Safety Controller CC-Link Interface Module User's Manual (Hardware)

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MODEL	WS-CC-U-HW
MODEL CODE	13J209
IB(NA)-0800459-C(1108)MEE	

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Precautions regarding warranty and specifications

MELSEC-WS series products are jointly developed and manufactured by Mitsubishi and SICK AG, Industrial Safety Systems, in Germany. Note that there are some precautions regarding warranty and specifications of MELSEC-WS series products.
<Warranty>
- The gratis warranty term of the product shall be for one (1) year after the date of delivery or for eighteen (18) months after manufacturing, whichever is less.
- The onerous repair term after discontinuation of production shall be for four (4) years.
- Mitsubishi shall mainly replace the product that needs a repair.
- It may take some time to respond to the problem or repair the product depending on the condition and timing.

<Specifications>
- General specifications of the products differ.

	MELSEC-WS	MELSEC-Q	MELSEC-QS
Operating ambient temperature	-25 to 55°C*1	0 to 55°C	0 to 55°C
Operating ambient humidity	10 to 95%RH	5 to 95%RH	5 to 95%RH
Storage ambient temperature	-25 to 70°C	-25 to 75°C	-40 to 75°C
Storage ambient humidity	10 to 95%RH	5 to 95%RH	5 to 95%RH

*1: When the WS0-GCC100202 is included in the system, operating ambient temperature will be 0 to 55°C.

- EMC standards that are applicable to the products differ.

	MELSEC-WS	MELSEC-Q, MELSEC-QS
EMC standards	EN 61000-6-2, EN 55011	EN 61131-2

1 About this document

1.1 Documentations for the MELSEC-WS system

These manuals apply for the MELSEC-WS CC-Link interface module WS0-GCC100202 (hereinafter, CC-Link interface module) and only in combination with the corresponding user's manual Safety Controller CC-Link Interface Module User's Manual.

The installation, configuration and commissioning of the MELSEC-WS safety control system are described in the Safety Controller User's Manual and Safety Controller Setting and Monitoring Tool Operating Manual.

Title	Number
Safety Controller User's Manual	WS-CPU-U-E (13JZ32)
Safety Controller Ethernet Interface User's Manual	WS-ET-U-E (13JZ33)
Safety Controller CC-Link Interface User's Manual	WS-CC-U-E (13JZ45)
Safety Controller Setting and Monitoring Tool Operating Manual	SW1DNNWS0ADR-B-O-E (13JU67)

In addition, mounting protective devices also requires specific technical skills which are not detailed in this documentation.

2 Correct use

CC-Link interface module is a CC-Link based gateway and a part of the MELSEC-WS system that communicates with primary control systems. It provides non-safe fieldbus data for control and diagnostic purposes.

The gateway does not have its own power supply and can only be operated with a MELSEC-WS system.

Up to two gateways can be used in a MELSEC-WS system. These must be installed directly to the right of the WS0-CPUx.

This gateway must be used only by qualified safety personnel and only on the machine where it has been installed and initialized by qualified safety personnel in accordance with the operating manuals.

ATTENTION

Observe the protective notes and measures in the MELSEC-WS User's manual!

Mitsubishi Electric Co. accepts no claims for liability if the equipment is used in any other way or if modifications are made to the device, even in the context of mounting and installation.

- When mounting, installing and using the MELSEC-WS system, observe the standards and directives applicable in your country.
- These manuals and the related operating manuals must be made available to the user of the machine where a MELSECWS system is installed. The machine operator is to be instructed in the use of the device by qualified safety personnel and must be instructed to read the operating manuals.

2.1 Disposal

Disposal of unusable or irreparable devices should always occur in accordance with the applicable country-specific wastedisposal regulations (e.g. European Waste Code 16 02 14).

3 Conditions of use for the product

(1) Although MELCO has obtained the certification for Product's compliance to the international safety standards IEC 61508, EN 954-1/ISO 13849-1 from TUV Rheinland, this fact does not guarantee that Product will be free from any malfunction or failure. The user of this Product shall comply with any and all applicable safety standard, regulation or law and take appropriate safety measures for the system in which the Product is installed or used and shall take the second or third safety measures other than the Product. MELCO is not liable for damages that could have been prevented by compliance with any applicable safety standard, regulation or law.
(2) MELCO prohibits the use of Products with or in any application involving, and MELCO shall not be liable for a default, a liability for defect warranty, a quality assurance, negligence or other tort and a product liability in these applications.
1) power plants,
2) trains, railway systems, airplanes, airline operations, other transportation systems,
3) hospitals, medical care, dialysis and life support facilities or equipment,
4) amusement equipments,
5) incineration and fuel devices,
6) handling of nuclear or hazardous materials or chemicals,
7) mining and drilling,
8) and other applications where the level of risk to human life, health or property are elevated.

