its own station) Flashing: Some switch setting has been changed with the power on.
POWER		Turns on when external power of 24VDC is supplied.
SW		Some switch setting is erroneous.
ERROR	M/S	On: A master station already exists on the same network.
	PRM	On: Parameter setting is erroneous.
	TIME	On: Data link monitoring timer has been activated. (Error at all stations)
	LINE	On: A cable is disconnected, or the transmission path is affected by noise, etc.
SD		On: Sending data
RD		On: Receiving data

QnAS master

A1SJ61QBT11 Master/local module (For QnAS series)

●Internal current consumption: 0.4A
●Weight: 0.25kg

■External dimensions



■Applicable CPU module

Mountable CPU model	
CPU module	Q2ASCPU(S1), Q2ASHCPU(S1)
Network module	A1SJ72QLP25, A1SJ72QBR15

Part names and settings

Operation status indicator LEDs

LED name	Description
RUN	On: When module is normal.
ERR.	On: All stations communication error. Flashing:Communication error occurred in the station.
MST	On: It is set at the master station.
S MST	On: It is set at the standby master station.
LOCAL	On: It is set at the local station.
CPU R/W	On: It is communicating with programmable controller CPU.(FROM/TO)
ERROR	Lights up when an error occurs
L RUN	On: Data link is operating. (host station)
L ERR.	On: Communication error. (host station)
SD	On: Data being sent.
RD	On: Data being received.

Station number setting switches

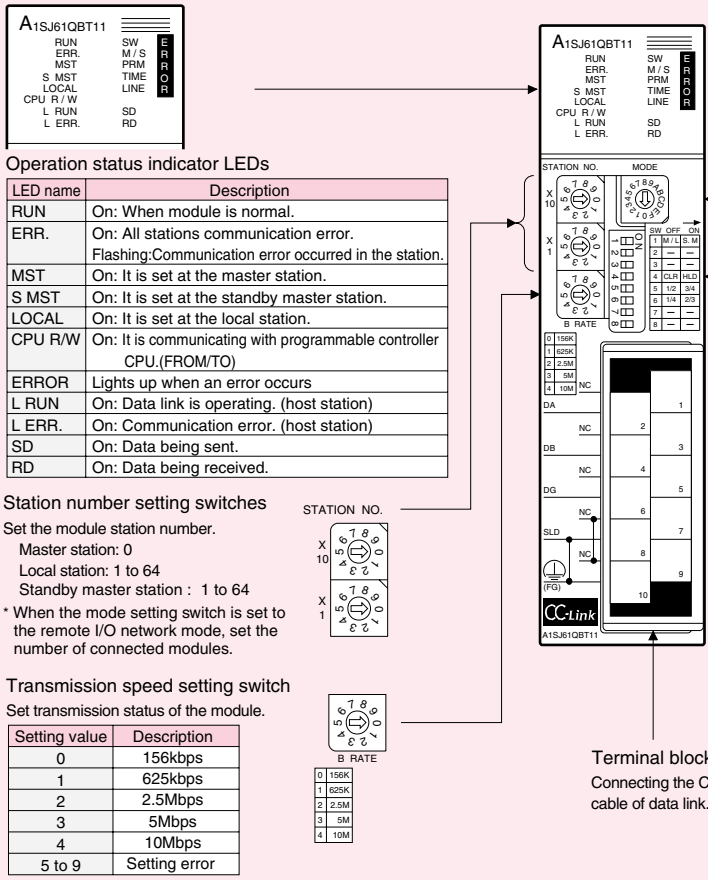
Set the module station number.
Master station: 0
Local station: 1 to 64
Standby master station : 1 to 64

* When the mode setting switch is set to the remote I/O network mode, set the number of connected modules.

Transmission speed setting switch

Set transmission status of the module.

Setting value	Description
0	156kbps
1	625kbps
2	2.5Mbps
3	5Mbps
4	10Mbps
5 to 9	Setting error



Terminal block

Connecting the CC-Link dedicated cable of data link.

Mode setting switch

Set the operation status of the module.

Setting value	Name	Description
0	Online (remote net mode)	Set when data link is made in remote net mode.
1	Online (remote I/O net mode)	Set when data link is made in remote I/O net mode.
2	Offline	Data-link disconnection status
3	Line test 1	–
4	Line test 2	–
5	Parameter confirmation test	–
6	Hardware test	–
7	N/A	Setting error ("SW" LED turn on)
8 to A	N/A	Setting prohibited due to internal use
B to F	N/A	Setting error ("SW" LED turn on)

Condition setting switches

Setting value	Setting contents	Description		
SW1	Station type	OFF: Master station/Local station ON : Standby master station		
SW2 SW3	N/A	Always OFF		
SW4	Input data status of the data link error station	OFF: Clear ON : Hold		
SW5 SW6	Number of occupied station	Number of occupied station	SW5	SW6
		1 station	OFF	OFF
		2 stations*	OFF	ON
		3 stations*	ON	ON
		4 stations	ON	OFF
SW7 SW8	N/A	Always OFF		

* Supported by the A1SJ61QBT11 hardware version G or later. For other versions, the number of occupied stations is set by SW5 only.
OFF: 1 station occupied
ON: 4 stations occupied
SW6 must be always OFF since its use is not allowed.

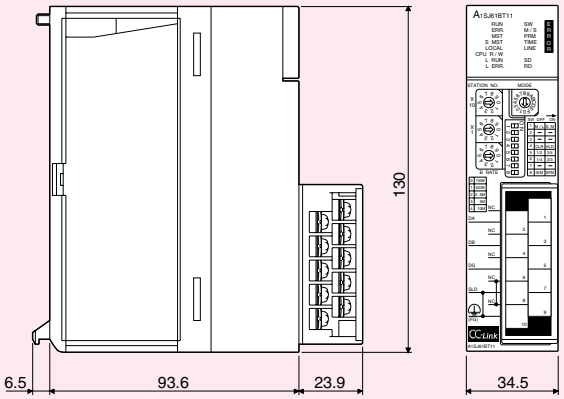
Master/Local modules

AnS master

A1SJ61BT11 Master/local module (for AnS series)

●Internal current consumption: 0.4A
●Weight: 0.25kg

■External dimensions

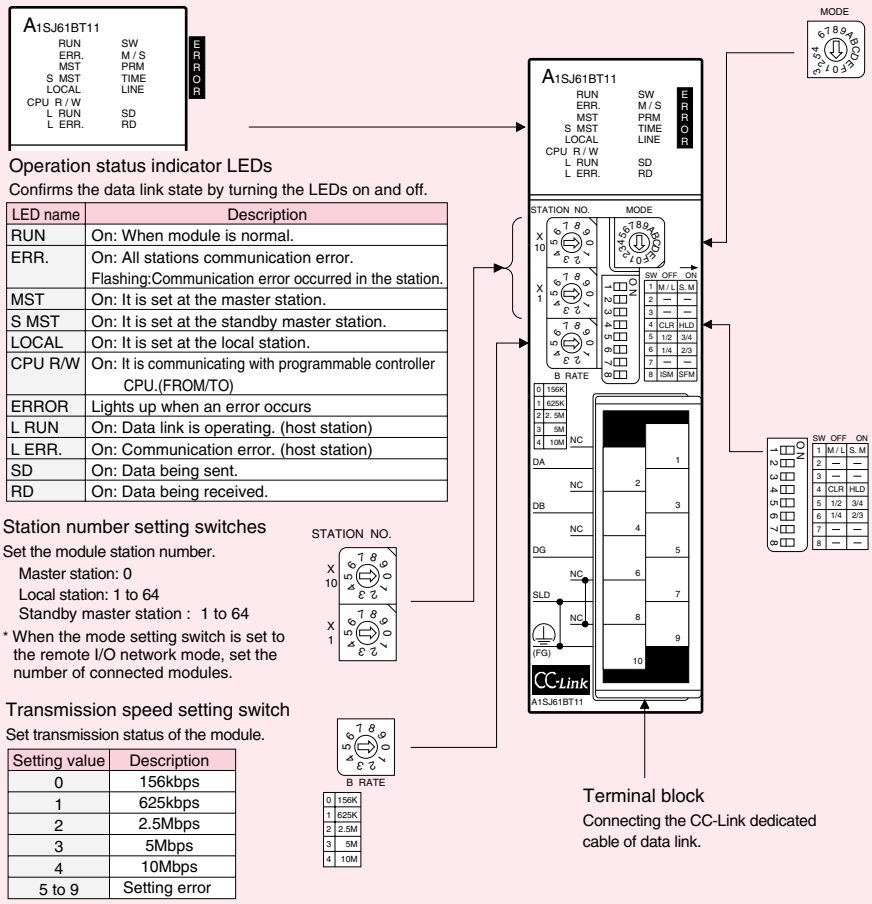


Unit: mm

■Applicable CPU module

Mountable CPU model	
CPU module	A1SCPU, A1SHCPU, A1SJCPU(S3), A1SJHCPU, A1SCPUC24-R2, A2SCPU, A2SHCPU, A2USCPU(S1), A2USHCPU-S1
Network module	A1SJ72QLP25, A1SJ72QBR15

Part names and settings



Operation status indicator LEDs

Confirms the data link state by turning the LEDs on and off.

LED name	Description
RUN	On: When module is normal.
ERR.	On: All stations communication error. Flashing:Communication error occurred in the station.
MST	On: It is set at the master station.
S MST	On: It is set at the standby master station.
LOCAL	On: It is set at the local station.
CPU R/W	On: It is communicating with programmable controller CPU.(FROM/TO)
ERROR	Lights up when an error occurs
L RUN	On: Data link is operating. (host station)
L ERR.	On: Communication error. (host station)
SD	On: Data being sent.
RD	On: Data being received.

Station number setting switches

Set the module station number.
Master station: 0
Local station: 1 to 64
Standby master station : 1 to 64

* When the mode setting switch is set to the remote I/O network mode, set the number of connected modules.

Transmission speed setting switch

Set transmission status of the module.

Setting value	Description
0	156kbps
1	625kbps
2	2.5Mbps
3	5Mbps
4	10Mbps
5 to 9	Setting error

Terminal block

Connecting the CC-Link dedicated cable of data link.

Mode setting switch

Set the operation status of the module.

Setting value	Name	Description
0	Online (remote net mode)	Set when data link is made in remote net mode.
1	Online (remote I/O net mode)	Set when data link is made in remote I/O net mode.
2	Offline	Data-link disconnection status
3	Line test 1	–
4	Line test 2	–
5	Parameter confirmation test	–
6	Hardware test	–
7	N/A	Setting error ("SW" LED turn on)
8 to A	N/A	Setting prohibited due to internal use
B to F	N/A	Setting error ("SW" LED turn on)

Condition setting switches

Setting value	Setting contents	Description		
SW1	Station type	OFF: Master station/Local station ON : Standby master station		
SW2 SW3	N/A	Always OFF		
SW4	Input data status of the data link error station	OFF: Clear ON : Hold		
SW5 SW6	Number of occupied station	Number of occupied station	SW5	SW6
		1 station	OFF	OFF
		2 stations*	OFF	ON
		3 stations*	ON	ON
		4 stations	ON	OFF
SW7 SW8	N/A	Always OFF		

*Supported by the A1SJ61BT11 hardware version G or later.
For other versions, the number of occupied stations is set by SW5 only.
OFF: 1 station occupied
ON : 4 stations occupied
SW6 must be always OFF since its use is not allowed.

Memo

Remote I/O modules

Overview

From a variety of products, you can select the optimum model that matches the connection method and I/O specifications of external devices.

● Screw terminal block type

Screw T. block

P.43

● Screw/2-piece terminal block type

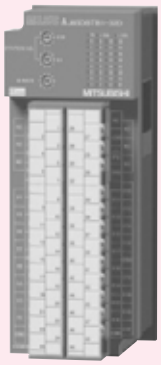
Screw T. block

P.65

● Screw/2-piece terminal block Dustproof type

Screw T. block

P.71



● Spring clamp terminal block push-in type, Spring clamp terminal block type

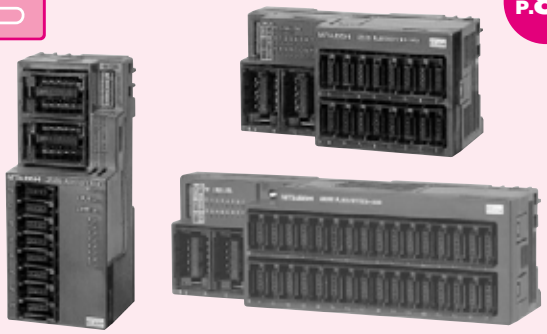
Spring clamp

P.77

● Sensor connector type (e-CON)

Sensor

P.85



● One-touch connector type

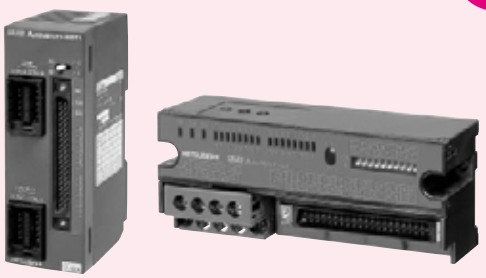
One-touch

P.95

● 40-pin connector (FCN connector type)

40-pin(FCN)

P.103



● Waterproof connector type

Waterproof

P.109

How to read Models

AJ65□BT□-□□□
(1) (2) (3) (4) (5) (6)

(1) Module type
F: Low profile waterproof type
S: Compact type
V: Connector type (compact)
None: Standard type
M: Module type
D: Dustproof type
A: Diagnostic function type

(2) Cable specifications
T: Twisted cable
(CC-Link dedicated cable)

(3) External load connection
A2: 2-wire output type with 8 M12 waterproof connectors
A4: 2- to 4-wire input type with 8 M12 waterproof connectors
A42: 2- to 4-wire input type or 2-wire output type with 8 M12 waterproof connectors
B1: Terminal block, single wire type (1 common)
B1B: Terminal block, single wire type (2 common)
B2: Terminal block, 2-wire type
B3: Terminal block, 3-wire type
B32: Terminal block, 3-wire type input or 2-wire output type
C1: One-touch connector, single wire type
C4: One-touch connector, 4-wire type
CF1: 40-pin connector (FCN connector), single wire type
CFJ1: 40-pin connector (FCN connector), shared power supply, single wire type
CU2: One-touch connector, 2-wire type
CU3: One-touch connector, 3-wire type
W4: Waterproof connector, 4-wire type
L1N: Lead type, single wire type
S2: Spring clamp terminal block, 2-wire type
S3: Spring clamp terminal block, 3-wire type
S32: Spring clamp terminal block, 3-wire type input or 2-wire output type
P3: Spring clamp terminal block push-in type, 3-wire type
CE2: Sensor connector (e-CON), 2-wire type
CE3: Sensor connector (e-CON), 2-wire type
CE32: Sensor connector (e-CON), 3-wire output or 2-wire input types
2B: 2-piece screw terminal block

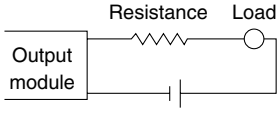
(4) I/O points
8: 8 points
16: 16 points
32: 32 points

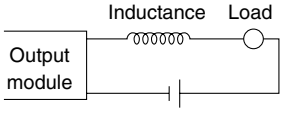
(5) I/O specifications
A: 100VAC input
D: 24VDC input
R: Relay output
S: Triac output
T: Transistor output
DT: 24VDC input, transistor output
DT1: DC input (input response speed: 0.2ms)/transistor output combination
DR: 24VDC/relay output combination
KD: With response speed switching function, 24VDC input
KDT2: With response speed switching function, 24VDC input/transistor output combination
KDT8: With response speed switching function, 12VDC, transistor output

(6) I/O types
E: Negative common (source) input type, source output type

Selection Considerations

(1) These modules are remote I/O modules dedicated to the CC-Link system. Do not connect them to any other data link system such as the MELSECNET/MINI.
(2) For the remote I/O modules, 32 points are assigned to one station.
When using a 16- or 8-point module, the rest of 16 or 24 points is left empty and is not available.
(3) When driving inductive loads with an output module, the maximum switching frequency must be 1 second or more for each of ON and OFF.
(4) If a counter or timer containing a DC/DC converter is used as a load for a transistor output module whose maximum load current is 0.1A, an inrush current will flow periodically when the module is ON or in operation. Therefore, selecting a module based on the average current only may cause a failure.
To avoid the effect of the inrush current in the case above, connect a resistance or inductance to the load in series, or use an output module of a larger maximum load current.





(5) Since the following output modules do not have the protection function, provide a protection circuit externally.
AJ65SBTB1-16T1, AJ65SBTB1-32T1, AJ65SBTB1-8T1, AJ65SBTB2-8T1, AJ65SBTB2-16T1, AJ65SBTC1-32T1, AJ65SBTB1-16DT2, AJ65SBTB1-32DT2, AJ65SBTB1-16DT3, AJ65SBTB1-32DT3, AJ65SBTB32-8DT2, AJ65SBTB32-16DT2, AJ65SBTC4-16DT2, AJ65SBTC1-32DT2, AJ65SBTC1-32DT3, AJ65VBTS2-16T, AJ65VBTS2-32T, AJ65VBTS32-16DT, and AJ65VBTS32-32DT.

Remote I/O modules

Models

Type		Model	Features			Page
			Input	Output	Others	
	Input module	AJ65SBTB2N-8A	AC input 8 pts; 100VAC 2-wire			44
		AJ65SBTB2N-16A	AC input 16 pts; 100VAC 2-wire			44
		AJ65SBTB1-8D	DC input 8 pts; +COM/-COM; 24VDC 1-wire			45
		AJ65SBTB3-8D	DC input 8 pts; +COM/-COM; 24VDC 3-wire			45
		AJ65SBTB1-16D	DC input 16 pts; +COM/-COM; 24VDC 1-wire			46
		AJ65SBTB1-16D1	DC input 16 pts; +COM/-COM; 24VDC 1-wire		High speed input	46
		AJ65SBTB3-16D	DC input 16 pts; +COM/-COM; 24VDC 3-wire			46
		AJ65SBTB3-16D5	DC input 16 pts; +COM/-COM; 5VDC 3-wire			47
		AJ65SBTB3-16KD	DC input 16 pts; +COM/-COM; 24VDC 3-wire			47
		AJ65SBTB1-32D	DC input 32 pts; +COM/-COM; 24VDC 1-wire			48
		AJ65SBTB1-32D1	DC input 32 pts; +COM/-COM; 24VDC 1-wire		High speed input	48
		AJ65SBTB1-32D5	DC input 32 pts; +COM/-COM; 5VDC 1-wire			48
		AJ65SBTB1-32KD	DC input 32 pts; +COM/-COM; 24VDC 1-wire			49
Screw T. block	Output module	AJ65SBTB1-8T		Transistor output 8 pts; Sink; 0.5A 1-wire	Protection	49
		AJ65SBTB1-8T1		Transistor output 8 pts; Sink; 0.5A 1-wire	Low leakage	49
		AJ65SBTB2-8T		Transistor output 8 pts; Sink; 0.5A 2-wire	Protection	50
		AJ65SBTB2-8T1		Transistor output 8 pts; Sink; 0.5A 2-wire	Low leakage	50
		AJ65SBTB1-16T		Transistor output 16 pts; Sink; 0.5A 1-wire	Protection	50
		AJ65SBTB1-16T1		Transistor output 16 pts; Sink; 0.5A 1-wire	Low leakage	50
		AJ65SBTB2-16T		Transistor output 16 pts; Sink; 0.5A 2-wire	Protection	51
		AJ65SBTB2-16T1		Transistor output 16 pts; Sink; 0.5A 2-wire	Low leakage	51
		AJ65SBTB1-32T		Transistor output 32 pts; Sink; 0.5A 1-wire	Protection	51
		AJ65SBTB1-32T1		Transistor output 32 pts; Sink; 0.5A 1-wire	Low leakage	51
		AJ65SBTB1-8TE		Transistor output 8 pts; Source; 0.1A 1-wire	Protection	52
		AJ65SBTB1-16TE		Transistor output 16 pts; Source; 0.1A 1-wire	Protection	52
		AJ65SBTB1B-16TE1		Transistor output 16 pts; Source; 0.5A 1-wire		53
		AJ65SBTB1-32TE1		Transistor output 32 pts; Source; 0.5A 1-wire		53

For the icons, refer to pages 273 to 274.

Type		Model	Features			Page
			Input	Output	Others	
Screw T. block	Output module	AJ65SBTB2N-8R		Relay output 8 pts / 2A 2-wire		54
		AJ65SBTB2N-16R		Relay output 16 pts / 2A 2-wire		54
		AJ65SBTB2N-8S		Triac output 8 pts / 0.6A 2-wire		55
		AJ65SBTB2N-16S		Triac output 16 pts / 0.6A 2-wire		55
	I/O combined module	AJ65SBTB32-8DT	DC input 4 pts / +COM / 24VDC 3-wire	Transistor output 4 pts / Sink / 0.5A 2-wire	Protection	56
		AJ65SBTB32-8DT2	DC input 4 pts / +COM / 24VDC 3-wire	Transistor output 4 pts / Sink / 0.5A 2-wire	Low leakage	56
		AJ65SBTB1-16DT	DC input 8 pts / +COM / 24VDC 1-wire	Transistor output 8 pts / Sink / 0.5A 1-wire	Protection	57
		AJ65SBTB1-16DT1	DC input 8 pts / +COM / 24VDC 1-wire	Transistor output 8 pts / Sink / 0.5A 1-wire	Protection	57
		AJ65SBTB1-16DT2	DC input 8 pts / +COM / 24VDC 1-wire	Transistor output 8 pts / Sink / 0.5A 1-wire	Low leakage	57
		AJ65SBTB1-16DT3	DC input 8 pts / +COM / 24VDC 1-wire	Transistor output 8 pts / Sink / 0.5A 1-wire	Low leakage	57
		AJ65SBTB32-16DT	DC input 8 pts / +COM / 24VDC 3-wire	Transistor output 8 pts / Sink / 0.5A 2-wire	Protection / High speed input	58
		AJ65SBTB32-16DT2	DC input 8 pts / +COM / 24VDC 3-wire	Transistor output 8 pts / Sink / 0.5A 2-wire	Low leakage	58
		AJ65SBTB32-16DR	DC input 8 pts / +COM -COM / 24VDC 3-wire	Relay output 8 pts / 2A 2-wire		59
		AJ65SBTB32-16KDT2	DC input 8 pts / +COM / 24VDC 3-wire	Relay output 8 pts / Sink / 0.5A 2-wire	Low leakage	60
		AJ65SBTB32-16KDT8	DC input 8 pts / +COM / 24VDC 3-wire	Relay output 8 pts / Sink / 0.5A 2-wire	Low leakage	60
		AJ65SBTB32-16KDR	DC input 8 pts / +COM -COM / 24VDC 3-wire	Relay output 8 pts / 2A 2-wire		61
		AJ65SBTB1-32DT	DC input 16 pts / +COM / 24VDC 1-wire	Transistor output 16 pts / Sink / 0.5A 1-wire	Protection	62
		AJ65SBTB1-32DT1	DC input 16 pts / +COM / 24VDC 1-wire	Transistor output 16 pts / Sink / 0.5A 1-wire	Protection / High speed input	62
		AJ65SBTB1-32DT2	DC input 16 pts / +COM / 24VDC 1-wire	Transistor output 16 pts / Sink / 0.5A 1-wire	Low leakage	62
		AJ65SBTB1-32DT3	DC input 16 pts / +COM / 24VDC 1-wire	Transistor output 16 pts / Sink / 0.5A 1-wire	High speed input / Low leakage	62
		AJ65SBTB1-32DTE1	DC input 16 pts / -COM / 24VDC 1-wire	Transistor output 16 pts / Source / 0.5A 1-wire		63
		AJ65SBTB1-32KDT2	DC input 16 pts / +COM / 24VDC 1-wire	Transistor output 16 pts / Sink / 0.5A 1-wire	Low leakage	64
		AJ65SBTB1-32KDT8	DC input 16 pts / +COM / 12VDC 1-wire	Transistor output 16 pts / Sink / 0.5A 1-wire	Low leakage	64
Screw/2-piece terminal block type	Input module	AJ65BTB1-16D	DC input 16 pts / +COM -COM / 24VDC 1-wire			66
		AJ65BTB2-16D	DC input 16 pts / +COM -COM / 24VDC 2-wire			66
	Output module	AJ65BTB1-16T		Transistor output 16 pts / Sink / 0.5A 1-wire		67
		AJ65BTB2-16T		Transistor output 16 pts / Sink / 0.5A 2-wire		67

Remote I/O modules

Models

Type			Model	Features			Page
				Input	Output	Others	
Screw terminal block type	Screw/2-piece terminal block type	Output module	AJ65BTB2-16R		Relay output 16 pts; 2.0A 2-wire		68
		I/O combined module	AJ65BTB1-16DT	DC input 8 pts; +COM; 24VDC 1-wire	Transistor output 8 pts; Sink; 0.5A 1-wire		69
			AJ65BTB2-16DT	DC input 8 pts; +COM; 24VDC 2-wire	Transistor output 8 pts; Sink; 0.5A 2-wire		70
			AJ65BTB2-16DR	DC input 8 pts; +COM; -COM; 24VDC 2-wire	Relay output 8 pts; 2.0A 2-wire		70
	Screw/2-piece terminal block Dustproof type	Input module	AJ65DBTB1-32D	DC input 32 pts; +COM; -COM; 24VDC 1-wire			72
		Output module	AJ65DBTB1-32T1		Transistor output 32 pts; Sink; 0.5A 1-wire	Low leakage	73
			AJ65DBTB1-32R		Relay output 32 pts; 2A 1-wire		74
		I/O combined module	AJ65DBTB1-32DT1	DC input 16 pts; +COM; 24VDC 1-wire	Transistor output 16 pts; Sink; 0.5A 1-wire		75
			AJ65DBTB1-32DR	DC input 16 pts; +COM; -COM; 24VDC 1-wire	Relay output 16 pts; Sink; 2A 1-wire		76
Spring clamp	Push-in type	Input module	AJ65ABTP3-16D NEW	DC input 16 pts; +COM; 24VDC 3-wire		Diagnostic function	79
			AJ65ABTP3-16DE NEW	DC input 16 pts; -COM; 24VDC 3-wire		Diagnostic function	80
		Input module	AJ65VBTS3-16D	DC input 16 pts; +COM; 24VDC 3-wire			81
			AJ65VBTS3-32D	DC input 32 pts; +COM; 24VDC 3-wire			81
		Output module	AJ65VBTS2-16T		Transistor output 16 pts; Sink; 0.5A 2-wire		82
			AJ65VBTS2-32T		Transistor output 32 pts; Sink; 0.5A 2-wire		82
		I/O combined module	AJ65VBTS32-16DT	DC input 8 pts; +COM; 24VDC 3-wire	Transistor output 8 pts; Sink; 0.5A 2-wire		83
			AJ65VBTS32-32DT	DC input 16 pts; +COM; 24VDC 3-wire	Transistor output 16 pts; Sink; 0.5A 2-wire		84
Sensor		Input module	AJ65VBTCE3-8D	DC input 8 pts; +COM; 24VDC 3-wire		Vertical	86
			AJ65VBTCE3-16D	DC input 16 pts; +COM; 24VDC 3-wire		Vertical	87
			AJ65VBTCE3-32D	DC input 32 pts; +COM; 24VDC 3-wire		Vertical	87
			AJ65VBTCE3-16DE	DC input 16 pts; -COM; 24VDC 3-wire		Vertical	88
			AJ65VBTCE3-32DE	DC input 32 pts; -COM; 24VDC 3-wire		Vertical	88
		Output module	AJ65VBTCE2-8T		Transistor output 8 pts; Sink; 0.1A 2-wire	Protection; Vertical	89
			AJ65VBTCE2-16T		Transistor output 16 pts; Sink; 0.1A 2-wire	Protection; Vertical	89
			AJ65VBTCE3-16TE NEW		Transistor output 16 pts; Source; 0.1A 3-wire	Protection; Vertical	90
		I/O combined module	AJ65VBTCE32-16DT	DC input 8 pts; +COM; 24VDC 3-wire	Transistor output 8 pts; Sink; 0.1A 2-wire	Protection; Vertical	91
			AJ65VBTCE3-16DTE NEW	DC input 8 pts; -COM; 24VDC 3-wire	Transistor output 8 pts; Source; 0.1A 3-wire	Protection; Vertical	92
			AJ65VBTCE32-32DT	DC input 16 pts; +COM; 24VDC 3-wire	Transistor output 16 pts; Sink; 0.1A 2-wire	Protection; Vertical	93

For the icons, refer to pages 273 to 274.

Type		Model	Features			Page
			Input	Output	Others	
Sensor	I/O combined module	AJ65VBTCE3-32DTE NEW	DC input 16 pts, +COM, 24VDC 3-wire	Transistor output 16 pts, Source, 0.1A 3-wire, Protection	Vertical	94
One-touch	Input module	AJ65VBTCU3-8D1	DC input 8 pts, +COM, 24VDC 3-wire		Vertical, High speed input	97
		AJ65VBTCU3-16D1	DC input 16 pts, +COM, 24VDC 3-wire		Vertical, High speed input	97
		AJ65SBTC4-16DN	DC input 16 pts, +COM, 24VDC 4-wire			98
		AJ65SBTC4-16DE	DC input 16 pts, -COM, 24VDC 4-wire			98
		AJ65SBTC1-32D	DC input 32 pts, +COM, -COM, 24VDC 1-wire			99
		AJ65SBTC1-32D1	DC input 32 pts, +COM, -COM, 24VDC 1-wire		High speed input	99
	Output module	AJ65VBTCU2-8T		Transistor output 8 pts, Sink, 0.1A 2-wire, Protection	Vertical	99
		AJ65VBTCU2-16T		Transistor output 16 pts, Sink, 0.1A 2-wire, Protection	Vertical	100
		AJ65SBTC1-32T		Transistor output 32 pts, Sink, 0.1A 1-wire, Protection		100
		AJ65SBTC1-32T1		Transistor output 32 pts, Sink, 0.1A 1-wire	Low leakage	100
	I/O combined module	AJ65SBTC4-16DT	DC input 8 pts, +COM, 24VDC 4-wire	Transistor output 8 pts, Sink, 0.5A 4-wire, Protection		101
		AJ65SBTC4-16DT2	DC input 8 pts, +COM, 24VDC 4-wire	Transistor output 8 pts, Sink, 0.5A 4-wire	Low leakage	101
		AJ65SBTC1-32DT	DC input 16 pts, +COM, 24VDC 1-wire	Transistor output 16 pts, Sink, 0.1A 1-wire, Protection		102
		AJ65SBTC1-32DT1	DC input 16 pts, +COM, 24VDC 1-wire	Transistor output 16 pts, Sink, 0.1A 1-wire, Protection	High speed input	102
		AJ65SBTC1-32DT2	DC input 16 pts, +COM, 24VDC 1-wire	Transistor output 16 pts, Sink, 0.1A 1-wire	Low leakage	102
		AJ65SBTC1-32DT3	DC input 16 pts, +COM, 24VDC 1-wire	Transistor output 16 pts, Sink, 0.1A 1-wire	High speed input, Low leakage	102
40-pin(FCN)	Input module	AJ65SBTCF1-32D	DC input 32 pts, +COM, -COM, 24VDC 1-wire			105
	Output module	AJ65SBTCF1-32T		Transistor output 32 pts, Sink, 0.1A 1-wire, Protection		105
	I/O combined module	AJ65SBTCF1-32DT	DC input 16 pts, +COM, -COM, 24VDC 1-wire	Transistor output 16 pts, Sink, 0.1A 1-wire, Protection		106
		AJ65VBTCF1-32DT1	DC input 16 pts, +COM, -COM, 24VDC 1-wire	Transistor output 16 pts, Sink, 0.1A 1-wire, Protection	High speed input	107
		AJ65VBTCFJ1-32DT1	DC input 16 pts, +COM, 24VDC 1-wire	Transistor output 16 pts, Sink, 0.1A 1-wire, Protection	High speed input, Shared power-supply 24V I/O	108
Waterproof	Input module	AJ65FBTA4-16D	DC input 16 pts, +COM, 24VDC 2-wire to 24VDC 4-wire			111
		AJ65FBTA4-16DE	DC input 16 pts, -COM, 24VDC 2-wire to 24VDC 4-wire			111
	Output module	AJ65FBTA2-16T		Transistor output 16 pts, Sink, 0.5A 2-wire, Protection		112
		AJ65FBTA2-16TE		Transistor output 16 pts, Source, 1.0A 2-wire, Protection		112
	I/O combined module	AJ65FBTA42-16DT	DC input 8 pts, +COM, 24VDC 2-wire to 24VDC 4-wire	Transistor output 8 pts, Sink, 0.5A 2-wire, Protection		113
		AJ65FBTA42-16DTE	DC input 8 pts, -COM, 24VDC 2-wire to 24VDC 4-wire	Transistor output 8 pts, Source, 1.0A 2-wire, Protection		113

Remote I/O modules

Models

For the icons, refer to pages 273 to 274.

Type		Model	Features			Page
			Input	Output	Others	
Embedded Refer to page 241 and later pages.	Input module	AJ65MBTL1N-16D	DC input 16 pts, +COM, Input V. 24VDC			242
	Input module	AJ65MBTL1N-32D	DC input 32 pts, +COM, Input V. 24VDC			242
	Output module	AJ65MBTL1N-16T		Transistor output 16 pts, Sink, Output load current 0.1A	Protection	243
	Output module	AJ65MBTL1N-32T		Transistor output 32 pts, Sink, Output load current 0.1A	Protection	243
	I/O combined module	AJ65MBTL1N-16DT	DC input 8 pts, +COM, Input V. 24VDC	Transistor output 8 pts, Sink, Output load current 0.1A	Protection	244

Memo

Remote I/O modules

Screw T. block

Screw terminal block type

Overview

Screw terminal block type

* The actual modules may slightly differ in shapes from the photos shown.

Features

- The use of self-up screws reduces wiring works. The round solderless terminal can be directly connected with the self-up screw by simply unfastening the terminal block screw.
- The protector covering the terminal block prevents the user from touching charged parts, allowing direct installation to a target machine.
- The module can be mounted in six orientations.

Part names and settings

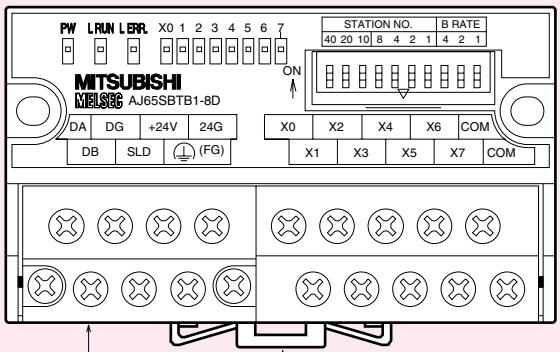
Station number setting switches
Select "10", "20" or "40" to set the tens place of the station number.
Select "1", "2", "4" or "8" to set the ones place of the station number.
Always set the station number within the range of 1 to 64.

Transmission speed setting switches

Setting value	Switch status 4	2	1	Transmission speed
0	OFF	OFF	OFF	156kbps
1	OFF	OFF	ON	625kbps
2	OFF	ON	OFF	2.5Mbps
3	OFF	ON	ON	5Mbps
4	ON	OFF	OFF	10Mbps

Operation status indicator LEDs

LED name	Description
PW	On: Power supply ON Off: Power supply OFF
L RUN	On: Normal communication Off: Communication shut off (time expiration error)
L ERR	On: Communication data error Flashing regularly: Indicates that the station number setting or transmission speed setting switch position was changed while power is ON Flashing irregularly: When the setting of the terminal resistor is wrong; when the cable for the module or CC-Link is affected by noise Off: Normal communication
X0 to 7F	On: Input ON Off: Input OFF



Terminal block

DIN rail hook
This hook is used to mount the module on the DIN rail.

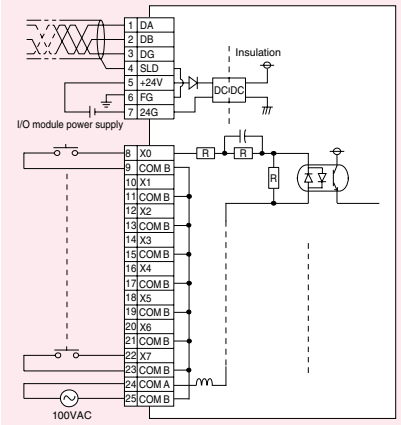
Input module
AJ65SBTB2N-8A

AC input 8 pts | 100VAC 2-wire | Screw T. block

Detailed specifications

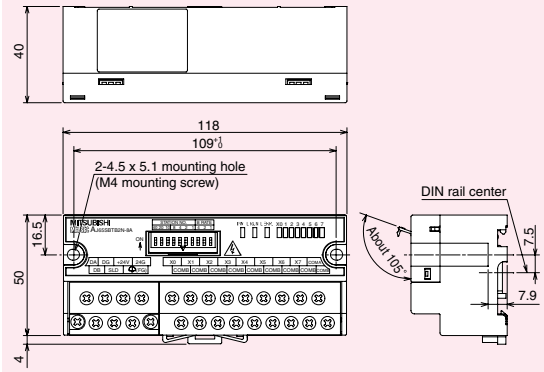
Input specifications		Description
Number of input points		8 points
Isolation method		Photocoupler
Rated input voltage/frequency		100 to 120VAC 50/60Hz
Rated input current		Approx.7mA (100VAC 60Hz)
Operating voltage range		85 to 132VAC (50/60 Hz ±3Hz (within 5% of distortion rate))
Maximum number of simultaneous input points		100% simultaneous ON (when 110VAC) 60% simultaneous ON (when 132VAC)
Inrush current		Max. 200mA within 1ms (when 132VAC)
ON voltage/ON current		80VAC or higher /3.5mA or higher
OFF voltage/OFF current		30VAC or lower /1.7mA or lower
Input resistance		Approx.15kΩ (60Hz), Approx. 18kΩ (50Hz)
Response time	OFF→ ON	20ms or lower (when 100VAC 60Hz)
	ON→ OFF	20ms or lower (when 100VAC 60Hz)
Wiring method for common		8 points/common (terminal block 2-wire type)
Number of occupied stations		1 station 32 points assignment (use 8 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio:within 5%)
	Current	35mA or lower (When 24VDC,all points ON)
Noise immunity		AC type noise voltage 1500Vp-p, DC type noise voltage 500Vp-p, noise width 1µs, noise frequency 25 to 60Hz (noise simulator condition) Fast transient/burst noise IEC61000-4-4: 1kV
Withstand voltage		1780VAC rms/3 cycles between all AC external terminals and ground (2000 m above sea level) 500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher,measured with a 500VDC insulation resistance tester between all AC external terminals and ground 10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Weight		0.20kg

External device connection diagram



External dimensions & terminal layout

Unit: mm



X0	X1	X2	X3	X4	X5	X6	X7	COMA
COMB	COMB	COMB	COMB	COMB	COMB	COMB	COMB	COMB

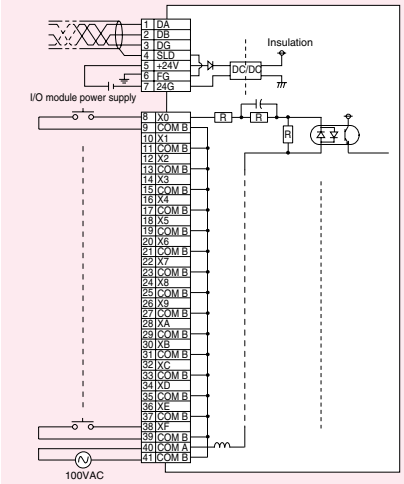
Input module
AJ65SBTB2N-16A

AC input 16 pts | 100VAC 2-wire | Screw T. block

Detailed specifications

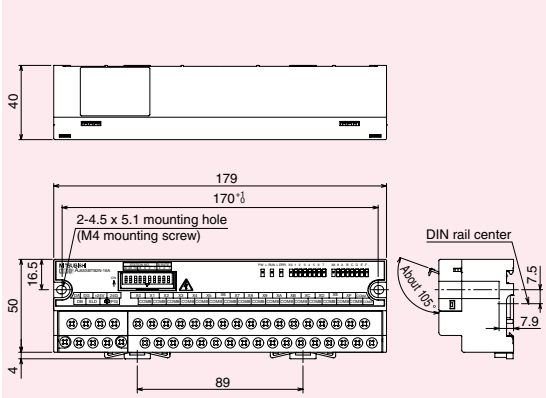
Input specifications		Description
Number of input points		16 points
Isolation method		Photocoupler
Rated input voltage/frequency		100 to 120VAC 50/60Hz
Rated input current		Approx.7mA (100VAC 60Hz)
Operating voltage range		85 to 132VAC (50/60 Hz ±3Hz (within 5% of distortion rate))
Maximum number of simultaneous input points		100% simultaneous ON (when 110VAC) 60% simultaneous ON (when 132VAC)
Inrush current		Max. 200mA within 1ms (when 132VAC)
ON voltage/ON current		80VAC or higher /5mA or higher
OFF voltage/OFF current		30VAC or lower /1.7mA or lower
Input resistance		Approx.15kΩ (60Hz), Approx. 18kΩ (50Hz)
Response time	OFF→ ON	20ms or lower (when 100VAC 60Hz)
	ON→ OFF	20ms or lower (when 100VAC 60Hz)
Wiring method for common		16 points/common (terminal block 2-wire type)
Number of occupied stations		1 station 32 points assignment (use 16 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio:within 5%)
	Current	40mA or lower (When 24VDC,all points ON)
Noise immunity		AC type noise voltage 1500Vp-p, DC type noise voltage 500Vp-p, noise width 1µs, noise frequency 25 to 60Hz (noise simulator condition) Fast transient/burst noise IEC61000-4-4: 1kV
Withstand voltage		1780VAC rms/3 cycles between all AC external terminals and ground (2000m above sea level) 500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher,measured with a 500VDC insulation resistance tester between all AC external terminals and ground 10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Weight		0.20kg

External device connection diagram



External dimensions & terminal layout

Unit: mm



X0	X1	X2	X3	X4	X5	X6	X7	X8	X9	XA	XB	XC	XD	XE	XF	COM A
COM B	COM B	COM B	COM B	COM B	COM B	COM B	COM B	COM B	COM B	COM B	COM B	COM B	COM B	COM B	COM B	COM B

Screw T. block

Screw terminal block type

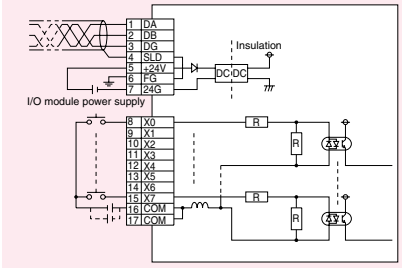
Input module
AJ65SBTB1-8D

DC input 8 pts | +COM -COM | 24VDC 1-wire | Screw T. block

■ Detailed specifications

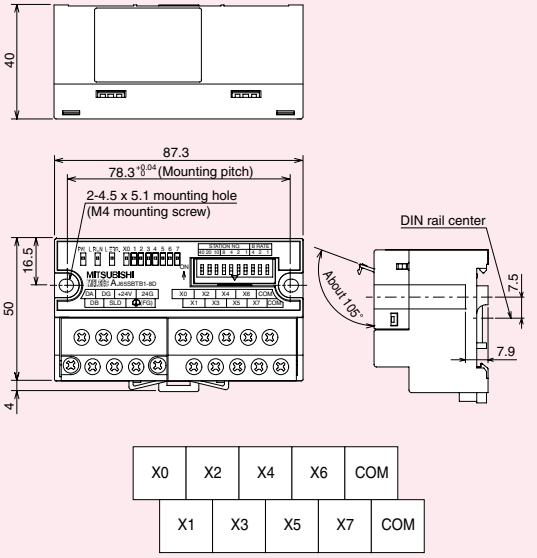
Input specifications		Description
Number of input points		8 points
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 7mA
Operating voltage range		19.2 to 26.4VDC (ripple ratio: within 5%)
Maximum number of simultaneous input points		100%
ON voltage/ON current		14V or higher/3.5mA or higher
OFF voltage/OFF current		6V or lower/1.7mA or lower
Input resistance		Approx. 3.3kΩ
Response time	OFF→ON	1.5ms or lower (when 24VDC)
	ON→OFF	1.5ms or lower (when 24VDC)
Wiring method for common		8 points/common (2 points) (terminal block 1-wire type)
Input format		Positive/negative common shared type (sink/source shared type)
Number of occupied stations		1 station 32 points assignment (use 8 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	30mA or lower (when 24VDC,all points ON)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Protection level		IP2X
Weight		0.14kg

■ External device connection diagram



■ External dimensions & terminal layout

Unit: mm



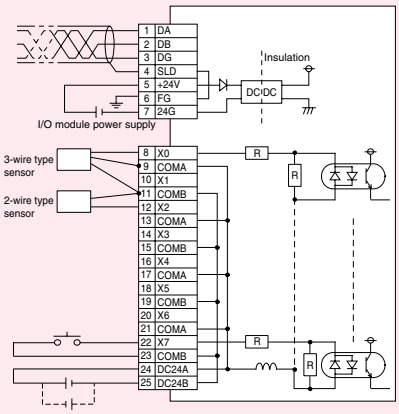
Input module
AJ65SBTB3-8D

DC input 8 pts | +COM -COM | 24VDC 3-wire | Screw T. block

■ Detailed specifications

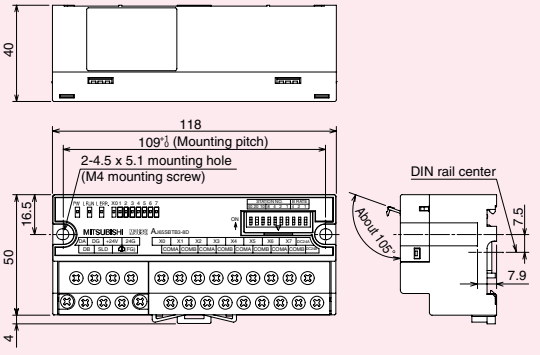
Input specifications		Description
Number of input points		8 points
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 7mA
Operating voltage range		19.2 to 26.4VDC (ripple ratio: within 5%)
Maximum number of simultaneous input points		100%
ON voltage/ON current		14V or higher/3.5mA or higher
OFF voltage/OFF current		6V or lower/1.7mA or lower
Input resistance		Approx. 3.3kΩ
Response time	OFF→ON	1.5ms or lower (when 24VDC)
	ON→OFF	1.5ms or lower (when 24VDC)
Wiring method for common		8 points/common (terminal block 3-wire type)
Input format		Positive/negative common shared type (sink/source shared type)
Number of occupied stations		1 station 32 points assignment (use 8 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	40mA or lower (when 24VDC,all points ON)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs,noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Protection level		IP2X
Weight		0.18kg

■ External device connection diagram



■ External dimensions & terminal layout

Unit: mm



X0	X1	X2	X3	X4	X5	X6	X7	DC 24A
COMA	COMB	COMA	COMB	COMA	COMB	COMA	COMB	DC 24B

Input module
AJ65SBTB1-16D

DC input 16pts | +COM -COM | 24VDC 1-wire | Screw T. block

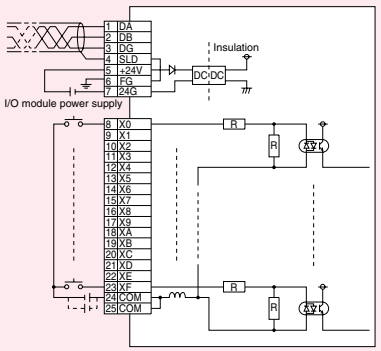
Input module
AJ65SBTB1-16D1

DC input 16pts | +COM -COM | 24VDC 1-wire | Screw T. block | High speed input

Detailed specifications

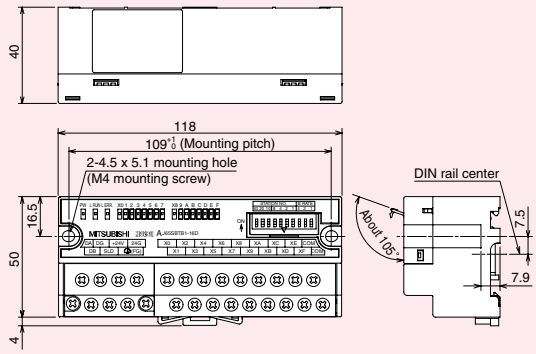
Input specifications		Description	
		AJ65SBTB1-16D	AJ65SBTB1-16D1
Number of input points		16 points	
Isolation method		Photocoupler	
Rated input voltage		24VDC	
Rated input current		Approx. 7mA	Approx. 5mA
Operating voltage range		19.2 to 26.4VDC (ripple ratio:within 5%)	
Maximum number of simultaneous input points		100%	
ON voltage/ON current		14V or higher/ 3.5mA or higher	15V or higher/ 3mA or higher
OFF voltage/OFF current		6V or lower/1.7mA or lower	3V or lower/0.5mA or lower
Input resistance		Approx. 3.3kΩ	Approx. 4.7kΩ
Response time	OFF→ON	1.5ms or lower (when 24VDC)	0.2ms or lower (when 24VDC)
	ON→OFF	1.5ms or lower (when 24VDC)	0.2ms or lower (when 24VDC)
Wiring method for common		16 points/common (2 points) (terminal block 1-wire type)	
Input format		Positive/negative common shared type (sink/source shared type)	
Number of occupied stations		1 station 32 points assignment (use 16 points)	
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)	
	Current	35mA or lower	40mA or lower
		(when 24VDC, all points ON)	
Noise immunity		DC type noise voltage 500 Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)	
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground	
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground	
Protection level		IP2X	
Weight		0.18kg	

External device connection diagram



External dimensions & terminal layout

Unit: mm



X0	X2	X4	X6	X8	XA	XC	XE	COM
X1	X3	X5	X7	X9	XB	XD	XF	COM

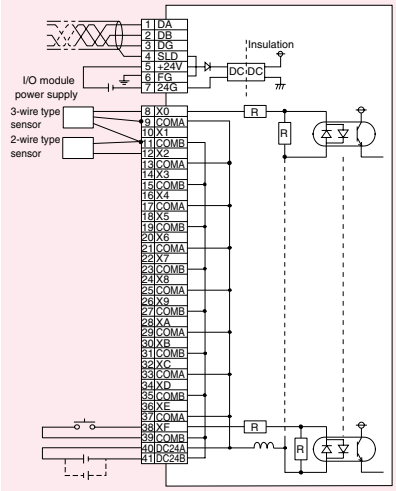
Input module
AJ65SBTB3-16D

DC input 16pts | +COM -COM | 24VDC 3-wire | Screw T. block

Detailed specifications

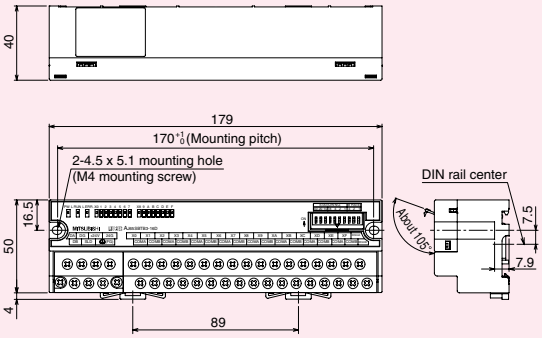
Input specifications		Description
Number of input points		16 points
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 7mA
Operating voltage range		19.2 to 26.4VDC (ripple ratio: within 5%)
Maximum number of simultaneous input points		100%
ON voltage/ON current		14V or higher/3.5mA or higher
OFF voltage/OFF current		6V or lower/1.7mA or lower
Input resistance		Approx. 3.3kΩ
Response time	OFF→ON	1.5ms or lower (when 24VDC)
	ON→OFF	1.5ms or lower (when 24VDC)
Wiring method for common		16 points/common (terminal block 3-wire type)
Input format		Positive/negative common shared type (sink/source shared type)
Number of occupied stations		1 station 32 points assignment (use 16 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	45mA or lower (when 24VDC, all points ON)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Protection level		IP2X
Weight		0.25kg

External device connection diagram



External dimensions & terminal layout

Unit: mm



X0	X1	X2	X3	X4	X5	X6	X7	X8	X9	XA	XB	XC	XD	XE	XF	DC 24A
COM A	COM B	COM A	COM B	COM A	COM B	COM A	COM B	COM A	COM B	COM A	COM B	COM A	COM B	COM A	COM B	DC 24B

Screw T. block

Screw terminal block type

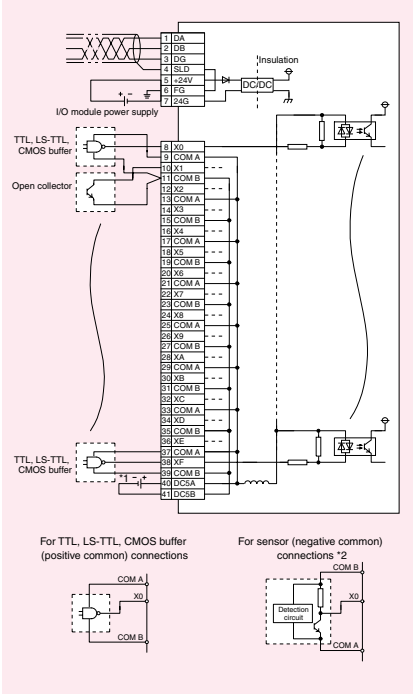
Input module
AJ65SBTB3-16D5

DC input 16 pts | +COM / -COM | 5VDC 3-wire | Screw T. block

Detailed specifications

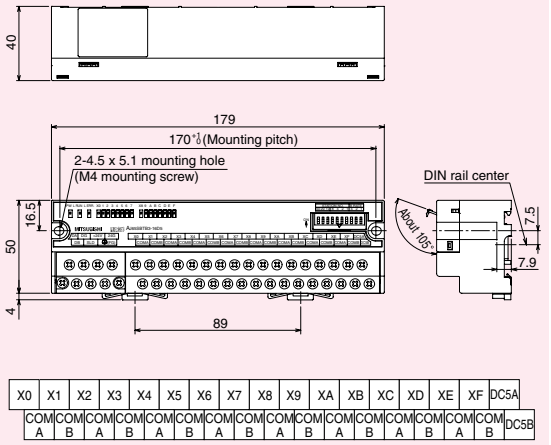
Input specifications		Description
Number of input points		16 points
Isolation method		Photocoupler
Rated input voltage		5VDC
Rated input current		Approx. 4.0mA
Operating voltage range		5VDC (+20/-15%, ripple ratio: within 5%)
Maximum number of simultaneous input points		100%
ON voltage/ON current		3.5V or higher/2mA or higher
OFF voltage/OFF current		1.5V or lower/1mA or lower
Input resistance		Approx. 1.0kΩ
Response time	OFF→ ON	1.5ms or lower (when 5VDC)
	ON→ OFF	1.5ms or lower (when 5VDC)
Wiring method for common		16 points/common (Terminal block 3-wire type)
Input format		Positive/negative common shared type (sink/source shared type)
Number of occupied stations		1 station 32 points assignment (use 16 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	30mA or lower (When 24VDC, all points ON)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Protection level		IP2X
Weight		0.25kg

External device connection diagram



External dimensions & terminal layout

Unit: mm



*1: Direction of polarity connecting external supply power for TTL, LS-TTL, CMOS buffer (positive common) connections.
Connect negative pole to DC5A and connect positive pole to DC5B for the sensor (negative common) connection.
*2: When connecting sensor for TTL output (source), use the one where a pull-up resister is built in or fix a pull-up resister outside.

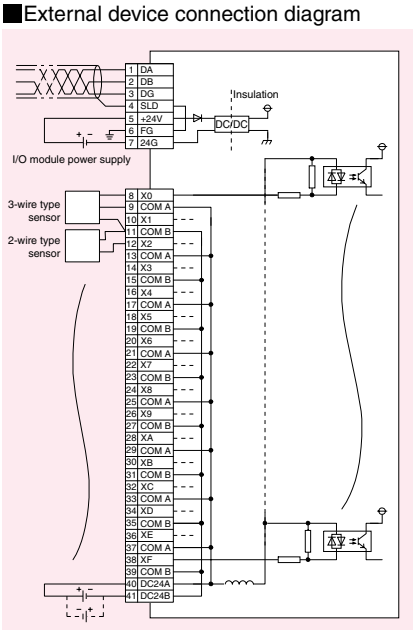
Input module
AJ65SBTB3-16KD

DC input 16 pts | +COM / -COM | 24VDC 3-wire | Screw T. block

Detailed specifications

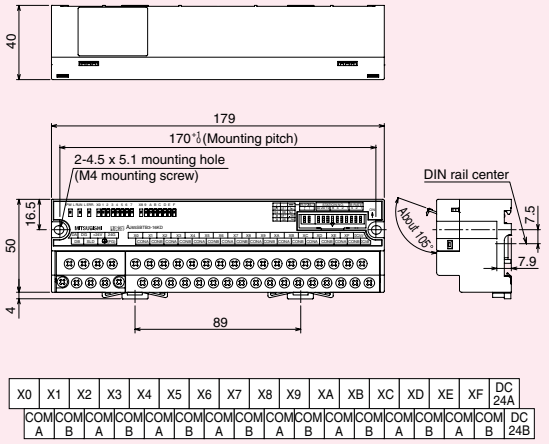
Input specifications					
Number of input points		16 points			
Isolation method		Photocoupler			
Rated input voltage		24VDC			
Rated input current		Approx. 7mA			
Operating voltage range		20.4 to 28.8VDC (ripple ratio: within 5%)			
Maximum number of simultaneous input points		100%			
ON voltage/ON current		14V or higher/4mA or higher			
OFF voltage/OFF current		5.5V or lower/1.7mA or lower			
Input resistance		Approx. 3.0kΩ			
Response time	Input response speed	0.2ms	1.5ms	5ms	10ms
	OFF→ON	0.2ms or lower	1.5ms or lower	5ms or lower	10ms or lower
	ON→OFF	0.2ms or lower	1.5ms or lower	5ms or lower	10ms or lower
Wiring method for common		16 points/common (terminal block 3-wire type)			
Input format		Positive/negative common shared type (sink/source shared type)			
Number of occupied stations		1 station 32 points assignment (use 16 points)			
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)			
	Current	50mA or lower (when 24VDC, all points ON)			
Noise immunity		DC type noise voltage 500 Vp-p, noise width 1μs, noise frequency 25 to 60 Hz (noise simulator condition)			
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground			
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground			
Protection level		IP2X			
Weight		0.26kg			

External device connection diagram



External dimensions & terminal layout

Unit: mm



Input module
AJ65SBTB1-32D

DC input 32 pts | +COM / -COM | 24VDC 1-wire | Screw T. block

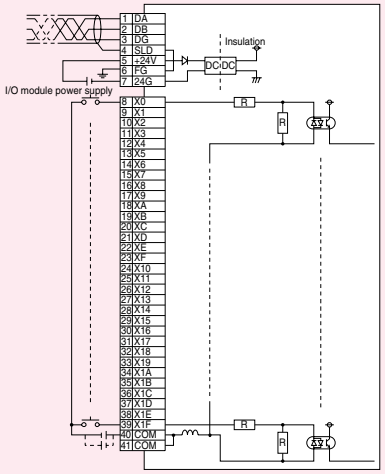
Input module
AJ65SBTB1-32D1

DC input 32 pts | +COM / -COM | 24VDC 1-wire | Screw T. block | High speed input

■Detailed specifications

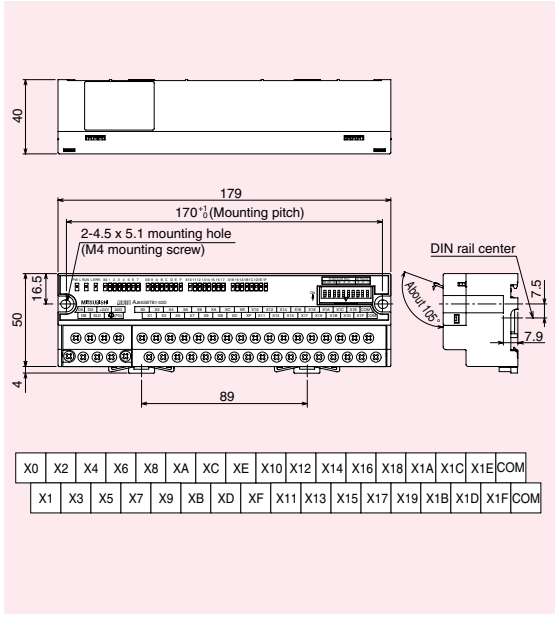
Input specifications		Description	
		AJ65SBTB1-32D	AJ65SBTB1-32D1
Number of input points		32 points	
Isolation method		Photocoupler	
Rated input voltage		24VDC	
Rated input current		Approx. 7mA	Approx. 5mA
Operating voltage range		19.2 to 26.4VDC (ripple ratio:within 5%)	
Maximum number of simultaneous input points		100%	
ON voltage/ON current		14V or higher/ 3.5mA or higher	15V or higher/ 3mA or higher
OFF voltage/OFF current		6V or lower/1.7mA or lower	3V or lower/0.5mA or lower
Input resistance		Approx. 3.3kΩ	Approx. 4.7kΩ
Response time	OFF→ON	1.5ms or lower (when 24VDC)	0.2ms or lower (when 24VDC)
	ON→OFF	1.5ms or lower (when 24VDC)	0.2ms or lower (when 24VDC)
Wiring method for common		32 points/common (2 points) (terminal block 1-wire type)	
Input format		Positive/negative common shared type (sink/source shared type)	
Number of occupied stations		1 station 32 points assignment (use 32 points)	
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)	
	Current	45mA or lower	50mA or lower (when 24VDC, all points ON)
Noise immunity		DC type noise voltage 500 Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)	
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground	
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground	
Protection level		IP2X	
Weight		0.25kg	

■External device connection diagram



■External dimensions & terminal layout

Unit: mm



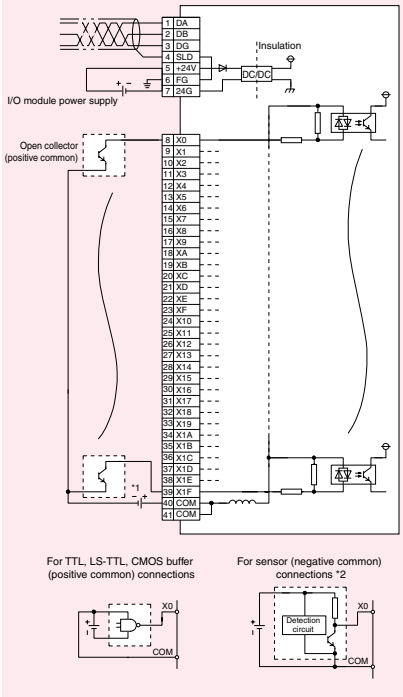
Input module
AJ65SBTB1-32D5

DC input 32 pts | +COM / -COM | 5VDC 1-wire | Screw T. block

■Detailed specifications

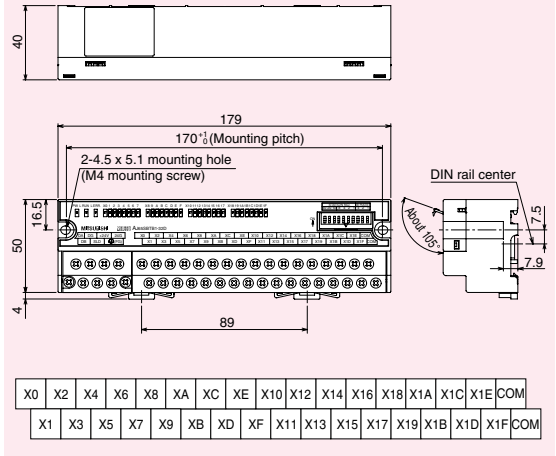
Input specifications		Description
Number of input points		32 points
Isolation method		Photocoupler
Rated input voltage		5VDC
Rated input current		Approx. 4.0mA
Operating voltage range		5VDC (+20/-15%, ripple ratio: within 5%)
Maximum number of simultaneous input points		100%
ON voltage/ON current		3.5V or higher/2mA or higher
OFF voltage/OFF current		1.5V or lower/1mA or lower
Input resistance		Approx. 1.0kΩ
Response time	OFF→ ON	1.5ms or lower (when 5VDC)
	ON→ OFF	1.5ms or lower (when 5VDC)
Wiring method for common		32 points/common (terminal block 1-wire type)
Input format		Positive/negative common shared type (sink/source shared type)
Number of occupied stations		1 station 32 points assignment (use 32 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple rate within 5%)
	Current	35mA or lower (When 24VDC, all points ON)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Protection level		IP2X
Weight		0.26kg

■External device connection diagram



■External dimensions & terminal layout

Unit: mm



*1: Direction of polarity connecting external supply power for TTL, LS-TTL, CMOS buffer (positive common) connections.
Connect negative pole to COM for the sensor (negative common) connection.
*2: When connecting sensor for TTL output (source), use the one where a pull-up resister is built in or fix a pull-up resister outside.

Screw T. block

Screw terminal block type

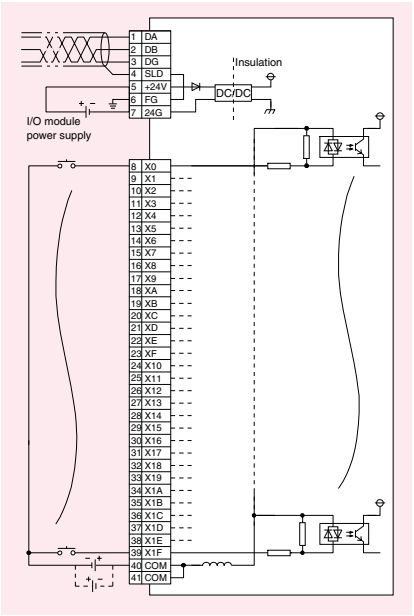
Input module
AJ65SBTB1-32KD

DC input 32 pts | +COM -COM | 24VDC 1-wire | Screw T. block

■Detailed specifications

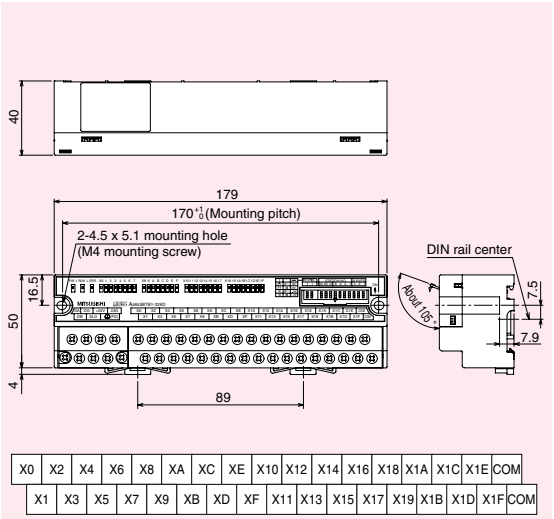
Input specifications		Description			
Number of input points		32 points			
Isolation method		Photocoupler			
Rated input voltage		24VDC			
Rated input current		Approx. 7mA			
Operating voltage range		20.4 to 28.8VDC (ripple ratio: within 5%)			
Maximum number of simultaneous input points		100% simultaneous ON (when 26.4VDC) 50% simultaneous ON (when 28.8VDC)			
ON voltage/ON current		14V or higher/4mA or higher			
OFF voltage/OFF current		5.5V or lower/1.7mA or lower			
Input resistance		Approx. 3.0kΩ			
Response time	Input response speed	0.2ms	1.5ms	5ms	10ms
	OFF→ON	0.2ms or lower	1.5ms or lower	5ms or lower	10ms or lower
	ON→OFF	0.2ms or lower	1.5ms or lower	5ms or lower	10ms or lower
Wiring method for common		32 points/common (terminal block 1-wire type)			
Input format		Positive/negative common shared type (sink/source shared type)			
Number of occupied stations		1 station 32 points assignment (use 32 points)			
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)			
	Current	75mA or lower (when 24VDC, all points ON)			
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60 Hz (noise simulator condition)			
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground			
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground			
Protection level		IP2X			
Weight		0.26kg			

■External device connection diagram



■External dimensions & terminal layout

Unit: mm



Output module
AJ65SBTB1-8T

Transistor output 8 pts | Sink | 0.5A 1-wire | Screw T. block | Protection

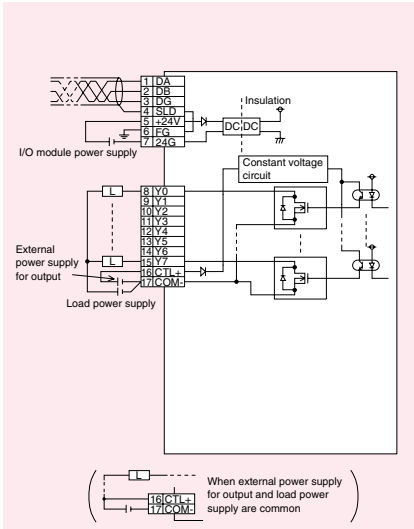
Output module
AJ65SBTB1-8T1

Transistor output 8 pts | Sink | 0.5A 1-wire | Screw T. block | Low leakage

■Detailed specifications

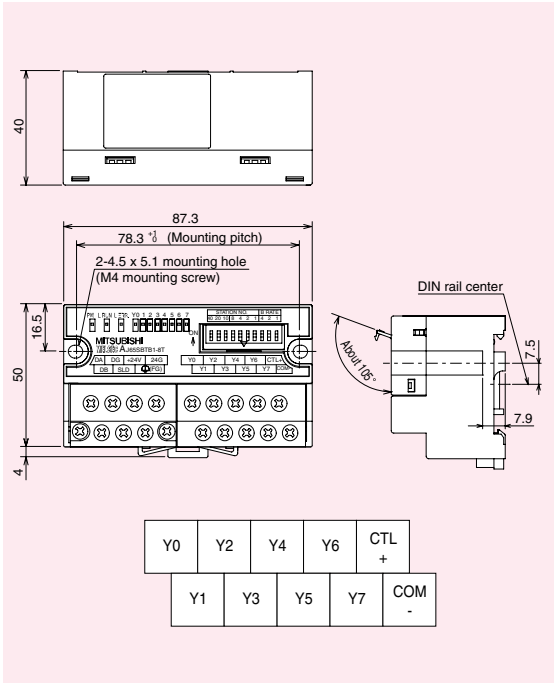
Output specifications		Description	
		AJ65SBTB1-8T	AJ65SBTB1-8T1
Number of output points		8 points	
Isolation method		Photocoupler	
Rated load voltage		12/24VDC	
Operating load voltage range		10.2 to 26.4VDC (ripple ratio: within 5%)	
Maximum load current		0.5A/point, 2.4A/common	
Maximum inrush current		1.0A 10ms or lower	
Leakage current at OFF		0.25mA or lower	0.1mA or lower
Maximum voltage drop at ON		0.3V or lower (TYP.) 0.5A, 0.6V or lower (MAX.) 0.5A	
Output format		Sink type	
Protection function		Overload protection function, overvoltage protection function and overheat protection function	None
Response time	OFF→ON	0.5ms or lower	
	ON→OFF	1.5ms or lower (resistive load)	
External power supply for output part	Voltage	10.2 to 26.4VDC (ripple ratio: within 5%)	
	Current	15mA or less (TYP. 24VDC/common) Not including external load current	
Surge suppressor		Zener diode	
Wiring method for common		8 points/common (terminal block 1-wire type)	
Number of occupied stations		1 station 32 points assignment (use 8 points)	
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)	
	Current	35mA or lower (when 24VDC, all points ON)	
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)	
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground	
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground	
Protection level		IP2X	
Weight		0.14kg	

■External device connection diagram



■External dimensions & terminal layout

Unit: mm



Output module
AJ65SBTB2-8T

Transistor output 8 pts | Sink | 0.5A 2-wire | Screw T. block | Protection

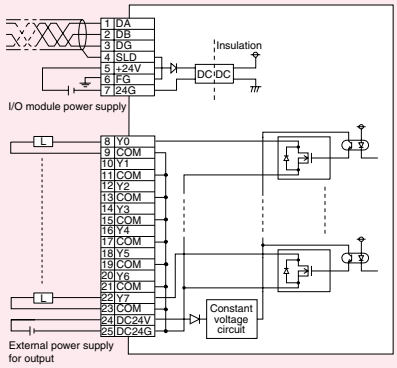
Output module
AJ65SBTB2-8T1

Transistor output 8 pts | Sink | 0.5A 2-wire | Screw T. block | Low leakage

■Detailed specifications

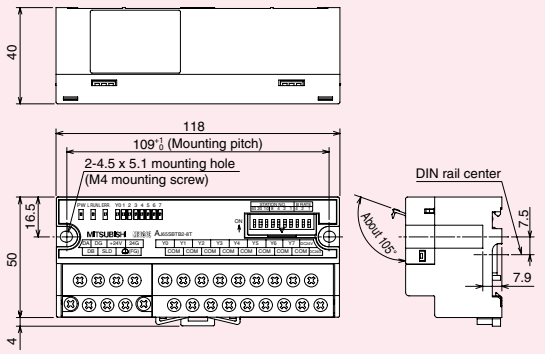
Output specifications		Description	
		AJ65SBTB2-8T	AJ65SBTB2-8T1
Number of output points		8 points	
Isolation method		Photocoupler	
Rated load voltage		12/24VDC	
Operating load voltage range		10.2 to 26.4VDC (ripple ratio: within 5%)	
Maximum load current		0.5A/point, 2.4A/common	
Maximum inrush current		1.0A 10ms or lower	
Leakage current at OFF		0.25mA or lower	0.1mA or lower
Maximum voltage drop at ON		0.3V or lower (TYP.) 0.5A, 0.6V or lower (MAX.) 0.5A	
Output format		Sink type	
Protection function		Overload protection function, overvoltage protection function and overheat protection function	None
Response time	OFF→ON	0.5ms or lower	
	ON→OFF	1.5ms or lower (resistive load)	
External power supply for output part	Voltage	10.2 to 26.4 VDC (ripple ratio: within 5%)	
	Current	17.8mA or less (TYP. 24VDC/common) Not including external load current	
Surge suppressor		Zener diode	
Wiring method for common		8 points/common (terminal block 2-wire type)	
Number of occupied stations		1 station 32 points assignment (use 8 points)	
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)	
	Current	40mA or lower	45mA or lower
		(when 24VDC, all points ON)	
Noise immunity		DC type noise voltage 500Vp-p, noise width 1µs, noise frequency 25 to 60Hz (noise simulator condition)	
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground	
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground	
Protection level		IP2X	
Weight		0.14kg	

■External device connection diagram



■External dimensions & terminal layout

Unit: mm



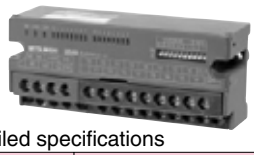
Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	DC 24V
COM	COM	COM	COM	COM	COM	COM	COM	DC 24G

Output module
AJ65SBTB1-16T

Transistor output 16 pts | Sink | 0.5A 1-wire | Screw T. block | Protection

Output module
AJ65SBTB1-16T1

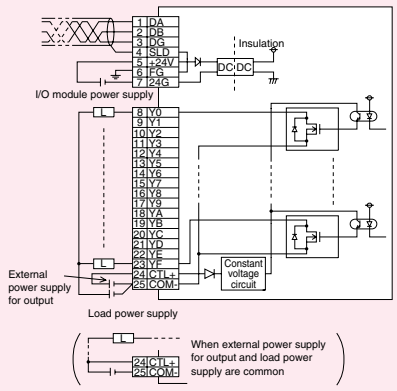
Transistor output 16 pts | Sink | 0.5A 1-wire | Screw T. block | Low leakage



■Detailed specifications

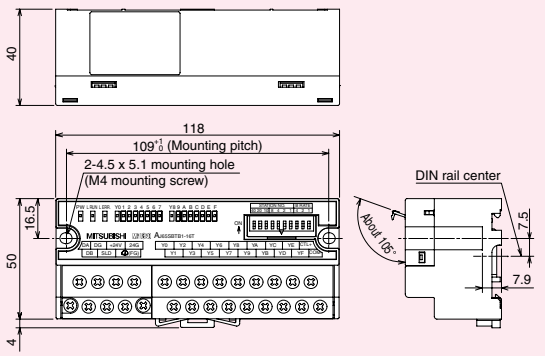
Output specifications		Description	
		AJ65SBTB1-16T	AJ65SBTB1-16T1
Number of output points		16 points	
Isolation method		Photocoupler	
Rated load voltage		12/24VDC	
Operating load voltage range		10.2 to 26.4VDC (ripple ratio: within 5%)	
Maximum load current		0.5A/point, 3.6A/common	
Maximum inrush current		1.0A 10ms or lower	
Leakage current at OFF		0.25mA or lower	0.1mA or lower
Maximum voltage drop at ON		0.3V or lower (TYP.) 0.5A, 0.6V or lower (MAX.) 0.5A	
Output format		Sink type	
Protection function		Overload protection function, overvoltage protection function and overheat protection function	None
Response time	OFF→ON	0.5ms or lower	
	ON→OFF	1.5ms or lower (resistive load)	
External power supply for output part	Voltage	10.2 to 26.4 VDC (ripple ratio: within 5%)	
	Current	30mA or lower (TYP. 24VDC/common) Not including external load current	
Surge suppressor		Zener diode	
Wiring method for common		16 points/common (terminal block 1-wire type)	
Number of occupied stations		1 station 32 points assignment (use 16 points)	
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)	
	Current	50mA or lower (when 24VDC, all points ON)	
Noise immunity		DC type noise voltage 500Vp-p, noise width 1µs, noise frequency 25 to 60Hz (noise simulator condition)	
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground	
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground	
Protection level		IP2X	
Weight		0.18kg	

■External device connection diagram



■External dimensions & terminal layout

Unit: mm



Y0	Y2	Y4	Y6	Y8	YA	YC	YE	CTL +
Y1	Y3	Y5	Y7	Y9	YB	YD	YF	COM -

Screw T. block

Screw terminal block type

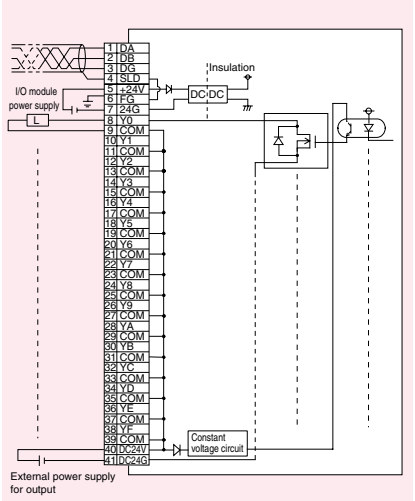
Output module
AJ65SBTB2-16T

Transistor output 16 pts | Sink | 0.5A 2-wire | Screw T. block | Protection

Output module
AJ65SBTB2-16T1

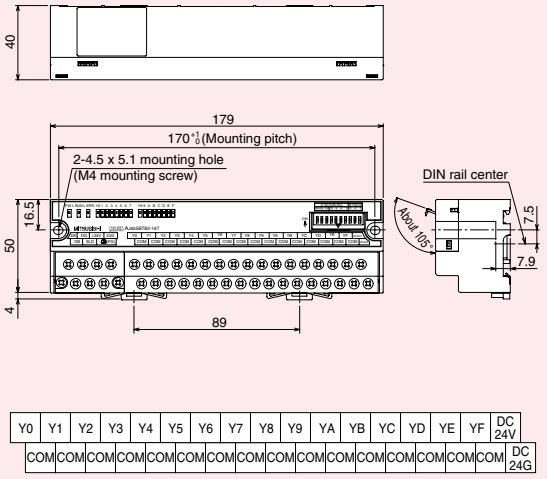
Transistor output 16 pts | Sink | 0.5A 2-wire | Screw T. block | Low leakage

■External device connection diagram



■External dimensions & terminal layout

Unit: mm



■Detailed specifications

Output specifications		Description	
		AJ65SBTB2-16T	AJ65SBTB2-16T1
Number of output points		16 points	
Isolation method		Photocoupler	
Rated load voltage		12/24VDC	
Operating load voltage range		10.2 to 26.4VDC (ripple ratio: within 5%)	
Maximum load current		0.5A/point, 3.6A/common	
Maximum inrush current		1.0A 10ms or lower	
Leakage current at OFF		0.25mA or lower	0.1mA or lower
Maximum voltage drop at ON		0.3V or lower (TYP.) 0.5A, 0.6V or lower (MAX.) 0.5A	
Output format		Sink type	
Protection function		Overload protection function, overvoltage protection function and overheat protection function	None
Response time	OFF→ON	0.5ms or lower	
	ON→OFF	1.5ms or lower (resistive load)	
External Power supply for output part	Voltage	10.2 to 26.4VDC (ripple ratio: within 5%)	
	Current	24.2mA or lower (TYP. 24VDC/common) Not including external load current	
Surge suppressor		Zener diode	
Wiring method for common		16 points/common (terminal block 2-wire type)	
Number of occupied stations		1 station 32 points assignment (use 16 points)	
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)	
	Current	55mA or lower (when 24VDC, all points ON)	
Noise immunity		DC type noise voltage 500Vp-p, noise width 1µs, noise frequency 25 to 60Hz (noise simulator condition)	
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground	
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground	
Protection level		IP2X	
Weight		0.25kg	

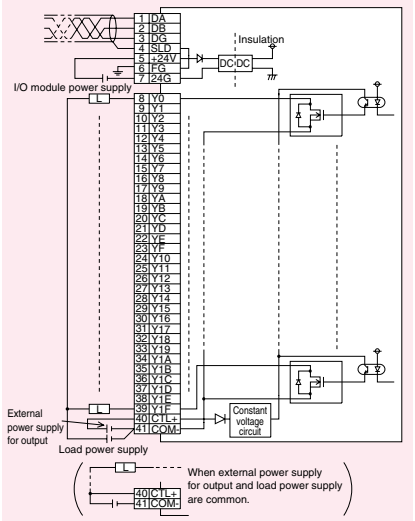
Output module
AJ65SBTB1-32T

Transistor output 32 pts | Sink | 0.5A 1-wire | Screw T. block | Protection

Output module
AJ65SBTB1-32T1

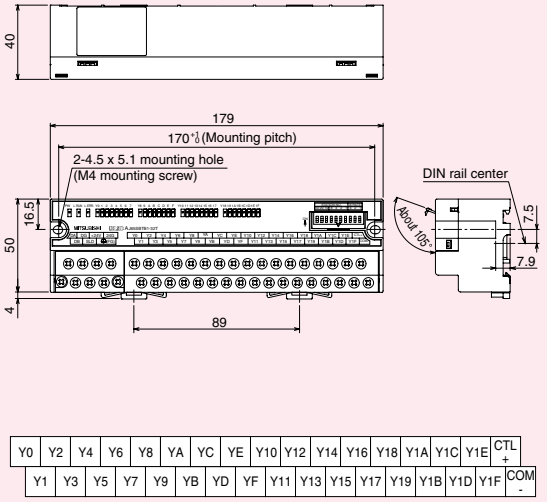
Transistor output 32 pts | Sink | 0.5A 1-wire | Screw T. block | Low leakage

■External device connection diagram



■External dimensions & terminal layout

Unit: mm



■Detailed specifications

Output specifications		Description	
		AJ65SBTB1-32T	AJ65SBTB1-32T1
Number of output points		32 points	
Isolation method		Photocoupler	
Rated load voltage		12/24VDC	
Operating load voltage range		10.2 to 26.4VDC (ripple ratio: within 5%)	
Maximum load current		0.5A/point, 4.8A/common	
Maximum inrush current		1.0A 10ms or lower	
Leakage current at OFF		0.25mA or lower	0.1mA or lower
Maximum voltage drop at ON		0.3V or lower (TYP.) 0.5A, 0.6V or lower (MAX.) 0.5A	
Output format		Sink type	
Protection function		Overload protection function, overvoltage protection function and overheat protection function	None
Response time	OFF→ON	0.5ms or lower	
	ON→OFF	1.5ms or lower (resistive load)	
External power supply for output part	Voltage	10.2 to 26.4VDC (ripple ratio: within 5%)	
	Current	50mA or lower (TYP. 24VDC/common) Not including external load current	
Surge suppressor		Zener diode	
Wiring method for common		32 points/common (terminal block 1-wire type)	
Number of occupied stations		1 station 32 points assignment (use 32 points)	
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)	
	Current	65mA or lower (when 24VDC, all points ON)	
Noise immunity		DC type noise voltage 500Vp-p, noise width 1µs, noise frequency 25 to 60Hz (noise simulator condition)	
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground	
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground	
Protection level		IP2X	
Weight		0.25kg	

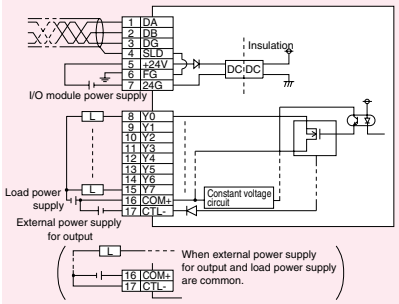
Output module
AJ65SBTB1-8TE

Transistor output 8 pts | Source | 0.1A 1-wire | Screw T. block | Protection

■Detailed specifications

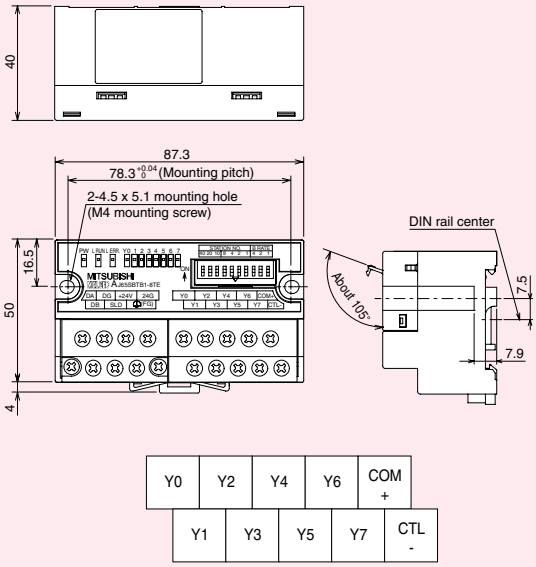
Output specifications		Description
Number of output points		8 points
Isolation method		Photocoupler
Rated load voltage		12/24VDC
Operating load voltage range		10.2 to 26.4VDC (ripple ratio: within 5%)
Maximum load current		0.1A/point 0.8A/common
Maximum inrush current		1.0A 10ms or lower
Leakage current at OFF		0.1mA or lower
Maximum voltage drop at ON		0.1V or lower (TYP.) 0.1A, 0.2V or lower (MAX.) 0.1A
Output format		Source type
Protection function		Overload protection function and overheat protection function
Response time	OFF→ON	0.5ms or lower
	ON→OFF	1.5ms or lower (resistive load)
External power supply for output part	Voltage	10.2 to 26.4VDC (ripple ratio: within 5%)
	Current	15mA or lower (TYP. 24VDC/1 common) Not including external load current
Surge suppressor		Zener diode
Wiring method for common		8 points/common (terminal block 1-wire type)
Number of occupied stations		1 station 32 points assignment (use 8 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	35mA or lower (when 24VDC and all points ON)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Weight		0.14kg

■External device connection diagram



■External dimensions & terminal layout

Unit: mm



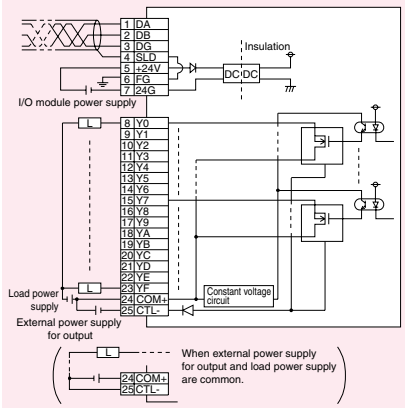
Output module
AJ65SBTB1-16TE

Transistor output 16 pts | Source | 0.1A 1-wire | Screw T. block | Protection

■Detailed specifications

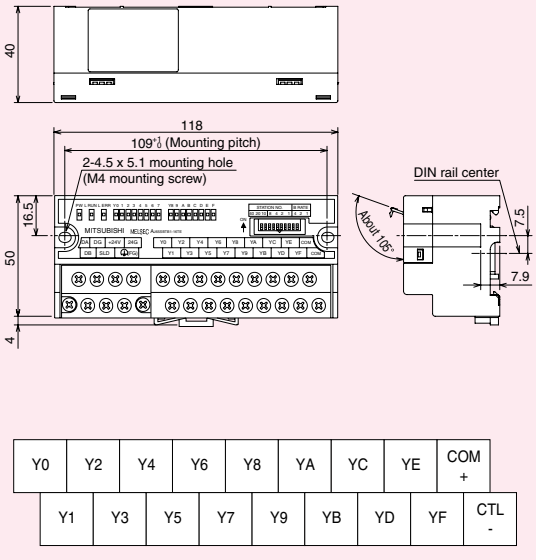
Output specifications		Description
Number of output points		16 points
Isolation method		Photocoupler
Rated load voltage		12/24VDC
Operating load voltage range		10.2 to 26.4VDC (ripple ratio: within 5%)
Maximum load current		0.1A/point, 1.6A/common
Maximum inrush current		1.0A 10ms or lower
Leakage current at OFF		0.1mA or lower
Maximum voltage drop at ON		0.1V or lower (TYP.) 0.1A, 0.2V or lower (MAX.) 0.1A
Output format		Source type
Protection function		Overload protection function and overheat protection function
Response time	OFF→ON	0.5ms or lower
	ON→OFF	1.5ms or lower (resistive load)
External power supply for output part	Voltage	10.2 to 26.4VDC (ripple ratio: within 5%)
	Current	30mA or lower (TYP. 24VDC/common) Not including external load current
Surge suppressor		Zener diode
Wiring method for common		16 points/common (terminal block 1-wire type)
Number of occupied stations		1 station 32 points assignment (use 16 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	50mA or lower (when 24VDC and all points ON)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Weight		0.18kg

■External device connection diagram



■External dimensions & terminal layout

Unit: mm



Screw T. block

Screw terminal block type

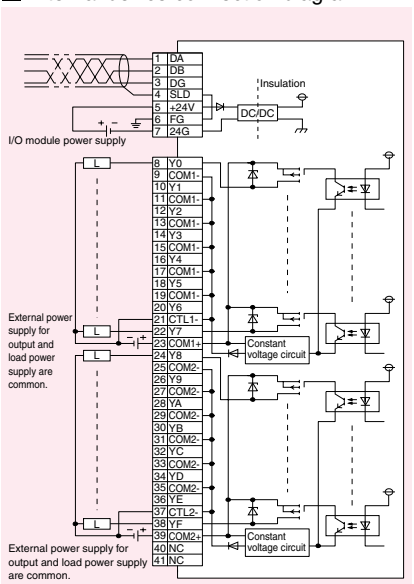
Output module
AJ65SBTB1B-16TE1

Transistor output 16 pts | Source | 0.5A 1-wire | Screw T. block

■Detailed specifications

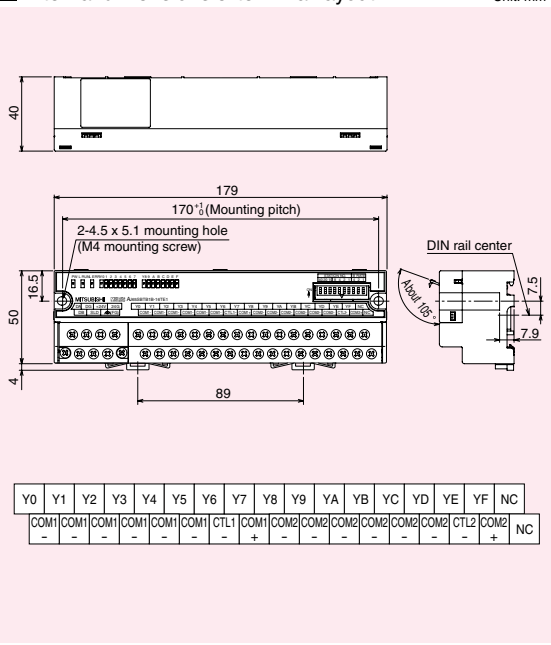
Output specifications		Description
Number of output points		16 points
Isolation method		Photocoupler
Rated load voltage		12/24VDC
Operating load voltage range		10.2 to 26.4VDC (ripple ratio: within 5%)
Maximum load current		0.5A/point, 4A/common
Maximum inrush current		1.0A 10ms or lower
Leakage current at OFF		0.1mA or lower
Maximum voltage drop at ON		0.5V or lower (TYP.) 0.5A, 0.8V or lower (MAX.) 0.5A
Output format		Source type
Response time	OFF→ON	0.5ms or lower
	ON→OFF	1.5ms or lower (resistive load)
External power supply for output part	Voltage	10.2 to 26.4VDC (ripple ratio: within 5%)
	Current	10mA or lower (TYP. 24VDC/common) Not including external load current
Surge suppressor		Zener diode
Wiring method for common		8 points/common (terminal block 1-wire type)
Number of occupied stations		1 station 32 points assignment (use 16 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	45mA or lower (when 24VDC and all points ON)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Weight		0.26kg

■External device connection diagram



■External dimensions & terminal layout

Unit: mm



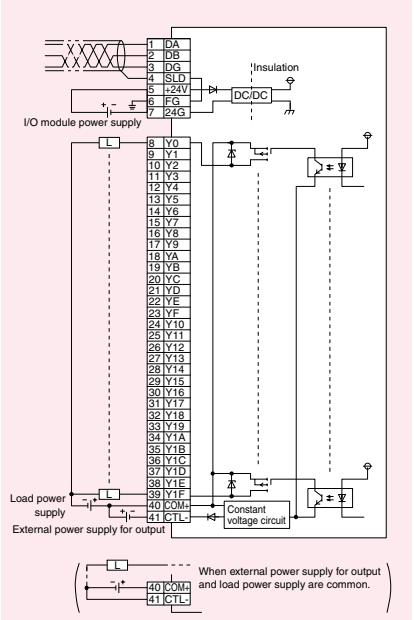
Output module
AJ65SBTB1-32TE1

Transistor output 32 pts | Source | 0.5A 1-wire | Screw T. block

■Detailed specifications

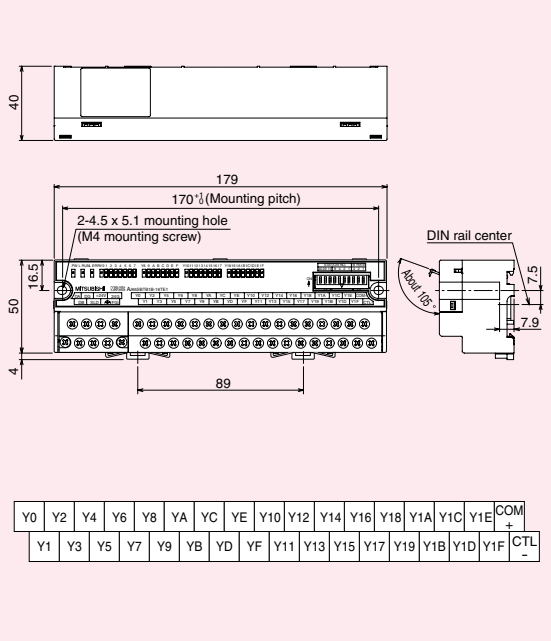
Output specifications		Description
Number of output points		32 points
Isolation method		Photocoupler
Rated load voltage		12/24VDC
Operating load voltage range		10.2 to 26.4VDC (ripple ratio: within 5%)
Maximum load current		0.5A/point, 4.8A/common
Maximum inrush current		1.0A 10ms or lower
Leakage current at OFF		0.1mA or lower
Maximum voltage drop at ON		0.5V or lower (TYP.) 0.5A, 0.8V or lower (MAX.) 0.5A
Output format		Source type
Response time	OFF→ON	0.5ms or lower
	ON→OFF	1.5ms or lower (resistive load)
External power supply for output part	Voltage	10.2 to 26.4VDC (ripple ratio: within 5%)
	Current	15mA or lower (TYP. 24VDC/common) Not including external load current
Surge suppressor		Zener diode
Wiring method for common		32 points/common (terminal block 1-wire type)
Number of occupied stations		1 station 32 points assignment (use 32 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	60mA or lower (when 24VDC and all points ON)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Weight		0.26kg

■External device connection diagram



■External dimensions & terminal layout

Unit: mm



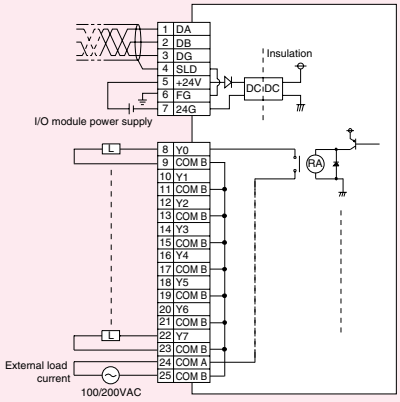
Output module
AJ65SBTB2N-8R

Relay output 8 pts | 2A 2-wire | Screw T. block

■Detailed specifications

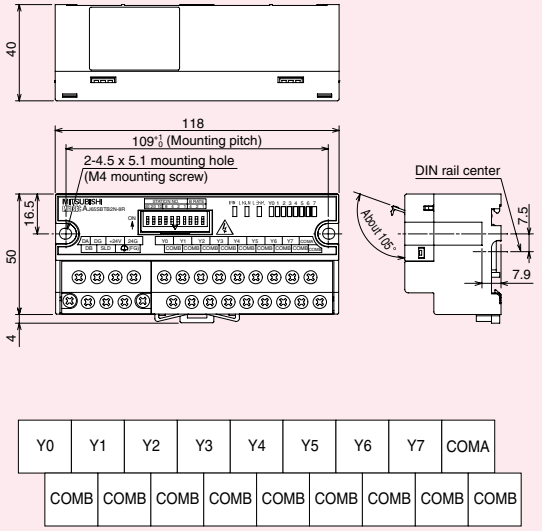
Output specifications		Description
Number of output points		8 points
Isolation method		Relay
Rated load voltage/current		24VDC (resistive load), 240VAC (cosϕ =1)/2A/point, 4A/common
Minimum switching load		5VDC 1mA
Maximum switching voltage		264VAC 125VDC
Response time	OFF→ON	10ms or lower
	ON→OFF	12ms or lower
Life	Mechanical	20 million times or more
	Electrical	Rated switching voltage/current load 100 thousand times or more
		200VAC 1.5A, 240VAC 1A (cosϕ =0.7) 100 thousand times or more
		200VAC 1A, 240VAC 0.5A (cosϕ =0.35) 100 thousand times or more
		24VDC 1A,100VDC 0.1A (L/R=7ms) 100 thousand times or more
Maximum switching frequency		3600 times/hour
Surge suppressor		None
Wiring method for common		8 points/common (terminal block 2-wire type)
Number of occupied stations		1 station 32 points assignment (use 8 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	85mA or lower (When 24VDC, all points ON)
Noise immunity		AC type noise voltage 1500Vp-p, DC type noise voltage 500Vp-p, noise width 1µs, noise frequency 25 to 60Hz (noise simulator condition) Fast transient/burst noise IEC61000-4-4: 1kV
Withstand voltage		2830VAC rms/3 cycles between all AC external terminals and ground (2000m above sea level) 500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all AC external terminals and ground 10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Weight		0.25kg

■External device connection diagram



■External dimensions & terminal layout

Unit: mm



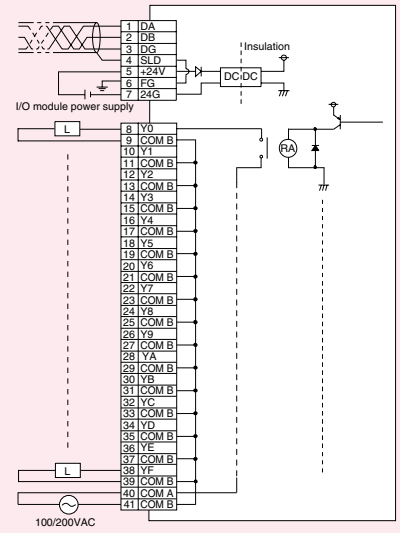
Output module
AJ65SBTB2N-16R

Relay output 16 pts | 2A 2-wire | Screw T. block

■Detailed specifications

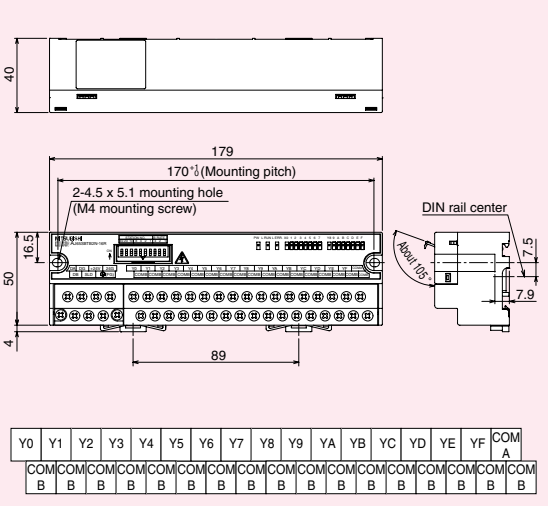
Output specifications		Description
Number of output points		16 points
Isolation method		Relay
Rated load voltage/current		24VDC (resistive load), 240VAC (cosϕ =1)/2A/point, 8A/common
Minimum switching load		5VDC 1mA
Maximum switching voltage		264VAC 125VDC
Response time	OFF→ON	10ms or lower
	ON→OFF	12ms or lower
Life	Mechanical	20 million times or more
	Electrical	Rated switching voltage/current load 100 thousand times or more
		200VAC 1.5A, 240VAC 1A (cosϕ =0.7) 100 thousand times or more
		200VAC 1A, 240VAC 0.5A (cosϕ =0.35) 100 thousand times or more
		24VDC 1A,100VDC 0.1A (L/R=7ms) 100 thousand times or more
Maximum switching frequency		3600 times/hour
Surge suppressor		None
Wiring method for common		16 points/common (terminal block 2-wire type)
Number of occupied stations		1 station 32 points assignment (use 16 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	120mA or lower (When 24VDC, all points ON)
Noise immunity		AC type noise voltage 1500Vp-p, DC type noise voltage 500Vp-p, noise width 1µs, noise frequency 25 to 60Hz (noise simulator condition) Fast transient/burst noise IEC61000-4-4: 1kV
Withstand voltage		2830VAC rms/3 cycles between all AC external terminals and ground (2000m above sea level) 500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all AC external terminals and ground 10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Weight		0.35kg

■External device connection diagram



■External dimensions & terminal layout

Unit: mm



Screw T. block

Screw terminal block type

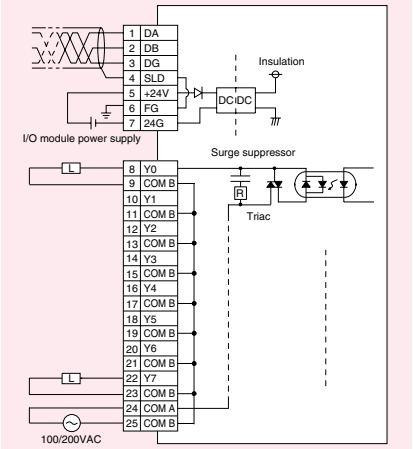
Output module
AJ65SBTB2N-8S

Triac output 8 pts | 0.6A 2-wire | Screw T. block

■Detailed specifications

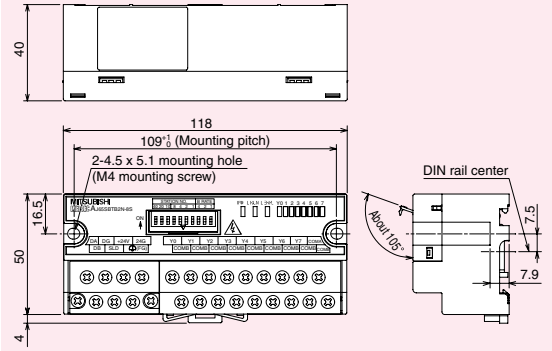
Output specifications		Description
Number of output points		8 points
Isolation method		Photocoupler
Rated load voltage		100 to 240VAC 50/60Hz±5%
Load voltage distortion rate		Within 5%
Maximum load voltage		264VAC
Maximum load current		0.6A/point, 2.4A/common
Minimum load voltage/current		50VAC 100mA, 100VAC 10mA, 240VAC 10mA
Maximum inrush current		25A 10ms or lower
Leakage current at OFF		1.5mA rms or lower (100VAC rms 60Hz), 3mA rms or lower (200VAC rms 60Hz)
Maximum voltage drop at ON		1.5V rms or lower (when 0.6A)
Response time	OFF→ON	1ms or lower
	ON→OFF	1ms+0.5 cycle or lower
Surge suppressor		CR absorber (0.01μF+47Ω)
Wiring method for common		8 points/common (terminal block 2-wire type)
Number of occupied stations		1 station 32 points assignment (use 8 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	55mA or lower (when 24VDC, all points ON)
Noise immunity		AC type noise voltage 1500Vp-p, DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition) Fast transient/burst noise IEC61000-4-4: 1kV
Withstand voltage		2830VAC rms/3 cycles between all AC external terminals and ground (2000m above sea level) 500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all AC external terminals and ground 10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Weight		0.25kg

■External device connection diagram



■External dimensions & terminal layout

Unit: mm



Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	COMA
COMB	COMB	COMB	COMB	COMB	COMB	COMB	COMB	COMB

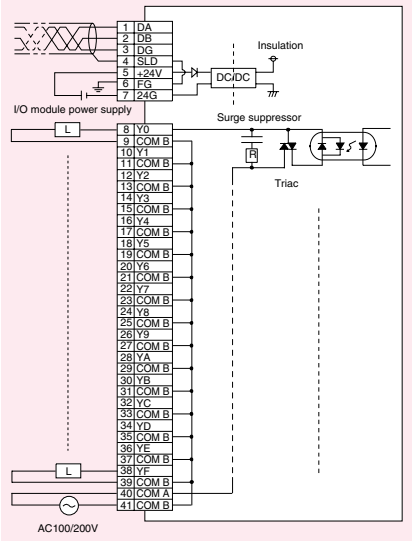
Output module
AJ65SBTB2N-16S

Triac output 16 pts | 0.6A 2-wire | Screw T. block

■Detailed specifications

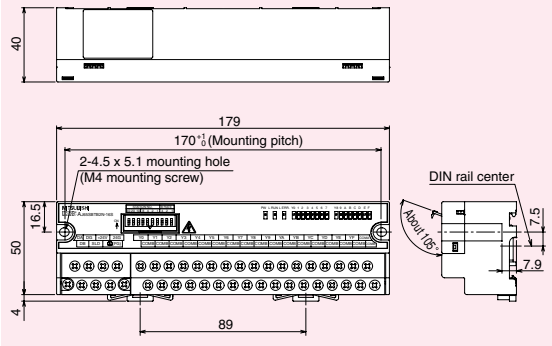
Output specifications		Description
Number of output points		16 points
Isolation method		Photocoupler
Rated load voltage		100 to 240VAC 50/60Hz±5%
Load voltage distortion rate		Within 5%
Maximum load voltage		264VAC
Maximum load current		0.6A/point, 4.8A/common
Minimum load voltage/current		50VAC 100mA, 100VAC 10mA, 240VAC 10mA
Maximum inrush current		25A 10ms or lower
Leakage current at OFF		1.5mA rms or lower (100VAC rms 60Hz), 3mA rms or lower (200VAC rms 60Hz)
Maximum voltage drop at ON		1.5V rms or lower (when 0.6A)
Response time	OFF→ON	1ms or lower
	ON→OFF	1ms+0.5 cycle or lower
Surge suppressor		CR absorber (0.01μF+47Ω)
Wiring method for common		16 points/common (terminal block 2-wire type)
Number of occupied stations		1 station 32 points assignment (use 16 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	85mA or lower (when 24VDC, all points ON)
Noise immunity		AC type noise voltage 1500Vp-p, DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition) Fast transient/burst noise IEC61000-4-4: 1kV
Withstand voltage		2830VAC rms/3 cycles between all AC external terminals and ground (2000m above sea level) 500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all AC external terminals and ground 10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Weight		0.35kg

■External device connection diagram



■External dimensions & terminal layout

Unit: mm



Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	YA	YB	YC	YD	YE	YF	COM A
COM B	COM B	COM B	COM B	COM B	COM B	COM B	COM B	COM B	COM B	COM B	COM B	COM B	COM B	COM B	COM B	COM B

I/O combined module
AJ65SBTB32-8DT

DC input 4 pts | +COM | 24VDC 3-wire | Transistor output 4 pts | Sink | 0.5A 2-wire | Screw T. block | Protection

I/O combined module
AJ65SBTB32-8DT2

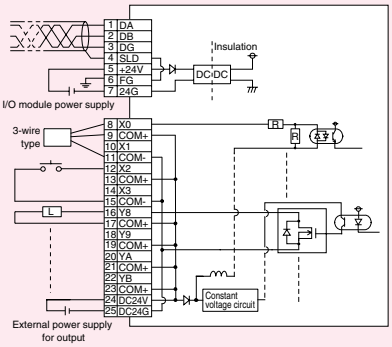
DC input 4 pts | +COM | 24VDC 3-wire | Transistor output 4 pts | Sink | 0.5A 2-wire | Screw T. block | Low leakage

■Detailed specifications

Input specifications		Description
Number of input points		4 points
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 7mA
Operating voltage range		19.2 to 26.4VDC (ripple ratio: within 5%)
Maximum number of simultaneous input points		100%
ON voltage/ON current		14V or higher/3.5mA or higher
OFF voltage/OFF current		6V or lower/1.7mA or lower
Input resistance		Approx. 3.3kΩ
Response time	OFF→ON	1.5ms or lower (when 24VDC)
	ON→OFF	1.5ms or lower (when 24VDC)
Input format		Positive common (Sink type)
Wiring method for common		8 points/common (terminal block 2-wire type)
Number of occupied stations		1 station 32 points assignment (use 8 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	45mA or lower (when 24VDC,all points ON)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Protection level		IP2X
Weight		0.18kg

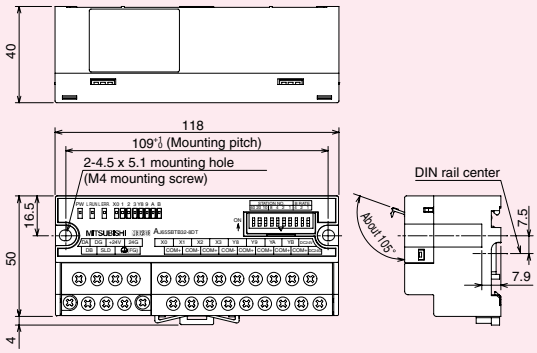
Output specifications		Description	
		AJ65SBTB32-8DT	AJ65SBTB32-8DT2
Number of output points		4 points	
Isolation method		Photocoupler	
Rated load voltage		24VDC	
Operating load voltage range		19.2 to 26.4VDC (ripple ratio: within 5%)	
Maximum load current		0.5A/point, 1.2A/common	
Maximum inrush current		1.0A 10ms or lower	
Leakage current at OFF		0.25mA or lower	0.1mA or lower
Maximum voltage drop at ON		0.3V or lower (TYP.) 0.5A, 0.6V or lower (MAX.) 0.5A	
Output format		Sink type	
Protection function		Overload protection function, overvoltage protection function and overheat protection function	None
Response time	OFF→ON	0.5ms or lower	
	ON→OFF	1.5ms or lower (resistive load)	
External power supply for output part	Voltage	19.2 to 26.4VDC (ripple ratio: within 5%)	
	Current	14.6mA or lower (when 24VDC, all points ON) Not including external load current	
Surge suppressor		Zener diode	
Wiring method for common		8 points/common (terminal block 2-wire type)	

■External device connection diagram



■External dimensions & terminal layout

Unit: mm



X0	X1	X2	X3	Y8	Y9	YA	YB	DC 24V
COM +	COM -	COM +	COM -	COM +	COM +	COM +	COM +	DC 24G

Screw T. block

Screw terminal block type

I/O combined module
AJ65SBTB1-16DT

DC input 8 pts | +COM | 24VDC 1-wire | Transistor output 8 pts | Sink | 0.5A 1-wire | Screw T. block | Protection

I/O combined module
AJ65SBTB1-16DT1

DC input 8 pts | +COM | 24VDC 1-wire | Transistor output 8 pts | Sink | 0.5A 1-wire | Screw T. block | Protection | High speed input

I/O combined module
AJ65SBTB1-16DT2

DC input 8 pts | +COM | 24VDC 1-wire | Transistor output 8 pts | Sink | 0.5A 1-wire | Screw T. block | Low leakage

I/O combined module
AJ65SBTB1-16DT3

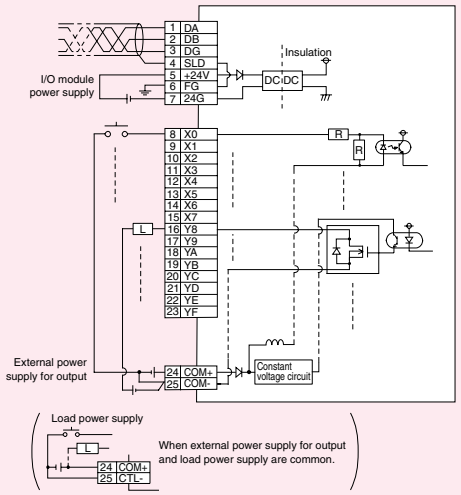
DC input 8 pts | +COM | 24VDC 1-wire | Transistor output 8 pts | Sink | 0.5A 1-wire | Screw T. block | Low leakage | High speed input

■Detailed specifications

Input specifications		Description			
		AJ65SBTB1-16DT	AJ65SBTB1-16DT1	AJ65SBTB1-16DT2	AJ65SBTB1-16DT3
Number of output points		8 points			
Isolation method		Photocoupler			
Rated input voltage		24VDC			
Rated input current		Approx. 7mA	Approx. 5mA	Approx. 7mA	Approx. 5mA
Operating voltage range		19.2 to 26.4VDC (ripple ratio: within 5%)			
Maximum number of simultaneous input points		100%			
ON voltage/ON current		14V or higher/3.5mA or higher	15V or higher/3.0mA or higher	14V or higher/3.5mA or higher	15V or higher/3.0mA or higher
OFF voltage/OFF current		6V or lower/1.7mA or lower	3V or lower/0.5mA or lower	6V or lower/1.7mA or lower	3V or lower/0.5mA or lower
Input resistance		Approx. 3.3kΩ	Approx. 4.7kΩ	Approx. 3.3kΩ	Approx. 4.7kΩ
Response time	OFF→ON	1.5ms or lower (when 24VDC)	0.2ms or lower (when 24VDC)	1.5ms or lower (when 24VDC)	0.2ms or lower (when 24VDC)
	ON→OFF	1.5ms or lower (when 24VDC)	0.2ms or lower (when 24VDC)	1.5ms or lower (when 24VDC)	0.2ms or lower (when 24VDC)
Input format		Positive common (sink type)			
Wiring method for common		16 points/common (terminal block 1-wire type)			
Number of occupied stations		1 station 32 points assignment (use 16 points)			
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)			
	Current	50mA or lower (when 24VDC, all points ON)	55mA or lower (when 24VDC, all points ON)	50mA or lower (when 24VDC, all points ON)	55mA or lower (when 24VDC, all points ON)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)			
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground			
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground			
Protection level		IP2X			
Weight		0.18kg			

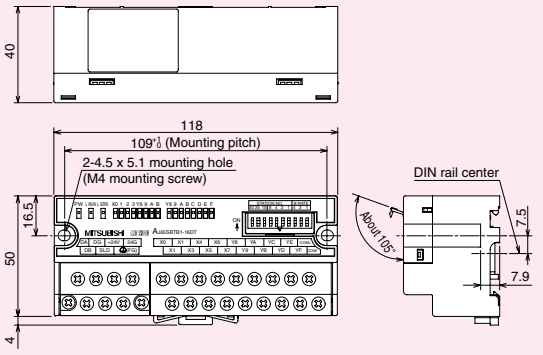
Output specifications		Description			
		AJ65SBTB1-16DT	AJ65SBTB1-16DT1	AJ65SBTB1-16DT2	AJ65SBTB1-16DT3
Number of output points		8 points			
Isolation method		Photocoupler			
Rated load voltage		24VDC			
Operating load voltage range		19.2 to 26.4VDC (ripple ratio: within 5%)			
Maximum load current		0.5A/point 2.4A/common			
Maximum load inrush current		1.0A 10ms or lower			
Leakage current at OFF		0.25mA or lower		0.1mA or lower	
Maximum voltage drop at ON		0.3V or lower (TYP.) 0.5A, 0.6V or lower (MAX.) 0.5A			
Output format		Sink type			
Protection function		Overload protection function, overvoltage protection function, overheat protection function		None	
Response time	OFF→ON	0.5ms or lower			
	ON→OFF	1.5ms or lower (resistive load)			
External power supply for output part	Voltage	19.2 to 26.4VDC (ripple ratio: within 5%)			
	Current	17.8mA or lower (when 24VDC, all points ON) Not including external load current			
Surge suppressor		Zener diode			

■External device connection diagram



■External dimensions & terminal layout

Unit: mm



X0	X2	X4	X6	Y8	YA	YC	YE	COM +	
X1	X3	X5	X7	Y9	YB	YD	YF	COM -	

I/O combined module
AJ65SBTB32-16DT

DC input 8 pts | +COM | 24VDC 3-wire | Transistor output 8 pts | Sink | 0.5A 2-wire | Screw T. block | Protection

I/O combined module
AJ65SBTB32-16DT2

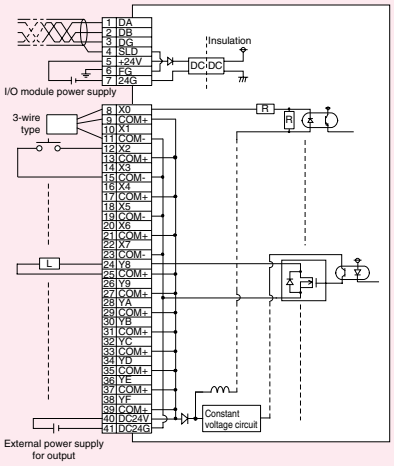
DC input 8 pts | +COM | 24VDC 3-wire | Transistor output 8 pts | Sink | 0.5A 2-wire | Screw T. block | Low leakage

■Detailed specifications

Input specifications		Description
Number of input points		8 points
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 7mA
Operating voltage range		19.2 to 26.4VDC (ripple ratio: within 5%)
Maximum number of simultaneous input points		100%
ON voltage/ON current		14V or higher/3.5mA or higher
OFF voltage/OFF current		6V or lower/1.7mA or lower
Input resistance		Approx. 3.3kΩ
Response time	OFF→ON	1.5ms or lower (when 24VDC)
	ON→OFF	1.5ms or lower (when 24VDC)
Input format		Positive common (Sink type)
Wiring method for common		8 points/common (terminal block 3-wire type)
Number of occupied stations		1 station 32 points assignment (use 16 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	50mA or lower (when 24VDC, all points ON)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Protection level		IP2X
Weight		0.25kg

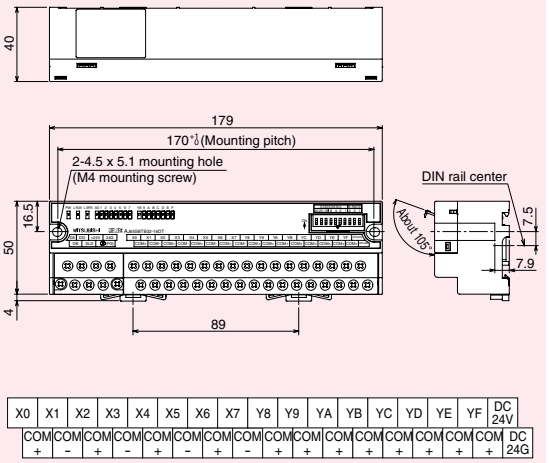
Output specifications		Description	
		AJ65SBTB32-16DT	AJ65SBTB32-16DT2
Number of output points		8 points	
Isolation method		Photocoupler	
Rated load voltage		24VDC	
Operating load voltage range		19.2 to 26.4VDC (ripple ratio: within 5%)	
Maximum load current		0.5A/point, 2.4A/common	
Maximum inrush current		1.0A 10ms or lower	
Leakage current at OFF		0.25mA or lower	0.1mA or lower
Maximum voltage drop at ON		0.3V or lower (TYP.) 0.5A, 0.6V or lower (MAX.) 0.5A	
Output format		Sink type	
Protection function		Overload protection function, overvoltage protection function and overheat protection function	None
Response time	OFF→ON	0.5ms or lower	
	ON→OFF	1.5ms or lower (resistive load)	
External power supply for output part	Voltage	19.2 to 26.4VDC (ripple ratio: within 5%)	
	Current	17.8mA or lower (when 24VDC, all points ON) Not including external load current	
Surge suppressor		Zener diode	
Wiring method for common		16 points/common (terminal block 2-wire type)	

■External device connection diagram



■External dimensions & terminal layout

Unit: mm



Screw T. block

Screw terminal block type

I/O combined module

AJ65SBTB32-16DR

DC input 8 pts | +COM / -COM | 24VDC 3-wire | Relay output 8 pts | 2A 2-wire | Screw T. block

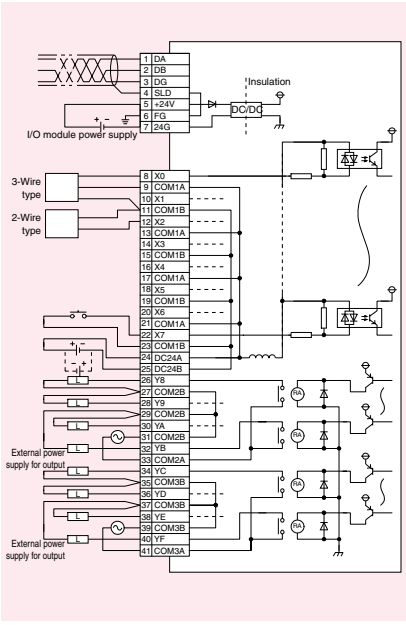
Detailed specifications

Input specifications		Description
Number of input points		8 points
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 7mA
Operating voltage range		19.2 to 26.4VDC (ripple ratio: within 5%)
Maximum number of simultaneous input points		100%
ON voltage/ON current		14V or higher/3.5mA or higher
OFF voltage/OFF current		6V or lower/1.7mA or lower
Input resistance		Approx. 3.3kΩ
Response time	OFF→ON	1.5ms or lower (when 24VDC)
	ON→OFF	1.5ms or lower (when 24VDC)
Wiring method for common		8 points/common (terminal block 3-wire type)
Input format		Positive/negative common shared type (sink/source shared type)

Output specifications		Description
Number of output points		8 points
Isolation method		Relay
Rated load voltage		24VDC (Resistive load) 240VAC ($\cos\phi$ =1) 2A/point 4A/common
Number of simultaneous ON points		All points
Minimum switching load		5VDC/1mA
Maximum switching voltage		264VAC 125VDC
Life	Mechanical	More than 20 million times
	Electrical	Rated switching voltage/current loads 100 thousand times or more 200VAC 1.5A, 240VAC 1A ($\cos\phi$ =0.7): 100 thousand times or more 200VAC 1A, 240VAC 0.5A ($\cos\phi$ =0.35): 100 thousand times or more 24VDC 1A, 100VDC 0.1A (L/R=7ms): 100 thousand times or more
Maximum switching frequency		3600 times/hour
Response time	OFF→ON	10ms or lower
	ON→OFF	12ms or lower
Wiring method for common		4 points/common (terminal block 2-wire type)
Surge suppressor		None

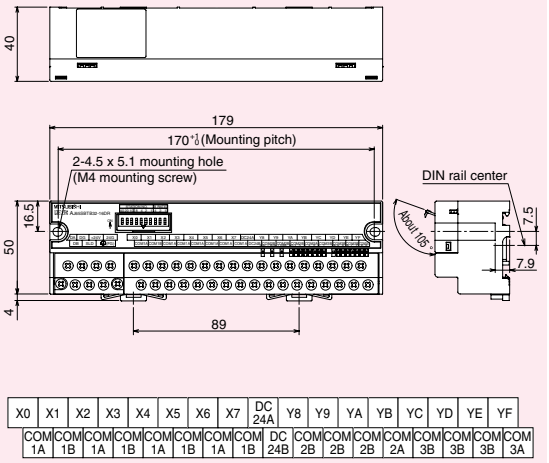
Specifications		Description
Number of occupied stations		1 station 32 points assignment (use 16 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	85mA or lower (When 24VDC, all points ON)
Noise immunity		AC type noise voltage 1500Vp-p, DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		2830VAC rms/3 cycles between all AC external terminals and ground (2000m above sea level) 500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all AC external terminals and ground 10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Protection level		IP1X
Weight		0.28kg

External device connection diagram



External dimensions & terminal layout

Unit: mm



X0	X1	X2	X3	X4	X5	X6	X7	DC 24A	Y8	Y9	YA	YB	YC	YD	YE	YF
COM 1A	COM 1B	COM 1A	COM 1B	COM 1A	COM 1B	COM 1A	COM 1B	DC 24B	COM 2B	COM 2B	COM 2B	COM 2A	COM 3B	COM 3B	COM 3B	COM 3A

I/O combined module
AJ65SBTB32-16KDT2

DC input 8 pts | +COM | 24VDC 3-wire | Relay output 8 pts | Sink | 0.5A 2-wire | Screw T. block | Low leakage

I/O combined module
AJ65SBTB32-16KDT8

DC input 8 pts | +COM | 24VDC 3-wire | Relay output 8 pts | Sink | 0.5A 2-wire | Screw T. block | Low leakage

