Changes for the Better

MITSUBISHI ELECTRIC

# Open Field Network
# CC-Link/LT Compatible Product Catalog


CC-Link/LT

MELFANS web
MITSUBISHI ELECTRIC
FA NETWORK SERVICE ON WORLD WIDE
http://www.nagoya.melco.co.jp/english/

MELSOFT

CC-Link

Mitsubishi Electric Corporation Nagoya Works is a factory certified for ISO14001 (standards for environmental management systems) and ISO9001 (standards for quality assurance management systems)

ISO 14001 JACO UKAS ENVIRONMENTAL MANAGEMENT 051

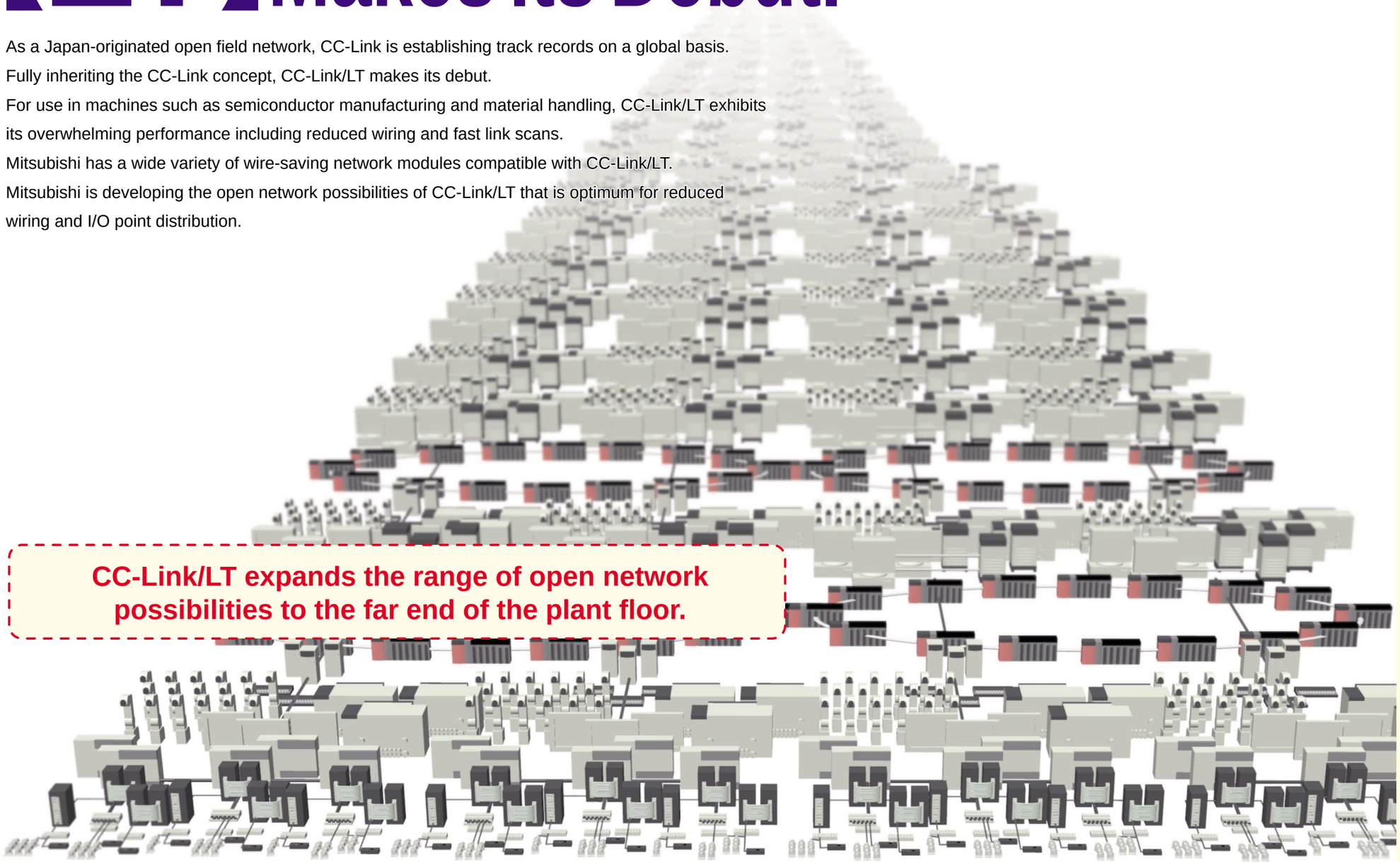
BVQI ISO 9001 UKAS QUALITY MANAGEMENT 008

Open Link of Wire-saving Networks

## Inheriting The Global Standard CC-Link

# (LT) Makes Its Debut.

As a Japan-originated open field network, CC-Link is establishing track records on a global basis.
Fully inheriting the CC-Link concept, CC-Link/LT makes its debut.
For use in machines such as semiconductor manufacturing and material handling, CC-Link/LT exhibits its overwhelming performance including reduced wiring and fast link scans.
Mitsubishi has a wide variety of wire-saving network modules compatible with CC-Link/LT.
Mitsubishi is developing the open network possibilities of CC-Link/LT that is optimum for reduced wiring and I/O point distribution.



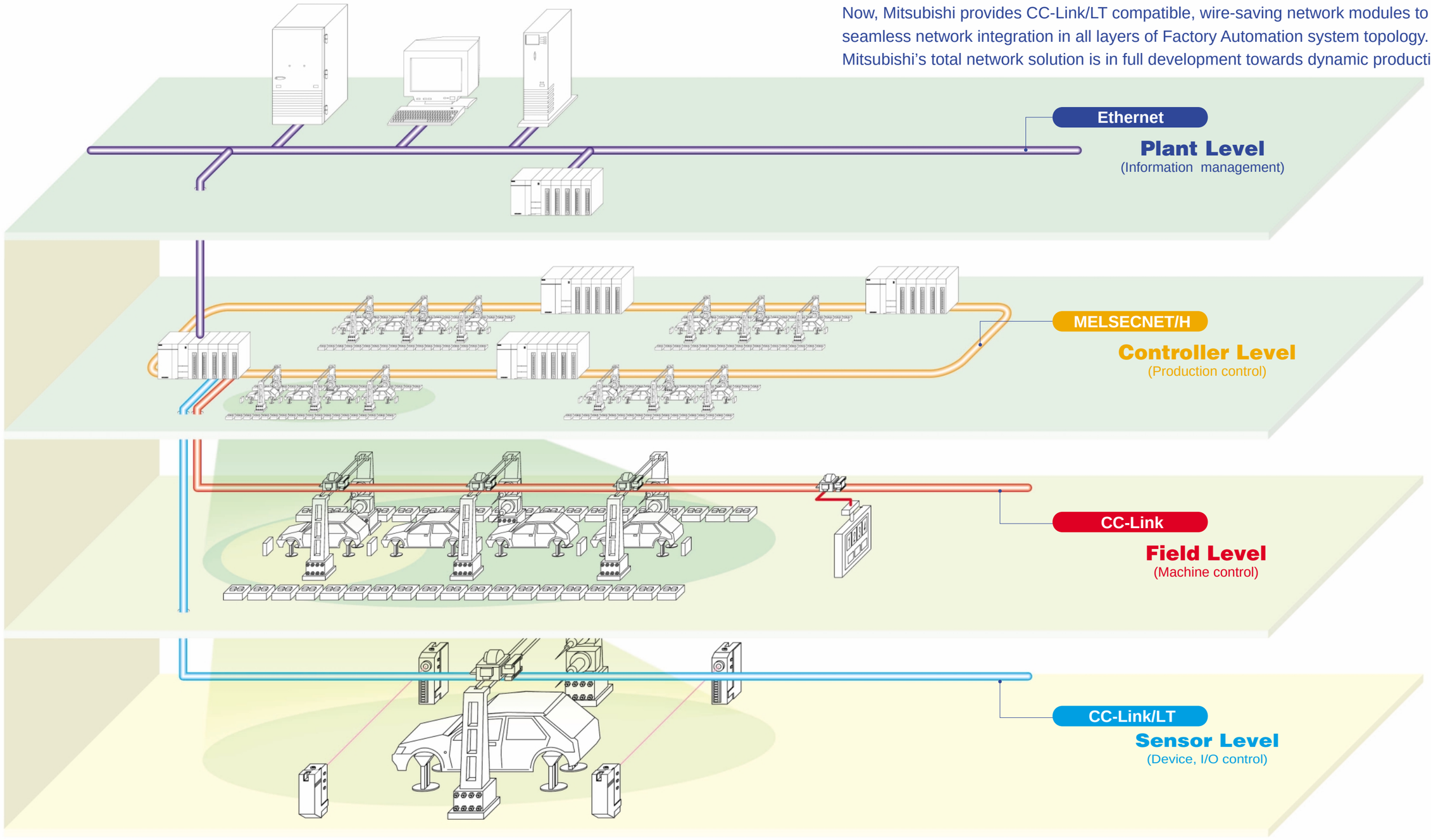
**CC-Link/LT expands the range of open network possibilities to the far end of the plant floor.**

CC-Link/LT

## INDEX

# Adding CC-Link/LT compatible products, Mitsubishi provides a total network solution.

From information management to production control, machine control, device and I/O control ...
Looking ahead to network interconnection in all of these layers,
Mitsubishi has presented one product after another that are compatible with not only Ethernet but also MELSECNET/H and CC-Link.
Now, Mitsubishi provides CC-Link/LT compatible, wire-saving network modules to achieve seamless network integration in all layers of Factory Automation system topology.
Mitsubishi's total network solution is in full development towards dynamic production activities.



# To expand open network possibilities to every corner of a field. "LT" further reinforces the CC-Link family.

As the Japan-originated global standard, CC-Link is increasing the range of field network possibilities.
"If we could seamlessly network the control field that ranges from machine control to device and I/O control in the integrated concept of CC-Link..."
The reinforced CC-Link family is a new answer to such a request from the plant floor.

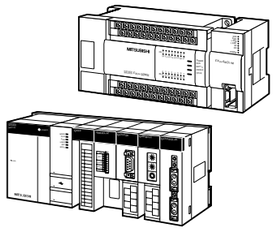
## For networking inside a panel/machine

CC-Link/LT

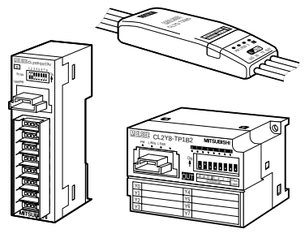
CC-Link/LT is a reduced-wiring network for use inside a panel/machine, designed to relieve on-site workers from complicated wiring, miswiring, etc. It is a practical solution for reducing wiring between sensors, actuators and controllers. Also, it utilizes the high performance of CC-Link such as fast response.

- Fast response ●Ease of working by connection of connectors ●Ease of extension and addition
- Communication and power supply lines are integrated into one line.
- 2-, 4-, 8- and 16-point remote I/O units are available.

### CC-Link/LT master station



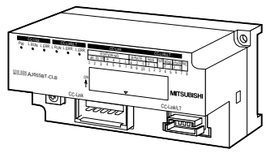
### Remote I/O stations



### Partner products

### CC-Link-CC-Link/LT bridge

Soon to be released



## For machine control inside a line

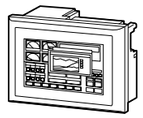
CC-Link

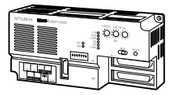
CC-Link is a high-speed field network that can handle both control and information together. At high communication speed of 10Mbps, it is compatible with 100m transmission distance and up to 64 connectable stations. Thanks to this overwhelming performance, CC-Link was certified for SEMI standard and is accelerating its openness.

- Fast communication ●Communication distance (100m to 1,200m) ●Improved workability by repeaters (T branch, optical, optical/spatial) ●Wide choice of partner maker products
- Fast cyclic transmission, large-capacity transient transmission (message data)

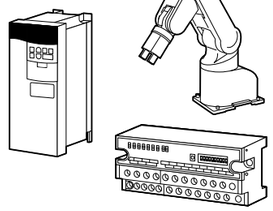
### Partner products

### Intelligent device stations

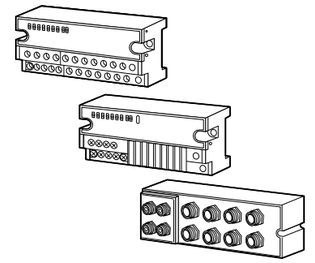




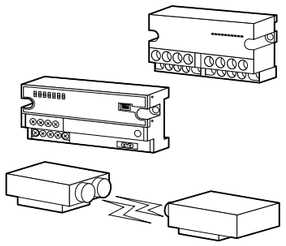
### Remote device stations



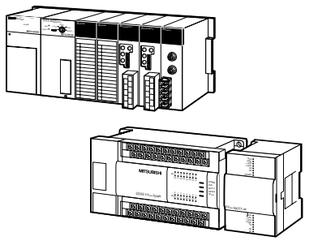
### Remote I/O stations



### Repeater modules



### CC-Link master station



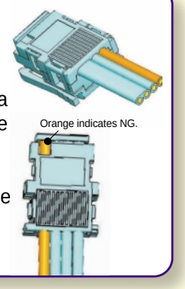
# The Factory Automation industry was waiting for this performance. CC-Link/LT meets the requirements set out from the industry.

## Openness of the original CC-Link family

- CC-Link/LT is an open network similar to CC-Link. You can make flexible choice of the optimum devices from multi-vendors to improve the flexibility of system construction.
- Wiring is reduced in panels, devices and machine-incorporated systems.

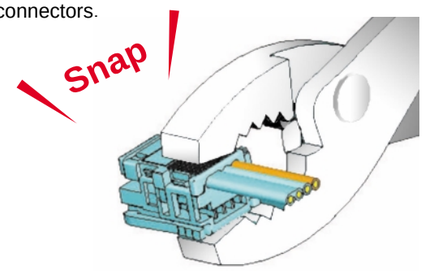
## Miswiring prevention

- Cables shaped to prevent miswiring
  The surface of each flat cable has a different shape, the cable will not fit in the connector if reversed.
- Connector with miswiring checking window
  The orange wire is visible when inserted the wrong way.




## Extreme ease of working

- The dedicated connectors achieve quick connection/ disconnection of communication cables. Units can be increased, added and replaced easily.
- The dedicated flat cables are used, enabling the reduction of working man-hours and cable costs.
- Commercially available pliers can be used for assembling connectors.

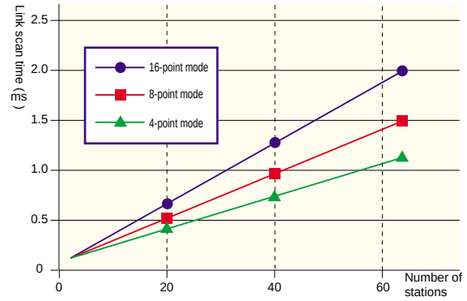



## Fast response

When 64 stations are connected, link scan time is a maximum of 1.2ms (at 2.5Mbps), achieving excellent fast response performance.
You can choose any of 2.5Mbps, 625kbps and 156kbps according to transmission distance.

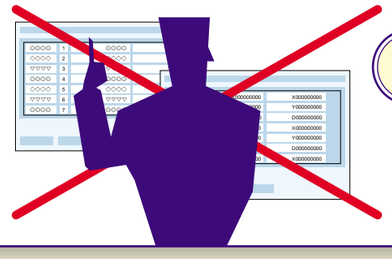
### Link scan time

◎CC-Link/LT link scan time (at 2.5Mbps)



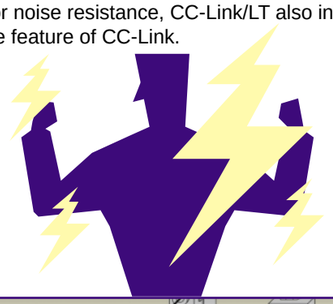

## No need to make parameter setting

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



## High noise resistance

For noise resistance, CC-Link/LT also inherits the feature of CC-Link.



