

AX Series IO Modules user manual

1.0

2022-8-30

Agile Express IO Modules

Distribution list:

Name/ Group	Company
EA	NODKA

Reviews/Approvals:

	Name / Function / Company	Signature
Author:	EA	
Reviewed by:		

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1. Introduction

This chapter provides necessary information of the product such as the features and manuals before actual use.

1.1 Related Manuals

The manuals related to the product are listed below, please read them as necessary along with this document before actual use.

Name	Purpose	Contents	How to get
User manual	Must read when operating the product.	Describes the hardware features and settings	Download from Nodka website

1.2 Safety Information

This document provides safety information using the following symbols to prevent accidents resulting in injury or death and the destruction of equipment and resources. Understand the meanings of these symbols to operate the equipment safely.

Symbol	Description
	WARNING WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
	DANGER DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
	NOTE NOTE provide the reader with additional information or refer to detailed sources of information.

1.3 System overview

AX series IO modules are used by model to distinguish between different signal types and application scenarios with different response speeds. Different types of input filter function is different, filter circuit has the function of suppressing electromagnetic interference, also have the effect of reducing the signal response.

- The filter time of 3ms is relatively slow, but can suppress the jitter of the mechanical switch, and for general applications, can provide a more stable signal.
- The filter time of 10μs is suitable for scenarios where a faster response speed is required.
- The filter time of 1μs is suitable for the acquisition of signals with short pulses at very short control periods.

The output port can carry out the maximum continuous output drive current of 0.5A/channel, which can satisfy most load devices, such as resistor, capacitive, inductive loads and lamps. All the output ports are designed to over-current protection, in the case of short circuit, the output circuit can close the port, after the short circuit state removed, back to normal state so the module will not suffer damage.

The rugged metal housing provides excellent electromagnetic shielding and heat dissipation, ensuring reliable applications in harsh environments.

- Product Features
 - ✓ Integrated EtherCAT bus, power supply and signal interface
 - ✓ Input current limiting protection
 - ✓ Input multiple filter configuration choices
 - ✓ Output short circuit protection
 - ✓ In-line terminal
 - ✓ Metal shell, IP30 protection class
 - ✓ DIN35 guide rail installation
- Application industry
 - ✓ Logic control
 - ✓ Bus data acquisition
 - ✓ Distributed control

- ✓ Distributed monitoring
- ✓ Industrial robot
- ✓ Numerical control machine tool

Module	Input channel	Input filtering	Output channel	Connector	Note
AX-1016-T000	16	3ms	16	In-line terminal	NPN
AX-1026-T000		10μs			
AX-1316-T000		3ms			PNP
AX-1326-T000		10μs			
AX-1013-T000	32	3ms	32	In-line terminal	NPN
AX-1023-T000		10us			
AX-1313-T000		3ms			PNP
AX-1323-T000		10us			

2. General Interface Description

2.1 Power supply

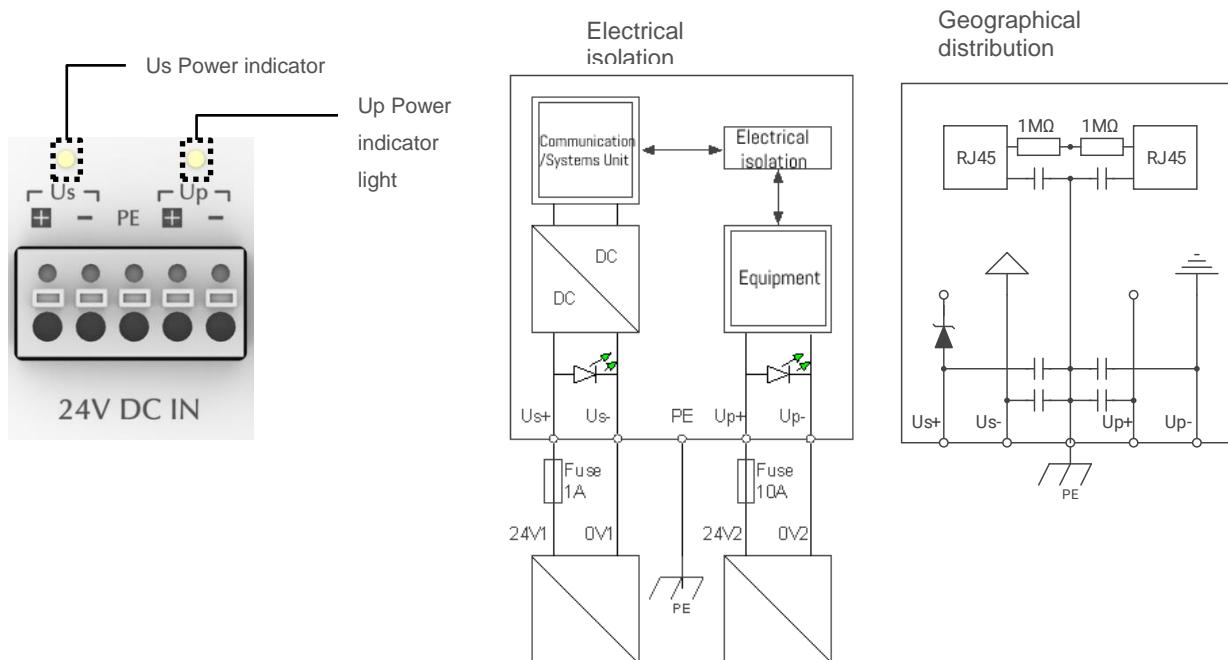
Us: Communication System power supply

The power port of the AX series IO module is marked as the Us 24V DC power supply interface, is mainly used to power the communication and control unit of the module. Through the module's built-in non-isolated DC/DC converter, the 24V DC supply voltage is converted to 5V/3.3V required by the communication and control unit.

Up: Field device side power supply

The power port of the AX series IO module is marked as the Up 24V DC power supply interface, is mainly used to power the module connected to the field peripheral unit, such as digital input, output, max 10A, 10A slow fuse in the Up power supply cable in series.

Us and Up to the power supply unit interior is completely electrical isolation. Because the electrical environment powered by Up is very harsh, there will be many disturbances, surges, and even voltage drops (when capacitive load is started). In order to ensure that the communication system unit always works stably and reliably, the Us and Up need to use completely independent 24V DC power supply to ensure the best electrical isolation effect.



Blow the fuse

It is recommended to use 1A fuse for Us input power and 10A slow fuse for Up input power. If the external input power supply cannot be separated, one power supply must be used and a slow fuse of not more than 10A must be used.

2.1.1 Interface definition

Led#	Direction	Notes
Us +	Input	Us communication system power supply 24V
Us -	Input	Us communication system power supply 0V
PE	Input	Shield ground
Up +	Input	Up field peripheral, load part power supply 24V
Up -	Input	Upfield peripheral, load part power supply 240V

2.1.2 Wiring specification

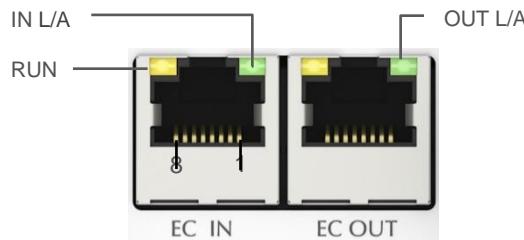
Connector	In-line terminal, manually removed by pressing
Single core wire	0.2 ... 1.5mm ²
Multiple soft wires	0.2 ... 1.5mm ²
Crimp bar terminal	0.2 ... 0.75mm ²
Strip length	8 ... 9mm

2.1.3 Indicator light

Led#	Object	Color	Notes
Us	Us communication, system power, indicator light	Green	Off: no power supply
			On: power supply
Up	Up field peripherals, loads, Power indicator light	Green	Off: no power supply On: power supply

2.2 EtherCAT communication

AX Series IO modules provide 2 RJ-45 for EtherCAT IN and EtherCAT OUT.



Cable standard
CAT5 Mask Ethernet cable cross/direct connection

2.2.1 Interface definition

Interface	Notes
EC IN	EtherCAT IN interface connects to the master station or the former slave station
EC OUT	EtherCAT OUT interface connects to the next slave station

2.2.2 Cable specification

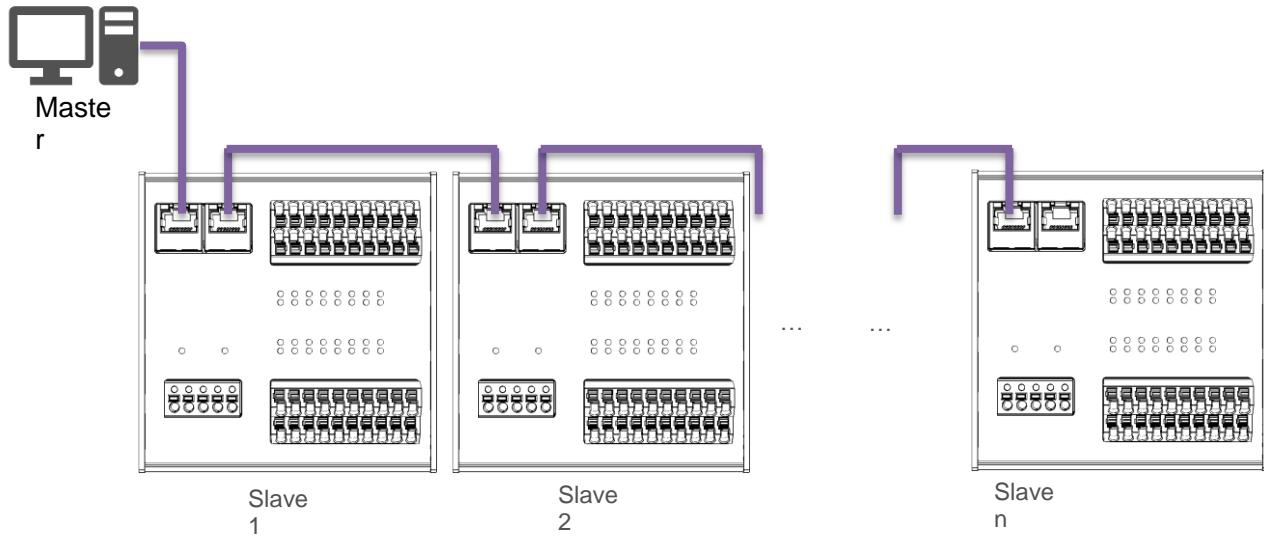
Number	Name	4 Core color	8 Core color	Notes
1	Tx+	Yellow	Orange and white	EtherCAT data transmission, differential signal +
2	Tx-	Orange	Orange	EtherCAT data transmission, differential signal -
3	Rx+	White	Green and white	EtherCAT data reception, differential signal +
6	Rx-	Blue	Green	EtherCAT data reception, differential signal -

Cables used to connect EtherCAT devices should be at least CAT5 with 360° coverage and reliable shielding. Both symmetric and crossed lines can be used.

2.2.3 Indicator light

Led#	Object	Color	Notes
RUN	EtherCAT state	Yellow	Off: Init state Flashing for 1s:Pre-OP state Flashing for 0.5s: S-OP state On:OP state
IN L/A	IN communication link status	Green	On:Establishes a connection with the positive-module Flashing:Establishes communication with the positive-module
OUT L/A	OUT communication link status	Green	On:Establishes a connection with the negative-module Flashing:Establishes communication with the negative-module

2.2.4 EtherCAT Bus topology



- 1) When the module is the first slave device connected to the master device, the IN port must be connected to the master device.
- 2) When the module is a slave device IN the middle position, the IN port is connected with the former slave device, and the OUT port is connected with the latter slave device.
- 3) When the module is the last slave device, the IN port is connected to the previous slave device, and the OUT port is empty.

3. Product Description

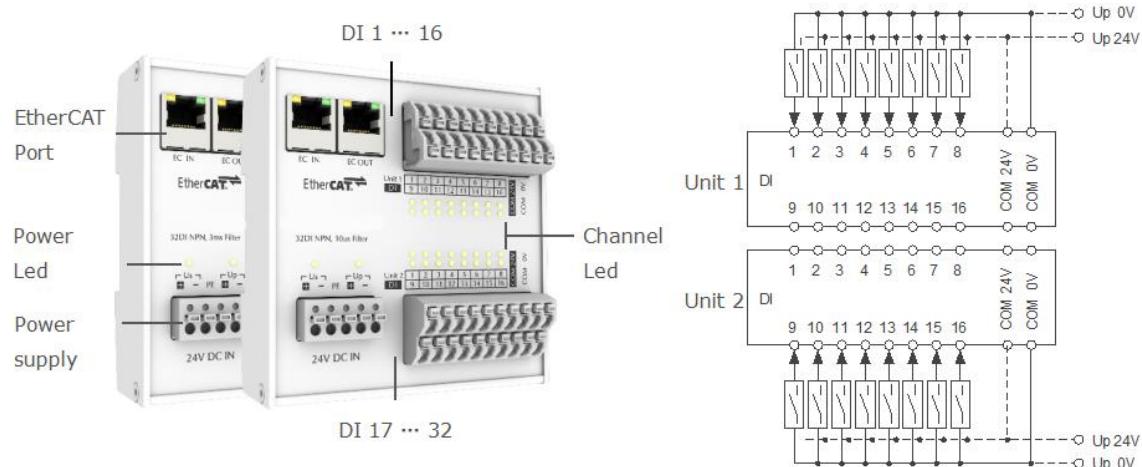
This section describes the product specifications and IO interface related content.

3.1 AX-10x0-T000

AX-10x0-T000(AX-1010-T000/AX-1020-T000)is an integrated power supply, communication port, digital input set as a whole module.It can be used to collect digital signals at the field end and transmit to the controller after electrical isolation. At the same time, the controller can be passed through the communication of binary signals. And all input signals have corresponding status indicators.

3.1.1 Product Introduction

AX-1010-T000/AX-1020-T000 digital input ports are NPN signal type.AX-1010-T000 is configured with a filter of 3ms to suppress jitter of mechanical switches and, for general applications, provide a more stable signal.AX-1020-T000 configure the time of 10μs filter, is suitable for the need for faster response speed.