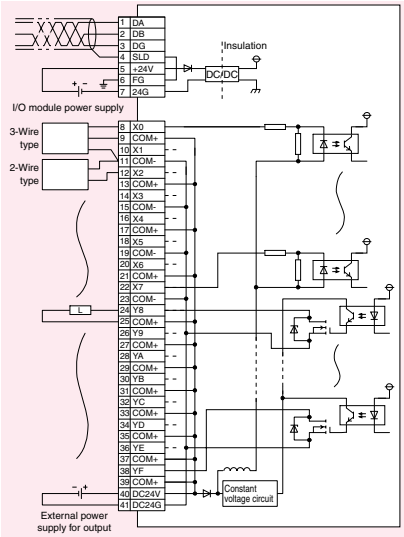
■Detailed specifications

Input specifications		Description	
		AJ65SBTB32-16KDT2	AJ65SBTB32-16KDT8
Number of input points		8 points	
Isolation method		Photocoupler	
Rated input voltage		24VDC	12VDC
Rated input current		Approx. 7mA	Approx. 11mA
Operating voltage range		20.4 to 28.8VDC (ripple ratio: within 5%)	10.2 to 14.4VDC (ripple ratio: within 5%)
Maximum number of simultaneous input points		100%	
ON voltage/ON current		14V or higher/4mA or higher	5.6V or higher/4mA or higher
OFF voltage/OFF current		5.5V or lower/1.7mA or lower	2.4V or lower/1.7mA or lower
Input resistance		Approx. 3.0kΩ	Approx. 1.0kΩ
Response time	OFF→ON	0.2ms: 0.2ms or lower, 1.5ms: 1.5ms or lower,	
	ON→OFF	5ms: 5ms or lower,10ms: 10ms or lower	
Input format		Positive common type (sink type)	
Wiring method for common		16 points/common (terminal block 3-wire type)	
Number of occupied stations		1 station 32 points assignment (use 16 points)	
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)	
	Current	55mA or lower (when 24VDC, all points ON)	
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)	
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground	
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground	
Protection level		IP2X	
Weight		0.26kg	

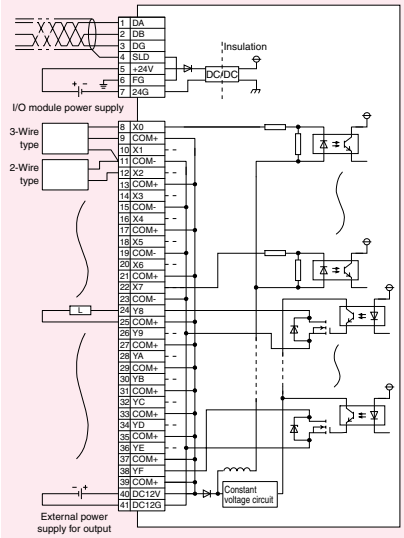
Output specifications		Description	
		AJ65SBTB32-16KDT2	AJ65SBTB32-16KDT8
Number of output points		8 points	
Isolation method		Photocoupler	
Rated load voltage		24VDC	12VDC
Operating load voltage range		20.4 to 28.8VDC (ripple ratio: within 5%)	10.2 to 14.4VDC (ripple ratio: within 5%)
Maximum load current		0.5A/point 2.4A/common	
Maximum inrush current		1.0A 10ms or lower	
Leakage current at OFF		0.1mA or lower	
Maximum voltage drop at ON		0.3VDC or lower (TYP.) 0.5A, 0.6VDC or lower (MAX.) 0.5A	
Output format		Sink type	
Protection function		None	
Response time	OFF→ON	0.5ms or lower	
	ON→OFF	1.5ms or lower (resistive load)	
External power supply for output part	Voltage	19.2 to 28.8VDC (ripple ratio: within 5%)	10.2 to 14.4VDC (ripple ratio: within 5%)
	Current	10mA or lower Not including external load current (when 24VDC, all points ON)	(when 12VDC, all points ON)
Surge suppressor		Zener diode	
Wiring method for common		16 points/common (terminal block 2-wire type)	

■External device connection diagram

•AJ65SBTB32-16KDT2

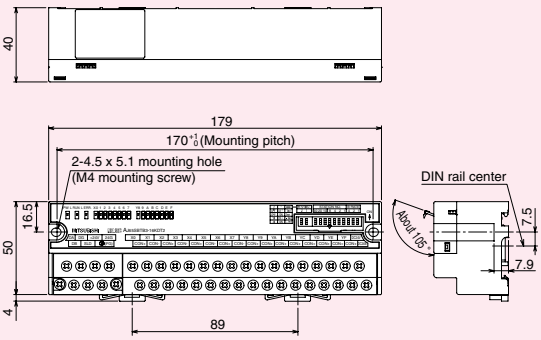


•AJ65SBTB32-16KDT8



■External dimensions & terminal layout

Unit: mm



•AJ65SBTB32-16KDT2

X0	X1	X2	X3	X4	X5	X6	X7	Y8	Y9	YA	YB	YC	YD	YE	YF	DC 24V
COM +	COM -	COM +	COM -	COM +	COM -	COM +	COM -	COM +	COM +	COM +	COM +	COM +	COM +	COM +	COM +	DC 24G

•AJ65SBTB32-16KDT8

X0	X1	X2	X3	X4	X5	X6	X7	Y8	Y9	YA	YB	YC	YD	YE	YF	DC 12V
COM +	COM -	COM +	COM -	COM +	COM -	COM +	COM -	COM +	COM +	COM +	COM +	COM +	COM +	COM +	COM +	DC 12G

Screw T. block

Screw terminal block type

I/O combined module

AJ65SBTB32-16KDR

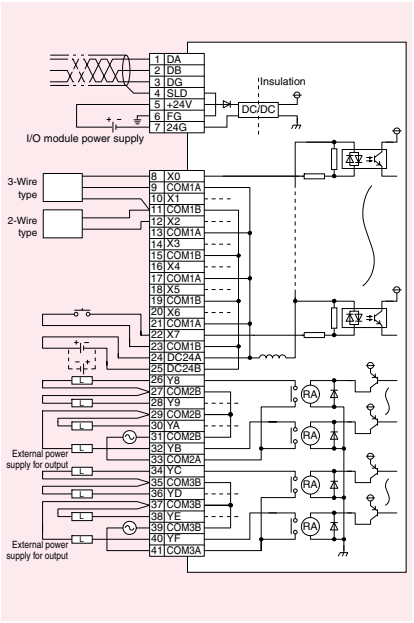
DC input 8 pts | +COM / -COM | 24VDC 3-wire | Relay output 8 pts | 2A 2-wire | Screw T. block

Detailed specifications

Input specifications		Description
Number of input points		8 points
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 7mA
Operating voltage range		20.4 to 28.8VDC (ripple ratio: within 5%)
Maximum number of simultaneous input points		100%
ON voltage/ON current		14V or higher/4mA or higher
OFF voltage/OFF current		5.5V or lower/1.7mA or lower
Input resistance		Approx. 3.0kΩ
Response time	OFF→ON	0.2ms: 0.2ms or lower, 1.5ms: 1.5ms or lower,
	ON→OFF	5ms: 5ms or lower, 10ms: 10ms or lower
Input format		Positive/negative common shared type (sink/source shared type)
Wiring method for common		8 points/common (terminal block 3-wire type)
Number of occupied stations		1 station 32 points assignment (use 16 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	100mA or lower (when 24VDC, all points ON)
Noise immunity		AC type noise voltage 1500Vp-p, DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		2830VAC rms/3 cycles between all AC external terminals and ground (2000 m above sea level) 500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all AC external terminals and ground 10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Protection level		IP1X
Weight		0.29kg

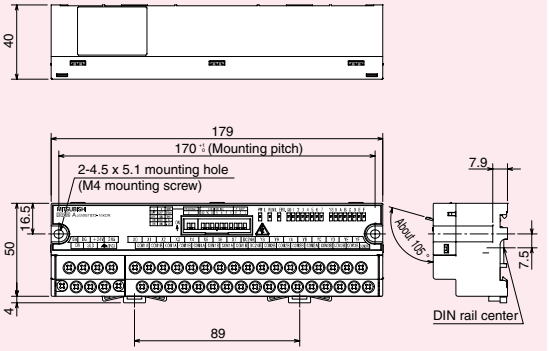
Output specifications		Description
Number of output points		8 points
Isolation method		Relay
Rated load voltage		24VDC (resistive load) 240VAC ($\cos\phi$ =1) 2A/point 4A/common
Number of simultaneous ON points		All points
Minimum switching load		5VDC/1mA
Maximum switching voltage		264VAC 125VDC
Life	Mechanical	More than 20 million times
	Electrical	Rated switching voltage/current loads 100 thousand times or more 200VAC 1.5A, 240VAC 1A ($\cos\phi$ =0.7): 100 thousand times or more 200VAC 1A, 240VAC 0.5A ($\cos\phi$ =0.35): 100 thousand times or more 24VDC 1A, 100VDC 0.1A (L/R=7ms): 100 thousand times or more
Maximum switching frequency		3600 times/hour
Response time	OFF→ON	10ms or lower
	ON→OFF	12ms or lower
Wiring method for common		4 points/common (terminal block 2-wire type)
Surge suppressor		None

External device connection diagram



External dimensions & terminal layout

Unit: mm



X0	X1	X2	X3	X4	X5	X6	X7	DC 24A	Y8	Y9	YA	YB	YC	YD	YE	YF
COM 1A	COM 1B	COM 1A	COM 1B	COM 1A	COM 1B	COM 1A	COM 1B	DC 24B	COM 2B	COM 2B	COM 2B	COM 2A	COM 3B	COM 3B	COM 3B	COM 3A

I/O combined module
AJ65SBTB1-32DT

DC input 16pts | +COM | 24VDC 1-wire | Transistor output 16pts | Sink | 0.5A 1-wire | Screw T. block | Protection

I/O combined module
AJ65SBTB1-32DT1

DC input 16pts | +COM | 24VDC 1-wire | Transistor output 16pts | Sink | 0.5A 1-wire | Screw T. block | Protection | High speed input

I/O combined module
AJ65SBTB1-32DT2

DC input 16pts | +COM | 24VDC 1-wire | Transistor output 16pts | Sink | 0.5A 1-wire | Screw T. block | Low leakage

I/O combined module
AJ65SBTB1-32DT3

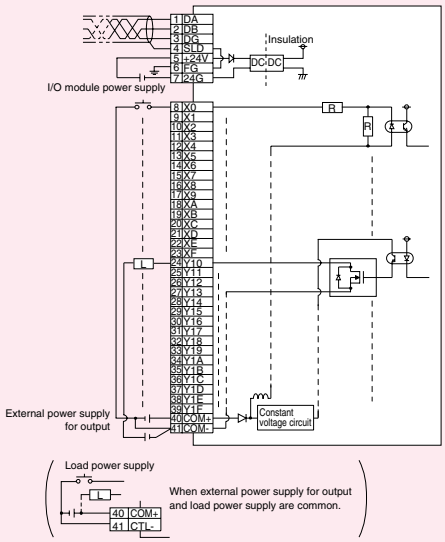
DC input 16pts | +COM | 24VDC 1-wire | Transistor output 16pts | Sink | 0.5A 1-wire | Screw T. block | High speed input | Low leakage

■Detailed specifications

Input specifications		Description			
		AJ65SBTB1-32DT	AJ65SBTB1-32DT1	AJ65SBTB1-32DT2	AJ65SBTB1-32DT3
Number of input points		16 points			
Isolation method		Photocoupler			
Rated input voltage		24VDC			
Rated input current		Approx. 7mA	Approx. 5mA	Approx. 7mA	Approx. 5mA
Operating voltage range		19.2 to 26.4VDC (ripple ratio: within 5%)			
Maximum number of simultaneous input points		100%			
ON voltage/ON current		14V or higher/3.5mA or higher	15V or higher/3.0mA or higher	14V or higher/3.5mA or higher	15V or higher/3.0mA or higher
OFF voltage/OFF current		6V or lower/1.7mA or lower	3V or lower/0.5mA or lower	6V or lower/1.7mA or lower	3V or lower/0.5mA or lower
Input resistance		Approx. 3.3kΩ	Approx. 4.7kΩ	Approx. 3.3kΩ	Approx. 4.7kΩ
Response time	OFF→ON	1.5ms or lower (when 24VDC)	0.2ms or lower (when 24VDC)	1.5ms or lower (when 24VDC)	0.2ms or lower (when 24VDC)
	ON→OFF	1.5ms or lower (when 24VDC)	0.2ms or lower (when 24VDC)	1.5ms or lower (when 24VDC)	0.2ms or lower (when 24VDC)
Input format		Positive common (sink type)			
Wiring method for common		32 points/common (terminal block 1-wire type)			
Number of occupied stations		1 station 32 points assignment (use 32 points)			
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)			
	Current	60mA or lower (when 24VDC, all points ON)			
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)			
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground			
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground			
Protection level		IP2X			
Weight		0.25kg			

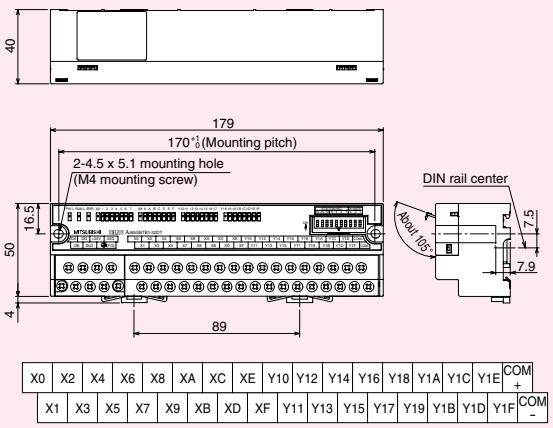
Output specifications		Description			
		AJ65SBTB1-32DT	AJ65SBTB1-32DT1	AJ65SBTB1-32DT2	AJ65SBTB1-32DT3
Number of output points		16 points			
Isolation method		Photocoupler			
Rated load voltage		24VDC			
Operating load voltage range		19.2 to 26.4VDC (ripple ratio: within 5%)			
Maximum load current		0.5A/point 3.6A/common			
Maximum inrush current		1.0A 10ms or lower			
Leakage current at OFF		0.25mA or lower		0.1mA or lower	
Maximum voltage drop at ON		0.3V or lower (TYP.) 0.5A, 0.6V or lower (MAX.) 0.5A			
Output format		Sink type			
Protection function		Overload protection function, overvoltage protection function, overheat protection function		None	
Response time	OFF→ON	0.5ms or lower			
	ON→OFF	1.5ms or lower (resistive load)			
External power supply for output part	Voltage	19.2 to 26.4VDC (ripple ratio: within 5%)			
	Current	30mA or lower (24VDC/common) Not including external load current	24.2mA or lower (when 24VDC, all points ON) Not including external load current	30mA or lower (when 24VDC, all points ON) Not including external load current	24.2mA or lower (when 24VDC, all points ON) Not including external load current
Surge suppressor		Zener diode			

■External device connection diagram



■External dimensions & terminal layout

Unit: mm



Screw T. block

Screw terminal block type

I/O combined module

AJ65SBTB1-32DTE1

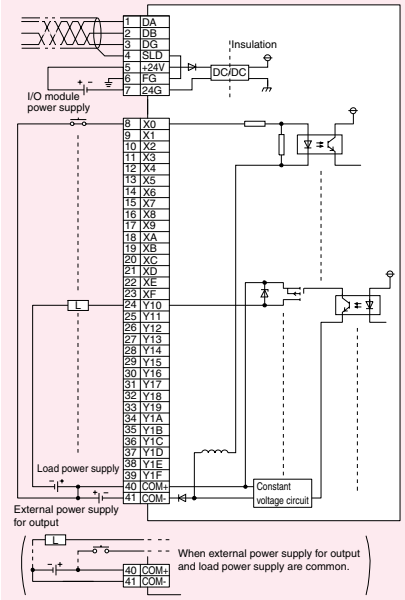
DC input 16 pts -COM | 24VDC 1-wire | Transistor output 16 pts Source | 0.5A 1-wire | Screw T. block

Detailed specifications

Input specifications		Description
Number of input points		16 points
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 7mA
Operating voltage range		19.2 to 26.4VDC (ripple ratio: within 5%)
Maximum number of simultaneous input points		100%
ON voltage/ON current		14V or higher/3.5mA or higher
OFF voltage/OFF current		6V or lower/1.7mA or lower
Input resistance		Approx. 3.3kΩ
Response time	OFF→ON	1.5ms or lower (when 24VDC)
	ON→OFF	1.5ms or lower (when 24VDC)
Input format		Negative common (Source type)
Wiring method for common		32 points/common (Terminal block 1-wire type)
Number of occupied stations		1 station 32 points assignment (use 32points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	50mA or lower (When 24VDC and all point is on)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester
Protection level		IP2X
Weight		0.26kg

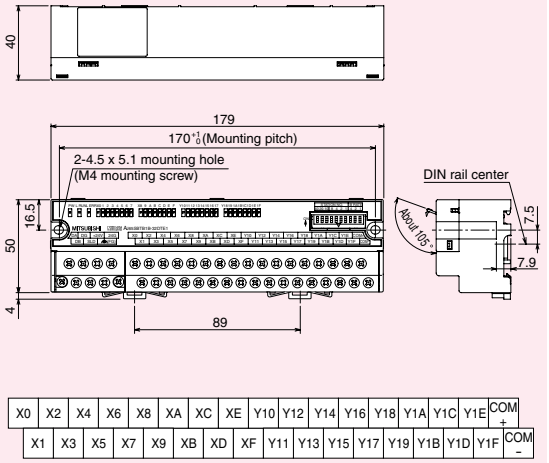
Output specifications		Description
Number of output points		16 points
Isolation method		Photocoupler
Rated load voltage		24VDC
Operating load voltage range		19.2 to 26.4VDC (ripple ratio: within 5%)
Maximum load current		0.5A/point 3.6A/common
Maximum inrush current		1.0A 10ms or lower
Leakage current at OFF		0.1mA or lower
Maximum voltage drop at ON		0.5VDC or lower (TYP) 0.5A 0.8VDC or lower (MAX) 0.5A
Output format		Source type
Response time	OFF→ON	0.5ms or lower
	ON→OFF	1.5ms or lower (Resistive load)
External Power supply for output	Voltage	19.2 to 26.4VDC (ripple ratio: within 5%)
	Current	10mA or lower (TYP.24VDC/common) Not including external load current
Surge suppressor		Zener diode

External device connection diagram



External dimensions & terminal layout

Unit: mm



I/O combined module
AJ65SBTB1-32KDT2

DC input 16pts | +COM | 24VDC 1-wire | Transistor output 16pts | Sink | 0.5A 1-wire | Screw T. block | Low leakage

I/O combined module
AJ65SBTB1-32KDT8

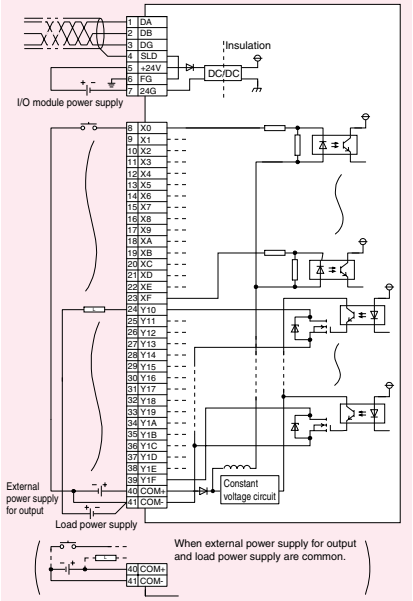
DC input 16pts | +COM | 12VDC 1-wire | Transistor output 16pts | Sink | 0.5A 1-wire | Screw T. block | Low leakage

■Detailed specifications

Input specifications		Description	
		AJ65SBTB1-32KDT2	AJ65SBTB1-32KDT8
Number of input points		16 points	
Isolation method		Photocoupler	
Rated input voltage		24VDC	12VDC
Rated input current		Approx. 7mA	Approx. 11mA
Operating voltage range		20.4 to 28.8VDC (ripple ratio: within 5%)	10.2 to 14.4VDC (ripple ratio: within 5%)
Maximum number of simultaneous input points		100% simultaneous ON (when 26.4VDC) 75% simultaneous ON (when 28.8VDC)	100%
ON voltage/ON current		14V or higher/4mA or higher	5.6V or higher/4mA or higher
OFF voltage/OFF current		5.5V or lower/1.7mA or lower	2.4V or lower/1.7mA or lower
Input resistance		Approx. 3.0kΩ	Approx. 1.0kΩ
Response time	OFF→ON	0.2ms: 0.2ms or lower, 1.5ms: 1.5ms or lower,	
	ON→OFF	5ms: 5ms or lower,10ms: 10ms or lower	
Input format		Positive common type (sink type)	
Wiring method for common		32 points/common (terminal block 1-wire type)	
Number of occupied stations		1 station 32 points assignment (use 32 points)	
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)	
	Current	65mA or lower (when 24VDC, all points ON)	
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)	
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground	
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground	
Protection level		IP2X	
Weight		0.26kg	

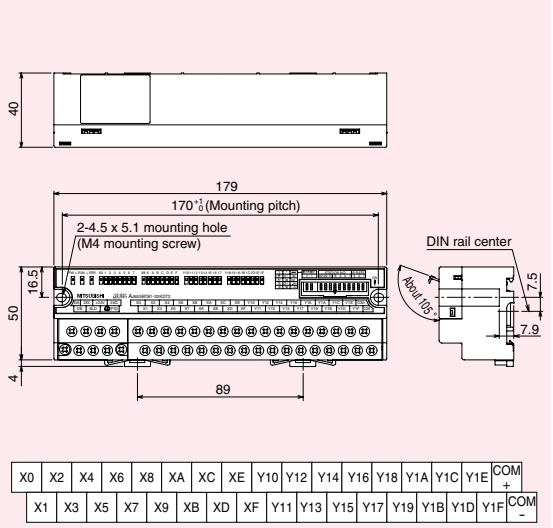
Output specifications		Description	
		AJ65SBTB1-32KDT2	AJ65SBTB1-32KDT8
Number of output points		16 points	
Isolation method		Photocoupler	
Rated load voltage		24VDC	12VDC
Operating load voltage range		20.4 to 28.8VDC (ripple ratio: within 5%)	10.2 to 14.4VDC (ripple ratio: within 5%)
Maximum load current		0.5A/point 3.6A/common	
Maximum inrush current		1.0A 10ms or lower	
Leakage current at OFF		0.1mA or lower	
Maximum voltage drop at ON		0.3VDC or lower (TYP.) 0.5A, 0.6VDC or lower (MAX.) 0.5A	
Output format		Sink type	
Protection function		None	
Response time	OFF→ON	0.5ms or lower	
	ON→OFF	1.5ms or lower (resistive load)	
External power supply for output part	Voltage	19.2 to 28.8VDC (ripple ratio: within 5%)	10.2 to 14.4VDC (ripple ratio: within 5%)
	Current	15mA or lower Not including external load current (when 24VDC, all points ON)	(when 12VDC, all points ON)
Surge suppressor		Zener diode	
Wiring method for common		32 points/common (terminal block 1-wire type)	

■External device connection diagram



■External dimensions & terminal layout

Unit: mm



Remote I/O module

Screw T. block

Screw/2-piece terminal block type

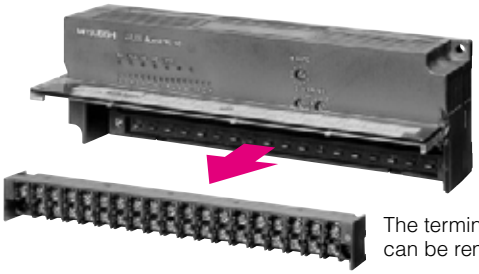
Overview

Screw/2-piece terminal block type

* The actual modules may slightly differ in shapes from the photos shown.

Features

- The I/O terminal block is removable.
- The module can be mounted in six orientations.
- The 2-piece structure allows easy servicing as the module can be replaced without rewiring.



The terminal block can be removed.

Part names and settings

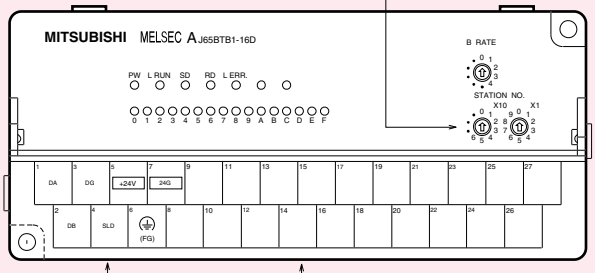
Station number setting switches
Set the tens place using the "X10" switch.
Set the ones place using the "X1" switch.
Make sure that the setting is within the range of 1 to 64.

Operation status indicator LEDs

LED name	Description
PW	Turns on when the remote I/O module is powered ON.
L RUN	Turns on when normal data are received from the master station and turns off when the timeout is reached.
L ERR	On: Communication error Flashing regularly: The station number and/or transmission speed switch setting has been changed while the power is on. Flashing irregularly: The terminating resistor setting is incorrect, or the module and CC-Link dedicated cables are being affected by noise. Off:Communication is normal.
X0 to 1F	Indicates the input ON/OFF status. Turns on and off when the input is ON or OFF respectively.

Transmission speed setting switch

Setting value	Transmission speed
0	156kbps
1	625kbps
2	2.5Mbps
3	5Mbps
4	10Mbps



Terminal block

DIN rail hook
This hook is used to mount the module on the DIN rail.

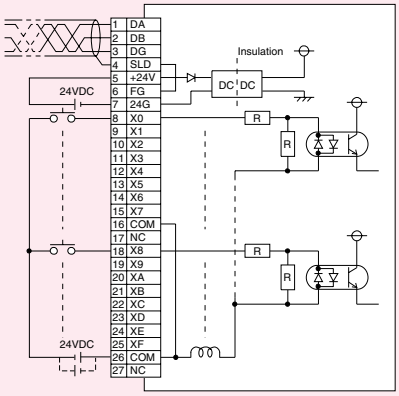
Input module
AJ65BTB1-16D

DC input 16pts | +COM / -COM | 24VDC 1-wire | Screw T. block

■Detailed specifications

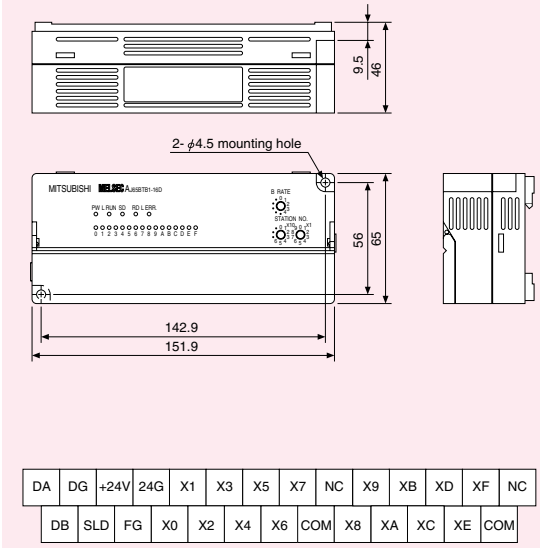
Input specifications		Description
Number of input points		16 points
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 7mA
Operating voltage range		19.2 to 28.8VDC (ripple ratio: within 5%)
Maximum number of simultaneous input points		100%
ON voltage/ON current		14V or higher/3.5mA or higher
OFF voltage/OFF current		6V or lower/1.7mA or lower
Input resistance		Approx. 3.3kΩ
Response time	OFF→ON	10ms or lower
	ON→OFF	10ms or lower
Wiring method for common		16 points/common (terminal block 1-wire type)
Input format		Positive/negative common shared type (sink/source shared type)
Number of occupied stations		1 station
I/O module power supply	Voltage	15.6 to 28.8VDC (ripple ratio: within 5%)
	Current	60mA or lower (when TYP.24VDC)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VDC for 1 minute between all DC external terminals together and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester
Weight		0.32kg

■External device connection diagram



■External dimensions & terminal layout

Unit: mm



DA	DG	+24V	24G	X1	X3	X5	X7	NC	X9	XB	XD	XF	NC
DB	SLD	FG	X0	X2	X4	X6	COM	X8	XA	XC	XE	COM	

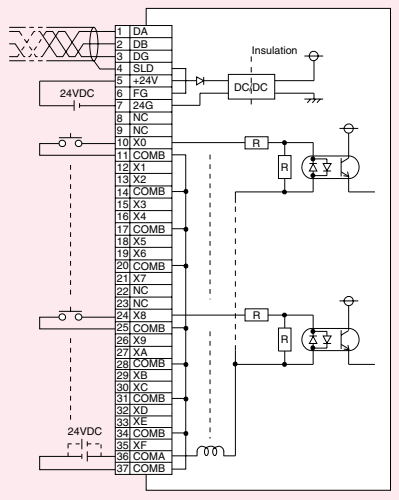
Input module
AJ65BTB2-16D

DC input 16pts | +COM / -COM | 24VDC 2-wire | Screw T. block

■Detailed specifications

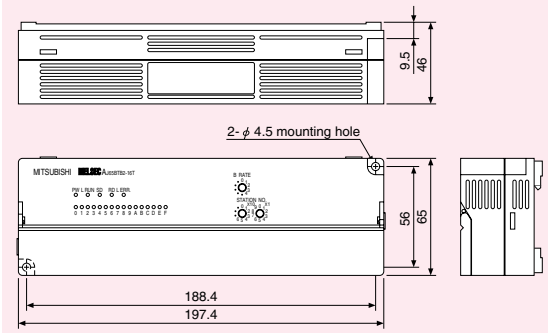
Input specifications		Description
Number of input points		16 points
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 7mA
Operating voltage range		19.2 to 28.8VDC (ripple ratio: within 5%)
Maximum number of simultaneous input points		100%
ON voltage/ON current		14V or higher/3.5mA or higher
OFF voltage/OFF current		6V or lower/1.7mA or lower
Input resistance		Approx. 3.3kΩ
Response time	OFF→ON	10ms or lower
	ON→OFF	10ms or lower
Wiring method for common		16 points/common (terminal block 2-wire type)
Input format		Positive/negative common shared type (sink/source shared type)
Number of occupied stations		1 station
I/O module power supply	Voltage	15.6 to 28.8VDC (ripple ratio: within 5%)
	Current	60mA or lower (when TYP.24VDC)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VDC for 1 minute between all DC external terminals together and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester
Weight		0.4kg

■External device connection diagram



■External dimensions & terminal layout

Unit: mm



DA	DG	+24V	24G	NC	COM B	X2	X3	COM B	X6	X7	NC	COM B	XA	XB	COM B	XE	XF	COM B	
DB	SLD	FG	NC	X0	X1	COM B	X4	X5	COM B	NC	X8	X9	COM B	XC	XD	COM B	COM A		

Screw T. block

Screw/2-piece terminal block type

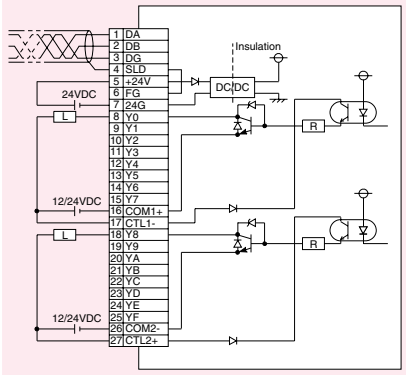
Output module
AJ65BTB1-16T

Transistor output 16 pts | Sink | 0.5A 1-wire | Screw T. block

■Detailed specifications

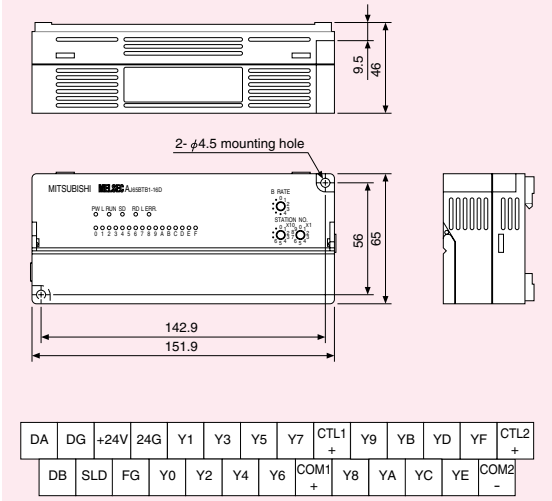
Output specifications		Description
Number of output points		16 points
Isolation method		Photocoupler
Rated load voltage		12/24VDC
Operating load voltage range		10.2 to 28.8VDC (ripple ratio: within 5%)
Maximum load current		0.5A/point 4A/common (Ta=45˚C) 218A/common (Ta=55˚C)
Maximum inrush current		4A 10ms or lower
Leakage current at OFF		0.1mA or lower
Maximum voltage drop at ON		0.9VDC or lower (TYP.) 0.5A, 1.5VDC or lower (MAX.) 0.5A
Output format		Sink type
Response time	OFF→ON	2ms or lower
	ON→OFF	2ms or lower (Resistive load)
External power supply for output part	Voltage	10.2 to 28.8VDC (ripple ratio: within 5%)
	Current	100mA or lower (TYP.24VDC/common) Not including external load current
Surge suppressor		Zener diode
Wiring method for common		8 points/common (terminal block 1-wire type)
Number of occupied stations		1 station
I/O module power supply	Voltage	15.6 to 28.8VDC (ripple ratio: within 5%)
	Current	80mA or lower (TYP.24VDC/common)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VDC for 1 minute between all DC external terminals together and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester
Weight		0.34kg

■External device connection diagram



■External dimensions & terminal layout

Unit: mm



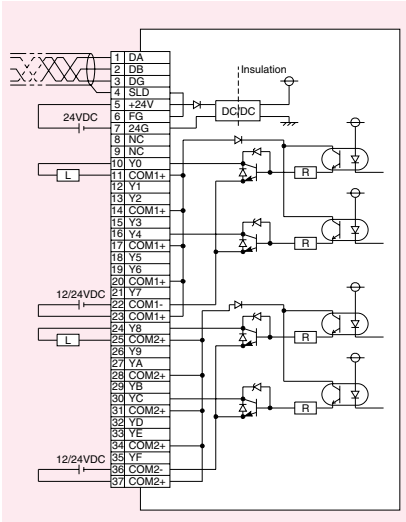
Output module
AJ65BTB2-16T

Transistor output 16 pts | Sink | 0.5A 2-wire | Screw T. block

■Detailed specifications

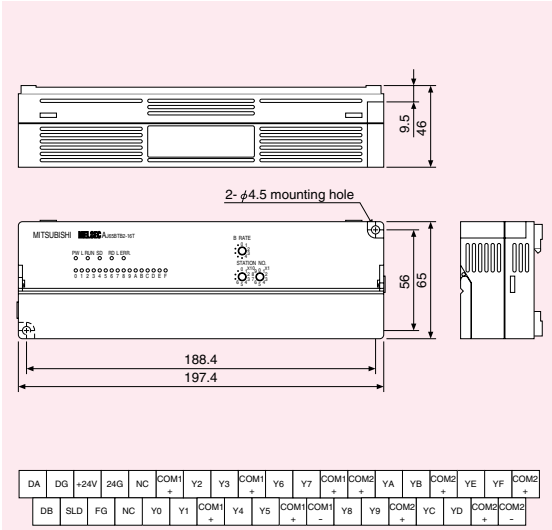
Output specifications		Description
Number of output points		16 points
Isolation method		Photocoupler
Rated load voltage		12/24VDC
Operating load voltage range		10.2 to 28.8VDC (ripple ratio: within 5%)
Maximum load current		0.5A/point 4A/common
Maximum inrush current		4A 10ms or lower
Leakage current at OFF		0.1mA or lower
Maximum voltage drop at ON		0.9VDC or lower (TYP.) 0.5A, 1.5VDC or lower (MAX.) 0.5A
Output format		Sink type
Response time	OFF→ON	2ms or lower
	ON→OFF	2ms or lower (Resistive load)
External power supply for output part	Voltage	10.2 to 28.8VDC (ripple ratio: within 5%)
	Current	100mA or lower (TYP.24VDC/common) Not including external load current
Surge suppressor		Zener diode
Wiring method for common		8 points/common (terminal block 2-wire type)
Number of occupied stations		1 station
I/O module power supply	Voltage	15.6 to 28.8VDC (ripple ratio: within 5%)
	Current	80mA or lower (TYP.24VDC/common)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VDC for 1 minute between all DC external terminals together and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester
Weight		0.41kg

■External device connection diagram



■External dimensions & terminal layout

Unit: mm



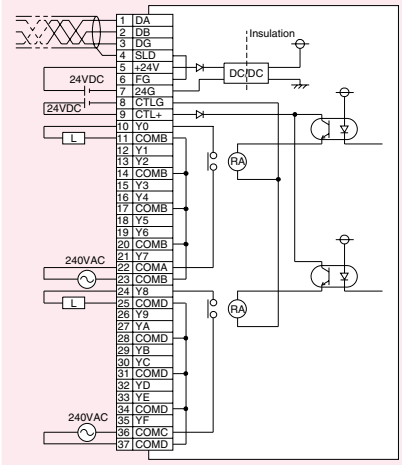
Output module
AJ65BTB2-16R

Relay output 16 pts | 2.0A 2-wire | Screw T. block

■Detailed specifications

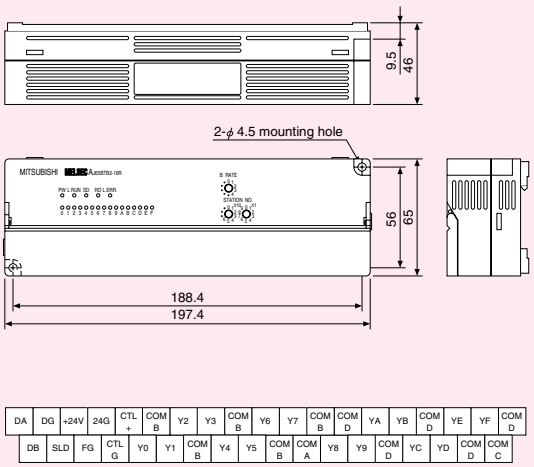
Output specifications		Description
Number of output points		16 points
Isolation method		Photocoupler
Rated load voltage/ current		24VDC (resistive load) / 2A/point 240VAC (COSϕ=1) / 8A/common
Minimum switching load		5VDC 1mA
Maximum switching voltage		250VAC 110VDC
Response time	OFF→ON	10ms or lower
	ON→OFF	12ms or lower
Life	Mechanical	More than 20 million times
	Electrical	Rated switching voltage/current loads more than 100,000 time
		200VAC 1.5A, 240VAC 1A (COSϕ=0.7) more than 100,000 times
		200VAC 1A, 240VAC 0.5A (COSϕ=0.35) more than 100,000 times
		24VDC 1A, 100VDC 0.1A (L/R=7ms) more than 100,000 times
Maximum switching frequency		3600 times/hour
External power supply for output (CTL+, CTLG)	Voltage	24VDC±10% (ripple ratio: 4Vp-p or lower)
	Current	90mA or lower (TYP.24VDC all point ON)
Surge suppressor		None
Wiring method for common		8 points/common (terminal block 2-wire type)
Number of occupied stations		1 station
I/O module power supply	Voltage	15.6 to 28.8VDC (ripple ratio: within 5%)
	Current	85mA or lower (at TYP.24VDC)
Noise immunity		AC type noise voltage 1500Vp-p, DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		1500VAC for 1 minute between all AC external terminals together and ground
Insulation resistance		500VAC for 1 minute between all DC external terminals together and ground 10MΩ or higher, measured with a 500VDC insulation resistance tester
Weight		0.47kg

■External device connection diagram



■External dimensions & terminal layout

Unit: mm



Screw T. block

Screw/2-piece terminal block type

I/O combined module
AJ65BTB1-16DT

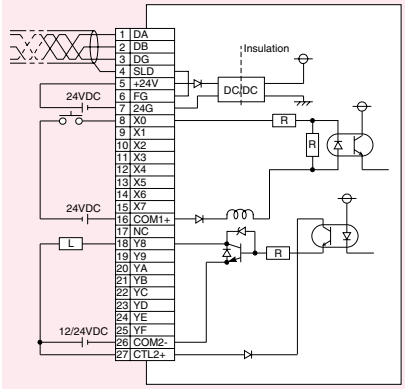
DC input 8 pts | +COM | 24VDC 1-wire | Transistor output 8 pts | Sink | 0.5A 1-wire | Screw T. block

■Detailed specifications

Input specifications		Description
Number of input points		8 points
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 7mA
Operating voltage range		19.2 to 28.8VDC (ripple ratio: within 5%)
Maximum number of simultaneous input points		100%
ON voltage/ON current		14V or higher/3.5mA or higher
OFF voltage/OFF current		6V or lower/1.7mA or lower
Input resistance		Approx. 3.3kΩ
Response time	OFF→ON	10ms or lower
	ON→OFF	10ms or lower
Wiring method for common		8 points/common (terminal block 1-wire type)
Input format		Positive common (sink type)
Number of occupied stations		1 station
I/O module power supply	Voltage	15.6 to 28.8VDC (ripple ratio: within 5%)
	Current	70mA or lower (when TYP.24VDC)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals together and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester
Weight		0.33kg

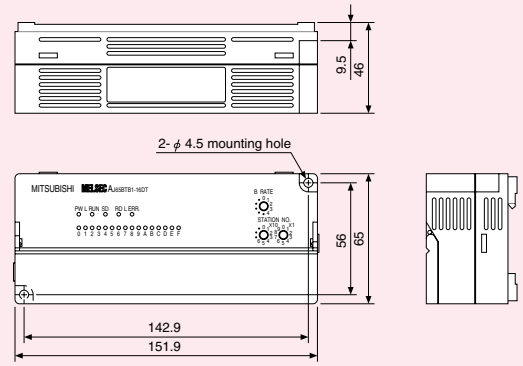
Output specifications		Description
Number of output points		8 points
Isolation method		Photocoupler
Rated load voltage		12/24VDC
Operating load voltage range		10.2 to 28.8VDC (ripple ratio: within 5%)
Maximum load current		0.5A/point 4A/common
Maximum inrush current		4A 10ms or lower
Leakage current at OFF		0.1mA or lower
Maximum voltage drop at ON		0.9VDC or lower (TYP.) 0.5A, 1.5VDC or lower (MAX.) 0.5A
Output format		Sink type
Response time	OFF→ON	2ms or lower
	ON→OFF	2ms or lower (Resistive load)
External power supply for output part	Voltage	10.2 to 28.8VDC (ripple ratio: within 5%)
	Current	50mA or lower (TYP.24VDC/common) Not including external load current
Surge suppressor		Zener diode
Wiring method for common		8 points/common

■External device connection diagram



■External dimensions & terminal layout

Unit: mm



DA	DG	+24V	24G	X1	X3	X5	X7	NC	Y9	YB	YD	YF	CTL2 +
DB	SLD	FG	X0	X2	X4	X6	COM1 +	Y8	YA	YC	YE	COM2 -	

I/O combined module
AJ65BTB2-16DT

DC input 8 pts | +COM | 24VDC 2-wire | Transistor output 8 pts | Sink | 0.5A 2-wire | Screw T. block

I/O combined module
AJ65BTB2-16DR

DC input 8 pts | +COM / -COM | 24VDC 2-wire | Relay output 8 pts | 2.0A 2-wire | Screw T. block

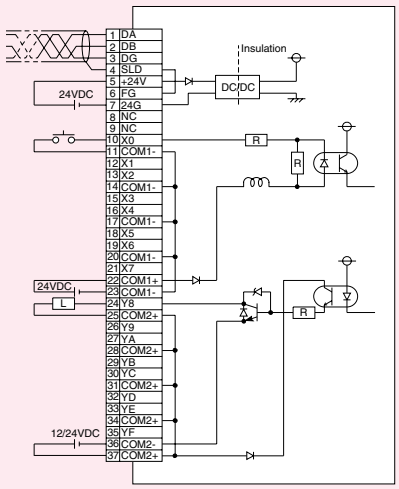
■Detailed specifications

Input specifications		Description	
		AJ65BTB2-16DT	AJ65BTB2-16DR
Number of input points		8 points	
Isolation method		Photocoupler	
Rated input voltage		24VDC	
Rated input current		Approx. 7mA	
Operating voltage range		19.2 to 28.8VDC (ripple ratio: within 5%)	
Maximum number of simultaneous input points		100%	
ON voltage/ON current		14V or higher/3.5mA or higher	
OFF voltage/OFF current		6V or lower/1.7mA or lower	
Input resistance		Approx. 3.3kΩ	
Response time	OFF→ON	10ms or lower	
	ON→OFF	10ms or lower	
Wiring method for common		8 points/common	
Input format		Sink type	Sink/source loading shared type
Number of occupied stations		1 station	
I/O module power supply	Voltage	15.6 to 28.8VDC (ripple ratio: within 5%)	
	Current	70mA or lower (when TYP.24VDC)	
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)	AC type noise voltage 1500Vp-p, DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals together and ground	1500VAC for 1 minute between all AC external terminals together and ground 500VAC for 1 minute between all DC external terminals together and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester	10MΩ or higher, measured with a 500VDC insulation resistance tester
Weight		0.41kg	0.43kg

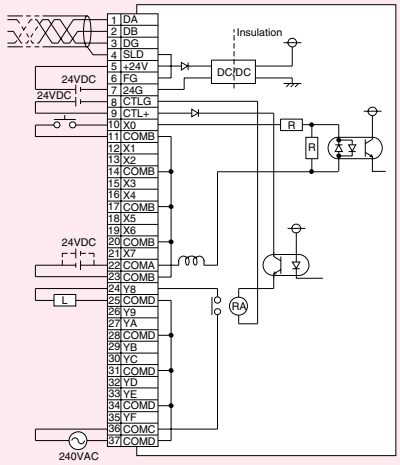
Output specifications		Description
		AJ65BTB2-16DT
Number of output points		8 points
Isolation method		Photocoupler
Rated load voltage		12/24VDC
Operating load voltage range		10.2 to 28.8VDC (ripple ratio: within 5%)
Maximum load current		0.5A/point 4A/common
Maximum inrush current		4A 10ms or lower
Leakage current at OFF		0.1mA or lower
Maximum voltage drop at ON		0.9VDC or lower (TYP.) 0.5A, 1.5VDC or lower (MAX.) 0.5A
Output format		Sink type
Response time	OFF→ON	2ms or lower
	ON→OFF	2ms or lower (Resistive load)
External power supply for output part	Voltage	10.2 to 28.8VDC (ripple ratio: within 5%)
	Current	50mA or lower (TYP.24VDC/common) Not including external load current
Surge suppressor		Zener diode
Wiring method for common		8 points/common
		AJ65BTB2-16DR
Number of output points		8 points
Isolation method		Photocoupler
Rated load voltage/current		24VDC (resistive load) / 2A/point 240VAC (COSϕ=1) / 8A/common
Minimum switching load		5VDC 1mA
Maximum switching voltage		250VAC 110VDC
Response time	OFF→ON	10ms or lower
	ON→OFF	12ms or lower
Life	Mechanical	20 million times or higher
	Electrical	Rated switching voltage/current loads more than 100,000 time
		200VAC 1.5A, 240VAC 1A (COSϕ=0.7) more than 100,000 times
		200VAC 1A, 240VAC 0.5A (COSϕ=0.35) more than 100,000 times
		24VDC 1A, 100VDC 0.1A (L/R=7ms) more than 100,000 times
Maximum switching frequency		3600 times/hour
External power supply for output part	Voltage	24VDC±10% (ripple ratio: 4Vp-p or lower)
	Current	45mA or lower (TYP.24VDC all point ON)
Surge suppressor		None
Wiring method for common		8 points/common

■External device connection diagram

•AJ65BTB2-16DT

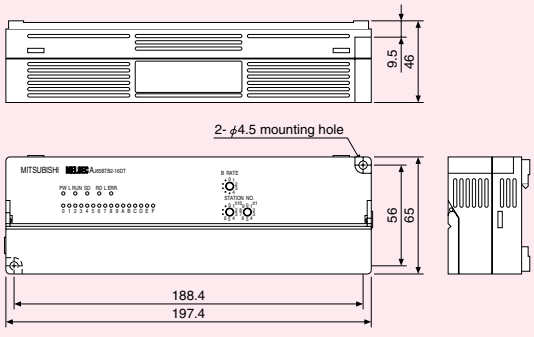


•AJ65BTB2-16DR



■External dimensions & terminal layout

Unit: mm



•AJ65BTB2-16DT

DA	DG	+24G	+24V	NC	COM1 -	X2	X3	COM 1-	X6	X7	COM1 -	COM2 +	YA	YB	COM2 +	YE	YF	COM2 +	
DB	SLD	FG	NC	X0	X1	COM1 -	X4	X5	COM1 -	COM1 +	Y8	Y9	COM2 +	YC	YD	COM2 +	COM2 -		

•AJ65BTB2-16DR

DA	DG	+24V	24G	CTL +	COM B	X2	X3	COM B	X6	X7	COM B	COM D	YA	YB	COM D	YE	YF	COM D	
DB	SLD	FG	CTLG	X0	X1	COM B	X4	X5	COM B	COM A	Y8	Y9	COM D	YC	YD	COM D	COM C		

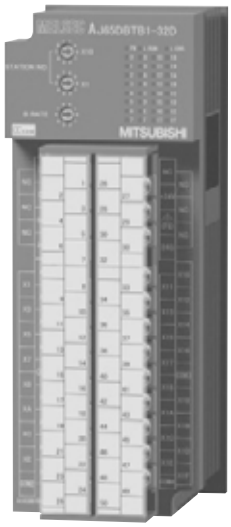
Remote I/O module

Screw T. block

Screw/2-piece terminal block Dustproof type

Overview

Screw/2-piece terminal block Dustproof type

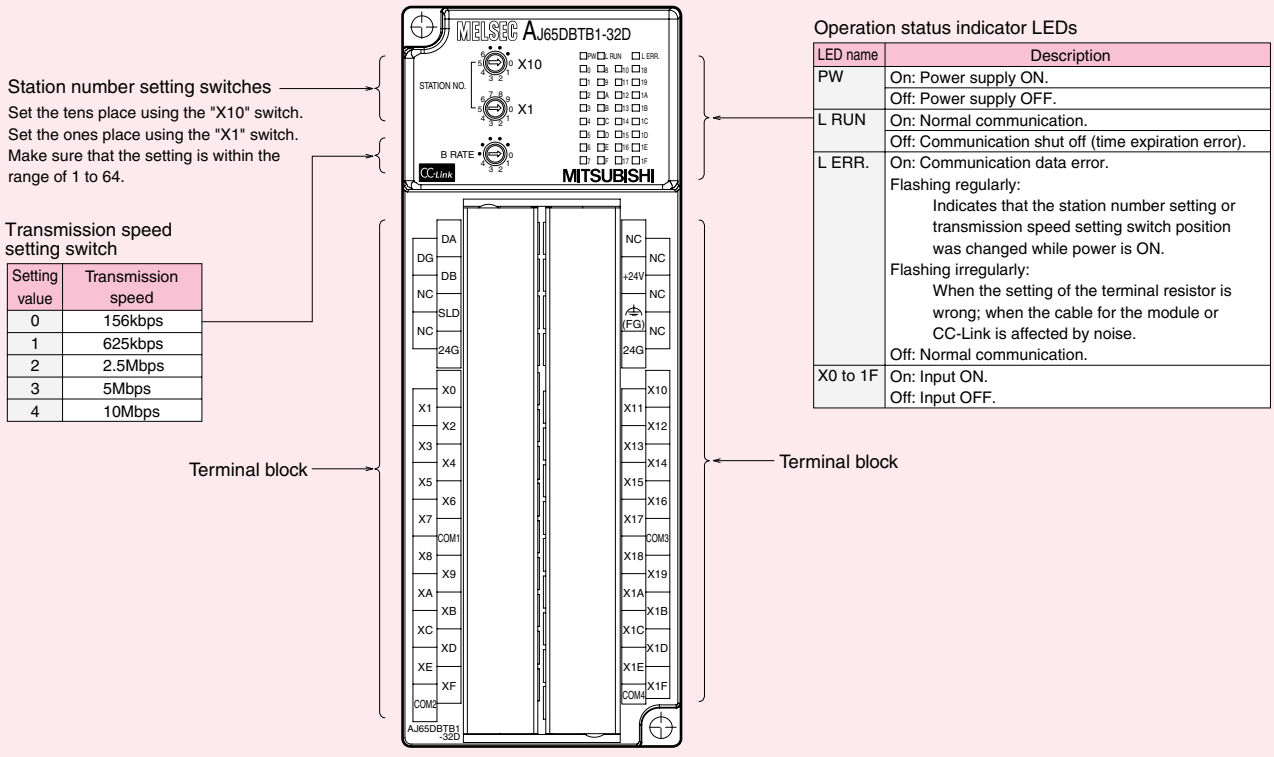


* The actual modules may slightly differ in shapes from the photos shown.

Features

- The I/O terminal block is removable.
- The module can be mounted in six orientations.
- With a 2-piece terminal block, the module can be replaced without rewiring for maintenance.

Part names and settings



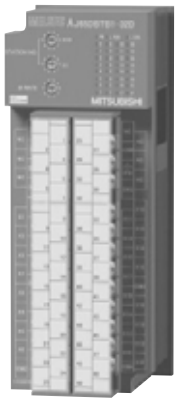
Setting value	Transmission speed
0	156kbps
1	625kbps
2	2.5Mbps
3	5Mbps
4	10Mbps

LED name	Description
PW	On: Power supply ON. Off: Power supply OFF.
L RUN	On: Normal communication. Off: Communication shut off (time expiration error).
L ERR.	On: Communication data error. Flashing regularly: Indicates that the station number setting or transmission speed setting switch position was changed while power is ON. Flashing irregularly: When the setting of the terminal resistor is wrong; when the cable for the module or CC-Link is affected by noise. Off: Normal communication.
X0 to 1F	On: Input ON. Off: Input OFF.

Input module

AJ65DBTB1-32D

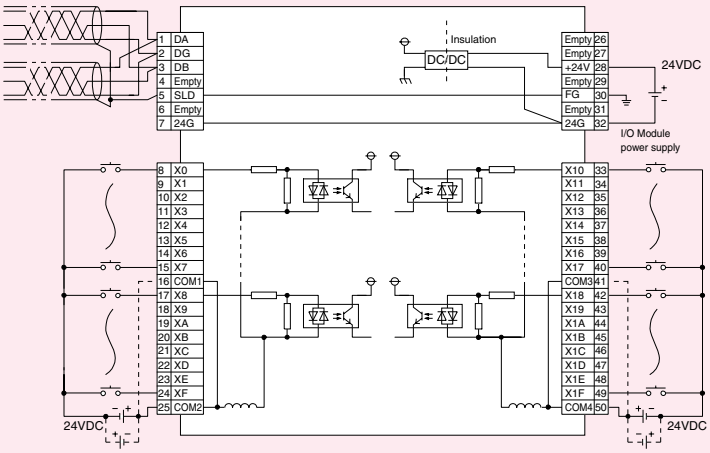
DC input 32 pts | +COM / -COM | 24VDC 1-wire | Screw T. block



■Detailed specifications

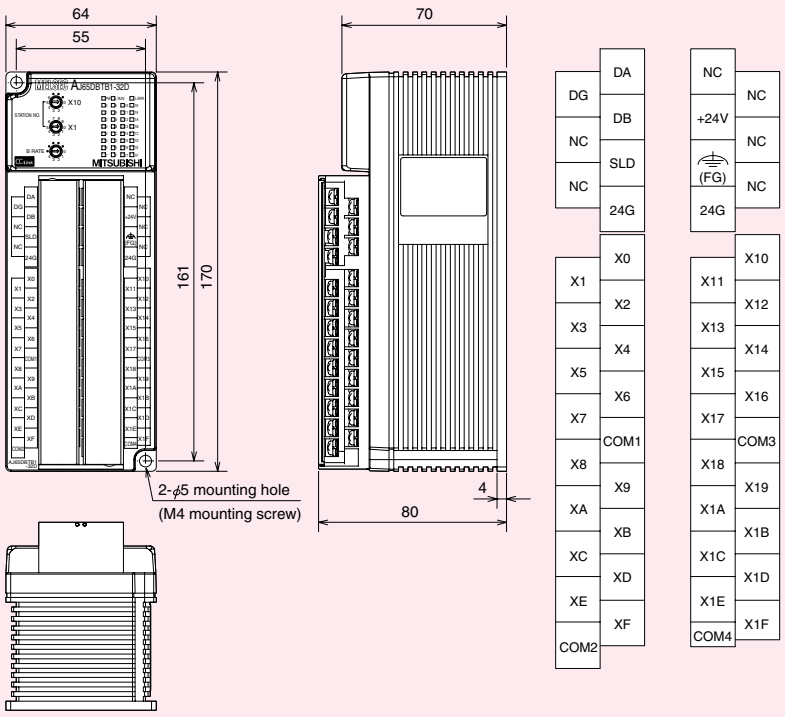
Input specifications		Description
Number of input points		32 points
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 5mA
Operating voltage range		20.4 to 31.2VDC (ripple ratio: within 5%)
Maximum number of simultaneous input points		100% (when 26.4VDC)
ON voltage/ON current		15V or higher/3mA or higher
OFF voltage/OFF current		5V or lower/1.5mA or lower
Input resistance		Approx. 4.7kΩ
Response time	OFF→ ON	10ms or lower (when 24VDC)
	ON→ OFF	10ms or lower (when 24VDC)
Wiring method for common		16 points/common (2 points) (terminal block 1-wire type)
Input format		Positive/negative common shared type (sink/source shared type)
Number of occupied stations		1 station 32 points assignment (use 32 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	45mA or lower (when 24VDC, all points on)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Protection level		IP2X
Weight		0.6kg

■External device connection diagram



■External dimensions & terminal layout

Unit: mm



Screw T. block

Screw/2-piece terminal block Dustproof type

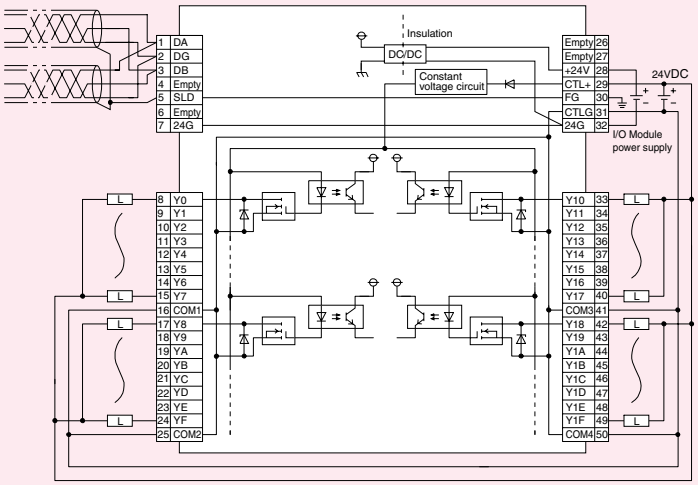
Output module
AJ65DBTB1-32T1

Transistor output 32 pts | Sink | 0.5A 1-wire | Screw T. block | Low leakage

■Detailed specifications

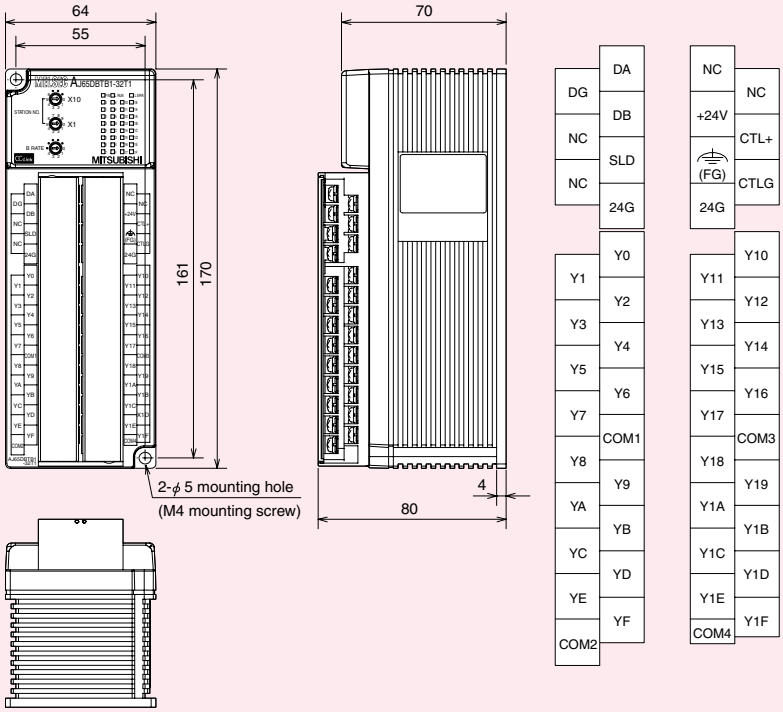
Output specifications		Description
Number of output points		32 points
Isolation method		Photocoupler
Rated load voltage		12/24VDC
Operating load voltage range		10.2 to 31.2VDC (ripple ratio: within 5%)
Maximum load current		0.5A/point 8A/common (2A/terminal)
Maximum inrush current		1.2A 10ms or lower
Leakage current at OFF		0.1mA or lower
Maximum voltage drop at ON		0.3V or lower (TYP.) 0.5A, 0.6V or lower (MAX.) 0.5A
Output format		Sink type
Response time	OFF→ON	0.5ms or lower
	ON→OFF	1.5ms or lower (resistive load)
External power supply for output part	Voltage	10.2 to 31.2VDC (ripple ratio: within 5%)
	Current	50mA or lower (when 24VDC, all points on) Not including external load current
Surge suppressor		Zener diode
Wiring method for common		32 points/common (4 points) (terminal block 1-wire type)
Number of occupied stations		1 station 32 points assignment (use 32 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	65mA or lower (when 24VDC, all points on)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Protection level		IP2X
Weight		0.7 kg

■External device connection diagram



■External dimensions & terminal layout

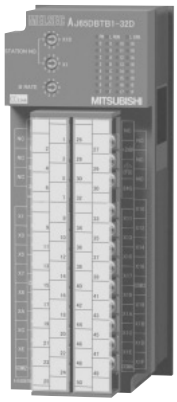
Unit: mm



Output module

AJ65DBTB1-32R

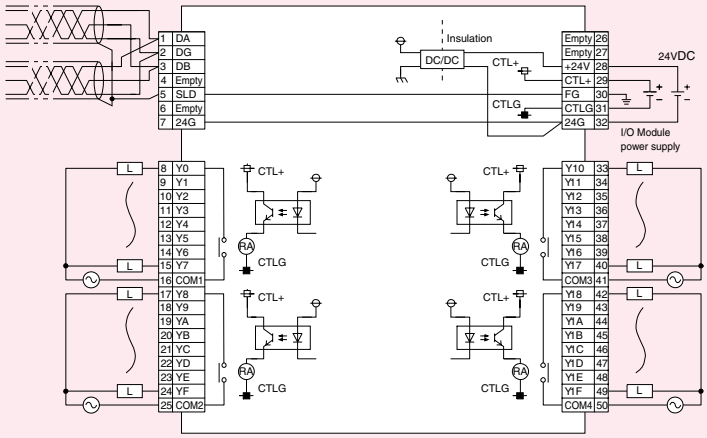
Relay output 32 pts | 2A 1-wire | Screw T. block



■Detailed specifications

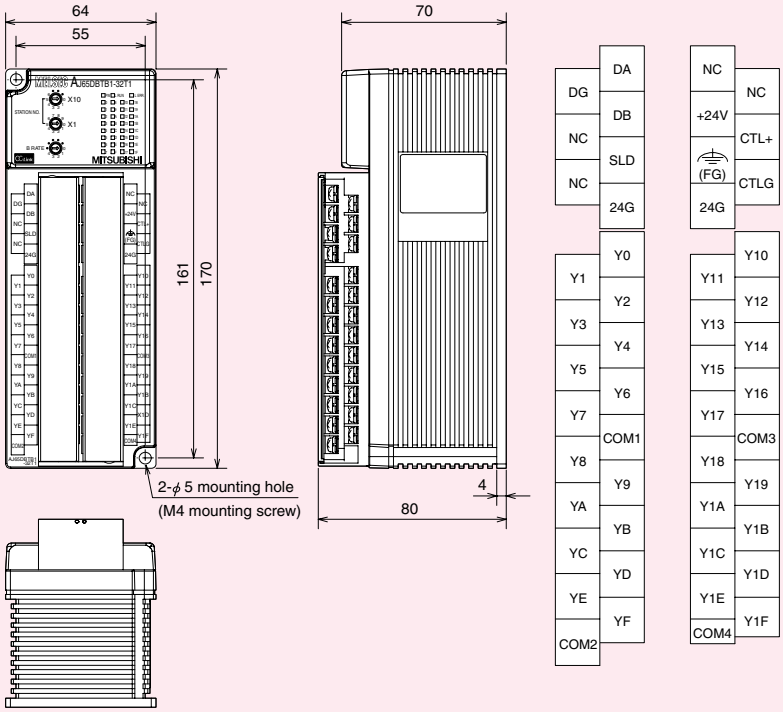
Output specifications		Description
Number of output points		32 points
Isolation method		Photocoupler
Rated load voltage/current		2 VDC (Resistive load) 240VAC (cos ϕ=1) 2 A/point 4A/common (2A/terminal)
Minimum switching load		5VDC/1 mA
Maximum switching voltage		264VAC 125VDC
Life	Mechanical	More than 20 million times
	Electrical	Rated switching voltage/current loads 100 thousand times or more 200VAC 1.5A, 240VAC 1A (cos ϕ=0.7): 100 thousand times or more 200VAC 1A, 240VAC 0.5A (cos ϕ=0.35): 100 thousand times or more 24VDC 1A, 100VDC 0.1A (L/R=7ms): 100 thousand times or more
Maximum switching frequency		3600 times/hour
Surge suppressor		None
Response time	OFF→ON	10ms or lower
	ON→OFF	12ms or lower
External power supply for output part (CTL+/CTLG terminal)	Voltage	24VDC±10% ripple ratio 4Vp-p or lower
	Current	180mA or lower (when 24VDC, all points on)
Wiring method for common		8 points/common (terminal block 1-wire type)
Number of occupied stations		1 station 32 points assignment (use 32 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	80mA or lower (when 24VDC, all points on)
Noise immunity		AC type noise voltage 1500Vp-p, DC type noise voltage 500Vp-p, noise width 1µs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		1500VAC for 1 minute between all AC external terminals and ground 500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all AC external terminals and ground 10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Protection level		IP1X
Weight		0.7kg

■External device connection diagram



■External dimensions & terminal layout

Unit: mm



Screw T. block

Screw/2-piece terminal block Dustproof type

I/O combined module
AJ65DBTB1-32DT1

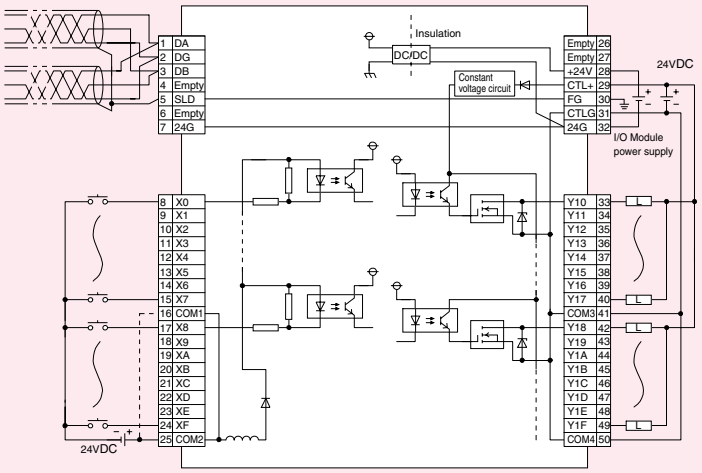
DC input 16 pts | +COM | 24VDC 1-wire | Transistor output 16 pts | Sink | 0.5A 1-wire | Screw T. block

■Detailed specifications

Input specifications		Description
Number of input points		16 points
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 5mA
Operating voltage range		20.4 to 31.2VDC (ripple ratio: within 5%)
Maximum number of simultaneous input points		100% (when 26.4VDC)
ON voltage/ON current		15V or higher/3mA or higher
OFF voltage/OFF current		5V or lower/1.5mA or lower
Input resistance		Approx. 4.7kΩ
Response time	OFF→ ON	10ms or lower (when 24VDC)
	ON→ OFF	10ms or lower (when 24VDC)
Input format		Positive common type (sink type)
Wiring method for common		16 points/common (2 points) (terminal block 1-wire type)
Number of occupied stations		1 station 32 points assignment (use 32 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	55mA or lower (when 24VDC, all points on)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Protection level		IP2X
Weight		0.65kg

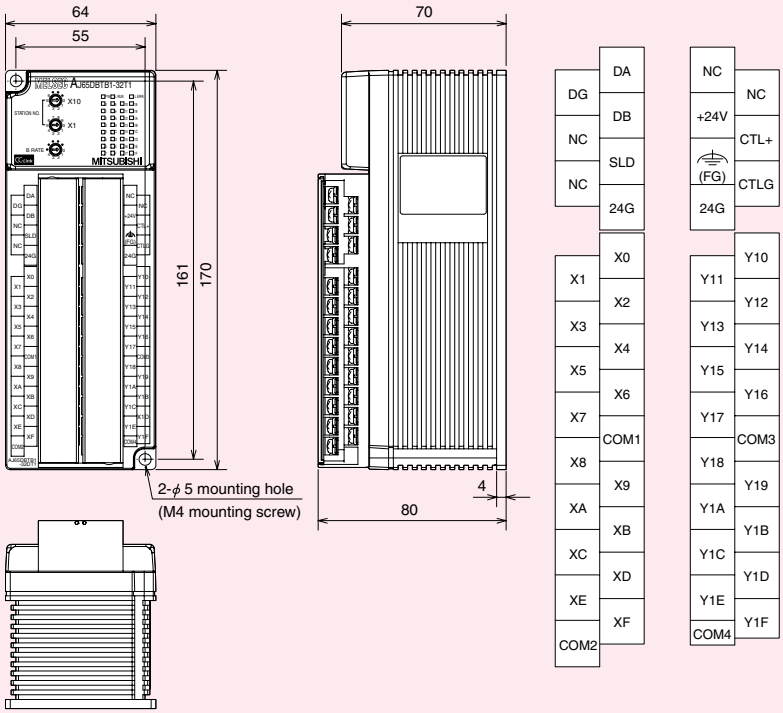
Output specifications		Description
Number of output points		16 points
Isolation method		Photocoupler
Rated load voltage		12/24VDC
Operating load voltage range		10.2 to 31.2VDC (ripple ratio: within 5%)
Maximum load current		0.5A/point 4A/common (2A/terminal)
Maximum inrush current		1.2A 10ms or lower
Leakage current at OFF		0.1mA or lower
Maximum voltage drop at ON		0.3V or lower (TYP.) 0.5A, 0.6V or lower (MAX.) 0.5A
Output format		Sink type
Response time	OFF→ON	0.5ms or lower
	ON→OFF	1.5ms or lower (resistive load)
External power supply for output part	Voltage	10.2 to 31.2VDC (ripple ratio: within 5%)
	Current	30mA or lower (when 24VDC, all points on) Not including external load current
Surge suppressor		Zener diode
Wiring method for common		16 points/common (2 points) (terminal block 1-wire type)

■External device connection diagram



■External dimensions & terminal layout

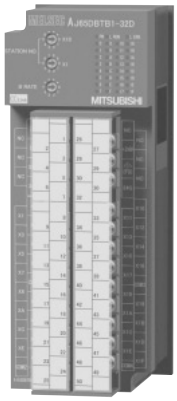
Unit: mm



I/O combined module

AJ65DBTB1-32DR

DC input 16 pts | +COM / -COM | 24VDC 1-wire | Relay output 16 pts | Sink | 2A 1-wire | Screw T. block



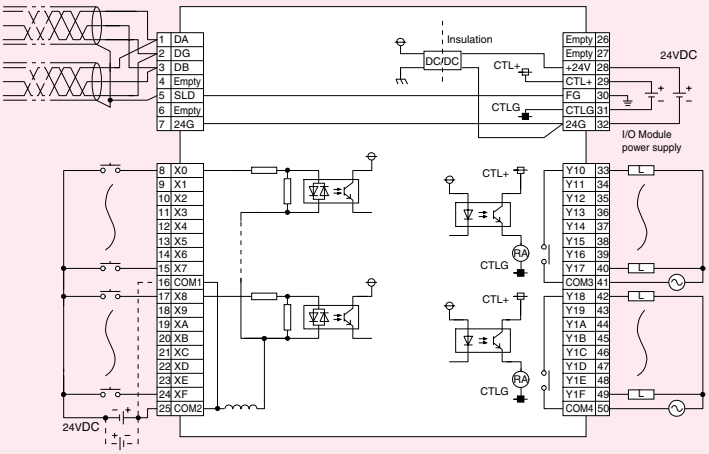
■Detailed specifications

Input specifications		Description
Number of input points		16 points
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 5mA
Operating voltage range		20.4 to 31.2VDC (ripple ratio: within 5%)
Maximum number of simultaneous input points		100% (when 26.4VDC)
ON voltage/ON current		15V or higher/3mA or higher
OFF voltage/OFF current		5V or lower/1.5mA or lower
Input resistance		Approx. 4.7kΩ
Response time	OFF→ON	10ms or lower (when 24VDC)
	ON→OFF	10ms or lower (when 24VDC)
Input format		Positive/negative common shared type (sink/source shared type)
Wiring method for common		16 points/common (2 points) (terminal block 1-wire type)

Output specifications		Description
Number of output points		16 points
Isolation method		Photocoupler
Rated load voltage		24VDC (Resistive load) 240 V AC (cosϕ =1) 2A/point 4A/common (2A/terminal)
Minimum switching load		5 VDC/1mA
Maximum switching voltage		264VAC 125VDC
Life	Mechanical	More than 20 million times
	Electrical	Rated switching voltage/current loads 100 thousand times or more 200VAC 1.5A, 240VAC 1A (cosϕ =0.7): 100 thousand times or more 200VAC 1A, 240VAC 0.5A (cosϕ =0.35): 100 thousand times or more 24VDC 1A, 100VDC 0.1A (L/R=7ms): 100 thousand times or more
Maximum switching frequency		3600 times/hour
Surge suppressor		None
Response time	OFF→ON	10ms or lower
	ON→OFF	12ms or lower
External power supply for output part (CTL+/CTLG terminal)	Voltage	24VDC 10% ripple ratio 4Vp-p or lower
	Current	90mA or lower (when 24VDC, all points on)
Wiring method for common		8 points/common (terminal block 1-wire type)

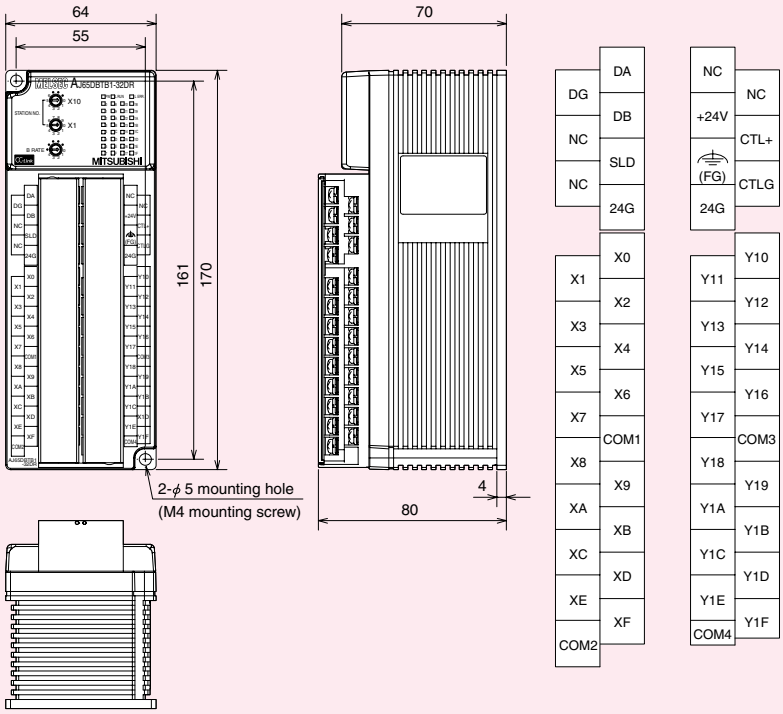
specifications		Description
Number of occupied stations		1 station 32 points assignment (use 32 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	60mA or lower (when 24VDC, all points ON)
Noise immunity		AC type noise voltage 1500Vp-p, DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		1500VAC for 1 minute between all AC external terminals and ground 500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 50VDC insulation resistance tester between all AC external terminals and ground 10MΩor higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Protection level		IP1X
Weight		0.65kg

■External device connection diagram



■External dimensions & terminal layout

Unit: mm



Remote I/O modules

Spring clamp

Spring clamp terminal block push-in type, Spring clamp terminal block type

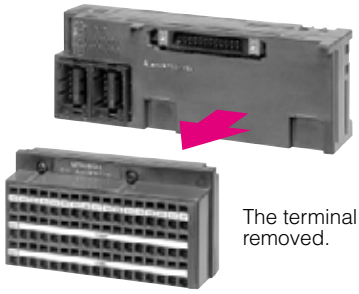
Overview

Spring clamp terminal block push-in type,
Spring clamp terminal block type

* The actual modules may slightly differ in shapes from the photos shown.

Features

- Wiring time can be reduced because no screw tightening and retightening are required.
- The 2-piece structure allows easy servicing as the module can be replaced without rewiring.
- DIN rail or screw mounting is selectable.
- The module can be mounted in six orientations.
- The 3-wire sensor can be connected.



The terminal block can be removed.

Part names and settings

Operation status indicator LEDs

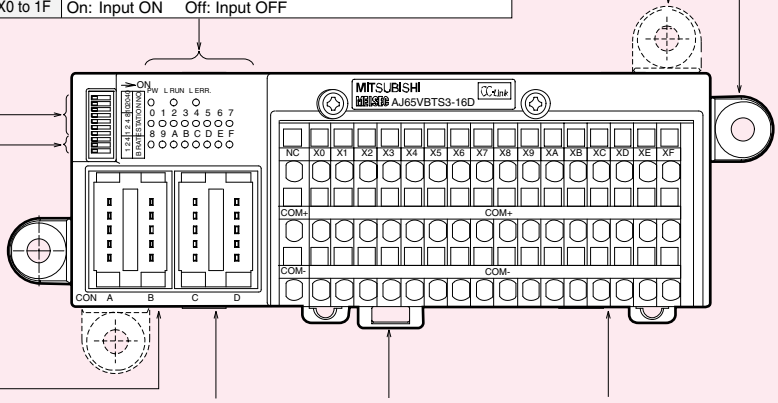
LED name	Description
PW	On: Power supply ON Off: Power supply OFF
L RUN	On: Normal communication Off: Communication shut off (time expiration error)
L ERR	On: Communication data error Flashing regularly: Indicates that the station number setting or transmission speed setting switch position was changed while power is ON Flashing irregularly: When the setting of the terminal resistor is wrong; when the cable for the module or CC-Link is affected by noise Off: Normal communication
X0 to 1F	On: Input ON Off: Input OFF

Holding fixture for screw installation
This removable fitting is used to mount the module to a panel.

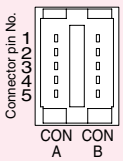
Station number setting switch
Select "10", "20" or "40" to set the tens place of the station number.
Select "1", "2", "4" or "8" to set the ones place of the station number.
Always set the station number within the range of 1 to 64.

Transmission speed setting switch

Setting value	Switch status 4	2	1	Transmission speed
0	OFF	OFF	OFF	156kbps
1	OFF	OFF	ON	625kbps
2	OFF	ON	OFF	2.5Mbps
3	OFF	ON	ON	5Mbps
4	ON	OFF	OFF	10Mbps

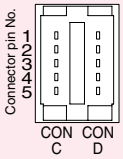


One-touch connector for communication
One-touch connector for connection of communication line.



Pin No.	Signal Name
1	DA
2	DB
3	DG
4	Empty
5	SLD

One-touch connector for power supply and FG
One-touch connector for unit power supply line and FG.



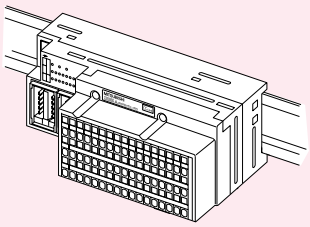
Pin No.	Signal Name
1	FG
2	+24V (UNIT)
3	24G (UNIT)
4	Empty
5	Empty

DIN rail hook
This hook is used to mount the module on the DIN rail.

Terminal block

The module can be mounted in six orientations.

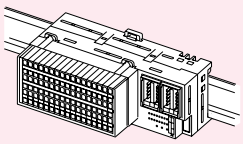
● Mounting orientation in which max. simultaneous input is not limited.



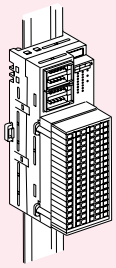
Front installation (Basic orientation)

● Mounting orientation max. simultaneous input is limited

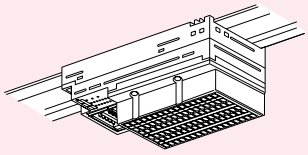
◎ Applicable models
AJ65VBTS3-16D, AJ65VBTS3-32D, AJ65VBTS32-32DT
(Refer to the derating curve)



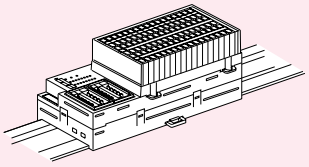
Front installation
(Upside-down orientation)



Front installation
(Vertical basic orientation)



Ceiling installation



Horizontal installation

Spring clamp

Spring clamp terminal block push-in type

Input module
AJ65ABTP3-16D

DC input 16 pts | +COM | 24VDC 3-wire | Spring clamp | Diagnostic function

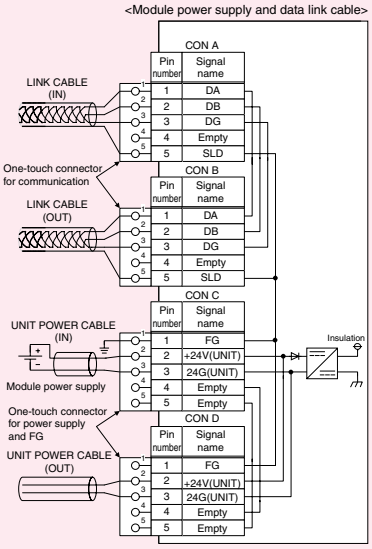
NEW

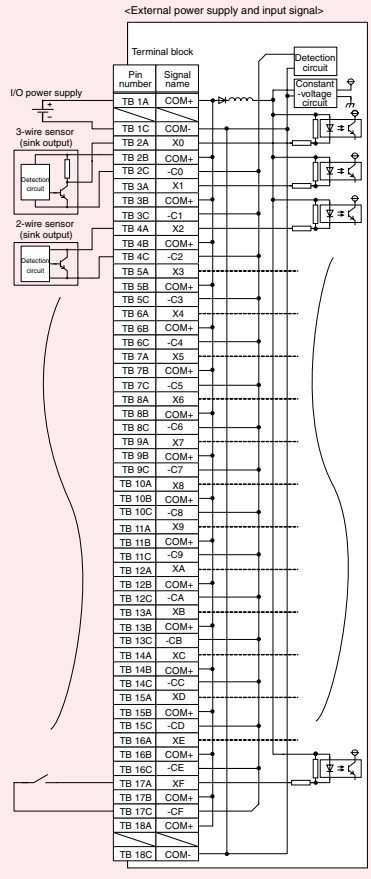
■Detailed specifications

Input specifications		Description
Number of input points		16 points
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 6mA
Operating voltage range		20.4 to 28.8VDC (ripple ratio: within 5%)
Maximum number of simultaneous input points		100%
ON voltage/ON current		14V or higher/3.5mA or higher
OFF voltage/OFF current		6V or lower/1.7mA or lower
Input resistance		Approx. 3.8kΩ
Response time	OFF→ON	1.5ms or lower (when 24VDC)
	ON→OFF	1.5ms or lower (when 24VDC)
Wiring method for common		16 points/common (3-wire, spring clamp terminal block push-in type)
Input format		Positive common (sink type)
Station type		Remote device station *1
Number of occupied stations		32-point assignment/station (16 points used)
Module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	55mA or lower (when 24VDC and all points ON)
Noise immunity		Noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (DC type noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher between all DC external terminals and ground (500VDC insulation resistance tester)
Weight		0.31kg

*1: This is a remote device station type module. Please take a look at the User's Manual for further details.

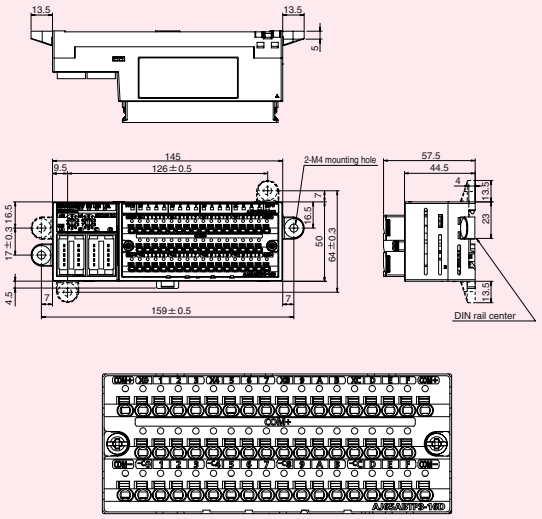
■External device connection diagram





■External dimensions & terminal layout

Unit: mm



See page 77 for the pin-out of the one-touch communication connector, and the power supply & FG connector.

Input module

AJ65ABTP3-16DE

DC input 16 pts -COM | 24VDC 3-wire | Spring clamp | Diagnostic function

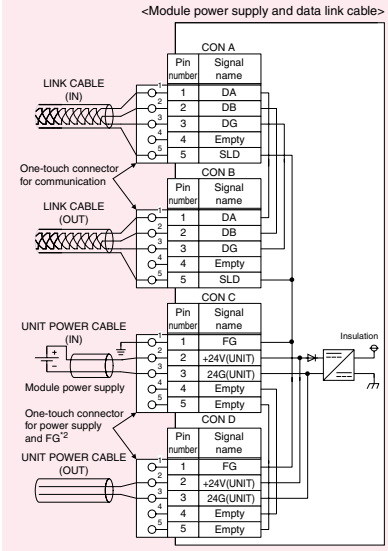
NEW

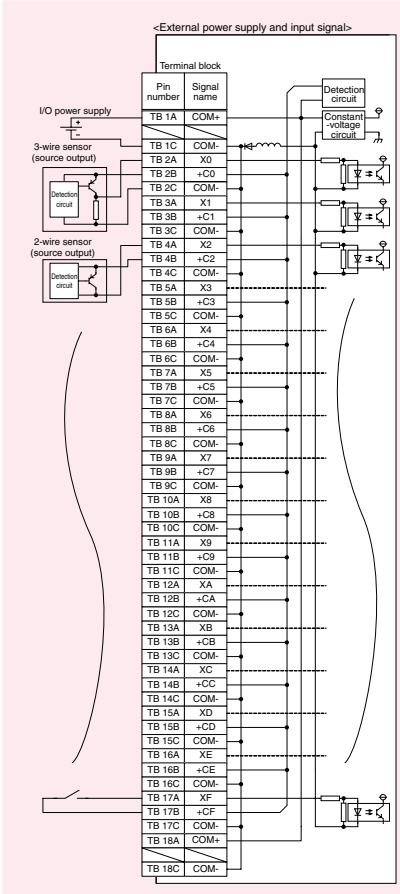
■Detailed specifications

Input specifications		Description
Number of input points		16 points
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 6mA
Operating voltage range		20.4 to 28.8VDC (ripple ratio: within 5%)
Maximum number of simultaneous input points		100%
ON voltage/ON current		14V or higher/3.5mA or higher
OFF voltage/OFF current		6V or lower/1.7mA or lower
Input resistance		Approx. 3.8kΩ
Response time	OFF→ON	1.5ms or lower (when 24VDC)
	ON→OFF	1.5ms or lower (when 24VDC)
Wiring method for common		16 points/common (3-wire, spring clamp terminal block push-in type)
Input format		Negative common (source type)
Station type		Remote device station *1
Number of occupied stations		32-point assignment/station (16 points used)
Module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	60mA or lower (when 24VDC and all points ON)
Noise immunity		Noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (DC type noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher between all DC external terminals and ground (500VDC insulation resistance tester)
Weight		0.31kg

*1: This is a remote device station type module. Please take a look at the User's Manual for further details.

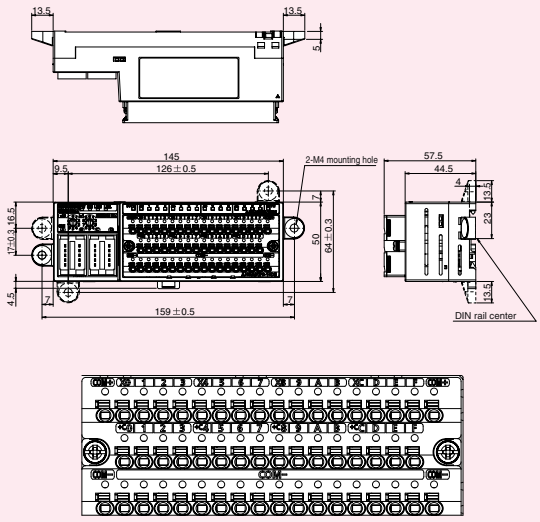
■External device connection diagram





■External dimensions & terminal layout

Unit: mm



See page 77 for the pin-out of the one-touch communication connector, and the power supply & FG connector.

Spring clamp

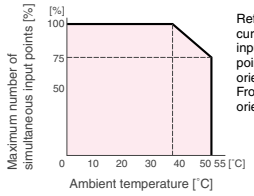
Spring clamp terminal block type

Input module
AJ65VBTS3-16D

DC input 16 pts | +COM | 24VDC 3-wire | Spring clamp

Detailed specifications

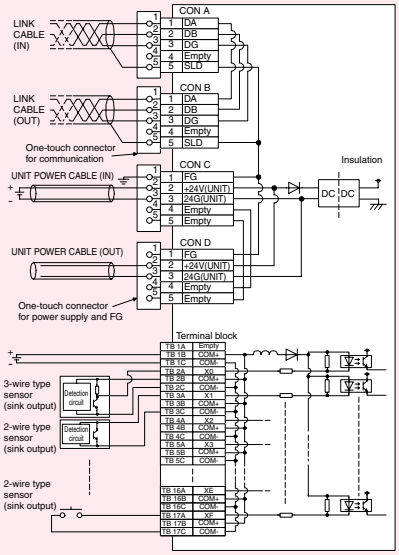
Input specifications		Description
Number of input points		16 points
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 5mA
Operating voltage range		19.2 to 26.4VDC (ripple ratio: within 5%)
Maximum number of simultaneous input points		100%/75%
ON voltage/ON current		14V or higher/3.5mA or higher
OFF voltage/OFF current		6V or lower/1.7mA or lower
Input resistance		Approx. 4.7kΩ
Response time	OFF→ON	1.5ms or lower (when 24VDC)
	ON→OFF	1.5ms or lower (when 24VDC)
Wiring method for common		16 points/common (spring clamp terminal block type 3-wire type)
Input format		Positive common (sink type)
Number of occupied stations		1 station 32 points assignment (use 16 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	35mA or lower (when 24VDC, all points ON)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Weight		0.24kg



Derating curve

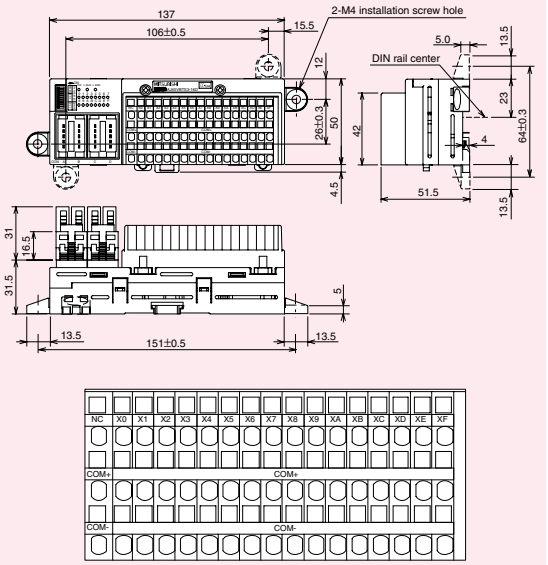
Refer to the derating curve on the left for input derating input points of the orientations other than Front mounting (Basic orientation).

External device connection diagram



External dimensions & terminal layout

Unit: mm



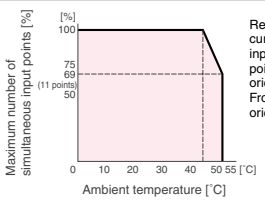
See page 77 for the pin-out of the one-touch communication connector, and the power supply & FG connector.

Input module
AJ65VBTS3-32D

DC input 32 pts | +COM | 24VDC 3-wire | Spring clamp

Detailed specifications

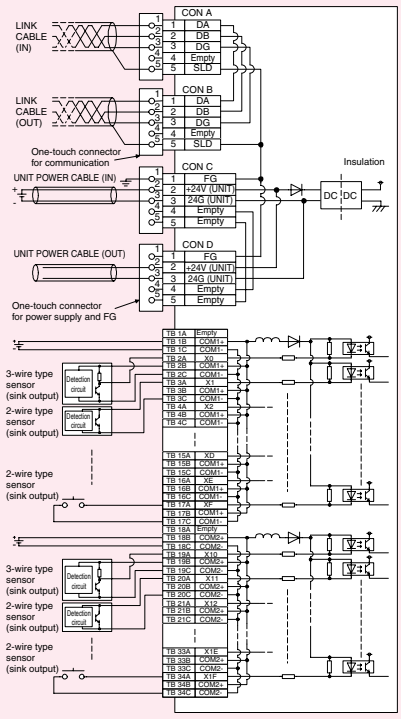
Input specifications		Description
Number of input points		32 points
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 5mA
Operating voltage range		19.2 to 26.4VDC (ripple ratio: within 5%)
Maximum number of simultaneous input points		100%/69%
ON voltage/ON current		14V or higher/3.5mA or higher
OFF voltage/OFF current		6V or lower/1.7mA or lower
Input resistance		Approx. 4.7kΩ
Response time	OFF→ON	1.5ms or lower (when 24VDC)
	ON→OFF	1.5ms or lower (when 24VDC)
Wiring method for common		16 points/common (spring clamp terminal block type 3-wire type)
Input format		Positive common (sink type)
Number of occupied stations		1 station 32 points assignment (use 32 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	40mA or lower (when 24VDC, all points ON)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Weight		0.41kg



Derating curve

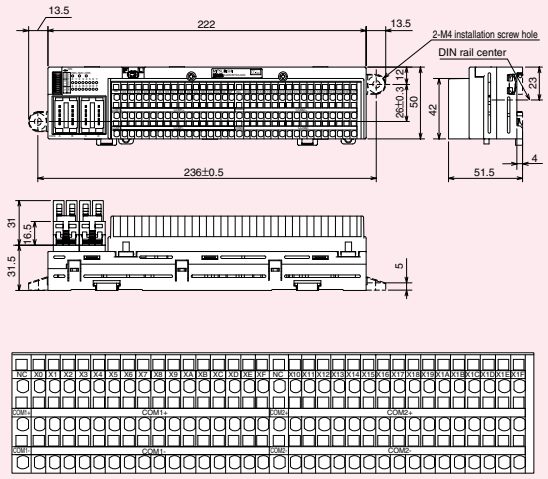
Refer to the derating curve on the left for input derating input points of the orientations other than Front mounting (Basic orientation).

External device connection diagram



External dimensions & terminal layout

Unit: mm



See page 77 for the pin-out of the one-touch communication connector, and the power supply & FG connector.

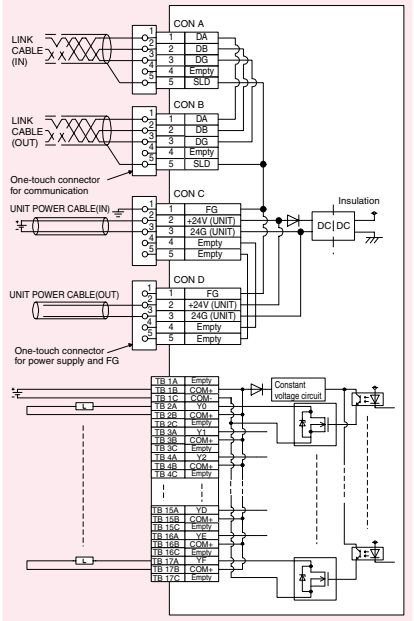
Output module
AJ65VBTS2-16T

Transistor output 16 pts | Sink | 0.5A 2-wire | Spring clamp

Detailed specifications

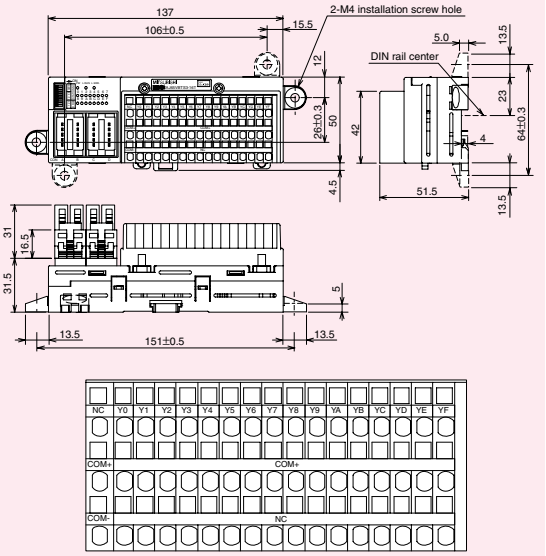
Output specifications		Description
Number of output points		16 points
Isolation method		Photocoupler
Rated load voltage		12/24VDC
Operating load voltage range		10.2 to 26.4VDC (ripple ratio: within 5%)
Maximum load current		0.5A/point 4A/common
Maximum inrush current		1.0A 10ms or lower
Leakage current at OFF		0.1mA or lower
Maximum voltage drop at ON		0.3V or lower (TYP.) 0.5A, 0.6V or lower (MAX.) 0.5A
Output format		Sink type
Protection function		None
Response time	OFF→ON	1ms or lower
	ON→OFF	1ms or lower (resistive load)
External power supply for output part	Voltage	10.2 to 26.4VDC (ripple ratio: within 5%)
	Current	30mA or lower (when 24VDC, all points ON) Not including external load current
Surge suppressor		Zener diode
Wiring method for common		16 points/common (spring clamp terminal block type 2-wire type)
Number of occupied stations		1 station 32 points assignment (use 16 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	45mA or lower (when 24VDC, all points ON)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Weight		0.24kg

External device connection diagram



External dimensions & terminal layout

Unit: mm



See page 77 for the pin-out of the one-touch communication connector, and the power supply & FG connector.

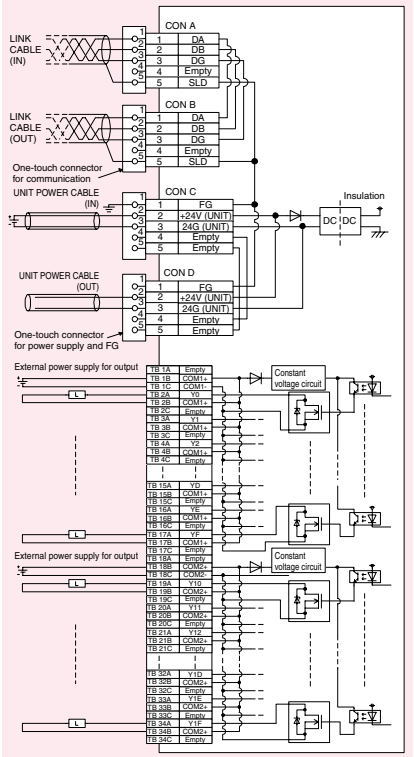
Output module
AJ65VBTS2-32T

Transistor output 32 pts | Sink | 0.5A 2-wire | Spring clamp

Detailed specifications

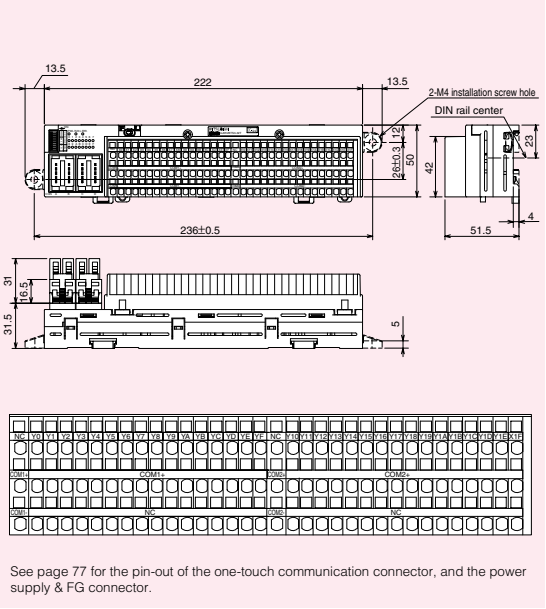
Output specifications		Description
Number of output points		32 points
Isolation method		Photocoupler
Rated load voltage		12/24VDC
Operating load voltage range		10.2 to 26.4VDC (ripple ratio: within 5%)
Maximum load current		0.5A/point 4A/common
Maximum inrush current		1.0A 10ms or lower
Leakage current at OFF		0.1mA or lower
Maximum voltage drop at ON		0.3V or lower (TYP.) 0.5A, 0.6V or lower (MAX.) 0.5A
Output format		Sink type
Protection function		None
Response time	OFF→ON	1ms or lower
	ON→OFF	1ms or lower (resistive load)
External power supply for output part	Voltage	10.2 to 26.4VDC (ripple ratio: within 5%)
	Current	30mA or lower (when 24VDC, all points ON) Not including external load current
Surge suppressor		Zener diode
Wiring method for common		16 points/common (spring clamp terminal block type 2-wire type)
Number of occupied stations		1 station 32 points assignment (use 32 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	60mA or lower (when 24VDC, all points ON)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Weight		0.40kg

External device connection diagram



External dimensions & terminal layout

Unit: mm



See page 77 for the pin-out of the one-touch communication connector, and the power supply & FG connector.

Spring clamp

Spring clamp terminal block type

I/O combined module
AJ65VBTS32-16DT

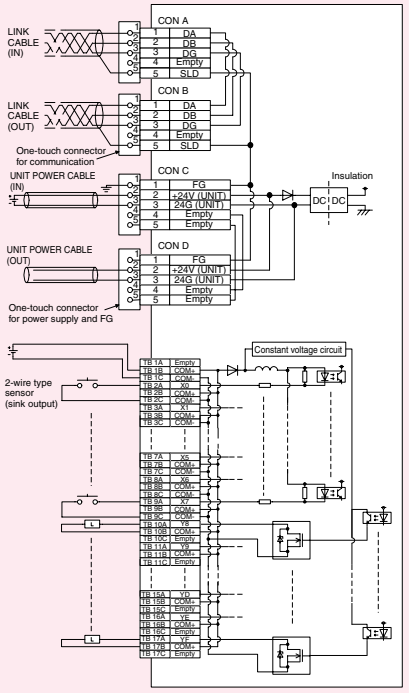
DC input 8 pts | +COM | 24VDC 3-wire | Transistor output 8 pts | Sink | 0.5A 2-wire | Spring clamp

■Detailed specifications

Input specifications		Description
Number of input points		8 points
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 5mA
Operating voltage range		19.2 to 26.4VDC (ripple ratio: within 5%)
Maximum number of simultaneous input points		100%
ON voltage/ON current		14V or higher/3.5mA or higher
OFF voltage/OFF current		6V or lower/1.7mA or lower
Input resistance		Approx. 4.7kΩ
Response time	OFF→ON	1.5ms or lower (when 24VDC)
	ON→OFF	1.5ms or lower (when 24VDC)
Input format		Positive common (sink type)
Wiring method for common		16 points/common (spring clamp terminal block type 3-wire type)
Number of occupied stations		1 station 32 points assignment (use 16 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	40mA or lower (when 24VDC, all points ON)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Weight		0.24kg

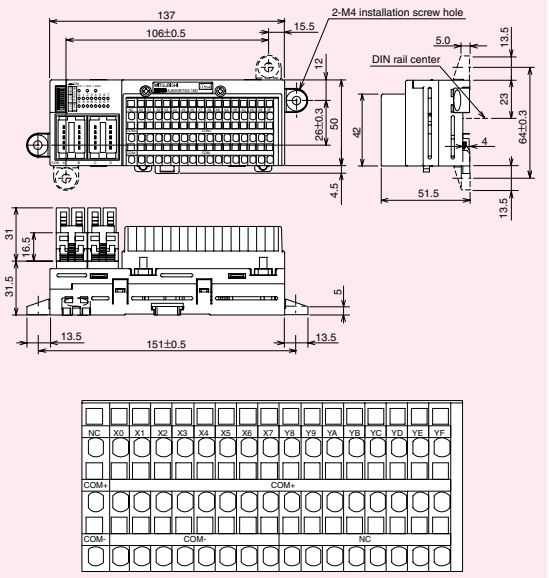
Output specifications		Description
Number of output points		8 points
Isolation method		Photocoupler
Rated load voltage		24VDC
Operating load voltage range		19.2 to 26.4VDC (ripple ratio: within 5%)
Maximum load current		0.5A/point 4A/common
Maximum inrush current		1.0A 10ms or lower
Leakage current at OFF		0.1mA or lower
Maximum voltage drop at ON		0.3V or lower (TYP.) 0.5A, 0.6V or lower (MAX.) 0.5A
Output format		Sink type
Protection function		None
Response time	OFF→ON	1ms or lower
	ON→OFF	1ms or lower (resistive load)
External power supply for output part	Voltage	10.2 to 26.4VDC (ripple ratio: within 5%)
	Current	15mA or lower (when 24VDC, all points ON) Not including external load current
Surge suppressor		Zener diode
Wiring method for common		16 points/common (spring clamp terminal block type 2-wire type)

■External device connection diagram



■External dimensions & terminal layout

Unit: mm



See page 77 for the pin-out of the one-touch communication connector, and the power supply & FG connector.

I/O combined module
AJ65VBTS32-32DT

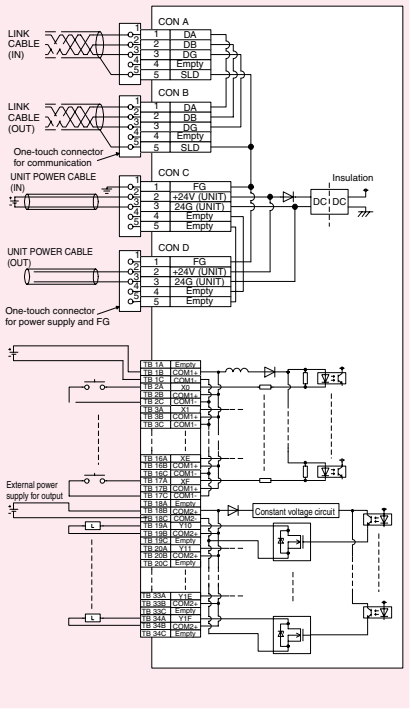
DC input 16 pts | +COM | 24VDC 3-wire | Transistor output 16 pts | Sink | 0.5A 2-wire | Spring clamp

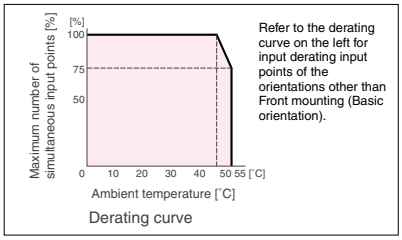
Detailed specifications

Input specifications		Description
Number of input points		16 points
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 5mA
Operating voltage range		19.2 to 26.4VDC (ripple ratio: within 5%)
Maximum number of simultaneous input points		100%/75%
ON voltage/ON current		14V or higher/3.5mA or higher
OFF voltage/OFF current		6V or lower/1.7mA or lower
Input resistance		Approx. 4.7kΩ
Response time	OFF→ON	1.5ms or lower (when 24VDC)
	ON→OFF	1.5ms or lower (when 24VDC)
Input format		Positive common (sink type)
Wiring method for common		16 points/common (spring clamp terminal block type 3-wire type)
Number of occupied stations		1 station 32 points assignment (use 32 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	50mA or lower (when 24VDC, all points ON)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Weight		0.41kg

Output specifications		Description
Number of output points		16 points
Isolation method		Photocoupler
Rated load voltage		12/24VDC
Operating load voltage range		10.2 to 26.4VDC (ripple ratio: within 5%)
Maximum load current		0.5A/point 4A/common
Maximum inrush current		1.0A 10ms or lower
Leakage current at OFF		0.1mA or lower
Maximum voltage drop at ON		0.3V or lower (TYP.) 0.5A, 0.6V or lower (MAX.) 0.5A
Output format		Sink type
Protection function		None
Response time	OFF→ON	1ms or lower
	ON→OFF	1ms or lower (resistive load)
External power supply for output part	Voltage	10.2 to 26.4VDC (ripple ratio: within 5%)
	Current	30mA or lower (when 24VDC, all points ON) Not including external load current
Surge suppressor		Zener diode
Wiring method for common		16 points/common (spring clamp terminal block type 2-wire type)

External device connection diagram

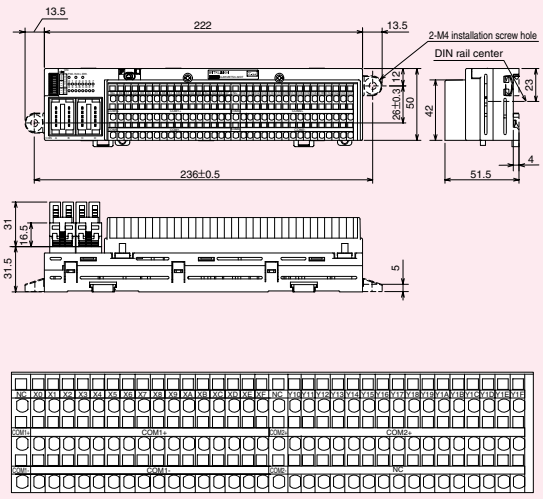




Refer to the derating curve on the left for input derating input points of the orientations other than Front mounting (Basic orientation).

External dimensions & terminal layout

Unit: mm



See page 77 for the pin-out of the one-touch communication connector, and the power supply & FG connector.

Remote I/O modules

Sensor

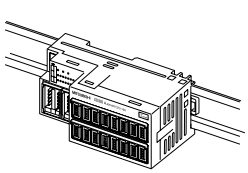
Sensor connector type (e-CON)

Overview

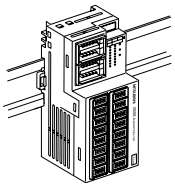
Sensor connector type (e-CON)

Features

- Industry-standard e-CON has been adopted.
- Easy wiring with sensor connectors
- DIN rail or screw mounting is selectable.
- The module can be mounted in six orientations.
- 3-wire sensor can be connected.
- The 16-point and 32-point modules can be attached to the DIN rail either vertically or horizontally.



Horizontal mounting



Vertical mounting

Part names and settings

Operation status indicator LEDs

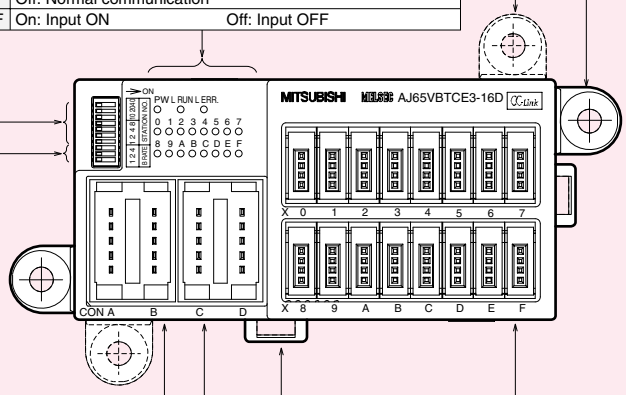
LED name	Description
PW	On: Power supply ON Off: Power supply OFF
L RUN	On: Normal communication Off: Communication shut off (time expiration error)
L ERR	On: Communication data error Flashing regularly: Indicates that the station number setting or transmission speed setting switch position was changed while power is ON Flashing irregularly: When the setting of the terminal resistor is wrong; when the cable for the module or CC-Link is affected by noise Off: Normal communication
X0 to 7,F	On: Input ON Off: Input OFF

Holding fixture for screw installation
This removable fitting is used to mount the module to a panel.

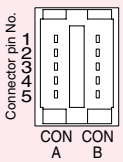
Station number setting switch
Select "10", "20" or "40" to set the tens place of the station number.
Select "1", "2", "4" or "8" to set the ones place of the station number.
Always set the station number within the range of 1 to 64.

Transmission speed setting switch

Setting value	Switch status 4	2	1	Transmission speed
0	OFF	OFF	OFF	156kbps
1	OFF	OFF	ON	625kbps
2	OFF	ON	OFF	2.5Mbps
3	OFF	ON	ON	5.0Mbps
4	ON	OFF	OFF	10Mbps

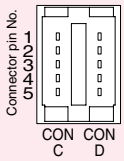


One-touch connector for communication
One-touch connector for connection of communication line.



Pin No.	Signal Name
1	DA
2	DB
3	DG
4	Empty
5	SLD

One-touch connector for power supply and FG
One-touch connector for unit power supply line and FG.



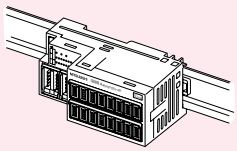
Pin No.	Signal Name
1	FG
2	+24V (UNIT)
3	24G (UNIT)
4	+24V (I/O)
5	24G (I/O)

DIN rail hook
This hook is used to mount the module on the DIN rail.

Connector for I/O
Connector for connection of I/O signal.

The module can be mounted in six orientations.

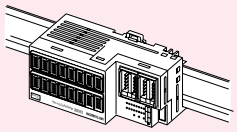
● Mounting orientation in which max, simultaneous input is not limited.



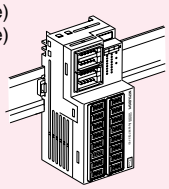
Front installation (Basic orientation)

● Mounting orientation in which max. simultaneous is limited.

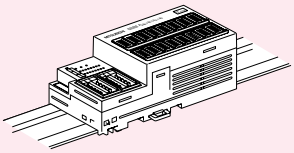
◎ Applicable models
AJ65VBTCE3-16D (Refer to the derating curve)
AJ65VBTCE3-32D (Refer to the derating curve)



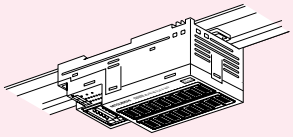
Front installation
(Upside-down orientation)



Front installation
(Vertical basic orientation)



Horizontal installation



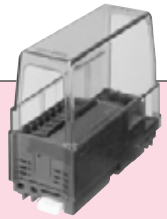
Ceiling installation

Convenient! Protective cover

Protective cover for sensor connector type (e-CON) module

- Prevents incorrect switch operation and disconnection of wiring connectors.
- Allows visual check of the LED states through the transparent cover.
- Can be attached or removed easily without any tool needed.

When attached to module



Protective cover for 8-point module
A6CVR-VCE8
Applicable models: AJ65VBTCE3-8D
AJ65VBTCE2-8T

When attached to module

Protective cover for 16-point module
A6CVR-VCE16
Applicable models: AJ65VBTCE3-16D
AJ65VBTCE2-16T
AJ65VBTCE32-16DT
AJ65VBTCE3-16DE
AJ65VBTCE3-16TE
AJ65VBTCE3-16DTE

See page 170 for the external dimensions.

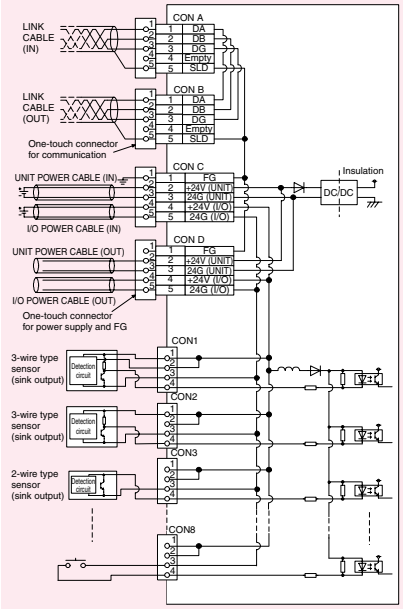
Input module
AJ65VBTCE3-8D

DC input 8 pts | +COM | 24VDC 3-wire | Sensor | Vertical

■Detailed specifications

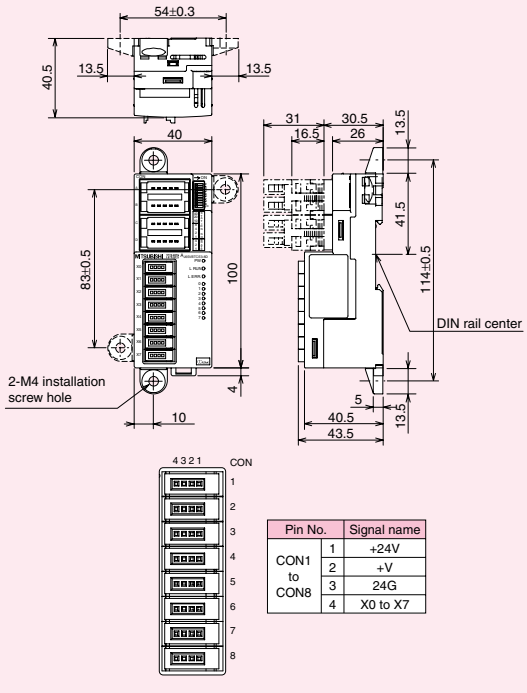
Input specifications		Description
Number of input points		8 points
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 5mA
Operating voltage range		19.2 to 26.4VDC (ripple ratio: within 5%)
Maximum number of simultaneous input points		100%
ON voltage/ON current		14V or higher/3.5mA or higher
OFF voltage/OFF current		6V or lower/1.7mA or lower
Input resistance		Approx. 4.7kΩ
Response time	OFF→ON	1.5ms or lower (when 24VDC)
	ON→OFF	1.5ms or lower (when 24VDC)
Wiring method for common		8 points/common (sensor connector (e-CON) 3-wire type)
Input format		Positive common (sink type)
Number of occupied stations		1 station 32 points assignment (use 8 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	30mA or lower (when 24VDC, all points ON)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Weight		0.10kg

■External device connection diagram



■External dimensions & terminal layout

Unit: mm



Pin No.		Signal name
CON1 to CON8	1	+24V
	2	+V
	3	24G
	4	X0 to X7

See page 85 for the pin-out of the one-touch communication connector, and the power supply & FG connector.

Sensor

Sensor connector type (e-CON)

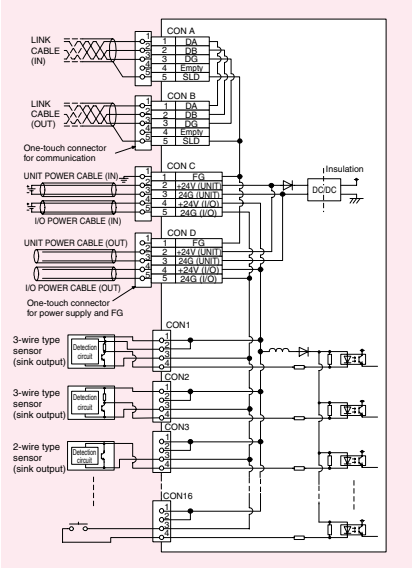
Input module
AJ65VBTCE3-16D

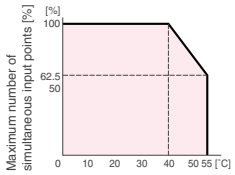
DC input 16 pts | +COM | 24VDC 3-wire | Sensor | Vertical

■Detailed specifications

Input specifications		Description
Number of input points		16 points
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 5mA
Operating voltage range		19.2 to 26.4VDC (ripple ratio: within 5%)
Maximum number of simultaneous input points		100%/62.5%
ON voltage/ON current		14V or higher/3.5mA or higher
OFF voltage/OFF current		6V or lower/1.7mA or lower
Input resistance		Approx. 4.7kΩ
Response time	OFF→ON	1.5ms or lower (when 24VDC)
	ON→OFF	1.5ms or lower (when 24VDC)
Wiring method for common		16 points/common (sensor connector (e-CON) 3-wire type)
Input format		Positive common (sink type)
Number of occupied stations		1 station 32 points assignment (use 16 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	35mA or lower (when 24VDC, all points ON)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Weight		0.10kg

■External device connection diagram

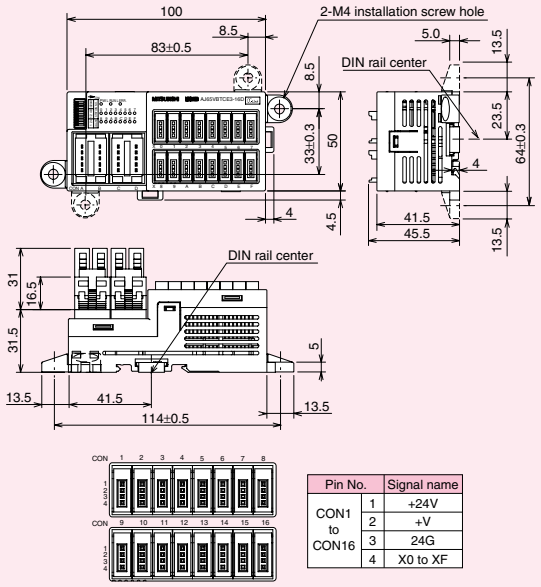




Refer to the derating curve on the left for input derating of the orientations other than Front mounting (Basic orientation).

■External dimensions & terminal layout

Unit: mm



Pin No.		Signal name
CON1 to CON16	1	+24V
	2	+V
	3	24G
	4	X0 to XF

See page 85 for the pin-out of the one-touch communication connector, and the power supply & FG connector.

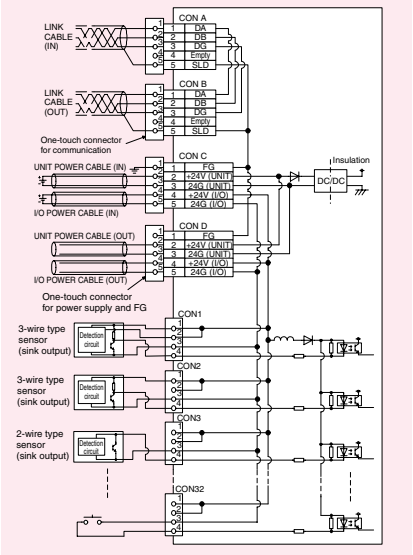
Input module
AJ65VBTCE3-32D

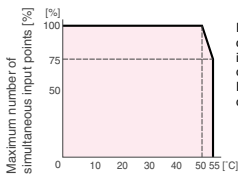
DC input 32 pts | +COM | 24VDC 3-wire | Sensor | Vertical

■Detailed specifications

Input specifications		Description
Number of input points		32 points
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 5mA
Operating voltage range		19.2 to 26.4VDC (ripple ratio: within 5%)
Maximum number of simultaneous input points		100%/75%
ON voltage/ON current		14V or higher/3.5mA or higher
OFF voltage/OFF current		6V or lower/1.7mA or lower
Input resistance		Approx. 4.7kΩ
Response time	OFF→ON	1.5ms or lower (when 24VDC)
	ON→OFF	1.5ms or lower (when 24VDC)
Wiring method for common		32 points/common (sensor connector (e-CON) 3-wire type)
Input format		Positive common (sink type)
Number of occupied stations		1 station 32 points assignment (use 32 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	40mA or lower (when 24VDC, all points ON)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Weight		0.16kg

■External device connection diagram

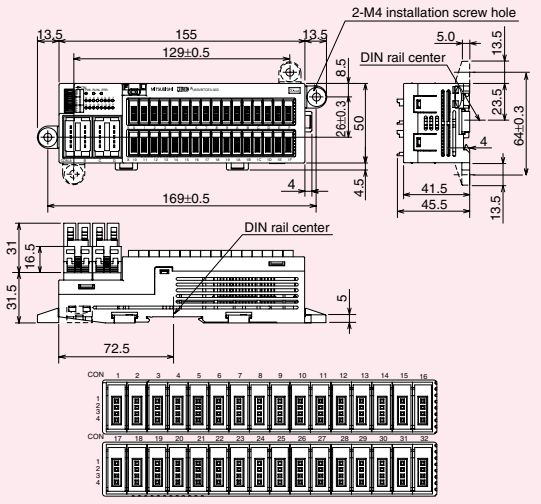




Refer to the derating curve on the left for input derating of the orientations other than Front mounting (Basic orientation).

■External dimensions & terminal layout

Unit: mm



Pin no.		Signal name
CON1 to CON32	1	+24V
	2	+V
	3	24G
	4	X0 to X1F

See page 85 for the pin-out of the one-touch communication connector, and the power supply & FG connector.