## Efficient use of I/O points

The adoption of the point mode (4, 8, 16 points) enables I/O assignment without wasting surplus I/O points.

## Strong lineup

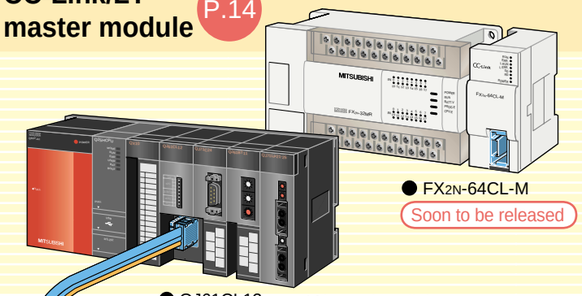
Units from 2 and 4 points to 8 and 16 points are available. You can select the optimum type from the strong lineup such as terminal block, sensor connector, MIL connector and cable types.

## Ease of Use

You can perform programming in the same manner as when accessing proximate I/O, without being conscious of the network.

# System Configuration Examples

## CC-Link/LT master module P.14

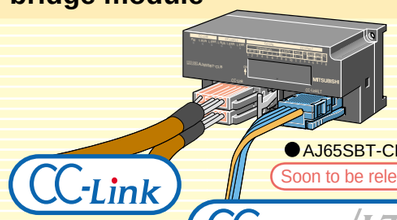


● FX2N-64CL-M
Soon to be released

● QJ61CL12

*Always install the master module at one end of the main line.

## CC-Link-CC-Link/LT bridge module



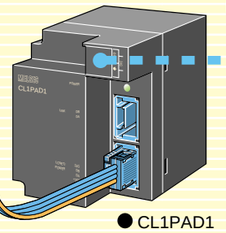
● AJ65SBT-CLB
Soon to be released

CC-Link

CC-Link/LT

**Terminating resistor** ● CL9-RYVK

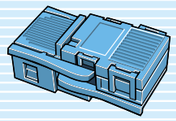
## Power supply adaptor P.30



● CL1PAD1

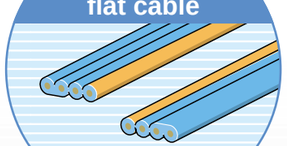
General-purpose power supply
DC24V

## Connector P.30



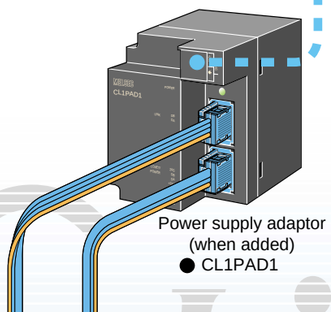
● CL9-CNF-18

## Dedicated flat cable P.30



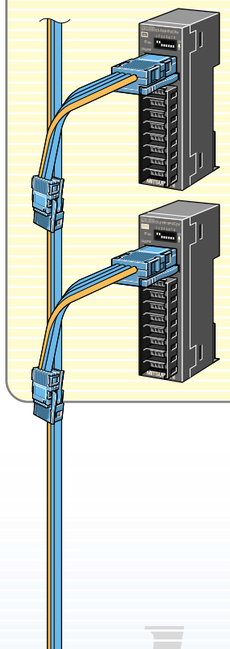
● CL9-FL4-18

General-purpose power supply
24VDC



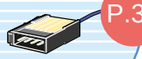
Power supply adaptor (when added)
● CL1PAD1

## Sensor connector type remote I/O modules P.24



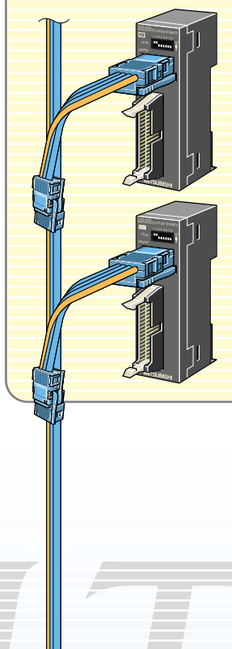
【8 points】
● CL2X8-D1C3V
24VDC input
● CL2Y8-TP1C2V
0.1A transistor output
with output protection

### Open sensor connector P.30



● ECN-*****

## MIL connector type remote I/O modules P.26

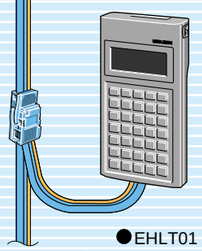


【16 points】
● CL2X16-D1M1V
24VDC input
● CL2Y16-TP1M1V
0.1A transistor output
with output protection

### Terminating resistor P.30

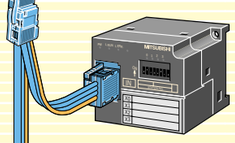
● CL9-RYVK

## Handy line tester

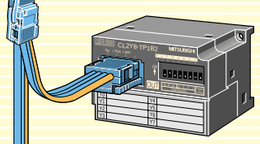


● EHLT01
Soon to be released
Made by Mitsubishi Electric Engineering Co., Ltd.

## Terminal block type remote I/O modules P.18



【4 points】
● CL1X4-D1B2
24VDC input
● CL1Y4-T1B2
0.1A transistor output
● CL1Y4-R1B2
2A relay output

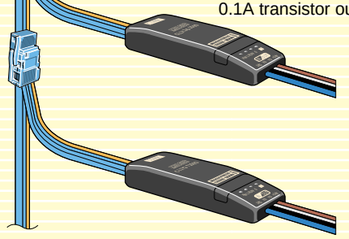


【8 points】
● CL2X8-D1B2
24VDC input
● CL2Y8-TP1B2
0.1A transistor output
with output protection
● CL1XY8-DT1B2
24VDC input/
0.1A transistor output
● CL1XY8-DR1B2
24VDC input/2A relay output

Soon to be released 【4 points】
24VDC input/0.1A transistor output
24VDC input/2A relay output

## Cable type remote I/O modules P.28

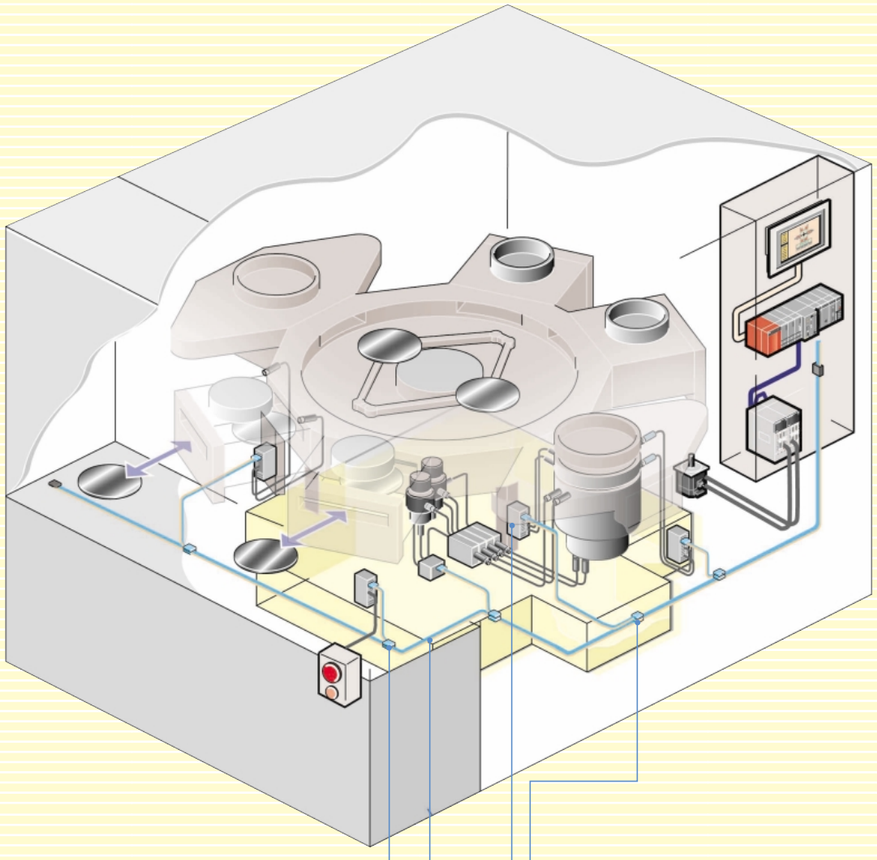
【2 points】
● CL1X2-D1D3S
24VDC input
● CL1Y2-T1D2S
0.1A transistor output
● CL1XY2-DT1D5S
24VDC input/
0.1A transistor output



# Application Examples

## 1 Machine-incorporated system example using CC-Link/LT

### Semiconductor manufacturing equipment



**Easy connector plugging**

The dedicated flat cable and connector ensure ease of adding a module.

**Reduced wiring/space saving**

T-branch connection and compact modules save wiring and space in equipment.

**Wiring cost reduction**

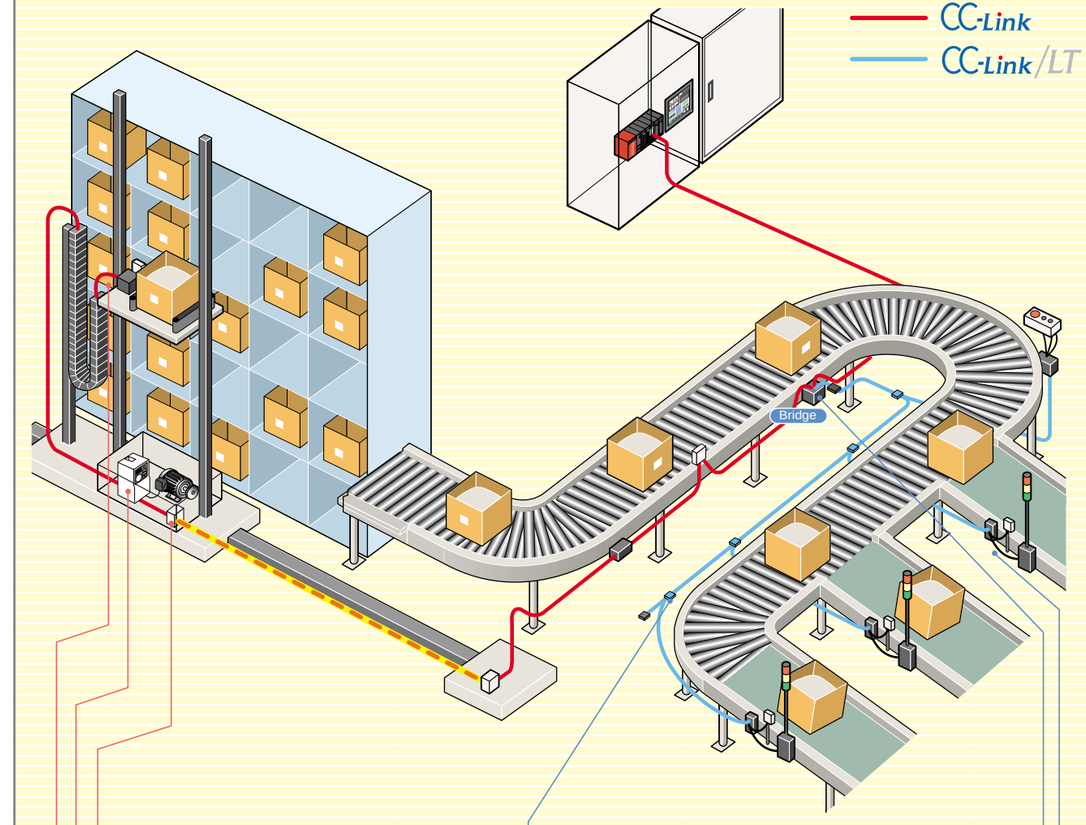
Wiring costs can be reduced substantially by combining the communication and power supply lines into a single cable.

**Wide assortment of I/O modules**

Terminal block, sensor connector, MIL connector and cable types are available.
There are a wide assortment of 2-, 4-, 8- and 16-point units.

## 2 System example combining CC-Link and CC-Link/LT

### Automated warehouse




**Improved workability by repeaters**

Workability of high degree of flexibility can be realized by optical/spatial repeaters, optical repeaters and repeaters (T branch).

**Connection of various devices**

A wide variety of controllers and I/O units can be connected, e.g. inverters, servos, analog units and ID controllers.

**Wide selection of partner products**

You can choose the optimum device from among many partner products to construct a system with a high degree of flexibility.

**CC-Link-CC-Link/LT bridge for seamless communication**

Data can be sent/received seamlessly from the host controller and monitoring/diagnostics can be performed using GX Developer.

**Ease of connecting various sensors**

The adoption of the open sensor connector ensures ease of connecting sensors, etc.

**Improved maintainability**

The dedicated flat cable and connector ensure flexible response to addition and modification.

# Master Modules

## Overview

Master modules compatible with the MELSEC CPUs are available.

● For Q series
QJ61CL12

Product explanation
▶Next page

● For FX series
FX2N-64CL-M

Soon to be released


## Model List

| Product | Model | Relevant Manual |
|---|---|---|
| Master module for Q series | QJ61CL12 | QJ61CL12 CC-Link/LT Master Module User's Manual (Details) |
| Master module for FX series | FX2N-64CL-M | |

## Point Mode Setting

● CC-Link/LT has adopted a new design called the "point mode".
The point mode is designed not to produce unnecessary empty points in order to use the I/O points efficiently.

●There are three different point mode, 4-, 8- and 16-point mode. If the occupied I/O point setting is the same, the number of controllable I/O points changes depending on the point mode.

●The table on the right indicates the relationships between the master module's number of occupied I/O points, point mode and number of connectable stations.
If the remote I/O unit is the same, the number of occupied stations changes depending on the point mode.
<For 16-point unit>
4-point mode: 4 stations occupied, 8-point mode: 2 stations occupied,
16-point mode: 1 station occupied

Number of stations that can be connected for each setting of master module

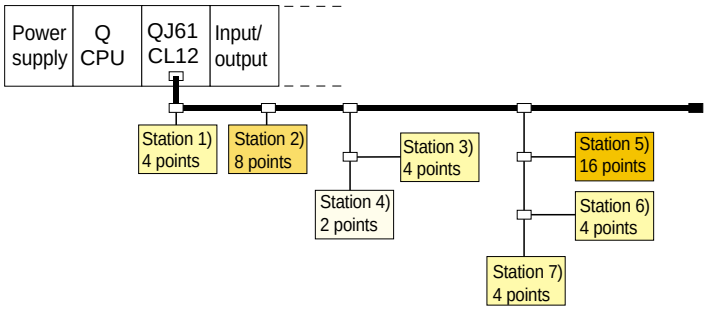
| Number of Master Module's Occupied I/O points | | 16 Points | 32 Points | 48 Points | 64 Points | 128 Points | 256 Points | 512 Points | 1024 Points |
|---|---|---|---|---|---|---|---|---|---|
| Point mode setting | 4-point mode | 4 | 8 | 12 | 16 | 32 | 64 | - | - |
| | 8-point mode | 2 | 4 | 6 | 8 | 16 | 32 | 64 | - |
| | 16-point mode | 1 | 2 | 3 | 4 | 8 | 16 | 32 | 64 |

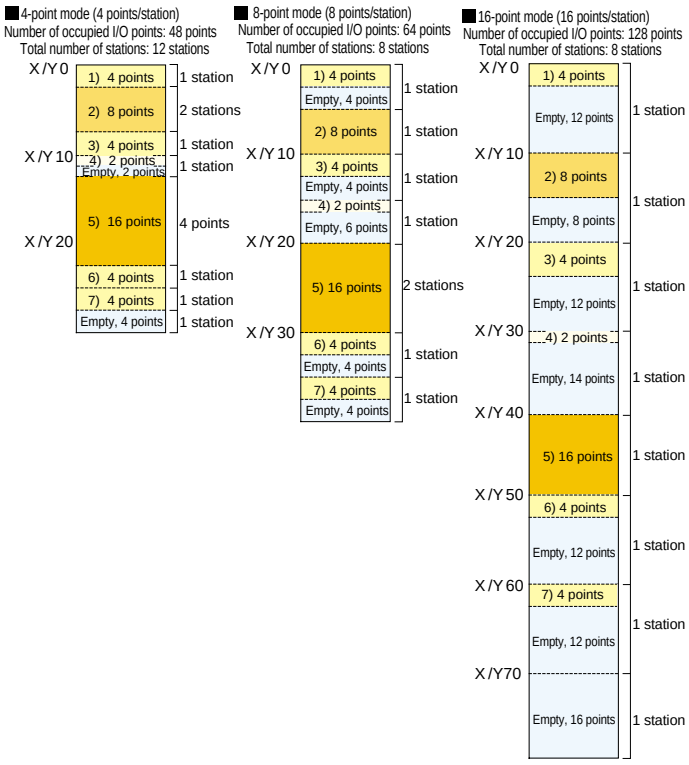
Example: When the number of occupied I/O points of the master module is 256
4-point mode: Up to 64 stations can be connected.
8-point mode: Up to 32 stations can be connected.
16-point mode: Up to 16 stations can be connect

● System configuration example
Which point mode to be selected depends on the number of used remote stations (I/O units). As a rule of thumb, select the I/O point mode used by the majority of remote modules in the system in order to reduce surplus occupied I/O points.

