FX20 series Modular I/O System EtherNet/IP User Manual

Tianjin Elco Automation Co., Ltd

CONTENT

1. Product introduction

The FX20 series modular I/O system is a new generation IP20 expandable I/O product launched by Elco. It's composed of bus adapters, I/O modules and functional modules, with the min. module width of only 15 mm, which is thin and compact, greatly saving space inside the control cabinet. The wiring terminal is designed with two separate sections, which facilitates module replacement and maintenance. Keeping the fresh family color scheme, it provides practical tool-free spring terminals for fast and convenient wiring. The terminal buttons are identified by color, and different colors represent different functions, improving the efficiency of wiring and checking to the most. FX20 adopts high-speed backplane bus technology, with high communication bandwidth and fast response speed, which can meet the application of high-speed production takt. By simply replacing the bus coupler, different automation bus systems can be connected. Currently, it is mainly compatible with mainstream Ethernet bus protocols such as EtherCAT, PROFINET, EtherNet/IP, CC-Link IE Field Basic, and can expand up to 32 sub-modules.

FX20 has a wide range of functional modules with powerful functions, including digital input and output, relay output, analog input and output, temperature measurement, high-speed counting, IO-Link master station, communication bridge, etc. It can meet the needs of various automation systems and is widely used in industries such as automobile manufacturing, parts processing, 3C electronics, lithium battery equipment, photovoltaic, logistics, printing and packaging.

This manual mainly introduces the mechanical installation, electrical installation, and module configuration examples of FX20 products.

2. Version change record

Revision date	Version	Content changed
2024-1	V1.0	1st version
2025-1	V1.1	Content updates
2025-7	V1.2	Updated some product images and document formats. Add some of module parameters. Add output hold function description.
2025-12	V2.0	Update fonts and layouts

3. About obtaining manuals

This manual is not shipped with the product. You can obtain its PDF file through the following methods:

- Log in to Elco's official website (www.elcoautomation.com), search for keywords, and download.
- Use WeChat to search and subscribe the official account of "Elco Automation" to obtain the product manual.
- Contact Elco sales engineers in your area to obtain the latest manual materials.

4. Warranty statement

Under normal use, if the product malfunctions or is damaged, Elco will be responsible for an 18 months warranty (from and subject to the delivery date; executed according to the agreement, if there is a contract). When it's over 18 months, maintenance fees will be charged.

- Within 18 months, repair fees will be charged for product damaged by the following circumstances.
- Failure to operate according to the manual
- Fires, floods, and abnormal voltage
- Used for abnormal functions

- Beyond the application scope
- Force majeure (natural disasters, earthquakes, lightning strikes).

The service fees shall be calculated according to Elco's unified standards. Subject to the contract, if there is.

5. Precautions

5.1. Safety statement

1) Please read and follow these precautions before installing, operating, and maintaining the product.

2) To ensure personal and equipment safety, please follow all precautions indicated on the product and in the manual when installing, operating, and maintaining the product.

3) The 'caution', 'warning' and 'danger items in the manual do not represent all precautions that should be followed, but only serve as supplements to all safety precautions.

4) This product should be used in an environment that meets the design specifications, otherwise it may cause malfunctions. Functional abnormalities or component damage caused by non-compliance with relevant regulations are not within the scope of product quality assurance.

5) Elco will not bear any legal responsibility for personal safety accidents, property losses, etc. caused by mishandling of products.

5.2. Definition of safety level

Caution	If not operated properly, it may result in minor body injury or equipment damage
Warning	If not operated properly, it may result in death or serious bodily injury.
Danger	If not operated properly, it will result in death or serious bodily injury.

5.3. Safety and tips

	Reminding		Please refer to the relevant manual content before operation
	Risk of electrical shock		Information tips
	General tips		Only authorized electrical personnel can operate
	Earthing		Only authorized mechanical personnel can operate

When designing control systems

Dangerous!

- Please be sure to design a safety circuit to ensure that the control system can still work safely in the event of external power failure or PLC failure;
- When long time overcurrent caused by exceeding rated load current or short circuit, the module may smoke or catch fire. So, safety devices such as fuses or circuit breakers need to be installed.

When installing

Warning!

- Only professional maintenance personnel who have been trained on electrical equipment and have sufficient electrical knowledge can install this product.

Dangerous!

- During the operation, all external power supplies used by the system must be disconnected. If the power supply is not fully disconnected, it may cause electric shock, module failure or malfunction.
- Do not use programmable controller in the following conditions: places with dust, oil fumes, conductive dust, corrosive gases, and flammable gas.
- Exposed to high temperatures, condensation, and wind and rain; In situations with vibration and impact. Electric shock, fire, and mis-operation can also cause product damage and deterioration.
- The programmable controller is an Open type device, please install it in a control cabinet with a lock (the IP rating of the control cabinet housing > IP20). Only operators who have been trained on electrical equipment and have sufficient electrical knowledge can open the control cabinet.
- During installation, avoid metal shavings and wire ends falling into the ventilation hole of the controller, which may cause fire, malfunction, and mis-operation.

Caution!

- After installation, ensure that there are no foreign objects on the ventilation surface, otherwise it may cause poor heat dissipation, fire, malfunction, and mis-operation.
- When installing, it needs to be tightly connected to connectors and the module connection hooks need to be securely locked. If the module is installed improperly, it may cause mis-operation, malfunction, and detachment.

When wiring

Dangerous!

- Only professional maintenance personnel who have been trained on electrical equipment and have sufficient electrical knowledge can carry out the wiring of this product;
- During the operation, all external power supplies used by the system must be disconnected. If the power supply is not fully disconnected, it may cause electric shock, module failure or malfunction.

Dangerous!

- Cable terminals should be well insulated to ensure that the insulation distance between cables does not decrease after installation on the terminal block. Otherwise, it may cause electric shock or equipment damage.
- To avoid electric shock, please cut off the power supply before connecting to the power supply of this product;
- The input power specifications of this product can be found in technical specifications. Please provide the power supply strictly in accordance with the data in the technical specifications. If the power supply is not within the required range, it will seriously damage this product. Therefore, please regularly check whether the DC power supply provided by the switching power supply is stable.

During operation and maintenance

Caution!

- Only professional maintenance personnel who have been trained on electrical equipment and have sufficient electrical knowledge can carry out the maintenance.
- Do not touch the terminals when powered on, otherwise it may cause electric shock or malfunction.
- During the operation, all external power supplies used by the system must be disconnected. If the power supply is not fully disconnected, it may cause electric shock or malfunction.

- At locations where operators directly come into contact with mechanical parts, such as loading and unloading mechanical tools, or where machinery operates automatically, careful consideration must be given to the function of on-site manual devices or other backup means. It needs to be independent of programmable controllers and can start or interrupt the automatic operation of the system.
- If the program needs to be modified while the system is running, it is necessary to consider using locks or other protective measures to ensure that only authorized personnel can make necessary modifications.

When Scrapping

Caution!

- Please treat it as industrial waste;
- Scrapped equipment and products need to be disposed of and recycled according to industrial waste treatment standards to avoid environmental pollution.

Please keep the content of this safety precautions properly for future reference, and be sure to hand over this manual to the end user.

6. FX20 Product Introduction

6.1. Appearance and function of EtherNet/IP bus adapter

Item	Name	Function	Status
1	Rail locking device	Lock FX20 module on the rail	Assembling completed: locking position; Disassembling module: unlocking position.
2	X1	EtherNet/IP bus input	-
3	X2	EtherNet/IP bus output	-
4	Module fixing device	Fixing module and rail	Disassembling module: pull out; Assembling completed: press down.
5	Adapter running indicator		
	PWR	Indicate power supply	Green: normal Off: abnormal
	BF	Indicate network status	Green: normal Red: configuration error
	SF	Report system error	Green: normal Red: error
	STA	Indicate backplane communication status	Green: normal Red: Backplane communication error
6	Power input terminal 0 V	0 V access	-
7	Power input terminal 24 V+	24 VDC access	-
8	PE	System grounding	-
9	Rotary code switches	Set FX20 IP address	-

6.2. FX20 EtherNet/IP adapter technical data

FX20-GW-EP00

ARTICLE PROPERTIES

PRODUCT TYPE	FX20 series modular I/O system EtherNet/IP adapter	**PRODUCT GROUP**	IP20 modular I/O system
DESCRIPTION	Gateway module for EtherNet/IP, 2 x RJ45, max. 32 cascadable modules, 24 V DC, IP20, DIN rail installation, overcurrent / reverse polarity / surge protection	**PU**	1 pcs
		COUNTRY OF ORIGIN	CN

TECHNICAL DATA

COMMUNICATION PROTOCOL	EtherNet/IP	**SUPPLY VOLTAGE (SYSTEM)**	24 V DC (± 20 %)
TRANSMISSION MEDIUM	Twisted pair S-UTP, 100 Ω, Cat. 5	**INPUT CURRENT (TYP.) AT NOMINAL LOAD (24 V)**	200 mA
TRANSMISSION RATE	10/100 Mbit/s	**BACKPLANE POWER SUPPLY VOLTAGE**	5 V DC
BUS SEGMENT LENGTH (MAX.)	100 m	**BACKPLANE POWER SUPPLY CURRENT (MAX.)**	3 A
BUS NODE ADDRESS	1 ... 254 (Rotary code switches setting) or set by configuration software	**ELECTRICAL ISOLATION**	500 V (power supply and bus)
WEB SERVER	The access address is set according to the rotary code switches or configuration software	**POWER PROTECTION**	Overcurrent protection, reverse polarity protection, surge protection
MAX. NUMBER OF CASCADABLE MODULES	32	**FAULT DIAGNOSIS METHOD**	LED, communication message
INPUT AND OUTPUT PROCESS MAPPING (MAX.)	504 bytes / 504 bytes		

CONNECTION DATA

WIRE CONNECTION	Plug-in terminal block	**STRIPPED LENGTHS**	8 … 10 mm 0.315 … 0.394 in
CROSS SECTION	0.08 mm² … 2.5 mm² AWG 28 … 14		

ENVIRONMENTAL REQUIREMENTS

PROTECTION CLASS	IP20	**ELECTRICAL FAST TRANSIENT (EFT)**	Level A, per IEC 61000-4-4
MOUNTING TYPE	DIN-35 mm rail	**ELECTRO-STATIC DISCHARGE**	Level A, per IEC 61000-4-2

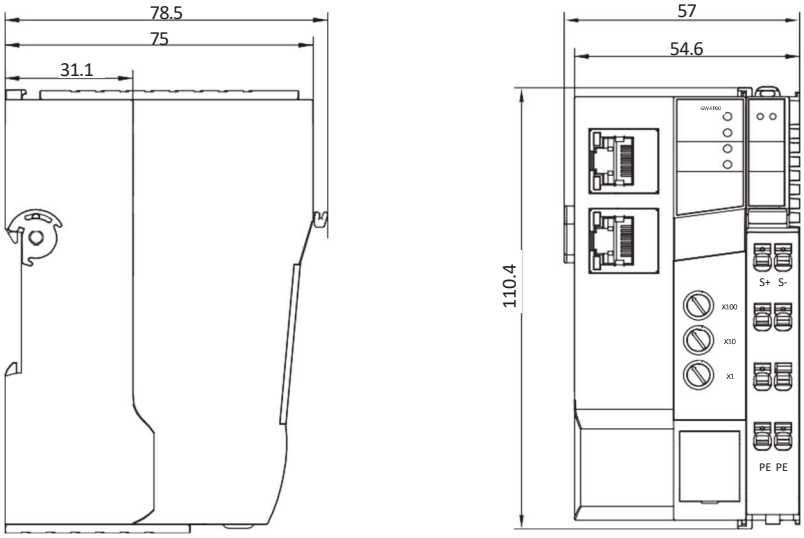
(ESD)

AMBIENT TEMPERATURE	-5 ... +60 °C	**SURGE TEST**	Level A, per IEC 61000-4-5
STORAGE TEMPERATURE	-25 ... +70 °C	**VIBRATION RESISTANCE**	4 g, per IEC 60068-2-6
RELATIVE HUMIDITY	95%, non-condensing	**SHOCK RESISTANCE**	15 g, per IEC 60068-2-27
OPERATING ALTITUDE	0 … 2000 m / 0 … 6562 ft	**EU ROHS COMPLIANCE STATUS**	Yes
POLLUTION DEGREE	2, per IEC 61131-2	**MATERIAL COMPLIANCE**	Compliant with REACH

GENERAL DATA

HOUSING MATERIAL	PPE	**DIMENSIONS (H X W X D)**	110.4 x 57 x 78.5 mm
WEIGHT	230 g	**MTTF (25 °C)**	111 years
COLOR	Light gray	**APPROVALS**	CE

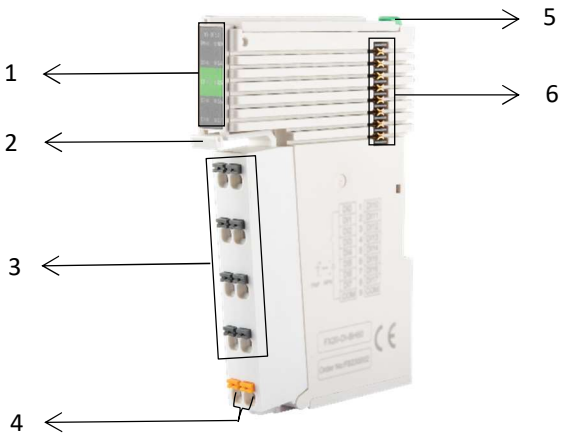
6.3. FX20 EtherNet/IP adapter profile drawing



6.4. Introduction to the appearance of I/O modules

6.4.1. 8-channel digital input/output module

6.4.1.1. 8-channel digital input module



Item	Name	Function	Status
1	Module running indicators		
	PW	Backplane power indicator	Green: normal; Red: I/O power supply abnormal; Off: no backplane power
	MD	Module error indicator	Green: normal Red: Module channel error Green blinking: Connected but not configured; Red and green blinking: Backplane communication abnormal;
	00-07	Input signal indicator	Green: input “1” Off: input “0”
2	Terminal disassembly device	Press the device to separate the terminal block from the module	-
3	IO input terminal 0-7	IO signal wiring	-
4	Common ground terminal	IO signal Common ground terminal	0 V when the input signal is PNP, 24 V+ when the input signal is NPN
5	Module fixing device	Used to fix the module to the standard mounting rail	Pulling up: assembling position; Pressing down: locking position
6	Backplane bus interface	Backplane communication among modules	-

6.4.1.2. 8-channel digital input module technical data

FX20-DI-BF60

ARTICLE PROPERTIES

PRODUCT TYPE	FX20 series modular I/O system digital input modules	**PRODUCT GROUP**	IP20 modular I/O system
DESCRIPTION	FX20-submoduel 8-channel input PNP / NPN, 24 V DC, IP20, DIN rail installation	**PU**	1 pc
		COUNTRY OF ORIGIN	CN

TECHNICAL DATA

NUMBER OF DIGITAL INPUTS	8	**INPUT FILTERING DELAY**	0 ms, 1 ms, 3 ms and 10 ms can be configured
INPUT TYPE	PNP / NPN	**CURRENT CONSUMPTION (5 V)**	60 mA
INPUT SIGNAL '0'	0 ... 5 V DC	**PROCESS DATA LENGTH**	1 byte
INPUT SIGNAL '1'	18 ... 30 V DC	**FAULT DIAGNOSIS METHOD**	LED, communication message

INPUT CURRENT PER CHANNEL FOR SIGNAL '1'	Typ. 4 mA

CONNECTION DATA

WIRE CONNECTION	Plug-in terminal block	**STRIPPED LENGTHS**	8 … 10 mm 0.315 … 0.394 in
CROSS SECTION	0.08 mm² … 2.5 mm² AWG 28 … 14		

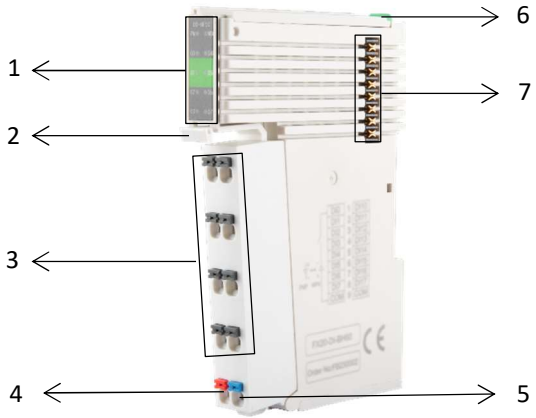
ENVIRONMENTAL REQUIREMENTS

PROTECTION CLASS	IP20	**ELECTRICAL FAST TRANSIENT (EFT)**	Level A, per IEC 61000-4-4
MOUNTING TYPE	DIN-35 mm rail	**ELECTRO-STATIC DISCHARGE (ESD)**	Level A, per IEC 61000-4-2
AMBIENT TEMPERATURE	-5 ... +60 °C	**SURGE TEST**	Level A, per IEC 61000-4-5
STORAGE TEMPERATURE	-25 ... +70 °C	**VIBRATION RESISTANCE**	4 g, per IEC 60068-2-6
RELATIVE HUMIDITY	95%, non-condensing	**SHOCK RESISTANCE**	15 g, per IEC 60068-2-27
OPERATING ALTITUDE	0 … 2000 m / 0 … 6562 ft	**EU ROHS COMPLIANCE STATUS**	Yes
POLLUTION DEGREE	2, per IEC 61131-2	**MATERIAL COMPLIANCE**	Compliant with REACH

GENERAL DATA

HOUSING MATERIAL	PPE	**DIMENSIONS (H X W X D)**	110.6 x 15 x 78.4 mm
WEIGHT	63 g	**MTTF (25 °C)**	155 years
COLOR	Light gray	**APPROVALS**	CE

6.4.1.3. 8-channel digital output modules



Item	Name	Function	Status
1	Module running indicators		
	PW	Backplane power indicator	Green: normal; Red: I/O power supply abnormal; Off: no backplane power
	MD	Module error indicator	Green: normal Red: Module channel error

			Green blinking: Connected but not configured; Red and green blinking: Backplane communication abnormal;
	00-07	Output signal indicator	Green: output “1” Off: output “0”
2	Terminal disassembly device	Press the device to separate the terminal block from the module	-
3	IO output terminal 0-7	IO signal wiring	-
4	24 V power terminal	24 V+	-
5	24 V power terminal	0 V	-
6	Module fixing device	Used to fix the module to the standard mounting rail	Pulling up: assembling position; Pressing down: locking position.
7	Backplane bus interface	Backplane communication	-

6.4.1.4. 8-channel digital output module technical data

FX20-DO-BF00

ARTICLE PROPERTIES

PRODUCT TYPE	FX20 series modular I/O system digital output modules	**PRODUCT GROUP**	IP20 modular I/O system
DESCRIPTION	FX20-submoduel 8-channel output PNP, 24 V DC, 0.5 A, IP20, DIN rail installation	**PU**	1 pc
		COUNTRY OF ORIGIN	CN

TECHNICAL DATA

NUMBER OF DIGITAL OUTPUTS	8	**SWITCHING FREQUENCY**	Max. 1 kHz (Resistive loads) Max. 1 Hz (Inductive loads) Max. 10 Hz (Lamps)
OUTPUT TYPE	PNP	**OUTPUT HOLD**	Supports, configured by PLC or web server
OUTPUT VOLTAGE	24 V DC	**CURRENT CONSUMPTION (5 V)**	60 mA
OUTPUT CURRENT	Max. 0.5 A per channel, total 4 A per module	**PROCESS DATA LENGTH**	1 byte
OUTPUT LOAD TYPES	Resistive loads, inductive loads, lamps	**FAULT DIAGNOSIS METHOD**	LED, communication message

CONNECTION DATA

WIRE CONNECTION	Plug-in terminal block	**STRIPPED LENGTHS**	8 … 10 mm 0.315 … 0.394 in
CROSS SECTION	0.08 mm² … 2.5 mm² AWG 28 … 14		

ENVIRONMENTAL REQUIREMENTS

PROTECTION CLASS	IP20	**ELECTRICAL FAST TRANSIENT (EFT)**	Level A, per IEC 61000-4-4
MOUNTING TYPE	DIN-35 mm rail	**ELECTRO-STATIC DISCHARGE (ESD)**	Level A, per IEC 61000-4-2
AMBIENT TEMPERATURE	-5 ... +60 °C	**SURGE TEST**	Level A, per IEC 61000-4-5
STORAGE TEMPERATURE	-25 ... +70 °C	**VIBRATION RESISTANCE**	4 g, per IEC 60068-2-6
RELATIVE HUMIDITY	95%, non-condensing	**SHOCK RESISTANCE**	15 g, per IEC 60068-2-27
OPERATING ALTITUDE	0 … 2000 m / 0 … 6562 ft	**EU ROHS COMPLIANCE STATUS**	Yes
POLLUTION DEGREE	2, per IEC 61131-2	**MATERIAL COMPLIANCE**	Compliant with REACH

GENERAL DATA

HOUSING MATERIAL	PPE	**DIMENSIONS (H X W X D)**	110.6 x 15 x 78.4 mm
WEIGHT	63 g	**MTTF (25 °C)**	155 years
COLOR	Light gray	**APPROVALS**	CE

FX20-DO-BF50

ARTICLE PROPERTIES

PRODUCT TYPE	FX20 series modular I/O system digital output modules	**PRODUCT GROUP**	IP20 modular I/O system
DESCRIPTION	FX20-submoduel 8-channel output NPN, 24 V DC, 0.5 A, IP20, DIN rail installation	**PU**	1 pc
		COUNTRY OF ORIGIN	CN

TECHNICAL DATA

NUMBER OF DIGITAL OUTPUTS	8	**SWITCHING FREQUENCY**	Max. 1 kHz (Resistive loads) Max. 1 Hz (Inductive loads) Max. 10 Hz (Lamps)
OUTPUT TYPE	NPN	**OUTPUT HOLD**	Supports, configured by PLC or web server
OUTPUT VOLTAGE	24 V DC	**CURRENT CONSUMPTION (5 V)**	60 mA
OUTPUT CURRENT	Max. 0.5 A per channel, total 4 A per module	**PROCESS DATA LENGTH**	1 byte
OUTPUT LOAD TYPES	Resistive loads, inductive loads, lamps	**FAULT DIAGNOSIS METHOD**	LED, communication message

CONNECTION DATA

WIRE CONNECTION	Plug-in terminal block	**STRIPPED LENGTHS**	8 … 10 mm 0.315 … 0.394 in
CROSS SECTION	0.08 mm² … 2.5 mm² AWG 28 … 14		

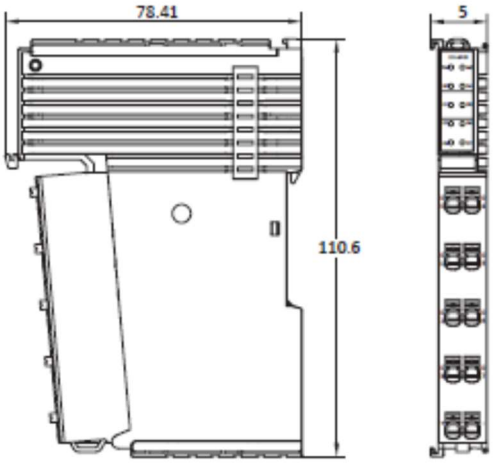
ENVIRONMENTAL REQUIREMENTS

PROTECTION CLASS	IP20	**ELECTRICAL FAST TRANSIENT (EFT)**	Level A, per IEC 61000-4-4
MOUNTING TYPE	DIN-35 mm rail	**ELECTRO-STATIC DISCHARGE (ESD)**	Level A, per IEC 61000-4-2
AMBIENT TEMPERATURE	-5 ... +60 °C	**SURGE TEST**	Level A, per IEC 61000-4-5
STORAGE TEMPERATURE	-25 ... +70 °C	**VIBRATION RESISTANCE**	4 g, per IEC 60068-2-6
RELATIVE HUMIDITY	95%, non-condensing	**SHOCK RESISTANCE**	15 g, per IEC 60068-2-27
OPERATING ALTITUDE	0 … 2000 m / 0 … 6562 ft	**EU ROHS COMPLIANCE STATUS**	Yes
POLLUTION DEGREE	2, per IEC 61131-2	**MATERIAL COMPLIANCE**	Compliant with REACH

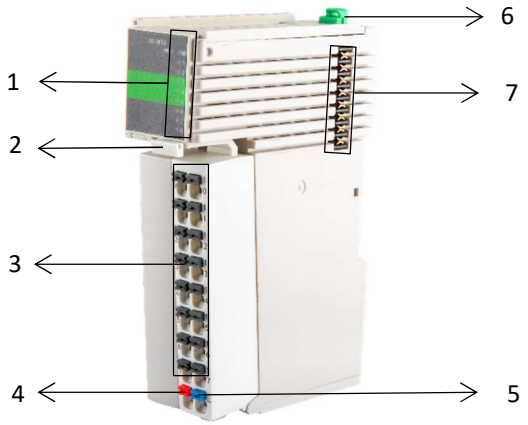
GENERAL DATA

HOUSING MATERIAL	PPE	**DIMENSIONS (H X W X D)**	110.6 x 15 x 78.4 mm
WEIGHT	63 g	**MTTF (25 °C)**	155 years
COLOR	Light gray	**APPROVALS**	CE

6.4.1.5. 8-channel digital input/output module profile drawing



6.4.1.6. 4/8-channel digital relay output modules



Item	Name	Function	Status
1	Module running indicator		
	PW	Backplane power indicator	Green: normal; Red: I/O power supply abnormal; Off: no backplane power
	MD	Module error indicator	Green: normal Red: Module channel error Green blinking: Connected but not configured; Red and green blinking: Backplane communication abnormal;
	00-07	Output signal indicator	Green: output “1” Off: output “0”
2	Terminal disassembly device	Press the device to separate the terminal block from the module	-
3	IO output terminal 0-7	IO signal wiring	-
4	24 V power terminal	24 V+	-
5	24 V power terminal	0 V	-
6	Module fixing device	Used to fix the module to the standard mounting rail	Pulling up: assembling position; Pressing down: locking position
7	Backplane bus interface	Backplane communication	-

6.4.1.7. 4/8-channel digital relay output modules technical data

FX20-DO-RD00

ARTICLE PROPERTIES

PRODUCT TYPE	FX20 series modular I/O system digital output modules	**PRODUCT GROUP**	IP20 modular I/O system
DESCRIPTION	FX20-submoduel 4-channel output SSR, 230 V AC, IP20, DIN rail installation	**PU**	1 pc
		COUNTRY OF ORIGIN	CN

TECHNICAL DATA

NUMBER OF DIGITAL OUTPUTS	4	**OUTPUT HOLD**	Supports, configured by PLC or web server
OUTPUT TYPE	AC solid state relay	**RELAY RESPONSE TIME**	3 ... 10 ms
CONTACT WORKING VOLTAGE	230 V AC	**ELECTRICAL LIFE**	20 million times
OUTPUT CURRENT	Max. 0.5 A per channel	**CURRENT CONSUMPTION (5 V)**	80 mA
OUTPUT LOAD TYPES	Resistive loads, lamps	**PROCESS DATA LENGTH**	1 byte
SWITCHING FREQUENCY	Max. 0.5 Hz	**FAULT DIAGNOSIS METHOD**	LED, communication message

CONNECTION DATA

WIRE CONNECTION	Plug-in terminal block	**STRIPPED LENGTHS**	8 … 10 mm 0.315 … 0.394 in
CROSS SECTION	0.08 mm² … 2.5 mm² AWG 28 … 14		

ENVIRONMENTAL REQUIREMENTS

PROTECTION CLASS	IP20	**ELECTRICAL FAST TRANSIENT (EFT)**	Level A, per IEC 61000-4-4
MOUNTING TYPE	DIN-35 mm rail	**ELECTRO-STATIC DISCHARGE (ESD)**	Level A, per IEC 61000-4-2
AMBIENT TEMPERATURE	-5 ... +60 °C	**SURGE TEST**	Level A, per IEC 61000-4-5
STORAGE TEMPERATURE	-25 ... +70 °C	**VIBRATION RESISTANCE**	4 g, per IEC 60068-2-6
RELATIVE HUMIDITY	95%, non-condensing	**SHOCK RESISTANCE**	15 g, per IEC 60068-2-27
OPERATING ALTITUDE	0 … 2000 m / 0 … 6562 ft	**EU ROHS COMPLIANCE STATUS**	Yes
POLLUTION DEGREE	2, per IEC 61131-2	**MATERIAL COMPLIANCE**	Compliant with REACH