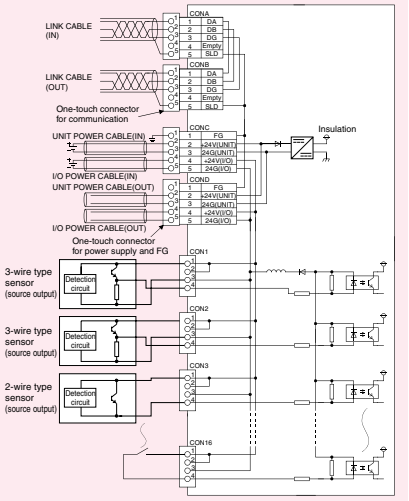
Input module
AJ65VBTCE3-16DE

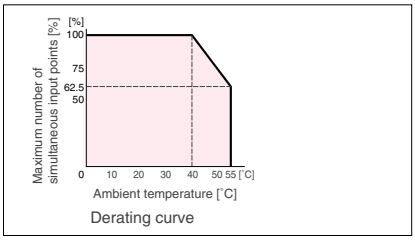
DC input 16 pts -COM | 24VDC 3-wire | Sensor | Vertical

■Detailed specifications

Input specifications		Description
Number of input points		16 points
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 5mA
Operating voltage range		19.2 to 26.4VDC (ripple ratio: within 5%)
Maximum number of simultaneous input points		100%/62.5%
ON voltage/ON current		14V or higher/3.5mA or higher
OFF voltage/OFF current		6V or lower/1.7mA or lower
Input resistance		Approx. 4.7kΩ
Response time	OFF→ON	1.5ms or lower (when 24VDC)
	ON→OFF	1.5ms or lower (when 24VDC)
Wiring method for common		16 points/common (sensor connector (e-CON) 3-wire type)
Input format		Negative common (source type)
Number of occupied stations		1 station 32 points assignment (use 16 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	35mA or lower (when 24VDC, all points ON)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Weight		0.11kg

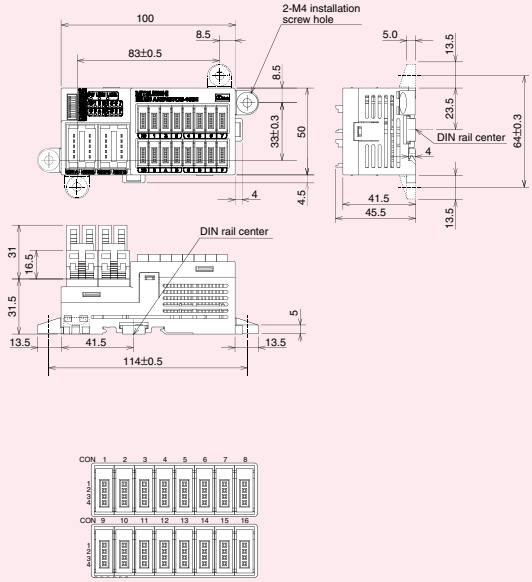
■External device connection diagram





■External dimensions & terminal layout

Unit: mm



See page 85 for the pin-out of the one-touch communication connector, and the power supply & FG connector.

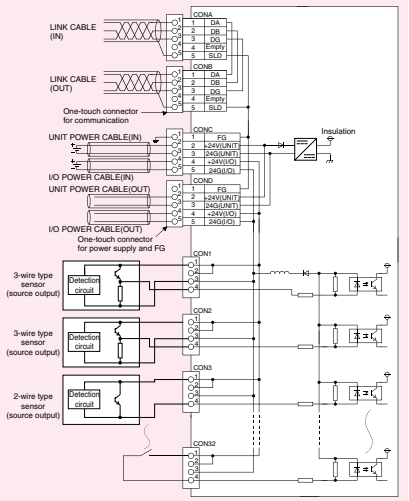
Input module
AJ65VBTCE3-32DE

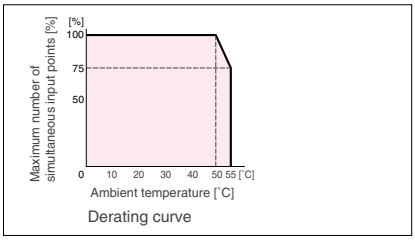
DC input 32 pts -COM | 24VDC 3-wire | Sensor | Vertical

■Detailed specifications

Input specifications		Description
Number of input points		32 points
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 5mA
Operating voltage range		19.2 to 26.4VDC (ripple ratio: within 5%)
Maximum number of simultaneous input points		100%/75%
ON voltage/ON current		14V or higher/3.5mA or higher
OFF voltage/OFF current		6V or lower/1.7mA or lower
Input resistance		Approx. 4.7kΩ
Response time	OFF→ON	1.5ms or lower (when 24VDC)
	ON→OFF	1.5ms or lower (when 24VDC)
Wiring method for common		32 points/common (sensor connector (e-CON) 3-wire type)
Input format		Negative common (source type)
Number of occupied stations		1 station 32 points assignment (use 32 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	40mA or lower (when 24VDC, all points ON)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Weight		0.16kg

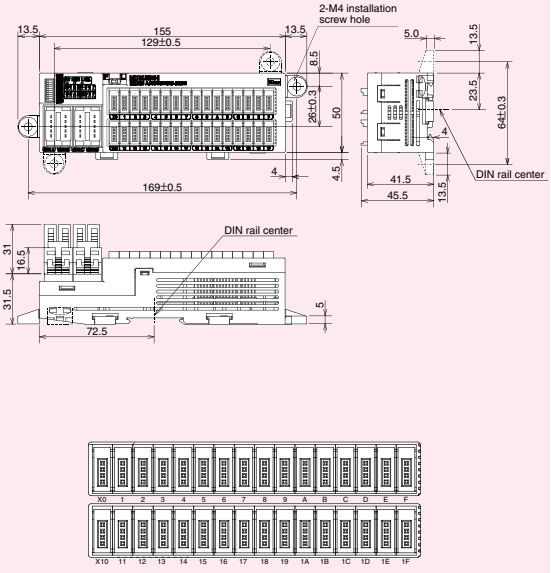
■External device connection diagram





■External dimensions & terminal layout

Unit: mm



See page 85 for the pin-out of the one-touch communication connector, and the power supply & FG connector.

Sensor

Sensor connector type (e-CON)

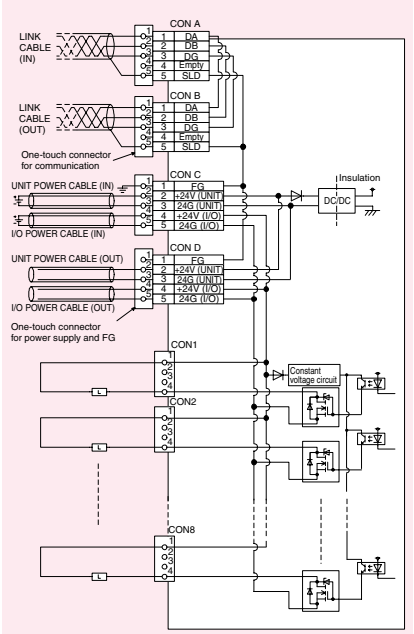
Output module
AJ65VBTCE2-8T

Transistor output 8 pts | Sink | 0.1A 2-wire | Protection | Sensor | Vertical

■Detailed specifications

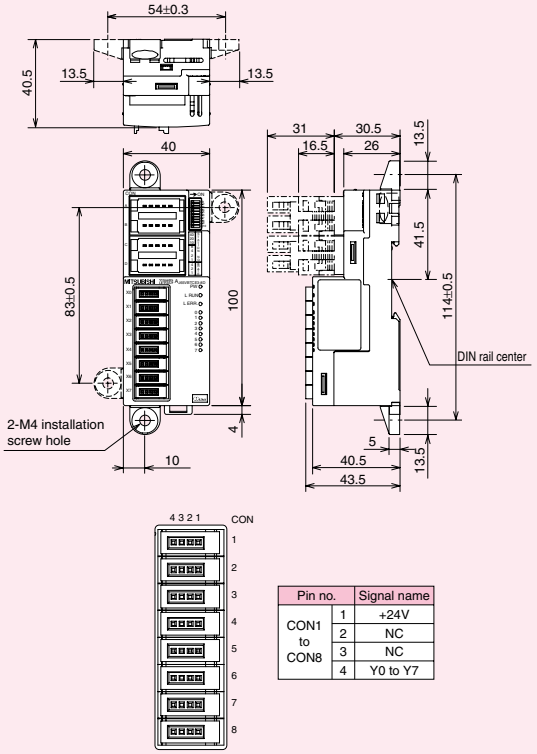
Output specifications		Description
Number of output points		8 points
Isolation method		Photocoupler
Rated load voltage		12/24VDC
Operating load voltage range		10.2 to 26.4VDC (ripple ratio: within 5%)
Maximum load current		0.1A/point 0.8A/common
Maximum inrush current		0.7A 10ms or lower
Leakage current at OFF		0.1mA or lower
Maximum voltage drop at ON		0.1V or lower (TYP.) 0.1A, 0.2V or lower (MAX.) 0.1A
Output format		Sink type
Protection function		Overload protection function, overvoltage protection function and overheat protection function
Response time	OFF→ON	1ms or lower
	ON→OFF	1ms or lower (resistive load)
External power supply for output part	Voltage	10.2 to 26.4VDC (ripple ratio: within 5%)
	Current	5mA or lower (when 24VDC, all points ON) Not including external load current
Surge suppressor		Zener diode
Wiring method for common		8 points/common (sensor connector (e-CON) 2-wire type)
Number of occupied stations		1 station 32 points assignment (use 16 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	35mA or lower (when 24VDC, all points ON)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Weight		0.10kg

■External device connection diagram



■External dimensions & terminal layout

Unit: mm



Pin no.		Signal name
CON1 to CON8	1	+24V
	2	NC
	3	NC
	4	Y0 to Y7

See page 85 for the pin-out of the one-touch communication connector, and the power supply & FG connector.

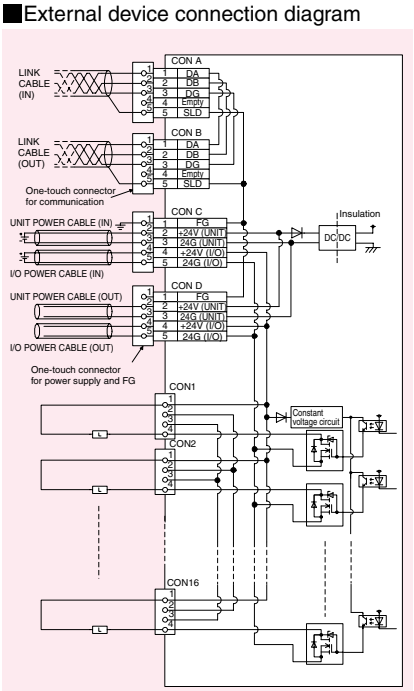
Output module
AJ65VBTCE2-16T

Transistor output 16 pts | Sink | 0.1A 2-wire | Protection | Sensor | Vertical

■Detailed specifications

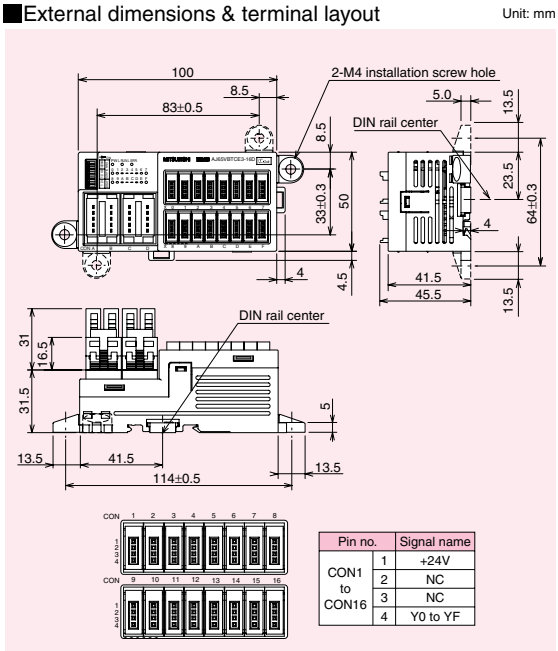
Output specifications		Description
Number of output points		16 points
Isolation method		Photocoupler
Rated load voltage		12/24VDC
Operating load voltage range		10.2 to 26.4VDC (ripple ratio: within 5%)
Maximum load current		0.1A/point 1.6A/common
Maximum inrush current		0.7A 10ms or lower
Leakage current at OFF		0.1mA or lower
Maximum voltage drop at ON		0.1V or lower (TYP.) 0.1A, 0.2V or lower (MAX.) 0.1A
Output format		Sink type
Protection function		Overload protection function, overvoltage protection function and overheat protection function
Response time	OFF→ON	1ms or lower
	ON→OFF	1ms or lower (resistive load)
External power supply for output part	Voltage	10.2 to 26.4VDC (ripple ratio: within 5%)
	Current	10mA or lower (when 24VDC, all points ON) Not including external load current
Surge suppressor		Zener diode
Wiring method for common		16 points/common (sensor connector (e-CON) 2-wire type)
Number of occupied stations		1 station 32 points assignment (use 16 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	45mA or lower (when 24VDC, all points ON)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Weight		0.10kg

■External device connection diagram



■External dimensions & terminal layout

Unit: mm



Pin no.		Signal name
CON1 to CON16	1	+24V
	2	NC
	3	NC
	4	Y0 to YF

See page 85 for the pin-out of the one-touch communication connector, and the power supply & FG connector.

Output module
AJ65VBTCE3-16TE

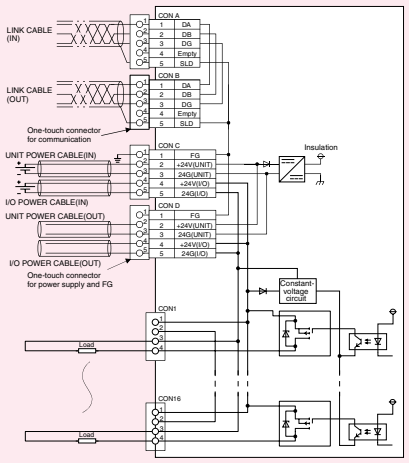
Transistor output 16 pts | Source | 0.1A 3-wire | Protection | Sensor | Vertical

NEW

■Detailed specifications

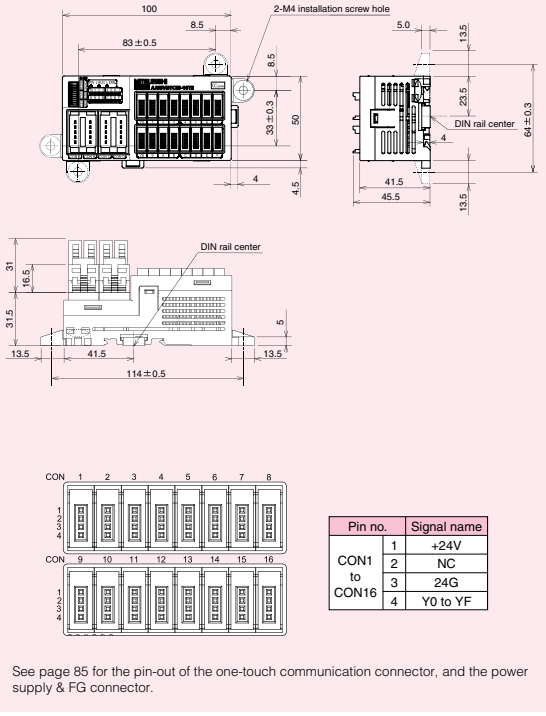
Output specifications		Description
Number of output points		16 points
Isolation method		Photocoupler
Rated load voltage		12/24VDC
Operating load voltage range		10.2 to 26.4VDC (ripple ratio: within 5%)
Maximum load current		0.1A/point 1.6A/common
Maximum inrush current		0.7A 10ms or lower
Leakage current at OFF		0.1mA or lower
Maximum voltage drop at ON		DC0.1V or lower (TYP.) 0.1A, DC0.2V or lower (MAX.) 0.1A
Output format		Source type
Protection function		Overload protection, overheat protection
Response time	OFF→ON	1ms or lower
	ON→OFF	1ms or lower (resistive load)
External power supply for output part	Voltage	10.2 to 26.4VDC (ripple ratio: within 5%)
	Current	11mA or lower (when 24VDC and all points ON), excluding external load current
Surge suppressor		Zener diode
Wiring method for common		16 points/common (3-wire, sensor connector (e-CON) type)
Number of occupied stations		32-point assignment/station (16 points used)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	45mA or lower (at 24VDC and all points ON)
Noise immunity		Noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (DC type noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher between all DC external terminals and ground (500VDC insulation resistance tester)
Weight		0.11kg

■External device connection diagram



■External dimensions & terminal layout

Unit: mm



Pin no.		Signal name
CON1 to CON16	1	+24V
	2	NC
	3	24G
	4	Y0 to YF

See page 85 for the pin-out of the one-touch communication connector, and the power supply & FG connector.

Sensor

Sensor connector type (e-CON)

I/O combined module
AJ65VBTCE32-16DT

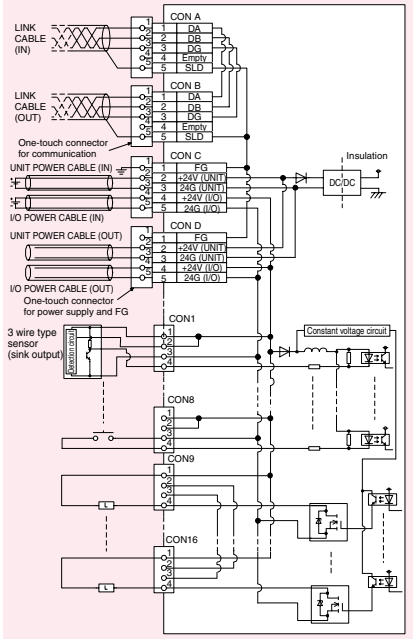
DC input 8 pts | +COM | 24VDC 3-wire | Transistor output 8 pts | Sink | 0.1A 2-wire | Sensor | Protection | Vertical

■Detailed specifications

Input specifications		Description
Number of input points		8 points
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 5mA
Operating voltage range		19.2 to 26.4VDC (ripple ratio: within 5%)
Maximum number of simultaneous input points		100%
ON voltage/ON current		14V or higher/3.5mA or higher
OFF voltage/OFF current		6V or lower/1.7mA or lower
Input resistance		Approx. 4.7kΩ
Response time	OFF→ON	1.5ms or lower (when 24VDC)
	ON→OFF	1.5ms or lower (when 24VDC)
Input format		Positive common (sink type)
Wiring method for common		16 points/common (sensor connector (e-CON) 3-wire type: Input sensor connector (e-CON) 2-wire type: Output)
Number of occupied stations		1 station 32 points assignment (use 16 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	40mA or lower (when 24VDC, all points ON)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Weight		0.11kg

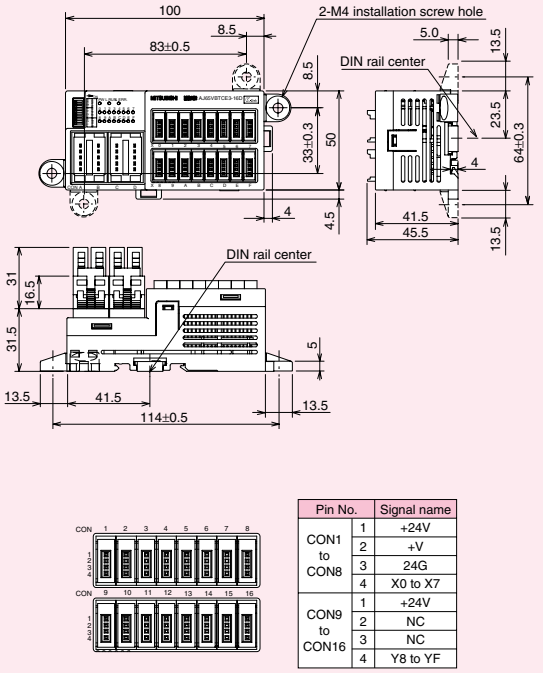
Output specifications		Description
Number of output points		8 points
Isolation method		Photocoupler
Rated load voltage		24VDC
Operating load voltage range		19.2 to 26.4VDC (ripple ratio: within 5%)
Maximum load current		0.1A/point 0.8A/common
Maximum inrush current		0.7A 10ms or lower
Leakage current at OFF		0.1mA or lower
Maximum voltage drop at ON		0.1V or lower (TYP.) 0.1A, 0.2V or lower (MAX.) 0.1A
Output format		Positive common (sink type)
Protection function		Overload protection function, overvoltage protection function and overheat protection function
Response time	OFF→ON	1ms or lower
	ON→OFF	1ms or lower (resistive load)
External power supply for output part	Voltage	19.2 to 26.4VDC (ripple ratio: 5%)
	Current	5mA or lower (when 24VDC, all points ON) Not including external load current
Surge suppressor		Zener diode

■External device connection diagram



■External dimensions & terminal layout

Unit: mm



Pin No.		Signal name
CON1 to CON8	1	+24V
	2	+V
	3	24G
	4	X0 to X7
CON9 to CON16	1	+24V
	2	NC
	3	NC
	4	Y8 to YF

See page 85 for the pin-out of the one-touch communication connector, and the power supply & FG connector.

I/O combined module
AJ65VBTCE3-16DTE

DC input 8 pts -COM 24VDC 3-wire Transistor output 8 pts Source 0.1A 3-wire Sensor Protection Vertical

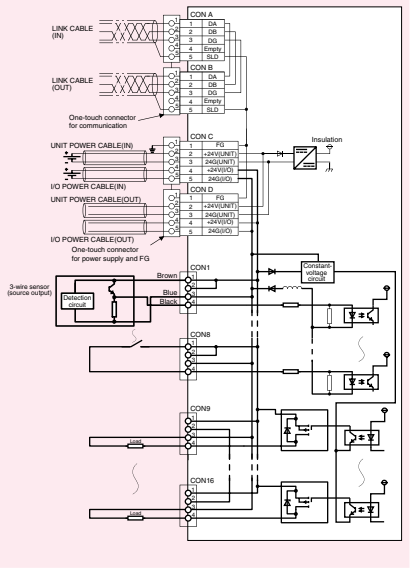
NEW

■Detailed specifications

Input specifications		Description
Number of input points		8 points
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 5mA
Operating voltage range		19.2 to 26.4VDC (ripple ratio: within 5%)
Maximum number of simultaneous input points		100%
ON voltage/ON current		14VDC or higher/3.5mA or higher
OFF voltage/OFF current		6VDC or lower/1.7mA or lower
Input resistance		Approx. 4.7kΩ
Response time	OFF→ON	1.5ms or lower (when 24VDC)
	ON→OFF	1.5ms or lower (when 24VDC)
Input format		Negative common (source type)
Wiring method for common		16 points/common(input: 3-wire sensor connector (e-CON) type, output: 3-wire sensor connector (e-CON) type)
Number of occupied stations		32-point assignment/station (16 points used)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	40mA or lower (when 24VDC and all points ON)
Noise immunity		Noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (DC type noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher between all DC external terminals and ground (500VDC insulation resistance tester)
Weight		0.11kg

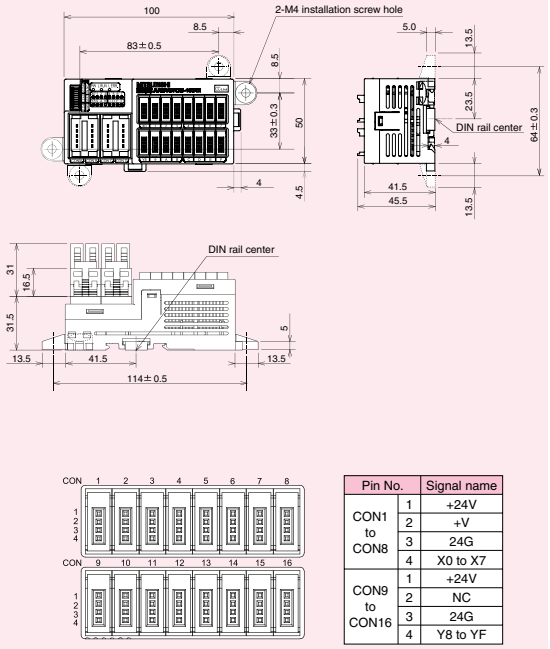
Output specifications		Description
Number of output points		8 points
Isolation method		Photocoupler
Rated load voltage		24VDC
Operating load voltage range		19.2 to 26.4VDC (ripple ratio: within 5%)
Maximum load current		0.1A/point, 0.8A/common
Maximum inrush current		0.7A, 10ms or lower
Leakage current at OFF		0.1mA or lower
Maximum voltage drop at ON		0.1VDC or lower (TYP.) 0.1A, 0.2VDC or lower (MAX.) 0.1A
Output format		Source type
Protection function		Overload protection, overheat protection
Response time	OFF→ON	1ms or lower
	ON→OFF	1ms or lower (resistive load)
External power supply for output part	Voltage	19.2 to 26.4VDC (ripple ratio: within 5%)
	Current	7mA or lower (when 24VDC and all points ON), excluding external load current
Surge suppressor		Zener diode

■External device connection diagram



■External dimensions & terminal layout

Unit: mm



Pin No.		Signal name
CON1 to CON8	1	+24V
	2	+V
	3	24G
	4	X0 to X7
CON9 to CON16	1	+24V
	2	NC
	3	24G
	4	Y8 to YF

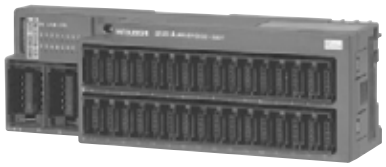
See page 85 for the pin-out of the one-touch communication connector, and the power supply & FG connector.

Sensor

Sensor connector type (e-CON)

I/O combined module
AJ65VBTCE32-32DT

DC input 16 pts | +COM | 24VDC 3-wire | Transistor output 16 pts | Sink | 0.1A 2-wire | Sensor | Protection | Vertical

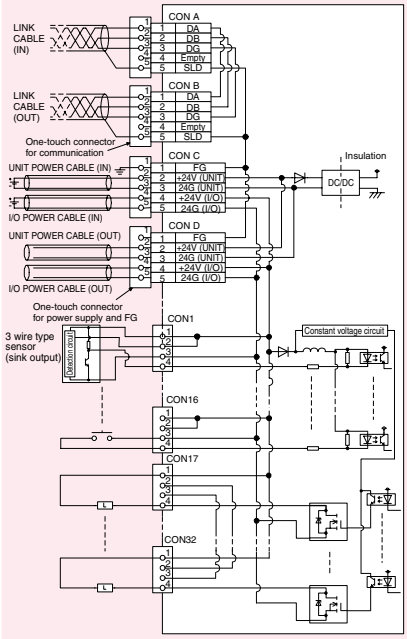


■Detailed specifications

Input specifications		Description
Number of input points		16 points
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 5mA
Operating voltage range		19.2 to 26.4VDC (ripple ratio: within 5%)
Maximum number of simultaneous input points		100%
ON voltage/ON current		14V or higher/3.5mA or higher
OFF voltage/OFF current		6V or lower/1.7mA or lower
Input resistance		Approx. 4.7kΩ
Response time	OFF→ON	1.5ms or lower (when 24VDC)
	ON→OFF	1.5ms or lower (when 24VDC)
Input format		Positive common (sink type)
Wiring method for common		32 points/common (sensor connector (e-CON) 3-wire type: Input sensor connector (e-CON) 2-wire type: Output)
Number of occupied stations		1 station 32 points assignment (use 32 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	45mA or lower (when 24VDC, all points ON)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Weight		0.16kg

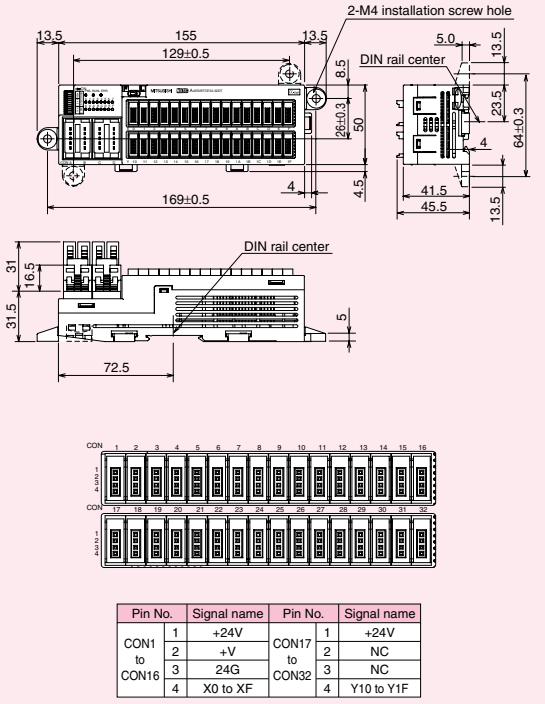
Output specifications		Description
Number of output points		16 points
Isolation method		Photocoupler
Rated load voltage		24VDC
Operating load voltage range		19.2 to 26.4VDC (ripple ratio: within 5%)
Maximum load current		0.1A/point 1.6A/common
Maximum inrush current		0.7A 10ms or lower
Leakage current at OFF		0.1mA or lower
Maximum voltage drop at ON		0.1V or lower (TYP.) 0.1A, 0.2V or lower (MAX.) 0.1A
Output format		Positive common (sink type)
Protection function		Overload protection function, overvoltage protection function and overheat protection function
Response time	OFF→ON	1ms or lower
	ON→OFF	1ms or lower (resistive load)
External power supply for output part	Voltage	19.2 to 26.4VDC (ripple ratio: 5%)
	Current	10mA or lower (when 24VDC, all points ON) Not including external load current
Surge suppressor		Zener diode

■External device connection diagram



■External dimensions & terminal layout

Unit: mm



Pin No.		Signal name	Pin No.		Signal name
CON1 to CON16	1	+24V	CON17 to CON32	1	+24V
	2	+V		2	NC
	3	24G		3	NC
	4	X0 to XF		4	Y10 to Y1F

See page 85 for the pin-out of the one-touch communication connector, and the power supply & FG connector.

I/O combined module
AJ65VBTCE3-32DTE

DC input 16 pts | -COM | 24VDC 3-wire | Transistor output 16 pts | Source | 0.1A 3-wire | Sensor | Protection | Vertical

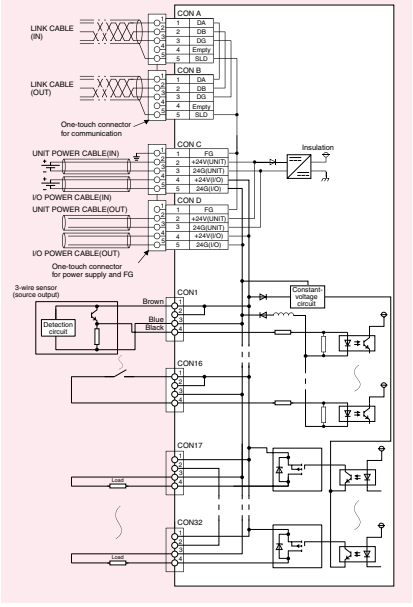
NEW

■Detailed specifications

Input specifications		Description
Number of input points		16 points
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 5mA
Operating voltage range		19.2 to 26.4VDC (ripple ratio: within 5%)
Maximum number of simultaneous input points		100%
ON voltage/ON current		14VDC or higher/3.5mA or higher
OFF voltage/OFF current		6VDC or lower/1.7mA or lower
Input resistance		Approx. 4.7kΩ
Response time	OFF→ON	1.5ms or lower (when 24VDC)
	ON→OFF	1.5ms or lower (when 24VDC)
Input format		Negative common (source type)
Wiring method for common		32 points/common (input: 3-wire sensor connector (e-CON) type, output: 3-wire sensor connector (e-CON) type)
Number of occupied stations		32-point assignment/station (32 points used)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	45mA or lower (when 24VDC and all points ON)
Noise immunity		Noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (DC type noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher between all DC external terminals and ground (500VDC insulation resistance tester)
Weight		0.16kg

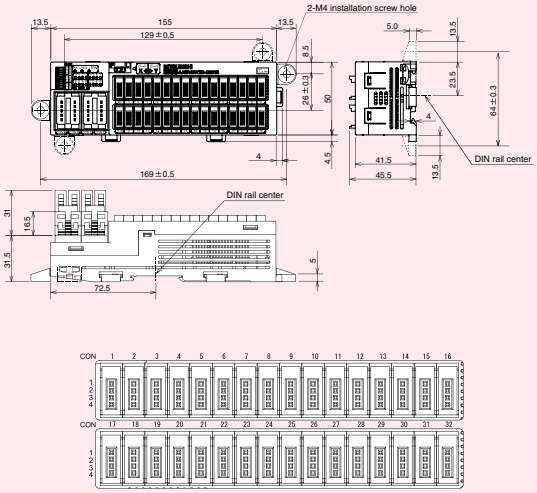
Output specifications		Description
Number of output points		16 points
Isolation method		Photocoupler
Rated load voltage		24VDC
Operating load voltage range		19.2 to 26.4VDC (ripple ratio: within 5%)
Maximum load current		0.1A/point, 1.6A/common
Maximum inrush current		0.7A, 10ms or lower
Leakage current at OFF		0.1mA or lower
Maximum voltage drop at ON		0.1VDC or lower (TYP.) 0.1A, 0.2VDC or lower (MAX.) 0.1A
Output format		Source type
Protection function		Overload protection, overheat protection
Response time	OFF→ON	1ms or lower
	ON→OFF	1ms or lower (resistive load)
External power supply for output part	Voltage	19.2 to 26.4VDC (ripple ratio: within 5%)
	Current	11mA or lower (when 24VDC and all points ON), excluding external load current
Surge suppressor		Zener diode

■External device connection diagram



■External dimensions & terminal layout

Unit: mm



Pin No.		Signal name	Pin No.		Signal name
CON1 to CON16	1	+24V	CON17 to CON32	1	+24V
	2	+V		2	NC
	3	24G		3	24G
	4	X0 to XF		4	Y10 to Y1F

See page 85 for the pin-out of the one-touch communication connector, and the power supply & FG connector.

Remote I/O modules

One-touch

One-touch connector type

Overview

One-touch connector type

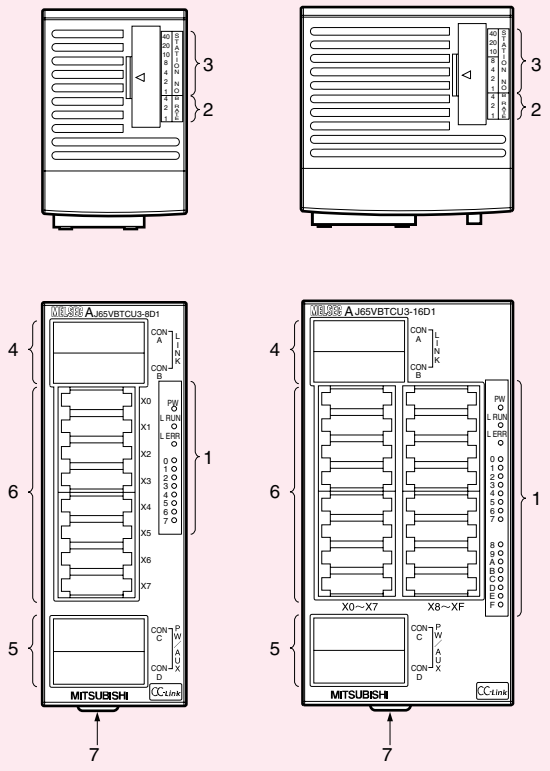
* The actual modules may slightly differ in shapes from the photos shown.

Features

- Easy wiring with sensor connectors
- 3-wire type sensor input is available.
- The module can be mounted in six orientations.

Part names and settings

AJ65VBTCU□-8□ AJ65VBTCU□-16□



1. Operation status indicator LEDs

LED name	Description
PW	On: Power supply ON Off: Power supply OFF
L RUN	On: Normal communication Off: Communication shut off (time expiration error)
L ERR	On: Communication data error Flashing regularly: Indicates that the station number setting or transmission speed setting switch position was changed while power is ON Flashing irregularly: When the setting of the terminal resistor is wrong; when the cable for the module or CC-Link is affected by noise Off: Normal communication
0 to F	On: Input/Output ON Off: Input/Output OFF

2. Transmission speed setting switch

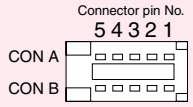
Setting value	Switch status 4	2	1	Transmission speed
0	OFF	OFF	OFF	156kbps
1	OFF	OFF	ON	625kbps
2	OFF	ON	OFF	2.5Mbps
3	OFF	ON	ON	5.0Mbps
4	ON	OFF	OFF	10Mbps

3. Station number setting switch

Select "10", "20" or "40" to set the tens place of the station number. Select "1", "2", "4" or "8" to set the ones place of the station number. Always set the station number within the range of 1 to 64.

4. One-touch connector for communication

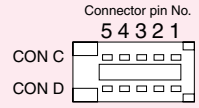
One-touch connector for communication line connection.



Pin No.	5	4	3	2	1
Signal Name	SLD	NC	DG	DB	DA

5. One-touch connector for power supply and FG

One-touch connector for module's power supply line and FG connections.



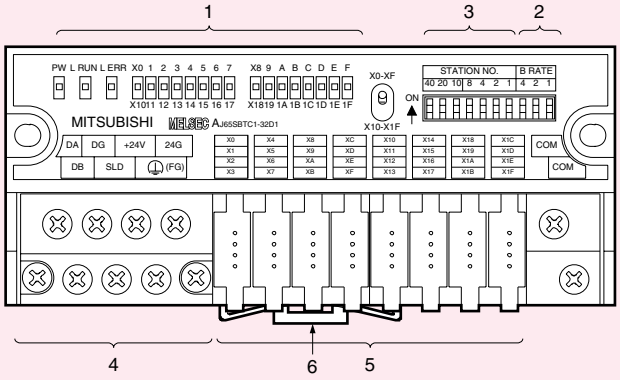
Pin No.	5	4	3	2	1
Signal Name	24G (I/O)	+24V (I/O)	24G (UNIT)	+24V (UNIT)	FG

6. Connector for I/O signal connections

7. DIN rail hook

Used to mount the module to the DIN rail.

AJ65SBTC□-16□
AJ65SBTC□-32□



1. Operation status indicator LEDs

LED name	Description
PW	On: Power supply ON Off: Power supply OFF
L RUN	On: Normal communication Off: Communication shut off (time expiration error)
L ERR	On: Communication data error Flashing regularly: Indicates that the station number setting or transmission speed setting switch position was changed while power is ON Flashing irregularly: When the setting of the terminal resistor is wrong; when the cable for the module or CC-Link is affected by noise Off: Normal communication
X0 to 1F Y0 to 1F	On: Input/Output ON Off: Input/Output OFF

2. Transmission speed setting switch

Setting value	Switch status			Transmission speed
	4	2	1	
0	OFF	OFF	OFF	156kbps
1	OFF	OFF	ON	625kbps
2	OFF	ON	OFF	2.5Mbps
3	OFF	ON	ON	5.0Mbps
4	ON	OFF	OFF	10Mbps

3. Station number setting switch

Select "10", "20" or "40" to set the tens place of the station number.
Select "1", "2", "4" or "8" to set the ones place of the station number.
Always set the station number within the range of 1 to 64.

4. Terminal block

DA	DG	+24V	24G
DB	SLD	FG	

5. Connector for I/O signal connections

6. DIN rail hook

Used to mount the module to the DIN rail.

One-touch

One-touch connector type

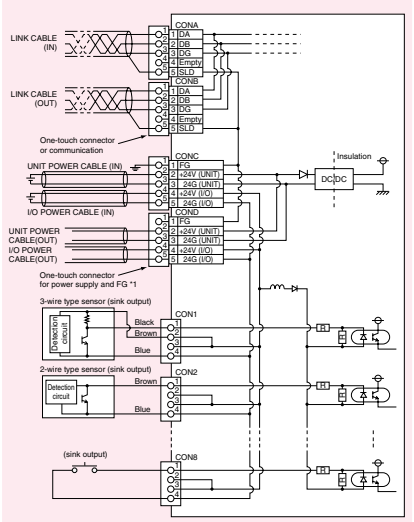
Input module
AJ65VBTCU3-8D1

DC input 8 pts | +COM | 24VDC 3-wire | One-touch | Vertical | High speed input

■Detailed specifications

Input specifications		Description
Number of input points		8 points
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 5mA
Operating voltage range		19.2 to 26.4VDC (ripple ratio: within 5%)
Maximum number of simultaneous input points		100%
ON voltage/ON current		15V or higher/3mA or higher
OFF voltage/OFF current		3V or lower/0.5mA or lower
Input resistance		Approx. 4.7kΩ
Response time	OFF→ON	0.2ms or lower (when 24VDC)
	ON→OFF	0.2ms or lower (when 24VDC)
Wiring method for common		8 points/common (one-touch connector plug 3-wire type)
Input format		Positive common (sink type)
Number of occupied stations		1 station 32 points assignment (use 8 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	35mA or lower (when 24VDC, all points ON)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Protection level		IP1XB
Weight		0.15kg

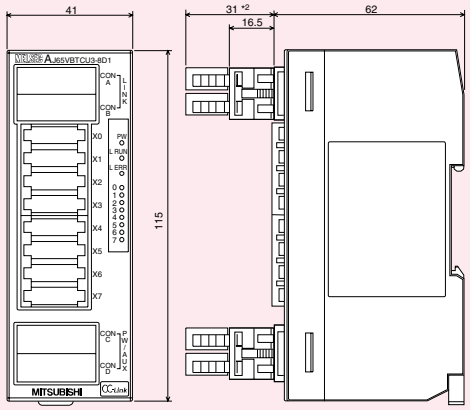
■External device connection diagram

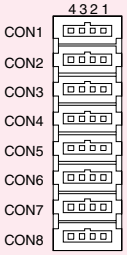


*1: The connector in non-divided line should be installed to empty of the connector for the power supply and FG.

■External dimensions & terminal layout

Unit: mm





Pin No.		Signal name
CON1 to CON8	1	X0 to X7
	2	+V
	3	+24V
	4	24G

*2: 14.5mm when online connector is not installed.

See page 95 for the pin-out of the one-touch communication connector, and the power supply & FG connector.

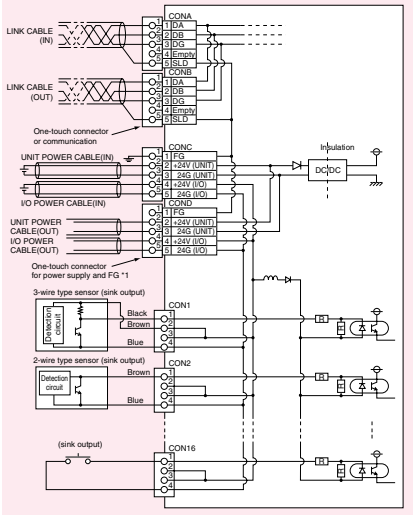
Input module
AJ65VBTCU3-16D1

DC input 16 pts | +COM | 24VDC 3-wire | One-touch | Vertical | High speed input

■Detailed specifications

Input specifications		Description
Number of input points		16 points
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 5mA
Operating voltage range		19.2 to 26.4VDC (ripple ratio: within 5%)
Maximum number of simultaneous input points		100%
ON voltage/ON current		15V or higher/3mA or higher
OFF voltage/OFF current		3V or lower/0.5mA or lower
Input resistance		Approx. 4.7kΩ
Response time	OFF→ON	0.2ms or lower (when 24VDC)
	ON→OFF	0.2ms or lower (when 24VDC)
Wiring method for common		16 points/common (one-touch connector plug 3-wire type)
Input format		Positive common (sink type)
Number of occupied stations		1 station 32 points assignment (use 16 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	40mA or lower (when 24VDC, all points ON)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Protection level		IP1XB
Weight		0.19kg

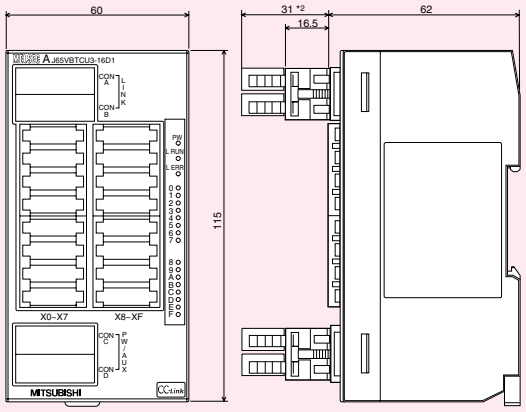
■External device connection diagram

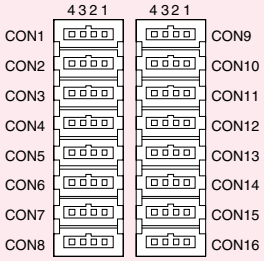


*1: The connector in non-divided line should be installed to empty of the connector for the power supply and FG.

■External dimensions & terminal layout

Unit: mm





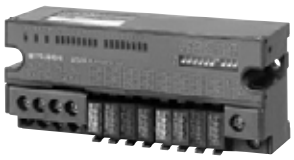
Pin No.		Signal name
CON1 to CON16	1	X0 to XF
	2	+V
	3	+24V
	4	24G

*2: 14.5mm when online connector is not installed.

See page 95 for the pin-out of the one-touch communication connector, and the power supply & FG connector.

Input module
AJ65SBTC4-16DN

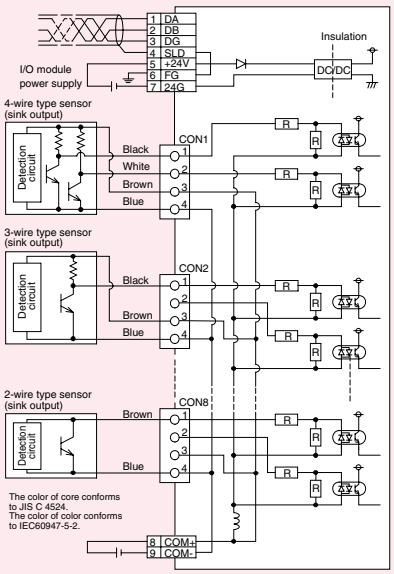
DC input 16 pts | +COM | 24VDC 4-wire | One-touch



Detailed specifications

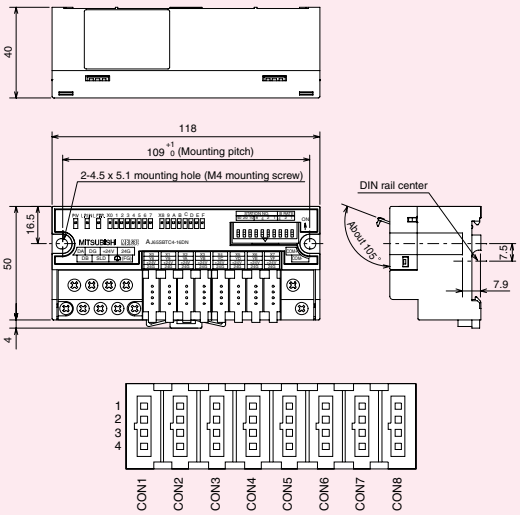
Input specifications		Description
Number of input points		16 points
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 5mA
Operating voltage range		19.2 to 26.4VDC (ripple ratio: within 5%)
Maximum number of simultaneous input points		100%
ON voltage/ON current		14V or higher/3.5mA or higher
OFF voltage/OFF current		6V or lower/1.7mA or lower
Input resistance		Approx. 4.7kΩ
Response time	OFF→ON	1.5ms or lower (when 24VDC)
	ON→OFF	1.5ms or lower (when 24VDC)
Wiring method for common		16 points/common (one-touch connector plug 4-wire type)
Input format		Positive common (sink type)
Number of occupied stations		1 station 32 points assignment (use 16 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	35mA or lower (when 24VDC, all points ON)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Protection level		IP2X
Weight		0.15kg

External device connection diagram



External dimensions & terminal layout

Unit: mm

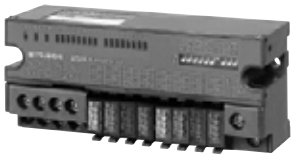


Pin No.		Signal name	Pin No.		Signal name	Pin No.		Signal name	Pin No.		Signal name
CON1	1	X0	CON3	1	X2	CON5	1	X4	CON7	1	X6
	2	X8		2	XA		2	XC		2	XE
	3	+24V		3	+24V		3	+24V		3	+24V
	4	24G		4	24G		4	24G		4	24G
CON2	1	X1	CON4	1	X3	CON6	1	X5	CON8	1	X7
	2	X9		2	XB		2	XD		2	XF
	3	+24V		3	+24V		3	+24V		3	+24V
	4	24G		4	24G		4	24G		4	24G

See page 95 for the pin-out of the one-touch communication connector, and the power supply & FG connector.

Input module
AJ65SBTC4-16DE

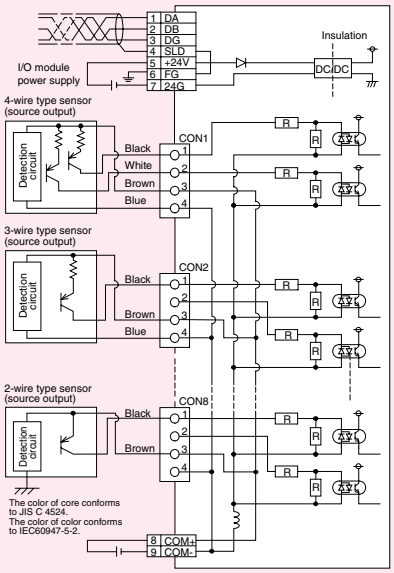
DC input 16 pts | -COM | 24VDC 4-wire | One-touch



Detailed specifications

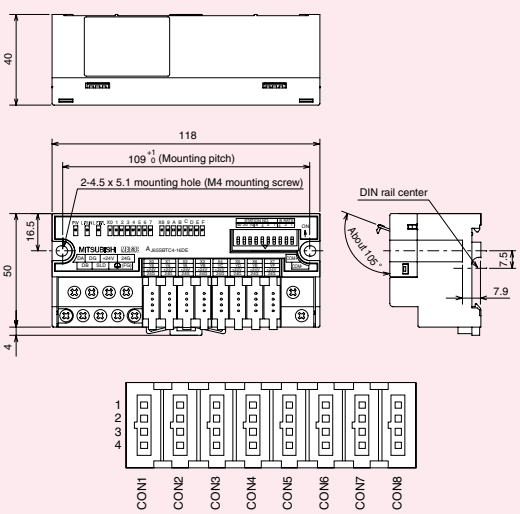
Input specifications		Description
Number of input points		16 points
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 5mA
Operating voltage range		19.2 to 26.4VDC (ripple ratio: within 5%)
Maximum number of simultaneous input points		100%
ON voltage/ON current		14V or higher/3.5mA or higher
OFF voltage/OFF current		6V or lower/1.7mA or lower
Input resistance		Approx. 4.7kΩ
Response time	OFF→ON	1.5ms or lower (when 24VDC)
	ON→OFF	1.5ms or lower (when 24VDC)
Wiring method for common		16 points/common (one-touch connector plug 4-wire type)
Input format		Negative common (source type)
Number of occupied stations		1 station 32 points assignment (use 16 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	35mA or lower (when 24VDC, all points ON)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Protection level		IP2X
Weight		0.15kg

External device connection diagram



External dimensions & terminal layout

Unit: mm



Pin No.		Signal name	Pin No.		Signal name	Pin No.		Signal name	Pin No.		Signal name
CON1	1	X0	CON3	1	X2	CON5	1	X4	CON7	1	X6
	2	X8		2	XA		2	XC		2	XE
	3	+24V		3	+24V		3	+24V		3	+24V
	4	24G		4	24G		4	24G		4	24G
CON2	1	X1	CON4	1	X3	CON6	1	X5	CON8	1	X7
	2	X9		2	XB		2	XD		2	XF
	3	+24V		3	+24V		3	+24V		3	+24V
	4	24G		4	24G		4	24G		4	24G

See page 95 for the pin-out of the one-touch communication connector, and the power supply & FG connector.

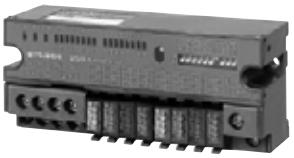
One-touch connector type

Input module
AJ65SBTC1-32D

DC input 32 pts | +COM / -COM | 24VDC 1-wire | One-touch

Input module
AJ65SBTC1-32D1

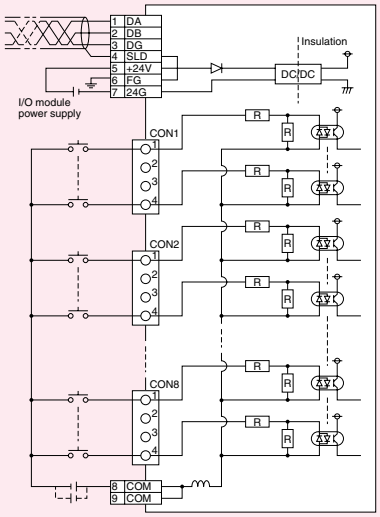
DC input 32 pts | +COM / -COM | 24VDC 1-wire | One-touch | High speed input

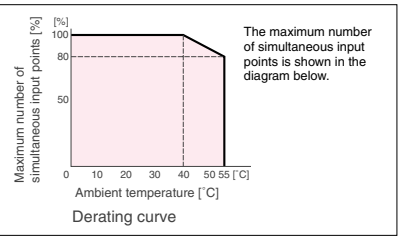


Detailed specifications

Input specifications		Description	
		AJ65SBTC1-32D	AJ65SBTC1-32D1
Number of input points		32 points	
Isolation method		Photocoupler	
Rated input voltage		24VDC	
Rated input current		Approx. 5mA	
Operating voltage range		19.2 to 26.4VDC (ripple ratio: within 5%)	
Maximum number of simultaneous input points		80%	100%
ON voltage/ON current		14V or higher/3.5mA or higher	15V or higher/3mA or higher
OFF voltage/OFF current		6V or lower/1.7mA or lower	3V or lower/0.5mA or lower
Input resistance		Approx. 4.7kΩ	
Response time	OFF→ON	1.5ms or lower (when 24VDC)	0.2ms or lower (when 24VDC)
	ON→OFF	1.5ms or lower (when 24VDC)	0.2ms or lower (when 24VDC)
Wiring method for common		8 points/common (one-touch connector plug 1-wire type)	
Input format		Positive/negative common shared type (sink/source shared type)	
Number of occupied stations		1 station 32 points assignment (use 32 points)	
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)	
	Current	45mA or lower (when 24VDC, all points ON)	
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)	
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground	
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground	
Protection level		–	IP2X
Weight		0.16kg	

External device connection diagram

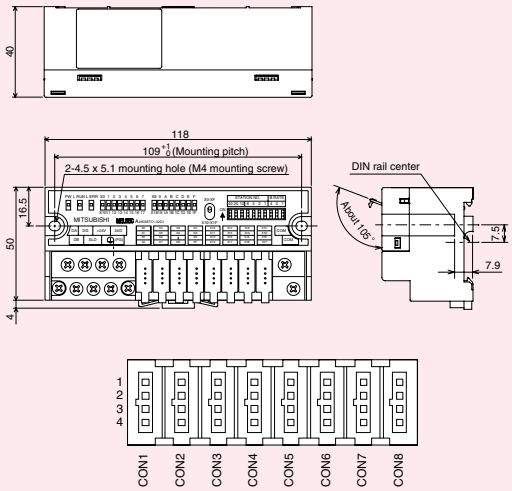




The maximum number of simultaneous input points is shown in the diagram below.

External dimensions & terminal layout

Unit: mm



Pin No.	Signal name	Pin No.	Signal name	Pin No.	Signal name	Pin No.	Signal name
CON1 1	X0	CON3 1	X8	CON5 1	X10	CON7 1	X18
2	X1	2	X9	2	X11	2	X19
3	X2	3	XA	3	X12	3	X1A
4	X3	4	XB	4	X13	4	X1B
CON2 1	X4	CON4 1	XC	CON6 1	X14	CON8 1	X1C
2	X5	2	XD	2	X15	2	X1D
3	X6	3	XE	3	X16	3	X1E
4	X7	4	XF	4	X17	4	X1F

See page 95 for the pin-out of the one-touch communication connector, and the power supply & FG connector.

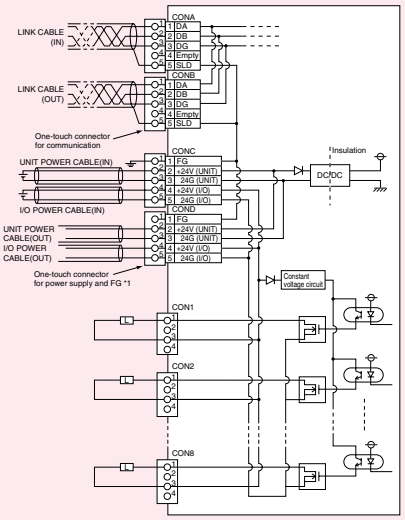
Output module
AJ65VBTCU2-8T

Transistor output 8 pts | Sink | 0.1A 2-wire | One-touch | Protection | Vertical

Detailed specifications

Output specifications		Description
Number of output points		8 points
Isolation method		Photocoupler
Rated load voltage		12/24VDC
Operating load voltage range		10.2 to 26.4VDC (ripple ratio: within 5%)
Maximum load current		0.1A/point 0.8A/common
Maximum inrush current		0.7A 10ms or lower
Leakage current at OFF		0.1mA or lower
Maximum voltage drop at ON		0.1V or lower (TYP.) 0.1A, 0.2V or lower (MAX.) 0.1A
Output format		Sink type
Protection function		Overload protection function, overvoltage protection function and overheat protection function
Response time	OFF→ON	1ms or lower
	ON→OFF	1ms or lower (resistive load)
External power supply for output part	Voltage	10.2 to 26.4VDC (ripple ratio: within 5%)
	Current	5mA or lower (TYP.24VDC/common) Not including external load current
Surge suppressor		Zener diode
Wiring method for common		8 points/common (one-touch connector plug 2-wire type)
Number of occupied stations		1 station 32 points assignment (use 8 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	35mA or lower (when 24VDC, all points ON)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Protection level		IP1XB
Weight		0.15kg

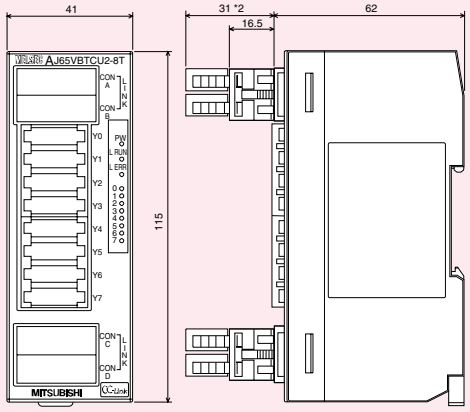
External device connection diagram



*1: The connector in non-divided line should be installed to empty of the connector for the power supply and FG.

External dimensions & terminal layout

Unit: mm



Pin No.	Signal name
CON1 to CON8 1	Y0 to Y7
2	Empty
3	+24V
4	Empty

*2: 14.5mm when online connector is not installed.

See page 95 for the pin-out of the one-touch communication connector, and the power supply & FG connector.

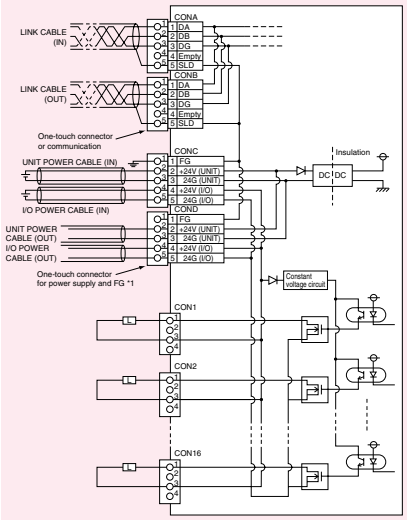
Output module
AJ65VBTCU2-16T

Transistor output 16 pts | Sink | 0.1A 2-wire | One-touch | Protection | Vertical

Detailed specifications

Output specifications		Description
Number of output points		16 points
Isolation method		Photocoupler
Rated load voltage		12/24VDC
Operating load voltage range		10.2 to 26.4VDC (ripple ratio: within 5%)
Maximum load current		0.1A/point 1.6A/common
Maximum inrush current		0.7A 10ms or lower
Leakage current at OFF		0.1mA or lower
Maximum voltage drop at ON		0.1V or lower (TYP.) 0.1A, 0.2V or lower (MAX.) 0.1A
Output format		Sink type
Protection function		Overload protection function, overvoltage protection function and overheat protection function
Response time	OFF→ON	1ms or lower
	ON→OFF	1ms or lower (rated load, resistive load)
External power supply for output part	Voltage	10.2 to 26.4VDC (ripple ratio: within 5%)
	Current	10mA or lower (TYP.24VDC/common) Not including external load current
Surge suppressor		Zener diode
Wiring method for common		16 points/common (one-touch connector plug 2-wire type)
Number of occupied stations		1 station 32 points assignment (use 16 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	40mA or lower (when 24VDC, all points ON)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1µs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Protection level		IP1XB
Weight		0.19kg

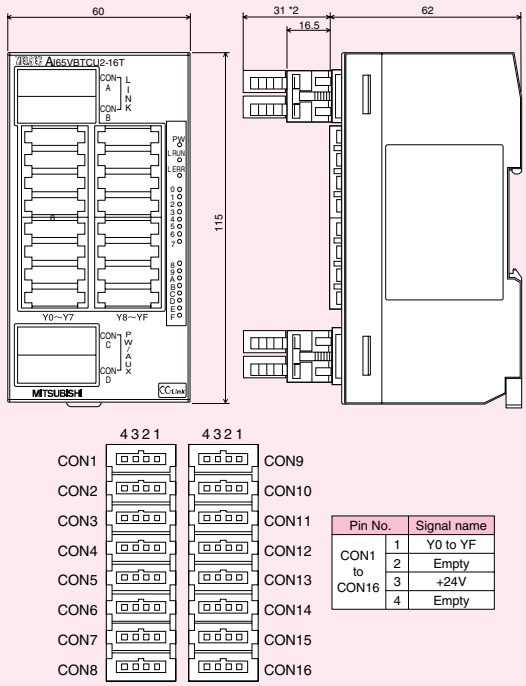
External device connection diagram



*1: The connector in non-divided line should be installed to empty of the connector for the power supply and FG.

External dimensions & terminal layout

Unit: mm



Pin No.	Signal name
CON1 to CON16 1	Y0 to YF
2	Empty
3	+24V
4	Empty

*2: 14.5mm when online connector is not installed.

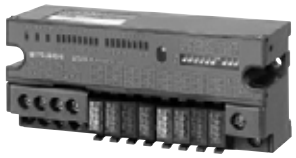
See page 95 for the pin-out of the one-touch communication connector, and the power supply & FG connector.

Output module
AJ65SBTC1-32T

Transistor output 32 pts | Sink | 0.1A 1-wire | One-touch | Protection

Output module
AJ65SBTC1-32T1

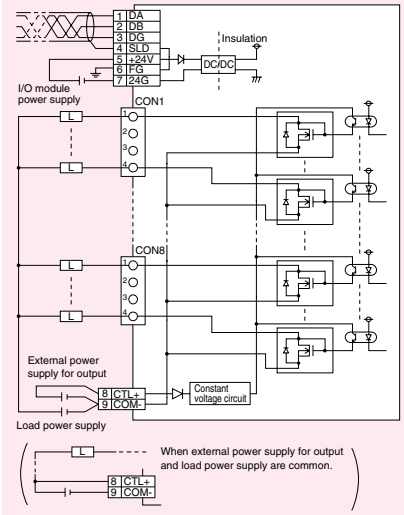
Transistor output 32 pts | Sink | 0.1A 1-wire | One-touch | Low leakage



Detailed specifications

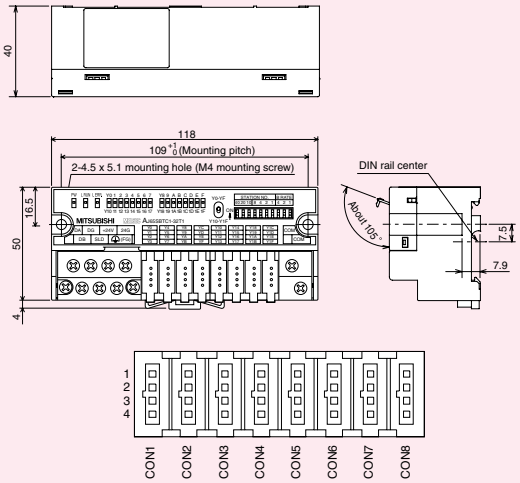
Output specifications		Description	
		AJ65SBTC1-32T	AJ65SBTC1-32T1
Number of output points		32 points	
Isolation method		Photocoupler	
Rated load voltage		12/24VDC	
Operating load voltage range		10.2 to 26.4VDC (ripple ratio: within 5%)	
Maximum load current		0.1A/point 3.2A/common	
Maximum inrush current		1.0A 10ms or lower	
Leakage current at OFF		0.25mA or lower	0.1mA or lower
Maximum voltage drop at ON		0.3V or lower (TYP.) 0.1A, 0.6V or lower (MAX.) 0.1A	
Output format		Sink type	
Protection function		Overload protection function, overvoltage protection function and overheat protection function	None
Response time	OFF→ON	0.5ms or lower	
	ON→OFF	1.5ms or lower (resistive load)	
External power supply for output part	Voltage	10.2 to 26.4VDC (ripple ratio: within 5%)	
	Current	50mA or lower (TYP.24VDC/common) Not including external load current	
Surge suppressor		Zener diode	
Wiring method for common		32 points/common (one-touch connector plug 1-wire type)	
Number of occupied stations		1 station 32 points assignment (use 32 points)	
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)	
	Current	60mA or lower (when 24VDC, all points ON)	
Noise immunity		DC type noise voltage 500Vp-p, noise width 1µs, noise frequency 25 to 60Hz (noise simulator condition)	
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground	
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground	
Protection level		IP2X	
Weight		0.16kg	

External device connection diagram



External dimensions & terminal layout

Unit: mm



Pin No.		Signal name	Pin No.		Signal name	Pin No.		Signal name	Pin No.		Signal name
CON1	1	Y0	CON3	1	Y8	CON5	1	Y10	CON7	1	Y18
	2	Y1		2	Y9		2	Y11		2	Y19
	3	Y2		3	YA		3	Y12		3	Y1A
	4	Y3		4	YB		4	Y13		4	Y1B
CON2	1	Y4	CON4	1	YC	CON6	1	Y14	CON8	1	Y1C
	2	Y5		2	YD		2	Y15		2	Y1D
	3	Y6		3	YE		3	Y16		3	Y1E
	4	Y7		4	YF		4	Y17		4	Y1F

See page 95 for the pin-out of the one-touch communication connector, and the power supply & FG connector.

One-touch

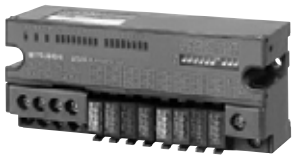
One-touch connector type

I/O combined module
AJ65SBTC4-16DT

DC input 8 pts | +COM | 24VDC 4-wire | Transistor output 8 pts | Sink | 0.5A 4-wire | One-touch | Protection

I/O combined module
AJ65SBTC4-16DT2

DC input 8 pts | +COM | 24VDC 4-wire | Transistor output 8 pts | Sink | 0.5A 4-wire | One-touch | Low leakage



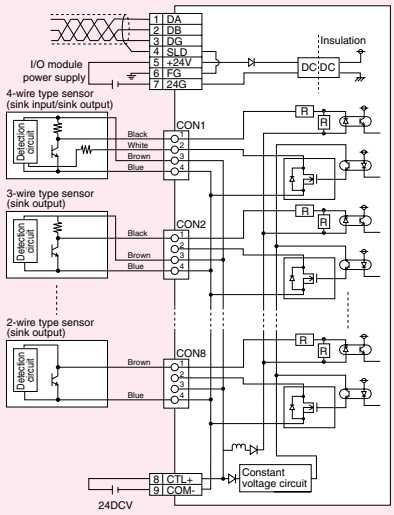
■Detailed specifications

Input specifications		Description
Number of input points		8 points
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 5mA
Operating voltage range		19.2 to 26.4VDC (ripple ratio: within 5%)
Maximum number of simultaneous input points		100%
ON voltage/ON current		14V or higher/3.5mA or higher
OFF voltage/OFF current		6V or lower/1.7mA or lower
Input resistance		Approx.4.7kΩ
Response time	OFF→ON	1.5ms or lower (when 24VDC)
	ON→OFF	1.5ms or lower (when 24VDC)
Input format		Positive common (sink type)
Wiring method for common		16 points/common (one-touch connector plug 4-wire type)
Number of occupied stations		1 station 32 points assignment (use 16 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	40mA or lower (when 24VDC, all points ON)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs,noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Weight		0.15kg

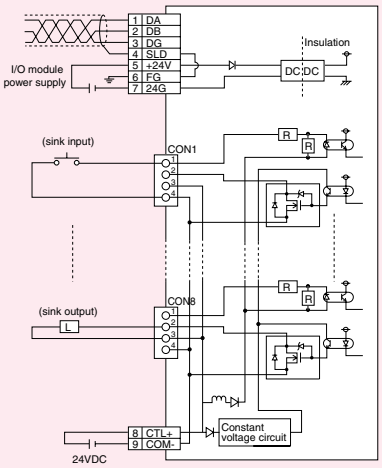
Output specifications		Description	
		AJ65SBTC4-16DT	AJ65SBTC4-16DT2
Number of output points		8 points	
Isolation method		Photocoupler	
Rated load voltage		24VDC	
Operating load voltage range		19.2 to 26.4VDC (ripple ratio: within 5%)	
Maximum load current		0.5A/point 2.4A/common	
Maximum inrush current		1.0A 10ms or lower	
Leakage current at OFF		0.25mA or lower	0.1mA or lower
Maximum voltage drop at ON		0.3VDC or lower (TYP.) 0.5A, 0.6VDC or lower (MAX.)0.5A	
Output format		Sink type	
Protection function		Overload protection function, overvoltage protection function, overheat protection function.	None
Response time	OFF→ON	0.5ms or lower	
	ON→OFF	1.5ms or lower (resistive load)	
External power supply for output part	Voltage	19.2 to 26.4VDC (ripple ratio: within 5%)	
	Current	13mA or lower (when 24VDC, all points ON) Not including external load current	
Surge suppressor		Zener diode	

■External device connection diagram

<Connection example for 4-wire, 3-wire, 2-wire sensor>

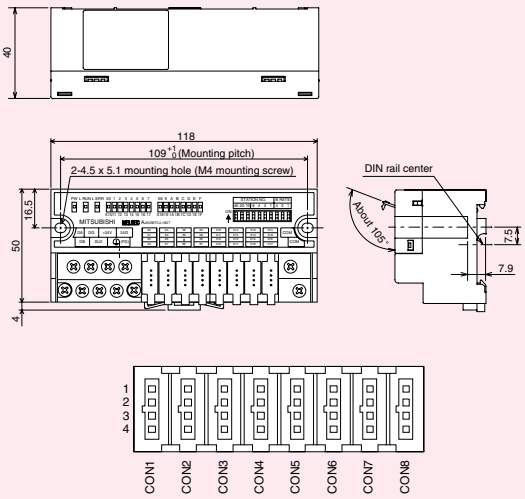


<Another connection example>



■External dimensions & terminal layout

Unit: mm



Pin No.		Signal name	Pin No.		Signal name	Pin No.		Signal name	Pin No.		Signal name
CON1	1	X0	CON3	1	X2	CON5	1	X4	CON7	1	X6
	2	Y8		2	YA		2	YC		2	YE
	3	+24V		3	+24V		3	+24V		3	+24V
	4	24G		4	24G		4	24G		4	24G
CON2	1	X1	CON4	1	X3	CON6	1	X5	CON8	1	X7
	2	Y9		2	YB		2	YD		2	YF
	3	+24V		3	+24V		3	+24V		3	+24V
	4	24G		4	24G		4	24G		4	24G

See page 95 for the pin-out of the one-touch communication connector, and the power supply & FG connector.

I/O combined module
AJ65SBTC1-32DT

DC input 16 pts | +COM | 24VDC 1-wire | Transistor output 16 pts | Sink | 0.1A 1-wire | One-touch | Protection

I/O combined module
AJ65SBTC1-32DT1

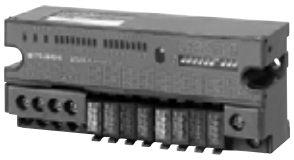
DC input 16 pts | +COM | 24VDC 1-wire | Transistor output 16 pts | Sink | 0.1A 1-wire | One-touch | Protection | High speed input

I/O combined module
AJ65SBTC1-32DT2

DC input 16 pts | +COM | 24VDC 1-wire | Transistor output 16 pts | Sink | 0.1A 1-wire | One-touch | Low leakage

I/O combined module
AJ65SBTC1-32DT3

DC input 16 pts | +COM | 24VDC 1-wire | Transistor output 16 pts | Sink | 0.1A 1-wire | One-touch | High speed input | Low leakage

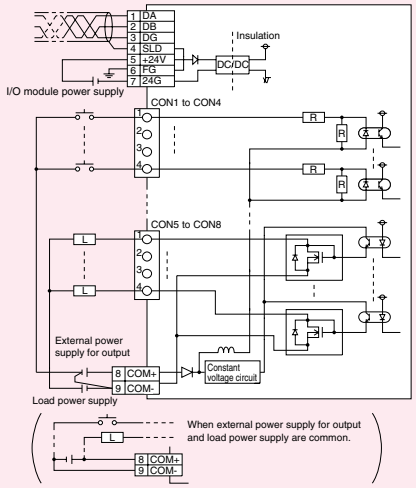


■Detailed specifications

Input specifications		Description			
		AJ65SBTC1-32DT	AJ65SBTC1-32DT1	AJ65SBTC1-32DT2	AJ65SBTC1-32DT3
Number of input points		16 points			
Isolation method		Photocoupler			
Rated input voltage		24VDC			
Rated input current		Approx. 5mA			
Operating voltage range		19.2 to 26.4VDC (ripple ratio: within 5%)			
Maximum number of simultaneous input points		100%			
ON voltage/ON current		14V or higher/ 3.5mA or higher	15V or higher/ 3mA or higher	14V or higher/ 3.5mA or higher	15V or higher/ 3mA or higher
OFF voltage/OFF current		6V or lower/ 1.7mA or lower	3V or lower/ 0.5mA or lower	6V or lower/ 1.7mA or lower	3V or lower/ 0.5mA or lower
Input resistance		Approx.4.7kΩ			
Response time	OFF→ON	1.5ms or lower (when 24VDC)	0.2ms or lower (when 24VDC)	1.5ms or lower (when 24VDC)	0.2ms or lower (when 24VDC)
	ON→OFF	1.5ms or lower (when 24VDC)	0.2ms or lower (when 24VDC)	1.5ms or lower (when 24VDC)	0.2ms or lower (when 24VDC)
Input format		Positive common (sink type)			
Wiring method for common		32 points/common (one-touch connector plug 1-wire type)			
Number of occupied stations		1 station 32 points assignment (use 32 points)			
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)			
	Current	50mA or lower (when 24VDC, all points ON)			
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)			
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground			
Insulation resistance		10MΩ or higher, measured with a 500 V DC insulation resistance tester between all DC external terminals and ground			
Weight		0.16kg			

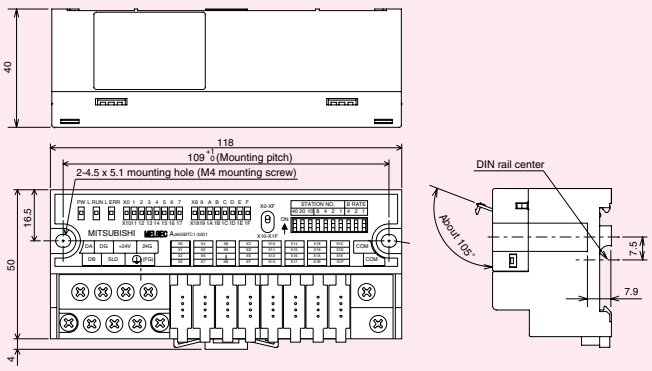
Output specifications		Description			
		AJ65SBTC1-32DT	AJ65SBTC1-32DT1	AJ65SBTC1-32DT2	AJ65SBTC1-32DT3
Number of output points		16 points			
Isolation method		Photocoupler			
Rated load voltage		24VDC			
Operating load voltage range		19.2 to 26.4 V DC (ripple ratio: within 5%)			
Maximum load current		0.1A/point 1.6A/common			
Maximum inrush current		1.0A 10ms or lower			
Leakage current at OFF		0.25mA or lower		0.1mA or lower	
Maximum voltage drop at ON		0.3V DC or lower (TYP.) 0.1A, 0.6VDC or lower (MAX.) 0.1A			
Output format		Sink type			
Protection function		Overload protection function, overvoltage protection function and overheat protection function		None	
Response time	OFF→ON	0.5ms or lower			
	ON→OFF	1.5ms or lower (resistive load)			
External power supply for output part	Voltage	19.2 to 26.4VDC (ripple ratio: within 5%)			
	Current	17mA or lower (when 24VDC, all points ON) Not including external load current			
Surge suppressor		Zener diode			

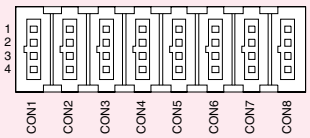
■External device connection diagram



■External dimensions & terminal layout

Unit: mm





Pin No.		Signal name	Pin No.		Signal name	Pin No.		Signal name	Pin No.		Signal name
CON1	1	X0	CON3	1	X8	CON5	1	Y10	CON7	1	Y18
	2	X1		2	X9		2	Y11		2	Y19
	3	X2		3	XA		3	Y12		3	Y1A
	4	X3		4	XB		4	Y13		4	Y1B
CON2	1	X4	CON4	1	XC	CON6	1	Y14	CON8	1	Y1C
	2	X5		2	XD		2	Y15		2	Y1D
	3	X6		3	XE		3	Y16		3	Y1E
	4	X7		4	XF		4	Y17		4	Y1F

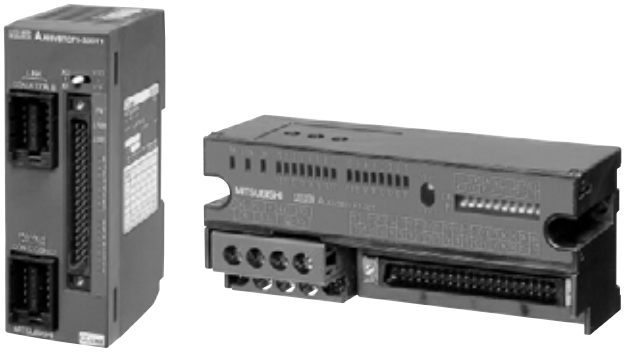
See page 95 for the pin-out of the one-touch communication connector, and the power supply & FG connector.

Remote I/O modules

40-pin connector (FCN connector type)

Overview

40-pin connector (FCN connector type)



* The actual modules may slightly differ in shapes from the photos shown.

Features

- The 40-pin connector (FCN connector type) allows connection of various devices.
- The module can be mounted in six orientations.

Part names and settings

AJ65SBTCF1-32□

Operation status indicator LEDs

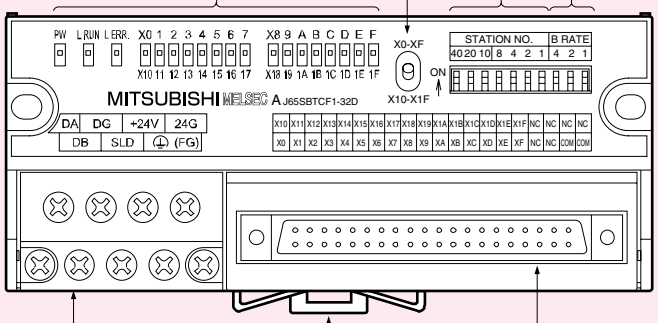
LED name	Description
PW	Turns on when the remote I/O module is powered ON
L RUN	Turns on when normal data are received from the master station and turns off when the timeout is reached
L ERR	Turns on when a transmission error (CRC error) occurs and off when the timeout is reached (L RUN also goes out.) Turns on due to incorrect station number or transmission speed setting Flashing when the station number and/or transmission speed switch setting has been changed while the power is ON
X0 to 1F Y0 to 1F	Indicates the input ON/OFF status Indicator is on when the input is ON, and is off when the input is OFF

Station number setting switch
Select "10", "20" or "40" to set the tens place of the station number.
Select "1", "2", "4" or "8" to set the ones place of the station number.
Always set the station number within the range of 1 to 64.

I/O display selector switch

Transmission speed setting switch

Setting value	Transmission speed
0	156kbps
1	625kbps
2	2.5Mbps
3	5.0Mbps
4	10Mbps

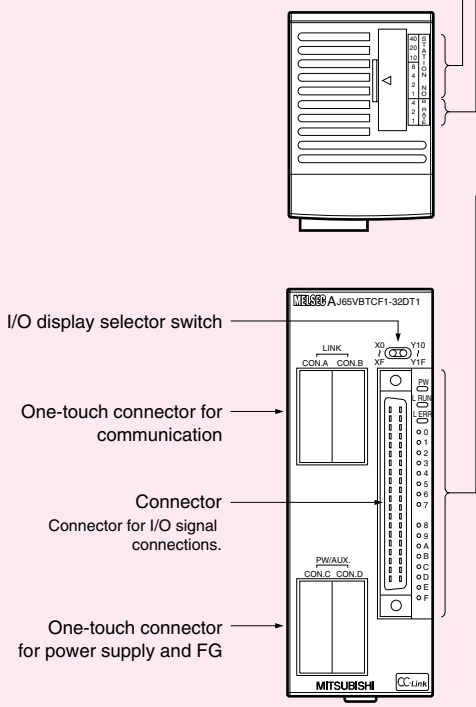


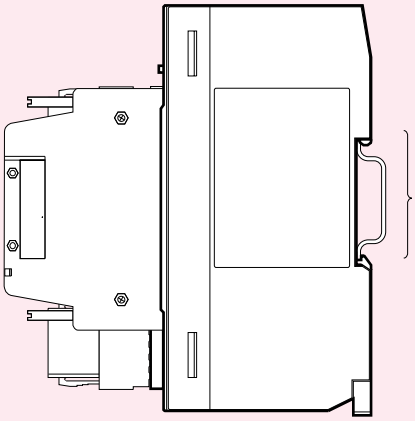
Terminal block
Terminal block for connection of compact remote I/O module power supply, transmissions, and input/output signals.

DIN rail hook
This hook is used to mount the module on the DIN rail.

Connector
Connector for I/O signal connections.

AJ65VBTCF□1-32DT1





Station number setting switch

Select "10", "20" or "40" to set the tens place of the station number.
Select "1", "2", "4" or "8" to set the ones place of the station number.
Always set the station number within the range of 1 to 64.

Transmission speed setting switch

Setting value	Transmission speed
0	156kbps
1	625kbps
2	2.5Mbps
3	5.0Mbps
4	10Mbps

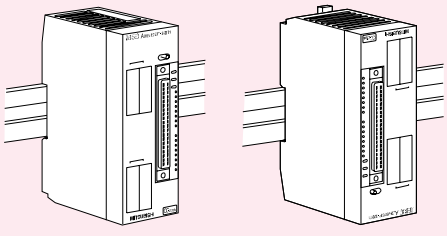
Operation status indicator LEDs

LED name	Description
PW	Turns on when the remote I/O module is powered ON
L RUN	Turns on when normal data are received from the master station and turns off when the timeout is reached
L ERR	Turns on when a transmission error (CRC error) occurs and off when the timeout is reached (L RUN also goes out.) Turns on due to incorrect station Number or transmission speed setting Flashing when the station Number and/or transmission speed switch setting has been changed while the power is on
X0 to 1F Y0 to 1F	Indicates the input ON/OFF status. Indicator is on when the input is ON, and is off when the input is OFF

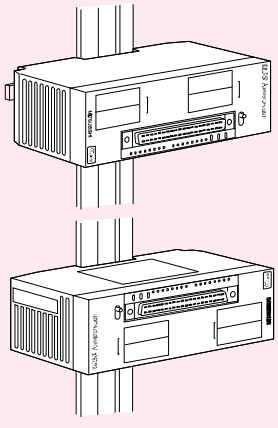
The module can be mounted in six orientations.

● Mounting orientation in which max. simultaneous input is limited

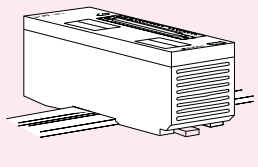
◎ Applicable models
AJ65VBTCF□1-32DT1 (Refer to the derating curve)



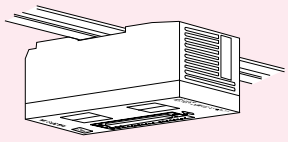
Front installation
(Basic orientation)



Front installation
(Upside-down orientation)



Horizontal installation



Ceiling installation

40-pin(FCN)

40-pin connector (FCN connector type)

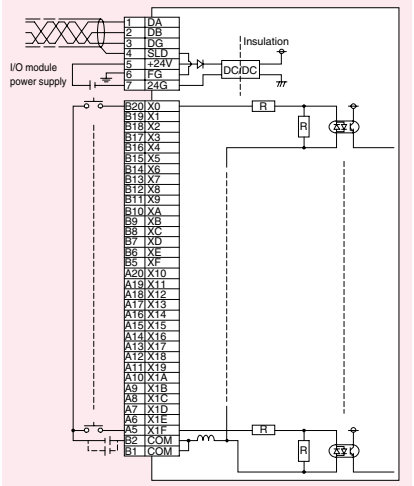
Input module
AJ65SBTCF1-32D

DC input 32 pts | +COM -COM | 24VDC 1-wire | 40-pin(FCN)

■Detailed specifications

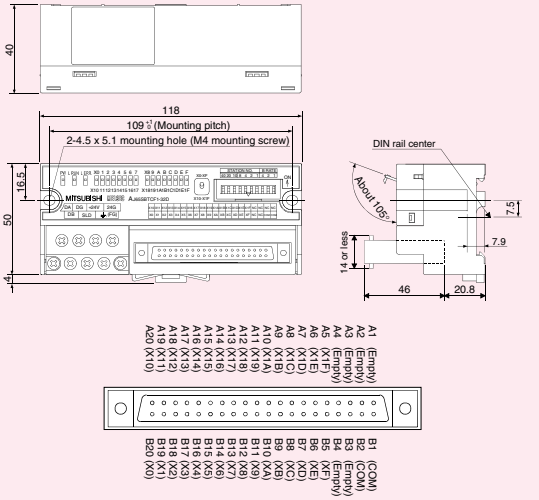
Input specifications		Description
Number of input points		32 points
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 5mA
Operating voltage range		19.2 to 26.4VDC (ripple ratio: within 5%)
Maximum number of simultaneous input points		100%
ON voltage/ON current		14V or higher/3.5mA or higher
OFF voltage/OFF current		6V or lower/1.7mA or lower
Input resistance		Approx. 4.7kΩ
Response time	OFF→ON	1.5ms or lower (when 24VDC)
	ON→OFF	1.5ms or lower (when 24VDC)
Wiring method for common		32 points/common (FCN connector 1-wire type)
Input format		Positive/negative common shared type (sink/source shared type)
Number of occupied stations		1 station 32 points assignment (use 32 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	45mA or lower (when 24VDC, all points ON)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Weight		0.15kg

■External device connection diagram



■External dimensions & terminal layout

Unit: mm



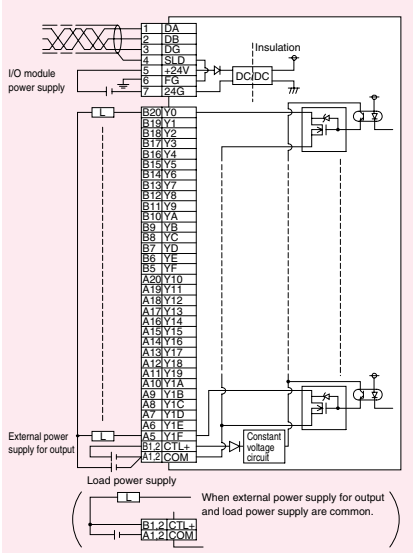
Output module
AJ65SBTCF1-32T

Transistor output 32 pts | Sink | 0.1A 1-wire | 40-pin(FCN) | Protection

■Detailed specifications

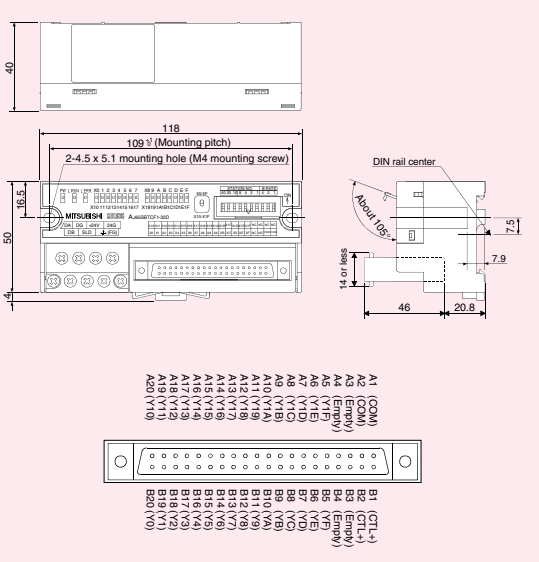
Output specifications		Description
Number of output points		32 points
Isolation method		Photocoupler
Rated load voltage		12/24VDC
Operating load voltage range		10.2 to 26.4VDC (ripple ratio: within 5%)
Maximum load current		0.1A/point 3.2A/common
Maximum inrush current		1.0A 10ms or lower
Leakage current at OFF		0.1mA or lower
Maximum voltage drop at ON		0.1V or lower (TYP.) 0.1A, 0.2V or lower (MAX.) 0.1A
Output format		Sink type
Protection function		Overload protection function, overvoltage protection function,overheat protection function.
Response time	OFF→ON	0.5ms or lower
	ON→OFF	1.5ms or lower (resistive load)
External power supply for output part	Voltage	10.2 to 26.4VDC (ripple ratio: within 5%)
	Current	50mA or lower (TYP.24VDC/common) Not including external load current
Surge suppressor		Zener diode
Wiring method for common		32 points/common (FCN connector 1-wire type)
Number of occupied stations		1 station 32 points assignment (use 32 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	60mA or lower (when 24VDC, all points ON)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Weight		0.24kg

■External device connection diagram



■External dimensions & terminal layout

Unit: mm



I/O combined module
AJ65SBTCF1-32DT

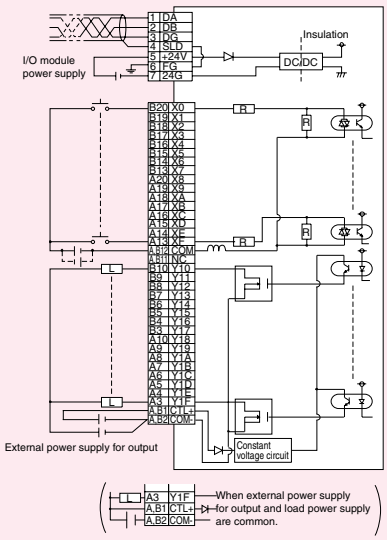
DC input 16 pts | +COM / -COM | 24VDC 1-wire | Transistor output 16 pts | Sink | 0.1A 1-wire | 40-pin(FCN) | Protection

■Detailed specifications

Input specifications		Description
Number of input points		16 points
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 5mA
Operating voltage range		19.2 to 26.4VDC (ripple ratio: within 5%)
Maximum number of simultaneous input points		100%
ON voltage/ON current		14V or higher/3.5mA or higher
OFF voltage/OFF current		6V or lower/1.7mA or lower
Input resistance		Approx. 4.7kΩ
Response time	OFF→ON	1.5ms or lower (when 24VDC)
	ON→OFF	1.5ms or lower (when 24VDC)
Wiring method for common		16 points/common (FCN connector 1-wire type)
Input format		Positive/negative common shared type (sink/source shared type)
Number of occupied stations		1 station 32 points assignment (use 32 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	50mA or lower (when 24VDC, all points ON)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Weight		0.15kg

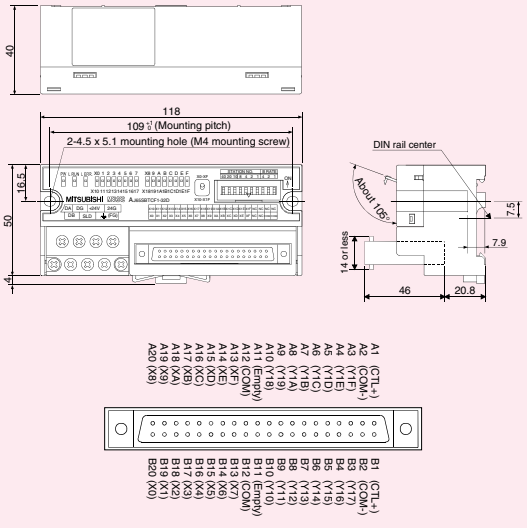
Output specifications		Description
Number of output points		16 points
Isolation method		Photocoupler
Rated load voltage		12/24VDC
Operating load voltage range		10.2 to 26.4VDC (ripple ratio: within 5%)
Maximum load current		0.1A/point 1.6A/common
Maximum inrush current		1.0A 10ms or lower
Leakage current at OFF		0.1mA or lower
Maximum voltage drop at ON		0.1V or lower (TYP.) 0.1A, 0.2V or lower (MAX.) 0.1A
Output format		Sink type
Protection function		Overload protection function, overvoltage protection function,overheat protection function.
Response time	OFF→ON	0.5ms or lower
	ON→OFF	1.5ms or lower (resistive load)
External power supply for output part	Voltage	10.2 to 26.4VDC (ripple ratio: within 5%)
	Current	30mA or lower (TYP.24VDC/common) Not including external load current
Surge suppressor		Zener diode
Wiring method for common		16 points/common (FCN connector 1-wire type)

■External device connection diagram



■External dimensions & terminal layout

Unit: mm



40-pin(FCN)

40-pin connector (FCN connector type)

I/O combined module
AJ65VBTCF1-32DT1

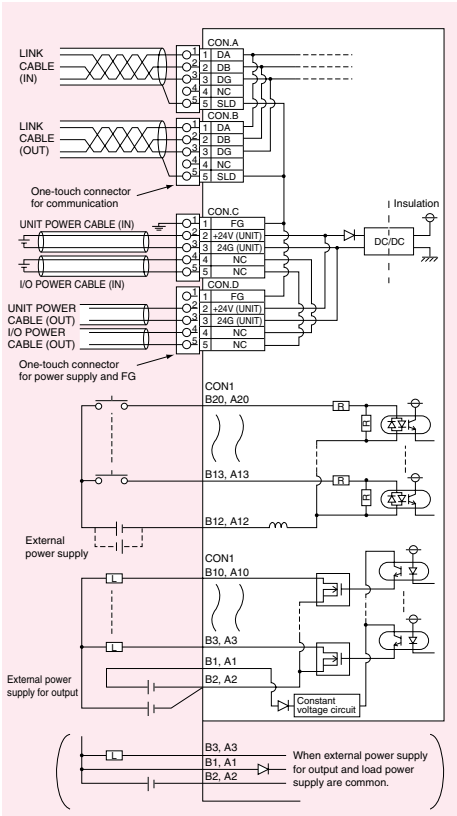
DC input 16 pts | +COM / -COM | 24VDC 1-wire | Transistor output 16 pts | Sink | 0.1A 1-wire | 40-pin(FCN) | Protection | High speed input

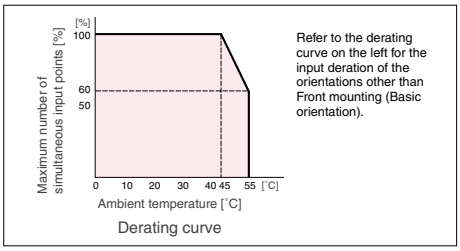
Detailed specifications

Input specifications		Description
Number of input points		16 points
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 5mA
Operating voltage range		19.2 to 26.4VDC (ripple ratio: within 5%)
Maximum number of simultaneous input points		100%/60%
ON voltage/ON current		15V or higher/3mA or higher
OFF voltage/OFF current		3V or lower/0.5mA or lower
Input resistance		Approx. 4.7kΩ
Response time	OFF→ON	0.2ms or lower (when 24VDC)
	ON→OFF	0.2ms or lower (when 24VDC)
Wiring method for common		16 points/common (FCN connector 1-wire type)
Input format		Positive/negative common shared type (sink/source shared type)
Number of occupied stations		1 station 32 points assignment (use 32 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	50mA or lower (when 24VDC, all points ON)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Weight		0.16kg

Output specifications		Description
Number of output points		16 points
Isolation method		Photocoupler
Rated load voltage		12/24VDC
Operating load voltage range		10.2 to 26.4VDC (ripple ratio: within 5%)
Maximum load current		0.1A/point 1.6A/common
Maximum inrush current		0.7A 10ms or lower
Leakage current at OFF		0.1mA or lower
Maximum voltage drop at ON		0.1V or lower (TYP.) 0.1A, 0.2V or lower (MAX.) 0.1A
Output format		Sink type
Protection function		Overload protection function, overvoltage protection function,overheat protection function.
Response time	OFF→ON	1ms or lower
	ON→OFF	1ms or lower (rated load, resistive load)
External power supply for output part	Voltage	10.2 to 26.4VDC (ripple ratio: within 5%)
	Current	10mA or lower (when 24VDC, all point ON) Not including external load current
Surge suppressor		Zener diode
Wiring method for common		16 points/common (FCN connector 1-wire type)

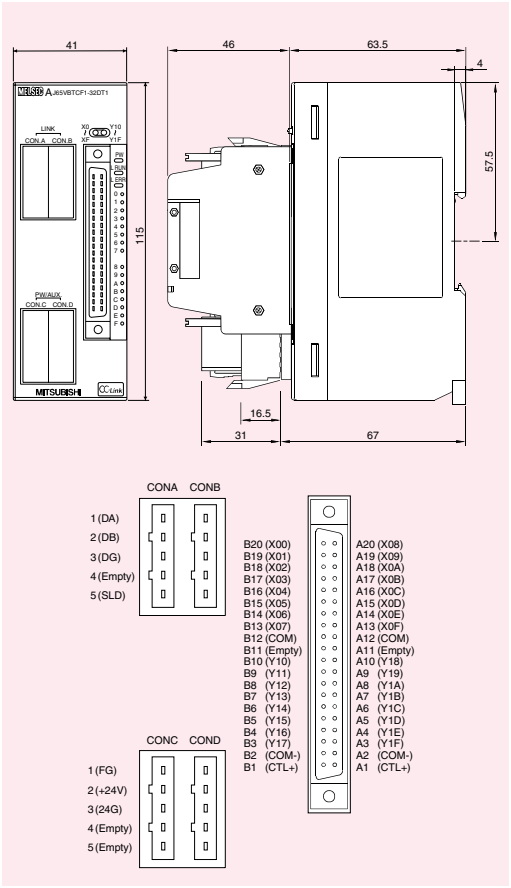
External device connection diagram





External dimensions & terminal layout

Unit: mm



DC input 16 pts | +COM | 24VDC 1-wire | Transistor output 16 pts | Sink | 0.1A 1-wire | 40-pin(FCN) | Protection | High speed input | Shared power supply

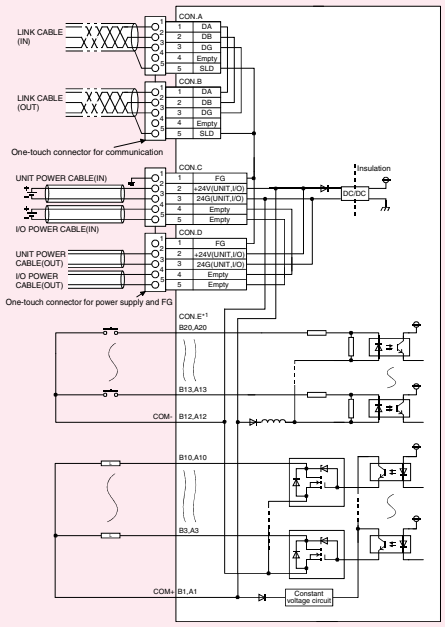
I/O combined module
AJ65VBTCFJ1-32DT1

■Detailed specifications

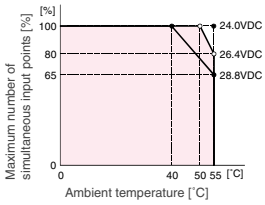
Input specifications		Description
Number of input points		16 points
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 5mA
Operating voltage range		Same as I/O module power supply
Maximum number of simultaneous input points		100%/40%
ON voltage/ON current		15V or higher/3mA or higher
OFF voltage/OFF current		3V or lower/0.5mA or lower
Input resistance		Approx. 4.7kΩ
Response time	OFF→ON	0.2ms or lower (when 24VDC)
	ON→OFF	0.2ms or lower (when 24VDC)
Wiring method for common		32 points/common (FCN connector 1-wire type)
Input format		Positive common (sink type)
Number of occupied stations		1 station 32 points assignment (use 32 points)
I/O module power supply	Voltage	20.4 to 28.8VDC (ripple ratio: within 5%)
	Current	50mA or lower (when 24VDC, all points ON) Not including external load current
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Weight		0.16kg

Output specifications		Description
Number of output points		16 points
Isolation method		Photocoupler
Rated load voltage		24VDC
Operating load voltage range		Same as I/O module power supply
Maximum load current		0.1A/point 1.6A/common
Maximum inrush current		0.7A 10ms or lower
Leakage current at OFF		0.1mA or lower
Maximum voltage drop at ON		0.1V or lower (TYP.) 0.1A, 0.2V or lower (MAX.) 0.1A
Output format		Sink type
Protection function		Overload protection function, overvoltage protection function,overheat protection function.
Response time	OFF→ON	1ms or lower
	ON→OFF	1ms or lower (rated load, resistive load)
Surge suppressor		Zener diode

■External device connection diagram

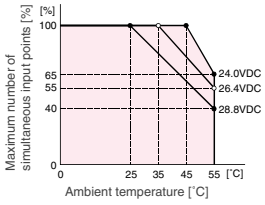


*1: Do not supply power to the CON.E from the outside.



Derating curve

Front mounting (Basic orientation)

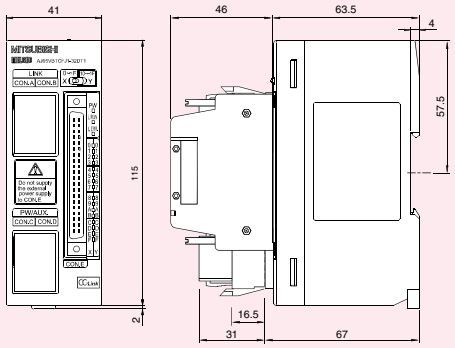


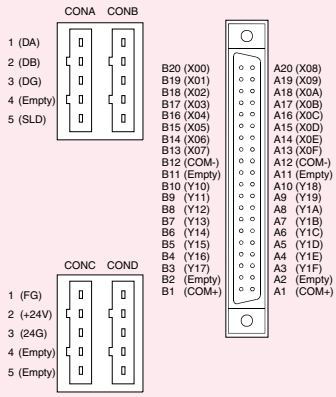
Derating curve

Other than Front mounting (Basic orientation)

■External dimensions & terminal layout

Unit: mm





Remote I/O modules

Waterproof connector type

Overview

Waterproof connector type

* The actual modules may slightly differ in shapes from the photos shown.

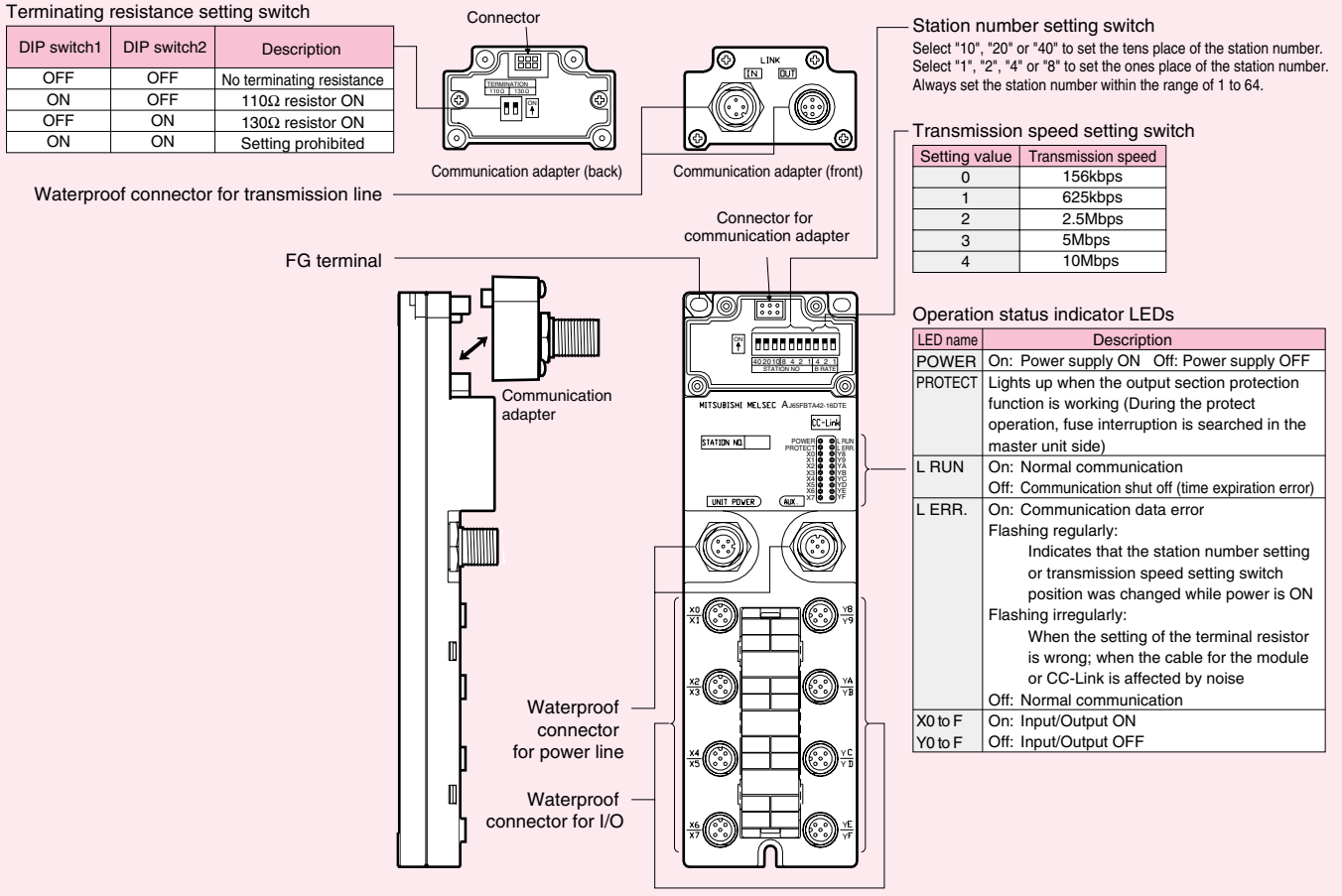
Features

- Waterproof type modules are compliant with the IP67 standard for water resistance.
- Modules can be replaced without stopping the system.
- Easy connections are available without tools, saving the work time and cost.
- Built-in terminating resistor (selected by 110Ω/130Ω switch)
- The module can be mounted in six orientations.

Part names and settings

Terminating resistance setting switch

DIP switch1	DIP switch2	Description
OFF	OFF	No terminating resistance
ON	OFF	110Ω resistor ON
OFF	ON	130Ω resistor ON
ON	ON	Setting prohibited



Station number setting switch

Select "10", "20" or "40" to set the tens place of the station number.
Select "1", "2", "4" or "8" to set the ones place of the station number.
Always set the station number within the range of 1 to 64.

Transmission speed setting switch

Setting value	Transmission speed
0	156kbps
1	625kbps
2	2.5Mbps
3	5Mbps
4	10Mbps

Operation status indicator LEDs

LED name	Description
POWER	On: Power supply ON Off: Power supply OFF
PROTECT	Lights up when the output section protection function is working (During the protect operation, fuse interruption is searched in the master unit side)
L RUN	On: Normal communication Off: Communication shut off (time expiration error)
L ERR.	On: Communication data error Flashing regularly: Indicates that the station number setting or transmission speed setting switch position was changed while power is ON Flashing irregularly: When the setting of the terminal resistor is wrong; when the cable for the module or CC-Link is affected by noise Off: Normal communication
X0 to F Y0 to F	On: Input/Output ON Off: Input/Output OFF

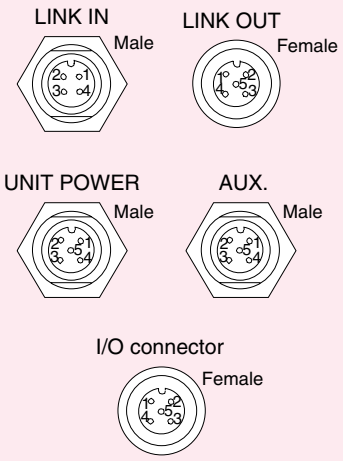
Communication connector

Pin No.	LINK IN	LINK OUT
1	SLD	SLD
2	DB	DB
3	DG	DG
4	DA	DA
5	No pins	Empty

Power supply connector

Pin No.	UNIT POWER	AUX.
1	+24V (UNIT)	+24V (I/O)
2	Empty	Empty
3	24G (UNIT)	24G (I/O)
4	Empty	Empty
5	FG	FG

Pin-out



View from module front

Waterproof

Waterproof connector type

Input module
AJ65FBTA4-16D

DC input 16 pts +COM 24VDC 2-wire to 24VDC 4-wire Waterproof

Input module
AJ65FBTA4-16DE

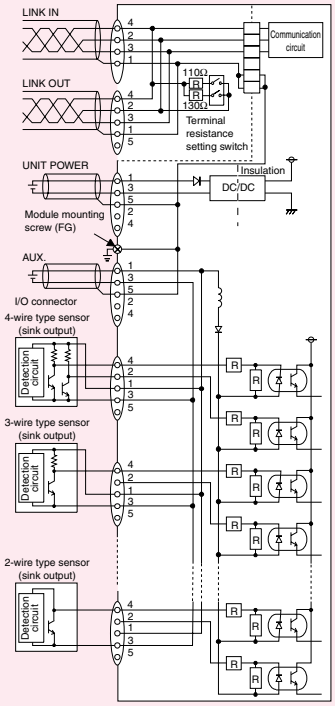
DC input 16 pts -COM 24VDC 2-wire to 24VDC 4-wire Waterproof

Detailed specifications

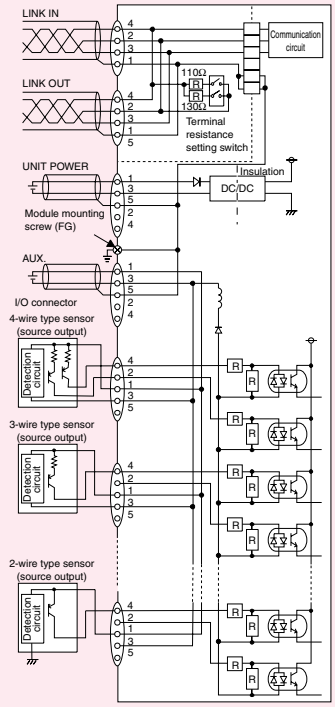
Input specifications		Description	
		AJ65FBTA4-16D	AJ65FBTA4-16DE
Number of input points		16 points	
Isolation method		Photocoupler	
Rated input voltage		24VDC	
Rated input current		Approx. 7mA	
Operating voltage range		20.4 to 26.4VDC (ripple ratio: within 5%)	
Maximum number of simultaneous input points		100%	
ON voltage/ON current		14V or higher/3.5mA or higher	
OFF voltage/OFF current		6V or lower/1.7mA or lower	
Input resistance		Approx. 3.3kΩ	
Response time	OFF→ON	1.5ms or lower (when 24VDC)	
	ON→OFF	1.5ms or lower (when 24VDC)	
Wiring method for common		16points/common (waterproof connector 2 to 4-wire type)	
Input format		Positive Common (sink type)	Negative Common (source type)
Number of occupied stations		1 station 32 points assignment (use 16 points)	
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)	
	Current	40mA or lower (when 24VDC, all points ON)	
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)	
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground	
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground	
Weight		0.40kg	

External device connection diagram

•AJ65FBTA4-16D

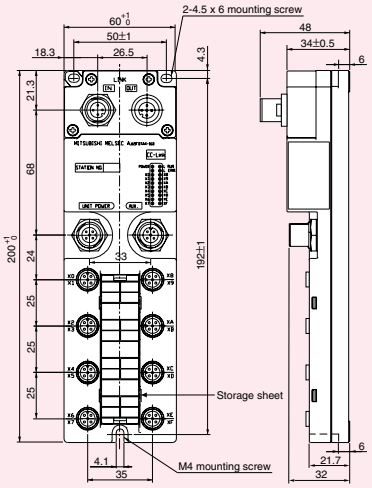


•AJ65FBTA4-16DE



External dimensions & terminal layout

Unit: mm



AJ65FBTA4-16D

Pin No.		Signal name	Pin No.		Signal name
X0	1	+24V	X8	1	+24V
	2	X1		2	X9
	3	24G		3	24G
X1	4	X0	X9	4	X8
	5	Empty		5	Empty
X2	1	+24V	XA	1	+24V
	2	X3		2	XB
	3	24G		3	24G
X3	4	X2	XB	4	XA
	5	Empty		5	Empty
X4	1	+24V	XC	1	+24V
	2	X5		2	XD
	3	24G		3	24G
X5	4	X4	XD	4	XC
	5	Empty		5	Empty
X6	1	+24V	XE	1	+24V
	2	X7		2	XF
	3	24G		3	24G
X7	4	X6	XF	4	XE
	5	Empty		5	Empty

AJ65FBTA4-16DE

Pin No.		Signal name	Pin No.		Signal name
X0	1	+24V	X8	1	+24V
	2	X1		2	X9
	3	24G		3	24G
X1	4	X0	X9	4	X8
	5	Empty		5	Empty
X2	1	+24V	XA	1	+24V
	2	X3		2	XB
	3	24G		3	24G
X3	4	X2	XB	4	XA
	5	Empty		5	Empty
X4	1	+24V	XC	1	+24V
	2	X5		2	XD
	3	24G		3	24G
X5	4	X4	XD	4	XC
	5	Empty		5	Empty
X6	1	+24V	XE	1	+24V
	2	X7		2	XF
	3	24G		3	24G
X7	4	X6	XF	4	XE
	5	Empty		5	Empty

See page 110 for the pin-out of the one-touch communication connector, and the power supply & FG connector.

Output module
AJ65FBTA2-16T

Transistor output 16 pts | Sink | 0.5A 2-wire | Waterproof | Protection

Output module
AJ65FBTA2-16TE

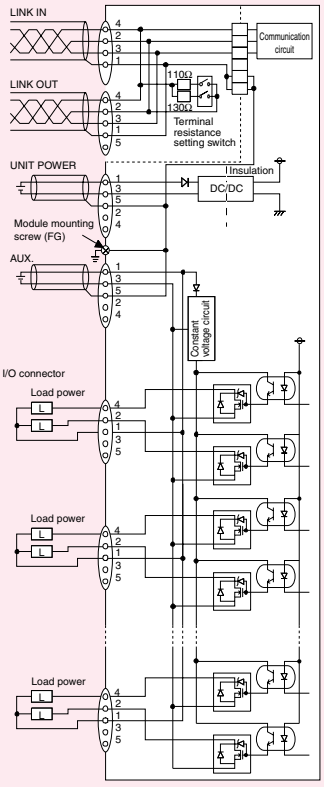
Transistor output 16 pts | Source | 1.0A 2-wire | Waterproof | Protection

■Detailed specifications

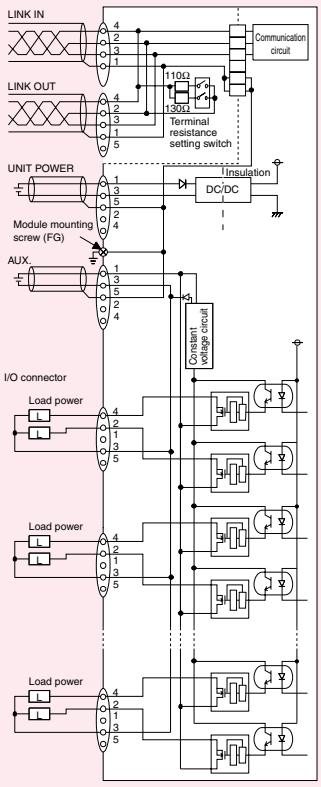
Output specifications		Description	
		AJ65FBTA2-16T	AJ65FBTA2-16TE
Number of output points		16 points	
Isolation method		Photocoupler	
Rated load voltage		12/24VDC	
Operating load voltage range		10.2 to 28.8VDC (ripple ratio: within 5%)	
Maximum load current		0.5A/point 4.0A/common	1.0A/point 4.0A/common
Maximum inrush current		1.0A 10ms or lower	2.0A 10ms or lower
Leakage current at OFF		0.25mA or lower	0.3mA or lower
Maximum voltage drop at ON		0.15V or lower (TYP.) 1.0A, 0.25V or lower (MAX.) 0.5A	0.15V or lower (TYP.) 0.5A, 0.25V or lower (MAX.) 0.5A
Output format		Sink type	Source type
Protect function		Overload protection function, overheat protection function LED lights up when protection is occurring.	
Response time	OFF→ON	0.5ms or lower	
	ON→OFF	1.5ms or lower (resistive load)	
External power supply for output part	Voltage	10.2 to 28.8VDC (ripple ratio: within 5%)	
	Current	20mA or lower	30mA or lower
		(when 24VDC, all points ON) Not including external load current	
Surge suppressor		Zener diode	
Wiring method for common		16 points/1 common (waterproof connector 2-wire type)	
Number of occupied stations		1 station 32 points assignment (use 16 points)	
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)	
	Current	50mA or lower (when 24VDC, all points ON)	
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)	
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground	
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground	
Weight		0.40kg	

■External device connection diagram

•AJ65FBTA2-16T

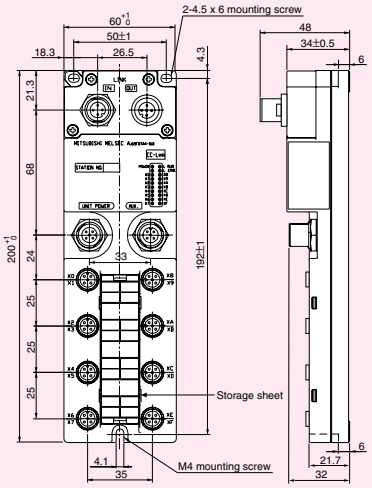


•AJ65FBTA2-16TE



■External dimensions & terminal layout

Unit: mm



AJ65FBTA2-16T

Pin No.		Signal name	Pin No.		Signal name
Y0	1	+24V	Y8	1	+24V
	2	Y1		2	Y9
	3	Empty		3	Empty
Y1	4	Y0	Y9	4	Y8
	5	Empty		5	Empty
Y2	1	+24V	YA	1	+24V
	2	Y3		2	YB
	3	Empty		3	Empty
Y3	4	Y2	YB	4	YA
	5	Empty		5	Empty
Y4	1	+24V	YC	1	+24V
	2	Y5		2	YD
	3	Empty		3	Empty
Y5	4	Y4	YD	4	YC
	5	Empty		5	Empty
Y6	1	+24V	YE	1	+24V
	2	Y7		2	YF
	3	Empty		3	Empty
Y7	4	Y6	YF	4	YE
	5	Empty		5	Empty

AJ65FBTA2-16TE

Pin No.		Signal name	Pin No.		Signal name
Y0	1	Empty	Y8	1	Empty
	2	Y1		2	Y9
	3	24G		3	24G
Y1	4	Y0	Y9	4	Y8
	5	Empty		5	Empty
Y2	1	Empty	YA	1	Empty
	2	Y3		2	YB
	3	24G		3	24G
Y3	4	Y2	YB	4	YA
	5	Empty		5	Empty
Y4	1	Empty	YC	1	Empty
	2	Y5		2	YD
	3	24G		3	24G
Y5	4	Y4	YD	4	YC
	5	Empty		5	Empty
Y6	1	Empty	YE	1	Empty
	2	Y7		2	YF
	3	24G		3	24G
Y7	4	Y6	YF	4	YE
	5	Empty		5	Empty

See page 110 for the pin-out of the one-touch communication connector, and the power supply & FG connector.

Waterproof

Waterproof connector type

DC input 8 pts | +COM | 24VDC 2-wire to 24VDC 4-wire
Transistor output 8 pts | Sink | 0.5A 2-wire | Waterproof | Protection

I/O combined module
AJ65FBTA42-16DT

DC input 8 pts | -COM | 24VDC 2-wire to 24VDC 4-wire
Transistor output 8 pts | Source | 1.0A 2-wire | Waterproof | Protection

I/O combined module
AJ65FBTA42-16DTE

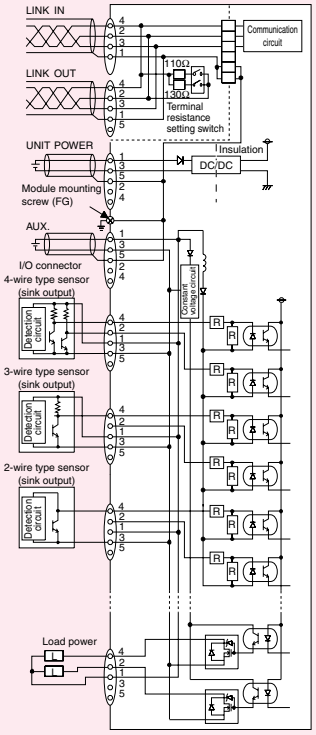
■Detailed specifications

Input specifications		Description	
		AJ65FBTA42-16DT	AJ65FBTA42-16DTE
Number of input points		8 points	
Isolation method		Photocoupler	
Rated input voltage		24VDC	
Rated input current		Approx. 7mA	
Operating voltage range		20.4 to 26.4VDC (ripple ratio: within 5%)	
Maximum number of simultaneous input points		100%	
ON voltage/ON current		14V or higher/3.5mA or higher	
OFF voltage/OFF current		6V or lower/1.7mA or lower	
Input resistance		Approx. 3.3kΩ	
Response time	OFF→ON	1.5ms or lower (when 24VDC)	
	ON→OFF	1.5ms or lower (when 24VDC)	
Wiring method for common		16points/common (waterproof connector 2 to 4-wire type)	
Input format		Positive Common (sink type)	Negative Common (source type)
Number of occupied stations		1 station 32 points assignment (use 16 points)	
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)	
	Current	50mA or lower	45mA or lower
		(when 24VDC, all points ON)	
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)	
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground	
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground	
Weight		0.40kg	

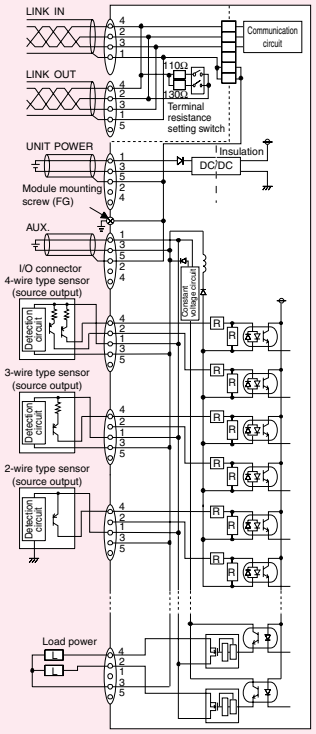
Output specifications		Description	
		AJ65FBTA42-16DT	AJ65FBTA42-16DTE
Number of output points		8 points	
Isolation method		Photocoupler	
Rated load voltage		24VDC	
Operating load voltage range		20.4 to 26.4VDC (ripple ratio: within 5%)	
Maximum load current		0.5A/point 2.4A/common	1.0A/point 4.0A/common
Maximum inrush current		1.0A 10ms or lower	2.0A 10ms or lower
Leakage current at OFF		0.25mA or lower	0.3mA or lower
Maximum voltage drop at ON		0.15V or lower (TYP.) 0.5A, 0.25V or lower (MAX.) 0.5A	0.15V or lower (TYP.) 1.0A, 0.2V or lower (MAX.) 1.0A
Output format		Sink type	Source type
Protect function		Overload protection function, overheat protection function	Overload protection function, overheat protection function LED lights up when protection is occurring.
Response time	OFF→ON	0.5ms or lower	
	ON→OFF	1.5ms or lower (resistive load)	
External power supply for output part	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)	
	Current	10mA or lower	15mA or lower
		(when 24VDC, all points ON) Not including external load current	
Surge suppressor		Zener diode	
Wiring method for common		16points/common (waterproof connector 2-wire type)	

■External device connection diagram

•AJ65FBTA42-16DT

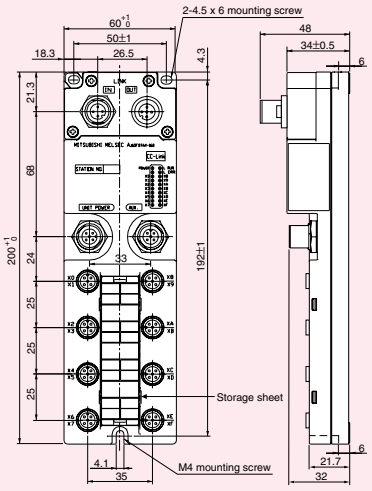


•AJ65FBTA42-16DTE



■External dimensions & terminal layout

Unit: mm



AJ65FBTA42-16DT

Pin No.		Signal name	Pin No.		Signal name
X0	1	+24V	Y8	1	+24V
	2	X1		2	Y9
	3	24G		3	Empty
X1	4	X0	Y9	4	Y8
	5	Empty		5	Empty
X2	1	+24V	YA	1	+24V
	2	X3		2	YB
	3	24G		3	Empty
X3	4	X2	YB	4	YA
	5	Empty		5	Empty
X4	1	+24V	YC	1	+24V
	2	X5		2	YD
	3	24G		3	Empty
X5	4	X4	YD	4	YC
	5	Empty		5	Empty
X6	1	+24V	YE	1	+24V
	2	X7		2	YF
	3	24G		3	Empty
X7	4	X6	YF	4	YE
	5	Empty		5	Empty

AJ65FBTA42-16DTE

Pin No.		Signal name	Pin No.		Signal name
X0	1	+24V	Y8	1	Empty
	2	X1		2	Y9
	3	24G		3	24G
X1	4	X0	Y9	4	Y8
	5	Empty		5	Empty
X2	1	+24V	YA	1	Empty
	2	X3		2	YB
	3	24G		3	24G
X3	4	X2	YB	4	YA
	5	Empty		5	Empty
X4	1	+24V	YC	1	Empty
	2	X5		2	YD
	3	24G		3	24G
X5	4	X4	YD	4	YC
	5	Empty		5	Empty
X6	1	+24V	YE	1	Empty
	2	X7		2	YF
	3	24G		3	24G
X7	4	X6	YF	4	YE
	5	Empty		5	Empty

See page 110 for the pin-out of the one-touch communication connector, and the power supply & FG connector.

