Remote I/O

User Manual

by EDA Technology Co., Ltd

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1 Hardware Manual

This chapter provides hardware information on the EtherCAT coupler, digital input/output module, analogue input/output module, temperature input module, high-speed counter module and bus end cover.

1.1 EtherCAT Coupler (ED-EIOBRG-EC)

This section describes the product overview, packing list, appearance, buttons, indicators, cable connections and interfaces of the ED-EIOBRG-EC.

1.1.1 Overview

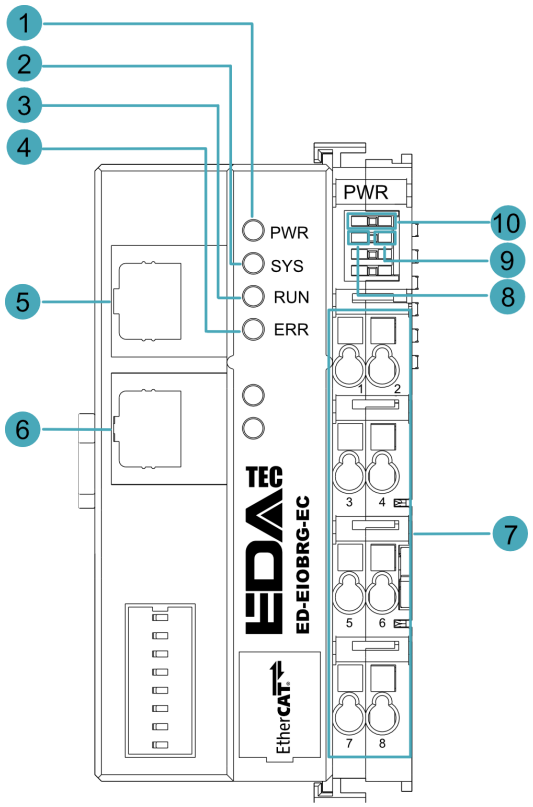
The ED-EIOBRG-EC is an EtherCAT coupler that provides an EtherCAT communication interface for connecting EtherCAT slave hardware devices. The ED-EIOBRG-EC has a transmission distance of up to 100 m and supports the extension of up to 32 I/O modules and up to 65,534 network nodes. The ED-EIOBRG-EC can be used as a connection node to connect multiple EtherCAT slaves to an EtherCAT network to meet the requirements of different application scenarios.

1.1.2 Packing List

1 x EtherCAT Coupler

1.1.3 Appearance

Introducing the functions and definitions of interfaces on each panel.



NO.	Function Definition
1	1 x EtherCAT Coupler power indicator, green, using for viewing the connection status of the coupler system power supply.
2	1 x System tip indicator, green, using for viewing the operational status of the coupler.
3	1 x Running indicator, green, using for viewing the running status of the coupler.
4	1 x Fault indicator, red, using to see if the coupler is malfunctioning.
5	1 x EtherCAT input port for access to the EtherCAT network, supporting to connect EtherCAT masters or the EtherCAT OUT port of other EtherCAT slaves.
6	1 x EtherCAT output port for connecting other EtherCAT devices on the same network segment, supporting to connect the EtherCAT IN port of other EtherCAT slaves.
7	8 x PT terminals, including 1 x System power port and 2 x Field power ports with an input voltage range of DC 24V (±20%).
8	1 x Overcurrent indicator, red, using to see if the coupler exceeds the maximum operating current.
9	1 x Input voltage indicator, green, using to see if the input voltage is normal.
10	2 x Connection indicators, green, using to see if the connection at the common end is working.

1.1.4 Indicator

Introducing the various statuses and meanings of indicators contained in ED-EIOBRG-EC device.

Indicator	Status	Description
PWR	On	The device is powered up.
	Off	The device is not powered up.
SYS	Blink	One flash per second when the device is normal.
	Off	The device is not powered up or system is not working properly.
RUN	On	The device is in normal operation.
	Blink	The device is in pre-operational or safe operating condition.
	Off	The device is not powered up or The device is powered up but not running.
ERP	On	The device is failure.
	Off	The device is in working.
Yellow indicator of Ethernet port	On	The data transmission is abnormal.
	Blink	Data is being transmitted over the Ethernet port.
	Off	The Ethernet connection is not set up.
Green indicator of Ethernet port	On	The Ethernet connection is in the normal state.
	Blink	The Ethernet connection is abnormal.
	Off	The Ethernet connection is not set up.

1.1.5 Interface

Introducing the definition and function of each interface.

1.1.5.1 Power Supply Interface

The ED-EIOBRG-EC device power interface contains 8 PT terminals with 1 system power port and 2 Field power ports, and the specific port definitions are listed in the following table.

- SYS Power: Access to an external power supply to power the ED-EIOBRG-EC with an input voltage range of DC 24V (±20%) and an input current of 2A (Max).
- Field Power: Access to an external power supply, power supply for extended I/O modules, input voltage range DC 24V (±20%), output current 10A (Max)

Pin ID	Pin Name	Pin ID	Pin Name
1	24V SYS	2	0V SYS
3	24V Field	4	24V Field
5	0V Field	6	0V Field

Pin ID	Pin Name	Pin ID	Pin Name
7	PE	8	PE

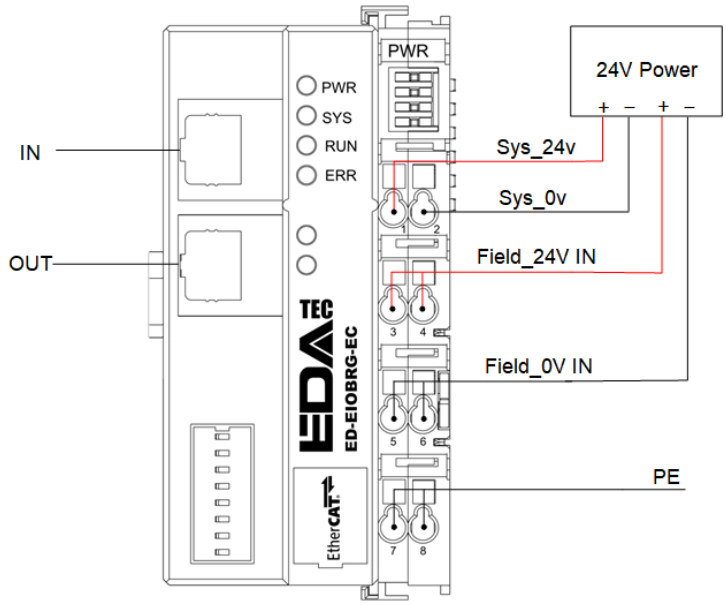
1.1.5.2 EtherCAT Interface

The ED-EIOBRG-EC contains 1 EtherCAT IN port and 1 EtherCAT OUT port.

- EtherCAT IN port: It is used for accessing the EtherCAT network, supporting to connect EtherCAT master or EtherCAT OUT port of EtherCAT slaves.
- EtherCAT OUT port: It is used to connect other EtherCAT device on the same network segment, supporting to connect EtherCAT IN port of EtherCAT slaves.

1.1.6 Connection Cables

For the definition of each terminal on ED-EIOBRG-EC device, see 1.1.5 Interface。



1.1.7 Expansion Modules

Supports the expansion of I/O modules on the right side of the ED-EIOBRG-EC, including: digital input modules, digital output modules, relay output modules, analogue input modules, analogue output modules, RTD input modules, thermocouple (TC) input modules, high-speed counter modules and bus end cover.

1.2 EtherCAT Digital Input Modules

The EtherCAT digital input modules contain both PNP and NPN signal types, and the specific models included are listed in the table below.

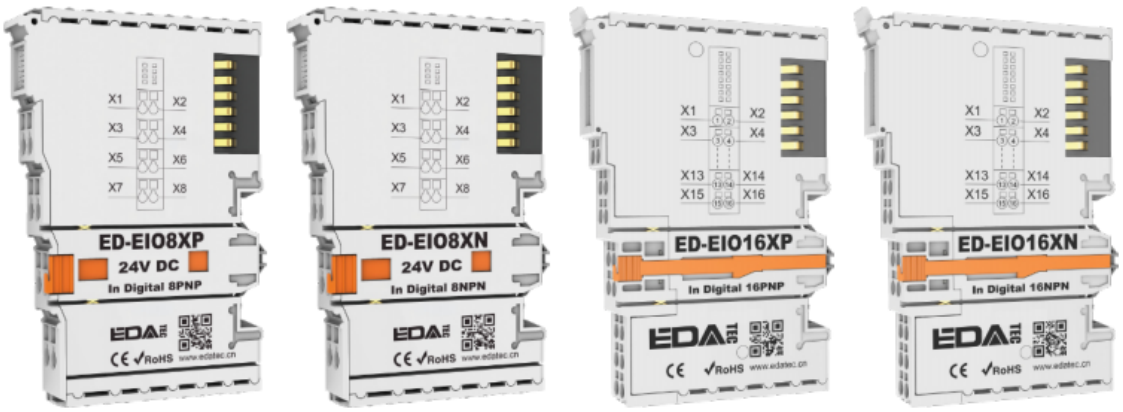
Model	Description
ED-EIO8XP	8-channel digital input module, PNP type

Model	Description
ED-EIO8XN	8-channel digital input module, NPN type
ED-EIO16XP	16-channel digital input module, PNP type
ED-EIO16XN	16-channel digital input module, NPN type

This section provides a product overview, packing list, appearance, and cable connections for digital input modules.

1.2.1 Overview

The EtherCAT digital input module include two types of PNP and NPN, supporting 8-channel and 16-channel inputs respectively. It is used for accessing external digital signals and transmitting them to the EtherCAT network, with optocoupler isolation between each channel.
EtherCAT digital input module adopts plug-in appearance structure, which is convenient to install on the right side of EtherCAT coupler or master PLC device. Up to 32 modules can be cascaded without additional power supply. Users can select the appropriate type and number of input channels according to actual requirements.



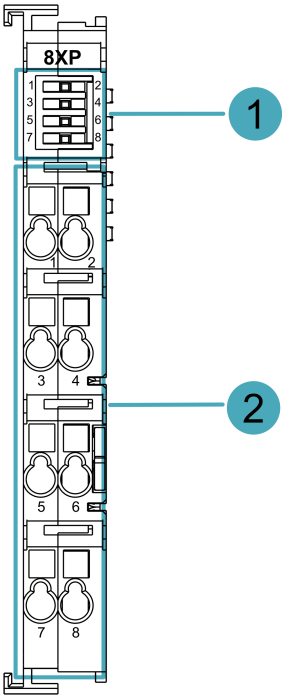
1.2.2 Packing List

1 x EtherCAT digital input module

1.2.3 Appearance

Introducing the functions and definitions of interfaces on each panel.

ED-EIO8XP: 8-channel digital input module (PNP type)

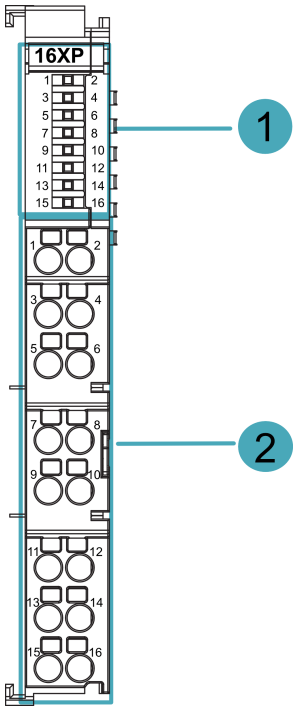


NO.	Function Definition
1	8 x Indicators, green, 1~8 indicate the indicator of 1~8 channels respectively, each channel indicator is independent of each other, including two states of on and off. • On: Corresponding channel detects a high level signal input • Off: No signal input for corresponding channel
2	8 x input ports, channels 1~8 correspond to signals X1~X8 respectively.

where the input ports are defined in the following table:

Pin ID	Pin Name	Pin ID	PIN Name
1	X1	2	X2
3	X3	4	X4
5	X5	6	X6
7	X7	8	X8

ED-EIO16XP: 16-channel digital input module (PNP type)

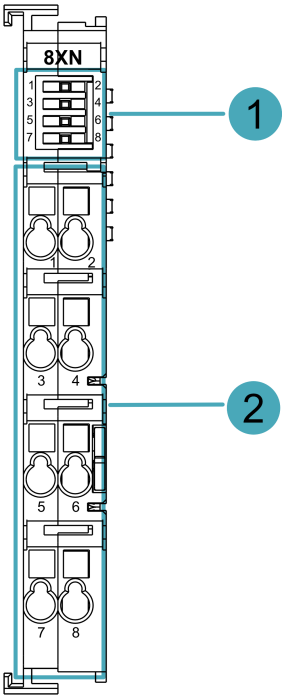


NO.	Function Definition
1	16 x Indicators, green, 1~16 indicate the indicators of 1~16 channels respectively, each channel indicator is independent of each other, including two states of on and off. • On: The corresponding channel detects a high level signal input. • Off: No signal input for corresponding channel
2	16 x input ports, 1~16 channels correspond to signals X1~X16 respectively.

Where the input ports are defined in the following table:

Pin ID	Pin Name	Pin ID	Pin Name
1	X1	2	X2
3	X3	4	X4
5	X5	6	X6
7	X7	8	X8
9	X9	10	X10
11	X11	12	X12
13	X13	14	X14
15	X15	16	X16

ED-EIO8XN: 8-channel digital input module (NPN type)

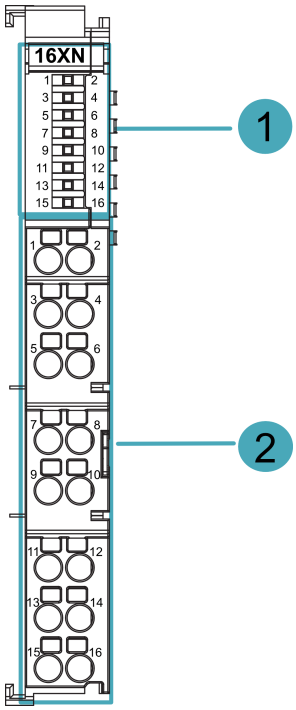


NO.	Function Definition
1	8 x Indicators, green, 1~8 indicate the indicator of 1~8 channels respectively, each channel indicator is independent of each other, including two states of on and off. • On: Corresponding channel detects a low level signal input • Off: No signal input for corresponding channel
2	8 x input ports, channels 1~8 correspond to signals X1~X8 respectively.

Where the input ports are defined in the following table:

Pin ID	Pin Name	Pin ID	Pin Name
1	X1	2	X2
3	X3	4	X4
5	X5	6	X6
7	X7	8	X8

ED-EIO16XN: 16-channel digital input module (NPN type)



NO.	Function Definition
1	16 x Indicators, green, 1~16 indicates the indicator of 1~16 channels respectively, each channel indicator is independent of each other and contains two states of on and off. • On: Corresponding channel detects a low level signal input • Off: No signal input for corresponding channel
2	16 x input ports, 1~16 channels correspond to signals X1~X16 respectively.