A point mode setting example is given below.
Unit whose occupied points are 2 points ... 1 module (station 4))
Unit whose occupied points are 4 points ... 4 modules (stations 1), 3), 6), 7))
Unit whose occupied points are 8 points ... 1 module (station 2))
Unit whose occupied points are 16 points ... 1 module (station 5))

Since there are the largest number of 4-point I/O units in this example, selection of the 4-point mode produces no surplus I/O points.

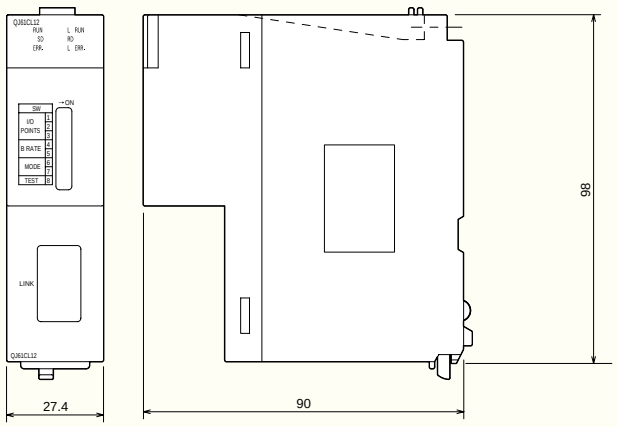


Master

# QJ61CL12 Master Module (Q Series)

## External dimensions




Unit: mm

- Current consumption: 130mA (5VDC), 28mA (24VDC), power supplied from power supply adaptor
- Weight: 0.09kg

## Applicable CPU

| Connectable CPU Models | | Number of Mountable Modules |
|---|---|---|
| QCPU High Performance model | Q02CPU,Q02HCPU,Q06HCPU,Q12HCPU,Q25HCPU | Max. 64 modules *1 |
| QCPU Basic model | Q00JCPU*2,Q00CPU,Q01CPU | |
| Process CPU | Q12PHCPU,Q25PHCPU | |
| NET/H remote station | QJ72LP25-25,QJ72LP25G(E),QJ72BR15 | |
| PC CPU *3 | PPC-CPU686(MS)-64, PPC-CPU686(MS)-128 | |

*1:The number of usable master modules changes depending on the occupied I/O point setting of the master module.
*2:Having a maximum of 256 I/O points, the Q00JCPU can use only the I/O points within the 256-point range.
(When the occupied I/O point setting is more than 256 points, the Q00JCPU detects an error and does not operate.)
*3:The PC CPU is made by CONTEC CO., LTD.

## Part Names and Settings

### LED indications

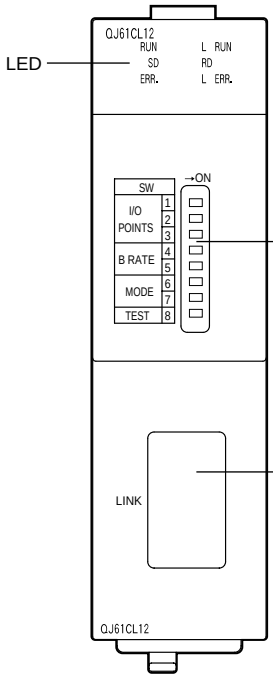
| LED Name | Description |
|---|---|
| RUN | On: Module is operating normally. |
| ERR. | On: Switch setting error<br>Flicker: Switch moved during operation |
| L RUN | On: Data link in execution |
| L ERR. | On: Data link error station (detected), any station outside control range<br>Flicker: Data link error stations (all stations) |
| SD | On: Data being sent |
| RD | On: Data being received |

### Operation setting switch setting details

| Operation setting switches | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Number of occupied I/O points | | | 16 points | 32 points | 48 points | 64 points | 128 points | 256 points | 512 points | 1024 points |
| 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 | | Must not be set * | |
| 4 | B RATE | | OFF | | ON | | OFF | | ON | |
| 5 | | | OFF | | OFF | | ON | | ON | |
| Point mode setting | | | 8 points | | 4 points | | 16 points | | Must not be set * | |
| 6 | MODE | | OFF | | ON | | OFF | | ON | |
| 7 | | | OFF | | OFF | | ON | | ON | |
| Test mode | | | OFF: ON LINE (normal operation) | | | | | | | |
| 8 | TEST | | ON: TEST mode (loopback test) | | | | | | | |

*ERR. LED is lit if the switches are moved to the position that must not be set.

QJ61CL12




| Pin No. | Signal Name |
|---|---|
| 4 | 24G |
| 3 | DB |
| 2 | DA |
| 1 | +24V |

# Remote I/O Modules

## *Overview*

A variety of modules are available for external connection equipment and applications.

### ● Terminal block type


For crimping terminal connection.
General connection method.

### ● Sensor connector type


Easy connection of sensors, etc.

### ● MIL connector type


Easy to do wiring work and convenient when device is located nearby.

### ● Cable type


Direct wiring to sensor, etc.

## *Model Identification*

CL□ □ □ – □ □ □ □ □ □

1 2 3 4 5 6 7

**1 Unit for CC-Link/LT**
□:1 or 2

**2 Unit type**
X: Input
Y: Output
XY: I/O hybrid

**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)
DT1: 24VDC input/ transistor output 0.1A
DR1: 24VDC input/ relay output 2A

**5 Connection form**
B: Terminal block
C: Sensor connector
M: MIL connector
D: Cable type

**6 Wire type**
1: 1-wire type
2: 2-wire type
3: 2- or 3-wire type
5: Input 2 or 3-wire type, output 2-wire type

**7 Shape**
S:Ultracompact
V: Vertical type
None: Normal type (horizontal type)

## Icon Identification

| Input | | Output | | Connection Form | | Others | |
|---|---|---|---|---|---|---|---|
|  | Input power supply specification<br>DC input |  | Input power supply specification<br>Number of input points |  | Terminal block type |  | With input response speed switching<br>Positive common input |
|  | Positive common input |  | Sink type output |  | Sensor connector type |  | With overcurrent protection.<br>With overheat protection. |
|  | Negative common input |  | Source type output |  | MIL connector type |  | With output hold function for communication error or reset |
|  | Input voltage<br>Connection wire type |  | Output load current<br>Connection wire type |  | Cable type |  | Vertical type |

## Model List

| Product | | Model | Function Outline | Page |
|---|---|---|---|---|
| Compact type remote I/O units | Input modules | CL1X2-D1D3S | DC input 2 points, +COM, 24VDC 2-wire type or 24VDC 3-wire type, Cable, Input response switching | 28 |
| | | CL1X4-D1B2 | DC input 4 points, +COM, -COM, 24VDC 2-wire type, Terminal block, Input response switching | 19 |
| | | CL2X8-D1B2 | DC input 8 points, +COM, -COM, 24VDC 2-wire type, Terminal block, Input response switching | 19 |
| | | CL2X8-D1C3V | DC input 8 points, +COM, 24VDC 2-wire type or 24VDC 3-wire type, Sensor, Input response switching, Vertical | 25 |
| | | CL2X16-D1M1V | DC input 16 points, +COM, 24VDC 1-wire type, MIL, Input response switching, Vertical | 27 |
| | Output modules | CL1Y2-T1D2S | Transistor output 2 points, Sink, 0.1A 2 points, Cable, Hold | 29 |
| | | CL1Y4-T1B2 | Transistor output 4 points, Sink, 0.1A 2-wire type, Terminal block, Hold | 20 |
| | | CL1Y4-R1B2 | Relay output 4 points, 2A 2-wire type, Terminal block, Hold | 20 |
| | | CL2Y8-TP1B2 | Transistor output 8 points, Sink, 0.1A 2-wire type, Terminal block, Protection, Hold | 21 |
| | | CL2Y8-TP1C2V | Transistor output 8 points, Sink, 0.1A 2-wire type, Sensor, Protection, Hold, Vertical | 25 |
| | | CL2Y16-TP1M1V | Transistor output 16 points, Sink, 0.1A 1-wire type, MIL, Protection, Hold, Vertical | 27 |
| | I/O modules | CL1XY2-DT1D5S | DC input 1 point, +COM, 24VDC 2-wire type or 24VDC 3-wire type, Transistor output 1 point, Sink, 0.1A 2-wire type, Cable, Hold | 29 |
| | | CL1XY8-DT1B2 | DC input 4 points, +COM, -COM, 24VDC 2 points, Transistor output 4 points, Sink, 0.1A 2 points, Terminal block, Hold | 22 |
| | | CL1XY8-DR1B2 | DC input 4 points, +COM, -COM, 24VDC 2 points, Relay output 4 points, 2A 2-wire type, Terminal block, Hold | 22 |

# Remote I/O Modules

Terminal block

## Terminal block type

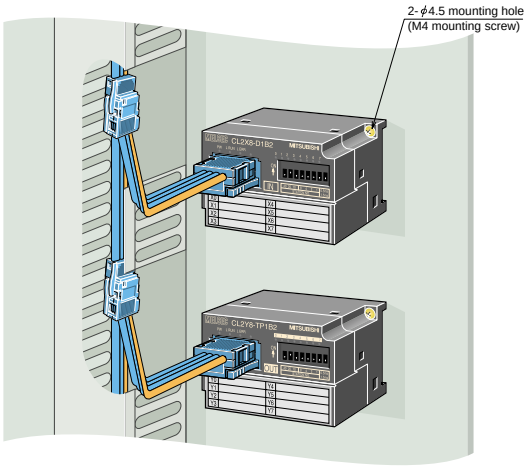
### Overview

Terminal block type


**Features**

- Small size in the industry's smallest class
- Terminal block cover has a nameplate that shows connection destinations at a glance
- Input modules used either as positive common or negative common
- Terminal block that can connect 2-wire sensors and loads intact

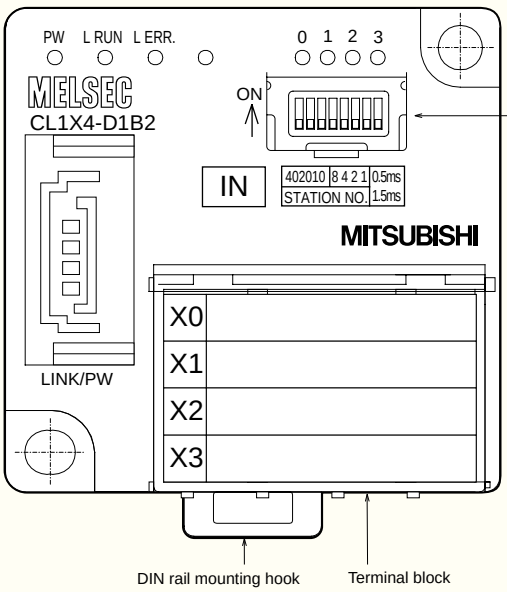
**Installation** ■DIN rail or direct mounting can be done.




### Part Names and Functions

| LED Name | Operation |
|---|---|
| PW | Lit when power is supplied. |
| L RUN | Lit when normal operation is performed. |
| L ERR. | Lit when communication error occurs. |

I/O operation indicator LEDs
ON: Lit
OFF: Extinguished




CC-Link/LT interface connector

| Pin No. | Signal Name |
|---|---|
| 4 | 24G |
| 3 | DB |
| 2 | DA |
| 1 | +24V |

DIP switches

| Setting | Switch Name | Description | | | |
|---|---|---|---|---|---|
| Station number setting switches | STATION NO. | Tenth digit | 40 | ON : 40 | OFF : 0 |
| | | | 20 | ON : 20 | |
| | | | 10 | ON : 10 | |
| | | Unit digit | 8 | ON : 8 | |
| | | | 4 | ON : 4 | |
| | | | 2 | ON : 2 | |
| | | | 1 | ON : 1 | |
| I/O operation setting | 0.5ms 1.5ms | Input unit: Response speed setting<br>OFF: 1.5ms (standard type)<br>ON: 0.5ms (fast response type) | | | |
| | HLD | Output unit : Hold function valid<br>OFF: Output clear<br>ON: Output held<br>I/O hybrid unit: Hold function valid<br>OFF: Output clear<br>ON: Output held | | | |

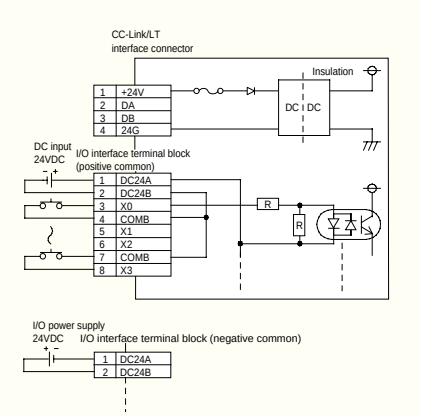
## CL1X4-D1B2 input module

DC input 4 points | +COM / -COM | 24VDC 2-wire type | Terminal block | Input response switching

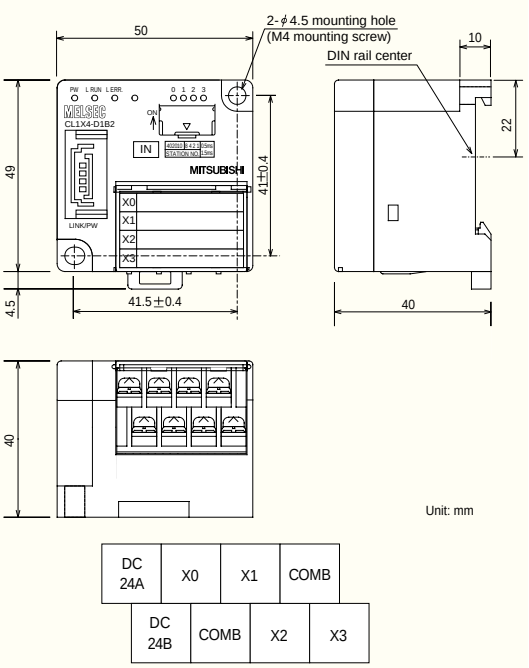
### Detailed specifications

| Input Specifications | | Description |
|---|---|---|
| Insulation system | | Photocoupler insulation |
| Rated input voltage | | 24VDC |
| Rated input current | | Approximately 4mA |
| Operating voltage range | | 20.4VDC to 28.8VDC(-15% to +20%)<br>Ripple ratio within 5% |
| Maximum number of simultaneous input points | | 100%(DC24V) |
| ON voltage/ON current | | 19V or more/3mA or more |
| OFF voltage/OFF current | | 11V or less/1.7mA or less |
| Input resistance | | 5.6kΩ |
| Response time | OFF→ON | 0.5ms/1.5ms or less (at 24VDC)<br>[Selected using DIP switch, default value = OFF/1.5ms] |
| | ON→OFF | 0.5ms/1.5ms or less (at 24VDC)<br>[Selected using DIP switch, default value = OFF/1.5ms] |
| Common system | | 4 points/1 common (2 points)<br>(terminal block 2-wire type) |
| Unit power supply | Voltage | 20.4 to 28.8VDC(-15% to +20%)<br>Ripple ratio within 5% |
| | Max. current consumption | 35mA or less (when all points ON) |
| Weight (kg) | | 0.06 |