Memo

Safety relay modules

Spring clamp

Safety relay module (P type) Positive common / Positive common

Overview

Relay module terminal block type

* The actual modules may slightly differ in shapes from the photos shown.

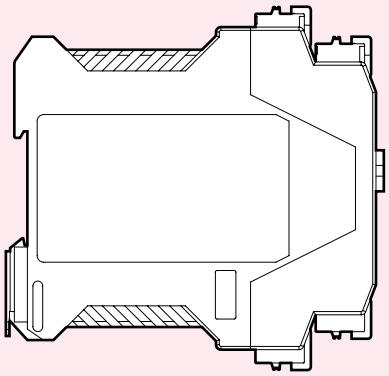
Features

■The safety system can be added easily.
Independent safety functions (Category 4 of EN954-1 , PL e of ISO13849-1) can be added by simply connecting the existing CC-Link cable.

■Reduced wiring with the CC-Link connection
The special wiring to monitor the status of the safety relay module is not required.
The cables are nicely organized inside/outside of the control panel.

■Safety status visibility
The cause of the safety system activation can be easily investigated since the status of safety outputs/inputs and internal relays are monitored.

Part names and settings



CC-Link station number setting switch
Select "X10" to set the tens place of the station number.
Select "X1" to set the ones place of the station number.
Always set the station number within the range of 1 to 64.
(The same station number cannot be used more than once.)

Module power supply part terminal block

Safety output part terminal block

Safety power supply/start-up part terminal block

Safety part extension connector

Start-up mode setting switch

Safety input part terminal block

Safety output part terminal block

CC-Link part/extension communication part terminal block

Serial number display

CC-Link transmission speed terminating resistance setting switch

Setting value	Switch status (B RATE)			Transmission speed
	4	2	1	
0	OFF	OFF	OFF	156kbps
1	OFF	OFF	ON	625kbps
2	OFF	ON	OFF	2.5Mbps
3	OFF	ON	ON	5Mbps
4	ON	OFF	OFF	10Mbps

Operation status indicator LEDs

LED name	Description
PW	On : Power supply ON Off : Power supply OFF, or power supply OFF with electric fuse
ERR.	On : Communication error with the extension safety relay module. Off : Normal
L RUN	On : Normal communication Off : Communication shut off (time expiration error)
SD	On : Data transmission
RD	Off : Data reception
L ERR.	On : A value set for station number setting switch or transmission speed setting switch is out of range. Flashing regularly: The setting of the station number setting switch or transmission setting switch is changed during operation. Flashing irregularly: The terminating resistor is not attached or wrongly attached. Or the module is influenced by noise. Off : Normal communication
S PW	On : Safety part power supply ON Off : Safety part power supply OFF, or OFF with electric fuse
Z	On : Safety output is generated (both K0 and K1 are ON). Off : Safety output is not generated.
X0 X1	On : Safety input is generated. Off : Safety input is not generated.
K0	On : Operating status of the internal safety relay K0 is ON. Off : Operating status of the internal safety relay K0 is OFF.
K1	On : Operating status of the internal safety relay K1 is ON. Off : Operating status of the internal safety relay K1 is OFF.

Safety relay module (P type) Positive common / Positive common

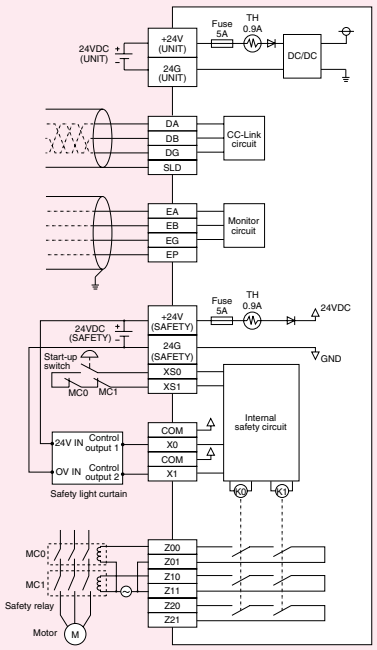
QS90SR2SP-CC

■Detailed specifications

Input specifications		Description
Number of safety input points		1 safety input point (2 inputs)
Number of other input points		1 start-up input point
Isolation method		Relay isolation
Safety input rated input voltage		24VDC
Safety input rated input current		4.6mA (300mA at relay start-up)
Operating voltage range		20.4 to 26.4VDC (ripple ratio: within 5%)
Input format	Type	P type
	X0	Positive common
	X1	Positive common
Wiring method for common		All safety inputs and safety outputs are independent.
Number of extension modules		Up to three extension safety relay modules can be connected.
Number of occupied stations		1 station 32 points assignment (use 32 points)
Module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	70mA (when not using extension module), 145mA (when using three extension modules)
Safety power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	85mA (when not using extension module), 325mA (when using three extension modules)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		2,500VAC/1mA or less for 1 minute between safety outputs 2,500VAC/1mA or less for 1 minute between safety input and safety output 2,500VAC/1mA or less for 1 minute between power supply and safety output
Insulation resistance		100MΩ or more, measured with a 500VDC insulation resistance tester between safety outputs 100MΩ or more, measured with a 500VDC insulation resistance tester between safety input and safety output 100MΩ or more, measured with a 500VDC insulation resistance tester between power supply and safety output
Level of protection		IP1X
Weight		0.37kg
External connection system		2-piece spring clamp terminal block

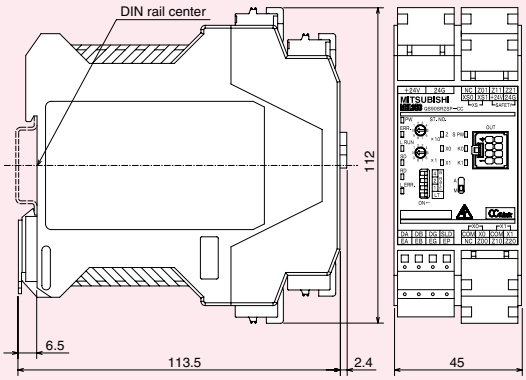
Output specifications		Description
Number of safety output points		1 safety output point (3 outputs)
Isolation method		Relay isolation
Rated load voltage		Category 3: 5.0A/point or less Category 4: 3.6A/point or less
Minimum switching load		5VDC/5mA
Maximum allowable voltage of contact		250VAC, 30VDC
Rated load	Resistance load	250VAC/5A, 30VDC/5A
	Inductive load	240VAC/2A ($\cos\phi$ = 0.3), 24VDC/1A (L/R = 48ms)
Relay life	Mechanical	Five million times or more
	Electrical	Hundred thousand times or more
Maximum switching frequency		1,200 times/hour based on the rated control capacity
Response time	Time until output ON	50ms or less (safety input ON → safety output ON)
	Time until output OFF	20ms or less (safety input OFF → safety output OFF)

■External device connection diagram



■External dimensions

Unit: mm



Spring clamp

Safety relay module (N type) Positive common / Negative common

Overview

Relay module terminal block type

* The actual modules may slightly differ in shapes from the photos shown.

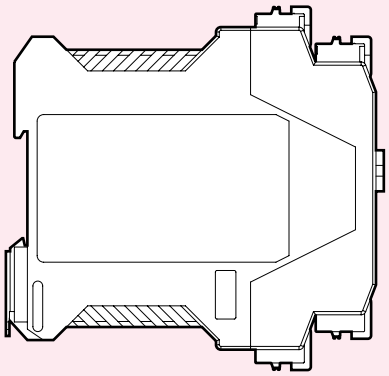
Features

■The safety system can be added easily.
Independent safety functions (Category 4 of EN954-1 , PL e of ISO13849-1) can be added by simply connecting the existing CC-Link cable.

■Reduced wiring with the CC-Link connection
The special wiring to monitor the status of the safety relay module is not required.
The cables are nicely organized inside/outside of the control panel.

■Safety status visibility
The cause of the safety system activation can be easily investigated since the status of safety outputs/inputs and internal relays are monitored.

Part names and settings



CC-Link station number setting switch
Select "X10" to set the tens place of the station number.
Select "X1" to set the ones place of the station number.
Always set the station number within the range of 1 to 64.
(The same station number cannot be used more than once.)

Module power supply part terminal block

Safety output part terminal block

Safety power supply/start-up part terminal block

Safety part extension connector

Start-up mode setting switch

Safety input part terminal block

Safety output part terminal block

CC-Link part/extension communication part terminal block

Serial number display

CC-Link transmission speed terminating resistance setting switch

Setting value	Switch status (B RATE)			Transmission speed
	4	2	1	
0	OFF	OFF	OFF	156kbps
1	OFF	OFF	ON	625kbps
2	OFF	ON	OFF	2.5Mbps
3	OFF	ON	ON	5Mbps
4	ON	OFF	OFF	10Mbps

Operation status indicator LEDs

LED name	Description
PW	On : Power supply ON Off : Power supply OFF, or power supply OFF with electric fuse
ERR.	On : Communication error with the extension safety relay module. Off : Normal
L RUN	On : Normal communication Off : Communication shut off (time expiration error)
SD	On : Data transmission
RD	Off : Data reception
L ERR.	On : A value set for station number setting switch or transmission speed setting switch is out of range. Flashing regularly: The setting of the station number setting switch or transmission setting switch is changed during operation. Flashing irregularly: The terminating resistor is not attached or wrongly attached. Or the module is influenced by noise. Off : Normal communication
S PW	On : Safety part power supply ON Off : Safety part power supply OFF, or OFF with electric fuse
Z	On : Safety output is generated (both K0 and K1 are ON). Off : Safety output is not generated.
X0 X1	On : Safety input is generated. Off : Safety input is not generated.
K0	On : Operating status of the internal safety relay K0 is ON. Off : Operating status of the internal safety relay K0 is OFF.
K1	On : Operating status of the internal safety relay K1 is ON. Off : Operating status of the internal safety relay K1 is OFF.

Safety relay module (N type) Positive common / Negative common

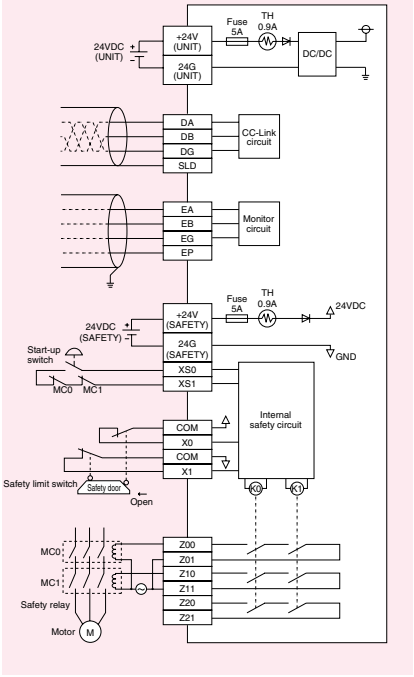
QS90SR2SN-CC

■Detailed specifications

Input specifications		Description
Number of safety input points		1 safety input point (2 inputs)
Number of other input points		1 start-up input point
Isolation method		Relay isolation
Safety input rated input voltage		24VDC
Safety input rated input current		4.6mA (300mA at relay start-up)
Operating voltage range		20.4 to 26.4VDC (ripple ratio: within 5%)
Input format	Type	N type
	X0	Positive common
	X1	Negative common
Wiring method for common		All safety inputs and safety outputs are independent.
Number of extension modules		Up to three extension safety relay modules can be connected.
Number of occupied stations		1 station 32 points assignment (use 32 points)
Module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	70mA (when not using extension module), 145mA (when using three extension modules)
Safety power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	85mA (when not using extension module), 325mA (when using three extension modules)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		2,500VAC/1mA or less for 1 minute between safety outputs 2,500VAC/1mA or less for 1 minute between safety input and safety output 2,500VAC/1mA or less for 1 minute between power supply and safety output
Insulation resistance		100MΩ or more, measured with a 500VDC insulation resistance tester between safety outputs 100MΩ or more, measured with a 500VDC insulation resistance tester between safety input and safety output 100MΩ or more, measured with a 500VDC insulation resistance tester between power supply and safety output
Level of protection		IP1X
Weight		0.37kg
External connection system		2-piece spring clamp terminal block

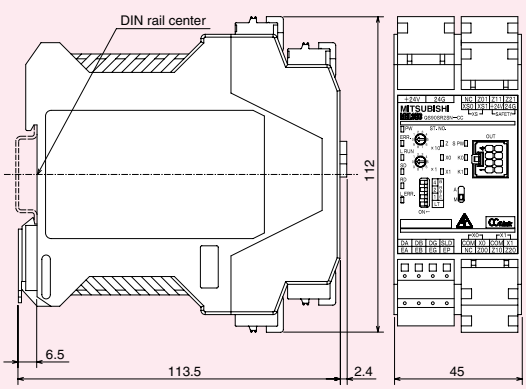
Output specifications		Description
Number of safety output points		1 safety output point (3 outputs)
Isolation method		Relay isolation
Rated load voltage		Category 3: 5.0A/point or less Category 4: 3.6A/point or less
Minimum switching load		5VDC/5mA
Maximum allowable voltage of contact		250VAC, 30VDC
Rated load	Resistance load	250VAC/5A, 30VDC/5A
	Inductive load	240VAC/2A ($\cos\phi$ = 0.3), 24VDC/1A (L/R = 48ms)
Relay life	Mechanical	Five million times or more
	Electrical	Hundred thousand times or more
Maximum switching frequency		1,200 times/hour based on the rated control capacity
Response time	Time until output ON	50ms or less (safety input ON → safety output ON)
	Time until output OFF	20ms or less (safety input OFF → safety output OFF)

■External device connection diagram



■External dimensions

Unit: mm



Safety controller module

Spring clamp

CC-Link interface module for safety controller

Overview

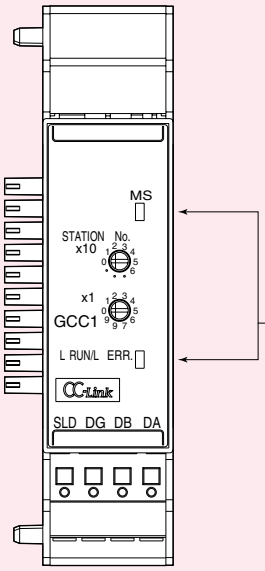
Spring clamp terminal block type

* The actual modules may slightly differ in shapes from the photos shown.

Features

- The safety controller CC-Link module enables communication between a CC-Link master station and the safety controller MELSEC-WS series. (It provides remote access to devices.)
- Communication settings are simple to make using the safety controller engineering software. In addition, communication data points can be given user labels that allow programs to be easily understood.
- The transmission speed auto-tracking function allows the module to match the speed of the master station without the need for any settings.
- Spring clamp terminals help to minimize man hours spent wiring CC-Link cable.
- Rewriting parameters is unnecessary when changing out modules.
- Connect to the safety controller using the monitor tool to configure settings and check the error history.

Part names and settings



LED

LED		Description
MS	Off	No power supply, immediately after the module start or hardware failure
	Lights up green	Executing (live process data from/to CPU)
	Flashes green	Idle (CPU stop)
	Flashes green/red	Executing, but data link stopped or faulty
	Flashes red	500ms ON 500ms OFF:Configuring/configuration required
		250ms ON 250ms OFF:Critical fault on CC-Link interface module
	Lights up red	Critical fault on another module
L RUN/ L ERR.	Off	No power supply or data link stopped
	Lights up green	data link active
	Flashes green/red	One of the following has been detected when data link is active. • Configuration change of the station number setting switch • Termination register not connected • Module or CC-Link dedicated cable affected by noise
	Flashes red	One of the following has been detected when data link is stopped. • Configuration change of the station number setting switch • Termination register not connected • Module or CC-Link dedicated cable affected by noise
	Lights up red	Station number setting switch out-of-range

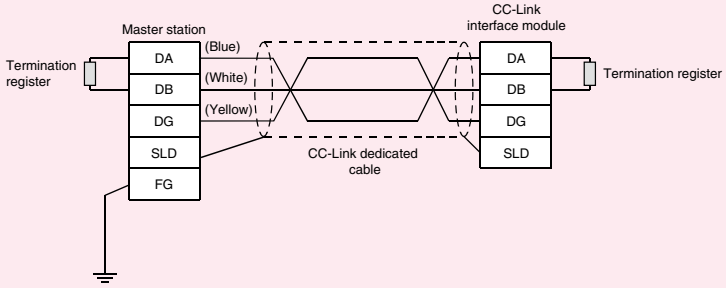
Switch

Name	Meaning
Station number setting switches	A switch for configuring a station number for the module (factory default:0) 1 to 64: Station number
Terminal block DA, DB, DG, SLD	For wiring, see external device connection diagram.

CC-Link interface module for safety controller

WS0-GCC100202

■External device connection diagram

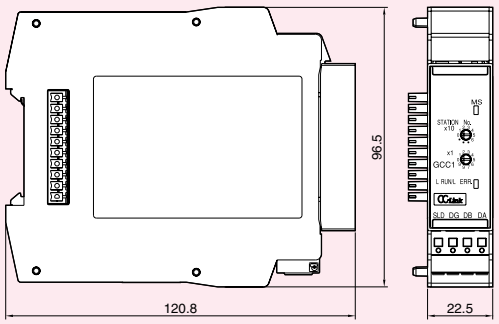


■Detailed specifications

Item	Specifications
Fieldbus	CC-Link
CC-Link station type	Remote device station
CC-Link Version	Ver.1.10
Data transmission speed	156kbps/625kbps/2.5Mbps/5Mbps/10Mbps(autosensing)
Station number	1 to 64 (factory default: 0)
Number of occupied stations	1 station (RX/RY 32 points each, RWw/RWr 4 points each)/ 2 stations (RX/RY 64 points each, RWw/RWr 8 points each)/ 3 stations (RX/RY 96 points each, RWw/RWr 12 points each)/ 4 stations (RX/RY 128 points each, RWw/RWr 16 points each) (The last 16 points of RX/RY are for system use (reserved).)
CC-Link interface	1 terminal block at the lower part of the module
Cable	Ver.1.10-compatible CC-Link dedicated cable
Data interface	Backplane bus (FLEXBUS+)
Ver1.10-compatible CC-Link dedicated cable	For the specifications and any inquiries on the CC-Link dedicated cables, refer to the following:CC-Link Partner Association website:http://www.cc-link.org/
Cable size	20 AWG
Temperature rating	-15°C to +75°C
Material	Conductor: Annealed copper wire (finely stranded)
Core type	Finely stranded
Solderless terminal (bar terminal) and crimp tool	1) Mitsubishi Electric Engineering Co.,Ltd. • Bar terminal model: FA-TVC125T9 • Crimp tool : FA-NH65A 2) NICHIFU Co.,Ltd. • Bar terminal model:TE0.5-10 (for CC-Link dedicated cable(0.5mm²)), TE1.5-10 (for SLD) • Crimp tool: NH-79 3) PHOENIX CONTACT • Bar terminal model:AI0.5-10WH (for CC-Link dedicated cable(0.5mm²)), AI1.5-10BK (for SLD) • Crimp tool:CRIMPFOX UD6, CRIMPFOX UD6-4,CRIMPFOX UD6-6, and CRIMPFOX ZA3 *Note: When a shielded cable is excessively crimped to a bar terminal using a tool, CRIMPFOX UD6-4 or CRIMPFOX UD6-6, the bar terminal may not be connected to the terminal block depending on the cross-sectional shape after crimping.
Tightening torque range	No torque range specified since two-tier tension-spring terminal is used.
Supply voltage	24 V DC (16.8 to 30 V DC)
Power consumption	Max. 1.4 W
FLEXBUS+	10-pin connector for internal safety bus (plug)
Ambient operating temperature	0°C to +55°C
Storage temperature	-25°C to +70°C
Humidity	10% to 95%, non-condensing
Climatic conditions	According to EN 61131-2
Vibration	Tested in accordance with IEC 61131-2.
Rigidity	Tested in accordance with IEC 61131-2.
Protection class	Ⅲ
Electromagnetic compatibility	IEC 61000-6-2, EN 55011 Class A
Housing material	Polycarbonate
Housing type	Device for control cabinet installation
Housing enclosure rating/terminals	IP 40/IP 20 according to IEC60529
Housing color	Light grey
Weight	120g
Mounting rail	Mounting rail according to IEC/EN 60715

■External dimensions

Unit: mm



Analog modules

Overview

All of the following types operate as remote device stations. The optimum module for your application can be selected from a wide variation of the products.

● One-touch connector type

One-touch

P.123

CC-Link V2

● Screw terminal block type

Screw T. block

P.127

● Screw/2-piece terminal block type

Screw T. block

P.133

Models

Product name		Model	Features	Page
One-touch	Voltage input	AJ65VBTCU-68ADVN	Occupied 1/3 st.s, Channel 8 CH, One-touch, CC-Link V2	125
	Current input	AJ65VBTCU-68ADIN	Occupied 1/3 st.s, Channel 8 CH, One-touch, CC-Link V2	125
	Voltage output	AJ65VBTCU-68DAVN	Occupied 1/3 st.s, Channel 8 CH, One-touch, CC-Link V2	126
Screw T. block	Voltage/current input	AJ65SBT-64AD	Occupied 1 st., Channel 4 CH, Screw T. block	129
		AJ65SBT2B-64AD	Occupied 1 st., Channel 4 CH, Screw T. block	130
		AJ65BT-64AD	Occupied 2 st.s, Channel 4 CH, Screw T. block	135
	Temperature input	AJ65SBT2B-64TD	Occupied 1 st., Channel 4 CH, Screw T. block	137
		AJ65BT-68TD	Occupied 4 st.s, Channel 8 CH, Screw T. block	138
		AJ65SBT2B-64RD3	Occupied 1 st., Channel 4 CH, Screw T. block	139
		AJ65BT-64RD3	Occupied 4 st.s, Channel 4 CH, Screw T. block	140
		AJ65BT-64RD4	Occupied 4 st.s, Channel 4 CH, Screw T. block	140
	Voltage /current output	AJ65SBT-62DA	Occupied 1 st., Channel 2 CH, Screw T. block	131
		AJ65SBT2B-64DA	Occupied 1 st., Channel 4 CH, Screw T. block	132
	Voltage output	AJ65BT-64DAV	Occupied 2 st.s, Channel 4 CH, Screw T. block	136
	Current output	AJ65BT-64DAI	Occupied 2 st.s, Channel 4 CH, Screw T. block	136

Analog modules

One-touch

One-touch connector type

Overview

One-touch connector type

Features

- Supports CC-Link Ver.2
- Easy wiring with one-touch connector

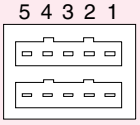
Part names and settings

AJ65VBTCU-68ADVN/AJ65VBTCU-68ADIN

One-touch connector for communication

Pin No.	Signal name
5	SLD
4	NC
3	DG
2	DB
1	DA

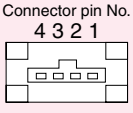
Connector pin No.



One-touch connector for analog input

Pin No.	Signal name
4	SLD
3	NC
2	V-/I-
1	V+/I+

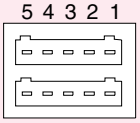
Connector pin No.

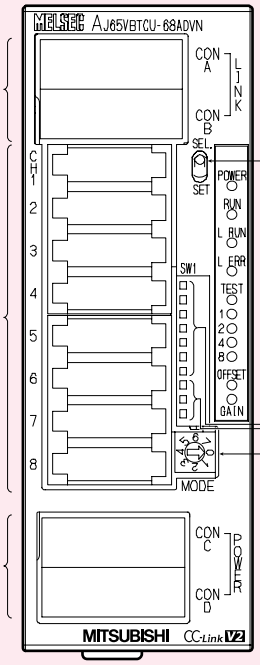


One-touch connector for power supply and FG

Pin No.	Signal name
5	FG1
4	AG
3	24G(UNIT)
2	+24V(UNIT)
1	FG

Connector pin No.





SELECT/SET switch

Operation status indicator LEDs

LED name	Description	
POWER	On: Power supply ON	
RUN	Normal mode	On: Normal operation
	Test mode	On: The SELECT/SET switch is set to SET
		Off: The SELECT/SET switch is set to SELECT or center position
L RUN	On: When communication is normal	
L ERR.	On: Indicates that transmission speed setting or station number setting is outside the range	

Offset/gain adjusting status indicator LEDs

Transmission speed setting switches

Setting value	Transmission speed
0	156kbps
1	625kbps
2	2.5Mbps
3	5Mbps
4	10Mbps

Station number setting switches

Use the switches in STATION NO. "10", "20" and "40" to set the tens place of the station number.
Use the switches in STATION NO. "1", "2", "4" and "8" to set the ones place of the station number.
Always set the station number within the range 1 to 64.

Mode selection switch

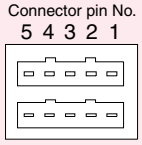
Description			
AJ65VBTCU-68ADVN		AJ65UBTCU-68ADIN	
Ver. 1 mode	Ver. 2 mode	Ver. 1 mode	Ver. 2 mode
0: Normal mode 1: Test mode (User range setting 1) 2: Test mode (User range setting 2)	3: Normal mode 4: Test mode (User range setting 1) 5: Test mode (User range setting 2) 6 to 7: Prohibited	0: Normal mode 1: Test mode (User range setting)	3: Normal mode 4: Test mode (User range setting) 2, 5 to 7: Prohibited

AJ65VBTCU-68DAVN

One-touch connector for communication

Pin No.	Signal name
5	SLD
4	NC
3	DG
2	DB
1	DA

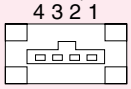
Connector pin No.



One-touch connector for analog output

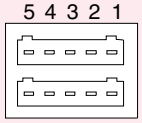
Pin No.	Signal name
4	NC
3	COM
2	NC
1	V+

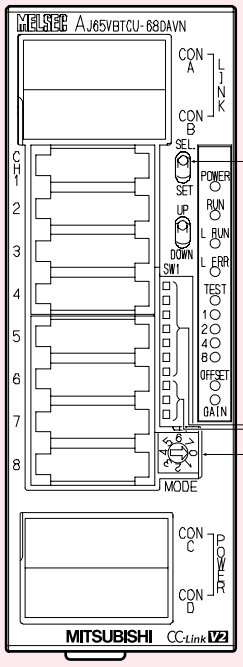
Connector pin No.



One-touch connector for power supply and FG

Pin No.	Signal name
5	NC
4	NC
3	24G(UNIT)
2	+24V(UNIT)
1	FG





SELECT/SET switch

Operation status indicator LEDs

LED name	Description	
POWER	On: Power supply ON	
RUN	Normal mode	On: Normal operation
	Test mode	On: The SELECT/SET switch is set to SET
		Off: The SELECT/SET switch is set to SELECT or center position
L RUN	On: When communication is normal	
L ERR.	On: Indicates that transmission speed setting or station number setting is outside the range	

Offset/gain adjusting status indicator LEDs

Transmission speed setting switches

Setting value	Transmission speed
0	156kbps
1	625kbps
2	2.5Mbps
3	5Mbps
4	10Mbps

Station number setting switches

Use the switches in STATION NO. "10", "20" and "40" to set the tens place of the station number.
Use the switches in STATION NO. "1", "2", "4" and "8" to set the ones place of the station number.
Always set the station number within the range 1 to 64.

Mode selection switch

Description	
AJ65VBTCU-68DAVN	
Ver. 1 mode	Ver. 2 mode
0: Normal mode	3: Normal mode
1: Test mode (User range setting 1)	4: Test mode (User range setting 1)
2: Test mode (User range setting 2)	5: Test mode (User range setting 2)
	6 to 7: Prohibited

One-touch connector type

Voltage input module
AJ65VBTCU-68ADVN

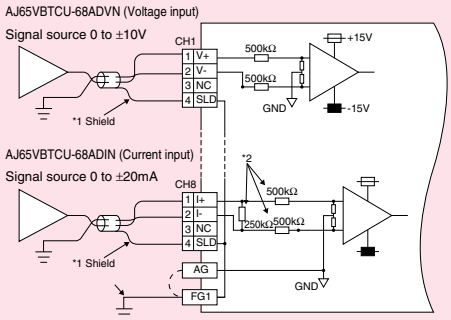
Occupied 1/3 st.s | Channel 8 CH | One-touch | CC-Link V2

Current input module
AJ65VBTCU-68ADIN

Occupied 1/3 st.s | Channel 8 CH | One-touch | CC-Link V2

CC-Link V2

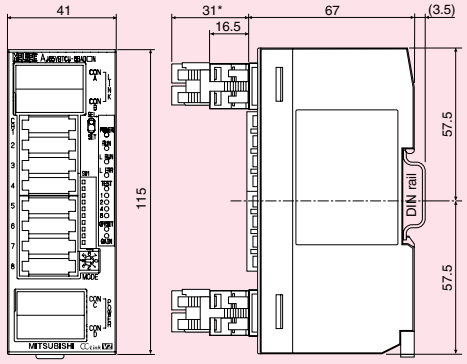
External device connection diagram



*1 Use a two-core twisted shield line for the power cable.
*2 Indicates the AJ65VBTCU-68ADIN input resistor.
*3 Always perform grounding for FG1. When there is a lot of noise, it may be better ground AG as well.
If the grounding wiring (grounding yes/no) is changed after the offset and gain are set, perform the setting of the offset/gain values again.

External dimensions & terminal layout

Unit: mm



*: 14.5mm when online connector is not installed.

Detailed specifications

Input specifications		Description	
		AJ65VBTCU-68ADVN	AJ65VBTCU-68ADIN
Analog input	Voltage	-10 to +10VDC (input resistance 1MΩ)	–
	Current	–	0 to 20mA DC (input resistance 250Ω)
Digital output		16-bit signed binary (-4096 to +4095)	16-bit signed binary (-96 to +4095)

I/O characteristics, maximum resolution accuracy (accuracy relative to maximum digital output value)

	Analog input range	Digital value	Accuracy: Ambient temperature 0 to 55°C	Accuracy: Ambient temperature 25±5°C	Maximum resolution
AJ65VBTCU-68ADVN Voltage	-10 to +10V	-4000 to +4000	±0.3% (±12digit*)	±0.2% (±8digit*)	2.5mV
	User range setting 1 (-10 to +10V)				
	0 to 5V	0 to 4000			1.25mV
	1 to 5V				1.0mV
	User range setting 2 (0 to +5V)				1.0mV
AJ65VBTCU-68ADIN Current	0 to 20mA	0 to 4000			5μA
	4 to 20mA				4μA
	User range setting (0 to 20mA)				4μA

*: 1digit refers to one digital unit.

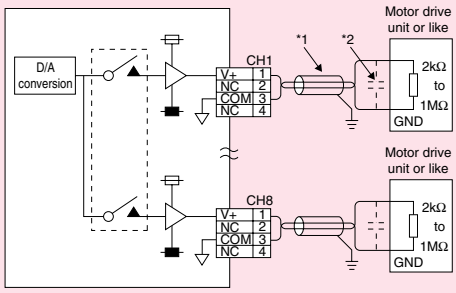
Input range switching		For each channel
Offset/gain setting		Provided
Maximum conversion speed		1ms/channel
Absolute maximum input		Voltage: ±15V / Current: ±30mA
Number of analog input points		8 channels/module
Station type		Remote device station
Number of occupied stations, Expanded cyclic setting		3 Ver.1-mode station (RWr/RWw: 12 words each, RX/RY: 32 points) 1 Ver.2-mode station (Extended 16 words each (Wr/RWw), RX/RY: 32 points), quadruple setting
CC-Link-compatible function		Cyclic transmission, extended cyclic transmission, reduction in station-to-station cable length
Withstand voltage		Between batch of power supply/communication systems and batch of analog inputs: 500VAC for one minute
Isolation method		Across communication system terminals and all analog input terminals: Photocoupler isolation, Across power supply system terminals and all analog input terminals: Photocoupler isolation Between channels: No isolation, Communication interface: Not isolated
External connection system		One-touch connector for communication [Transmission circuit] (5 pins pressure welding type, the plug for the connector is sold separately) One-touch connector for power supply and FG [Unit power supply and FG] (5 pins pressure welding type, the plug for the connector is sold separately) One-touch connector for analog I/O (4 pins pressure welding type, the plug for the connector is sold separately) <Sold separately> Online connector for communication: A6CON-LJ5P, Online connector for power supply: A6CON-PWJ5P
Applicable wire size	One-touch connector for communication	Communication line: Ver. 1.10 compatible CC-Link dedicated cable 0.5mm² (AWG#20) [ϕ2.2 to 3.0], shielded wire 0.5mm² (AWG#20)
	One-touch connector for power supply	0.66 to 0.98mm² (AWG#18) [ϕ2.2 to 3.0] wire diameter 0.16 mm² or more
	One-touch connector for analog I/O	ϕ1.0 to 1.4 (A6CON-P214), ϕ1.4 to 2.0 (A6CON-P220) [Applicable wire size: 0.14 to 0.2 mm²] ϕ1.0 to 1.4 (A6CON-P514), ϕ1.4 to 2.0 (A6CON-P520) [Applicable wire size: 0.3 to 0.3 mm²]
Applicable DIN rail		TH35-7.5Fe, TH35-7.5Al (conforming to JIS C 2812) CC-Link connector type metal installation fitting : A6PLT-J65V1
External power supply		24VDC (20.4 to 26.4VDC ripple ratio : within 5%)
Inrush current		4.2A, 1.2 ms or less
Internal current consumption (24VDC)		0.10A
Weight		0.17kg

Voltage output module

AJ65VBTCU-68DAVN

Occupied 1/3 s.s | Channel 8 CH | One-touch | CC-Link V2

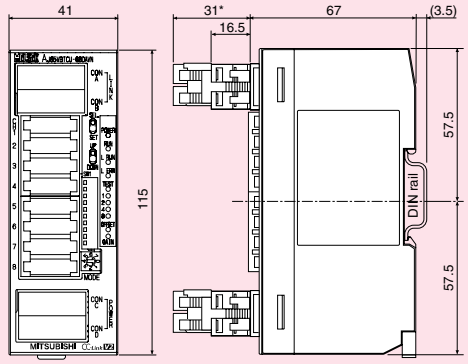
External device connection diagram



*1 Use a two-core twist shielded line for the wiring.
*2 If noise or ripples occur in the external wiring, connect a 0.1 to 0.47μF capacitor (25V or higher voltage-resistant product) to the input terminals of the external device.

External dimensions & terminal layout

Unit: mm



*: 14.5mm when online connector is not installed.

Detailed specifications

Output specifications		Description
Digital input		16-bit signed binary (-4096 to +4095)
Analog output		-10 to +10VDC (external load resistance: 2kΩ to 1MΩ)
I/O characteristics, maximum resolution accuracy (accuracy relative to maximum analog output value)		See table below
Output range switching		For each channel
Offset/gain setting		Provided
Maximum conversion speed		1ms/channel
Output short protection		Provided
Absolute maximum output		±12V
Number of analog output points		8 channels/module
Station type		Remote device station
Number of occupied stations, Expanded cyclic setting		3 Ver.1-mode stations (RWr/RWw: 12 words each, RX/RY: 32 points) 1 Ver.2-mode stations (Extended 16 words each (Wr/RWw), RX/RY: 32 points), quadruple setting
CC-Link-compatible function		Cyclic transmission, extended cyclic transmission, reduction in station-to-station cable length
Isolation method		Across communication system terminals and all analog output terminals: Photocoupler isolation Across power supply system terminals and all analog output terminals: Transformer isolation Between channels: No isolated
External connection system		One-touch connector for communication [Transmission circuit] (5 pins pressure welding type, the plug for the connector is sold separately) One-touch connector for power supply and FG [Unit power supply and FG] (5 pins pressure welding type, the plug for the connector is sold separately) One-touch connector for analog I/O (4 pins pressure welding type, the plug for the connector is sold separately) <Sold separately> Online connector for communication : A6CON-LJ5P, Online connector for power supply : A6CON-PWJ5P
Applicable wire size	One-touch connector for communication	Communication line: Ver. 1.10 compatible CC-Link dedicated cable 0.5mm² (AWG#20) [ϕ2.2 to 3.0], shielded wire 0.5mm² (AWG#20)
	One-touch connector for power supply	0.66 to 0.98mm² (AWG#18) [ϕ2.2 to 3.0] wire diameter 0.16 mm² or more
	One-touch connector for analog I/O	ϕ 1.0 to 1.4 (A6CON-P214), ϕ1.4 to 2.0 (A6CON-P220) [Applicable wire size: 0.14 to 0.2 mm²] ϕ 1.0 to 1.4 (A6CON-P514), ϕ1.4 to 2.0 (A6CON-P520) [Applicable wire size: 0.3 to 0.3 mm²]
Applicable DIN rail		TH35-7.5Fe, TH35-7.5Al (conforming to JIS C 2812) CC-Link connector type metal installation fitting: A6PLT-J65V1
External power supply		24VDC (20.4 to 26.4VDC ripple ratio: within 5%)
Inrush current		4.3A, 1.2 ms or less
Internal current consumption		0.15A
Weight		0.16kg

	Digital input value	Analog output	Accuracy: Ambient temperature 0 to 55°C	Accuracy: Ambient temperature 25±5°C	Maximum resolution
Voltage	-4000 to +4000	-10 to +10V	±0.3% (±30mV)	±0.2% (±20mV)	2.5mV
		User range setting 1 (-10 to +10V)			
	0 to 4000	0 to 5V	±0.3% (±15mV)	±0.2% (±10mV)	1.25mV
		1 to 5V			1.0mV
		User range setting 2 (0 to 5V)			1.0mV

Analog modules

Screw T. block

Screw terminal block type

Overview

Screw terminal block type

Features

■ The use of self-up screws has reduced wiring works. (No need to remove terminal screws when wiring round solderless terminals)

■ The "finger protect" design allows direct installation to machines.

Part names and settings

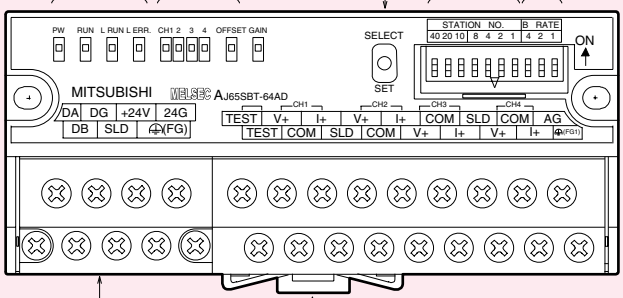
AJ65SBT-64AD

Operation status indicator LEDs

LED name	Description	
PW	On: Power supply ON	
RUN	Normal mode	On: Normal operation Flashing: 0.1s intervals Input range setting error Off: 24VDC power failure or watchdog timer error occurred
	Test mode	On: The SELECT/SET switch is set to SET Flashing: 0.1s intervals: Input range setting is not set to any of "user range setting 1 to 3" 0.5s intervals: The offset/gain setting is out of the setting range
L RUN	On: When communication is normal	
L ERR.	On: Indicates that transmission speed setting or station number setting is outside of the range	

Offset/gain adjusting status indicator LEDs

LED name	Description	
CH□ OFFSET GAIN	Normal mode	Always off
	Test mode	A lit LED is changed in turn each time the SELECT/SET switch is set to SELECT.



SELECT/SET switch

Station number setting switches

Station Number	Tens place 40	20	10	Ones place 8	4	2	1
1	OFF	OFF	OFF	OFF	OFF	OFF	ON
2	OFF	OFF	OFF	OFF	OFF	ON	OFF
3	OFF	OFF	OFF	OFF	OFF	ON	ON
4	OFF	OFF	OFF	OFF	ON	OFF	OFF
:	:	:	:	:	:	:	:
10	OFF	OFF	ON	OFF	OFF	ON	OFF
11	OFF	OFF	ON	OFF	OFF	ON	ON
:	:	:	:	:	:	:	:
64	ON	ON	OFF	OFF	ON	OFF	OFF

Transmission speed setting switches

Setting value	Switch status 4	2	1	Transmission speed
0	OFF	OFF	OFF	156kbps
1	OFF	OFF	ON	625kbps
2	OFF	ON	OFF	2.5Mbps
3	OFF	ON	ON	5Mbps
4	ON	OFF	OFF	10Mbps

Terminal block
Terminal block for connection to the module power supply, transmission and I/O signal lines.

DIN rail hook
Used to mount the module to the DIN rail.

AJ65SBT-62DA

Operation status indicator LEDs

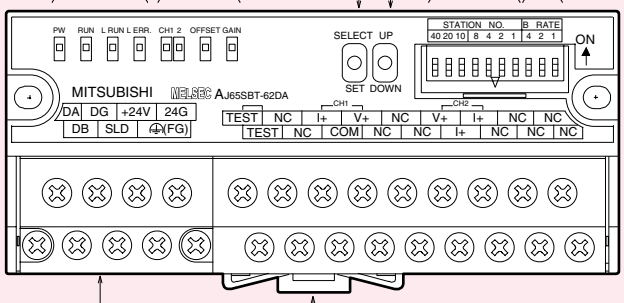
LED name	Description		
PW	On: Power supply ON		
RUN	Normal mode	On:	Normal operation
		Flashing:	0.1s intervals Output range setting error
		Off:	24VDC power failure or watchdog timer error occurred.
	Test mode	On:	The SELECT/SET switch is set to SET.
		Flashing:	0.1s intervals: Output range setting is not set to any of "user range setting 1 to 3"
			0.5s intervals: The offset/gain setting is out of the setting range
		Off:	Indicates that the SELECT/SET switch is in the SELECT or center position
L RUN	On: When communication is normal		
L ERR.	On: Indicates that transmission speed setting or station number setting is outside of the range		

Offset/gain adjusting status indicator LEDs

LED name	Description	
CH□ OFFSET GAIN	Normal mode	Always off
	Test mode	A lit LED is changed in turn each time the SELECT/SET switch is set to SELECT

SELECT/SET switch

UP/DOWN switch



Station number setting switches

Station Number	Tens place			Ones place			
	40	20	10	8	4	2	1
1	OFF	OFF	OFF	OFF	OFF	OFF	ON
2	OFF	OFF	OFF	OFF	OFF	ON	OFF
3	OFF	OFF	OFF	OFF	OFF	ON	ON
4	OFF	OFF	OFF	OFF	ON	OFF	OFF
:	:	:	:	:	:	:	:
10	OFF	OFF	ON	OFF	OFF	OFF	OFF
11	OFF	OFF	ON	OFF	OFF	OFF	ON
:	:	:	:	:	:	:	:
64	ON	ON	OFF	OFF	ON	OFF	OFF

Transmission speed setting switches

Setting value	Switch status			Transmission speed
	4	2	1	
0	OFF	OFF	OFF	156kbps
1	OFF	OFF	ON	625kbps
2	OFF	ON	OFF	2.5Mbps
3	OFF	ON	ON	5Mbps
4	ON	OFF	OFF	10Mbps

Terminal block
Terminal block for connection to the module power supply, transmission and I/O signal lines.

DIN rail hook
Used to mount the module to the DIN rail.

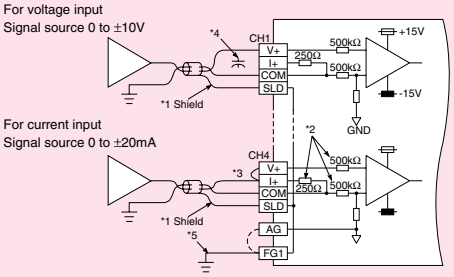
Screw T. block

Screw terminal block type

Voltage/current input module
AJ65SBT-64AD

Occupied 1 st. | Channel 4 CH | Screw T. block

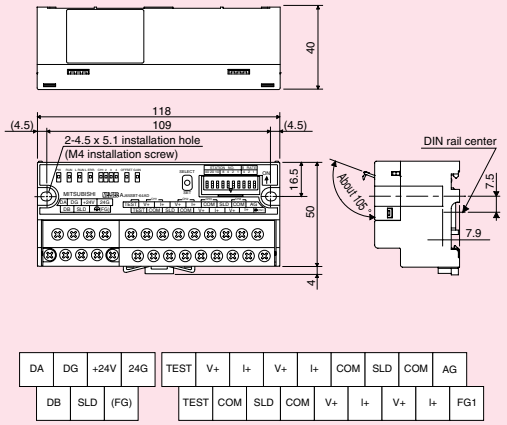
External device connection diagram



*1 Use a two-core twisted shield line for the power cable.
*2 Indicates the AJ65SBT-64AD input resistor.
*3 For the current input, be sure to connect the (V+) and (I+) terminals.
*4 When noise or ripple occurs with the external cable, connect a condenser with about 0.1 to 0.47μF (25V or higher voltage-resistant product) between the terminal V and COM.
*5 Always perform grounding for FG1. When there is a lot of noise, it may be better ground AG as well.
If the grounding wiring (grounding yes/no) is changed after the offset and gain are set, perform the setting of the offset/gain values again.

External dimensions & terminal layout

Unit: mm



Detailed specifications

Output specifications		Description				
Analog input	Voltage	-10 to +10VDC (input resistance 1MΩ)				
	Current	0 to 20mADC (input resistance 250Ω)				
Digital output		16-bit signed binary (-4096 to +4095)				
I/O characteristics, maximum resolution accuracy (accuracy relative to maximum digital output value)		Analog input range		Digital output	Maximum resolution	Accuracy: Ambient temperature 0 to 55°C / Ambient temperature 25±5°C
	Voltage	-10 to +10V		-4000 to +4000	2.5mV	±0.4% (±16 digit*) / ±0.2% (±8 digit*)
		-10 to +10 (User range setting 1)				
		0 to 5V		0 to 4000	1.25mV	
		1 to 5V			1.0mV	
		0 to 5V (User range setting 2)				
	Current	0 to 20mA		0 to 4000	5μA	
		4 to 20mA			4μA	
		0 to 20mA (User range setting 3)				
Input range switching		For each channel				
Offset/gain setting		Provided				
Maximum conversion speed		1ms/channel				
Absolute maximum input		Voltage: ±15V, Current: ±30mA				
Number of analog input points		4 channels/module				
Station type		Remote device station				
Number of occupied stations		1 station (RX/RY: 32 points each, RWr/RWw: 4 words each)				
Withstand voltage		Between power supply/communication system batch and analog input batch: 500VAC, 1 minute				
Isolation method		Across communication system terminals and all analog input terminals: Photocoupler isolated Across power supply system terminals and all analog input terminals: Photocoupler isolated Across channels: Non-isolated				
External connection		7-point 2-piece terminal block (transmission circuit, module power supply, FG), Direct-coupled, 18-point terminal block (analog output area)				
Applicable wire size		0.3 to 0.75mm^2				
Module mounting screw		M4 screw x 0.7mm x 16mm or more, Can also be mounted to DIN rail				
Applicable DIN rail		TH35-7.5Fe, TH35-7.5Al (conforming to JIS C 2812)				
Applicable solderless terminal		RAV1.25 to 3 (conforming to JIS C 2805)				
Internal current consumption (24VDC)		0.09A				
Weight		0.20kg				

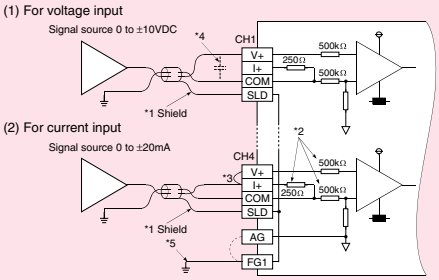
Voltage/current input module

AJ65SBT2B-64AD

High accuracy, high resolution, high speed, 2-piece terminal block type

Occupied 1 st.s | Channel 4 CH | Screw T. block

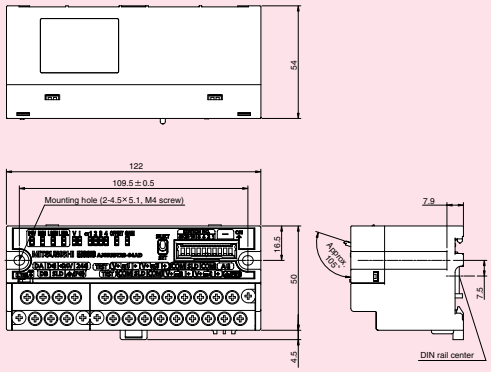
External device connection diagram



*1 Use a two-core twisted shield line for the power cable.
*2 Indicates the AJ65SBT2B-64AD input resistor.
*3 For the current input, be sure to connect the (V+) and (I+) terminals.
*4 When noise or ripple occurs with the external cable, connect a condenser with about 0.1 to 0.47 μF (25V or higher voltage-resistant product) between the terminal V and COM.
*5 Always perform grounding for FG1. When there is a lot of noise, it may be better ground AG as well.
If the grounding wiring (grounding yes/no) is changed after the offset and gain are set, perform the setting of the offset/gain values again.

External dimensions

Unit: mm



Detailed specifications

Output specifications		Description			
Analog input	Voltage	-10 to 10VDC (Input resistance: 1MΩ)			
	Current	0 to 20mADC (Input resistance: 250Ω)			
Digital output		16-bit signed binary (-16384 to 16383)			
I/O characteristics, resolution, accuracy (accuracy at the maximum digital output value)		Analog input range	Digital output value	Maximum resolution	Accuracy*1 (Ambient temperature 0 to 55°C)
	Voltage	-10 to +10V	-16000 to 16000	0.625mV	±0.2% (±32digit*2)
		-10 to +10 (User range setting 1)		0.5mV*3	
		-5 to 5V (User range setting 2)		0.25mV*3	
		0 to 5V	0 to 16000	0.3125mV	
		1 to 5V		0.25mV	
	Current	0 to 20mA	0 to 16000	1.25μA	
		4 to 20mA		1μA	
		User range setting 2	-16000 to 16000	1μA*3	
Conversion speed		200μs/channel			
Absolute maximum input		Voltage: ±15V Current: ±30mA*4			
Number of analog input points		4 channels			
CC-Link station type		Remote device station			
Number of occupied stations		1 station			
Number of offset/gain setting times*5		Max. 10,000 times			
Withstand voltage		500VAC for 1 minute between all power supply and communication system terminals and all analog input terminals			
Insulation method		Between communication system terminal and all analog input terminals: Photocoupler isolation Between power supply system terminal and all analog input terminals: Transformer insulation Between input channels: Non-insulation			
Noise immunity		Noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (DC type noise simulator condition)			
Built-in terminating resistor		Provided (110Ω)			
External connection system	Communication part, module power supply part	7-point two-piece terminal block M3 x 5.2 screw (tightening torque range: 0.59 to 0.88N·m) Applicable solderless terminal: 2 or less			
	I/O part	18-point two-piece terminal block M3 x 5.2 screw (tightening torque range: 0.59 to 0.88N·m) Applicable solderless terminal: 2 or less			
Applicable wire size		0.3 to 2.0mm²			
Module mounting screw		M4 screw x 0.7mm x 16mm or more (tightening torque range: 0.78 to 1.08 N·m) Mountable with a DIN rail			
Applicable DIN rail External power supply		TH35-7.5Fe, TH35-7.5Al (compliant with IEC 60715) 24VDC (20.4 to 28.8VDC) Inrush current: 1.6A, 4.0ms or less Current consumption: 0.12A (24VDC)			
Weight		0.25kg			

*1: Except when receiving noise influence.
*2: Digit is for digital value.
*3: These values indicate the maximum resolution with user range setting.
*4: This value indicates a momentary input current value at which the built-in resistor will not be broken.
*5: The number of times that the SELECT/SET switch is set to SET in test mode.

Screw T. block

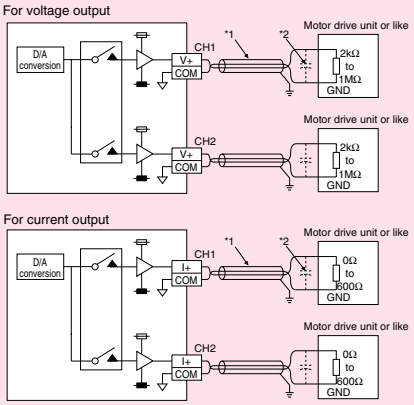
Screw terminal block type

Voltage/current output module

AJ65SBT-62DA

Occupied 1 st.s | Channel 2 CH | Screw T. block

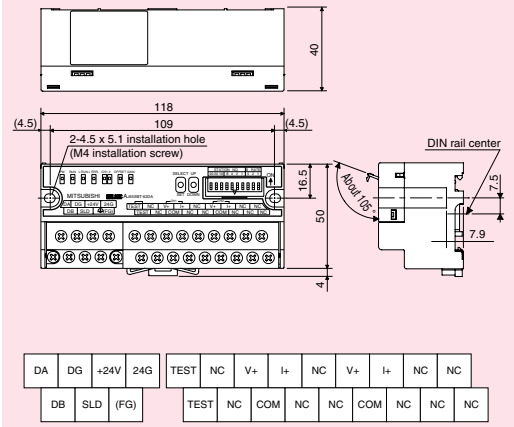
■External device connection diagram



*1 Use a two-core twist shielded line for the wiring.
*2 If noise or ripples occur in the external wiring, connect a 0.1 to 0.47μF capacitor (25V or higher voltage-resistant product) to the output terminals of the external device.

■External dimensions & terminal layout

Unit: mm



■Detailed specifications

Output specifications		Description				
Digital input	Voltage	16-bit signed binary (-4096 to +4095)				
	Current	16-bit signed binary (0 to +4095)				
Analog output	Voltage	-10 to +10VDC (external load resistance: 2kΩ to 1MΩ)				
	Current	0 to 20mADC (external load resistance: 0Ω to 600Ω)				
I/O characteristics, maximum resolution accuracy (accuracy relative to maximum analog output value)		Digital input value	Analog output range	Maximum resolution	Accuracy	
					Ambient temperature 0 to 55°C	Ambient temperature 25±5°C
	Voltage	-4000 to +4000	-10 to +10V	2.5mV	±0.4% (±40mV)	±0.2% (±20mV)
			-10 to +10 (User range setting 1)			
		0 to 4000	0 to 5V	1.25mV	±0.4% (±20mV)	±0.2% (±10mV)
			1 to 5V	1.0mV		
			0 to 5V (User range setting 2)			
	Current	0 to 4000	0 to 20mA	5μA	±0.4% (±80μA)	±0.2% (±40μA)
			4 to 20mA	4μA		
			0 to 20mA (User range setting 3)			
Output range switching		For each channel				
Offset/gain setting		Provided				
Output short protection		Provided				
Maximum conversion speed		1ms/channel				
Number of analog output points		2 channels/module				
Number of occupied stations		1 station (RX/RY: 32 points each, RWr/RWw: 4 words each)				
Connectable terminal block		7-point 2-piece terminal block [transmission circuit, module power supply, FG], Direct-coupled, 18-point terminal block [analog output area], M3 screws				
Applicable wire size		0.3 to 0.75 mm^2				
Module mounting screw		M4 screw x 0.7mm x 16mm or more, Can also be mounted to DIN rail				
Applicable DIN rail		TH35-7.5Fe, TH35-7.5Al (conforming to JIS C 2812)				
Applicable solderless terminal		RAV1.25 to 3 (conforming to JIS C 2805)				
Internal current consumption (24VDC)		0.16A				
Weight		0.20kg				

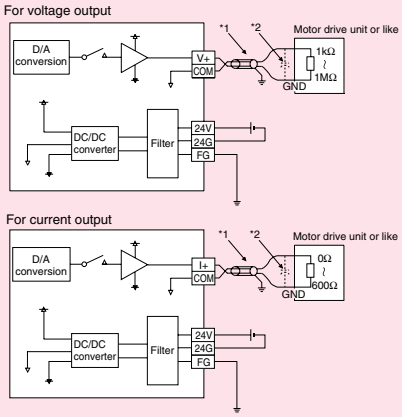
Voltage/current output module

AJ65SBT2B-64DA

High resolution, high speed, 2-piece terminal block type

Occupied 1 st. | Channel 4 CH | Screw T. block

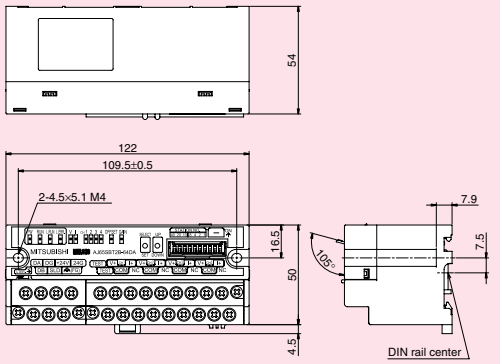
External device connection diagram



*1 Use a two-core twist shielded line for the wiring.
*2 If noise or ripples occur in the external wiring, connect a 0.1 to 0.47μF capacitor (25V or higher voltage-resistant product) to the output terminals of the external device.

External dimensions

Unit: mm



Detailed specifications

Output specifications		Description					
Digital input	Voltage	16-bit signed binary (-12288 to 12287, -16384 to 16383, -288 to 12287)					
	Current	16-bit signed binary (-228 to 12287)					
Analog output	Voltage	-10 to 10VDC (external load resistance: 1kΩ to 1MΩ)					
	Current	0 to 20mADC (external load resistance: 0Ω to 600Ω)					
I/O characteristics, maximum resolution accuracy (accuracy relative to maximum analog output value)			Digital input value	Analog output range	Maximum solution	Accuracy	
						Ambient temperature 0 to 55°C	Ambient temperature 25±5°C
	Voltage		-16000 to 16000	-10 to 10	0.625mV	±0.3% (±30mV)	±0.2% (±20mV)
			0 to 12000	0 to 5V	0.416mV	±0.3% (±15mV)	±0.2% (±10mV)
			0 to 12000	1 to 5V	0.333mV		
			-12000 to 12000	-10 to 10V (User range setting 2)	0.333mV	±0.3% (±30mV)	±0.2% (±20mV)
	Current		0 to 12000	0 to 20mA	1.66μA	±0.3% (±60μA)	±0.2% (±40μA)
			0 to 12000	4 to 20mA	1.33μA		
			0 to 12000	0 to 20mA (User range setting 1)	0.95μA		
Output short protection		Provided					
Number of analog output points		4 channels/module					
Number of occupied stations		1 station (RX/RY: 32 points each, RWr/RWw: 4 points each)					
Withstand voltage		Between power supply/communication system batch and analog input batch: 500VAC, 1 minute					
Isolation method		Across communication system terminals and all analog output terminals: Photocoupler isolation Across power supply system terminals and all analog output terminals: Transformer isolation Across channels: Not isolated					
Connectable terminal block		7-point 2-piece terminal block (transmission circuit, module power supply, FG), 18-point 2-piece terminal block (analog output area), M3 screws					
Applicable wire size		0.3 to 2.0mm^2					
Module mounting screw		M4 screw x 0.7mm x 16mm or more, Can also be mounted to DIN rail					
Applicable solderless terminal		RAV1.25 to 3 (conforming to JIS C 2805), V2-MS3 (JST Mfg., Co., Ltd.), RAP2-3SL (Nippon Tanshi Co., Ltd.), TGV2-3N (Nichifu Moris)					
Internal current consumption (24VDC)		0.24A					
Weight		0.25kg					

Analog modules

Screw T. block

Screw/2-piece terminal block type

Overview

Screw/2-piece terminal block type

Features

- The I/O terminal block is removable.
- The 2-piece structure allows easy servicing such as module replacement without rewiring

Part names and settings

AJ65BT-64AD

Transmission speed setting switch

Setting value	Transmission speed
0	156kbps (factory default)
1	625kbps
2	2.5Mbps
3	5Mbps
4	10Mbps
0 to 4 other	N/A (The L ERR. LED turns on, showing a communication error.)

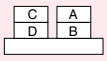
Station number setting switches

Set the analog input range

	Voltage	Current
A	0 to 10V	(0 to 20mA)*
B	1 to 5V	4 to 20mA
C	-10 to 10V	-20 to 20mA
D	0 to 5V	0 to 20mA

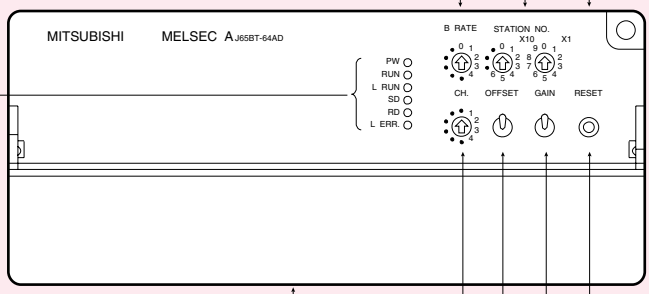
* When using in the range 0 to 20mA, select D.

Analog input range setting pin



Operation status indicator LEDs

LED name	Description	
PW	On: Power supply ON	
RUN	Normal mode	On: Normal operation
L RUN	On: Normal communication	
SD	On: Data being sent	
RD	On: Data being received	
L ERR.	On: Communication data error	



RESET switch
GAIN switch
OFFSET switch
Channel selection switch

Terminal block
Terminal block for connection to the module power supply, transmission and I/O signals lines.

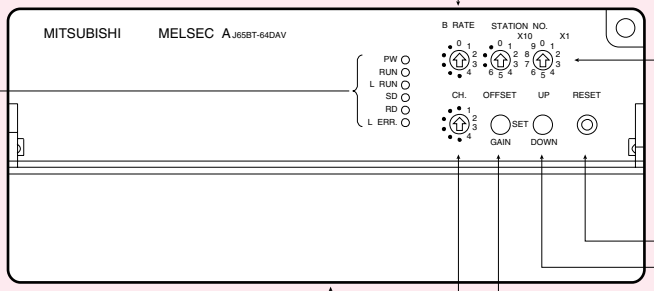
AJ65BT-64DAV/AJ65BT-64DAI

Transmission speed setting switch

Setting value	Transmission speed
0	156kbps (factory default)
1	625kbps
2	2.5Mbps
3	5.0Mbps
4	10Mbps

Operation status indicator LEDs

LED name	Description	
PW	On: Power supply ON	
RUN	Normal mode	On: Normal operation
L RUN	On: When communication is normal	
SD	On: Data being sent	
RD	On: Data being received	
L ERR.	On: When the baud rate or station number setting is invalid	



Station number setting switches

RESET switch

UP/DOWN switch

OFFSET switch

Channel selection switch

Terminal block

Terminal block for connection to the module power supply, transmission and I/O signal lines.

AJ65BT-68TD
AJ65BT-64RD3/AJ65BT-64RD4

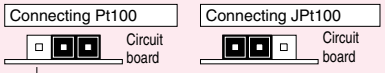
Transmission speed setting switch

Setting value	Transmission speed
0	156kbps (factory default)
1	625kbps
2	2.5Mbps
3	5Mbps
4	10Mbps
0 to 4 other	Use prohibited (The L ERR. LED turns on, showing a communication error.)

Operation status indicator LEDs

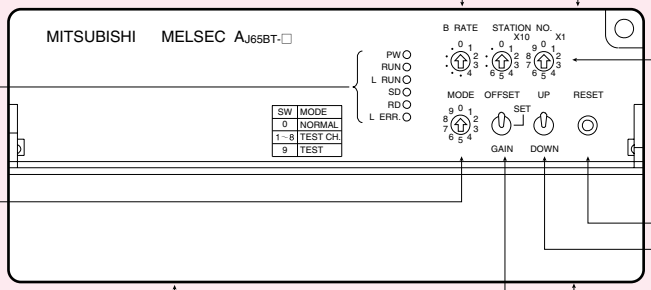
LED name	Description	
PW	On: Power supply ON	
RUN	Normal mode	On: Normal operation
L RUN	On: When communication is normal	
SD	On: Data being sent	
RD	On: Data being received	
L ERR.	On: Communication data error (CRC error)	

Pins for specifying the platinum RTD type



Mode switch

Setting value		Description
0	NORMAL	Terminates the test mode in normal operation (Factory default)
1 to 8	TEST CH.	Used to select a channel in the test mode to compensate for errors of the channel
9	TEST	To compensate for errors, select this. After 2 seconds, the system enters the test mode



Station number setting switches

RESET switch

UP/DOWN switch

Offset/gain setting switch

Setting value	Description
OFFSET	Compensation mode for the offset value
GAIN	Compensation mode for the gain value
SET	Stores a temperature value, which is detected when this switch is changed from OFFSET/GAIN to SET, in the internal memory as an offset/gain value

Terminal block

Terminal block for connection to the module power supply, transmission and I/O signal lines.

Pt100 RTD

Resistance temperature detector for measuring terminal block temperature (attached to the module).

Screw T. block

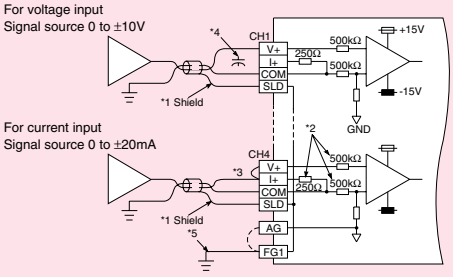
Screw/2-piece terminal block type

Voltage/current input module

AJ65BT-64AD

Occupied 1 st. | Channel 2 CH | Screw T. block

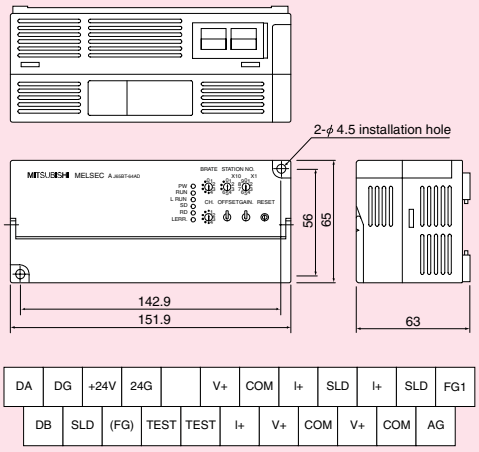
External device connection diagram



*1 Use a two-core twisted shield line for the power cable.
*2 Indicates the AJ65BT-64AD input resistor.
*3 For the current input, be sure to connect the (V+) and (I+) terminals.
*4 When noise or ripple occurs with the external cable, connect a condenser with about 0.1 to 0.47μF25WV between the terminal V and COM.
*5 Always perform grounding for FG1. When there is a lot of noise, it may be better to ground AG as well.
If the grounding wiring (grounding yes/no) is changed after the offset and gain are set, perform the setting of the offset/ gain values again.

External dimensions & terminal layout

Unit: mm



Detailed specifications

Input specifications		Description			
Analog input	Voltage	-10 to +10VDC (input resistance 1MΩ)			
	Current	-20 to +20 mADC (input resistance 250Ω)			
Digital output		-2000 to +2000 or 0 to +4000			
I/O characteristics, maximum resolution accuracy (accuracy relative to maximum digital output value)		Analog input value		Digital output value	Maximum resolution	Accuracy
		Voltage/current				
	Voltage	-10 to +10V		0 to +4000 or -2000 to +2000	5mV	±1% (±40 digit*) *: 1digit refers to one digital unit.
		0 to +10			2.5mV	
		0 to 5V			1.25mV	
		1 to 5V			1mV	
	Current	-20 to 20mA		0 to +4000 or -2000 to +2000	20μA	
		0 to 20mA			10μA	
					5μA	
		4 to 20mA			4μA	
Input range switching		All channels in batch				
Offset/gain setting		Provided				
Maximum conversion speed		1 ms/channel				
Absolute maximum input		Voltage: ±15V, Current: ±30mA				
Number of analog input points		4 channels/module				
Station type		Remote device station				
Number of occupied stations		2 stations (RX/RY: 32 points, RWr/RWw each 8 points)				
Withstand voltage		Between batch of power supply/communication systems and batch of analog inputs: 500 VAC for one minute				
Isolation method		Photo-coupler insulation between power supply/communication and analog input (not isolated between channels)				
Connection terminal block		27-point terminal block (M3.5)				
Applicable wire size		0.75 to 2.00mm²				
Module mounting screw		M4 x 0.7 mm x 16mm or more, Can be installed with DIN rail				
Applicable DIN rail		TH35-7.5Fe, TH35-7.5Al, TH35-15Fe (conforming to JIS C 2812)				
Applicable solderless terminal		RAV1.25 to 3.5, RAV2 to 3.5				
Internal current consumption (24VDC)		0.12A				
Weight		0.35kg				
External dimensions		151.9(W) x 65(H) x 63(D)mm				

Voltage output module
AJ65BT-64DAV

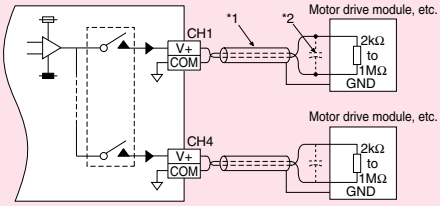
Occupied 2 st.s | Channel 4 CH | Screw T. block

Current output module
AJ65BT-64DAI

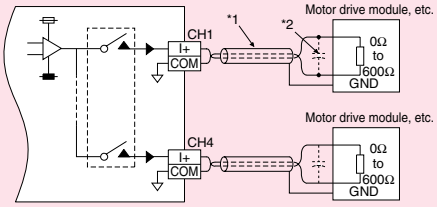
Occupied 2 st.s | Channel 4 CH | Screw T. block

External device connection diagram

•AJ65BT-64DAV



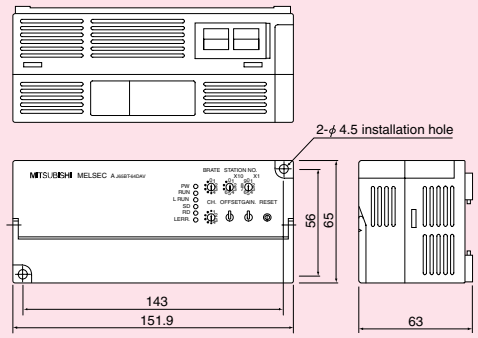
•AJ65BT-64DAI



*1 Use two-core shielded line for the wiring.
*2 When noise or ripple generates within the external wiring, connect a condenser with 0.1 to 0.47μF (25V or more voltage resistance parts) specification to the input terminal of the external device.

External dimensions & terminal layout

Unit: mm



•AJ65BT-64DAV

DA	DG	+24V	24G	HLD/ CLR	HLD/ CLR	CH1 V+		CH2 V+		CH3 V+		CH4 V+							
DB	SLD	(FG)	TEST	TEST		COM		COM		COM		COM							

•AJ65BT-64DAI

DA	DG	+24V	24G	HLD/ CLR	HLD/ CLR		CH1 I+		CH2 I+		CH3 I+		CH4 I+						
DB	SLD	(FG)	TEST	TEST		COM		COM		COM		COM							

Detailed specifications

Input specifications		Description							
		AJ65BT-64DAV				AJ65BT-64DAI			
Digital input	Voltage	16-bit signed binary (-2048 to +2047)				–			
	Current	–				16-bit signed binary (0 to 4095)			
Analog output	Voltage	-10 to +10VDC (external load resistance: 2kΩ to 1MΩ)				–			
	Current	–				4 to 20mA DC (external load resistance: 0Ω to 600Ω)			
I/O characteristics, maximum resolution accuracy (accuracy relative to maximum analog output value)		Digital input value	Analog input value	Max. resolution	Accuracy (overall)	Digital input value	Analog input value	Max. resolution	Accuracy (overall)
		+2000	+10V	5mV	±1% (±100mV)	–	–	–	–
		+1000	+5V						
		0	±0						
		-1000	-5V						
		-2000	-10V						
		–	–	–	–	4000	+20mA	4μA	±1% (±200μA)
						2000	+12mA		
						0	+4mA		
Output range switching		None							
Offset/gain setting		Provided							
Output short protection		Provided							
Maximum conversion speed		1 ms/channel							
Number of analog output points		4 channels/module							
Number of occupied stations		2 stations (RX/RY: 32 points each, RWr/RWw: 8 words each)							
Connectable terminal block		27-point terminal block (M3.5)							
Applicable wire size		0.75 to 2.00mm²							
Module mounting screw		M4 x 0.7 mm x 16 mm or more, possible to mount on a DIN rail							
Applicable DIN rail		TH35-7.5Fe, TH35-7.5AI, TH35-15Fe (conforming to JIS C 2812)							
Applicable solderless terminal		RAV1.25 to 3.5, RAV2 to 3.5							
Internal current consumption (24VDC)		0.18A				0.27A			
Weight		0.4kg							

Screw T. block

Screw/2-piece terminal block type

Thermocouple input module

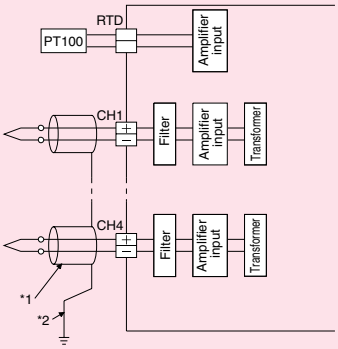
AJ65SBT2B-64TD

Occupied 1 st.s | Channel 4 CH | Screw T. block

Detailed specifications

Input specifications	Description
Temperature sensor input	-270 to 1820°C
Measured temperature value	16-bit signed binary (-2700 to 18200:value rounded to one decimal place x 10)
Overall accuracy	*1
Cold junction compensation accuracy	±1.0°C
Maximum resolution	B, R, S, N:0.3°C, K, E, J, T:0.1°C
Conversion speed	640ms/4 channels
Sampling cycle	160ms/4 channels
Number of analog input points	4 channels + Pt100 connection channel x 2
Number of writes to Flash memory	Up to 10,000 times
Number of occupied stations	1 station (RX/RY:32 points each, RWr/RWw:4 points each)
Withstand voltage	Between all power supply systems and all communication systems and cold junction compensation channels Between thermocouple input and all communication systems and cold junction compensation channels Between thermocouple input channels 500VAC for one minute
Isolation method	Between all power supply systems and all communication systems and cold junction compensation channels Between thermocouple input and all communication systems and cold junction compensation channels Between thermocouple input channels Transformer isolation
Applicable wire size	• RAV1.25-3 (JIS C 2805 compliant) [Applicable wire size: 0.3 to 1.25mm2] • V2-MS3, RAP2-3SL, TGV2-3N [Applicable wire size: 1.25 to 2.0mm2]
Module mounting screw	M4 x 0.7mm x 16mm or more screw (tightening torque range: 0.78 to 1.08N•m) The module can also be mounted with a DIN rail.
Applicable DIN rail	TH35-7.5Fe, TH35-7.5AI (IEC 60715 compliant)
External power supply	24VDC (20.4VDC to 28.8VDC)
Internal current consumption (24VDC)	0.12A
Weight	0.3kg

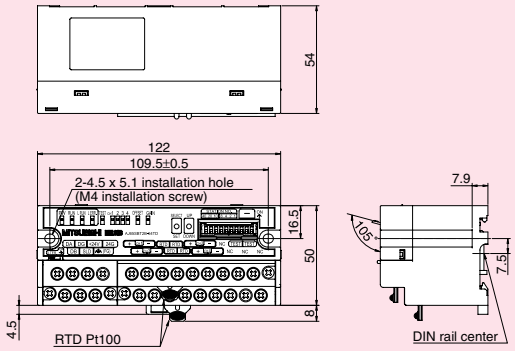
External device connection diagram



*1 Use shielded compensation lead wires.
*2 Be sure to ground it.

External dimensions & terminal layout

Unit: mm



*1 Calculate the overall accuracy by the following method.
(Overall accuracy) = (Conversion accuracy) + (Temperature characteristics) x (Operating ambient temperature variation) + (Cold junction compensation accuracy)
The operating ambient temperature variation indicates a deviation of an operating ambient temperature from a range of 25 5 .
Example) When using the thermocouple B at an operating ambient temperature of 35 and a measured temperature of 1000 , the overall accuracy is: (±2.5°C) + (±0.4°C) x (35°C - 30°C)+(±1)=±5.5°C

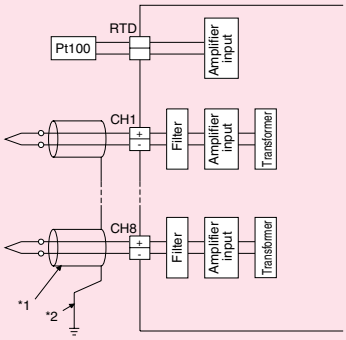
Thermocouple temperature input module
AJ65BT-68TD

Occupied 4 st.s | Channel 8 CH | Screw T. block

■ Detailed specifications

Input specifications	Description
Connectable thermocouples	B, R, S, K, E, J, T
Temperature input range	-200 to 1700°C
Temperature detection value	16-bit signed binary (-2000 to 17000: Value to 1 decimal place x 10)
Scaling value	16-bit signed binary (0 to 2000)
Overall accuracy	*1
Cold junction compensation accuracy	±1.0°C
Maximum resolution	B, R, S: 0.3°C K, E, J, T: 0.1°C
Conversion speed (sampling time: ms/ch)	45ms/channel
Temperature sensor input channel	8 + 1 (Pt100 connected) channels
Station type	Remote device station
Number of occupied stations	4 stations (RX/RY: 128 points each, RWr/RWw: 16 words each)
Isolation method	Between thermocouple input and CC-Link transmission system and between channels: Transformer isolation
Applicable solderless terminal	RAV1.25 to 3, RAV2 to 3.5 (conforming to JIS C 2805)
Connectable terminal block	27-point terminal block (M3.5 x 7 screws)
Allowable momentary power failure time	1ms
Applicable wire size	0.75 to 2.00mm²
Module mounting screw	M4 x 0.7mm x 16mm or more, possible to mount on a DIN rail
Applicable DIN rail	TH35-7.5Fe, TH35-7.5AI, TH35-15Fe (conforming to JIS C 2812)
External power supply	24VDC (18 to 30VDC)
Internal current consumption (24VDC)	0.081A
Weight	0.4kg

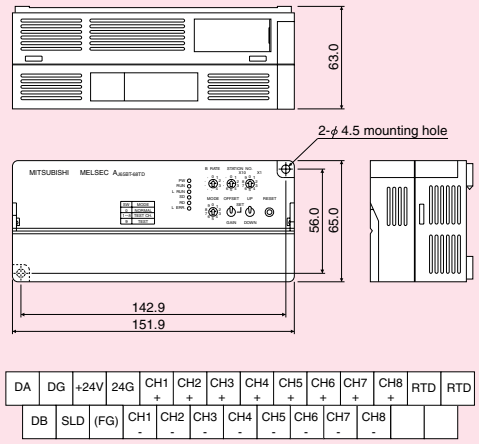
■ External device connection diagram



*1 Use shielded compensating lead wires.
*2 Be sure to ground it.

■ External dimensions & terminal layout

Unit: mm



*1 The calculation method of overall accuracy is as shown below:
(Overall accuracy) = (Conversion accuracy) + (Temperature characteristic) x(Operating ambient temperature change) + (Cold-junction compensation accuracy)
Here, the operating ambient temperature change denotes a value varied from the operating ambient temperature range of 25±5°C.
Example: The overall accuracy with operating thermocouple of K, measured temperature of 150°C, and operating ambient temperature of 35°C is: (±0.5°C) + (±0.06°C) x (5°C) + (±1°C) = ±1.8°C

Screw T. block

Screw/2-piece terminal block type

RTD input module

AJ65SBT2B-64RD3

Occupied 1st. | Channel 4CH | Screw T. block

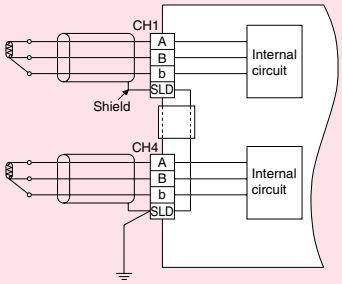
■Detailed specifications

Input specifications	Description
Measurement method	3-conductor type
Connectable RTD	Pt100 (JIS C 1604-1997), JPt100 (JIS C 1604-1981), Ni100 (DIN 43760 1987)
Measurement range	Refer to the table below.
Conversion accuracy	
Resolution	
Conversion speed	40ms/channel
Temperature sensor input channel	4 channels/module
Station type	Remote device station
Number of occupied stations	1 station (RX/RY: 32 points each, RWr/RWw: 4 points each)
Isolation method	Across communication system terminals and all RTD input terminals: Photocoupler isolation Across power supply system terminals and all RTD input terminals: Transformer isolation Across channels: Not isolated
Applicable solderless terminal	RAV1.25 to 3 (conforming to JIS C 2805), V2-MS3 (JST Mfg., Co., Ltd.), RAP2-3SL (Nippon Tanshi Co., Ltd.), TGV2-3N (Nichifu Moris)
Connectable terminal block	7-point 2-piece terminal block (transmission circuit, module power supply, FG), 18-point 2-piece terminal block (analog output area), M3 screws
Applicable wire size	0.3 to 2.0mm^2
Module mounting screw	M4 x 0.7mm x 16mm or more, possible to mount on a DIN rail
Applicable DIN rail	TH35-7.5Fe, TH35-7.5Al, (conforming to JIS C 2812)
External power supply	24VDC (20.4 to 28.8VDC)
Internal current consumption (24VDC)	0.14A
Weight	0.25kg

Measurement range		Conversion accuracy *1 *2 Ambient temperature 0 to 55°C	Conversion accuracy *1 *2 Ambient temperature 25±5°C	Resolution
Pt100	-200 to 850°C	±1.4°C	±0.5°C	0.1°C
	-20 to 120°C	±0.6°C	±0.2°C	
	0 to 200°C	±0.6°C	±0.2°C	
JPt100	-180 to 600°C	±1.0°C	±0.4°C	
	-20 to 120°C	±0.6°C	±0.2°C	
	0 to 200°C	±0.6°C	±0.2°C	
Ni100	-60 to 180°C	±0.5°C	±0.2°C	

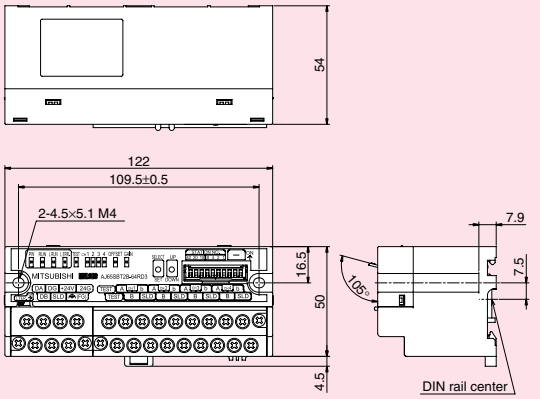
*1 Except when noise is applied.
*2 The accuracy for measured temperature value is the sum of the conversion accuracy of the module and the tolerance of the connected RTD.

■External device connection diagram



■External dimensions

Unit: mm



Platinum RTD
Pt 100 temperature input module

AJ65BT-64RD3

Occupied 4 st.s | Channel 4 CH | Screw T. block

Platinum RTD
Pt 100 temperature input module

AJ65BT-64RD4

Occupied 4 st.s | Channel 4 CH | Screw T. block

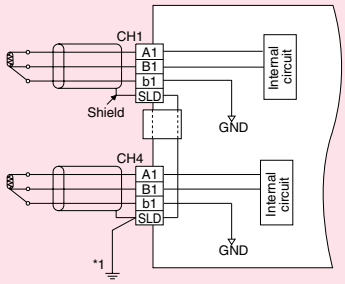
Detailed specifications

Input specifications	Description	
	AJ65BT-64RD3	AJ65BT-64RD4
Temperature measurement method	3-wire type	4-wire type
Connectable platinum RTD	Pt100, JPt100	
Temperature input range	-180 to 600°C	
Temperature detection value	16-bit signed binary (-1800 to 6000: Value to 1 decimal place x 10) 32-bit signed binary (-180000 to 600000: Value to 3 decimal places x 1000)	
Overall accuracy	Ambient temperature (25±5°C): ±0.1% (relative to the maximum value)	
	Ambient temperature (20°C or less, 30°C or more): ±0.25% (relative to the maximum value)	
Resolution	0.025°C	
Conversion speed (sampling time: ms/ch) *2	40ms/channel	
Temperature sensor input channel	4 channels/module	
Station type	Remote device station	
Number of occupied stations	4 stations (RX/RY: 128 points each, RWr/RWw: 16 words each)	
Isolation method	Between platinum RTD inputs and CC-Link transmission system: Photocoupler isolation, Between channels: Not isolated	
Applicable solderless terminal	RAV1.25 to 3.5, RAV2 to 3.5 (conforming to JIS C 2805)	
Connectable terminal block	27-point terminal block (M3.5 x 7 screws)	
Allowable momentary power failure time	1ms	
Applicable wire size	0.75 to 2.00mm²	
Module mounting screw	M4 x 0.7mm x 16mm or more, possible to mount on a DIN rail	
Applicable DIN rail	TH35-7.5Fe, TH35-7.5AI, TH35-15Fe (conforming to JIS C 2812)	
External power supply	24VDC (18 to 30VDC)	
Internal current consumption (24VDC)	0.17A	
Weight	0.38kg	

External device connection diagram

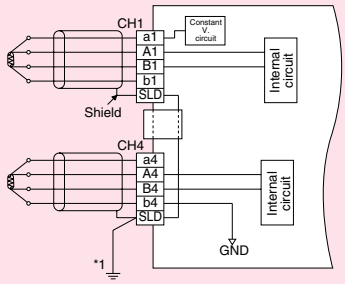
•AJ65BT-64RD3

The highest accuracy can be obtained for AJ65BT-64RD3 by using 3-wire type platinum RTD.
Example of connecting a 3-wire type platinum RTD.



•AJ65BT-64RD4

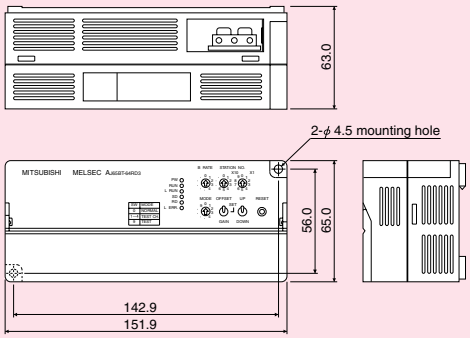
The highest accuracy can be obtained for AJ65BT-64RD4 by using 4-wire type platinum RTD.
Example of connecting a 4-wire type platinum RTD.



*1 Depending on the usage environment, there are cases when it is better to ground these.

External dimensions & terminal layout

Unit: mm



•AJ65BT-64RD3

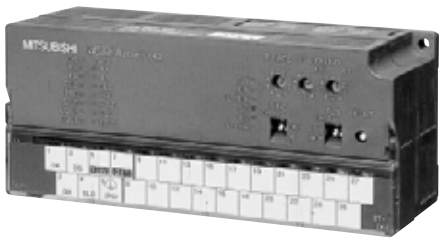
DA	DG	+24V	24G	A1	b1	SLD	A2	b2	A3	b3	SLD	A4	b4	
DB	SLD	(FG)	NC	B1	SLD	NC	B2	NC	B3	SLD	NC	B4		

•AJ65BT-64RD4

DA	DG	+24V	24G	A1	b1	SLD	A2	b2	A3	b3	SLD	A4	b4	
DB	SLD	(FG)	a1	B1	SLD	a2	B2	a3	B3	SLD	a4	B4		

High-speed counter modules

High-speed counter module
AJ65BT-D62
AJ65BT-D62D
AJ65BT-D62D-S1



Features

- Wide counting range, from 0 to 16777215 (24-bit binary)
- External input: 5/12/24VDC (2 to 5mA)
- Multiplication of count is possible.
- Counting speed switching enables error-free counting even in the case of slow rise or fall.
- The following 4 counter functions are available.
  - Latch counter function
  - Sampling counter function
  - Periodic pulse counter function
  - Count disable function

- Related manual

  User's manual IB-66822 (13JL44)

Performance specifications

Item			Specifications					
			AJ65BT-D62		AJ65BT-D62D		AJ65BT-D62D-S1	
Counting speed setting switch			HIGH side	LOW side	HIGH side	LOW side	HIGH side	LOW side
Number of channels			2 channels					
Count input signal	Phase		1 phase input, 2 phase input					
	Signal level (ϕ A, ϕ B)		5/12/24VDC 2 to 5mA		EIA Standard RS-422-A Differential line driver level [Am26LS31 (manufactured by Texas Instruments Japan) or equivalent]			
Counter	Maximum counting speed	1-phase input	200kpps	10kpps	400kpps	10kpps	400kpps	10kpps
		2-phase input	200kpps	7kpps	300kpps	7kpps	300kpps	7kpps
	Signal level		24-bit binary 0 to 16777215					
	Type		UP/DOWN preset counter and ring counter functions					
	Minimum count pulse width (Set the time for rise and fall of input to 2µs or less. Duty ratio: 50%)		5µs 2.5µs 2.5µs (1,2 phase input) *1	100µs 142µs 50 50 µs µs (1 phase input) 71 71 µs µs (2 phase input) *1	2.5µs 3.3µs 1.25 1.25 µs µs (1 phase input) 1.65 1.65 µs µs (2 phase input) *2	100µs 142µs 50 50 µs µs (1 phase input) 71 71 µs µs (2 phase input) *2	2.5µs 3.3µs 1.25 1.25 µs µs (1 phase input) 1.65 1.65 µs µs (2 phase input) *2	100µs 142µs 50 50 µs µs (1 phase input) 71 71 µs µs (2 phase input) *2
Coincidence output	Comparison range		24-bit binary					
	Comparison result		Set value < Count value Set value = Count value Set value > Count value					
External input	Preset		5/12/24VDC 2 to 5mA				EIA Standard RS-422-A Differential line driver level (Am26LS31 or equivalent)	
	Function start		5/12/24VDC 2 to 5mA					
	Response time		OFF→ON: 0.5ms or less ON→OFF: 3ms or less					
External output	Coincidence output		2A/common					
	Response time		0.1ms or less					
Station type			Remote device station					
Number of occupied stations			4 stations					
Power supply voltage			18 to 28.8VDC					
Current consumption (for 24VDC)			70mA		100mA		120mA	
Connectable terminal block			27 terminal blocks (seven M3.5 screws)					
Applicable wire size			0.75 to 2.00mm^2					
Applicable solderless terminal			RAV1.25-3, RAV2-3.5 (conforming to JIS C 2805)					
Allowable momentary power failure time			1ms					
Module mounting screw			M4 x 0.7mm(0.03in.) 16mm(0.63in.) or larger screws (tightening torque range 78 to 118N•m {8 to 12kgf•m}) Can also be mounted using a DIN rail					
Applicable DIN rail			TH35-7.5Fe, TH35-7.5Al, TH35-15Fe (conforming to JIS C 2B12)					
Weight			0.41kg		0.42kg			

*1 The rise or fall time of the input signal should be 2 µs or less and have a duty ratio of 50%.
*2 The rise or fall time of the input signal should be 0.1 µs or less and have a duty ratio of 50%.

Part names and settings

Operation status indicator LEDs

LED name	Description
PW	On: Power supply ON
RUN	On: Normal operation
L RUN	On: Normal communication
SD	On: Data being sent
RD	On: Data being received
L ERR.	On: Communication data error (CRC error)

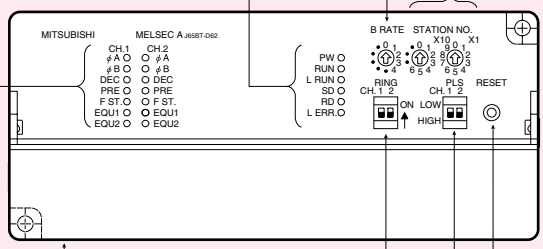
Operation status indicator LEDs

LED name	Description
ϕ A	Turns on when voltage is applied to the phase A pulse input terminal
ϕ B	Turns on when voltage is applied to the phase B pulse input terminal
DEC	Turns on when the counter value is decremented
PRE	Turns on and remains on when voltage is applied to the RESET terminal Turns off when the external preset detection reset command signal turns on
F ST.	Turns on when voltage is applied to the F.START terminal
EQU1	Turns on when coincidence output setting No.1 = counter value
EQU2	Turns on when coincidence output setting No.2 = counter value (Not available for AJ65BT-D62D-S1)

Transmission speed setting switch

The transmission speed of the high-speed counter module is set (for data link).

Setting value	Transmission speed
0	156 kbps (factory set value)
1	625kbps
2	2.5Mbps
3	5Mbps
4	10Mbps
Other than 0 to 4	Not used (When a number other than 0 to 4 is used, the L ERR. LED lights up and a communication error is generated.)



Station number setting switches

The station number of the high-speed counter module is set within the range from 1 to 61.
Set the tens place using the "X10" switch.
Set the ones place using the "X1" switch.

RESET switch

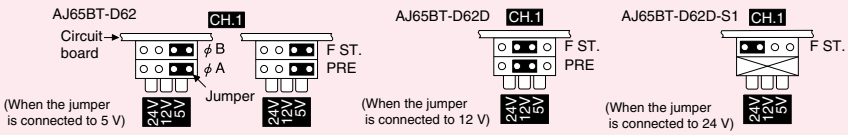
Counting speed setting switch

Ring counter setting switch

This is used to set whether to enable or disable the ring-counter function.

Terminal block

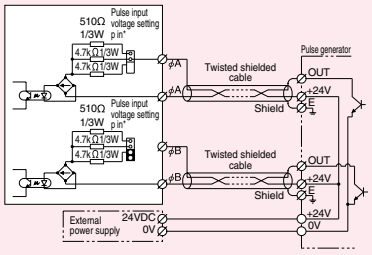
Pulse input voltage setting pin (same for CH.2)



External connection diagram (Example of connection with a pulse generator)

Example of connection with an open-collector output type pulse generator (24VDC)

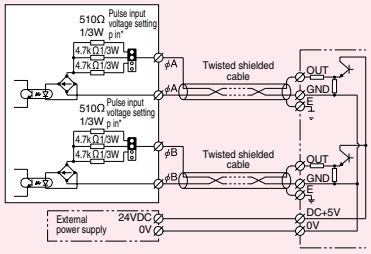
•AJ65BT-D62



Remark:* Set the pulse input voltage setting pin to the position.

Example of connection with a voltage-output type pulse generator (5VDC)

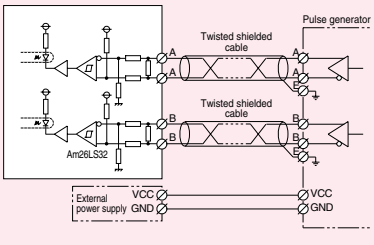
•AJ65BT-D62



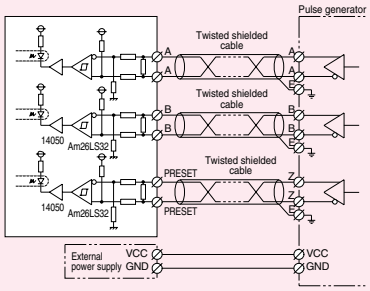
Remark:* Set the pulse input voltage setting pin to the position.

Example of connection with a line driver pulse generator (equivalent to Am26L31)

•AJ65BT-D62D

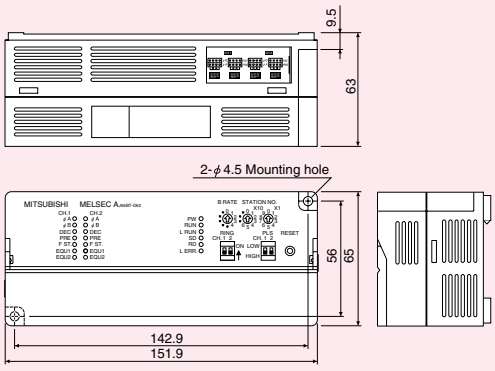


•AJ65BT-D62D-S1



External dimensions

Unit: mm



•AJ65BT-D62

DA	DG	+24V	24G	ΦA	ΦB	COM	ΦA	ΦB	RESET	F.START	EQU2	EQU1	COM
DB	SLD	(FG)	ΦA	ΦB	RESET	F.START	ΦA	ΦB	COM	EQU1	EQU1	12/24V	

•AJ65BT-D62D

DA	DG	+24V	24G	ΦA $\overline{A}$	ΦB $\overline{B}$	COM	ΦA A	ΦB B	RESET	F.START	EQU2	EQU1	COM
DB	SLD	(FG)	ΦA A	ΦB B	RESET	F.START	ΦA $\overline{A}$	ΦB $\overline{B}$	COM	EQU1	EQU1	12/24V	

•AJ65BT-D62D-S1

DA	DG	+24V	24G	ΦA $\overline{A}$	ΦB $\overline{B}$	$\overline{\text{RESET}}$	F.START	ΦA A	ΦB B	$\overline{\text{RESET}}$	F.START	EQU1	COM
DB	SLD	(FG)	ΦA A	ΦB B	RESET	F.START	ΦA $\overline{A}$	ΦB $\overline{B}$	RESET	F.START	EQU1	12/24V	

Positioning module

Positioning module
AJ65BT-D75P2-S3

Features

■The positioning modules can be utilized in distributed control

■An absolute position detection system can be easily established by using the AC servo MELSERVO-H/J2/J2S Series

■A built-in differential driver has enabled the following:
- ●High-speed pulse output (400kpps)
- ●Longer connection distance to a drive unit (up to 10m)

■Various positioning control functions
- ●Up to 600 positioning data can be set per axis. Seven kinds of zero return functions are available.
- ●Automatic trapezoidal acceleration/deceleration or S-pattern
- ●acceleration/deceleration functions are selectable

■Related manual

User's Manual IB-66824 (13JL46)

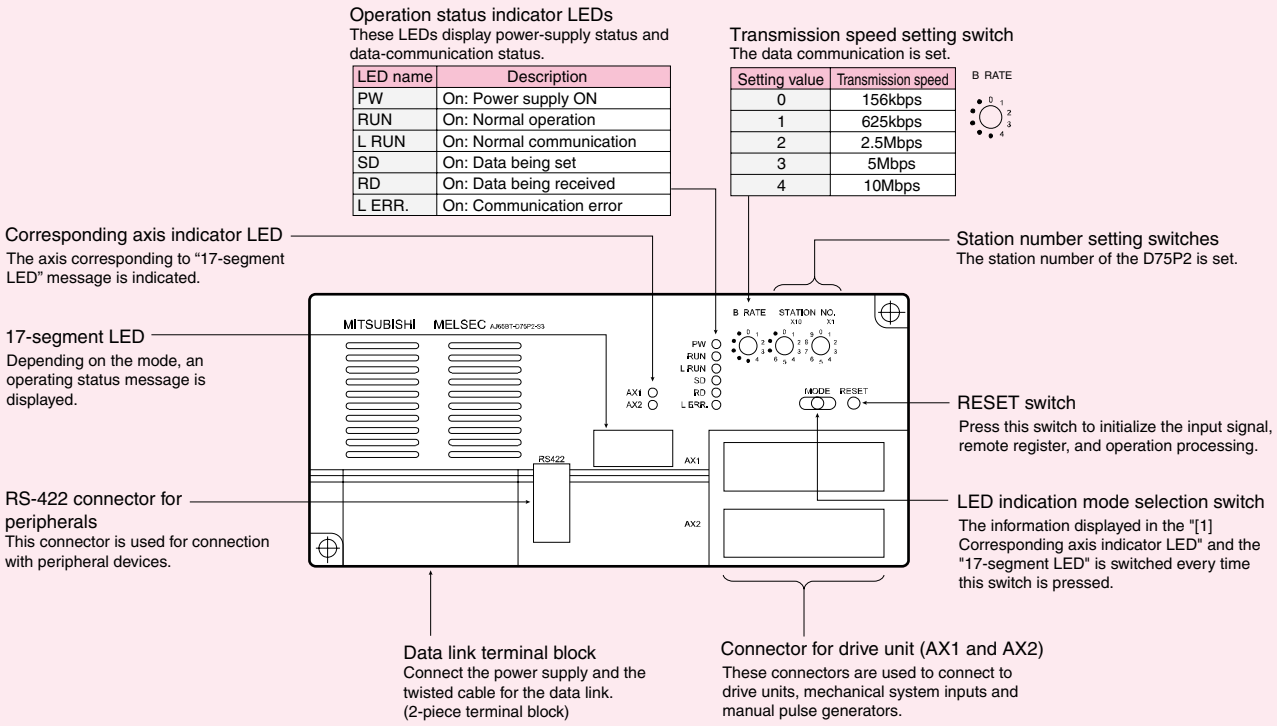
■Performance specifications

Item		Specifications
Number of control axes		2 axes
Interpolation function		2-axis linear interpolation, 2-axis circular interpolation *1
Control method		PTP (Point to Point) control, locus control (both linear and circular interpolation), speed control, speed/position switching control
Control unit		mm, inch, degree, pulse
Positioning data		Up to 600 data (positioning data No.: 1 to 600) per axis
Peripheral/software package		Windows version 75P GX Configurator-AP A7HGP /SW1RX-AD75P or later PC-9800 series /SW1NX-AD75P or later *2 DOS/V PC IBM PC/AT compatible PC/SW1IVD-AD75P or later *3
Teaching unit		AD75TU (software version D or later)
Backup		Parameters and positioning data are stored in the flash memory (battery-less).
Positioning	Positioning method	PTP control: Incremental/absolute system Speed/position switching control: Incremental/absolute system *4 Locus control: Incremental/absolute system
	Positioning range *5	Absolute system · -214748364.8 to 214748364.7 (μm)/ -13421772.8 to 13421772.7 (μm) · -21474.83648 to 21474.83647 (inch)/ -1342.17728 to 1342.17727 (inch) · 0 to 359.99999 (degree)/0 to 359.99999 (degree) · -2147483648 to 2147483647 (pulse)/ -134217728 to 134217727 (pulse) Incremental system · -214748364.8 to 214748364.7 (μm)/ -13421772.8 to 13421772.7 (μm) · -21474.83648 to 21474.83647 (inch)/ -1342.17728 to 1342.17727 (inch) · -21474.83648 to 21474.83647 (degree)/ -1342.17728 to 1342.17727 (degree) · -2147483648 to 2147483647 (pulse)/ -134217728 to 134217727 (pulse) Speed/position switching control (incremental system) · 0 to 214748364.7 (μm)/0 to 13421772.7 (μm) · 0 to 21474.83647 (inch)/0 to 1342.17727 (inch) · 0 to 21474.83647 (degree)/0 to 1342.17727 (degree) · 0 to 2147483647 (pulse)/0 to 134217727 (pulse) Speed/position switching control (absolute system) · 0 to 359.99999 (degree)/0 to 359.99999 (degree)
	Speed command *5	0.01 to 6000000.00 (mm/min)/0.01 to 375000.00 (mm/min) 0.001 to 600000.000 (inch/min)/0.001 to 37500.000 (inch/min) 0.001 to 600000.000 (degree/min)/0.001 to 37500.000 (degree/min) 1 to 1000000 (pulse/s)/1 to 62500 (pulse/s)
	Acceleration/ deceleration processing	Automatic trapezoidal acceleration/deceleration and S-curve acceleration/deceleration *6
	Acceleration/ deceleration time	Can be switched between “1 to 65535” and “1 to 8388608” (ms). 4 patterns can be set for each of the acc. and dec. times.
	Sudden stop deceleration time	Can be switched between “1 to 65535” and “1 to 8388908” (ms). (The ranges are same as those of the Acc/Dec time.)
	Start-up time	20 ms or less (excluding link scan time)

Item	Specifications
Connector for drive unit	10136-3000VE (soldering-type, accessory) 10136-6000EL (pressure connection type, sold separately)
Applicable wire size	10136-3000VE: AWG#24 to #30 (approx. 0.05 to 0.2SQ) 10136-6000EL: AWG#28 (approx. 0.08SQ)
Maximum output pulse	When connected to differential driver: 400kbps When connected to open collector: 200kbps
Maximum connection distance to servo amplifier	When connected to differential driver: 10m When connected to open collector: 2m
Station type	Intelligent device station
Number of occupied stations	4 stations (RX/RY: 128 points each, RWr/RWw: 16 words each)
External power supply	24VDC (20.4 to 26.4VDC)
Applicable conductor size	0.75 to 2.00 mm^2
Module mounting screws	M4 x 0.7 mm x 16 mm or more, possible to mount on a DIN rail
Applicable DIN rail	TH35-7.5Fe, TH35-7.5Al, TH35-15Fe (conforming to JIS C 2812)
Applicable solderless terminal	RAV1.25 to 3.5, RAV2 to 3.5
24VDC internal current consumption	0.30A
External dimensions	170 (W) x 63.5 (H) x 80 (D) mm
Weight	0.50kg

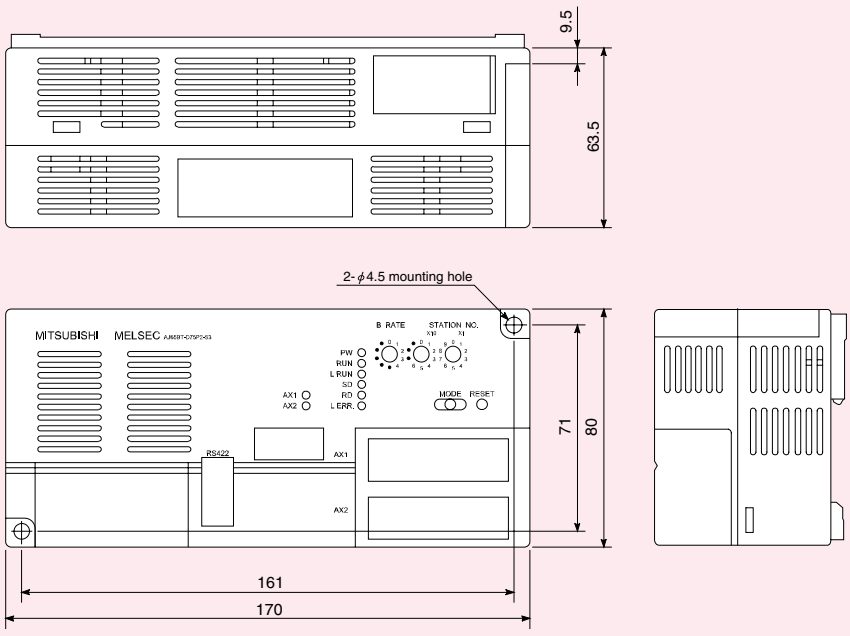
*1 The circular interpolation function is not available when a stepping motor is used.
*2 PC-9800 Series is a registered trademark of NEC
*3 DOS/V is a registered trademark of IBM Japan, Ltd.
*4 In the absolute system, the control unit of the speed/position switching control is "degree" only.
*5 Indicates a setting range of "standard mode/stepping motor mode".
*6 The automatic S-curve acceleration/deceleration is not available when a stepping motor is used.

■Part names and settings



■External dimensions

Unit: mm

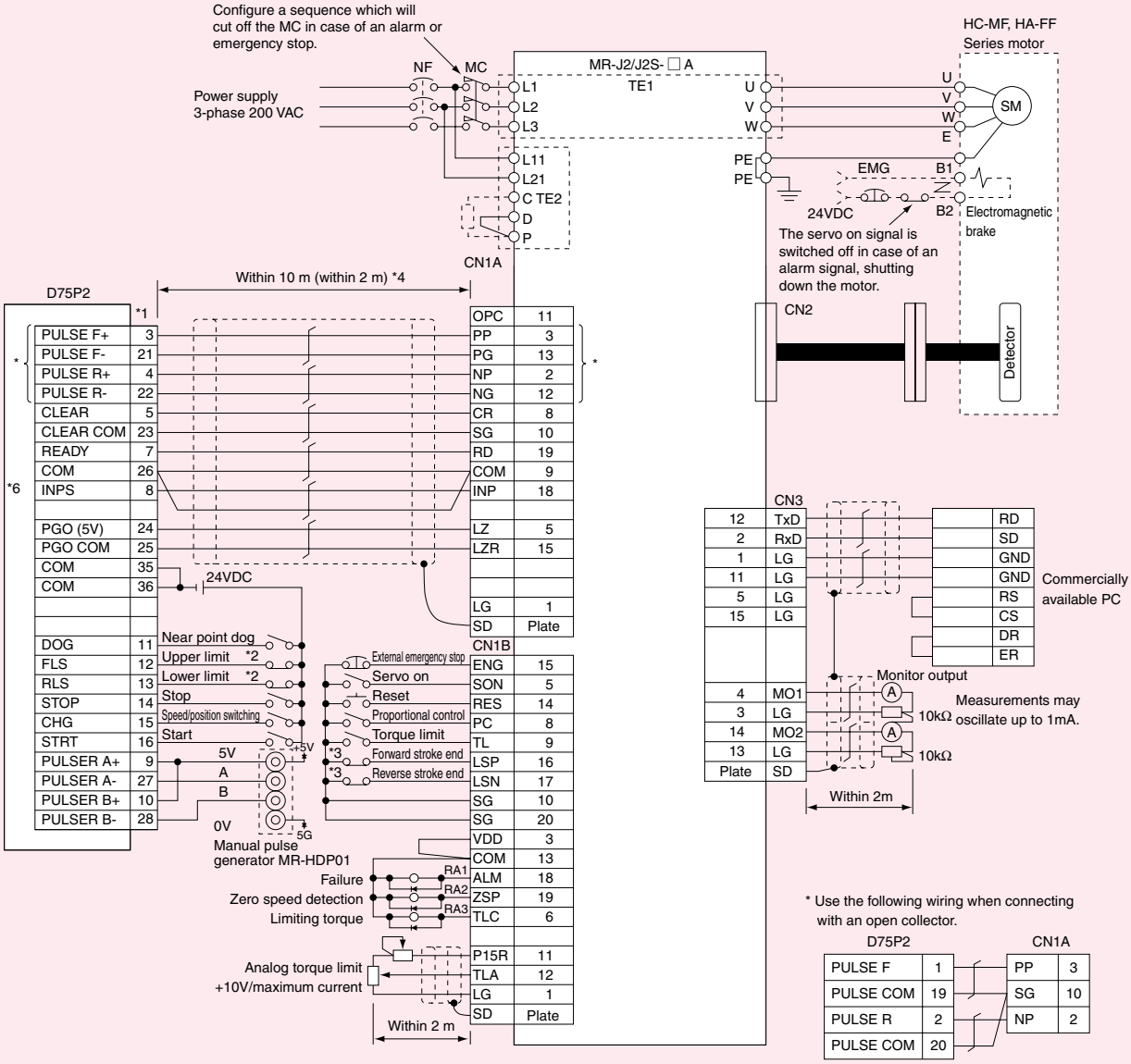


Positioning module

■External connection diagram

■Example of connection between D75P2 and MR-J2/J2S-□A (Differential Driver (Open collector), Negative Logic *5)

The figure below does not have a connection for recovering absolute position.
See the next page for the connection for recovery of absolute position.



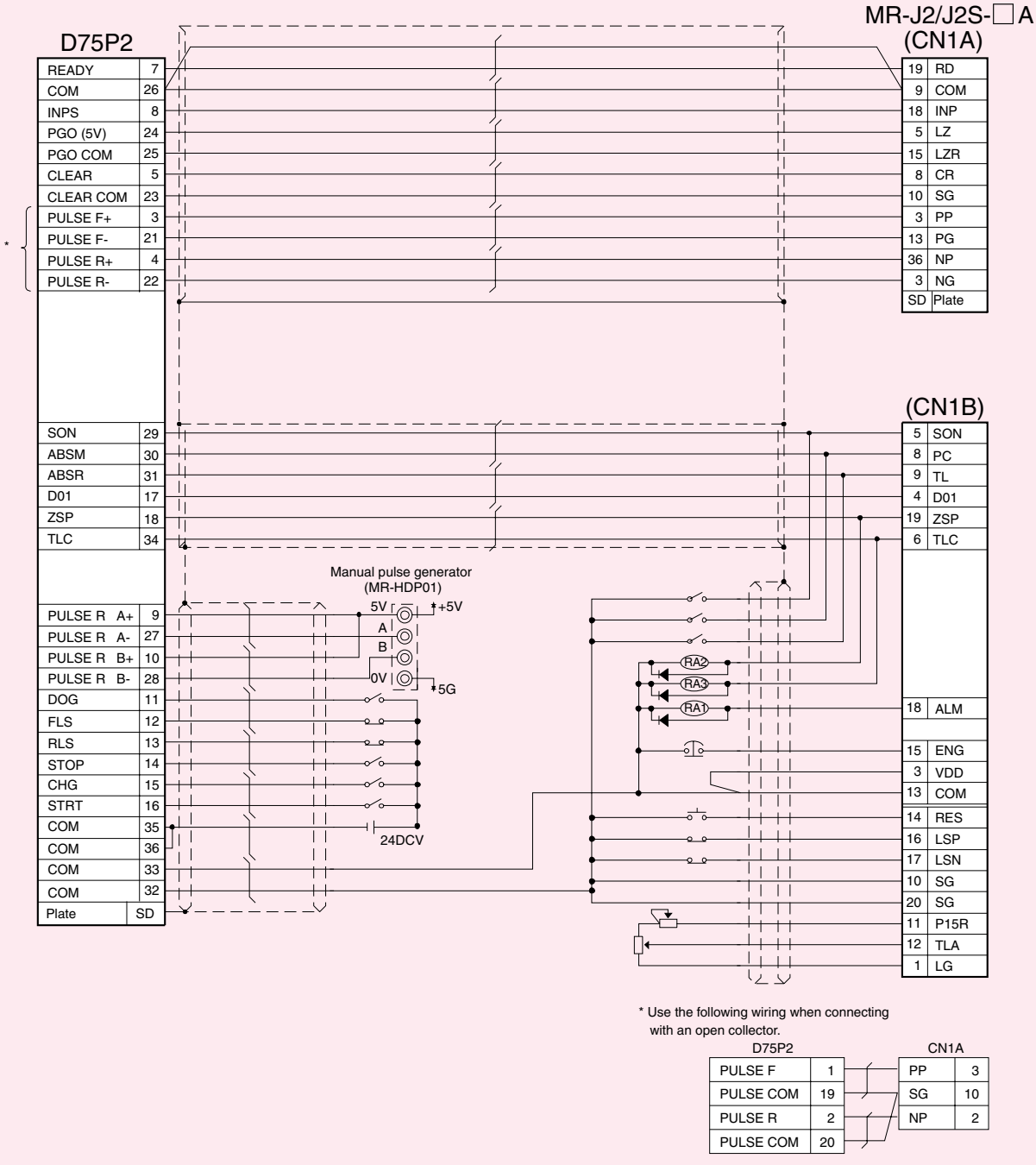
*1 The same connector pin numbers of D75P2 are used for axes 1 and 2.
*2 The upper limit (FLS) and lower limit (RLS) of D75P2 are used in the retry function at the time of zero point return. Set them inside the limit switches for the servo amplifier.
*3 Limit switch for servo amplifier (for stopping)
*4 Indicates the distance between the controller and amplifier. It is 2m or less when using the open collector.
*5 For the D75P2, select "Negative logic" in "Logic selection for pulse output to the drive unit" of Detailed parameters 1.
*6 The in-position signal line is not necessarily to be wired.
(The signal is output only to the in-position flag (RX (n+1)4, rx(n+4)4), not being used in the internal processing of the D75P2.)

■Remarks

"AD75C20SNJ2 type cable (for differential driver)" can be used for the connection between D75P2 and MR-J2/J2S-□A.

External connection diagram

Example of connection for performing absolute position recovery



RS-232 interface module

RS-232 interface module
AJ65BT-R2N

Features

■ Start-up and control adjacent to the devices are possible.
Online operations are available with GX Developer and GOT; therefore, debug and maintenance works are more efficient.

■ The module supports a transmission speed of 115200bps*1

■ Settings are easy when multiple programmable controllers are connected.
Easy settings of sequence programs improve efficiency in program development.

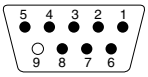
■ Related manual
User's Manual IB-0800381E (13JY30)

■ Performance specifications

Item			Specifications
RS-232 specifications	Interface specifications		RS-232-compliant (D-Sub 9P) (A)
	Transmission method		Full-duplex communication method
	Synchronization method		Asynchronous method
	Transmission speed		300,600,1200,2400,4800,9600,19200, 38400, 57600*1, 115200*1 bps (Select with RS-232 transmission setting switches.)
	Data format	Start bit	1
		Data bit	7/8
		Parity bit	1 (Vertical parity)/None
		Stop bit	1/2
	Error detection		Checked (even/odd)/Not checked
	Communication control (flow control)		DTR/DSR (ER/DR) control DC1/DC3 control
	Transmission distance		Up to 15m
	OS reception area		5120 bytes
Data link specifications	General-purpose I/O specifications		Input side: 24VDC (Positive/negative common shared type) 2 points Output side: Transistor output (Sink type) 12/24VDC 2-point terminal block (B) (C)
	CC-Link station type		Intelligent device station
	Number of occupied stations		1 station (RX/RY: 32 points each, RWr/RWw: 4-points each)
	Power supply voltage		24VDC
	Current consumption		0.11A (when TYP.24VDC)
	Number of writes to E²PROM		Up to 100,000 times
	External dimensions		170 (W) x 80 (H) x 47 (D) mm
	Weight		0.40kg

*1: Unless data are sent concurrently from the AJ65BT-R2N and external-device sides in Nonprocedural protocol mode, communication at 57600bps or 115200bps is available.
In the event of concurrent transmission, an RS-232 receive overrun error (BB23H) may occur.

(A) RS-232 connector specifications

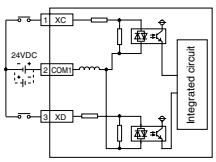


The AJ65BT-R2N uses the following RS-232 interface connector.
• DDK Ltd.
9-pin D-sub (female) screw type
17JE-13090-37 (D23A)

Pin No.	Signal name	Signal code	Signal direction AJ65BT-R2N ⟷ External device
1	Receive carrier detect	CD	←
2	Receive data	RD(RXD)	←
3	Send data	SD(TXD)	→
4	Data terminal ready	DTR(ER)	→
5	Signal ground	SG	←
6	Data set ready	DSR(DR)	←
7	Request to send	RS(RTS)	→
8	Clear to send	CS(CTS)	←
9	–	Unused	–

(B) General-purpose input specifications

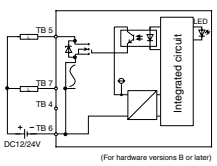
	AJ65BT-R2N	External connection
DC input (Positive/negative common shared type)	Number of input points	2 points
	Isolation method	Photocoupler
	Rated input voltage	24VDC
	Rated input current	Approx. 7mA
	Operating voltage range	19.2 to 28.8VDC (Ripple ratio: 5% or less)
	Maximum number of simultaneous input points	100%
	ON voltage/ON current	14V/3.5mA or higher
	OFF voltage/OFF current	6V/1.7mA or lower
	Input resistance	Approx. 3.3kΩ
	Response time	OFF→ON: 10m or less ON→OFF: 10m or less
	Wiring method for common	2 points/common (COM1) Positive/negative common shared type
	External connection system	7-point terminal block (M3.5 screw)
	Applicable wire size	0.75 to 2mm²
	Applicable solderless terminal	RAV1.25-3.5, RAV2-3.5 (conforming to JIS C 2805)



Terminal No.	Signal name	Terminal No.	Signal name
TB1	XC	TB3	XD
TB2	COM1	–	–

(C) General-purpose output specifications

	AJ65BT-R2N	External connection
Transistor output (Sink type)	Number of output points	2 points
	Isolation method	Photocoupler
	Rated load voltage	12-24V DC (+20/-15%)
	Operating load voltage range	10.2 to 28.8VDC (Ripple ratio: 5% or less)
	Maximum load current	0.1A/point 0.2A/common
	Maximum inrush current	0.7A, 10ms or less
	Leakage current at OFF	0.1mA or less
	Maximum voltage drop at ON	0.1VDC (TYP.) 0.1A, 0.2VDC (MAX.) 0.1A
	Output method	Sink type
	Response time	OFF→ON : 1ms or less ON→OFF: 1ms or less (Resistance load)
	External power supply for output part	Voltage: 10.2 to 28.8VDC (Ripple ratio: 5% or less) Current :10mA (at 24VDC) (MAX all points ON)
	Surge suppressor	Zener diode
	Wiring method for common	2 points/common (COM2)
	External connection system	7-point terminal block (M3.5 screws)
	Applicable wire size	0.75 to 2mm²
	Applicable solderless terminal	RAV1.25-3.5, RAV2-3.5 (conforming to IEC 60715)
	Protective function	Provided • Overheat protection function is activated for each point. • Overload protection function is activated for each point. (Detection is not possible.)



(For hardware versions B or later)

Terminal No.	Signal name	Terminal No.	Signal name
TB4	NC	TB6	COM2
TB5	YC	TB7	YD

■Part names and settings

Operation status indicator LEDs

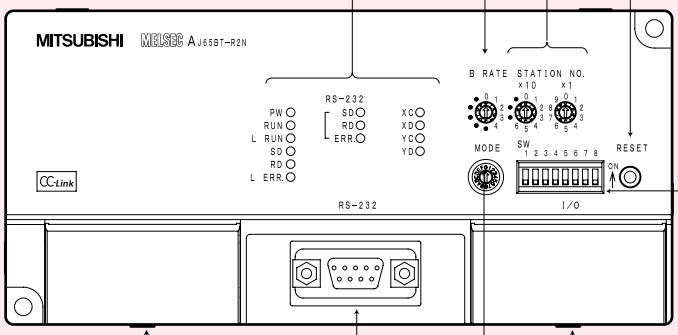
LED name	Description	
PW	On: Power is ON	
RUN	On: Operating normally	
L RUN	On: Communicating normally	
SD	On or Flashing: Data being sent by data link	
RD	On or Flashing: Data being received by data link	
L ERR.	On	Invalid transmission speed or station No. setting
	Flashing regularly	Transmission speed or station No. setting changed after power-ON
	Flashing irregularly	• Terminating resistor not connected • AJ65BT-R2N or CC-Link dedicated cable affected by noise
	Off	Communicating normally
RS-232 SD	On or Flashing: RS-232 data being sent	
RS-232 RD	On or Flashing: RS-232 data being received	
RS-232 ERR.	On: When Nonprocedural protocol mode is active, RS-232 transmission error	
XC, XD	On: General-purpose input (XC, XD) is ON	
YC, YD	On: General-purpose output (YC, YD) is ON	

Transmission speed setting switch

Setting value	Transmission speed
0	156kbps
1	625kbps
2	2.5Mbps
3	5Mbps
4	10Mbps
•	N/A

Station number setting switches
Set a station number for the AJ65BT-R2N (Factory default: 0)

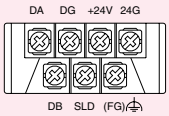
RESET switch
Used to return to the power-up status



RS-232 transmission setting switches
Set the RS-232 transmission specifications

Switch No.	Setting item	Switch status					
			ON			OFF	
SW1 to 4	Transmission speed	SW	1	2	3	4	
			0	0	0	0	300bps
			1	0	0	0	600bps
			0	1	0	0	1200bps
			1	1	0	0	2400bps
			0	0	1	0	4800bps
			1	0	1	0	9600bps
			0	1	1	0	19200bps
			1	1	1	0	38400bps
			0	0	0	1	57600bps
			1	0	0	1	115200bps
		0: OFF 1: ON					
SW5	Data bit length	8				7	
SW6	Parity bit	Present				None	
SW7		Even				Odd	
SW8	Stop bit length	2				1	

Data link terminal block
Connect a CC-Link dedicated cable for power supply and data link
(Detachable terminal block)



RS-232 interface
Set the RS-232 transmission specifications

General-purpose I/O terminal block
Connect input/output wires (Detachable terminal block)

Mode setting switch
Set the operation status of the AJ65BT-R2N

Setting value	Name			Description
0	Nonprocedural protocol mode	For send/ receive buffer communication function	Mode 0	Communications are performed in nonprocedural protocol mode. Set this when using the send/receive buffer communication function.
1		For automatic buffer memory update function	Mode 1	
2			Mode 2	Communications are performed in nonprocedural protocol mode.
3			Mode 3	Set this when using the automatic buffer memory update function.
4			Mode 4	
5	MELSOFT connection mode			Used for communications with GX Developer.
D	Hardware test mode			Set this when conducting a hardware test.

■External connection

The AJ65BT-R2N does not use the CD signal as a control signal for data communication with the external device.

DC code control and DTR/DSR (ER/DR) control

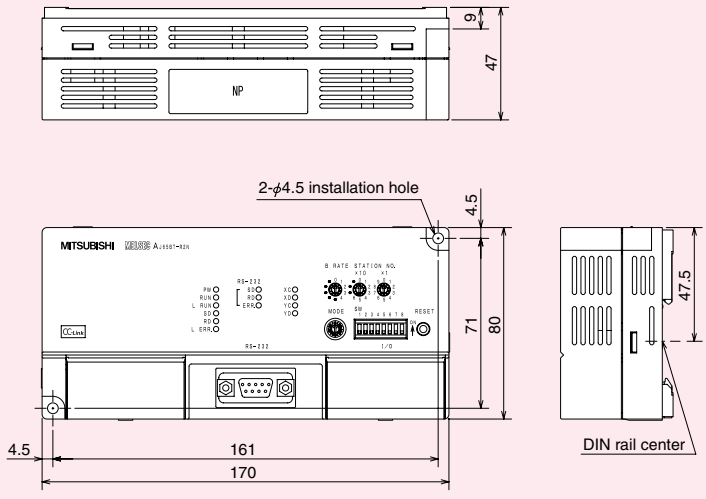
AJ65BT-R2N side (DTE)		Cable connection and signaling	External device (DTE)
Signal name	Pin No.		Signal name
SD	3		SD
RD	2		RD
RS	7		RS
CS	8		CS
DR	6		DR
SG	5		SG
CD	1		CD
ER	4		ER

Connection example for DC code control only

AJ65BT-R2N side (DTE)		Cable connection and signaling	External device (DTE)
Signal name	Pin No.		Signal name
SD	3		SD
RD	2		RD
RS	7		RS
CS	8		CS
DR	6		DR
SG	5		SG
CD	1		CD
ER	4		ER

■External dimensions

Unit: mm



Interface board for personal computer

Interface board for personal computer

Q80BD-J61BT11N
Q81BD-J61BT11

CC-Link V2

Features

■Supports PCI Express bus and Microsoft Windows Server 2003 R2
Being compatible with PCI Express bus and Microsoft Windows Server 2003 R2, more PC options are available for CC-Link systems. In addition, a dual-core processor and multiple CPU configuration PC are supported.