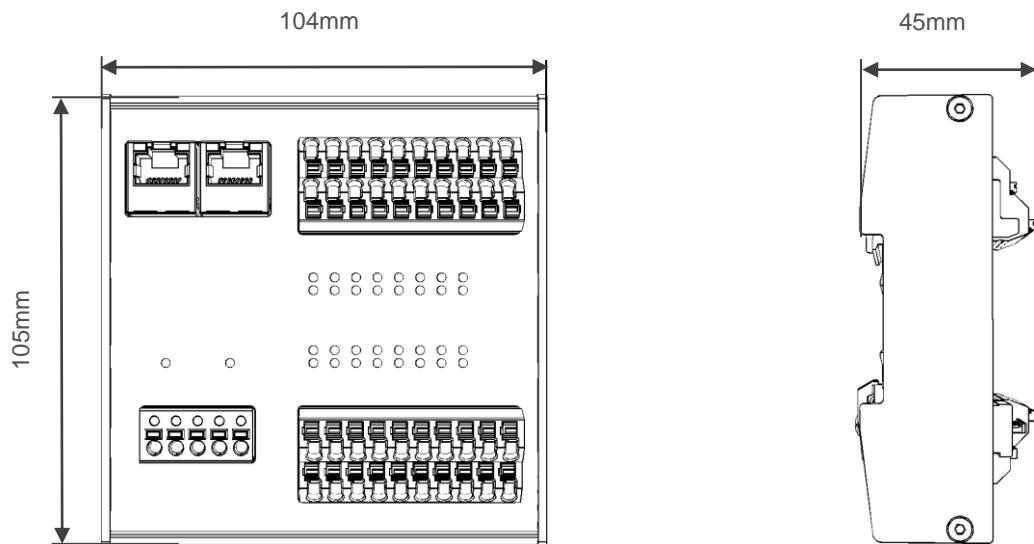


3.1.2 Technical data

Technical data	AX-1010-T000	AX-1020-T000
Bus protocol	EtherCAT	
Bus interface	2 x RJ45 (IN & OUT)	
Distributed clock (64bit)	-	
Voltage	24 VDC (-15 %/ +20 %)	
Us current	~ 100mA	
Up current	max.10A	
Digital input signal	NPN	
Input channel	32	
Input filtering	3ms	10μs
Input current consumption	Typically 3mA	
Input "0" voltage range	18 ... 30V	
Input "1" voltage range	0 ... 7V	

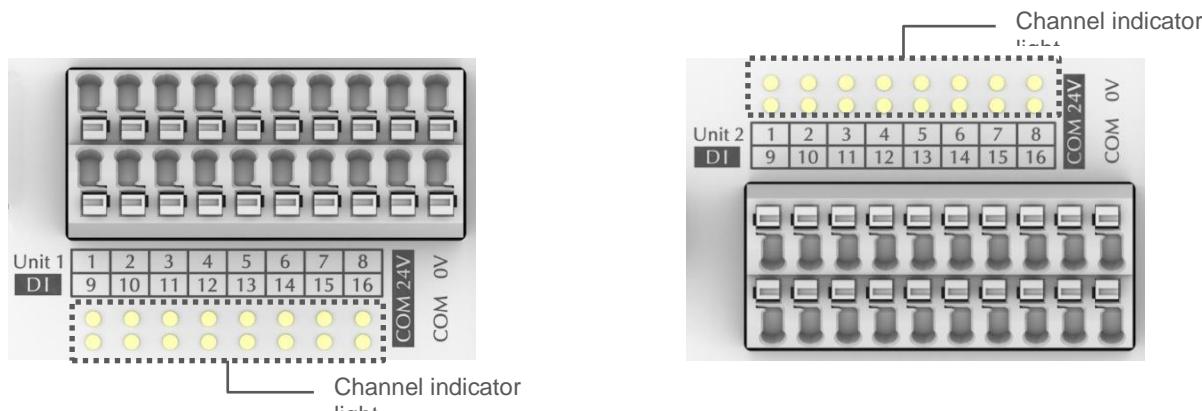
Electrical isolation	500V (communication and field voltage)
Connector	In-line terminal
Specification of wire	Hard wire: 0.2 ... 1.5mm ² , multi-strand soft wire: 0.2 ... 1.5mm ² , rod terminal: 0.2 ... 0.75mm ²
Dimensions (W x H x D)	~ 105 x 104 x 45mm
weight	~ 300g
Shell material	Aluminum alloy
Installation	35 mm DIN guide according to EN 60715
Location of installation	35 mm from top to bottom clearance
Operating temperature range	0 ... +60°C
Storage temperature range	-25 ... +70°C
Relative humidity	10 ... 95%
Electromagnetic compatibility	Comply with EN 61000-6-2/EN 61000-6-4
Protection class	IP30
Authentication	CE

3.1.3 Product size



3.1.4 IO wiring instructions

3.1.4.1 DI digital input



The sensor can be powered by COM port to realize single wire/two-wire/three-wire system wiring, thus simplifying the electrical wiring design. COM port is powered by Up. Users can choose to use COM port power supply according to the actual situation, or use other same source potential distribution for peripheral power supply.

■ Interface definition

Unit 1 DI	Direction	Notes
1 ... 16	Input	Digital input 1-16 channels
COM 0V	Output	The output of the power supply Up 0V is used for the power supply of the field digital input equipment
COM 24V	Output	The output of the power supply Up 24V is used for the power supply of the field digital input equipment
Unit 2 DI	Direction	Notes
1 ... 16	Input	Digital input 17-32 channels
COM 0V	Output	The output of the power supply Up 0V is used for the power supply of the field digital input equipment
COM 24V	Output	The output of the power supply Up 24V is used for the power supply of the field digital input equipment

■ Indicator light

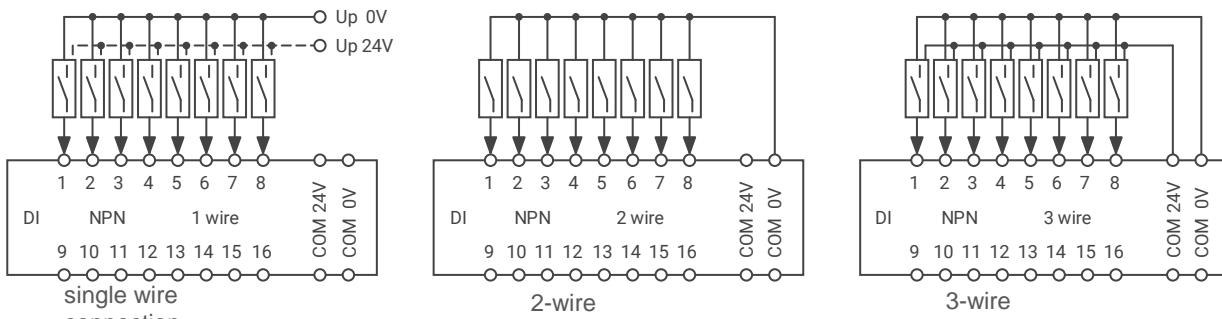
Unit 1 DI	Object	Color	Notes
1 ... 16	Digital input 1-16 channels	Green	Off: The input signal is inactivity. On: The input signal is activity.
Unit 2 DI	Object	Color	Notes
1 ... 16	Digital input 17-32 channels	Green	Off: The input signal is inactivity. On: The input signal is activity.

■ Wiring specification

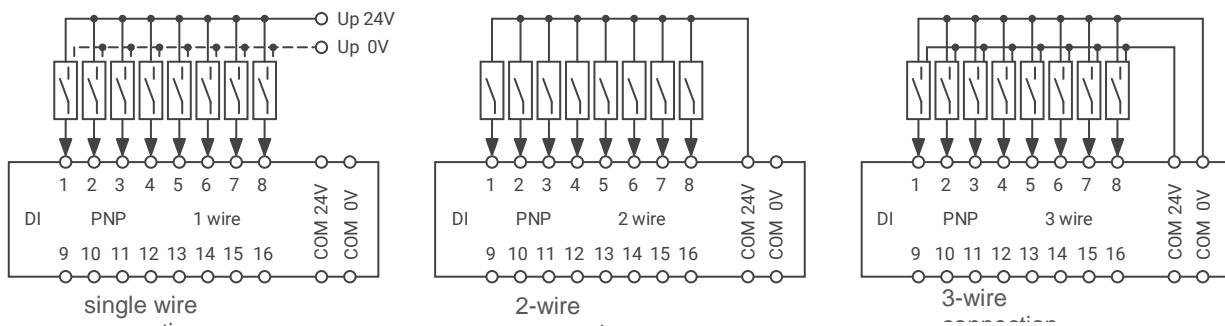
Connector	In-line terminal, manually removed by pressing
Single core wire	0.2 ... 1.5mm ²
Multiple soft wires	0.2 ... 1.5mm ²
Crimp bar terminal	0.2 ... 0.75mm ²
Strip length	8 ... 9mm

■ Connection Technology:

NPN



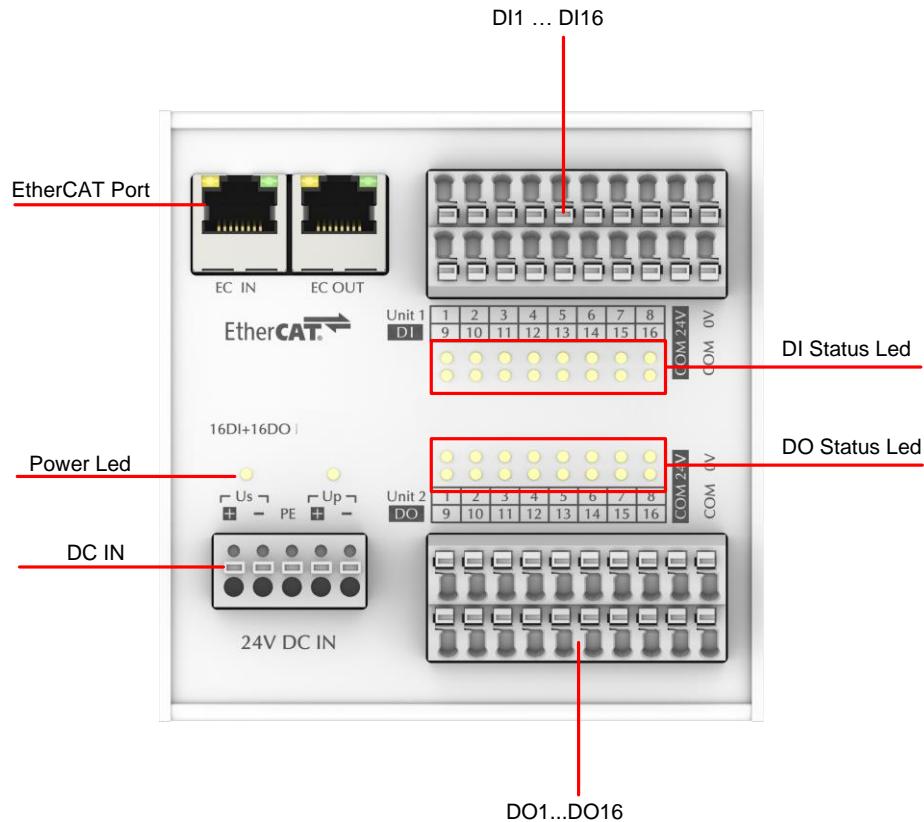
PNP

**3.2 AX-10x6-T000**

AX-10x6-T000(AX-1016-T000/AX-1026-T000)is an integrated power supply, communication port, digital input and output set as a whole module.It can be used to collect digital signals at the field end and transmit to the controller after electrical isolation. At the same time, the binary signal transmitted by the controller through communication can be output at the wiring port of the module after electrical isolation.And all input and out signals have corresponding status indicators.

3.2.1 Product Introduction

AX-1016-T000/AX-1026-T000 digital input and output ports are NPN signal type.AX-1016-T000 is configured with a filter of 3ms to suppress jitter of mechanical switches and, for general applications, provide a more stable signal.AX-1026-T000 configure the time of 10μs filter, is suitable for the need for faster response speed.

