CC-Link IE TSN/Ethernet Network Interface Module User's Manual
(Hardware Edition)

Network interface module (digital input/output)	FA3-TH1T16XC, FA3-TH1T16Y, FA3-TH1T16YE FA3-TH1M16XC, FA3-TH1M16Y, FA3-TH1M16YE
Network interface module (analog input/output)	FA3-AT1T8X, FA3-AT1T8Y FA3-AT1M8X, FA3-AT1M8Y

50D-FG0528-B(2203)MEE

SAFETY PRECAUTIONS

(Read these precautions before using this product.)
Before using this product, please read this manual and the relevant manuals carefully and pay full attention to safety to handle the product correctly.
The precautions given in this manual are concerned with this product only. For the safety precautions of the programmable controller system, refer to the user's manual for the CPU module and the master module used.
If the product is not used in a way that is described in this manual, the protection performance provided by the product may be impaired.
In this manual, the CC-Link IE TSN/Ethernet network interface module is referred to as the module, and the safety precautions are classified into two levels: " ⚠ WARNING" and " ⚠ CAUTION".

⚠ WARNING	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
⚠ CAUTION	Indicates that incorrect handling may cause hazardous conditions, resulting in minor or moderate injury or property damage.

Under some circumstances, failure to observe the precautions given under " ⚠ CAUTION" may lead to serious consequences.
Observe the precautions of both levels because they are important for personal and system safety.
Make sure that the end users read this manual and then keep the manual in a safe place for future reference.

[Design Precautions]

⚠ **WARNING**

- In the case of a communication failure in the network, data of the master station are held. Check the data link status of each station (SW00B0 to SW00B7) and configure an interlock circuit in the program to ensure that the entire system will operate safely.
  Failure to do so may result in an accident due to an incorrect output or malfunction.
- When the network interface module (digital output) is disconnected from the network due to a communication failure or when the CPU module is in the STOP state, the module maintains or turns off the output according to the output HOLD/CLEAR setting. Configure an interlock circuit in the program to ensure that the entire system will operate safely. Failure to do so may result in an accident due to an incorrect output or malfunction.
- Do not use any "Use prohibited" remote I/O signals and "Use prohibited" remote register areas.
  If any is used, correct operation of the module cannot be guaranteed.
- Depending on the failure type of the module, the output may be held or an incorrect value may be outputted. Configure an external circuit for monitoring output signals that could cause a serious accident.
- Configure safety circuits external to the programmable controller to ensure that the entire system operates safely even when a fault occurs in the external power supply or the programmable controller. Failure to do so may result in an accident due to an incorrect output or malfunction.
  (1) The analog output status differs depending on the setting status of the functions used to control analog output. Pay full attention to set each function. For details on the analog output status, refer to the CC-Link IE TSN/Ethernet Network Interface Module User's Manual (Detailed Edition).
  (2) Depending on the failure type of output elements or their internal circuits, proper output may not be obtained. Configure an external circuit for monitoring output signals that could cause a serious accident.

[Design Precautions]

⚠ **CAUTION**

- Store the modules at the storage ambient temperature and humidity. Failure to do so can cause malfunction or failure of the module.
- Do not install the control lines or communication cables together with the main circuit lines or power cables. Keep a distance of 100mm or more between them. Failure to do so may result in malfunction due to noise.

[Security Precautions]

⚠ **WARNING**

- To maintain the security (confidentiality, integrity, and availability) of the programmable controller and the system against unauthorized access, denial-of-service (DoS) attacks, computer viruses, and other cyberattacks from external devices via the network, take appropriate measures such as firewalls, virtual private networks (VPNs), and antivirus solutions.

[Installation Precautions]

⚠ **WARNING**

- Shut off all phases of the external power supply used in the system before installing. Failure to do so may result in electric shock, product damage or malfunction.

[Installation Precautions]

⚠ **CAUTION**

- Use the module in an environment that complies with the general specifications described in this manual.
  Failure to do so can cause electric shock, fire, malfunction, or damage to or deterioration of the product.
- Fix the module securely using DIN rails or mounting brackets. Tighten the mounting screws within the specified torque range. Failure to do so can cause the dropping, short circuit, or malfunction of the module. Overtightening can damage the mounting screw and/or module, resulting in the dropping, or malfunction of the module.
- Do not directly touch the conductive part of the module. Doing so can cause malfunction or failure of the module.
- Fully mount the terminal block and connector of each connection cable to the module connector. Insufficient contact can cause malfunction of the module.

[Wiring Precautions]

⚠ **WARNING**

- Shut off all phases of the external power supply used in the system before wiring. Failure to do so may result in electric shock, product damage or malfunction.