### External equipment connection diagram




### External dimensions, terminal layout



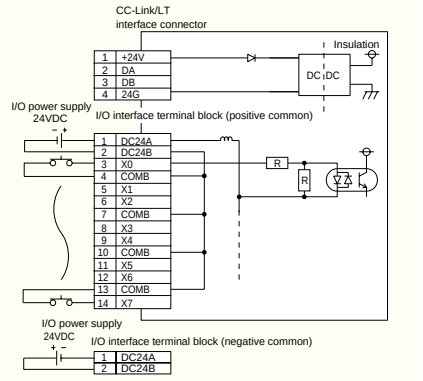

## CL2X8-D1B2 input module

DC input 8 points | +COM / -COM | 24VDC 2-wire type | Terminal block | Input response switching

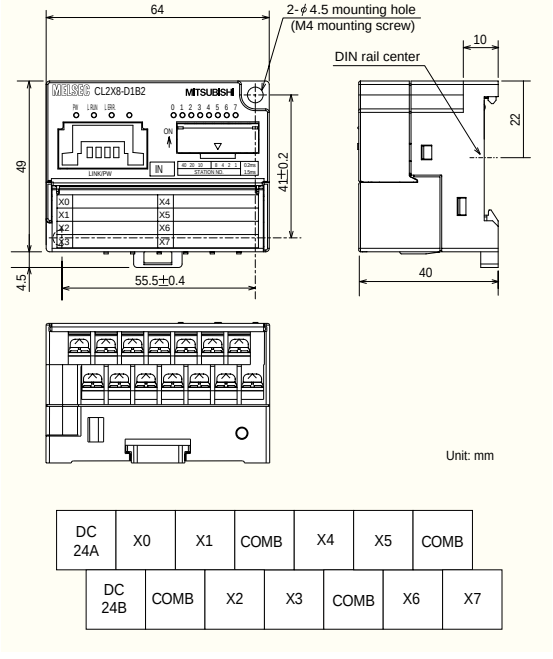
### Detailed specifications

| Specifications | | Description |
|---|---|---|
| Insulation system | | Photocoupler insulation |
| Rated input voltage | | 24VDC |
| Rated input current | | Approximately 4mA |
| Operating voltage range | | 20.4 to 28.8VDC(-15% to +20%)<br>Ripple ratio within 5% |
| Maximum number of simultaneous input points | | 100%(24VDC) |
| ON voltage/ON current | | 19V or more/3mA or more |
| OFF voltage/OFF current | | 11V or less/1.7mA or less |
| Input resistance | | 5.6kΩ |
| Response time | OFF→ON | 0.5ms/1.5ms or less (at 24VDC)<br>[Selected using DIP switch, default value = OFF/1.5ms] |
| | ON→OFF | 0.5ms/1.5ms or less (at 24VDC)<br>[Selected using DIP switch, default value = OFF/1.5ms] |
| Common system | | 8 points/1 common (4 points)<br>(terminal block 2-wire type) |
| Unit power supply | Voltage | 20.4 to 28.8VDC(-15% to +20%)<br>Ripple ratio within 5% |
| | Max. current consumption | 40mA or less (when all points ON) |
| Weight (kg) | | 0.09 |

### External equipment connection diagram




### External dimensions, terminal layout



# Remote I/O Modules

Terminal block

## *Terminal block type*

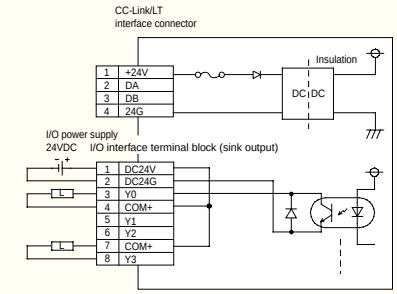
### CL1Y4-T1B2 output module

Transistor output 4 points | Sink | 0.1A 2-wire type | Terminal block | Hold

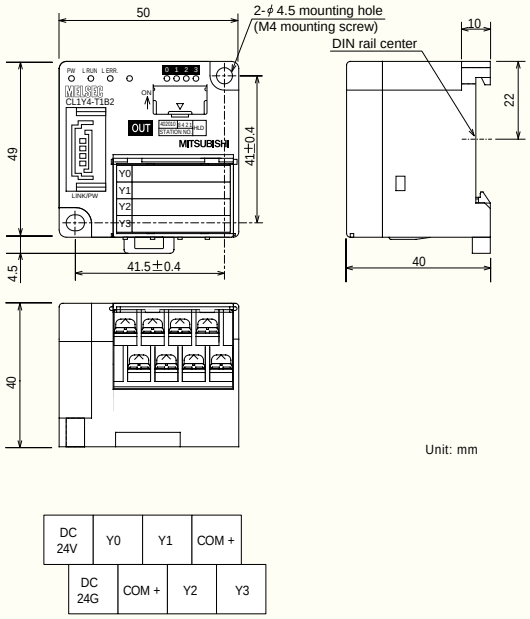
■ Detailed specifications

| Output Specifications | | Description |
|---|---|---|
| Insulation system | | Photocoupler insulation |
| Rated load voltage | | 12/24VDC |
| Operating load voltage range | | 10.2 to 28.8VDC (ripple ratio within 5%) |
| Maximum load current | | 0.1A/1 point 0.4A/1 common |
| Maximum inrush current | | 0.4A 10ms or less |
| OFF-time leakage current | | 0.1mA or less/30VDC |
| ON-time maximum voltage drop | | 0.3V or less (TYP) 0.1A, 0.6V or less (MAX) 0.1A |
| Response time | OFF→ON | 1.0ms or less |
| | ON→OFF | 1.0ms or less |
| Surge suppressor | | Zener diode |
| Common system | | 4 points/1 common (2 points) (terminal block 2-wire type) |
| Unit power supply | Voltage | 20.4 to 28.8VDC (ripple ratio within 5%) |
| | Max. current consumption | 60mA or less (when all points ON) |
| Weight (kg) | | 0.06 |

■ External equipment connection diagram




■ External dimensions, terminal layout



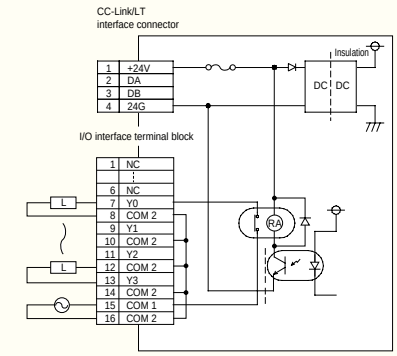

### CL1Y4-R1B2 output module

Relay output 4 points | 2A 2-wire type | Terminal block | Hold

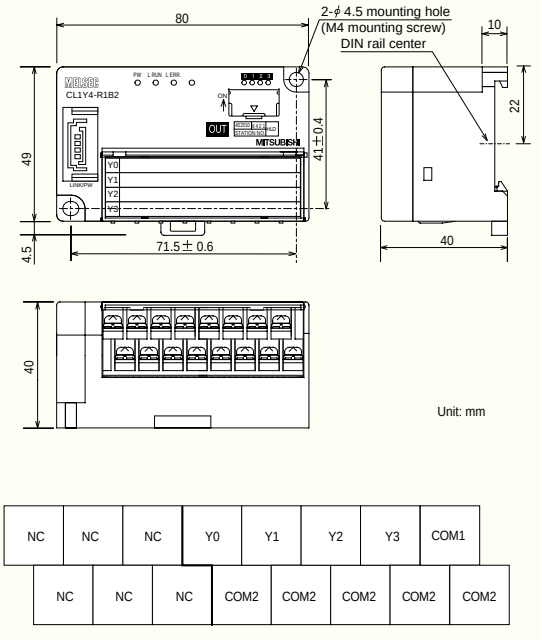
■ Detailed specifications

| Output Specifications | | Description |
|---|---|---|
| Rated switching voltage, current | | 30VDC 2A/1 point, 250VAC 2A/1 point |
| Maximum load voltage | | 250VAC or less, 30VDC or less |
| Response time | OFF→ON | Approximately 1.0ms or less |
| | ON→OFF | Approximately 1.0ms or less |
| Maximum current consumption | | 65mA or less (when all points ON) |
| Weight (kg) | | 0.11 |

■ External equipment connection diagram



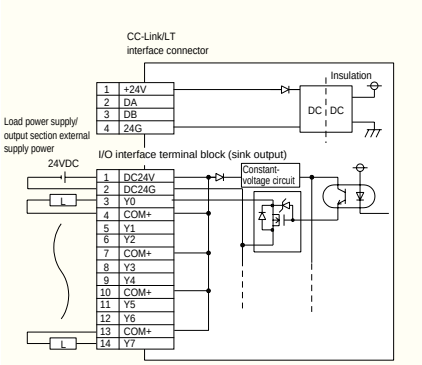

■ External dimensions, terminal layout



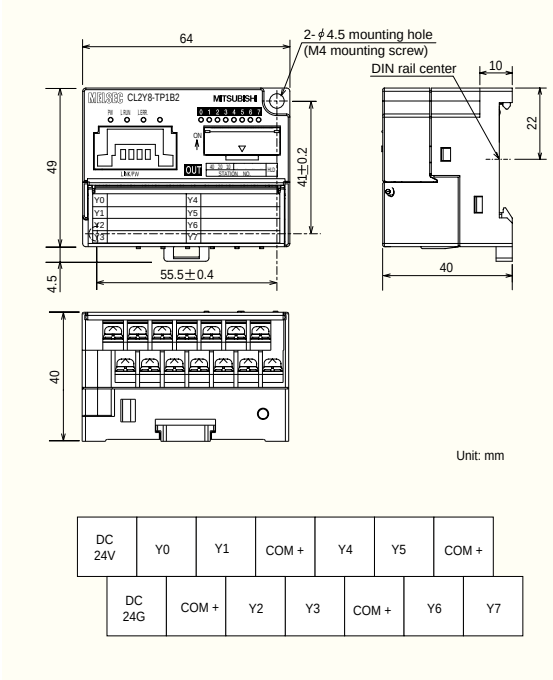
# CL2Y8-TP1B2 output module


Transistor output 8 points | Sink | 0.1A 2-wire type | Terminal block | Protection | Hold

## External equipment connection diagram




## External dimensions, terminal layout




## Detailed specifications

| Output Specifications | | Description |
|---|---|---|
| Insulation system | | Photocoupler insulation |
| Rated load voltage | | 12/24VDC |
| Operating load voltage range | | 10.2 to 28.8VDC (ripple ratio within 5%) |
| Maximum load current | | 0.1A/1 point 0.8A/1 common |
| Maximum inrush current | | 0.7A 10ms or less |
| OFF-time leakage current | | 0.1mA or less |
| ON-time maximum voltage drop | | 0.3V or less (TYP) 0.1A, 0.6V or less (MAX) 0.1A |
| Response time | OFF→ON | 0.5ms or less |
| | ON→OFF | 0.5ms or less (resistive load) |
| Surge suppressor | | Zener diode |
| Common system | | 8 points/1 common (4 points) (terminal block 2-wire type) |
| Output section external supply power | Voltage | As in load power supply |
| | Current consumption | 15mA or less (TYP. 24VDC, when all points ON) |
| Unit power supply | Voltage | 20.4 to 28.8VDC (ripple ratio within 5%) |
| | Max. current consumption | 40mA or less (when all points ON) |
| Weight (kg) | | 0.09 |

## Specifications common to terminal block types

| Specifications | Description |
|---|---|
| Applicable crimping terminal /wire size | ・RAV1.25-3 (conforming to JIS C2805) [Applicable wire size: 0.3 to 1.25mm²] |
| Unit mounting method | DIN rail mounting or screw mounting: M4×0.7mm×16mm or more (Tightening torque range 78 to 108N・cm) |
| Applicable DIN rail | TH35-7.5Fe, TH35-7.5Al (conforming to JIS C2812) |

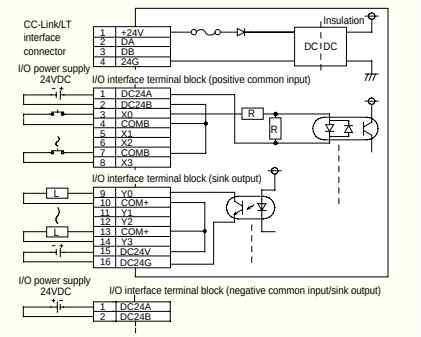
# Remote I/O Modules

## Terminal block type

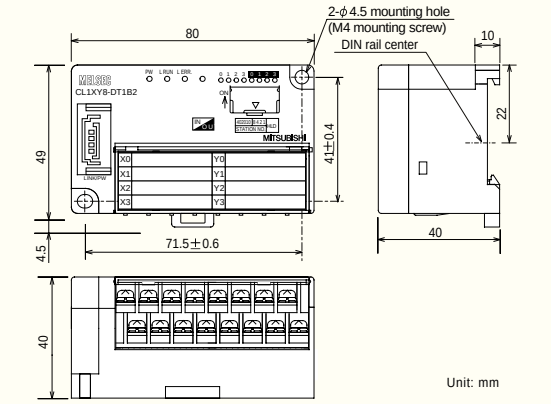
### CL1XY8-DT1B2 I/O module

DC input 4 points | +COM / -COM | 24VDC 2-wire type | Transistor output 4 points | Sink | 0.1A 2-wire type | Terminal block | Hold

■External equipment connection diagram




■External dimensions, terminal layout




Unit: mm

| DC 24A | X0 | X1 | COMB | Y0 | Y1 | COM + | DC 24V |
|---|---|---|---|---|---|---|---|
| DC 24B | COMB | X2 | X3 | COM + | Y2 | Y3 | DC 24G |

■Detailed specifications

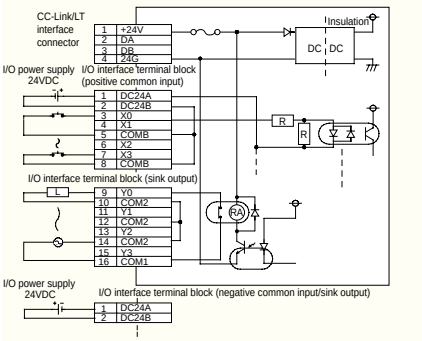
| Input Specifications | | Description |
|---|---|---|
| Insulation system | | Photocoupler insulation |
| Rated input voltage | | 24VDC |
| Rated input current | | Approximately 4mA |
| Operating voltage range | | 20.4 to 28.8VDC (-15% to +20%)<br>Ripple ratio within 5% |
| Maximum number of simultaneous input points | | 100% (24VDC) |
| ON voltage/ON current | | 19V or more/3mA or more |
| OFF voltage/OFF current | | 11V or less/1.7mA or less |
| Input resistance | | 5.6kΩ |
| Response time | OFF→ON | 1.5ms or less |
| | ON→OFF | 1.5ms or less |
| Common system | | 4 points/1 common (2 points)<br>(terminal block 2-wire type) |
| Unit power supply | Voltage | 20.4 to 28.8VDC (-15% to +20%)<br>Ripple ratio within 5% |
| | Max.current consumption | 65mA or less (when all points ON) |
| Weight (kg) | | 0.10 |

| Output Specifications | | Description |
|---|---|---|
| Insulation system | | Photocoupler insulation |
| Rated load voltage | | 12/24VDC |
| Operating load voltage range | | 10.2 to 28.8VDC (ripple ratio within 5%) |
| Maximum load current | | 0.1A/1 point 0.4A/1 common |
| OFF-time leakage current | | 0.1mA or less/30VDC |
| ON-time maximum voltage drop | | 0.3V or less (TYP) 0.1A,<br>0.6V or less (MAX) 0.1A |
| Response time | OFF→ON | 1.0ms or less |
| | ON→OFF | 1.0ms or less |
| Surge suppressor | | Zener diode |
| Common system | | 4 points/1 common (2 points)<br>(terminal block 2-wire type) |