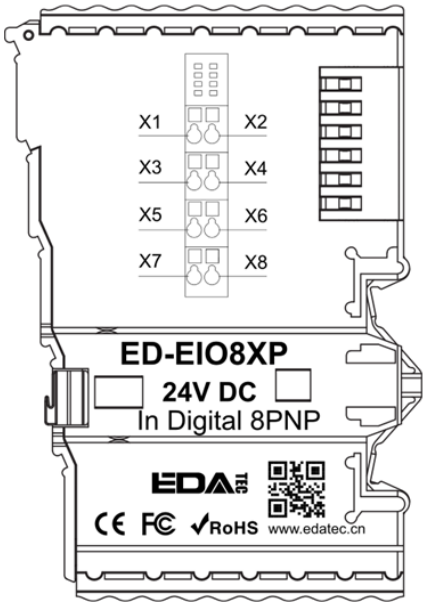
Where the input ports are defined in the following table:

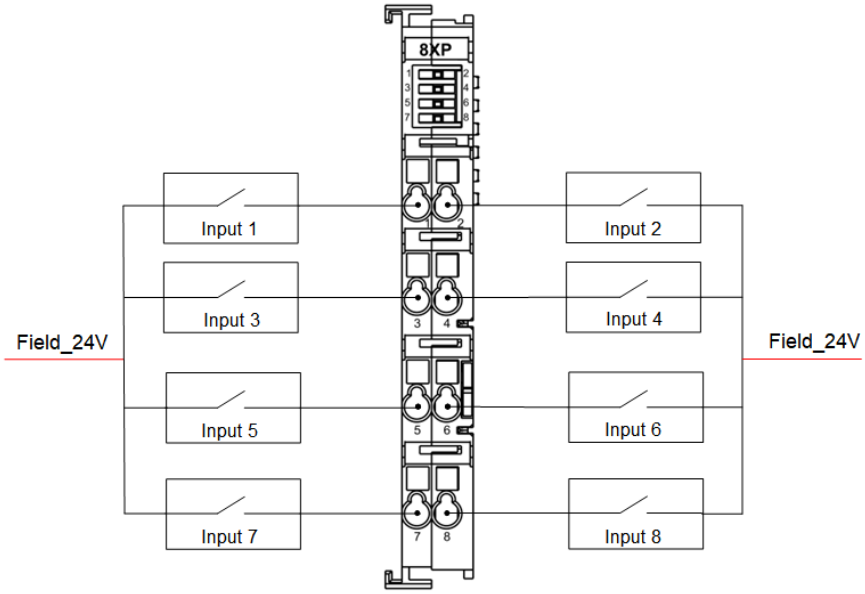
Pin ID	Pin Name	Pin ID	Pin Name
1	X1	2	X2
3	X3	4	X4
5	X5	6	X6
7	X7	8	X8
9	X9	10	X10
11	X11	12	X12
13	X13	14	X14
15	X15	16	X16

1.2.4 Connection Cables

ED-EIO8XP and ED-EIO16XP Digital Input Module (PNP type) Wiring Diagram:

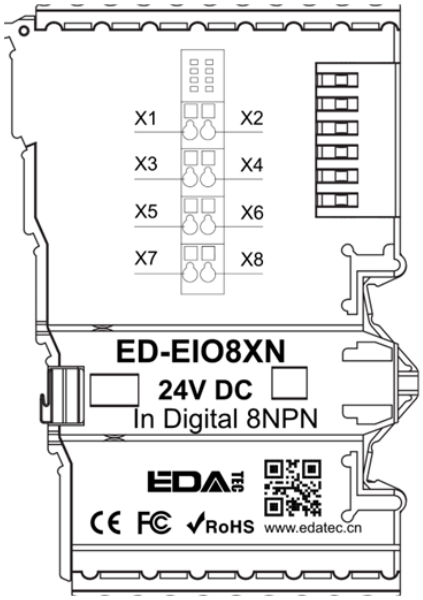
The wiring schematic is shown using the 8-terminal module as an example only:

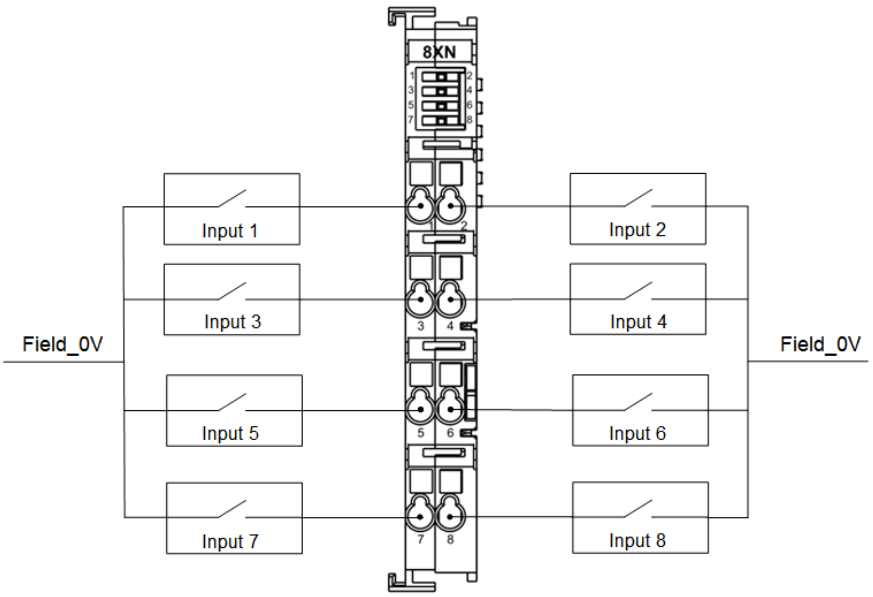




ED-EIO8XN and ED-EIO16XN Digital Input Modules (NPN type) Wiring Diagram:

The wiring schematic is shown using the 8-terminal module as an example only:





1.3 EtherCAT digital output modules

The EtherCAT digital output modules contain both transistor and relay types, where the transistors support both PNP and NPN signal types, and the specific models included are listed in the table below.

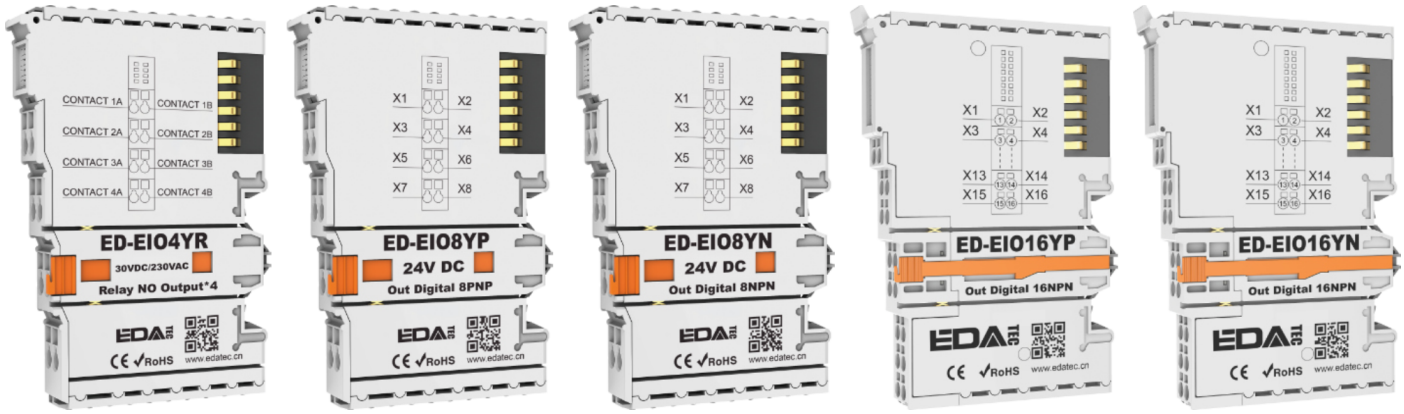
Model	Description
ED-EIO4YR	4-channel relay output module
ED-EIO8YP	8-channel digital output module, PNP type
ED-EIO8YN	8-channel digital output module, NPN type
ED-EIO16YP	16-channel digital output module, PNP type

Model	Description
ED-EIO16YN	16-channel digital output module, NPN type

This section provides a product overview, packing list, appearance, and cable connections for digital output modules.

1.3.1 Overview

The EtherCAT digital output modules include transistors (PNP/NPN) and relay types, supporting 4, 8 and 16 outputs respectively, which are used to transmit control signals from the EtherCAT network to external devices, with optocoupler isolation between each channel. The EtherCAT digital output modules have a plug-in appearance and can be easily mounted on the right side of the EtherCAT coupler or master PLC device. Up to 32 modules can be cascaded without additional power supply, and the user can choose the appropriate type and number of output channels according to actual requirements.



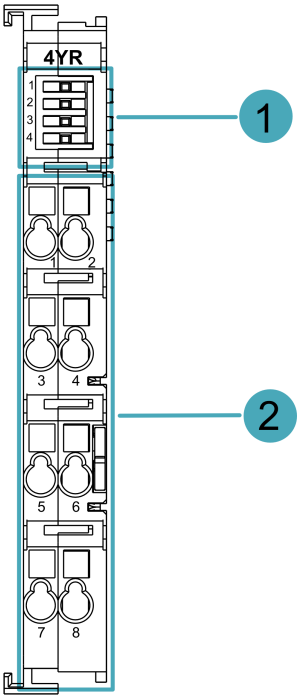
1.3.2 Packing List

1 x EtherCAT digital output module

1.3.3 Appearance

Introducing the functions and definitions of interfaces on each panel.

ED-EIO4YR: 4-channel relay output module

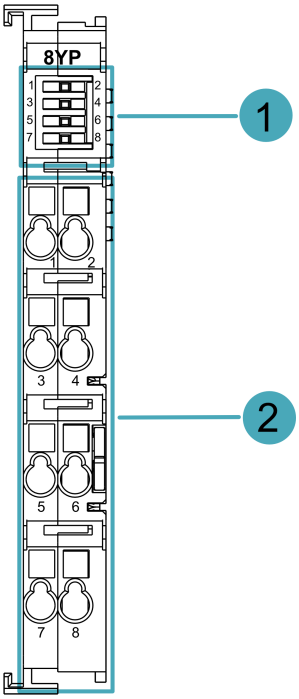


NO.	Function Definition
1	4 x Indicators, green, 1~4 indicate the indicator of 1~4 channels respectively, each channel indicator is independent of each other and contains two states of on and off. • On: Corresponding channel relay is normally closed • Off: Corresponding channel relay is normally open
2	8 x output ports, channels 1, 3, 5 and 7 correspond to the signals CONTACT 1A~CONTACT 4A respectively; channels 2, 4, 6 and 8 correspond to the signals CONTACT 1B~CONTACT 4B respectively.

Where the output ports are defined in the following table:

Pin ID	Pin Name	Pin ID	Pin Name
1	CONTACT 1A	2	CONTACT 1B
3	CONTACT 2A	4	CONTACT 2B
5	CONTACT 3A	6	CONTACT 3B
7	CONTACT 4A	8	CONTACT 4B

ED-EIO8YP: 8-channel digital output module (PNP type)

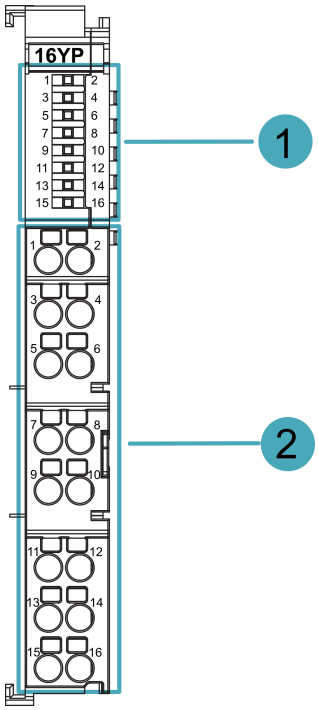


NO.	Function Definition
1	8 x Indicators, 1~8 indicate the indicator of 1~8 channels respectively, each channel indicato is independent of each other, including two states of on and off. • On: Corresponding channel outputs a high level signal • Off: No signal output from corresponding channel
2	8 x output ports, channels 1~8 correspond to signals Y1~Y8 respectively.

Where the output ports are defined in the following table:

Pin ID	Pin Name	Pin ID	Pin Name
1	Y1	2	Y2
3	Y3	4	Y4
5	Y5	6	Y6
7	Y7	8	Y8

ED-EIO16YP: 16-channel digital output module (PNP type)

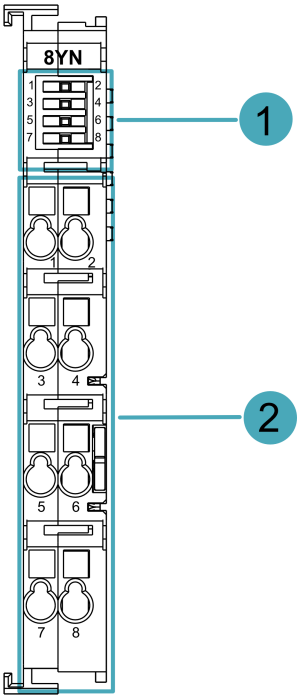


NO.	Function Definition
1	16 x Indicators, 1~16 indicate the indicators of 1~16 channels respectively, each channel indicator is independent of each other, including two states of on and off. • On: Corresponding channel outputs a high level signal • Off: No signal output from corresponding channel
2	16 x output ports, 1~16 channels correspond to signals Y1~Y16 respectively.

Where the output ports are defined in the following table:

Pin ID	Pin Name	Pin ID	Pin Name
1	Y1	2	Y2
3	Y3	4	Y4
5	Y5	6	Y6
7	Y7	8	Y8
9	Y9	10	Y10
11	Y11	12	Y12
13	Y13	14	Y14
15	Y15	16	Y16

ED-EIO8YN: 8-channel digital output module (NPN type)

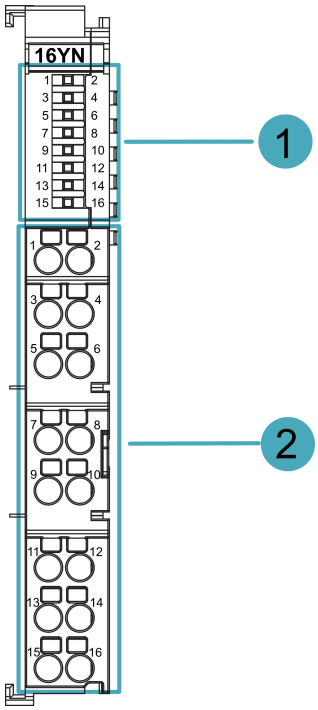


NO.	Function Definition
1	8 x Indicators, 1~8 indicate the indicator of 1~8 channels respectively, each channel indicator is independent of each other, including two states of on and off. • On: Corresponding channel output low level signal • Off: No signal output from corresponding channel
2	8 x output ports, channels 1~8 correspond to signals Y1~Y8 respectively.