4 Product description

Before using the module, check that the following items are provided.

Item	Amount	Remarks
WS0-GCC100202	1	-
Terminating resistor 110Ω 1/2W (brown-brown-brown)	1	Bar terminal

Screw terminals (for replacement) (WS0-TBS4) are not available for the WS0-GCC100202.

4.1 Communication data

The CC-Link interface module provides the following data:

- input values (ON/OFF) for all MELSEC-WS extension modules and EFI devices connected
- output values (ON/OFF) for all MELSEC-WS input/output extension modules and EFI devices connected
- logic results
- the error and status information of all modules

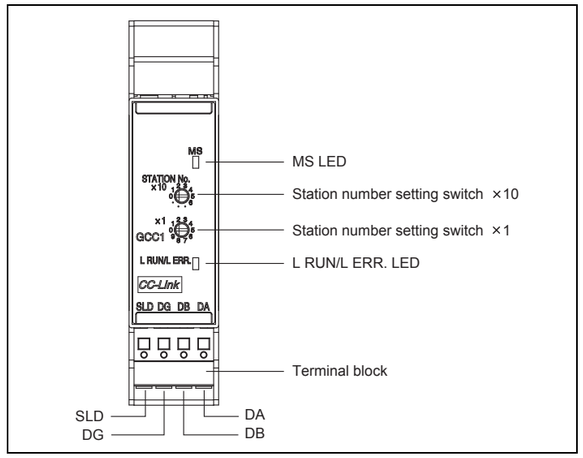
For detailed description of the data set and configuration, please read the "Safety Controller CC-Link Interface User's Manual".
The occurrence of random or systematic faults within the module or in its control does not impede the MELSEC-WS system's safety function.

ATTENTION

Do not use non-safe data from network modules for safety related applications.
Network modules only processes non-safety-related data which is not suitable for operation on a safety fieldbus.

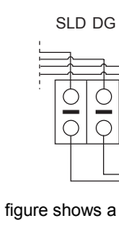
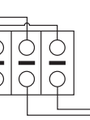
4.2 Display elements

The CC-Link interface module is equipped with two LEDs: MS and L RUN/ L ERR.



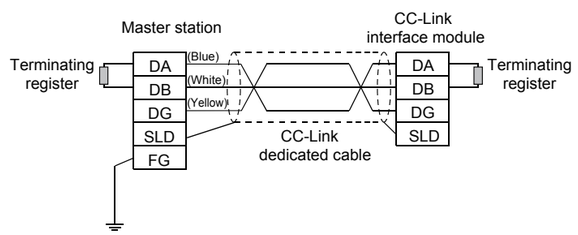
LED		Meaning
MS	Off	No power supply, immediately after the module start or hardware failure
	Lights up Green	Executing (live process data from/to CPU)
	Flashes Green	Idle (CPU STOP)
	Flashes Green/Red	Executing, but data link stopped or faulty
	Flashes Red	1 Hz: Configuring/configuration required 2 Hz: Critical fault on CC-Link interface module
	Lights up Red	Critical fault on another module

LED		Meaning
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 • Terminating 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 • Terminating register not connected • Module or CC-Link dedicated cable affected by noise
	Lights up Red	Station number setting switch out-of-range

Name	Meaning
Station number setting switch 	A switch for configuring a station number for the module (factory default: 0) 1 to 64: Station number When the number other than 1 to 64 is configured, the MS LED flashes in red and the L RUN/L ERR. LED lights up in red. Example: Setting the station number 11 
Terminal block DA, DB, DG, SLD	CC-Link dedicated cables are connected for data link. For wiring, see Section 4.3. The SLD terminal is internally connected to the earthing spring contact. (the connecting part to the DIN rail). This two-piece terminal block allows a replacement of the failed module with the system being connected to CC-Link network. (Before replacement, power off the module to be replaced.) For the crimp tools, see Chapter 8.

4.3 CC-Link dedicated cable connection

The following shows the connection between the CC-Link interface module and the master station using a CC-Link dedicated cable.



Use a bar terminal to connect the cable to the CC-Link interface module. For applicable bar terminals, see Chapter 8 Cable specifications.
Two poles of each terminal are internally connected. (See below.)