GENERAL DATA

HOUSING MATERIAL	PPE	**DIMENSIONS (H X W X D)**	110.6 x 28.1 x 78.4 mm
WEIGHT	90 g	**MTTF (25 °C)**	155 years
COLOR	Light gray	**APPROVALS**	CE

FX20-DO-RF50

ARTICLE PROPERTIES

PRODUCT TYPE	FX20 series modular I/O system digital output modules	**PRODUCT GROUP**	IP20 modular I/O system
DESCRIPTION	FX20-submoduel 8-channel output mechanical relays, output voltage 250 V AC / 30 V DC, IP20, DIN rail installation	**PU**	1 pc
		COUNTRY OF ORIGIN	CN

TECHNICAL DATA

NUMBER OF DIGITAL OUTPUTS	8	**OUTPUT HOLD**	Supports, configured by PLC or web server
OUTPUT TYPE	Mechanical relays	**RELAY RESPONSE TIME**	About 15 ms
CONTACT WORKING VOLTAGE	250 V AC / 30 V DC	**ELECTRICAL LIFE**	100,000 times
OUTPUT CURRENT	Max. 2 A per channel	**CURRENT CONSUMPTION (5 V)**	65 mA
OUTPUT LOAD TYPES	Resistive loads, lamps	**PROCESS DATA LENGTH**	1 byte
SWITCHING FREQUENCY	Less than 6 times per minute	**FAULT DIAGNOSIS METHOD**	LED, communication message

CONNECTION DATA

WIRE CONNECTION	Plug-in terminal block	**STRIPPED LENGTHS**	8 … 10 mm 0.315 … 0.394 in
CROSS SECTION	0.08 mm² … 2.5 mm² AWG 28 … 14		

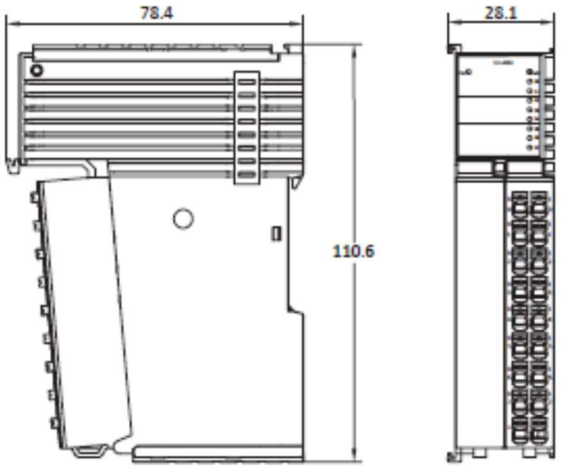
ENVIRONMENTAL REQUIREMENTS

PROTECTION CLASS	IP20	**ELECTRICAL FAST TRANSIENT (EFT)**	Level A, per IEC 61000-4-4
MOUNTING TYPE	DIN-35 mm rail	**ELECTRO-STATIC DISCHARGE (ESD)**	Level A, per IEC 61000-4-2
AMBIENT TEMPERATURE	-5 ... +60 °C	**SURGE TEST**	Level A, per IEC 61000-4-5
STORAGE TEMPERATURE	-25 ... +70 °C	**VIBRATION RESISTANCE**	4 g, per IEC 60068-2-6
RELATIVE HUMIDITY	95%, non-condensing	**SHOCK RESISTANCE**	15 g, per IEC 60068-2-27
OPERATING ALTITUDE	0 … 2000 m / 0 … 6562 ft	**EU ROHS COMPLIANCE STATUS**	Yes
POLLUTION DEGREE	2, per IEC 61131-2	**MATERIAL COMPLIANCE**	Compliant with REACH

GENERAL DATA

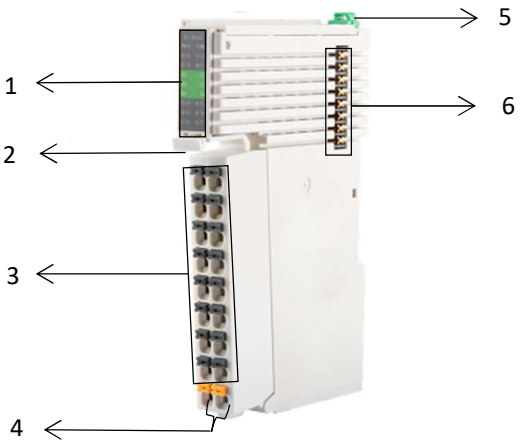
HOUSING MATERIAL	PPE	**DIMENSIONS (H X W X D)**	110.6 x 28.1 x 78.4 mm
WEIGHT	90 g	**MTTF (25 °C)**	155 years
COLOR	Light gray	**APPROVALS**	CE

6.4.1.8. 4/8-channel digital relay output module profile drawing



6.4.2. 16-channel digital input output module

6.4.2.1. 16-channel digital input module



Item	Name	Function	Status
1	Module running indicator		
	PW	Backplane power indicator	Green: normal; Off: no backplane power
	MD	Module error indicator	Green: normal Red: Module channel error Green blinking: Connected but not configured; Red and green blinking: Backplane communication abnormal;
	00-07 10-17	Input signal indicators	Green: output 1 Off: output 0

2	Terminal disassembly device	Press the device to separate the terminal block from the module	-
3	IO input terminal 00-07/10-17	IO signal wiring	-
4	Common terminals	IO signal common terminals	0 V when the input signal is PNP, 24 V+ when the input signal is NPN
5	Module fixing device	Used to fix the module to the standard mounting rail	Pulling up: assembling position; Pressing down: locking position
6	Backplane interface	Backplane communication	-

6.4.2.2. 16 digital input module technical data

FX20-DI-BL60

ARTICLE PROPERTIES

PRODUCT TYPE	FX20 series modular I/O system digital input modules	**PRODUCT GROUP**	IP20 modular I/O system
DESCRIPTION	FX20-submoduel 32-channel input PNP/ NPN, 24 V DC, IP20, DIN rail installation	**PU**	1 pc
		COUNTRY OF ORIGIN	CN

TECHNICAL DATA

NUMBER OF DIGITAL INPUTS	32	**INPUT FILTERING DELAY**	0 ms, 1 ms, 3 ms and 10 ms can be configured
INPUT TYPE	PNP / NPN	**CURRENT CONSUMPTION (5 V)**	60 mA
INPUT SIGNAL '0'	0 … 5 V DC	**PROCESS DATA LENGTH**	4 bytes
INPUT SIGNAL '1'	18 … 30 V DC	**FAULT DIAGNOSIS METHOD**	LED, communication message
INPUT CURRENT PER CHANNEL FOR SIGNAL '1'	Typ. 4 mA		

CONNECTION DATA

WIRE CONNECTION	Plug-in terminal block	**STRIPPED LENGTHS**	8 … 10 mm 0.315 … 0.394 in
CROSS SECTION	0.08 mm² … 2.5 mm² AWG 28 … 14		

ENVIRONMENTAL REQUIREMENTS

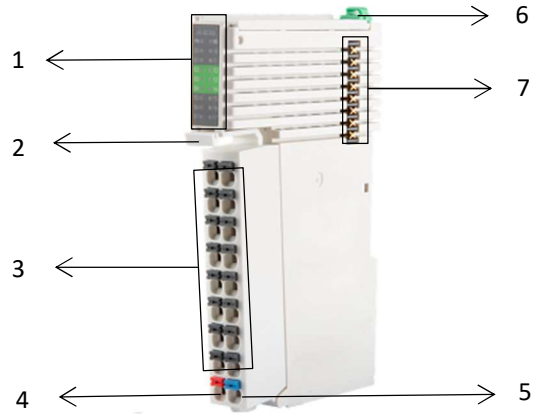
PROTECTION CLASS	IP20	**ELECTRICAL FAST TRANSIENT (EFT)**	Level A, per IEC 61000-4-4
MOUNTING TYPE	DIN-35 mm rail	**ELECTRO-STATIC DISCHARGE (ESD)**	Level A, per IEC 61000-4-2
AMBIENT TEMPERATURE	-5 ... +60 °C	**SURGE TEST**	Level A, per IEC 61000-4-5

STORAGE TEMPERATURE	-25 ... +70 °C	**VIBRATION RESISTANCE**	4 g, per IEC 60068-2-6
RELATIVE HUMIDITY	95%, non-condensing	**SHOCK RESISTANCE**	15 g, per IEC 60068-2-27
OPERATING ALTITUDE	0 … 2000 m / 0 … 6562 ft	**EU ROHS COMPLIANCE STATUS**	Yes
POLLUTION DEGREE	2, per IEC 61131-2	**MATERIAL COMPLIANCE**	Compliant with REACH

GENERAL DATA

HOUSING MATERIAL	PPE	**DIMENSIONS (H X W X D)**	110.6 x 28.1 x 78.4 mm
WEIGHT	128 g	**MTTF (25 °C)**	155 years
COLOR	Light gray	**APPROVALS**	CE

6.4.2.3. 16-channel digital output module



Item	Name	Function	Status
1	Module running indicator		
	PW	Backplane power indicator	Green: normal; Red: I/O power supply abnormal; Off: no backplane power
	MD	Module error indicator	Green: normal Red: Module channel error Green blinking: Connected but not configured; Red and green blinking: Backplane communication abnormal;
	00-07 10-17	Output signal indicator	Green: output “1” Off: output “0”
2	Terminal disassembly device	Press the device to separate the terminal block from the module	-
3	I/O output terminal 0-7,10-17	I/O signal wiring	-
4	24 V power terminal	24 V+	-

5	24 V power terminal	0 V	-
6	Module fixing device	Used to fix the module to the standard mounting rail	Pulling up: assembling position; Pressing down: locking position
7	Backplane expansion interface	Backplane communication	-

6.4.2.4. 16-channel digital output module technical data

FX20-DO-BH00

ARTICLE PROPERTIES

PRODUCT TYPE	FX20 series modular I/O system digital output modules	**PRODUCT GROUP**	IP20 modular I/O system
DESCRIPTION	FX20-submoduel 16-channel output PNP, 24 V DC, 0.5 A, IP20, DIN rail installation	**PU**	1 pc
		COUNTRY OF ORIGIN	CN

TECHNICAL DATA

NUMBER OF DIGITAL OUTPUTS	16	**SWITCHING FREQUENCY**	Max. 1 kHz (Resistive loads) Max. 1 Hz (Inductive loads) Max. 10 Hz (Lamps)
OUTPUT TYPE	PNP	**OUTPUT HOLD**	Supports, configured by PLC or web server
OUTPUT VOLTAGE	24 V DC	**CURRENT CONSUMPTION (5 V)**	60 mA
OUTPUT CURRENT	Max. 0.5 A per channel, total 4 A per module	**PROCESS DATA LENGTH**	2 bytes
OUTPUT LOAD TYPES	Resistive loads, inductive loads, lamps	**FAULT DIAGNOSIS METHOD**	LED, communication message

CONNECTION DATA

WIRE CONNECTION	Plug-in terminal block	**STRIPPED LENGTHS**	8 … 10 mm 0.315 … 0.394 in
CROSS SECTION	0.08 mm² … 2.5 mm² AWG 28 … 14		

ENVIRONMENTAL REQUIREMENTS

PROTECTION CLASS	IP20	**ELECTRICAL FAST TRANSIENT (EFT)**	Level A, per IEC 61000-4-4
MOUNTING TYPE	DIN-35 mm rail	**ELECTRO-STATIC DISCHARGE (ESD)**	Level A, per IEC 61000-4-2
AMBIENT TEMPERATURE	-5 ... +60 °C	**SURGE TEST**	Level A, per IEC 61000-4-5
STORAGE TEMPERATURE	-25 ... +70 °C	**VIBRATION RESISTANCE**	4 g, per IEC 60068-2-6
RELATIVE HUMIDITY	95%, non-condensing	**SHOCK RESISTANCE**	15 g, per IEC 60068-2-27
OPERATING ALTITUDE	0 … 2000 m / 0 … 6562 ft	**EU ROHS COMPLIANCE STATUS**	Yes

POLLUTION DEGREE	2, per IEC 61131-2	**MATERIAL COMPLIANCE**	Compliant with REACH

GENERAL DATA

HOUSING MATERIAL	PPE	**DIMENSIONS (H X W X D)**	110.6 x 15 x 78.4 mm
WEIGHT	63 g	**MTTF (25 °C)**	155 years
COLOR	Light gray	**APPROVALS**	CE

FX20-DO-BH50

ARTICLE PROPERTIES

PRODUCT TYPE	FX20 series modular I/O system digital output modules	**PRODUCT GROUP**	IP20 modular I/O system
DESCRIPTION	FX20-submoduel 16-channel output NPN, 24 V DC, 0.5 A, IP20, DIN rail installation	**PU**	1 pc
		COUNTRY OF ORIGIN	CN

TECHNICAL DATA

NUMBER OF DIGITAL OUTPUTS	16	**SWITCHING FREQUENCY**	Max. 1 kHz (Resistive loads) Max. 1 Hz (Inductive loads) Max. 10 Hz (Lamps)
OUTPUT TYPE	NPN	**OUTPUT HOLD**	Supports, configured by PLC or web server
OUTPUT VOLTAGE	24 V DC	**CURRENT CONSUMPTION (5 V)**	60 mA
OUTPUT CURRENT	Max. 0.5 A per channel, total 4 A per module	**PROCESS DATA LENGTH**	2 bytes
OUTPUT LOAD TYPES	Resistive loads, inductive loads, lamps	**FAULT DIAGNOSIS METHOD**	LED, communication message

CONNECTION DATA

WIRE CONNECTION	Plug-in terminal block	**STRIPPED LENGTHS**	8 … 10 mm 0.315 … 0.394 in
CROSS SECTION	0.08 mm² … 2.5 mm² AWG 28 … 14		

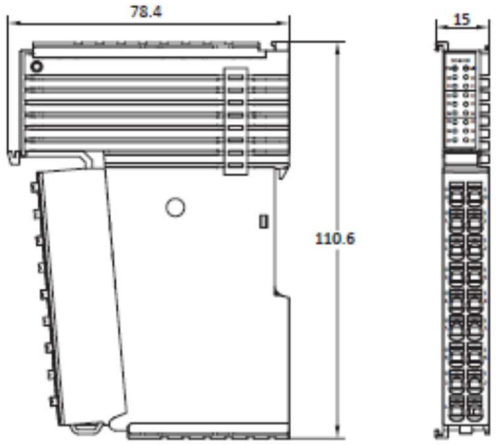
ENVIRONMENTAL REQUIREMENTS

PROTECTION CLASS	IP20	**ELECTRICAL FAST TRANSIENT (EFT)**	Level A, per IEC 61000-4-4
MOUNTING TYPE	DIN-35 mm rail	**ELECTRO-STATIC DISCHARGE (ESD)**	Level A, per IEC 61000-4-2
AMBIENT TEMPERATURE	-5 ... +60 °C	**SURGE TEST**	Level A, per IEC 61000-4-5
STORAGE TEMPERATURE	-25 ... +70 °C	**VIBRATION RESISTANCE**	4 g, per IEC 60068-2-6
RELATIVE HUMIDITY	95%, non-condensing	**SHOCK RESISTANCE**	15 g, per IEC 60068-2-27
OPERATING ALTITUDE	0 … 2000 m / 0 … 6562 ft	**EU ROHS COMPLIANCE STATUS**	Yes
POLLUTION DEGREE	2, per IEC 61131-2	**MATERIAL COMPLIANCE**	Compliant with REACH

GENERAL DATA

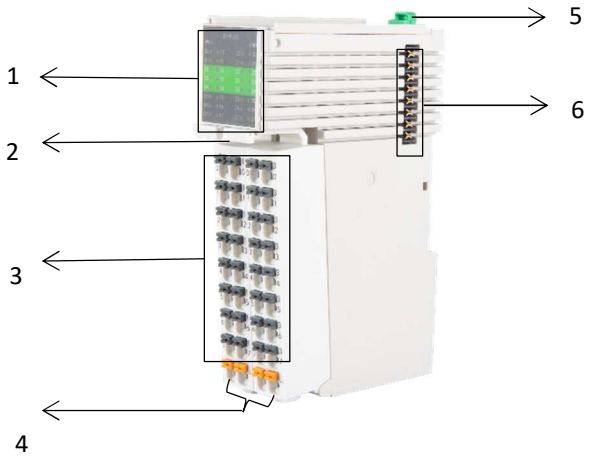
HOUSING MATERIAL	PPE	**DIMENSIONS (H X W X D)**	110.6 x 15 x 78.4 mm
WEIGHT	63 g	**MTTF (25 ℃)**	155 years
COLOR	Light gray	**APPROVALS**	CE

6.4.2.5. 16 digital input output module profile drawing



6.4.3. 32-channel digital input output module

6.4.3.1. 32-channel digital input module



Item	Name	Function	Status
1	Module running indicator		
	PW	Backplane power indicator	Green: normal; Off: no backplane power
	MD	Module error indicator	Green: normal Red: Module channel error Green blinking: Connected but not configured;

			Red and green blinking: Backplane communication abnormal;
	00-07,10-17 20-27,30-37	Input signal indicator	Green: output “1” Off: output “0”
2	Terminal disassembly device	Press the device to separate the terminal block from the module	-
3	IO input terminal 00-07,10-17, 20-27,30-37	I/O signal wiring	-
4	Common terminals	I/O signal common terminals	0 V when the input signal is PNP, 24 V+ when the input signal is NPN
5	Module fixing device	Used to fix the module to the standard mounting rail	Pulling up: assembling position; Pressing down: locking position
6	Backplane expansion interface	Backplane communication	-

6.4.3.2. 32-channel digital input module technical data

FX20-DI-BL60

ARTICLE PROPERTIES

PRODUCT TYPE	FX20 series modular I/O system digital input modules	**PRODUCT GROUP**	IP20 modular I/O system
DESCRIPTION	FX20-submoduel 32-channel input PNP/ NPN, 24 V DC, IP20, DIN rail installation	**PU**	1 pc
		COUNTRY OF ORIGIN	CN

TECHNICAL DATA

NUMBER OF DIGITAL INPUTS	32	**INPUT FILTERING DELAY**	0 ms, 1 ms, 3 ms and 10 ms can be configured
INPUT TYPE	PNP / NPN	**CURRENT CONSUMPTION (5 V)**	60 mA
INPUT SIGNAL '0'	0 … 5 V DC	**PROCESS DATA LENGTH**	4 bytes
INPUT SIGNAL '1'	18 … 30 V DC	**FAULT DIAGNOSIS METHOD**	LED, communication message
INPUT CURRENT PER CHANNEL FOR SIGNAL '1'	Typ. 4 mA		

CONNECTION DATA

WIRE CONNECTION	Plug-in terminal block	**STRIPPED LENGTHS**	8 … 10 mm 0.315 … 0.394 in
CROSS SECTION	0.08 mm² … 2.5 mm² AWG 28 … 14		

ENVIRONMENTAL REQUIREMENTS

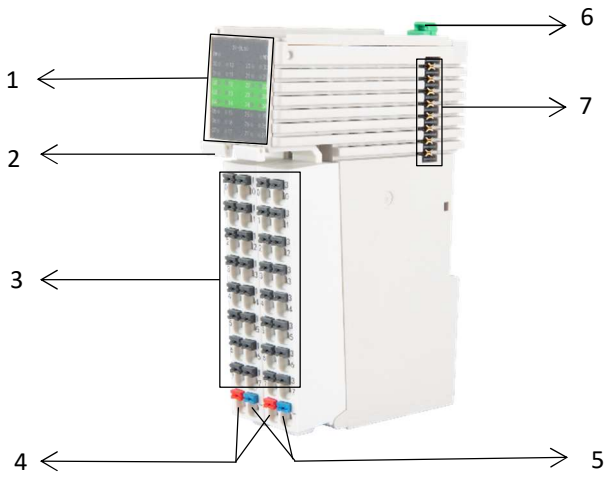
PROTECTION CLASS	IP20	**ELECTRICAL FAST TRANSIENT (EFT)**	Level A, per IEC 61000-4-4

MOUNTING TYPE	DIN-35 mm rail	**ELECTRO-STATIC DISCHARGE (ESD)**	Level A, per IEC 61000-4-2
AMBIENT TEMPERATURE	-5 ... +60 °C	**SURGE TEST**	Level A, per IEC 61000-4-5
STORAGE TEMPERATURE	-25 ... +70 °C	**VIBRATION RESISTANCE**	4 g, per IEC 60068-2-6
RELATIVE HUMIDITY	95%, non-condensing	**SHOCK RESISTANCE**	15 g, per IEC 60068-2-27
OPERATING ALTITUDE	0 … 2000 m / 0 … 6562 ft	**EU ROHS COMPLIANCE STATUS**	Yes
POLLUTION DEGREE	2, per IEC 61131-2	**MATERIAL COMPLIANCE**	Compliant with REACH

GENERAL DATA

HOUSING MATERIAL	PPE	**DIMENSIONS (H X W X D)**	110.6 x 28.1 x 78.4 mm
WEIGHT	128 g	**MTTF (25 ℃)**	155 years
COLOR	Light gray	**APPROVALS**	CE

6.4.3.3. 32-channel digital output module



Item	Name	Function	Status
1	Module running indicators		
	PW	Backplane power indicator	Green: normal; Red: I/O power supply abnormal; Off: no backplane power
	MD	Module error indicator	Green: normal Red: Module channel error Green blinking: Connected but not configured; Red and green blinking: Backplane communication abnormal;
	00-07,10-17 20-27,30-37	Output signal indicator	Green: output “1” Off: output “0”
2	Terminal disassembly device	Press the device to separate the terminal block from the module	-

3	I/O output terminal 00-07,10-17, 20-27,30-37	I/O signal wiring	-
4	24 V power terminal	24V+	-
5	24 V power terminal	0V	-
6	Module fixing device	Used to fix the module to the standard mounting rail	Pulling up: assembling position; Pressing down: locking position
7	Backplane bus interface	Backplane communication	-

6.4.3.4. 32-channel digital output module technical data

FX20-DO-BL00

ARTICLE PROPERTIES

PRODUCT TYPE	FX20 series modular I/O system digital output modules	**PRODUCT GROUP**	IP20 modular I/O system
DESCRIPTION	FX20-submoduel 32-channel output PNP, 24 V DC, 0.5 A, IP20, DIN rail installation	**PU**	1 pc
		COUNTRY OF ORIGIN	CN

TECHNICAL DATA

NUMBER OF DIGITAL OUTPUTS	32	**SWITCHING FREQUENCY**	Max. 1 kHz (Resistive loads) Max. 1 Hz (Inductive loads) Max. 10 Hz (Lamps)
OUTPUT TYPE	PNP	**OUTPUT HOLD**	Supports, configured by PLC or web server
OUTPUT VOLTAGE	24 V DC	**CURRENT CONSUMPTION (5 V)**	60 mA
OUTPUT CURRENT	Max. 0.5 A per channel, total 4 A per module	**PROCESS DATA LENGTH**	4 bytes
OUTPUT LOAD TYPES	Resistive loads, inductive loads, lamps	**FAULT DIAGNOSIS METHOD**	LED, communication message

CONNECTION DATA

WIRE CONNECTION	Plug-in terminal block	**STRIPPED LENGTHS**	8 … 10 mm 0.315 … 0.394 in
CROSS SECTION	0.08 mm² … 2.5 mm² AWG 28 … 14		

ENVIRONMENTAL REQUIREMENTS

PROTECTION CLASS	IP20	**ELECTRICAL FAST TRANSIENT (EFT)**	Level A, per IEC 61000-4-4
MOUNTING TYPE	DIN-35 mm rail	**ELECTRO-STATIC DISCHARGE (ESD)**	Level A, per IEC 61000-4-2
AMBIENT TEMPERATURE	-5 ... +60 °C	**SURGE TEST**	Level A, per IEC 61000-4-5

STORAGE TEMPERATURE	-25 ... +70 °C	**VIBRATION RESISTANCE**	4 g, per IEC 60068-2-6
RELATIVE HUMIDITY	95%, non-condensing	**SHOCK RESISTANCE**	15 g, per IEC 60068-2-27
OPERATING ALTITUDE	0 … 2000 m / 0 … 6562 ft	**EU ROHS COMPLIANCE STATUS**	Yes
POLLUTION DEGREE	2, per IEC 61131-2	**MATERIAL COMPLIANCE**	Compliant with REACH

GENERAL DATA

HOUSING MATERIAL	PPE	**DIMENSIONS (H X W X D)**	110.6 x 28.1 x 78.4 mm
WEIGHT	128 g	**MTTF (25 °C)**	155 years
COLOR	Light gray	**APPROVALS**	CE

FX20-DO-BL50

ARTICLE PROPERTIES

PRODUCT TYPE	FX20 series modular I/O system digital output modules	**PRODUCT GROUP**	IP20 modular I/O system
DESCRIPTION	FX20-submoduel 32-channel output NPN, 24 V DC, 0.5 A, IP20, DIN rail installation	**PU** **COUNTRY OF ORIGIN**	1 pc CN

TECHNICAL DATA

NUMBER OF DIGITAL OUTPUTS	32	**SWITCHING FREQUENCY**	Max. 1 kHz (Resistive loads) Max. 1 Hz (Inductive loads) Max. 10 Hz (Lamps)
OUTPUT TYPE	NPN	**OUTPUT HOLD**	Supports, configured by PLC or web server
OUTPUT VOLTAGE	24 V DC	**CURRENT CONSUMPTION (5 V)**	60 mA
OUTPUT CURRENT	Max. 0.5 A per channel, total 4 A per module	**PROCESS DATA LENGTH**	4 bytes
OUTPUT LOAD TYPES	Resistive loads, inductive loads, lamps	**FAULT DIAGNOSIS METHOD**	LED, communication message

CONNECTION DATA

WIRE CONNECTION	Plug-in terminal block	**STRIPPED LENGTHS**	8 … 10 mm 0.315 … 0.394 in
CROSS SECTION	0.08 mm² … 2.5 mm² AWG 28 … 14		

ENVIRONMENTAL REQUIREMENTS

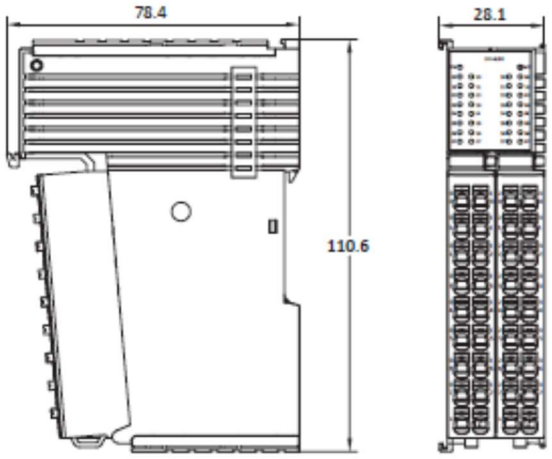
PROTECTION CLASS	IP20	**ELECTRICAL FAST TRANSIENT (EFT)**	Level A, per IEC 61000-4-4
MOUNTING TYPE	DIN-35 mm rail	**ELECTRO-STATIC DISCHARGE (ESD)**	Level A, per IEC 61000-4-2
AMBIENT TEMPERATURE	-5 ... +60 °C	**SURGE TEST**	Level A, per IEC 61000-4-5
STORAGE TEMPERATURE	-25 ... +70 °C	**VIBRATION RESISTANCE**	4 g, per IEC 60068-2-6

RELATIVE HUMIDITY	95%, non-condensing	**SHOCK RESISTANCE**	15 g, per IEC 60068-2-27
OPERATING ALTITUDE	0 … 2000 m / 0 … 6562 ft	**EU ROHS COMPLIANCE STATUS**	Yes
POLLUTION DEGREE	2, per IEC 61131-2	**MATERIAL COMPLIANCE**	Compliant with REACH