[Wiring Precautions]

⚠ **CAUTION**

- Individually ground the FG terminal of the programmable controller with a ground resistance of 100 ohms or less. Failure to do so can cause electric shock or malfunction of the module.
- Place the cables such as communication cables and power cables in a duct or clamp them. Failure to do so can cause movement or shifting of the cables, damage to the module or cables due to careless pulling, or malfunction of the module due to insufficient cable contact.
- Check the rated voltage and terminal layout before wiring to the module, and connect the cables correctly. Failure to do so can cause fire or the module to fail or malfunction.
- Check the interface type and correctly connect the cable. Connecting a cable to an incorrect interface or miswiring can cause the module or external devices to malfunction.
- Tighten the terminal block mounting screws within the specified torque range. Failure to secure the terminal block may cause drop, short circuit, or malfunction of the module. Overtightening the screws may damage the module.
- When removing the cable such as the connection cable or power cable from the module, do not pull the cable by the cable part. While securely pressing the open/close button on the terminal block, remove the cables. Pulling the cable connected to the module can cause damage to the module and/or cable or malfunction due to poor contact.
- Prevent foreign matter such as dust or wire chips from entering the module. Failure to do so can cause fire, failure, or malfunction.
- Do not install the control lines or communication cables together with the main circuit lines or power cables. Keep a distance of 100mm or more between them. Failure to do so may result in malfunction due to noise.
- Do not connect the polarities of +24V and 24G of external power supply conversely. Doing so can cause failure of the module.
- Install the module on the DIN rail or fix it with mounting screws in the control panel before using it.

[Startup and Maintenance Precautions]

⚠ **WARNING**

- Do not touch any terminal while power is on. Doing so will cause electric shock or malfunction.
- Shut off the external power supply (all phases) used in the system before cleaning the module or tightening the mounting screws for the terminal block for module power supply and FG. Failure to do so may result in electric shock, product damage or malfunction.

[Startup and Maintenance Precautions]

⚠ **CAUTION**

- Do not disassemble or modify the module. Doing so may cause failure, malfunction, injury, or a fire.
- Shut off the external power supply (all phases) used in the system before installing or removing the module to/from the control panel. Failure to do so may cause the module to fail or malfunction.
- Shut off the external power supply (all phases) used in the system, and then, tighten terminal screws or module fixing screws within the specified torque range. Failure to do so may cause the module to fail or malfunction. Undertightening can cause drop of the screw, short circuit, or malfunction. Overtightening can damage the screw and/or module, resulting in drop, short circuit, or malfunction.
- Do not drop or apply strong shock to the module. Doing so may damage the module.
- Before handling the module or cables connected to the module, touch a conducting object such as grounded metal to release the static electricity from your body. Failure to do so may cause the module to fail or malfunction.
- Do not use thinner, benzene, acetone, or kerosene when cleaning the module. Doing so can cause damage to the module.
- Do not insert water or wire through the gaps in the case. Doing so can cause fire or electric shock.
- Do not use this product as a detector for physical protection. Doing so can cause an accident due to an incorrect output or malfunction.
- In the unlikely event that something is abnormal with the product, stop using the product immediately, turn off the power supply, and please consult your local Mitsubishi Electric representative. Continued use of the module in this condition can cause the module to fail or malfunction.
- Do not use the product in locations where chemical products and oil are scattered. Doing so can cause fire or the module to fail or malfunction.
- When using the product, be sure to observe the defined ambient temperature and humidity. Doing so can cause fire or the module to fail or malfunction.
- When the module is powered, do not touch the module, cables between the network interface module and the digital signal converter or analog signal converter, and the terminal block for module power supply and FG. Doing so may result in injury or cause the module to malfunction due to the static electricity in your body.
- Startup and maintenance of a control panel must be performed by qualified maintenance personnel with knowledge of protection against electric shock. Lock the control panel so that only qualified maintenance personnel can operate it.
- The ESD susceptibility symbol shown below is placed on the left side of a connector for the digital signal converter or analog signal converter. This symbol indicates that a module is susceptible to static electricity passed through the connector. Before handling the connector, touch a conducting object such as a grounded metal to release the static electricity from your body. Failure to do so may cause the module to fail or malfunction. Do not touch the connector when the module is powered. Doing so may result in injury or cause the module to malfunction due to the static electricity in your body.

[Disposal Precautions]

⚠ **CAUTION**

- When disposing of this product, treat it as industrial waste.