Where the output ports are defined in the following table:

Pin ID	Pin Name	Pin ID	Pin Name
1	Y1	2	Y2
3	Y3	4	Y4
5	Y5	6	Y6
7	Y7	8	Y8

ED-EIO16YP: 16-channel digital output module (NPN type)



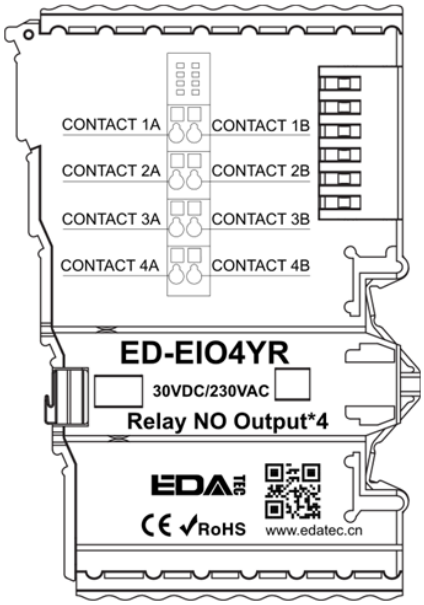
NO.	Function Definition
1	16 x Indicator, green, 1~16 indicates the indicator of 1~16 channels respectively, each channel indicator is independent of each other and contains two states of on and off. • On：Corresponding channel output low level signal • Off：No signal output from corresponding channel
2	16 x output ports, 1~16 channels correspond to signals Y1~Y16 respectively.

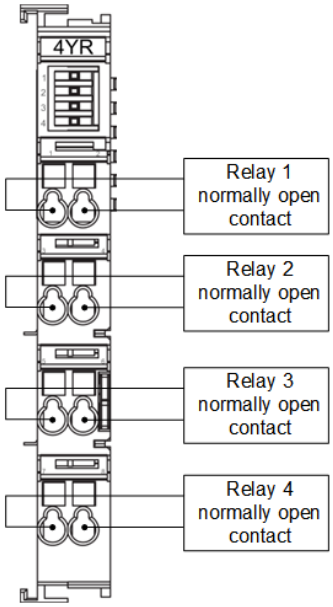
Where the output ports are defined in the following table:

Pin ID	Pin Name	Pin ID	Pin Name
1	Y1	2	Y2
3	Y3	4	Y4
5	Y5	6	Y6
7	Y7	8	Y8
9	Y9	10	Y10
11	Y11	12	Y12
13	Y13	14	Y14
15	Y15	16	Y16

1.3.4 Connection Cables

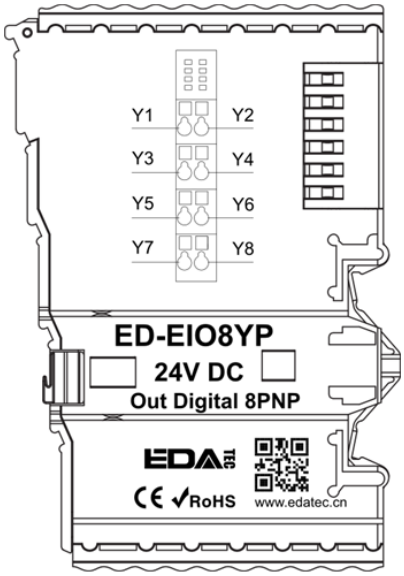
ED-EIO4YR Relay Output Module Wiring Diagram:

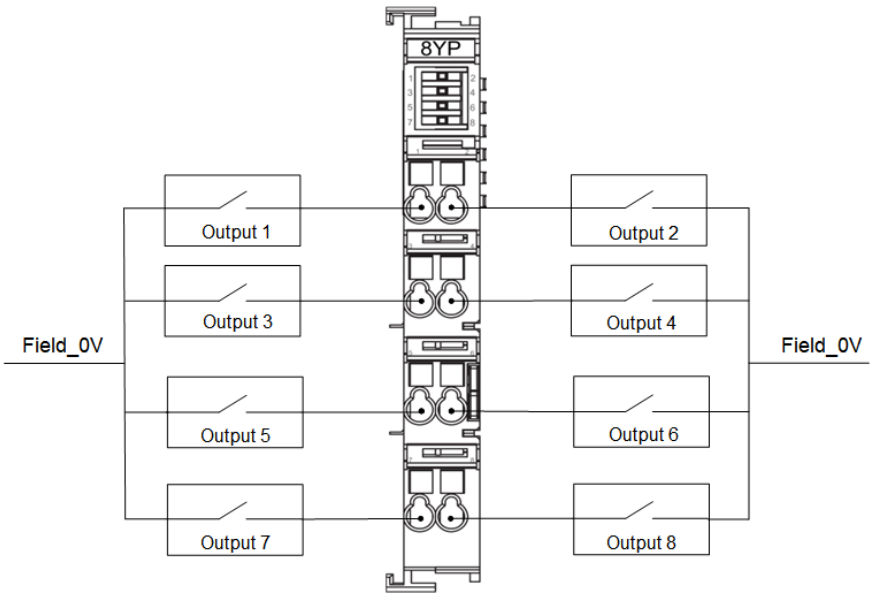




ED-EIO8YP and ED-EIO16YP digital output modules (PNP type) wiring diagram:

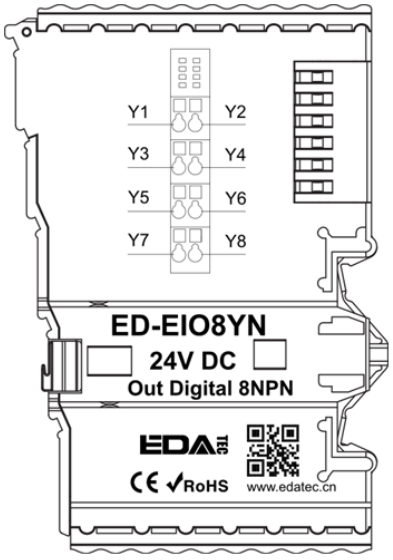
The wiring schematic is shown using the 8-terminal module as an example only:

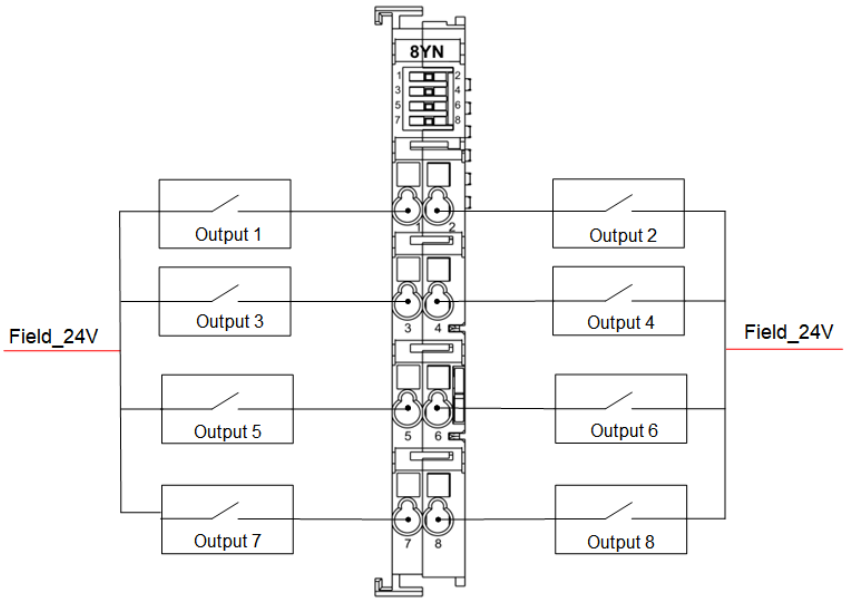




ED-EIO8YN and ED-EIO16YN digital output modules (NPN type) wiring diagram:

The wiring schematic is shown using the 8-terminal module as an example only:





1.4 EtherCAT analog input modules

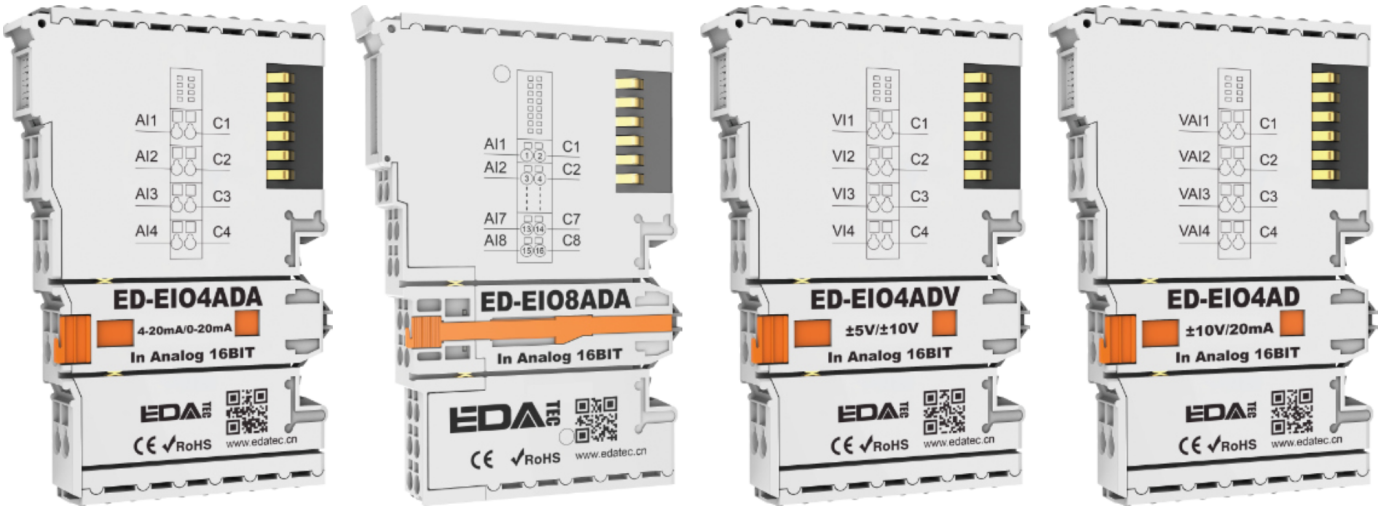
The EtherCAT analog input modules are available as current inputs, voltage inputs and current/voltage hybrids, with the specific models listed in the table below.

Model	Description
ED-EIO4ADA	4-channel current input module, 4-20mA/0-20mA, configurable
ED-EIO8ADA	8-channel current input module, 4-20mA/0-20mA, configurable
ED-EIO4ADV	4-channel voltage input module, -5~5V/0~10V/-10~10V, configurable
ED-EIO4AD	4-channel mixed voltage/current input module, -5~5V/0~10V/-10~10V/4-20mA/0-20mA, configurable

This section provides a product overview, packing list, appearance, and cable connections for analog input modules.

1.4.1 Overview

The EtherCAT analog input modules with 3 types of current input, voltage input and current/voltage mixing that support 4 and 8 signal inputs, respectively, to receive external analog signals and transmit them to the EtherCAT network.
The EtherCAT analogue input modules have a plug-in appearance and are easy to install on the right side of the EtherCAT coupler or master PLC device. Up to 32 modules can be cascaded without additional power supply. Users can select the appropriate type and number of input channels according to actual requirements.



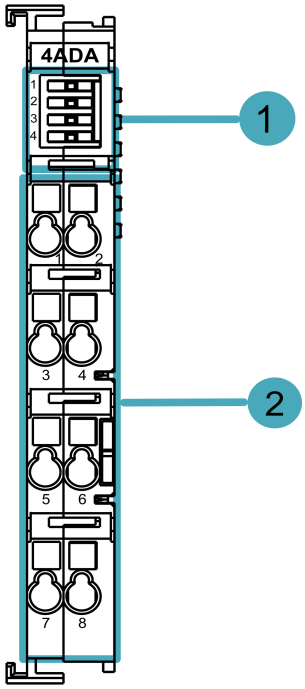
1.4.2 Packing List

1 x EtherCAT analog input module

1.4.3 Appearance

Introducing the functions and definitions of interfaces on each panel.

ED-EIO4ADA: 4-Channel Current Input Module



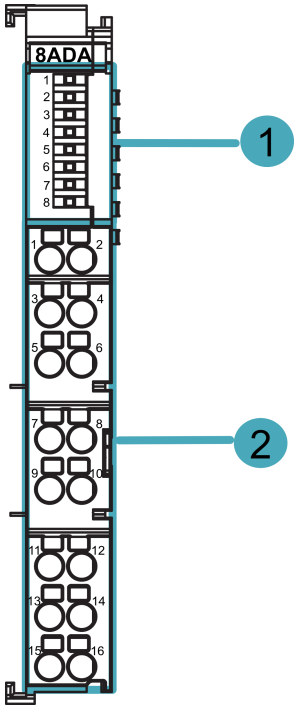
NO.	Function Definition
1	4 x Indicators, 1~4 indicate the indicator of AI1/C1~AI4/C4 channels respectively, each channel indicator is independent of each other and contains three states of on, blink and off. • On: Module is powered up • Blink: Corresponding channel detects input as 0~20mA or 4~20mA • Off: Module is not powered up

NO.	Function Definition
2	8 x input ports, channels 1, 3, 5 and 7 correspond to signals AI1~AI4 respectively. channels 2, 4, 6 and 8 correspond to signals C1~C4 respectively.

Where the input ports are defined in the following table:

Pin ID	Pin Name	Pin ID	Pin Name
1	AI1	2	C1
3	AI2	4	C2
5	AI3	6	C3
7	AI4	8	C4

ED-EIO8ADA: 8-Channel Current Input Module

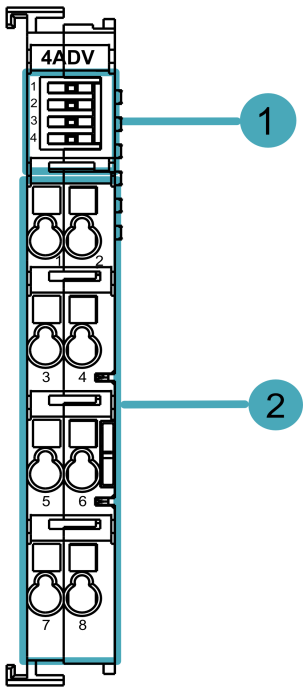


NO.	Function Definition
1	8 x Indicators, 1~8 indicate the indicator of AI1/C1~AI8/C8 channels respectively, and the indicator lamps of each channel are independent of each other, including three states of on, blink and off. • On: Module is powered up • Blink: Corresponding channel detects input as 0~20mA or 4~20mA • Off: Module is not powered up
2	16 x input ports, channels 1, 3, 5, 7, 9, 11, 13 and 15 correspond to signals AI1~AI8 respectively. channels 2, 4, 6, 8, 10, 12, 14 and 16 correspond to signals C1~C8 respectively.