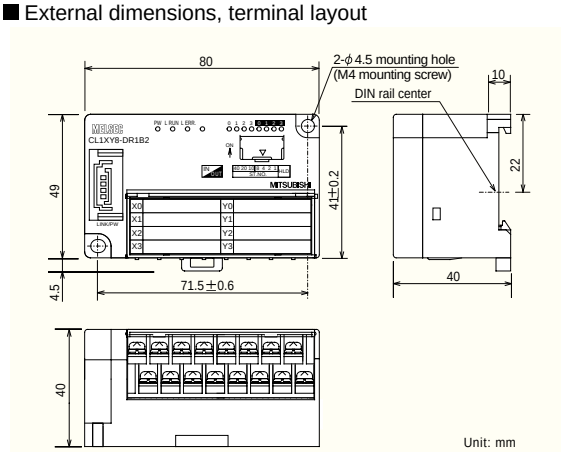
### CL1XY8-DR1B2 I/O module

DC input 4 points | +COM / -COM | 24VDC 2-wire type | Transistor output 4 points | 2A 2-wire type | Terminal block | Hold

■External equipment connection diagram




■External dimensions, terminal layout




Unit: mm

| DC 24A | X0 | X1 | COMB | Y0 | Y1 | Y2 | Y3 |
|---|---|---|---|---|---|---|---|
| DC 24B | COMB | X2 | X3 | COM2 | COM2 | COM2 | COM1 |

■Detailed specifications

| Input Specifications | | Description |
|---|---|---|
| Insulation system | | Photocoupler insulation |
| Rated input voltage | | 24VDC |
| Rated input current | | Approximately 4mA |
| Operating voltage range | | 20.4 to 28.8VDC(-15% to +20%)<br>Ripple ratio within 5% |
| Maximum number of simultaneous input points | | 100%(24VDC) |
| ON voltage/ON current | | 19V or more/3mA or more |
| OFF voltage/OFF current | | 11V or less/1.7mA or less |
| Input resistance | | 5.6k Ω |
| Response time | OFF→ON | 1.5ms or less |
| | ON→OFF | 1.5ms or less |
| Common system | | 4 points/1 common (2 points)<br>(terminal block 2-wire type) |
| Unit power supply | Voltage | 20.4 to 28.8VDC (-15% to +20%)<br>Ripple ratio within 5% |
| | Max.current consumption | 70mA or less (when all points ON) |
| Weight (kg) | | 0.11 |

| Output Specifications | | Description |
|---|---|---|
| Rated switching voltage, current | | 30VDC 2A/1 point,<br>250VAC 2A/1 point |
| Maximum load voltage | | 250VAC or less, 30VDC or less |
| Response time | OFF→ON | 1.0ms or less |
| | ON→OFF | 1.0ms or less |

# Remote I/O Modules

Sensor

## Sensor connector type

### Overview

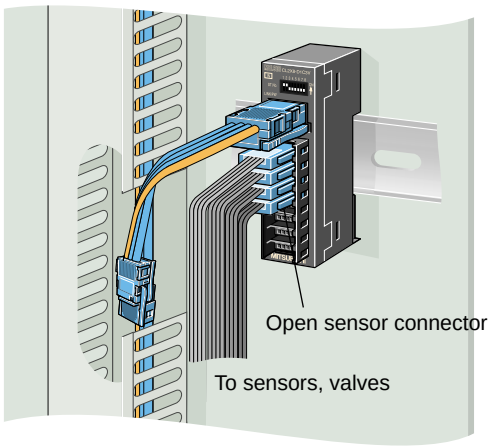
Sensor connector type

### Features

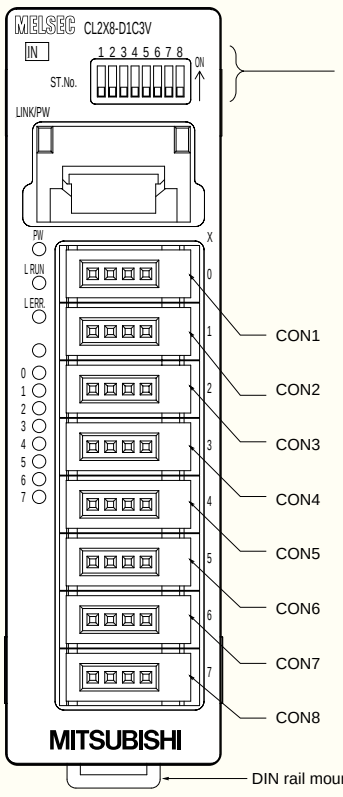
- The smallest size in the industry
- Adoption of open sensor connector that is easy to connect sensors
- Unit can be replaced by merely disconnecting the connector.

### Installation

■ DIN rail mounting can be done.




### Part Names and Functions




CC-Link/LT interface connector

| Pin No. | Signal Name |
|---|---|
| 1 | +24V |
| 2 | DA |
| 3 | DB |
| 4 | 24G |

Operation indicator LEDs
ON: Lit
OFF: Extinguished

| LED Name | Operation |
|---|---|
| PW | Lit when power is supplied |
| L RUN | Lit when normal operation is performed. |
| L ERR. | Lit when communication error occurs. |

I/O operation indicator LEDs
ON: Lit
OFF: Extinguished

DIP switches

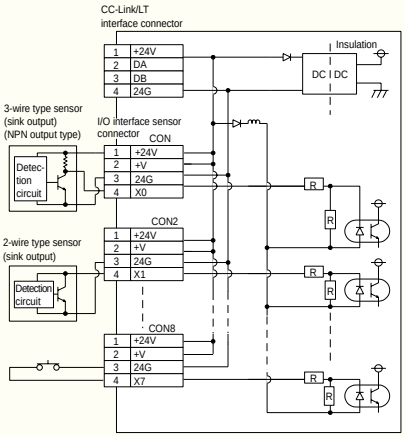
| Setting | Switch Name | ST.No. | Description | | | |
|---|---|---|---|---|---|---|
| Station number setting switches | STATION NO. | 1 | Tenth digit | 40 | ON : 40 | OFF : 0 |
| | | 2 | | 20 | ON : 20 | |
| | | 3 | | 10 | ON : 10 | |
| | | 4 | Unit digit | 8 | ON : 8 | |
| | | 5 | | 4 | ON : 4 | |
| | | 6 | | 2 | ON : 2 | |
| | | 7 | | 1 | ON : 1 | |
| I/O operation setting | 0.5ms 1.5ms | 8 | Input unit: Response speed setting<br>OFF: 1.5ms (standard type)<br>ON: 0.5ms (fast response type) | | | |
| | HLD | | Output unit: Hold function valid<br>OFF: Output clear<br>ON: Output held | | | |

DIN rail mounting hook ※Refer to page 21 for DIN rail mounting specifications.

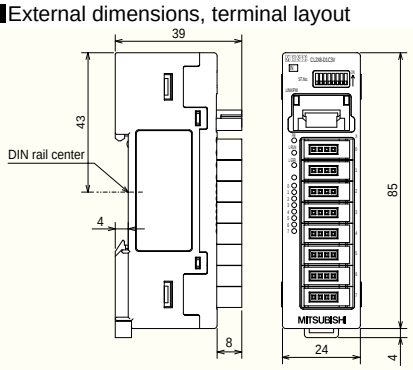
## CL2X8-D1C3V input module

DC input 8 points | +COM | 24VDC 2-wire type or 24VDC 3-wire type | Sensor | Input response switching | Vertical

### ■External equipment connection diagram




### ■External dimensions, terminal layout




Unit: mm

I/O interface sensor connector

| 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 |

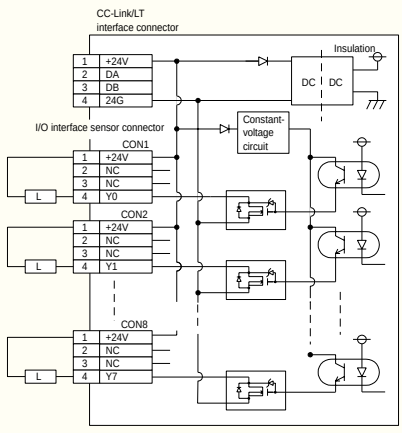
### ■Detailed specifications

| Input Specifications | | Description |
|---|---|---|
| Insulation system | | Photocoupler insulation |
| Rated input voltage | | 24VDC |
| Rated input current | | Approximately 4mA |
| Operating voltage range | | As in unit power supply |
| Maximum number of simultaneous input points | | 100%(24VDC) |
| ON voltage/ON current | | 19V or more/3mA or more |
| OFF voltage/OFF current | | 11V or less/1.7mA or less |
| Input resistance | | 5.6kΩ |
| Response time | OFF→ON | 0.5ms/1.5ms or less (at 24VDC) [Selected using DIP switch, default value = OFF/1.5ms] |
| | ON→OFF | 0.5ms/1.5ms or less (at 24VDC) [Selected using DIP switch, default value = OFF/1.5ms] |
| Common system | | 8 points/1 common (sensor connector 3-wire type) |
| Unit power supply | Voltage | 20.4 to 28.8VDC (-15% to +20%) Ripple ratio within 5% |
| | Max.current consumption | 40mA or less (when all points ON) |
| Weight (kg) | | 0.05 |

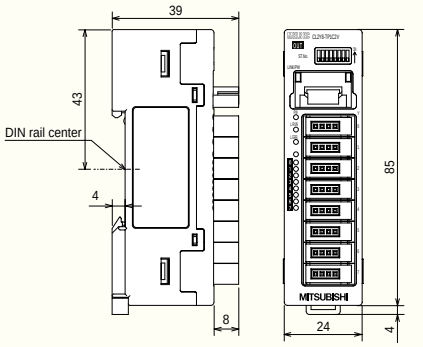
## CL2Y8-TP1C2V output module

Transistor output 8 points | Sink | 0.1A 2-wire type | Sensor | Protection | Hold | Vertical

### ■External equipment connection diagram




### ■External dimensions, terminal layout




Unit: mm

I/O interface sensor connector

| 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 |

### ■Detailed specifications

| Input Specifications | | Description |
|---|---|---|
| Insulation system | | Photocoupler insulation |
| Rated load voltage | | 24VDC |
| Operating load voltage range | | As in unit power supply |
| Maximum load current | | 0.1A/1 point 0.8A/common |
| Maximum inrush current | | 0.7A 10ms or less |
| OFF-time leakage current | | 0.1mA or less |
| ON-time maximum voltage drop | | 0.3V or less (TYP) 0.1A, 0.6V or less (MAX) 0.1A |
| Response time | OFF→ON | 0.5ms or less |
| | ON → OFF | 0.5ms or less (resistive load) |
| Surge suppressor | | Zener diode |
| Common system | | 8 points/1 common (sensor connector 2-wire type) |
| Output section external supply power | | As in unit power supply |
| Unit power supply | Voltage | 20.4 to 28.8VDC (ripple ratio within 5%) |
| | Max.current consumption | 55mA or less (when all points ON), external load current not included |
| Weight (kg) | | 0.05 |

# Remote I/O Modules

## MIL connector type

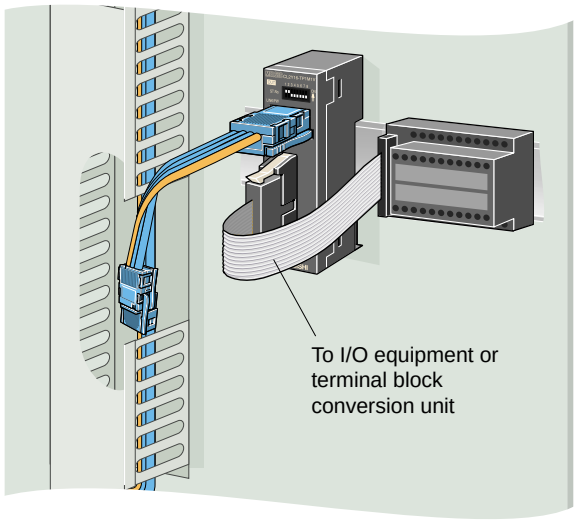
### Overview

MIL connector type

**Features**

- The smallest size in the industry
- MIL connector that is easy to connect a relay terminal or terminal block conversion module
- Unit can be replaced by merely disconnecting the connector.

**Installation** ■ DIN rail mounting can be done.




### Part Names and Functions

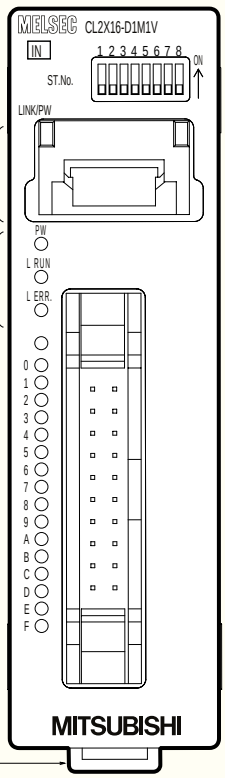
CC-Link/LT interface connector

| Pin No. | Signal Name |
|---|---|
| 1 | +24V |
| 2 | DA |
| 3 | DB |
| 4 | 24G |

Operation indicator LEDs
ON: Lit
OFF: Extinguished

| LED Name | Operation |
|---|---|
| PW | Lit when power is supplied. |
| L RUN | Lit when normal operation is performed. |
| L ERR. | Lit when communication error occurs. |

I/O operation indicator LEDs
ON: Lit
OFF: Extinguished



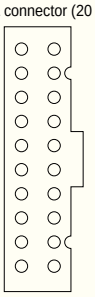

DIN rail mounting hook

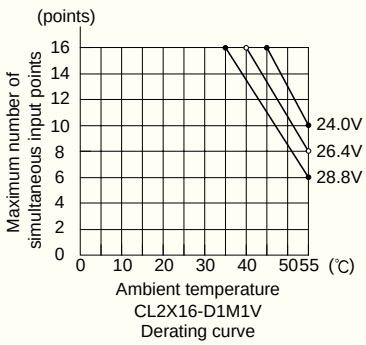
*Refer to page 21 for DIN rail mounting specifications.