CONDITIONS OF USE FOR THE PRODUCT

(1) This Mitsubishi Electric Engineering Company Limited (hereinafter referred to as "MEE") product shall be used in applications that will not lead to a major accident even in the unlikely event any failure or defect should occur in the product in which this Mitsubishi product is incorporated, and shall be systematically provided with external backup and fail-safe functions that operate in the event of any failure or defect.
(2) This MEE product has been designed and manufactured as a general purpose product for general industry applications and the like. Thus, the product shall be excluded from use in special equipment, system, and other applications such as those listed below. If used in such applications, Mitsubishi shall not bear any responsibility whatsoever for the quality, performance, and safety of the Mitsubishi product (including but not limited to non-performance of main obligation, defect liability, quality assurance liability, tort liability, and product liability):
  • Applications in which the public could be greatly affected such as the applications of the nuclear and other power plants operated by the respective power companies
  • Applications in which a special quality assurance system is required, such as the applications of railway companies or government or other public offices
  • Use in aircraft, medical applications, railway applications, incineration and fuel devices, passenger vehicles, manned transport devices, equipment for recreation and amusement, and safety devices, in which human life or assets could be greatly affected
  Note that such an application of the Mitsubishi product may be permitted as determined by Mitsubishi if the user accepts that the application is to be limited and a special quality is not to be required (a quality that exceeds the general specifications). For details, please consult with Mitsubishi.
(3) MEE shall have no responsibility or liability for any problems involving programmable controller trouble and system trouble caused by DoS attacks, unauthorized access, computer viruses, and other cyberattacks.

EMC and Low Voltage Directives

For compliance with the EMC and Low Voltage Directives, refer to the User's Manual described in "Relevant Manuals".

Relevant Manuals

The following manual describes the details of the products.
Please read it carefully and develop familiarity with the functions and performance of the products to handle them correctly.
Please consult your local Mitsubishi Electric representative, if necessary.

Manual [manual number]	Available form
CC-Link IE TSN/Ethernet Network Interface Module User's Manual (Detailed Edition) [50D-FG0531]	Print book PDF

Packing List

Check that the following items are included in the package.

Item	Quantity
CC-Link IE TSN/Ethernet network interface module	1
Mounting bracket	2
CC-Link IE TSN/Ethernet Network Interface Module User's Manual (Hardware Edition) (this manual)	1
Precautions for Use (Chinese)	1

General Specifications

Item	Specifications				
Operating ambient temperature	0 to 55℃				
Storage ambient temperature	-25 to 75℃				
Operating ambient humidity	5 to 95%RH, non-condensing				
Storage ambient humidity					
Vibration resistance	—	Frequency	Constant acceleration	Half amplitude	Number of sweeps
	Under intermittent vibration	5 to 8.4Hz	—	3.5mm	10 times each in the X, Y, and Z directions
		8.4 to 150Hz	9.8m/s²	—	
	Under continuous vibration	5 to 8.4Hz	—	1.75mm	—
		8.4 to 150Hz	4.9m/s²	—	
Shock resistance	147m/s², 3 times each in the X, Y, and Z directions				
Operating atmosphere	No corrosive gases				
Operating altitude*1	0 to 2000m				
Installation location	Inside a control panel*2				
Overvoltage category*3	Ⅱor lower				
Pollution degree*4	2 or less				

*1 Do not use or store the module under pressure higher than the atmospheric pressure at an altitude of 0 meters. Doing so may cause malfunction. When using the module under pressure, please consult your local Mitsubishi Electric representative.
*2 Install the module in a control panel that satisfies both of the following: a protection degree of IP20, UL50 Type 1 or higher. Design the control panel suitable for the environment if necessary.
*3 This indicates the assumption that the equipment is connected to a power distribution system, ranging from a public electrical power distribution network down to machinery within the premises. Category Ⅱ applies to equipment for which electrical power is supplied from fixed facilities. The surge voltage withstand level for equipment with the rated voltage of up to 300V is 2500V.
*4 This index indicates the degree to which conductive material is generated in terms of the environment in which the equipment is used. In pollution degree 2, only non-conductive pollution occurs. A temporary conductivity caused by condensation must be expected occasionally.

Ethernet Communication Specifications

Item			Network interface module (digital input/output)	Network interface module (analog input/output)
Network specifications	CC-Link IE TSN	Communication speed	1Gbps/100Mbps	
		Communication mode	1000BASE-T full-duplex, 100BASE-TX full-duplex	
		Station type	Remote station	
		Authentication Class	Authentication Class B	
		Topology	Line topology, star topology, or mixture of star topology and line topology	
		Number of link points	RX/RY: 16 points RWr/RWw: 16 points	RX/RY: 32 points RWr/RWw: 32 points
	CC-Link IE Field Network	Communication speed	1Gbps	
		Station type	Remote device station	
		Topology	Line topology, star topology, mixture of star topology and line topology, or ring topology	
		Number of link points	RX/RY: 16 points RWr/RWw: 16 points	RX/RY: 32 points RWr/RWw: 32 points
	CC-Link IE Field Network Basic	Communication speed	100Mbps	
		Communication mode	100BASE-TX full-duplex	
		Station type	Slave	
		Topology	Star topology	
		Communication method	UDP/IP	
		Number of connectable modules	Refer to the manual for the master station used.	
		Number of occupied stations	One station	
		Number of link points	RX/RY: 64 points RWr/RWw: 32 points	
		Reference response time	1ms	
	SLMP	Communication speed	100Mbps	
		Communication mode	100BASE-TX full-duplex	
		Station type	Server	
		Topology	Star topology	
		Communication format	Compliant with IEEE802.3 (100BASE-TX) standard	
		Communication method	UDP/IP	
		Communication port	45237	
		Frame type	3E frame	
		Communication data code	Binary	
	MODBUS/TCP*1	Communication speed	100Mbps/10Mbps (auto-negotiation)	
		Communication mode	100BASE-TX full-duplex/half-duplex, 10BASE-T full-duplex/half-duplex	
		Device type	MODBUS/TCP slave device	
		Topology	Star topology	
		Communication format	Compliant with IEEE 802.3 (10BASE-T/100BASE-TX) standard	
		Communication method	TCP/IP	
		Communication port	502	
		Number of TCP connections	Up to two connections	
Interface			RJ45 connector (AUTO MDI/MDI-X)	
Maximum frame size			1518 bytes	
Maximum segment length			100m For the length between hubs, check with the manufacturer of the switching hub to be used.	
Number of cascade connections			Check with the manufacturer of the switching hub to be used.	
IP version			IPv4	