Where the input ports are defined in the following table:

Pin ID	Pin Name	Pin ID	Pin Name
1	AI1	2	C1
3	AI2	4	C2
5	AI3	6	C3
7	AI4	8	C4
9	AI5	10	C5
11	AI6	12	C6
13	AI7	14	C7
15	AI8	16	C8

ED-EIO4ADV: 4-Channel Voltage Input Module

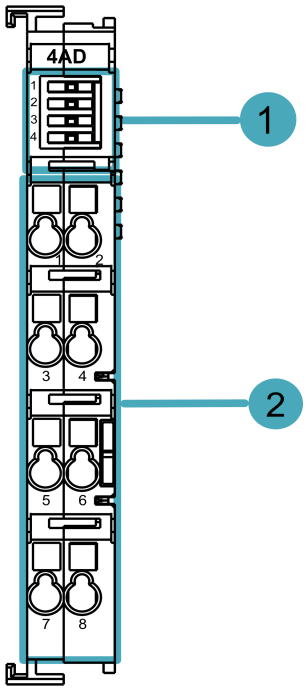


NO.	Function Definition
1	4 x Indicators, 1~4 indicate the indicator of VI1/C1~VI4/C4 channels respectively, each channel indicator is independent of each other and contains three states of on, blink and off. • On: Corresponding channel detects input out of valid range • Blink: Corresponding channel detects input as -5~5V or 0~10V or -10~10V • Off: No signal input
2	8 x input ports, channels 1, 3, 5 and 7 correspond to signals VI1~VI4 respectively. channels 2, 4, 6 and 8 correspond to signals C1~C4 respectively.

Where the input ports are defined in the following table:

Pin ID	Pin Name	Pin ID	Pin Name
1	VI1	2	C1
3	VI2	4	C2
5	VI3	6	C3
7	VI4	8	C4

ED-EIO4AD: 4-Channel Voltage/Current Mixed Input Module



NO.	Function Definition
1	4 x Indicators, green, 1~4 indicate the indicator of VAI1/C1~VAI4/C4 channels respectively, each channel indicator is independent of each other and contains three states of on, blink and off. • When used as a voltage input channel: ◦ On: Corresponding channel detects input out of valid range ◦ Blink: Corresponding channel detects input as -5~5V or 0~10V or -10~10V ◦ Off: No signal input • When used as a current input channel: ◦ On: Module is powered up ◦ Blink: Corresponding channel detects input as 0~20mA or 4~20mA ◦ Off: Module not powered up
2	8 x input ports, channels 1, 3, 5 and 7 correspond to signals VAI1~VAI4 respectively. channels 2, 4, 6 and 8 correspond to signals C1~C4 respectively.

Where the input ports are defined in the following table:

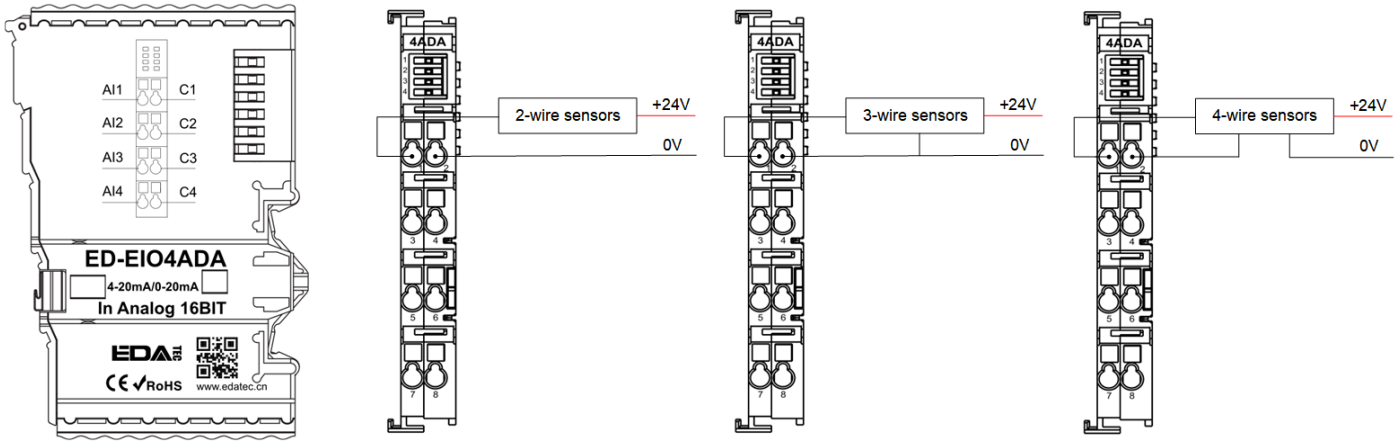
Pin ID	Pin Name	Pin ID	Pin Name
1	VAI1	2	C1

Pin ID	Pin Name	Pin ID	Pin Name
3	VAI2	4	C2
5	VAI3	6	C3
7	VAI4	8	C4

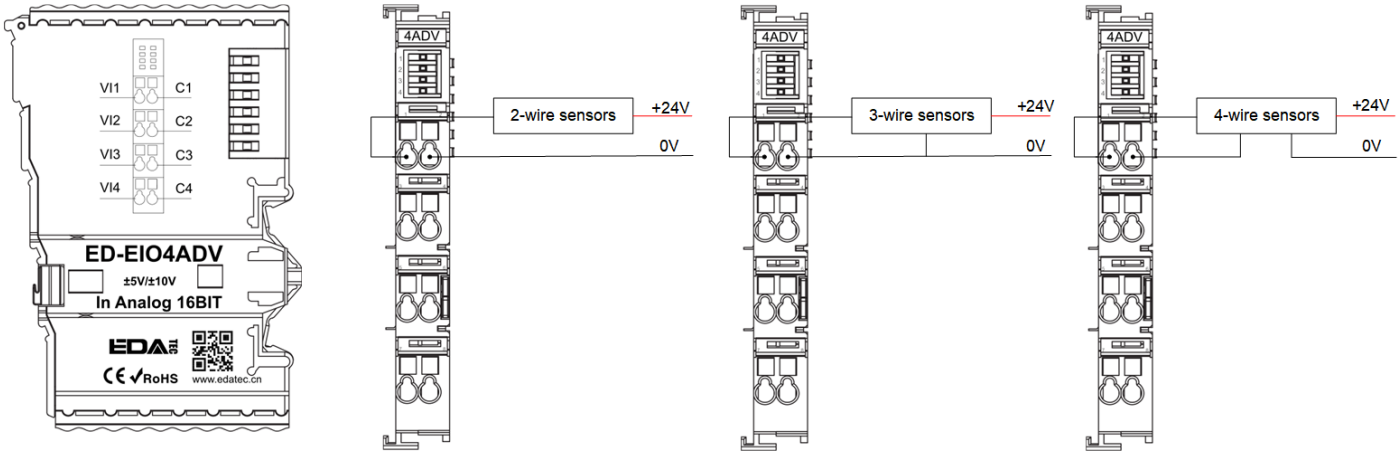
1.4.4 Connection Cables

Analogue current input modules ED-EIO4ADA and ED-EIO8ADA wiring diagram:

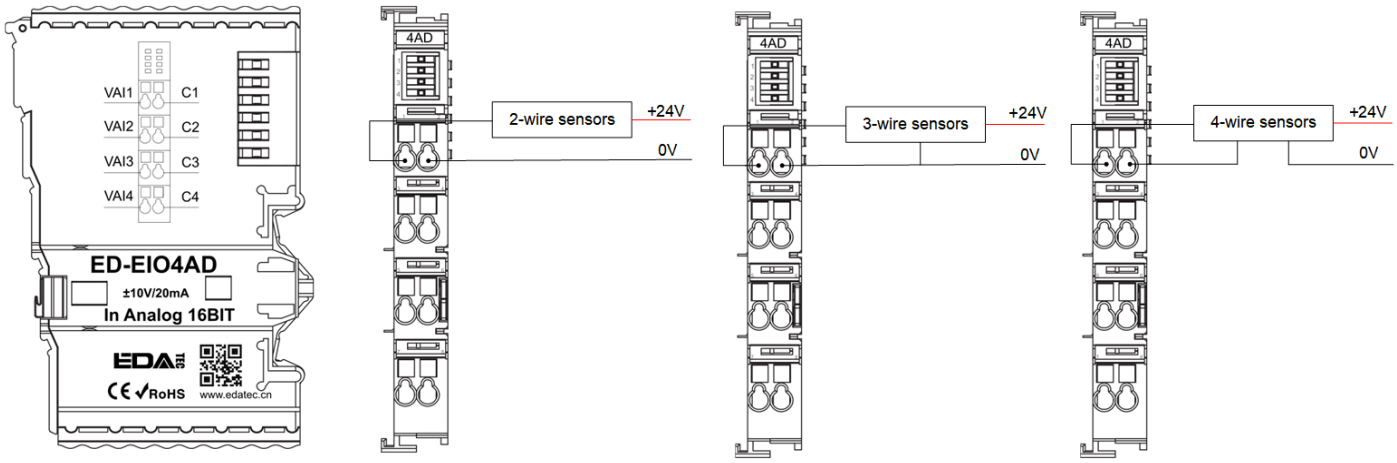
The wiring is illustrated using the 4-channel current input module as an example only:



Analogue voltage input module ED-EIO4ADV wiring diagram:



Analogue voltage/current hybrid input module ED-EIO4AD wiring diagram:



TIP

ED-EIO4AD module for the voltage input, wiring needs to distinguish between the odd channel access voltage positive, the even number of channels access voltage negative, for the current input access without distinguishing between positive and negative.

1.5 EtherCAT analog output modules

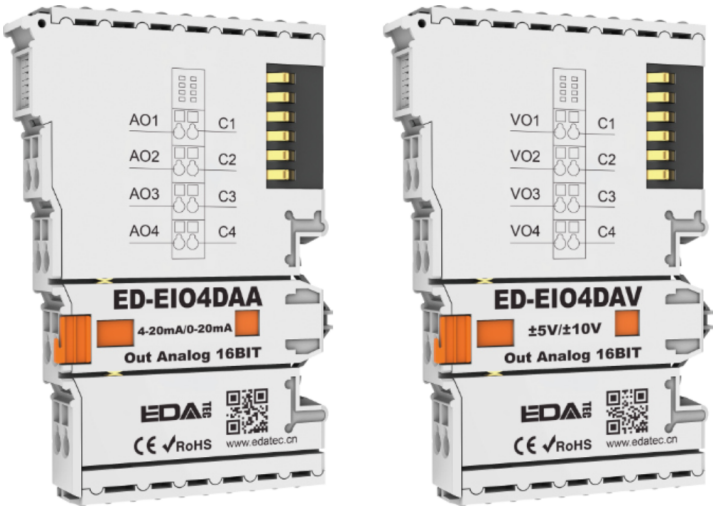
The EtherCAT analog output modules include two types of current output and voltage output, which are listed in the table below.

Model	Description
ED-EIO4DAA	4-channel current output module, 4-20mA/0-20mA, configurable
ED-EIO4DAV	4-channel voltage output module, -5~5V/0~10V/-10~10V, configurable

This section provides a product overview, packing list, appearance, and cable connections for analog input modules.

1.5.1Overview

The EtherCAT analog output modules include two types of current output and voltage output, and support 4-channel outputs for converting digital control signals into continuously changing analog signals. The EtherCAT analogue output modules have a plug-in construction and can be easily mounted on the right side of the EtherCAT coupler or master PLC device. Up to 32 modules can be cascaded without additional power supply. Users can select the appropriate type and number of output channels according to actual requirements.



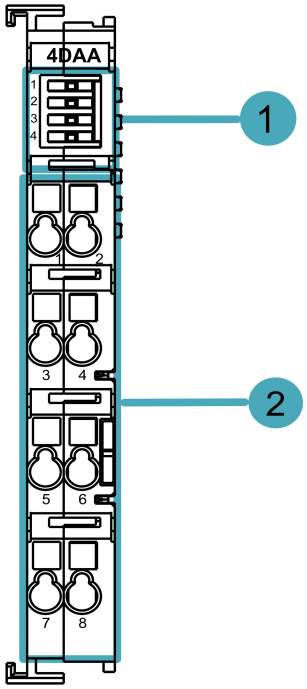
1.5.2 Packing List

1 x EtherCAT analog output module

1.5.3 Appearance

Introducing the functions and definitions of interfaces on each panel.

ED-EIO4ADAA: 4-channel current output module



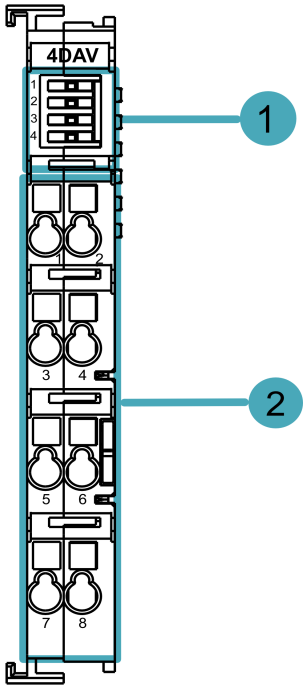
NO.	Function Definition
1	4 x Indicators, 1~4 indicate the indicator of AO1/C1~AO4/C4 channels respectively, each channel indicator is independent of each other and including two states of blink and off. • blinking: Corresponding channel output current signal • Off: No signal output from corresponding channel
2	

NO.	Function Definition
	8 x output ports, channels 1, 3, 5 and 7 correspond to signals AO1~AO4 respectively. channels 2, 4, 6 and 8 correspond to signals C1~C4 respectively.

Where the output ports are defined in the following table:

Pin ID	Pin Name	Pin ID	Pin Name
1	AO1	2	C1
3	AO2	4	C2
5	AO3	6	C3
7	AO4	8	C4

ED-EIO4ADAA: 4-channel voltage output module



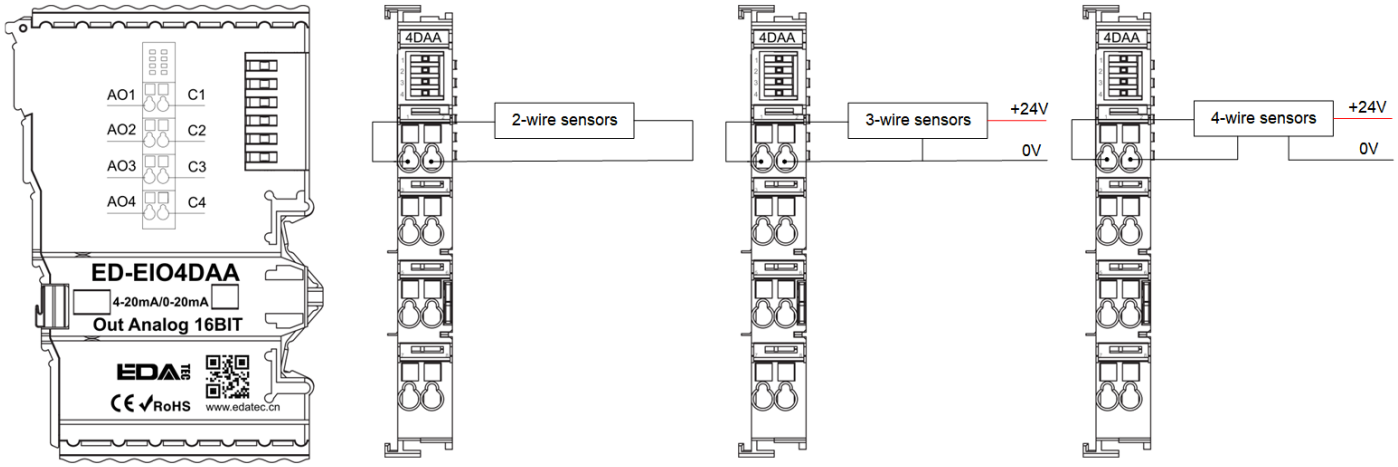
NO.	Function Definition
1	4 x Indicators, green, 1~4 indicate the indicators of VO1/C1~VO4/C4 channels respectively, each channel indicator is independent of each other and including two states of blink and off. • Blink: Corresponding channel output voltage signal • Off: No signal output for corresponding channel
2	8 x output ports, channels 1, 3, 5 and 7 correspond to signals VO1~AVO4 respectively. channels 2, 4, 6 and 8 correspond to signals C1~C4 respectively.