■Simple logging with Excel
With simple settings using MX Component and MX Sheet, programmable controller's device data can be collected or written in Excel. Time-consuming programming tasks are eliminated.

■Easy to program with Microsoft Visual Basic or Microsoft Visual C++
User programs such as programmable controller CPU's remote RUN/STOP/PAUSE and reading/writing devices can be created easily with Microsoft Visual Basic or Microsoft Visual C++ functions.

■Performance specifications

Item	Q80BD-J61BT11N	Q81BD-J61BT11
Station type	Master station, standby master station or local station	
Number of occupied stations (for local station)	1 to 4 stations (changed using the parameter settings of Utilities)	
Number of mountable modules	Up to 4 modules *1	
Slot	PC PCI bus slot (half size)	PC PCI Express X1, X2, X4, X8, X16 slot (half size)
Number of occupied slots	1 slot	
Current consumption	5VDC 0.56A	3.3V 1.06A
External dimensions	158 (W) x 121 (H) x 19 (D) mm	
Weight	0.11kg	

*1: A CC-Link Ver. 2 board and Ver. 1 board (A80BDE-J61BT11/13) cannot be used together in the same personal computer.

■Part names and settings

Operation status indicator LEDs

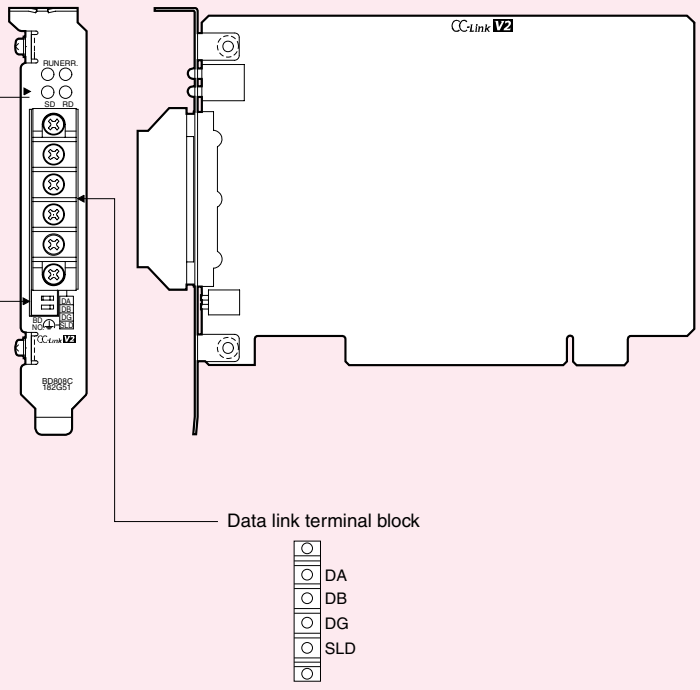
LED name		Description
Normal mode		
RUN	Off	: A WDT error has occurred, or the board is being reset
	On	: Operating normally
ERR.	Off	: No communication error has occurred, or the board is being reset
	On	: All stations are faulty
	Flashing	: There is a faulty station or station No. is duplicated
SD	Off	: No data have been transmitted, or the board is being reset
	On	: Data are being transmitted
RD	Off	: No data have been received, or the board is being received, or the board is being reset
	On	: Data are being received
Error mode		
RUN	Flashing	: Indicates the board is in the error mode
	On	: No error
	Off	: No error
ERR.	Off	: No OS start error has occurred
	On	: An OS start error has occurred
SD	Off	: No driver response error has occurred
	On	: A driver response error has occurred
RD	Off	: No PCI bus error has occurred
	On	: A PCI bus error has occurred

Channel number setting switches

Set the channel number of the CC-Link Ver.2 board.

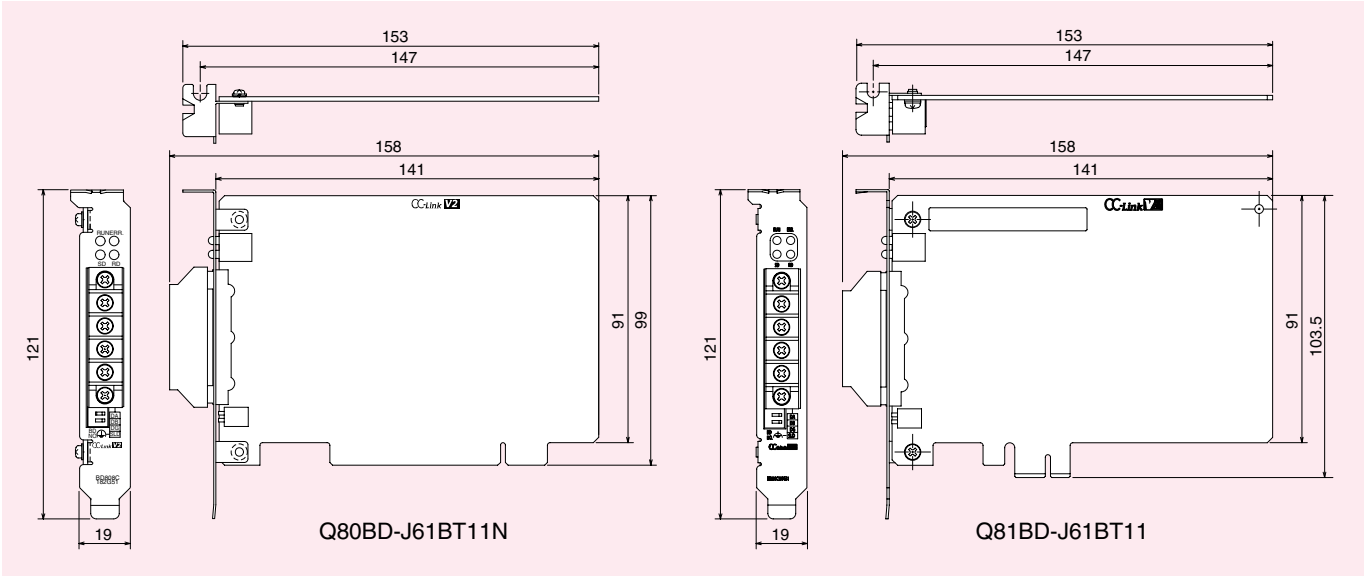
Board No.	Channel No.	Switch 1	Switch 2	Remark
0	81	OFF	OFF	Default setting
1	82	ON	OFF	-
2	83	OFF	ON	-
3	84	ON	ON	-

If two or more CC-Link Ver.2 boards are mounted, prevent duplication of the board numbers.



■External dimensions

Unit: mm



CC-Link Ver.2 utility (supplied)

● The CC-Link Ver.2 Utility software package provides the following functions:
- Board information display
- Line monitor (other stations)
- Memory and I/O diagnosis
- Test
- Parameter setting
- Target setting for multi-CPU system compatible programmable controller communication

etc.

Device monitor utility (supplied)

● The Device monitor utility software package provides the following functions:
- Batch monitor and 16-point registration monitor
- Device value change

User's manual

● Both Japanese and English version of user's manuals (PDF) are included.

SW1DNC-CCBD2-B

CC-Link Ver.2 utility, device monitor utility, and user's manual (PDF) are included in the CD-ROM (SW1DNC-CCBD2-B) supplied with the board.

■The parameters can be easily set.
The parameters required for CC-Link system operation can be easily set using CC-Link Ver. 2 Utilities.

■The CC-Link system test and monitor status information can be easily displayed using the IBM-PC/AT compatible personal computer.

■User program functions are provided.
The provided Microsoft® Visual C++®, Microsoft® Visual Basic®, Microsoft® Visual Studio 2005, Microsoft® Visual C++®.NET 2003 and Microsoft® Visual Basic®.NET 2003 functions allow you to remotely control remote I/O stations, remote device stations, intelligent device stations and local stations, perform read and write operations and easily develop user programs.

Examples: Remote I/O station input X and output Y ON/OFF control
Remote device station (analog module) analog voltage output control
Intelligent device station (RS-232C module) communication control

■Operating environment

Item	Description
IBM-PC/AT compatible personal computer	IBM-PC/AT-compatible personal computer with one or more PCI/PCI Express bus slots, satisfying the specifications described below in "Applicable operating system and the corresponding required PC performance" *2,3
Operating system (OS)*1	Microsoft® Windows® Server 2003 R2 or Microsoft® Windows® NT Workstation Operating System Version 4.0 or Microsoft® Windows® 2000 Professional Operating System or Microsoft® Windows® XP Professional Operating System or Microsoft® Windows® XP Home Edition Operating System or Microsoft® Windows Vista® Ultimate Operating System or Microsoft® Windows Vista® Home Premium Operating System or Microsoft® Windows Vista® Home Basic Operating System or Microsoft® Windows Vista® Business Operating System or Microsoft® Windows Vista® Enterprise Operating System *4,5 Microsoft Windows® 7 Home Premium Operating System Microsoft Windows® 7 Professional Operating System Microsoft Windows® 7 Ultimate Operating System Microsoft Windows® 7 Enterprise Operating System
Programming language	Microsoft® Visual Basic® 5.0 (English version) or Microsoft® Visual Basic® 6.0 (English version) or Microsoft® Visual C++® 5.0 (English version) or Microsoft® Visual C++® 6.0 (English version) or Microsoft® Visual C++® .NET 2003 or Microsoft® Visual Basic® .NET 2003 or Microsoft® Visual Studio 2005 Visual Basic® or Microsoft® Visual Studio 2005 Visual C++® *6
Required free hard disk space	80MB or more
Disk drive (necessary at installation)	CD-ROM disc drive

*1: 64-bit version is not supported.
*2: This product does not work with a multiprocessor IBM-PC/AT-compatible personal computer, as the driver is incompatible.
*3: This board can be used in IBM-PC/AT compatible personal computers which conform to the PCI standard.
Using a personal computer not compliant with the PCI standard may result in a problem due to bad electrical contact, erroneous operation or other reason.
*4: Mitsubishi Electric Corporation onerously discloses "Open Field Network CC-Link Compatible Product Development Reference Manual CC-Link Ver.2 Q80BD-J61BT11N Driver" (L(NA)-080601ENG) as information to develop drivers compatible with various operating systems.
For details, refer to "Open Field Network CC-Link, CC-Link/LT Compatible Product Development Guidebook" (L(NA)-08052E-A).
*5: Both Japanese and English version of utilities are included in the supplied CD-ROM (SW1DNC-CCBD2-B).
For Japanese OS, the Japanese version of utility, and for English OS, the English version of utility is installed.
For other than Japanese or English OS, the English version of utility is installed, but an operation is not guaranteed.
*6: Visual Basic® Ver.5.0 and Visual C++® Ver.5.0 cannot be used when Windows® 2000 Professional or Windows® XP and Windows Vista® is used.

■Applicable operating system and the corresponding required personal computer performance

Operating system (OS)	Description		Operating system (OS)	Description	
	CPU	Required memory		CPU	Required memory
Windows® Server2003 R2	Pentium® 550MHz or more	256MB or more	Windows® Vista Business	Pentium® 800MHz or more	512MB or more
Windows® 2000 Professional	Pentium® 133MHz or more	64MB or more	Windows® Vista Enterprise	Pentium® 800MHz or more	512MB or more
Windows® XP Professional	Pentium® 300MHz or more	128MB or more	Windows NT® Workstation 4.0*7	Pentium® 133MHz or more	32MB or more
Windows® XP Home Edition	Pentium® 300MHz or more	128MB or more	Windows® 7 Ultimate*1	Pentium® 1GHz or more	1GB or more
Windows® Vista Ultimate	Pentium® 800MHz or more	512MB or more	Windows® 7 Professional*1	Pentium® 1GHz or more	1GB or more
Windows® Vista Home Premium	Pentium® 800MHz or more	512MB or more	Windows® 7 Home Premium*1	Pentium® 1GHz or more	1GB or more
Windows® Vista Home Basic	Pentium® 800MHz or more	512MB or more	Windows® 7 Enterprise*1	Pentium® 1GHz or more	1GB or more

*7: Can be used for Q80BD-J61BT11N only.

Memo

Interface board for personal computer

Interface board for FA computer
ECP-CL2BD

CC-Link V2

Mitsubishi Electric Engineering Corporation

Features

- Control and monitor CC-Link devices using compact PCI bus interface (cPCI) compatible industrial computers.
- The CC-Link Industrial PC interface board can operate as a master or local station and is compatible with CC-Link version 2.
- Configure CC-Link parameters using the included software.
- Function libraries are available to help create user programs.

■Performance specifications

Item	ECP-CL2BD
Station type	Master station, standby master station or local station
Number of occupied stations (for local station)	1 to 4 stations (changed using the parameter settings of Utilities)
Number of mountable modules	Up to 4 modules *1
Slot	FA computer of Compact Peripheral Component Interconnect bus (3U size)
Number of occupied slots	slot
Current consumption	5VDC 0.5A
External dimensions	210(W)x131(H)x20(D)mm
Weight	0.17kg

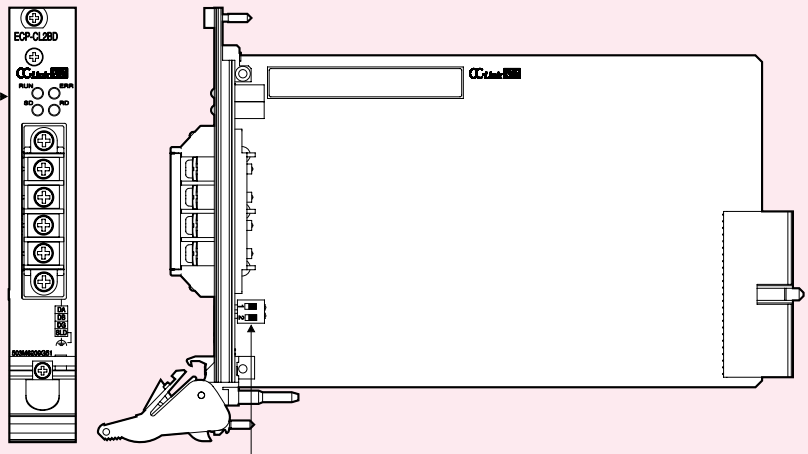
*1: ECP-CL2BD and other boards cannot be used together in the same computer.

■Part names and settings

Operation status indicator LEDs

RUN ERR. SD RD

LED name		Description
Normal mode		
RUN	Off	: A WDT error has occurred, or the board is being reset
	On	: Operation normally
ERR.	Off	: No communication error has occurred. or the board is being reset
	On	: All stations are faulty
	Flashing	: There is a faulty station or station No. is duplicated
SD	Off	: No data have been transmitted, or the board is being reset
	On	: Data are being transmitted
RD	Off	: No data have been transmitted, or the board is being reset
	On	: Data are being received
Error mode		
RUN	Flashing	: Indicates the board is in the error mode
	On	: No error
	Off	: No error
ERR.	Off	: No OS start error has occurred
	On	: An OS start error has occurred
SD	Off	: No driver response error has occurred
	On	: A driver response error has occurred
RD	Off	: No PCI bus error has occurred
	On	: A PCI bus error has occurred



Channel number setting switches

BD NO.

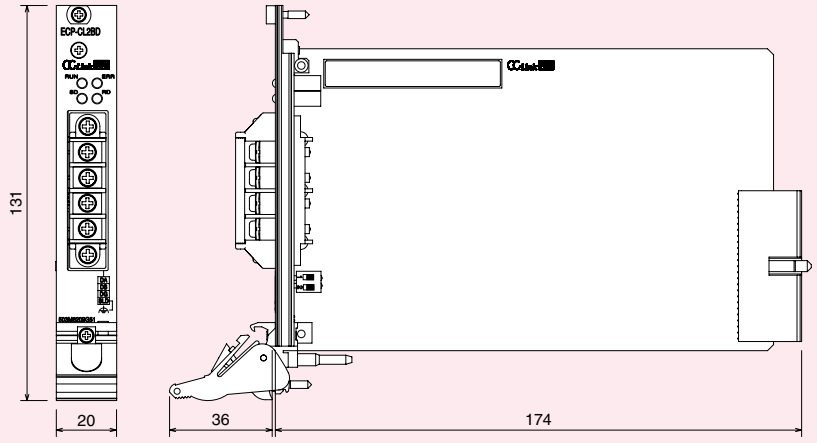
Set the channel number of the CC-Link Ver.2 board.

Board No.	Channel No.	Switch 1	Switch 2	Remark
0	81	OFF	OFF	Default setting
1	82	ON	OFF	-
2	83	OFF	ON	-
3	84	ON	ON	-

If two or more CC-Link Ver.2 boards are mounted, prevent duplication of the board numbers.

■External dimensions

Unit:mm



■Operation environment

Item	Description		
FAcomputer	CPU	Pentium 133MHz or more	
	Required memory	64MB or more	
	Required free hard disk space	80MB or more	
	Monitor	Resolution 800x600 dot or higher (Recommended:1024 x 768dot) *4	
	Disk drive	CD-ROM disc drive (necessary at installation)	
	CompactPCI	Specification	Compliant with PICMG 2.0 Rev3.0 *6
		Compatible voltage	5V
		Operation frequency	33MHz
		Number of occupied slots	1slot
		Size	3Usize (100mm x 160mm)
		Number of mountable modules	Up to 4 modules *7
Operation system (OS) *2, 3	Windows® 2000 Professional		
	Windows® XP Professional		
Programming language *5	Visual Basic® 6.0	Visual C++® 6.0	
	Visual Basic® .NET2003	Visual C++® .NET 2003	
	Visual Basic® 2005	Visual C++® 2005	

*2: Windows® "Standby" and "Hibernate" modes are not supported by the interface board.
*3: The software utility can only be installed, uninstalled, and run by users with administrator access.
*4: The utility does not support the large fonts Windows® accessibility feature.
*5: User programs created in different language environments can not be used together. (For example a program created in a Japanese environment cannot be used in an English environment.)
*6: The interface board can not be hot-swapped.
*7: Only one CC-Link Ver.1 or Ver.2 board can be installed per computer.

Repeater modules

Overview

Lineup of repeater modules covers a wide range of CC-Link applications and improves flexibility in network constructions.

●Thin, waterproof type repeater hub module
AJ65FBTA-RPH
P.157

This module allows star topology wiring.

●Spring clamp terminal block type repeater hub module
AJ65BTS-RPH
P.159

●Repeater module (T-branch)
AJ65SBT-RPT
P.161

T-branch wiring is available for use of CC-Link at any transmission speed, and the transmission distance can be extended.

●Optical repeater module
AJ65SBT-RPS/AJ65SBT-RPG
P.163

Using optical fiber cables extends the transmission distance and prevents problems caused by transmission line noise. T-branch wiring is also available.

●Space optical repeater module
AJ65BT-RPI-10A/AJ65BT-RPI-10B
P.165

Space transmission via infrared light enables interconnection with the devices such as slave devices mounted on mobile objects, for which physical cable connection is difficult.

■Up to 64 modules of remote I/O stations, remote device stations, local stations, standby master stations, intelligent device stations and repeater modules can be connected within one segment*1. The number of slave stations that can be controlled by one master station is unchanged regardless of whether repeater(s) are used or not.

■By using repeater modules, the master station can communicate with slave stations on up to 10 stages away from the master station (when using AJ65SBT-RPT). (The maximum number of accessible states is 3 for AJ65SBT-RPS, and 2 for AJ65SBT-RPG, AJ65SBT-RPI-10A or AJ65SBT-RPI-10B.)

*1: A block of devices connected from one terminating resistor to another is referred to as a segment in the CC-Link system that uses repeater(s).

Models

Product name	Model	Related manual
Thin, waterproof type repeater hub module	AJ65FBTA-RPH	User's Manual IB-0800288 (13JP55)
Spring clamp terminal block type repeater hub module	AJ65BTS-RPH	User's Manual IB-0800346 (13JP97)
Repeater module (T-branch)	AJ65SBT-RPT	User's Manual IB-0800078 (13JQ81)
Optical repeater module	AJ65SBT-RPS	User's Manual IB-0800089 (13JQ85)
	AJ65SBT-RPG	
Space optical repeater module	AJ65BT-RPI-10A	User's Manual IB-0800090 (13JQ86)
	AJ65BT-RPI-10B	

Repeater modules

Thin, waterproof type repeater hub module
AJ65FBTA-RPH

Features

■Star topology network of 8 branch lines is configurable.
Up to 8 branch lines (segments) can be connected in star topology and used at any transmission speed available for the CC-Link.

■Max. transmission distance of 1200m per branch, and further extendable by connecting 2 stages
The transmission distance can be extended up to 1200m (at 156kbps) per branch line (segment).
The overall length can be more increased if a hub is connected to each branch. Up to 64 slave stations (local, remote I/O, remote device and/or intelligent device stations, etc.) are connectable.
This module can be used together with other conventional repeater modules, enabling flexible networking.

■Waterproof structure enables external installation
With IP67 waterproof and dustproof design, external installation is available, reducing the installation works and cost.

■Easy to add modules to the existing system
Slave stations can be easily added without rewiring the existing system, enabling flexible network construction.
Also, when any network problem occurs, this repeater module allows module replacement by each branch line.

■Related manual

User's Manual IB-0800288(13JP55)

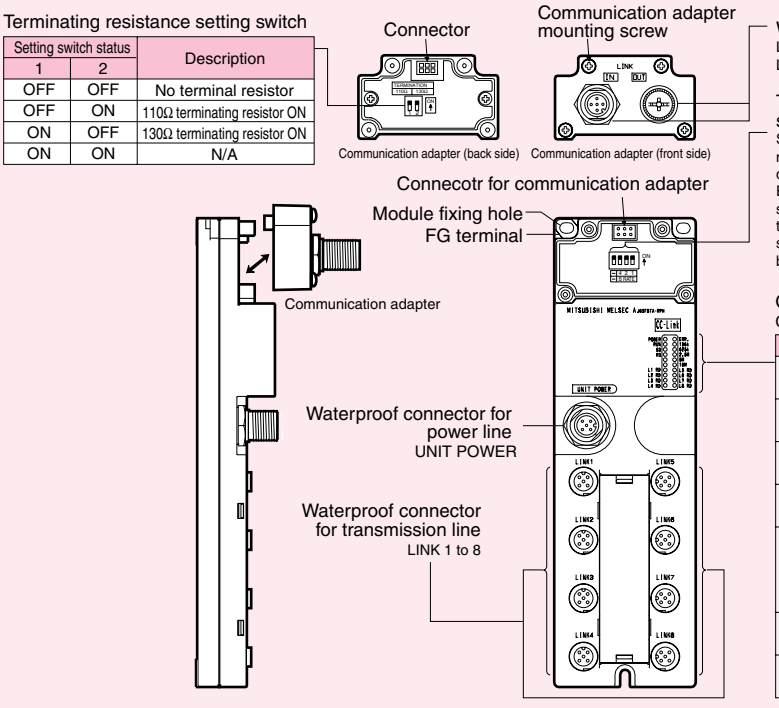
■Performance specifications

Item	Specifications	
Station number	– (none)	
Station type	– (none)	
Number of occupied stations	0 (none)	
Transmission speed	Can select from 156kbps / 625kbps / 2.5Mbps / 5Mbps / 10Mbps	
Number of connectable slave stations	The total number of modules connected to a trunk line and branch line shall conform to the maximum number of connectable modules of the master module used.	
Connection position	Trunk line side: No restriction (compliant with the CC-Link specifications) Branch line side: Connect to the end of the branch line (segment end)	
Maximum number of stages per segment	AJ65FBTA-RPH only	2nd stage
	Combination of AJ65FBTA-RPH and AJ65SBT-RPT	3nd stage
	Combination of AJ65FBTA-RPH and one of AJ65SBT-RPS/RPG, AJ65BT-RPI, or AJ65BTS-RPH	2nd stage
Maximum overall cable length	Trunk line: The max. length for each transmission rate, Branch line: The max. length for the transmission rate of each branch	
Built-in terminating resistor	Trunk line side: No resistance, 110Ω or 130Ω can ne selected Branch line side: 110Ω fixed	
Connector	M12 waterproof connector (IEC947-5-2)	
Mounting orientation	No restriction (mountable in 6 orientations)	
Module mounting screw	M4 mounting screw, 2-4.5x6 slot M4 mounting screw	
Power supply voltage	24VDC external power supply (20.4 to 26.4V, ripple within ±5%)	

■Part names and settings

Terminating resistance setting switch

Setting switch status		Description
1	2	
OFF	OFF	No terminal resistor
OFF	ON	110Ω terminating resistor ON
ON	OFF	130Ω terminating resistor ON
ON	ON	N/A



Waterproof connector for transmission line
LINK IN (left side)
LINK OUT (right side)

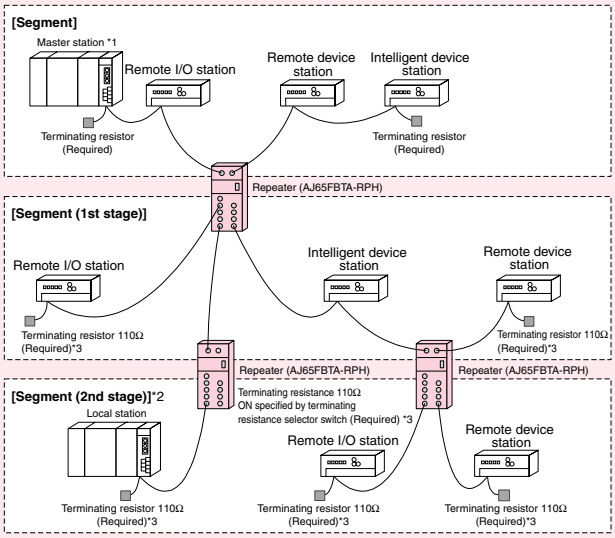
Transmission speed setting switches
Set the transmission speed of the module (set to 0 at the time of delivery).
Ensure to set the transmission speed at a speed specified below. transmission speed of the trunk line side is identical with that of the branch line side.

Setting value	Switch status 4	2	1	Transmission speed
0	OFF	OFF	OFF	156kbps
1	OFF	OFF	ON	625kbps
2	OFF	ON	OFF	2.5Mbps
3	OFF	ON	ON	5Mbps
4	ON	OFF	OFF	10Mbps

Operation status indicator LEDs
Check for the module condition by observing the state of lighting of the LEDs.

LED name	Description
POWER	On: Power supply ON
	Off: Power supply OFF
RUN	On: Module is operating normally
	Off: Module is not operating normally
SD	On : Data are being sent to the LINK IN or LINK OUT of the trunk line
	Off : Data are not being sent to the LINK IN or LINK OUT of the trunk line
RD	On : Data are being received from the LINK IN or LINK OUT of the trunk line
	Off : Data are not being received from the LINK IN or LINK OUT of the trunk line
ERR.	On: transmission speed setting out-of-range error or communication error occurred
	Flashing: Indicates that you forgot fitting the terminating resistor or the module or CC-Link dedicated cable is affected by noise.
	Off: Module is operating normally
156k,625k, 2.5M,5M,10M	The LED of transmission speed, set by the transmission speed setting switch, is lit.
L1 RD to L8 RD	On : Data are being received from the LINK1 to 8 of the branch line
	Off : Data are not being received from the LINK1 to 8 of the branch line

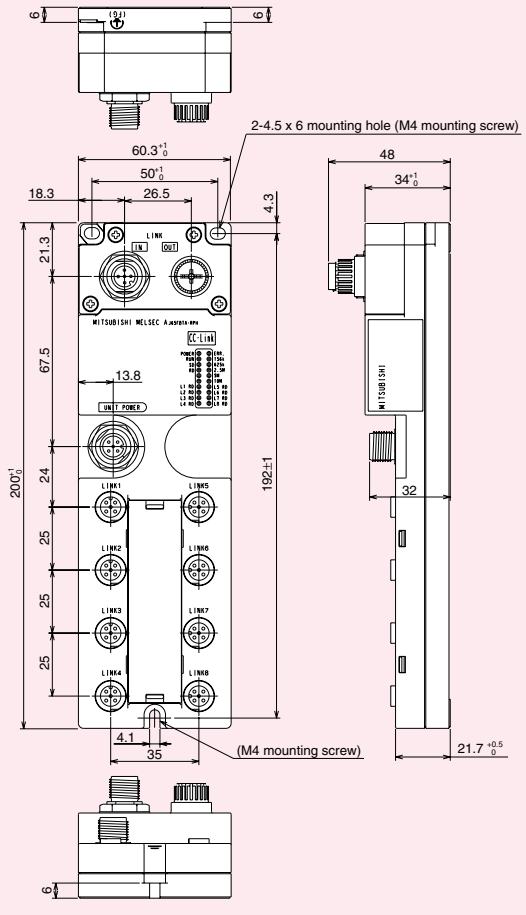
■System configuration



*1: It is necessary to match the transmission speed of each segment to that of the master station.
*2: Two more stages can be connected as segments.
*3: Use a terminating resistor of 110Ω for the AJ65FBTA-RPH. Use of 130Ω is not allowed.
(Ver.1.00-compatible CC-Link dedicated high performance cable cannot be used.)

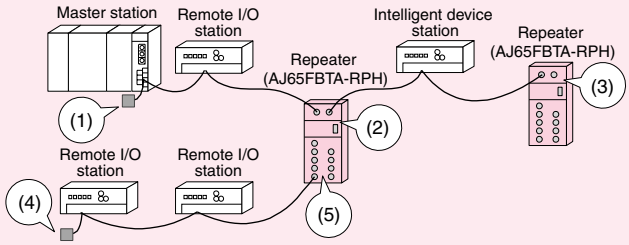
■External dimensions

Unit: mm



■Module connection

The method of connecting the AJ65FBTA-RPH module to the CC-Link system through the CC-Link dedicated cable is shown below.



(1) For the segment connected to the trunk line side of the AJ65FBTA-RPH, connect a terminating resistor to the module connected at the end.
Select a type for terminating resistor in accordance with the type of the connected communication cable.
For details, refer to the manual of the module connected.
(2) When connecting the trunk line side of AJ65FBTA-RPH to any other than the segment termination, turn off the terminating resistor.
In addition, connect the shielding wire of the CC-Link dedicated cable to "SLD" of each module, and ground both ends via "FG" The interval between SLD and FG is connected in the module in advance.
(3) When connecting the trunk line side of the AJ65FBTA-RPH to the end of the segment, turn on the terminating resistor.
Select a type for terminating resistor in accordance with the type of the connected communication cable.
In addition, connect the shielding wire of the CC-Link dedicated cable to "SLD" of each module, and ground both ends via "FG" The interval between SLD and FG is connected in the module in advance.
(4) Connect the included 110Ω terminating resistor to the module located at the end of a segment when the branch line side of the AJ65FBTA-RPH is connected to the segment.
For the connection of terminal resistor, refer to the manual of the module connected.
(5) For the branch line side of the AJ65FBTA-RPH, use the incorporated 110Ω terminating resistor. (Switch settings are not necessary.)
In addition, connect the shielding wire of the CC-Link dedicated cable to "SLD" of each module, and ground both ends via "FG".
Note that SLD and FG are connected to each other in the module.

Repeater modules

Spring clamp terminal block type repeater hub module
AJ65BTS-RPH

Features

■Star-topology wiring (T-branch) with 8 branch lines (segments) available in CC-Link system
By placing the AJ65BTS-RPH between modules of the CC-Link system, star-topology wiring (T-branch) with up to 8 branch lines (segments) can be used in the CC-Link system of all transmission rates (10Mbps, 5Mbps, 2.5Mbps, 625kbps, and 156kbps).

■Extended transmission distance in CC-Link system
Use of this module enables the transmission distance of the CC-Link system to be extended.
In addition, use of multiple modules enables the transmission distance of the CC-Link system to be extended up to 2 stages.

■Energy saving by adoption of a spring clamp terminal block
The AJ65BTS-RPH has adopted a spring clamp terminal block.
Because screw tightening is not needed, working steps can be reduced.
The terminal block can be installed to or removed from the module, which reduces the maintenance cost and improves the maintainability.
All the operation and wiring parts are placed on the module front, allowing easier operation and wiring.

■Improved maintenability by system separation
By using the AJ65BTS-RPH, any of the systems can be separated and error location can be identified quickly.
This prevents the whole system from being seriously affected by an error.

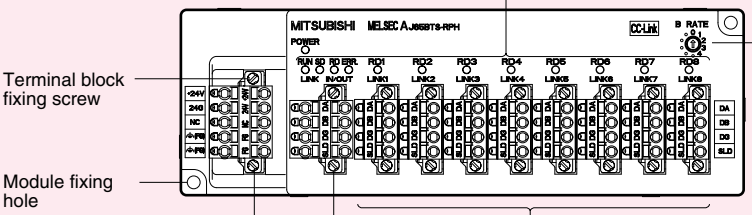
■Related manual

User's Manual IB-0800346 (13JP97)

■Performance specifications

Item		Specifications	
Station number		– (none)	
Station type		– (none)	
Number of occupied stations		0 (none)	
Transmission speed		Can select from 156kbps / 625kbps / 2.5Mbps / 5Mbps / 10Mbps	
Maximum number of modules connected to trunk line		64	
Connection position		Trunk line side: No restriction (compliant with the CC-Link specifications) Branch line side: Connect to the end of the branch line (segment end)	
Maximum number of stages per segment		AJ65BTS-RPH only	2nd stage
		Combination of AJ65BTS-RPH and AJ65SBT-RPT	3rd stage
		Combination of AJ65BTS-RPH and one of AJ65FBTA-RPH, AJ65SBT-RPS/RPG, or AJ65BT-RPI	2nd stage
Terminating resistor		Trunk line side: 110Ω, or 130Ω can be selected. Branch line side: 110Ω (built-in)	
Connectable terminal block	Terminal block type	Spring clamp terminal block	
	Applicable wire size	AWG #24 to 12, ϕ0.5 to 1.78mm^2 single cable, 0.2 to 2.5mm^2 stranded cable	
Mounting orientation		No restriction (mountable in 6 orientations)	
Module mounting screw		M4 mounting screw	
Applicable DIN rail		TH35-7.5Fe, TH35-7.5Al (conforming to IEC 60715)	
Power supply	Voltage	24VDC external power supply (20.4 to 26.4V, ripple within ±5%)	
	Current	0.36A (when TYP. 24VDC)	

■Part names and settings



Terminal block fixing screw

Module fixing hole

Operation status indicator LEDs
Check for the module condition by observing the state of lighting of the LEDs.

LED name	Description
POWER	On: Power supply ON
	Off: Power supply OFF
RUN	On: Module is operating normally
	Off: Module is not operating normally
SD LINK IN/OUT	On: Data are being sent to the LINK IN or LINK OUT of the trunk line
	Off: Data are not being sent to the LINK IN or LINK OUT of the trunk line
RD LINK IN/OUT	On: Data are being received from the LINK IN or LINK OUT of the trunk line
	Off: Data are not being received from the LINK IN or LINK OUT of the trunk line
ERR.	On: Transmission speed setting out-of-range error or communication error occurred
	Flashing: Terminating resistor is missing. The module and CC-Link cables are affected by noise. Or the transmission speed was changed after power up.
	Off: Module is operating normally
RD LINK 1 to 8	On: Data are being received from the LINK1 to 8 of the branch line
	Off: Data are not being received from the LINK1 to 8 of the branch line

Power terminal block
Connects the module power supply (24V DC) and the ground cable (FG: Functional Ground)

+24V	+24V
24G	24G
NC	NC
FG	FG
FG	FG

Communication terminal block (Trunk line side)
Connects the transmission lines on the trunk line side (LINK IN/OUT)

DA	DA
DB	DB
DG	DG
SLD	SLD

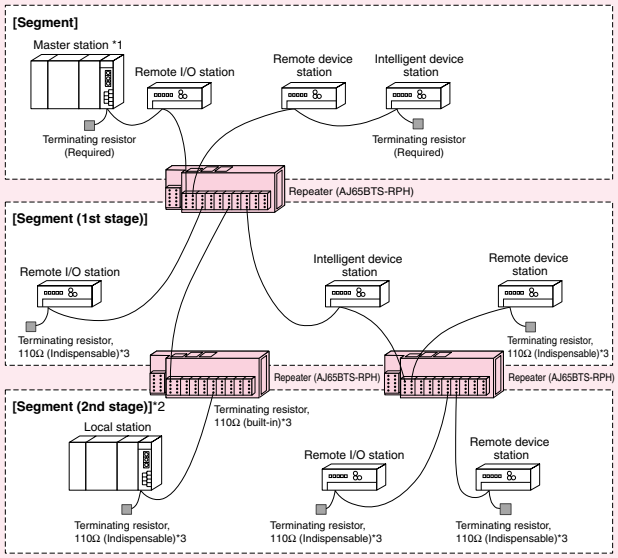
Communication terminal block (Branch line side)
Connects the transmission lines on the branch line side (LINK 1 to 8)

DA
DB
DG
SLD

Transmission speed setting switch
Set the transmission speed of the module (set to 0 at the time of delivery).
Ensure to set the transmission speed at a speed specified below.
Transmission speed of the trunk line side is identical with that of the branch line side.

Setting value	Switch status
0	156kbps
1	625kbps
2	2.5Mbps
3	5Mbps
4	10Mbps
Other than 0 to 4	N/A If set to other than 0 to 4, the ERR.LED is turned on and data are not transferred.

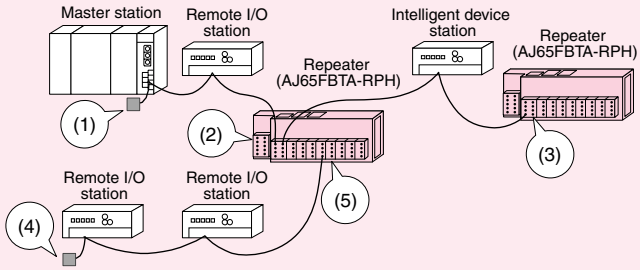
■System configuration



*1: It is necessary to match the transmission speed of each segment to that of the master station.
*2: Two more stages can be connected as segments.
*3: Use a terminating resistor of 110Ω for the AJ65FBTA-RPH. Use of 130Ω is not allowed.

■Module connection

The method of connecting the AJ65BTS-RPH module to the CC-Link system through the CC-Link dedicated cable is shown below.



(1) For the segment connected to the trunk line side of the AJ65BTS-RPH, connect a terminating resistor to the module connected at the end.
Select a type for terminating resistor in accordance with the type of the connected communication cable.
For details, refer to the manual of the module connected.

(2) Do not connect any terminating resistor to the AJ65BTS-RPH when the trunk line side is connected to a station that is not located at the end of the segment.
In addition, connect the shielding wire of the CC-Link dedicated cable to "SLD" of each module, and ground both ends via "FG" The interval between SLD and FG is connected in the module in advance.

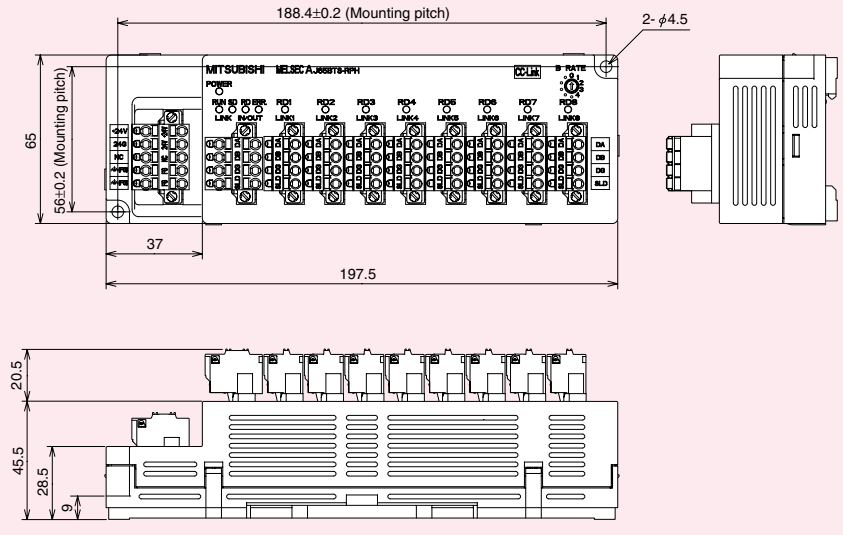
(3) Connect the included terminating resistor to the AJ65BTS-RPH when the trunk line side is connected to a station that is located at the end of the segment.
Select a type for terminating resistor in accordance with the type of the connected communication cable.
In addition, connect the shielding wire of the CC-Link dedicated cable to "SLD" of each module, and ground both ends via "FG" The interval between SLD and FG is connected in the module in advance.

(4) Connect the included 110Ω terminating resistor to the module located at the end of a segment when the branch line side of the AJ65BTS-RPH is connected to the segment.
For the connection of terminal resistor, refer to the manual of the module connected.

(5) For the branch line side of the AJ65BTS-RPH, use the incorporated 110Ω terminating resistor.
In addition, connect the shielding wire of the CC-Link dedicated cable to "SLD" of each module, and ground both ends via "FG".
Note that SLD and FG are connected to each other in the module.

■External dimensions

Unit: mm



Repeater modules

Repeater module (T-branch)
AJ65SBT-RPT

Features

■T-branch wiring in the CC-Link system is available.
Connecting this module between other CC-Link system modules enables T-branch wiring at any CC-Link system transmission speed (10Mbps, 5Mbps, 2.5Mbps, 625kbps or 156kbps).

■The transmission distance of the CC-Link system can be extended.
Use of this module allows extension of the transmission distance in the CC-Link system.
Extensions of up to 10 stages are possible by using multiple AJ65SBT-RPT modules.

■Related manual

User's Manual IB-0800078 (13JQ81)

■Performance specifications

Item		Specifications
Transmission speed		Selectable from among 156kbps, 625kbps, 2.5Mbps, 5Mbps and 10Mbps
Maximum number of stages per segment		10 stage
Maximum transmission distance of each segment		Varies according to transmission speed
Number of occupied stations		0 (none)
Settable station number		None
External power supply	Voltage	20.4 to 26.4VDC
	Current	60.0mA (when TYP. 24VDC)
External dimensions		87.3 (W) x 54 (H) x 40 (D) mm
Weight		0.2kg

■Part names and settings

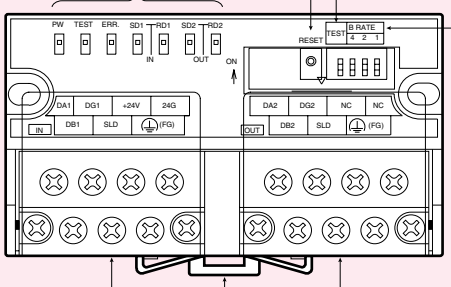
Operation status indicator LEDs
Check for the module condition by observing the state of lighting of the LEDs.

LED name	During hardware test	During normal operation
PW	On: Power supply is turned ON	
	Off: Power supply is turned OFF or reset switch is pressed	
TEST	On: Hardware test is under operation	
	Off: Communication is under operation	
ERR.	On: Hardware is faulty Switch set value is faulty	On: Communication is faulty Switch set value is faulty
	Flashing: Switch set value was changed changed during operation	Flashing: Switch set value was changed during operation
	Off: Normal	Off: Communication is normal
SD1	Flashing: Circuit is normal	On: Data is being transmitted to IN side
	Off: Circuit is faulty	Off: Data is not transmitted to IN side
RD1	Flashing: Circuit on IN side is normal	On: Data is being received from IN side
	Off: Circuit on IN side is faulty	Off: Data is not received from IN side
SD2	Flashing: Circuit is normal	On: Data is being transmitted to OUT side
	Off: Circuit is faulty	Off: Data is not transmitted to OUT side
RD2	Flashing: Circuit on OUT side is normal	On: Data is being received from OUT side
	Off: Circuit on OUT side is faulty	Off: Data is not received from OUT side

RESET switch
Reset the module on the hardware side (set to OFF at the time of delivery).

TEST switch
Set the operating condition of the module (set to OFF at the time of delivery).

Switch status	Operating status
ON	Hardware test
OFF	Normal operation



Transmission speed setting switch
Set the transmission speed of the module (set to 0 at the time of delivery).
Be sure to set it as shown in the table below.
Any other setting will light up the "ERR." LED.

Setting value	Switch status 4	2	1	Transmission speed
0	OFF	OFF	OFF	156kbps
1	OFF	OFF	ON	625kbps
2	OFF	ON	OFF	2.5Mbps
3	OFF	ON	ON	5Mbps
4	ON	OFF	OFF	10Mbps

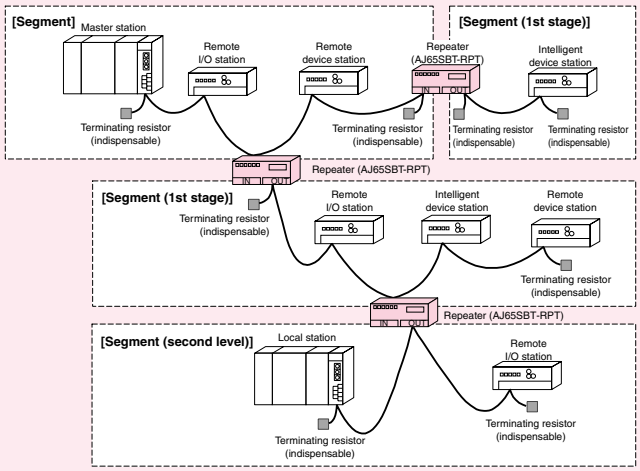
IN side terminal block
Terminal block for connecting the CC-Link dedicated cable on the side where the power supply and master station are located.

DIN rail hook
Hook for installing the module on the DIN rail.

OUT side terminal block
Terminal block for connecting the CC-Link dedicated cable on the side where the master station is not located.

POINT
The states of setting of the test switch and transmission speed set switch obtained when the module power supply is set from OFF to ON or the reset switch is set to OFF become effective.
When the states of setting are changed with the module power supply turned ON, perform the above operations again.

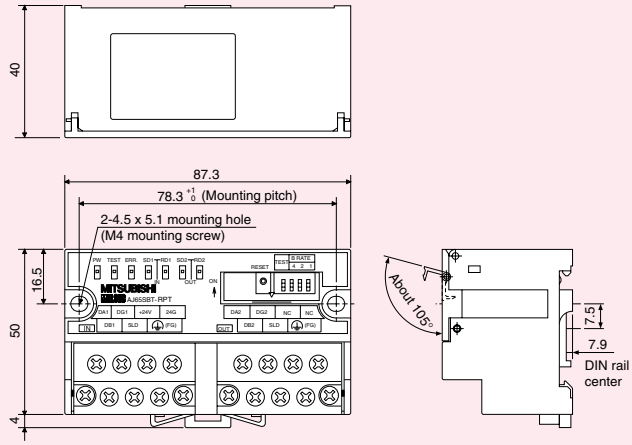
■System configuration



*1: A repeater module is used to make connection between different segments and extend the CC-Link system.
*2: In the CC-Link system using repealers, a block of devices connected from one terminating resistor to another is referred to as a segment.
(The conventional CC-Link system is made up of one segment.)
*3: It is necessary to match the transmission speed of each segment device to that of the master station.

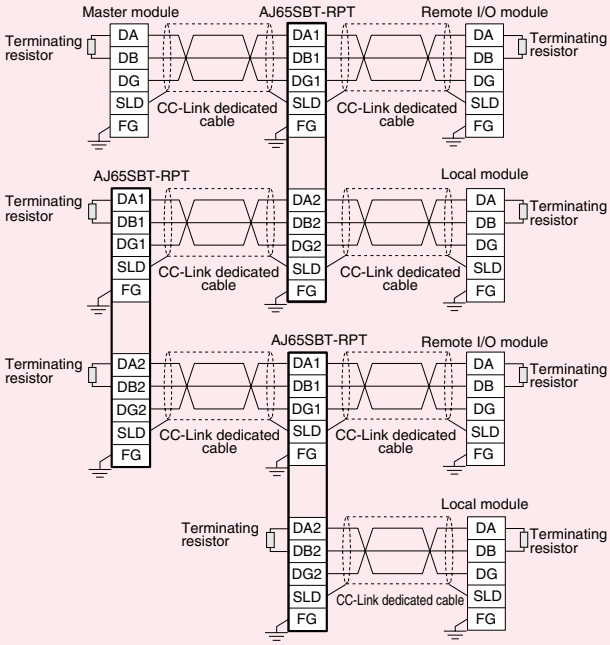
■External dimensions

Unit: mm



■Module connection

The following shows how to connect the AJ65SBT-RPT to a CC-Link system with CC-Link dedicated cables.



IMPORTANT
In each segment, ensure to use the same type of CC-Link dedicated cables.
If different types of cables are used, normal data transmission will not be assured.

POINT
- Ensure to connect the terminating resistor to both end modules of each segment.
  In addition, connect them between DA and DB (DA1-DB1 and DA2-DB2 for AJ65SBT-RPT).
  (The terminating resistor are furnished with the module.)
- The terminating resistor vary according to the type of cables in use.
  For detail, refer to the User's Manual of the applicable master module.
- Connect the shield wire of the CC-Link dedicated cable to "SLD" of each module, and ground both ends of the shielded wire via "FG".
  The SLD and FG are connected within the module.

Repeater modules

Optical repeater module
AJ65SBT-RPS
AJ65SBT-RPG

Features

■The transmission distance of the CC-Link system can be extended.
Using pairs of the same models, AJ65SBT-RPS (for SI/QSI type optical fiber cable) or AJ65SBT-RPG (for GI type optical fiber cable), allows extension of the transmission distance in the CC-Link system.
Extensions of up to 3 stages are possible by using multiple pairs of modules (up to 2 stages for the AJ65SBT-RPG).

■T-branch wiring in the CC-Link system is available.
Connecting these modules between other CC-Link system modules enables T-branch wiring.

■Stable and noise-tolerant system
Using optical fiber cables for branching or extension prevents problems caused by noise, improving the system stability.

■Related manual

User's Manual IB-0800089 (13JQ85)

■Performance specifications

Item			Specifications		
			AJ65SBT-RPS		AJ65SBT-RPG
Common specifications	Power supply	Voltage	20.4 to 26.4VDC		
		Current	60mA (when TYP. 24VDC)		
	External dimensions		118 (W) X 54 (H) X 40 (D) mm		
	Weight		0.2kg		
CC-Link communication specifications	Supplied parts		Terminating resistor (110Ω x 1, 130Ω x 1)		
	Maximum number of stages per system		3 stages		2 stages
	Number of occupied stations		0 (none)		
Optical communication specifications	Connection cable		SI-200/220	QSI-185/230	GI-50/125
	Applicable connector		CA7003		CA9103S
	Maximum transmission distance of optical fiber cable between repeater modules		500m	1000m	2000m

■Part names and settings

Operation status indicator LEDs
Check for the module condition by observing the state of lighting of the LEDs

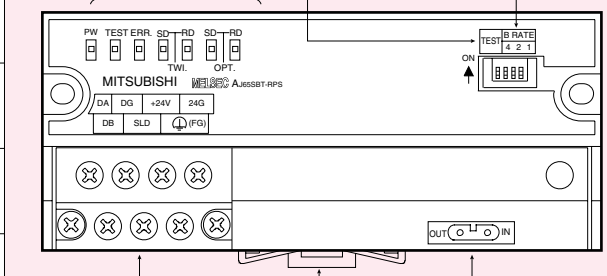
LED name	During hardware test	During normal operation
PW	On: At power-ON	
	Off: At power-OFF	
TEST	On: Hardware test is under operation	
	Off: Communication is under operation	
ERR.	On: Hardware is faulty Switch set value is faulty	On: Communication is faulty Switch set value is faulty
	Flashing: Switch set value was changed during operation	Flashing: Switch set value was changed during operation
	Off: Normal	Off: Communication is normal
TWI.SD	Flashing: Circuit is normal	On: Data is being transmitted to CC-Link side
	Off: Circuit is faulty	Off: Data is not transmitted to CC-Link side
TWI.RD	Flashing: CC-Link side circuit is normal	On: Data is being received from CC-Link side
	Off: Optical communication side circuit is faulty	Off: Data is not received from CC-Link side
OPT.SD	Flashing: Circuit is normal	On: Data is being transmitted to optical communication side
	Off: Circuit is faulty	Off: Data is not transmitted to optical communication side
OPT.RD	Flashing: CC-Link side circuit is normal	On: Data is being received from optical communication side
	Off: Optical communication side circuit is faulty	Off: Data is not received from optical communication side

TEST switch
Set the operating condition of the module (set to OFF at the time of delivery).

Switch status	Operation status
ON	Hardware test
OFF	Normal operation

Transmission speed setting switches
Set the transmission speed of the module (set to 0 at the time of delivery).
Be sure to set it as shown in the table below.
Any other setting will light up the "ERR." LED.

Setting value	Switch status 4	2	1	Transmission speed
0	OFF	OFF	OFF	156kbps
1	OFF	OFF	ON	625kbps
2	OFF	ON	OFF	2.5Mbps
3	OFF	ON	ON	5Mbps
4	ON	OFF	OFF	10Mbps



Terminal block
Terminal block for connecting the power supply and CC-Link dedicated cables.

DIN rail hook
Hook for installing the module on the DIN rail.

Optical interface

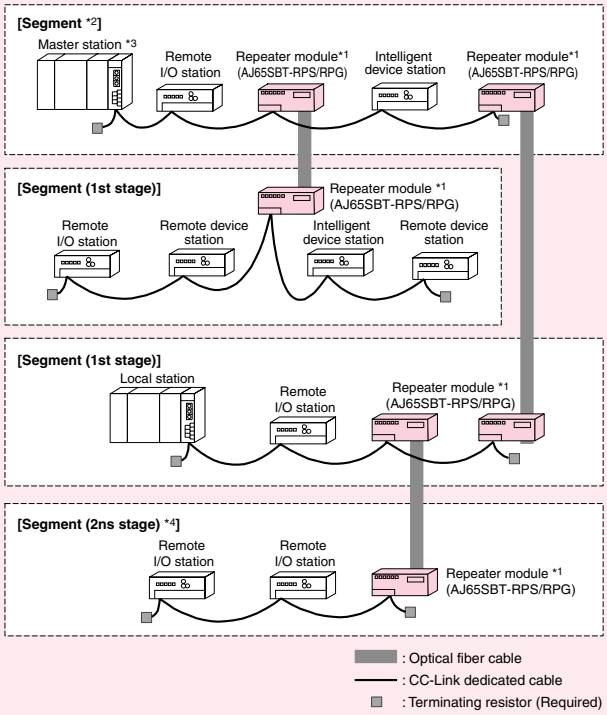
POINT
The setting of the test switch is made valid when the module power is turned from OFF to ON.
If the setting is changed with the module power ON, perform the above operation again.

■System configuration

Combinations of optical repeater modules and optical fiber cables

The optical repeater modules can be used in the following combinations with optical fiber cable.

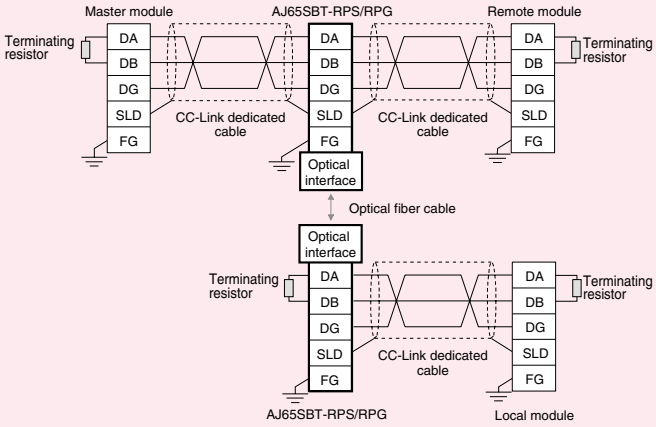
Optical repeater module	Optical fiber cable
AJ65SBT-RPS	SI-type optical fiber cable (maximum extension distance of cable: 500m)
	QSI-type optical fiber cable (maximum extension distance of cable: 1000m)
AJ65SBT-RPG	GI-type optical fiber cable (maximum extension distance of cable: 2000m)



*1: A repeater module is used to make connection between different segments and extend the CC-Link system.
*2: In the CC-Link system using repeater modules, a block of devices connected from one terminating resistor to another is referred to as a segment.
(The conventional CC-Link system is made up of one segment.)
*3: It is necessary to match the transmission speed of each segment device to that of the master station.
*4: Up to 3 stages can be added to a system. (Up to 2 stages for use of the AJ65SBT-RPG)

■Module connection

The following shows how to connect the AJ65SBT-RPS/RPG to a CC-Link system with CC-Link dedicated cables.



IMPORTANT

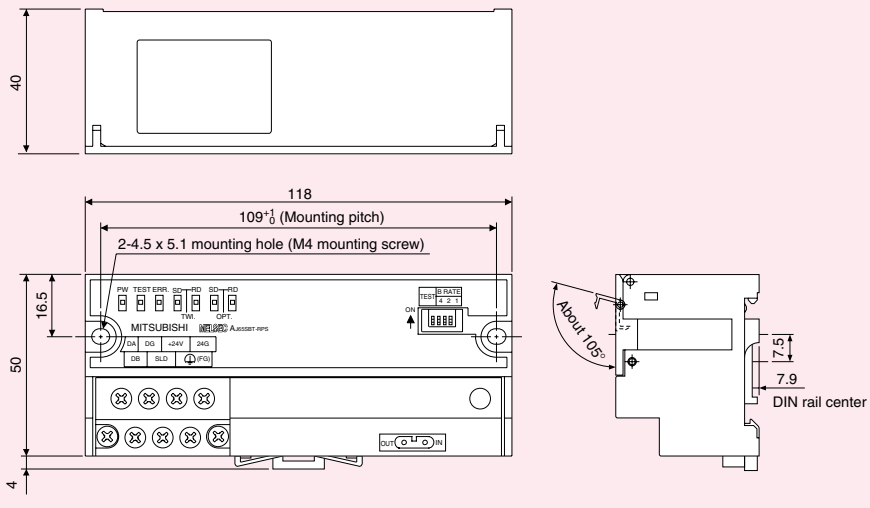
In each segment, ensure to use the same type of CC-Link dedicated cables.
If different types of cables are used, normal data transmission will not be assured.

POINT

- Ensure to connect the terminating resistor to both end modules of each segment.
  In addition, connect them between DA and DB.
  (The terminating resistor are furnished with the module.)
- The terminating resistor varies according to the type of cables in use.
  For detail, refer to the User's Manual of the applicable master module.
- Connect the shielded wire of the CC-Link dedicated cable to "SLD" of each module, and ground both ends of the shielded wire via "FG".
  The SLD and FG are connected within the module.

■External dimensions

Unit: mm



Repeater modules

Space optical repeater module
AJ65BT-RPI-10A
AJ65BT-RPI-10B

Features

■Space transmission using infrared light is available.
Combination of the AJ65BT-RPI-10A and AJ65BT-RPI-10A allows space transmission in the CC-Link system over distances from 1 to 100m using infrared light. By adopting these modules, CC-Link systems can be used in places where wiring is difficult. The maximum transmission speed is 2.5Mbps.

■Communication status of modules can be monitored.
By setting a station number and parameters on the master station (regarding a pair as a remote I/O station), the optical reception status of connected modules can be monitored (Data are loaded to the master station.).
Also, reception status indication with the LEDs is available by sequence programs in the master station, allowing fine adjustment of the optical axis.

■The AJ65BT-RPI-10A and AJ65BT-RPI-10B must be used as a pair.

■Related manual

User's Manual IB-0800090 (13JQ86)

■Performance specifications

Item			Specifications
Common specifications	Power supply	Voltage	20.4 to 26.4VDC
		Current	137mA (at TYP. 24VDC)
	External dimensions		161 (W) X 100 (H) X 57.5 (D) mm
	Weight		0.5kg
CC-Link communication specifications	Transmission speed		Selectable from 156k/625k/2.5Mbps.
	Maximum number of stages per segment		2 stages
	Number of occupied stations		When using monitor function : 1station When not using monitor function : 0station
Optical communication specifications	Optical transmission distance		0 to 100m
	Orientation angle		Optical transmission distance of 0 to 50m: Full angle ±2° Optical transmission distance of 50 to 100m: Full angle ±1°
	Modulation frequency		A module to B module: 36 ±3MHz B module to A module: 44 ±2.5MHz
	Modulation method		FSK
Special note: general specifications	Ambient illumination *		10000 lx or less (avoid direct sunlight)

* Reference values (based on JIS Z9110) of ambient illumination are shown below.
- I llumination required for work using visual attention in a plant: 3000 to 1500 lx
- Illumination required for work in an office: 2000 to 750 lx

■Part names and settings

Transmission speed setting switch
Used to set the transmission speed of the module. (Factory setting: 0)

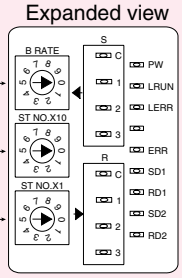
Setting value	Transmission speed
0	156kbps
1	625kbps
2	2.5Mbps
3 to 9	N/A

Station number setting switch (Tens place)

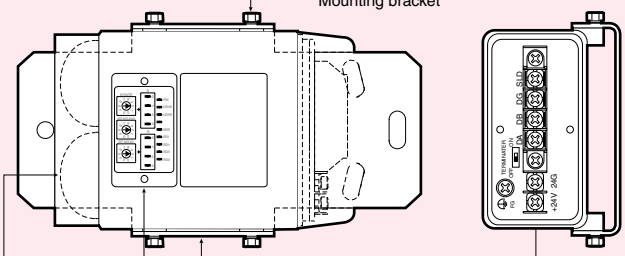
Station number setting switch (Ones place)
Used to set the station number of the module.
Also used to set whether the monitor function is used or not.
(Factory setting: 0)

00	Monitor function is not used
01 to 64	Station number when monitor function is used
65 to 99	Must not be set.

Expanded view



Module mounting screws
Used to fix the module to the mounting bracket.
Mounting bracket



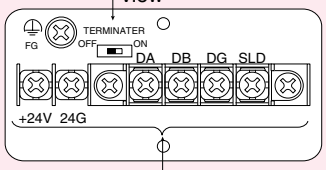
Lens surfaces
Used to make optical communication.

Mounting bracket
Used to mount the module.

Cover mounting screw
Used to fix the display window to the module.
The display window is removed when switch setting is to be made.

Terminating resistance setting switch
Used to set whether the built-in terminating resistor (110Ω) of the module is used or not.
(Factory setting: OFF)

Expanded view



Terminal block
Used to connect the power supply cable and CC-Link dedicated cables.

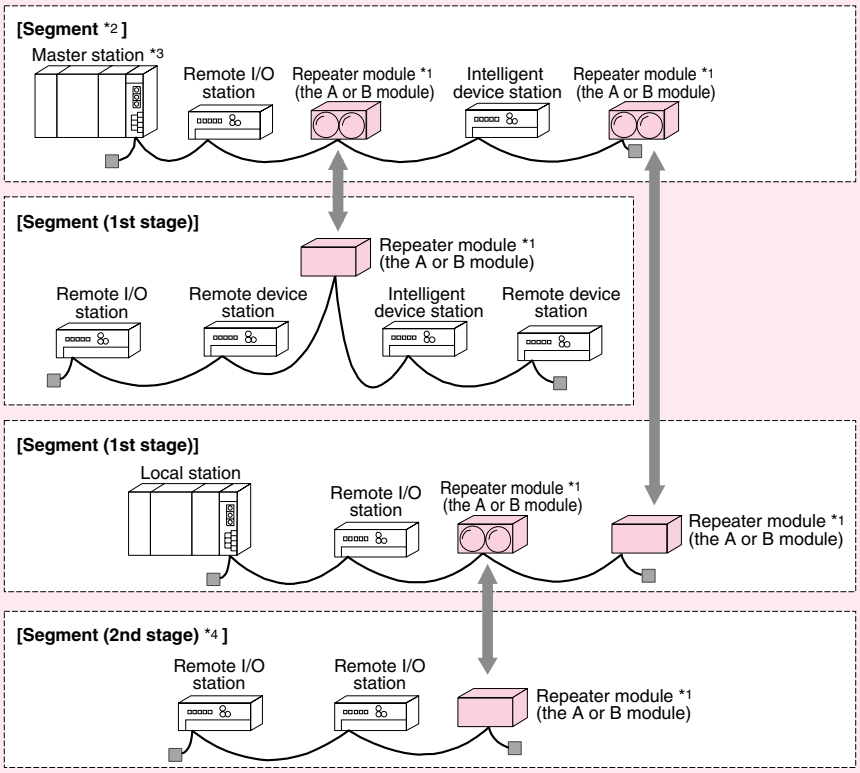
Operation status indicator LEDs
Check for the module condition by observing the state of lighting of the LEDs.

LED name	Description	
PW	On: Indicates that power is ON Off: Indicates that power is OFF	
LRUN	On: Indicates normal communication when the monitor function is used Off: Indicates that a communication error occurred when the monitor function is used or that the monitor function is not used	
LERR	On: Indicates that a communication error occurred when the monitor function is used or that the monitor function is not used Off: Indicates normal communication when the monitor function is used	
ERR	On: Indicates a communication error Off: Indicates a normal status	
SD1	On: Indicates that data is being sent to the connection cable side Off: Indicates that data is not sent to the connection cable side	
SD2	On: Indicates that data is being sent to the light output side Off: Indicates that data is not sent to the light output side	
RD1	On: Indicates that data is being received from the connection cable side Off: Indicates that data is not received from the connection cable side	
RD2	On: Indicates that data is being received from the light input side Off: Indicates that data is not received from the light input side	
SC	On: Indicates that RY (n+1) 0 is ON Off: Indicates that RY (n+1) 0 is OFF	Lit only when the monitor function is used.
S1	On: Indicates that RY (n+1) 1 is ON Off: Indicates that RY (n+1) 1 is OFF	
S2	On: Indicates that RY (n+1) 2 is ON Off: Indicates that RY (n+1) 2 is OFF	
S3	On: Indicates that RY (n+1) 3 is ON Off: Indicates that RY (n+1) 3 is OFF	
RC	On: Indicates that the own module is enabled for light receiving Off: Indicates that the own module is disabled for light receiving	
R1	On: Indicates that the light receiving level allowance of the own module is 1.5 times or more Off: Indicates that the light receiving level allowance of the own module is less than 1.5 times (based on RC)	
R2	On: Indicates that the light receiving level allowance of the own module is 2.0 times or more Off: Indicates that the light receiving level allowance of the own module is less than 2.0 times (based on RC)	
R3	On: Indicates that the light receiving level allowance of the own module is 2.5 times or more Off: Indicates that the light receiving level allowance of the own module is less than 2.5 times (based on RC)	

POINT
The settings of the transmission speed setting switch and station number setting switches are made valid when the module power is switched from OFF to ON. If any switch setting has been changed with the module power ON, perform the above operation again.

Repeater modules

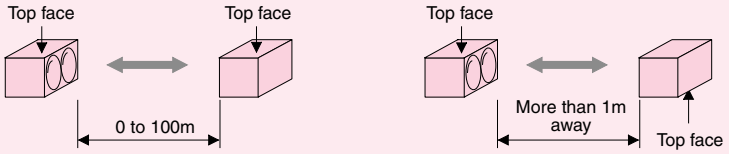
■System configuration



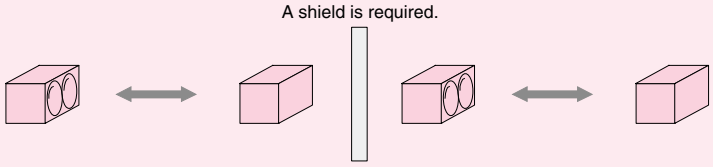
: Space transmission
: CC-Link dedicated cable
: Terminating resistor (Required)

*1 A repeater module is used to make connection between different segments and extend the CC-Link system.
AJ65BT-RPI-10A (module A) and AJ65BT-RPI-10B (module B) must be used as a pair.
*2 In the CC-Link system using repeaters, a block of device connected from one terminating resistor to another is referred to as a segment.
(The conventional CC-Link system is made up of one segment.)
*3 It is necessary to match the transmission speed of each segment device to that of the master station (2.5 Mbps/625 kbps/156 kbps).
*4 Up to 2 stages can be added to a system.

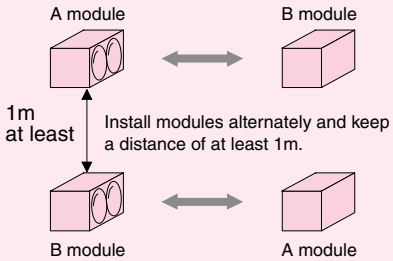
● When mounting the AJ65BT-RPI-10A/10B, it has no specific mounting orientation as a module alone. However, it should be mounted with its top face placed in the same orientation as that of the mating module with which optical communication is made. When these modules are mounted in opposite orientations, they must be mounted more than 1m away from each other.



● When using multiple sets of the AJ65BT-RPI-10A/10B in line, provide shields between the sets. Not doing so can cause a malfunction due to interference.

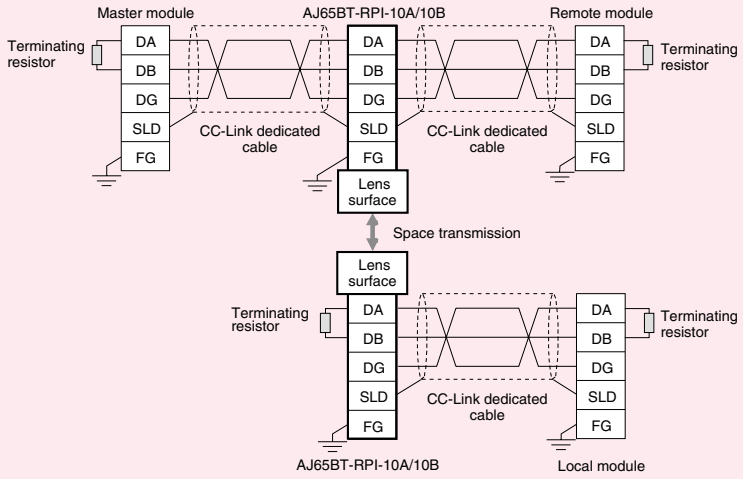


● If multiple pairs of the AJ65BT-RPI-10A and -10B are placed in parallel, position modules A and B alternately for each pair and keep a 1m distance or more between pairs. Failure to do so may cause a malfunction due to interference.



■Module connection

The method of connecting the AJ65BT-RPI-10A/10B module to the CC-Link system through the CC-Link dedicated cable is shown below.

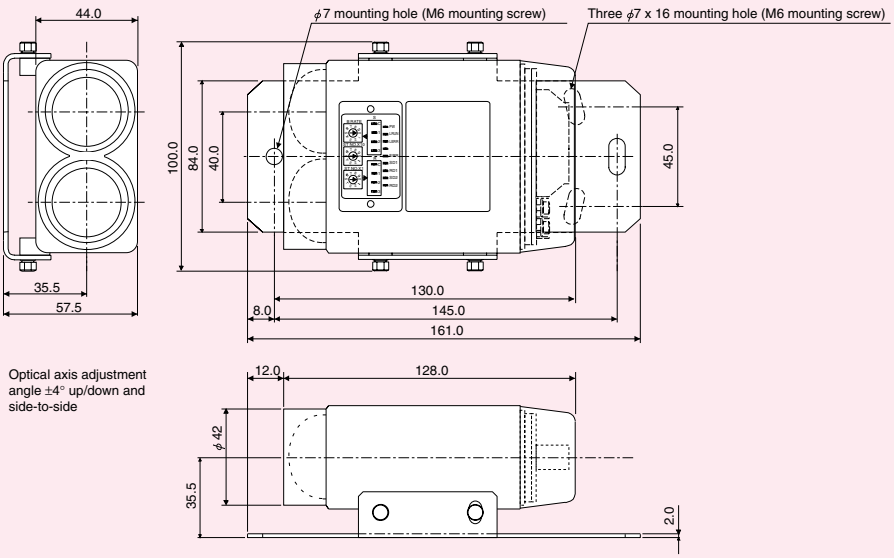


IMPORTANT
In each segment, ensure to use the same type of CC-Link dedicated cables. If different types of cables are used, normal data transmission will not be assured.

POINT
- Ensure to connect the terminating resistors to both end modules of each segment. In addition, connect them between DA and DB (DA1-DB1 and DA2-DB2 for AJ65BT-RPI-10A/10B). (The terminating resistors are furnished with the module.)
- The terminating resistors vary according to the type of cables in use. For detail, refer to the User's Manual of the applicable master module.
- Connect the shield cable of the CC-Link dedicated cable to "SLD" of each module, and ground both ends of the cable through "FG" to a class-D (class 3) ground. SLD and FG are wired to each other inside the module.

■External dimensions

Unit: mm



Optional parts

Accessories

One-touch connector plug

Model: A6CON-P214 (20pcs)
A6CON-P220 (20pcs)
A6CON-P514 (20pcs)
A6CON-P520 (20pcs)

●One-touch connector for I/O module inputs/outputs
Adoption of the press-fitting connection method can drastically reduce wiring steps.

Model name	Applicable cable core (mm^2)	Applicable cable outside diameter (mm)
A6CON-P214	0.14 to 0.2	ϕ1.0 to 1.4
A6CON-P220	(AWG#26 to 24)	ϕ1.4 to 2.0
A6CON-P514	0.3 to 0.5	ϕ1.0 to 1.4
A6CON-P520	(AWG#22 to 20)	ϕ1.4 to 2.0

◎Applicable model
AJ65SBTC □-□type remote I/O modules
AJ65VBTCU □-□type remote I/O modules
AJ65VBTCU-□type analog modules

One-touch connector plug for communication

Model: A6CON-L5P (10pcs)

●One-touch connector for I/O module communications
Adopting the press-fitting connection method and providing connectors on the same face will improve wiring works.

◎Applicable model
AJ65ABTP □-□type remote I/O modules
AJ65VBTS □-□type remote I/O modules
AJ65VBTCE □-□type remote I/O modules
AJ65VBTCU □-□type remote I/O modules
AJ65VBTCU-□type analog modules
AJ65SBT-CLBM-M type CC-Link-CC-Link/LT bridge modules

One-touch connector plug for power supply and FG

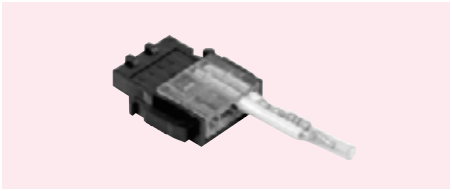
Model: A6CON-PW5P (10pcs)
A6CON-PW5P-SOD (10pcs)

●One-touch connector for I/O module power supply and FG
Adopting the press-fitting connection method and providing connectors on the same face will improve wiring works.

Model name	Applicable cable core (mm^2)	Applicable cable outside diameter (mm)
A6CON-PW5P	0.75(0.66 to 0.98)	ϕ2.2 to 3.0
A6CON-PW5P-SOD	(AWG#18)	ϕ2.0 to 2.3

◎Applicable model
AJ65ABTP □-□type remote I/O modules
AJ65VBTS □-□type remote I/O modules
AJ65VBTCE □-□type remote I/O modules
AJ65VBTCU □-□type remote I/O modules
AJ65VBTCU-□type analog modules

One-touch connector plug with terminating resistor



Model: A6CON-TR11 (1pc)

●One-touch connector with terminating resistor for I/O module
Adopting the press-fitting connection method and providing connectors on the same face will improve wiring works.

◎Applicable model
AJ65ABTP □-□type remote I/O modules
AJ65VBTS □-□type remote I/O modules
AJ65VBTCE □-□type remote I/O modules
AJ65VBTCU □-□type remote I/O modules
AJ65VBTCU-□type analog modules
AJ65SBT-CLBM-M type CC-Link-CC-Link/LT bridge modules

Online connector for communication

Model: A6CON-LJ5P (5pcs)

●Online connector for communications
Module replacement is possible without stopping communication.

◎Applicable model
AJ65ABTP □-□type remote I/O modules
AJ65VBTS □-□type remote I/O modules
AJ65VBTCE □-□type remote I/O modules
AJ65VBTCU □-□type remote I/O modules
AJ65VBTCU-□type analog modules
AJ65VBTCF □-□type remote I/O modules
AJ65SBT-CLBM-M type CC-Link-CC-Link/LT bridge modules

Online connector for power supply and FG

Model: A6CON-PWJ5P (5pcs)

●Online connector for power supply and FG
Module replacement is possible without stopping communication.

◎Applicable model
AJ65ABTP □-□type remote I/O modules
AJ65VBTS □-□type remote I/O modules
AJ65VBTCE □-□type remote I/O modules
AJ65VBTCU □-□type remote I/O modules
AJ65VBTCU-□type analog modules
AJ65VBTCF □-□type remote I/O modules

Protective cap for unused connector

Model: A6CAP-WP2 (20pcs)

◎Applicable model
AJ65FBTA □-□ type remote I/O modules

●Protective cap for I/O module connector unused.

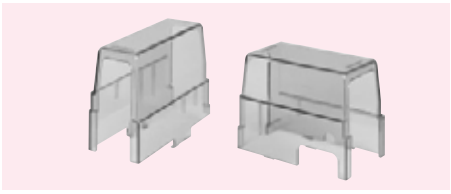
40-pin connector (FCN connector)

Model: A6CON1 (1pc) < Soldered>
A6CON2 (1pc) <Solderless>
A6CON3 (1pc) <Press-fitting>
A6CON4 (1pc) < Soldered (for straight slant type only) >

●40-pin (FCN) connector for I/O module

◎Applicable model
AJ65VBTS □-□ type remote I/O modules
AJ65BTCF □-□ type remote I/O modules
AJ65VBTCF □-□ type remote I/O modules

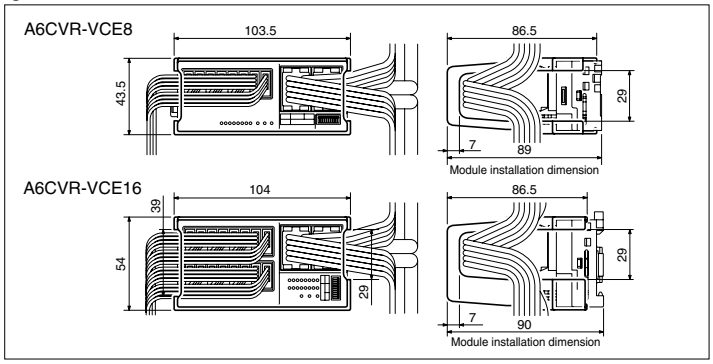
Protective cover (for e-CON type remote I/O module)



Model: A6CVR-VCE8 (10pcs)
A6CVR-VCE16 (10pcs)

●Protective cover for e-CON type I/O module
Prevents wiring connector disconnections, and erroneous switch operation.

◎External dimensions Unit: mm



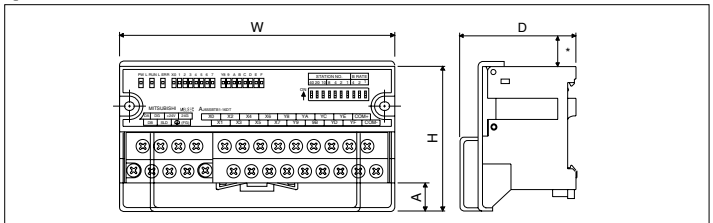
◎Applicable model
<A6CVR-VCE8 type>
AJ65VBTCE3-8D, AJ65VBTCE2-8T type remote I/O modules
<A6CVR-VCE16 type>
AJ65VBTCE3-16D, AJ65VBTCE2-16T, AJ65VBTCE32-16DT, AJ65VBTCE3-16DE, AJ65VBTCE3-16TE, AJ65VBTCE3-16DTE type remote I/O modules

Protective cover (for remote I/O module)

Model: A6CVR-8 (10pcs)
A6CVR-16 (10pcs)
A6CVR-32 (10pcs)

●Protective cover for I/O module
Prevents foreign matter from entering the terminal block.

◎External dimensions Unit: mm



	W	H	D	A
When the protective cover for 8-point module is attached	87.3	62	54	10.1
When the protective cover for 16-point module is attached	118			
When the protective cover for 32-point module is attached	179			

* The minimum length of the upper part of the protective cover is 10mm or more.

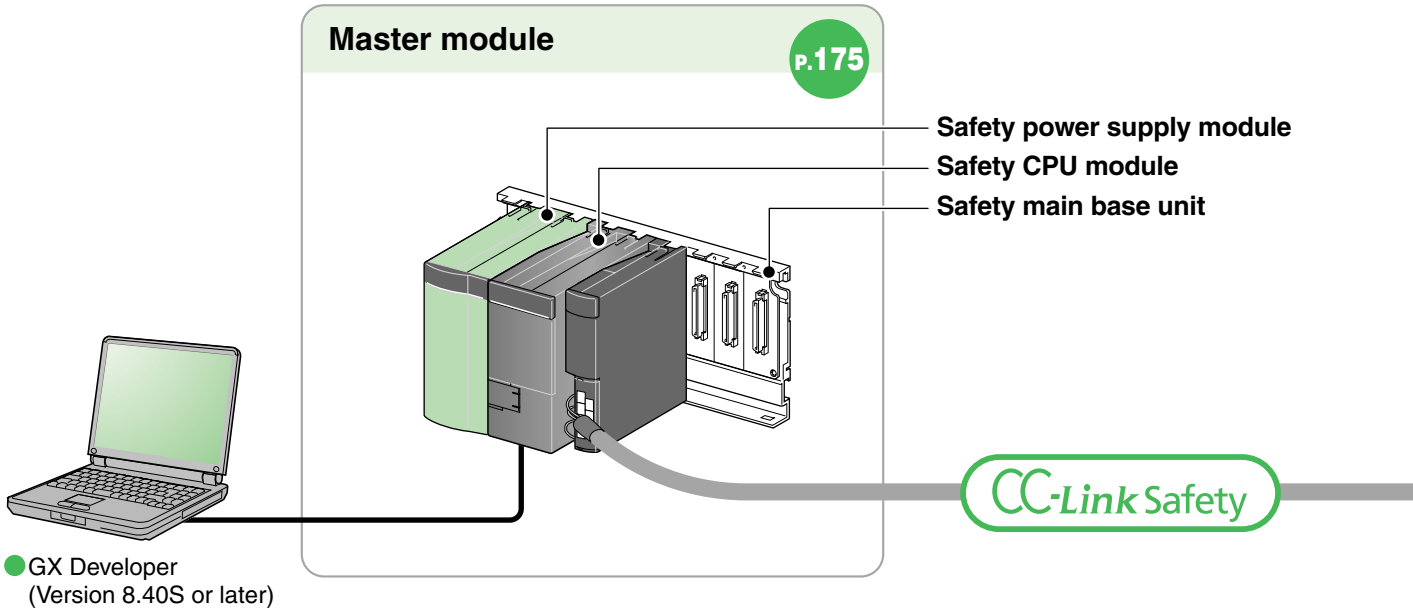
◎Models

Product name	Model	Applicable module
Protective cover for 8-point module (10pcs)	A6CVR-8	AJ65SBTB1-8□, AJ65SBT-RPT
Protective cover for 16-point module (10pcs)	A6CVR-16	AJ65SBTB1-16□, AJ65SBTC1-32□, AJ65SBT-RPG, AJ65SBT-RPS, AJ65SBTC4-□, AJ65SBTB2N-8□, AJ65SBTB2-8□, AJ65SBTB3-8D, AJ65SBTB32-8DT
Protective cover for 32-point module (10pcs)	A6CVR-32	AJ65SBTB1-32□, AJ65SBTB2-16□, AJ65SBTB2N-16□, AJ65SBTB3-16□, AJ65SBTB32-16DT

Memo

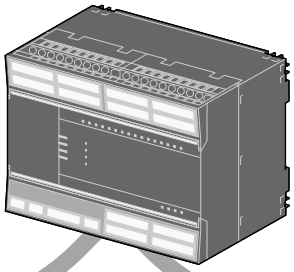
CC-Link Safety

System Configuration Examples



Remote I/O module

P.177

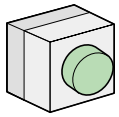


Partner product

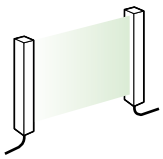
CC-Link Partner Association

Refer to the CC-Link Partner Association catalog

- Light curtain
- Robots and others



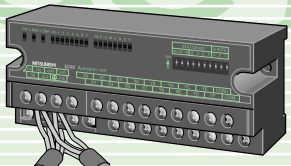
● Emergency stop switch



● Light curtain

● Remote device station

● Standard remote I/O station



P.24 To CC-Link products pages

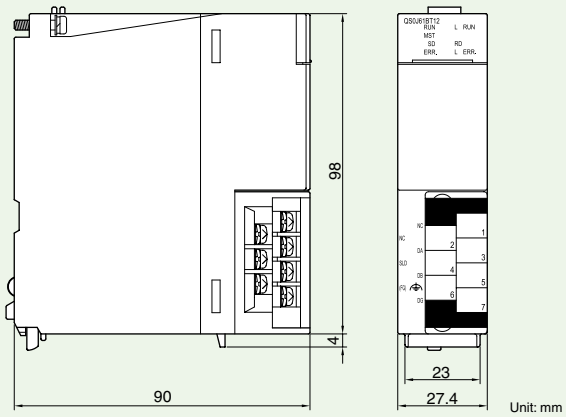
Master module

QS master

QS0J61BT12 Master module (For QS series)

●Internal current consumption: 0.46A
●Weight: 0.12kg

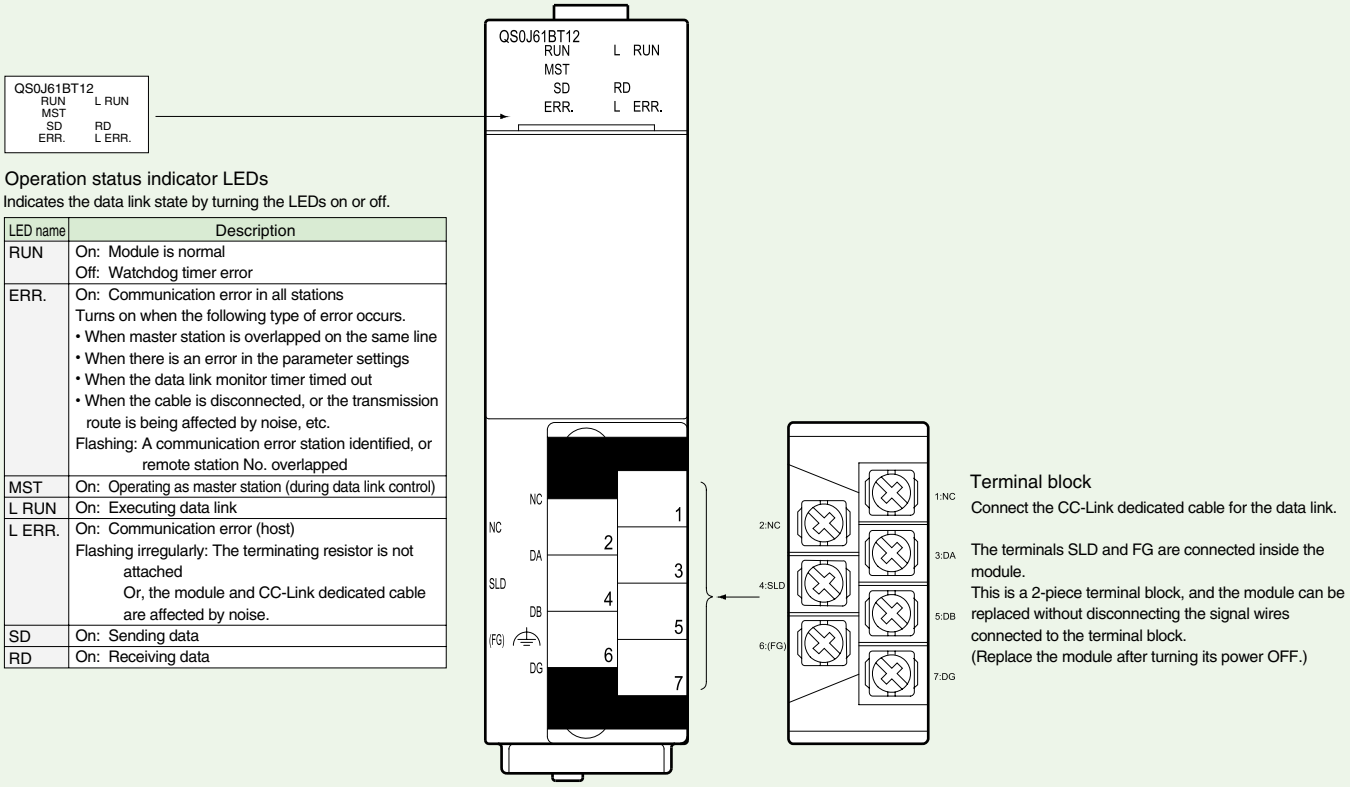
■External dimensions



■Applicable CPU module

Connectable CPU model		Description
Safety CPU module	QS001CPU	Program capacity: 14k steps Number of I/O device points: 6,144 points Number of operation/error histories: 3,000
Safety main base unit	QS034B	4 slots
Safety power supply module	QS061P-A1	Input: 100 to 120VAC, 50/60Hz Output: 5V 6A overvoltage protection, overcurrent protection, shutdown circuit diagnostics
	QS061P-A2	Input: 200 to 240VAC, 50/60Hz Output: 5V 6A overvoltage protection, overcurrent protection, shutdown circuit diagnostics

Part names and settings



Operation status indicator LEDs

Indicates the data link state by turning the LEDs on or off.

LED name	Description
RUN	On: Module is normal Off: Watchdog timer error
ERR.	On: Communication error in all stations Turns on when the following type of error occurs. • When master station is overlapped on the same line • When there is an error in the parameter settings • When the data link monitor timer timed out • When the cable is disconnected, or the transmission route is being affected by noise, etc. Flashing: A communication error station identified, or remote station No. overlapped
MST	On: Operating as master station (during data link control)
L RUN	On: Executing data link
L ERR.	On: Communication error (host) Flashing irregularly: The terminating resistor is not attached Or, the module and CC-Link dedicated cable are affected by noise.
SD	On: Sending data
RD	On: Receiving data

Terminal block

Connect the CC-Link dedicated cable for the data link.

The terminals SLD and FG are connected inside the module.
This is a 2-piece terminal block, and the module can be replaced without disconnecting the signal wires connected to the terminal block.
(Replace the module after turning its power OFF.)

■Performance specifications

Item		Performance specifications				
Transmission speed		Selectable from 156kbps/625kbps/2.5Mbps/5Mbps/10Mbps				
Maximum overall cable length (maximum transmission distance)		For Ver.1.10 compatible CC-Link dedicated cable (terminating resistor of 110Ω used)				
		Transmission speed	Cable length between stations		Maximum overall cable length	
		156kbps	20cm or longer		1200m	
		625kbps			900m	
		2.5Mbps			400m	
		5Mbps			160m	
		10Mbps			100m	
Maximum number of connectable modules		64 modules (safety remote station: 42 modules)				
Maximum number of link points per system		Remote I/O (RX, RY): 2048 points each				
		Remote register (RWr): 256 points (remote device station→master station)				
		Remote register (RWw): 256 points (master station→remote device station)				
Number of link points per remote station	Station type	Safety remote station	Standard remote station			
	Number of occupied stations	1 station	1 station	2 stations	3 stations	4 stations
	RX	32 points	32 points	64 points	96 points	128 points
	RY	32 points	32 points	64 points	96 points	128 points
	RWr	0 points	4 points	8 points	12 points	16 points
	RWw	0 points	4 points	8 points	12 points	16 points
Communication method		Broadcast polling method				
Synchronization method		Flag synchronous system				
Encoding method		NRZI method				
Transmission path		Bus (RS-485)				
Transmission format		HDLC compliant				
Error control system		CRC32 *2 $(X^{32} + X^{26} + X^{23} + X^{22} + X^{16} + X^{12} + X^{11} + X^{10} + X^{8} + X^{7} + X^{5} + X^{4} + X^{2} + X + 1)$				
		CRC16 $(X^{16} + X^{12} + X^{5} + 1)$				
Recommended connection cable		Version 1.10 compatible CC-Link dedicated cable *1				
Number of I/O occupied stations		32 points (I/O assignment: 32 intelligent points)				
5VDC internal current consumption		0.46A				
Weight		0.12kg				

* 1: CC-Link dedicated cable (Ver.1.00) or CC-Link dedicated high-performance cable can be also used. Using a cable together with another type of cable is not allowed. Attach terminating resistors which match the cable type.
* 2: Error detection using CRC32 is not performed for communication with standard remote I/O stations or remote device stations.

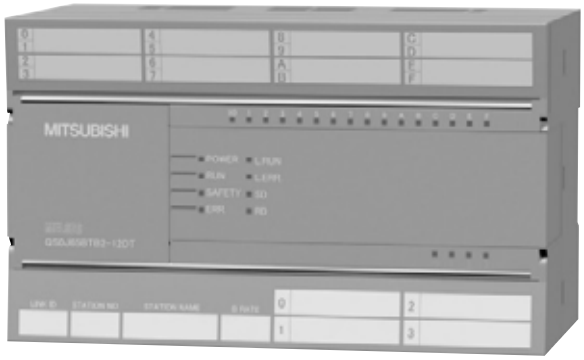
Remote I/O modules

Screw T. block

Screw/2-piece terminal block type

Overview

Screw/2-piece terminal block type



* The actual modules may slightly differ in shapes from the photos shown.

Features

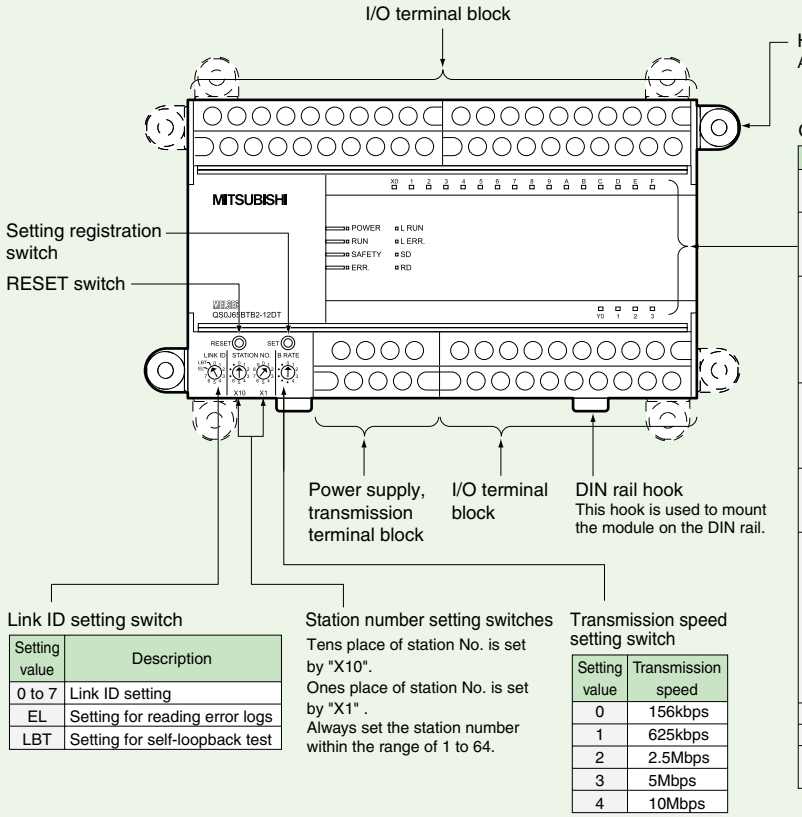
■The module has obtained the certifications of the highest safety level for programmable controller.
A safety network system ensuring high safety can be easily configured.

■The system complying with Category 3 or Category 4 of EN954-1 can be configured by the combination of wiring and parameters.

■Using the module reduces the system installation space compared to a system with safety relay.

■Using a 2-piece terminal block can reduce wiring works and prevent incorrect wiring when replacing the modules.
Also, since the module has multiple COM terminals, no additional relay terminal block is required.

Part names and settings



Operation status indicator LEDs

LED name	Description
POWER	On (green): Normally powered Off: Powered OFF or error occurred (blown fuse)
RUN	On (green): Normally operating, or moderate error occurred Flashing (green): Saving switch setting Off Serious error occurred
SAFETY	On (green): Connected to CC-Link Safety System, or self-loopback test completed normally Flashing (green): Self-loopback test in execution Off: Not connected to CC-Link Safety System, or self-loopback test completed in error
ERR.	On (red): Serious error occurred, or self-loopback test completed in error Flashing (red): Moderate error occurred Off: Normally operating
L RUN	On (green): Normally communicating in the CC-Link Safety System Off: Communication failure in the CC-Link Safety System (Timeout error)
L ERR.	On (red): Value set by Link ID, Station number, or Transmission setting switch is out of range Flashing regularly (red) : Setting of Link ID, Station number, and/or Transmission setting switch is different from that of the internal nonvolatile memory Flashing irregularly (red) : Wrong terminal resistor setting, or noise influence Off: Normally operating
SD	On (green): Data being sent
RD	On (green): Data being received
X0 to XF Y0 to Y3	On (red): I/O ON Off: I/O OFF

Link ID setting switch

Setting value	Description
0 to 7	Link ID setting
EL	Setting for reading error logs
LBT	Setting for self-loopback test

Station number setting switches
Tens place of station No. is set by "X10".
Ones place of station No. is set by "X1" .
Always set the station number within the range of 1 to 64.

Transmission speed setting switch

Setting value	Transmission speed
0	156kbps
1	625kbps
2	2.5Mbps
3	5Mbps
4	10Mbps

I/O combined module
QS0J65BTB2-12DT

DC input 8 pts | -COM | 24VDC 2-wire | Transistor output 4 pts | Sink / Source | 0.5A 2-wire | Screw T. block | Protection

■Detailed specifications

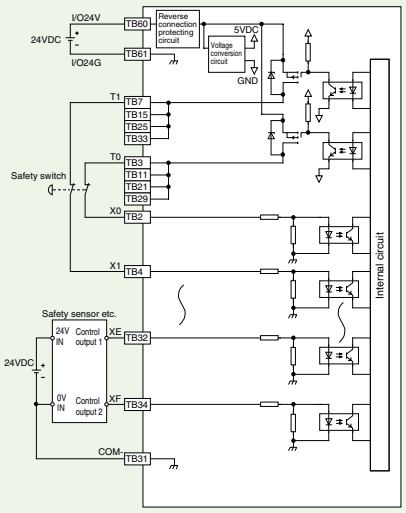
Input specifications		Description
Number of input points		8 points(dual input), 16points(single input)*1
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 4.6mA
Operating voltage range		19.2 to 28.8VDC (ripple ratio: within 5%)
Maximum number of simultaneous input points		100%
ON voltage/ON current		15V or higher/2mA or higher
OFF voltage/OFF current		5V or lower/0.5mA or lower
Input resistance		Approx. 5.6kΩ
Response time	OFF→ON	0.4ms or lower (when 24VDC)
	ON→OFF	0.4ms or lower (when 24VDC)
Safety remote station input response time*2		11.2ms or less + time of noise removal filter (1ms, 5ms, 10ms, 20ms, 50ms)
Input format		Negative common (source type)
Wiring method for common		16 points/common (terminal block 2-wire type)
Number of occupied stations		1 station
Safety refresh response processing time*3		9.6ms
I/O module power supply	Voltage	19.2 to 28.8VDC (ripple ratio: within 5%)
	Current	140mA or lower (when 24VDC, all points ON)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Protection level		IP2X
Weight		0.67kg

Output specifications		Description
Number of output points		4 points (source + sink type) 2 points (source + source type)
Isolation method		Photocoupler
Rated load voltage		24VDC
Operating load voltage range		19.2 to 28.8VDC (ripple ratio: within 5%)
Maximum load current		0.5A/point
Maximum inrush current		1.0A 10ms or lower
Leakage current at OFF		0.5mA or lower
Maximum voltage drop at ON		1.0VDC or lower
Output format		Source + sink type, Source + source type
Protection function		Module power overvoltage/ overcurrent protection function
Response time	OFF→ON	0.4ms or lower (when 24VDC)
	ON→OFF	0.4ms or lower (when 24VDC)
Safety remote station output response time*4		10.4ms or less (at ON→OFF), 11.2ms or less (at OFF→ON)
External power supply for output part	Voltage	19.2 to 28.8VDC (ripple ratio: within 5%)
	Current	60mA or lower (when 24VDC, all points ON) Not including external load current
Surge suppressor		Zener diode
Wiring method for common		4 points/common (terminal block 2-wire type)

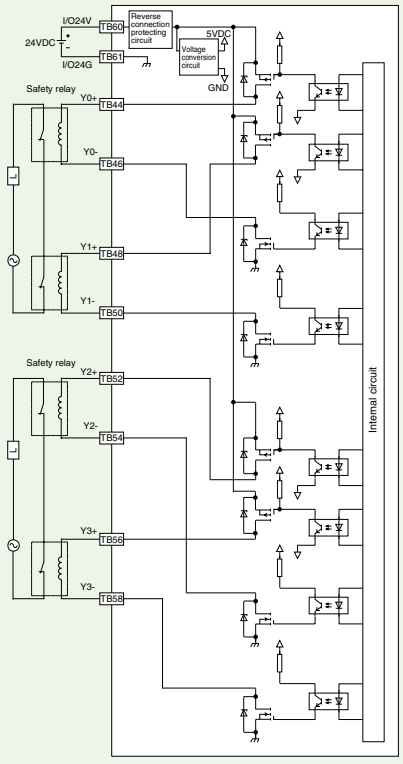
*1: For module technical version C or earlier, the number of input points are 8 points. (Two input terminals are assigned for each input since dual wiring is supported.)
*2: For module technical version A, the safety remote station input response time is 32ms or less + time of noise removal filter.
*3: For module technical version A, the safety refresh response processing time is 38ms.
*4: For module technical version A, the safety remote station output response time is 32ms or less.

■External device connection diagram

• Example of wiring with input equipment

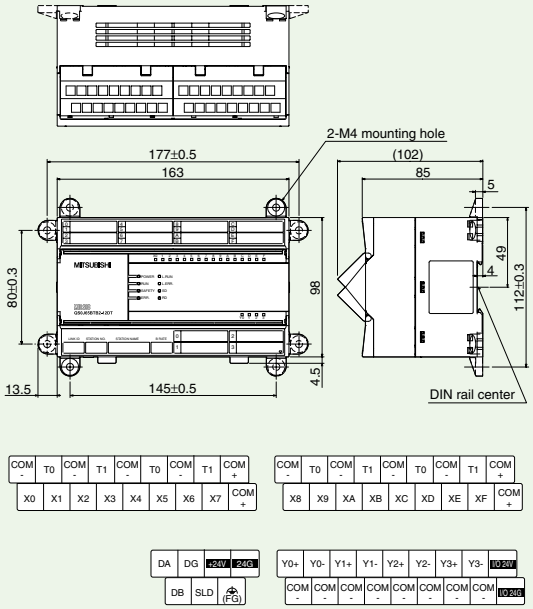


• Example of wiring with output equipment



■External dimensions & terminal layout

Unit: mm



Remote I/O modules

Spring clamp

Spring clamp terminal block type

Overview

Spring clamp terminal block type

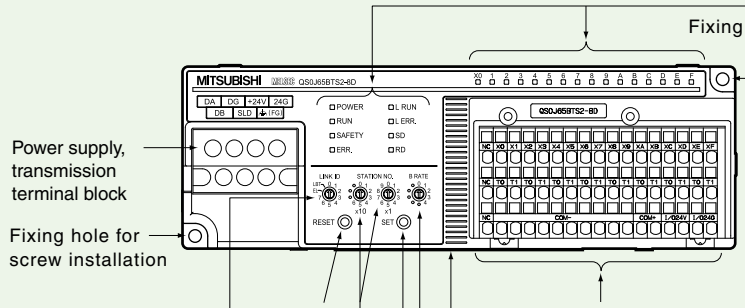
* The actual modules may slightly differ in shapes from the photos shown.

Features

■ The remote I/O module which has obtained the highest safety level applicable to programmable controllers, and the safety-related system with high security can be configured.

■ The system complying with Category 3 or Category 4 of EN954-1 can be configured by the combination of wiring and parameters.

Part names and settings



Operation status indicator LEDs

LED name	Description	
POWER	On (green):	Normally powered
	Off:	Powered OFF or error occurred (blown fuse)
RUN	On (green):	Normally operating, or moderate error occurred
	Flashing (green):	Saving switch setting
	Off	Serious error occurred
SAFETY	On (green):	Connected to CC-Link Safety System, or self-loopback test completed normally
	Flashing (green):	Self-loopback test in execution
	Off:	Not connected to CC-Link Safety System, or self-loopback test completed in error
ERR.	On (red):	Serious error occurred, or self-loopback test completed in error
	Flashing (red):	Moderate error occurred
	Off:	Normally operating
L RUN	On (green):	Normally communicating in the CC-Link Safety System
	Off:	Communication failure in the CC-Link Safety System (Timeout error)
L ERR.	On (red):	Value set by Link ID, Station number, or Transmission setting switch is out of range
	Flashing regularly (red) :	Setting of Link ID, Station number, and/or Transmission setting switch is different from that of the internal nonvolatile memory
	Flashing irregularly (red) :	Wrong terminal resistor setting, or noise influence
	Off:	Normally operating
SD	On (green):	Data being sent
RD	On (green):	Data being received
X0 to XF	On (red):	Input ON
	Off:	Input OFF

Link ID setting switch

Setting value	Description
0 to 7	Link ID setting
EL	Setting for reading error logs
LBT	Setting for self-loopback test

Station number setting switches

Tens place of station No. is set by "X10". Ones place of station No. is set by "X1". Always set the station number of the Safety remote I/O module within the range of 1 to 64.

Transmission speed setting switch

Setting value	Transmission speed
0	156kbps
1	625kbps
2	2.5Mbps
3	5Mbps
4	10Mbps

Input module
QS0J65BTS2-8D

DC input 8 pts | -COM | 24VDC 2-wire | Spring clamp | Protection

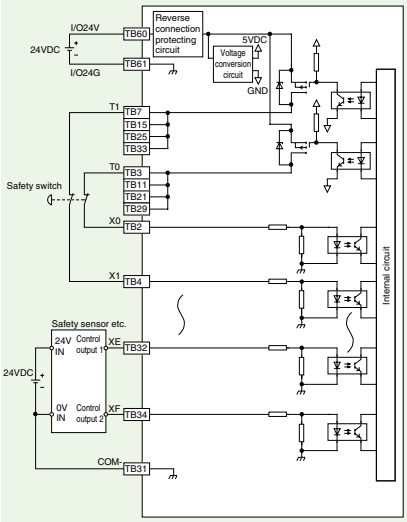
■Detailed specifications

Input specifications		Description
Number of input points		8 points(dual input), 16points(single input)*1
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 5.9mA
Operating voltage range		19.2 to 28.8VDC (ripple ratio: within 5%)
Maximum number of simultaneous input points		100%
ON voltage/ON current		15VDC or higher/2mA or higher
OFF voltage/OFF current		5VDC or lower/0.5mA or lower
Safety remote station input response time		11.2ms or less + time of noise removal filter (1ms, 5ms, 10ms, 20ms, 50ms)
Input resistance		Approx. 4.3kΩ
Response time	OFF→ON	0.4ms or lower (at 24VDC)
	ON→OFF	0.4ms or lower (at 24VDC)
Input format		Negative common (source type)
Wiring method for common		16 input points/common (spring clamp terminal block 2-wire type)
Number of occupied station		1 station
Safety refresh response processing time		9.6ms
I/O module power supply	Voltage	19.2 to 28.8VDC (ripple ratio: within 5%)
	Current	120mA (24VDC, all points ON)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Protection level		IP2X
Weight		0.46kg

*1: For module technical version A, the number of input points are 8 points. (Two input terminals are assigned for each input since dual wiring is supported.)

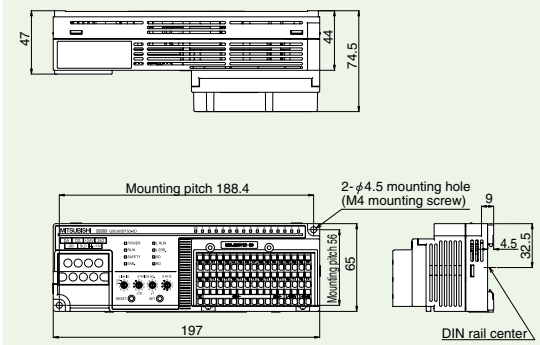
■External device connection diagram

• Example of wiring with input equipment



■External dimensions

Unit: mm



Remote I/O modules

Spring clamp

Spring clamp terminal block type

Overview

Spring clamp terminal block type

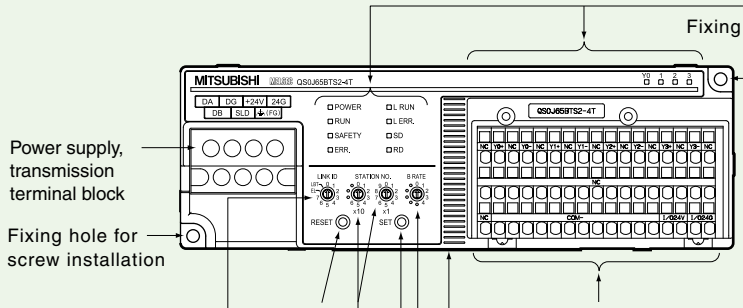
* The actual modules may slightly differ in shapes from the photos shown.

Features

■The remote I/O module which has obtained the highest safety level applicable to programmable controllers, and the safety-related system with high security can be configured.

■The system complying with Category 3 or Category 4 of EN954-1 can be configured by the combination of wiring and parameters.

Part names and settings



Operation status indicator LEDs

LED name	Description	
POWER	On (green):	Normally powered
	Off:	Powered OFF or error occurred (blown fuse)
RUN	On (green):	Normally operating, or moderate error occurred
	Flashing (green):	Saving switch setting
	Off	Serious error occurred
SAFETY	On (green):	Connected to CC-Link Safety System, or self-loopback test completed normally
	Flashing (green):	Self-loopback test in execution
	Off:	Not connected to CC-Link Safety System, or self-loopback test completed in error
ERR.	On (red):	Serious error occurred, or self-loopback test completed in error
	Flashing (red):	Moderate error occurred
	Off:	Normally operating
L RUN	On (green):	Normally communicating in the CC-Link Safety System
	Off:	Communication failure in the CC-Link Safety System (Timeout error)
L ERR.	On (red):	Value set by Link ID, Station number, or Transmission setting switch is out of range
	Flashing regularly (red) :	Setting of Link ID, Station number, and/or Transmission setting switch is different from that of the internal nonvolatile memory
	Flashing irregularly (red) :	Wrong terminal resistor setting, or noise influence
	Off:	Normally operating
SD	On (green):	Data being sent
RD	On (green):	Data being received
Y0 to Y3	On (red):	Output ON
	Off:	Output OFF

Link ID setting switch

Setting value	Description
0 to 7	Link ID setting
EL	Setting for reading error logs
LBT	Setting for self-loopback test

Station number setting switches

Tens place of station No. is set by "X10". Ones place of station No. is set by "X1". Always set the station number of the Safety remote I/O module within the range of 1 to 64.

Transmission speed setting switch

Setting value	Transmission speed
0	156kbps
1	625kbps
2	2.5Mbps
3	5Mbps
4	10Mbps

Output module
QS0J65BTS2-4T

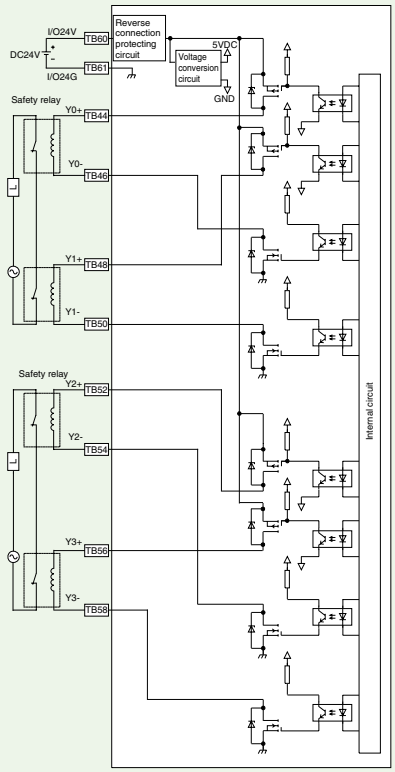
Transistor output 4 pts | Sink / Source | 0.5A 2-wire | Spring clamp | Protection

■Detailed specifications

Output specifications		Description
Number of output points		4 points (source + sink type) 2 points (source + source type)
Isolation method		Photocoupler
Rated load voltage		24VDC
Operating load voltage range		19.2 to 28.8VDC (ripple ratio: within 5%)
Maximum load current		0.5A/point
Maximum inrush current		1.0A 10ms or lower
Leakage current at OFF		0.5mA or lower
Maximum voltage drop at ON		1.0VDC or lower
Output format		Source + Sink type, Source + source type
Protection function		Output overload protection function
Response time	OFF→ON	0.4ms or lower (at 24VDC)
	ON→OFF	0.4ms or lower (at 24VDC)
Safety remote station output response time		10.4ms or less (at ON→OFF), 11.2ms or less (at OFF→ON)
External power supply for output part	Voltage	19.2 to 28.8VDC (ripple ratio: within 5%)
	Current	45mA (24VDC, all points ON, excluding the external load current)
Surge suppressor		Zener diode
Wiring method for common		4 points/common (spring clamp terminal block 2-wire type)
Number of occupied stations		1 station
Safety refresh response processing time		9.6ms
I/O module power supply	Voltage	19.2 to 28.8VDC (ripple ratio: within 5%)
	Current	95mA or lower (24VDC, all points ON)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Protection level		IP2X
Weight		0.45kg

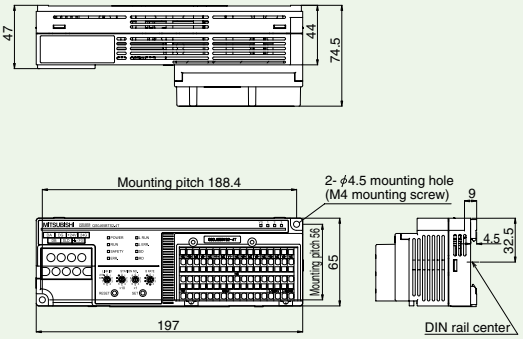
■External device connection diagram

• Example of wiring with output equipment



■External dimensions

Unit: mm



Memo

CC-Link/LT

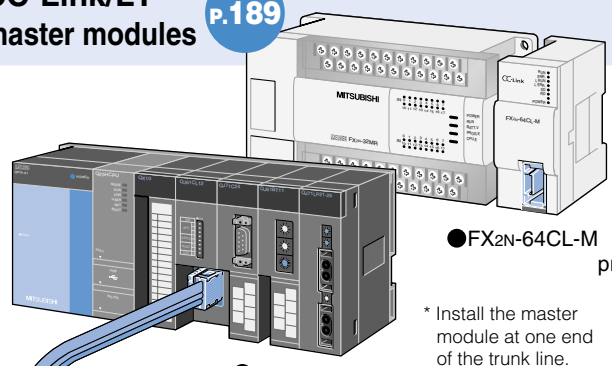
System Configuration Examples

Product Information

System Configuration Examples

Using dedicated flat cables only

CC-Link/LT master modules P.189



●FX2N-64CL-M

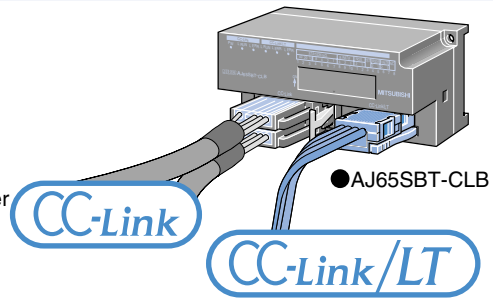
●QJ61CL12

* Install the master module at one end of the trunk line.

CC-Link/LT programmable controller with master function

●FX3UC-32MT-LT

CC-Link-CC-Link/LT bridge module P.197



●AJ65SBT-CLB

CC-Link

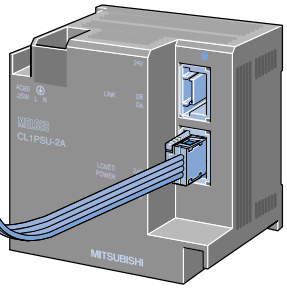
CC-Link/LT

Terminating resistor

●CL9-TERM

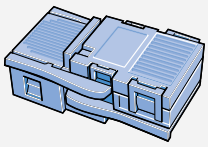
* Use identical terminating resistors at both ends. Place it close to the master module (within 20cm).

Dedicated power supply P.233



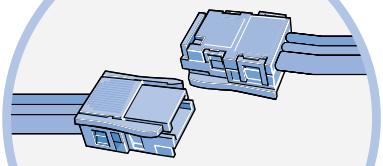
●CL1PSU-2A

Connector for dedicated flat cable P.237



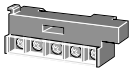
●CL9-CNF-18

Separation and extension using connectors



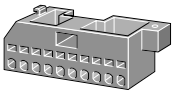
* When separating or extending a trunk line, up to 10 connections are available using connectors.

Common terminal block for screw terminal block P.238

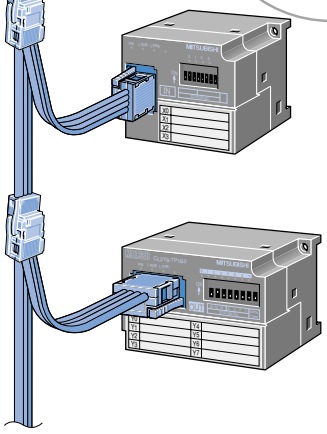


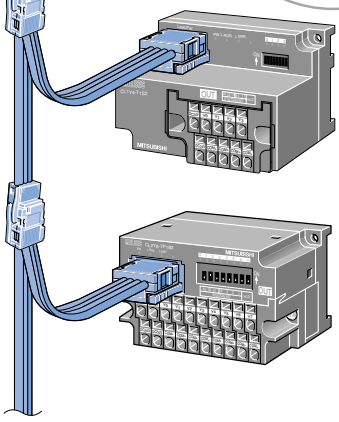
●CL2TE-5

Spring clamp terminal block type common terminal block P.238



●CL2TE-10S



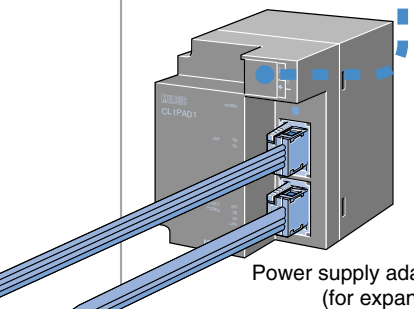


Screw terminal block type remote I/O modules P.203

Spring clamp terminal block type remote I/O modules P.209

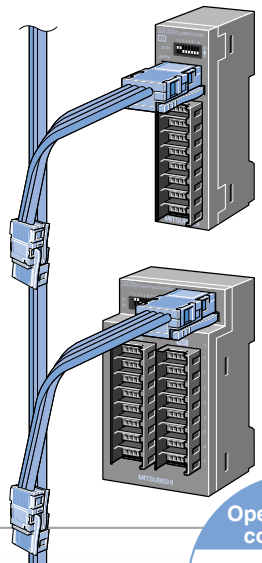
General-purpose power supply
24VDC

Power supply adapter P.233

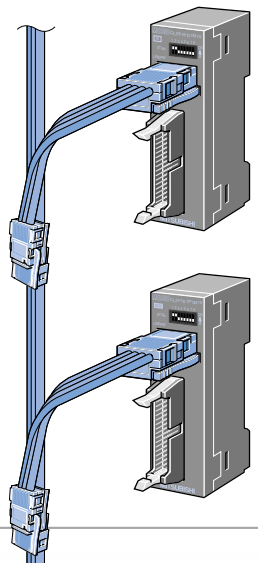


Power supply adaptor (for expansion)
●CL1PAD1

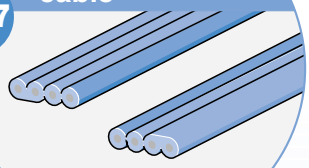
Sensor connector type remote I/O modules P.215



MIL connector type remote I/O modules P.221



Dedicated flat cable P.237



●CL9-FL4-18

Open sensor connector P.237

●ECN-******

Terminating resistor P.237

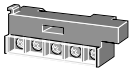
●CL9-TERM

* Can be used with any of dedicated flat cable, VCTF cable and flexible cable.

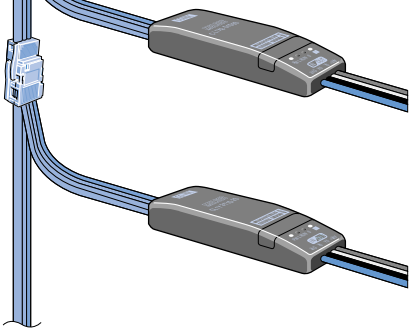
Module holder P.238

●CL1-HLD

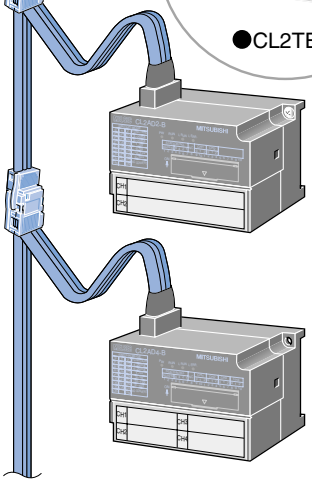
Common terminal block for screw terminal block P.238



●CL2TE-5

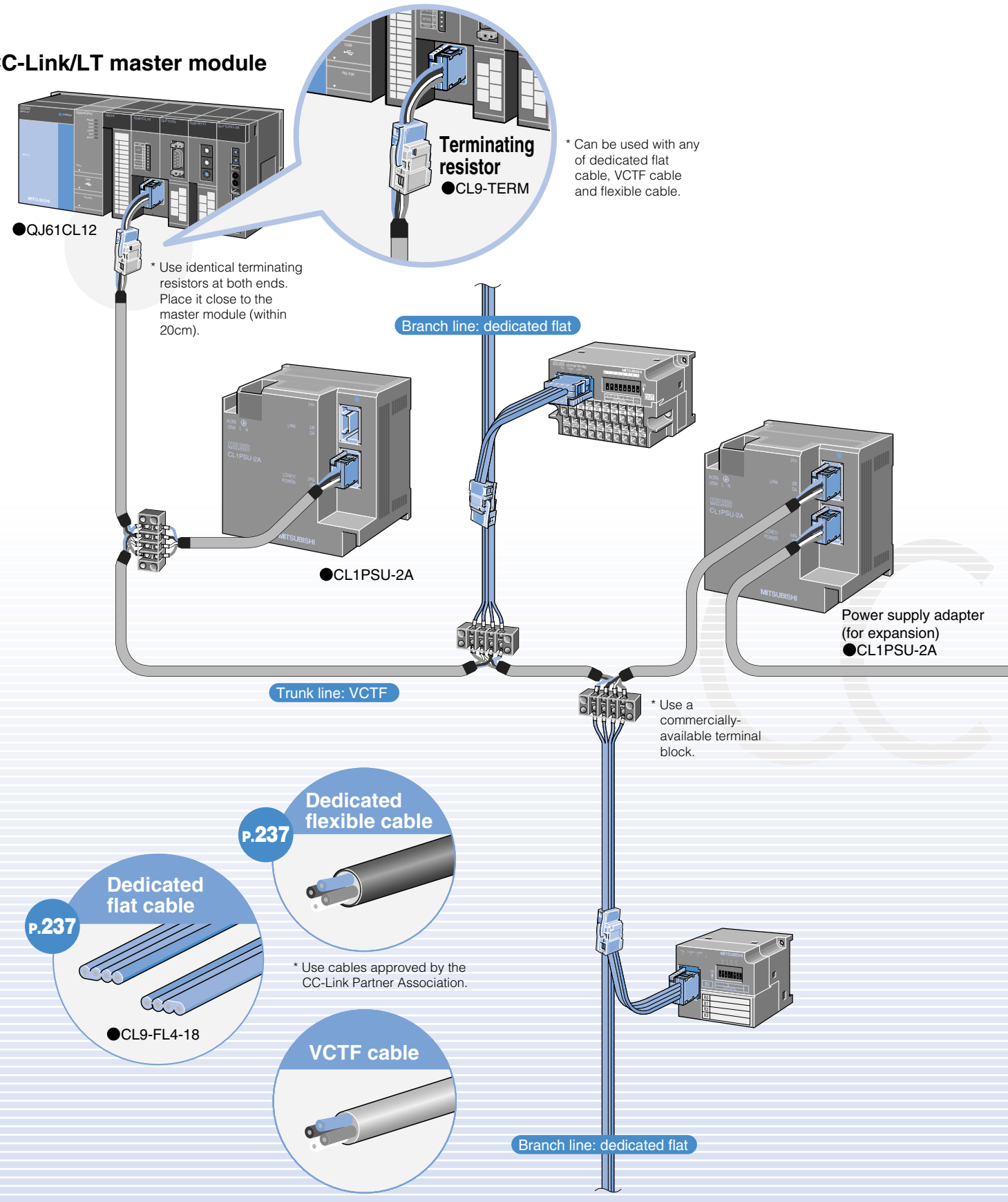


Cable type remote I/O modules P.225

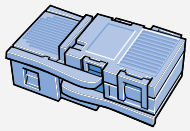


Screw terminal block type analog modules P.229

Using various cables

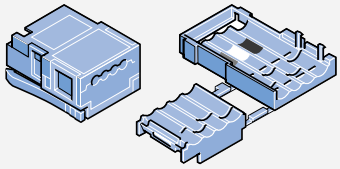


Connector for dedicated flat cable P.237



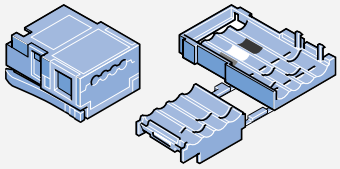
●CL9-CNF-18
Body: Light blue
Cover: Light blue

Connector for VCTF cable P.237



●CL9-CNR-23
Body: Light blue
Cover: Green

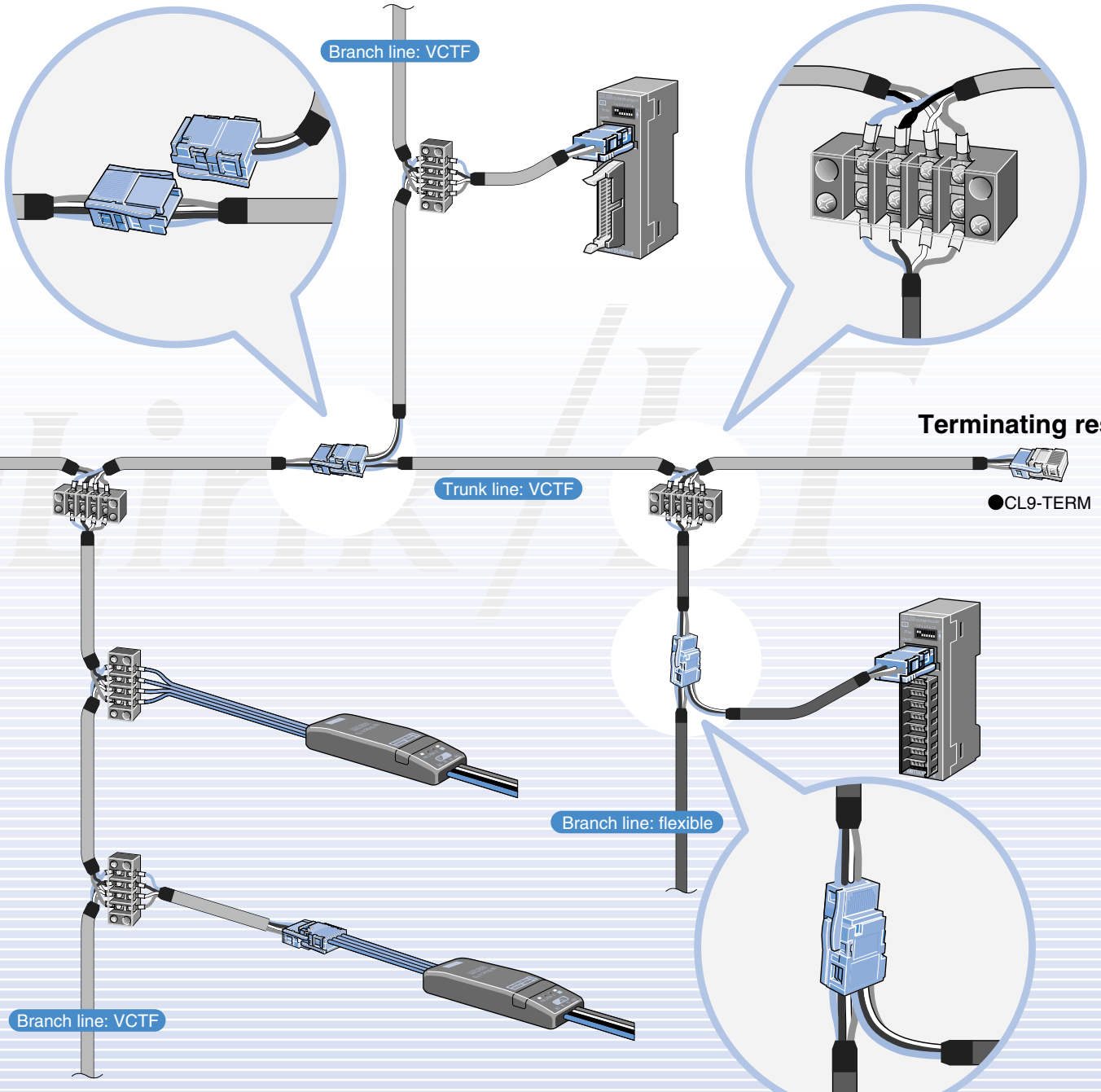
Connector for dedicated flexible cable P.237



●CL9-CNR-20
Body: Light blue
Cover: Yellowish green

T-branching using connector

T-branching using terminal block



Master modules/Bridge module

Overview

Master and bridge modules supporting MELSEC CPUs are available.