*1 FA3-TH1M16XC, FA3-TH1M16Y, FA3-TH1M16YE, FA3-AT1M8X, FA3-AT1M8Y

Performance Specifications

■ **Network interface module (digital input)**

Item		FA3-TH1T16XC, FA3-TH1M16XC
Number of input points		16 points
Rated input voltage		24VDC (allowable voltage range: 21.6 to 26.4VDC)
Isolation method		Photocoupler
Maximum number of simultaneous input points		100%
Input response time		*1
Input Format		Positive/negative common shared type
Withstand voltage		500VAC for 1 minute across DC external terminal batch ground
Isolation resistance		500VDC across DC external terminal batch ground 10MΩ or higher (isolation resistance tester)
External interface	Communication part	RJ45 connector
	Module power supply part	Terminal block for module power supply and FG (two-piece spring clamp terminal block)
Applicable DIN rail		☞ DIN rail
Connection cable		☞ Ethernet cables
Terminal block for module power supply and FG*2	Applicable wire size	☞ Wire
	Applicable solderless terminal	☞ Terminal processing of wires
Module power supply*3	Voltage	24VDC (ripple ratio: within 5%) (allowable voltage range: 20.4 to 28.8VDC)
	Current	0.11A
External dimensions	H (height)	105mm (projection parts not included)
	W (width)	40mm
	D (depth)	70mm (projection parts not included)
Weight		160g

*1 The time can be changed with the input response time setting function.

Timing	Set value (default: 1ms)							
	0ms	0.2ms	1ms	1.5ms	5ms	10ms	20ms	70ms
OFF→ON (MAX)	0.1ms	0.2ms	1ms	1.5ms	5ms	10ms	20ms	70ms
ON→OFF (MAX)	0.4ms	0.5ms	1ms	1.5ms	5ms	10ms	20ms	70ms

*2 When wiring to the terminal block, insert only one cable to a wire insertion opening to connect it to a terminal. Connecting two or more cables to one terminal may cause poor contact.
*3 Use the power supply that meets the following requirements: LVLC (voltage and current limited circuit) of UL 508, SELV (Safety Extra-Low Voltage) circuit, LIM (Limited Energy Circuit).

■ **Network interface module (digital output)**

Item		FA3-TH1T16Y, FA3-TH1M16Y	FA3-TH1T16YE, FA3-TH1M16YE
Number of output points		16 points	
Isolation method		Photocoupler	
Rated load voltage		24VDC (allowable voltage range: 21.6 to 26.4VDC)	
Output response time	OFF → ON	0.5ms or less	
	ON → OFF	1.5ms or less	
Output type		Sink type	Source type
Surge suppressor		Zener diode	
Withstand voltage		500VAC for 1 minute across DC external terminal batch ground	
Isolation resistance		500VDC across DC external terminal batch ground 10MΩ or higher (isolation resistance tester)	
External interface	Communication part	RJ45 connector	
	Module power supply part	Terminal block for module power supply and FG (two-piece spring clamp terminal block)	
Applicable DIN rail		☞ DIN rail	
Connection cable		☞ Ethernet cables	
Terminal block for module power supply and FG*1	Applicable wire size	☞ Wire	
	Applicable solderless terminal	☞ Terminal processing of wires	
Module power supply*2	Voltage	24VDC (ripple ratio: within 5%) (allowable voltage range: 20.4 to 28.8VDC)	
	Current	0.12A	
External dimensions	H (height)	105mm (projection parts not included)	
	W (width)	40mm	
	D (depth)	70mm (projection parts not included)	
Weight		160g	

*1 When wiring to the terminal block, insert only one cable to a wire insertion opening to connect it to a terminal. Connecting two or more cables to one terminal may cause poor contact.
*2 Use the power supply that meets the following requirements: LVLC (voltage and current limited circuit) of UL 508, SELV (Safety Extra-Low Voltage) circuit, LIM (Limited Energy Circuit).