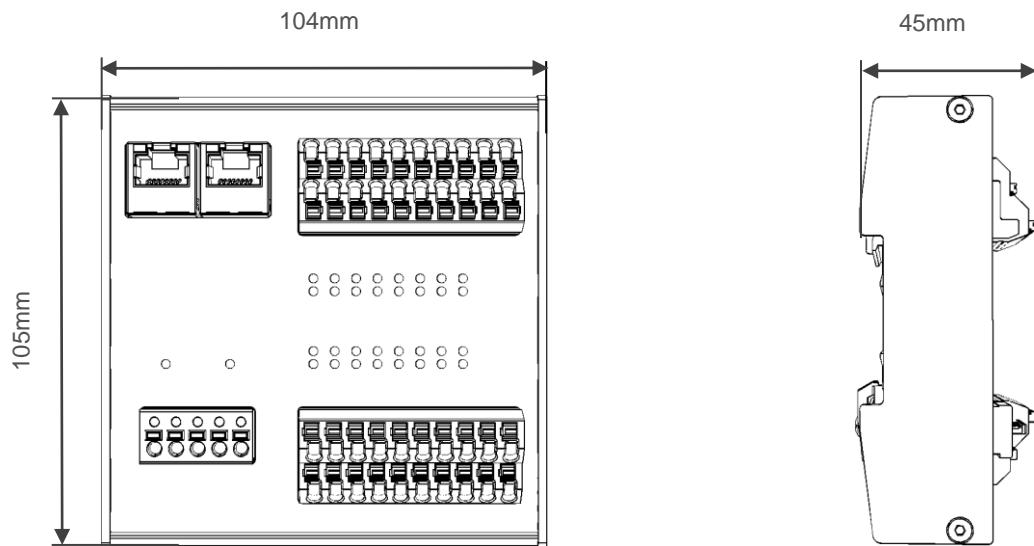


3.2.2 Technical data

Technical data	AX-1016-T000	AX-1026-T000
Bus protocol	EtherCAT	
Bus interface	2 x RJ45 (IN & OUT)	
Distributed clock (64bit)	-	
Voltage	24 VDC (-15 %/ +20 %)	
Us current	~ 100mA	
Up current	max.10A	
Digital input signal	NPN	
Input channel	16	
Input filtering	3ms	10µs
Input current consumption	Typically 3mA	
Input "0" voltage range	18 ... 30V	
Input "1" voltage range	0 ... 7V	
Digital output signal	NPN	
Output channel	16	
Output drive current	0.5A/channel; Max 8A all channel	
Output switch action	Typically T _{ON} : 15µs ; T _{OFF} : 300µs	

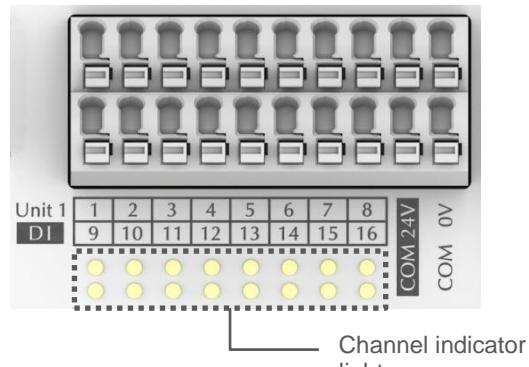
time	
Output protection	Short circuit protection
Load	Resistors, inductors, capacitors and lamps
Electrical isolation	500V (communication and field voltage)
Connector	In-line terminal
Specification of wire	Hard wire: 0.2 ... 1.5mm ² , multi-strand soft wire: 0.2 ... 1.5mm ² , rod terminal: 0.2 ... 0.75mm ²
Dimensions (W x H x D)	approx 105 x 104 x 45mm
weight	~ 300g
Shell material	Aluminum alloy
Installation	35 mm DIN guide according to EN 60715
Location of installation	35 mm from top to bottom clearance
Operating temperature range	0 ... +60°C
Storage temperature range	-25 ... +70°C
Relative humidity	10 ... 95%
Electromagnetic compatibility	Comply with EN 61000-6-2/EN 61000-6-4
Protection class	IP30
Authentication	CE

3.2.3 Product size



3.2.4 IO wiring instructions

3.2.4.1 DI digital input



The sensor can be powered by COM port to realize single wire/two-wire/three-wire system wiring, thus simplifying the electrical wiring design. COM port is powered by Up. Users can choose to use COM port power supply according to the actual situation, or use other same source potential distribution for peripheral power supply.

■ Interface definition

Unit 1 DI	Direction	Notes
1 ... 16	Input	Digital input 1-16 channels
COM 0V	Output	The output of the power supply Up 0V is used for the power supply of the field digital input equipment
COM 24V	Output	The output of the power supply Up 24V is used for the power supply of the field digital input equipment

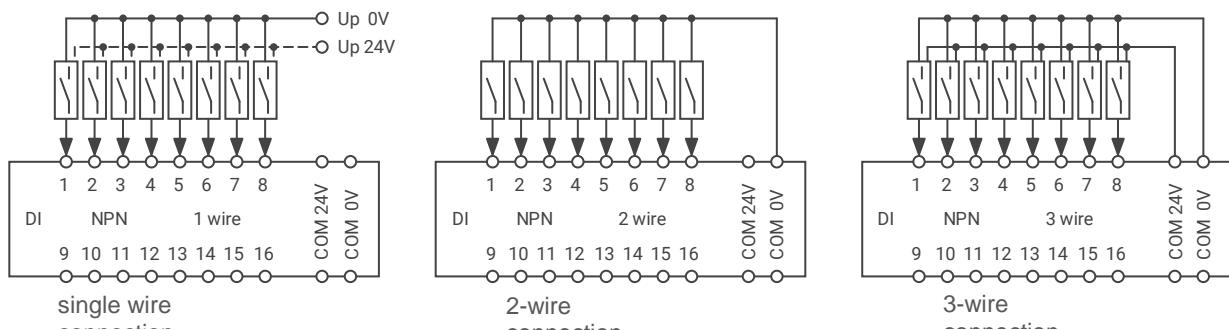
■ Indicator light

Unit 1 DI	Object	Color	Notes
1 ... 16	Digital input 1-16 channels	Green	Off: The input signal is inactivity. On: The input signal is activity.

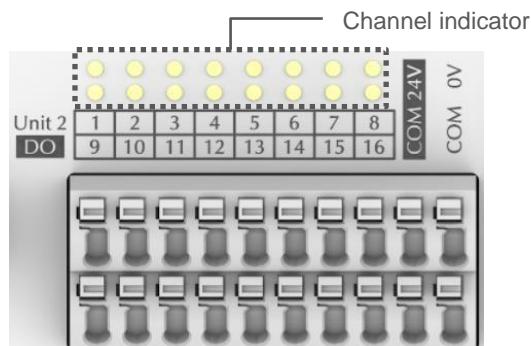
■ Wiring specification

Connector	In-line terminal, manually removed by pressing
Single core wire	0.2 ... 1.5mm ²
Multiple soft wires	0.2 ... 1.5mm ²
Crimp bar terminal	0.2 ... 0.75mm ²
Strip length	8 ... 9mm

■ Connection Technology(NPN)



3.2.4.2 DO digital output



The actuator can be powered by COM port to realize single wire/two-wire/three-wire system wiring, thus simplifying the electrical wiring design. COM port is powered by Up. Users can choose to use COM port power supply according to the actual situation, or use other same source potential distribution for peripheral power supply.

■ Interface definition

Unit 2 DO	Direction	Notes
1 ... 16	Output	Digital output 1-16 channels
COM 0V	Output	The output of the power supply Up 0V is used for the power supply of the field digital output equipment
COM 24V	Output	The output of the power supply Up 24V is used for the power supply of the field digital output equipment

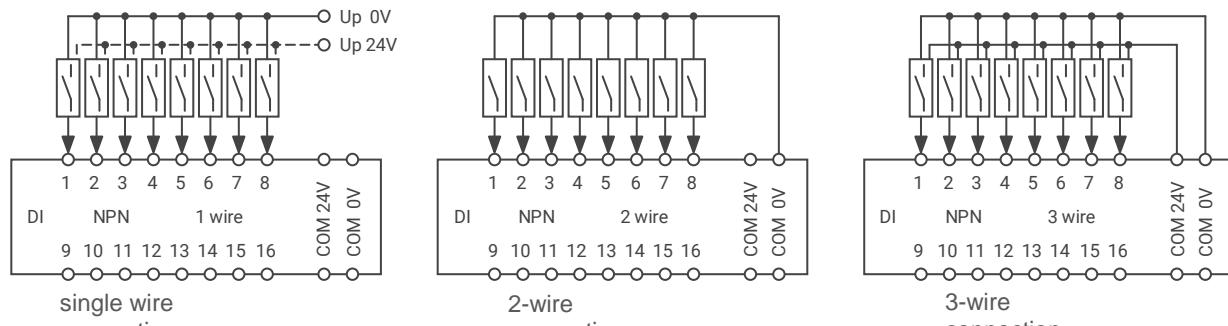
■ Indicator light

Unit 2 DO	Object	Color	Notes
1 ... 16	Digital output 1-16 channels	Green	Off: The input signal is inactivity. On: The input signal is activity.

■ Wiring specification

Connector	In-line terminal, manually removed by pressing
Single core wire	0.2 ... 1.5mm ²
Multiple soft wires	0.2 ... 1.5mm ²
Crimp bar terminal	0.2 ... 0.75mm ²
Strip length	8 ... 9mm

■ Connection Technology(NPN)

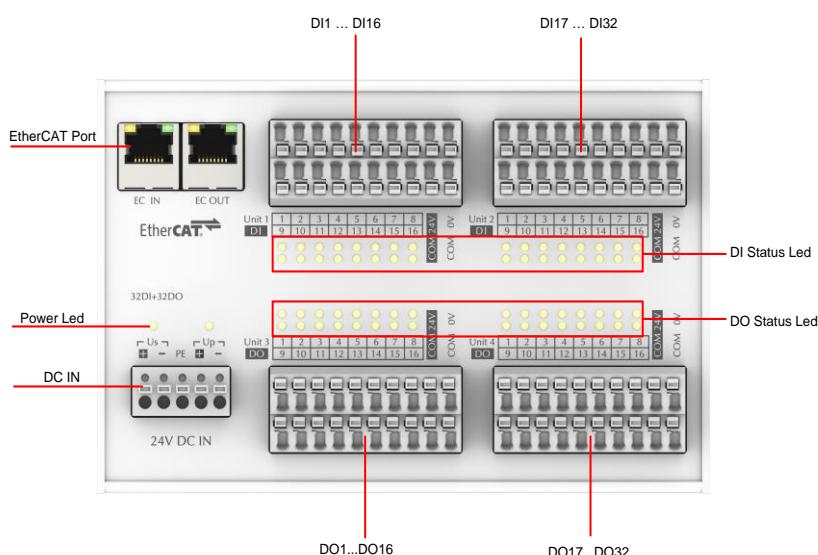


3.3 AX-10x3-T000

AX-10x3-T000(AX-1013-T000/AX-1023-T000)is an integrated power supply, communication port, digital input and output set as a whole module.It can be used to collect digital signals at the field end and transmit to the controller after electrical isolation. At the same time, the binary signal transmitted by the controller through communication can be output at the wiring port of the module after electrical isolation.And all input and out signals have corresponding status indicators.

3.3.1 Product Introduction

AX-10x3 series IO module for digital input and output ports are NPN signal type. AX-1013-T000 is configured with a filter of 3ms to suppress jitter of mechanical switches and, for general applications, provide a more stable signal.AX-1023-T000 configure the time of 10μs filter, is suitable for the need for faster response speed.

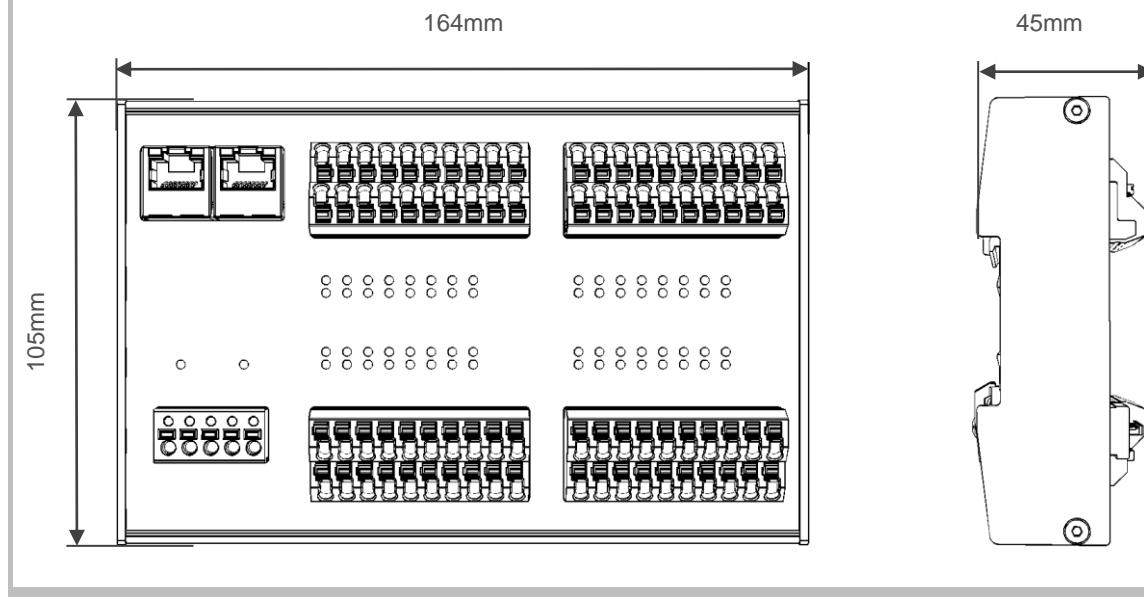


3.3.2 Technical data

Technical data	AX-1013-T000	AX-1023-T000
Bus protocol	EtherCAT	
Bus interface	2 x RJ45 (IN & OUT)	
Distributed clock (64bit)	-	
Voltage	24 VDC (-15 %/ +20 %)	
Us current	~ 120mA	
Up current	max.10A	
Digital input signal	NPN	
Input channel	32	
Input filtering	3ms	10µs
Input current consumption	Typically 3mA	
Input "0" voltage range	18 ... 30V	
Input "1" voltage range	0 ... 7V	
Digital output signal	NPN	
Output channel	32	
Output drive current	0.5A/channel; Max 8A all channel	
Output switch action time	Typically T _{ON} : 15µs ; T _{OFF} : 300µs	
Output protection	Short circuit protection	
Load	Resistors, inductors, capacitors and lamps	
Electrical isolation	500V (communication and field voltage)	
Connector	In-line terminal	
Specification of wire	Hard wire: 0.2 ... 1.5mm ² , multi-strand soft wire: 0.2 ... 1.5mm ² , rod terminal: 0.2 ... 0.75mm ²	
Dimensions (W x H x D)	approx 105 x 164 x 45mm	
weight	~ 300g	
Shell material	Aluminum alloy	
Installation	35 mm DIN guide according to EN 60715	
Location of installation	35 mm from top to bottom clearance	
Operating temperature range	0 ... +60°C	
Storage temperature range	-25 ... +70°C	
Relative humidity	10...95%	
Electromagnetic compatibility	Comply with EN 61000-6-2/EN 61000-6-4	
Protection class	IP30	

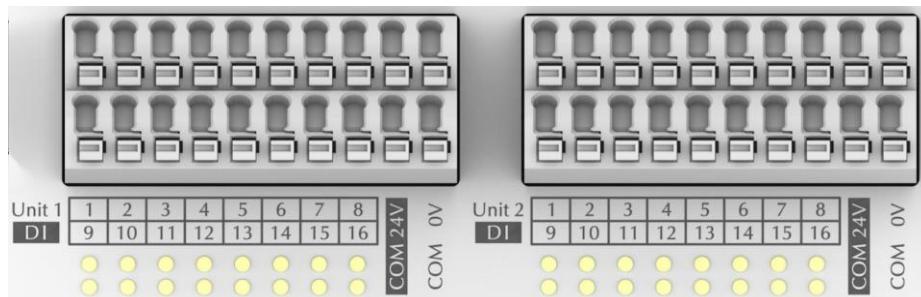
Authentication	CE
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3.3.3 Product size



3.3.4 IO wiring instructions

3.3.4.1 DI digital input



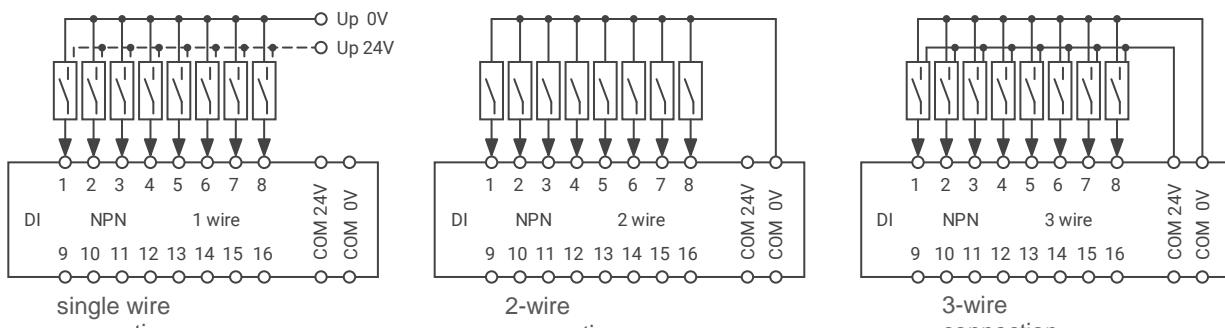
The sensor can be powered by COM port to realize single wire/two-wire/three-wire system wiring, thus simplifying the electrical wiring design. COM port is powered by Up.