Where the output ports are defined in the following table:

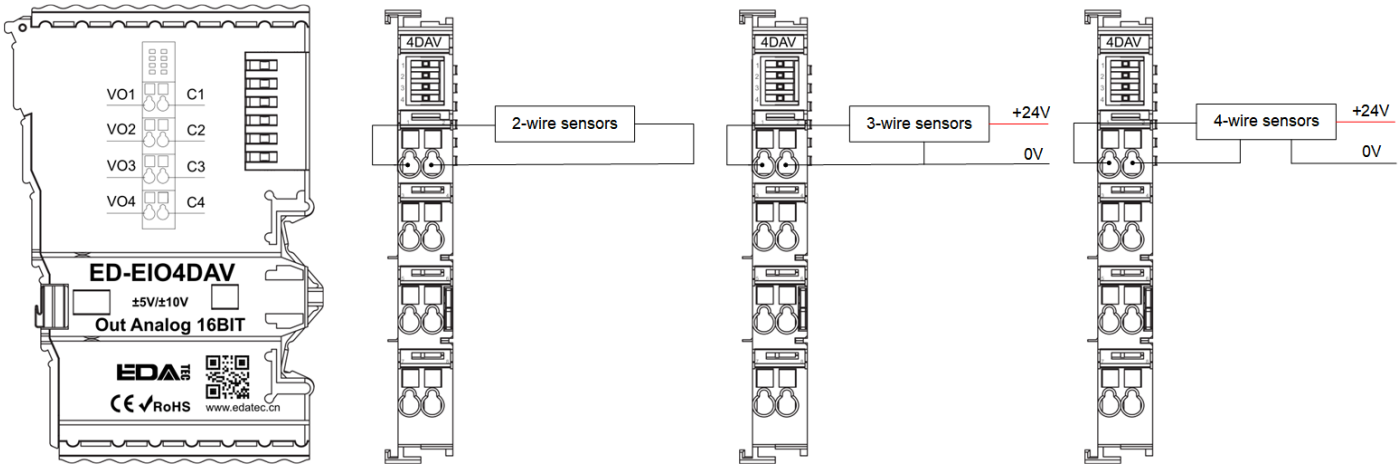
Pin ID	Pin Name	Pin ID	Pin Name
1	VO1	2	C1
3	VO2	4	C2
5	VO3	6	C3
7	VO4	8	C4

1.5.4 Connection Cables

Analogue current output module ED-EIO4DAA wiring diagram:



Analogue voltage output module ED-EIO4DAV wiring diagram:



1.6 EtherCAT Temperature Input Modules

The EtherCAT Temperature Input Modules are available in two types, RTD and thermocouple, as shown in the table below.

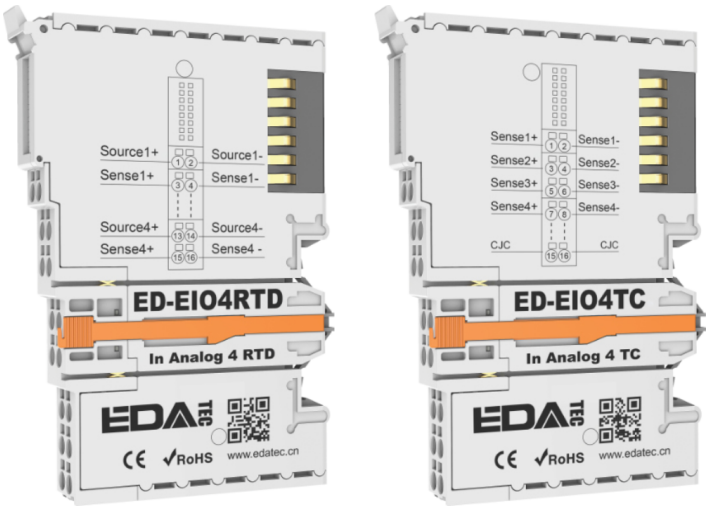
Model	Description
ED-EIO4RTD	4-Channel RTD Module

Model	Description
ED-EIO4TC	4-Channel Thermocouple Module

This section provides a product overview, packing list, appearance, and cable connections for temperature input modules.

1.6.1 Overview

The EtherCAT Temperature Input Module include two types of RTDs and thermocouples and supports 4-channel signal inputs with RTDs of types PT100, PT200, PT500, PT1000 and Ni20 and thermocouples of types K, J, T, E, N, S, R, B, and C. It is used to measure temperatures and transmit temperature data to the EtherCAT network. The EtherCAT temperature input modules have a plug-in appearance and are easy to install on the right side of an EtherCAT coupler or master PLC device. Up to 32 modules are supported in cascade without additional power supply, and the user can select the appropriate type according to actual requirements.



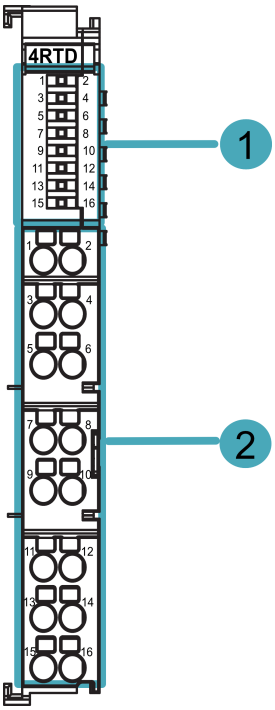
1.6.2 Packing List

1 x EtherCAT temperature input module

1.6.3 Appearance

Introducing the functions and definitions of interfaces on each panel.

ED-EIO4RTD: 4-channel RTD module

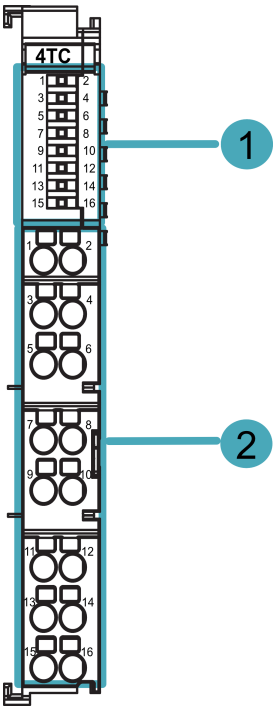


NO.	Function Definition
1	4 x Indicators, 1, 3, 5 and 7 indicate the indicator for channels 1~4 respectively, the indicator include two states of blink and off. • Blink: The corresponding channel detects a temperature signal input. • Off: No signal input for corresponding channel
2	16 x Input ports, the detailed port Pin Name is shown in the table below.

Where the input ports of ED-EIO4RTD are defined in the following table:

Pin ID	Pin Name	Pin ID	Pin Name
1	Source1+	2	Source1-
3	Sense1+	4	Sense1-
5	Source2+	6	Source2-
7	Sense2+	8	Sense2-
9	Source3+	10	Source3-
11	Sense3+	12	Sense3-
13	Source4+	14	Source4-
15	Sense4+	16	Sense4-

ED-EIO4TC: 4-channel thermocouple module



NO.	Function Definition
1	4 x Indicators, Green, 1, 3, 5, 7 indicate the indicator for channels 1~4 respectively, the indicator contain two states of blink and off. • Blink: The corresponding channel detects a temperature signal input. • Off: No signal input for corresponding channel
2	16 x Input ports, the detailed port Pin Name is shown in the table below.

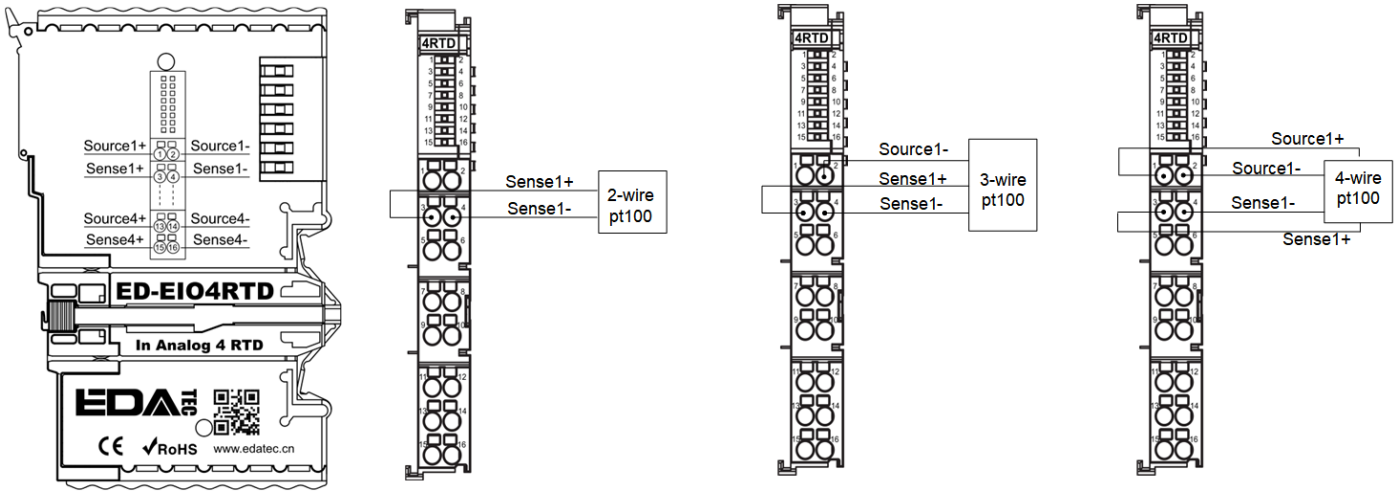
Where the input ports of ED-EIO4TC are defined in the following table:

Pin ID	Pin Name	Pin ID	Pin Name
1	Sense1+	2	Sense1-
3	Sense2+	4	Sense2-
5	Sense3+	6	Sense3-
7	Sense4+	8	Sense4-
9	NC	10	NC
11	NC	12	NC
13	NC	14	NC
15	CJC	16	CJC

1.6.4 Connection Cables

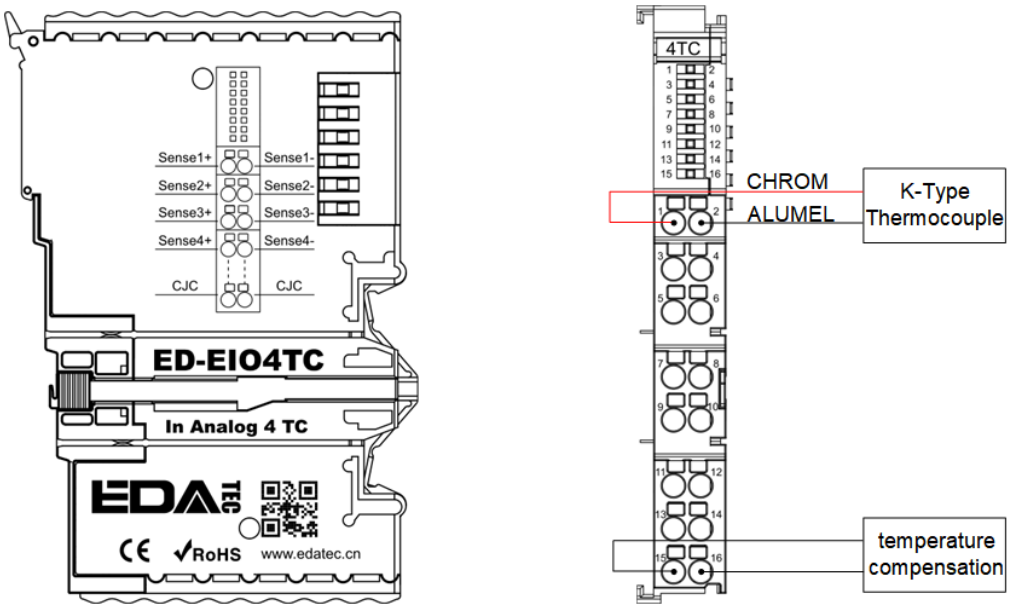
ED-EIO4RTD: 4-channel RTD module wiring diagram:

Take pt100 RTD wiring as an example:



ED-EIO4TC: 4-Channel Thermocouple Module Wiring Diagram:

Take type K thermocouple wiring as an example:



1.7 EtherCAT High Speed Counter Module

The EtherCAT High-Speed Counter Module is a 2-channel differential high-speed counter module with the following model numbers.

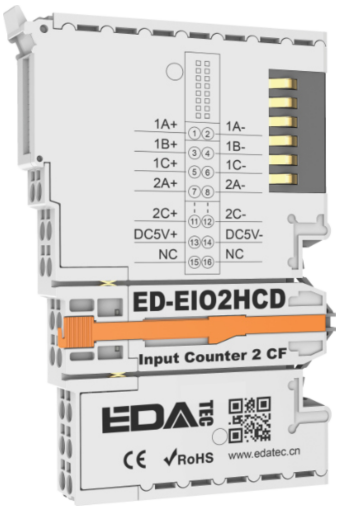
Model	Description
ED-EIO2HCD	2-channel high-speed counter module

This section provides a product overview, packing list, appearance, and cable connections for high-speed counter module.

1.7.1 Overview

The ED-EIO2HCD is a 2-channel differential high-speed counter module for counting devices (e.g. handwheels or quadrature encoders, etc.) in the industrial field.

The EtherCAT high-speed counter module has a plug-in structure, which makes it easy to be mounted on the right-hand side of an EtherCAT coupler or master PLC device. Up to 32 modules are supported in cascade without additional power supply.