DIP switches

| Setting | Switch Name | ST.No. | Description | | | |
|---|---|---|---|---|---|---|
| Station number setting switches | STATION NO. | 1 | Tenth digit | 40 | ON : 40 | OFF : 0 |
| | | 2 | | 20 | ON : 20 | |
| | | 3 | | 10 | ON : 10 | |
| | | 4 | Unit digit | 8 | ON : 8 | |
| | | 5 | | 4 | ON : 4 | |
| | | 6 | | 2 | ON : 2 | |
| | | 7 | | 1 | ON : 1 | |
| I/O operation setting | 0.5ms 1.5ms | 8 | Input unit: Response speed setting OFF: 1.5ms (standard type) ON: 0.5ms (fast response type) | | | |
| | HLD | | Output unit: Hold function valid OFF: Output clear ON: Output held | | | |

MIL connector (20 pins)






CL2X16-D1M1V Derating curve

## CL2X16-D1M1V input module

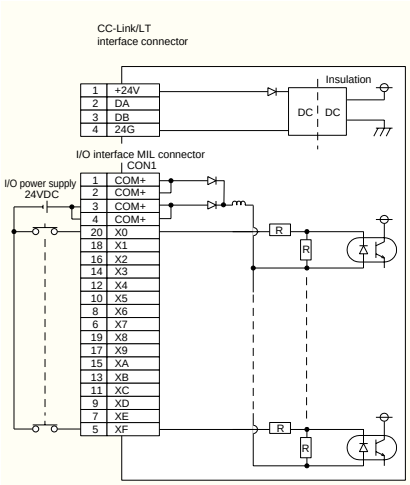
DC input 16 points | +COM | 24VDC 2-wire type | MIL | Input response switching | Vertical

### Detailed specifications

| Input Specifications | | Description |
|---|---|---|
| Insulation system | | Photocoupler insulation |
| Rated input voltage | | 24VDC |
| Rated input current | | Approximately 4mA |
| Operating voltage range | | 20.4 to 28.8VDC(-15% to +20%)<br>Ripple ratio within 5% |
| Maximum number of simultaneous input points | | 62.5%(24VDC)(※1) |
| ON voltage/ON current | | 19V or more/3mA or more |
| OFF voltage/OFF current | | 11V or less/1.7mA or less |
| Input resistance | | 5.6kΩ |
| Response time | OFF→ON | 0.5ms/1.5ms or less (at 24VDC)<br>[Selected using DIP switch, default value = OFF/1.5ms] |
| | ON→OFF | 0.5ms/1.5ms or less (at 24VDC)<br>[Selected using DIP switch, default value = OFF/1.5ms] |
| Common system | | 16 points/1 common (2 points)<br>(MIL connector 1-wire type) |
| Unit power supply | Voltage | 20.4 to 28.8VDC(-15% to +20%)<br>Ripple ratio within 5% |
| | Max. current consumption | 45mA or less (when all points ON) |
| Weight (kg) | | 0.05 |

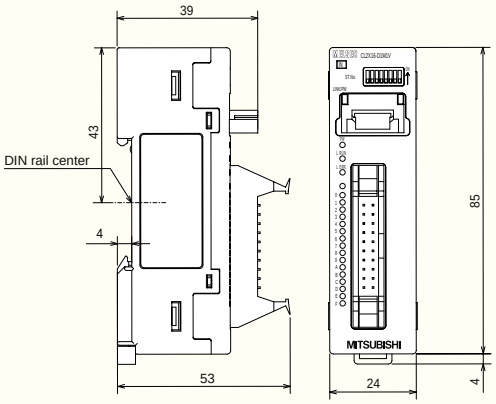
* 1) Refer to the derating curve on page 26.

### External equipment connection diagram




* For COM+, use either of 1P and 2P or 3P and 4P.

### External dimensions, terminal layout




Unit: mm

I/O interface MIL connector

| Terminal No. | Signal Name | Terminal No. | Signal Name |
|---|---|---|---|
| CON1-1 | COM+ | CON1-8 | X6 |
| CON1-2 | COM+ | CON1-6 | X7 |
| CON1-3 | COM+ | CON1-19 | X8 |
| CON1-4 | COM+ | CON1-17 | X9 |
| CON1-20 | X0 | CON1-15 | XA |
| CON1-18 | X1 | CON1-13 | XB |
| CON1-16 | X2 | CON1-11 | XC |
| CON1-14 | X3 | CON1-9 | XD |
| CON1-12 | X4 | CON1-7 | XE |
| CON1-10 | X5 | CON1-5 | XF |

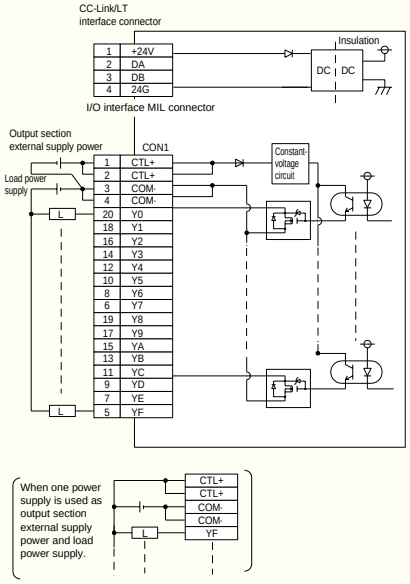
## CL2Y16-TP1M1V output module

Transistor output 16 points | Sink | 0.1A 1-wire type | MIL | Protection | Hold | Vertical

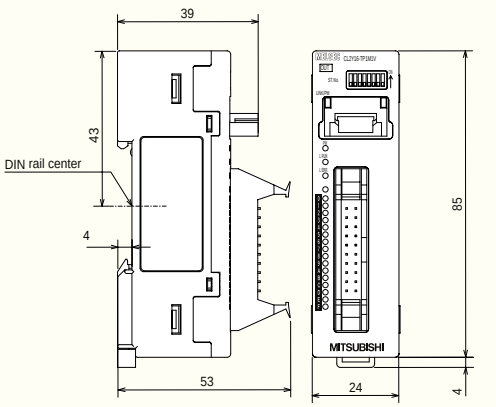
### Detailed specifications

| Output Specifications | | Description |
|---|---|---|
| Insulation system | | Photocoupler insulation |
| Rated load voltage | | 12/24VDC |
| Operating load voltage range | | 10.2 to 28.8VDC(ripple ratio within 5%) |
| Maximum load current | | 0.1A/1 point 1.6A/common |
| Maximum inrush current | | 0.7A 10ms or less |
| OFF-time leakage current | | 0.1mA or less |
| ON-time maximum voltage drop | | 0.3V or less (TYP) 0.1A,<br>0.6V or less (MAX) 0.1A |
| Response time | OFF→ON | 1.0ms or less |
| | ON→OFF | 1.0ms or less (resistive load) |
| Surge suppressor | | Zener diode |
| Common system | | 16 points/1 common (2 points)<br>(MIL connector 1-wire type) |
| Output section external supply power | Voltage | 10.2 to 28.8VDC (ripple ratio within 5%) |
| | Current consumption | 15mA or less (TYP. 24VDC, when all points ON)<br>External load current not included |
| Unit power supply | Voltage | 20.4 to 28.8VDC (ripple ratio within 5%) |
| | Max. current consumption | 50mA or less (when all points ON) |
| Weight (kg) | | 0.05 |

### External equipment connection diagram




### External dimensions, terminal layout




Unit: mm

I/O interface MIL connector

| Terminal No. | Signal Name | Terminal No. | Signal Name |
|---|---|---|---|
| CON1-1 | CTL+ | CON1-8 | Y6 |
| CON1-2 | CTL+ | CON1-6 | Y7 |
| CON1-3 | COM- | CON1-19 | Y8 |
| CON1-4 | COM- | CON1-17 | Y9 |
| CON1-20 | Y0 | CON1-15 | YA |
| CON1-18 | Y1 | CON1-13 | YB |
| CON1-16 | Y2 | CON1-11 | YC |
| CON1-14 | Y3 | CON1-9 | YD |
| CON1-12 | Y4 | CON1-7 | YE |
| CON1-10 | Y5 | CON1-5 | YF |

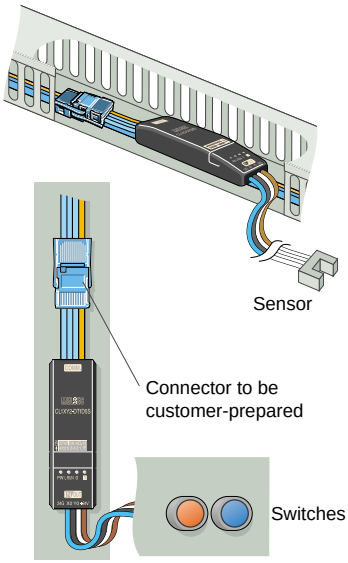
# Remote I/O Modules

## Cable type

### Overview

Cable type

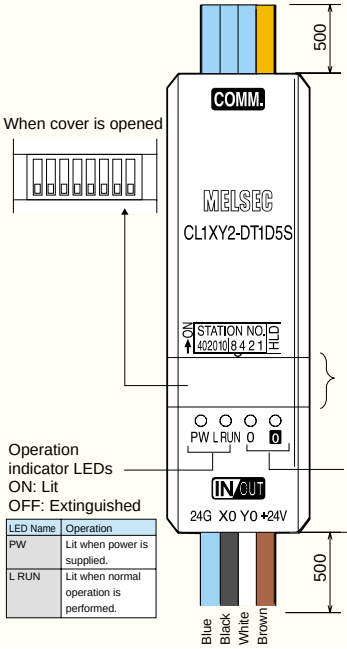
### Installation




### Features

- Small size in the industry's smallest class
- Like a cable, this module can be placed in a duct.
- Communication cable and external equipment connection cable are combined as one for ease of wiring.

### Part Names and Functions




DIP switches

| Setting | Switch Name | Description | | | |
|---|---|---|---|---|---|
| Station number setting switches | STATION NO. | Tenth digit | 40 | ON : 40 | OFF : 0 |
| | | | 20 | ON : 20 | |
| | | | 10 | ON : 10 | |
| | | Unit digit | 8 | ON : 8 | |
| | | | 4 | ON : 4 | |
| | | | 2 | ON : 2 | |
| | | | 1 | ON : 1 | |
| I/O operation setting | 0.5ms 1.5ms | Input unit: Response speed setting<br>OFF: 1.5ms (standard type)<br>ON: 0.5ms (fast response type) | | | |
| | HLD | Output unit: Hold function valid<br>OFF: Output clear<br>ON: Output held<br>I/O hybrid unit:Hold function valid<br>OFF: Output clear<br>ON: Output held | | | |

Operation indicator LEDs
ON: Lit
OFF: Extinguished

| LED Name | Operation |
|---|---|
| PW | Lit when power is supplied. |
| L RUN | Lit when normal operation is performed. |

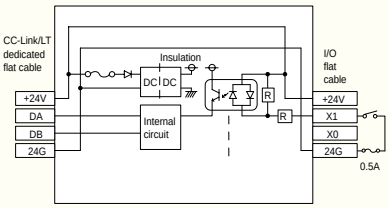
I/O operation indicator LEDs
ON: Lit
OFF: Extinguished

Unit: mm

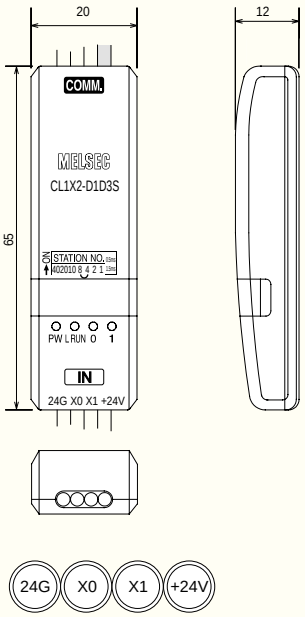
## CL1X2-D1D3S input module

DC input 2 points | +COM | 24VDC 2-wire type or 24VDC 3-wire type | Cable | Input response switching

### External equipment connection diagram




### External dimensions, terminal layout




Unit: mm

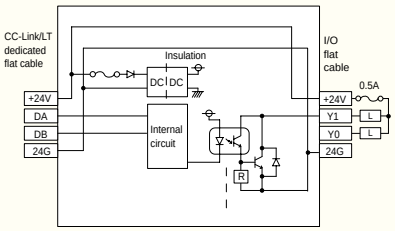
### Detailed specifications

| Specifications | | Description |
|---|---|---|
| Insulation system | | Photocoupler insulation |
| Rated input voltage | | 24VDC |
| Rated input current | | Approximately 4mA |
| Operating voltage range | | 20.4 to 28.8VDC (-15% to +20%)<br>Ripple ratio within 5% |
| Maximum number of simultaneous input points | | 100%(24VDC) |
| ON voltage/ON current | | 19V or more/3mA or more |
| OFF voltage/OFF current | | 11V or less/1.7mA or less |
| Input resistance | | 5.6kΩ |
| Response time | OFF→ON | 0.5ms/1.5ms or less (at 24VDC)<br>[Selected using DIP switch, default value = OFF/1.5ms] |
| | ON→OFF | 0.5ms/1.5ms or less (at 24VDC)<br>[Selected using DIP switch, default value = OFF/1.5ms] |
| Common system | | 2 points/1 common (1 point) |
| Unit power supply | Voltage | 20.4 to 28.8VDC(-15% to +20%)<br>Ripple ratio within 5% |
| | Max. current consumption | 35mA or less (when all points ON) |
| Weight (kg) | | 0.07(communication and input cables 500mm included) |

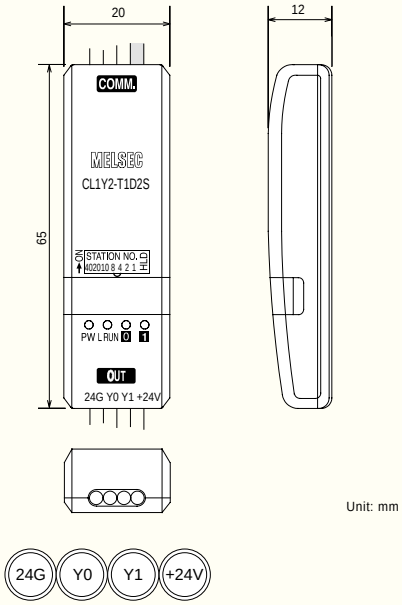
## CL1Y2-T1D2S output module

Transistor output 2 points | Sink | 0.1A 2-wire type | Cable | Hold

### External equipment connection diagram




### External dimensions, terminal layout




Unit: mm

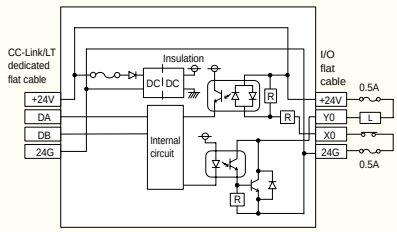
### Detailed specifications

| Output Specifications | | Description |
|---|---|---|
| Insulation system | | Photocoupler insulation |
| Rated load voltage | | 24VDC |
| Operating load voltage range | | 20.4 to 28.8VDC (ripple ratio within 5%) |
| Maximum load current | | 0.1A/1 point 0.4A/1 common |
| Maximum rush current | | 0.4A/10ms |
| OFF-time leakage current | | 0.1mA or less/30VDC |
| ON-time maximum voltage drop | | 1V or less (MAX) 0.1A |
| Response time | OFF→ON | 1.0ms or less |
| | ON→OFF | 1.0ms or less (resistive load) |
| Surge suppressor | | Zener diode |
| Common system | | 2 points/1 common (1 point) |
| Unit power supply | Voltage | 20.4 to 28.8VDC (ripple ratio within 5%) |
| | Max. current consumption | 35mA or less (when all points ON) |
| Weight (kg) | | 0.07(communication and input cables 500mm included) |

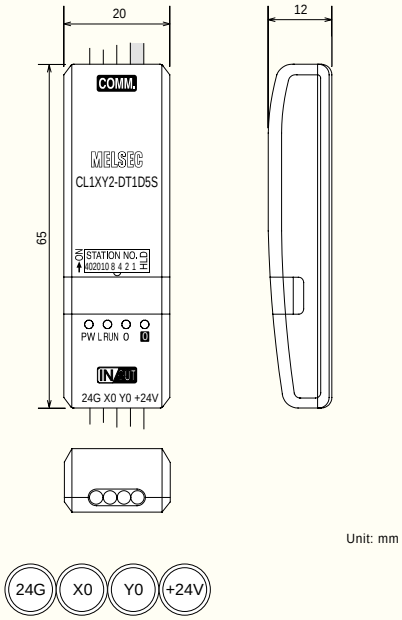
## CL1XY2-DT1D5S I/O module

DC input 1 points | +COM | 24VDC 2-wire type | or | 24VDC 3-wire type | Transistor output 1 points | Sink | 0.1A 2-wire type | Cable | Hold

### External equipment connection diagram




### External dimensions, terminal layout




Unit: mm

### Detailed specifications

| Input Specifications | | Description |
|---|---|---|
| Insulation system | | Photocoupler insulation |
| Rated input voltage | | 24VDC |
| Rated input current | | Approximately 4mA |
| Operating voltage range | | 20.4 to 28.8VDC (-15% to +20%) Ripple ratio within 5% |
| Maximum number of simultaneous input points | | 100% (24VDC) |
| ON voltage/ON current | | 19V or more/3mA or more |
| OFF voltage/OFF current | | 11V or less/1.7mA or less |
| Input resistance | | 5.6kΩ |
| Unit power supply | Voltage | 20.4 to 28.8VDC (-15% to +20%) Ripple ratio within 5% |
| | Max.current consumption | 35mA or less (when all points ON) |
| Weight (kg) | | 0.07 (communication and input cables 500mm included) |

| Output Specifications | | Description |
|---|---|---|
| Insulation system | | Photocoupler insulation |
| Rated load voltage | | 24VDC |
| Operating load voltage range | | 20.4 to 28.8VDC (ripple ratio within 5%) |
| Maximum load current | | 0.1A/1 point 0.4A/common |
| Maximum rush current | | 0.4A/10ms |
| OFF-time leakage current | | 0.1mA or less/30VDC |
| ON-time maximum voltage drop | | 1V or less (MAX) 0.1A |
| Response time | OFF→ON | 1.0ms or less |
| | ON→OFF | 1.0ms or less (resistive load) |
| Surge suppressor | | Zener diode |
| Common system | | 1 point/1 common (1 point) |

# Power Supply Adaptor and Others

## *Power Supply Adaptor*

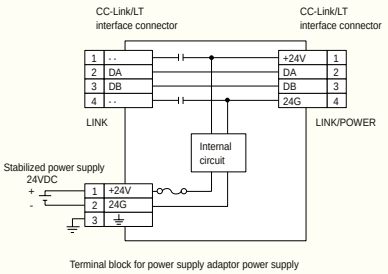
### CL1PAD1 power supply adaptor

■ Detailed specifications

| Specifications | Description |
|---|---|
| Maximum input voltage | 28.8VDC |
| Maximum input current | 5.0A |
| Insulation resistance | 10MΩ across input-FG by 500VDC insulation resistance tester |
| External connection system | Module power supply: Terminal block, 3 pins (M3 screw)<br>Communication line(transmission circuits are all changed into communication line)/ unit supply power section:<br>CC-Link/LT dedicated flat cable compatibility<br>CC-Link/LT dedicated connector (4p)×2 |

At least one power supply adaptor is always required for the CC-Link/LT system.