Users can choose to use COM port power supply according to the actual situation, or use other same source potential distribution for peripheral power supply.

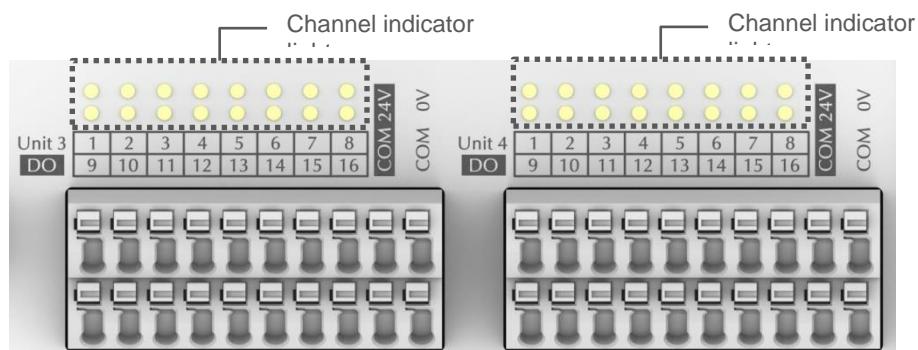
■ Interface definition

Unit 1 DI	Direction	Notes
1 ... 16	Input	Digital input 1-16 channels
COM 0V	Output	The output of the power supply Up 0V is used for the power supply of the field digital input equipment
COM 24V	Output	The output of the power supply Up 24V is used for the power supply of the field digital input equipment
Unit 2 DI	Direction	Notes
1 ... 16	Input	Digital input 17-32 channels
COM 0V	Output	The output of the power supply Up 0V is used for the power supply of the field digital input equipment

COM 24V	Output	The output of the power supply Up 24V is used for the power supply of the field digital input equipment	
■ Indicator light			
Unit 1 DI	Object	Color	Notes
1 ... 16	Digital input 1-16 channels	Green	Off:The input signal is inactivity. On:The input signal is activity.
■ Wiring specification			
Connector	In-line terminal, manually removed by pressing		
Single core wire	0.2 ... 1.5mm ²		
Multiple soft wires	0.2 ... 1.5mm ²		
Crimp bar terminal	0.2 ... 0.75mm ²		
Strip length	8 ... 9mm		
■ Connection Technology(NPN)			



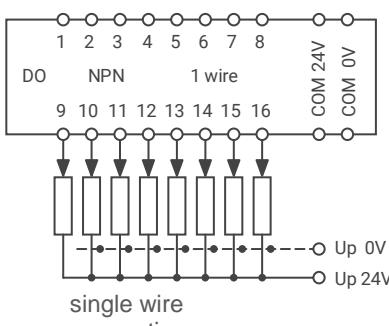
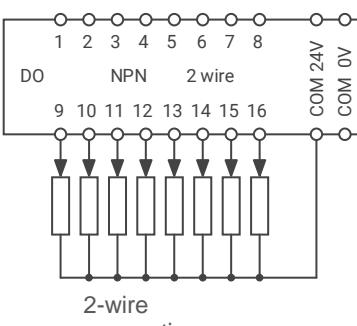
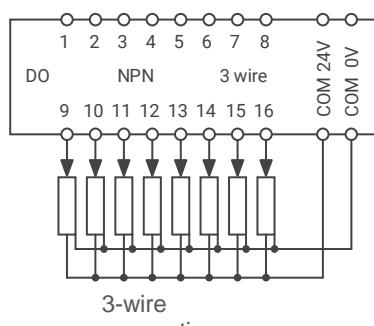
3.3.4.2 DO digital output



The actuator can be powered by COM port to realize single wire/two-wire/three-wire system wiring, thus simplifying the electrical wiring design. COM port is powered by Up. Users can choose to use COM port power supply according to the actual situation, or use other same source potential distribution for peripheral power supply.

■ Interface definition

Unit 3 DO	Direction	Notes
1 ... 16	Output	Digital output 1-16 channels

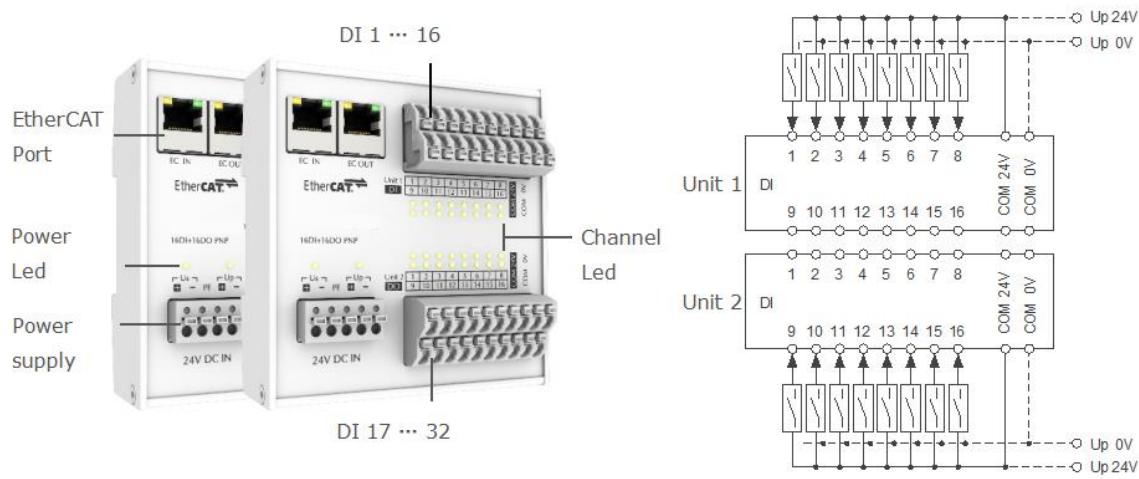
COM 0V	Output	The output of the power supply Up 0V is used for the power supply of the field digital output equipment	
COM 24V	Output	The output of the power supply Up 24V is used for the power supply of the field digital output equipment	
Unit 4 DO	Direction	Notes	
1 ... 16	Output	Digital output 17-32 channels	
COM 0V	Output	The output of the power supply Up 0V is used for the power supply of the field digital output equipment	
COM 24V	Output	The output of the power supply Up 24V is used for the power supply of the field digital output equipment	
■ Indicator light			
Unit 3 DO	Object	Color	Notes
1 ... 16	Digital output 1-16 channels	Green	Off:The input signal is inactivity. On:The input signal is activity.
Unit 4 DO	Object	Color	Notes
1 ... 16	Digital output 17-32 channels	Green	Off:The input signal is inactivity. On:The input signal is activity.
■ Wiring specification			
Connector	In-line terminal, manually removed by pressing		
Single core wire	0.2 ... 1.5mm ²		
Multiple soft wires	0.2 ... 1.5mm ²		
Crimp bar terminal	0.2 ... 0.75mm ²		
Strip length	8 ... 9mm		
■ Connection Technology(NPN)			
			

3.4 AX-13x0-T000

AX-13x0-T000(AX-1310-T000/AX-1320-T000)is an integrated power supply, communication port, digital input set as a whole module.It can be used to collect digital signals at the field end and transmit to the controller after electrical isolation. At the same time, the controller can be passed through the communication of binary signals. And all input signals have corresponding status indicators.

3.4.1 Product Introduction

AX-1310-T000 AX-1320-T000 digital input/output ports are PNP signal types.AX-1310-T000 is configured with a filter of 3ms to suppress jitter of mechanical switches and, for general applications, provide a more stable signal.AX-1320-T000 configure the time of 10μs filter, is suitable for the need for faster response speed.

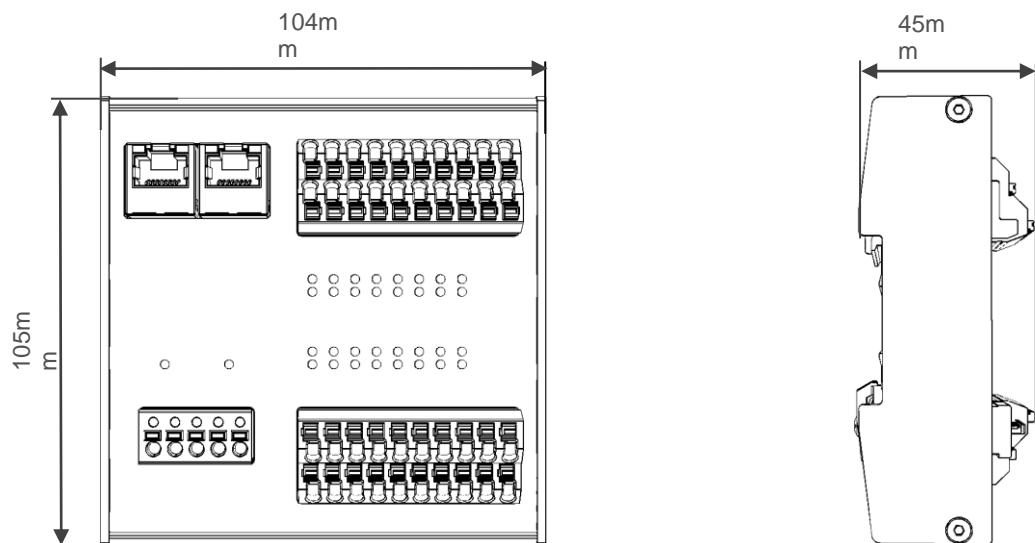


3.4.2 Technical data

Technical data	AX-1310-T000	AX-1320-T000
Bus protocol	EtherCAT	
Bus interface	2 x RJ45 (IN & OUT)	
Distributed clock (64bit)	-	
Voltage	24 VDC (-15 %/ +20 %)	
Us current	~ 100mA	
Up current	max.10A	
Digital input signal	PNP	
Input channel	32	
Input filtering	3ms	10μs
Input current consumption	Typically 3mA	
Input "0" voltage range	-3 ... +5V	
Input "1" voltage range	11 ... 30V	
Electrical isolation	500V (communication and field voltage)	
Connector	In-line terminal	
Specification of wire	Hard wire: 0.2 ... 1.5mm ² , multi-strand soft wire: 0.2 ... 1.5mm ² , rod terminal: 0.2 ... 0.75mm ²	
Dimensions (W x H x D)	approx 105 x 104 x 45mm	
weight	~ 300g	
Shell material	Aluminum alloy	
Installation	35 mm DIN guide according to EN 60715	

Location of installation	35 mm from top to bottom clearance
Operating temperature range	0 ... +60°C
Storage temperature range	-25 ... +70°C
Relative humidity	10 ... 95%
Electromagnetic compatibility	Comply with EN 61000-6-2/EN 61000-6-4
Protection class	IP30
Authentication	CE

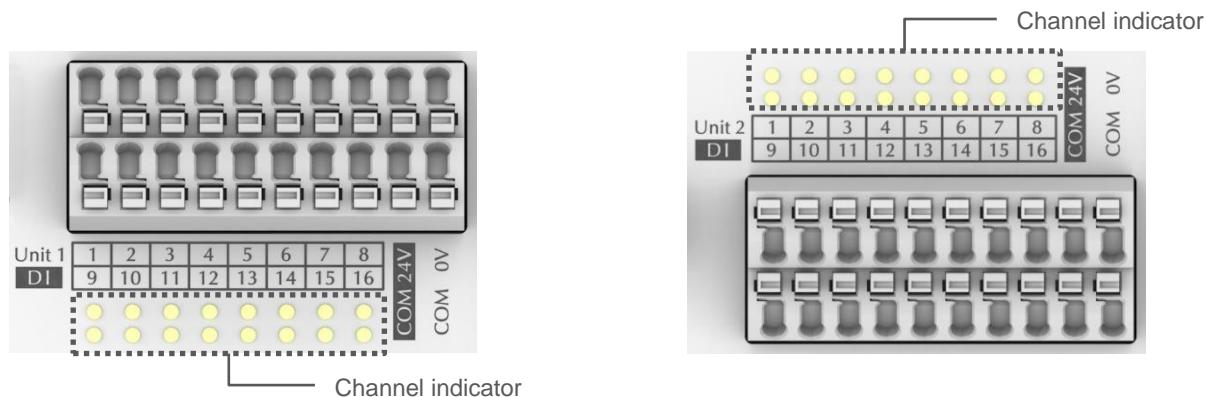
3.4.3 Product size



3.4.4 IO wiring instructions

3.4.4.1 DI digital input

The sensor can be powered by COM port to realize single wire/two-wire/three-wire system wiring, thus simplifying the electrical wiring design. COM port is powered by Up. Users can choose to use COM port power supply according to the actual situation, or use other same source potential distribution for peripheral power supply.