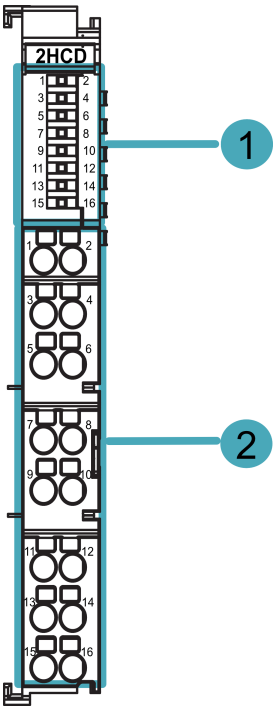
1.7.2 Packing List

1 x EtherCAT high-speed counter module

1.7.3 Appearance

Introducing the functions and definitions of interfaces on each panel.

ED-EIO2HCD: 2-channel differential high-speed counter module



NO.	Function Definition
1	

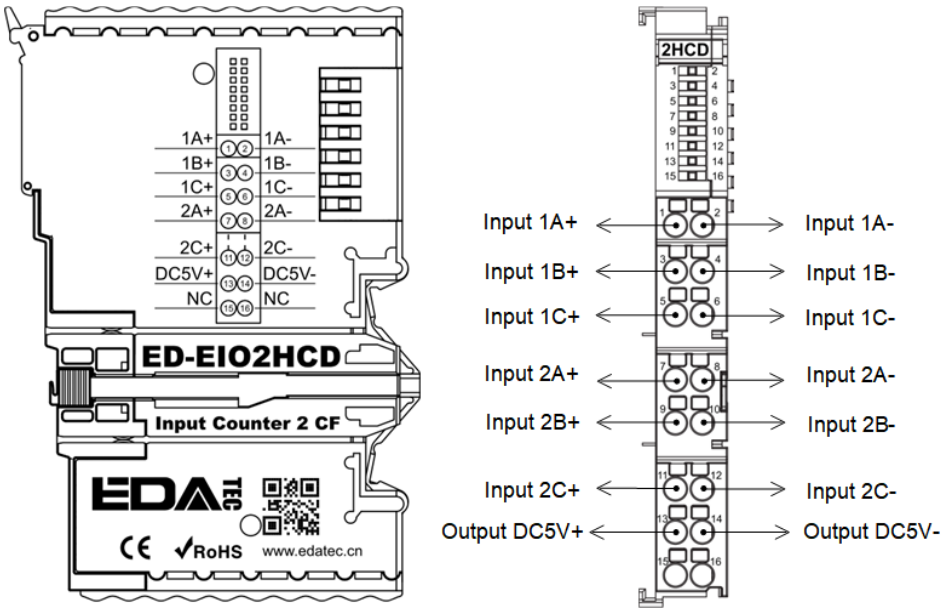
NO.	Function Definition
	6 x Indicators, green, 1, 3 and 5 correspond to channel 1, 2, 4 and 6 correspond to channel 2, the indicator contain three states of on, blink and off. • On(5 and 6): Module is powered up • Blink(1~4): Encoder signal input detected on the corresponding channel • Off (1~4): No signal input for the corresponding channel • Off (5 and 6): Encoder signal input detected on the corresponding channel
2	16 x Input Ports,, the detailed port Pin Name is shown in the table below.

where the input ports of ED-EIO2HCD are defined in the following table:

Pin ID	Pin Name	Pin ID	Pin Name
1	1A+	2	1A-
3	1B+	4	1B-
5	1C+	6	1C-
7	2A+	8	2A-
9	2B+	10	2B-
11	2C+	12	2C-
13	DC5V+	14	DC5V-
15	NC	16	NC

1.7.4 Connection Cables

ED-EIO2HCD: 2-channel differential high-speed counter module wiring diagram:



1.8 EtherCAT Power Expansion Modules

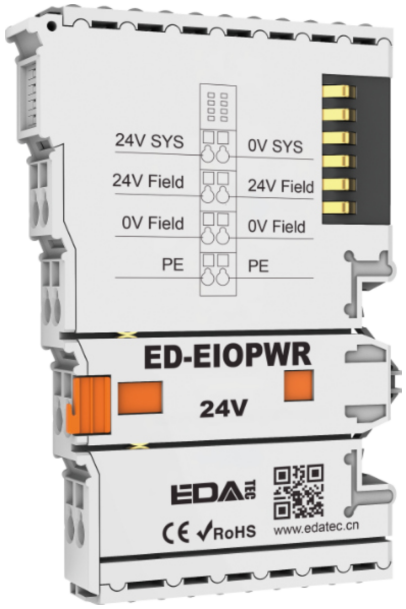
The specific models of the EtherCAT power extension modules are listed in the table below.

Model	Description
ED-EIOPWR	Power Expansion Module

This section provides a product overview, packing list, appearance, and cable connections for power extension module.

1.8.1 Overview

The power supply expansion module is mainly used to provide stable and reliable power supply for the devices in EtherCAT network, which can increase the power capacity of the system and meet the power supply requirements of more devices. The plug-in structure supports DIN-rail mounting, with over-current protection, over-voltage protection, short-circuit protection and other functions to ensure the safe operation of the system.



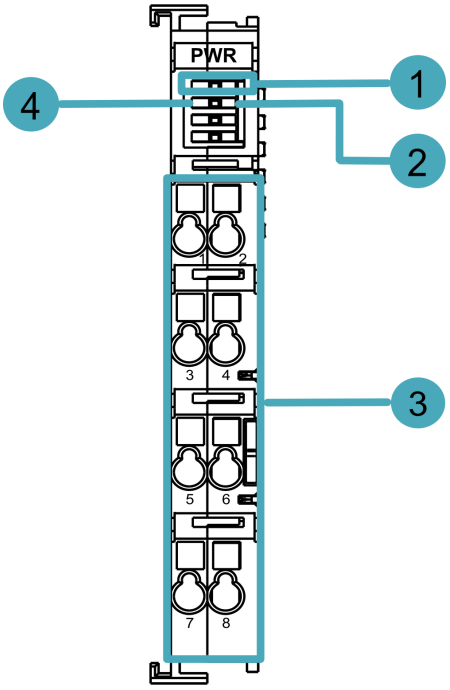
1.8.2 Packing List

1 x Power Expansion Module

1.8.3 Appearance

Introducing the functions and definitions of interfaces on each panel.

ED-EIOPWR: Power Expansion Module



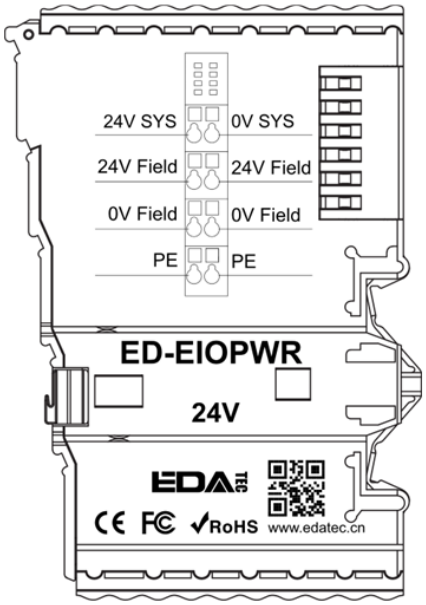
NO.	Function Definition
1	2 x Connection indicators, green, to see if the connection at the common end is working. • On: Module is connected • Off: Module not connected
2	1 x Input voltage indicator, green, to see if the input voltage is normal. • On: Input voltage within normal range • Off: Input voltage too high or too low
3	8 x power ports, the detailed port Pin Names are listed in the table below.
4	1 x Overcurrent indicator, red, to see if the coupler exceeds the maximum operating current. • On: Input current too high • Off: Input current within normal range

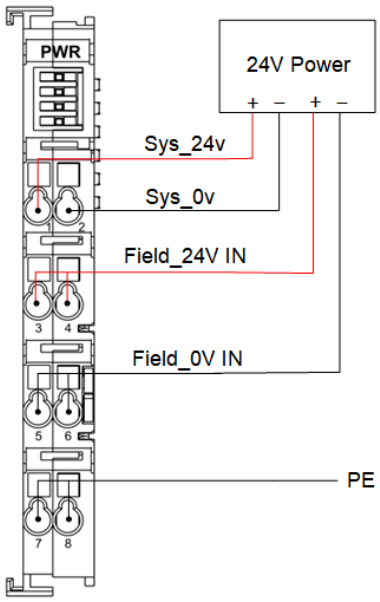
where the ports of ED-EIOPWR are defined in the following table:

Pin ID	Pin Name	Pin ID	Pin Name
1	24V SYS	2	0V SYS
3	24V Field	4	24V Field
5	0V Field	6	0V Field
7	PE	8	PE

1.8.4 Connection Cables

ED-EIOPWR: Power Expansion Module Wiring Diagram:





1.9 Bus End Cover

The specific model of Bus End cover is listed in the table below.

Model	Description
ED-EIOTERM	Bus End Cover

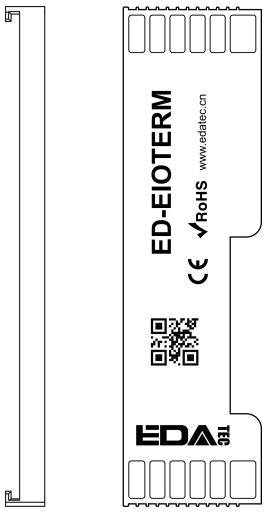
1.9.1 Overview

The Bus End Cover is mainly used to cover the E-bus contacts of the EtherCAT bus end I/O modules, to protect the E-bus contacts mechanically and electrically, and has a plug-in construction for screw-free mounting.

1.9.2 Packing List

1 x Bus End Cover

1.9.3 Appearance



2 Installing Device

This chapter introduces how to install the device.

2.1 EtherCAT Coupler Installation and Dismantling

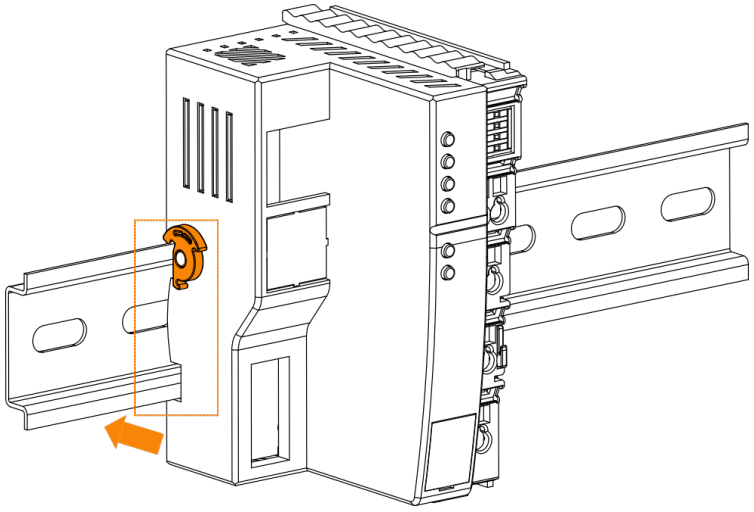
The EtherCAT coupler supports mounting on DIN rails.

2.1.1 Installing

> TIP
>
> The ED-EIOBRG-EC unit is shipped from the factory without the DIN rail included in the box, and the following is intended as an installation illustration only.
> Switch off the power to the unit before starting the installation.

Steps:

Slip the notch on the back of the EtherCAT coupler over the DIN rail, press it down and push in the DIN snap pin to secure the EtherCAT coupler to the DIN rail.

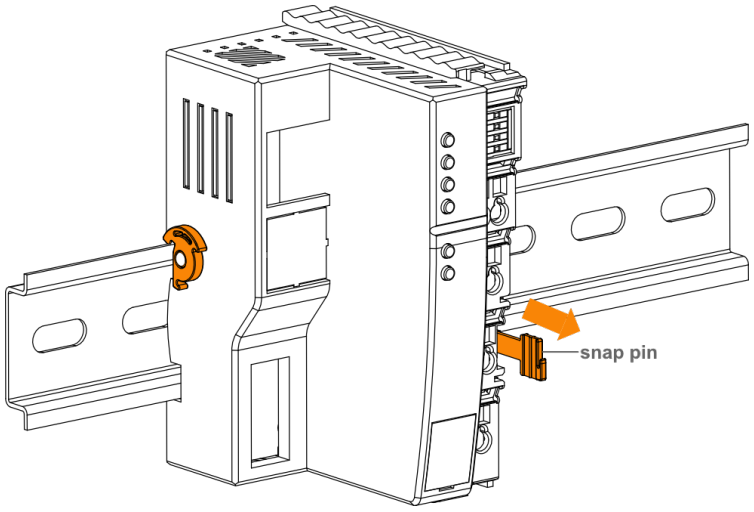


2.1.2 Dismantling

Switch off the power to the unit and disconnect the cables from the unit before you start dismantling it.

Steps:

Hold the coupler's snap pin by hand and then pull it out in the direction of the arrow to disengage the coupler from the DIN rail.



2.2 I/O module installation and Dismantling

The I/O modules support mounting on DIN rails.

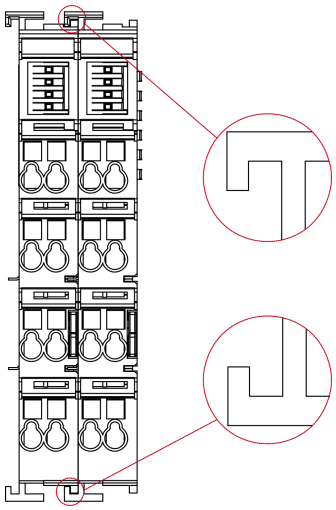
2.2.1 Installing

> TIP
>
> The I/O module devices are shipped with DIN rails not included in the box, and the following is intended as a mounting illustration only.
> Before starting the installation, please switch off the power supply of the device.
> If you encounter a situation where the module cannot be installed, please do not force the installation to avoid damaging the module.

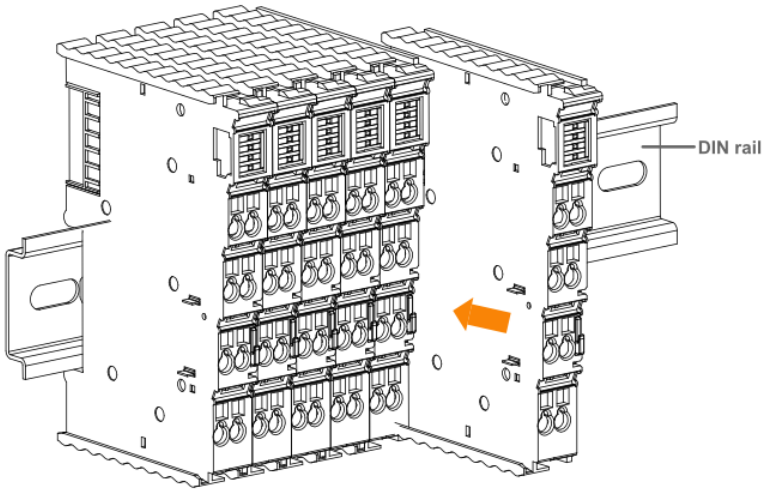
Steps:

The following is an example of the installation of an 8-terminal module only.