■ **Network interface module (analog input)**

Item		FA3-AT1T8X, FA3-AT1M8X
Analog input	Voltage	1 to 5VDC
Digital output		-384 to 16383
I/O characteristics*1	Analog input range	1 to 5V
	Digital output	0 to 16000
Accuracy*1 (accuracy of the maximum digital output value)	Ambient temperature: 0 to 55℃	±0.3% (±48 digit)
	Ambient temperature: 25±5℃	±0.1% (±16 digit)
	Maximum resolution	0.25mV
Maximum conversion speed		1ms/channel
Absolute maximum input		Voltage: ±15V
Number of analog input points		8 channels/module
Isolation	Isolation method	Between communication system terminal and all analog input terminals: Digital isolator Between power supply system terminal and all analog input terminals: Transformer Between analog input channels: Non-isolation
	Withstand voltage	500VAC for 1 minute
	Isolation resistance	5MΩ or higher (500VDC isolation resistance tester)
External interface	Communication part	RJ45 connector
	Module power supply part	Terminal block for module power supply and FG (two-piece spring clamp terminal block)
Applicable DIN rail		☞ DIN rail
Connection cable		☞ Ethernet cables
Terminal block for module power supply and FG*2	Applicable wire size	☞ Wire
	Applicable solderless terminal	☞ Terminal processing of wires
Module power supply*3	Voltage	24VDC (ripple ratio: within 5%) (allowable voltage range: 20.4 to 28.8VDC)
	Current	0.14A
External dimensions	H (height)	105mm (projection parts not included)
	W (width)	40mm
	D (depth)	70mm (projection parts not included)
Weight		160g

*1 For the I/O conversion characteristics and accuracy, refer to the CC-Link IE TSN/Ethernet Network Interface Module User's Manual (Detailed Edition).
*2 When wiring to the terminal block, insert only one cable to a wire insertion opening to connect it to a terminal. Connecting two or more cables to one terminal may cause poor contact.
*3 Use the power supply that meets the following requirements: LVLC (voltage and current limited circuit) of UL 508, SELV (Safety Extra-Low Voltage) circuit, LIM (Limited Energy Circuit).

■ **Network interface module (analog output)**

Item		FA3-AT1T8Y, FA3-AT1M8Y
Digital input		0 to 16000
Analog output	Voltage	1 to 5VDC (external load resistance: 10kΩ or more)
I/O characteristics*1	Digital input value	0 to 16000
	Analog output range	1 to 5V
Accuracy*1 (accuracy for the maximum analog output value)	Ambient temperature: 0 to 55℃	±0.3% (±12mV)
	Ambient temperature: 25±5℃	±0.1% (±4mV)
	Maximum resolution	0.25mV
Maximum conversion speed		1ms/channel
Output short circuit protection		Available
Maximum output		+5V
Number of analog output points		8 channels/module
Isolation	Isolation method	Between communication system terminal and all analog output terminals: Digital isolator Between power supply system terminal and all analog output terminals: Transformer Between analog output channels: Non-isolation
	Withstand voltage	500VAC for 1 minute
	Isolation resistance	5MΩ or higher (500VDC isolation resistance tester)

Item		FA3-AT1T8Y, FA3-AT1M8Y
External interface	Communication part	RJ45 connector
	Module power supply part	Terminal block for module power supply and FG (two-piece spring clamp terminal block)
Applicable DIN rail		☞ DIN rail
Connection cable		☞ Ethernet cables
Terminal block for module power supply and FG*2	Applicable wire size	☞ Wire
	Applicable solderless terminal	☞ Terminal processing of wires
Module power supply*3	Voltage	24VDC (ripple ratio: within 5%) (allowable voltage range: 20.4 to 28.8VDC)
	Current	0.14A
External dimensions	H (height)	105mm (projection parts not included)
	W (width)	40mm
	D (depth)	70mm (projection parts not included)
Weight		160g

*1 For the I/O conversion characteristics and accuracy, refer to the CC-Link IE TSN/Ethernet Network Interface Module User's Manual (Detailed Edition).
*2 When wiring to the terminal block, insert only one cable to a wire insertion opening to connect it to a terminal. Connecting two or more cables to one terminal may cause poor contact.
*3 Use the power supply that meets the following requirements: LVLC (voltage and current limited circuit) of UL 508, SELV (Safety Extra-Low Voltage) circuit, LIM (Limited Energy Circuit).

Connectable Devices

The following tables list devices that can be connected to the CC-Link IE TSN/Ethernet network interface modules.