■ Interface definition

Unit 1 DI	Direction	Notes
1 ... 16	Input	Digital input 1-16 channels
COM 0V	Output	The output of the power supply Up 0V is used for the power supply of the field digital input equipment
COM 24V	Output	The output of the power supply Up 24V is used for the power supply of the field digital input equipment
Unit 2 DI	Direction	Notes
1 ... 16	Input	Digital input 17-32 channels
COM 0V	Output	The output of the power supply Up 0V is used for the power supply of the field digital input equipment
COM 24V	Output	The output of the power supply Up 24V is used for the power supply of the field digital input equipment

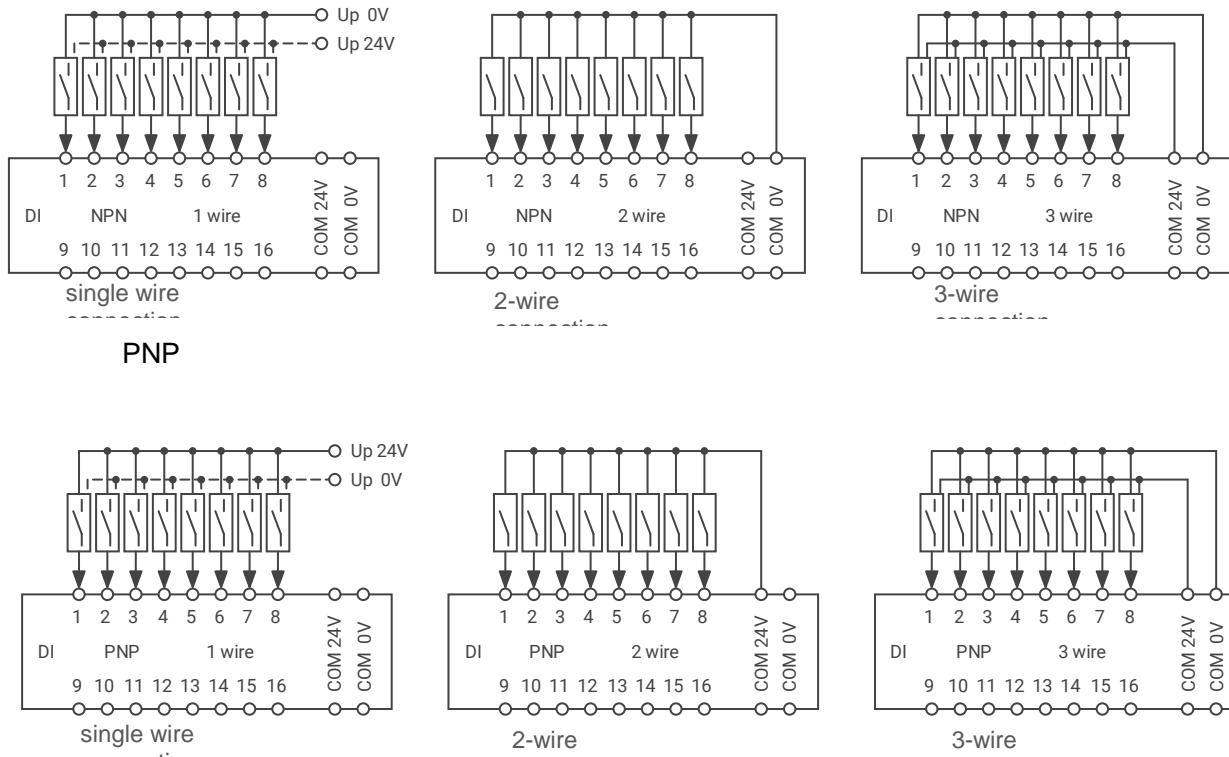
■ Indicator light

Unit 1 DI	Object	Color	Notes
1 ... 16	Digital input 1-16 channels	Green	Off:The input signal is inactivity. On:The input signal is activity.
Unit 2 DI	Object	Color	Notes
1 ... 16	Digital input 17-32 channels	Green	Off:The input signal is inactivity. On:The input signal is activity.

■ Wiring specification

Connector	In-line terminal, manually removed by pressing
Single core wire	0.2 ... 1.5mm ²
Multiple soft wires	0.2 ... 1.5mm ²
Crimp bar terminal	0.2 ... 0.75mm ²
Strip length	8 ... 9mm

■ Connection Technology
NPN

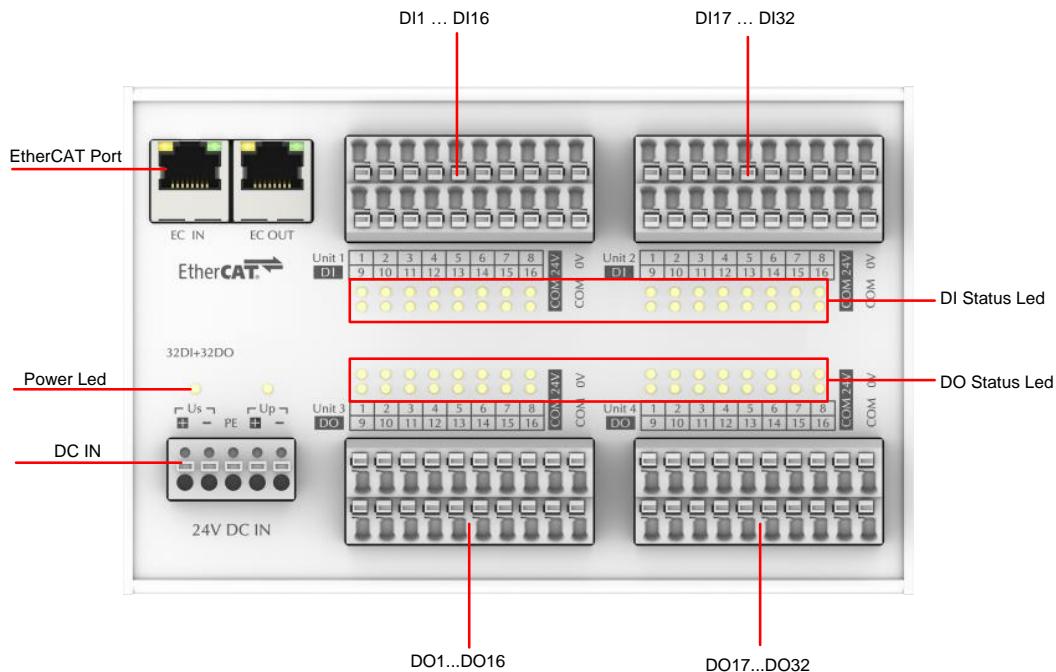


3.5 AX-13x3-T000

AX-1xx3-T000(AX-1313-T000/AX-1323-T000)is an integrated power supply, communication port, digital input and output set as a whole module.It can be used to collect digital signals at the field end and transmit to the controller after electrical isolation. At the same time, the binary signal transmitted by the controller through communication can be output at the wiring port of the module after electrical isolation.And all input and out signals have corresponding status indicators.

3.5.1 Product Introduction

AX-10x3 series IO module for digital input and output ports are PNP signal type.AX-1313-T000 is configured with a filter of 3ms to suppress jitter of mechanical switches and, for general applications, provide a more stable signal.AX-1323-T000 configure the time of 10μs filter, is suitable for the need for faster response speed.

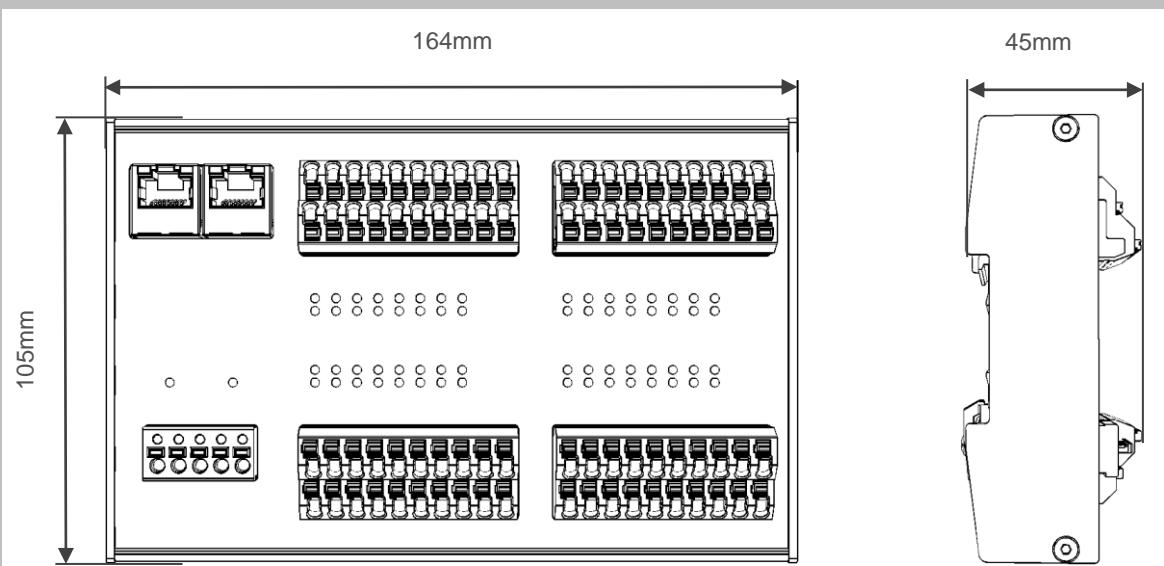


3.5.2 Technical data

Technical data	AX-1313-T000	AX-1323-T000
Bus protocol	EtherCAT	
Bus interface	2 x RJ45 (IN & OUT)	
Distributed clock (64bit)	-	
Voltage	24 VDC (-15 %/ +20 %)	
Us current	~ 120mA	
Up current	max.10A	
Digital input signal	PNP	
Input channel	32	
Input filtering	3ms	10µs
Input current consumption	Typically 3mA	
Input "0" voltage range	-3 ... +5V	
Input "1" voltage range	11 ... 30V	
Digital output signal	PNP	
Output channel	32	
Output drive current	0.5A/channel; Max 10A all channel	
Output switch action time	Typically T _{ON} : 15µs ; T _{OFF} : 300µs	
Output protection	Short circuit protection	
Load	Resistors, inductors, capacitors and lamps	
Electrical isolation	500V (communication and field voltage)	

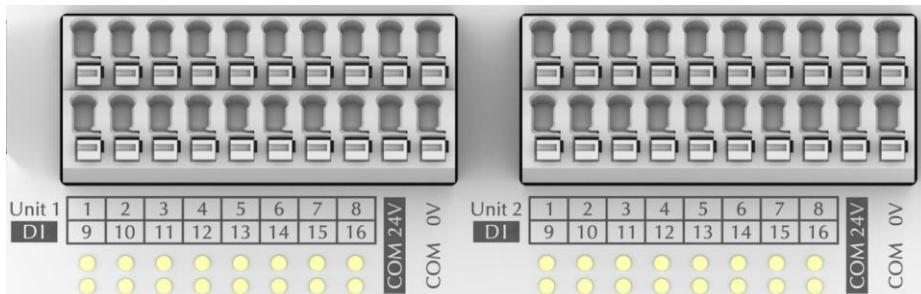
Connector	In-line terminal
Specification of wire	Hard wire: 0.2 ... 1.5mm ² , multi-strand soft wire: 0.2 ... 1.5mm ² , rod terminal: 0.2 ... 0.75mm ²
Dimensions (W x H x D)	approx 105 x 164 x 45mm
weight	~ 300g
Shell material	Aluminum alloy
Installation	35 mm DIN guide according to EN 60715
Location of installation	35 mm from top to bottom clearance
Operating temperature range	0 ... +60°C
Storage temperature range	-25 ... +70°C
Relative humidity	10...95%
Electromagnetic compatibility	Comply with EN 61000-6-2/EN 61000-6-4
Protection class	IP30
Authentication	CE

3.5.3 Product size



3.5.4 IO wiring instructions

3.5.4.1 DI digital input



The sensor can be powered by COM port to realize single wire/two-wire/three-wire system wiring, thus simplifying the electrical wiring design. COM port is powered by Up.

Users can choose to use COM port power supply according to the actual situation, or use other same source potential distribution for peripheral power supply.

■ Interface definition

Unit 1 DI	Direction	Notes
1 ... 16	Input	Digital input 1-16 channels
COM 0V	Output	The output of the power supply Up 0V is used for the power supply of the field digital input equipment
COM 24V	Output	The output of the power supply Up 24V is used for the power supply of the field digital input equipment
Unit 2 DI	Direction	Notes
1 ... 16	Input	Digital input 17-32 channels
COM 0V	Output	The output of the power supply Up 0V is used for the power supply of the field digital input equipment
COM 24V	Output	The output of the power supply Up 24V is used for the power supply of the field digital input equipment

■ Indicator light

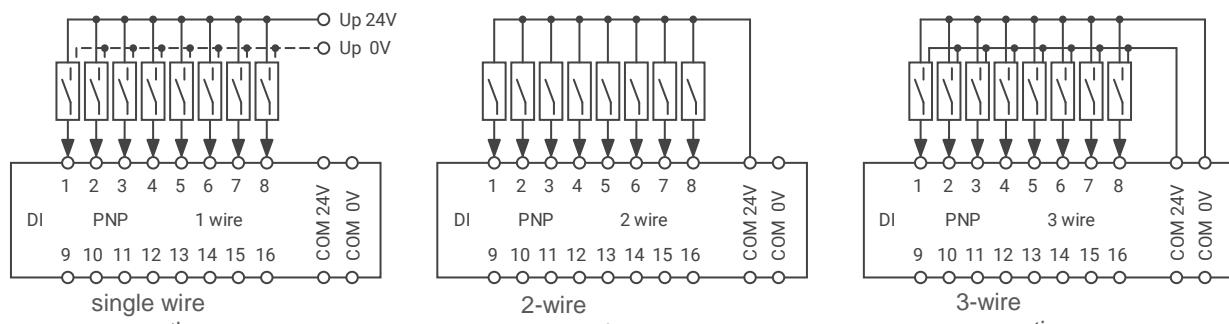
Unit 1 DI	Object	Color	Notes
1 ... 16	Digital input 1-16 channels	Green	Off:The input signal is inactivity. On:The input signal is activity.
Unit 2 DI	Object	Color	Notes
1 ... 16	Digital input 17-32 channels	Green	Off:The input signal is inactivity. On:The input signal is activity.