1. Align the notches in the I/O module.



2. Secure the I/O module to the DIN rail by pushing the I/O module in the direction of the arrow onto the DIN snap pin.



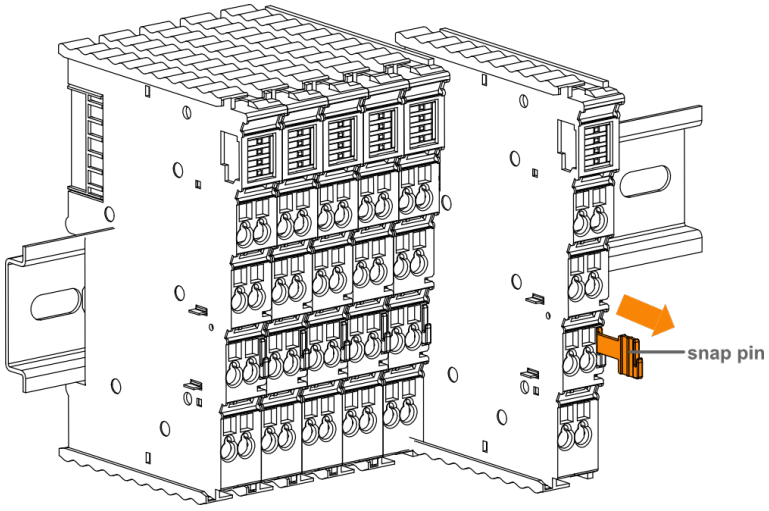
2.2.2 Dismantling

Before starting the removal, please switch off the power of the device and disconnect the cables from the module.
If you encounter a situation where the module cannot be removed, please do not force to carry out the removal to avoid damaging the module.

Steps:

The following is an example of the dismantling of an 8-terminal module only.

Hold the snap pin of the I/O module by hand and then pull it out in the direction of the arrow to disengage the module from the DIN rail.



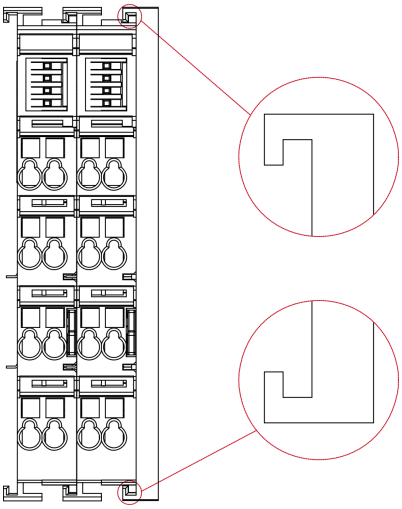
2.3 EtherCAT Terminal Cover Mount

A Bus End Cover is required on the right side of I/O module at the end of each EtherCAT bus station.

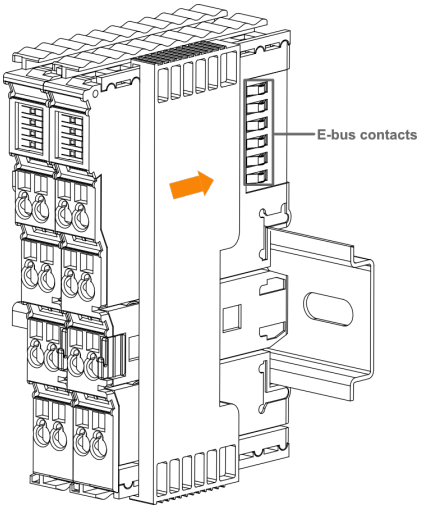
> TIP
>
> Before you start installing, please turn off the power to the system.

Steps:

1. Align the notches in the I/O module and the Bus End Cover.



2. Push the Bus End Cover onto the DIN-rail the the direction of the arrow, so that it covers the E-bus contacts of the I/O module and fits it over the DIN-rail.



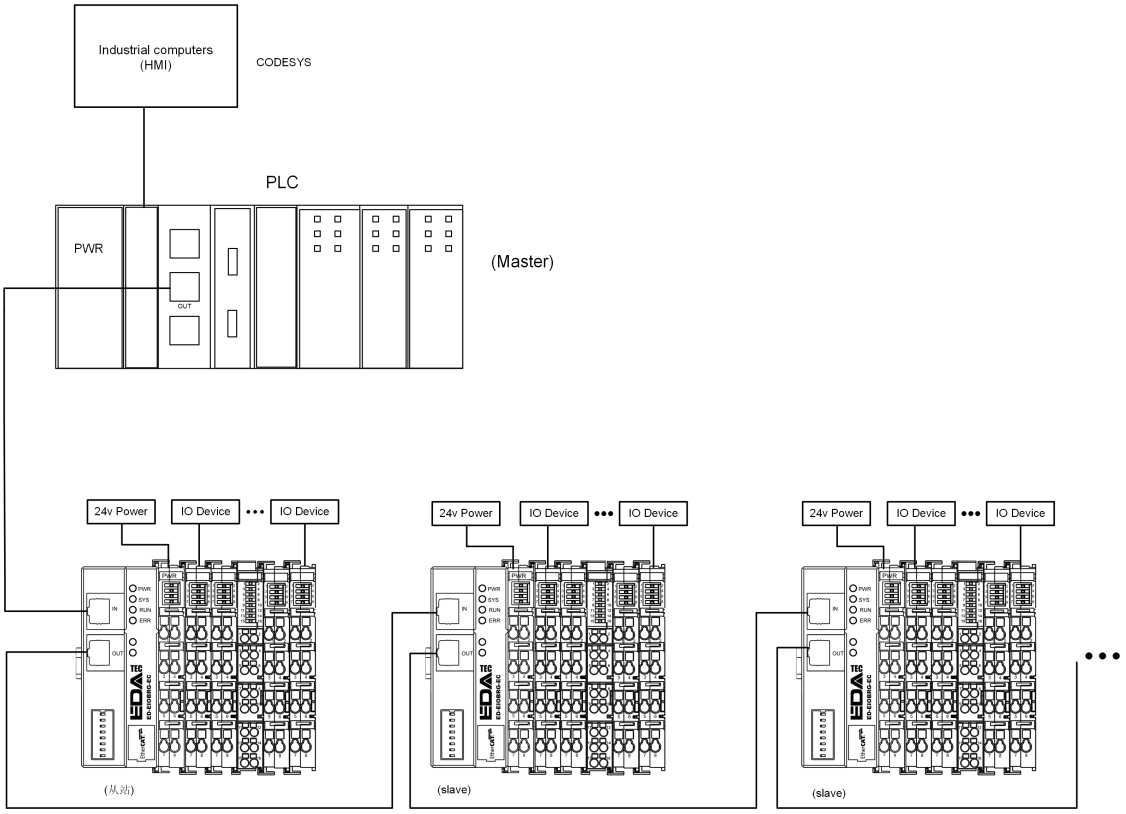
3 System Networking

Introduces how cables are connected.

Preparation:

- Accessories such as industrial PCs, power supplies, IO devices, etc. have been acquired for normal use.
- A functioning network has been acquired.
- A working HDMI cable and network cable have been obtained.

Schematic diagram of connecting cables:



4 Configuring System

4.1 Obtaining Device Files

The device files for EDATEC EtherCAT coupler and EtherCAT I/O modules are integrated. Both the EtherCAT coupler and EtherCAT I/O modules use the same device file, which can be downloaded at: ED-EIOBRG-EC Device File (https://1826505135.v.123pan.cn/1826505135/35175339) .

- In an actual network configuration where both the EtherCAT coupler and EtherCAT I/O modules are used, you only need to install the device file once when connecting the EtherCAT coupler.
- If the EtherCAT I/O modules are used independently in the network, the device file must be installed separately.

4.2 Configuration Example

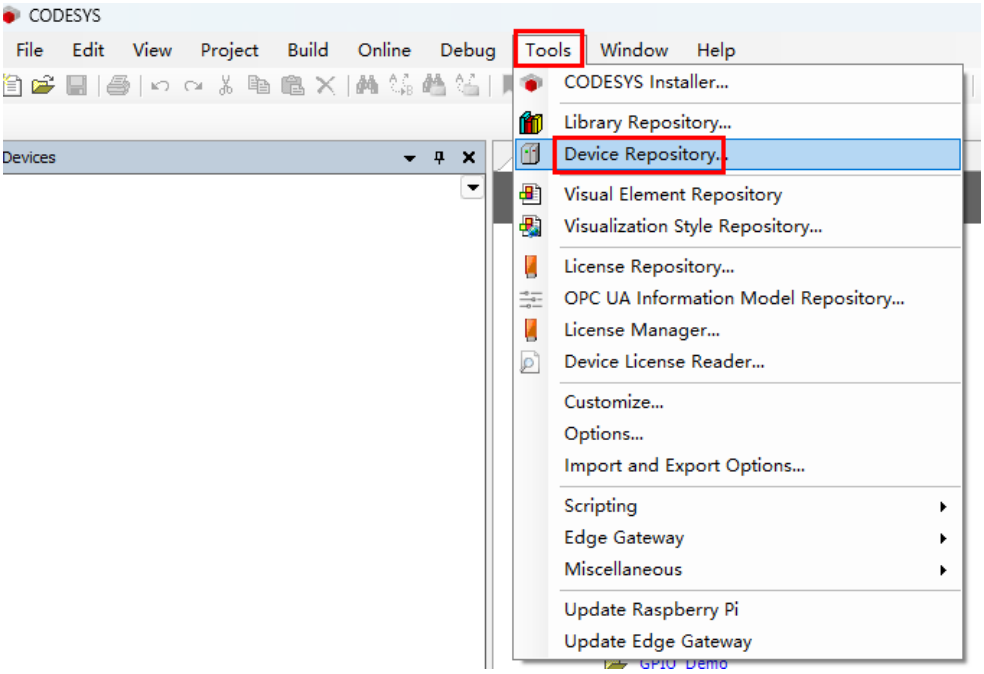
An example of building an EtherCAT coupler configuration environment with CODESYS Soft PLC as the master.

Preparation:

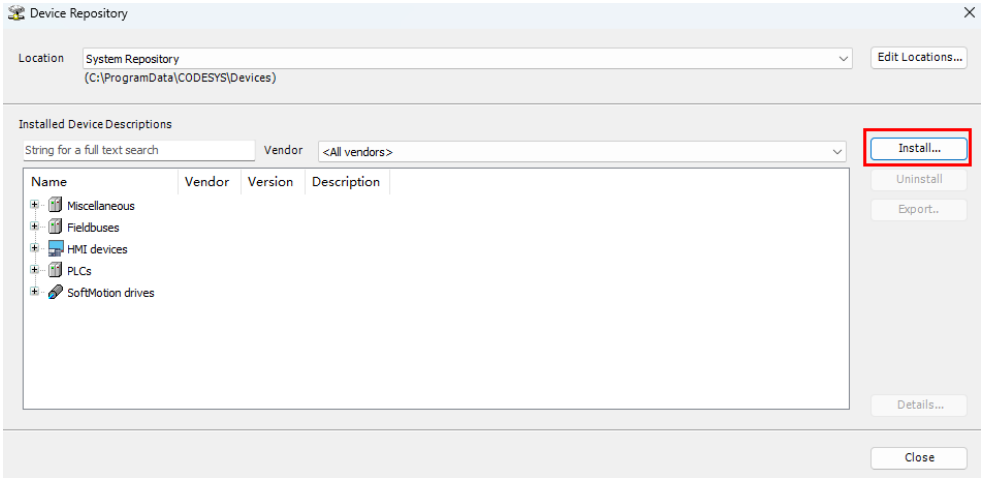
- A PC with CODESYS V3.5.19.0 or later installed.
- A number of network cables have been acquired.
- The available EtherCAT couplers (ED-EIOBRG-EC) have been acquired.
- The device description file (e.g. “ED-EIOBRG-EC-xxxxxx.xml”) for the EtherCAT coupler ED-EIOBRG-EC has been obtained.
- The connection of the EtherCAT analog module to the EtherCAT coupler has been completed.

Steps:

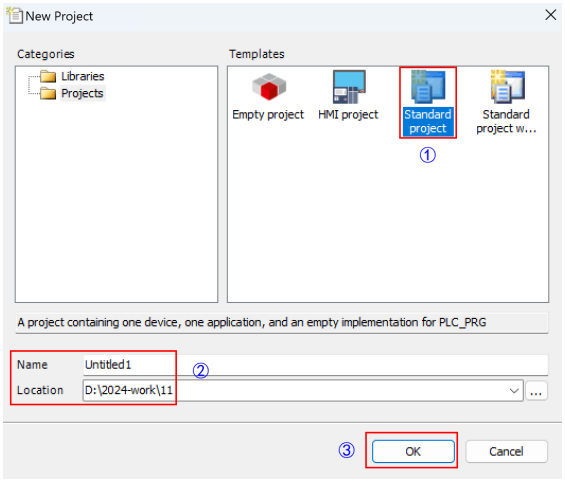
1. Double-click the CODESYS icon on the PC desktop to open the CODESYS software. Select “Tools” → “Device Repository” in the menu bar.



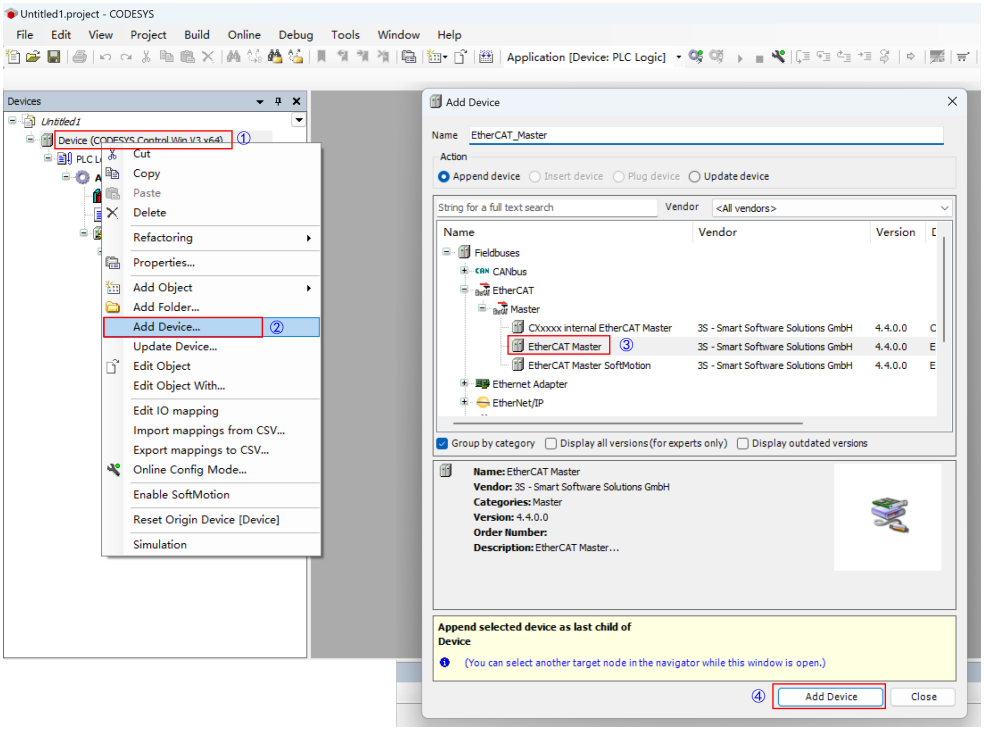
2. In the "Device Repository" pane, click "Install", select the device file and click Open to install it.