GENERAL DATA

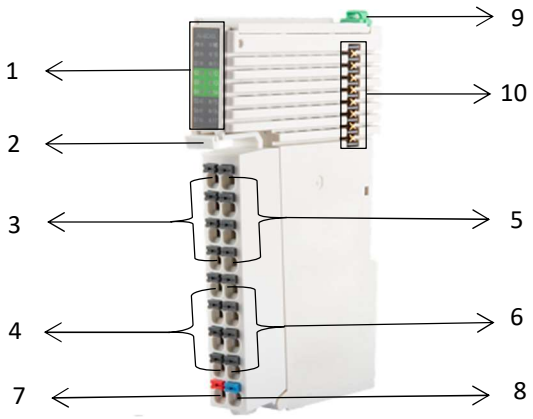
HOUSING MATERIAL	PPE	**DIMENSIONS (H X W X D)**	110.6 x 28.1 x 78.4 mm
WEIGHT	128 g	**MTTF (25 °C)**	155 years
COLOR	Light gray	**APPROVALS**	CE

6.4.3.5. 32-channel digital input/output module profile drawing



6.4.4. 4-channel analog input/output module

6.4.3.1. 4-channel analog input module



Item	Name	Function	Status
1	Module running indicators		

	PW	Backplane power indicator	Green: normal; Red: I/O power supply abnormal; Off: no backplane power
	MD	Module error indicator	Green: normal Red: Module channel error Green blinking: Connected but not configured; Red and green blinking: Backplane communication abnormal;
	C1-C4	Input signal indicator	Green: input normal Red: input over range
2	Terminal disassembly device	Press the device to separate the terminal block from the module	-
3	Analog input channel 0	Analog input	-
4	Analog input channel 1	Analog input	-
5	Analog input channel 2	Analog input	-
6	Analog input channel 3	Analog input	-
7	24 V power terminal	24V+	-
8	24 V power terminal	0V	-
9	Module fixing device	Used to fix the module to the standard mounting rail	Pulling up: assembling position; Pressing down: locking position
10	Backplane bus interface	Backplane communication	-

6.4.3.2. 4-channel analog input module technical data

FX20-AI-BD60

ARTICLE PROPERTIES

PRODUCT TYPE	FX20 series modular I/O system analog input modules	**PRODUCT GROUP**	IP20 modular I/O system
DESCRIPTION	FX20-submodule 4-channel analog input, voltage / current types, 24 V DC, IP20, DIN rail installation	**PU**	1 pc
		COUNTRY OF ORIGIN	CN

TECHNICAL DATA

NUMBER OF ANALOG INPUTS	4	**MEASURING ACCURACY**	± 0.2 %
INPUT TYPE	0 … 10 V, ± 10 V, 1 … 5 V, 0/4 … 20 mA, ±20 mA	**OPERATING VOLTAGE**	24 V DC
INPUT IMPEDANCE	Current type: 250 Ω Voltage type: 1 MΩ	**CURRENT CONSUMPTION (5 V)**	60 mA
INPUT RESOLUTION	16 bits	**PROCESS DATA LENGTH**	8 bytes

CONVERTING TIME	3 ms	**FAULT DIAGNOSIS METHOD**	LED, communication message

CONNECTION DATA

WIRE CONNECTION	Plug-in terminal block	**STRIPPED LENGTHS**	8 … 10 mm 0.315 … 0.394 in
CROSS SECTION	0.08 … 2.5 mm² AWG 28 … 14		

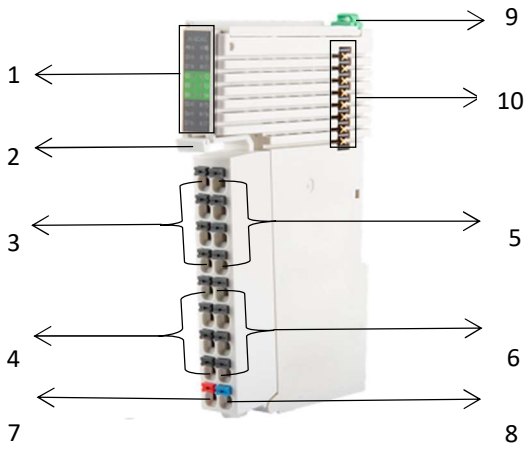
ENVIRONMENTAL REQUIREMENTS

PROTECTION CLASS	IP20	**ELECTRICAL FAST TRANSIENT (EFT)**	Level A, per IEC 61000-4-4
MOUNTING TYPE	DIN-35 mm rail	**ELECTRO-STATIC DISCHARGE (ESD)**	Level A, per IEC 61000-4-2
AMBIENT TEMPERATURE	-5 ... +60 °C	**SURGE TEST**	Level A, per IEC 61000-4-5
STORAGE TEMPERATURE	-25 ... +70 °C	**VIBRATION RESISTANCE**	4 g, per IEC 60068-2-6
RELATIVE HUMIDITY	95%, non-condensing	**SHOCK RESISTANCE**	15 g, per IEC 60068-2-27
OPERATING ALTITUDE	0 … 2000 m / 0 … 6562 ft	**EU ROHS COMPLIANCE STATUS**	Yes
POLLUTION DEGREE	2, compliant with IEC 61131-2	**MATERIAL COMPLIANCE**	Compliant with REACH

GENERAL DATA

HOUSING MATERIAL	PPE	**DIMENSIONS (H X W X D)**	110.6 x 15 x 78.4 mm
WEIGHT	63 g	**MTTF (25 °C)**	196 years
COLOR	Light gray	**APPROVALS**	CE

6.4.3.3. 4-channel analog output module



Item	Name	Function	Status
1	Module running indicators		
	PW	Backplane power indicator	Green: normal; Red: I/O power supply abnormal;

			Off: no backplane power
	MD	Module error indicator	Green: normal Red: Module channel error Green blinking: Connected but not be configured; Red and green blinking: Backplane communication abnormal.
	C1-C4	Output signal indicator	Green: output normal Red: output over range
2	Terminal disassembly device	Press the device to separate the terminal block from the module	-
3	Analog output 0	Analog output	-
4	Analog output 1	Analog output	-
5	Analog output 2	Analog output	-
6	Analog output 3	Analog output	-
7	24 V power terminal	24 V+	-
8	24 V power terminal	0 V	-
9	Module fixing device	Used to fix the module to the standard mounting rail	Pulling up: assembling position; Pressing down: locking position
10	Backplane bus interface	Backplane communication	

6.4.3.4. 4-channel analog output module technical data

FX20-AO-BD60

ARTICLE PROPERTIES

PRODUCT TYPE	FX20 series modular I/O system analog output modules	**PRODUCT GROUP**	IP20 modular I/O system
DESCRIPTION	FX20-submodule 4-channel analog output, voltage/ current types, 24 V DC, IP20, DIN rail installation	**PU**	1 pc
		COUNTRY OF ORIGIN	CN

TECHNICAL DATA

NUMBER OF ANALOG INPUTS	4	**OPERATING VOLTAGE**	24 V DC
OUTPUT TYPE	0 … 10 V, ± 10 V, 1 … 5 V, 0/4 … 20 mA	**CURRENT CONSUMPTION (5 V)**	60 mA
OUTPUT RESOLUTION	16 bits	**PROCESS DATA LENGTH**	8 bytes
CONVERTING TIME	2 ms	**FAULT DIAGNOSIS METHOD**	LED, communication message
MEASURING ACCURACY	± 0.2 %		

CONNECTION DATA

WIRE CONNECTION	Plug-in terminal block	**STRIPPED LENGTHS**	8 … 10 mm 0.315 … 0.394 in
CROSS SECTION	0.08 mm² … 2.5 mm² AWG 28 … 14		

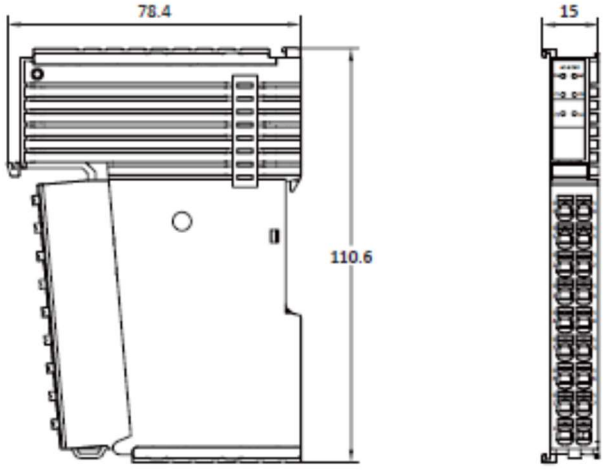
ENVIRONMENTAL REQUIREMENTS

PROTECTION CLASS	IP20	**ELECTRICAL FAST TRANSIENT (EFT)**	Level A, per IEC 61000-4-4
MOUNTING TYPE	DIN-35 mm rail	**ELECTRO-STATIC DISCHARGE (ESD)**	Level A, per IEC 61000-4-2
AMBIENT TEMPERATURE	-5 ... +60 °C	**SURGE TEST**	Level A, per IEC 61000-4-5
STORAGE TEMPERATURE	-25 ... +70 °C	**VIBRATION RESISTANCE**	4 g, per IEC 60068-2-6
RELATIVE HUMIDITY	95%, non-condensing	**SHOCK RESISTANCE**	15 g, per IEC 60068-2-27
OPERATING ALTITUDE	0 … 2000 m / 0 … 6562 ft	**EU ROHS COMPLIANCE STATUS**	Yes
POLLUTION DEGREE	2, per IEC 61131-2	**MATERIAL COMPLIANCE**	Compliant with REACH

GENERAL DATA

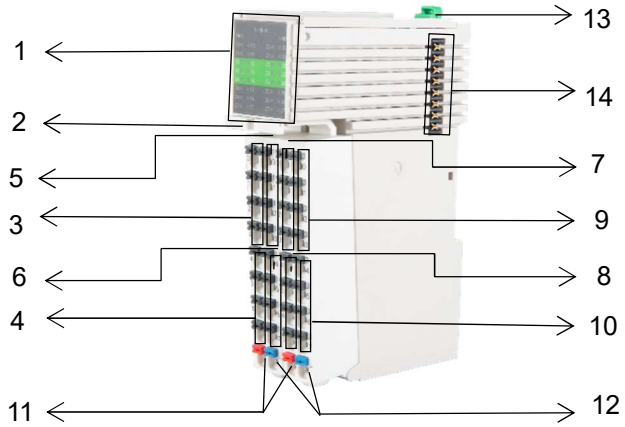
HOUSING MATERIAL	PPE	**DIMENSIONS (H X W X D)**	110.6 x 15 x 78.4 mm
WEIGHT	63 g	**MTTF (25 °C)**	196 years
COLOR	Light gray	**APPROVALS**	CE

6.4.3.5. 4-channel analog input output module profile drawing



6.4.5. 8-channel analog input output modules

6.4.5.1. 8-channel analog input modules



Item	Name	Function	Status
1	Module running indicators		
	PW	Backplane power indicator	Green: normal; Red: I/O power supply abnormal; Off: no backplane power
	MD	Module error indicator	Green: normal Red: Module channel error Green blinking: Connected but not configured; Red and green blinking: Backplane communication abnormal;
	C1-C8	Input signal indicator	Green: input normal Red: input over range
2	Terminal disassembly device	Press the device to separate the terminal block from the module	-
3	Analog input channel 0	Analog input	-
4	Analog input channel 1	Analog input	-
5	Analog input channel 2	Analog input	-
6	Analog input channel 3	Analog input	-
7	Analog input channel 4	Analog input	-
8	Analog input channel 5	Analog input	-
9	Analog input channel 6	Analog input	-
10	Analog input channel 7	Analog input	-
11	24 V power terminal	24 V+	-
12	24 V power terminal	0 V	-
13	Module fixing device	Used to fix the module to the standard mounting rail	Pulling up: assembling position; Pressing down: locking position
14	Backplane bus interface	Backplane communication	-

6.4.5.2. 8-channel analog input module technical data

FX20-AI-BF60

ARTICLE PROPERTIES

PRODUCT TYPE	FX20 series modular I/O system analog input modules	**PRODUCT GROUP**	IP20 modular I/O system
DESCRIPTION	FX20-submodule 8-channel analog input, voltage / current types, 24 V DC, IP20, DIN rail installation	**PU**	1 pc
		COUNTRY OF ORIGIN	CN

TECHNICAL DATA

NUMBER OF ANALOG INPUTS	8	**MEASURING ACCURACY**	± 0.2 %
INPUT TYPE	0 … 10 V, ± 10 V, 1 … 5 V, 0/4 … 20 mA, ± 20 mA	**OPERATING VOLTAGE**	24 V DC
INPUT IMPEDANCE	Current type: 250 Ω Voltage type: 1 MΩ	**CURRENT CONSUMPTION (5 V)**	60 mA
INPUT RESOLUTION	16 bits	**PROCESS DATA LENGTH**	16 bytes
CONVERTING TIME	3 ms	**FAULT DIAGNOSIS METHOD**	LED, communication message

CONNECTION DATA

WIRE CONNECTION	Plug-in terminal block	**STRIPPED LENGTHS**	8 … 10 mm 0.315 … 0.394 in
CROSS SECTION	0.08 mm² … 2.5 mm² AWG 28 … 14		

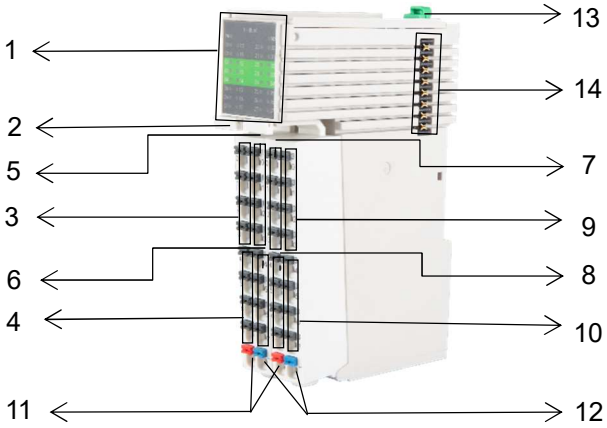
ENVIRONMENTAL REQUIREMENTS

PROTECTION CLASS	IP20	**ELECTRICAL FAST TRANSIENT (EFT)**	Level A, per IEC 61000-4-4
MOUNTING TYPE	DIN-35 mm rail	**ELECTRO-STATIC DISCHARGE (ESD)**	Level A, per IEC 61000-4-2
AMBIENT TEMPERATURE	-5 ... +60 °C	**SURGE TEST**	Level A, per IEC 61000-4-5
STORAGE TEMPERATURE	-25 ... +70 °C	**VIBRATION RESISTANCE**	4 g, per IEC 60068-2-6
RELATIVE HUMIDITY	95%, non-condensing	**SHOCK RESISTANCE**	15 g, per IEC 60068-2-27
OPERATING ALTITUDE	0 … 2000 m / 0 … 6562 ft	**EU ROHS COMPLIANCE STATUS**	Yes
POLLUTION DEGREE	2, per IEC 61131-2	**MATERIAL COMPLIANCE**	Compliant with REACH

GENERAL DATA

HOUSING MATERIAL	PPE	**DIMENSIONS (H X W X D)**	110.6 x 28.1 x 78.4 mm
WEIGHT	128 g	**MTTF (25 °C)**	196 years
COLOR	Light gray	**APPROVALS**	CE

6.4.5.3. 8-channel analog output module



Item	Name	Function	Status
1	Module running indicator		
	PW	Backplane power indicator	Green: normal; Red: I/O power supply abnormal; Off: no backplane power
	MD	Module error indicator	Green: normal Red: Module channel error Green blinking: Connected but not configured; Red and green blinking: Backplane communication abnormal;
	C1-C8	Output signal indicator	Green: output normal Red: output over range
2	Terminal disassembly device	Press the device to separate the terminal block from the module	-
3	Analog output 0	Analog output	-
4	Analog output 1	Analog output	-
5	Analog output 2	Analog output	-
6	Analog output 3	Analog output	-
7	Analog output 4	Analog output	-
8	Analog output 5	Analog output	-
9	Analog output 6	Analog output	-
10	Analog output 7	Analog output	-
11	24 V power terminal	24 V+	-
12	24 V power terminal	0 V	-
13	Module fixing device	Used to fix the module to the standard mounting rail	Pulling up: assembling position; Pressing down: locking position
14	Backplane bus interface	Backplane communication	-

6.4.5.4. 8-channel analog output module technical data

FX20-AO-BF60

ARTICLE PROPERTIES

PRODUCT TYPE	FX20 series modular I/O system analog output modules	**PRODUCT GROUP**	IP20 modular I/O system
DESCRIPTION	FX20-submodule 8-channel analog output, voltage / current types, 24 V DC, IP20, DIN rail installation	**PU**	1 pc
		COUNTRY OF ORIGIN	CN

TECHNICAL DATA

NUMBER OF ANALOG INPUTS	8	**OPERATING VOLTAGE**	24 V DC
OUTPUT TYPE	0 … 10 V, ± 10 V, 1 … 5 V, 0/4 … 20 mA	**CURRENT CONSUMPTION (5 V)**	60 mA
OUTPUT RESOLUTION	16 bits	**PROCESS DATA LENGTH**	16 bytes
CONVERTING TIME	2 ms	**FAULT DIAGNOSIS METHOD**	LED, communication message
MEASURING ACCURACY	± 0.2 %		

CONNECTION DATA

WIRE CONNECTION	Plug-in terminal block	**STRIPPED LENGTHS**	8 … 10 mm, 0.315 … 0.394 in
CROSS SECTION	0.08 mm² … 2.5 mm², AWG 28 … 14		

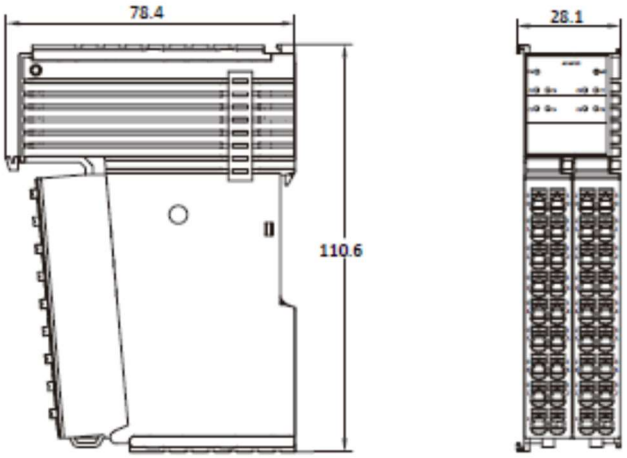
ENVIRONMENTAL REQUIREMENTS

PROTECTION CLASS	IP20	**ELECTRO-STATIC DISCHARGE (ESD)**	Level A, per IEC 61000-4-2
MOUNTING TYPE	DIN-35 mm rail	**SURGE TEST**	Level A, per IEC 61000-4-5
AMBIENT TEMPERATURE	-5 ... +60 °C	**VIBRATION RESISTANCE**	4 g, per IEC 60068-2-6
STORAGE TEMPERATURE	-25 ... +70 °C	**SHOCK RESISTANCE**	15 g, per IEC 60068-2-27
RELATIVE HUMIDITY	95%, non-condensing	**EU ROHS COMPLIANCE STATUS**	Yes
OPERATING ALTITUDE	0 … 2000 m / 0 … 6562 ft	**MATERIAL COMPLIANCE**	Compliant with REACH
POLLUTION DEGREE	2, per IEC 61131-2	**DIMENSIONS (H X W X D)**	110.6 x 28 x 78.4 mm
ELECTRICAL FAST TRANSIENT (EFT)	Level A, per IEC 61000-4-4	**CONFORMITY MARKING**	CE

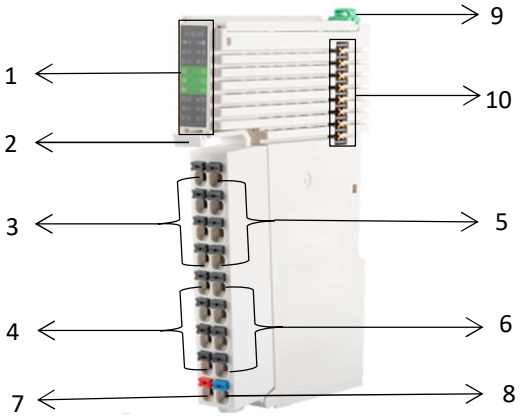
GENERAL DATA

HOUSING MATERIAL	PPE	**DIMENSIONS (H X W X D)**	110.6 x 28 x 78.4 mm
WEIGHT	63 g	**MTTF (25 °C)**	196 years
COLOR	Light gray	**APPROVALS**	CE

6.4.5.5. 8-channel analog input/output module profile drawing



6.4.6. 4-channel temperature measurement modules



Item	Name	Function	Status
1	Module running indicators		
	PW	Backplane power indicator	Green: normal; Red: I/O power supply abnormal; Off: no backplane power
	MD	Module error indicator	Green: normal Red: Module channel error Green blinking: Connected but not configured; Red and green blinking: Backplane communication abnormal;
	C1-C4	Temperature measurement signal indicator	Green: input normal Red: input over range
2	Terminal disassembly device	Press the device to separate the terminal block from the module	-

3	Temp measurement channel 0	Analog output	-
4	Temp measurement channel 1	Analog output	-
5	Temp measurement channel 2	Analog output	-
6	Temp measurement channel 3	Analog output	-
7	24 V power terminal	24V+	-
8	24 V power terminal	0V	-
9	Module fixing device	Used to fix the module to the standard mounting rail	Pulling up: assembling position; Pressing down: locking position
10	Backplane bus interface	Backplane communication	-

6.4.5.1. 4-channel temperature measurement modules technical data

FX20-AI-BD80

ARTICLE PROPERTIES

PRODUCT TYPE	FX20 series modular I/O system analog input modules	**PRODUCT GROUP**	IP20 modular I/O system
DESCRIPTION	FX20-submodule 4-channel RTD measurement, 24 V DC, IP20, DIN rail installation	**PU**	1 pc
		COUNTRY OF ORIGIN	CN

TECHNICAL DATA

NUMBER OF ANALOG INPUTS	4	**MEASUREMENT ACCURACY**	Within 2 °C
INPUT TYPE	Thermal resistance, (2-wire, 3-wire): PT100, PT1000	**OPERATING VOLTAGE**	24 V DC
INPUT RESOLUTION	16 bits	**CURRENT CONSUMPTION (5 V)**	60 mA
CONVERTING TIME(TYP.)	320 ms	**PROCESS DATA LENGTH**	8 bytes
SENSITIVITY	0.1 °C	**FAULT DIAGNOSIS METHOD**	LED, communication message

CONNECTION DATA

WIRE CONNECTION	Plug-in terminal block	**STRIPPED LENGTHS**	8 … 10 mm, 0.315 … 0.394 in
CROSS SECTION	0.08 mm² … 2.5 mm², AWG 28 … 14		

ENVIRONMENTAL REQUIREMENTS

PROTECTION CLASS	IP20	**ELECTRICAL FAST TRANSIENT (EFT)**	Level A, per IEC 61000-4-4
MOUNTING TYPE	DIN-35 mm rail	**ELECTRO-STATIC DISCHARGE (ESD)**	Level A, per IEC 61000-4-2

AMBIENT TEMPERATURE	-5 ... +60 °C	**SURGE TEST**	Level A, per IEC 61000-4-5
STORAGE TEMPERATURE	-25 ... +70 °C	**VIBRATION RESISTANCE**	4 g, per IEC 60068-2-6
RELATIVE HUMIDITY	95%, non-condensing	**VIBRATION RESISTANCE**	4 g, per IEC 60068-2-6
OPERATING ALTITUDE	0 … 2000 m / 0 … 6562 ft	**SHOCK RESISTANCE**	15 g, per IEC 60068-2-27
HOUSING MATERIAL	PPE	**EU ROHS COMPLIANCE STATUS**	Yes
POLLUTION DEGREE	2, compliant with IEC 61131-2	**MATERIAL COMPLIANCE**	Compliant with REACH

GENERAL DATA

HOUSING MATERIAL	PPE	**DIMENSIONS (H X W X D)**	110.6 x 15 x 78.4 mm
WEIGHT	63 g	**MTTF (25 °C)**	196 years
COLOR	Light gray	**APPROVALS**	CE

FX20-AI-BD90

ARTICLE PROPERTIES

PRODUCT TYPE	FX20 series modular I/O system analog input modules	**PRODUCT GROUP**	IP20 modular I/O system
DESCRIPTION	FX20-submodule 4-channel TC measurement, 24 V DC, IP20, DIN rail installation	**PU**	1 pc
		COUNTRY OF ORIGIN	CN

TECHNICAL DATA

NUMBER OF ANALOG INPUTS	4	**MEASUREMENT ACCURACY**	Within 2 °C
INPUT TYPE	Thermocouples: J, K, T, N, E types	**OPERATING VOLTAGE**	24 V DC
INPUT RESOLUTION	16 bits	**CURRENT CONSUMPTION (5 V)**	60 mA
CONVERTING TIME(TYP.)	320 ms	**PROCESS DATA LENGTH**	8 bytes
SENSITIVITY	0.1 °C	**FAULT DIAGNOSIS METHOD**	LED, communication message

CONNECTION DATA

WIRE CONNECTION	Plug-in terminal block	**STRIPPED LENGTHS**	8 … 10 mm,0.315 … 0.394 in
CROSS SECTION	0.08 mm² … 2.5 mm², AWG 28 … 14		

ENVIRONMENTAL REQUIREMENTS

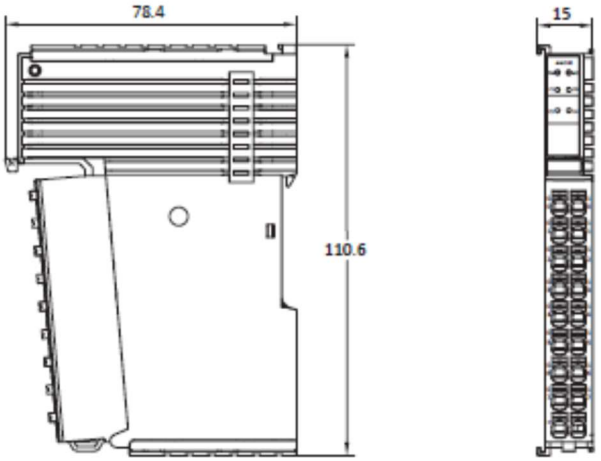
PROTECTION CLASS	IP20	**ELECTRICAL FAST TRANSIENT (EFT)**	Level A, per IEC 61000-4-4
MOUNTING TYPE	DIN-35 mm rail	**ELECTRO-STATIC DISCHARGE (ESD)**	Level A, per IEC 61000-4-2
AMBIENT TEMPERATURE	-5 ... +60 °C	**SURGE TEST**	Level A, per IEC 61000-4-5
STORAGE TEMPERATURE	-25 ... +70 °C	**VIBRATION RESISTANCE**	4 g, per IEC 60068-2-6

RELATIVE HUMIDITY	95%, non-condensing	**SHOCK RESISTANCE**	15 g, per IEC 60068-2-27
OPERATING ALTITUDE	0 … 2000 m / 0 … 6562 ft	**EU ROHS COMPLIANCE STATUS**	Yes
POLLUTION DEGREE	2, per IEC 61131-2	**MATERIAL COMPLIANCE**	Compliant with REACH

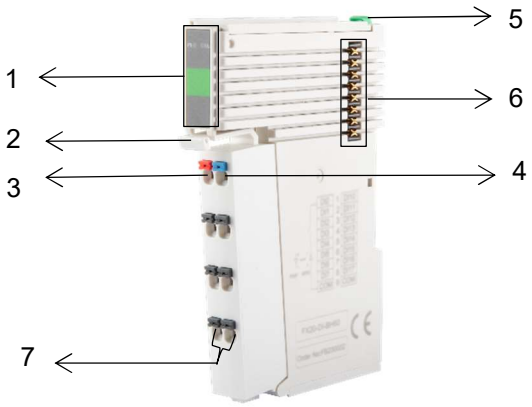
GENERAL DATA

HOUSING MATERIAL	PPE	**DIMENSIONS (H X W X D)**	110.6 x 15 x 78.4 mm
WEIGHT	63 g	**MTTF (25 °C)**	196 years
COLOR	Light gray	**APPROVALS**	CE

6.4.5.2. 4-channel temperature measurement module profile drawing



6.4.7. Auxiliary power module



Item	Name	Function	Status
1	Module running indicators		
	PW	24 V power indicator	Green: normal Red: 24V overvoltage
	Us	Backplane power indicator	Green: normal Off: no power supply