For Q series
QJ61CL12

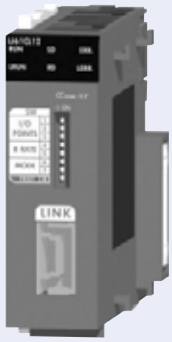
Q master

P.193

For L series
LJ61CL12

L master

P.194



For FX series
FX3UC-32MT-LT(-2)*

FX master

P.195

For FX series
FX2N-64CL-M

FX master

P.196

For CC-Link
AJ65SBT-CLB

Bridge

P.197

*: Network parameters for FX3UC-32MT-LT-2 can be configured with GX Developer.

Models

Product name	Model	Related manual
Q series master module	QJ61CL12	QJ61CL12 type CC-Link/LT Master Module User's Manual
L series master module	LJ61CL12	LJ61CL12 type CC-Link/LT Master Module User's Manual
FX3UC series CC-Link/LT programmable controller (built-in master function)	FX3UC-32MT-LT(-2)*	FX3UC Series User's Manual (Hardware)
FX Series master module	FX2N-64CL-M	FX2N-64CL-M type CC-Link/LT Master Module User's Manual
CC-Link - CC-Link/LT bridge module	AJ65SBT-CLB	AJ65SBT-CLB type CC-Link - CC-Link/LT Bridge Module User's Manual

*: Network parameters for FX3UC-32MT-LT-2 can be configured with GX Developer.

Using the point mode

<Overview>

- A new "point number mode" has been adopted to promote efficient handling of CC-Link/LT input/output points.
- The "point number mode" comprises a 4-point mode, an 8-point mode, and a 16-point mode, allowing the number of controlled remote stations to be changed by a "point number mode" setting, even when the "number of occupied I/O points" setting is the same. (The FX series master module has only 2 modes: a 4-point mode, and a 16-point mode.)
- The "point number mode" allows the occupied station number to be changed even though the remote I/O module is the same.

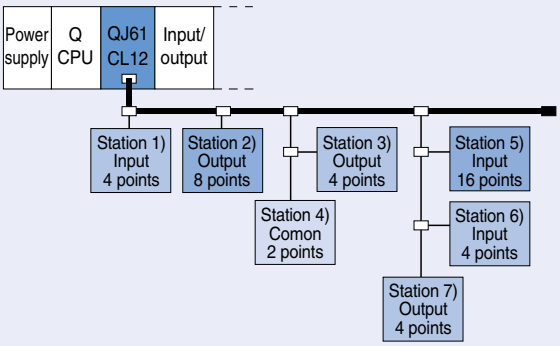
	2- or 4-point module	8-point module	16-point module
4-point mode	1 station occupied	2 stations occupied	4 stations occupied
8-point mode	1 station occupied	1 station occupied	2 stations occupied
16-point mode	1 station occupied	1 station occupied	1 station occupied

Master modules/Bridge module

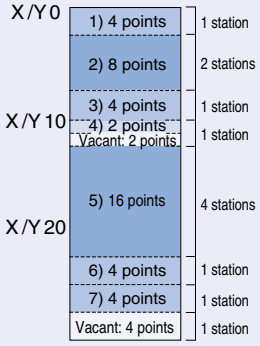
Point mode setting examples

Q master L master Bridge

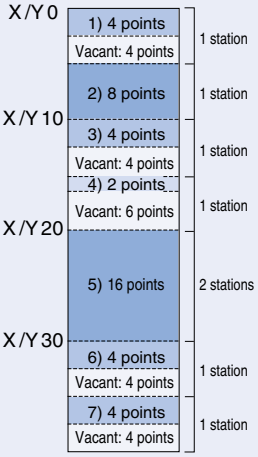
● System configuration example
2-point module: 1 4-point module: 4
8-point module: 1 16-point module: 1



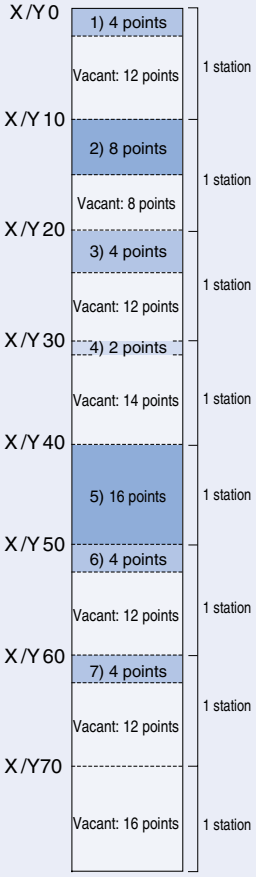
■4-point mode (4 points/station)
No. of occupied I/O points: 48
Total No. of stations: 12



■8-point mode (8 points/station)
No. of occupied I/O points: 64
Total No. of stations: 8



■16-point mode (16 points/station)
No. of occupied I/O points: 128
Total No. of stations: 8



Q master Number of stations that can be connected for each setting of master module

Number of master module's Occupied I/O Points		16 Points	32 Points	48 Points	64 Points	128 Points	256 Points	512 Points	1024 Points
Point mode setting	4-point mode	4	8	12	16	32	64	64	64
	8-point mode	2	4	6	8	16	32	64	64
	16-point mode	1	2	3	4	8	16	32	64

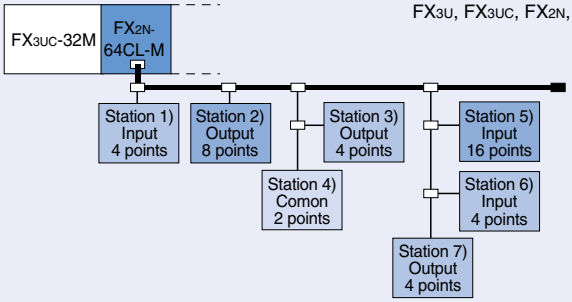
<Example>
When the number of occupied I/O points is 256, the master module can connect:
4-point mode: Up to 64 stations
8-point mode: Up to 32 stations
16-point mode: Up to 16 stations

Bridge Number of stations that can be connected for each setting of bridge

Number of occupied stations setting		2 stations occupied	4 stations occupied	8 stations occupied
Point mode setting	4-point mode	12	28	56
	8-point mode	6	14	28
	16-point mode	3	7	14

FX master

● The I/O numbers of the remote I/O modules connected to the FX series master module are continued from the preceding ones to eliminate unassigned numbers.
(However, as the I/O numbers of the FX series are assigned in units of 8 points, there will be a maximum of 14 (7/7) unassigned numbers if 8 points are not occupied by the last module.)



● For the FX series master module, the number of occupied points does not change if the setting is either the 4- or 16-point mode. (64 stations can be connected.)

As a whole system, the FX series can be used within the following ranges.
FX_{1N}, $FX_{1NC} \leq 128$ points
FX_{3U}, FX_{3UC}, FX_{2N}, $FX_{2NC} \leq 256$ points

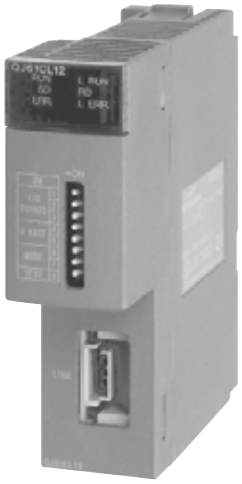
		I/O Numbers (In the case of FX_{3U}-32M)		■4-points mode Total number of stations : 11 stations	■16-points mode Total number of stations : 7 stations
		Input: X	Output: Y		
FX_{3UC}-32M		X0 to X17	Y0 to Y17	—	—
Remote I/O module	1)	X20 to X23	—	1 station	1 station
	2)	—	Y20 to Y27	2 stations	1 station
	3)	—	Y30 to Y33	1 station	1 station
	4)	X24	Y34	1 station	1 station
	5)	X25 to X44	—	4 stations	1 station
	6)	X45 to X50	—	1 station	1 station
	7)	—	Y35 to Y40	1 station	1 station
	Empty	X51 to X57	Y41 to Y47		

The remote I/O modules 1) to 7) are assigned consecutive I/O numbers in units of 8 points.
When an extension module/block is connected after the master module in this example, it is assigned the I/O numbers of X60 and later/Y50 and later.

Master modules/Bridge module

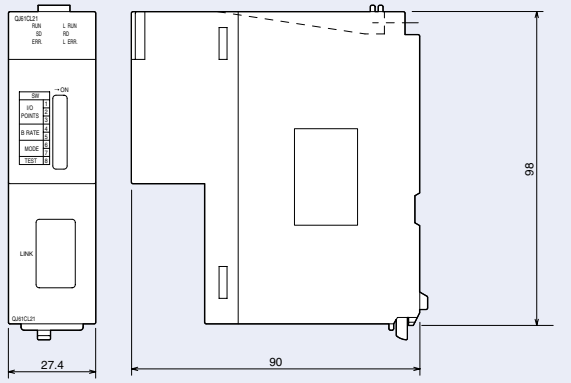
Q master

QJ61CL12 Master module (For Q series)



- Current consumption: 130mA (5VDC, power supplied from programmable controller), 28mA (24VDC, power supplied from power supply adaptor)
- Starting current : 70mA (24VDC, power supplied from power supply adaptor)
- Weight : 0.09kg

■ External dimensions



Unit: mm

■ Applicable CPU module

Mountable CPU model		Number of mountable modules
CPU modules	Q00JCPU, Q00CPU, Q01CPU, Q02CPU, Q02HCPU, Q06HCPU, Q12HCPU, Q25HCPU, Q02PHCPU, Q06PHCPU, Q12PHCPU, Q25PHCPU, Q12PRHCPU, Q25PRHCPU, Q00UJCPU, Q00UCPU, Q01UCPU, Q02UCPU, Q03UDCPU, Q04UDHCPU, Q06UDHCPU, Q10UDHCPU, Q13UDHCPU, Q20UDHCPU, Q26UDHCPU, Q03UDECPU, Q04UDEHCPU, Q06UDEHCPU, Q10UDEHCPU, Q13UDEHCPU, Q20UDEHCPU, Q26UDEHCPU, Q50UDEHCPU, Q100UDEHCPU, Q06CCPU-V, Q06CCPU-V-B, Q12DCCPU-V	Max. 64 *1 modules
Network modules	QJ72LP25-25, QJ72LP25G(E), QJ72BR15	

*1:The number of usable master modules changes depending on the occupied I/O point setting of the master module.

Part names and settings

Operation status indicator LEDs

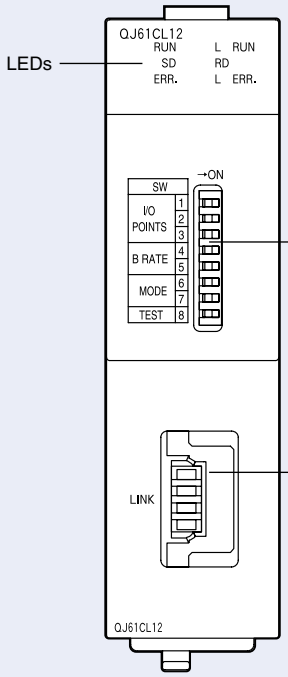
LED	Description
RUN	ON: Normal module operation OFF: Hardware failure
L RUN	<Normal operation> ON: Data link being executed OFF: Data link stopped <In test mode> ON: Normal self-loopback test OFF: Self-loopback test error
SD	ON: Data being sent
RD	ON: Data being received
ERR.	ON: Incorrect switch setting Flashing: Switch setting changed during operation
L ERR.	<Normal operation> ON: Data link faulty station or station outside control range detected Flashing: Data link error in all stations <In test mode> ON: Self-loopback test error OFF: Normal self-loopback test

Operation setting switch setting details

Operation setting switches									
Number of I/O occupied stations			16-point	32-point	48-point	64-point	128-point	256-point	512-point	1024-point
1	I/O POINTS		OFF	ON	OFF	ON	OFF	ON	OFF	ON
2			OFF	OFF	ON	ON	OFF	OFF	ON	ON
3			OFF	OFF	OFF	OFF	ON	ON	ON	ON
Transmission speed setting			156kbps		625kbps		2.5Mbps		Setting prohibited*	
4	B RATE		OFF		ON		OFF		ON	
5			OFF		OFF		ON		ON	
Point mode setting			8-point		4-point		16-point		Setting prohibited*	
6	MODE		OFF		ON		OFF		ON	
7			OFF		OFF		ON		ON	
Test mode			OFF: Online (Normal operation)							
8	TEST		ON: Test mode (Self-loopback test)							

* "ERR." LED is ON if these items are set when the settings are enabled.

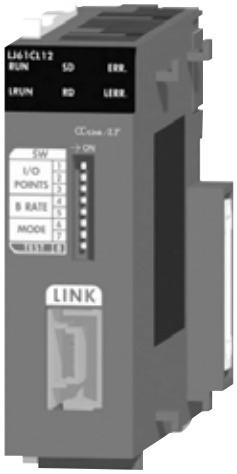
QJ61CL12



Pin No.	Signal Name
4	24G
3	DB
2	DA
1	+24V

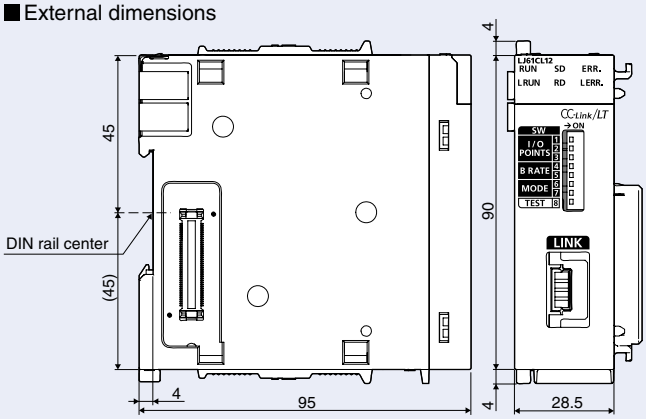
L master

LJ61CL12 Master module (For L series)



- Current consumption: 160mA (5VDC, power supplied from programmable controller), 30mA (24VDC, power supplied from power supply adaptor)
- Starting current : 70mA (24VDC, power supplied from power supply adaptor)
- Weight : 0.12kg

■ External dimensions



■ Applicable CPU module

Mountable CPU model		Number of mountable modules
CPU	L02CPU, L26CPU-BT, L02CPU-P, L26CPU-PBT	Max. 10 modules *1
Head module	LJ72GF15-T2	

*1:The number of usable CPUs and master modules changes depending on the occupied I/O point setting of the master module.

Part names and settings

Operation status indicator LEDs

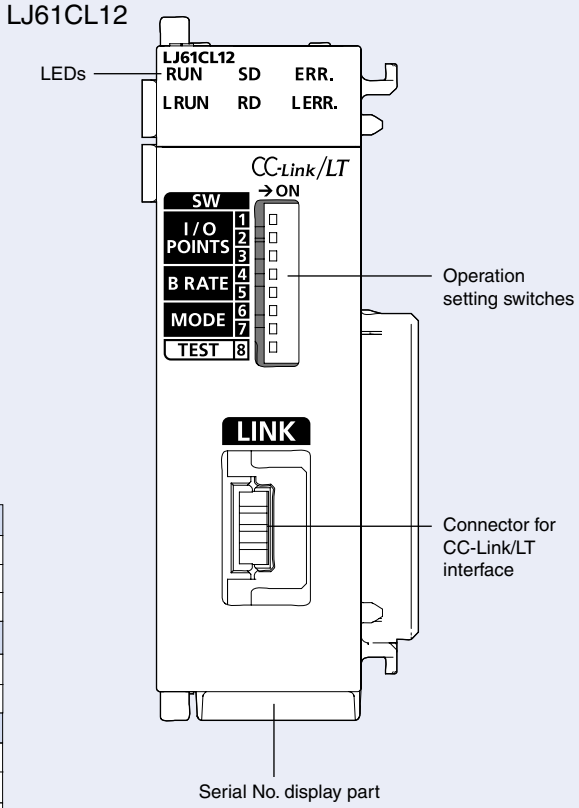
LED	Description
RUN	ON: Normal module operation OFF: Hardware failure
L RUN	<Normal operation> ON: Data link being executed OFF: Data link stopped <In test mode> ON: Normal self-loopback test OFF: Self-loopback test error
SD	ON: Data being sent
RD	ON: Data being received
ERR.	ON: Incorrect switch setting Flashing: Switch setting changed during operation
L ERR.	<Normal operation> ON: Data link faulty station or station outside control range detected Flashing: Data link error in all stations <In test mode> ON: Self-loopback test error OFF: Normal self-loopback test

Operation setting switch setting details

Operation setting switches										
Number of I/O occupied stations			16-point	32-point	48-point	64-point	128-point	256-point	512-point	1024-point
1	I/O POINTS		OFF	ON	OFF	ON	OFF	ON	OFF	ON
2			OFF	OFF	ON	ON	OFF	OFF	ON	ON
3			OFF	OFF	OFF	OFF	ON	ON	ON	ON
Transmission speed setting			156kbps		625kbps		2.5Mbps		Setting prohibited*	
4	B RATE		OFF		ON		OFF		ON	
5			OFF		OFF		ON		ON	
Point mode setting			8-point		4-point		16-point		Setting prohibited*	
6	MODE		OFF		ON		OFF		ON	
7			OFF		OFF		ON		ON	
Test mode			OFF: Online (Normal operation)							
8	TEST		ON: Test mode (Self-loopback test)							

* When the switch is set to "Setting prohibited", the ERR. LED turns on.

LJ61CL12



Master modules/Bridge module

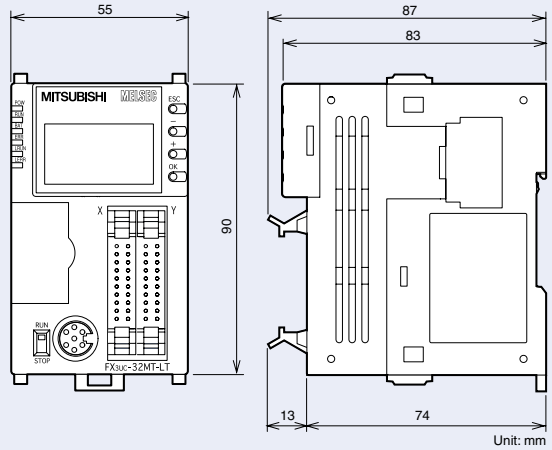
FX master

FX3UC-32MT-LT(-2) Micro programmable controller (Built-in master function)

No power supply adapter is needed up to 350mA as a power supply is built in.

- Current consumption : 7W (main module only)
- Built-in power supply : 24VDC 350mA (for CC-Link/LT network)
- Weight : 0.25kg

■External dimensions



■Applicable CPU module

CPU model	Number of I/O points used
FX3UC-32MT-LT(-2)	Main module + extension unit/block + special module (8 occupied points) x No. of modules used + occupied points for CC-Link/LT ≦ 256 points

* CC-Link/LT parameters for FX3UC-32MT-LT-2 can be configured with GX Works2, GX Developer or display modules.

Part names and settings

Operation status indicator LEDs

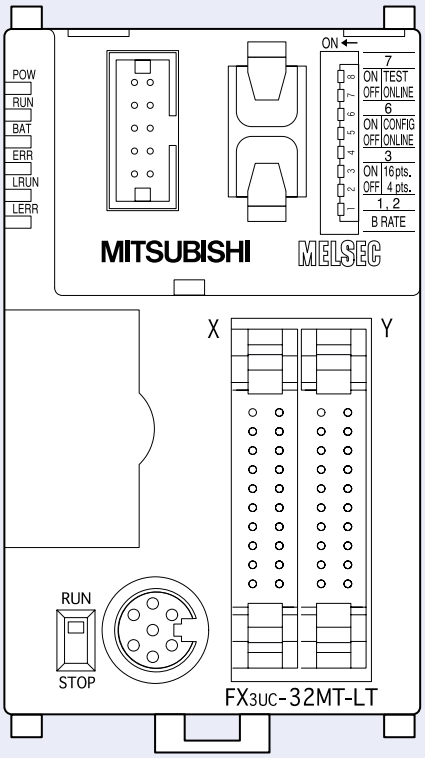
LED name	Description
POW	On: Programmable controller power supplied Off: Programmable controller power not supplied
RUN	On: Programmable controller running Off: Programmable controller stopped
BAT	On: Low battery voltage Off: Normal battery voltage
ERR.	Flashing: Program error has occurred On: CPU error has occurred
L RUN	On: Data link in execution (CC-Link/LT network) Off: Data link stopped (CC-Link/LT network)
L ERR.	On: Data link error (CC-Link/LT network) Flashing: Data link error has occurred on all stations (CC-Link/LT network) Off: Data link is normally operated

Operation setting switch setting details

Operation setting switch						
Transmission speed setting			156kbps	625kbps	2.5Mbps	N/A *
1	B RATE		OFF	ON	OFF	ON
2			OFF	OFF	ON	ON
Point mode setting			4-point		16-point	
3	MODE		OFF		ON	
Unused						
4		OFF				
5						
CONFIG mode		OFF: Online (normal operation) ON: CONFIG mode (checks connected stations and saves that information to the internal EEPROM.)				
6	CONFIG					
Test mode		OFF: Online (normal operation) ON: Test mode (loop-back test)				
7	TEST					
Unused						
8		OFF				

* "ERR." LED is on if these items are set when the settings are enabled.

FX3UC-32MT-LT
(With display module removed)



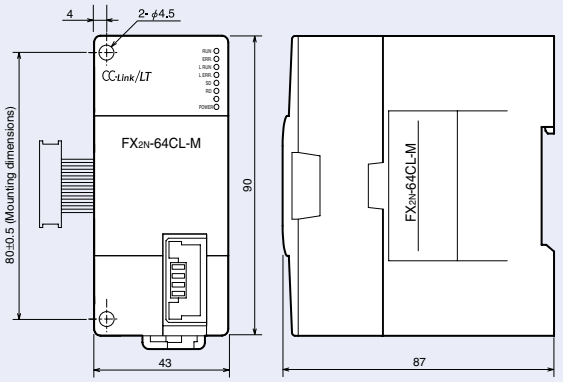
Actual size

FX master

FX2N-64CL-M Master module (FX series)

- Current consumption : 190mA
  (5VDC, supplied from programmable controller)
  25mA
  (24VDC, supplied from power adapter)
- Current at start-up : 35mA
  (24VDC, supplied from power adapter)
- Weight : 0.15kg

■External dimensions



Unit: mm

■Applicable CPU module

Mountable CPU model	Number of I/O points used
FX1N, FX1NC	Main module + extension unit/block + special module (8 occupied points) x No. of modules used + occupied points for CC-Link/LT ≦ 128 points
FX2N, FX2NC, FX3UC	Main module + extension unit/block + special module (8 occupied points) x No. of modules used + occupied points for CC-Link/LT ≦ 256 points

* Because the FX2N-64CL-M is handled as a special module, it occupies 8 I/O points (inputs or outputs). (This does not include the No. of points occupied by CC-Link/LT.)
The FX2NC-CNV-IF is required to connect with the FX1NC or FX2NC.
The FX2NC-CNV-IF or FX3UC-IPS-SV is required to connect with the FX3UC.

Part names and settings

Operation status indicator LEDs

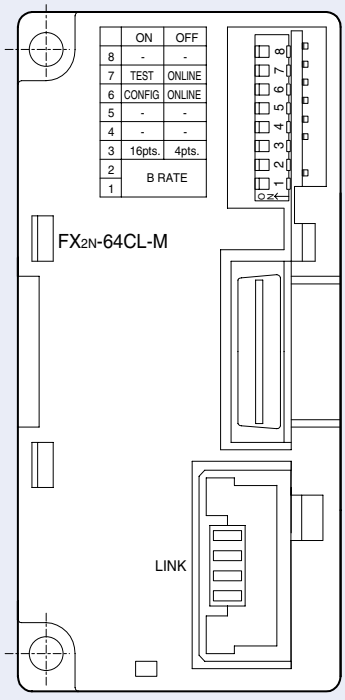
LED name	Description
POWER	On : Module power is supplied (excluding communication power) Off : No module power is supplied (excluding communication power)
RUN	On : Module is operating normally
ERR.	On : Switch setting error Flashing : Switch changed during operation
L RUN	On : Data link in execution
L ERR.	On : Data link error station (detected), a station out of control range exists Flashing : Data link error stations (all stations) Off : Data link is being executed normally
SD	On : Sending data
RD	On : Receiving data

Operation setting switch setting details

Operation setting switch						
	Transmission speed setting		156kbps	625kbps	2.5Mbps	N/A *
	1	B RATE	OFF	ON	OFF	ON
	2		OFF	OFF	ON	ON
	Point mode setting		4-point		16-point	
	3	MODE	OFF		ON	
	Unused					
	4	Unused				
	5					
	CONFIG mode		OFF: Online (normal operation) ON: CONFIG mode (checks connected stations and saves that information to the internal EEPROM.)			
	6	CONFIG				
	Test mode		OFF: Online (normal operation) ON: Test mode (loop-back test)			
	7	TEST				
	Unused					
	8	Unused				

* "ERR." LED is ON if these items are set when the settings are enabled.

FX2N-64CL-M
(With top cover open)



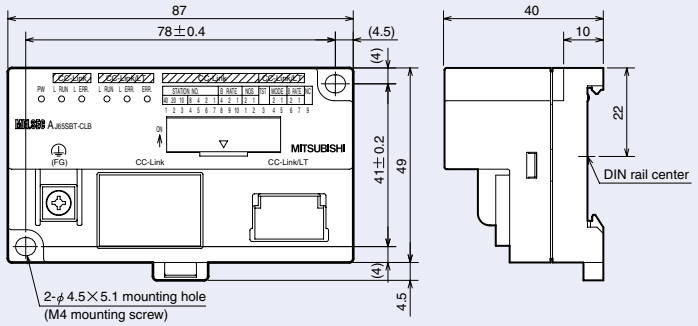
Actual size

Master modules/Bridge module

Bridge

AJ65SBT-CLB Bridge module (For CC-Link)

● External dimensions



Unit: mm

- Current consumption: 75mA (24VDC, supplied from power adapter)
- Current at start-up : 165mA (24VDC, supplied from power adapter)
- Weight : 0.09kg

● Applicable master module

Mountable master module models	
Q series	QJ61BT11, QJ61BT11N
QnA series	AJ61QBT11, A1SJ61QBT11
A series	AJ61BT11, A1SJ61BT11
FX series	FX2N-16CCL-M*
PCI board	A80BD-J61BT11, Q80BD-J61BT11N
Other	CC-Link partner manufacturers' master modules

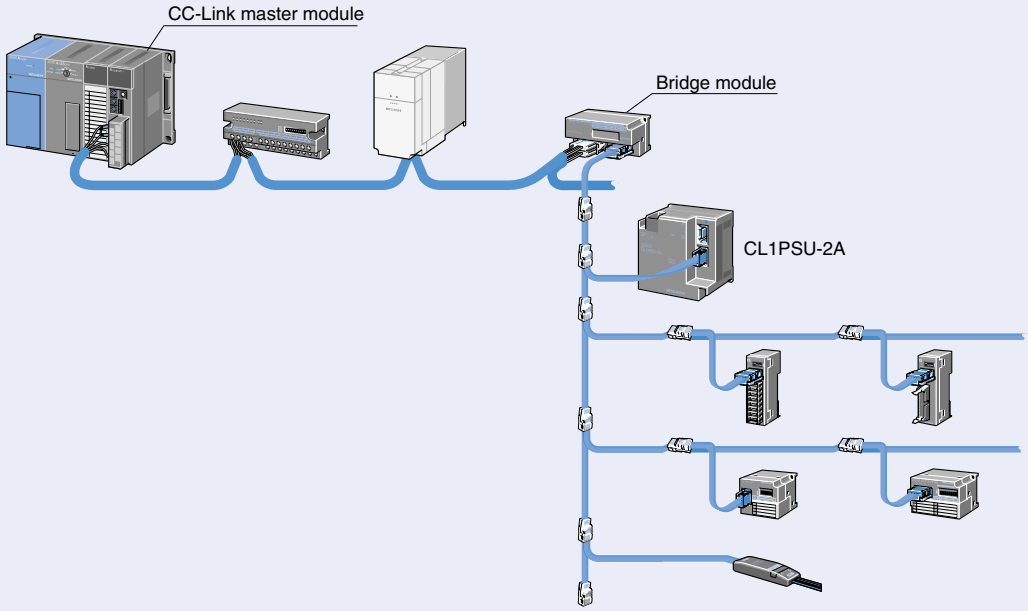
* The FX series can be used in a system within the following range:
FX1N, FX1NC ≦128 points
FX3U, FX3UC, FX2N, FX2NC ≦ 256 points

● Performance specifications

Item	Specifications		
CC-Link			
Station type	Remote device station		
Number of occupied stations	Selected from 2, 4 and 8 stations *		
	64 points each for RX and RY (16 points are used in the system) 8 points each for RWr and RWw		
	128 points each for RX and RY (16 points are used in the system) 16 points each for RWr and RWw		
	256 points each for RX and RY (32 points are used in the system) 32 points each for RWr and RWw		
CC-Link/LT			
Number of occupied stations (CC-Link)	2 stations	4 stations	8 stations
Maximum number of connectable stations (CC-Link/LT)	4-point mode	12 stations	28 stations	56 stations
	8-point mode	6 stations	14 stations	28 stations
	16-point mode	3 stations	7 stations	14 stations
Remote station number	1 to 56		
Bridge module position	Connected at end of trunk line		

* When 8 stations are occupied, make a parameter setting so that two consecutive 4-station-occupying modules are connected.

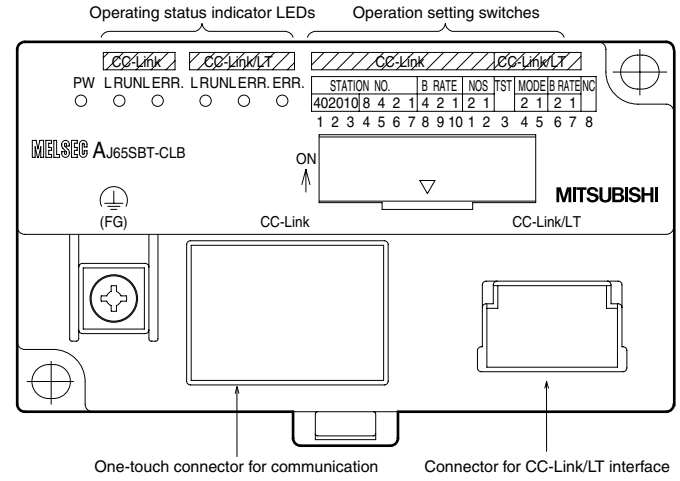
● Bridge module configuration example



Part names and settings

Operation status indicator LEDs

LED name		Color	Description
Common	PW	Red	On: The module is operating normally Off: Module error or no power supply
CC-Link part	L RUN		On: Data link communication is normal Off: Data link communication failure (timeout)
	L ERR.		On: CC-Link switch setting error Data link communication error Flashing: CC-Link switch changed during operation Off: Normal
CC-Link/LT part	L RUN		<During regular operation> On: Data link in execution Off: Data link stopped <Self-loopback test mode> On: Self-loopback test normal Off: Self-loopback test fault
	L ERR.		<During regular operation> On: Data link error station (detected), a station out of control range exists Flashing: Data link error stations (all stations) Off: No error <Self-loopback test mode> On: Self-loopback test fault Off: Self-loopback test normal
	ERR.		Setting error detection On: CC-Link/LT side switch setting error Flashing: CC-Link/LT side switch changed during operation Off: No error



Actual size

Operation setting switch setting details

Name		Description
CC-Link	Station number setting switches STATION NO.	Set the tens place using "10", "20" and/or "40" of station number. Set the ones place using "1", "2", "4" and/or "8" of station number. All are set to OFF prior to shipment. When 2, 4 or 8 stations are occupied, numbers ranging 1 to 63, 61 or 57 can be set respectively. Any other number setting causes a setting error. ("L ERR." turns on.)
	Transmission speed setting switches B RATE	Settings other than the above cause a setting error. ("L ERR." turns on)
	Occupied stations setting switches NOS: Numbers of Occupied Stations	Settings other than the above cause a setting error. ("L ERR." turns on)
CC-Link/LT	Self-loopback test setting switch TST	Off: Normal operation mode (factory-set) On: Self-loopback test mode
	Point mode setting switches MODE	Settings other than the above cause a setting error. ("L ERR." turns on)
	Transmission speed setting switches B RATE	Settings other than the above cause a setting error. ("L ERR." turns on)

Station number setting switches STATION NO.

Station Number	Tens place			Ones place			
	40	20	10	8	4	2	1
1	OFF	OFF	OFF	OFF	OFF	OFF	ON
2	OFF	OFF	OFF	OFF	OFF	ON	OFF
3	OFF	OFF	OFF	OFF	OFF	ON	ON
4	OFF	OFF	OFF	OFF	ON	OFF	OFF
:							
10	OFF	OFF	ON	OFF	OFF	OFF	OFF
11	OFF	OFF	ON	OFF	OFF	OFF	ON
:							
63	ON	ON	OFF	OFF	OFF	ON	ON

Transmission speed setting switches B RATE

Setting value	Switch status 4	2	1	Transmission speed
0 (factory-set)	OFF	OFF	OFF	156kbps
1	OFF	OFF	ON	625kbps
2	OFF	ON	OFF	2.5Mbps
3	OFF	ON	ON	5.0Mbps
4	ON	OFF	OFF	10Mbps

Occupied stations setting switches NOS: Numbers of Occupied Stations

Setting value	Switch status 2	1	Number of occupied stations
0 (factory-set)	OFF	OFF	2 stations
1	OFF	ON	4 stations
2	ON	OFF	8 stations

Point mode setting switches MODE

Setting value	Switch status 2	1	Point mode
0 (factory-set)	OFF	OFF	8-point
1	OFF	ON	4-point
2	ON	OFF	16-point

Transmission speed setting switches B RATE

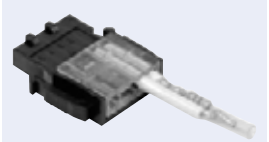
Setting value	Switch status 2	1	Transmission speed
0 (factory-set)	OFF	OFF	156kbps
1	OFF	ON	625kbps
2	ON	OFF	2.5Mbps

Bridge module accessories

CC-Link wiring connectors for the AJ65SBT-CLB bridge module.

One-touch connector plug for communication

One-touch connector plug with terminating resistor



Online connector for communication

Product name	Model	Specifications
One-touch connector plug for communication (10pcs)	A6CON-L5P	One-touch connector plug for communication : 5-pin [transmission circuit terminal (IDC type)] Applicable cable : FANC-110SBH (made by Kuramo Denko Co., Ltd.) CS-110 (made by Daiden Co., Ltd.)
Online connector for communication (5pcs)	A6CON-LJ5P	Online connector for communication : 5-pole (10 pin)
One-touch connector plug with terminating resistor (1pc)	A6CON-TR11	One-touch connector plug with terminating resistor (110Ω) • Make sure to use this terminating resistor if a connector type remote I/O is used at the terminal station.

Remote I/O modules

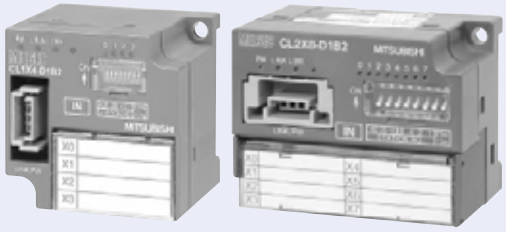
Overview

A variety of modules have been produced for supporting many kinds of external connection devices and applications.

Screw terminal block type

Screw T. block

P.203

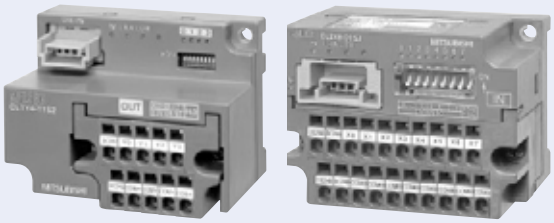


Suitable for the general type connection, solderless terminal connection.

Spring clamp terminal block type

Spring clamp

P.209

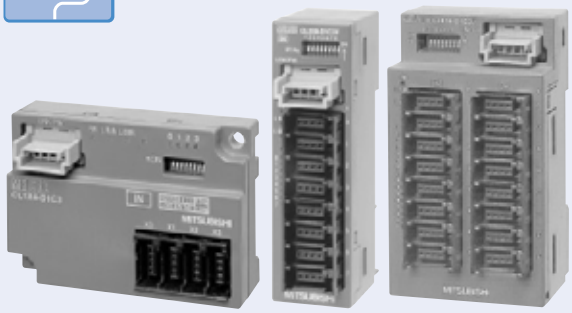


No retightening needed.

Sensor connector type (e-CON)

Sensor

P.215



Easy sensor connection

MIL connector type

MIL

P.221

Wiring is easy and it is convenient when a connecting device is located nearby.

Cable type

Cable

P.225

Direct wiring to sensors, etc.

How to read models

CL□ □ □ – □ □ □ □ □ □

1 2 3 4 5 6 7

1 Module for CC-Link/LT
□: 1 or 2

2 Module type
X: Input
Y: Output
XY: I/O composite

3 Total number of I/O points
2: 2 points
4: 4 points
8: 8 points
16: 16 points

4 I/O specifications
D1: 24VDC input
R1: Relay output 2A
T1: Transistor output 0.1A
TP1: Transistor output 0.1A (with output protection function)
DT1: 24VDC input/transistor output 0.1A
DR1: 24VDC input/relay output 2A
DTP1: 24VDC input/transistor output (with output protection function)

5 Connection format
B: Screw terminal block
S: Spring clamp terminal block
C: Sensor connector
M: MIL connector
D: Cable type
MJ: MIL connector (shared power supply)

6 Wire type
1: Single wire type
2: 2-wire type
3: 2- or 3-wire type
5: 2- or 3-wire type for inputs, 2-wire type for outputs

7 Shape
S: Ultra-compact type
V: Vertical type
None: Standard type (horizontal type)

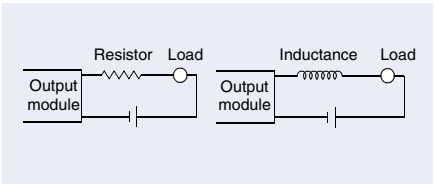
Precautions when selecting a remote I/O module

The following explains the precautions and specifications for selecting the remote I/O modules available for the CC-Link/LT system.

(1) When using the output module to drive a load L, the maximum switching frequencies should be ON for 1s or more and OFF 1s or more.

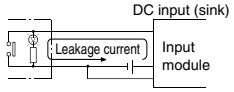
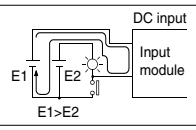
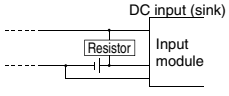
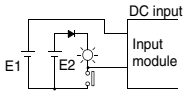
(2) When the counter or timer that uses a DC/DC converter as a load is used with the transistor output module of maximum load current 0.1A, a rush current will flow at given intervals when it is ON or operating. Therefore, selecting the output module in terms of an average current can cause a malfunction or failure.
When using the above load, connect a resistor or inductance in series with the load to reduce the influence of the rush current, or use an output module that has a larger maximum load current.

(3) The shared power supply type of MIL connectors (CL2X16-D1MJ1V, CL2Y16-TP1MJ1V) is not compatible with existing models (CL2X16-D1M1V, CL2Y16-TP1M1V) for wiring. That is because the I/O part power is supplied from the CC-Link/LT interface connector. Do not supply power to the power supply pin of the I/O interface connector from external.



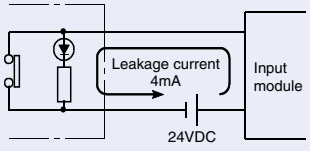
Input circuit troubleshooting

The following table provides input circuit troubleshooting methods. (Those of the sensor and cable type remote I/O modules are not included.)

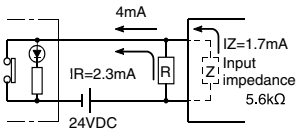
	Example 1	Example 2
Condition	Input signal does not turn off.	Input signal does not turn off.
Cause	• Leakage current due to the LED indicator switch 	• Current flow due to use of two power supplies 
Corrective Action	• Connect a proper resistor as shown on the right to drop the voltage across the input terminal and COM1 below the OFF voltage. 	• Use a single power supply. • Connect a diode to prevent a current flow (as shown on the right). 

<Calculation example for Example 1>

The connected LED indicator switch feeds a 4mA leakage current when 24VDC power is input to the input module.



(1) The input signal will not turn off since the OFF current of the input module does not satisfy 1.7mA. Therefore, connect a resistor as shown below.



(2) Calculate the resistor value, R, so that a 2.3mA or higher current will flow in the resistor to be connected in order to satisfy the 1.7mA OFF current of the input module.

IR:IZ=Z (Input impedance) : R

$$R \leqq \frac{Iz}{IR} \times (\text{Input impedance}) = \frac{1.7}{2.3} \times 5.6 = 4.1(k\Omega)$$

R is less than 4.1kΩ. When the resistor R is 3.9 kΩ, the power capacity W of the resistor R is as follows.

$$W = (\text{Input voltage})^2 \div R = 26.4^2(V) \div 3.9k(\Omega) = 0.18(W)$$

(3) Using a safety factor of 3 to 5 to select the power capacity of the resistor for the actual power consumption, connect the resistor 3.9kW, 1W.

Remote I/O modules

Models

For the icons, refer to pages 273 to 274.

Product name	Model	Features				Page
		Input	Output	Type	Others	
Input module	CL1X2-D1D3S	DC input 2 pts, +COM, 24VDC 2-wire or 24VDC 3-wire		Cable	Input switch, Shared power supply	225
	CL1X4-D1B2	DC input 4 pts, +COM, -COM, 24VDC 2-wire		Screw T. block	Input switch	204
	CL1X4-D1S2	DC input 4 pts, +COM, -COM, 24VDC 2-wire		Spring clamp	Input switch	211
	CL1X4-D1C3	DC input 4 pts, +COM, 24VDC 2-wire or 24VDC 3-wire		Sensor	Input switch, Shared power supply	217
	CL2X8-D1B2	DC input 8 pts, +COM, -COM, 24VDC 2-wire		Screw T. block	Input switch	204
	CL2X8-D1C3V	DC input 8 pts, +COM, 24VDC 2-wire or 24VDC 3-wire		Sensor	Input switch, Vertical, Shared power supply	217
	CL2X8-D1S2	DC input 8 pts, +COM, -COM, 24VDC 2-wire		Spring clamp	Input switch	211
	CL2X16-D1M1V	DC input 16 pts, +COM, 24VDC 1-wire		MIL	Input switch, Vertical	222
	CL2X16-D1C3V	DC input 16 pts, +COM, 24VDC 2-wire or 24VDC 3-wire		Sensor	Input switch, Vertical, Shared power supply	218
	CL2X16-D1MJ1V	DC input 16 pts, +COM, 24VDC 1-wire		MIL	Input switch, Vertical, Shared power supply	222
Output module	CL1Y2-T1D2S		Transistor output 2 pts, Sink, 0.1A 2-wire	Cable	Hold, Shared power supply	226
	CL1Y4-T1B2		Transistor output 4 pts, Sink, 0.1A 2-wire	Screw T. block	Hold	205
	CL1Y4-R1B2		Relay output 4 pts, 2A 2-wire	Screw T. block	Hold	205
	CL1Y4-R1B1		Relay output 4 pts, 2A 1-wire	Screw T. block	Hold	206
	CL1Y4-T1S2		Transistor output 4 pts, Sink, 0.1A 2-wire	Spring clamp	Hold	212
	CL1Y4-T1C2		Relay output 4 pts, Sink, 0.1A 2-wire	Sensor	Hold, Shared power supply	218
	CL2Y8-TP1B2		Transistor output 8 pts, Sink, 0.1A 2-wire	Screw T. block	Protection, Hold	206
	CL2Y8-TP1C2V		Transistor output 8 pts, Sink, 0.1A 2-wire	Sensor	Protection, Hold, Vertical, Shared power supply	219
	CL2Y8-TP1S2		Transistor output 8 pts, Sink, 0.1A 2-wire	Spring clamp	Protection, Hold	212
	CL2Y8-TPE1S2		Transistor output 8 pts, Source, 0.1A 2-wire	Spring clamp	Protection, Hold	213
	CL2Y16-TP1M1V		Transistor output 16 pts, Sink, 0.1A 1-wire	MIL	Protection, Hold, Vertical	223
	CL2Y16-TPE1M1V		Transistor output 16 pts, Source, 0.1A 1-wire	MIL	Protection, Hold, Vertical	223
	CL2Y16-TP1C2V		Transistor output 16 pts, Sink, 0.1A 2-wire	Sensor	Protection, Hold, Vertical, Shared power supply	219
	CL2Y16-TP1MJ1V		Transistor output 16 pts, Sink, 0.1A 2-wire	MIL	Protection, Hold, Vertical, Shared power supply	224
I/O combined module	CL1XY2-DT1D5S	DC input 1, +COM, 24VDC 2-wire or 24VDC 3-wire	Transistor output 1 pts, Sink, 0.1A 2-wire	Cable	Hold, Shared power supply	226
	CL1XY4-DT1B2	DC input 2 pts, +COM, -COM, 24VDC 2-wire	Transistor output 2 pts, Sink, 0.1A 2-wire	Screw T. block	Hold	207
	CL1XY4-DR1B2	DC input 2 pts, +COM, -COM, 24VDC 2-wire	Relay output 2 pts, 2A 2-wire	Screw T. block	Hold	207
	CL1XY8-DT1B2	DC input 4 pts, +COM, -COM, 24VDC 2-wire	Transistor output 4 pts, Sink, 0.1A 2-wire	Screw T. block	Hold	208
	CL1XY8-DR1B2	DC input 4 pts, +COM, -COM, 24VDC 2-wire	Relay output 4 pts, 2A 2-wire	Screw T. block	Hold	208
	CL2XY16-DTP1C5V	DC input 8 pts, +COM, 24VDC 2-wire or 24VDC 3-wire	Transistor output 8 pts, Sink, 0.1A 2-wire	Sensor	Input switch, Protection, Hold, Vertical, Shared power supply	220

Memo

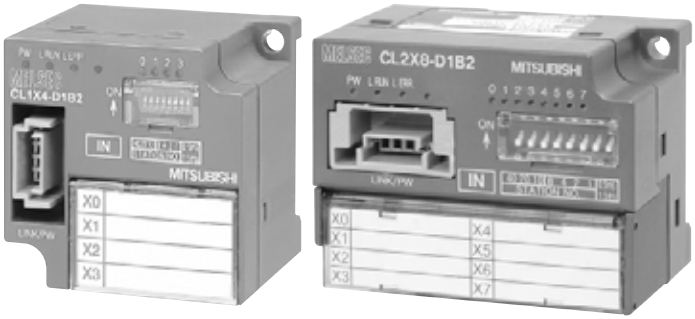
Remote I/O modules

Screw T. block

Screw terminal block type

Overview

Screw terminal block type

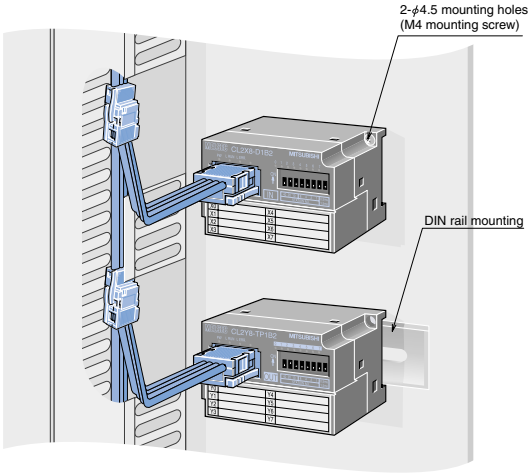


Features

- The industry's most compact size
- Terminal block cover with nameplate showing connected devices
- Input modules with positive/negative common shared
- Terminal block structure enabling simple connection of 2-wire sensors or other loads

Installation

■Direct or DIN rail mounting is possible.



Part names and settings

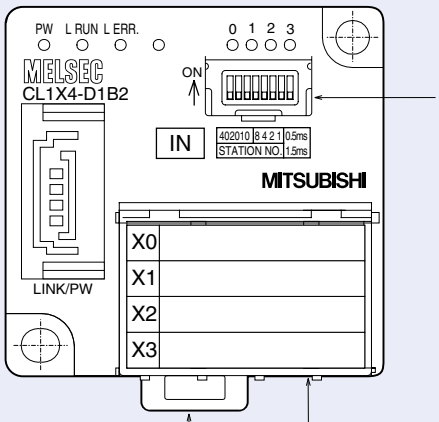
Operation status indicator LEDs

LED name	Description
PW	On: Power supply ON
L RUN	On: Normal communication
L ERR.	On: Communication error

Operating status indicator LEDs
ON: LED is on.
OFF: LED is off.

Connector for CC-Link/ LT interface

Pin No.	Signal name
4	24G
3	DB
2	DA
1	+24V



Actual size

DIP switch

Setting	Switch name	Station No.	Description			
Station number setting switches	STATION NO.	1	Tens place	40	On : 40	Off : 0
		2		20	On : 20	
		3		10	On : 10	
		4	Ones place	8	On : 8	
		5		4	On : 4	
		6		2	On : 2	
		7		1	On : 1	
I/O operation setting	0.5ms 1.5ms	8	For input module: response speed setting Off : 1.5ms (standard type) On : 0.5ms (high-speed response type)			
	HLD		For output module: HOLD function setting Off : Output CLEAR On : Output HOLD For I/O composite module: HOLD function setting Off : Output CLEAR On : Output HOLD			

The DIP switches are all set to OFF prior to shipment.

Terminal block

DIN rail hook

* Refer to page 227 for the DIN rail mounting specifications.

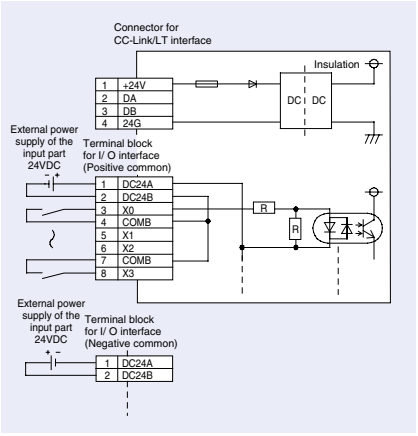
Input module
CL1X4-D1B2

DC input 4 pts | +COM / -COM | 24VDC 2-wire | Screw T. block | Input switch

■ Detailed specifications

Input specifications		Description
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 4mA
Operating voltage range		20.4 to 28.8VDC (-15% to +20%) (ripple ratio: within 5%)
Maximum number of simultaneous input points		100% (when 24VDC)
ON voltage/ON current		19V/3mA or higher
OFF voltage/OFF current		11V/1.7mA or lower
Input resistance		5.6kΩ
Response time	OFF→ON	0.5 ms/1.5 ms or less (when 24VDC) Selectable by DIP SW (default = OFF / 1.5ms)
	ON→OFF	0.5 ms/1.5 ms or less (when 24VDC) Selectable by DIP SW (default = OFF / 1.5ms)
Wiring method for common		4 points/common (2 points) (terminal block 2-wire type)
Power supply	Voltage	20.4 to 28.8VDC (-15% to +20%) (ripple ratio: within 5%
	Current consumption	40mA or lower (when all points ON)
	Current at start-up	70mA
Number of occupied stations		In 4-, 8- or 16-point mode: Occupies 1 stations (see table on the right)
Weight		0.06kg

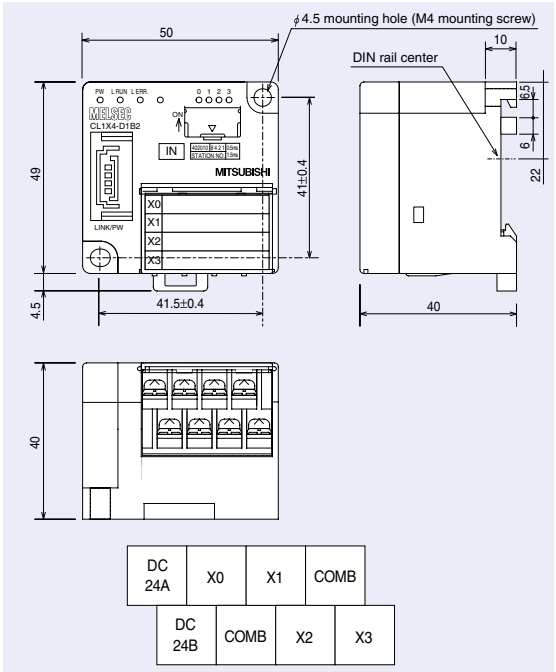
■ External connection diagram



Q, bridge		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Point mode	4 pts	X	■	■	■	■											
		Y															
	8 pts	X	■	■	■	■	■	■	■	■							
		Y															
	16 pts	X	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
		Y															
FX		0	1	2	3	4	5	6	7	10	11	12	13	14	15	16	17

■ External dimensions & terminal layout

Unit: mm



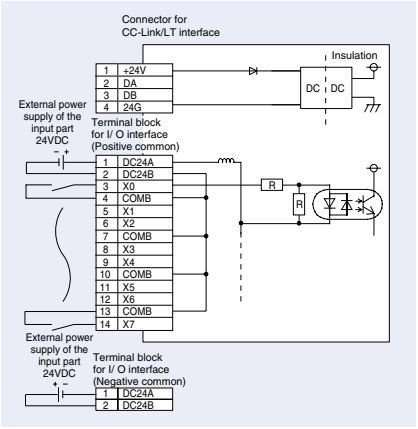
Input module
CL2X8-D1B2

DC input 8 pts | +COM / -COM | 24VDC 2-wire | Screw T. block | Input switch

■ Detailed specifications

Input specifications			Description	
Isolation method			Photocoupler	
Rated input voltage			24VDC	
Rated input current			Approx. 4mA	
Operating voltage range			20.4 to 28.8VDC (ripple ratio: within 5%)	
Maximum number of simultaneous input points			100% (when 24VDC)	
ON voltage/ON current			19V/3 mA or higher	
OFF voltage/OFF current			11V/1.7mA or lower	
Input resistance			5.6kΩ	
Response time	Response time setting		0.5ms (high-speed response type)	1.5ms (standard type)
	OFF→ON	TYP.	0.05ms	–
		MAX.	0.1ms	1.5ms
	ON→OFF	TYP.	0.2ms	–
		MAX.	0.5ms	1.5ms
Wiring method for common			8 points/common (4 points) (terminal block 2-wire type)	
Power supply	Voltage		20.4 to 28.8VDC (ripple ratio: within 5%)	
	Current consumption		40mA or lower (when 24VDC, all points ON)	
	Current at start-up		70mA	
Number of occupied stations			In 4-point mode: Occupies 2 stations In 8- or 16-point mode: Occupies 1 station (see table on the right)	
Weight			0.09kg	

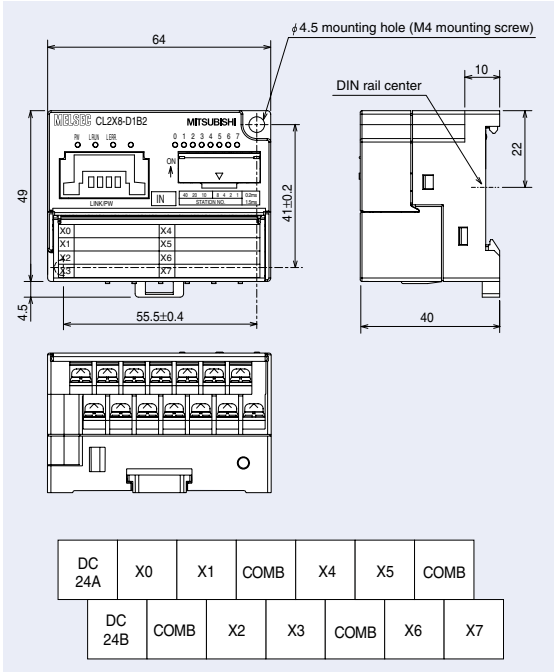
■ External connection diagram



Q, bridge		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Point mode	4 pts	X	■	■	■	■											
		Y															
	8 pts	X	■	■	■	■	■	■	■	■							
		Y															
	16 pts	X	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
		Y															
FX		0	1	2	3	4	5	6	7	10	11	12	13	14	15	16	17

■ External dimensions & terminal layout

Unit: mm



Screw T. block

Screw terminal block type

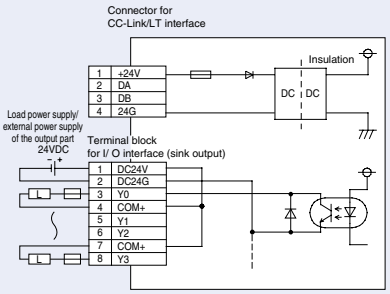
Output module
CL1Y4-T1B2

Transistor output 4 pts | Sink | 0.1A 2-wire | Screw T. block | Hold

■Detailed specifications

Output specifications		Description
Isolation method		Photocoupler
Rated load voltage		12/24VDC
Operating load voltage range		10.2 to 28.8VDC (ripple ratio: within 5%)
Maximum load current		0.1A/point 0.4A/common
Maximum inrush current		0.4A 10ms
Leakage current at OFF		0.1mA or lower/30VDC
Maximum voltage drop at ON		0.3V or lower (TYP) 0.1A, 0.6V or lower (MAX) 0.1A
Response time	OFF→ON	1.0ms or lower
	ON→OFF	1.0ms or lower
Surge suppressor		Zener diode
Wiring method for common		4 points/common (2-point) (terminal block 2-wire type)
Power supply	Voltage	20.4 to 28.8VDC (24VDC -15% to +20%) (ripple ratio: within 5%)
	Current consumption	60mA or lower (when all points ON)
	Current at start-up	70mA
Number of occupied stations		In 4-, 8- or 16-point mode: Occupies 1 station (see table on the right)
Weight		0.06kg

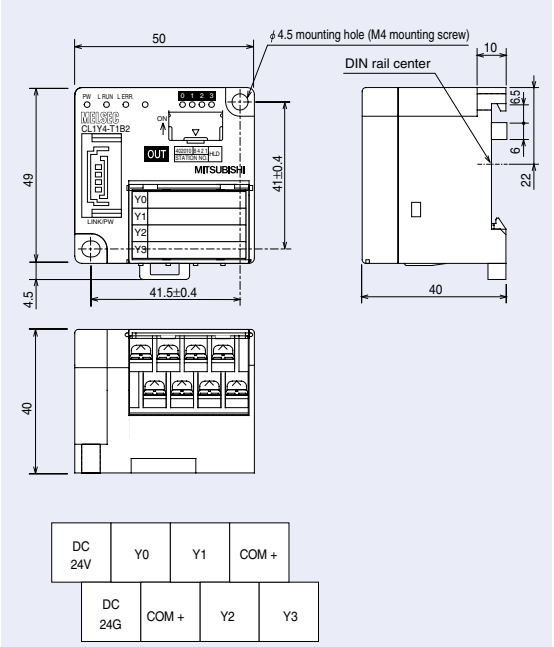
■External connection diagram



Q, bridge		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Point mode	4 pts	X															
		Y															
	8 pts	X															
		Y															
	16 pts	X															
		Y															
FX		0	1	2	3	4	5	6	7	10	11	12	13	14	15	16	17

■External dimensions & terminal layout

Unit: mm



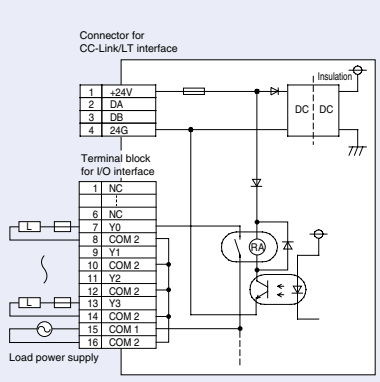
Output module
CL1Y4-R1B2

Relay output 4 pts | 2A 2-wire | Screw T. block | Hold

■Detailed specifications

Output specifications		Description
Isolation method		Mechanical
Rated load voltage		250VAC or lower, 30VDC or lower
Maximum load current		2A/point 4A/common
Response time	OFF→ON	Approx. 10ms or lower
	ON→OFF	Approx. 10ms or lower
Wiring method for common		4 points/common (5-point) (terminal block 2-wire type)
Contact life		200VAC 1.5A, 240VAC 1A (COSϕ=0.7) 100,000 times or more
		200VAC 1A, 240VAC 0.1A (COSϕ=0.35) 100,000 times or more
		24VDC 1A 100VDC 0.1A (L/R=7ms) 100,000 times or more
Power supply	Voltage	20.4 to 28.8VDC (ripple ratio: within 5%)
	Current consumption	65mA or lower (when all points ON)
	Current at start-up	70mA
Number of occupied stations		In 4-, 8- or 16-point mode: Occupies 1 station (see table on the right)
Weight		0.11kg

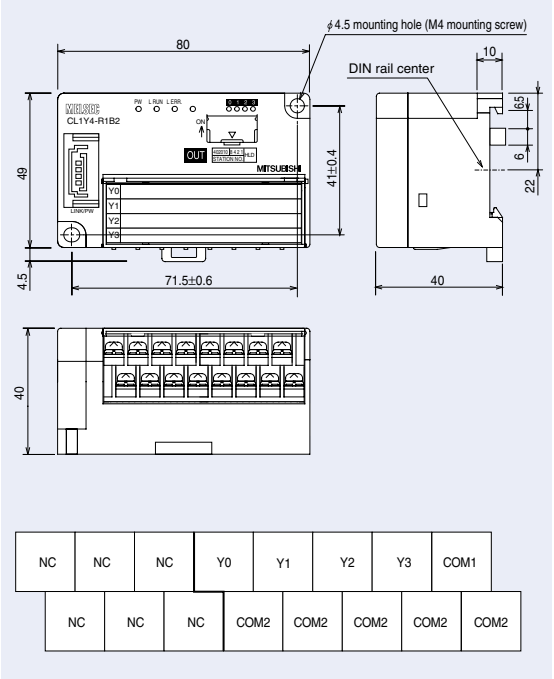
■External connection diagram



Q, bridge		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Point mode	4 pts	X															
		Y															
	8 pts	X															
		Y															
	16 pts	X															
		Y															
FX		0	1	2	3	4	5	6	7	10	11	12	13	14	15	16	17

■External dimensions & terminal layout

Unit: mm



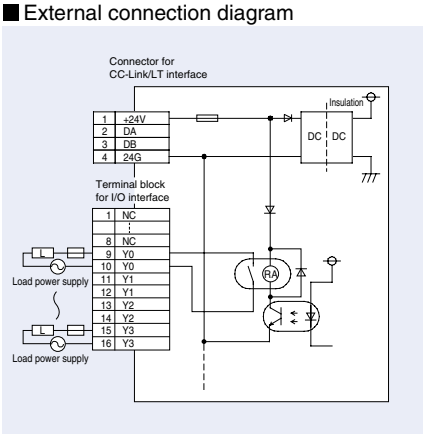
Output module
CL1Y4-R1B1

Relay output 4 pts | 2A 1-wire | Screw T. block | Hold

■ Detailed specifications

Output specifications		Description
Isolation method		Mechanical
Rated load voltage		250VAC or lower, 30VDC or lower
Maximum load current		2A/point 2A/common
Response time	OFF→ON	Approx. 10ms or lower
	ON→OFF	Approx. 10ms or lower
Wiring method for common		1 point/common (independent) (terminal block 1-wire type)
Contact life		200VAC 1.5A, 240VAC 1A (COSϕ=0.7) 100,000 times or more
		200VAC 1A, 240VAC 0.1A (COSϕ=0.35) 100,000 times or more
		24VDC 1A 100VDC 0.1A (L/R=7ms) 100,000 times or more
Power supply	Voltage	20.4 to 28.8VDC (24VDC -15% to +20%) (ripple ratio: within 5%)
	Current consumption	65mA or lower (when all points ON)
	Current at start-up	70mA
Number of occupied stations		In 4-, 8- or 16-point mode: Occupies 1 station (see table on the right)
Weight		0.11kg

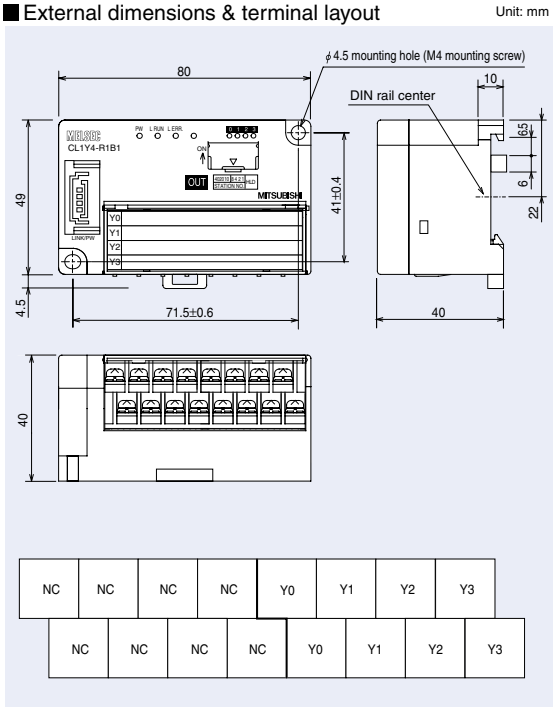
■ External connection diagram



Q. bridge		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Point mode	4 pts	X															
		Y															
	8 pts	X															
		Y															
	16 pts	X															
		Y															
FX		0	1	2	3	4	5	6	7	10	11	12	13	14	15	16	17

■ External dimensions & terminal layout

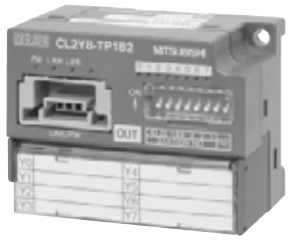
Unit: mm



NC	NC	NC	NC	Y0	Y1	Y2	Y3
NC	NC	NC	NC	Y0	Y1	Y2	Y3

Output module
CL2Y8-TP1B2

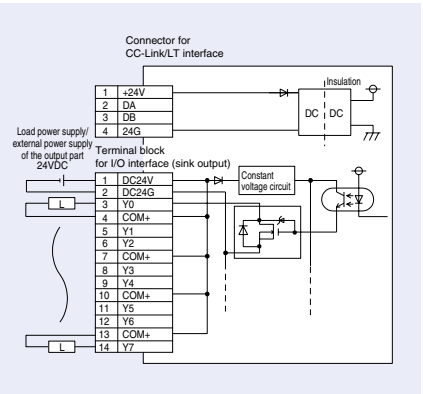
Transistor output 8 pts | Sink | 0.1A 2-wire | Screw T. block | Protection | Hold



■ Detailed specifications

Output specifications		Description
Isolation method		Photocoupler
Rated load voltage		12/24VDC
Operating load voltage range		10.2 to 28.8VDC (ripple ratio: within 5%)
Maximum load current		0.1A/point 0.8 A/common
Maximum inrush current		0.7A 10ms or lower
Leakage current at OFF		0.1mA or lower
Maximum voltage drop at ON		0.3V or lower (TYP) 0.1A, 0.6V or lower (MAX) 0.1A
Response time	OFF→ON	0.5ms or lower
	ON→OFF	0.5ms or lower (resistive load)
Surge suppressor		Zener diode
Wiring method for common		8 points/common (4-point) (terminal block 2-wire type)
External power supply for output part	Voltage	10.2 to 28.8VDC (ripple ratio: within 5%)
	Current consumption	15mA or lower (whenTYP.24VDC, all points ON) Not including external load current
Power supply	Voltage	20.4 to 28.8VDC (ripple ratio: within 5%)
	Current consumption	40mA or lower (when 24VDC, all points ON)
	Current at start-up	70mA
Number of occupied stations		In 4-point mode: Occupies 2 stations In 8- or 16-point mode: Occupies 1 station (see table on the right)
Weight		0.09kg

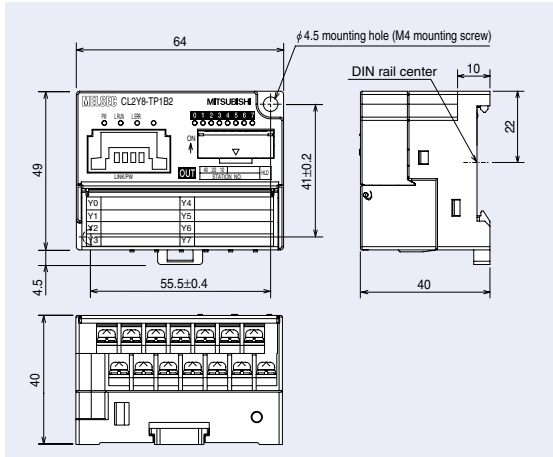
■ External connection diagram



Q. bridge		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Point mode	4 pts	X															
		Y															
	8 pts	X															
		Y															
	16 pts	X															
		Y															
FX		0	1	2	3	4	5	6	7	10	11	12	13	14	15	16	17

■ External dimensions & terminal layout

Unit: mm



DC 24V	Y0	Y1	COM +	Y4	Y5	COM +
DC 24G	COM +	Y2	Y3	COM +	Y6	Y7

Screw T. block

Screw terminal block type

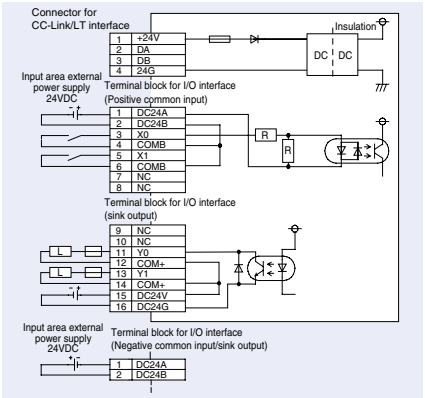
I/O combined module
CL1XY4-DT1B2

DC input 2 pts | +COM / -COM | 24VDC 2-wire | Transistor output 2 pts | Sink | 0.1A 2-wire | Screw T. block | Hold

Detailed specifications

Input specifications		Description
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 4mA
Operating voltage range		20.4 to 28.8VDC (24VDC -15% to +20%) (ripple ratio: within 5%)
Maximum number of simultaneous input points		100% (when 24VDC)
ON voltage/ON current		19V/3mA or higher
OFF voltage/OFF current		11V/1.7mA or lower
Input resistance		5.6kΩ
Response time	OFF→ON	1.5ms (when 24VDC)
	ON→OFF	1.5ms (when 24VDC)
Wiring method for common		2 points/common (2-point) (terminal block 2-wire type)
Power supply	Voltage	20.4 to 28.8VDC (24VDC -15% to +20%) (ripple ratio: within 5%)
	Current consumption	55mA or lower (when all points ON)
	Current at start-up	70mA
Number of occupied stations		In 4-, 8- or 16-point mode: Occupies 1 station (see table on the right)
Weight		0.10kg

External connection diagram

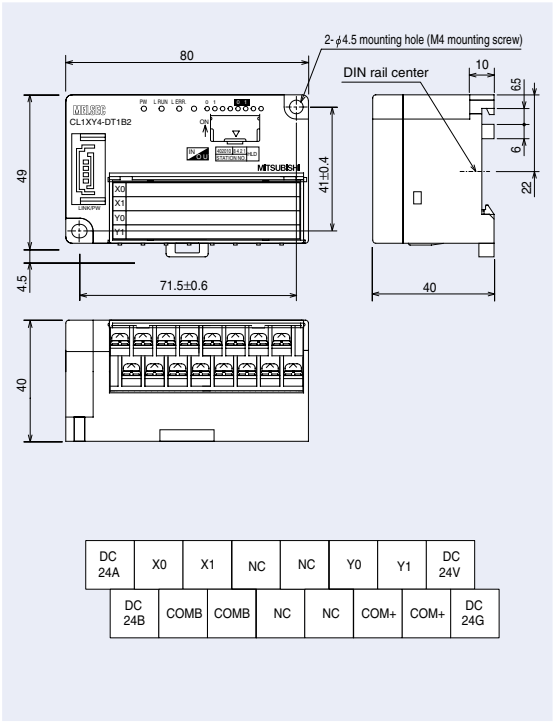


Output specifications		Description
Isolation method		Photocoupler
Rated load voltage		12/24VDC
Operating load voltage range		10.2 to 28.8VDC (ripple ratio: within 5%)
Maximum load current		0.1A/point 0.2A/common
Maximum inrush current		0.4A/10ms
Leakage current at OFF		0.1mA or lower
Maximum voltage drop at ON		0.3V or lower (TYP) 0.1 A, 0.6V or lower (MAX) 0.1A
Response time	OFF→ON	1.0ms or lower
	ON→OFF	1.0ms or lower
Surge suppressor		Zener diode
Wiring method for common		2 points/common (2 points) (terminal block 2-wire type)

Q, bridge		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Point mode	4 pts	X															
		Y															
	8 pts	X															
		Y															
	16 pts	X															
		Y															
FX		0	1	2	3	4	5	6	7	10	11	12	13	14	15	16	17

External dimensions & terminal layout

Unit: mm



DC 24A	X0	X1	NC	NC	Y0	Y1	DC 24V
DC 24B	COMB	COMB	NC	NC	COM+	COM+	DC 24G

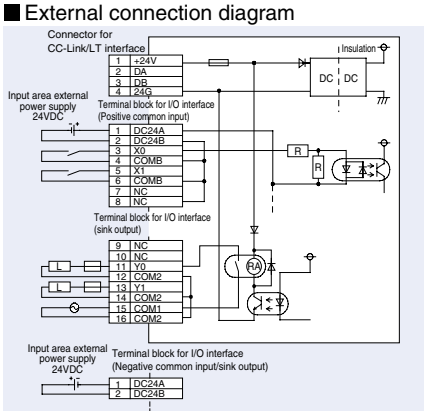
I/O combined module
CL1XY4-DR1B2

DC input 2 pts | +COM / -COM | 24VDC 2-wire | Relay output 2 pts | 2A 2-wire | Screw T. block | Hold

Detailed specifications

Input specifications		Description
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 4mA
Operating voltage range		20.4 to 28.8VDC (24VDC -15% to +20%) (ripple ratio: within 5%)
Maximum number of simultaneous input points		100% (when 24VDC)
ON voltage/ON current		19V/3mA or higher
OFF voltage/OFF current		11V/1.7mA or lower
Input resistance		5.6kΩ
Response time	OFF→ON	1.5ms
	ON→OFF	1.5ms
Wiring method for common		2 points/common (2-point) (terminal block 2-wire type)
Power supply	Voltage	20.4 to 28.8VDC (24VDC -15% to +20%) (ripple ratio: within 5%)
	Current consumption	60mA or lower (when all points ON)
	Current at start-up	70mA
Number of occupied stations		In 4-, 8- or 16-point mode: Occupies 1 station (see table on the right)
Weight		0.11kg

External connection diagram

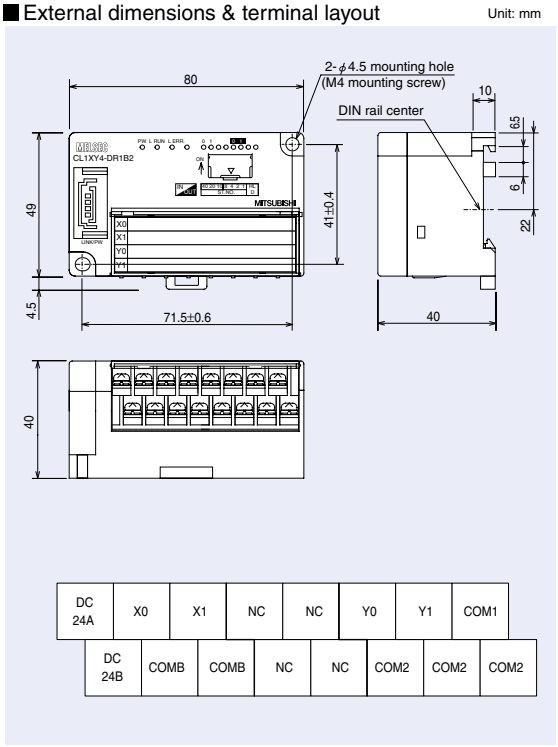


Output specifications		Description	
Isolation method		Mechanical	
Maximum load current		2A/point 4A/common	
Rated load voltage		250VAC or lower, 30VDC or lower	
Response time	OFF→ON	Approx. 10ms or lower	
	ON→OFF	Approx. 10ms or lower	
Wiring method for common		2 points/common (3 points) (Terminal block 2-wire type)	
Contact life		200VAC 1.5A, 240VAC 1A (COSφ=0.7)	100000 times or more
		200VAC 1A, 240VAC 0.1A (COSφ=0.35)	100000 times or more
		24VDC 1A 100VDC 0.1A (L/R=7ms)	100000 times or more

Q, bridge		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Point mode	4 pts	X															
		Y															
	8 pts	X															
		Y															
	16 pts	X															
		Y															
FX		0	1	2	3	4	5	6	7	10	11	12	13	14	15	16	17

External dimensions & terminal layout

Unit: mm



DC 24A	X0	X1	NC	NC	Y0	Y1	COM1
DC 24B	COMB	COMB	NC	NC	COM2	COM2	COM2

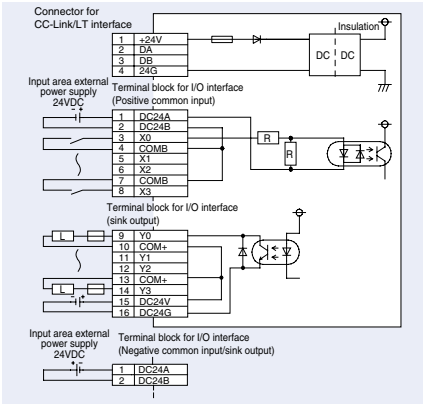
I/O combined module
CL1XY8-DT1B2

DC input 4 pts | +COM / -COM | 24VDC 2-wire | Transistor output 4 pts | Sink | 0.1A 2-wire | Screw T. block | Hold

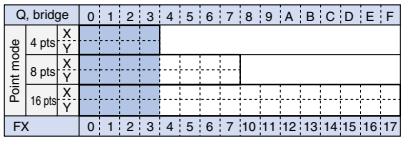
Detailed specifications

Input specifications		Description
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 4mA
Operating voltage range		20.4 to 28.8VDC (24VDC -15% to +20%) (ripple ratio: within 5%)
Maximum number of simultaneous input points		100% (when 24VDC)
ON voltage/ON current		19V/3mA or higher
OFF voltage/OFF current		11V/1.7mA or lower
Input resistance		5.6kΩ
Response time	OFF→ON	1.5ms (when 24VDC)
	ON→OFF	1.5ms (when 24VDC)
Wiring method for common		4 points/common (2-point) (terminal block 2-wire type)
Power supply	Voltage	20.4 to 28.8VDC (24VDC -15 % to +20 %) (ripple ratio: within 5%)
	Current consumption	65mA or lower (when all points ON)
	Current at start-up	70mA
Number of occupied stations		In 4-, 8- or 16-point mode: Occupies 1 station (see table on the right)
Weight		0.10kg

External connection diagram

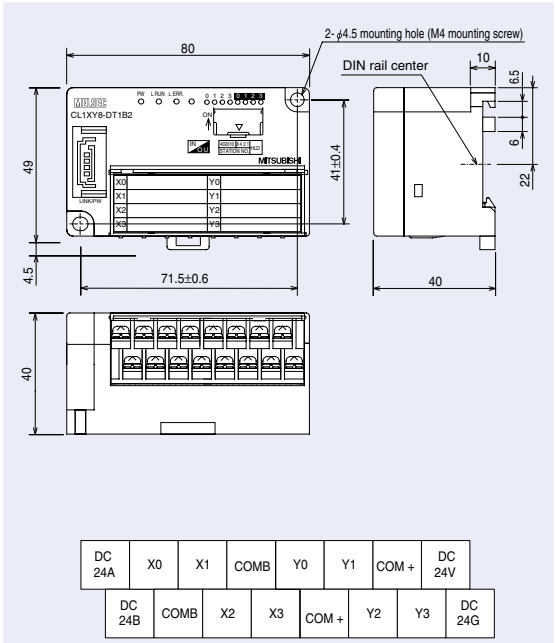


Output specifications		Description
Isolation method		Photocoupler
Rated load voltage		12/24VDC
Operating load voltage range		10.2 to 28.8VDC (ripple ratio: within 5%)
Maximum load current		0.1A/point 0.4A/common
Maximum inrush current		0.4A/10ms
Leakage current at OFF		0.1mA or lower
Maximum voltage drop at ON		0.3V or lower (TYP) 0.1A, 0.6V or lower (MAX) 0.1A
Response time	OFF→ON	1.0ms or lower
	ON→OFF	1.0ms or lower
Surge suppressor		Zener diode
Wiring method for common		4 points/common (2-point) (terminal block 2-wire type)



External dimensions & terminal layout

Unit: mm



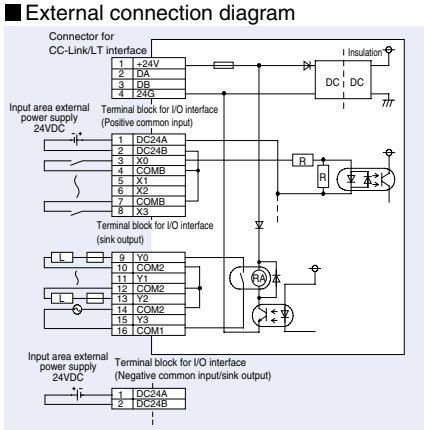
I/O combined module
CL1XY8-DR1B2

DC input 4 pts | +COM / -COM | 24VDC 2-wire | Relay output 4 pts | 2A 2-wire | Screw T. block | Hold

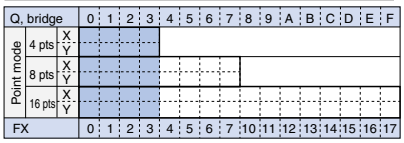
Detailed specifications

Input specifications		Description
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 4 mA
Operating voltage range		20.4 to 28.8VDC (24VDC -15% to +20%) (ripple ratio: within 5%)
Maximum number of simultaneous input points		100% (when 24VDC)
ON voltage/ON current		19V/3mA or higher
OFF voltage/OFF current		11V/1.7mA or lower
Input resistance		5.6kΩ
Response time	OFF→ON	1.5ms (when 24VDC)
	ON→OFF	1.5ms (when 24VDC)
Wiring method for common		4 points/common (2-point) (terminal block 2-wire type)
Power supply	Voltage	20.4 to 28.8VDC (24VDC -15% to +20%) (ripple ratio: within 5%)
	Current consumption	70mA or lower (when all points ON)
	Current at start-up	70mA
Number of occupied stations		In 4-, 8- or 16-point mode: Occupies 1 station (see table on the right)
Weight		0.11kg

External connection diagram

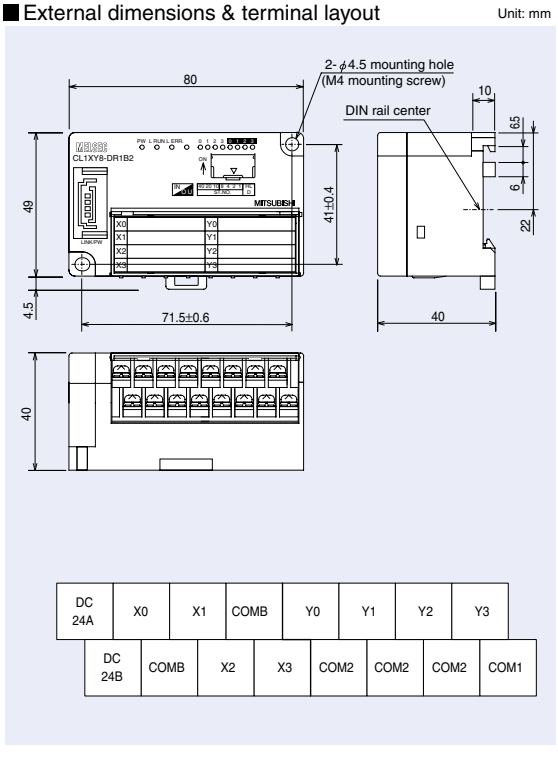


Output specifications		Description	
Isolation method		Mechanical	
Maximum load current		2A/point 4A/common	
Rated load voltage		250VAC or lower, 30VDC or lower	
Response time	OFF→ON	Approx. 10ms or lower	
	ON→OFF	Approx. 10ms or lower	
Wiring method for common		4 points/common (3-point) (terminal block 2-wire type)	
Contact life		200VAC 1.5A, 240VAC 1A (COSφ=0.7)	100 thousand times or more
		200VAC 1A, 240VAC 0.1A (COSφ=0.35)	100 thousand times or more
		24VDC 1A 100VDC 0.1A (L/R=7ms)	100 thousand times or more



External dimensions & terminal layout

Unit: mm



Remote I/O modules

Spring clamp

Spring clamp terminal block type

Overview

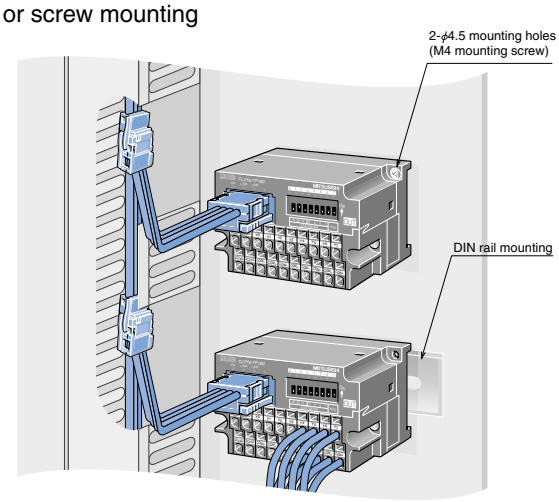
Spring clamp terminal block type

Features

- Retightening is not required. The applicable wire size is 0.3 to 1.5mm² (AWG22 to 16).
- Two-piece structure (The terminal block section is removable.)
- Input modules with positive/negative common shared

Installation

■DIN rail or screw mounting



Part names and settings

CL1X4-D1S2/CL1Y4-T1S2

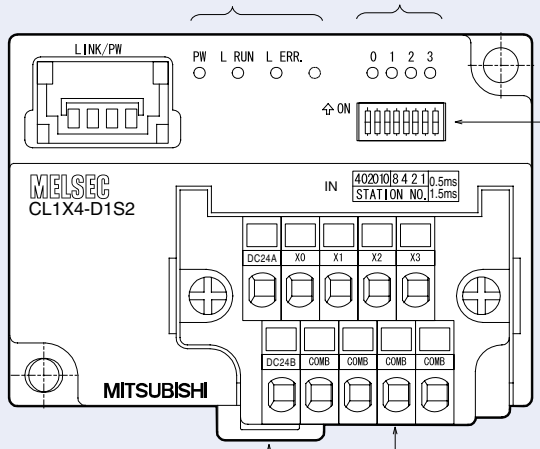
Operation status indicator LEDs

LED name	Description
PW	On : Power supply ON
L RUN	On : Normal communication
L ERR.	On : Communication error, or invalid switch setting

I/O operation status indicator LEDs
ON: LED is on.
OFF: LED is off.

Connector for CC-Link/ LT interface

Pin No.	Signal name
1	+24V
2	DA
3	DB
4	24G



Actual size

DIP switch

Setting	Switch name	Station No.	Description			
Station number setting switches	STATION NO.	1	Tens place	40	On: 40	Off: 0
		2		20	On: 20	
		3		10	On: 10	
		4	Ones place	8	On: 8	
		5		4	On: 4	
		6		2	On: 2	
		7		1	On: 1	
I/O operation setting	0.5ms 1.5ms	8	For input module: response speed setting Off: 1.5ms (standard type) On: 0.5ms (high-speed response type)			
	HLD		For output module: HOLD function setting Off: Output CLEAR On: Output HOLD			

The DIP switches are all set to OFF prior to shipment.

Spring clamp terminal block

Hook for DIN rail

* Refer to page 227 for the DIN rail mounting specifications.

CL2X8-D1S2/CL2Y8-TP1S2

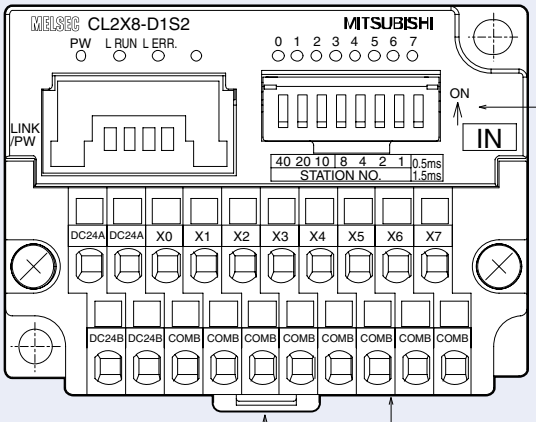
Operation status indicator LEDs

LED name	Description
PW	On : Power supply ON
L RUN	On : Normal communication
L ERR.	On : Communication error, or invalid switch setting

I/O operation status indicator LEDs
ON: LED is on.
OFF: LED is off.

Connector for CC-Link/ LT interface

Pin No.	Signal name
1	+24V
2	DA
3	DB
4	24G



Actual size

DIP switch

Setting	Switch name	Station No.	Description		
Station number setting switches	STATION NO.	1	Tens place	40	On:40
		2		20	On: 20
		3		10	On: 10
		4	Ones place	8	On: 8
		5		4	On: 4
		6		2	On: 2
		7		1	On: 1
					Off: 0
I/O operation setting	0.5ms 1.5ms	8	For input module: response speed setting Off: 1.5ms (standard type) On: 0.5ms (high-speed response type)		
	HLD		For output module: HOLD function setting Off: Output CLEAR On: Output HOLD		

DIP switches are all set to OFF prior to shipment.

Spring clamp terminal block

DIN rail hook

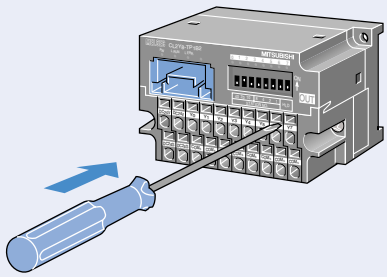
* Refer to page 227 for the DIN rail mounting specifications.

Connect wires in 3 easy steps!

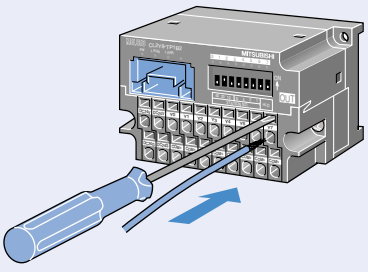
Wiring cables to spring terminal block

Connect cables to the spring clamp terminal block in the following steps.

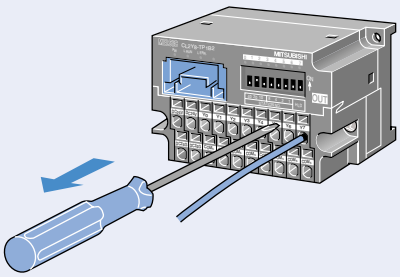
1 Insert a dedicated tool.



2 Insert a cable.



3 Remove the dedicated tool.



* Use the dedicated spring clamp terminal block tool (KD-5339) (refer to page 237).
Do not use a general flat-blade screwdriver as it may damage the spring clamp terminal block or its coating.

Spring clamp

Spring clamp terminal block type

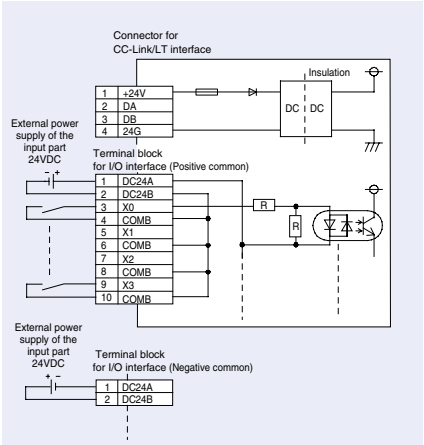
Input module
CL1X4-D1S2

DC input 4 pts | +COM / -COM | 24VDC 2-wire | Spring clamp | Input switch

■ Detailed specifications

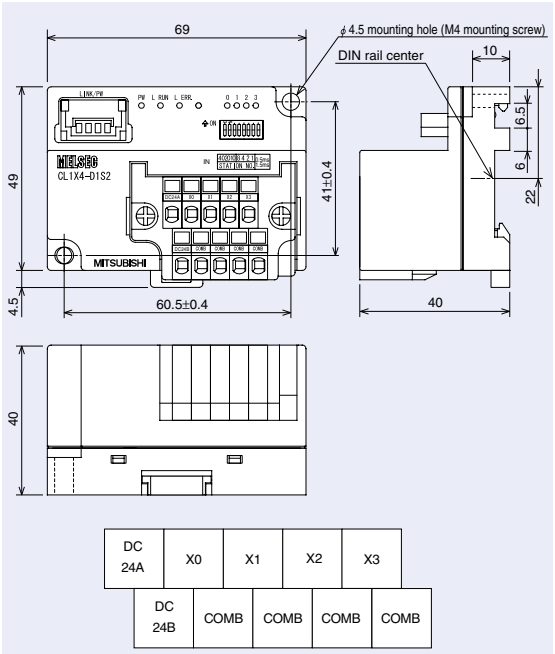
Input specifications		Description
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 4mA
Operating voltage range		20.4 to 28.8VDC (-15% to +20%) (ripple ratio: within 5%)
Maximum number of simultaneous input points		100% (when 24VDC)
ON voltage/ON current		19V/3mA or higher
OFF voltage/OFF current		11V/1.7mA or lower
Input resistance		Approx. 5.6kΩ
Response time	OFF→ON	0.5ms/1.5ms or lower (when 24VDC) Selectable by DIP SW (default = OFF / 1.5ms)
	ON→OFF	0.5ms/1.5ms or lower (when 24VDC) Selectable by DIP SW (default = OFF / 1.5ms)
Wiring method for common		4 points/common (4-point) (terminal block 2-wire type)
Power supply	Voltage	20.4 to 28.8VDC (-15% to +20%) (ripple ratio: within 5%)
	Current consumption	40mA or lower (when all points ON)
	Current at start-up	70mA
Number of occupied stations		In 4-, 8- or 16-point mode: Occupies 1 station (see table on the right)
Weight		0.09kg

■ External connection diagram



■ External dimensions & terminal layout

Unit: mm



Q, bridge		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Point mode	4 pts	X															
		Y															
	8 pts	X															
		Y															
	16 pts	X															
		Y															
FX		0	1	2	3	4	5	6	7	10	11	12	13	14	15	16	17

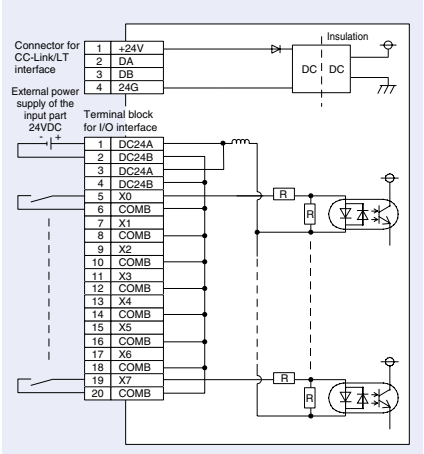
Input module
CL2X8-D1S2

DC input 8 pts | +COM / -COM | 24VDC 2-wire | Spring clamp | Input switch

■ Detailed specifications

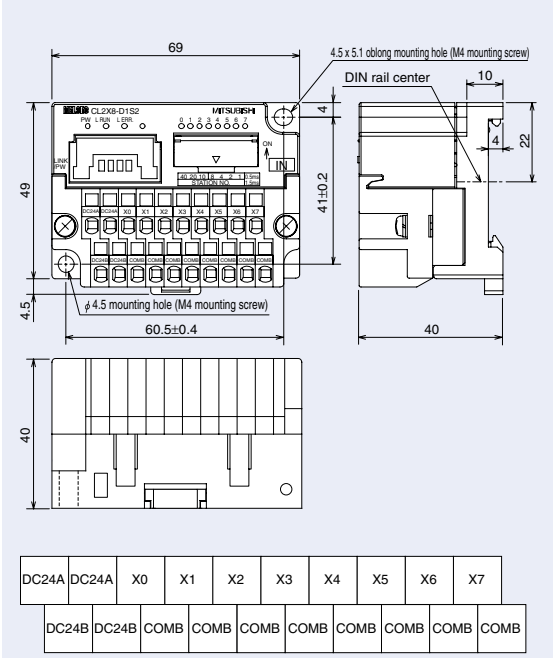
Input specifications			Description	
Isolation method			Photocoupler	
Rated input voltage			24VDC	
Rated input current			Approx. 4mA	
Operating voltage range			20.4 to 28.8VDC (-15% to +20%) (ripple ratio: within 5%)	
Maximum number of simultaneous input points			100%	
ON voltage/ON current			19V/3mA or higher	
OFF voltage/OFF current			11V/1.7mA or lower	
Input resistance			Approx. 5.6kΩ	
Response time	Response time setting		0.5ms (high-speed response type)	1.5ms (standard type)
	OFF→ON	TYP.	0.05ms	–
		MAX.	0.1ms	1.5ms
	ON→OFF	TYP.	0.2ms	–
		MAX.	0.5ms	1.5ms
Wiring method for common			8 points/common (8-point) (terminal block 2-wire type)	
Power supply	Voltage		24VDC (ripple ratio: within 5%)	
	Current consumption		40mA or lower (when 24VDC, all points ON)	
	Current at start-up		70mA or lower (when 24VDC)	
Number of occupied stations			In 4-point mode: Occupies 2 stations In 8- or 16-point mode: Occupies 1 station (see table on the right)	
Weight			0.12kg	

■ External connection diagram



■ External dimensions & terminal layout

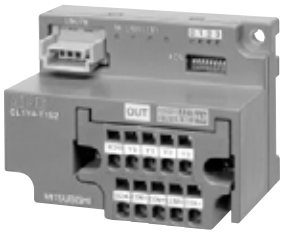
Unit: mm



Q, bridge		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Point mode	4 pts	X															
		Y															
	8 pts	X															
		Y															
	16 pts	X															
		Y															
FX		0	1	2	3	4	5	6	7	10	11	12	13	14	15	16	17

Output module
CL1Y4-T1S2

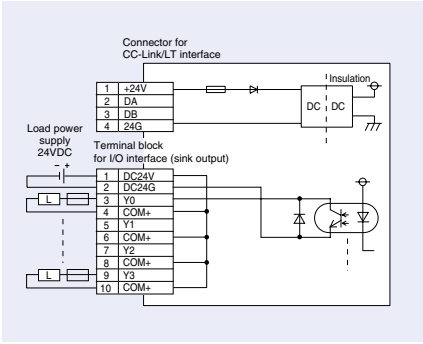
Transistor output 4 pts | Sink | 0.1A 2-wire | Spring clamp | Hold



Detailed specifications

Output specifications		Description
Isolation method		Photocoupler
Rated load voltage		12/24VDC
Operating load voltage range		10.2 to 28.8VDC (ripple ratio: within 5%)
Maximum load current		0.1A/point, 0.4A/common
Maximum inrush current		0.4A 10ms or lower
Leakage current at OFF		0.1mA or lower
Maximum voltage drop at ON		0.3V or lower (TYP) 0.1A, 0.6V or lower (MAX) 0.1A
Response time	OFF→ON	1.0ms or lower
	ON→OFF	1.0ms or lower
Surge suppressor		Zener diode
Wiring method for common		4 points/common (4-point) (terminal block 2-wire type)
Power supply	Voltage	20.4 to 28.8VDC (24VDC -15% to +20%) (ripple ratio: within 5%)
	Current consumption	60mA or lower (when all points ON)
	Current at start-up	70mA
Number of occupied stations		In 4- or 8-point mode: Occupies 1 station (see table on the right)
Weight		0.09kg

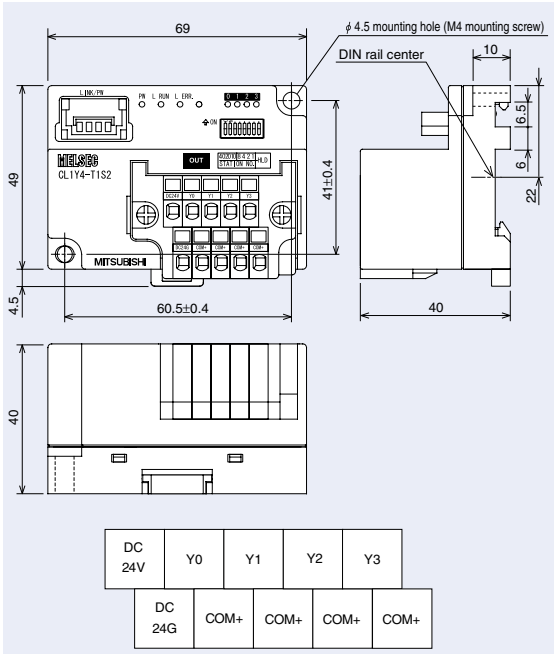
External connection diagram



Q, bridge		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Point mode	4 pts	X															
		Y															
	8 pts	X															
		Y															
	16 pts	X															
		Y															
FX		0	1	2	3	4	5	6	7	10	11	12	13	14	15	16	17

External dimensions & terminal layout

Unit: mm



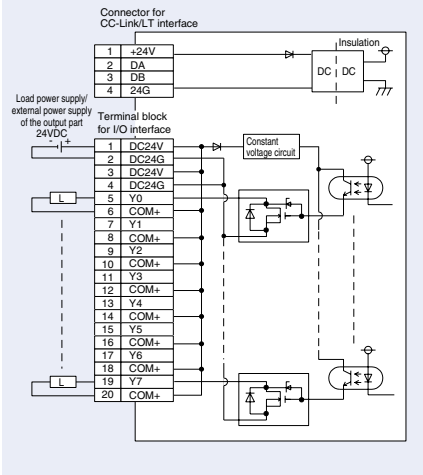
Output module
CL2Y8-TP1S2

Transistor output 8 pts | Sink | 0.1A 2-wire | Spring clamp | Protection | Hold

Detailed specifications

Output specifications		Description
Isolation method		Photocoupler
Rated load voltage		12/24VDC
Operating load voltage range		24VDC (ripple ratio: within 5%)
Maximum load current		0.1A/point, 0.8A/common
Maximum inrush current		0.7A 10ms or lower
Leakage current at OFF		0.1mA or lower
Maximum voltage drop at ON		0.3V or lower (TYP) 0.1A, 0.6V or lower (MAX) 0.1A
Response time	OFF→ON	0.5ms or lower
	ON→OFF	0.5ms or lower (resistive load)
Surge suppressor		Zener diode
Wiring method for common		8 points/common (8-point) (terminal block 2-wire type)
External power supply for output part	Voltage	10.2 to 28.8VDC (ripple ratio: within 5%)
	Current consumption	15mA (when 24VDC, all points ON) Not including external load current
Power supply	Voltage	24VDC (ripple ratio: within 5%)
	Current consumption	40mA or lower (when 24VDC, all points ON)
	Current at start-up	70mA (when 24VDC)
Number of occupied stations		In 4-point mode: Occupies 2 stations In 8- or 16-point mode: Occupies 1 station (see table on the right)
Weight		0.12kg

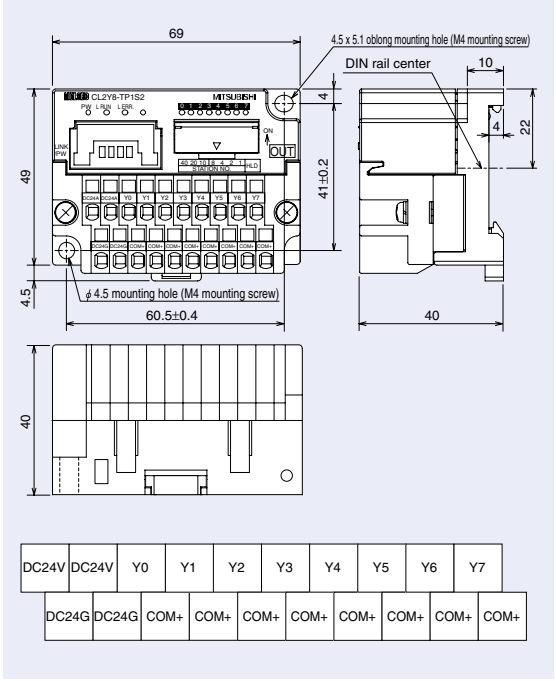
External connection diagram



Q, bridge		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Point mode	4 pts	X															
		Y															
	8 pts	X															
		Y															
	16 pts	X															
		Y															
FX		0	1	2	3	4	5	6	7	10	11	12	13	14	15	16	17

External dimensions & terminal layout

Unit: mm



Spring clamp

Spring clamp terminal block type

Output module

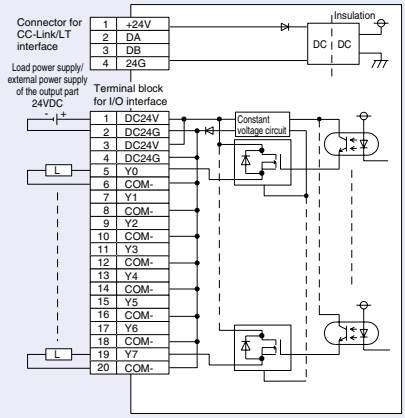
CL2Y8-TPE1S2

Transistor output 8 pts | Source | 0.1A 2-wire | Spring clamp | Protection | Hold

■ Detailed specifications

Output specifications		Description
Isolation method		Photocoupler
Rated load voltage		12/24VDC
Operating load voltage range		10.2 to 28.8VDC (ripple ratio: within 5%)
Maximum load current		0.1A/point, 0.8A/common
Maximum inrush current		0.7A 10ms or lower
Leakage current at OFF		0.1mA or lower
Maximum voltage drop at ON		0.1V or lower (TYP) 0.1A, 0.2V or lower (MAX) 0.1A
Response time	OFF→ON	1.0ms or lower
	ON→OFF	1.0ms or lower (resistive load)
Surge suppressor		Zener diode
Wiring method for common		8 points/common (8-point) (terminal block 2-wire type)
External power supply for output part	Voltage	10.2 to 28.8VDC (ripple rate: within 5%)
	Current consumption	10mA or lower (when 24VDC, all points ON) Not including external load current
Power supply	Voltage	24VDC (-15% to +20%) (ripple ratio: within 5%)
	Current consumption	40mA or lower (when 24VDC, all points ON)
	Current at start-up	70mA or lower (when 24VDC)
Number of occupied stations		In 4-point mode: Occupies 2 stations In 8- or 16-point mode: Occupies 1 station (see table on the right)
Weight		0.13kg

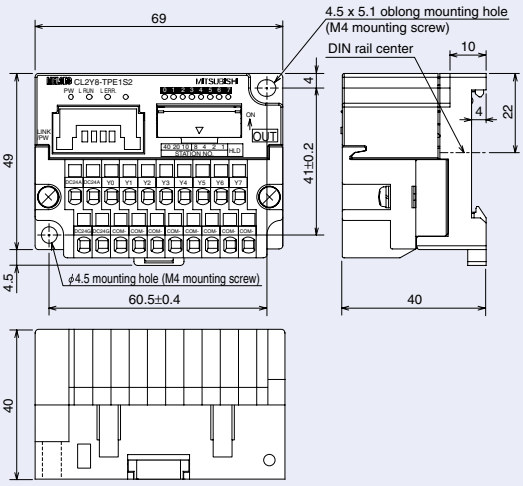
■ External connection diagram



Q, bridge		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Point mode	4 pts	X															
		Y															
	8 pts	X															
		Y															
	16 pts	X															
		Y															
FX		0	1	2	3	4	5	6	7	10	11	12	13	14	15	16	17

■ External dimensions & terminal layout

Unit: mm



DC24V	DC24V	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7
DC24G	DC24G	COM-	COM-	COM-	COM-	COM-	COM-	COM-	COM-

Memo

Remote I/O modules

Sensor

Sensor connector type (e-CON)

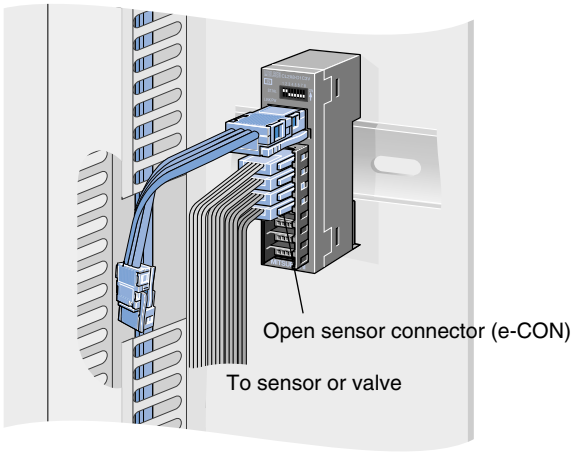
Overview

Sensor connector type (e-CON)

Features

- The industry's most compact size
- Adoption of open sensor connectors (e-CON) for easy sensor connection
- Simple module replacement by only disconnecting the connector

Installation work ■DIN rail mounting



Part names and settings

CL1X4-D1C3/CL1Y4-T1C2

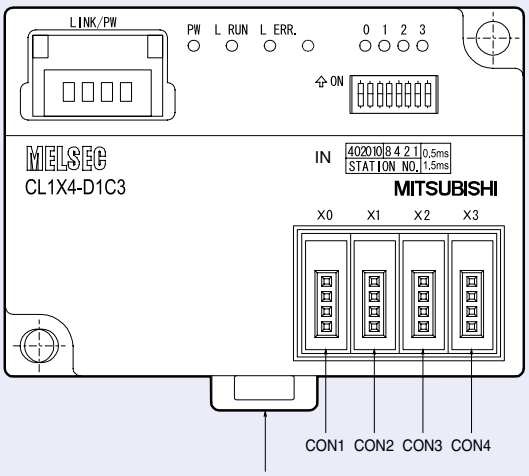
Operation status indicator LEDs
ON: LED is on.
OFF: LED is off.

LED name	Description
PW	On: Power supply ON
L RUN	On: Normal communication
L ERR.	On: Communication error, or invalid switch setting

I/O operation status indicator LEDs
ON: LED is on.
OFF: LED is off.

Connector for CC-Link/ LT interface

Pin No.	Signal name
1	24G
2	DB
3	DA
4	+24V



Actual size

DIP switch

Setting	Switch name	Station No.	Description		
Station number setting switches	STATION NO.	1	Tens place	40	On: 40
		2		20	On: 20
		3		10	On: 10
		4	Ones place	8	On: 8
		5		4	On: 4
		6		2	On: 2
		7		1	On: 1
					Off: 0
I/O operation setting	0.5ms 1.5ms	8	For input module: response speed setting Off: 1.5ms (standard type) On: 0.5ms (high-speed response type)		
	HLD		For output module: HOLD function setting Off: Output CLEAR On: Output HOLD		

The DIP switches are all set to OFF prior to shipment.

DIN rail hook

* Refer to page 227 for the DIN rail mounting specifications.

CL2X8-D1C3V/CL2Y8-TP1C2V

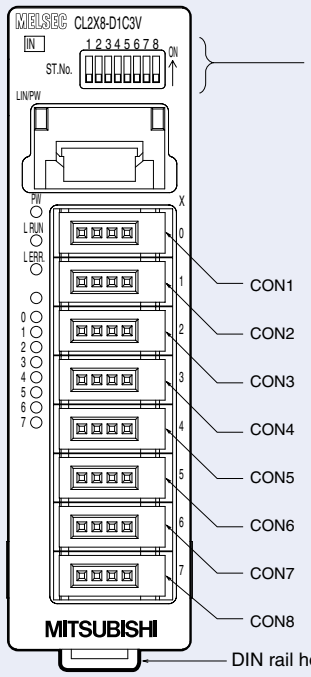
Connector for CC-Link/ LT interface

Pin No.	Signal name
1	+24V
2	DA
3	DB
4	24G

Operation status indicator LEDs
ON: LED is on.
OFF: LED is off.

LED name	Description
PW	On: Power supply ON
L RUN	On: Normal communication
L ERR.	On: Invalid switch setting

I/O operation status indicator LEDs
ON: LED is on.
OFF: LED is off.



Actual size

DIP switch

Setting	Switch name	Station No.	Description			
Station number setting switches	STATION NO.	1	Tens place	40	On: 40	Off: 0
		2		20	On: 20	
		3		10	On: 10	
		4	Ones place	8	On: 8	
		5		4	On: 4	
		6		2	On: 2	
		7		1	On: 1	
I/O operation setting	0.5ms 1.5ms	8	For input module: response speed setting Off: 1.5ms (standard type) On: 0.5ms (high-speed response type)			
	HLD		For output module: HOLD function setting Off: Output CLEAR On: Output HOLD			

The DIP switches are all set to OFF prior to shipment.

* Refer to page 227 for the DIN rail mounting specifications.

CL2X16-D1C3V/CL2Y16-TP1C2V/CL2XY16-DTP1C5V

DIP switch

Setting	Switch name	Station No.	Description			
Station number setting switches	STATION NO.	1	Tens place	40	On: 40	Off: 0
		2		20	On: 20	
		3		10	On: 10	
		4	Ones place	8	On: 8	
		5		4	On: 4	
		6		2	On: 2	
		7		1	On: 1	
I/O operation setting	0.5ms 1.5ms	8	For input, I/O composite modules: response speed setting Off: 1.5ms (standard type) On: 0.5ms (high-speed response type)			
	HLD	9*	For output module: HOLD function setting Off: Output CLEAR On: Output HOLD			

The DIP switches are all set to OFF prior to shipment.

* I/O combined module (CL2XY-16-DTP1C5V) only

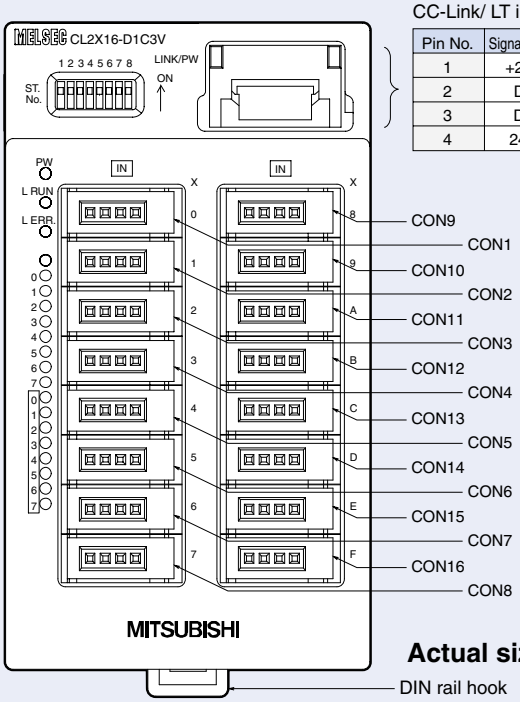
Connector for CC-Link/ LT interface

Pin No.	Signal name
1	+24V
2	DA
3	DB
4	24G

Operation status indicator LEDs
ON: LED is on.
OFF: LED is off.

LED name	Description
PW	On: Power supply ON
L RUN	On: Normal communication
L ERR.	On: Communication error, or invalid switch setting

I/O operation status indicator LEDs
ON: LED is on.
OFF: LED is off.



Actual size

* Refer page 227 for the DIN rail mounting specifications.