Network interface module (digital input/output)

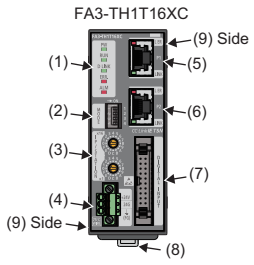
Network interface module	Connectable digital signal converter
Digital input FA3-TH1T16XC FA3-TH1M16XC	FA-TH16XRA20S, FA-TH16X100A31, FA-TH16X200A31, FA-TH16X24D31, FA-TH16X100A31L, FA-TH16X200A31L, FA-TH16X24D31L, FA-TH16X48D31L, FA-TH16X100D31L, FA1-TH8X2SC20S1E, FA1-TH4X2SC20S1E, FA1-TH16X24RA1L20S1E, FA1-TH16X24RA1H20S1E
Digital output sink type FA3-TH1T16Y FA3-TH1M16Y	FA-TH16YRA11, FA-TH16YRA11S, FA-TH16YRA20, FA-TH16YRA20S, FA-TH16YRA20SL, FA-TH16YRA21, FA-TH16YRA21S, FA-TH16YRAC20S, FA-TH16YRAB20SL, FA-TH16YSR11S, FA-TH16YSR20S, FA-TH16YSR21S, FA-TH16YTL11S, FA-TH16YTL21S, FA-TH16YTR20S, FA-TH16Y2TR20, FA-TH16YTH11S, FA1-TH16Y2RA20S1E, FA1-TH16Y1SR20S1E, FA1-TH16Y1TR20S1E, FA1-TH16Y2SC20S1E
Digital output source type FA3-TH1T16YE FA3-TH1M16YE	FA-THE16YTR20S, FA-THE16YTH11S, FA1-TH1E16Y2RA20S, FA1-TH1E16Y2RA20S1E, FA1-TH1E16Y1SR20S1E, FA1-TH1E16Y1TR20S1E, FA1-TH1E16Y2SC20S1E

Network interface module (analog input/output)

Network interface module	Connectable analog signal converter	
	Base unit	Module
Analog input FA3-AT1T8X FA3-AT1M8X	FA-ATB8XTB	FA-ATSVM1XV05, FA-ATSVM1XV15, FA-ATSVM1XV1010, FA-ATSVM1XA420, FA-ATSVM1XD, FA-ATSVM1XRPT, FA-ATSVM1XRPT0010, FA-ATSVM1XRPT0020, FA-ATSVM1XRJPT, FA-ATSVM1XTB, FA-ATSVM1XTR, FA-ATSVM1XTS, FA-ATSVM1XTK, FA-ATSVM1XTK0040, FA-ATSVM1XTK0060, FA-ATSVM1XTK0080, FA-ATSVM1XTE, FA-ATSVM1XTJ, FA-ATSVM1XTT, FA-ATSVM1XTN, FA-ATNDM5
Analog output FA3-AT1T8Y FA3-AT1M8Y	FA-ATB8YTB	FA-ATSVM1YV05, FA-ATSVM1YV15, FA-ATSVM1YV010, FA-ATSVM1YV1010, FA-ATSVM1YA020, FA-ATSVM1YA420, FA-ATNDM5

As the external power supply for connectable devices, use the power supply that meets the following requirements: LVLC (voltage and current limited circuit) of UL 508, SELV (Safety Extra-Low Voltage) circuit, LIM (Limited Energy Circuit).
The pass-through module is not supported.
For additional information on connectable devices, please consult your local Mitsubishi Electric representative.

Part Names



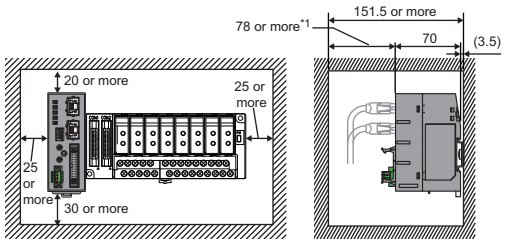
No.	Name			Description
(1)	Operating status LED	PW LED	Green	On: Power-on Off: The 24VDC power supply is off.
		RUN LED	Green	On: Normal operation Flashing: Unit test in progress Off: A major error has occurred or setting of the network setting switch is disabled.
		D LINK LED	Green	On: Data link in operation (cyclic transmission being performed) SLMP command being received or communication status being monitored (SLMP) Connection being established (MODBUS/TCP) Flashing: Data link stop (cyclic transmission stopped) Connection not established (MODBUS/TCP) Off: Data link not performed (disconnected) SLMP command not being received or communication status monitoring timeout (SLMP)
		ERR. LED	Red	On: A moderate error or major error has occurred. Flashing (0.2s interval): Setting error of the network setting switch*1 Flashing (0.5s interval): Minor error has occurred. Off: Normal operation
		ALM LED	Red	On: An alarm has occurred. Flashing: Input signal error detected (FA3-AT1T8X, FA3-AT1M8X) Off: Normal operation
(2)	Network setting switch			Set the communication speed of CC-Link IE TSN and the network/protocol.*2
(3)	IP address/station number setting switches			Set the fourth octet of IP address or the station number.*2
(4)	Terminal block for module power supply and FG			A terminal block for the connection of a module power supply (24VDC) and FG
(5)	P1			RJ45 connector to connect an Ethernet cable to. Use P1 for CC-Link IE Field Network Basic, SLMP, or MODBUS/TCP.
	Communication status LED	L ER LED	Red	On: The data the network interface module has received are abnormal. Off: The data the network interface module has received are normal.
		LINK LED	Green	On: Link-up Off: Link-down
(6)	P2			Same as P1. However, this port is not used for CC-Link IE Field Network Basic, SLMP, and MODBUS/TCP. (In that case, connect an Ethernet cable to P1.)
	Communication status LED	L ER LED	Red	
		LINK LED	Green	
(7)	A connector for the digital signal converter or analog signal converter			A connector for connecting to the digital signal converter or analog signal converter
(8)	DIN rail hook			A hook for mounting the network interface module on a DIN rail
(9)	Hole for the mounting bracket			Holes to attach the bracket