2	Terminal disassembly device	Press the device to separate the terminal block from the module	-
3	External power supply terminal	24 V+	-
4	External power supply terminal	0 V	-
5	Module fixing device	Used to fix the module to the standard mounting rail	Pulling up: assembling position; Pressing down: locking position
6	Backplane bus interface	Backplane communication	-
7	Grounding terminal	PE	-

6.4.5.1. Auxiliary power module technical data

FX20-PS-AB00

ARTICLE PROPERTIES

PRODUCT TYPE	FX20 series modular I/O system auxiliary power supply module	**PRODUCT GROUP**	IP20 modular I/O system
DESCRIPTION	FX20-submodul power supply, 24 V DC, IP20, DIN rail installation, overcurrent and reverse polarity protection	**PU**	1 pc
		COUNTRY OF ORIGIN	CN

TECHNICAL DATA

INPUT VOLTAGE	24 V DC	**OUTPUT CURRENT**	Max. 3 A
INPUT VOLTAGE RANGE	20.4.....28.8 V DC	**POWER PROTECTION**	Overcurrent protection, power polarity reverse protection
OUTPUT VOLTAGE	5 V DC	**EFFICIENCY**	95%

CONNECTION DATA

WIRE CONNECTION	Plug-in terminal block	**STRIPPED LENGTHS**	8 … 10 mm 0.315 … 0.394 in
CROSS SECTION	0.08 mm² … 2.5 mm² AWG 28 … 14		

ENVIRONMENTAL REQUIREMENTS

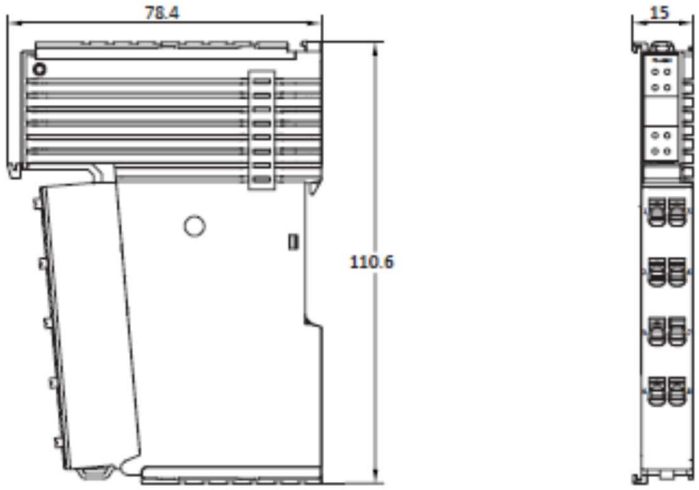
PROTECTION CLASS	IP20	**ELECTRICAL FAST TRANSIENT (EFT)**	Level A, per IEC 61000-4-4
MOUNTING TYPE	DIN-35 mm rail	**ELECTRO-STATIC DISCHARGE (ESD)**	Level A, per IEC 61000-4-2
AMBIENT TEMPERATURE	-5 ... +60 °C	**SURGE TEST**	Level A, per IEC 61000-4-5
STORAGE TEMPERATURE	-25 ... +70 °C	**VIBRATION RESISTANCE**	4 g, per IEC 60068-2-6
RELATIVE HUMIDITY	95%, non-condensing	**SHOCK RESISTANCE**	15 g, per IEC 60068-2-27
OPERATING ALTITUDE	0 … 2000 m / 0 … 6562 ft	**EU ROHS COMPLIANCE STA-**	Yes

		TUS	
POLLUTION DEGREE	2, per IEC 61131-2	**MATERIAL COMPLIANCE**	Compliant with REACH

GENERAL DATA

HOUSING MATERIAL	PPE	**DIMENSIONS (H X W X D)**	110.6 x 15 x 78.4 mm
WEIGHT	63 g	**APPROVALS**	CE
COLOR	Light gray		

6.4.5.2. Auxiliary power module profile drawing



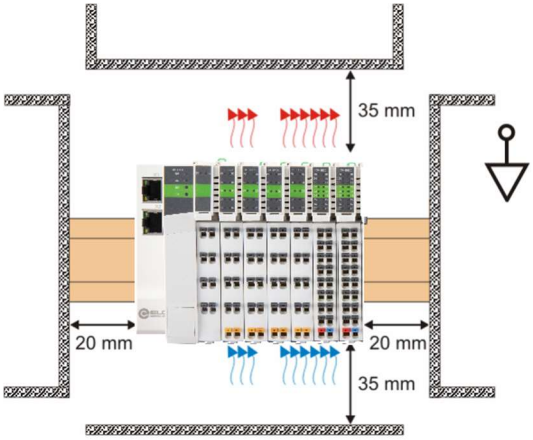
7. Mechanical installation and disassembly

7.1. Installation location and minimum installation distance

The installation position and reserved space are shown in the following figure. Install the installation guide rail horizontally to the designated installation position, and the connection surface of the connector and I/O modules must face forward.

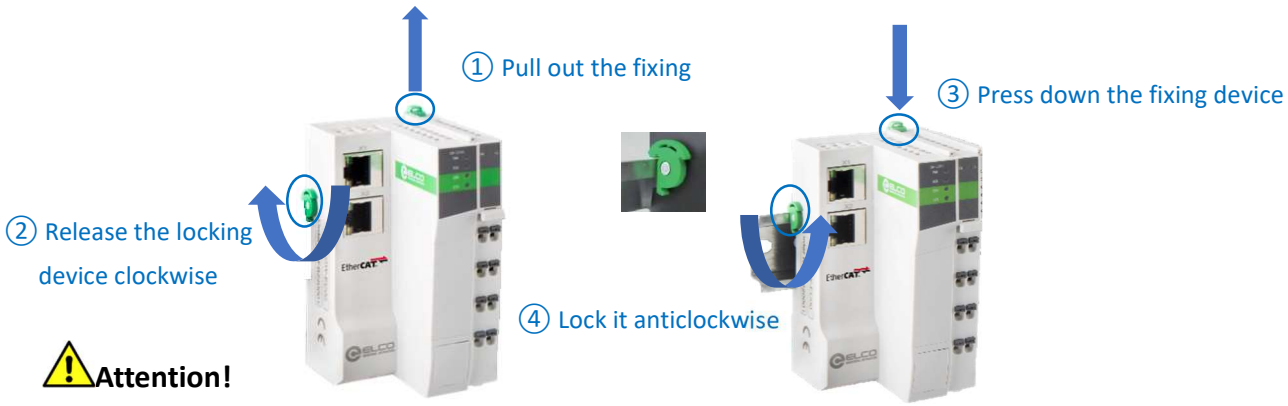
The installation position should maintain a certain distance from adjacent electrical components or cabinets to facilitate heat dissipation. The recommended minimum installation clearance can refer to the markings in the above figure.

Ensure that FX20 is ventilated from bottom to top and achieve optimal cooling through convective ventilation.



7.1. FX20 adapter installation

The installation is carried out according to the following steps:

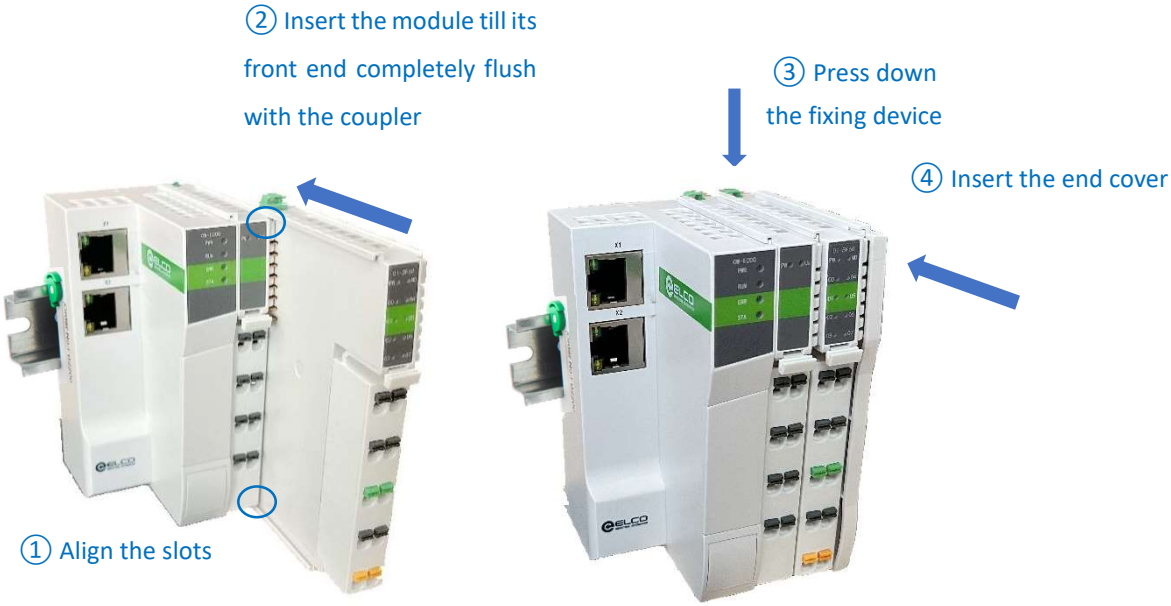


Attention!

During installation, align the module with the DIN rail and press the fixing device in the direction indicated by the arrow. After installation, there will be a noticeable clicking sound; change the position of the locking device slightly; after installing the module properly, make the locking device clamp the upper edge of the rail; to avoid damaging the product, do not apply excessive force.

7.2. I/O modules installation

After the installation of the adapter, the function modules can be sequentially inserted from the right side of the adapter. Before the insertion, ensure to pull out the fixing device and aligned with the two slots on the module.



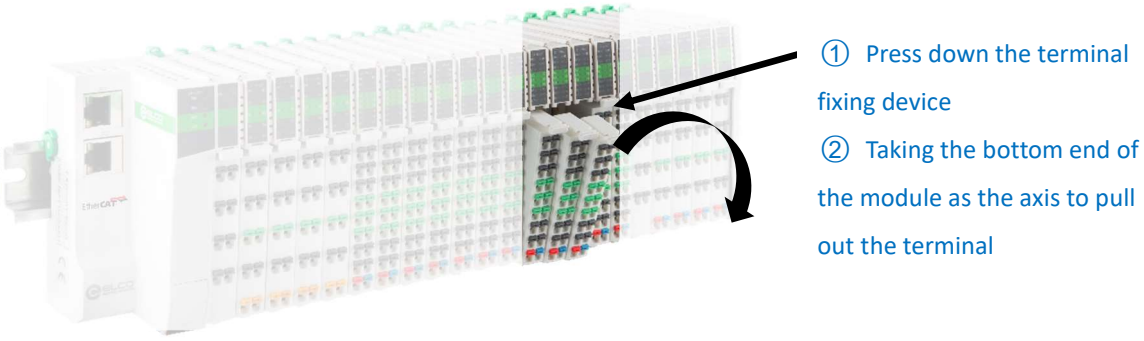
Caution!

The end cover is only to protect the backplane bus interface of the end module, and it is packaged and shipped together with the adapter.

7.3. Modules disassembly

Use a flat screwdriver or similar tool to pry up the locking device on the rail, and then pull the module away from the DIN rail.

The wiring terminals of all modules can be removed separately to facilitate module replacement, as follows:



Warning!

The mechanical installation and disassembly of modules require qualified professional mechanical personnel to operate and pay attention to the correct wearing and use of labor protection equipment.

8. Electrical installation and wiring

8.1. Cable specification

8.1.1. Communication cable

EtherNet/IP bus communication uses shielded network cables for data transmission, without short circuits, misalignment, and poor contact; The length of the cable between devices cannot exceed 100m, as exceeding this length will cause signal attenuation and affect normal communication. The following specifications of communication cables are recommended:

Item	Specification
Cable type	Elastic crossover cable, S-FTP, category 5
Standards met	EIA/TIA568A,EN50173,ISO/IEC11801 EIA/TIA bulletin TSB,EIA/TIA SB40-A&TSB36
Conductor section	AWG26
Wire type	Twisted pair
Wire pair	4

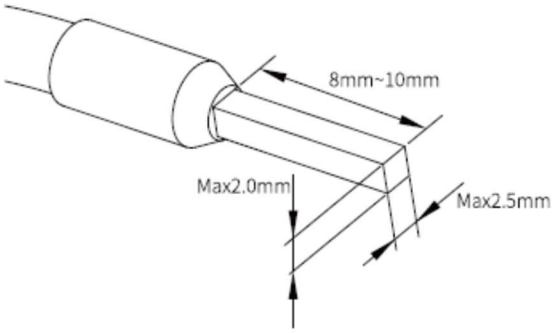
Pre-wired connectors are better for communication and construction. Elco pre-wired connectors can provide customized cable material and cable length in accordance with communication technology requirements. The following Elco Ethernet connectors are available:

Model	Description
E16DA4002M020	RJ45-M12 double-ended pre-wired Ethernet connector, male straight, D-CODE, 4-pin, Cat5e, PVC, 2 M, fixed installation
E66D04002M020	RJ45-RJ45 double-ended pre-wired Ethernet connector, male straight-male straight, 4-pin, Cat5e, PVC, 2 M, fixed installation
E16DA4004M020	RJ45-M12 double-ended pre-wired Ethernet connector, male straight, D-CODE,4-pin, Cat5e, PVC, 2 M, suitable for drag chain
E66D04004M020	RJ45-RJ45 double-ended pre-wired Ethernet connector, male straight-male straight,4-pin, Cat5e, PUR,2 M, suitable for drag chain

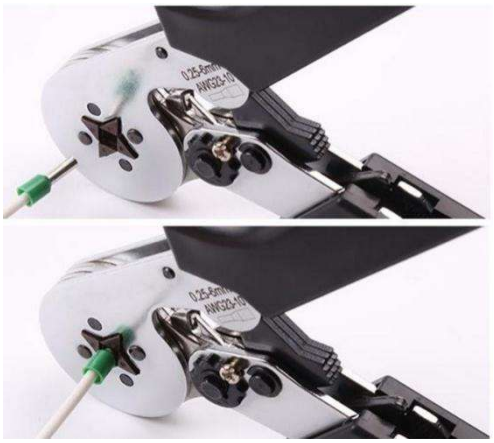
For more selection of Ethernet connectors, please refer to Elco's "Connectivity System Catalog".

8.1.2. Power and signal cables

The FX20 series adopts tool-free spring wiring terminals, and the wiring needs to be equipped with tube type cold pressing cable lugs. Please refer to the following figure for the stripping length and cable lug specifications:



Standard cable crimper can be used for pressing the wire ear, as shown in the following figure:

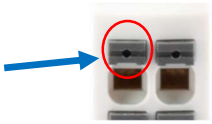


The wire connection does not need tools, and the wiring method is as follows:

1) Install the wire ear on the wire;
2) Insert the wire installed with the wire ear into the plug-in terminal to its most;
3) Pull the cable to ensure its fixed securely.

To release the wire:

1) Press the terminal spring button with your hand or a flat screwdriver
2) Pull out the wire and release the button.

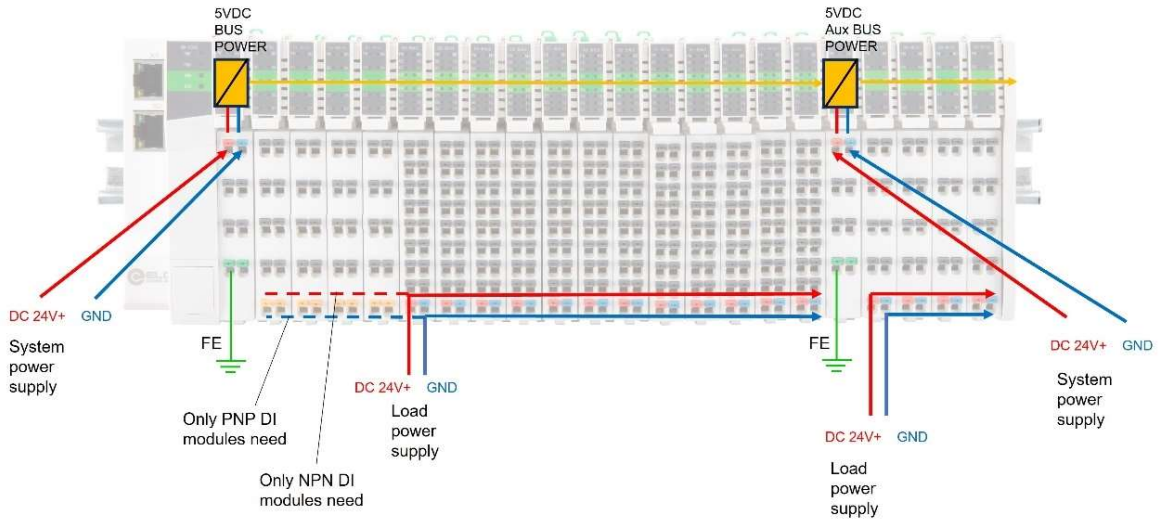


8.2. Modules wiring diagram

8.2.1. FX20 system power supply diagram

The FX20 series backplane 5 V DC power supply is provided by the adapter, and the load power supply for modules need to be provided separately. Additionally, an auxiliary power supply module can provide a larger backplane power supply current. Usually, when the number of modules exceeds 16 in FX20, the auxiliary power supply module should be considered.

The power supply system diagram is as follows:

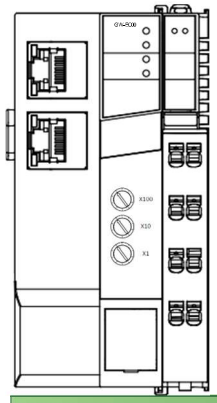


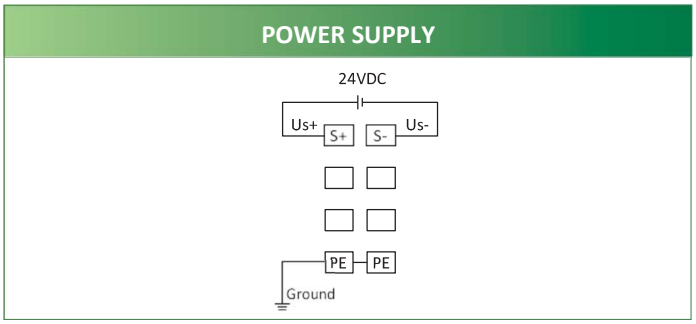
Warning!

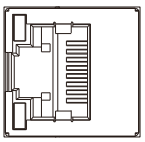
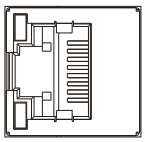
- **Be sure to disconnect all power connections before wiring!**
- **To ensure safety, must reliably connect the module grounding terminal to the ground!**
- **The wiring work must be operated by authorized electrical personnel to ensure safety!**
- **Using cables that do not meet the requirements will result in serious equipment damage or personal injury!**

Please refer to this manual or the wiring diagram printed on the side of the module for wiring. Incorrect wiring will cause module damage or personal injury!

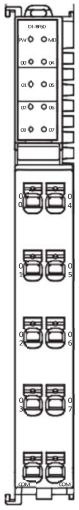
8.2.2. EtherNet/IP Bus adapters wiring diagram

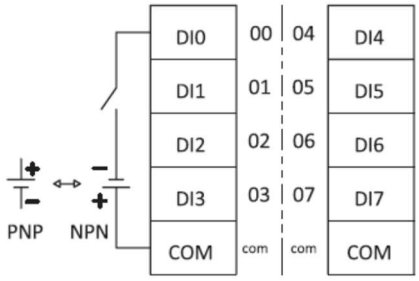




BUS IN (X1)		BUS OUT (X2)	
	1 - TD+: Tranceive Data+		1 - TD+: Tranceive Data+
	2 - TD-: Tranceive Data-		2 - TD-: Tranceive Data-
	3 - RD+: Receive Data+		3 - RD+: Receive Data+
	6 - TD-: Receive Data-		6 - TD-: Receive Data-

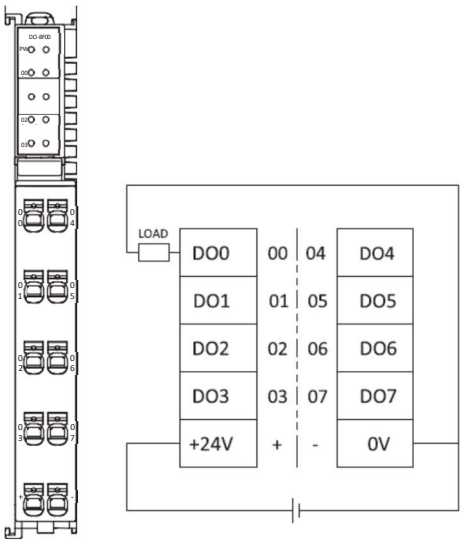
8.2.3. 8-channel DI module wiring diagram and I/O mapping





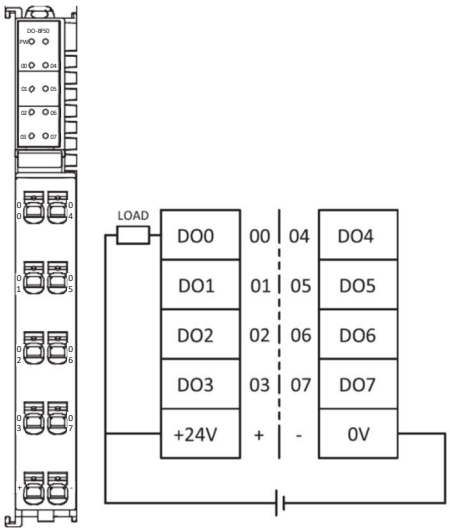
Model: FX20-DI-BF60									
Input Byte 0	Terminal No.	07	06	05	04	03	02	01	00
	Address	I n.7	I n.6	I n.5	I n.4	I n.3	I n.2	I n.1	I n.0
	Byte 0	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
n: Starting byte of configuration									

8.2.4. 8-channel DO PNP module wiring diagram and I/O mapping



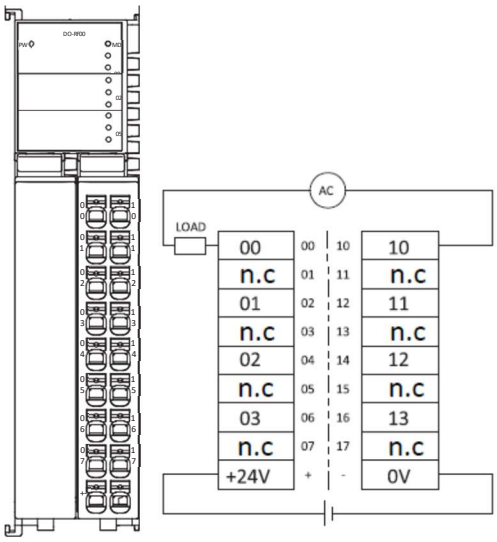
Model: FX20-DO-BF00									
Output Byte 0	Terminal No.	07	06	05	04	03	02	01	00
	Address	Q n.7	Q n.6	Q n.5	Q n.4	Q n.3	Q n.2	Q n.1	Q n.0
	Byte 0	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
n: Starting byte of configuration									

8.2.5. 8-channel DO NPN module wiring diagram and I/O mapping



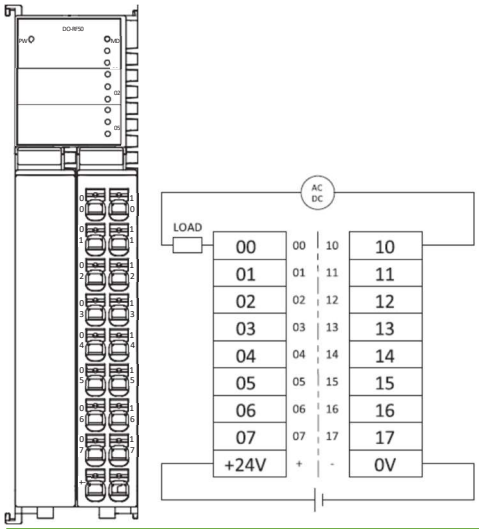
Model: FX20-DO-BF50									
Output Byte 0	Terminal No.	07	06	05	04	03	02	01	00
	Address	Q n.7	Q n.6	Q n.5	Q n.4	Q n.3	Q n.2	Q n.1	Q n.0
	Byte 0	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
n: Starting byte of configuration									

8.2.6. 4-channel SSR (AC) output module wiring diagram I/O mapping



Model: FX20-DO-RD00									
Output Byte 0	Terminal No.	07	06	05	04	03	02	01	00
	Address	-	-	-	-	Q n.3	Q n.2	Q n.1	Q n.0
	Byte 0	-	-	-	-	Bit 3	Bit 2	Bit 1	Bit 0
-	Terminal No.	17	16	15	14	13	12	11	10
	Address	-	-	-	-	-	-	-	-
n: Starting byte of configuration									

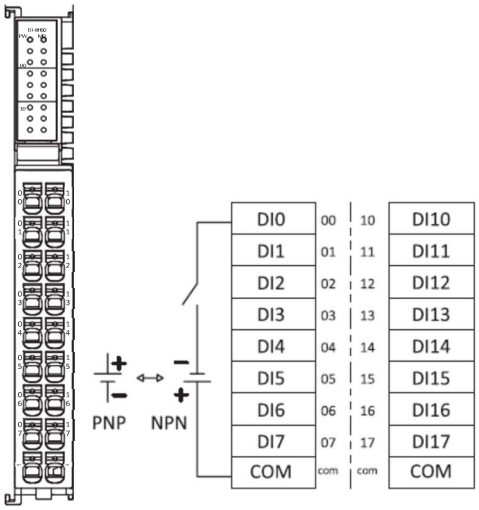
8.2.7. 8-channel relay output module wiring diagram and I/O mapping



Model: FX20-DO-RF50									
Output Byte 0	Terminal No.	07	06	05	04	03	02	01	00
	Address	Q n.7	Q n.6	Q n.5	Q n.4	Q n.3	Q n.2	Q n.1	Q n.0
	Byte 0	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
-	Terminal No.	17	16	15	14	13	12	11	10
	Address	-	-	-	-	-	-	-	-

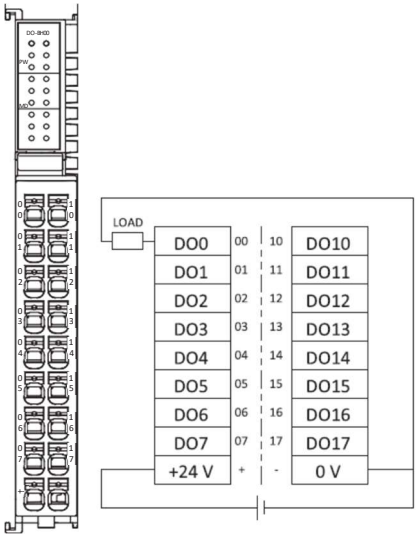
n: Starting byte of configuration

8.2.8. 16-channel DI module wiring diagram and I/O mapping



Model: FX20-DI-BH60									
Input Byte 0	Terminal No.	07	06	05	04	03	02	01	00
	Address	I n.7	I n.6	I n.5	I n.4	I n.3	I n.2	I n.1	I n.0
	Byte 0	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Input Byte 1	Terminal No.	17	16	15	14	13	12	11	10
	Address	I(n+1).7	I(n+1).6	I (n+1).5	I(n+1).4	I(n+1).3	I (n+1).2	I (n+1).1	I (n+1).0
	Byte 1	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
n: Starting byte of configuration									

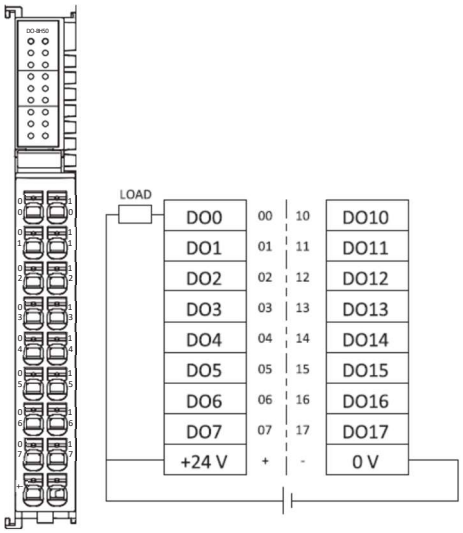
8.2.9. 16-channel DO PNP module wiring diagram and I/O mapping