■ Wiring specification

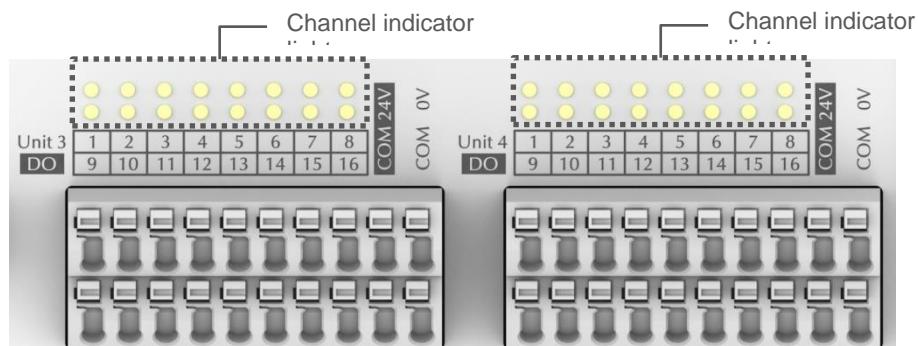
Connector In-line terminal, manually removed by pressing

Single core wire	0.2 ... 1.5mm ²
Multiple soft wires	0.2 ... 1.5mm ²
Crimp bar terminal	0.2 ... 0.75mm ²
Strip length	8 ... 9mm

■ Connection Technology(PNP)



3.5.4.2 DO digital output



The actuator can be powered by COM port to realize single wire/two-wire/three-wire system wiring, thus simplifying the electrical wiring design. COM port is powered by Up.

Users can choose to use COM port power supply according to the actual situation, or use other same source potential distribution for peripheral power supply.

■ Interface definition

Unit 3 DO	Direction	Digital output 1-16 channels
1 ... 16	Output	The output of the power supply Up 0V is used for the power supply of the field digital output equipment
COM 0V	Output	The output of the power supply Up 24V is used for the power supply of the field digital output equipment
COM 24V	Output	Notes
Unit 4 DO	Direction	Digital output 17-32 channels

1 ... 16	Output	The output of the power supply Up 0V is used for the power supply of the field digital output equipment
COM 0V	Output	The output of the power supply Up 24V is used for the power supply of the field digital output equipment
COM 24V	Output	Digital output 1-16 channels

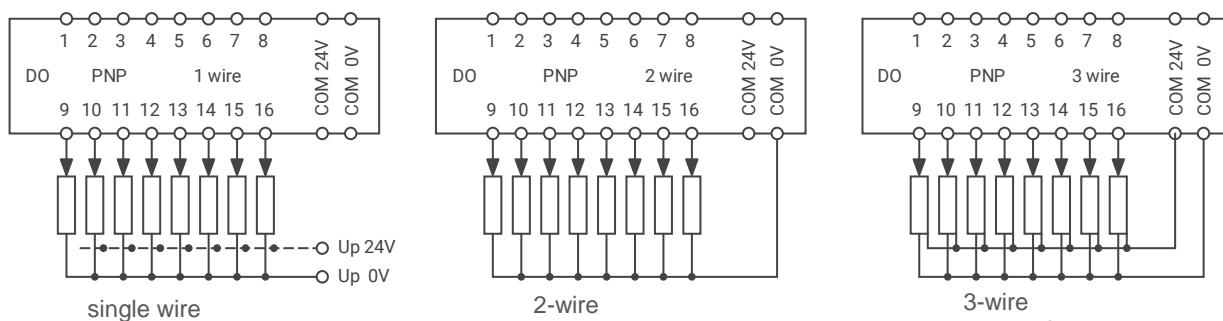
■ Indicator light

Unit 3 DO	Object	Color	Notes
1 ... 16	Digital output 1-16 channels	Green	Off:The input signal is inactivity. On:The input signal is activity.
Unit 4 DO	Object	Color	Notes
1 ... 16	Digital output 17-32 channels	Green	Off:The input signal is inactivity. On:The input signal is activity.

■ Wiring specification

Connector	In-line terminal, manually removed by pressing
Single core wire	0.2 ... 1.5mm ²
Multiple soft wires	0.2 ... 1.5mm ²
Crimp bar terminal	0.2 ... 0.75mm ²
Strip length	8 ... 9mm

■ Connection Technology(PNP)

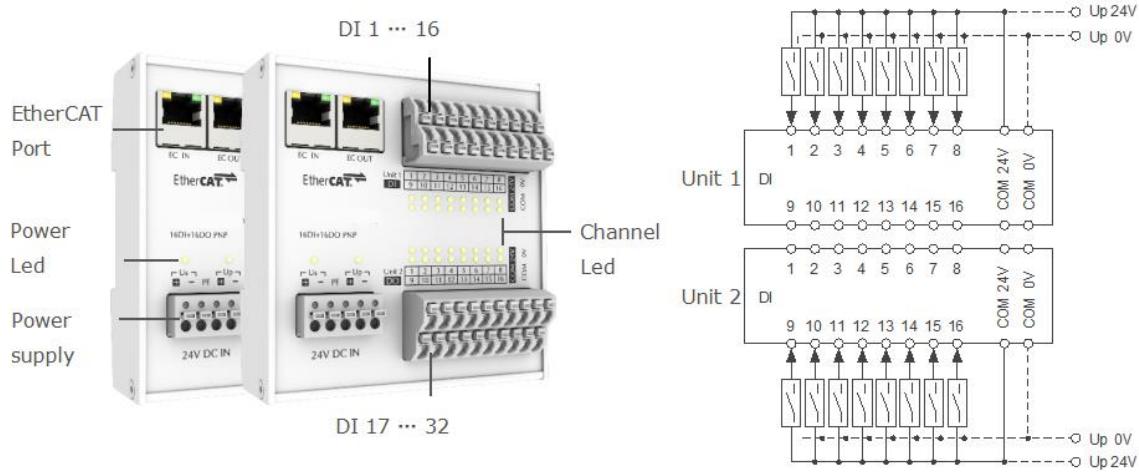


3.6 AX-13x6-T000

AX-13x6-T000(AX-1316-T000/AX-1326-T000)is an integrated power supply, communication port, digital input and output set as a whole module.It can be used to collect digital signals at the field end and transmit to the controller after electrical isolation. At the same time, the binary signal transmitted by the controller through communication can be output at the wiring port of the module after electrical isolation.And all input and out signals have corresponding status indicators.

3.6.1 Product Introduction

AX-1316-T000/AX-1326-T000digital input/output ports are PNP signal types.AX-1316-T000 is configured with a filter of 3ms to suppress jitter of mechanical switches and, for general applications, provide a more stable signal.AX-1326-T000 configure the time of 10μs filter, is suitable for the need for faster response speed.

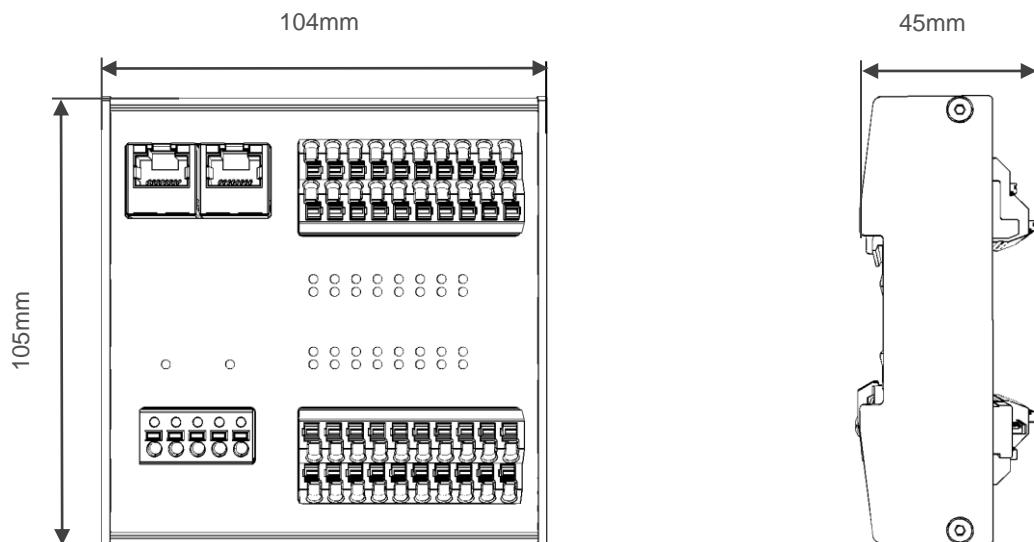


3.6.2 Technical data

Technical data	AX-1316-T000	AX-1326-T000
Bus protocol	EtherCAT	
Bus interface	2 x RJ45 (IN & OUT)	
Distributed clock (64bit)	-	
Voltage	24 VDC (-15 %/ +20 %)	
Us current	~ 100mA	
Up current	max.10A	
Digital input signal	PNP	
Input channel	16	
Input filtering	3ms	10µs
Input current consumption	Typically 3mA	
Input "0" voltage range	-3 ... +5V	
Input "1" voltage range	11 ... 30V	
Digital output signal	PNP	
Output channel	16	
Output drive current	0.5A/channel; Max 8A all channel	
Output switch action time	Typically T _{ON} : 15µs ; T _{OFF} : 300µs	
Output protection	Short circuit protection	
Load	Resistors, inductors, capacitors and lamps	
Electrical isolation	500V (communication and field voltage)	
Connector	In-line terminal	
Specification of wire	Hard wire: 0.2 ... 1.5mm ² , multi-strand soft wire: 0.2 ... 1.5mm ² , rod terminal:	

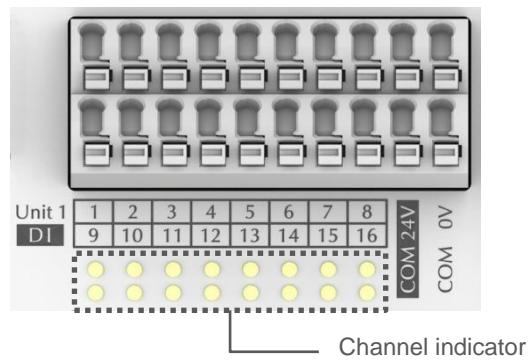
	0.2 ... 0.75mm ²
Dimensions (W x H x D)	approx 105 x 104 x 45mm
weight	~ 300g
Shell material	Aluminum alloy
Installation	35 mm DIN guide according to EN 60715
Location of installation	35 mm from top to bottom clearance
Operating temperature range	0 ... +60°C
Storage temperature range	-25 ... +70°C
Relative humidity	10 ... 95%
Electromagnetic compatibility	Comply with EN 61000-6-2/EN 61000-6-4
Protection class	IP30
Authentication	CE

3.6.3 Product size



3.6.4 IO wiring instructions

3.6.4.1 DI digital input



The sensor can be powered by COM port to realize single wire/two-wire/three-wire system wiring, thus simplifying the electrical wiring design. COM port is powered by Up. Users can choose to use COM port power supply according to the actual situation, or use other same source potential distribution for peripheral power supply.

■ Interface definition

Unit 1 DI	Direction	Notes
1 ... 16	Input	Digital input 1-16 channels
COM 0V	Output	The output of the power supply Up 0V is used for the power supply of the field digital input equipment
COM 24V	Output	The output of the power supply Up 24V is used for the power supply of the field digital input equipment

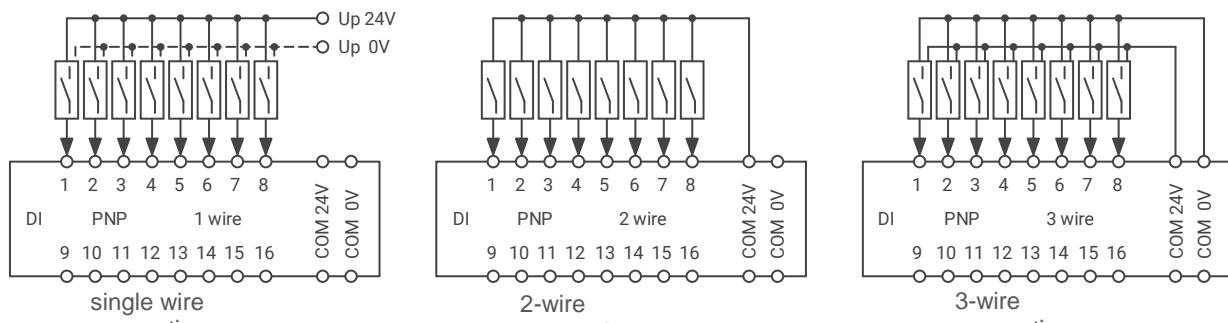
■ Indicator light

Unit 1 DI	Object	Color	Notes
1 ... 16	Digital input 1-16 channels	Green	Off: The input signal is inactivity. On: The input signal is activity.