The above figure shows a view from under the module after wiring.

4.4 Interface

The CC-Link interface module has a removable terminal block for network connection. The module can be easily replaced without re-wiring. (The voltage supply to the module must be off before replacing the module.)

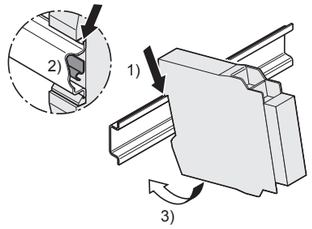
5 Mounting/Dismantling

ATTENTION

The MELSEC-WS system is only suitable for mounting in a control cabinet with at least IP54 degree of protection. While supply voltage is applied, gateways must not be plugged to nor be removed from the MELSEC-WS system. To ensure full electromagnetic compatibility (EMC), the DIN mounting rail must be connected to functional earth (FE).

5.1 Steps for mounting the modules

- In a MELSEC-WS system the CPU module WS0-CPU0 or WS0-CPU1 is positioned at the extreme left, the two optional gateways follow directly. Only then do the expansion modules follow. The relays modules WS0-4RO have to be mounted at the extreme right.
- The modules are located in a 22.5-mm wide modular system for 35 mm DIN rails to EN 60715.
- The connection between the modules is effected by means of the plug connection integrated in the housing.
- Mount the module in accordance with EN 50274.
- Ensure that suitable ESD protective measures are also taken during mounting. Otherwise the FLEXBUS+ bus may be damaged.

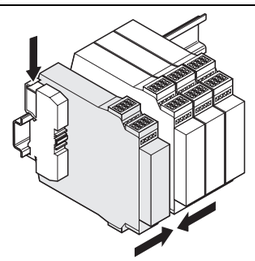


⇒ Make sure that the voltage supply of the MELSEC-WS system is switched off.

⇒ Hang the device onto the DIN rail 1).

⇒ Ensure that the earthing spring contact 2) contacts the DIN rail such that it can electrically conduct.

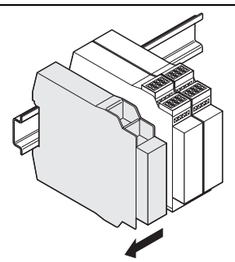
⇒ Latch the module onto the DIN rail by pressing it lightly in the direction of the arrow 3).



⇒ Slide the modules together individually in the direction of the arrow until the side plug connection latches in.

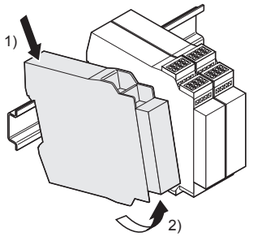
⇒ Install the end clips on the right and left.

5.2 Steps for dismantling the modules



⇒ Remove the plug-in package terminals with wiring and the end clips.

⇒ If there are several modules, slide the modules away from each other individually in the direction of the arrow until the side plug connection is separated.



⇒ Press the module downwards at the rear 1) and remove it from the DIN rail in the direction of the arrow while keeping it pressed down 2).

6 Configuration and commissioning

ATTENTION

Do not commission without a check by specialist personnel!
Before the initial commissioning of the system in which you are using a MELSEC-WS system, it must be checked and released by qualified safety personnel. The results of this check must be documented.

The CC-Link interface module can be configured using the MELSEC-WS Setting and monitor tool via the WS0-CPUx module's RS232 interface.

7 In the event of faults

ATTENTION

In the event of unclear faults, cease operation!
Stop the machine if you cannot clearly identify or allocate the error and if you cannot safely rectify the malfunction.
Complete functional test after error rectification!
Carry out a full functional test after an error has been rectified.

8 Technical data

Supply circuits

Item	Specifications
Supply voltage	24 V DC (16.8 … 30 V DC)
Power consumption	Max. 1.4 W

Interfaces

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*1
Data interface	Backplane bus (FLEXBUS+)

*1: Connect a terminating resistor (110Ω).

General specifications

Item	Specifications
Fieldbus	CC-Link
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	IP40/IP20 according to IEC 60529
Housing color	Light grey
Weight	120 g
Mounting rail	Mounting rail according to IEC/EN 60715

Cable specifications

Item	Specifications
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	20AWG
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 ($0.5mm^2$)), TE1.5-10 (for SLD) • Crimp tool: NH-79 3) PHOENIX CONTACT • Bar terminal model: AI0.5-10WH (for CC-Link dedicated cable ($0.5mm^2$)), 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.

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Specifications subject to change without notice.

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