Sensor

Sensor connector type (e-CON)

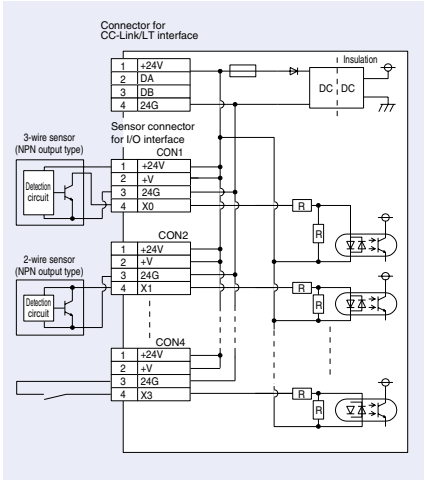
Input module
CL1X4-D1C3

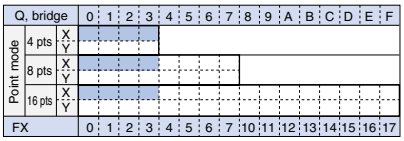
DC input 4 pts | +COM | 24VDC 2-wire or 24VDC 3-wire | Sensor | Input switch | Shared power supply 24V I/O

■Detailed specifications

Input specifications		Description
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 4mA
Operating voltage range		20.4 to 28.8VDC (-15% to +20%) (ripple ratio: within 5%)
Maximum number of simultaneous input points		100% (when 24VDC)
ON voltage/ON current		19V/3mA or higher
OFF voltage/OFF current		11V/1.7mA or lower
Input resistance		5.6kΩ
Response time	OFF→ON	0.5ms/1.5ms or lower (when 24VDC) Selectable by DIP SW (default = OFF / 1.5ms)
	ON→OFF	0.5ms/1.5ms or lower (when 24VDC) Selectable by DIP SW (default = OFF / 1.5ms)
Wiring method for common		4 points/common (sensor connector 3-wire type)
Maximum allowable current for I/O power supply		0.5A or lower/common
Power supply	Voltage	20.4 to 28.8VDC (ripple ratio: within 5%)
	Current consumption	35mA or lower (when all points ON) Not including external load current
	Current at start-up	70mA
Number of occupied stations		In 4-, 8- or 16-point mode: Occupies 1 station (see table on the right)
Weight		0.04kg

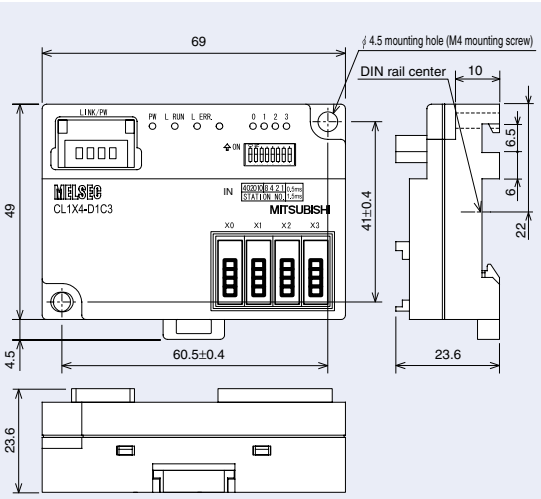
■External connection diagram





■External dimensions & terminal layout

Unit: mm



Sensor connector for I/O interface

Terminal No.	Signal name	Terminal No.	Signal name
CON1-1	+24V	CON3-1	+24V
CON1-2	+V	CON3-2	+V
CON1-3	24G	CON3-3	24G
CON1-4	X0	CON3-4	X2
CON2-1	+24V	CON4-1	+24V
CON2-2	+V	CON4-2	+V
CON2-3	24G	CON4-3	24G
CON2-4	X1	CON4-4	X3

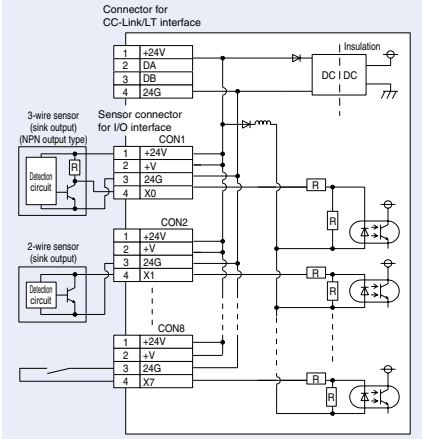
Input module
CL2X8-D1C3V

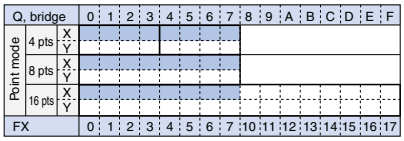
DC input 8 pts | +COM | 24VDC 2-wire or 24VDC 3-wire | Sensor | Input switch | Vertical | Shared power supply 24V I/O

■Detailed specifications

Input specifications			Description	
Isolation method			Photocoupler	
Rated input voltage			24VDC	
Rated input current			Approx. 4mA	
Operating voltage range			Same as module power supply	
Maximum number of simultaneous input points			100% (when 24VDC)	
ON voltage/ON current			19V/3mA or higher	
OFF voltage/OFF current			11V/1.7mA or lower	
Input resistance			5.6kΩ	
Response time	Response time setting		0.5ms (high-speed response type)	1.5ms (standard type)
	OFF→ON	TYP.	0.05ms	–
		MAX.	0.1ms	1.5ms
	ON→OFF	TYP.	0.2ms	–
		MAX.	0.5ms	1.5ms
Wiring method for common			8 points/common (sensor connector 3-wire type)	
Maximum allowable current for I/O power supply			1.0A or lower/common	
Power supply	Voltage		20.4 to 28.8VDC (ripple ratio: within 5%)	
	Current consumption		40mA or lower (when all points ON) Not including external load current	
	Current at start-up		70mA	
Number of occupied stations			In 4-point mode: Occupies 2 stations In 8- or 16-point mode: Occupies 1 station (see table on the right)	
Weight			0.05kg	

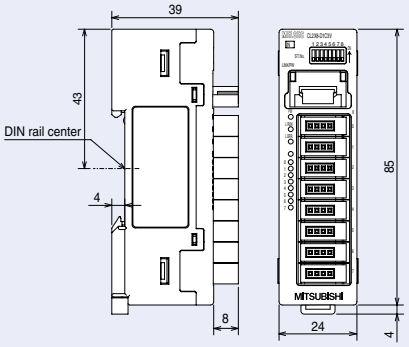
■External connection diagram





■External dimensions & terminal layout

Unit: mm



Sensor connector for I/O interface

Terminal No.	Signal name	Terminal No.	Signal name
CON1-1	+24V	CON5-1	+24V
CON1-2	+V	CON5-2	+V
CON1-3	24G	CON5-3	24G
CON1-4	X0	CON5-4	X4
CON2-1	+24V	CON6-1	+24V
CON2-2	+V	CON6-2	+V
CON2-3	24G	CON6-3	24G
CON2-4	X1	CON6-4	X5
CON3-1	+24V	CON7-1	+24V
CON3-2	+V	CON7-2	+V
CON3-3	24G	CON7-3	24G
CON3-4	X2	CON7-4	X6
CON4-1	+24V	CON8-1	+24V
CON4-2	+V	CON8-2	+V
CON4-3	24G	CON8-3	24G
CON4-4	X3	CON8-4	X7

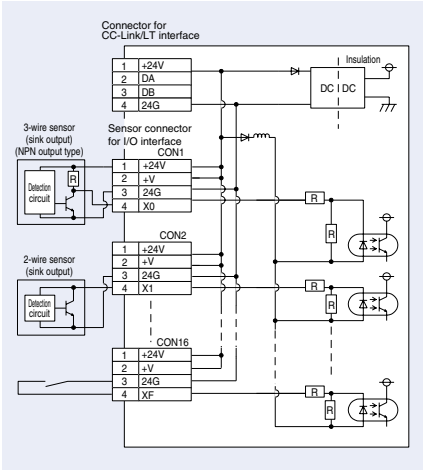
Input module
CL2X16-D1C3V

DC input 16 pts | +COM | 24VDC 2-wire or 24VDC 3-wire | Sensor | Input switch | Vertical | Shared power supply 24V I/O

Detailed specifications

Input specifications			Description	
Isolation method			Photocoupler	
Rated input voltage			24VDC	
Rated input current			Approx. 4mA	
Operating voltage range			Same as module power supply	
Maximum number of simultaneous input points			100%	
ON voltage/ON current			19V/3mA or higher	
OFF voltage/OFF current			11V/1.7mA or lower	
Input resistance			5.6kΩ	
Response time	Response time setting		0.5ms (high-speed response type)	1.5ms (standard type)
	OFF→ON	TYP.	0.05ms	–
		MAX.	0.1ms	1.5ms
	ON→OFF	TYP.	0.2ms	–
		MAX.	0.5ms	1.5ms
Wiring method for common			16 points/common (sensor connector 3-wire type)	
Maximum allowable current for I/O power supply			1.0A or lower/common	
Power supply	Voltage		24VDC (ripple ratio: within 5%)	
	Current consumption		45mA or lower (when 24VDC, all points ON)	
	Current at start-up		70mA or lower (when 24VDC)	
Number of occupied stations			In 4-point mode: Occupies 4 stations In 8-point mode: Occupies 2 stations In 16-point mode: Occupies 1 station (see table on the right)	
Weight			0.08kg	

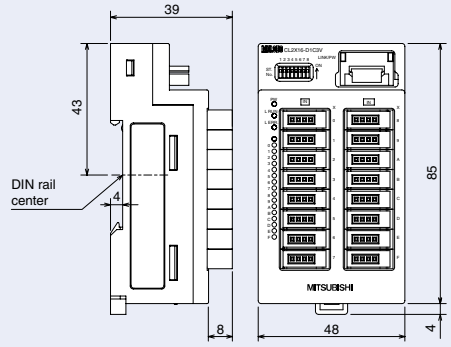
External connection diagram



Q, bridge		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Point mode	4 pts	X															
		Y															
	8 pts	X															
		Y															
	16 pts	X															
		Y															
FX		0	1	2	3	4	5	6	7	10	11	12	13	14	15	16	17

External dimensions & terminal layout

Unit: mm



Sensor connector for I/O interface

Terminal No.	Signal name	Terminal No.	Signal name	Terminal No.	Signal name	Terminal No.	Signal name
CON1-1	+24V	CON5-1	+24V	CON9-1	+24V	CON13-1	+24V
CON1-2	+V	CON5-2	+V	CON9-2	+V	CON13-2	+V
CON1-3	24G	CON5-3	24G	CON9-3	24G	CON13-3	24G
CON1-4	X0	CON5-4	X4	CON9-4	X8	CON13-4	XC
CON2-1	+24V	CON6-1	+24V	CON10-1	+24V	CON14-1	+24V
CON2-2	+V	CON6-2	+V	CON10-2	+V	CON14-2	+V
CON2-3	24G	CON6-3	24G	CON10-3	24G	CON14-3	24G
CON2-4	X1	CON6-4	X5	CON10-4	X9	CON14-4	XD
CON3-1	+24V	CON7-1	+24V	CON11-1	+24V	CON15-1	+24V
CON3-2	+V	CON7-2	+V	CON11-2	+V	CON15-2	+V
CON3-3	24G	CON7-3	24G	CON11-3	24G	CON15-3	24G
CON3-4	X2	CON7-4	X6	CON11-4	XA	CON15-4	XE
CON4-1	+24V	CON8-1	+24V	CON12-1	+24V	CON16-1	+24V
CON4-2	+V	CON8-2	+V	CON12-2	+V	CON16-2	+V
CON4-3	24G	CON8-3	24G	CON12-3	24G	CON16-3	24G
CON4-4	X3	CON8-4	X7	CON12-4	XB	CON16-4	XF

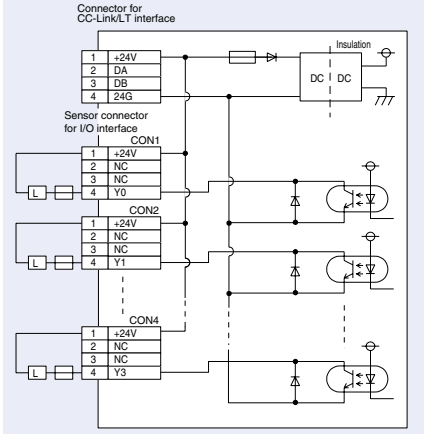
Output module
CL1Y4-T1C2

Transistor output 4 pts | Sink | 0.1A 2-wire | Sensor | Hold | Shared power supply 24V I/O

Detailed specifications

Output specifications			Description
Isolation method			Photocoupler
Rated load voltage			24VDC
Operating load voltage range			20.4 to 28.8VDC (ripple ratio: within 5%)
Maximum load current			0.1A/point 0.4A/common
Maximum inrush current			0.4A 10ms
Leakage current at OFF			0.1mA or lower
Maximum voltage drop at ON			0.3V or lower (TYP) 0.1A, 0.6V or lower (MAX) 0.1A
Response time	OFF→ON		1.0ms or lower
	ON→OFF		1.0ms or lower
Surge suppressor			Zener diode
Wiring method for common			4 points/common (sensor connector 2-wire type)
Maximum allowable current for I/O power supply			Same as module power supply
Power supply	Voltage		20.4 to 28.8VDC (24VDC -15% to +20%) (ripple ratio: within 5%)
	Current consumption		60mA or lower (when all points ON) Not including external load current
	Current at start-up		70mA
Number of occupied stations			In 4-, 8- or 16-point mode: Occupies 1 station (see table on the right)
Weight			0.04kg

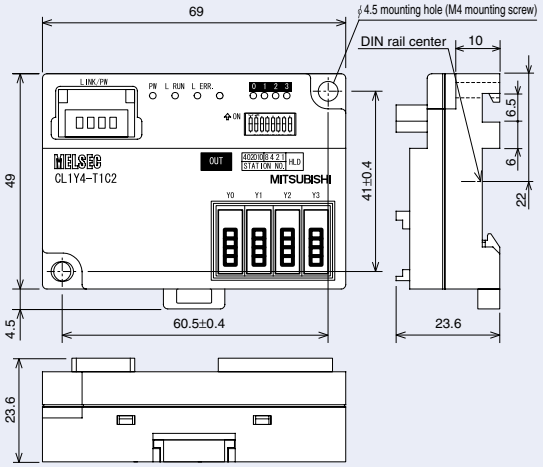
External connection diagram



Q, bridge		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Point mode	4 pts	X															
		Y															
	8 pts	X															
		Y															
	16 pts	X															
		Y															
FX		0	1	2	3	4	5	6	7	10	11	12	13	14	15	16	17

External dimensions & terminal layout

Unit: mm



Sensor connector for I/O interface

Terminal No.	Signal name	Terminal No.	Signal name
CON1-1	+24V	CON3-1	+24V
CON1-2	NC	CON3-2	NC
CON1-3	NC	CON3-3	NC
CON1-4	Y0	CON3-4	Y2
CON2-1	+24V	CON4-1	+24V
CON2-2	NC	CON4-2	NC
CON2-3	NC	CON4-3	NC
CON2-4	Y1	CON4-4	Y3

Sensor

Sensor connector type (e-CON)

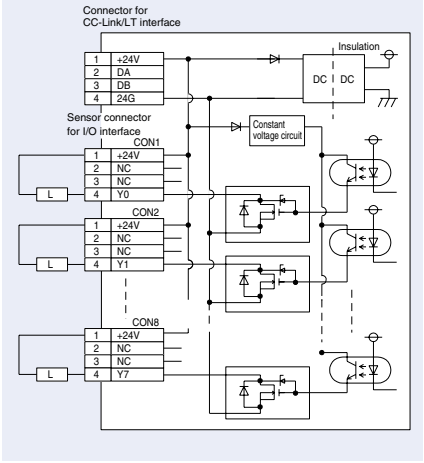
Output module
CL2Y8-TP1C2V

Transistor output 8pts | Sink | 0.1A 2-wire | Sensor | Protection | Hold | Vertical | Shared power-supply 24V I/O

Detailed specifications

Output specifications		Description
Isolation method		Photocoupler
Rated load voltage		24VDC
Operating load voltage range		Same as module power supply
Maximum load current		0.1A/point 0.8A/common
Maximum inrush current		0.7A 10ms or lower
Leakage current at OFF		0.1mA or lower
Maximum voltage drop at ON		0.3V or lower (TYP) 0.1A, 0.6V or lower (MAX) 0.1A
Response time	OFF→ON	0.5ms or lower
	ON→OFF	0.5ms or lower (resistive load)
Surge suppressor		Zener diode
Wiring method for common		8 points/common (sensor connector 2-wire type)
External power supply for output part		Same as module power supply
Power supply	Voltage	20.4 to 28.8VDC (ripple ratio: within 5%)
	Current consumption	55mA or lower (when all points ON) Not including external load current
	Current at start-up	70mA
Number of occupied stations		In 4-point mode: Occupies 2 stations In 8- or 16-point mode: Occupies 1 station (see table on the right)
Weight		0.05kg

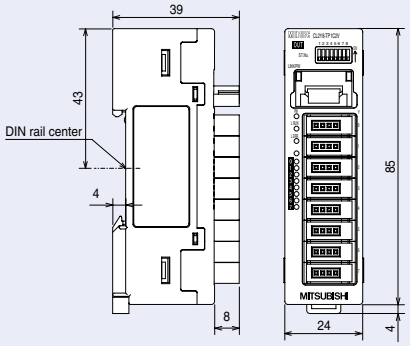
External connection diagram



Q, bridge		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Point mode	4 pts	X															
		Y															
	8 pts	X															
		Y															
	16 pts	X															
		Y															
FX		0	1	2	3	4	5	6	7	10	11	12	13	14	15	16	17

External dimensions & terminal layout

Unit: mm



Sensor connector for I/O interface

Terminal No.	Signal name	Terminal No.	Signal name
CON1-1	+24V	CON5-1	+24V
CON1-2	NC	CON5-2	NC
CON1-3	NC	CON5-3	NC
CON1-4	Y0	CON5-4	Y4
CON2-1	+24V	CON6-1	+24V
CON2-2	NC	CON6-2	NC
CON2-3	NC	CON6-3	NC
CON2-4	Y1	CON6-4	Y5
CON3-1	+24V	CON7-1	+24V
CON3-2	NC	CON7-2	NC
CON3-3	NC	CON7-3	NC
CON3-4	Y2	CON7-4	Y6
CON4-1	+24V	CON8-1	+24V
CON4-2	NC	CON8-2	NC
CON4-3	NC	CON8-3	NC
CON4-4	Y3	CON8-4	Y7

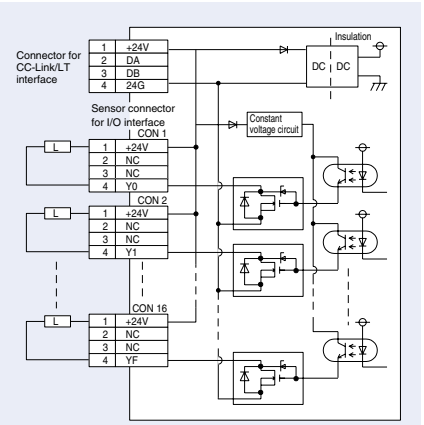
Output module
CL2Y16-TP1C2V

Transistor output 16pts | Sink | 0.1A 2-wire | Sensor | Protection | Hold | Vertical | Shared power-supply 24V I/O

Detailed specifications

Output specifications		Description
Isolation method		Photocoupler
Rated load voltage		24VDC
Operating load voltage range		Same as module power supply
Maximum load current		0.1A/point 1.6A/common
Maximum inrush current		0.7A 10ms or lower
Leakage current at OFF		0.1mA or lower
Maximum voltage drop at ON		0.3V or lower (TYP) 0.1A, 0.6V or lower (MAX) 0.1A
Response time	OFF→ON	0.5ms or lower
	ON→OFF	0.5ms or lower (resistive load)
Surge suppressor		Zener diode
Wiring method for common		16 points/common (sensor connector 2-wire type)
External power supply for output part		Same as module power supply
Power supply	Voltage	24VDC (-15%+20%) (ripple ratio: within 5%)
	Current consumption	55mA or lower (when all points ON) Not including external load current
	Current at start-up	70mA
Number of occupied stations		In 4-point mode: Occupies 4 stations In 8-point mode: Occupies 2 stations In 16-point mode: Occupies 1 station (see table on the right)
Weight		0.08kg

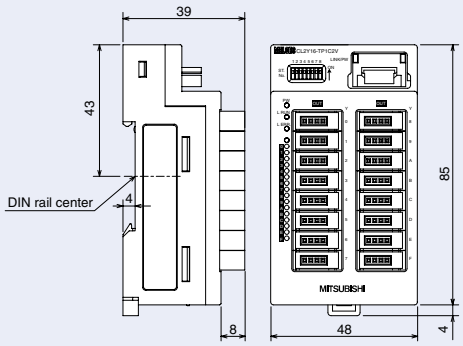
External connection diagram



Q, bridge		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Point mode	4 pts	X															
		Y															
	8 pts	X															
		Y															
	16 pts	X															
		Y															
FX		0	1	2	3	4	5	6	7	10	11	12	13	14	15	16	17

External dimensions & terminal layout

Unit: mm



Sensor connector for I/O interface

Terminal No.	Signal name	Terminal No.	Signal name	Terminal No.	Signal name	Terminal No.	Signal name
CON1-1	+24V	CON5-1	+24V	CON9-1	+24V	CON13-1	+24V
CON1-2	NC	CON5-2	NC	CON9-2	NC	CON13-2	NC
CON1-3	NC	CON5-3	NC	CON9-3	NC	CON13-3	NC
CON1-4	Y0	CON5-4	Y4	CON9-4	Y8	CON13-4	YC
CON2-1	+24V	CON6-1	+24V	CON10-1	+24V	CON14-1	+24V
CON2-2	NC	CON6-2	NC	CON10-2	NC	CON14-2	NC
CON2-3	NC	CON6-3	NC	CON10-3	NC	CON14-3	NC
CON2-4	Y1	CON6-4	Y5	CON10-4	Y9	CON14-4	YD
CON3-1	+24V	CON7-1	+24V	CON11-1	+24V	CON15-1	+24V
CON3-2	NC	CON7-2	NC	CON11-2	NC	CON15-2	NC
CON3-3	NC	CON7-3	NC	CON11-3	NC	CON15-3	NC
CON3-4	Y2	CON7-4	Y6	CON11-4	YA	CON15-4	YE
CON4-1	+24V	CON8-1	+24V	CON12-1	+24V	CON16-1	+24V
CON4-2	NC	CON8-2	NC	CON12-2	NC	CON16-2	NC
CON4-3	NC	CON8-3	NC	CON12-3	NC	CON16-3	NC
CON4-4	Y3	CON8-4	Y7	CON12-4	YB	CON16-4	YF

DC input 8 pts | +COM | 24VDC 2-wire or 24VDC 3-wire | Transistor output 8 pts | Sink | 0.1A 2-wire

Sensor | Input switch | Protection | Hold | Vertical | Shared power supply 24V I/O

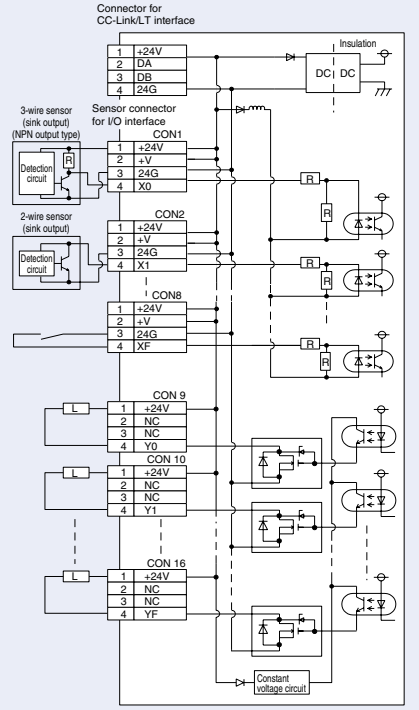
I/O combined module
CL2XY16-DTP1C5V

■ Detailed specifications

Input specifications			Description	
Isolation method			Photocoupler	
Rated input voltage			24VDC	
Rated input current			Approx. 4mA	
Operating voltage range			Same as module power supply	
Maximum number of simultaneous input points			100% (when 24VDC)	
ON voltage/ON current			19V/3mA or higher	
OFF voltage/OFF current			11V/1.7mA or lower	
Input resistance			5.6kΩ	
Response time	Response time setting		0.5ms (high-speed response type)	1.5ms (standard type)
	OFF→ON	TYP.	0.05ms	–
		MAX.	0.1ms	1.5ms
	ON→OFF	TYP.	0.2ms	–
		MAX.	0.5ms	1.5ms
Wiring method for common			8 points/common (sensor connector 3-wire type)	
I/O power supply maximum allowable current			1.0A or lower/common	
Power supply	Voltage		24VDC (-15% to +20%) (ripple ratio: within 5%)	
	Current consumption		50mA or lower (when 24VDC, all points ON)	
	Current at start-up		70mA or lower (when 24VDC)	
Number of occupied stations			In 4-point mode: Occupies 2 stations In 8- or 16-point mode: Occupies 1 station (see table on the right)	
Weight			0.08kg	

Output specifications		Description
Isolation method		Photocoupler
Rated load voltage		24VDC
Operating load voltage range		20.4 to 28.8VDC (-15% to +20%) (ripple ratio: within 5%)
Maximum load current		0.1A/point 0.8A/common
Leakage current at OFF		0.1mA or lower
Maximum voltage drop at ON		0.3V or lower (TYP) 0.1A, 0.6V or lower (MAX) 0.1A
Response time	OFF→ON	0.5ms or lower
	ON→OFF	0.5ms or lower (resistive load)
Surge suppressor		Zener diode
Wiring method for common		8 points/common (2-point) (sensor connector 2-wire type)
External power supply for output part		Same as module power supply

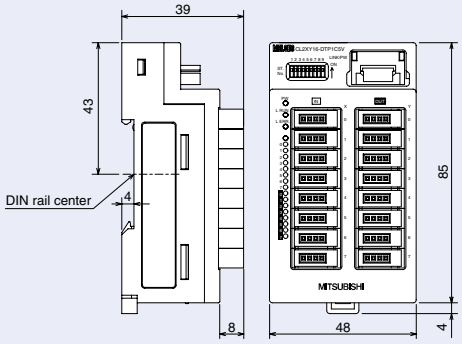
■ External connection diagram



Q, bridge		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Point mode	4 pts	X															
		Y															
	8 pts	X															
		Y															
	16 pts	X															
		Y															
FX		0	1	2	3	4	5	6	7	10	11	12	13	14	15	16	17

■ External dimensions & terminal layout

Unit: mm



Sensor connector for I/O interface

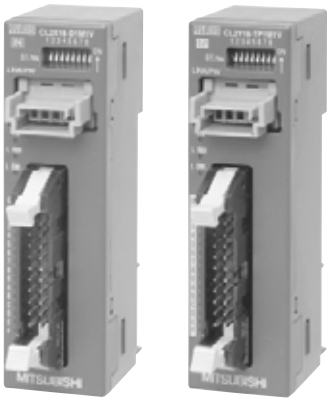
Terminal No.	Signal name	Terminal No.	Signal name	Terminal No.	Signal name	Terminal No.	Signal name
CON1-1	+24V	CON5-1	+24V	CON9-1	+24V	CON13-1	+24V
CON1-2	+V	CON5-2	+V	CON9-2	NC	CON13-2	NC
CON1-3	24G	CON5-3	24G	CON9-3	NC	CON13-3	NC
CON1-4	X0	CON5-4	X4	CON9-4	Y0	CON13-4	Y4
CON2-1	+24V	CON6-1	+24V	CON10-1	+24V	CON14-1	+24V
CON2-2	+V	CON6-2	+V	CON10-2	NC	CON14-2	NC
CON2-3	24G	CON6-3	24G	CON10-3	NC	CON14-3	NC
CON2-4	X1	CON6-4	X5	CON10-4	Y1	CON14-4	Y5
CON3-1	+24V	CON7-1	+24V	CON11-1	+24V	CON15-1	+24V
CON3-2	+V	CON7-2	+V	CON11-2	NC	CON15-2	NC
CON3-3	24G	CON7-3	24G	CON11-3	NC	CON15-3	NC
CON3-4	X2	CON7-4	X6	CON11-4	Y2	CON15-4	Y6
CON4-1	+24V	CON8-1	+24V	CON12-1	+24V	CON16-1	+24V
CON4-2	+V	CON8-2	+V	CON12-2	NC	CON16-2	NC
CON4-3	24G	CON8-3	24G	CON12-3	NC	CON16-3	NC
CON4-4	X3	CON8-4	X7	CON12-4	Y3	CON16-4	Y7

Remote I/O modules

MIL connector type

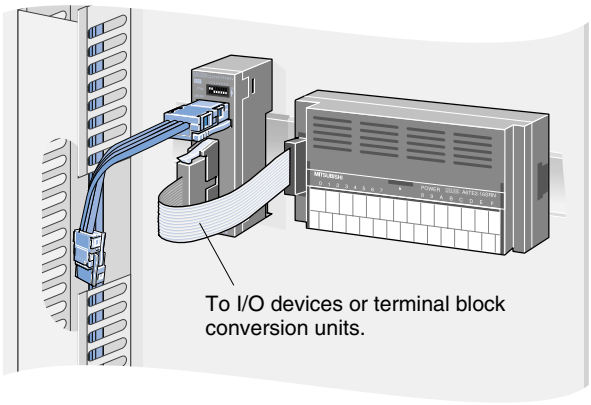
Overview

MIL connector type



Installation

■DIN rail mounting



Features

- ■The industry's most compact size
- ■MIL connector used for easy connection to relay terminals, terminal block conversion modules, solenoid valves, and others.
- ■Simple module replacement by only removing the connector
- ■Modules with a shared power supply for module and I/O parts are available. No external power supply for I/O part saves cost and space. (CL2X16-D1MJ1V and CL2Y16-TP1MJ1V)

Part names and settings

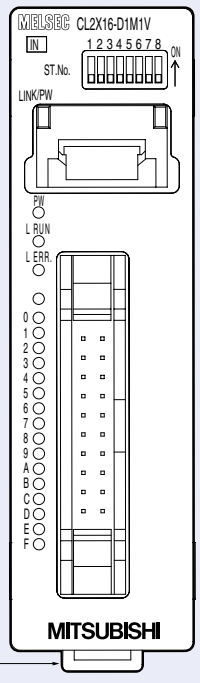
Connector for CC-Link/ LT interface

Pin No.	Signal name
1	+24V
2	DA
3	DB
4	24G

Operation status indicator LEDs
ON: LED is on.
OFF: LED is off.

LED name	Description
PW	On: Power supply ON
L RUN	On: Normal communication
L ERR.	On: Invalid switch setting

I/O operation status indicator LEDs
ON: LED is on.
OFF: LED is off.



Actual size

DIN rail hook

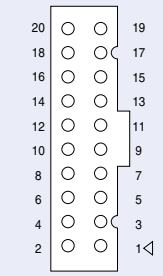
* Refer to page 227 for the DIN rail mounting specifications.

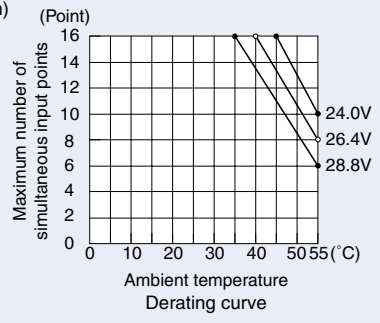
DIP switch

Setting	Switch name	Station No.	Description			
Station number setting switches	STATION NO.	1	Tens place	40	On: 40	Off : 0
		2		20	On: 20	
		3		10	On: 10	
		4	Ones place	8	On: 8	
		5		4	On: 4	
		6		2	On: 2	
		7		1	On: 1	
I/O operation setting	0.5ms 1.5ms	8	For input module: response speed setting Off: 1.5ms (standard type) On: 0.5ms (high-speed response type)			
	HLD		For output module: HOLD function setting Off: Output CLEAR On: Output HOLD			

The DIP switches are all set to OFF prior to shipment.

MIL connector (20-pin)





Derating curve

Input module
CL2X16-D1M1V

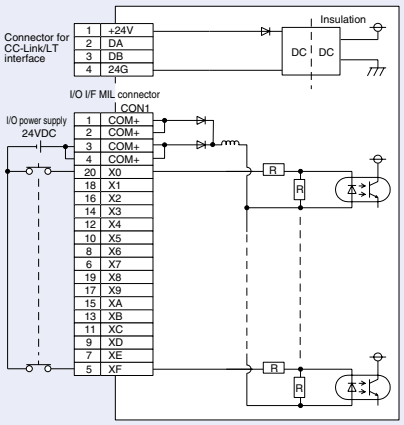
DC input 16 pts | +COM | 24VDC 1-wire | MIL | Input switch | Vertical

Detailed specifications

Input specifications			Description	
Isolation method			Photocoupler	
Rated input voltage			24VDC	
Rated input current			Approx. 4mA	
Operating voltage range			20.4 to 28.8VDC (ripple ratio: within 5%)	
Maximum number of simultaneous input points			62.5% (when 24VDC) *1	
ON voltage/ON current			19V/3mA or higher	
OFF voltage/OFF current			11V/1.7mA or lower	
Input resistance			5.6kΩ	
Response time	Response time setting		0.5ms (high-speed response type)	1.5ms (standard type)
	OFF→ON	TYP.	0.05ms	–
		MAX.	0.1ms	1.5ms
	ON→OFF	TYP.	0.2ms	–
		MAX.	0.5ms	1.5ms
Wiring method for common			16 points/common (2 points) (MIL connector 1-wire type)	
Power supply	Voltage		20.4 to 28.8VDC (-15% to +20%) (ripple ratio: within 5%)	
	Current consumption		45mA or lower (when 24VDC, all points ON)	
	Current at start-up		70mA	
Number of occupied stations			In 4-point mode: Occupies 4 stations In 8-point mode: Occupies 2 stations In 16-point mode: Occupies 1 station (see table on the right)	
Weight			0.05kg	

*1: Refer to page 221 for derating curve details.

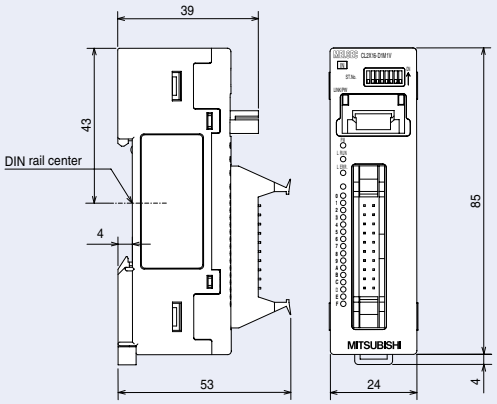
External connection diagram



*: For the COM+ terminal, use either pair of CON1- 1 and CON1- 2 or CON1- 3 and CON1- 4.

External dimensions & terminal layout

Unit: mm



MIL connector for I/O interface

Terminal No.	Signal name	Terminal No.	Signal name
CON1-20	X0	CON1-19	X8
CON1-18	X1	CON1-17	X9
CON1-16	X2	CON1-15	XA
CON1-14	X3	CON1-13	XB
CON1-12	X4	CON1-11	XC
CON1-10	X5	CON1-9	XD
CON1-8	X6	CON1-7	XE
CON1-6	X7	CON1-5	XF
CON1-4	COM+	CON1-3	COM+
CON1-2	COM+	CON1-1	COM+

Q, bridge		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Point mode	4 ps	X															
		Y															
	8 pts	X															
		Y															
	16 pts	X															
		Y															
FX		0	1	2	3	4	5	6	7	10	11	12	13	14	15	16	17

Input module
CL2X16-D1MJ1V

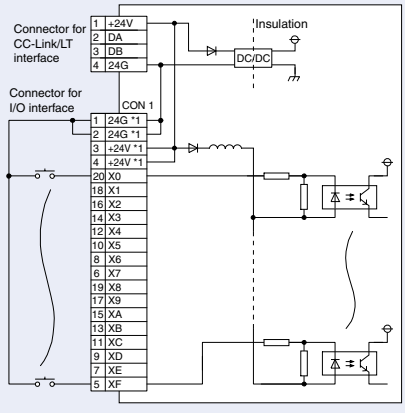
DC input 16 pts | +COM | 24VDC 2-wire | MIL | Input switch | Vertical | Shared power supply

Detailed specifications

Input specifications			Description	
Isolation method			Photocoupler	
Rated input voltage			24VDC (same as module power supply)	
Rated input current			Approx. 4mA	
Operating voltage range			20.4 to 28.8VDC (ripple ratio: within 5%)	
Maximum number of simultaneous input points			62.5% (when 24VDC) *1	
ON voltage/ON current			19V/3mA or higher	
OFF voltage/OFF current			11V/1.7mA or lower	
Input resistance			5.6kΩ	
Response time	Response time setting		0.5ms (high-speed response type)	1.5ms (standard type)
	OFF→ON	TYP.	0.05ms	–
		MAX.	0.1ms	1.5ms
	ON→OFF	TYP.	0.2ms	–
		MAX.	0.5ms	1.5ms
Wiring method for common			16 points/common (2 points) (MIL connector 1-wire type)	
Maximum allowable current for I/O power supply			1.0A or lower/common	
Power supply	Voltage		20.4 to 28.8VDC (ripple ratio: within 5%)	
	Current consumption		45mA or lower (when 24VDC, all points ON) Not including external load current	
	Current at start-up		70mA or lower (when 24VDC)	
Number of occupied stations			In 4-point mode: Occupies 4 stations In 8-point mode: Occupies 2 stations In 16-point mode: Occupies 1 station (see table on the right)	
Weight			0.05kg	

*1: Refer to page 221 for derating curve details.

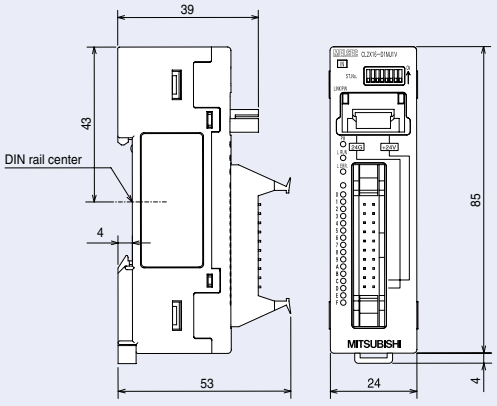
External connection diagram



*1: Do not supply power to the power supply pin from the outside.

External dimensions & terminal layout

Unit: mm



MIL connector for I/O interface

Terminal No.	Signal name	Terminal No.	Signal name
CON1-20	X0	CON1-19	X8
CON1-18	X1	CON1-17	X9
CON1-16	X2	CON1-15	XA
CON1-14	X3	CON1-13	XB
CON1-12	X4	CON1-11	XC
CON1-10	X5	CON1-9	XD
CON1-8	X6	CON1-7	XE
CON1-6	X7	CON1-5	XF
CON1-4	+24V *1	CON1-3	+24V *1
CON1-2	24G *1	CON1-1	24G *1

Q, bridge		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Point mode	4 ps	X															
		Y															
	8 pts	X															
		Y															
	16 pts	X															
		Y															
FX		0	1	2	3	4	5	6	7	10	11	12	13	14	15	16	17

MIL connector type

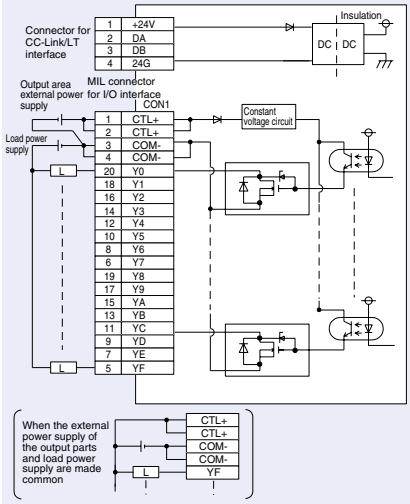
Output module
CL2Y16-TP1M1V

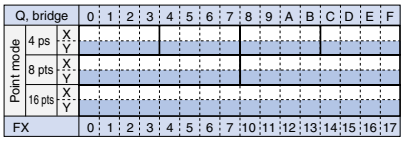
Transistor output 16pts | Sink | 0.1A 1-wire | MIL | Protection | Hold | Vertical

■Detailed specifications

Output specifications		Description
Isolation method		Photocoupler
Rated load voltage		12/24VDC (same as module power supply)
Operating load voltage range		10.2 to 28.8VDC (ripple ratio: within 5%)
Maximum load current		0.1A/point 1.6A/common
Maximum inrush current		0.7A 10ms or less
Leakage current at OFF		0.1mA or lower
Maximum voltage drop at ON		0.3V or lower (TYP) 0.1A, 0.6V or lower (MAX) 0.1A
Response time	OFF→ON	0.5ms or less
	ON→OFF	0.5ms or less (resistive load)
Surge suppressor		Zener diode
Wiring method for common		16 points/common (2 points) (MIL connector 1-wire type)
External power supply for output part	Voltage	10.2 to 28.8VDC (ripple ratio: within 5%)
	Current consumption	15mA or lower (when TYP.24VDC, all points ON) Not including external load current
Power supply	Voltage	20.4 to 28.8VDC (ripple ratio: within 5%)
	Current consumption	50mA or lower (when 24VDC, all points ON)
	Current at start-up	70mA
Number of occupied stations		In 4-point mode: Occupies 4 stations In 8-point mode: Occupies 2 stations In 16-point mode: Occupies 1 station (see table on the right)
Weight		0.05kg

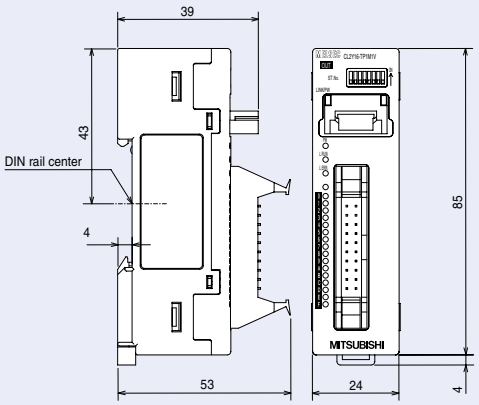
■External connection diagram





■External dimensions & terminal layout

Unit: mm



MIL connector for I/O interface

Terminal No.	Signal name	Terminal No.	Signal name
CON1-20	Y0	CON1-19	Y8
CON1-18	Y1	CON1-17	Y9
CON1-16	Y2	CON1-15	YA
CON1-14	Y3	CON1-13	YB
CON1-12	Y4	CON1-11	YC
CON1-10	Y5	CON1-9	YD
CON1-8	Y6	CON1-7	YE
CON1-6	Y7	CON1-5	YF
CON1-4	COM-	CON1-3	COM-
CON1-2	CTL+	CON1-1	CTL+

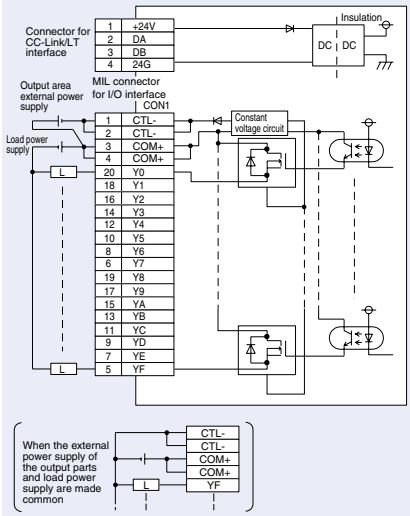
Output module
CL2Y16-TPE1M1V

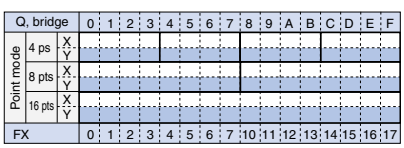
Transistor output 16pts | Source | 0.1A 1-wire | MIL | Protection | Hold | Vertical

■Detailed specifications

Output specifications		Description
Isolation method		Photocoupler
Rated load voltage		12/24VDC
Operating load voltage range		10.2 to 28.8VDC (ripple ratio: within 5%)
Maximum load current		0.1A/point 1.6A/common
Maximum inrush current		0.7A 10ms or less
Leakage current at OFF		0.1mA or lower
Maximum voltage drop at ON		0.1V or lower (TYP) 0.1A, 0.2V or lower (MAX) 0.1A
Response time	OFF→ON	1.0ms or less
	ON→OFF	1.0ms or less (resistive load)
Surge suppressor		Zener diode
Wiring method for common		16 points/common (2 points) (MIL connector 1-wire type)
External power supply for output part	Voltage	10.2 to 28.8VDC (ripple ratio: within 5%)
	Current consumption	15mA or lower (when TYP.24VDC, all points ON) Not including external load current
Power supply	Voltage	20.4 to 28.8VDC (ripple ratio: within 5%)
	Current consumption	50mA or lower (when all points ON)
	Current at start-up	70mA
Number of occupied stations		In 4-point mode: Occupies 4 stations In 8-point mode: Occupies 2 stations In 16-point mode: Occupies 1 station (see table on the right)
Weight		0.05kg

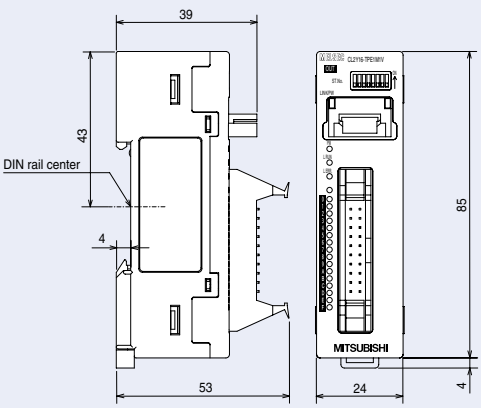
■External connection diagram





■External dimensions & terminal layout

Unit: mm



MIL connector for I/O interface

Terminal No.	Signal name	Terminal No.	Signal name
CON1-20	Y0	CON1-19	Y8
CON1-18	Y1	CON1-17	Y9
CON1-16	Y2	CON1-15	YA
CON1-14	Y3	CON1-13	YB
CON1-12	Y4	CON1-11	YC
CON1-10	Y5	CON1-9	YD
CON1-8	Y6	CON1-7	YE
CON1-6	Y7	CON1-5	YF
CON1-4	COM+	CON1-3	COM+
CON1-2	CTL-	CON1-1	CTL-

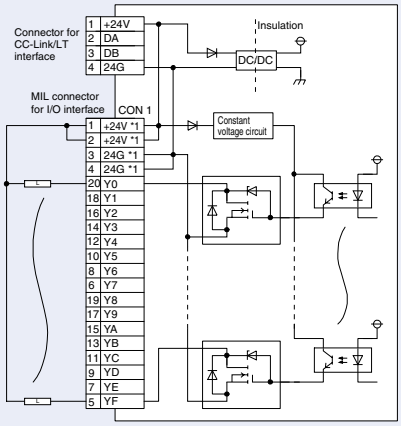
Output module
CL2Y16-TP1MJ1V

Transistor output 16pts | Sink | 0.1A 1-wire | MIL | Protection | Hold | Vertical | Shared power supply 24V I/O

Detailed specifications

Output specifications		Description
Isolation method		Photocoupler
Rated load voltage		12/24VDC (same as module power supply)
Operating load voltage range		20.4 to 28.8VDC (ripple ratio: within 5%)
Maximum load current		0.1A/point 1.6A/common
Maximum inrush current		0.7A 10ms or less
Leakage current at OFF		0.1mA or lower
Maximum voltage drop at ON		0.3V or lower (TYP) 0.1A, 0.6V or lower (MAX) 0.1A
Response time	OFF→ON	0.5ms or less
	ON→OFF	0.5ms or less (resistive load)
Surge suppressor		Zener diode
Wiring method for common		16 points/common (MIL connector 1-wire type)
Power supply	Voltage	20.4 to 28.8VDC (ripple ratio: within 5%)
	Current consumption	55mA or lower (when 24VDC, all points ON) Not including external load current
	Current at start-up	70mA or lower (24VDC)
Number of occupied stations		In 4-point mode: Occupies 4 stations In 8-point mode: Occupies 2 stations In 16-point mode: Occupies 1 station (see table on the right)
Weight		0.05kg

External connection diagram

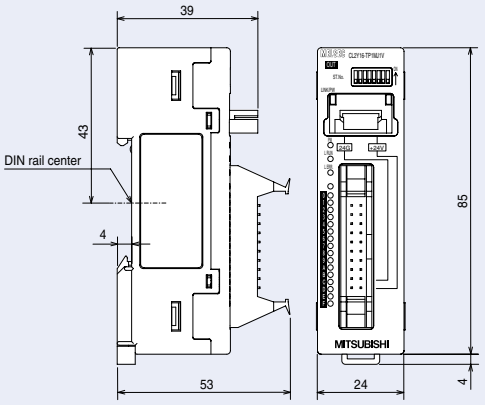


*1: Do not supply power to the power supply pin from the outside.

Q, bridge			0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Point mode	4 ps	X																
		Y																
	8 pts	X																
		Y																
	16 pts	X																
		Y																
FX			0	1	2	3	4	5	6	7	10	11	12	13	14	15	16	17

External dimensions & terminal layout

Unit: mm



MIL connector for I/O interface

Terminal No.	Signal name	Terminal No.	Signal name
CON1-20	Y0	CON1-19	Y8
CON1-18	Y1	CON1-17	Y9
CON1-16	Y2	CON1-15	YA
CON1-14	Y3	CON1-13	YB
CON1-12	Y4	CON1-11	YC
CON1-10	Y5	CON1-9	YD
CON1-8	Y6	CON1-7	YE
CON1-6	Y7	CON1-5	YF
CON1-4	24G	CON1-3	24G
CON1-2	+24V	CON1-1	+24V

Remote I/O modules

Cable

Cable type

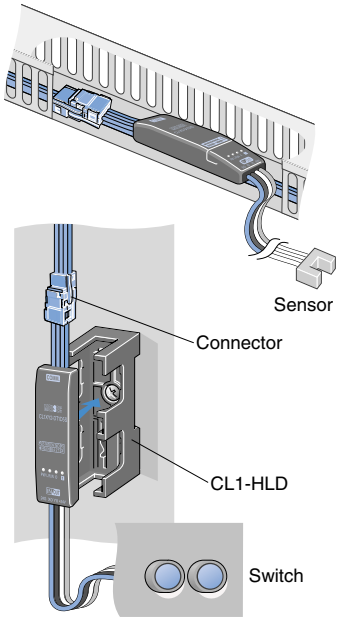
Overview

Cable type

Features

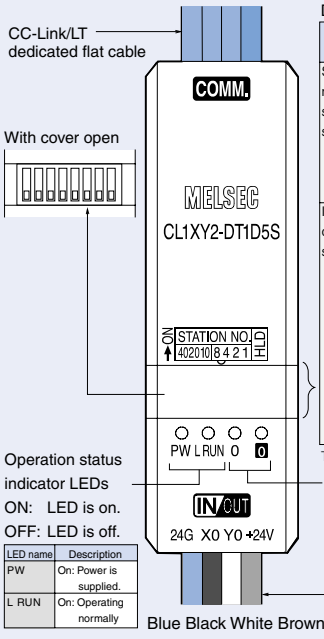
- The industry's most compact size
- The module can be stored in a duct with cables.
- Integration of communication cables and external device connection cables for easy wiring

Installation



Refer to page 227 for cable connection examples.

Part names and settings



DIP switch

Setting	Switch name	Station No.	Description			
Station number setting switches	STATION NO.	1	Tens place	40	On : 40	Off : 0
		2		20	On : 20	
		3		10	On : 10	
		4	Ones place	8	On : 8	
		5		4	On : 4	
		6		2	On : 2	
		7		1	On : 1	
I/O operation setting	0.5ms 1.5ms	8	For input module: response speed setting Off: 1.5ms (standard type) On: 0.5ms (high-speed response type)			
	HLD	8	For output module: HOLD function setting Off: Output CLEAR On: Output HOLD For I/O composite modules: HOLD function setting Off: Output CLEAR On: Output HOLD			

The DIP switches are all set to OFF prior to shipment.

LED name	Description
PW	On: Power is supplied.
L RUN	On: Operating normally

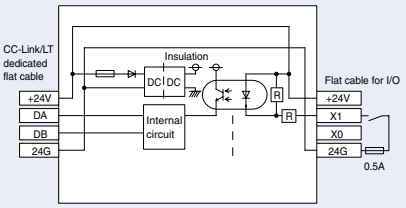
Actual size

* The cable type I/O module has a dedicated flat cable connected directly. Therefore, the module-side cable length should not exceed 20cm when connecting a VCTF cable or a flexible cable.

Input module
CL1X2-D1D3S

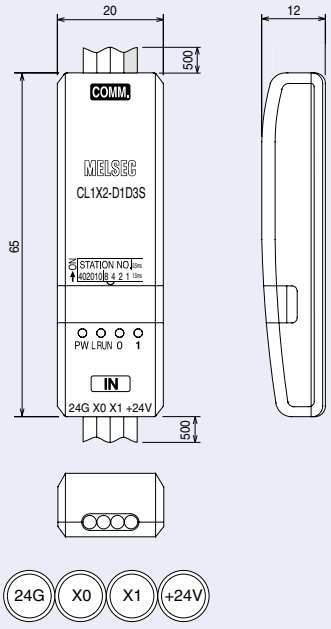
DC input 2 pts | +COM | 24VDC 2-wire or 24VDC 3-wire | Cable | Input switch | Shared power supply 24V I/O

External connection diagram



External dimensions & terminal layout

Unit: mm



Detailed specifications

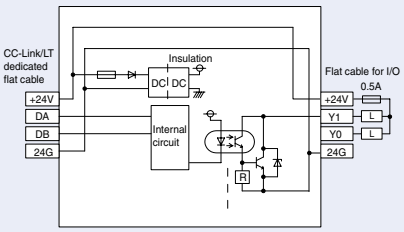
Input specifications		Description
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 4mA
Operating voltage range		Same as module power supply
Maximum number of simultaneous input points		100% (when 24VDC)
ON voltage/ON current		19V/3mA or higher
OFF voltage/OFF current		11V/1.7mA or lower
Input resistance		5.6kΩ
Response time	OFF→ON	0.5ms/1.5ms or lower (when 24VDC) Selectable by DIP SW (default = OFF / 1.5ms)
	ON→OFF	0.5ms/1.5ms or lower (when 24VDC) Selectable by DIP SW (default = OFF / 1.5ms)
Wiring method for common		2 points/common (1 point)
Maximum allowable current for I/O power supply		0.2A or lower/common
Power supply	Voltage	20.4 to 28.8VDC (-15% to +20%) (ripple ratio: within 5%)
	Current consumption	40mA or lower (when all points ON) Not including input current.
	Current at start-up	70mA
I/O flat cable (wire diameter)		AWG18 (34/0.18)
Number of occupied stations		In 4-, 8- or 16-point mode: Occupies 1 station (see table on the right)
Weight		0.07kg (includes the 500mm communication and input cables)

Q, bridge			0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Point mode	4 pts	X																
		Y																
	8 pts	X																
		Y																
	16 pts	X																
		Y																
FX			0	1	2	3	4	5	6	7	10	11	12	13	14	15	16	17

Output module
CL1Y2-T1D2S

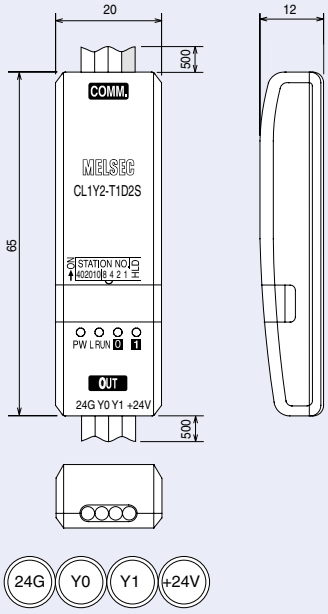
Transistor output 2 pts | Sink | 0.1A 2-wire | Cable | Hold | Shared power supply 24V I/O

External connection diagram



External dimensions & terminal layout

Unit: mm



Detailed specifications

Output specifications		Description
Isolation method		Photocoupler
Rated load voltage		24VDC
Operating load voltage range		Same as module power supply
Maximum load current		0.1A/point 0.2A/common
Maximum inrush current		0.4A 10ms or lower
Leakage current at OFF		0.1mA or lower
Maximum voltage drop at ON		1V or lower (MAX) 0.1A
Response time	OFF→ON	1.0ms or lower
	ON→OFF	1.0ms or lower
Surge suppressor		Zener diode
Wiring method for common		2 points/common (1 point)
Power supply	Voltage	20.4 to 28.8VDC (24VDC -15% to +20%) (ripple ratio: within 5%)
	Current consumption	40mA or lower (when all points ON) Not including load current
	Current at start-up	70mA
Number of occupied stations		In 4-, 8- or 16-point mode: Occupies 1 station (see table on the right)
I/O flat cable (wire diameter)		AWG18 (34/0.18)
Weight		0.07kg (includes the 500mm communication and output cables)

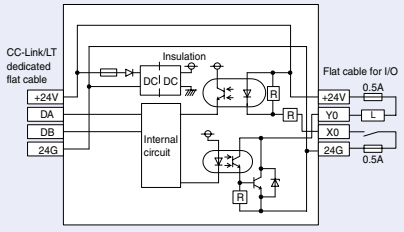
Q, bridge		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Point mode	4 pts	X															
		Y															
	8 pts	X															
		Y															
	16 pts	X															
		Y															
FX		0	1	2	3	4	5	6	7	10	11	12	13	14	15	16	17

DC input 1 pts | +COM | 24VDC 2-wire or 24VDC 3-wire

I/O combined module
CL1XY2-DT1D5S

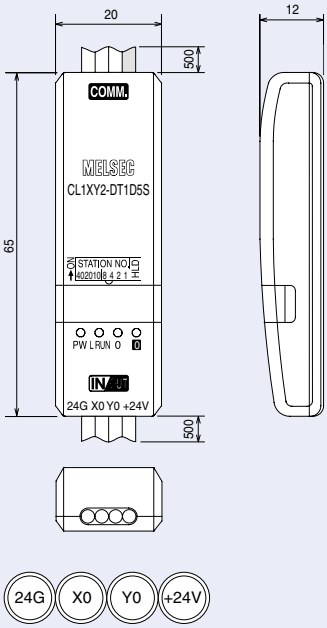
Transistor output 1 pts | Sink | 0.1A 2-wire | Cable | Hold | Shared power supply 24V I/O

External connection diagram



External dimensions & terminal layout

Unit: mm



Detailed specifications

Input specifications		Description
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 4mA
Operating voltage range		Same as module power supply
Maximum number of simultaneous input points		100% (when 24 VDC)
ON voltage/ON current		19V/3mA or higher
OFF voltage/OFF current		11V/1.7mA or lower
Input resistance		5.6kΩ
Response time	OFF→ON	1.5ms or lower (when 24VDC)
	ON→OFF	1.5ms or lower (when 24VDC)
Wiring method for common		1 points/common (1 point)
Maximum allowable current for I/O power supply		0.2A or lower/common
Power supply	Voltage	20.4 to 28.8VDC (-15% to +20%) (ripple ratio: within 5%)
	Current consumption	40mA or lower (when all points ON) Not including input and load current.
	Current at start-up	70mA
Number of occupied stations		In 4-, 8- or 16-point mode: Occupies 1 station (see table on the right)
I/O flat cable (wire diameter)		AWG18 (34/0.18)
Weight		0.07kg (includes the 500mm communication and I/O cables)

Output specifications		Description
Isolation method		Photocoupler
Rated load voltage		24VDC
Operating load voltage range		Same as module power supply
Maximum load current		0.1A/point 0.1A/common
Maximum inrush current		0.4A 10ms or less
Leakage current at OFF		0.1mA or lower/30VDC
Maximum voltage drop at ON		1V or lower (MAX) 0.1A
Response time	OFF→ON	1.0ms or lower
	ON→OFF	1.0ms or lower
Surge suppressor		Zener diode
Wiring method for common		1 points/common (1 point)

Q, bridge		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Point mode	4 pts	X															
		Y															
	8 pts	X															
		Y															
	16 pts	X															
		Y															
FX		0	1	2	3	4	5	6	7	10	11	12	13	14	15	16	17

Remote I/O modules

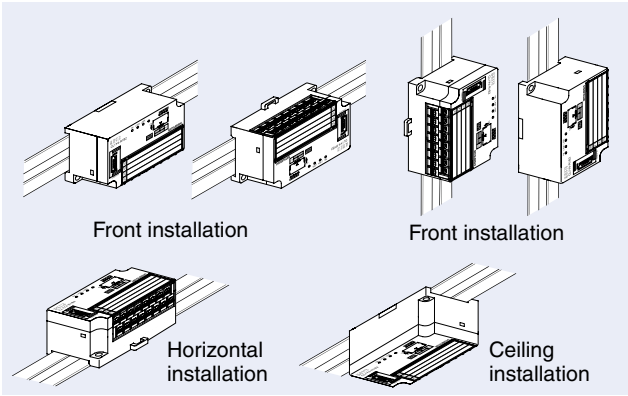
Remote I/O module information

■Mounting

Type	Specifications	Description
Screw T. block / Sensor / MIL / Spring clamp	DIN rail	DIN-rail mounting, TH35-7.5Fe, TH35-7.5AI (conforming to JIS C 2812 standard)
Screw T. block / Sensor / Spring clamp	Screw	Screw mounting: M4 x 0.7mm x 16mm or more (Tightening torque range is 78 to 108N•cm) * 4-point type sensor connector only.

* Using a holder together allows the cable type module mounting with both DIN rail and screws.

DIN-rail mounting example Mountable in six orientations



■Terminal block type wiring specifications

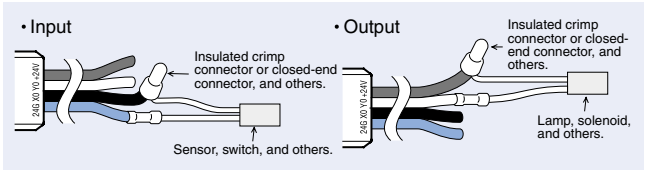
Screw T. block

Specifications	Description
Applicable solderless terminal / wire size	• RAV1.25-3 (conforming to JIS C 2805 standard) • V1.25-3 (JST Mfg., Co., Ltd.) • 1.25-3, TG1.25-3 (Nichifu Moris) (Applicable wire size: 0.3 to 1.25mm²)

■Cable type connection examples

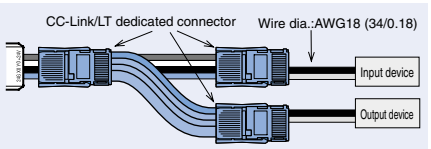
Cable

The cable length from the module to a sensor shall be 3m or less. Measure the sensor's drive voltage externally to ensure a proper voltage.

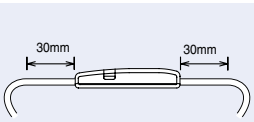


●I/O flat cable connection example (for I/O combined modules)

When the diameter of an I/O device connection cable is same as that of the I/O flat cable, it can be connected through a CC-Link/LT dedicated connector.

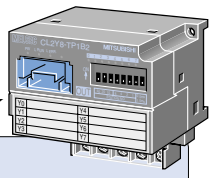


●Cable handling
Do not bend the cable in the area within 30mm from the module.



Convenient!

Common Terminal Block



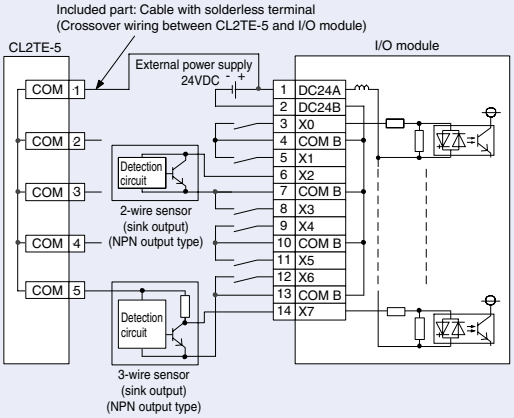
Screw terminal block
CL2TE-5 Compatible models: CL2X8-D1B2, CL2Y8-TP1B2

Included: 1 daisy chain cable with solderless terminal (100mm)

When using an input module
Usable as 1 point/common. By connecting a +24V wire to the common terminal block, connection of a 3-wire sensor is available.

When using an output module
Usable as 1 point/common.

■External connection (wiring example)

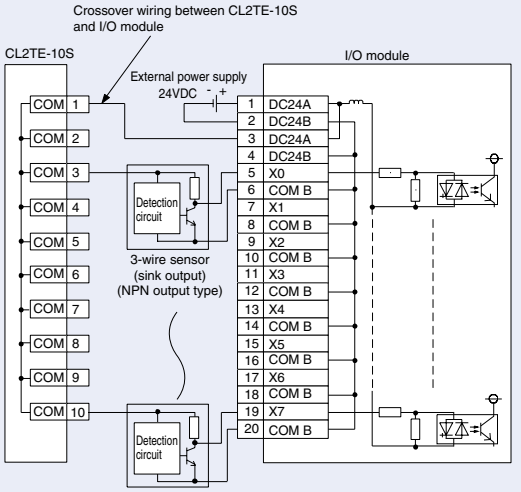


CL2TE-10S	
Pin No.	Signal name
1	COM
2	COM
3	COM
4	COM
5	COM
6	COM
7	COM
8	COM
9	COM
10	COM
Connection target I/O module CL2X8-D1B2 (as reference)	

Spring clamp terminal block
CL2TE-10S Compatible models: CL2X8-D1S2

When using an input module
By connecting a +24V wire to the common terminal block, connection of a 3-wire sensor is available.

■External connection (wiring example)



CL2TE-5	
Pin No.	Signal name
1	COM
2	COM
3	COM
4	COM
5	COM
Connection target I/O module CL2X8-D1S2 (as reference)	

Memo

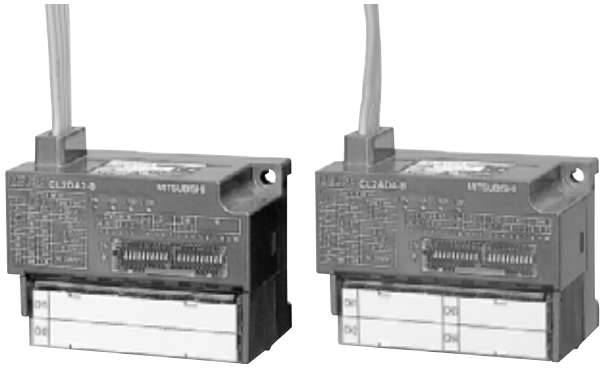
Analog modules

Screw T. block

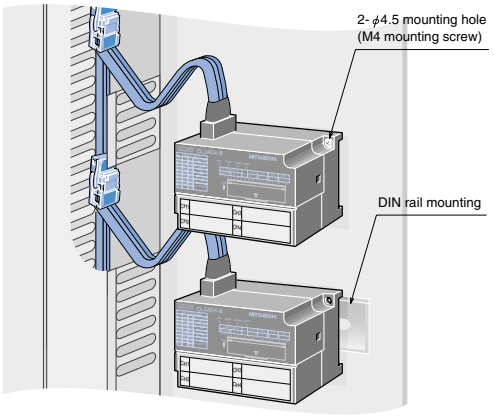
Screw terminal block type

Overview

Screw terminal block type



Installation ■DIN rail mounting



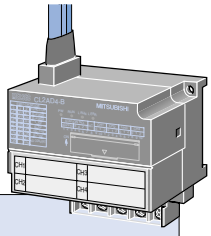
Features

■Efficient usage of I/O points (Number of occupied stations) is available because the points can be changed by the preset conversion-enabled channel.
(The number of occupied stations changes depending on the setting of the channel for which conversion is enabled.)

■The dedicated flat cable (50cm) is directly connected to a module.

Convenient!

Common Terminal Block



Screw terminal block
CL2TE-5 Applicable model: CL2AD4-B

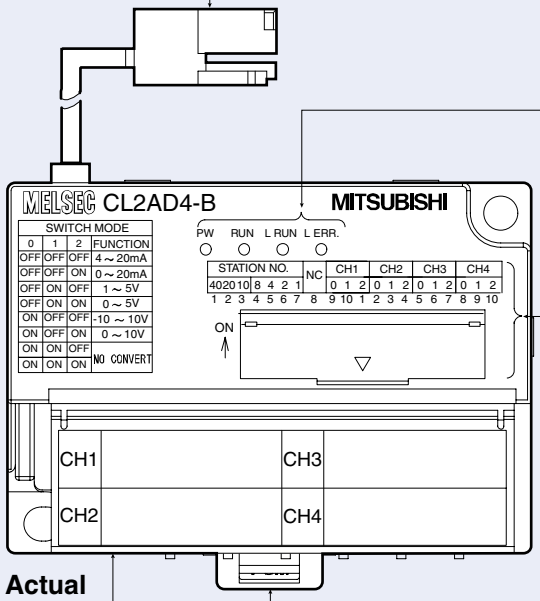
Included:
1 daisy chain cable
with solderless terminal
(100mm)

When using an analog module

Attaching the common terminal block to the above analog module and using a shielded cable make the cable grounding easy.

Part names and settings

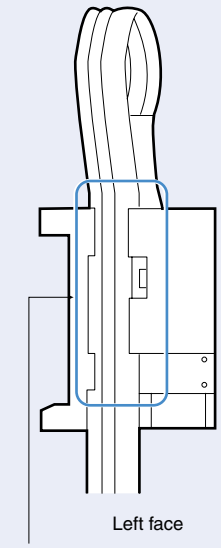
Connector for CC-Link/ LT interface
Connector for CC-Link/LT communication line and module power supply connection (optional)



Actual size

Terminal block

DIN rail hook
This hook is used to mount the module on the DIN rail.



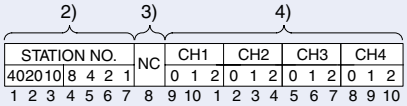
Left face

Cable guide
Used when direct-connection cable is connected in a downward direction.

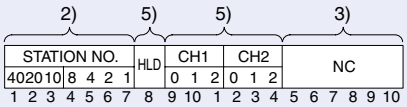
1) Operation status indicator LEDs

LED name	Description
PW	On: Power supply ON. Off: Power failure or large voltage drop
RUN	On: Module operating normally Flashing: All channels are set to "Conversion disable" by Analog input setting switch. Setting of Analog input setting switch was changed during operation. Or, NC is switched ON. Off: Watch dog timer error or hardware failure
L RUN	On: Normal communication Off: Communication failure (timeout error)
L ERR.	On: Communication data error Station number switch setting is invalid. Other than 16-point mode is set. Communication is interrupted (timeout error). Or, all channels are set to "Conversion disable" by Analog input setting switch. Flashing regularly (0.4s): Station number setting switch was changed after power-ON. Flashing irregularly: A terminating resistor is missing. The module or cables are affected by noise. Off: Communication is normal.

●CL2AD4-B



●CL2DA2-B



The DIP switches are all set to OFF prior to shipment.

2) Station number setting switches

Switch name	Description
STATION NO.	Select "10", "20" or "40" to set the tens place of the station number. Select "1", "2", "4" or "8" to set the Ones place of the station number. Always set the station number within the range of 1 to 64. Setting of other than 1 to 64 will result in an error, turning on the "L ERR." LED. The same station number cannot be used more than once.

Station No.	Tens place			Ones place			
	40	20	10	8	4	2	1
1	OFF	OFF	OFF	OFF	OFF	OFF	ON
2	OFF	OFF	OFF	OFF	OFF	ON	OFF
3	OFF	OFF	OFF	OFF	OFF	ON	ON
4	OFF	OFF	OFF	OFF	ON	OFF	OFF
:	:	:	:	:	:	:	:
10	OFF	OFF	ON	OFF	OFF	OFF	OFF
11	OFF	OFF	ON	OFF	OFF	OFF	ON
:	:	:	:	:	:	:	:
64	ON	ON	OFF	OFF	ON	OFF	OFF

3) NC

Not used (System use only)
This must be OFF at all times. Turning it ON will flash the RUN LED.

6) HOLD/CLEAR setting switch

Set whether to retain or hold analog values when communications are interrupted. (This setting applies to all channels.)
OFF: Clear
ON: Hold

4) Analog input setting switch

Switch name	Description
CH1 to 4	Set the A/D conversion enable/disable selection and input range for each channel. Set unused channels to be conversion-disabled.

Input range		Switch status 0	1	2
Conversion enable	4 to 20mA	OFF	OFF	OFF
	0 to 20mA	OFF	OFF	ON
	1 to 5V	OFF	ON	OFF
	0 to 5V	OFF	ON	ON
	-10 to 10V	ON	OFF	OFF
	0 to 10V	ON	OFF	ON
Conversion disable		ON	ON	OFF
		ON	ON	ON

5) Analog output setting switch

Switch name	Description
CH1 to 4	Set the D/A conversion enable/disable selection and output range for each channel. Set unused channels to be conversion-disabled.

Output range		Switch status 0	1	2
Conversion enable	4 to 20mA	OFF	OFF	OFF
	0 to 20mA	OFF	OFF	ON
	1 to 5V	OFF	ON	OFF
	0 to 5V	OFF	ON	ON
	-10 to 10V	ON	OFF	OFF
	0 to 10V	ON	OFF	ON
Conversion disable		ON	ON	OFF
		ON	ON	ON

Screw T. block

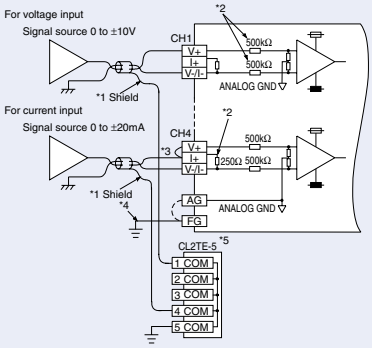
Screw terminal block type

Analog input module
CL2AD4-B

Occupied 4 st.s | Channel 4 CH | Remote device | Screw T. block

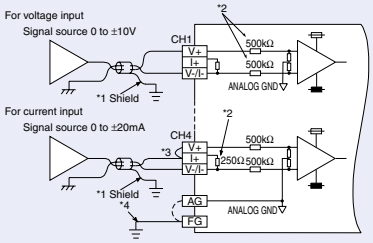
External connection diagram

• When using CL2TE-5 common terminal block



*1: Use a two-core twisted shield line for the power cable.
*2: Indicates the CL2AD4-B input resistor.
*3: For the current input, be sure to connect the (V+) and (I+) terminals.
*4: Always perform grounding for FG. When there is a lot of noise, it may be better ground AG as well.
*5: Using the CL2TE-5 allows grounding of the shield wires all at once.

• When not using CL2TE-5 common terminal block



*1: Use a two-core twisted shield line for the power cable.
*2: Indicates the CL2AD4-B input resistor.
*3: For the current input, be sure to connect the (V+) and (I+) terminals.
*4: Always perform grounding for FG. When there is a lot of noise, it may be better ground AG as well.

Detailed specifications

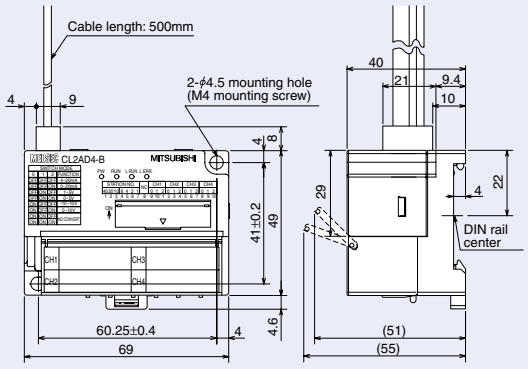
Input specifications		Description
Analog input	Voltage	-10 to 10VDC (input resistance 1MΩ)
	Current	0 to 20mADC (input resistance 250Ω)
Digital output		15-bit signed binary (-4096 to 4095)
I/O characteristics, maximum resolution accuracy (accuracy relative to maximum digital output value)		See table below
Conversion speed		200µs/4 channels *4
Absolute maximum input		Voltage: ±15V, Current: ±30mA
Number of analog input points		4 channels/module
CC-Link/LT station type		Remote device station
Number of occupied stations		4 stations in 16-point mode *5
Isolation specifications		Between communication system and analog inputs: Photocoupler isolation, Transformer isolation Between power supply system and analog inputs: Photocoupler isolation, Transformer isolation Between communication system and power supply system: Photocoupler isolation, Transformer isolation Between channels: No insulation
Connectable terminal block		Direct type 14-point terminal block (M3 screw)
Applicable wire size		0.3 to 1.25 mm^2
Applicable solderless terminal		RAV1.25-3 (conforming to JIS C 2805), V1.25-3 (Japan Solderless Terminal Mfg. Co., Ltd.), 1.25-3, TG1.25-3(NICHIFU TERMINAL INDUSTRIES Co., Ltd.)
Module installation method		DIN rail installation, mounted by screws of type M4 x 0.7 mm x 16 mm or larger Can be installed in six directions
Applicable DIN rail		TH35-7.5Fe, TH35-7.5Al, (conforming to IEC 60715)
Power supply *6	Voltage	24VDC (20.4VDC to 28.8VDC, ripple ratio: within 5%)
	Current consumption	70mA
	Current at start-up	570mA
Weight		0.15kg

	Analog input range	Digital output value	Accuracy: Ambient temperature 0 to 55°C	Accuracy: Ambient temperature 25±5°C *1	Temperature coefficient *3	Max. resolution
Voltage	-10 to 10V	-4000 to 4000	±0.4% (±16 digit *2)	±0.2% (±8 digit *2)	±80ppm/°C (±0.008%/°C *2)	2.5mV
	0 to 10V	0 to 4000				2.5mV
	0 to 5V					1.25mV
	1 to 5V					1.0mV
Current	0 to 20mA	0 to 4000				5µA
	4 to 20mA					4µA

*1: Reference accuracy.
*2: "digit" indicates a digital output value.
*3: Accuracy per temperature change of 1°C.
*4: When a primary delay filter is used, the conversion speed of the primary delay filter channel is 400µs.
*5: The number of occupied I/O points (number of occupied stations) varies depending on the last conversion-enabled channel.
*6: Supplied by the dedicated power supply or power supply adapter.

External dimensions & terminal layout

Unit: mm



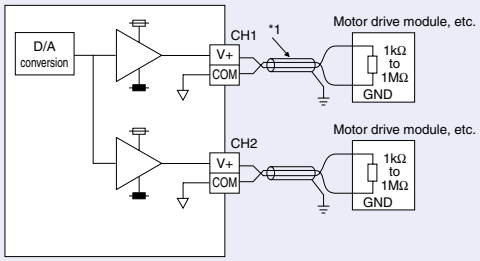
1 AG	3 CH1 V+	5 CH1 V-/I-	7 CH2 I+	9 CH3 V+	11 CH3 V-/I-	13 CH4 I+
2 FG	4 CH1 I+	6 CH2 V+	8 CH2 V-/I-	10 CH3 I+	12 CH4 V+	14 CH4 V-/I-

Analog output module
CL2DA2-B

Occupied 2 st.s | Channel 2 CH | Remote device | Screw T. block

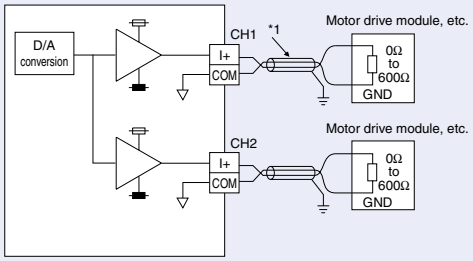
External device connection diagram

• For voltage output



*1: Use a 2-core twisted shield line for the power cable.

• For current output



*1: Use a 2-core twisted shield line for the power cable.

Detailed specifications

Output specifications		Description
Digital input	Voltage	15-bit signed binary (-4096 to 4095)
	Current	15-bit signed binary (-96 to 4095)
Analog output	Voltage	-10 to 10VDC (input resistance: 1kΩ to 1MΩ)
	Current	0 to 20mADC (external load resistance: 0 to 600Ω)

I/O characteristics, maximum resolution accuracy (accuracy relative to maximum analog output value)

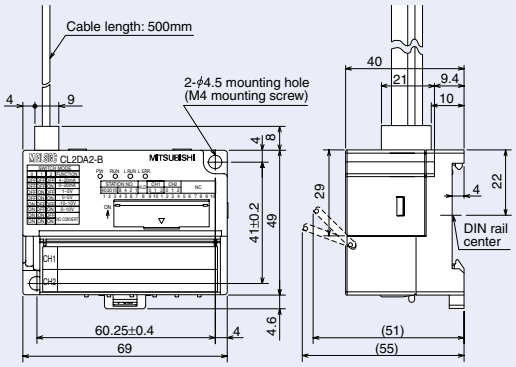
	Analog output range	Digital value	Accuracy: Ambient temperature 0 to 55°C	Accuracy: Ambient temperature 25±5°C *1	Temperature coefficient *2	Max. resolution
Voltage	-10 to 10V	-4000 to +4000	±0.4% (±40mV)	±0.2% (±20mV)	±80ppm/°C (±0.0080%/°C)	2.5mV
	0 to 10V	0 to 4000				
	0 to 5V		±0.4% (±20mV)	±0.2% (±10mV)		1.25mV
	1v5V					1.0mV
Current	0 to 20mA	0 to 4000	±0.4% (±80μA)	±0.2% (±40μA)		5μA
	4 to 20mA					4μA

Conversion speed		200μs/2 channels
Output short protection		Yes
Absolute maximum output		Voltage: ±12V, current: +21mA
Number of analog output points		2 channels/module
CC-Link/LT station type		Remote device station
Number of occupied stations		2 stations in 16-point mode *3
Isolation specifications		Between communication system and analog outputs: Photocoupler isolation, Transformer isolation Between power supply system and analog outputs: Photocoupler isolation, Transformer isolation Between communication system and power supply line: Photocoupler isolation, Transformer isolation Between channels: No insulation
Connectable terminal block		Direct type 14-point terminal block (M3 screw)
Applicable wire size		0.3 to 1.25 mm^2
Applicable solderless terminal		RAV1.25-3 (conforming to JIS C 2805), V1.25-3 (Japan Solderless Terminal Mfg. Co., Ltd.), 1.25-3, TG1.25-3(NICHIFU TERMINAL INDUSTRIES Co., Ltd.)
Module installation method		DIN rail installation, mounted by screws of type M4 x 0.7mm x 16mm or larger Can be installed in six directions
Applicable DIN rail		TH35-7.5Fe, TH35-7.5Al, (conforming to IEC 60715)
Power supply *4	Voltage	24VDC (20.4VDC to 28.8VDC, ripple ratio: within 5%)
	Current consumption	170mA
	Current at start-up	470mA
Weight		0.15kg

*1: Reference accuracy.
*2: Accuracy per temperature change of 1°C.
*3: The number of occupied I/O points (number of occupied stations) changes depending on the last channel enabled for conversion.
*4: Supplied by the dedicated power supply or power supply adapter.

External dimensions & terminal layout

Unit: mm



1	3	5	7 CH1 V+	9 CH1 I+	11 CH2 V+	13 CH2 I+
2 FG	4	6	8 COM	10	12 COM	14

Dedicated power supply/ Power supply adapter

Dedicated power supply/Power supply adapter

The CC-Link/LT system requires 1 or more of these modules. (*)

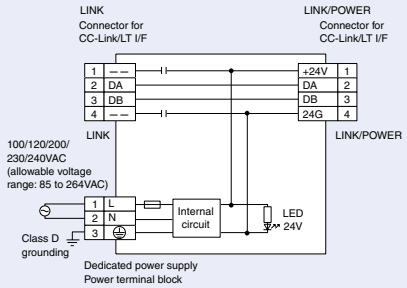
* The FX3UC-32MT-LT programmable controller has an internal 350mA power supply. For details, refer to the "FX3UC Programmable Controller User's Manual (Hardware Edition)".

CL1PSU-2A Power supply

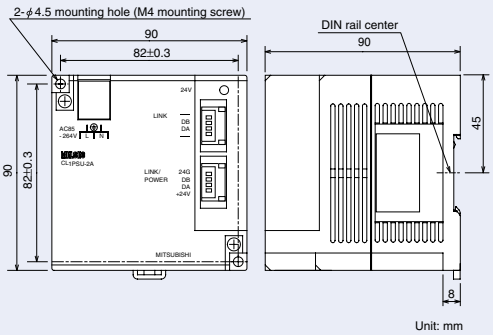
■Detailed specifications

Specifications		Description
Input	Rated voltage	100/120/200/230/240VAC
	Allowable voltage range	85 to 264VAC
	Rated current	1.2A/100VAC, 0.7A/200VAC
	Rated frequency	50/60Hz
	Power fuse	3.15A
	Inrush current	Max. 50A/100VAC, Max. 60A/200VAC
Output	Output voltage	24VDC +10%/-5%
	Output current	0.01A to 2A derating according to ambient temperature and line voltage [The current consumption should not exceed 2A when power is supplied (excluding immediately after power ON).]
	Ripple noise	500mVp-p or lower
Noise immunity		Noise voltage 1000Vp-p, noise width noise width 1µs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		AC type 1500VAC for 1 minute DC type 500VAC for 1 minute
Allowable momentary power failure period		Operation continues at momentary power outages of 10ms or lower.
Insulation resistance		Across all external terminals and ground terminal, 10MΩ by 500VDC insulation resistance tester
Protection function	Overvoltage protection	27V to 33V output shut-off No automatic recovery
	Overcurrent protection	110 to 160% drooping characteristic Automatic recovery
External connection system		• Allowable power supply terminal blocks 3 points to dedicated power supply (M3 screws) • Communication section and power supply section to CC-Link/LT system: CC-Link/LT dedicated connector (4-pin) x 2
Weight		0.40kg

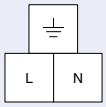
■External connection diagram



■External dimensions



■Terminal layout



■Features

The CC-Link/LT system dedicated power supply has a built-in 2A power supply.

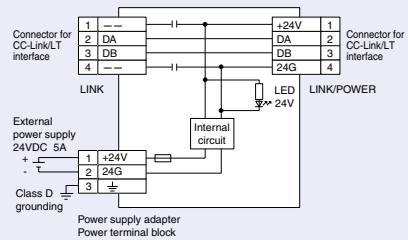
CL1PAD1 Power supply adapter

■Detailed specifications

Specifications	Description
Voltage input range	Depending on connected model. Max. 28.8VDC
Maximum rated current	5.0A *
Insulation resistance	Across all external terminals and ground terminal, 10MΩ by 500VDC insulation resistance tester
External connection system	Module power supply: terminal block 3 pins (M3 screws) Communication line/module power supply: CC-Link/LT dedicated connector (4p) compatible with CC-Link/LT dedicated flat cable x 2
Weight	0.26kg

* In regular operation, use the adapter so that the max. rated current is not exceeded. (Refer to 236 page)

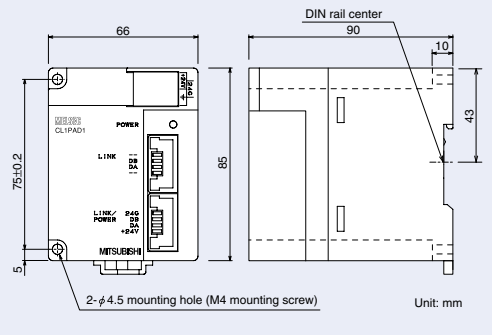
■External connection diagram



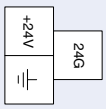
• External power supply should be provided by the customer.

The operation voltage for the CC-Link/LT system must be maintained at 20.4V or higher.
For selection and power supply capacity calculation (technical information), refer to page 236.

■External dimensions



■Terminal layout



■Features

This power supply adapter is designed to stabilize the whole system when power is supplied from the external power supply to the CC-Link system.

Selecting a power supply

Select on appropriate power supply for the CC-Link/LT system, considering the following 3 check points.

Power supply adapter installation: Number of power supply adapters

The CC-Link/LT system requires one or more dedicated power supply (CL1PSU-2A) or power supply adaptor (CL1PAD1). The number of required power supply adaptors is obtained by 1) and 2).

1) Current consumption calculation

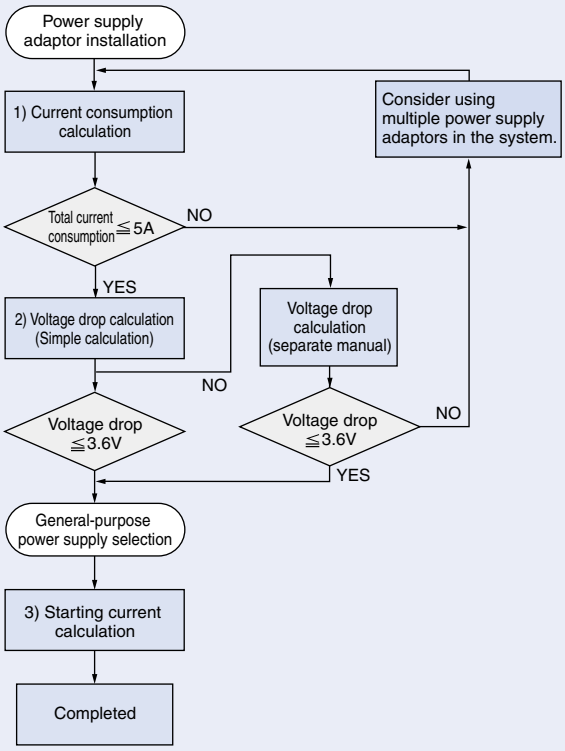
2) Voltage drop calculation

General-purpose power supply selection (for power supply adapter): General-purpose power supply's current capacity

A general-purpose power supply must be prepared to drive the CC-Link/LT system. The general-purpose power supply's current capacity is obtained by 1) and 3) below.

1) Current consumption calculation

3) Starting current calculation



Number of dedicated power supplies or power supply adapters

When the following conditions 1) Current consumption calculation and 2) Voltage drop calculation are satisfied, one dedicates power supply or power supply adapter is enough for normal system operation. If not satisfied, 2 or more power supplies or power supply adapters are required.

1) Current consumption calculation (with power supply adapter (CL1PAD1))

● Because the current capacity for 1 power supply adaptor is 5A, the total current consumption is less than or equal to 5A.

Total current consumption ≦5A

Current consumption of CC-Link/LT system = **Total current consumption of all CC-Link/LT modules (refer to the table below.)** + **Total current consumption of I/O devices (such as sensors)**

- As the module with *1 in the table below supplies power to I/O devices, add its current consumption to the current consumption of the CC-Link/LT system.
- The input module with *2 in the table below includes current flows between "+24V, +V" and "24G". Set each allowable current as follows:

e-CON type (4-point type)	: 0.5A/module or less
e-CON type (8-point/16-point type)	: 1.0A/module or less
MIL connector type	: 1.0A/module or less
Cable type	: 0.2A/module or less

≦5A

List of CC-Link/LT modules and their current consumption

● Remote I/O modules

Module type	Model	Specifications	Current consumption (mA)
Master/Bridge modules	QJ61CL12	CC-Link/LT master module for Q series	28
	LJ61CL12	CC-Link/LT master module for L series	30
	FX2N-64CL-M	CC-Link/LT master module for FX series	25
	AJ65SBT-CLB	CC-Link - CC-Link/LT bridge module	75
Screw terminal block type	CL1X4-D1B2	4-point terminal block 24VDC input	40
	CL1Y4-T1B2	4-point terminal block 0.1A Tr output	60
	CL1Y4-R1B2	4-point terminal block 2A relay output	65
	CL1Y4-R1B1	4-point terminal block 2A relay output	65
	CL2X8-D1B2	8-point terminal block 24VDC input	40
	CL2Y8-TP1B2	8-point terminal block 0.1A Tr output	40
	CL1XY4-DT1B2	4-point terminal block 24VDC input/0.1A Tr output	55
	CL1XY4-DR1B2	4-point terminal block 24VDC input/2A relay output	60
	CL1XY8-DT1B2	8-point terminal block 24VDC input/0.1A Tr output	65
	CL1XY8-DR1B2	8-point terminal block 24VDC input/2A relay output	70
Spring clamp terminal block type	CL1X4-D1S2	4-point terminal block 24VDC input	40
	CL1Y4-T1S2	4-point terminal block 0.1A Tr output	60
	CL2X8-D1S2	8-point terminal block 24VDC input	40
	CL2Y8-TP1S2	8-point terminal block 0.1A Tr source output	40
	CL2Y8-TPE1S2	8-point terminal block 0.1A Tr output	40

Module type	Model	Specifications	Current consumption (mA)
Sensor connector type (e-CON)	CL1X4-D1C3	4-point sensor connector 24VDC input	35 *1,2
	CL1Y4-T1C2	4-point sensor connector 0.1A Tr output	60 *1
	CL2X8-D1C3V	8-point sensor connector 24VDC input	40 *1,2
	CL2Y8-TP1C2V	8-point sensor connector 0.1A Tr output	45 *1
	CL2X16-D1C3V	16-point sensor connector 24VDC input	45 *1,2
	CL2Y16-TP1C2V	16-point sensor connector 0.1A Tr output	55 *1
	CL2XY16-DTP1C5V	16-point terminal block 24VDC input/0.1A Tr output	50 *1,2
MIL connector type	CL2X16-D1M1V	16-point MIL connector 24VDC input	45
	CL2X16-D1MJ1V	16-point MIL connector 24VDC input	45 *1,2
	CL2Y16-TP1M1V	16-point MIL connector 0.1A Tr output	50
	CL2Y16-TPE1M1V	16-point MIL connector 0.1A Tr source output	50
	CL2Y16-TP1MJ1V	16-point MIL connector 0.1A Tr output	55 *1
Cable type	CL1X2-D1D3S	2-point cable type 24VDC input	40 *1,2
	CL1Y2-T1D2S	2-point cable type 0.1A Tr output	40 *1
	CL1XY2-DT1D5S	2-point cable type 24VDC input/0.1A Tr output	40 *1,2

● Analog module

Module type	Model	Specifications	Current consumption (mA)
Screw terminal block type	CL2AD4-B	4-channel voltage/current input	70
	CL2DA2-B	2-channel voltage/current input	170

2) Voltage drop calculation

● To ensure stable system operation, Voltage drop ≦ 3.6V

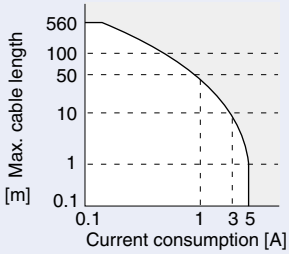
● Since the minimum operating voltage of each module is 20.4V, [General-purpose power supply voltage - voltage drop] ≧ 20.4V

The voltage drop can be calculated as shown below.

● Simple calculation method

Using the lookup chart or calculation formula, a voltage drop value can be calculated easily. (Ambient temperature: 20˚C)

a. Using look up chart



If the point is within the area enclosed by the curved line, the number of power supply adapter can be one.
(Using dedicated flat cables)

b. Using calculation formula

●When using various cables

Voltage drop (V) = (Max. distance (m) + Constant: 9) × Constant: 0.08 × Total current consumption (A) ≦ 3.6V

●When using dedicated flat cables

Voltage drop (V) = (Max. distance (m) + Constant: 11) × Constant: 0.06 × Total current consumption (A) ≦ 3.6V

Max. distance: The station farthest from the power supply adapter

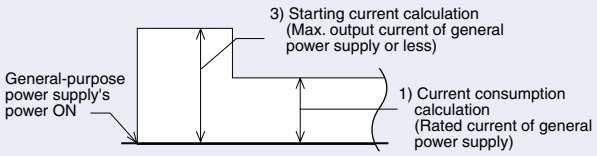
Total current consumption: Total current consumption of all CC-Link/LT modules + Total current consumption of all connected I/O devices (sensors, etc.)

Current capacity calculation for general-purpose power supply

To calculate the current capacity of a general power supply, use the value found by 1) Current consumption calculation as the rated current (steady state). Also, when the CC-Link/LT system is started (at power-on), the value found by 3) Starting current calculation given below should be within the maximum output current* of the general power supply.

*On some general power supplies, the maximum output current may be indicated as a <peak output current> or <overcurrent (protective) function>. Refer to these values.

<Current consumption change at CC-Link/LT system power ON>



1) Current consumption calculation (see the expression on page 234) ≦ General-purpose power supply's rated output current
3) Starting current calculation

Max. output current of general power supply or less ≧ Total starting current consumption of CC-Link/LT modules (See the table below.) + Total current consumption of all I/O devices (sensors, etc.)
• As the module marked with an asterisk (*) in the table below supplies power to I/O devices, its value must be included in the current consumption of the CC-Link/LT system.

List of refer to CC-Link/LT modules and their starting currents

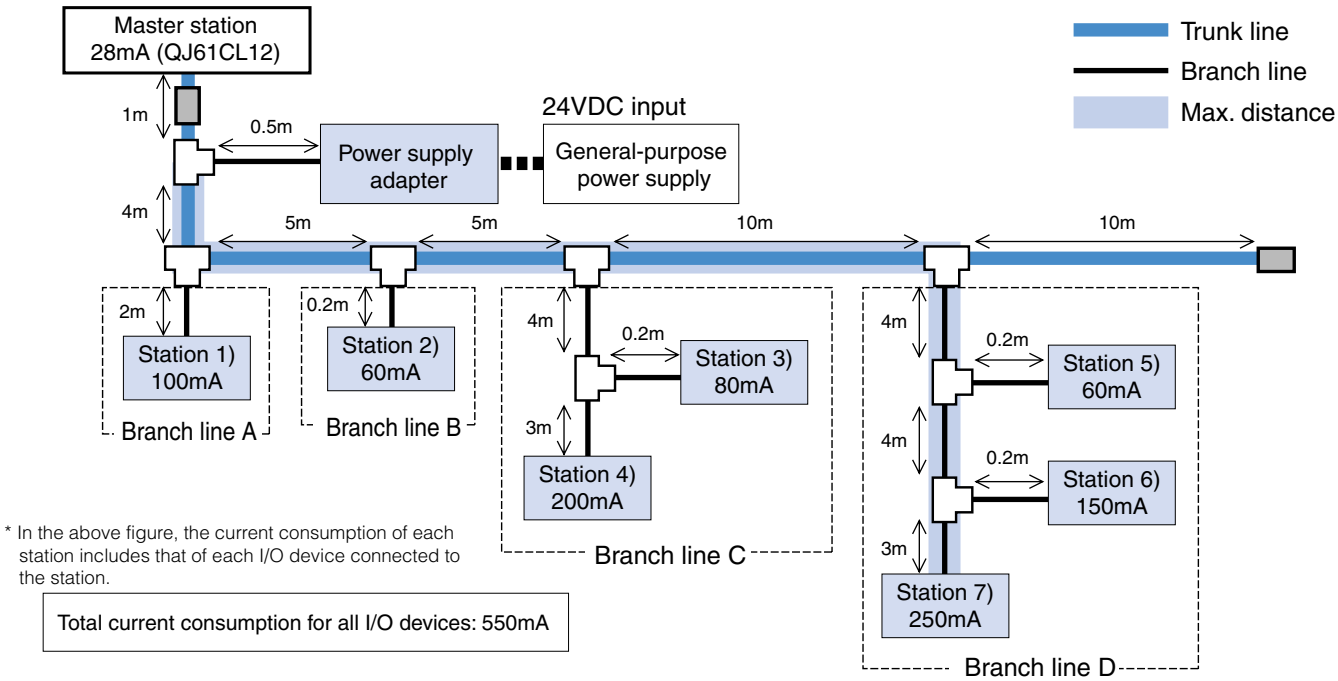
Module type	Model	Specifications	Current consumption (mA)
Master/Bridge modules	QJ61CL12	CC-Link/LT master module for Q series	70
	LJ61CL12	CC-Link/LT master module for L series	70
	FX2N-64CL-M	CC-Link/LT master module for FX series	35
	AJ65SBT-CLB	CC-Link - CC-Link/LT bridge module	165
Screw terminal block type	CL1X4-D1B2	4-point terminal block 24VDC input	70
	CL1Y4-T1B2	4-point terminal block 0.1A Tr output	70
	CL1Y4-R1B2	4-point terminal block 2A relay output	70
	CL1Y4-R1B1	4-point terminal block 2A relay output	70
	CL2X8-D1B2	8-point terminal block 24VDC input	70
	CL2Y8-TP1B2	8-point terminal block 0.1A Tr output	70
	CL1XY4-DT1B2	4-point terminal block 24VDC input/0.1A Tr output	70
	CL1XY4-DR1B2	4-point terminal block 24VDC input/2A relay output	70
	CL1XY8-DT1B2	8-point terminal block 24VDC input/0.1A Tr output	70
	CL1XY8-DR1B2	8-point terminal block 24VDC input/2A relay output	70
Spring clamp terminal block type	CL1X4-D1S2	4-point terminal block 24VDC input	70
	CL1Y4-T1S2	4-point terminal block 0.1A Tr output	70
	CL2X8-D1S2	8-point terminal block 24VDC input	70
	CL2Y8-TP1S2	8-point terminal block 0.1A Tr source output	70
	CL2Y8-TPE1S2	8-point terminal block 0.1A Tr output	70

Module type	Model	Specifications	Current consumption (mA)
Sensor connector type (e-CON)	CL1X4-D1C3	4-point sensor connector 24VDC input	70 *
	CL1Y4-T1C2	4-point sensor connector 0.1A Tr output	70 *
	CL2X8-D1C3V	8-point sensor connector 24VDC input	70 *
	CL2Y8-TP1C2V	8-point sensor connector 0.1A Tr output	70 *
	CL2X16-D1C3V	16-point sensor connector 24VDC input	70 *
	CL2Y16-TP1C2V	16-point sensor connector 0.1A Tr output	70 *
	CL2XY16-DTP1C5V	16-point terminal block 24VDC input/0.1A Tr output	70 *
MIL connector type	CL2X16-D1M1V	16-point MIL connector 24VDC input	70
	CL2X16-D1MJ1V	16-point MIL connector 24VDC input	70 *
	CL2Y16-TP1M1V	16-point MIL connector 0.1A Tr output	70
	CL2Y16-TPE1M1V	16-point MIL connector 0.1A Tr source output	70
	CL2Y16-TP1MJ1V	16-point MIL connector 0.1A Tr output	70 *
Cable type	CL1X2-D1D3S	2-point cable type 24VDC input	70 *
	CL1Y2-T1D2S	2-point cable type 0.1A Tr output	70 *
	CL1XY2-DT1D5S	2-point cable type 24VDC input/0.1A Tr output	70 *

For details, refer to the power supply adapter (CL1PAD1) manual.

Calculation examples

<System configuration example> (Using dedicated flat cables)



* In the above figure, the current consumption of each station includes that of each I/O device connected to the station.

Total current consumption for all I/O devices: 550mA

■Power supply adaptor installation: Number of power supply adapters

1) Current consumption calculation

Sum of current consumptions

28mA	+	100mA	+	60mA	+	80mA	+	200mA	+	60mA	+	150mA	+	250mA	=	928mA ≒ 1A	≦	5A
Master station		Station 1)		Station 2)		Station 3)		Station 4)		Station 5)		Station 6)		Station 7)				

2) Voltage drop calculation

(35.5m + constant: 11)	×	constant: 0.06	×	1A	=	2.79V	≦	3.6V

Max. distance: Station from power supply adaptor, station 7) on branch line D

0.5m	+	4m	+	5m	+	5m	+	10m	+	4m	+	4m	+	3m	=	35.5m

24V	−	2.79V	=	21.21V	≧	20.4V

From the above 1) and 2), appropriate current and voltage can be supplied with one power supply adapter.

■General-purpose power supply selection: General-purpose power supply's current capacity

1) Calculated current consumption = 1A	≦	General-purpose power supply's rated current

3) Starting current calculation

Total starting current

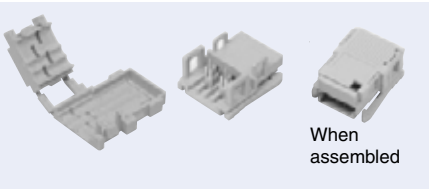
Starting current: 70mA	+	Starting current: 70mA	×	7 modules	+	550mA	=	1110mA=1.11A	≦	Maximum output current of general power supply Master station
Master station		Remote I/O station				Total current consumption of I/O devices				

From the above calculations, select a general-purpose power supply whose max. output current is 111% or more relative to the rated current of 1A.

Optional products

Accessories

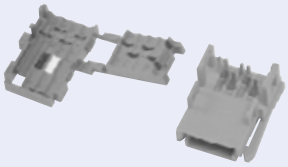
Connector for dedicated flat cable



Model: CL9-CNF-18

- Connector designed specially for use in the CC-Link/LT system (10 pcs/package)
  This connector consists of 2 components.

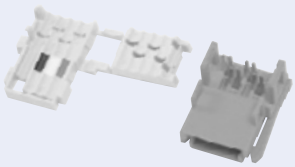
Connector for VCTF cable



Model: CL9-CNR-23

- Connector designed specially for use in the CC-Link/LT system (20 pcs/package)
  This connector consists of 2 components.

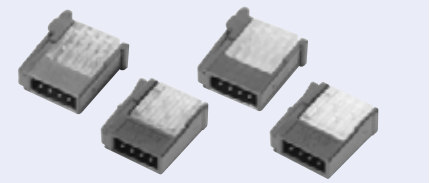
Connector for flexible cable



Model: CL9-CNR-20

- Connector designed specially for use in the CC-Link/LT system (20 pcs/package)
  This connector consists of 2 components.

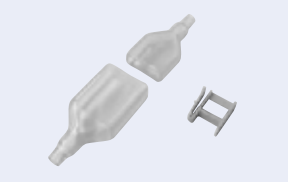
Open sensor connector (e-CON)



Model: ECN-****

- I/O connector for sensor connector type only.
  *The model name varies depending on the connector color or cable diameter.

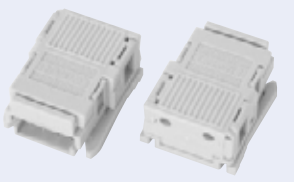
Joint shield/Dust shield



Model: ECN-CVR4**

- Protection shields for relay part of open sensor connectors, and empty slots of sensor connector remote I/O module.

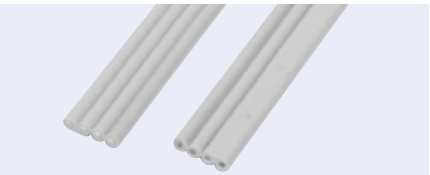
Terminating resistor



Model: CL9-TERM

- Terminating resistor for dedicated flat cable, VCTF cable, and flexible cable.
  (2 pcs/package)

Dedicated flat cable



Model: CL9-FL4-18

- CC-Link/LT dedicated flat cable
  To prevent incorrect cable insertion, the number of grooves is decreased by 1 on one side.

Dedicated flexible cable

Model: CL9-MV4-075

- Highly flexible insulator (ETFE) and strand structure has realized excellent flexing performance of 4 million times* or more.
  *Measured under the specified conditions

Tool for spring clamp terminal block

Model: KD-5339

- Special tool used for cable connection to or disconnection from a spring clamp terminal.

IDC tool for communication connector

Model: L-TOOL-N

- Special tool used for crimping a cable to a communication connector.

IDC tool for open sensor connector

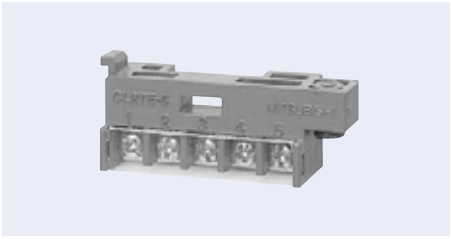
Model: e-TOOL-N

- Special tool used for connecting a cable to an open sensor connector (e-CON).

If you have any inquiries, contact: Mitsubishi Electric System & Service Co., Ltd.

Screw terminal block

Common terminal block



Model: CL2TE-5

- Common terminal block for remote I/O modules (screw terminals) / analog modules
  Applicable model: CL2X8-D1B2, CL2Y8-TP1B2, CL2AD4-B
  Included: 1 daisy chain cable with solderless terminal (100mm)

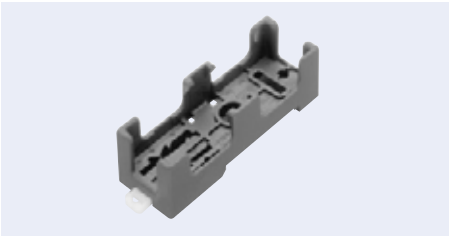
Spring clamp terminal block

Common terminal block

Model: CL2TE-10S

- Common terminal block for remote I/O modules (spring clamp terminal block)
  Applicable model: CL2X8-D1S2

Holder



Model: CL1-HLD (5pcs/package)

- Holder for remote I/O modules (cable types).

Memo

CC-Link
CC-Link/LT

Embedded Modules

Software/Other

Technical Information

Support

Embedded Modules

Embedded I/O modules

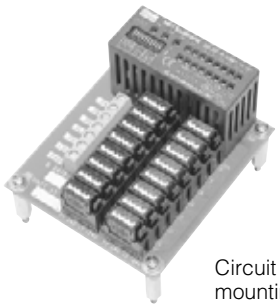
Overview

CC-Link

* The shapes of actual modules may differ somewhat from the shapes depicted in these photographs.

Features

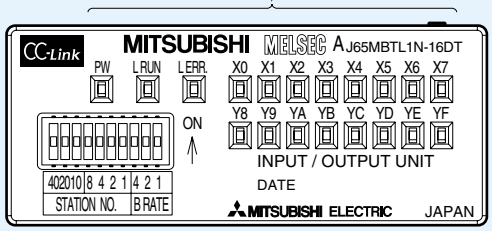
■Mounting this product to your circuit board allows easy development of remote I/O stations.



Circuit board mounting example

Part names and settings

●AJ65MBTL1N-M



Operation status indicator LEDs

LED name	Description
PW	Turns on when power supply of CC-Link embedded I/O module is turned ON.
L RUN	Checks if the input module is communicating with the master station of CC-Link embedded I/O adapter normally. Turns on when normal data is received from master station, and turns off when time has expired.
L ERR	On: When communication data errors (CRC error) occur, and when the station number setting or data link transmission speed setting violates the setting switch range. Flashing regularly: Indicates that the station number setting or transmission speed setting switch position was changed while power is on. Flashing irregularly: Indicates that the terminal resistor is left unconnected or that the CC-Link embedded I/O adapter or CC-Link dedicated cable is affected by noise.
X0 to XF/ X0 to X1F Y0 to YF/ Y0 to Y1F	Indicates the input/output ON/OFF status. Indicator is on when the input is ON, and is off when the input is OFF.

Station number setting switch

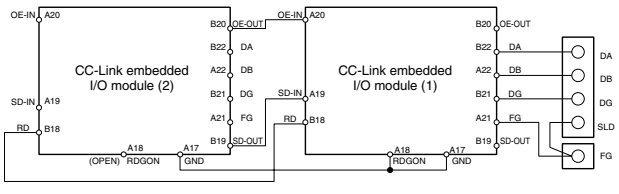
Set the tens place using "10", "20" and/or "40" of STATION NO.
Set the ones place using "1", "2", "4" and/or "8" of STATION NO.

Transmission speed setting switch

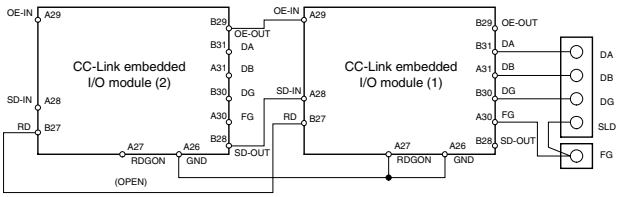
Pin No.	Signal name
0	156kbps
1	625kbps
2	2.5Mbps
3	5Mbps
4	10Mbps

Cascade connection method

●AJ65MBTL1N-16D ●AJ65MBTL1N-16DT
●AJ65MBTL1N-16T



●AJ65MBTL1N-32D
●AJ65MBTL1N-32T



* Reserve at least 5mm between I/O modules.

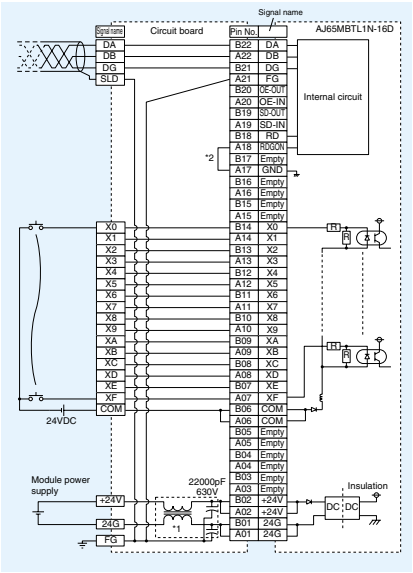
Input module
AJ65MBTL1N-16D

DC input 16 pts | +COM | Input 24VDC | Embedded

Detailed specifications

Input specifications		Description
Number of input points		16 points
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 4mA
Operating voltage range		19.2 to 26.4VDC (ripple ratio: within 5%)
Maximum number of simultaneous input points		50%
ON voltage/ON current		18VAC/3.5mA or higher
OFF voltage/OFF current		6VAC/1.7mA or lower
Input resistance		5.1kΩ
Response time	OFF→ON	1.5ms or lower (when 24VDC)
	ON→OFF	1.5ms or lower (when 24VDC)
Input format		Positive common (Sink type)
Wiring method for common		16 points/common
Number of occupied stations		1 station 32 points assignment (use 16 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple rate: within 5%)
	Current	35mA or lower (when TYP.24VDC)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Weight		0.03kg
External connection system		44-pin, 2-row, 2mm-pitch pin header

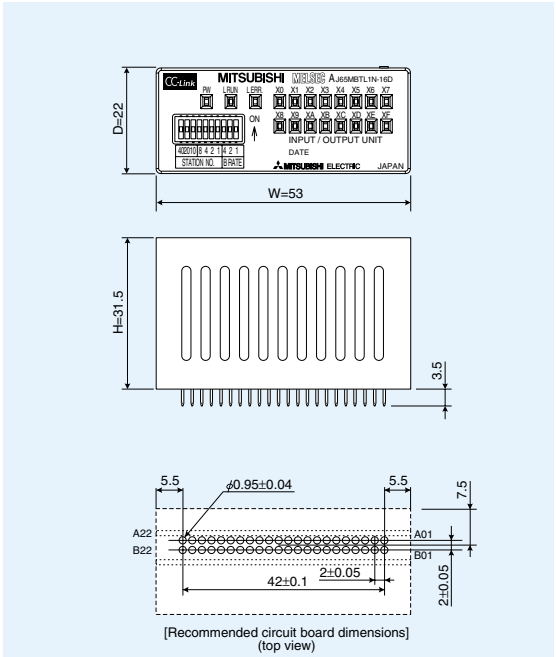
External connection diagram



*1: Add the circuit for noise reduction capability.
*2: Connect A17 and A18 without fail if cascade connection is not made.

External dimensions & terminal layout

Unit: mm



[Recommended circuit board dimensions]
(top view)

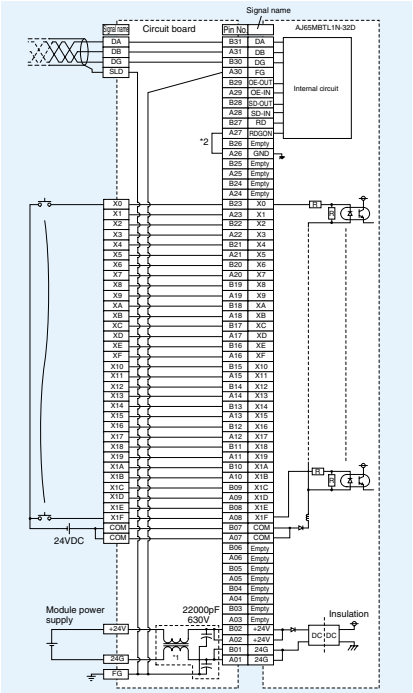
Input module
AJ65MBTL1N-32D

DC input 32 pts | +COM | Input 24VDC | Embedded

Detailed specifications

Input specifications		Description
Number of input points		32 points
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 4mA
Operating voltage range		19.2 to 26.4VDC (ripple ratio: within 5%)
Maximum number of simultaneous input points		50%
ON voltage/ON current		18VAC/3.5mA or higher
OFF voltage/OFF current		6VAC/1.7mA or lower
Input resistance		5.1kΩ
Response time	OFF→ON	1.5ms or less (when 24VDC)
	ON→OFF	1.5ms or less (when 24VDC)
Input format		Positive common (Sink type)
Wiring method for common		32 points/common
Number of occupied stations		1 station 32 points assignment (use 16 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple rate: within 5%)
	Current	45mA or lower (when TYP.24VDC)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Weight		0.04kg
External connection system		62-pin, 2-row, 2mm-pitch pin header

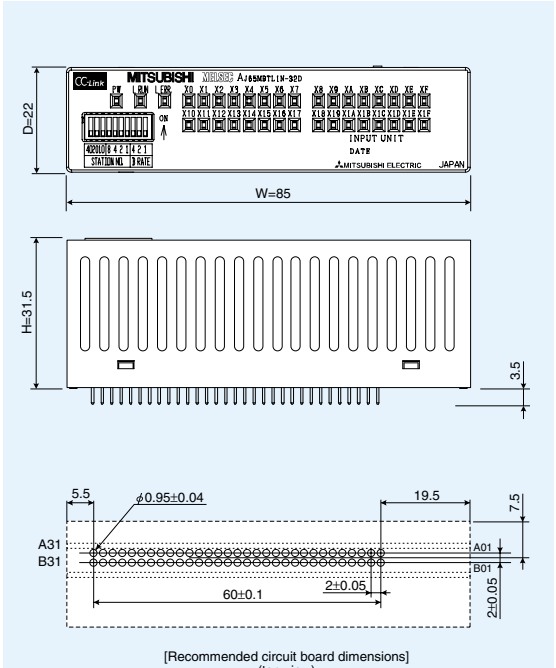
External connection diagram



*1: Add the circuit for noise reduction capability.
*2: Connect A26 and A27 without fail if cascade connection is not made.

External dimensions & terminal layout

Unit: mm



[Recommended circuit board dimensions]
(top view)

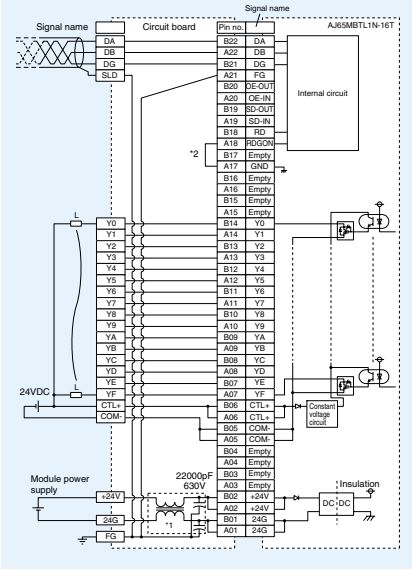
Output module
AJ65MBTL1N-16T

Transistor output 16 pts | Sink | Output L. current 0.1A | Embedded | Protection

Detailed specifications

Output specifications		Description
Number of output points		16 points
Isolation method		Photocoupler
Rated load voltage		12/24VDC
Operating load voltage range		10.2 to 26.4VDC (ripple ratio: within 5%)
Maximum load current		0.1A/point, 1.6A/common
Maximum inrush current		0.7A 10ms or less
Leakage current at OFF		0.1mA or lower
Maximum voltage drop at ON		0.1V or lower (TYP) 0.1A, 0.2V or lower (MAX) 0.1A
Output format		Sink type
Protection function		Overload protection, overvoltage protection, overheat protection
Response time	OFF→ON	1ms or lower
	ON→OFF	1ms or lower (rated load, resistive load)
External power supply for output part	Voltage	10.2 to 26.4VDC (ripple ratio: within 5%)
	Current	10mA or less (when 24VDC and all point is on) Not including external load current
Surge suppressor		Zener diode
Wiring method for common		16 points/common
Number of occupied stations		1 station 32 points assignment (use 16 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	50mA or lower (when 24VDC, all points ON)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Weight		0.03kg
External connection system		44-pin, 2-row, 2mm-pitch pin header

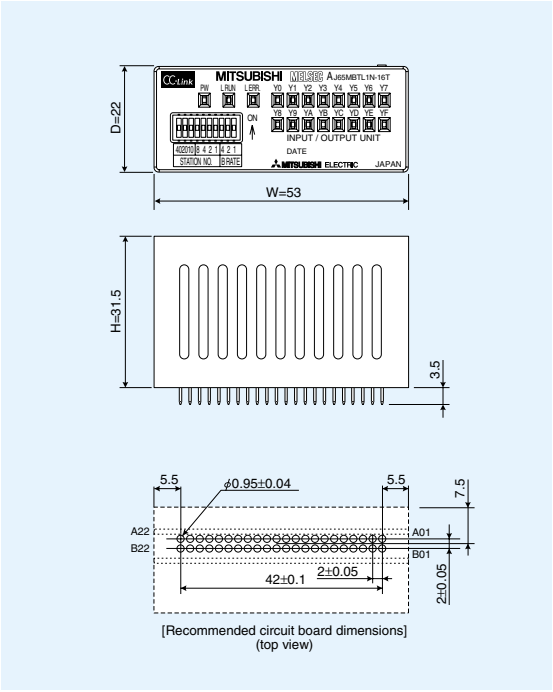
External connection diagram



*1: Add the circuit for noise reduction capability.
*2: Connect A17 and A18 without fail if cascade connection is not made.

External dimensions & terminal layout

Unit: mm



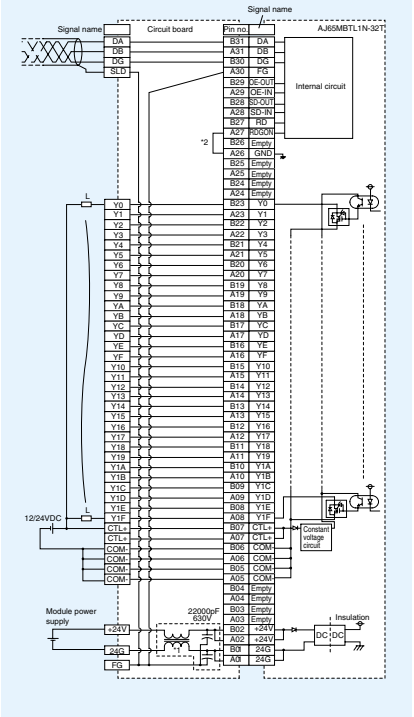
Output module
AJ65MBTL1N-32T

Transistor output 32 pts | Sink | Output L. current 0.1A | Embedded | Protection

Detailed specifications

Output specifications		Description
Number of output points		32 points
Isolation method		Photocoupler
Rated load voltage		12/24VDC
Operating load voltage range		10.2 to 26.4VDC (ripple ratio: within 5%)
Maximum load current		0.1 A/point, 3.2A/common
Maximum inrush current		0.7A 10ms or lower
Leakage current at OFF		0.1mA or lower
Maximum voltage drop at ON		0.1V or lower (TYP) 0.1A, 0.2V or lower (MAX) 0.1A
Output format		Sink type
Protection function		Overload protection, overvoltage protection, overheat protection
Response time	OFF→ON	1ms or lower
	ON→OFF	1ms or lower (rated load, resistive load)
External power supply for output part	Voltage	10.2 to 26.4VDC (ripple ratio: within 5%)
	Current	15mA or less (when 24VDC and all point is on) Not including external load current
Surge suppressor		Zener diode
Wiring method for common		32 points/common
Number of occupied stations		1 station 32 points assignment (use 32 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple ratio: within 5%)
	Current	60mA or less (when 24VDC, all points ON)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Weight		0.04kg
External connection system		62-pin, 2-row, 2mm-pitch pin header

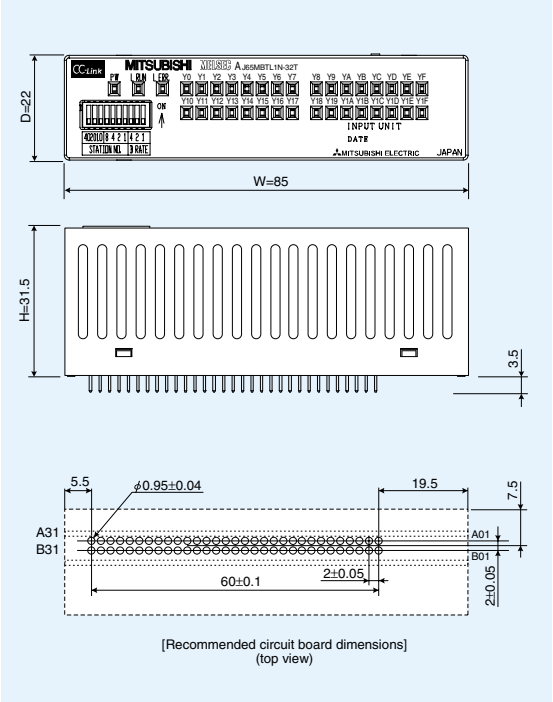
External connection diagram



*1: Add the circuit for noise reduction capability.
*2: Connect A26 and A27 without fail if cascade connection is not made.

External dimensions & terminal layout

Unit: mm



I/O module

AJ65MBTL1N-16DT

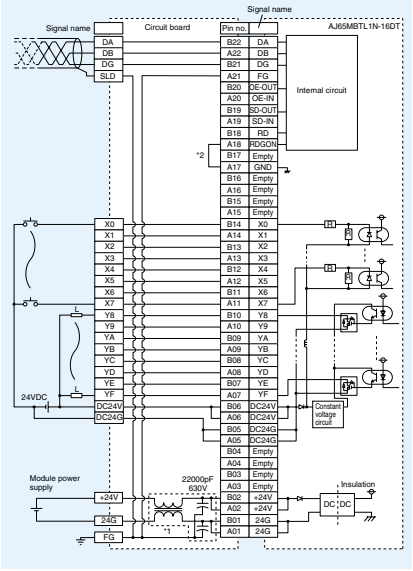
DC input 8 pts | +COM | Input 24VDC | Transistor output 8 pts | Sink | Output L. current 0.1A | Embedded | Protection

Detailed specifications

Input specifications		Description
Number of input points		8 points
Isolation method		Photocoupler
Rated input voltage		24VDC
Rated input current		Approx. 7mA
Operating voltage range		19.2 to 26.4VDC (ripple ratio: within 5%)
Maximum number of simultaneous input points		50%
ON voltage/ON current		14VAC/3.5mA or higher
OFF voltage/OFF current		6 VAC/1.7mA or lower
Input resistance		Approx. 3.3kΩ
Response time	OFF→ON	1.5ms or lower (when 24VDC)
	ON→OFF	1.5ms or lower (when 24VDC)
Input format		Positive common (sink type)
Wiring method for common		16 points/common
Number of occupied stations		1 station 32 points assignment (use 16 points)
I/O module power supply	Voltage	20.4 to 26.4VDC (ripple rate: within 5%)
	Current	50mA or less (when TYP.24VDC)
Noise immunity		DC type noise voltage 500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition)
Withstand voltage		500VAC for 1 minute between all DC external terminals and ground
Insulation resistance		10MΩ or higher, measured with a 500VDC insulation resistance tester between all DC external terminals and ground
Weight		0.03kg
External connection system		44-pin, 2-row, 2mm-pitch pin header

Output specifications		Description
Number of output points		8 points
Isolation method		Photocoupler
Rated load voltage		24VDC
Operating load voltage range		20.4 to 26.4VDC (ripple ratio: within 5%)
Maximum load current		0.1A/point, 0.8A/common
Maximum inrush current		0.7A 10ms or lower
Leakage current at OFF		0.1mA or lower
Maximum voltage drop at ON		0.1V or less (TYP) 0.1A, 0.2V or less (MAX) 0.1A
Output format		Sink type
Protection function		Overload protection, overvoltage protection, overheat protection
Response time	OFF→ON	1ms or lower
	ON→OFF	1ms or lower (rated load, resistive load)
External power supply for output part	Voltage	19.2 to 26.4VDC (ripple ratio: within 5%)
	Current	5mA or lower (when 24VDC, all points ON) Not including external load current
Surge suppressor		Zener diode

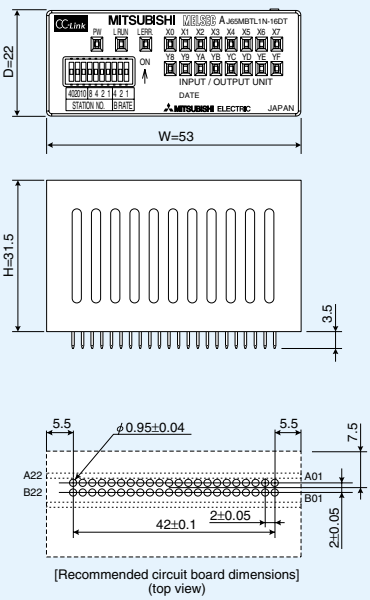
External connection diagram



*1: Add the circuit for noise reduction capability.
*2: Connect A17 and A18 without fail if cascade connection is not made.

External dimensions & terminal layout

Unit: mm



[Recommended circuit board dimensions]
(top view)

CC-Link Ver.2 embedded type interface board

CC-Link V2

Q50BD-CCV2 CC-Link

Features

■Master station, standby master station, local station and intelligent device station can be easily developed.
Installing the interface board to a user circuit board enables features of the CC-link master station, standby master station, local station or intelligent device station.

■The interface board is compatible with CC-Link Ver.2.
As it is compatible with CC-Link Ver.2, the cyclic transmission data size can be increased up to 8192 points for RX/RY and up to 2048 words for RWr/RWw per network.
The interface board is also backward compatible with the older specifications (Ver.1).

■Mounting space can be saved.
The interface board is compact in size, which dimensions are 70mm x 80mm.

■Use of general-purpose bus interfaces allows easy communication with circuits on a user circuit board.
Using general memory control signals (Address bus, Data bus, Read, Write, etc.), communications are easily performed between a user circuit board and the interface board.

■Related manual

Reference Manual SH(NA)-080700ENG (13JR82)

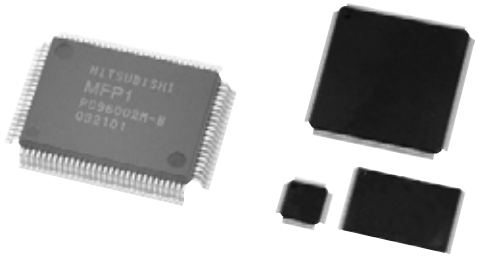
■Basic specifications

Classification	Item	Specifications
Bus, MPU	Bus interface	General-purpose bus interface
	MPU	SH3 (HD6417708RF100AV) QFP 144pin
Internal memory	ROM	ROM 512Kword x 16bit (8Mbit)
	SRAM	Dual port RAM 32Kword x 16bit (512Kbit)
		Work RAM 256Kword x 16bit (4Mbit)
Communication area	Communication chip	MFP1N
Indication		6 LEDs: Green (RUN, L RUN, SD, RD), red (ERR., L ERR.)
Switch		Station No. setting switch, transmission speed, mode setting switch, select switch
Current consumption		0.32A
Dimensions		70.0 x 80.0 mm
Weight		0.03kg

Object development

CC-Link V2

MFP1N Device kit



Features

■The CC-Link Ver. 2 compatible product development tool with object software allows you to develop master stations, standby master stations, local stations and intelligent device stations.

■This product is compatible with CC-Link Ver. 2.
With CC-Link Ver. 2 compatibility, the maximum number of cyclic data points can be extended to 8,192 points for RX/RY and 2,048 words for RWr/RWw. CC-Link Ver. 2 is also compatible with old specifications (Ver. 1.10).

■Data communication can be easily performed.
Use of a dual port RAM enables easy data communication between the network circuit and user application circuit.

■Object code installation method is selectable.
To develop Ver. 2 compatible products, object code installation is required. An installation method can be selected from two methods: using serial communication and using a ROM writer. As a transfer tool for the serial communication, please use the "HyperTerminal" function provided in Windows®2000 and Windows®XP.

■The CC-Link Ver. 2 compatible product development tool with object software is composed of the object code (SW1D5C-CCV20B) and a network circuit. The network circuit is made up using a device kit (Q6KT-NPC2OG51).