Model: FX20-DO-BH00									
Output Byte 0	Terminal No.	07	06	05	04	03	02	01	00
	Address	Q n.7	Q n.6	Q n.5	Q n.4	Q n.3	Q n.2	Q n.1	Q n.0
	Byte 0	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Output	Terminal No.	17	16	15	14	13	12	11	10

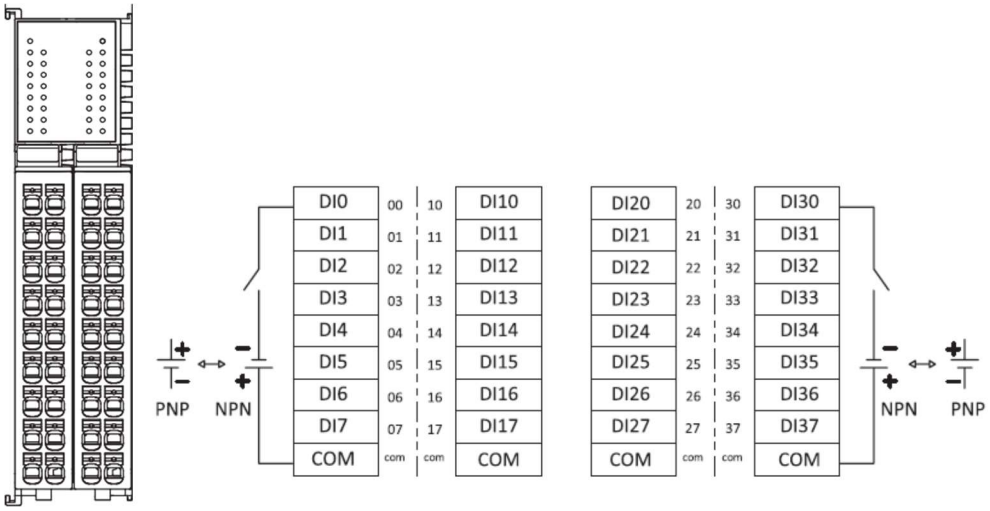
Byte 1	Address	Q(n+1).7	Q(n+1).6	Q (n+1).5	Q(n+1).4	Q(n+1).3	Q (n+1).2	Q (n+1).1	Q (n+1).0
	Byte 1	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
n: Starting byte of configuration									

8.2.10. 16-channel DO NPN module wiring diagram and I/O mapping



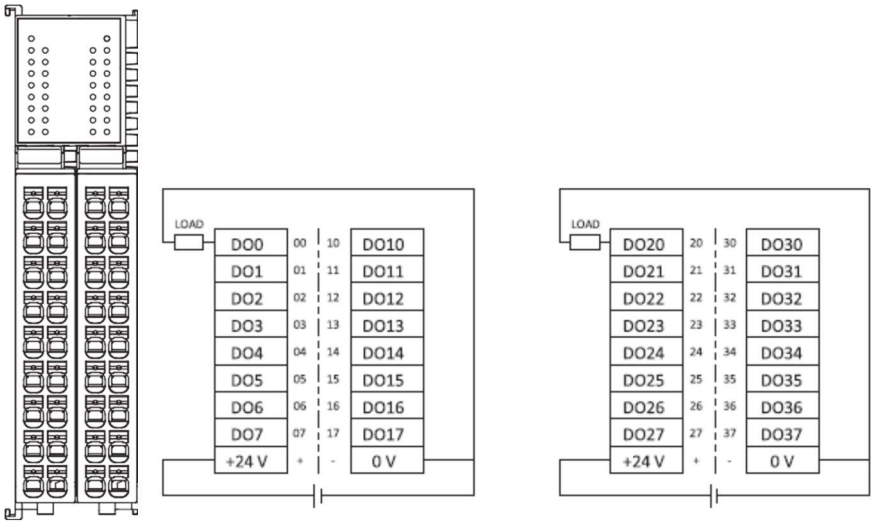
Model: FX20-DO-BH50									
Outpu	Terminal No.	07	06	05	04	03	02	01	00
t	Address	Q n.7	Q n.6	Q n.5	Q n.4	Q n.3	Q n.2	Q n.1	Q n.0
Byte 0	Byte 0	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Outpu	Terminal No.	17	16	15	14	13	12	11	10
t	Address	Q(n+1).7	Q(n+1).6	Q (n+1).5	Q(n+1).4	Q(n+1).3	Q (n+1).2	Q (n+1).1	Q (n+1).0
Byte 1	Byte 1	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
n: Starting byte of configuration									

8.2.11. 32-channel DI module wiring diagram and I/O mapping



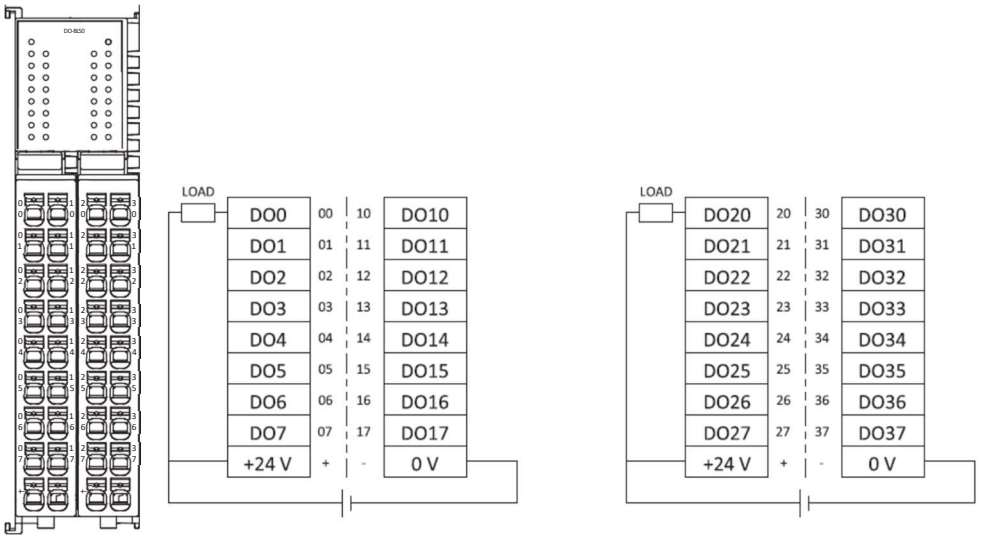
Model: FX20-DI-BL60									
Input Byte 0	Terminal No.	07	06	05	04	03	02	01	00
	Address	I n.7	I n.6	I n.5	I n.4	I n.3	I n.2	I n.1	I n.0
	Byte 0	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Input Byte 1	Terminal No.	17	16	15	14	13	12	11	10
	Address	I(n+1).7	I(n+1).6	I (n+1).5	I(n+1).4	I(n+1).3	I (n+1).2	I (n+1).1	I (n+1).0
	Byte 1	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Input Byte 2	Terminal No.	27	26	25	24	23	22	21	20
	Address	I(n+2).7	I(n+2).6	I (n+2).5	I(n+2).4	I(n+2).3	I (n+2).2	I (n+2).1	I (n+2).0
	Byte 2	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Input Byte 3	Terminal No.	37	36	35	34	33	32	31	30
	Address	I(n+3).7	I(n+3).6	I (n+3).5	I(n+3).4	I(n+3).3	I (n+3).2	I (n+3).1	I (n+3).0
	Byte 3	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
n: Starting byte of configuration									

8.2.12. 32-channel DO PNP module wiring diagram and I/O mapping



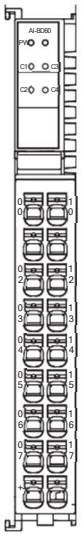
Model: FX20-DO-BL00									
Output Byte 0	Terminal No.	07	06	05	04	03	02	01	00
	Address	Q n.7	Q n.6	Q n.5	Q n.4	Q n.3	Q n.2	Q n.1	Q n.0
	Byte 0	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Output Byte 1	Terminal No.	17	16	15	14	13	12	11	10
	Address	Q(n+1).7	Q(n+1).6	Q (n+1).5	Q(n+1).4	Q(n+1).3	Q (n+1).2	Q (n+1).1	Q (n+1).0
	Byte 1	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Output Byte 2	Terminal No.	27	26	25	24	23	22	21	20
	Address	Q(n+2).7	Q(n+2).6	Q (n+2).5	Q(n+2).4	Q(n+2).3	Q (n+2).2	Q (n+2).1	Q (n+2).0
	Byte 2	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Output Byte 3	Terminal No.	37	36	35	34	33	32	31	30
	Address	Q(n+3).7	Q(n+3).6	Q (n+3).5	Q(n+3).4	Q(n+3).3	Q (n+3).2	Q (n+3).1	Q (n+3).0
	Byte 3	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
n: Starting byte of configuration									

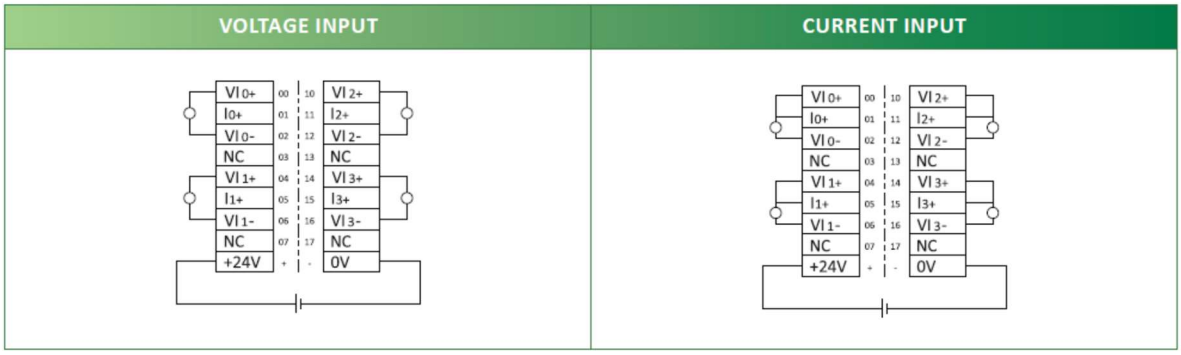
8.2.13. 32-channel DO NPN module wiring diagram and I/O mapping



Model: FX20-DO-BL50									
Output Byte 0	Terminal No.	07	06	05	04	03	02	01	00
	Address	Q n.7	Q n.6	Q n.5	Q n.4	Q n.3	Q n.2	Q n.1	Q n.0
	Byte 0	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Output Byte 1	Terminal No.	17	16	15	14	13	12	11	10
	Address	Q(n+1).7	Q(n+1).6	Q (n+1).5	Q(n+1).4	Q(n+1).3	Q (n+1).2	Q (n+1).1	Q (n+1).0
	Byte 1	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Output Byte 2	Terminal No.	27	26	25	24	23	22	21	20
	Address	Q(n+2).7	Q(n+2).6	Q (n+2).5	Q(n+2).4	Q(n+2).3	Q (n+2).2	Q (n+2).1	Q (n+2).0
	Byte 2	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Output Byte 3	Terminal No.	37	36	35	34	33	32	31	30
	Address	Q(n+3).7	Q(n+3).6	Q (n+3).5	Q(n+3).4	Q(n+3).3	Q (n+3).2	Q (n+3).1	Q (n+3).0
	Byte 3	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
n: Starting byte of configuration									

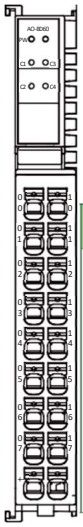
8.2.14. 4-channel AI module wiring diagram and I/O mapping





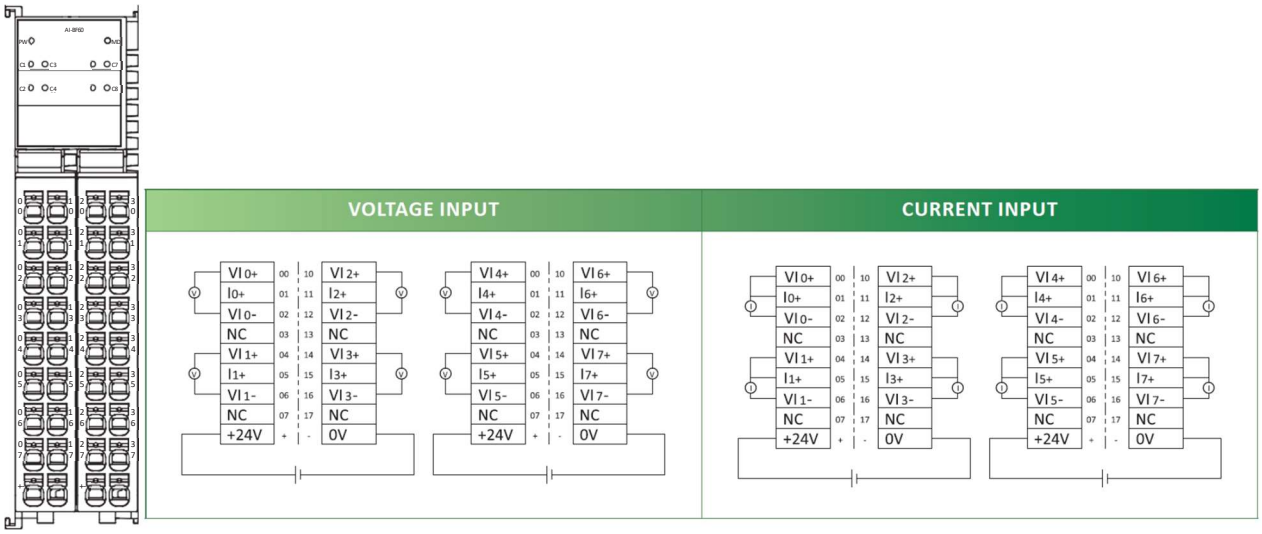
Model: FX20-AI-BD60								
Terminal No.	07	06	05	04	03	02	01	00
Address	IW n+2				IW n			
Channel	Channel 1				Channel 0			
Terminal No.	17	16	15	14	13	12	11	10
Address	IW n+6				IW n+4			
Channel	Channel 3				Channel 2			
n: Starting byte of configuration								

8.2.15. 4-channel AO module wiring diagram and I/O mapping



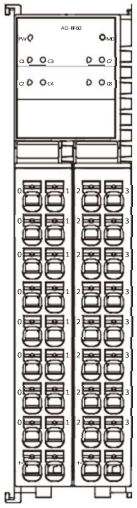
Model: FX20-AO-BD60								
Terminal No.	07	06	05	04	03	02	01	00
Address	QW n+2				QW n			
Channel	Channel 1				Channel 0			
Terminal No.	17	16	15	14	13	12	11	10
Address	QW n+6				QW n+4			
Channel	Channel 3				Channel 2			
n: Starting byte of configuration								

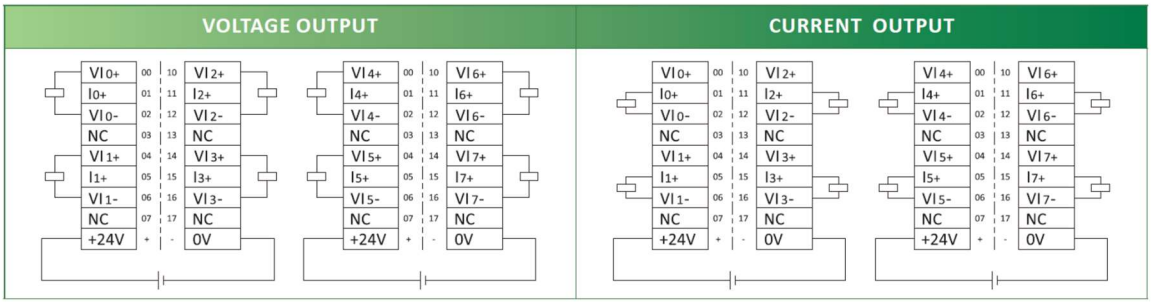
8.2.16. 8-channel AI module wiring diagram and I/O mapping



Model: FX20-AI-BF60								
Terminal No.	07	06	05	04	03	02	01	00
Address	IW n+2				IW n			
Channel	Channel 1				Channel 0			
Terminal No.	17	16	15	14	13	12	11	10
Address	IW n+6				IW n+4			
Channel	Channel 3				Channel 2			
Terminal No.	27	26	25	24	23	22	21	20
Address	IW n+10				IW n+8			
Channel	Channel 5				Channel 4			
Terminal No.	37	36	35	34	33	32	31	30
Address	IW n+14				IW n+12			
Channel	Channel 7				Channel 6			
n: Starting byte of configuration								

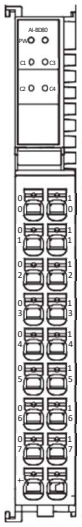
8.2.17. 8-channel AO module wiring diagram and I/O mapping

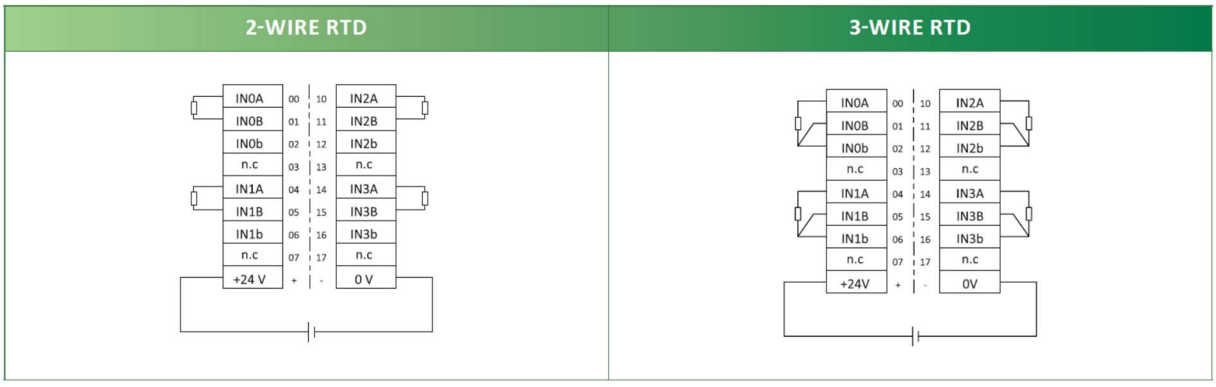




Model: FX20-AO-BF60								
Terminal No.	07	06	05	04	03	02	01	00
Address	QW n+2				QW n			
Channel	Channel 1				Channel 0			
Terminal No.	17	16	15	14	13	12	11	10
Address	QW n+6				QW n+4			
Channel	Channel 3				Channel 2			
Terminal No.	27	26	25	24	23	22	21	20
Address	QW n+10				QW n+8			
Channel	Channel 5				Channel 4			
Terminal No.	37	36	35	34	33	32	31	30
Address	QW n+14				QW n+12			
Channel	Channel 7				Channel 6			
n: Starting byte of configuration								

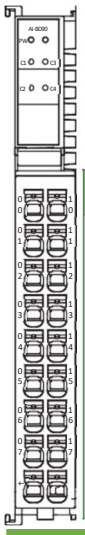
8.2.18. 4-channel RTD module wiring diagram and I/O mapping



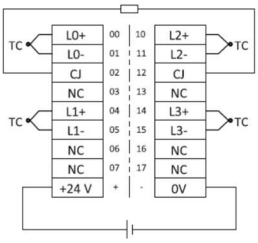


Model: FX20-AI-BD80								
Terminal No.	07	06	05	04	03	02	01	00
Address	IW n+2				IW n			
Channel	Channel 1				Channel 0			
Terminal No.	17	16	15	14	13	12	11	10
Address	IW n+6				IW n+4			
Channel	Channel 3				Channel 2			
n: Starting byte of configuration								

8.2.19. 4-channel TC module wiring diagram and I/O mapping

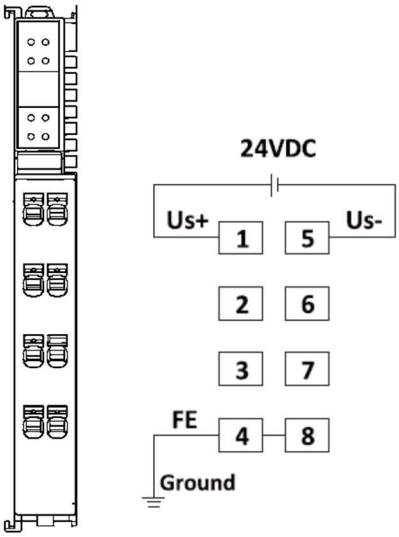


NTC



Model: FX20-AI-BD90								
Terminal No.	07	06	05	04	03	02	01	00
Address	IW n+2				IW n			
Channel	Channel 1				Channel 0			
Terminal No.	17	16	15	14	13	12	11	10
Address	IW n+6				IW n+4			
Channel	Channel 3				Channel 2			
n: Starting byte of configuration								

8.2.20. Auxiliary power module wiring diagram



Warning !

- **Module wiring diagrams are printed on the side of the module for easy reference during wiring and debugging.**
- **Only electrical technicians can carry out wiring and related operations.**

9. Configuration and testing

9.1. FX20 EtherNet/IP adapter IP address setting method

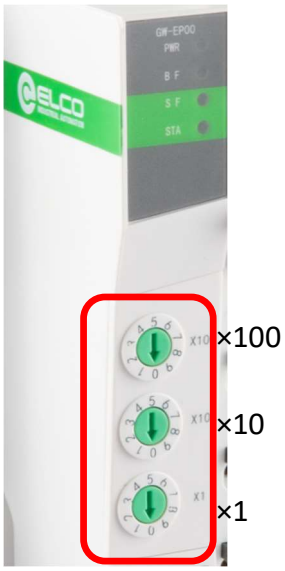
The EtherNet/IP adapter have no IP address by default at the factory, and users can set the correct IP by using the rotary code switches or third-party IP configuration tools.

9.1.1. Setting IP address by using the rotary code switches

The EtherNet/IP adapter can set its IP address through the rotary code switches, which can range from 192.168.1.1 to 192.168.1.254, meaning that the adapter can only set the "192.168.1. x" network segment.

The rotary code switches from top to bottom is × 100, × 10 and × 1,

As shown in the following figure:



Setting method:

1) Turn off the adapter;
2) Use a flat screwdriver to turn the three rotary code switches to the desired IP address. The final IP address is the sum of the three toggle switches multiplied by a multiplier, and the legal address is 1 to 254;
3) Power on the adapter again, and after successful initialization, the adapter will work under the new IP address.

9.1.2. Setting IP addresses through IP configuration tools

When the range of IP addresses cannot meet actual needs, setting tools such as “IP Setting Tool” can be used to set the IP, and the steps are as follows:

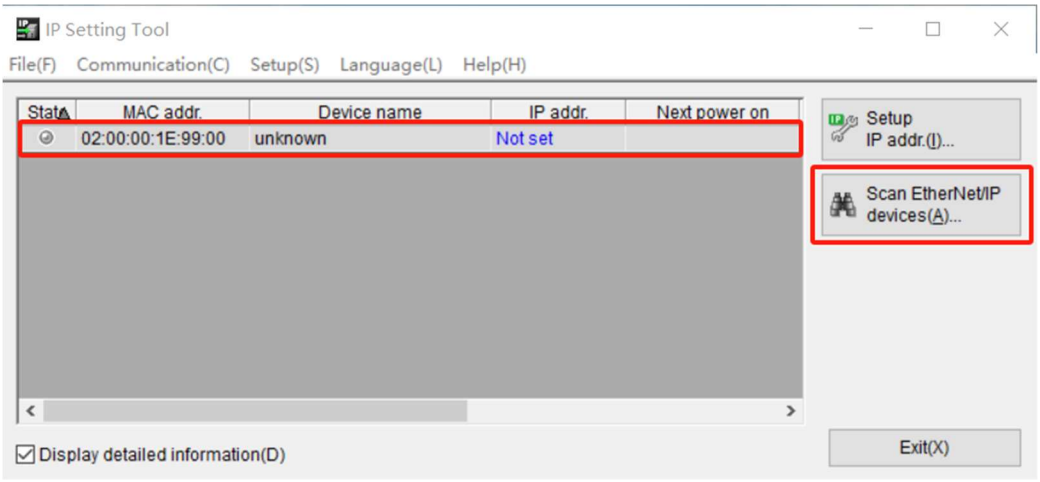
9.1.2.1. In the power-off state, turn all the rotary code switches of the adapter to "9", and when powered on, the adapter will delete the default IP configuration;

9.1.2.2. Turn off the adapter again, turn all the rotary code switches to "0", and then power on again;

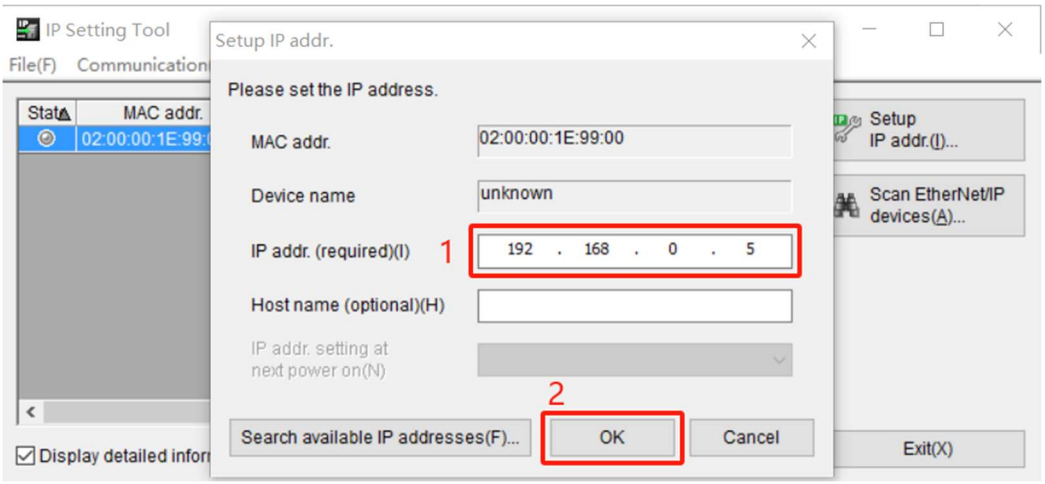
9.1.2.3. Use “IP Setting Tool” or other IP tools to configure the IP address of the adapter, the specific operation steps are as follows:

1) Connect the FX20 adapter to the power supply and Ethernet cable according to the wiring instructions;
2) After correctly installing " IP Setting Tool " on the PC according to the installation wizard, open the software and set the computer IP address to the same network segment address as the IP to be set by FX20; In this example, the PC IP is set to 192.168.0.100;

3) Open the " IP Setting Tool " software interface, click the "Scan EtherNet/IP device" button, or wait for a few seconds, if the connection is normal, the software will display all scan results of the computer connection based on the module's MAC on the interface:

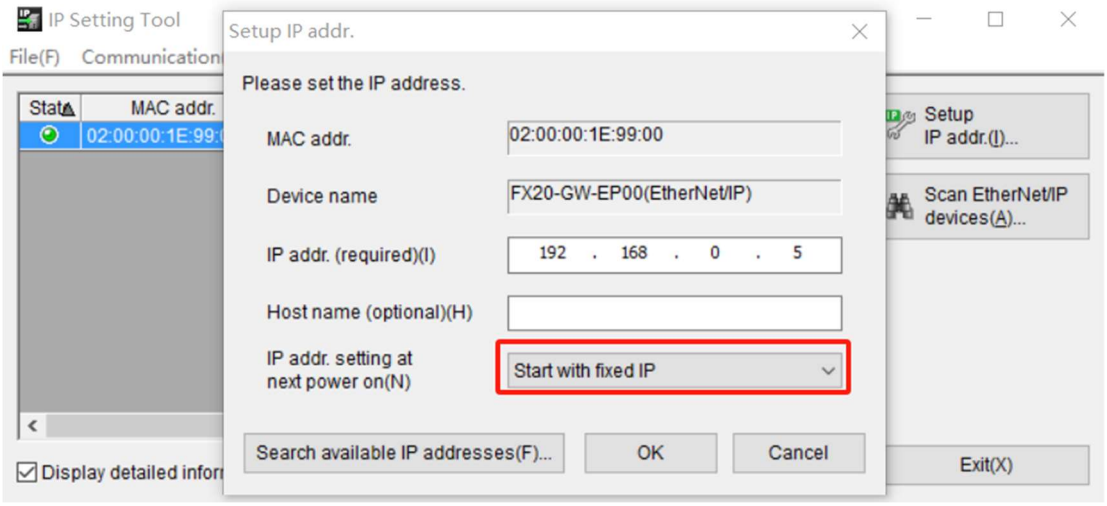


4) Click on the module you want to set, click on "Setup IP addr..." button, enter the IP address you want to set in the pop-up dialog box and click OK to confirm.