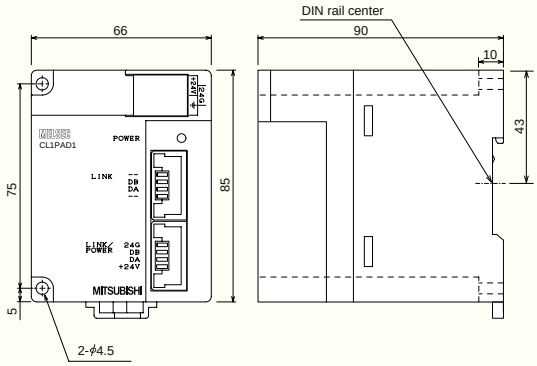
■ External equipment connection diagram



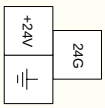

● External supply power should be prepared by the customer.

Refer to page 34 for selection and power supply capacity calculation (technical information).

■ External dimensions




■ Terminal layout

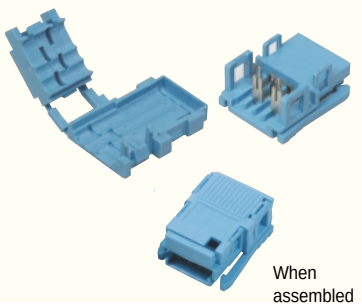



■ Features

This power supply adaptor is designed to stabilize the whole system when power is supplied to the CC-Link/LT system from an external power supply (customer-prepared).

## *Accessories*

### Communication connector




Model: CL9-CNF-18

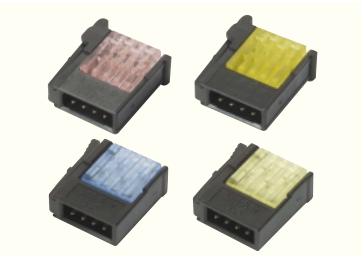
● Connector exclusively for CC-Link/LT (In packs of ten)
Male/female-integrated connector of two-piece structure.

### Cable

Model: CL9-FL4-18

● CC-Link/LT dedicated flat cable.
For prevention of reverse insertion, the number of grooves on one side is one fewer than that on the other.

### Open sensor connectors



Model: ECN-******

● I/O connectors exclusively for sensor connector type.

* : Model changes depending on the connector color and wire diameter.

### Terminating resistor

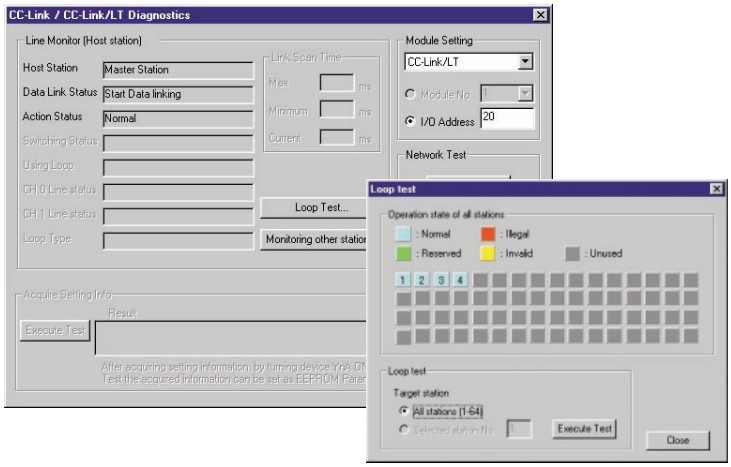
Model: CL9-RYVK

● Terminating resistor for CC-Link/LT dedicated cable (CL9-FL4-18).
(In packs of two)

## Software (MELSEC Programming Software)

GX-Developer SW□D5C-GPPW-E

■CC-Link/LT can be diagnosed/monitored using GX Developer.




■The QCPU allows host monitor, other station monitor and line monitor to be performed in "CC-Link/LT diagnostics" of GX Developer.

■Operating environment

| Item | Environment |
|---|---|
| OS | Windows 95 (English version), Windows 98 (English version) |
| | Windows NT Workstation 4.0 (English version), |
| | Windows 2000 (English version), Windows ME (English version) |
| CPU | Pentium 133MHz or more |
| Display | Resolution 800×600 dots or more (recommended 1024×768 dots) |
| Memory | 32MB or more |
| Hard disk capacity | 80MB or more |
| Disk drive | 3.5 inch (1.44MB) floppy disk drive, CD-ROM drive |

| Product | Environment | Description | Relevant Manuals, Etc. |
|---|---|---|---|
| GX Developer | SW□D5C-GPPW-E | MELSEC PLC software package | Operating Manual (SH-080166)<br>Mitsubishi Integrated FA Software Catalog (L(NA)08008) |

## CC-Link/LT Dedicated Communication LSIs

**Soon to be released**

CLC13 (for master station), CLC21 (for remote I/O station)

You can develop CC-Link/LT compatible products easily without being conscious of a communication protocol.

【CLC13】(master station)
Having a built-in communication protocol, this LSI allows you to develop the product that will control data communication and remote stations, without being conscious of a communication protocol, by performing memory read/write from an external CPU.

【CLC21】(remote I/O station)
Having a built-in communication protocol, this LSI allows you to develop the product that will handle bit data, without using an external CPU (programless).

| Product | CLC13 | CLC21 | |
|---|---|---|---|
| Order model | CL2GA13-60 | CL2GA21-60 | CL2GA21-300 |
| Packing unit | 60 pcs. | 60 pcs. | 300 pcs. |
| Application | Master station | Remote I/O station | |

CLC:CC-Link/LT Controller

### Precautions

- To purchase the communication LSIs, you need to become a member (regular or higher member) of the CC-Link Partner Association (CLPA). Refer to page 36 for the CC-Link Partner Association.
- For details of the communication LSIs, contact the following Open System Center.

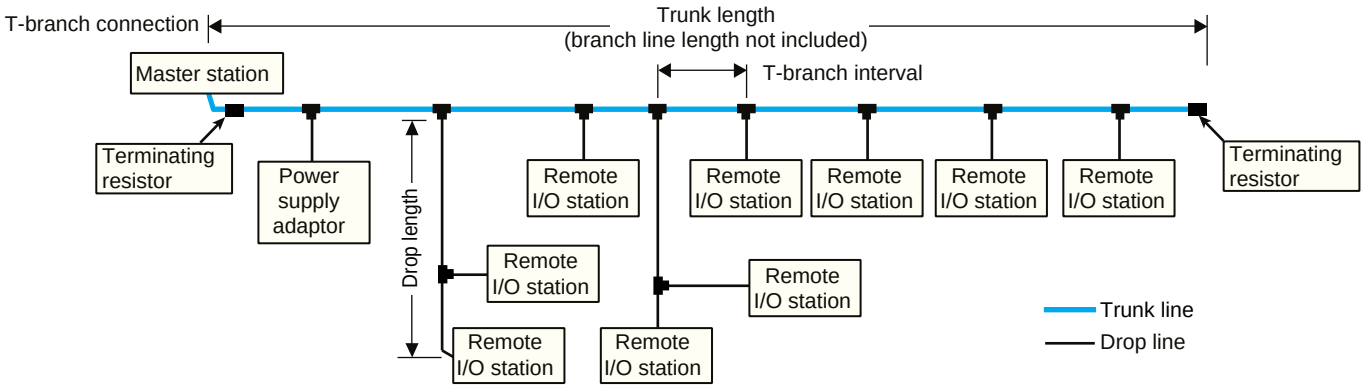
Open System Center, Nagoya Works,
Mitsubishi Electric Corporation
Tel:+81-52-712-2369 Fax:+81-52-712-2419
Open: 9:00 to 12:00, 13:00 to 17:00
(Except Saturdays, Sundays, national holidays and our holidays)

# Specifications

## CC-Link/LT Specifications

| | | | | 4-Point Mode | 8-Point Mode | 16-Point Mode |
|---|---|---|---|---|---|---|
| Control specifications | Maximum number of link points<br>Points within parentheses assume that I/O are used | | | 256 points (512 points) | 512 points (1024 points) | 1024 points (2048 points) |
| | Number of link points per station<br>Points within parentheses assume that I/O are used | | | 4 points (8 points) | 8 points (16 points) | 16 points (32 points) |
| | Link scan time (ms) | When 32 stations are connected | Number of points | 128 points | 256 points | 512 points |
| | | | 2.5Mbps | 0.7 | 0.8 | 1.0 |
| | | | 625kbps | 2.2 | 2.7 | 3.8 |
| | | | 156kbps | 8.0 | 10.0 | 14.1 |
| | | When 64 stations are connected | Number of points | 256 points | 512 points | 1024 points |
| | | | 2.5Mbps | 1.2 | 1.5 | 2.0 |
| | | | 625kbps | 4.3 | 5.4 | 7.4 |
| | | | 156kbps | 15.6 | 20.0 | 27.8 |
| Communication specifications | Communication speed (bps) | | | 2.5M/625k/156k | | |
| | Protocol | | | BITR (Broadcastpollintg + Interval Timed Response) | | |
| | Network topology | | | T-branch | | |
| | Error control method | | | CRC | | |
| | Number of connected units | | | 64 | | |
| | Remote station numbers | | | 1 to 64 | | |
| | Maximum number of modules connected in 1 drop line | | | 8 | | |
| | Distance between stations | | | No restriction | | |
| | T-branch interval | | | No restriction | | |
| | Master station connection position | | | Connected to the end of the main line | | |
| | RAS functions | | | Network diagnostics, internal loopback diagnostics, slave station separation, automatic return to system | | |
| | Connection cable | | | Dedicated flat cable(0.75mm$^2$ ×4) | | |

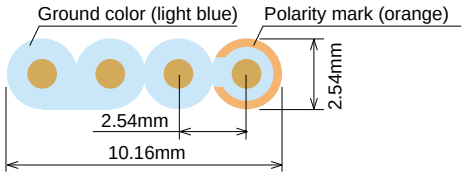
## Network Wiring Specifications




| Item | Specifications | | | Remarks |
|---|---|---|---|---|
| Communication speed | 2.5Mbps | 625kbps | 156kbps | - |
| Distance between stations | No restriction | | | - |
| Maximum number of modules connected in 1 drop line | 8 | | | - |
| Maximum trunk length | 35m | 100m | 500m | Cable length between terminating resistors<br>Branch line length not included |
| T-branch interval | No restriction | | | - |
| Maximum drop length | 4m | 16m | 60m | Cable length per branch |
| Cumulative drop line length | 15m | 50m | 200m | Sum of all drop lines |

# Cable Specifications

CC-Link/LT dedicated flat cable specifications

| Item | Specifications | Section |
|---|---|---|
| Cable type | Flat cable |  |
| Operating temperature range | -10 to 80℃ | |
| Rated voltage | 30V | |
| Number of cores | 4 | |
| Conductor resistance (20℃) | 23.4Ω/Km or less | |
| Safety | UL Subject 758 | |
| Flame resistance | UL VW-1・-F- | |



# General Specifications

General specifications indicate the specifications of the environment where these products can be installed and operated.
Unless otherwise exceptional specifications are indicated, the general specifications apply to all products.
Install and operate the products in the environment given in the general specifications.

| Item | Specifications | | | | |
|---|---|---|---|---|---|
| Operating ambient temperature | 0 to 55℃ (*1) | | | | |
| Storage ambient temperature | -25 to 75℃ (*1) | | | | |
| Operating ambient humidity | Conforming to JIS B 3502, IEC61131-2, level RH-2 (5 to 95%RH, non-condensing) | | | | |
| Storage ambient humidity | Conforming to JIS B 3502, IEC61131-2, level RH-2 (5 to 95%RH, non-condensing) | | | | |
| Vibration resistance | Conforming to JIS B 3502, IEC 61131-2 | Under intermittent vibration | | | Sweep count |
| | | Frequency | Acceleration | Amplitude | 10 times each in X, Y, Z directions (for 80 minutes) |
| | | 10 to 57Hz | - | 0.075mm | |
| | | 57 to 150Hz | 9.8m/s$^2$ | | |
| | | Under continuous vibration | | | |
| | | Frequency | Acceleration | Amplitude | |
| | | 10 to 57Hz | - | 0.035mm | |
| | | 57 to 150Hz | 4.9m/s$^2$ | - | |
| Shock resistance | Conforming to JIS B 3502, IEC 61131-2 (147m/s$^2$, 3 times in each of directions X, Y, Z) | | | | |
| Operating atmosphere | No corrosive gases | | | | |
| Operating altitude | Conforming to JIS B 3502, IEC 61131-2 (2000m or less) (*2) | | | | |
| Installation place | Inside control box(*3) | | | | |
| Overvoltage category | Conforming to JIS B 3502, IEC 61131-2 (category II or less)(* 4) | | | | |
| Pollution level | Conforming to JIS B 3502, IEC 61131-2, pollution level 2 or less(*5) | | | | |

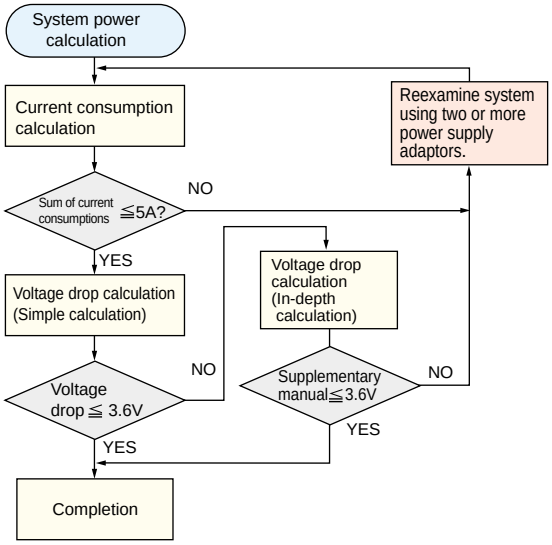
*1) The operating/storage ambient temperature satisfies the requirements that exceed the stipulations of JIS B 3502 and IEC61131-2.
*2) The equipment cannot be used under pressure higher than the atmospheric pressure of altitude 0m. Doing so can cause a failure.
*3) The equipment can be used in any environment other than in a control box if it satisfies the conditions such as the operating ambient temperature and operating ambient humidity.
*4) This indicates the section of the power supply to which the equipment is assumed to be connected between the public electrical power distribution network and the machinery within premises. Category II applies to equipment for which electrical power is supplied from fixed facilities. The surge voltage withstand level for up to the rated voltage of 300V is 2500V.
*5) This index indicates the degree to which conductive material is generated in the environment where the equipment is used. In pollution level 2, only non-conductive pollution occurs but temporary conductivity may be produced due to condensing.