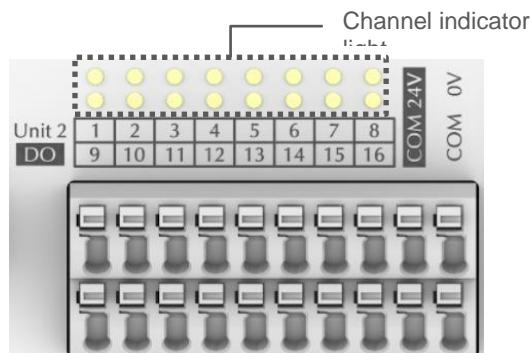
■ Wiring specification

Connector	In-line terminal, manually removed by pressing
Single core wire	0.2 ... 1.5mm ²
Multiple soft wires	0.2 ... 1.5mm ²
Crimp bar terminal	0.2 ... 0.75mm ²
Strip length	8 ... 9mm

■ Connection Technology(PNP)



3.6.4.2 DO digital output



The actuator can be powered by COM port to realize single wire/two-wire/three-wire system wiring, thus simplifying the electrical wiring design. COM port is powered by Up.

Users can choose to use COM port power supply according to the actual situation, or use other same source potential distribution for peripheral power supply.

■ Interface definition

Unit 2 DO	Direction	Digital output 1-16 channels
1 ... 16	Output	The output of the power supply Up 0V is used for the power supply of the field digital output equipment
COM 0V	Output	The output of the power supply Up 24V is used for the power supply of the field digital output equipment
COM 24V	Output	Notes

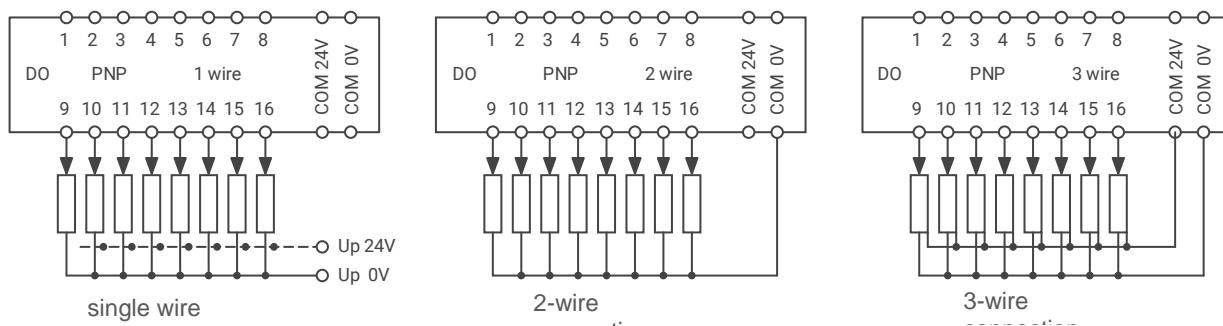
■ Indicator light

Unit 2 DO	Object	Color	Notes
1 ... 16	Digital output 1-16 channels	Green	Off: The input signal is inactivity. On: The input signal is activity.

■ Wiring specification

Connector	In-line terminal, manually removed by pressing
Single core wire	0.2 ... 1.5mm ²
Multiple soft wires	0.2 ... 1.5mm ²
Crimp bar terminal	0.2 ... 0.75mm ²
Strip length	8 ... 9mm

■ Wiring specification(PNP)



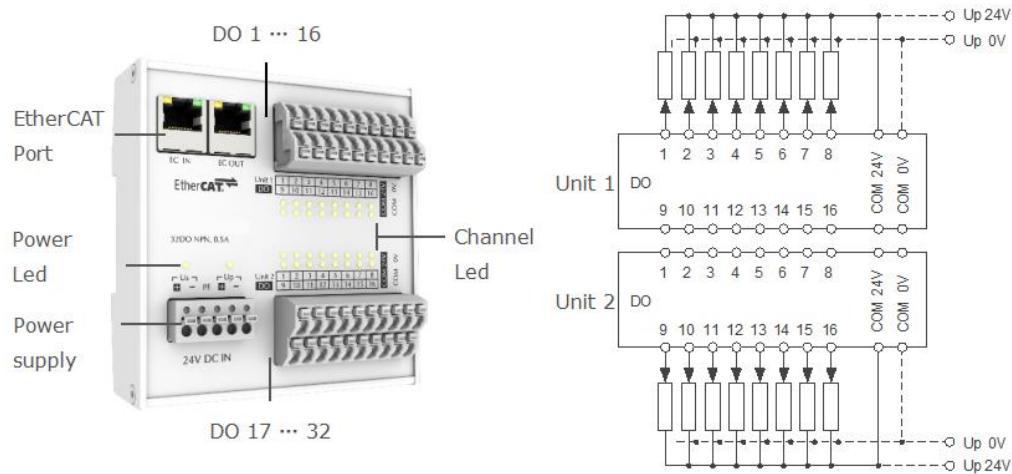
3.7 AX-2x10-T000

AX-2x10-T000(AX-2010-T000/AX-2310-T000) is an integrated power supply, communication port, digital output set as a whole module. At the same time, the binary signal transmitted by the

controller through communication can be output at the wiring port of the module after electrical isolation. And all out signals have corresponding status indicators.

3.7.1 Product Introduction

AX-2010-T000 digital output port for the NPN single types, AX-2310-T000 output ports are all PNP signal types. The output port can carry out the maximum continuous output drive current of 0.5A/ channel, which can satisfy most load devices, such as resistor, capacitive, inductive loads and lamps. All the output ports are designed to over-current protection, in the case of short circuit, the output circuit can close the port, after the short circuit state removed, back to normal state so the module will not suffer damage.

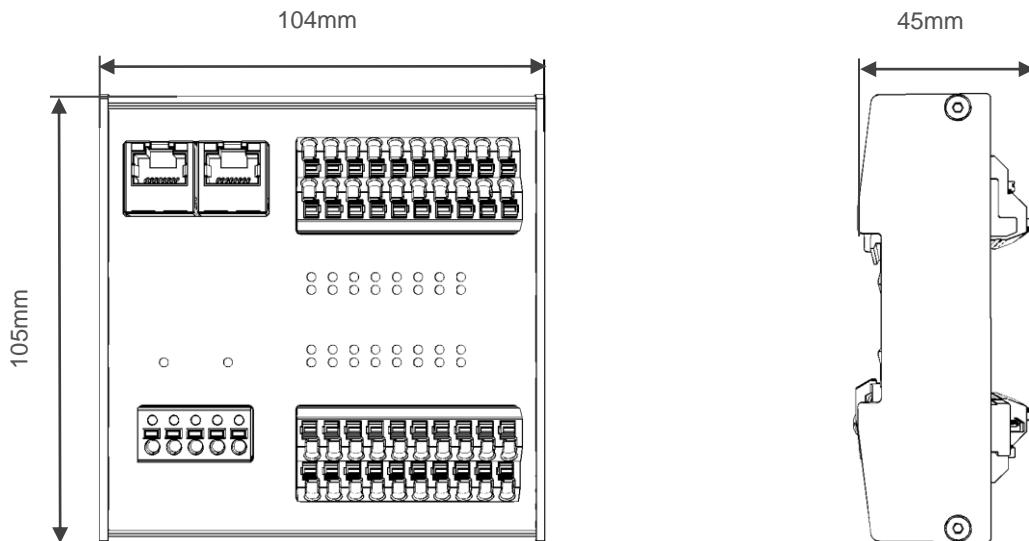


3.7.2 Technical data

Technical data	AX-2010-T000	AX-2310-T000
Bus protocol	EtherCAT	
Bus interface	2 x RJ45 (IN & OUT)	
Distributed clock (64bit)	-	
Voltage	24 VDC (-15 %/ +20 %)	
Us current	~ 100mA	
Up current	max.10A	
Digital output signal	NPN	PNP
Output channel	32	16
Output drive current	0.5A/channel; Max 10A all channel	
Output switch action time	Typically T _{ON} : 15μs ; T _{OFF} : 300μs	
Output protection	Short circuit protection	
Load	Resistors, inductors, capacitors and lamps	
Electrical isolation	500V (communication and field voltage)	

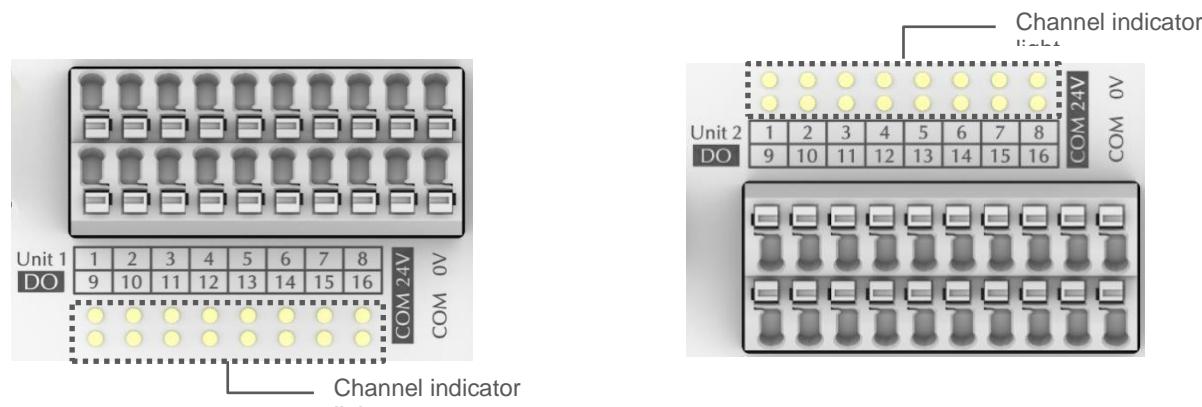
Connector	In-line terminal
Specification of wire	Hard wire: 0.2 ... 1.5mm ² , multi-strand soft wire: 0.2 ... 1.5mm ² , rod terminal: 0.2 ... 0.75mm ²
Dimensions (W x H x D)	approx 105 x 104 x 45mm
weight	~ 300g
Shell material	Aluminum alloy
Installation	35 mm DIN guide according to EN 60715
Location of installation	35 mm from top to bottom clearance
Operating temperature range	0 ... +60°C
Storage temperature range	-25 ... +70°C
Relative humidity	10 ... 95%
Electromagnetic compatibility	Comply with EN 61000-6-2/EN 61000-6-4
Protection class	IP30
Authentication	CE

3.7.3 Product size



3.7.4 IO wiring instructions

3.7.4.1 DO digital output



The actuator can be powered by COM port to realize single wire/two-wire/three-wire system wiring, thus simplifying the electrical wiring design. COM port is powered by Up. Users can choose to use COM port power supply according to the actual situation, or use other same source potential distribution for peripheral power supply.

■ Interface definition

Unit 1 DO	Direction	Digital output 1-16 channels
1 ... 16	Output	The output of the power supply Up 0V is used for the power supply of the field digital output equipment
COM 0V	Output	The output of the power supply Up 24V is used for the power supply of the field digital output equipment
COM 24V	Output	Notes
Unit 2 DO	Direction	Digital output 17-32 channels
1 ... 16	Output	The output of the power supply Up 0V is used for the power supply of the field digital output equipment
COM 0V	Output	The output of the power supply Up 24V is used for the power supply of the field digital output equipment
COM 24V	Output	Digital output 1-16 channels

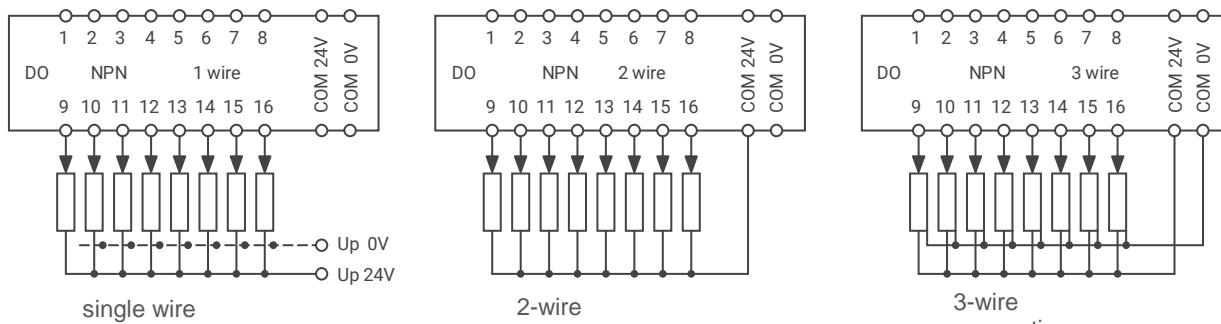
■ Indicator light

Unit 1 DO	Object	Color	Notes
1 ... 16	Digital output 1-16 channels	Green	Off:The input signal is inactivity. On:The input signal is activity.
Unit 2 DO	Object	Color	Notes
1 ... 16	Digital output 17-32 channels	Green	Off:The input signal is inactivity. On:The input signal is activity.