*1 This error occurs if the module is powered on while the network setting switch is set to N/A.
*2 For how to set, refer to the CC-Link IE TSN/Ethernet Network Interface Module User's Manual (Detailed Edition).

Installation of Network Interface Module

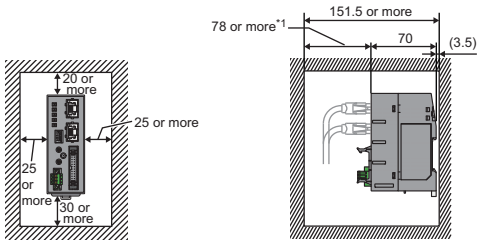
The network interface module can be installed in five orientations by using a DIN rail or mounting brackets. (The module cannot be installed downward.)
Use the network interface module indoors.
Install the network interface module in a control panel considering operability, maintainability, and environmental resistance. Provide clearance between the network interface module and surrounding structures or other network interface modules (except the digital signal converter and the analog signal converter) as shown below.

When using the dedicated cable



(Unit: mm)

When using the signal converter connection extension cable



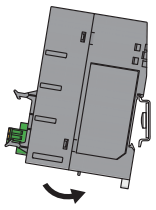
(Unit: mm)
*1 The length depends on the bending radius of the Ethernet cables. Check the bending radius in the specifications of the Ethernet cables used.

Installing the module on a DIN rail

■ **DIN rail**

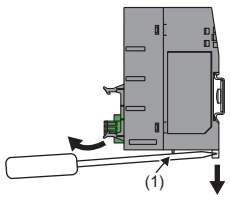
- Use the DIN rail of TH35-7.5Fe or TH35-7.5Al (compliant with JIS C 2812).
- Fix a DIN rail using mounting screws at intervals of 200mm or less.

■ **Installation procedure**



Hang the upper fixing tab of the module to the DIN rail, and push the module to the DIN rail to snap it into place.

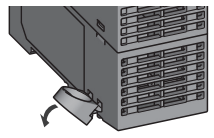
■ **Removal procedure**



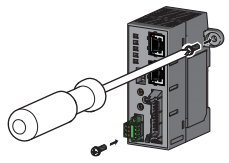
Insert a flathead screwdriver into the hook. Push down the hook by leverage of the screwdriver with the projection (1) under the module as a fulcrum to remove the module from the DIN rail.

How to mount the module using the mounting bracket

■ **Installation procedure**



Install the bracket to the module. Tilt the bracket and insert its projection parts into the holes of the module.
Press down the bracket in the direction shown by the arrow to snap it into place.



Tighten two M4 screws to the tightening torque of 0.82 to 1.11 N·m to install the module in a control panel.

Connection to Digital Signal Converter (Terminal Module) or Analog Signal Converter

To connect between the network interface module (digital input/output) and the digital signal converter or between the network interface module (analog input/output) and the analog signal converter, use the network interface module cable.
Align the notch of cable connector with the notch of module connector, and push it in. Insert the cable connector to the end of the module connector to fix the cable securely.
The network interface module cables do not have electrical polarity for connection.

Network interface module cables

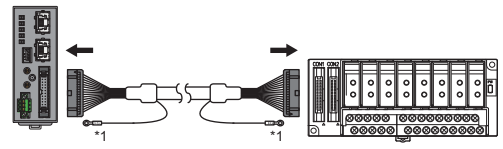
The following table lists network interface module cables used for connecting the network interface module to connectable devices.