5) Pop up successful IP setting dialog box.

6) Click again to select the FX20 module with the IP address already set, click on "Setup IP addr..." ， Select 'start fixed IP' from the “IP addr. setting at next power on” dialog box and click OK.



7) At this point, the IP address of the FX20 adapter has been successfully fixed in the module.

9.1.3. IP configuration tool method switching callback rotary code switches setting IP method

If the IP configured using the " IP Setting Tool " in the early stage is switched back to dial-up mode, the following steps need to be taken:

9.1.3.1. Turn off the adapter, set all dial switches to "9", and then power on again. The adapter will delete the IP configuration.

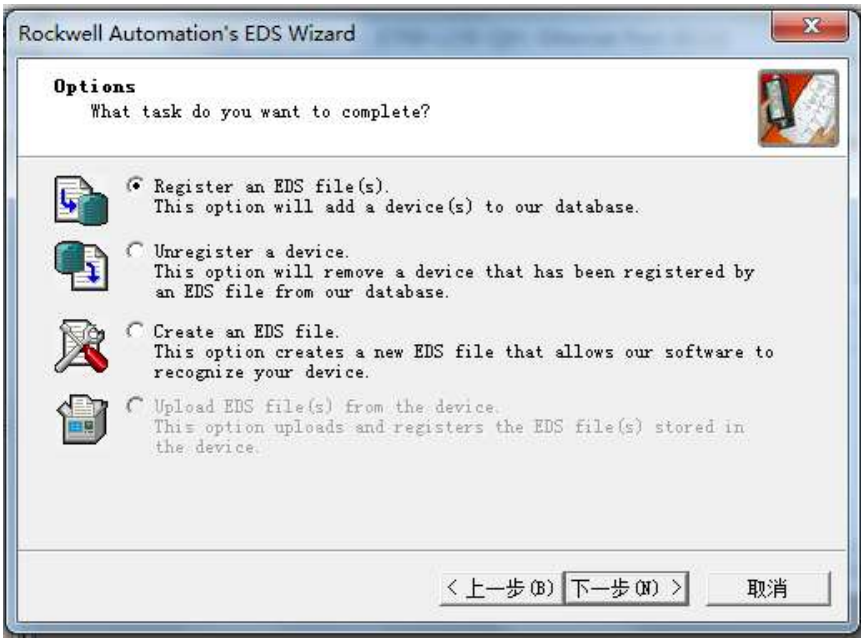
9.1.3.2. When the adapter is powered off, set the dial to any IP address that needs to be set between "1" to "254", and then power on again. The IP address will be set to 192.168.0. x (x is the address displayed on the rotary code switch).

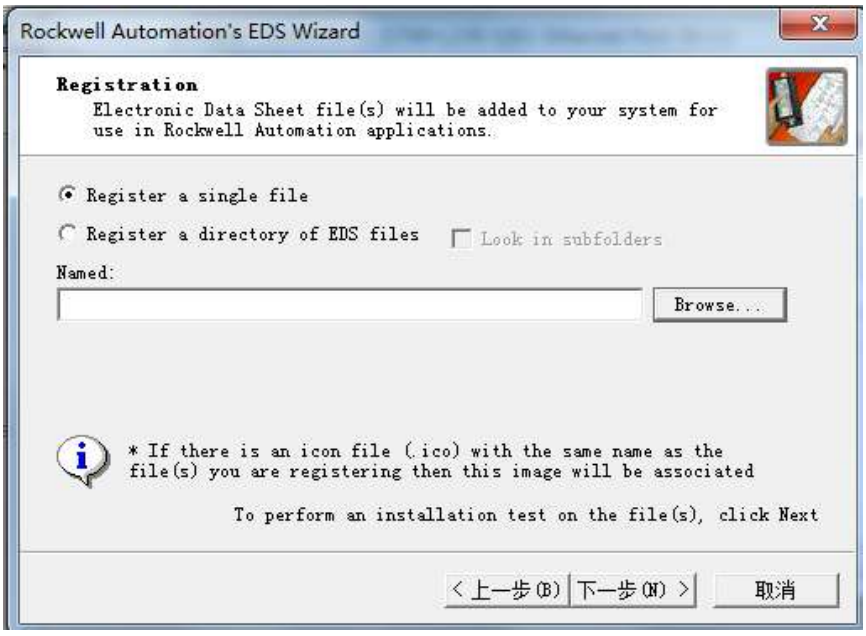
9.2. FX20 is configured on Allen Bradley PLC through EtherNet/IP

9.2.1. Installing FX20 EDS Files

Install the EDS file for FX20 adapter. This configuration file (. eds format) is used to integrate FX20 as a standard EIP slave into your system.

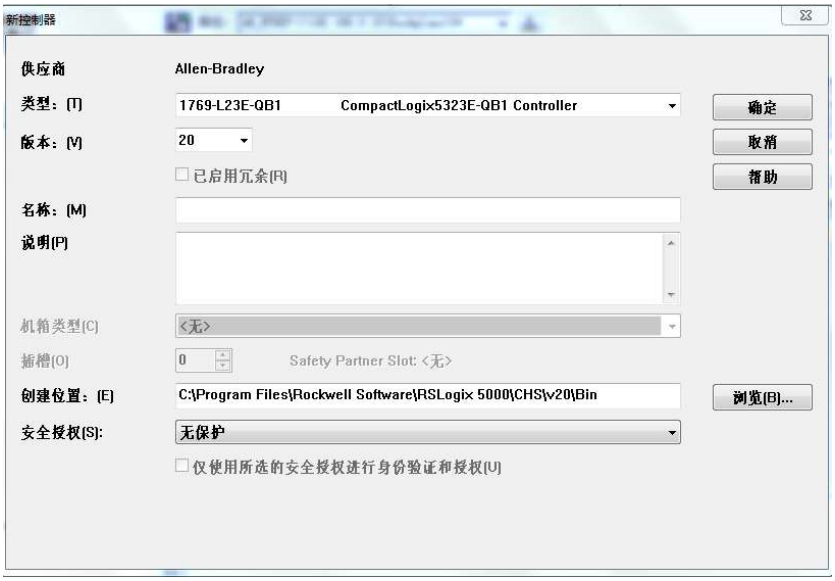
In the toolbar, click on the "Tools" option, click on the "EDS Hardware Installation Tool", find the path to the EDS file, and select FX20-GW-EP00 for AB to install the EDS file.



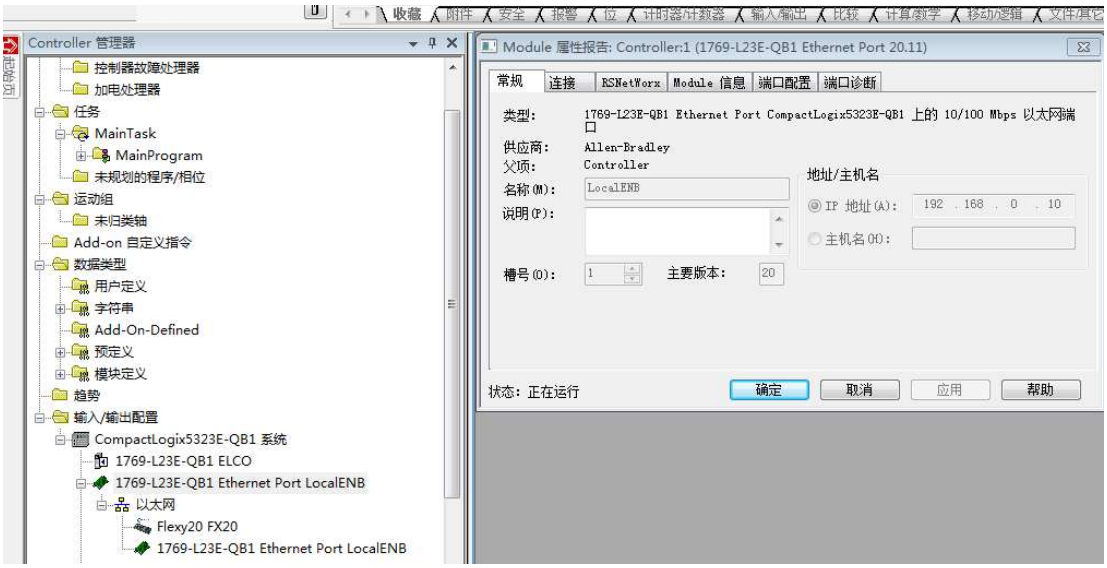


9.2.2. Configurate FX20

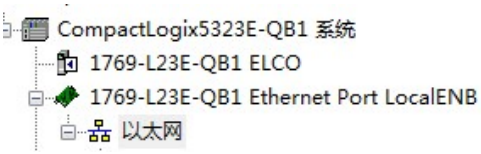
9.2.2.1. Open RS Logix 5000, create a new project, and fill in relevant information based on the PLC model.

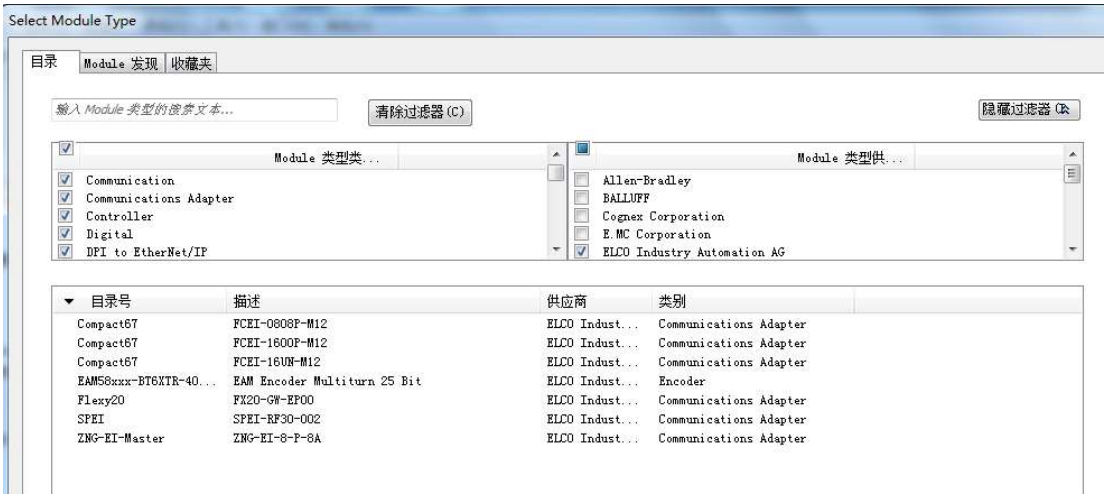


9.2.2.2. Set the IP address of the EtherNet/IP port of the PLC. In this example, the IP of the PLC is set to 192.168.0.10, and the IP of the FX20 adapter is set to 192.168.0.5. Be sure to set the PLC and adapter on the same network segment.

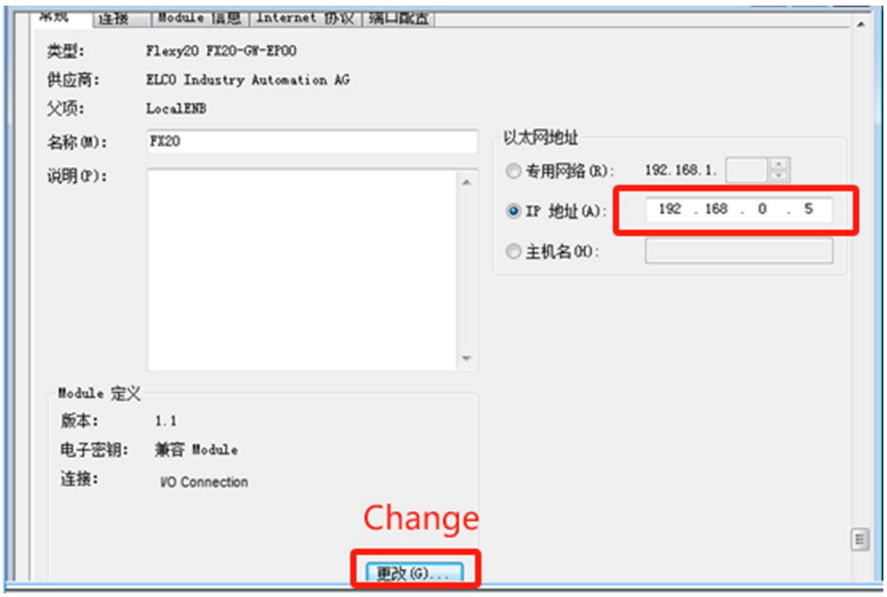


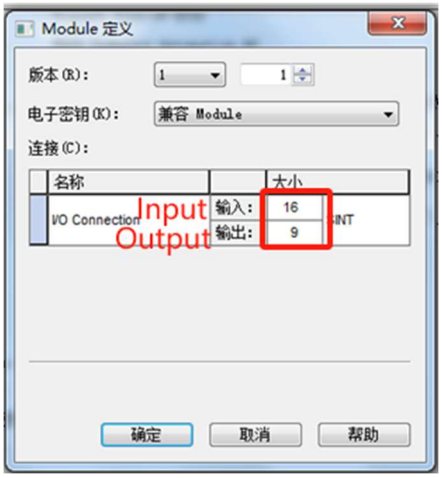
9.2.2.3. Click on the Ethernet option in the project tree, right-click on Create Module, and select “FX20-GW-EP00”.



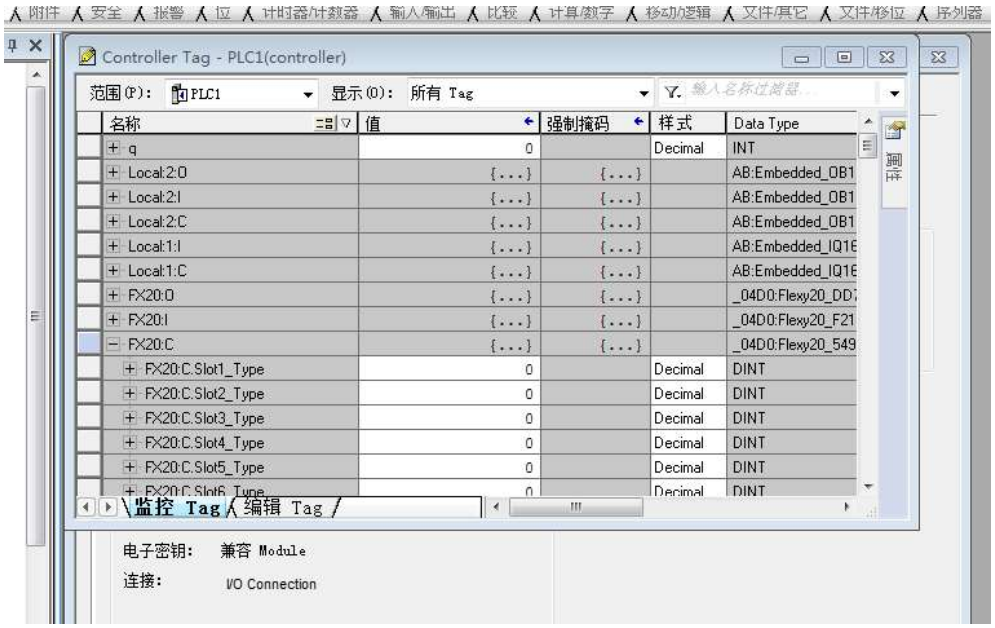


9.2.2.4. Set the device name and IP address, click the “Change” option to configure the byte length of input and output the adapter occupies 8 bytes of input and 8 bytes of output, the final input and output bytes need to be calculated based on the actual configured module byte input and output length. In this example, 4* 16DI modules and 1*8DO module are configured, so the final input byte is 16 and the output byte is 9.





9.2.2.5. Click on the controller tag option in the control tree, select FX20: C (FX20 is the adapter name, which can be set in the IP settings interface), enter the device code, configure the slot, and configure module information according to the equipment code table.

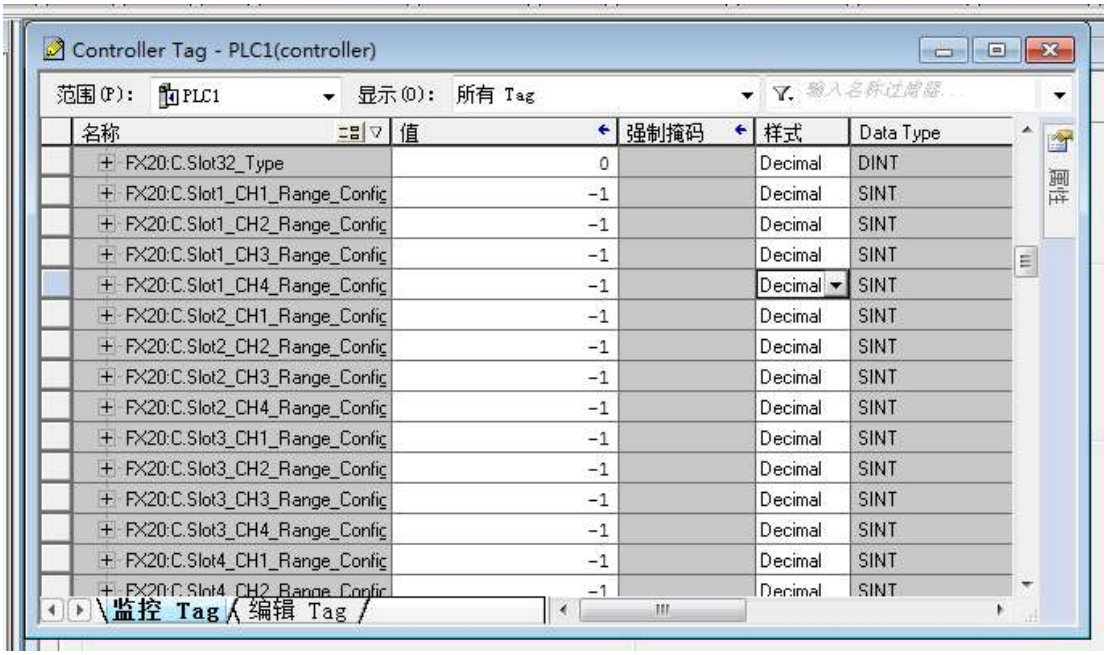


Equipment code table

Equipment name	Model	Code
None	Empty	0
8DI	FX20-DI-BF60	65792
16DI	FX20-DI-BH60	131584
32DI	FX20-DI-BL60	459776
8DO（PNP）	FX20-DO-BF00	268500993
8DO（NPN）	FX20-DO-BF50	268566529
16DO（PNP）	FX20-DO-BH00	268632066
16DO（NPN）	FX20-DO-BH50	268697602
32 DO（PNP）	FX20-DO-BL00	268828676
32 DO（NPN）	FX20-DO-BL50	268894212
4AI	FX20-AI-BD60	-1610545152
4AO	FX20-AO-BD60	-1342111736
4RTD	FX20-AI-BD80	-1073674240
4TC	FX20-AI-BD90	-1073608704

9.2.2.6. Methods for configuring analog modules

Select the slot x that needs to be configured (X is the slot number) to configure the channel information for each channel. Enter the channel code, which is in hexadecimal.



Analog modules configuration code table

Channel Configuration	Configuration Code
Current In +/-20mA	0x01
Current In 0...20mA	0x02
Current In 4...20mA	0x03
Voltage In +/-10V	0x10
Voltage In 0...10V	0x11
Voltage In 1...5V	0x12
Current Out 0...20mA	0x22
Current Out 4...20mA	0x23
Voltage Out +/-10V	0x30
Voltage Out 0...10V	0x31
Voltage Out 1...5V	0x32
Thermocouple J with code-junction	0x40
Thermocouple K with code-junction	0x41
Thermocouple T with code-junction	0x42
Thermocouple N with code-junction	0x43
Thermocouple E with code-junction	0x44
Thermocouple J without code-junction	0x50
Thermocouple K without code-junction	0x51
Thermocouple T without code-junction	0x52
Thermocouple N without code-junction	0x53
Thermocouple E without code-junction	0x54
RDT PT100 2-wire	0x60
RDT PT1000 2-wire	0x61
RDT PT100 3-wire	0x70

RDT PT1000 3-wire	0x71
Empty	0xFF

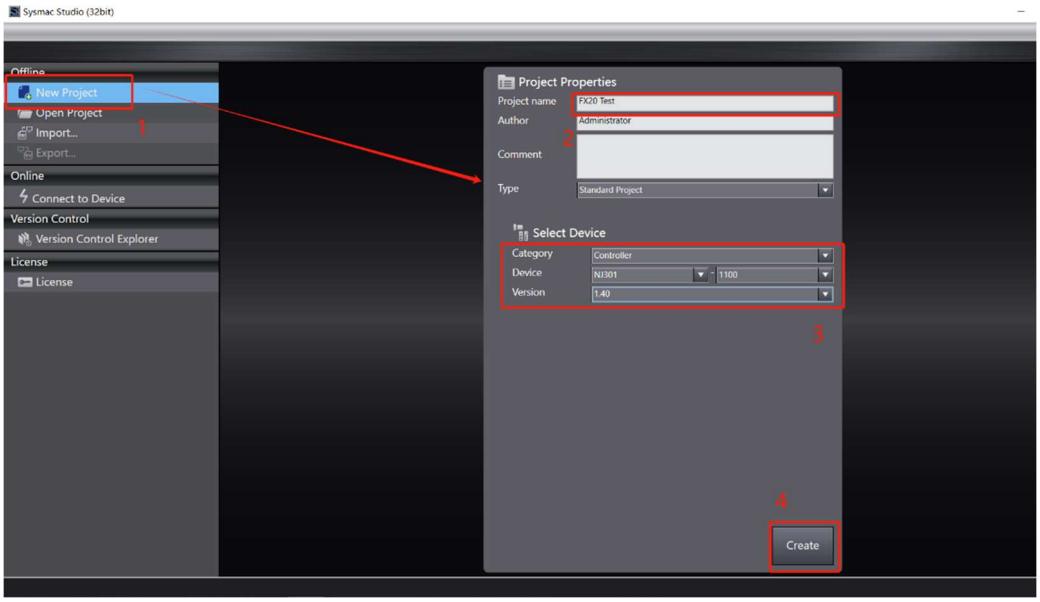
9.2.2.7. After the configuration is completed, set the download path and select the corresponding channel for downloading. If the configuration is successful and error free, all four indicator lights on the adapter should be green; If the BF light turns red, it indicates that the configuration has not been successful.

9.3. FX20 is configured and tested on Omron PLC through EtherNet/IP

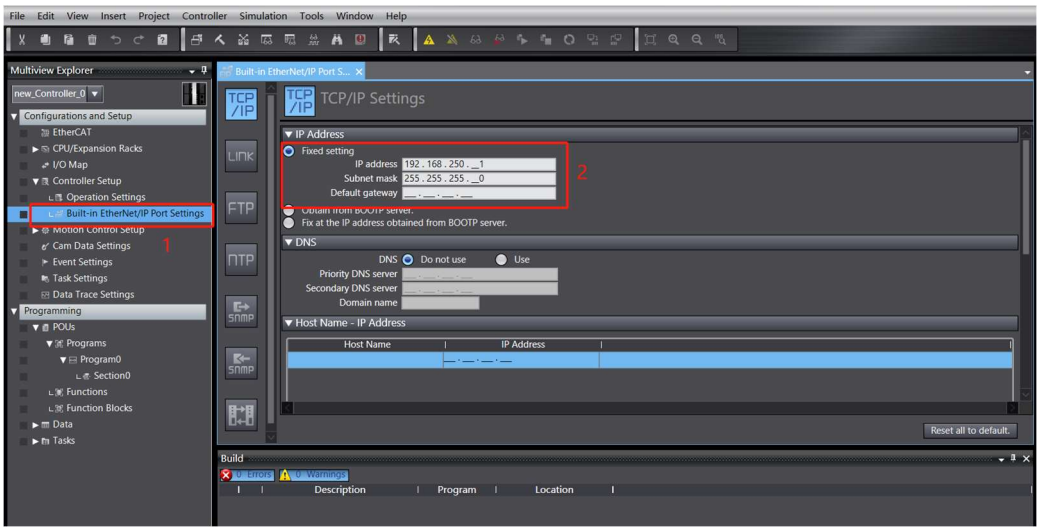
This example uses Omron NJ301-1100 series PLC, which is configured with FX20 through EtherNet/IP in Sysmac Studio. FX20 uses one EtherNet/IP adapter FX20-GW-EP00 to connect four I/O modules, namely 16DI module FX20-DI-BH60, 16DO module FX20-DO-BH00, 4AI module FX20-AI-BD60, and 4AO module FX20-AO-BD60.

Below is a brief explanation of the specific software configuration and debugging process.

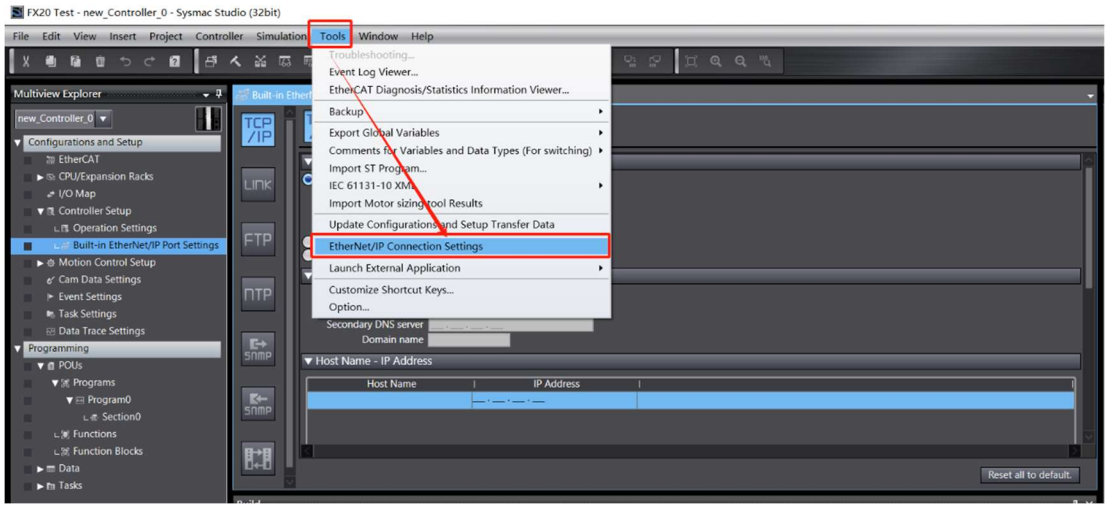
9.3.1. Open the Sysmac Studio software, click on "New Project", fill in the corresponding information according to the PLC model, and click on "Create".