3. After successful installation, click "Close".
4. In the menu bar, select "File"-> "New Project", open the “New Project” pane, create a standard project.



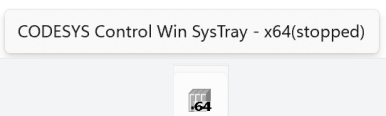
5. In the pop-up pane, select “CODESYS Control V3 × 64” as a device and set the programming language to “Structured Text(ST)”.
6. Right-click and select “Device (CODESYS Control V3 × 64)”, then select “Add Device” in the menu to add the master EtherCAT Master.

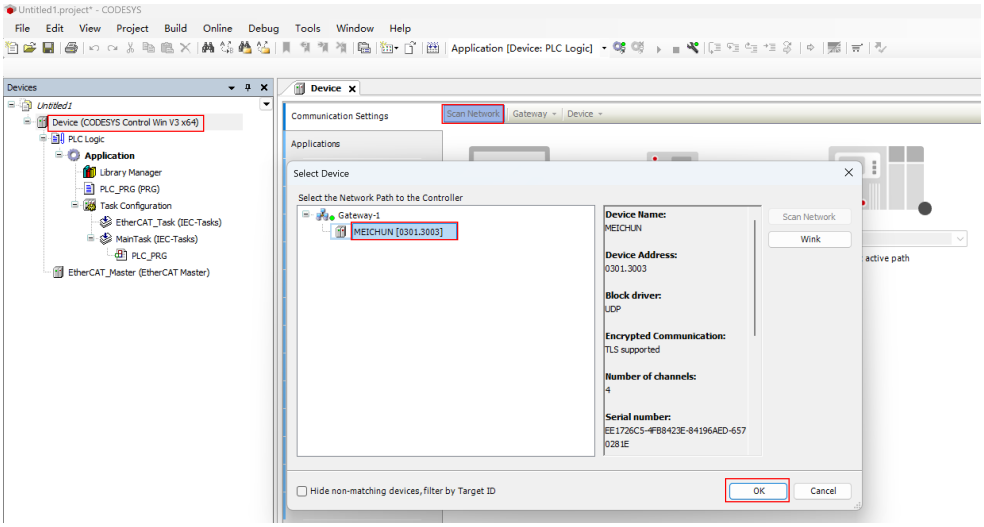


7. Open the soft PLC that comes with CODESYS, then left-click and double-click on Device and select “Scan Network” to connect to the soft PLC.

TIP

After installing the CODESYS software, the CODESYS soft PLC will be automatically installed on the PC (can be viewed in the bottom right corner of the PC's application icon) as shown below.

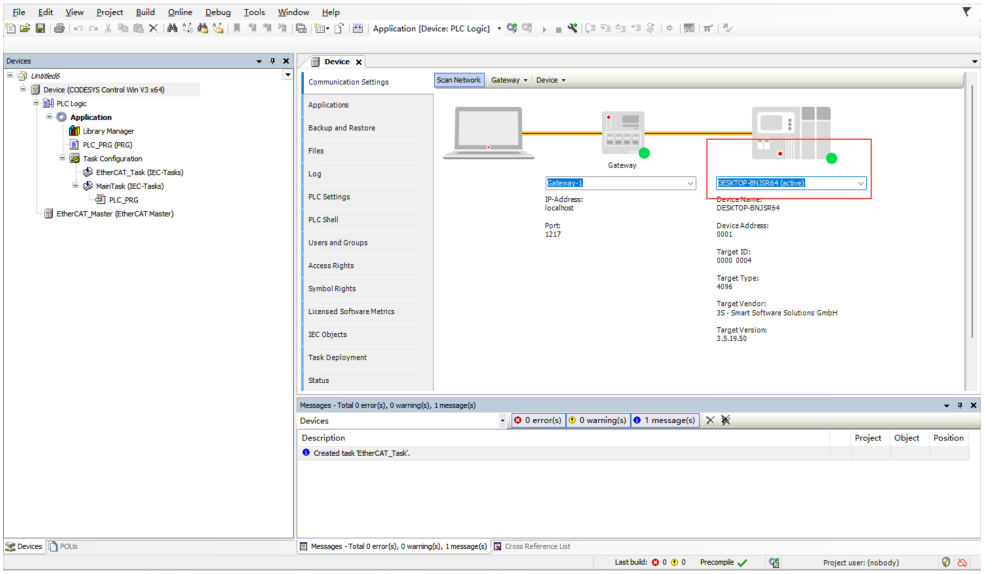




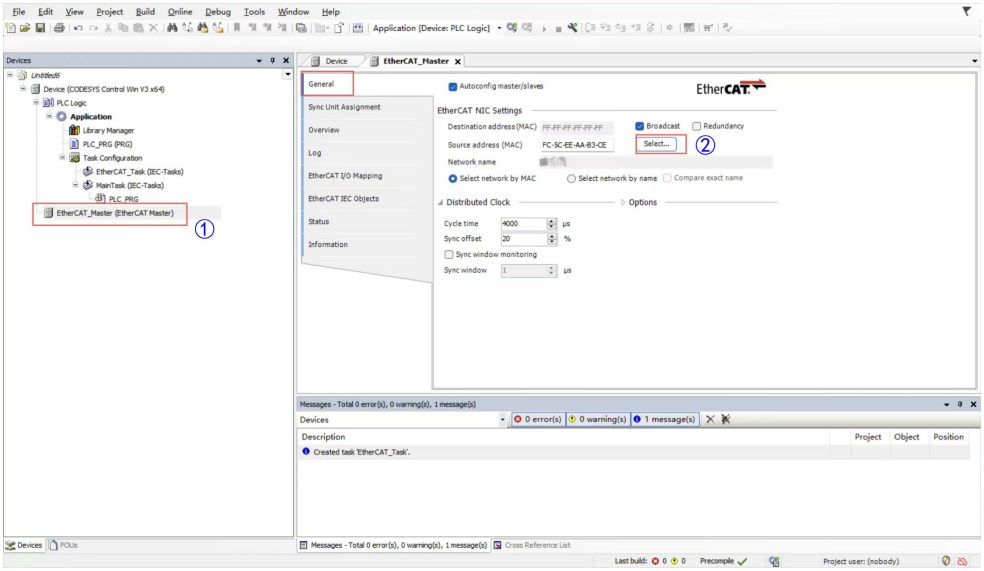
TIP

If the device user login pop-up appears, you will need to log in with your username and password or follow the prompts to register.

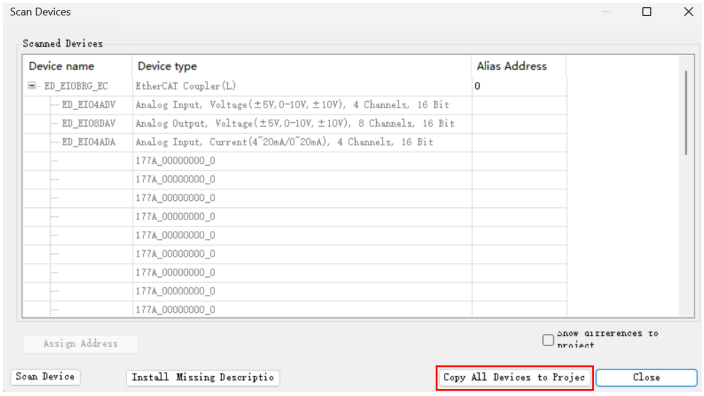
8. Connection to the soft PLC was successful.



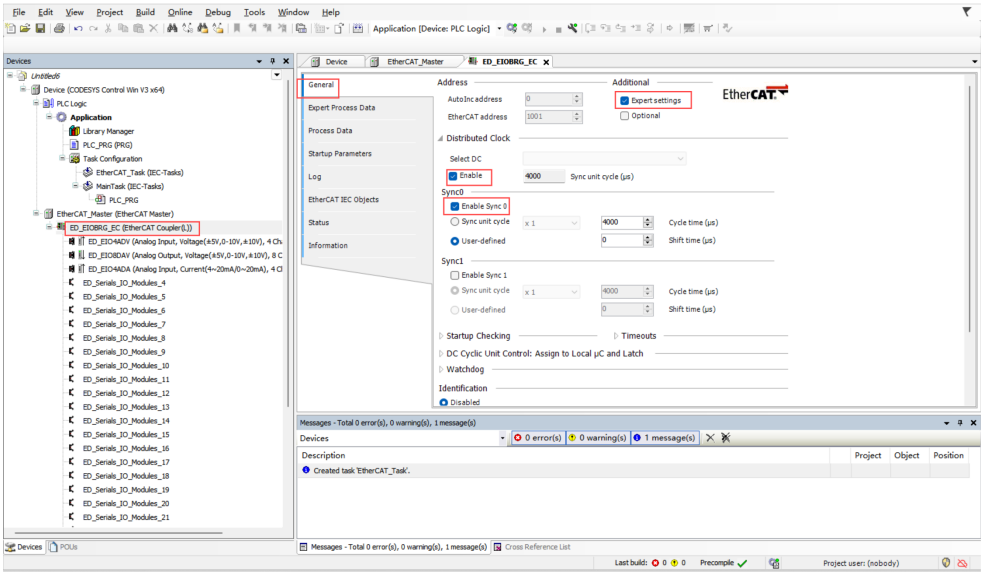
9. Left-click and double-click on the EtherCAT master device to set the source address (the exact name can be seen in the pc network manager).



10. Click on the EtherCAT master device, select “Scan for Devices” in the menu, and copy all devices to the project after scanning is completed.

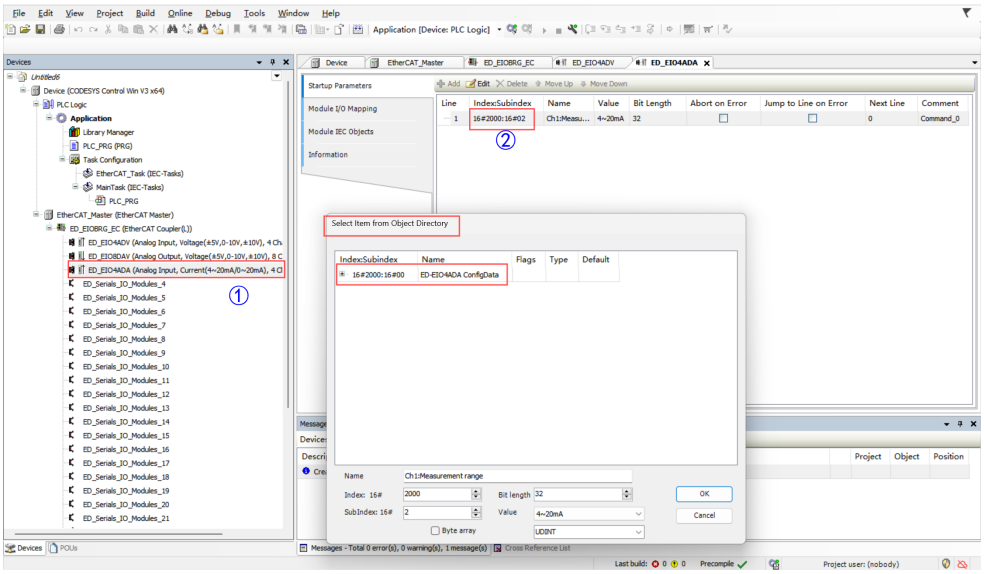


11. To set up the slave, double-click on the slave, enable "Expert settings", and enable " Select DC" and "Sync0".

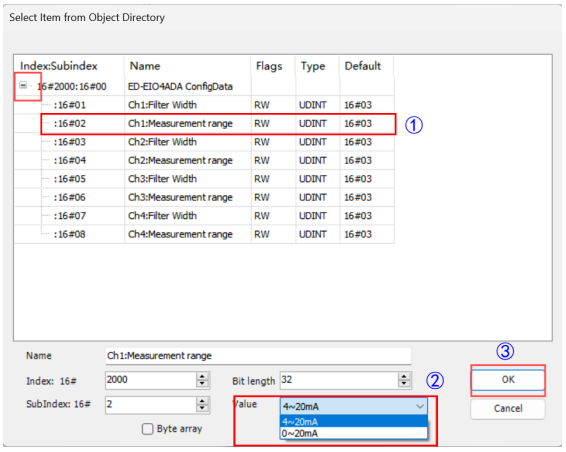


12. (Optional) To configure the analogue input module with 0~20mA or 4~20mA, double click on the module, and then double click on ‘Index: Subindex’ in the right interface.

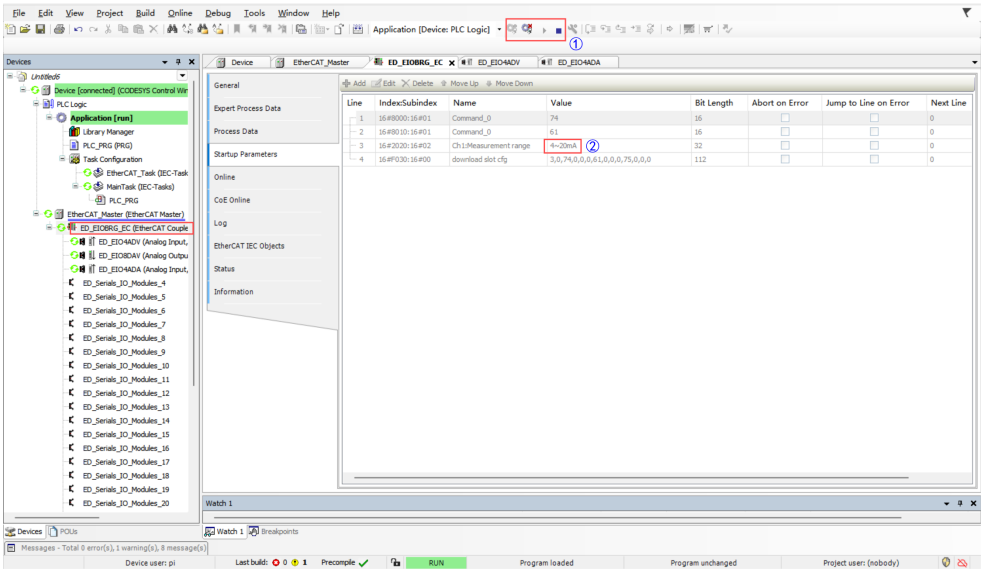
> TIP
>
> I/O voltage modules are configured in the same way as current modules.



13. Select the channel, set the specific current value in “Value” and click “OK”..



14. Click Login and Startup to see that the configuration is complete in the startup parameters of the master.


①
②
Startup Parameters
Line
Index:Subindex
Name
Value
Bit Length
Abort on Error
Jump to Line on Error
Next Line
4~20mA