Item	Model	Length	Description
Dedicated cable	—	85mm	Included in the package with "-01C" appended to the model name of the network interface module.
Signal converter connection extension cable	FA3-CB2L10MM1H20	1.0m	Sold separately
	FA3-CB2L20MM1H20	2.0m	
	FA3-CB2L30MM1H20	3.0m	

When using the dedicated cable

When using an analog signal converter, connect the dedicated cable to CON1.

When using the signal converter connection extension cable



When using an analog signal converter, connect the signal converter connection extension cable to CON1.
*1 Ground the FG line to the control panel (both ends).

Wiring to Terminal Block for Module Power Supply and FG

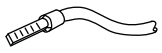
Wire

The following table shows the suitable wire for connection to the terminal block for module power supply and FG.

Diameter	Type	Material	Temperature rating
0.14 to 1.5mm² (26 to 16 AWG)	Stranded wire or solid wire	Copper	75℃ or higher

The size of a terminal hole on the terminal block is 2.4mm × 1.5mm.

Terminal processing of wires



Strip the coating from the end of the wire, and install a ferrule solderless terminal to the stripped part.
For the length to strip, refer to the specifications of the ferrule solderless terminal to be used.
If the coating is stripped too long, the conductive part protrudes to the front of the terminal block, resulting in the risk of electric shock or a short circuit between terminals.
If the coating is stripped too short, contact failure can occur.

The following table lists the reference products of ferrule solderless terminals and crimping tools.

Model (sleeve length)	Applicable wire size	Crimping tool	Manufacturer
AI 0.34-10 TQ (10mm) AI 0.34-8 TQ (8mm)	0.34mm² (22 AWG)	CRIMPFOX6	PHOENIX CONTACT GmbH & Co. KG
AI 0.5-10 WH (10mm) AI 0.5-8 WH (8mm)	0.5mm² (20 AWG)		
A 0.5-10 (10mm) A 0.5-8 (8mm)	0.5mm² (20 AWG)		
A 0.75-10 (10mm) A 0.75-8 (8mm)	0.75mm² (18 AWG)		
A 1-10 (10mm) A 1-8 (8mm)	1.0mm² (18 AWG)		
A 1.5-10 (10mm)	1.5mm² (16 AWG)		
216-302 (8mm)	0.34mm² (24 to 22 AWG)	206-1204	WAGO Kontakttechnik GmbH & Co. KG
216-201 (8mm)	0.5mm² (22 to 20 AWG)		

Wiring

Confirm that all phases of the external power supply used in the system are shut off in advance.
Insert and push the wire into the wire insertion opening. Pull the wire lightly to check that the wire is securely clamped.
For the precautions on wiring, refer to the CC-Link IE TSN/Ethernet Network Interface Module User's Manual (Detailed Edition).

Wiring of Ethernet Cables

Ethernet cables

The following table lists applicable Ethernet cables.

Communication performance	Ethernet cable
1Gbps	Ethernet cables that meet the 1000BASE-T standard: Category 5e or higher (double shielded, STP), straight cable
100Mbps	Ethernet cables that meet the 100BASE-TX standard: Category 5 or higher (double shielded, STP), straight cable
10Mbps	Ethernet cables that meet the 10BASE-T standard: Category 3 or higher (unshielded, UTP or double shielded, STP), straight cable

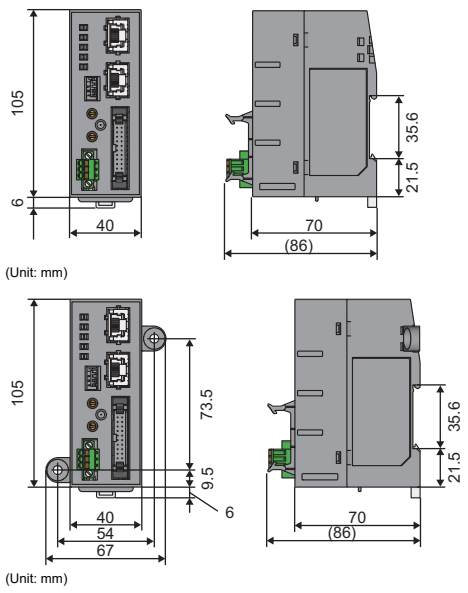
Do not use the cables with broken latches.

Connecting the Ethernet cable

(1) Power off the network interface module and the external device.
(2) With attention to the orientation of the cable, push the Ethernet cable connector into the network interface module until it clicks. Use P1 for CC-Link IE Field Network Basic, SLMP, or MODBUS/TCP.
(3) Power on the network interface module.
(4) Power on the external device.
(5) Check that the LINK LED on the port into which the Ethernet cable is connected is on.

Attach the included dustproof cap to the unused connector.
For the precautions on wiring, refer to the CC-Link IE TSN/Ethernet Network Interface Module User's Manual (Detailed Edition).

External Dimensions



(Unit: mm)

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Note that the gratis warranty period shall be limited to 18 months after manufacturing, which includes six months as the distribution period in the market.
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