# Power Supply Adaptor Installation

## Concept of Power Supply Adaptor Installation

A CC-Link/LT system always requires one or more power supply adaptors.
To construct a system with one power supply adaptor, the following two conditions must be satisfied.
If they cannot be satisfied, the system using two or more power supply adaptors must be reexamined

| | |
|---|---|
| 1. Since the current capacity of the power supply adaptor is 5A | Sum of current consumptions≦ 5A |
| 2. Since the minimum operating voltage of each unit is 20.4V | Voltage drop ≦3.6V (At 24VDC: 24V - 20.4V = 3.6V) |




## System Power Calculation Method

1) Current consumption calculation

Current consumption of CC-Link/LT system = Sum of current consumptions of CC-Link/LT modules (see below) + Sum of current consumptions of I/O equipment (sensors, etc.) *Modules marked * in the following table supply power to I/O equipment. ≦ 5A

CC-Link/LT unit current consumption list

| Type | Model | Specifications | Current Consumption (mA) |
|---|---|---|---|
| Master module | QJ61CL12 | Q series CC-Link/LT master module | 28 |
| Terminal block type | CL1X4-D1B2 | 4-point terminal block 24VDC input | 35 |
| | CL1Y4-T1B2 | 4-point terminal block 0.1A transistor output | 60 |
| | CL1Y4-R1B2 | 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 transistor output | 40 |
| | CL1XY8-DT1B2 | 8-point terminal block 24VDC input/0.1A transistor output | 65 |
| | CL1XY8-DR1B2 | 8-point terminal block 24VDC input/2A relay output | 70 |

| Type | Model | Specifications | Current Consumption (mA) |
|---|---|---|---|
| Sensor connector type | CL2X8-D1C3V | 8-point sensor connector 24VDC input | 40 * |
| | CL2Y8-TP1C2V | 8-point sensor connector 0.1A transistor output | 40 * |
| MIL connector type | CL2X16-D1M1V | 16-point MIL connector 24VDC input | 45 |
| | CL2Y16-TP1M1V | 16-point MIL connector 0.1A transistor output | 50 |
| Cable type | CL1X2-D1D3S | 2-point cable type 24VDC input | 35 * |
| | CL1Y2-T1D2S | 2-point cable type 0.1A transistor output | 35 * |
| | CL1XY2-T1D2S | 2-point cable type 24VDC input/0.1A transistor output | 35 * |

2) Voltage drop calculation

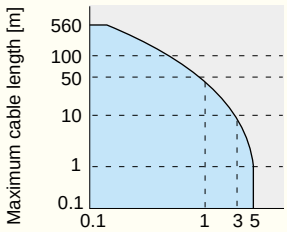
Simple and in-depth calculation methods are available for voltage drop calculation.

●Simple calculation method

A simple calculation method for ease of making confirmation. Make calculation using the look-up chart or calculation expression.
(At power supply voltage: 24VDC, ambient temperature: 20℃)

*Use the in-depth calculation method for calculation if the ambient temperature differs greatly from 20℃ or the main and branch lines are extended using connectors.

a. Selection using look-up chart




Within the above frame, the number of power supply adaptors may be one

b. Selection using calculation expression

Voltage drop (V) = (longest distance (m) + constant: 11) × constant : 0.06 × current consumption sum (A) ≦ 3.6V

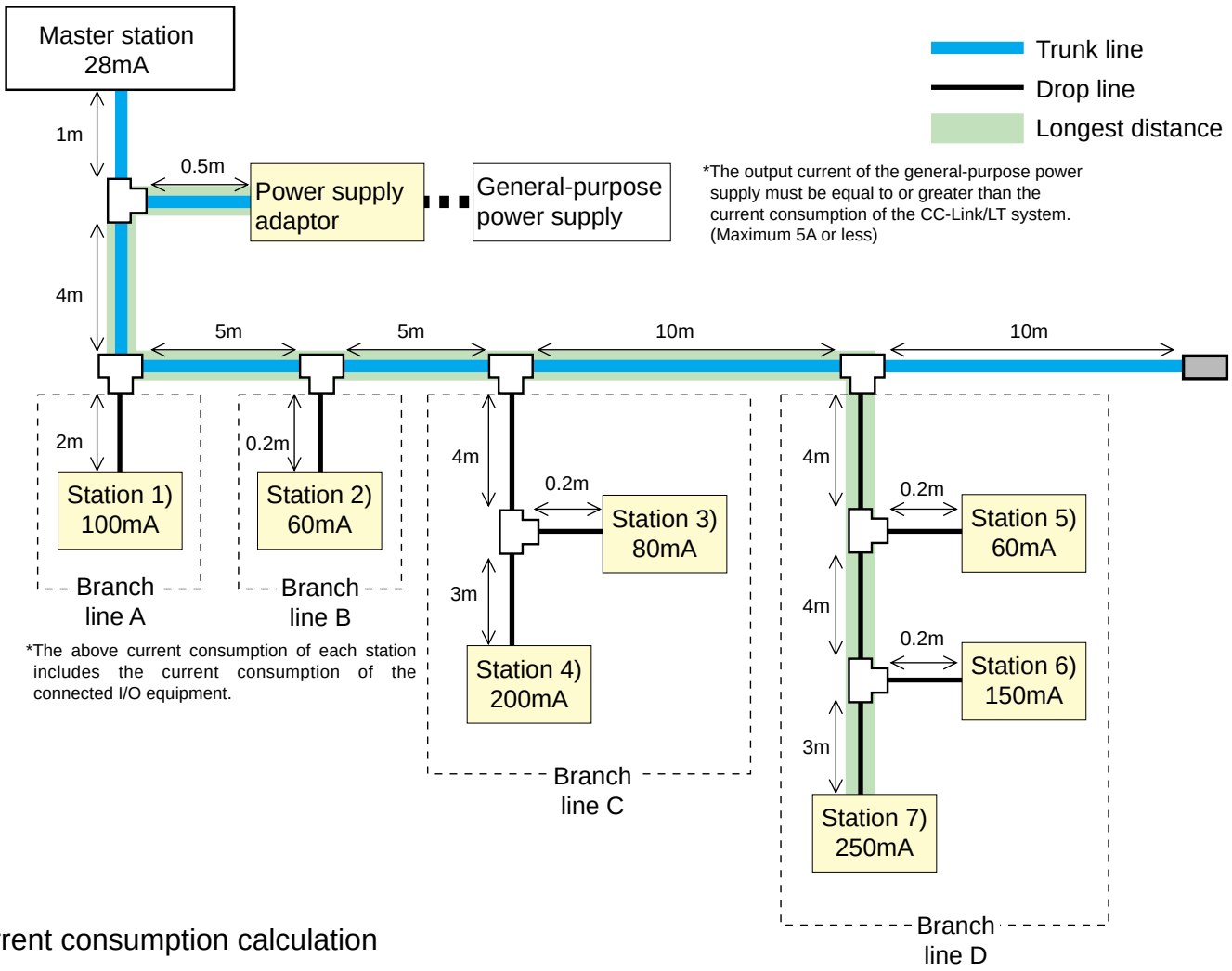
Longest distance: The farthest station from the power supply adaptor

Current consumption sum: Current consumption sum of CC-Link/LT modules + Current consumption sum of I/O equipment (such as sensors) (Current consumptions of connected I/O equipment)

Refer to the supplementary manual of the power supply adaptor (CL1PAD1) for details.

## Calculation Examples

<System configuration example>




### 1) Current consumption calculation

Sum of current consumptions

28mA + 100mA + 60mA + 80mA + 200mA + 60mA + 150mA + 250mA = 928mA = 0.9A ≦ 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 × 0.9A = 2.511V ≦ 3.6V

Longest distance: The remotest station from the power supply adaptor, station 7) of branch line D

0.5m + 4m + 5m + 5m + 10m + 4m + 4m + 3m = 35.5m

From above 1) and 2), both the current and voltage can be supplied by one power supply adaptor.

# CC-Link Partner Association

Shake Hands

The "CC-Link" and "CC-Link/LT" network satisfies the need for both "openness" and"safety."
The CC-Link Partner Association backs up customers all over the world.

## What is the CC-Link Partner Association?

The CC-Link Partner Association is an organization made up of CC-Link product-development partner manufacturers in order to popularize CC-Link and CC-Link/LT.

Name CC-Link Partner Association
Abbreviation CLPA

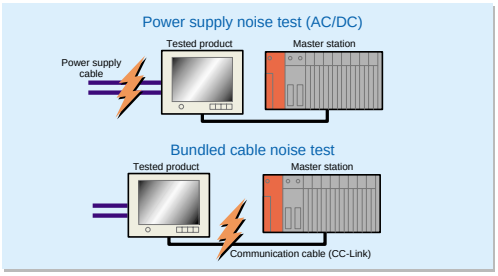
The CC-Link Partner Association helps users to construct automated plants and vendors to develop products that are compatible with CC-Link and CC-Link/LT.

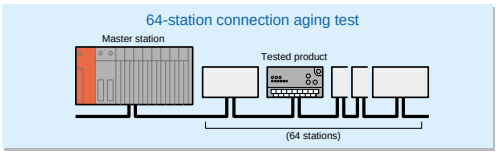
■ Vendor support
- Presentations at various exhibitions
- Planning and organizing various seminars
- Delivery of information using homepages and Internet services
- Delivery of catalogs and materials for easy selection of partner manufacturers' products and network-related products
- Support of development of CC-Link and CC-Link/LT compatible products
- Performing conformance tests
- Operation of the window used to join the CC-Link Partner Association

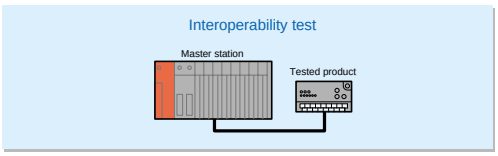
■ User support
- Delivery of information using homepages and Internet services
- Delivery of catalogs and materials for easy selection of partner manufacturers' products and network-related products

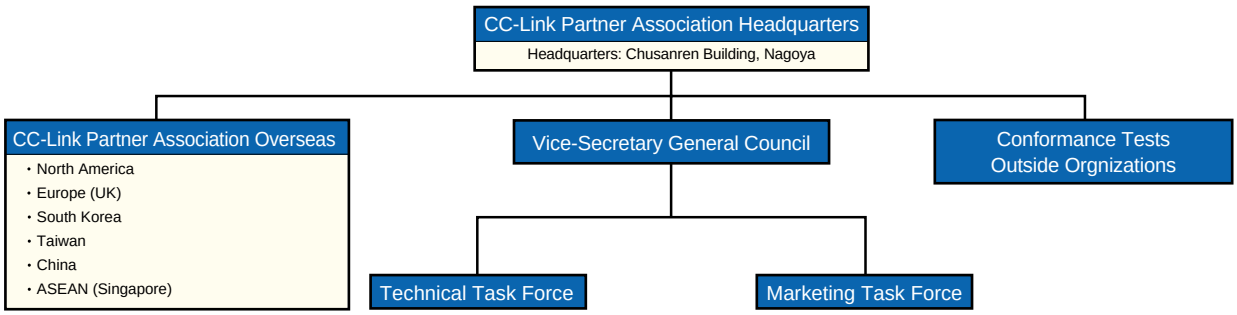
## What Does a Conformance Test Mean?

A conformance test is conducted for each model of all the CC-Link and CC-Link/LT products sold by a partner manufacturer. The test ensures that it can be used safely.




Contact

CC-Link Partner Association
3-12-13 (Chusanren Building), Shirakabe,
Higashi-ku, Nagoya, Japan
TEL (052)936-6050 FAX (052)936-6005
Mail address: cc-link@post0.mind.ne.jp

CC-Link Partner Association Home Page Address
**http://www.cc-link.org**

# CC-Link/LT Related Product Model List

| Unit Type | | Model | Description | IP Indication | Reference Page |
|---|---|---|---|---|---|
| Master module | | QJ61CL12 | CC-Link/LT master module for Q series | IP2X | 15 |
| | | FX2N-64CL- M | CC-Link/LT master module for FX1N, FX2N, FX1NC, FX2NC | — | — |
| Bridge unit | | AJ65SBT-CLB | CC-Link-CC-Link/LT bridge unit | — | — |
| Remote I/O unit | Terminal block type | CL1X4-D1B2 | Input4 points: 24VDC (used as either positive common or negative common type) | IP2X | 19 |
| | | CL1Y4-T1B2 | Output: 4 points, 24VDC (sink type), 0.1A transistor output | IP2X | 20 |
| | | CL1Y4-R1B2 | Output: 4 points, 30VDC, 250VAC or less, 2A relay output | IP1X | 20 |
| | | CL2X8-D1B2 | Input: 8 points, 24VDC (used as either positive common or negative common type) | IP2X | 19 |
| | | CL2Y8-TP1B2 | Output: 8 points, 24VDC (sink type) 0.1A transistor output (with output protection) | IP2X | 21 |
| | | CL1XY8-DT1B2 | Input: 4 points, 24VDC (used as either positive common or negative common type) Output: 4 points, 24VDC (sink type), 0.1A transistor output | IP2X | 22 |
| | | CL1XY8-DR1B2 | Input: 4 points, 24VDC (used as either positive common or negative common type) Output: 4 points, 30VDC, 250VAC or less, 2A relay output | IP1X | 22 |
| | Sensor connector type | CL2X8-D1C3V | Input: 8 points, 24VDC (positive common type) | IP2X | 25 |
| | | CL2Y8-TP1C2V | Output: 8 points, 24VDC (sink type) 0.1A transistor output (with output protection) | IP2X | 25 |
| | MIL connector type | CL2X16-D1M1V | Input: 16 points, 24VDC (positive common type) | IP2X | 27 |
| | | CL2Y16-TP1M1V | Output: 16 points, 24VDC (sink type) 0.1A transistor output (with output protection) | IP2X | 27 |
| | Cable type | CL1X2-D1D3S | Input: 2 points, 24VDC (positive common type) | IP2X | 28 |
| | | CL1Y2-T1D2S | Output: 2 points, 24VDC (sink type), 0.1A transistor output | IP2X | 29 |
| | | CL1XY2-DT1D5S | Input: 1 point, 24VDC (positive common type) Output: 1 point, 24VDC (sink type), 0.1A transistor output | IP2X | 29 |
| Power supply adaptor | | CL1PAD1 | CL1PAD1 power supply adaptor for CC-Link/LT (5A) | IP2X | 30 |
| Communication LSI for master station | CLC13 | CL2GA13-60 | Communication LSI for master station (in packs of 60) | — | 31 |
| Communication LSI for remote I/O station | CLC21 | CL2GA21-60 | Communication LSI for remote I/O station (in packs of 60) | — | 31 |
| | | CL2GA21-300 | Communication LSI for remote I/O station (in packs of 300) | — | 31 |

| Unit Type | | Model | Description | IP Indication | Reference Page |
|---|---|---|---|---|---|
| Accessory | Communication connector | CL9-CNF-18 | Connector for connection of CC-Link/LT dedicated flat cable | IP2X | 30 |
| | Cable | CL9-FL4-18 | CC-Link/LT dedicated flat cable | IP2X | 30 |
| | Terminating resistor | CL9-RYVK | CC-Link/LT dedicated terminating resistor | IP2X | 30 |
| | Open sensor connector | ECN-****** | I/O connector for sensor connector type *: Model changes depending on connector color and wire diameter. | IP2X | 30 |

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# Open Field Network
# CC-Link/LT Compatible Product Catalog

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