■Related manual

Reference Manual SH(NA)-080701ENG (13JV05)

■Models

Item	MFP1N		Device kit
Order model name	A6GA-CCMFP1NN60F	A6GA-CCMFP1NN300F	Q6KT-NPC2OG51
Application	Master station / local station / intelligent device station		Network circuit
Package unit	60pcs	300pcs	40pcs
LSI external shape	100-pin QFP (Quad FLAT Package) 20 x 14 mm body, 0.65mm between pins		–

MFP: Mitsubishi Field-network Processor

For MFP1N, a separate license agreement is required. For the development of CC-Link products that use MFP, "Open Field Network CC-Link, CC-Link/LT Compatible Product Development Guidebook (L(NA)-08052E)" is available.

For details or lead-free/RoHS compatible products, contact the Open System Center.

Communication LSI dedicated

MFP2N CC-Link
MFP2AN CC-Link
MFP3N CC-Link

Features

■CC-Link compatible devices can be developed easily without worrying about the communication protocol. Also the CC-Link communication protocol is built-in.

●MFP2N /MFP2AN (for remote I/O stations)
Devices that handle bit information (digital input/output) can be developed easily without a CPU.

●MFP2N can control max. 32 points and MFP2AN can control max. 16 points.

●MFP3N (for remote device stations)
Simply access to an external CPU via the two port RAM. Devices that handle bit information (digital input/output) and word information (remote register) can be developed easily without concern for communication protocol.

■Related manual

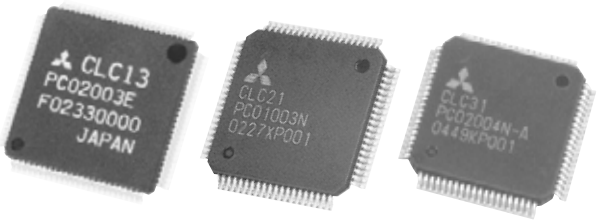
MFP2A	Reference Manual	SH(NA)-080622ENG (13JV13)
MFP2AN	Reference Manual	SH(NA)-080623ENG (13JV14)
MFP3N	Reference Manual	SH(NA)-080624ENG (13JV15)

■Models

Item	MFP2AN		MFP2N		MFP3N	
Order model name	A6GA-CCMFP2ANN 60F	A6GA-CCMFP2ANN 300F	A6GA-CCMFP2NN 60F	A6GA-CCMFP2NN 300F	A6GA-CCMFP3NN 60F	A6GA-CCMFP3NN 300F
Application	Remote I/O station		Remote I/O station		Remove device station	
Package unit	60pcs	300pcs	60pcs	300pcs	60pcs	300pcs
LSI external shape	80-pin QFP (Quad FLAT Package) 12 x 12 mm body, 0.5mm between pins		100-pin QFP (Quad FLAT Package) 14 x 14 mm body, 0.5mm between pins			

MFP: Mitsubishi Field-network Processor
For the development of CC-Link products that use MFP, "Open Field Network CC-Link, CC-Link/LT Compatible Product Development Guidebook (L(NA)-08052E-A)" is available.
For details or lead-free/RoHS compatible products, contact the Open System Center.

CLC13 CC-Link/LT
CLC21 CC-Link/LT
CLC31 CC-Link/LT



Features

■CC-Link compatible devices can be developed easily without worrying about the communication protocol. Also the CC-Link communication protocol is built-in.

●CLC13 (for master stations)
An internal communication protocol makes it easy (by memory reading from an external CPU) to develop devices for data communication and remote station control without worrying about the communication protocol.

●CLC21 (for remote I/O stations)
An internal communication protocol makes it easy to develop devices for handling bit data without using an external CPU (programless).

●CLC31 (for remote device stations)
Communication LSI for CC-Link/LT remote devices.

■Related manual

CLC13	Reference Manual	SH(NA)-080703ENG (13JV09)
CLC21	Reference Manual	SH(NA)-080707ENG (13JV10)
CLC31	Reference Manual	SH(NA)-080704ENG (13JV11)

■Models

Item	CLC13	CLC21		CLC31
Order model name	CL2GA13-60	CL2GA21-60	CL2GA21-300	CL2GA31-60
Application	Master station	Remote master station		Remote device station
Package unit	60pcs	60pcs	300pcs	60pcs
LSI external shape	100-pin QFP (Quad FLAT Package) 14 x 14mm body, 0.5mm between pins	80-pin QFP (Quad FLAT Package) 12 x 12mm body, 0.5mm between pins		80-pin QFP (Quad FLAT Package) 12 x 12mm body, 0.5mm between pins

CLC: CC-Link/LT Controller

Memo

Embedded modules

The Open System Center provides development support for embedded modules.
Admission (regular member, executive member or board member) into the CC-Link Partner Association (CLPA) is required in order to purchase embedded modules.
(For details of CLPA, refer to page 275.)

■Contact info for inquiries:
CC-Link Partner Association (Japan)
TEL: +81-52-919-1588 FAX: +81-52-916-8655

●Open Field Network CC-Link, CC-Link/LT Compatible Product Development Guidebook

(L(NA)-08052E)

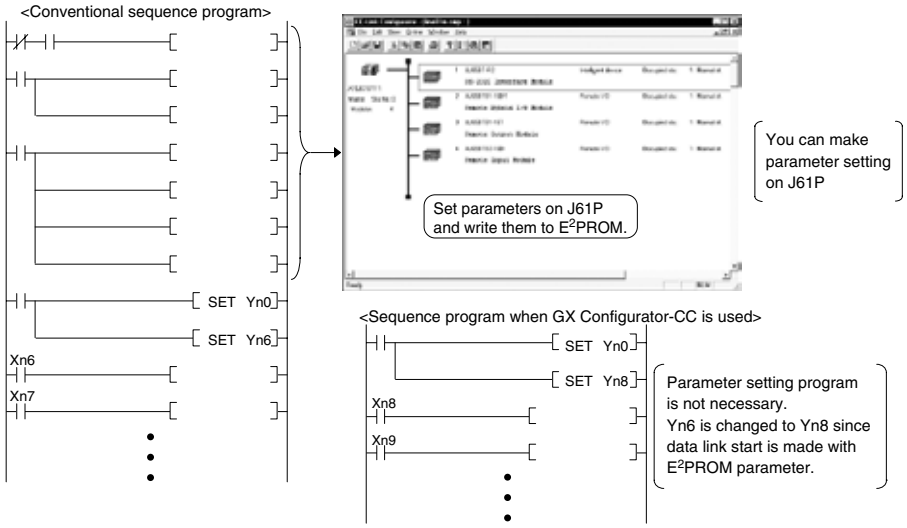
When developing CC-Link and CC-Link/LT compatible products using development tools (such as embedded type interface board, object development, communication LSI dedicated) offered by Mitsubishi Electric Corporation, "Open Field Network CC-Link, CC-Link/LT Compatible Product Development Guidebook", which describes more details of development tools, is available.

Software/Other

Configurator for CC-Link
GX Configurator-CC

SW□D5C-J61P

■It is possible to set parameters directly in Windows® without having to create a sequence program.



Features

■Master parameter setting is available for A series master modules.

■Parameters of remote device stations connected to a QnA or A series master module can be uploaded or downloaded, and monitoring and tests are also executable.

■Via an A series master module, buffer memory setting is available for the AJ65BT-R2.

■Enriched diagnostic function is provided.

■Operating environment

Item	Operating environment
OS	Microsoft® Windows® 95 (English version), Windows® 98 (English version), Microsoft® Windows NT® Workstation 4.0 (English version), Microsoft® Windows® 2000 Professional (English version), Microsoft® Windows® Millennium Edition (English version), Microsoft® Windows® XP Professional (English version), Microsoft® Windows® XP Home Edition (English version)
CPU	Pentium 133 MHz or more*1
Display	Resolution: 800 x 600 or more (1024 x 768 are recommended.)
Memory	32MB or more*2
Required free hard disk space	120MB or more
Disk drive	CD-ROM disc drive
Communication interface	RS-232C port: Necessary for communication with programmable controller CPU (Required for access to programmable controller CPU other than Q02H/Q06H/Q12H/Q25HCPU) USB port: Usable for communication with QCPU (Q mode) (Except for Q00J/Q00/Q01/Q02CPU and Remote I/O module)

*1: Pentium 150MHz or faster processor is recommended to use Microsoft® Windows® Millennium Edition.

*2: 64MB or more is recommended for Microsoft® Windows® 2000 Professional and Microsoft® Windows® Vista, and 128MB or more for Microsoft® Windows® XP.

■Models

Product name	Model	Description	Related manual and other
GX Configurator-CC	SW□D5C-J61P	Software package for parameter setting of the CC-Link master module as well as parameter setting, line test, and monitoring of remote device stations	Operating manual SH-080103 Mitsubishi Integrated FA Software Catalog L(NA)08008

Precaution FX programmable controller cannot be used. The master station parameters for the Q and QnA Series programmable controller CPUs must be set by GX Developer.

MELSEC programming software GX Developer

SW□D5C-GPPW

■CC-Link, CC-Link Safety parameter setting can be done with GX Developer alone. Ver. 2 mode parameters can be set simply.

Features

■The parameter setting function "Network Parameter (CC-Link)" of GX Developer allows the setting of parameters without a sequence program for QCPU (Q mode) and QnA programmable controller CPUs.

■Networks with Q, QnA and A programmable controller CPUs can be monitored with the "CC-Link Diagnostic function of GX Developer.

■Operating environment

Item	Operating environment
OS*1	Microsoft® Windows® 95 (English version), Microsoft® Windows® 98 (English version), Microsoft® Windows NT® Workstation 4.0 (English version), Microsoft® Windows® 2000 Professional (English version), Microsoft® Windows® Millennium Edition (English version), Microsoft® Windows® XP Professional*3, Microsoft® Windows® XP Home Edition, Microsoft® Windows Vista® Ultimate (English version), Microsoft® Windows Vista® Home Premium (English version), Microsoft® Windows Vista® Home Basic (English version), Microsoft® Windows Vista® Business (English version), Microsoft® Windows Vista® Enterprise (English version), Microsoft® Windows® 7 Starter Operating System (English version), Microsoft® Windows® 7 Home Premium Operating System (English version), Microsoft® Windows® 7 Professional Operating System (English version), Microsoft® Windows® 7 Ultimate Operating System (English version), Microsoft® Windows® 7 Enterprise Operating System (English version)
CPU	Pentium 133MHz or more*2
Display	Resolution: 800 x 600 or more (1024 x 768 are recommended.)
Memory	32MBor more*2
Required free hard disk space	200MB or more
Disk drive	CD-ROM disc drive
Communication interface	RS-232C port: Necessary for communication with programmable controller CPU (Required for access to programmable controller CPU other than Q02H/Q06H/Q12H/Q25HCPU) USB port: Usable for communication with QCPU (Q mode) (Except for Q00J/Q00/Q01/Q02CPU and Remote I/O module) Ethernet port: Usable for QCPU and LCPU with Ethernet ports.

*1: Windows® XP (64bit version) and Windows® Vista (64bit version) are not supported.

*2: See Operating manual for details.

■Models

Product name	Model	Description	Related manual and other
GX Developer	SW□D5C-GPPW	MELSEC programmable controller programming software package	Operating manual SH-080373E Mitsubishi Integrated FA Software Catalog L(NA)08008

FX Series interface block

FX3U-64CCL

Features

■This interface block is used to connect Mitsubishi Micro-Programmable Controller of the FX3G, FX3U and FX3UC series to a CC-Link network as remote-device stations.
Only one FX3U-64CCL unit can be connected to a single programmable logic controller main unit.

■From the programming software connected to the Q master or local stations, you can access the Micro PLC base unit via CC-Link. (For GX Developer Ver.8.76E or later)

■Performance specifications

Item	Specifications
Number of occupied stations	1 to 4 stations (set by the rotary switch)
Power supply	5VDC(Supplied from a programmable controller) 24VDC (Supplied from external power supply. programmable controller service power supply is usable.)
Applicable programmable controller	FX3G,FX3U, FX3UC (Ver. 2.20 (from products manufactured in May, 2005 with SER No. 55****) and later) An FX2NC-CNV-IF or FX3UC-1PS-5V is necessary to connect the 64CCL with the FX3UC PLC. Only one 64CCL unit can be connected to a main unit.
Number of occupied I/O points	8 points for the FX programmable controller
External dimensions	55 (W) x 90 (H) x 87 (D) mm
Weight	0.3kg

FX2N-32CCL

Features

■This interface block is used to connect Mitsubishi Micro-Programmable Controller of the FX1N, FX2N, FX1NC, FX2NC and FX3UC series to a CC-Link network as remote-device stations.

- Introduction of a micro programmable controller enables distributed control easily and cost effectively.
- The maximum data of up to 112 bits and 16 words can be sent or received with the master station (when 4 stations are occupied).
- Since the number of occupied stations can be selected (1 to 4), a system according to the communication scale can be configured.

■Performance specifications

Item	Specifications
Number of occupied stations	1 to 4 stations (set by the rotary switch) (remote device station)
Power supply	5VDC 130mA (Supplied from a programmable controller) 24VDC 50mA (Supplied from external power supply. programmable controller service power supply is usable.)
Applicable programmable controller	Mitsubishi micro-programmable controller FX1N, FX2N series FX1NC, FX2NC, FX3UC series (connector conversion module required)
Number of occupied I/O points	8 points for the FX programmable controller
External dimensions	43 (W) x 90 (H) x 87 (D) mm
Weight	0.2kg

AC servo amplifier / Interface modules

MR-J3-□T
MR-J3-□T1

Features

- As the servo amplifier has the built-in positioning function, position data and speed data can be set via CC-Link.
- Start/stop of the module, and monitor display are executable via CC-Link (compatible CC-Link version: Ver.1.10).
- Since the module uses serial communication, wiring can be reduced.
- A distributed control system for the AC servo amplifier can be easily configured.
- Parameter settings and monitoring of operation status can be easily made with the parameter unit MR-PRU03 (option).
- Positioning with the DIO command is available with the extension I/O unit MR-J3-D01 (option).

■Performance specifications

Item			Specifications
Command method	Point table	Position data (feed rate)	31 points (when occupies 1 station) 255 points (when occupies 2 stations)
		Speed data	• Setting with point table • Setting acceleration/deceleration time with point table • Setting parameters for the S-pattern acceleration/deceleration time constant
	Remote register		Enabled (when occupied 2 stations)
Home position return method			Dog type, count type, data setting type, stopper type, home position ignorance (servo-on position as home position), dog type (rear end reference), count type (front end reference), dog cradle type dog type first Z-phase reference, dog type front end reference, dogless Z-phase reference
Number of occupied stations			1 station/2 stations (remote device station)

MR-J2S-MCP-S084
MR-J2S-T01

Features

- No positioning controller may be needed because the servo amplifier has a built-in positioning function.
- This servo has sophisticated functions such as high level real time auto tuning, machine resonance suppression filter, etc.
- These models are suitable for high frequency positioning.
- Transmission of positioning data, start/stop and monitoring are executable through a CC-Link network.
- Servomotors ranging from 50W to 7kW are applicable.
- A distributed control system with AC servo amplifiers can be easily configured.

■Performance specifications

Item			Specifications
Command method			Positioning method
Command method	Point table	Position data (feed rate)	Up to 31 points (Point table number selection)
		Speed data	• Setting with point table • Setting acceleration/deceleration time with point table • Setting parameters for the S-pattern acceleration/deceleration time constant
	Position data input*	Position data (feed rate)	Enabled (when occupied 2 stations)
		Speed data	
Absolute position system			Enabled
Home position return method			Dog type, count type, data setting type, stopper type, home position ignorance (servo-on position as home position), dog type (rear end reference), count type (front end reference), dog cradle type
Number of occupied stations			1 station/2 stations (remote device station)

* The position data input method: The positioning data is transferred directly to the servo amplifier via CC-Link communication.

Note: A servo amplifier (MR-J2S-MCP-S084) and a CC-Link interface module (MR-J2S-T01) are necessary. Supply power (5VDC) from the servo amplifier to MR-J2S-T01.

Inverters

FREQROL-C500
FREQROL-V500

Features

■FREQROL-C500 series

FR-C520-0.1KN to 3.7KN 7 models

- The programmable controller function built in this series inverter allows sequence control using the inverter only (without I/O options).
- The ladder sequence can be programmed with "GX Developer".
- The built-in CC-Link function allows communication between the master station and inverter with one CC-Link cable only, reducing the number of cables.

■FREQROL-V500 series

FR-V520-1.5K to 55K 13 models
FR-A540-1.5K to 55K 13 models 26 models in total

■FREQROL-V500L series

FR-V520L-75K 1 models
FR-A540L-75K to 250K 7 models 8 models in total

- Using the optional unit, FR-A5NC allows connection to the CC-Link network. Up to 42 inverters can be connected.
- The adaptive magnetic flux observer can reduce torque fluctuations caused by changes in motor temperature.
- Easy gain tuning function automatically adjusts the speed control gain and position loop gain.

■Performance specifications

Item	FREQROL-C500	FEQROL-V500/V500L
Catalog number	L (NA) 06034	L (NA) 06037E
Capacity range	0.1kW to 3.7kW(200V)	1.5kW to 55kW/75kW(200V) 1.5kW to 55kW/75kW to 250kW(400V)
Output frequency range	0.5 to 120Hz	0 to 3000r/min
Control method	V/F control	Vector control and V/F control
Frequency setting signal	CC-Link communication, RS-485 communication and digital setting using built-in programmable controller function	Input via CC-Link communication and/or panel, and parameter module (option) (Analog input: 0 to 10VDC, 0 to ±10VDC)
Start torque	———	150% 1r/min (in case of vector control)
Acceleration/deceleration time setting	0.01 to 999s (Individual setting is allowed.)	0 to 3600s (Individual setting is allowed.)
Acceleration/deceleration pattern	linear	Switchable among linear, S-pattern A, B and C
Protection/alarm functions	Overcurrent shutdown, regenerative overvoltage, overload shutdown, overheat fin, stall prevention, and others	Overcurrent shutdown, regenerative overvoltage, overload shutdown, stall prevention momentary power failure, and others
Ambient temperature	-10°C to +50°C (no freezing allowed)	
Number of occupied stations	1 station (remote device station)	

FREQROL-A700
FREQROL-F700
FREQROL-E700

CC-Link V2

Features

■FREQROL-A700 series

FR-A720-0.4K to 90K 17 models
FR-A740-0.4K to 500K 29 models 46 models in total

- CC-Link operation is possible by using the FR-A7NC inverter option. Up to 42 inverters can be connected.
- High accuracy/fast response speed operation by the vector control can be performed with a general-purpose motor without encoder. The torque limit during the torque or speed control is also available.
- New functions include a life assessment function and an internal EMC filter, etc., making it more useful than ever.

■FREQROL-F700 series

FR-F720-0.75K to 110K 17 models
FR-F740-0.75K to 560K 29 models 46 models in total

- Dedicated model for fan pumps, and successor to the F500 Series. Offers optimal excitation control (upgraded version), and reduced power consumption due to functions such as a energy-saving monitor monitor.
- New functions include a life assessment function and an internal EMC filter, etc., making it more useful than ever.
- CC-Link operation is possible by using the FR-A7NC inverter option. Up to 42 inverters can be connected.

■FREQROL-E700 series

FR-E720-0.1K to 15K 11 models
FR-E740-0.4K to 15K 9 models 20 models in total

- Advancement from the general-purpose magnetic flux vector control to the advanced magnetic flux vector control! Class top-level driving performance is realized. Since V/F control and general-purpose magnetic flux vector control operations are available, replacement of the conventional models (FR-E500 series) is ensured.
- The installation size is the same as the conventional models (FREQROL-E500 series) in consideration of compatibility. (7.5K or less)
- CC-Link operation is possible by using the FR-A7NC inverter option. Up to 42 inverters can be connected.

■Performance specifications

Item	FREQROL-E700	FREQROL-A700	FREQROL-F700
Catalog number	L (NA)06051ENG	L (NA)06044ENG	L (NA) 06040ENG
Capacity range	0.1kW to 15kW (200V)	0.4kW to 90kW (200V)	0.75kW to 110kW (200V)
	0.4kW to 15kW (400V)	0.4kW to 500kW (400V)	0.75kW to 110kW (400V)
Output frequency range	0.2 to 400Hz	0.2 to 400Hz	0.5 to 400Hz
Control method	V/F control, advanced magnetic flux vector control, general-purpose magnetic flux vector control, optimum excitation control	V/F control, advanced magnetic flux vector control, real sensorless vector control, vector control (with option FR-A7AP)	V/F control, optimum excitation control, simple magnetic flux vector control
Frequency setting signal	Input via CC-Link communication and/or operation panel, or parameter unit (optional) (Analog input: 0 to 5VDC, 0 to 10VDC,4 to 20mA)	Input via CC-Link communication and/or operation panel, or parameter unit (optional) (Analog input: 0 to 5VDC, 0 to 10VDC, 0 to ±5VDC, 0 to ±10VDC, 4 to 20mA)	Input via CC-Link communication and/or operation panel, or parameter unit (optional) (Analog input: 0 to 5VDC, 0 to 10VDC, 0 to ±5VDC, 0 to ±10VDC, 4 to 20mA)
Start torque	200% or more (at 0.5Hz) With setting advanced magnetic flux vector control (3.7K or less)	200% 0.3Hz (0.4 to 3.7K), 150% 0.3Hz (5.5K or more) (with real sensorless vector control or vector control)	120%: 3Hz (When simple magnetic flux vector control and slip compensation are set.)
Acceleration/deceleration time setting	0.01 to 360s, 0.1 to 3600s (Acceleration and deceleration can be set individually.)	0 to 3600s (Individual setting is allowed.)	
Acceleration/deceleration pattern	Selectable from linear or S-pattern acceleration/deceleration mode.	Selectable from linear, S-pattern acceleration/deceleration mode or backlash measures acceleration/deceleration.	Switchable among linear, S-pattern type A, and S-pattern type B
Protection/alarm functions	Overcurrent shutdown, regenerative overvoltage, overload shutdown, output short-circuit, stall prevention, momentary power failure, and others		
Ambient temperature	(-10˚C to +50˚C for totally-enclosed structure specifications)	-10˚C to +50˚C (no freezing allowed)	
Number of occupied stations	1 station (remote device station)		
	Expanded cyclic settings of x1, x2, x4, x8 (selectable)		

Mitsubishi Graphic Operation Terminal GOT Series

GOT1000 series

CC-Link V2

Features With sophisticated basic performance, GOT1000 series is a next generation standard.

- ■Beautiful screens with 60,000 colors can be displayed.
- ■The processing speeds in “drawing”, “computing” and “communication” have been improved, enabling the response performance 4-times faster than before.
- ■The TrueType font supporting Unicode 2.1 has been adopted.
  Multiple languages all over the world can be displayed clearly.
- ■A USB interface is provided on the front.
  Data transmission is easy without opening the panel and operability can be improved.
- ■By mounting a communication unit on the GOT1000 series, the GOT can be connected to a programmable controller via CC-Link. (Ver.2-compatible)

■Performance specifications (CC-Link communication unit for GOT1000 series)

Item		GT15-J61BT13	
Station type		Intelligent device station	
Number of occupied stations		Selectable from 1 station/4 stations.	
Maximum number of link points per system	Ver.2 mode	Remote I/O (RX, RY) *1	8192 points
		Remote register (RWw)	2048 points
		Remote register (RWr)	2048 points
	Ver.1 mode	Remote I/O (RX, RY) *1	2048 points
		Remote register (RWw)	256 points
		Remote register (RWr)	256 points
Number of link points per station		Refer to *2.	
Number of link points for each of the number of occupied stations		Refer to *3.	
Transmission speed		156kbps/625kbps/2.5Mbps/5Mbps/10Mbps	
Maximum connection distance		Varies depending on the transmission speed.	
Maximum number of connectable modules		26 The maximum number of connectable module varies depending on the configuration of the CC-Link system. For details, refer to the User's Manual for the CC-Link.	
Connection cable		CC-Link dedicated cable	

*1: 16 points in the number of device points of the I/O signal (RX, RY) were occupied for system area, respectively.

*2: The number of link points per station varies depending on the CC-Link mode setting as shown below.

CC-Link mode setting	CC-Link Ver.2				CC-Link Ver.1
Link device	Number of link points for each of the number of occupied stations				Number of link points per station
	Expanded cyclic setting				
	Single	Double	Quadruple	Octuple	
Remote I/O (RX, RY)	23 points	32 points	64 points	128 points	32 points
Remote register (RWw)	4 points	8 points	16 points	32 points	4 points
Remote register (RWr)	4 points	8 points	16 points	32 points	4 points

*3: The number of link points for each of the number of occupied stations varies depending on the CC-Link mode setting as shown below.

CC-Link mode setting	CC-Link Ver.2								CC-Link Ver.1	
Link device	Number of link points for each of the number of occupied stations								Number of link points for each of the number of occupied stations	
	Expanded cyclic setting									
	Single		Double		Quadruple		Octuple			
	Exclusive station 1	Exclusive station 4	Exclusive station 1	Exclusive station 4	Exclusive station 1	Exclusive station 4	Exclusive station 1	Exclusive station 4	Exclusive station 1	Exclusive station 4
Remote I/O (RX, RY)	23 points	128 points	32 points	224 points	64 points	448 points	128 points	896 points	32 points	128 points
Remote register (RWw)	4 points	16 points	8 points	32 points	16 points	64 points	32 points	128 points	4 points	16 points
Remote register (RWr)	4 points	16 points	8 points	32 points	16 points	64 points	32 points	128 points	4 points	16 points

Handy GOT

Features Enriched functions are portable!
Compact display unit

- Using as an operation terminal for your machine
  Operation switch names can be changed.
- Even in a limited installation space where a general operation panel can be hardly installed
  This GOT can be used in such a space only when it is necessary.
- Convenient for start-up, adjustment or setup change
  Teaching operations can be set viewing from various directions.
  Using as a peripheral of a programmable controller.
- The program list display function and monitoring function allow easy program debugging.
- Connection to CC-Link network
  By using the CC-Link interface unit, the Handy GOT can be connected to a Q series programmable controller via a CC-Link network.

CNC (Computerized Numerical Control)

MELDAS series

Features Global CNC MELDAS 64AS/64S/65S/66S

- The world highest-level hardware performance: The CPU performance has been upgraded more than previous M60 series with 64-bit CPU and programmable controller LSI.
- Major 12 languages are supported.
- Connection to various networks is available.
- Introduction of this series model allows comfortable system development.
- High-speed and high-accuracy machining has been thoroughly pursued.
- Multiple axes and systems can be controlled.

CNC for machining line C6/C64

- The built-in 64-bit RISC has improved the basic performance and control functionality.
- The time and cost for designing electrical circuits can be reduced by the enhanced built-in programmable controller.
- The improved maintenance function can reduce the system downtime system downtime.
- Connection to various networks is available.

■Performance specifications

Item			MELDAS C6		MELDAS C64			MELDAS 64AS		MELDAS 64S		MELDAS 65S		MELDAS 66S	
Machining center family			TORAMAN C6 (T family)	–	FTL C64 (M family)	–	TORAMAN C6 (T family)	M64ASM		M64SM		M65SM		M66SM	
Lathe family			–	FTL C6 (L family)	–	FTL C64 (L family)	–		M64ASL		M64SL		M65SL		M66SL
Control axis	Max. number of axes (NC axis + spindle + Programmable controller axis)		7	7	14	14	14	5	5	7	7	7	14	7	14
	Peripheral axes (MR-J2-CT)		5		7			4	4	4	4	4	4	4	4
Machine interface	Machine contacts (standard/max.)	DI	16/80		16/80			*1) 64/512 (RIO type)		*1) 64/512 (RIO type)		*1) 64/256 (RIO type)		*1) 64/512 (RIO type)	
		DO	1/65		1/65			*1) 48/512 (RIO type)		*1) 48/512 (RIO type)		*1) 48/256 (RIO type)		*1) 48/512 (RIO type)	
	Operation board I/F (DI/DO)	1	–		–			64/48		64/48		64/48		64/48	
		2	–		–			64/48 (Total: 128/96)		64/48 (Total: 128/96)		64/48 (Total: 128/96)		64/48 (Total: 128/96)	
	Maximum remote I/O (DI/DO)		512/512		512/512			–		–		–		–	
Tape length (standard/maximum)			40/600		40/600			40/600		40/5120		40/5120		40/5120	
PLC/APLC memory capacity (maximum)			32000 steps		32000 steps			32000 steps		32000 steps		32000 steps		32000 steps	
Station types			Master station / Local station												
Number of occupied stations			1 station to 4 stations												

Industrial robots

RP, RV-S, RH-SH, RV-T, RH/RC-G series

<Controller>

■The reinforced network functionality enables various system configurations.
■This robot controller can be used with the robots shown below. (Please consult us for combinations.)

Features

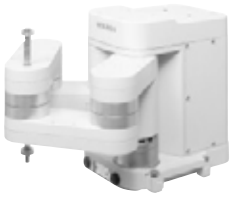
■Adoption of the 64-bit RISC processor allows high-speed and highly accurate locus control, enabling a variety of operations.
■With the additional axis control function (optional), traveling axes and turntables can be controlled. (Up to 8 axes)
■Using personal computer support software, operations such as program editing or monitoring are executable. (Optional)
■Only by installing a CC-Link card into the option slot, this controller can communicate with the master station via CC-Link.
■Use of the dedicated programming language (MELFA-BASIC IV) makes access to devices on the CC-Link network easy.

■Performance specifications

Item	CR1-571	CR2A-572	CR4-533
Control method	PTP control, CP control		
Number of control axes	4 to 6 axes (Simultaneous control of 2 additional axes)		
Main functions	Joint interpolation, linear interpolation, 3-dimensional circular interpolation, palletizing, conditional branching, subroutine, multitask, adaptive acceleration/deceleration control, deflection correction, Cartesian compliance control, etc.		
Number of occupied stations	1 station to 4 stations [set by the DIP switch] (intelligent device station)		

<Robot> ■These robots are compatible with the controllers specified above. (Contact us for combinations.)

*: Our standard conditions



Micro robot RP Series

■Small size, high speed and high accuracy are enabled.
- Max. load: 1kg to 5kg
- Arm length: 236mm to 453mm
- Cycle time: 0.28 sec *

Vertically articulated robot RV Series

■Processing is available from various angles.
- Max. load: 1kg to 20kg
- Arm length: 418mm to 1561mm
- Oil mist proof type, applicable to clean-room environment [special specifications]
- 5-axis model, 6-axis model

Horizontally articulated robot RH Series

■This series is suitable for high-speed and high-precision operation.
- Max. load: 5kg to 15kg
- Arm length: 350mm to 850mm
- Oil mist proof type, applicable to clean-room environment [special specifications]
- Cycle time: 0.46 sec *

Palletizing robot RV-T Series

■High-speed palletizing robot suitable for material handling
- Max. load: 100kg to 150kg
- Arm length: 2360mm to 2730mm
- Processing capacity: Max. 1600 cycles/hour *

LCD glass substrate transfer robot RH/RC-G Series

■High-speed large glass substrate transfer robot
- Various axis structures are available in cylindrical, scalar and double-arm types.
- This series is applicable to various substrate sizes and layouts.
- Deflection correction function allows high-speed and high-precision transfer.

Breaker

MDU Breaker

A breaker with a display function
Space-saving breaker with built-in VT (Voltage Transformer) and CT (Current Transformer)

Features

■A display function has been added to the previous low-voltage breaker.

Measurement and display of load current, line voltage, electric power, harmonic current, leakage current and power factor allows check of consuming energy, supporting energy saving activities.

■Since the VT and CT are built in the unit, installation space can be saved.
High cost-performance can be achieved for new and renewed applications.

■A wide range from rated 50A (225A frame) to 6300A (6300A frame) can be supported, which makes this breaker suitable for various applications.

■Models compatible with CC-Link, B/NET and pulse transmission are available, allowing flexible transmission of measured data.

■Performance specifications

Item	Specifications
Measured values	Load current (current value, demand value, and max. demand value) Line voltage (current value, demand value, and maximum demand value) Electric power (current value, demand value, and max. demand value) Electric energy (integration value, hourly electric energy, and max. value of hourly electric energy) Leakage current (current value, demand value, and max. demand value) Power factor (current value)
Number of occupied stations	1 station (remote device station)
Compatible version	Ver.1.10

Energy measurement modules

EMU2-HM1-C
EMU2-RD1-C **EMU2-RD3-C**
EMU2-RD5-C **EMU2-RD7-C**
EMU2-RD2-C-4W
EMU2-RD4-C-4W

Features

- Streamlined system configuration is available with different types of modules for 1, 3, 5 and 7 circuits provided. (3-phase 4-wire is for 2 and 4 circuits)
- Modules for both low-voltage only and high/low-voltage are available, allowing configuration of incoming circuit (high-voltage) and distribution circuit (low-voltage) in one module.
- The existing CT wiring can be used without rewiring the system with the support of a separate type 5A current sensor.

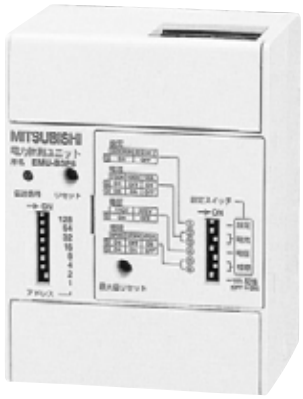
Performance specifications

Item	EMU2-HM1-C	EMU2-RD1-C	EMU2-RD3-C	EMU2-RD5-C	EMU2-RD7-C	EMU2-RD2-C-4W	EMU2-RD4-C-4W
Phase/wire type	Single phase 2-wire / single phase 3-wire / 3 phase 3-wire					Single phase 4-wire	
Applicable circuit	Low-voltage only	High/Low-voltage					
Number of circuits measured	1 circuit		3 circuits	5 circuits	7 circuits	2 circuits	4 circuits
Rated voltage	110/220V shared (for single phase 2-wire and 3 phase 3-wire) 100/200V (for single phase 3-wire)	110/220V (for single phase 2-wire and 3 phase 3-wire) 100/200V (for single phase 3-wire)				63.5/110V, 110/190V, 120/208V, 220/380V, 240/415V	
Rated current	50A, 100A, 250A, 400A, 600A (for a separate type current sensor) 5A (for a separate type 5A current sensor)						
Measured values	Electric energy, current, current demand, voltage, electric power, electric power demand, and power factor						
	Reactive power energy, reactive power, frequency, harmonic current, and harmonic voltage						
CC-Link communication	No. of stations occupied: One station (remote device station) Version: Ver.1.10						

Power measurement modules

EMU-C3P5
EMU-C33P5-5A

Easily installed to existing circuit!
Applicable to many kinds of applications



Features

- In combination with a separate type current sensor (50A, 100A, 250A), this module can be easily installed to the existing circuit.
- Measurement is available in many items (current, voltage, electric power, electric energy, leakage current, time of max. value detection), supporting a variety of system configurations.
- By installing a display unit (sold separately), measured data can be displayed on the module.
  The display unit can be set vertically or horizontally, since its "rotation mechanism" allows the unit rotation of 90 degrees in both right and left directions

■ Performance specifications

Item	EMU-C3P5	EMU-C3P5-5A
Phase/wire type	Single phase 2-wire / single phase 3-wire / 3-phase 3-wire (selected by the setting switch)	
Rated voltage	110/220V (selected by the setting switch)	
Rated current	250A / 100A / 50A (selectable)	5A (current on the primary side current sensor)
Measured values	Current (each phase, total, demand, and max. demand value) Voltage (each phase, total, and max. value) Electric power (current, demand, and max. demand value) Electric energy (integration value, hourly integration value, and max. value of hourly electric energy) Leakage current (current value, demand value, and max. demand value) Time of max. value detection	
Number of occupied stations	1 station (remote device station)	

Multi-circuit power measuring module [Eco Monitor II]

EMU-C7P4-6-A

Measurement of multiple circuits (6 in 3-phase 3-wire case) is available with one Eco Monitor II

Features

■Current, voltage, electric power and energy values of multiple low-voltage circuits can be measured at the same time. Also, because single module can store, display and transfer measured data, installation space and steps can be saved.

■Pulse inputs of up to 4 circuits allow production count for management based on energy consumption rate, or measurement of energy other than electric power, such as steam flow or gas flow.

■By collecting and handling data via networks (CC-Link, B/NET and/or LONWORKS), energy-saving system can be managed. When data are stored in this stand-alone module, they can be analyzed and used for energy saving control. Adding some cassette-type network communication modules enables various kinds of system expansions depending on your budget.

■Performance specifications

Item	Specifications
Measured values	Load current (current value, demand value, and max. demand value) Line voltage (current value, demand value, and max. demand value) Electric power (current value, demand value, and max. demand value) Electric energy (integration value, haurly electric energy, and max. value of hourly electric energy) Leakage current (current value, demand value, and max. demand value) Power factor (current value)
Number of occupied stations	1 station (remote device station)
Compatible version	Ver.1.10

Protective relays

MELPRO-D series

Advanced communication network compatible relay supports automatic power distribution.

Features

■Full access is available from the central control system.
(Integer constant, measured value, operating status, constant monitoring, time, etc.)

■A wide range of models is applicable to protection of various high-voltage or extra-high-voltage systems.
(Protection for power distributor, transformer, motor, power generator, system interconnection, etc.)

■Various measurement functions are available.
(Error memory, measurement of current, voltage, power, frequency, etc.)

■Other features include:

- Programmable contacts (Any values can be set as output contacts using or logic)
- Highly accurate protection of high-speed sampling using digital calculation
- Advanced constant monitoring function
- Drawer mechanism designed for ease of maintenance

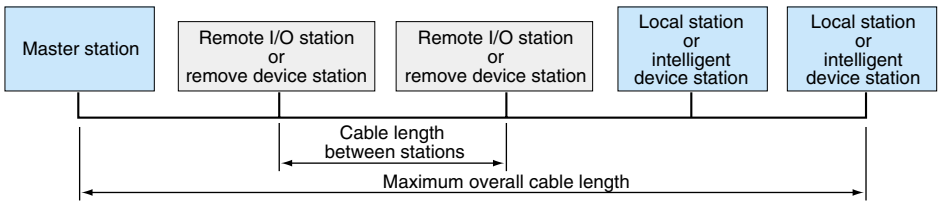
■Performance specifications

Item	C□□□-A□□D□
Control power	For both 100 to 220VDC and 100 to 220VAC
External dimensions	D1 unit: Approximately 150 (W) x 250 (H) x 200 (D) mm, approximately 3kg D2 unit: Approximately 300 (W) x 250 (H) x 200 (D) mm, approximately 5kg
Number of occupied stations	1 station (remote device station)

Memo

Technical Information

CC-Link (Version1.10) specifications

Item		Specifications
Control specifications	Maximum number of link points	Remote I/O (RX,RY) :2048 points each Remote register (RWw) :256 points Remote register (RWr) :256 points
	Number of link points per station	Remote I/O (RX,RY) :32 points each Remote register (RWw) :4 points Remote register (RWr) :4 points
Communication specifications	Transmission speed	10M/5M/2.5M/625k/156kbps
	Communication method	Broadcast polling method
	Synchronization method	Flag synchronous method
	Encoding method	NRZI method
	Transmission path	Bus type (conforms to EIA RS-485)
	Transmission format	Conforms to HDLC
	Error control system	CRC ($X^{16} + X^{12} + X^5 + 1$)
	Number of connectable modules	64 modules. However, the following conditions must be satisfied. (1 x a) + (2 x b) + (3 x c) + (4 x d) ≦ 64 a: Number of modules occupying 1 station, b: Number of modules occupying 2 stations, c: Number of modules occupying 3 stations, d: Number of modules occupying 4 stations (16 x A) + (54 x B) + (88 x C) ≦ 2304 A: Number of remote I/O stations ---------- Max. 64 modules B: Number of remote device stations ---------- Max. 42 modules C: Number local stations, standby master stations and intelligent device stations ---- Max. 26 modules
	Remote station number	1 to 64
	Maximum overall cable length and cable length between stations	 Ver.1.10 compatible CC-Link dedicated cable (terminating resistor of 110Ω used)

Transmission speed	Cable length between stations	Maximum overall cable length
156kbps	20cm or longer	1200m
625kbps		900m
2.5Mbps		400m
5Mbps		160m
10Mbps		100m

When Ver.1.10 modules and Ver.1.00 modules are mixed, the Maximum overall cable length and the station-to-station cable length conform to the Ver1.00 specifications.

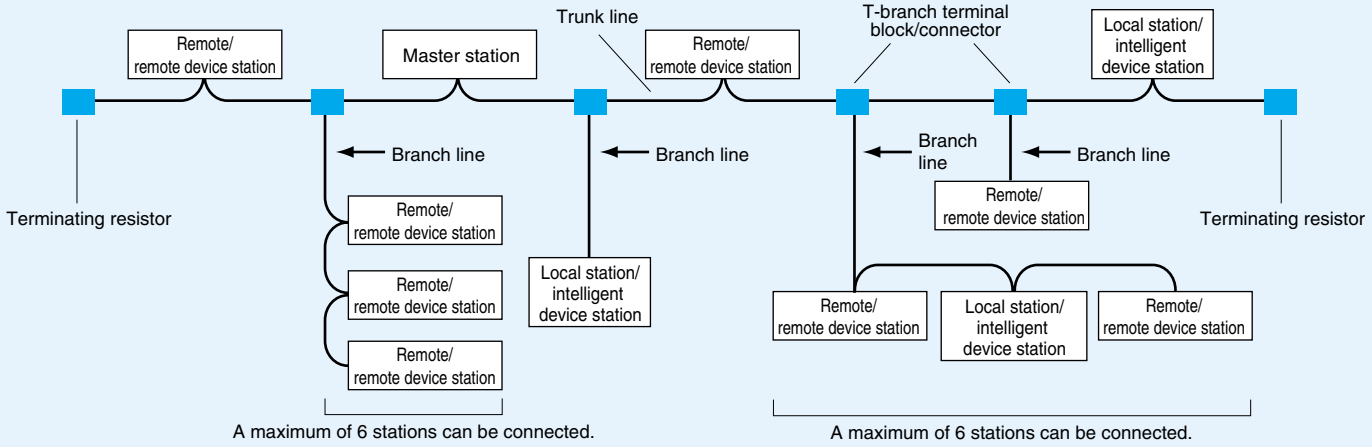
	Connection cable	CC-Link Ver.1.10 compatible cable ・Use the dedicated cable certified by CC-Link Partnership Association. ・Please note that operation will not be guaranteed if the other cable is used. ・Cables from different manufacturers can be used together if they support Ver.1.10. ・For the specifications of the CC-Link dedicated cable or the contact information on them, refer to the partner product catalogs published by CC-Link Partner Association or visit its web site at http://www.cc-link.org. ・The CC-Link dedicated cables, the high-performance CC-Link dedicated cables and Ver.1.10-compatible CC-Link dedicated cables cannot be used together.
Function		Automatic refresh function*1 RAS functions (Standby master function, Automatic return function, Slave station cut-off function, error detection by link special relays/registers, test/monitor) *1 May not be supported depending on CPUs to be used together. *2 This function is available only for the Q Series. Remote I/O network mode*1 Scan synchronous function Automatic CC-Link startup*2 Reserved station function Error invalid station setting function Support for duplex function*2
Remarks		If relay terminal blocks or relay connectors are used for the CC-Link cable installation, the communication error may occur depending on the system. Connect cables directly to each CC-Link module, or consider using the CC-Link repeater modules. For the recommended connection condition of CC-Link cable relay connector, refer to the table below.

Transmission speed		156kbps	625kbps	10Mbps, 5Mbps, and 2.5Mbps are not applicable.
Cable length between stations	Cable length between master/local station or intelligent device station and adjacent station	1m or more		For the system configuration of only remote I/O stations and remote device stations.
		2m or more		For the system configuration consisting of local stations and intelligent device stations.
	Cable length between remote I/O stations or remote device stations (shortest cable)	30cm or more		–
Maximum transmission distance		500m	100m	–
Relay connector spacing		No limitation		–

T-Branch communication specifications CC-Link

(When repeater modules (T-branch) are not used)

System configuration

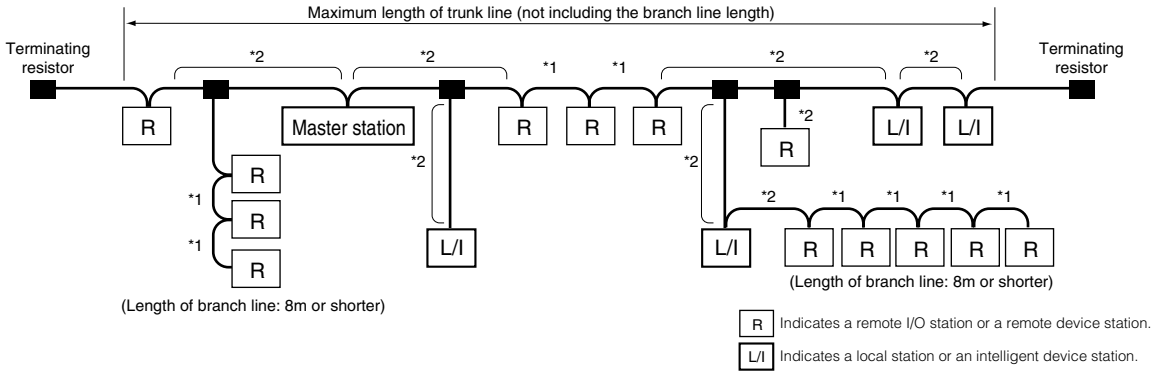


Item not listed below are conformed to the CC-Link specifications.
The table below lists the communication specifications for T-branch connections without repeater modules (T-branch).

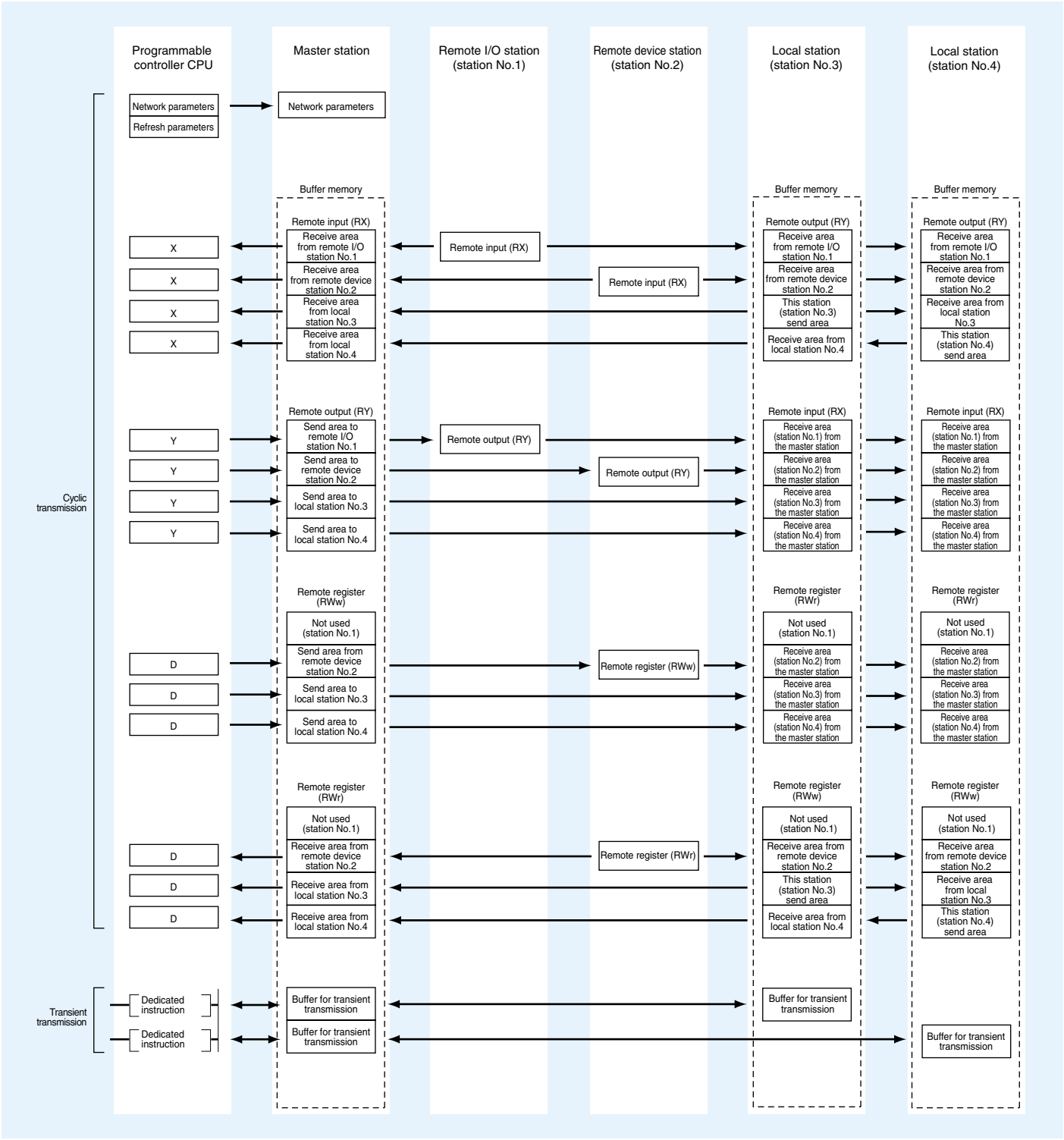
Item	Specifications			Remarks
Transmission speed	625kbps		156kbps	10 M/5 M/2.5 Mbps are not allowed.
Maximum trunk line length	100m		500m	Indicates the length of the cable between terminal resistors. The length of the T-branch cable is not included.
Maximum branch line length	50m	8m	200m	Indicates the overall cable length per branch.
Total branch line length				Indicates the overall length of the entire branch cable.
Maximum number of connectable stations per branch line	6 per branch			The total number of connected stations depends on the CC-Link specifications.
Connection cable	• CC-Link dedicated cable • Ver.1.10-compatible CC-Link dedicated cable			• The CC-Link dedicated high-performance cable cannot be used. (e.g., FANC-SBH). • Mixing of different brands of CC-Link dedicated cables is not allowed. • Mixing of different brands of Ver. 1.10 compatible CC-Link dedicated cables is allowed.
T-branch terminal block /connector	• Terminal block: Any commercially available terminal block • Connector: FA sensor connectors compliant with NECA4202 (IEC947-5-2) or equivalent are recommended. (NECA: Nippon Electric Control Equipment Industries Association standard)			• At 10M/5M/2.5Mbps, do not use any commercially available terminal block. (Use repeater modules for the branch connection.) • When wiring cables for the trunk line side, try not to remove the covering as much as possible.
Maximum trunk line length, T-branch interval, cable length between stations	CC-Link dedicated cable (uses 110Ω terminating resistor)			

Transmission speed	Maximum trunk line length	T branch interval	Length of cable between the remote I/O stations or remote device stations *1	Length of cable between the master/local station or intelligent device station and the adjacent station(s) *2
625kbps	100m	No limit	30cm or longer	1m or longer (A) / 2m or longer (B)
156kbps	500m			

(A): The cable length of 1m or longer is for a system configured only with remote I/O stations and remote device stations.
(B): The cable length of 2m or longer is for a system configuration that contains local stations and intelligent device stations.



CC-Link communication

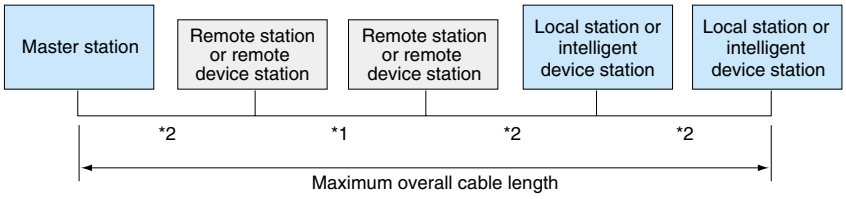


Cyclic transmission	Bit transmission	Data of 32 input points and 32 output points per station can be transmitted.
	Word transmission	Data of 4 points can be read or written per station.
Transient transmission	Dedicated instruction	Transient transmission is executable to local stations or intelligent device stations.

CC-Link specifications

■ The following 2 items of the CC-Link Ver.1.00 are different from those of Ver.1.10:
- Maximum overall cable length and cable length between stations
- Connection cable

CC-Link Version 1.00 specifications (Differences from Version 1.10)

<table>
<tr><th>Item</th><th>Specifications</th></tr>
<tr><td>Maximum overall cable length
and cable length between stations</td><td>


*1 Cable length between remote I/O stations or remote device stations
*2 Cable length between the master, local or intelligent device station and adjacent station

Ver.1.10 compatible CC-Link dedicated cable (terminating resistor of 110Ω used)
<table>
<tr><th rowspan="2">Transmission speed</th><th colspan="2">Cable length between stations</th><th rowspan="2">Maximum overall cable length</th></tr>
<tr><th>*1</th><th>*2</th></tr>
<tr><td>156kbps</td><td rowspan="3">30 cm or more</td><td rowspan="7">1m or more A)/
2m or more B)</td><td>1200m</td></tr>
<tr><td>625kbps</td><td>600m</td></tr>
<tr><td>2.5Mbps</td><td>200m</td></tr>
<tr><td rowspan="2">5Mbps</td><td>30cm to 59cm</td><td>110m</td></tr>
<tr><td>60 cm min.</td><td>150m</td></tr>
<tr><td rowspan="3">10Mbps</td><td>30cm to 59cm</td><td>50m</td></tr>
<tr><td>60cm to 99cm</td><td>80m</td></tr>
<tr><td>1m or more</td><td>100m</td></tr>
</table>
A) : 1m or more, in case of a system configuration with remote I/O and remote device stations only.
B) : 2m or more, in case of a system configuration that includes local station(s) and intelligent device station(s).
When a cable length within the above range is used between remote I/O stations or remote device stations, the corresponding Maximum overall cable length should be applied.
</td></tr>
<tr><td>Connection cable</td><td>CC-Link dedicated cable/CC-Link dedicated high performance cable
• The dedicated cable and dedicated high performance cable cannot be used together.
• Cables of different manufacturers cannot be used together.</td></tr>
</table>

Differences Between CC-Link Versions 2 and 1 CC-Link

With CC-Link Ver. 2, the cyclic data size can be increased through extended cyclic setting.

CC-Link Ver.1 specifications

Item		Specifications		
Maximum number of link points		Remote I/O (RX, RY): 2048 points each	Remote register (RWw): 256 points	Remote register (RWr): 256 points
Number of link points per station		Remote I/O (RX, RY): 32 points each	Remote register (RWw): 4 points	Remote register (RWr): 4 points
Number of link points for each number of occupied stations	Occupied 1 station	Remote I/O (RX, RY): 32 points each	Remote register (RWw): 4 points	Remote register (RWr): 4 points
	Occupied 2 station	Remote I/O (RX, RY): 64 points each	Remote register (RWw): 8 points	Remote register (RWr): 8 points
	Occupied 3 station	Remote I/O (RX, RY): 96 points each	Remote register (RWw): 12 points	Remote register (RWr): 12 points
	Occupied 4 station	Remote I/O (RX, RY): 128 points each	Remote register (RWw): 16 points	Remote register (RWr): 16 points
Number of connectable modules		1) Total number of stations (1 x a) + (2 x b) + (3 x c) + (4 x d) ≤ 64 a: Number of modules 1 occupied station, b: Number of modules 2 occupied stations, c: Number of modules 3 occupied stations, d: Number of modules 4 occupied stations 2) Number of connectable modules (16 x a) + (54 x b) + (88 x c) ≤ 2304 A: Number of remote I/O stations ----------Max. 64 modules B: Number of remote device stations ----------Max. 42 modules C: Number of local stations, standby master stations and intelligent device stations -------Max. 26 modules		

CC-Link Ver.2 specifications

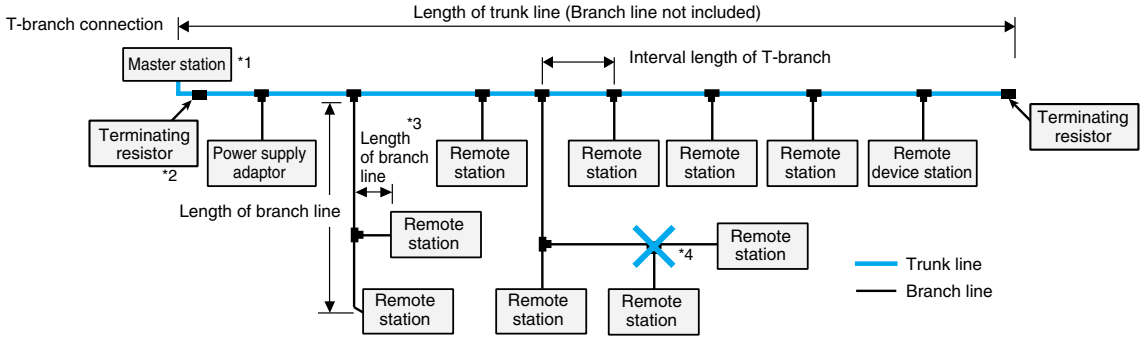
Item			Specifications			
Maximum number of link points			Remote I/O (RX, RY): 8192 points each, Remote register (RWw): 2048 points, Remote register (RWr): 2048 points			
Expanded cyclic setting			Single	Double	Quadruple	Octuple
Number of link points per station		Remote I/O (RX, RY)	32 points each	32 points each	64 points each	128 points each
		Remote register (RWw)	4 points	8 points	16 points	32 points
		Remote register (RWr)	4 points	8 points	16 points	32 points
Number of link points for each number of occupied stations	Occupied 1 station	Remote I/O (RX, RY)	32 points each	32 points each	64 points each	128 points each
		Remote register (RWw)	4 points	8 points	16 points	32 points
		Remote register (RWr)	4 points	8 points	16 points	32 points
	Occupied 2 station	Remote I/O (RX, RY)	64 points each	96 points each	192 points each	384 points each
		Remote register (RWw)	8 points	16 points	32 points	64 points
		Remote register (RWr)	8 points	16 points	32 points	64 points
	Occupied 3 station	Remote I/O (RX, RY)	96 points each	160 points each	320 points each	640 points each
		Remote register (RWw)	12 points	24 points	48 points	96 points
		Remote register (RWr)	12 points	24 points	48 points	96 points
	Occupied 4 station	Remote I/O (RX, RY)	128 points each	224 points each	448 points each	896 points each
		Remote register (RWw)	16 points	32 points	64 points	128 points
		Remote register (RWr)	16 points	32 points	64 points	128 points
Number of connectable modules			1) Total number of stations (a + a2 + a4 + a8) + (b + b2 + b4 + b8) x 2 + (c + c2 + c4 + c8) x 3 + (d + d2 + d4 + d8) x 4 ≤ 64 2) Number of input/output points of all remote stations (a x 32 + a2 x 32 + a4 x 64 + a8 x 128) + (b x 64 + b2 x 96 + b4 x 192 + b8 x 384) + (c x 96 + c2 x 160 + c4 x 320 + c8 x 640) + (d x 128 + d2 x 224 + d4 x 448 + d8 x 896) ≤ 8192 3) Number of all remote register points (a x 4 + a2 x 8 + a4 x 16 + a8 x 32) + (b x 8 + b2 x 16 + b4 x 32 + b8 x 64) + (c x 12 + c2 x 24 + c4 x 48 + c8 x 96) + (d x 16 + d2 x 32 + d4 x 64 + d8 x 128) ≤ 2048 a : The total number of ver.1 compatible slave stations that occupy 1 station, and ver.2 compatible slave stations that occupy 1 station which are set to "Single". b : The total number of ver.1 compatible slave stations that occupy 2 stations, and ver.2 compatible slave stations that occupy 2 stations which are set to "Single". c : The total number of ver.1 compatible slave stations that occupy 3 stations, and ver.2 compatible slave stations that occupy 3 stations which are set to "Single". d : The total number of ver.1 compatible slave stations that occupy 4 stations, and ver.2 compatible slave stations that occupy 4 stations which are set to "Single". a2: The number of ver.2 compatible stations that occupy 1 station which are set to "Double". b2: The number of ver.2 compatible stations that occupy 2 stations which are set to "Double". c2: The number of ver.2 compatible stations that occupy 3 stations which are set to "Double". d2: The number of ver.2 compatible stations that occupy 4 stations which are set to "Double". a4: The number of ver.2 compatible stations that occupy 1 station which are set to "Quadruple". b4: The number of ver.2 compatible stations that occupy 2 stations which are set to "Quadruple". c4: The number of ver.2 compatible stations that occupy 3 stations which are set to "Quadruple". d4: The number of ver.2 compatible stations that occupy 4 stations which are set to "Quadruple". a8: The number of ver.2 compatible stations that occupy 1 station which are set to "Octuple". b8: The number of ver.2 compatible stations that occupy 2 stations which are set to "Octuple". c8: The number of ver.2 compatible stations that occupy 3 stations which are set to "Octuple". d8: The number of ver.2 compatible stations that occupy 4 stations which are set to "Octuple". 4) Number of connectable modules 16 x A+54 x B+88 x C ≤ 2304 A: Number of remote I/O stations ----------Max. 64 modules B: Number of remote device stations ----------Max. 42 modules C: Number of local stations, standby master stations and intelligent device stations ---------Max. 26 modules			

* 2) and 3) are Ver. 2 mode only; calculation is necessary.
* There is no change in the cable and wiring specification for CC-Link Ver. 2. Use Ver. 1 cable for the connection of Ver. 2 devices.

CC-Link/LT specifications

Item				4-point mode	8-point mode	16-point mode
Control specifications	Maximum number of link points (When the same I/O address is used)			256 points (512 points)	512 points (1024 points)	1024 points (2048 points)
	Number of link points per station (When the same I/O address is used)			4 points (8 points)	8 points (16 points)	16 points (32 points)
	Link scan time	When 32 stations connected	Number of points	128 points	256 points	512 points
			2.5Mbps	0.7ms	0.8ms	1.0ms
			625kbps	2.2ms	2.7ms	3.8ms
			156kbps	8.0ms	10.0ms	14.1ms
		When 64 stations connected	Number of points	256 points	512 points	1024 points
			2.5Mbps	1.2ms	1.5ms	2.0ms
			625kbps	4.3ms	5.4ms	7.4 s
			156kbps	15.6ms	20.0ms	27.8ms
Communication specifications	Transmission speed			2.5Mbps/625kbps/156kbps		
	Communication protocol			BITR (Broadcastpolling + Interval Timed Response)		
	Transmission path			T-branch type		
	Error control system			CRC		
	Number of connectable modules			64		
	Remote station number			1 to 64		
	Maximum number of connectable stations per branch line			8		
	Distance between stations			No limit		
	T-branch interval			No limit		
	Master station position			End of trunk line		
	RAS function			Network diagnosis, Internal loopback diagnosis, Station detach function, Automatic return function		
	Connection cable			Dedicated flat cable (0.75mm^2 x 4), VCTF cable, high flexible cable		

CC-Link/LT network wiring specifications



Item	Specifications			Remarks
Transmission speed	2.5Mbps	625kbps	156kbps	–
Distance between stations	No limit			–
Maximum Number of stations on a trunk line	8 modules			–
Length of trunk line	35m	100m	500m	Cable length between 2 terminating resistors (Branch line length not included)
T-branch interval	No limit			–
Maximum length of branch line	4m	16m	60m	Cable length per branch line
Overall length of branch lines	15m	50m	200m	Total length of all trunk lines

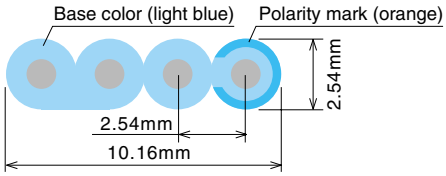
*1 Always install the master module at one end of the trunk line.
*2 Install a terminating resistor near the master module (within 20cm).
*3 The length of a line branched from a branch line is also included in the max. branch line length and overall branch line length.
*4 Cables cannot be connected between branch lines.

◎Precautions for using different types of cables together

1. ***Different types of cables cannot be used together on the trunk line.***
2. ***Dedicated flat cables, VCTF cables and flexible cables can be used together for branch lines.***
   * The wiring specifications do not change according to on the used cables and mixed use of cables.
3. ***Different types of cables cannot be used together on the same branch line.***
   * When the module with cable (e.g. CL1Y2-T1D2S) is used, it can be connected to a different type of cable by making sure the dedicated cables are within 20 cm.

CC-Link/LT cable specifications CC-Link/LT

CC-Link/LT dedicated flat cable specifications

Item	Specifications	Cross section
Cable type	Flat cable	
Operating temperature range	-10 to 80˚C	
Rated voltage	30V	
Number of cores	4	
Conductor resistance (20˚C)	23.4Ω/Km or less	
Safety	UL Subject758	
Flame resistance	UL VW-1 • -F-	

VCTF cable specifications (quoted from JIS C 3306 standard)

Type	Number of cores	Conductor			Insulator thickness	Sheath thickness	Conductor resistance (20˚C)
		Nominal cross-section area	Number of strands/ stand diameter	Outside diameter			
Vinyl cabtyre round cord	4	0.75mm²	30/0.18mm	1.1mm	0.6mm	1.0mm	25.1Ω/km

List of flexible cables certified by CC-Link partner Association

The following CC-Link Association certified dedicated flexible cables should be used.

Manufacturer name	Dedicated Flexible cable model
Mitsubishi Electric System & Service Co., Ltd.	CL9-MV4-075
DAIDEN CO., LTD.	CM/LT(2586) AWG19/4C
Yoshinogawa Electric Wire & Cable Inc.	CRFV-A075C04-LT
KURAMO ELECTRIC CO., LTD.	FANC-Z/LT

General specifications CC-Link CC-Link/LT

Item	Specifications					
	CC-Link			CC-Link/LT		
Operating ambient temperature	0 to 55˚C *3			0 to 55˚C *4		
Storage ambient temperature	-20 to 75˚C *3			-25 to 75˚C *4		
Operating ambient humidity	10 to 90%RH, non-condensing *5 (The waterproof type remote I/O modules conform to the IP67 standard. *6)			5 to 95% RH, no condensation allowed (conforming to JIS B 3502, IEC 61131-2, level RH-2)		
Storage ambient humidity	10 to 90%RH, non-condensing *6			5 to 95% RH, no condensation allowed (conforming to JIS B 3502, IEC 61131-2, level RH-2)		
Vibration resistance	Conforming to JIS B 3502, IEC 61131-2		Frequency	Acceleration	Amplitude	Number of sweeps
		Under intermittent vibration	5 to 8.4Hz	-	3.5mm	10 times each in X, Y and Z directions (for 80minutes)
			8.4 to 150Hz	9.8m/s²	-	
		Under continuous vibration	5 to 8.4Hz	-	1.75mm	
			8.4 to 150Hz	4.9m/s²	-	
Shock resistance	Conforming to JIS B 3502, IEC 61131-2 (147m/s², 3 times in each of directions X, Y and Z)					
Operating ambience	No corrosive gases					
Operating altitude	2000m (6562ft) or lower *7					
Installation location	Inside control panel					
Overvoltage category *1	II or lower					
Pollution degree *2	2 or lower					

*1: It indicates the device is to be connected to which power distribution part, within the area from the public electricity network to machinery on the premises.
Category II applies to devices to which power is supplied from fixed installations.
The surge voltage withstand for devices rated up to 300V is 2500V.

*2: This is an index showing the degree of the conductive pollution that can occur in the environment where the device is used.
In Pollution degree 2, only nonconductive pollution occurs.
Occasionally, however, temporary conductivity caused by condensation can be expected.

*3: The table below shows the operating ambient temperature and storage ambient temperature for the AJ65FBTA-RPH type waterproof remote I/O modules and Q Series master module.

Item		AJ65FBTA-RPH	Q Series Master module
Operating ambient temperature		0 to 45˚C	0 to 55˚C
Storage ambient temperature	Not wired (standalone product)	-25 to 75˚C	-25 to 75˚C

*4: The ambient operating/storage temperatures satisfy requirements in excess of the JIS B 3502, IEC61131-2 standards.

*5: Use the master module for the Q Series within an ambient operating humidity of 5 to 95%.

*6: This is applicable to conditions where waterproof connectors are used for all modules or waterproof caps are placed in unused through-pipes.

*7: Do not operate or store the programmable controller at altitude 0m or more in a pressurized environment. It may malfunction if it is operated.
Contact us when operating in a pressurized state.

Terminology list CC-Link CC-Link/LT

Additional mode
A mode used when a Ver.2 slave station is added to the system configured in the Ver.1 mode. Use of this mode can reduce steps for program modification.

AnSHCPU
A generic term for the A1SHCPU, A1SJHCPU and A2SHCPU.

AnUSCPU
A generic term for the A2USCPU (-S1) and A2USHCPU-S1.

Automatic return
This function allows a module disconnected from the data link (due to power-off, etc.) to automatically rejoin the data link when the module is recovered to normal status.

Bit data
1-bit data that is represented as either 0 (OFF) or 1 (ON)

Broadcast polling method
A method by which polling and data communication to each station is performed using the same communication packet, which in turn transmits data to all stations simultaneously.

Cyclic transmission
A communication method where data are refreshed across the CC-Link network periodically

Error invalid station setting
A setting that prevents a station specified with a network parameter from being treated as a data link error station. This setting allows the station to stay ON even in the case where it is to be turned OFF in the system configuration.

Extended cyclic setting
In the extended cyclic transmission, the extended cyclic points can be set as 2 times, 4 times or 8 times of the normal cyclic transmission points.

I/O mode
A mode in which the PLC CPU cannot receive transient transmission requests from intelligent device stations.

Intelligent device module
A module that can perform transient transmission (AJ65BT-R2N, local station module, etc.).

Intelligent device station
A station that can perform cyclic transmission and transient transmission on a 1:n basis with the master station (AJ65BT-R2N, local station, etc.).

Intelligent mode
A mode in which the PLC CPU can receive transient transmission requests from intelligent device stations.

Local module
A generic term for QJ61BT11(N), AJ61BT11, A1SJ61BT11, AJ61QBT11 and A1SJ61QBT11 modules when used as local stations.

Local station
A station that can perform n: n cyclic transmission and transient transmission with the master station and other local stations. It can also monitor RX, RY, RWr and RWw of remote stations.

Master/local module
A generic term for the QJ61BT11(N), AJ61BT11, A1SJ61BT11, AJ61QBT11 and A1SJ61QBT11 modules.

Master module
A generic term for QJ61BT11(N), AJ61BT11, A1SJ61BT11, AJ61QBT11 and A1SJ61QBT11 modules when used as master stations.

Master station
A station that controls one or more slave stations (remote I/O stations, remote device stations, intelligent device stations and/or local stations). The master station retains control information (parameters) and controls the entire network. One master station is required per network system.

Message
Data that is exchanged by transient transmission.

Number of modules
The number of physical devices connected to one CC-Link network.

Number of stations
The total number of occupied stations of all slave stations connected to the CC-Link network.

Number of occupied stations
The number of stations used by a single slave station. One to four stations can be set depending on the number of data. A remote I/O station can only be set to occupy one station.

QCPU (A mode)
A generic term for the Q02CPU-A, Q02HCPU-A and Q06HCPU-A.

QCPU
A generic term for the Q00JCPU, Q00CPU, Q01CPU, Q02CPU, Q02HCPU, Q06HCPU, Q12HCPU, Q25HCPU, Q12PH, Q25PHCPU, Q12PRHCPU, Q25PRHCPU, Q02UCPU, Q03UDCPU, Q04UDHCPU, Q06UDHCPU, Q13UDHCPU and Q26UDHCPU.

Off-line test
The hardware test (operation check of the module), line test (connection status check) and parameter check test (check of set parameters) can be performed.

QnACPU
A generic term for the Q2ASCPU, Q2ASCPU-S1, Q2ASHCPU, Q2ASHCPU-S1 and Q4ARCPU.

RAS function
R (Reliability) A (Availability) S (Serviceability).

Remote device station
A remote station that can handle bit data and word data (Input from/output to external devices, analog data exchange: AJ65BT-64AD, AJ65BT-64DAV and AJ65BT-64DAI, etc.)

Remote I/O network mode
A special mode used for high-speed data communication with remote I/O stations (Using this mode can reduce the link scan time when the system consists of a master station and remote I/O stations only.)

Remote I/O station
A remote station than can only handle bit data and occupy only one station. (Input from/output to external devices: AJ65BTB1-16D, AJ65SBTB1-16D, etc.)

Remote network mode
A mode in which the master station can communicate with all stations on the CC-Link network (remote I/O stations, remote device stations, local station, intelligent device stations and the standby master station).

Remote station
A generic term for remote I/O stations and remote device stations; controlled by the master station.

Reserved station
When a station is to be connected to the network in the future, setting the station as a reserved station prevents it from being treated as a data link error station. If a connected module is specified for this, it cannot perform the data link.

RWr
Remote register (read area): Word data transmitted to each station using cyclic transmission. For convenience, the area that stores this information is expressed as RWr. Input data is referred to as RWr at the master station.

RWw
Remote registers (write area): Word data transmitted to each station using cyclic transmission. For convenience, the area that stores this information is expressed as RWw. Output data is referred to as RWw at the master station.

RX
Remote input: Bit data transmitted to each station using cyclic transmission. For convenience, the area that stores this information is expressed as RX. Input data is referred to as RX at the master station.

RY
Remote output: Bit data transmitted to each station using cyclic transmission. For convenience, the area that stores this information is expressed as RY. Output data is referred to as RY at the master station.

SB
Link special relay: Special bit data that stores the data link status (either ON or OFF) of the master station, local station and intelligent device station. This area is expressed as SB for convenience.

Slave station
A generic term for stations other than the master station (remote I/O station, remote device station, intelligent device station, and local station).

Slave station separation
When a module on a network has failed to perform the data link due to some reason such as power-off, it is disconnected from the network and only normal modules continue the data link.

Station
A device that exists on the CC-Link network, where the station number assignment can be from 0 to 64.

Station number
This is used to distinguish between stations on the CC-Link network. Zero is assigned to the master station, and any of 1 to 64 can be assigned to a slave station. Unique station numbers without duplication must be used.

Standby master station
If the master station is forced to stop due to an error, this station inherits the master station control. The standby master station has functions equivalent to those of the master station, and operates as a local station when there are no errors in the master station.

SW
Link special register: Special word data that stores the data link status of the master station, local station and intelligent device station. This area is expressed as SW for convenience.

Transient transmission
This type of communication is performed between 1:1 stations when required in a specific time instance.

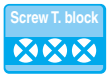
Ver. 1 mode
Mode of conventional CC-Link (Ver. 1.10)

Ver. 2 mode
In this mode, cyclic data can be increased with extended cyclic setting.

Word data
Data type consisting of 16 bits. One word data can express a value between “-32,768 and 32,767” in signed decimal, between “0 and 95,535” in unsigned decimal, and between “0 and FFFFh” in hexadecimal.

Icon Identification

Connection Types



CC-Link CC-Link/LT

This is the most popular type of cable connection, and screws are used for device connection.

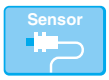
CC-Link

Modules equipped with self-up screws enable cable connection without removing terminal screws. (Modules adopting the "finger protect" design)

* Finger protect
  This allows installation of a module without contact with its live part.

CC-Link CC-Link/LT

Cable connection can be made by inserting a cable and clamping it with a spring. Because no screw tightening is required, cables can be connected or disconnected easily with excellent contact reliability and high resistance to vibration.
Note that a dedicated tool must be used not to damage the terminal block and its coating.



CC-Link CC-Link/LT

The industry standard “e-CON” system allows easy sensor replacement for each plug.
This connection type supports a wide range of cable diameters and realizes excellent contact reliability by using a press-fitting method.
Wiring steps can be drastically reduced since soldering, stripping and screwing are not needed.
Dedicated pliers are available although commercially available pliers can also be used.

CC-Link

By inserting individual cables into the plug and pressing the plug into the connector, cables can be connected.
Wiring steps can be drastically reduced since soldering, stripping and screwing are not needed.

CC-Link

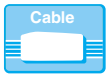
Use of 40-pin connector allows connections to various devices.
Cable connection made easily by inserting or removing connectors remarkably reduces wiring steps.

CC-Link

Adoption of the IP67-compliant waterproof structure allows installation in the environment where it may be exposed to water or moisture and also outside panels.

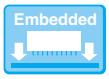
CC-Link

This type can be connected to devices meeting the MIL standard.
Connection to a relay terminal or terminal block converter module is easy, and modules can be replaced simply by using the connector.



CC-Link/LT

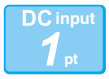
This type can be set in a conduit like general cables.
A communication cable and an external device connection cable is integrated, which enables easy wiring.
Two-point input, 2-point output and 1-point input/output modules are available, allowing connection to devices of small I/O points.



CC-Link

This type can be mounted to boards that have been designed and manufactured by customers, and can be embedded to devices.

Input



Upper part: Power supply specifications

CC-Link CC-Link/LT

DC input and AC input power supply types are available.

Lower part: Number of input points

CC-Link

The number of input points available for the module is indicated.
4-point, 8-point, 16-point, and 32-point modules are available.

CC-Link/LT

The number of input points available for communication of the module is indicated.
Modules that can handle data amount of 2-point, 4-point, 8-point and 16 points are available.

Upper part: Input voltage

CC-Link CC-Link/LT

The rated input voltage is indicated.
Please observe the specifications to prevent failure or damage of input terminals.

Lower part: Connection format

CC-Link CC-Link/LT

Modules supporting 1- to 4-wire types are available.
Select a connection type suitable for the specifications of the connected device.

CC-Link CC-Link/LT

The positive common input is DC input in which input terminals are positive. Connecting an input terminal to the negative pole turns ON the circuit. Connections to switches, relays, NPN transistor output of sensors, etc. are available. Widely used in Japan and the U.S.A.

CC-Link CC-Link/LT

The negative common input is DC input in which input terminals are negative. Connecting an input terminal to the positive pole turns ON the circuit. Connections to switches, relays, PNP transistor output of sensors, etc. are available. Widely used in Europe.

Output

Upper part: Type specifications

CC-Link CC-Link/LT

This indicates the output type of the output module outputting ON/OFF signals.
There are the following 3 types: Non-contact transistor output for DC, non-contact triac output for AC and relay output for AC/DC.

Lower part: Number of output points

CC-Link

Number of output points available for the module is indicated.
4-point, 8-point, 16-point, and 32-point modules are available.

CC-Link/LT

Number of output points available for communication of the module is indicated.
Modules that can handle data amount of 2-point, 4-point, 8-point and 16 points are available.

Upper part: Output load current

CC-Link CC-Link/LT

The maximum load current is indicated.
Current exceeding this will damage the elements of output modules.
The maximum current can be discharged through a common line.

Lower part: Wire type

CC-Link CC-Link/LT

Modules supporting 1- to 4-wire types are available.
Select a connection type suitable for the specifications of the connected device.

CC-Link CC-Link/LT

A transistor is used for this DC output type, and current flows from a load to an output terminal when the output turns ON.
Connect a load between an output terminal and the positive terminal of the power supply.
Widely used in Japan and the U.S.A.

CC-Link CC-Link/LT

A transistor is used for this DC output type, and current flows from an output terminal to a load when the output turns ON.
Connect a load between an output terminal and the negative terminal of the power supply.
Widely used in Europe.

Others

CC-Link CC-Link/LT

This type has a function by which the response speed of an input filter (input time constant) can be switched between “High –speed” and “Standard”. The “High-speed” setting increases the accuracy while more noise may be picked up.

CC-Link CC-Link/LT

Excessive current or voltage may damage a module by heat. This protective function stops the module to prevent its damage in such a case.

CC-Link

The overload (overcurrent) protection, overvoltage protection and overheat protection functions have been provided.

CC-Link/LT

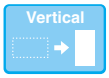
The overload (overcurrent) protection and overheat protection functions have been provided.

Overload (overcurrent) protection function:
This function prevents a current exceeding a prescribed level from flowing to output elements. Although output devices turn on or off properly even if an excessive current flows, if the condition is kept unchanged, the overheat protection function will be activated.
When the protection function is triggered, recover the external output devices as soon as possible.

Overheat protection function:
This function stops the operation when an output element is extraordinarily heated. This function is activated when an excessive current flows to an output element due to short circuit, or when surge occurs frequently.

CC-Link CC-Link/LT

In the event of a communication error, this function allows the module to hold the output data immediately before the error without clearing. Whether to hold or clear the data can be changed in the setting.



CC-Link CC-Link/LT

The module can be vertically installed. This enables module installation in small spaces.

CC-Link

The module has a high-speed input response time.

CC-Link

The module has minimal current leakage when the output signal is OFF.

CC-Link

The cyclic data amount can be increased up to 8 times in the setting compared with the old models. This setting can reduce unused points.

CC-Link CC-Link/LT

The module can supply 24VDC power of an external connection device from the I/O module power supply or the CC-Link/LT interface through the communication cable. Therefore, no external I/O power supply is required, and the installation space and cost can be reduced.

CC-Link

The disconnection (no connection) or short-circuit (ground) of an input wiring (sensor power supply) can be detected by each point.

Support

CC-Link - Open and Global !
CLPA is supporting the spread of CC-Link.

**Exhibiting in trade shows, conducting conformance tests, sending out the latest information...
Through these and other popularization activities, CLPA is extending the possibilities of CC-Link.**

The Japan-original open field network, CC-Link. CLPA (CC-Link Partner Association), in which Mitsubishi Electric also participates, was established with a view to spreading CC-Link to the world. Through vigorous activities such as planning and running trade shows and seminars, conducting conformance tests, and providing information by catalogs, pamphlets, and the Internet, the number of CLPA partner manufacturers and CC-Link compatible products is increasing steadily, and the CLPA is becoming a driving force for the globalization of CC-Link.

CC-Link Partner Association

This web site provides the latest CC-Link information.

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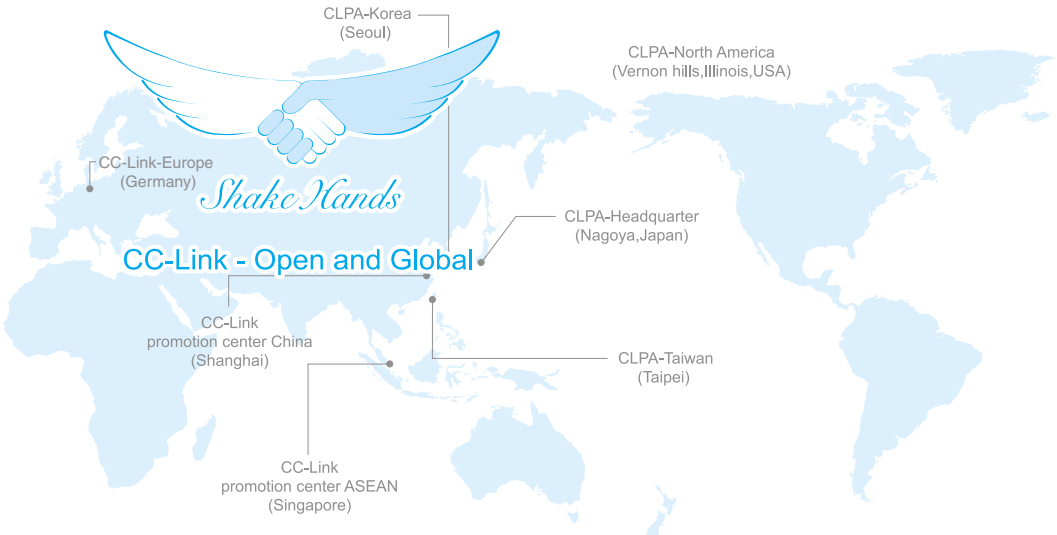
Nagoya 462-0825, Japan
TEL : +81-52-919-1588 / FAX :+81-52-916-8655
URL: http://www.cc-link.org E-mail: info@cc-link.org

■Conformance tests support the rapid increase of compatible products.

■Exhibitions and seminars are held to recruit new partner members.

**CC-Link - Open and Global!
CC-Link is accelerating toward a global network.**

CLPA has established CLPA offices all over the world in order to spread CC-Link to Japanese and overseas manufacturers. Through positive activities such as exhibiting in trade shows in the major cities and setting up conformance test organizations, CLPA sends out information designed to expand the potential of CC-Link and increasing the number of CLPA partners.



Responding to the amenable running of FA systems through an enhanced support system.

Global FA Centers

"Mitsubishi Global FA Centers" are located throughout North America, Europe, and Asia to develop products complying with international standards and to provide attentive services.

North American FA Center
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Area covered: India

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Tel: +66-2906-3238 / Fax: +66-2906-3239
Area covered: Thailand

CC-Link Related Product Model Names

Mitsubishi Electric Corporation

Module type		Model name	Specifications	Protection level
Master/local module		QJ61BT11N	Master/local module for Q Series CC-Link Ver.2-compatible	-
		L26CPU-BT	CPU with master/local function for L series CC-Link Ver.2-compatible Sink Output type	-
		L26CPU-PBT	CPU with master/local function for L series CC-Link Ver.2-compatible Source Output type	-
		LJ61BT11	Master/local module for L series CC-Link Ver.2-compatible	-
		FX2N-16CCL-M	Master block for FX Series (FX1N/FX2N/FX3U/FX1NC/FX2NC/FX3UC/FX3G)	-
		A1SJ61QBT11	Master/local module for QnAS/QnASHCPU	-
		A1SJ61BT11	Master/local module for AnS/AnSH/AnUS/AnUSHCPU	-
Remote I/O module	Screw terminal block type	AJ65SBTB2N-8A	Input 8 points: 100 to 120VAC 2-wire type Response time 20ms Terminal block type	IP1X
		AJ65SBTB2N-16A	Input 16 points: 100 to 120VAC 2-wire type Response time 20ms Terminal block type	IP1X
		AJ65SBTB1-8D	Input 8 points: 24VDC (positive/negative common shared) 1-wire type Terminal block type Response time 1.5ms	IP2X
		AJ65SBTB3-8D	Input 8 points: 24VDC (positive/negative common shared) 3-wire type Terminal block type Response time 1.5ms	IP2X
		AJ65SBTB1-16D	Input 16 points: 24VDC (positive/negative common shared) 1-wire type Terminal block type Response time 1.5ms	IP2X
		AJ65SBTB1-16D1	Input 16 points: 24VDC (positive/negative common shared) 1-wire type High-speed response Terminal block type Response time 0.2ms	IP2X
		AJ65SBTB3-16D	Input 16 points: 24VDC (positive/negative common shared) 3-wire type Terminal block type Response time 1.5ms	IP2X
		AJ65SBTB3-16D5	Input 16 points: 5VDC (positive/negative common shared) 3-wire type Terminal block type Response time 1.5ms	IP2X
		AJ65SBTB3-16KD	Input 16 points: 24VDC (positive/negative common shared) 3-wire type Terminal block type Response time 0.2/1.5/5/10ms switching type	IP2X
		AJ65SBTB1-32D	Input 32 points: 24VDC (positive/negative common shared) 1-wire type Terminal block type Response time 1.5ms	IP2X
		AJ65SBTB1-32D1	Input 32 points: 24VDC (positive/negative common shared) 1-wire type High-speed response Terminal block type Response time 0.2ms	IP2X
		AJ65SBTB1-32D5	Input 32 points: 5VDC (positive/negative common shared) 1-wire type Terminal block type Response time 1.5ms	IP2X
		AJ65SBTB1-32KD	Input 32 points: 24VDC (positive/negative common shared) 1-wire type Terminal block type Response time 0.2/1.5/5/10ms switching type	IP2X
		AJ65SBTB1-8T	Output 8 points: 12/24VDC (0.5A) Transistor output (sink type) 1-wire type Terminal block type	IP2X
		AJ65SBTB1-8T1	Output 8 points: 12/24VDC (0.5A) Transistor output (sink type) 1-wire type Terminal block type (low-leakage current type)	IP2X
		AJ65SBTB2-8T	Output 8 points: 12/24VDC (0.5A) Transistor output (sink type) 2-wire type Terminal block type	IP2X
		AJ65SBTB2-8T1	Output 8 points: 12/24VDC (0.5A) Transistor output (sink type) 2-wire type Terminal block type (low-leakage current type)	IP2X
		AJ65SBTB1-16T	Output 16 points: 12/24VDC (0.5A) Transistor output (sink type) 1-wire type Terminal block type	IP2X
		AJ65SBTB1-16T1	Output 16 points: 12/24VDC (0.5A) Transistor output (sink type) 1-wire type Terminal block type (low-leakage current type)	IP2X
		AJ65SBTB2-16T	Output 16 points: 12/24VDC (0.5A) Transistor output (sink type) 2-wire type Terminal block type	IP2X
		AJ65SBTB2-16T1	Output 16 points: 12/24VDC (0.5A) Transistor output (sink type) 2-wire type Terminal block type (low-leakage current type)	IP2X
		AJ65SBTB1-32T	Output 32 points: 12/24VDC (0.5A) Transistor output (sink type) 1-wire type Terminal block type	IP2X
		AJ65SBTB1-32T1	Output 32 points: 12/24VDC (0.5A) Transistor output (sink type) 1-wire type Terminal block type (low-leakage current type)	IP2X
		AJ65SBTB1-8TE	Output 8 points: 12/24VDC (0.1A) Transistor output (source type) 1-wire type Terminal block type	IP2X
		AJ65SBTB1-16TE	Output 16 points: 12/24VDC (0.1A) Transistor output (source type) 1-wire type Terminal block type	IP2X
		AJ65SBTB1B-16TE1	Output 16 points: 12/24VDC (0.5A) Transistor output (source type) 1-wire type Terminal block type	IP2X
		AJ65SBTB1-32TE1	Output 32 points: 12/24VDC (0.5A) Transistor output (source type) 1-wire type Terminal block type	IP2X
		AJ65SBTB2N-8R	Output 8 points: 24VDC/240VAC (2A) Relay output 2-wire type Terminal block type	IP1X
		AJ65SBTB2N-16R	Output 16 points: 24VDC/240VAC (2A) Relay output 2-wire type Terminal block type	IP1X
		AJ65SBTB2N-8S	Output 8 points: 100 to 240VAC (0.6A) Triac output 2-wire type Terminal block type	IP1X
		AJ65SBTB2N-16S	Output 16 points: 100 to 240VAC (0.6A) Triac output 2-wire type Terminal block type	IP1X
		AJ65SBTB32-8DT	Input 4 points: 24VDC (positive common) 3-wire type Response time 1.5ms Output 4 points: 24VDC (0.5A) Transistor output (sink type) 2-wire type Terminal block type	IP2X
		AJ65SBTB32-8DT2	Input 4 points: 24VDC (positive common) 3-wire type Response time 1.5ms Output 4 points: 24VDC (0.5A) Transistor output (sink type) 2-wire type Terminal block type (low-leakage current type)	IP2X
		AJ65SBTB1-16DT	Input 8 points: 24VDC (positive common)1-wire type Response time 1.5ms Output 8 points: 24VDC (0.5A) Transistor output (sink type) 1-wire type Terminal block type	IP2X
		AJ65SBTB1-16DT1	Input 8 points: 24VDC (positive common)1-wire type High-speed response Response time 0.2ms Output 8 points: 24VDC (0.5A) Transistor output (sink type) 1-wire type Terminal block type	IP2X
		AJ65SBTB1-16DT2	input 8 points: 24VDC (positive common) 1-wire type Response time 1.5ms Output 8 points: 24VDC (0.5A) Transistor output (sink type) 1-wire type Terminal block type (low-leakage current type)	IP2X
		AJ65SBTB1-16DT3	Input 8 points: 24VDC (positive common) 1-wire type High-speed response Response time 0.2ms Output 8 points: 24VDC (0.5A) Transistor output (sink type) 1-wire type Terminal block type (low-leakage current type)	IP2X
		AJ65SBTB32-16DT	Input 8 points: 24VDC (positive common) 3-wire type Response time 1.5ms Output 8 points: 24VDC (0.5A) Transistor output(sink type) 2-wire type Terminal block type	IP2X
		AJ65SBTB32-16DT2	Input 8 points: 24VDC (positive common) 3-wire type Response time 1.5ms Output 8 points: 24VDC (0.5A) Transistor output (sink type) 2-wire type Terminal block type (low-leakage current type)	IP2X
		AJ65SBTB32-16KDT2	Input 8 points: 24VDC (positive common) 3-wire type Response time 0.2/1.5/5/10ms switching type Output 8 points: 24VDC (0.5A) Transistor output (sink type) 2-wire type Terminal block type (low-leakage current type)	IP2X
		AJ65SBTB32-16KDT8	Input 8 points: 24VDC (positive common) 3-wire type Response time 0.2/1.5/5/10ms switching type Output 8 points: 12VDC (0.5A) Transistor output (sink type) 2-wire type Terminal block type (low-leakage current type)	IP2X
		AJ65SBTB32-16KDR	Input 8 points: 24VDC (positive/negative common shared) 3-wire type Response time 0.2/1.5/5/10ms switching type Output 8 points: 24VDC/240VAC (2A) Relay output 2-wire type Terminal block type	IP1X
		AJ65SBTB1-32DT	Input 16 points: 24VDC (positive common) 1-wire type Response time 1.5ms Output16 points: 24VDC (0.5A) Transistor output (sink type) 1-wire type Terminal block type	IP2X
		AJ65SBTB1-32DT1	Input 16 points: 24VDC (positive common) 1-wire type High-speed response Response time 0.2ms Output16 points: 24VDC (0.5A) Transistor output (sink type) 1-wire type Terminal block type	IP2X
		AJ65SBTB1-32DT2	Input 16 points: 24VDC (positive common) 1-wire type Response time 1.5ms Output16 points: 24VDC (0.5A) Transistor output (sink type) 1-wire type Terminal block type (low-leakage current type)	IP2X
		AJ65SBTB1-32DT3	Input 16 points: 24VDC (positive common) 1-wire type High-speed response Response time 0.2ms Output16 points: 24VDC (0.5A) Transistor output (sink type) 1-wire type Terminal block type (low-leakage current type)	IP2X
		AJ65SBTB1-32DTE1	Input 16 points: 24VDC (negative common) 1-wire type High-speed response Response time 1.5ms Output16 points: 24VDC (0.5A) Transistor output (source type) 1-wire type Terminal block type	IP2X
		AJ65SBTB32-16DR	Input 8 points: 24VDC (positive/negative common shared) 3-wire type Response time 1.5ms Output 8 points: 24VDC/240VAC (2A) Relay output 2-wire type Terminal block type	IP1X
		AJ65SBTB1-32KDT2	Input 16 points: 24VDC (positive common) 1-wire type Response time 0.2/1.5/5/10ms switching type Output16 points: 24VDC (0.5A) Transistor output (sink type) 1-wire type Terminal block type (low-leakage current type)	IP2X
		AJ65SBTB1-32KDT8	Input 16 points: 12VDC (positive common) 1-wire type Response time 0.2/1.5/5/10ms switching type Output16 points: 12VDC (0.5A) Transistor output (sink type) 1-wire type Terminal block type (low-leakage current type)	IP2X

Module type		Model name	Specifications	Protection level
Remote I/O module	Screw/2-piece terminal block type	AJ65BTB1-16D	Input 16 points: 24VDC (positive/negative common shared) 1-wire type Terminal block type Response time 10ms	IP2X
		AJ65BTB2-16D	Input 16 points: 24VDC (positive/negative common shared) 2-wire type Terminal block type Response time 10ms	IP2X
		AJ65BTB1-16T	Output 16 points: 12/24VDC (0.5A) Transistor output (sink type) 1-wire type Terminal block type	IP2X
		AJ65BTB2-16T	Output 16 points: 12/24VDC (0.5A) Transistor output (sink type) 2-wire type Terminal block type	IP2X
		AJ65BTB2-16R	Output 16 points: 24VDC/240VAC (2A) Relay output 2-wire type Terminal block type	IP1X
		AJ65BTB1-16DT	Input 8 points: 24VDC (positive common) Response time 10ms Output 8 points: 12/24VDC (0.5A) Transistor output (sink type) 1-wire type Terminal block type	IP2X
		AJ65BTB2-16DT	Input 8 points: 24VDC (positive common) Response time 10ms Output 8 points: 12/24VDC (0.5A)Transistor output (sink type) 2-wire type Terminal block type	IP2X
		AJ65BTB2-16DR	Input 8 points: 24VDC (positive/negative common shared) Response time 10ms Output 8 points: 24VDC/240VAC (2A) Relay output 2-wire type Terminal block type	IP1X
	Screw/2-piece terminal block Dustproof type	AJ65DBTB1-32D	Input 32 points: 24VDC (positive/negative common shared) 1-wire type Terminal block type Response time 10ms	IP2X
		AJ65DBTB1-32T1	Output 32 points: 12/24VDC (0.5A) Transistor output (sink type) 1-wire type Terminal block type (low-leakage current type)	IP2X
		AJ65DBTB1-32R	Output 32 points: 24VDC/240VAC (2A) Relay output 1-wire type Terminal block type	IP1X
		AJ65DBTB1-32DT1	Input 16 points: 24VDC (positive common) Response time 10ms Output 16 points: 12/24VDC (0.5A) Transistor output (sink type) 1-wire type Terminal block type	IP2X
		AJ65DBTB1-32DR	Input 16 points: 24VDC (positive/negative common shared) Response time 10ms Output 16 points: 24VDC/240VAC (2A) Relay output 1-wire type Terminal block type	IP1X
	Spring clamp terminal block push-in type	AJ65ABTP3-16D NEW	Input 16 points: 24VDC/6mA (positive common) 3-wire type Response time 1.5ms	IP1XB
		AJ65ABTP3-16DE NEW	Input 16 points: 24VDC/6mA (negative common) 3-wire type Response time 1.5ms	IP1XB
	Spring clamp terminal block type	AJ65VBTS3-16D	Input 16 points: 24VDC/5mA (negative common) 3-wire type Response time 1.5ms	IP1XB
		AJ65VBTS3-32D	Input 32 points: 24VDC/5mA (negative common) 3-wire type Response time 1.5ms	IP1XB
		AJ65VBTS2-16T	Output 16 points: 12/24VDC (0.5A) Transistor output (sink type) 2-wire type	IP1XB
		AJ65VBTS2-32T	Output 32 points: 12/24VDC (0.5A) Transistor output (sink type) 2-wire type	IP1XB
		AJ65VBTS32-16DT	Input 8 points: 24VDC/5mA (positive common) 3-wire type Response time 1.5ms Output 8 points: 24VDC (0.5A) Transistor output (sink type) 2-wire type	IP1XB
		AJ65VBTS32-32DT	Input 16 points: 24VDC/5mA (positive common) 32-wire type Response time 1.5ms Output 16 points: 12/24VDC (0.5A) Transistor output (sink type) 2-wire type	IP1XB
	Sensor connector type	AJ65VBTCE3-8D	Input 8 points: 24VDC/5mA (positive common) 3-wire type Response time 1.5ms	IP1XB
		AJ65VBTCE3-16D	Input 16 points: 24VDC/5mA (positive common) 3-wire type Response time 1.5ms	IP1XB
		AJ65VBTCE3-32D	Input 32 points: 24VDC/5mA (positive common) 3-wire type Response time 1.5ms	IP1XB
		AJ65VBTCE3-16DE	Input 16 points: 24VDC/5mA (negative common) 3-wire type Response time 1.5ms	IP1XB
		AJ65VBTCE3-32DE	Input 32 points: 24VDC/5mA (negative common) 3-wire type Response time 1.5ms	IP1XB
		AJ65VBTCE2-8T	Output 8 points: 12/24VDC (0.1A) Transistor output (sink type) 2-wire type	IP1XB
		AJ65VBTCE2-16T	Output 16 points: 12/24VDC (0.1A) Transistor output (sink type) 2-wire type	IP1XB
		AJ65VBTCE3-16TE NEW	Output 16 points: 12/24VDC (0.1A) Transistor output (Source type) 3-wire type	IP1XB
		AJ65VBTCE32-16DT	Input 8 points: 24VDC/5mA (positive common) 3-wire type Response time 1.5ms Output 8 points: 24VDC (0.1A) Transistor output (sink type) 2-wire type	IP1XB
		AJ65VBTCE3-16DTE NEW	Input 8 points: 24VDC/5mA (negative common) 3-wire type Response time 1.5ms Output 8 points: 24VDC (0.1A) Transistor output (Source type) 3-wire type	IP1XB
		AJ65VBTCE32-32DT	Input 16 points: 24VDC/5mA (positive common) 3-wire type Response time 1.5ms Output 16 points: 24VDC (0.1A) Transistor output (sink type) 2-wire type	IP1XB
		AJ65VBTCE3-32DTE NEW	Input 16 points: 24VDC/5mA (negative common) 3-wire type Response time 1.5ms Output 16 points: 24VDC (0.1A) Transistor output (Source type) 3-wire type	IP1XB
	One-touch connector type	AJ65VBTCU3-8D1	Input 8 points: 24VDC (positive common) 3-wire type Response time 0.2ms One-touch connector type	IP1XB
		AJ65VBTCU3-16D1	Input 16 points: 24VDC (positive common) 3-wire type Response time 0.2ms One-touch connector type	IP1XB
		AJ65SBTC4-16DN	Input 16 points: 24VDC (positive common) 4-wire type Response time 1.5ms One-touch connector type	IP2X
		AJ65SBTC4-16DE	Input 16 points: 24VDC (negative common) 4-wire type Response time 1.5ms One-touch connector type	IP2X
		AJ65SBTC1-32D	Input 32 points: 24VDC (positive/negative common shared) 1-wire type One-touch connector type (plug: sold separately) Response time 1.5ms	IP2X
		AJ65SBTC1-32D1	Input 32 points: 24VDC (positive/negative common shared) 1-wire type High-speed response One-touch connector type (plug: sold separately) Response time 0.2ms	IP2X
		AJ65VBTCU2-8T	Output 8 points: 12/24VDC (0.1A) Transistor output (sink type) 2-wire type One-touch connector type	IP1XB
		AJ65VBTCU2-16T	Output 16 points: 12/24VDC (0.1A) Transistor output (sink type) 2-wire type One-touch connector type	IP1XB
		AJ65SBTC1-32T	Output 32 points: 12/24VDC (0.1A) Transistor output (sink type) 1-wire type One-touch connector type (plug: sold separately)	IP2X
		AJ65SBTC1-32T1	Output 32 points: 12/24VDC (0.1A) Transistor output (sink type) 1-wire type One-touch connector type (low-leakage current type)	IP2X
		AJ65SBTC4-16DT	Input 8 points: 24VDC (positive common) 4-wire type (for 8 sensors) Response time 1.5ms Output 8 points: 24VDC (0.5A) Transistor output (sink type) 4-wire type One-touch connector type (plug: sold separately)	IP2X
		AJ65SBTC4-16DT2	Input 8 points: 24VDC (positive common) 4-wire type Response time 1.5ms Output 8 points: 24VDC (0.5A) Transistor output (sink type) 4-wire type One-touch connector type (plug: sold separately) (low-leakage current type)	IP2X
		AJ65SBTC1-32DT	Input 16 points: 24VDC (positive common) 1-wire type Response time 1.5ms Output 16 points: 24VDC (0.1A) Transistor output (sink type) 1-wire type One-touch connector type (plug: sold separately)	IP2X
		AJ65SBTC1-32DT1	Input 16 points: 24VDC (positive common) 1-wire type High-speed response Response time 0.2ms Output 16 points: 24VDC (0.1A) Transistor output (sink type) 1-wire type One-touch connector type (plug: sold separately)	IP2X
		AJ65SBTC1-32DT2	Input 16 points: 24VDC (positive common) 1-wire type Response time 1.5ms Output 16 points: 24VDC (0.1A) Transistor output (sink type) 1-wire type One-touch connector type (plug: sold separately) (low-leakage current type)	IP2X
		AJ65SBTC1-32DT3	Input 16 points: 24VDC (positive common) 1-wire type High-speed response Response time 0.2ms Output 16 points: 24VDC (0.1A) Transistor output (sink type) 1-wire type One-touch connector type (plug: sold separately) (low-leakage current type)	IP2X
	40-pin connector type (FCN connector type)	AJ65SBTCF1-32D	Input 32 points: 24VDC (positive/negative common shared) 1-wire type Response time 1.5ms FCN connector type (40-pin connector)	IP2X
		AJ65BTC1-32D	Input 32 points: 24VDC (positive/negative common shared) 1-wire type Response time 10ms FCN connector type (40-pin connector)	IP2X
		AJ65SBTCF1-32T	Output 32 points: 12/24VDC (0.1A) Transistor output (sink type) 1-wire type FCN connector type (40-pin connector)	IP2X
		AJ65BTC1-32T	Output 32 points: 12/24VDC (0.1A) Transistor output (sink type) 1-wire type FCN connector type (40-pin connector)	IP2X
		AJ65SBTCF1-32DT	Input 16 points: 24VDC (positive/negative common shared) 1-wire type Response time 1.5ms Output 16 points: 12/24VDC (0.1A) Transistor output (sink type) 1-wire type FCN connector type (40-pin connector)	IP2X
		AJ65VBTCF1-32DT1	Input 16 points: 24VDC (positive/negative common shared) 1-wire type Response time 0.2ms Output 16 points: 12/24VDC (0.1A) Transistor output (sink type) 1-wire type FCN connector type	IP1XB
		AJ65VBTCFJ1-32DT1	Input 16 points: 24VDC (positive common) 1-wire type Response time 0.2ms Shared power supply for module and I/O parts Output 16 points: 24VDC (0.1A) Transistor output (sink type) 1-wire type FCN connector type	IP1XB

* Positive common: sink type, negative common: source type

Module type			Model name	Specifications	Protection level
Remote I/O module	Waterproof connector type		AJ65FBTA4-16D	Input 24VDC (positive common) 4-wire type Thin, waterproof type Response time 1.5ms	IP67
			AJ65FBTA4-16DE	Input 24VDC (negative common) 4-wire type Thin, waterproof type Response time 1.5ms	IP67
			AJ65FBTA2-16T	Output 16 points: 12/24VDC (0.5A) Transistor output (sink type) 2-wire type Thin, waterproof type	IP67
			AJ65FBTA2-16TE	Output 16 points: 12/24VDC (1.0A) Transistor output (source type) 2-wire type Thin, waterproof type	IP67
			AJ65FBTA42-16DT	Input 8 points: 24VDC (positive common) 4-wire type Response time 1.5ms Output 8 points: 24VDC (0.5A)Transistor output sink type 2-wire type Thin, waterproof type	IP67
			AJ65FBTA42-16DTE	Input 8 points: 24VDC (negative common) 4-wire type Response time 1.5ms Output 8 points: 24VDC (1.0A) Transistor output (source type) 2-wire type Thin, waterproof type	IP67
Safety relay module	Spring clamp terminal block type		QS90SR2SP-CC	For CC-Link Safety input: 1 point (2 inputs) P type (positive common/positive common input) Safety output: 1 point (3 outputs)	IP1X
			QS90SR2SN-CC	For CC-Link Safety input: 1 point (2 inputs) N type (positive common/negative common input) Safety output: 1 point (3 outputs)	IP1X
Safety Controller	Spring clamp terminal block type		WS0-GCC100202	CC-Link interface module for WS series	IP2X
Analog module	Screw terminal block type	Voltage/current input	AJ65SBT-64AD	4-channel voltage/current input A/D conversion module (analog input module)	IP2X
			AJ65SBT2B-64AD	4-channel voltage/current input A/D conversion module (analog input module) High accuracy, high resolution, high speed, 2-piece terminal block type	IP2X
			AJ65BT-64AD	4-channel voltage/current input A/D conversion module (analog input module) Screw/2-piece terminal block type	IP2X
		Temperature input	AJ65BT-64RD3	4-channel Pt100 (3-wire type) input Platinum RTD Pt100 temperature input	IP2X
			AJ65BT-64RD4	4-channel Pt100 (4-wire type) input Platinum RTD Pt100 temperature input	IP2X
			AJ65SBT2B-64TD	4-channel thermocouple input Thermocouple temperature input module	IP2X
			AJ65BT-68TD	8-channel thermocouple input Thermocouple temperature input module	IP2X
			AJ65SBT2B-64RD3	4-channel RTD input module	IP2X
		Voltage/current output	AJ65SBT-62DA	2-channel voltage/current output D/A conversion module (analog output module)	IP2X
			AJ65SBT2B-64DA	4-channel voltage/current output D/A conversion module (analog output module)	IP2X
		Voltage output	AJ65BT-64DAV	4-channel voltage output D/A conversion module (analog output module)	IP2X
		Current output	AJ65BT-64DAI	4-channel current output D/A conversion module (analog output module)	IP2X
	One-touch connector type	Voltage input	AJ65VBTCU-68ADVN	8-channel voltage input A/D conversion module (analog input module) CC-Link Ver.2-compatible	IP1XB
		Current input	AJ65VBTCU-68ADIN	8-channel current input A/D conversion module (analog input module) CC-Link Ver.2-compatible	IP1XB
		Voltage output	AJ65VBTCU-68DAVN	8-channel voltage output D/A conversion module (analog output module) CC-Link Ver.2-compatible	IP1XB
High-speed counter module			AJ65BT-D62	DC input Preset DC input	IP2X
			AJ65BT-D62D	Differential input Preset DC input	IP2X
			AJ65BT-D62D-S1	Differential input Preset differential input	IP2X
Positioning module			AJ65BT-D75P2-S3	2 axes (independent, with/ linear and circular interpolation)	IP2X
RS-232 interface module			AJ65BT-R2N	RS-232 1-channel, with/ DC input 2 points Transistor output 2 points	IP2X
Interface board for personal computer			Q80BD-J61BT11N	CC-Link interface board for an IBM PC/AT compatible PC (for PCI bus slot: master station, standby master station or local station)	-
			Q81BD-J61BT11	CC-Link interface board for an IBM PC/AT compatible PC (for PCI Express bus slot: master station, standby master station or local station)	-
FX Series interface block			FX3U-64CCL	Interface block for FX3G, FX3U, FX3UC Series	-
			FX2N-32CCL	Interface block for FX1N,FX2N,FX3U,FX1NC,FX2NC,FX3UC Series	-
Repeater module	Thin, waterproof type repeater hub module		AJ65FBTA-RPH	8-port star wiring hub module with repeater function, IP67-compatible	IP67
	Spring clamp terminal block type repeater hub module		AJ65BTS-RPH	8-port star wiring hub module with repeater function, Spring clamp terminal block type	-
	Repeater module (T-branch)		AJ65SBT-RPT	T-branch module with repeater function	IP2X
	Optical repeater module		AJ65SBT-RPS	For SI/QSI type fiber cable (Use 2 modules as a set)	IP2X
			AJ65SBT-RPG	For GI type fiber cable (Use 2 modules as a set)	IP2X
	Space optical repeater module		AJ65BT-RPI-10A	AJ65BT-RPI-10A and AJ65BT-RPI-10B used as a pair, 156k/625k/2.5Mbps supported	IP2X
			AJ65BT-RPI-10B		IP2X
Embedded type I/O module			AJ65MBTL1N-16D	Input 16 points : 24VDC (positive common) Pin header type 44-pin (2 rows) Embedded type Response time 1.5ms	-
			AJ65MBTL1N-16T	Output 16 points : 12/24VDC (0.1A) Transistor output (sink type) Pin header type 44-pin (2 rows) Embedded type	-
			AJ65MBTL1N-16DT	Input 8 points : 24VDC (positive common) Response time 1.5ms Output 8 points : 24VDC (0.1A) Transistor output (sink type) Pin header type 44-pin (2 rows) Embedded type	-
			AJ65MBTL1N-32D	Input 32 points : 24VDC (positive common) Pin head type 62-pin (2 rows) Embedded type Response time 1.5ms	-
			AJ65MBTL1N-32T	Output 32 points : 12/24VDC (0.1A) Transistor output (sink type) Pin head type 62-pin (2 rows) Embedded type	-
Embedded type interface board			Q50BD-CCV2	Master/local/intelligent device station CC-Link Ver.2 compatible	-
Object development	MFP1N		A6GA-CCMFP1NN60F	Communication LSI for lead-free/RoHS compatible master/local/intelligent device station (60pcs)	-
			A6GA-CCMFP1NN300F	Communication LSI for lead-free/RoHS compatible master/local/intelligent device station (300pcs)	-
	Device kit		Q6KT-NPC2OG51	For network circuit (Flash ROM x 1pc, SPLD x 2pcs)	-
Dedicated communication LSI	MFP2AN		A6GA-CCMFP2ANN 60F	Communication LSI for lead-free/RoHS compatible remote I/O station (16 points) (60pcs)	-
			A6GA-CCMFP2ANN 300F	Communication LSI for lead-free/RoHS compatible remote I/O station (16 points) (300pcs)	-
	MFP2N		A6GA-CCMFP2NN 60F	Communication LSI for lead-free/RoHS compatible remote I/O station (32 points) (60pcs)	-
			A6GA-CCMFP2NN 300F	Communication LSI for lead-free/RoHS compatible remote I/O station (32 points) (300pcs)	-
	MFP3N		A6GA-CCMFP3NN 60F	Communication LSI for lead-free/RoHS compatible remote device station (60pcs)	-
			A6GA-CCMFP3NN 300F	Communication LSI for lead-free/RoHS compatible remote device station (300pcs)	-

* Positive common: sink type, negative common: source type

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Module type	Model name	Specifications	Protection level
CompactPCI compatible interface board	ECP-CL2BD	CC-Link interface board for FA computer (CompactPCI bus slot 3U size: master station, standby master station or local station)	-

Optional parts for I/O modules

■ One-touch connector plugs

Product name	Model name	Specifications		
		Plug color	Applicable cable core (mm)	Applicable cable outside diameter (mm)
One-touch connector plug (20pcs)	A6CON-P214	Transparent	0.14 to 0.2 (AWG #26 to 24)	1.0 to 1.4 dia.
	A6CON-P220	Yellow		1.4 to 2.0 dia.
	A6CON-P514	Red	0.3 to 0.5 (AWG #22 to 20)	1.0 to 1.4 dia.
	A6CON-P520	Blue		1.4 to 2.0 dia.
One-touch connector plug for communication (10pcs)	A6CON-L5P	One-touch connector plug for communication 5-pin [transmission circuit terminal (IDC type)] Applicable cable: FANC-110SBH (made by Kuramo Denko Co., Ltd.) CS10 (made by Daiden Co., Ltd.)		
One-touch connector plug for power supply and FG (10pcs)	A6CON-PW5P	One-touch connector plug for power supply and FG 5-pin [module power supply terminal, I/O power supply terminal, FG terminal (IDC type)] Applicable wire size: 0.66 to 0.98mm^2 (AWG#18) [2.2 to 3.0mm dia.] Strand diameter 0.16mm or more		
	A6CON-PW5P-SOD	One-touch connector plug for power supply and FG 5-pin [module power supply terminal, I/O power supply terminal, FG terminal (IDC type)] Applicable wire size: 0.66 to 0.98mm^2 (AWG#18) [2.0 to 2.3mm dia.] Strand diameter 0.16mm or more		
One-touch connector plug with terminating resistor (1pc)	A6CON-TR11	One-touch connector plug for communication with terminating resistor (110Ω) When the connector type remote I/O is used for the end station, be sure to use this.		

■ Online connector

Product name	Model name	Specifications
Online connector for communication (5pcs)	A6CON-LJ5P	Online connector for communication 5-pole (10-pin)
Online connector for power supply and FG (5pcs)	A6CON-PWJ5P	Online connector for power supply and FG 5-pole (10-pin)

■ Protective cover for remote I/O module

Product name	Model name	Applicable module
Protective cover for 8-point module (10pcs)	A6CVR-8	AJ65SBTB1-8D, AJ65SBTB1-8T, AJ65SBTB1-8TE, AJ65SBT-RPT, AJ65SBTB1-8T1
	A6CVR-VCE8	AJ65VBTCE3-8D, AJ65VBTCE2-8T
Protective cover for 16-point module (10pcs)	A6CVR-16	AJ65SBTB1-16D, AJ65SBTB1-16D1, AJ65SBTC1-32D, AJ65SBTC1-32D1, AJ65SBTB3-8D, AJ65SBTB2-8A, AJ65SBTB2N-8A, AJ65SBTB1-16T, AJ65SBTB1-16T1, AJ65SBTC1-32T, AJ65SBTB2-8T, AJ65SBTB1-16TE, AJ65SBTB2-8R, AJ65SBTB2N-8R, AJ65SBTB2-8S, AJ65SBTB2N-8S, AJ65SBTC1-32DT, AJ65SBTC1-32DT1, AJ65SBTC4-16D, AJ65SBTC4-16DT, AJ65SBTB1-16DT, AJ65SBTB1-16DT1, AJ65SBTB32-8DT, AJ65SBT-RPG, AJ65SBT-RPS, AJ65SBTC4-16DN, AJ65SBTC4-16DE, AJ65SBTB2-8T1, AJ65SBTB1-16DT2, AJ65SBTC1-32DT2, AJ65SBTC1-32DT3, AJ65SBTC4-16DT2, AJ65SBTB1-16DT3, AJ65SBTB32-8DT2
	A6CVR-VCE16	AJ65VBTCE3-16D, AJ65VBTCE2-16T, AJ65VBTCE32-16DT, AJ65VBTCE3-16DE, AJ65VBTCE3-16TE, AJ65VBTCE3-16DTE
Protective cover for 32-point module (10pcs)	A6CVR-32	AJ65SBTB1-32D, AJ65SBTB1-32D1, AJ65SBTB3-16D, AJ65SBTB2-16A, AJ65SBTB2N-16A, AJ65SBTB1-32T, AJ65SBTB1-32T1, AJ65SBTB2-16T, AJ65SBTB2N-16R, AJ65SBTB2-16S, AJ65SBTB2N-16S, AJ65SBTB1-32DT, AJ65SBTB1-32DT1, AJ65SBTB32-16DT, AJ65SBTB2N-16R, AJ65SBTB2-16T1, AJ65SBTB1-32DT3, AJ65SBTB32-16DT2, AJ65SBTB1-32DT2

■ Protective cap for unused connector

Product name	Model name	Specifications
Waterproof cap (20pcs)	A6CAP-WP2	For protective cover for unused connector, waterproof protective structure: IP67-compatible, applicable for AJ65FBTA□-□ I/O module

■ 40-pin connector (FCN connector)

Product name	Model name	Specifications
40-pin connector (FCN connector) (1pc)	A6CON1	Solder type (straight-out type)
	A6CON2	Crimp type (straight-out type)
	A6CON3	IDC type (flat cable type)
	A6CON4	Solder type (straight-out/diagonal-out type)

CC-Link Safety Related Product Model Names

Mitsubishi Electric Corporation

Module type		Model name	Specifications	Protection level
Master module		QS0J61BT12	Maximum number of stations: 64 stations (maximum of 42 safety stations) Safety station information management	IP2X
Remote I/O module	Screw/2-piece terminal block type	QS0J65BTB2-12DT	Safety input: 8points(dual input), 16points(single input) Safety output: 4 points (source + sink type), 2 points (source + source type)	IP2X
	Spring clamp terminal block type	QS0J65BTS2-8D	Safety input: 8points(dual input), 16points(single input)	IP2X
		QS0J65BTS2-4T	Safety output: 4 points (source + sink type), 2 points (source + source type)	IP2X

CC-Link/LT Related Product Model Names

Mitsubishi Electric Corporation

Module type			Model name	Specifications	Protection level
Master module			QJ61CL12	CC-Link/LT master module for Q Series	-
			LJ61CL12	CC-Link/LT master module for L Series	-
			FX2N-64CL-M	CC-Link/LT master module for FX1N, FX2N, FX3N, FX1NC, FX2NC, and FX3NUC	-
			FX3UC-32MT-LT(-2)*1	FX3UC series CC-Link/LT programmable controller (built-in master function)	-
Bridge module			AJ65SBT-CLB	CC-Link - CC-Link/LT bridge module	IP2X
Remote I/O module	Screw terminal block type		CL1X4-D1B2	Input 4 points: 24VDC (positive/negative common shared)	IP2X
			CL2X8-D1B2	Input 8 points: 24VDC (positive/negative common shared)	IP2X
			CL1Y4-T1B2	Output 4 points: 12/24VDC (sink type) 0.1A Transistor output	IP2X
			CL2Y8-TP1B2	Output 8 points: 12/24VDC (sink type) 0.1A Transistor module (with output protection function)	IP2X
			CL1Y4-R1B2	Output 4 points: 30VDC , 250VAC or less 2A Relay output	IP1X
			CL1Y4-R1B1	Output 4 points: 30VDC , 250VAC or less 2A Relay output 1 point 1 common (independent)	IP1X
			CL1XY4-DT1B2	Input 2 points: 24VDC (positive/negative common shared) Output 2 points: 12/24VDC (sink type) 0.1A Transistor output	IP2X
			CL1XY8-DT1B2	Input 4 points: 24VDC (positive/negative common shared) Output 4 points: 12/24VDC (sink type) 0.1A Transistor output	IP2X
			CL1XY4-DR1B2	Input 2 points: 24VDC (positive/negative common shared) Output 2 points: 30VDC , 250VAC or less (sink type) 2A Relay output	IP1X
			CL1XY8-DR1B2	Input 4 points: 24VDC (positive/negative common shared) Output 4 points: 30VDC , 250VAC or less 2A Relay output	IP1X
	Spring clamp terminal block type		CL1X4-D1S2	Input 4 points: 24VDC (positive/negative common shared)	IP2X
			CL2X8-D1S2	Input 8 points: 24VDC (positive/negative common shared)	IP2X
			CL1Y4-T1S2	Output 4 points: 12/24VDC (sink type) 0.1A Transistor output	IP2X
			CL2Y8-TP1S2	Output 8 points: 12/24VDC (sink type) 0.1A Transistor output (output protection function)	IP2X
			CL2Y8-TPE1S2	Output 8 points: 12/24VDC (source type) 0.1A Transistor output (output protection function)	IP2X
	Sensor connector type (e-CON)		CL1X4-D1C3	Input 4 points: 24VDC (positive common)	IP2X
			CL2X8-D1C3V	Input 8 points: 24VDC (positive common)	IP2X
			CL2X16-D1C3V	Input 16 points: 24VDC (positive common)	IP2X
			CL1Y4-T1C2	Output 4 points: 24VDC (sink type) 0.1A Transistor output	IP2X
			CL2Y8-TP1C2V	Output 8 points: 24VDC (sink type) 0.1A Transistor module (output protection function)	IP2X
			CL2Y16-TP1C2V	Output 16 points: 24VDC (sink type) 0.1A Transistor module (output protection function)	IP2X
			CL2XY16-DTP1C5V	Input 8 points: 24VDC (positive common) Output 8 points: 24VDC (sink type) 0.1A Transistor module (output protection function)	IP2X
	MIL connector type		CL2X16-D1M1V	Input 16 points: 24VDC (positive common)	IP2X
			CL2X16-D1MJ1V	Input 16 points: 24VDC (positive common) Shared power supply for module and I/O parts	IP2X
			CL2Y16-TP1M1V	Output 16 points: 12/24VDC (sink type) 0.1A Transistor module (output protection function)	IP2X
			CL2Y16-TP1MJ1V	Output 16 points: 24VDC (sink type) 0.1A Transistor module (output protection function) Shared power supply for module and I/O parts	IP2X
			CL2Y16-TPE1M1V	Output 16 points: 12/24VDC (source type) 0.1A Transistor module (output protection function)	IP2X
	Cable type		CL1X2-D1D3S	Input 2 points: 24VDC (positive common)	IP2X
			CL1Y2-T1D2S	Output 2 points: 24VDC (sink type) 0.1A Transistor output	IP2X
			CL1XY2-DT1D5S	Input 1 points: 24VDC (positive common) Output 1 points: 24VDC (sink type) 0.1A Transistor output	IP2X
Analog module	Screw terminal block type	Voltage/current input	CL2AD4-B	4-channel voltage/current input A/D conversion module (analog input module)	IP2X
		Voltage/current output	CL2DA2-B	2-channel voltage/current output D/A conversion module (analog output module)	IP2X
Dedicated power supply			CL1PSU-2A	CC-Link/LT dedicated power supply (2A)	IP1X
Power supply adapter			CL1PAD1	Power supply adapter (5A) for CL1PAD1 CC-Link/LT	-
Communication LSI for master station	CLC13		CL2GA13-60	Communication LSI for lead-free/RoHS compatible master station (60pcs)	-
Communication LSI for remote I/O station	CLC21		CL2GA21-60	Communication LSI for lead-free/RoHS compatible remote I/O station (60pcs)	-
			CL2GA21-300	Communication LSI for lead-free/RoHS compatible remote I/O station (300pcs)	-
Communication LSI for remote device station	CLC31		CL2GA31-60	Communication LSI for remote device station (60pcs)	-
Accessories	Common terminal block		CL2TE-5	Common terminal block for screw terminal block type modules (applicable model: CL2X8-D1B2, CL2Y8-TP1B2, CL2AD4-B)	-
			CL2TE-10S	Common terminal block for spring clamp terminal block type modules (applicable model : CL2X8-D1S2)	-
	Holder		CL1-HLD	Holder for cable type mounting (5pcs)	-

*1: CC-Link/LT parameters for FX3UC-32MT-LT-2 can be configured with GX Works2, GX Developer or display modules.

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Module type		Model name	Specifications	Protection level
Accessories	Connector	CL9-CNF-18	Connector for CC-Link/LT dedicated flat cable	-
		CL9-CNR-23	Connector for CC-Link/LT dedicated VCTF cable	-
		CL9-CNR-20	Connector for CC-Link/LT dedicated flexible cable	-
	Cable	CL9-FL4-18	CC-Link/LT dedicated flat cable	-
		CL9-MV4-075	CC-Link/LT dedicated flexible cable	-
	Terminating resistor	CL9-TERM	Terminating resistor for dedicated flat, VCTF, and flexible cables	-
	Open sensor connector (e-CON)	ECN-******	I/O connector for sensor connector type modules *: The model name differs according to the color and wire diameter.	-
	Joint shield/Dust shield	ECN-CVR4****	Protection shields for relay part of open sensor connectors, and empty slots of sensor connectors remote I/O module	-
	Tool	L-TOOL-N	IDC tool for connector	-
		e-TOOL-N	IDC tool for open sensor connector	-
		KD-5339	Tool for spring clamp terminal block	-

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Open Field Network
CC-Link Compatible Product databook

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