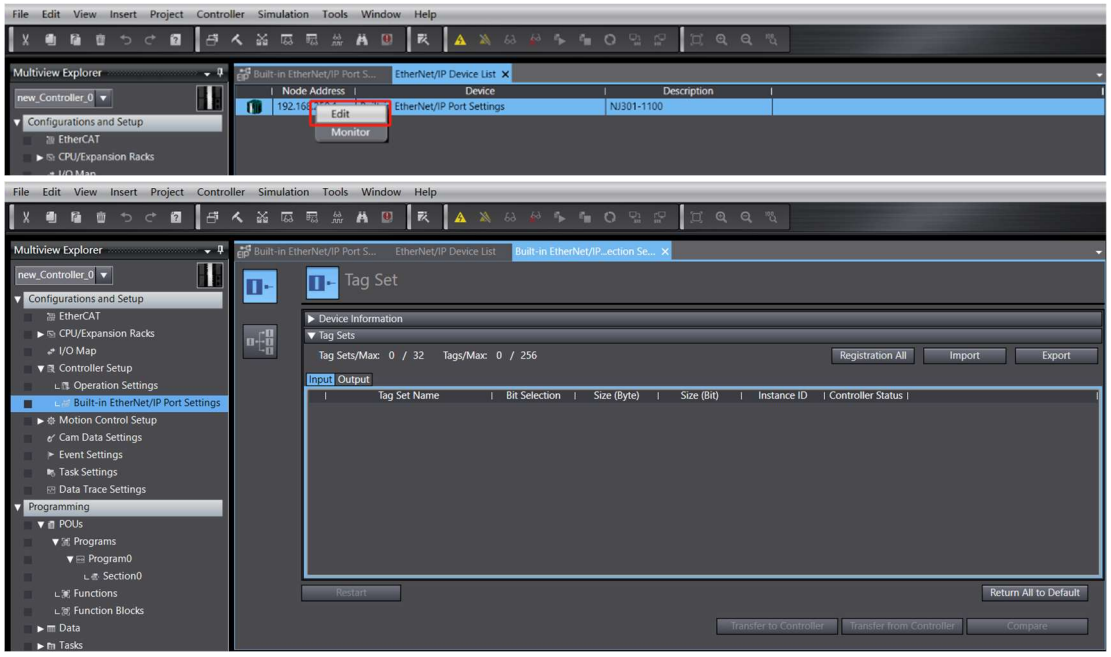
9.3.2. Set the IP address for the built-in EtherNet/IP port of the PLC. In this example, the default IP address for the PLC is 192.168.250.1, and the corresponding IP address for the FX20 module is 192.168.250.7. Note that the PLC and module should be set to the same network segment. The IP setting method for the module can refer to the " FX20 EtherNet/IP adapter IP address setting method ".



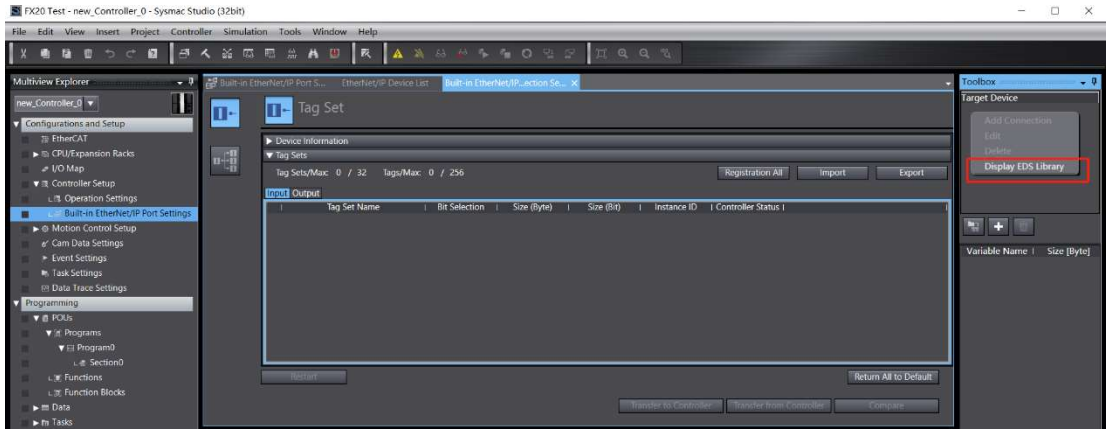
9.3.3. Set up the EtherNet/IP network by selecting "Tools>EtherNet/IP Connection Settings" from the menu bar.



9.3.4. Double clicks or right-click on the newly opened interface and select "Edit" to open the built-in EtherNet/IP port settings interface of the PLC.

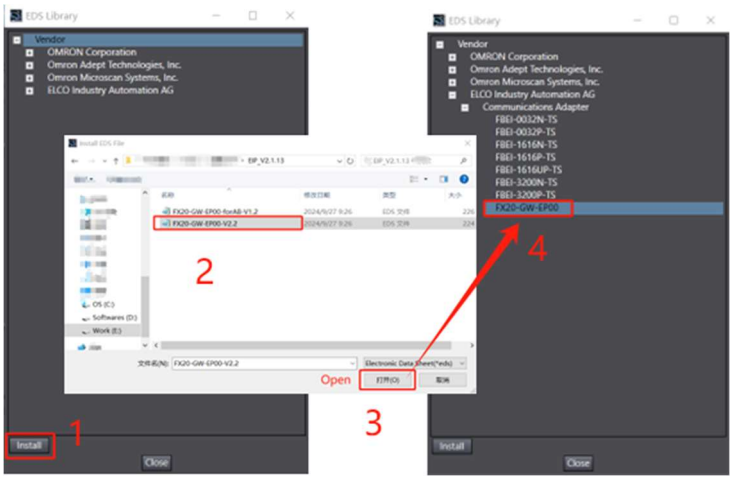


9.3.5. Right click on the toolbox on the right side of the connection settings and select "Display EDS Library".

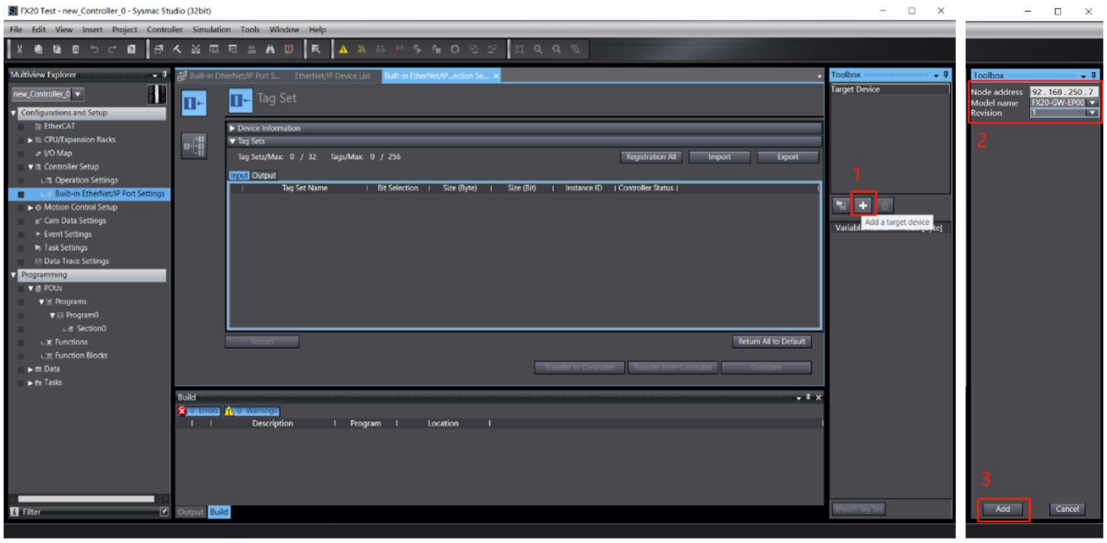


9.3.6. In the newly popped up window, click the "Install" button, find the path to the EDS file, and select the

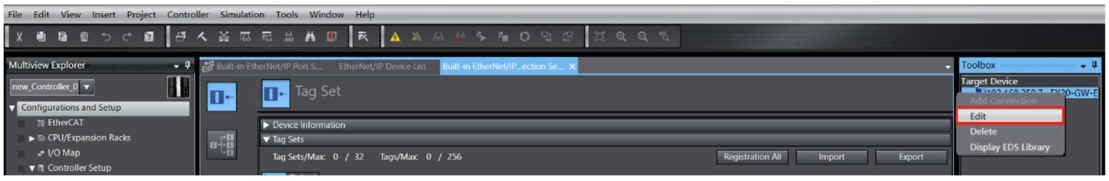
"FX20-GW-EP00.eds" file for installation.



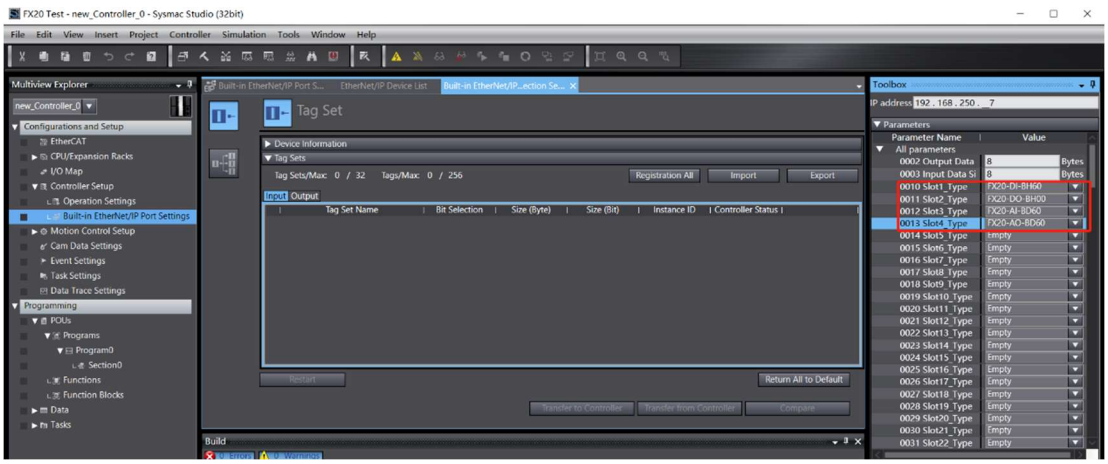
9.3.7. Click the "+" button in the toolbox, fill in the IP address of the module to be configured in the pop-up window (in this example, 192.168.250.7), select the model FX20-GW-EP00 of the FX20 coupler in the module name, and choose the latest revision version. After completion, click the "Add" button.



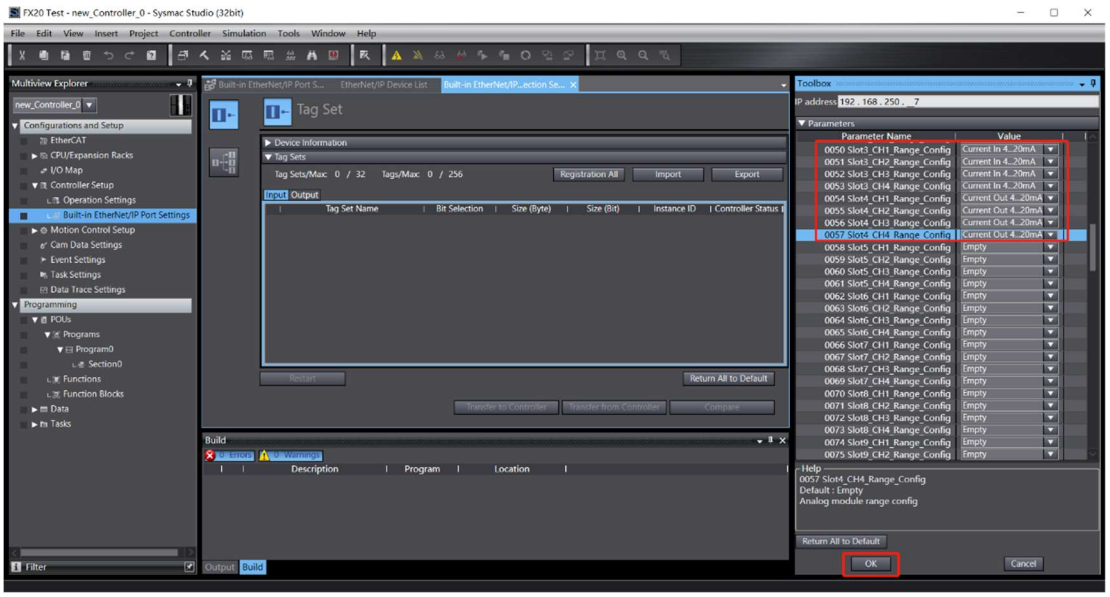
9.3.8. Right click to edit on the newly created target device “192.168.250.7 FX20-GW-EP00 Rev 1”.



9.3.9. Select the corresponding I/O module model from the dropdown menu in the corresponding slot, and pay attention to ensuring that the configuration order is consistent with the actual module connection order.

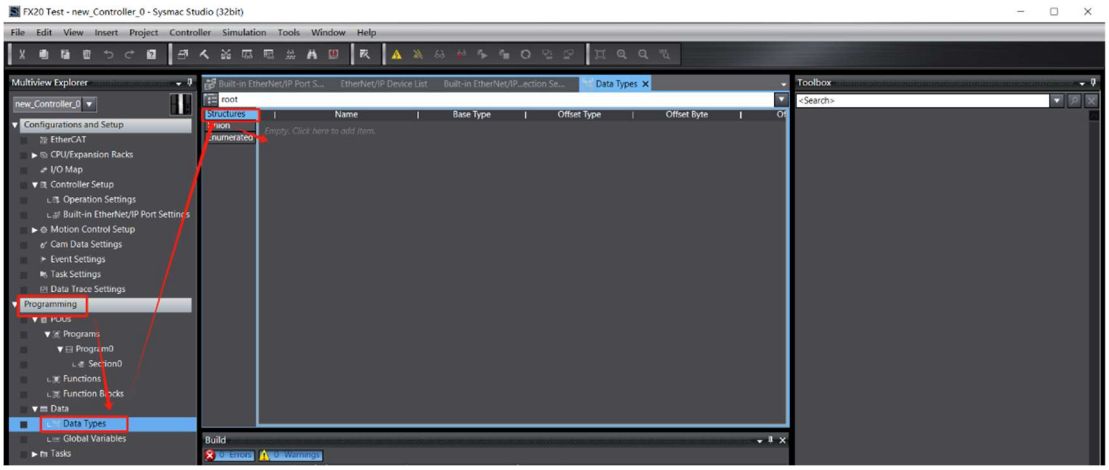


9.3.10. For analog modules, it is also necessary to configure the corresponding slot parameters, select the correct voltage or current signal and range. Pull down the progress bar to find the range and configuration of slot 3 and slot 4 CH1-CH4, and select the corresponding setting parameters for each channel from the drop-down menu. For example, we set each channel of the 4AI module as an input of 4-20mA signal, each channel of the 4AO module as an output of 4-20mA, and keep other parameter settings as default "Empty". After setting up, click "OK".

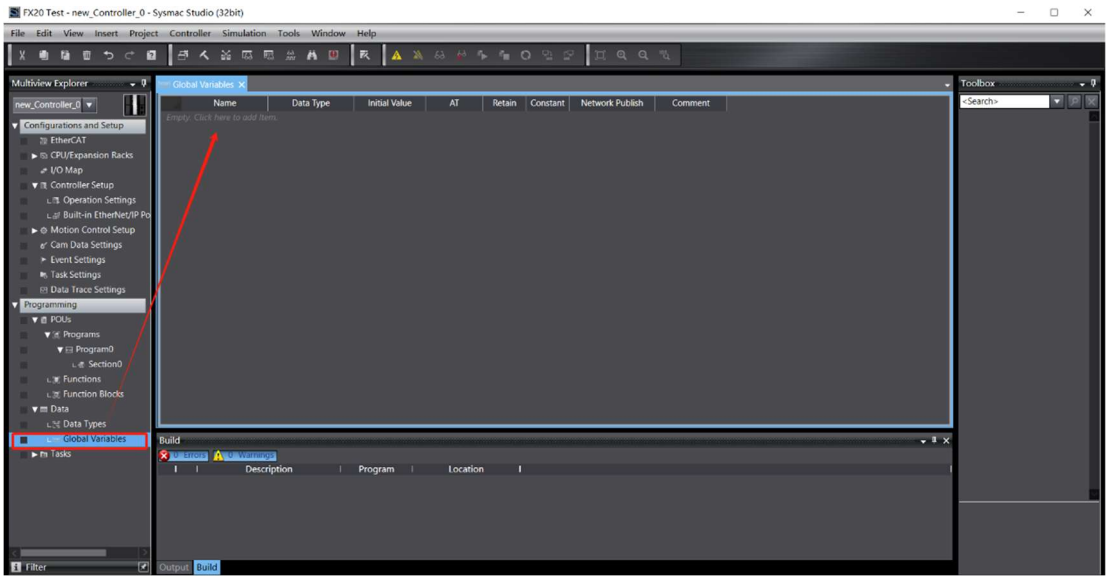


9.3.11. Establish the Data types: Double click on "Programming ->Data ->Data Types" from the left menu, and create two structure for Input and Output based on the configured I/O module type. For convenience, use the module model as the member's name.

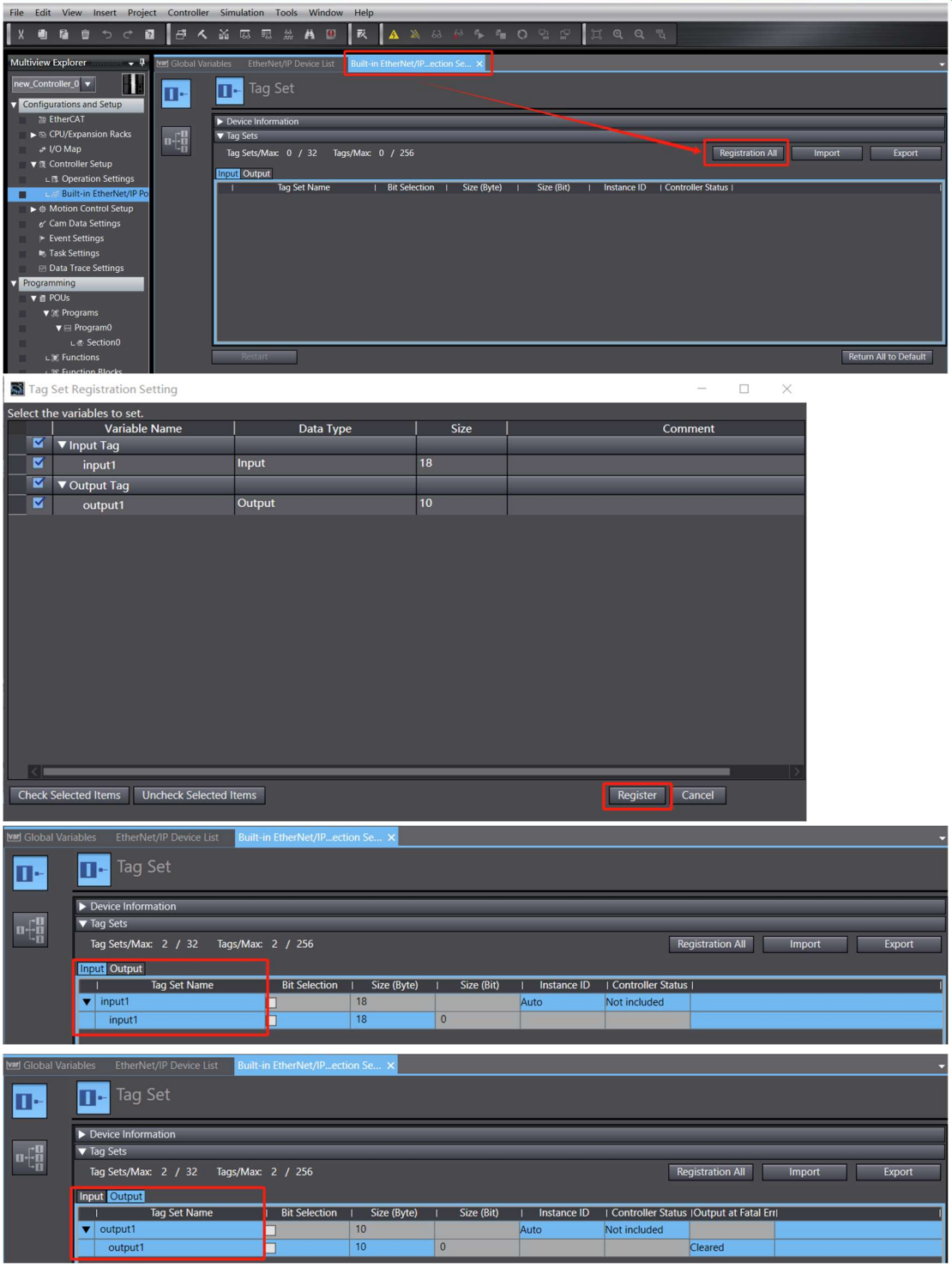
Attention: The model spacing symbol is an underline "_" instead of a dash "-" .



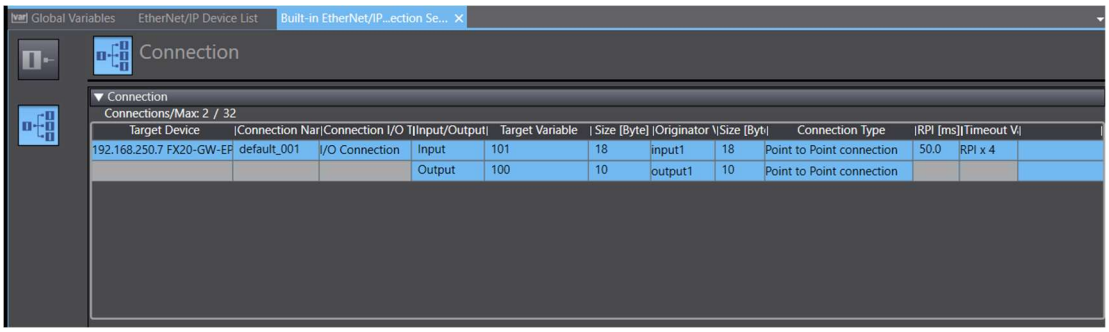
9.3.12. Double clicks the "Global Variables" menu on the left to create two global variables, input1 and output1. Fill in the data type with the structure names "Input" and "Output", and associate them with the structure "Input" and "Output" through the drop-down menu of the "Network Public" option.



9.3.13. In the "Built in EtherNet/IP Port Settings" tab, click the "Registration All" button in the "Tag Set", confirm in the pop-up dialog box, and click "Register".



9.3.14. In the "Connection" settings, select and fill in the relevant parameters such as "Target Device", "Input/Output", "Target Variable", "Starting Variable", "Connection Type", etc. in sequence, keeping them consistent with the previously established global variables.



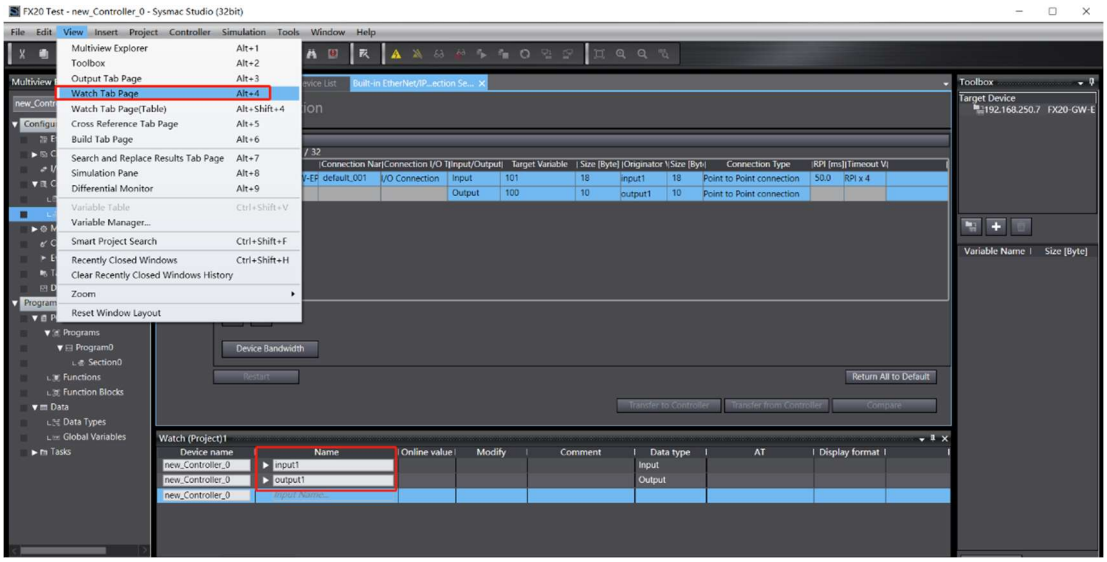
Note:

If the above parameter configuration is changed, the connection needs to be deleted and the connection configuration needs to be re added to take effect.

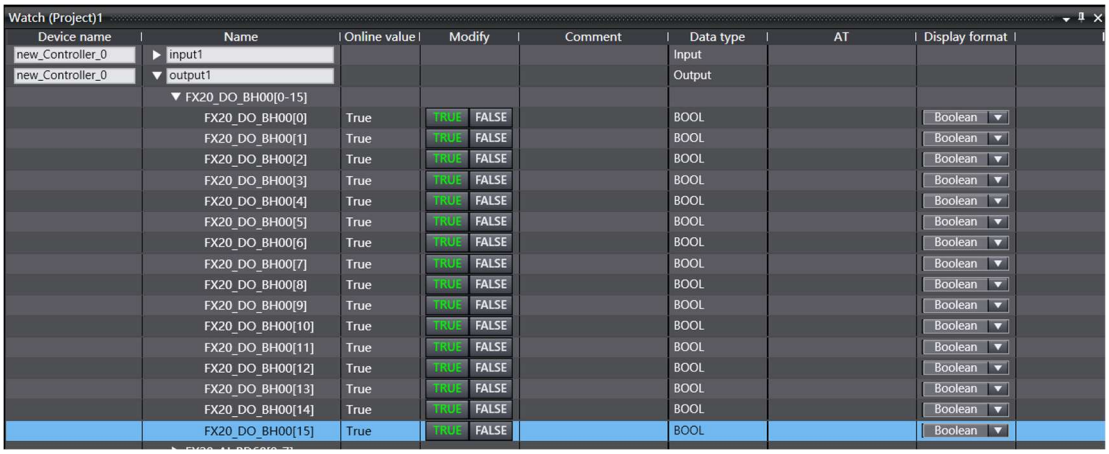
9.3.15. At this point, the FX20 modules have been configured through EtherNet/IP bus connection in Omron Sysmac Studio, and the parameter configuration is transmitted to the PLC. If the configuration is correct, the relevant indicator light BF of the FX20 adapter module will remain green and can be used for input and output signal testing.

9.3.16. Input/Output Test

1) Open menu: view->watch tab page, enter variable names input1 and output1:



2) By sequentially forcing the output channels to "Ture", 16 output channel indicator lights can be lit. Similarly, by inputting a high-level signal, the input channel can be monitored to become "Ture".



9.4. FX20 parameters configuration in web server

The FX20 EtherNet/IP adapter module supports web server functionality, which can be accessed by entering the IP address of the adapter module through a PC browser. This makes the configuration of FX20 I/O module parameters faster and more efficient.

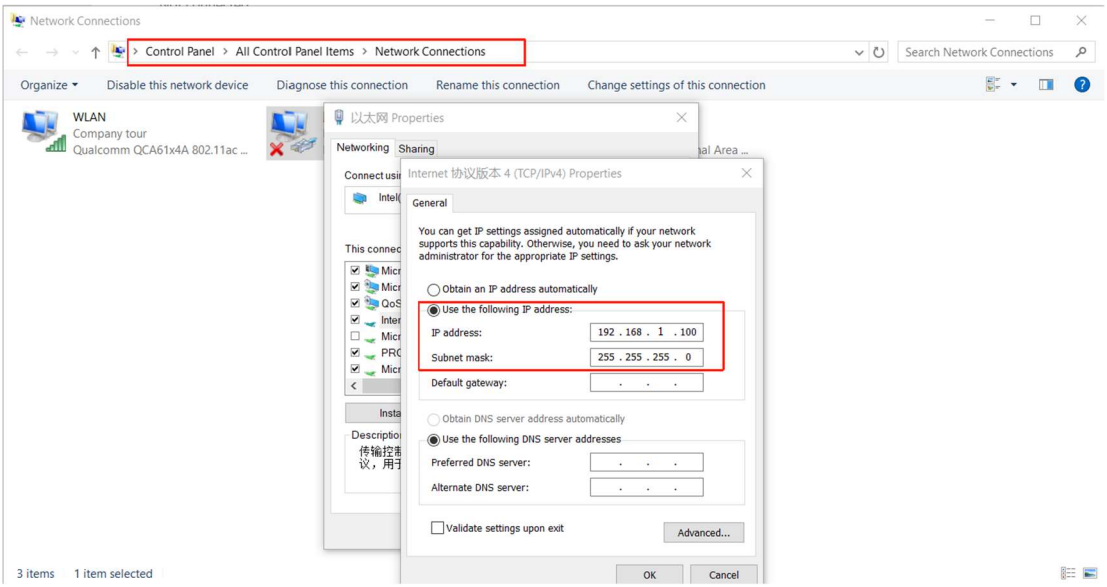
9.4.1. Overview of FX20 web server parameter settings

Module Type	parameters	Default value	Options
Digital input	Filter set	0ms	0ms,1ms,3ms,5ms,10ms
Digital output	Offline Status	Set to 0	Set to 0
			Set to 1
			Hold the last value
Analog input	Endian Set	Little endian	Little endian
			Big endian
	Range	Deactive	Deactive
			Current in +/-20 mA
			Current in 0…20 mA
			Current in 4…20 mA
			Voltage in +/-10 V
			Voltage in 0…10 V
			Voltage in 1…5 V
	Filter set	Extremely weak	Extremely weak
			weak
			medium
			strong
			Extremely strong
	Diagnostic	Disable	Disable
			Enable
Analog output	Endian Set	Little endian	Little endian
			Big endian
	Range	Deactive	Deactive
			Current in +/-20 mA
			Current in 0…20 mA

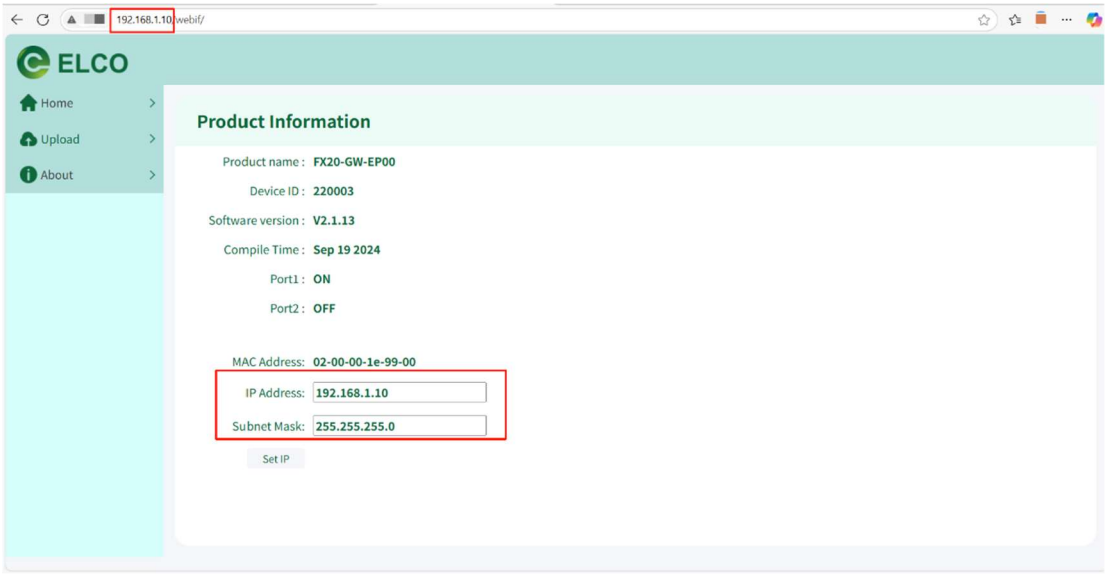
			Current in 4…20 mA
			Voltage in +/-10 V
			Voltage in 0…10 V
			Voltage in 1…5 V
	Filter set	Extremely weak	Extremely weak
			weak
			medium
			strong
			Extremely strong
	Diagnostic	Disable	Disable
			Enable
	Offline Status	Set to 0	Set to 0
			Set to 1
			Hold the last value
	Substitute value	0	0…65535

9.4.2. Instructions for using FX20 web server

9.4.2.1. Disconnect the FX20 from the PLC and connect it directly to the computer network port via Ethernet cable. Set the computer IP address to the same network segment as FX20. In this example, the FX20 IP address is set to 192.168.1.10, and the PC IP address is set to 192.168.1.100.



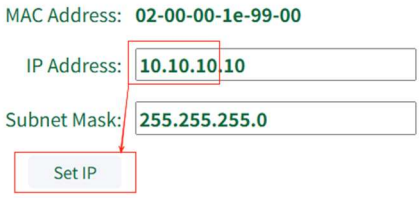
9.4.2.2. Open the PC browser, enter the IP address of the FX20 EtherNet/IP adapter in the address bar, press enter, and enter the FX20 web server homepage. On the homepage, you can view the product name, device ID, software version, MAC address, current IP address, and other information of the gateway module.



On the homepage, you can modify the IP address range of FX20. If you need to modify the same network segment address, please use rotary dialing, refer to "9.1. FX20 EtherNet/IP adapter IP address setting method". If cross network segment modification is required, third-party configuration tools can be used, or the web server address configuration function can be used.

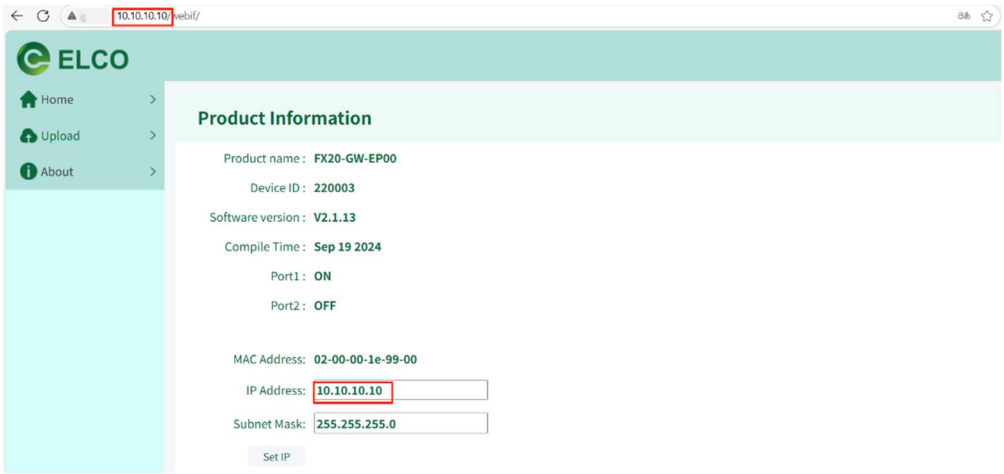
For example, if the FX20 IP address is changed to 10.10.10.10, the operation method is as follows:

a) Fill in the new address segment 10.10.10.10 in the IP address bar on the homepage.

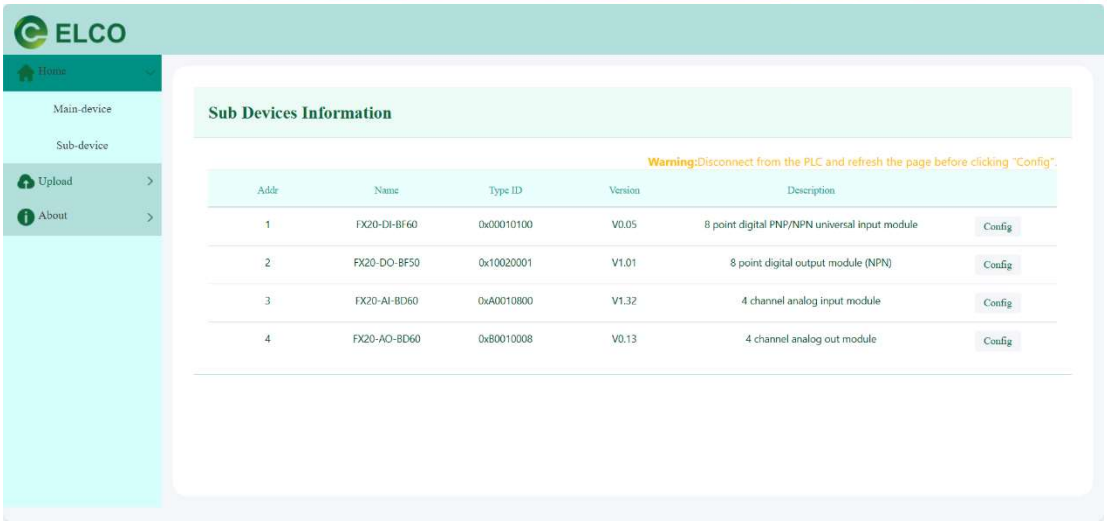


b) After clicking the "Set IP" button and powering on FX20 again, FX20 will operate in a new network segment.

Attention: Please also change the IP address of the PC to 10.10.10. X network segment and log in to the web server again.



9.4.2.3. Click on "Home>Sub device" to view the I/O modules information connected to the gateway module.

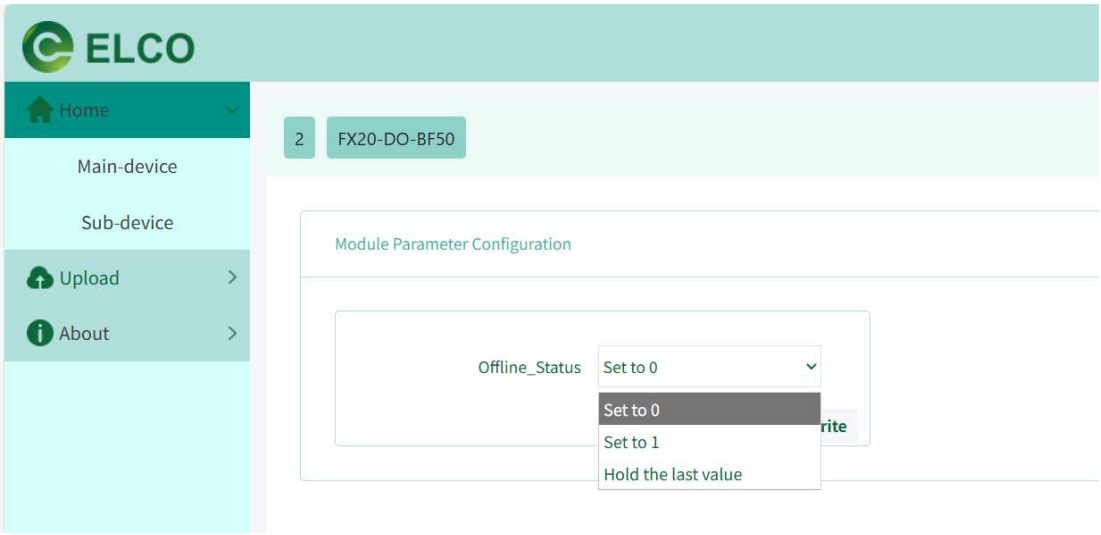


9.4.2.4. Digital input module configuration. Click on the "config" button corresponding to the digital input module to enter the corresponding configuration interface.

The configurable option for the digital input module is only the filtering time, which can be selected from five options: 0, 1, 3, 5, and 10ms. The longer the filtering time, the more effective the software will be in filtering out interference, and the corresponding input state acquisition period will also be extended. Please choose the appropriate filtering time as needed. Default is 0, turn off digital filtering.

Click the write button to confirm the parameters, and click the read button to read the current parameters.

9.4.2.5. Digital output module configuration. Return to the “Sub Devices Information” page, select the "config" button corresponding to "FX20-DO-BF50", and enter the configuration page.



This page provides options for the output response of the digital output module when the bus network is interrupted, which is the output hold function.

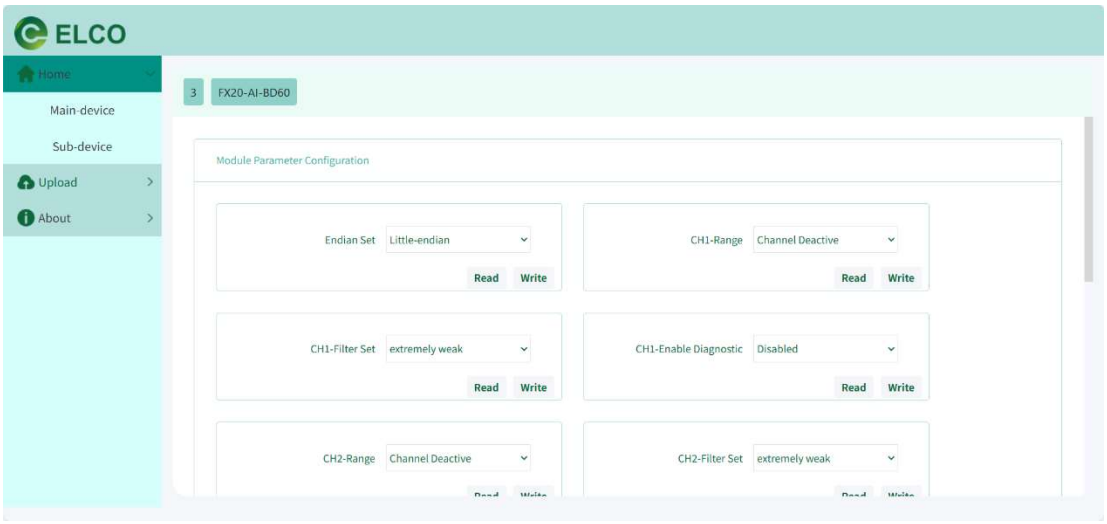
Set to 0: After a bus network interruption, all output channels will be low level.

Set to 1: After the bus network is interrupted, all output channels will output high level.

Hold the last value: After a bus network interruption, all output channels will maintain their respective output states unchanged.

The default setting is "set to 0". After selecting, click the "write" button to write the parameters, and click the "read" button to view the current settings.

9.4.2.6. Analog input module configuration. Return to the “Sub Devices Information” page, select the "config" button corresponding to "FX20-AI-BD60", and enter the configuration page.



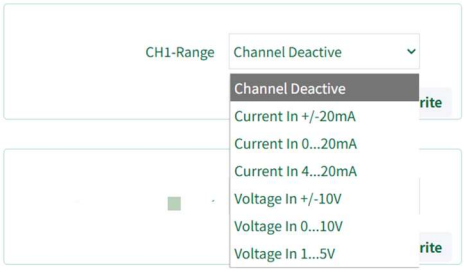
On this configuration page, the data bytes big or little endian of all channels in the module was configured, and configuration items were made for the signal range, filtering strength, and diagnostic enable of each of the four channels. We take channel 1 as an example to illustrate that the other channel settings are the same as channel 1.

a) **Endian set:** Default Little endian, the correct byte storage format for analog data needs to be selected based on the PLC.

Little Endian: The low byte of the numerical value is stored in the low bit address of the memory, and the high byte is stored in the high bit address of the memory.

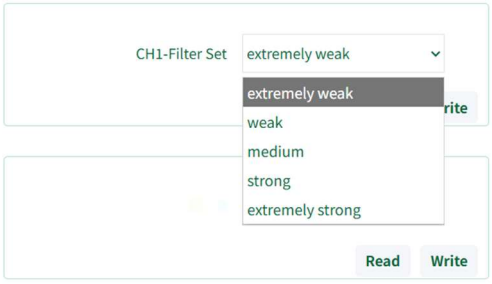
Big-endian: The high-order byte of the numerical value is stored in the low order address of the memory, and the low order byte is stored in the high-order address of the memory.

b) **CH1-Range:** Default channel deactive, Select the correct signal type and range based on the connected analog signal.



After selecting, click the "write" button to write the parameters, and click the "read" button to view the current settings.

c) **CH1-Filter Set:** The selection of filtering strength adopts software filtering method. Filtering enhancement will reduce interference signals, but it will also lower the sampling frequency, affecting the real-time performance of the signal. On the contrary, weakening the filtering will improve the real-time signal acquisition, but it will also introduce clutter interference. Please choose the appropriate software filtering strength according to the situation.

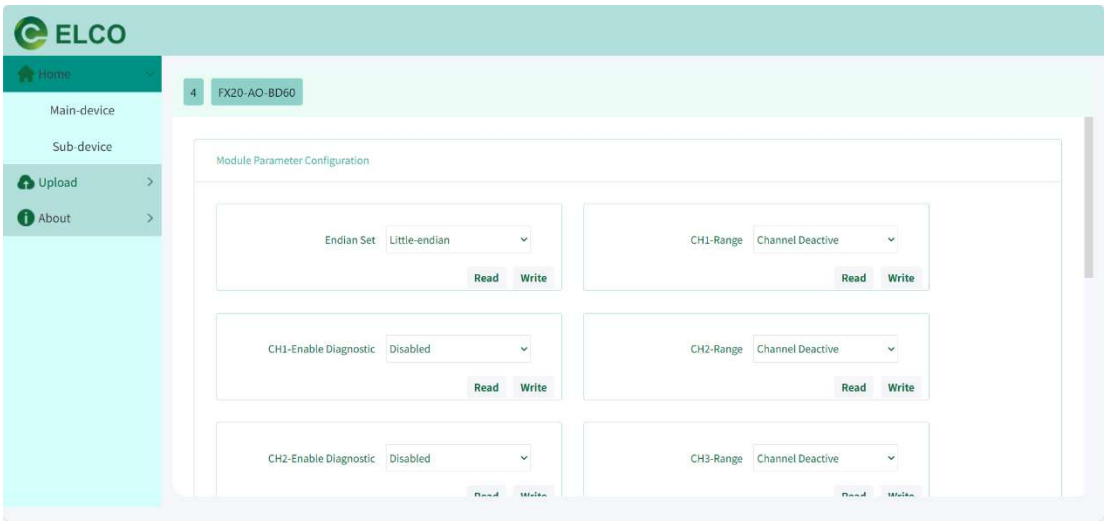


After selecting, click the "write" button to write the parameters, and click the "read" button to view the current settings.

d) **CH1-Enable Diagnostic:** Diagnosis enables control, when enable diagnostic is enabled, the diagnostic bytes of the gateway module will provide feedback on the alarm information of the channel. Please refer to 9.1.2 Register Allocation.

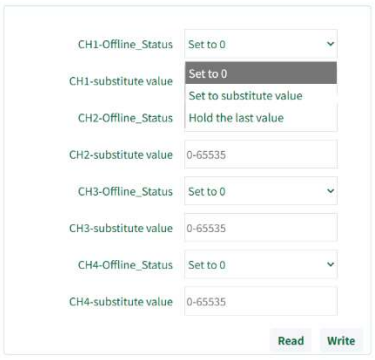
After selecting, click the "write" button to write the parameters, and click the "read" button to view the current settings.

9.4.2.7. Analog output module configuration. Return to the “Sub Devices Information” page, select the "config" button corresponding to "FX20-AO-BD60", and enter the configuration page.



The three settings of Endian set, Range, and Enable Diagnostic are the same as those of the analog input module, as described in the previous section.

a) Analog output hold function setting



Set to 0: After a bus network interruption, all analog output channels of the module have output values of 0.

Set to substitute value: After the bus network is interrupted, the output channel of the module outputs a preset substitute value, with a range of decimal 0-65535.

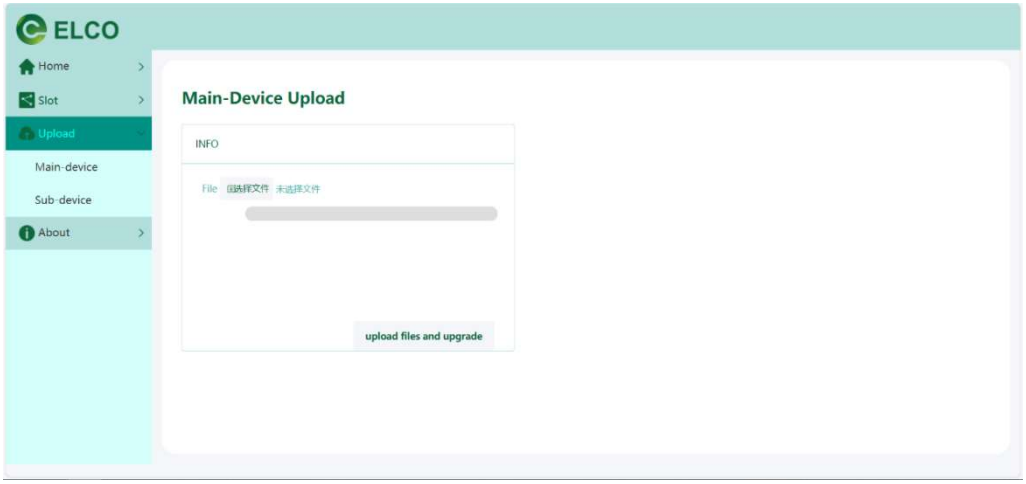
Hold the last value: After a bus network interruption, all output channels will maintain their respective output states unchanged.

The default setting is "set to 0". After selecting, click the "write" button to write the parameters, and click the "read" button to view the current settings.

9.4.2.8. Upload upgrade function

FX20 supports firmware upgrade operations through web servers. By importing upgrade files, firmware

upgrades can be performed on FX20 couplers and I/O modules. Specific methods are attached separately.



Note:

1. Do not attempt to upgrade on your own unless necessary;
2. The upgrade file must be provided by the official ELCO company;
3. Do not power off during the upgrade process;
4. After the upgrade is completed, the FX20 power supply needs to be restarted.

9.5. Representation of analog module values

The PLC processes analog values in binary format. The FX20 analog input module converts analog process signals into digital format, and the analog output module converts digital output values into analog signals.

Digital analog values are applicable to input and output values within the same rated range. Each analog signal occupies PLC address of 1 word, which means each analog signal corresponds to a 16bit value. The symbol of the analog value is always set at the highest bit 15: 0 represents positive and 1 represents negative. For analog modules with a resolution less than 16 bits, analog values are stored in a left aligned manner, and the unused least significant bits are filled with 0. For example, the analog value 18035 can be represented as the following binary value:

Bits	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
16bit	0	1	0	0	0	1	1	0	0	1	1	1	0	0	1	1
14bit	0	1	0	0	0	1	1	0	0	1	1	1	0	0	0	0

Analog signal types can be divided into bipolar and unipolar, with a current bipolar value of ± 20mA (input only) and a voltage bipolar value of ± 10 V, the current unipolarity values are 0-20mA and 4-20mA, and the voltage unipolarity values are 1-5 V and 0-10 V.

The thermal resistor supports 2-wire and 3-wire PT100/1000, and the thermocouple can support multiple TC types (internal compensation) such as J, K, T, N, E, etc.

9.4.1. Analog value input and output range of bipolar current

System value	Current input/output range			
	Decimalism	Hexadecimal	±20 mA	
118.515%	32767	7FFF	≥ 23.7 mA	Overflow, locking max. value
	27649	6C01		Overshoot range
100%	27648	6C00	20 mA	Rated range
75%	20736	5100	15 mA	
0.00362%	1	1	723.4 nA	
0%	0	0	0 mA	
	-1	FFFF	-723.4 nA	
-75%	-20736	AF00	-15 mA	
-100%	-27648	9400	-20 mA	
	-27649	93FF		Overshoot range
-118.519%	-32768	8000	≤ -23.7 mA	Underflow, locking min. value

9.4.2. Analog value input and output range of bipolar voltage

System value	Current input/output range			
	Decimalism	Hexadecimal	± 10V	
	32767	7FFF	> 10.24 V	Overflow, locking max. value
102.4%	28310	6E96	10.24 V	Overshoot range

	27649	6C01		
100%	27648	6C00	10 V	
75%	20736	5100	7.5 V	
0.00362%	1	1	361.7 µV	
0%	0	0	0 V	Rated range
	-1	FFFF	-361.7 µV	
-75%	-20736	AF00	-7.5 V	
-100%	-27648	9400	-10 V	
	-27649	93FF		Overshoot range
-102.4%	-28310	916A	-10.24 V	
	-32768	8000	< -10.24V	Underflow, locking min. value

9.4.3. Analog value input and output range of unipolar current

System value	Current input/output range				
	Decimalism	Hexadecimal	0~20mA	4~20mA	
118.515%	32767	7FFF	≥ 23.7 mA	≥ 22.96 mA	Overflow, locking max. value
	27649	6C01			Overshoot range
100%	27648	6C00	20 mA	20 mA	
75%	20736	5100	15 mA	16 mA	
0.00362%	1	1	723.4 nA	4mA+578.7nA	Rated range
0%	0	0	0 mA	4 mA	
-0.00362%	-1	FFFF			
-17.59%	-4864	ED00	-3.52 mA	1.185 mA	Overshoot range
	-32768	8000	<-3.52 mA	< 1.185 mA	Underflow, locking min. value

9.4.4. Analog value input and output range of unipolar voltage

System value	Current input/output range				
	Decimalism	Hexadecimal	1~5 V	0~10 V	
	32767	7FFF	> 5.7 V	> 10.24 V	Overflow, locking max. value
118.515%	32767	7FFF	5.7 V		Overshoot range
102.4%	28310	6E96		10.24 V	

100%	27648	6C00	5 V	10 V	Rated range
75%	20736	5100	4 V	7.5 V	
0.00362%	1	1	1V+144.7 μV	361.7 μV	
0%	0	0	1 V	0 V	
	-1	FFFF			Overshoot range
-17.59%	-4864	ED00		-1.759 V	
-25%	-6912	E500	0 V		
	-32768	8000	< 0 V	< -1.759 V	Underflow, locking min. value

9.4.5. Analog value measurement range of PT x00 standard thermal resistance

System value		Current input range	
Decimalism	Hexadecimal	-200~+850 ℃	
32767	7FFF	≥ 850.1 ℃	Overflow, locking max. value
8500	2134	850 ℃	Rated range
6375	18E7	637.5 ℃	
10	A	1 ℃	
0	0	0 ℃	
-10	FFF6	-1 ℃	
-1500	FA24	-150 ℃	
-2000	F830	-200 ℃	
-32768	8000	≤ -200.1 ℃	Underflow, locking min. value

9.4.6. Representation of simulated values within the measurement range of thermocouples

For J. K, T, N, and E type thermocouples, determine the rated input and output range based on the temperature range of the graduation table. Divide the decimalism value of the system by 10 to obtain the current temperature, with a resolution of 0.1 ℃, and lock max. or min. value when exceeding the limit.

10. Fault diagnosis

Name	Status	Meaning	Recommended treatment
Adapter indicators			
PWR	Green	Normal	None
	Off	Power abnormal	1. Check if the polarity of the power wiring is correct; 2. Check if the power supply voltage is normal; 3. Adapter failure, replace it.
BF	Green	Normal	None
	Red	Communication abnormal	1. Check if the network cable is connected reliably; 2. Check for configuration errors; 3. Adapter failure, replace it.
SF	Green	Normal	None
	Red	Error occurred	1. Check if there is a short circuit or overload in the I/O module; 2. Adapter or I/O module faulty, replace it;
STA	Green	Normal	None
	Red	Backplane communication error	1. Check if the backplane connection between modules is reliable; 2. Attempt to power off and restart the FX20 system again;
Digital I/O indicators			
PW	Green	Normal	None
	Off	24V power supply abnormal	1. Check if the 24V wiring of the I/O module is correct; 2. Check if the 24V power supply voltage of the I/O module is normal; 3. I/O module damaged, replace it.
MD	Green	Normal	None
	Green blinking	Connected but not configured	Check if the modules are configured correctly.
	Green and red blinking	Backplane communication abnormal	1.Check if the connections between modules are reliable; 2. Restart FX20 system power supply; 3. I/O module malfunction, replace it.
	Red	Module error	1. Check if the I/O module is configured correctly; 2. Check if there is a short circuit or overload in the I/O module; 3. I/O module damaged, replace it.
00-07/10-17	Green	Signal “1”	None
20-27/30-37	Off	Signal “0”	None
Analog I/O indicators			
PW	Green	Normal	
	Off	24V power supply abnormal	1. Check if the 24V wiring of the I/O module is correct; 2. Check if the 24V power supply voltage of the I/O module

			is normal; 3. I/O module damaged, replace.
MD	Green	Normal	None
	Green blinking	Connected but not configured	Check if the modules are configured correctly;
	Green and red blinking	Backplane communication abnormal;	1.Check if the connections between modules are reliable; 2. Restart FX20 system power supply; 3. I/O module malfunction, replace it.
	Red	Module error	1.Check if the I/O module is configured correctly; 2.Check if there is a short circuit or overload in the IO module; 3. The analog channel value exceeds the range; 4.I/O module damaged, replace.
C1-C4/ C1-C8	Off	Normal	None
	Red	Channel over range	Check the analog input output signal range.
Auxiliary power supply module indicators			
PW	Green	Normal	None
	Red	24V overvoltage or undervoltage	Check if the input 24V power supply voltage is normal.
Us	Green	Normal	None
	Off	No backplane 5V power supply	1. Check if the backplane connection between modules is reliable; 2. Power module damaged, replace.