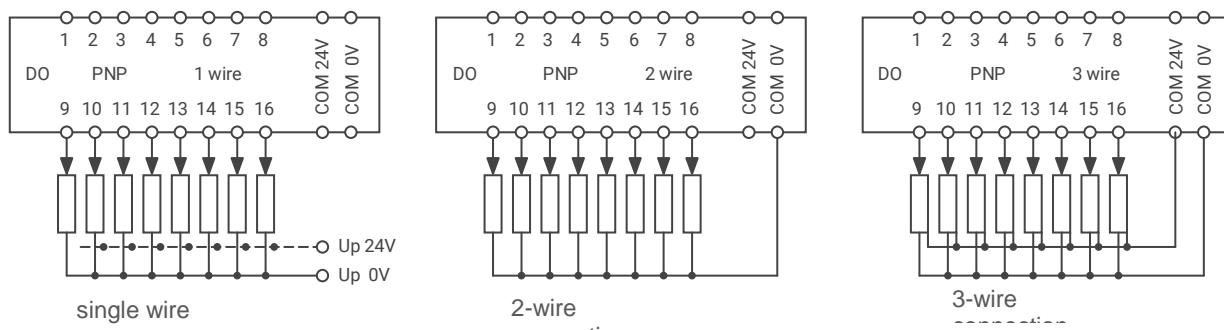
■ Wiring specification

Connector	In-line terminal, manually removed by pressing
Single core wire	0.2 ... 1.5mm ²
Multiple soft wires	0.2 ... 1.5mm ²
Crimp bar terminal	0.2 ... 0.75mm ²
Strip length	8 ... 9mm

■ Connection Technology
NPN



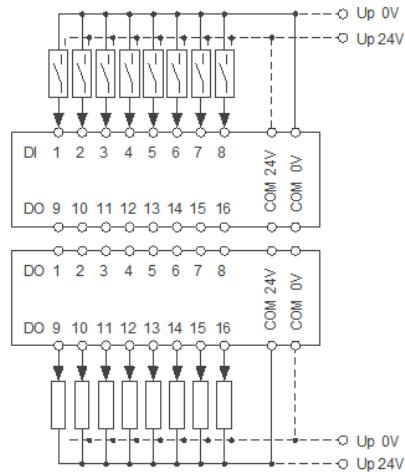
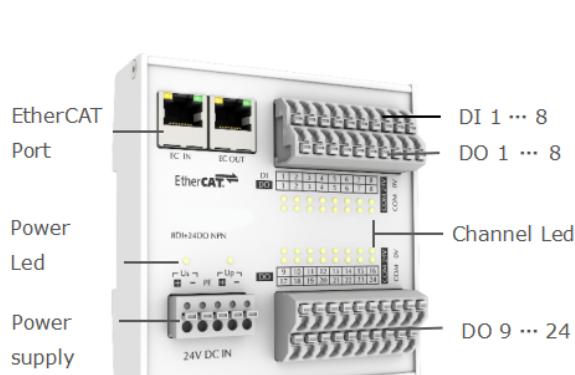
PNP

**3.8 AX-2x15-T000**

AX-2x15-T000(AX-2015-T000/AX-2315-T000)is an integrated power supply, communication port, digital input and output set as a whole module.It can be used to collect digital signals at the field end and transmit to the controller after electrical isolation.At the same time, the binary signal transmitted by the controller through communication can be output at the wiring port of the module after electrical isolation.And all output and input signals have corresponding status indicators.

3.8.1 Product Introduction

AX-2015-T000 digital signal input and output ports are NPN types, AX-2315-T000 digital quantity input/output port are PNP signal types.AX-2015-T000 is configured with a 3ms filter that suppresses jitter of mechanical switches and provides a more stable signal for general applications.

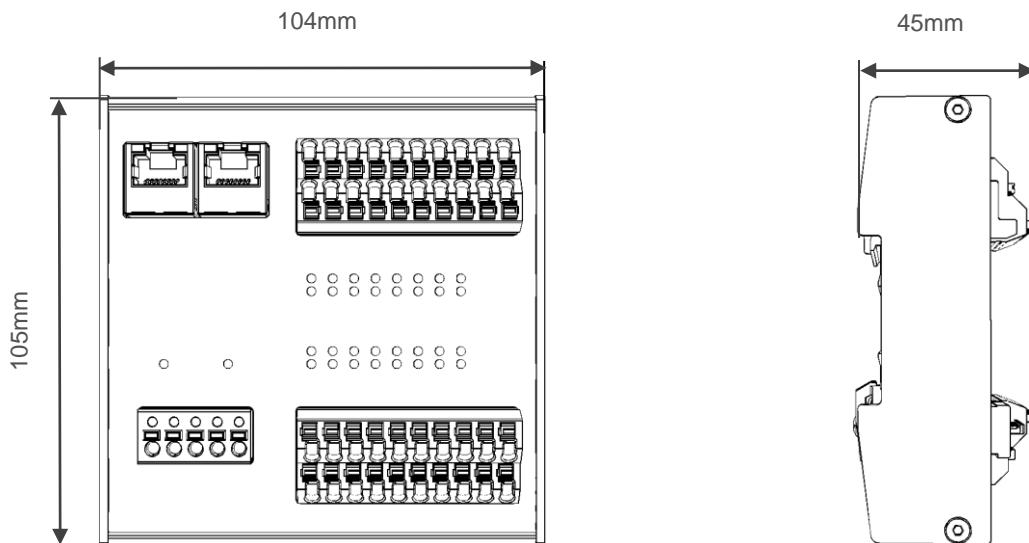


3.8.2 Technical data

Technical data	AX-2015-T000	AX-2315-T000
Bus protocol	EtherCAT	
Bus interface	2 x RJ45 (IN & OUT)	
Distributed clock (64bit)	-	
Voltage	24 VDC (-15 %/ +20 %)	
Us current	~ 100mA	
Up current	max.10A	
Digital input signal	NPN	PNP
Input channel	8	
Input filtering	3ms	
Input current consumption	Typically 3mA	
Input "0" voltage range	18 ... 30V	-3 ... +5V
Input "1" voltage range	0 ... 7V	11 ... 30V
Digital output signal	NPN	PNP
Output channel	24	
Output drive current	0.5A/channel; Max 10A all channel	
Output switch action time	Typically T _{ON} : 15µs ; T _{OFF} : 300µs	
Output protection	Short circuit protection	
Load	Resistors, inductors, capacitors and lamps	
Electrical isolation	500V (communication and field voltage)	
Connector	In-line terminal	

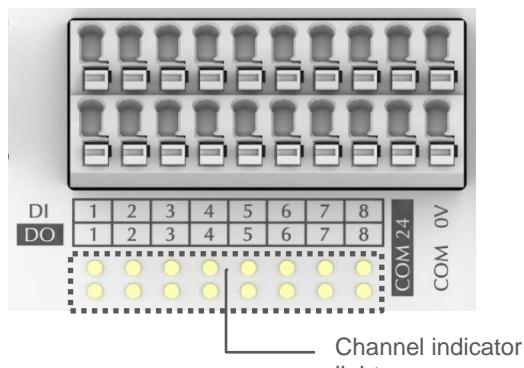
Specification of wire	Hard wire: 0.2 ... 1.5mm ² , multi-strand soft wire: 0.2 ... 1.5mm ² , rod terminal: 0.2 ... 0.75mm ²
Dimensions (W x H x D)	approx 105 x 104 x 45mm
weight	~ 300g
Shell material	Aluminum alloy
Installation	35 mm DIN guide according to EN 60715
Location of installation	35 mm from top to bottom clearance
Operating temperature range	0 ... +60°C
Storage temperature range	-25 ... +70°C
Relative humidity	10 ... 95%
Electromagnetic compatibility	Comply with EN 61000-6-2/EN 61000-6-4
Protection class	IP30
Authentication	CE

3.8.3 Product size



3.8.4 IO wiring instructions

3.8.4.1 DI digital input



The sensor can be powered by COM port to realize single wire/two-wire/three-wire system wiring, thus simplifying the electrical wiring design. COM port is powered by Up. Users can choose to use COM port power supply according to the actual situation, or use other same source potential distribution for peripheral power supply.

■ Interface definition

DI	Direction	Notes
1 ... 8	Input	Digital input 1-8 channels
COM 0V	Output	The output of the power supply Up 0V is used for the power supply of the field digital input equipment
COM 24V	Output	The output of the power supply Up 24V is used for the power supply of the field digital input equipment

■ Indicator light

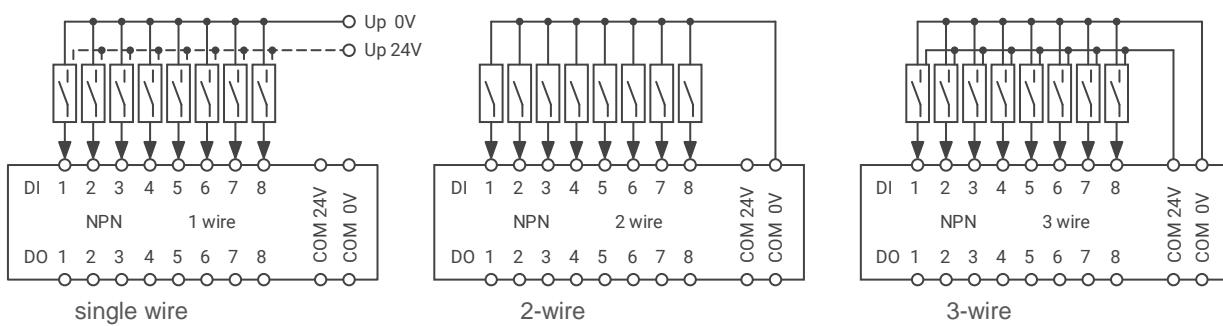
DI	Object	Color	Notes
1 ... 8	Digital input 1-8 channels	Green	Off: The input signal is inactivity. On: The input signal is activity.

■ Wiring specification

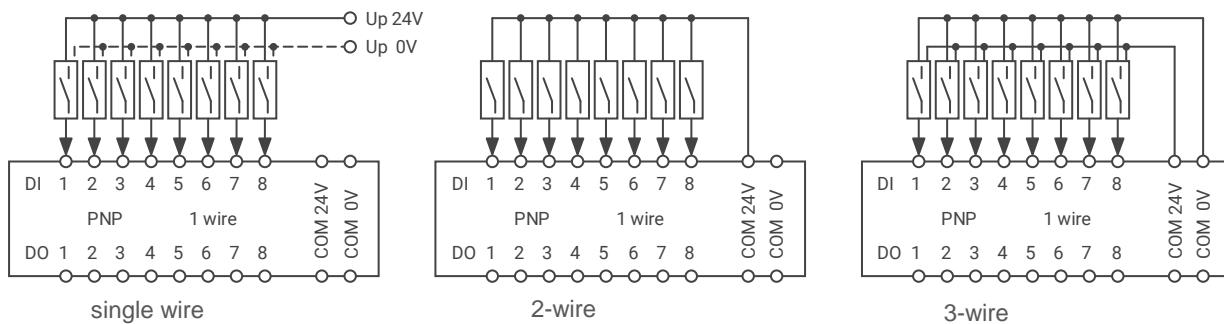
Connector	In-line terminal, manually removed by pressing
Single core wire	0.2 ... 1.5mm ²
Multiple soft wires	0.2 ... 1.5mm ²
Crimp bar terminal	0.2 ... 0.75mm ²
Strip length	8 ... 9mm

■ Connection Technology

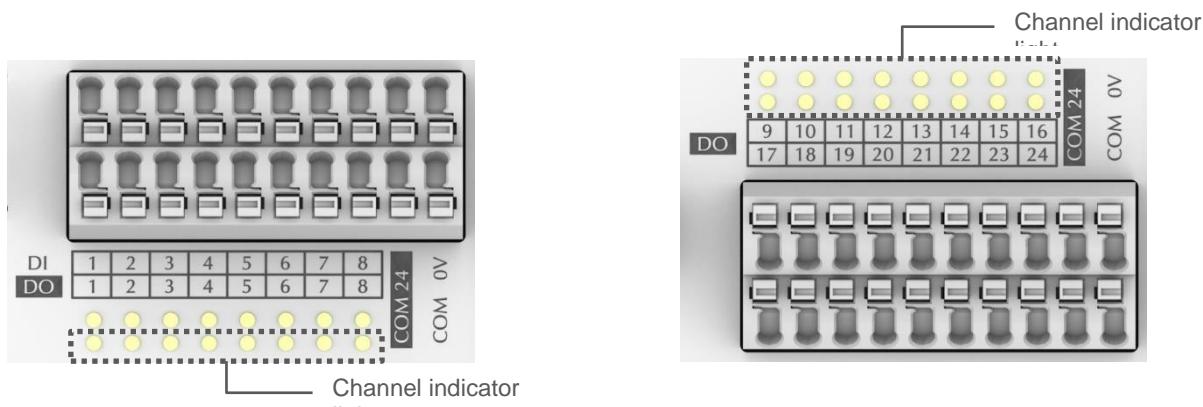
NPN



PNP



3.8.4.2 DO digital output



The actuator can be powered by COM port to realize single wire/two-wire/three-wire system wiring, thus simplifying the electrical wiring design. COM port is powered by Up.

Users can choose to use COM port power supply according to the actual situation, or use other same source potential distribution for peripheral power supply.

■ Interface definition

DO	Direction	Notes
1 ... 8	Output	Digital output 1-8 channels
9 ... 24	Output	Digital output 9-24 channels
COM 0V	Output	The output of the power supply Up 0V is used for the power supply of the field digital input equipment
COM 24V	Output	The output of the power supply Up 24V is used for the power supply of the field digital input equipment

■ Indicator light

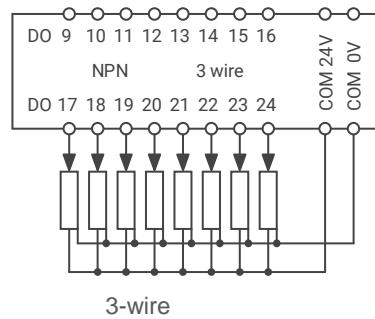
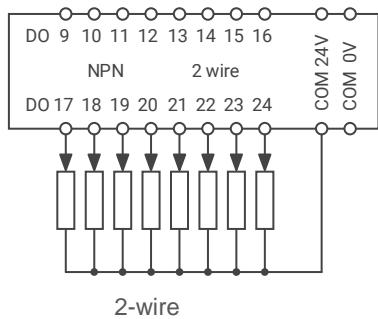
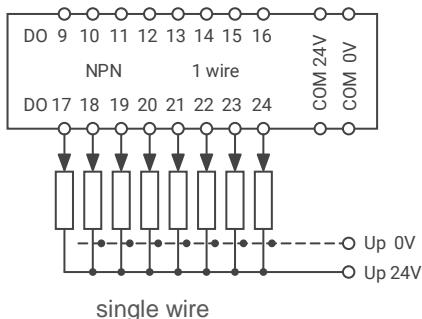
DO	Object	Color	Notes
1 ... 8	Digital output 1-8 channels		Off: The input signal is inactivity. On: The input signal is activity.
9 ... 24	Digital output 9-24 channels	Green	

■ Wiring specification

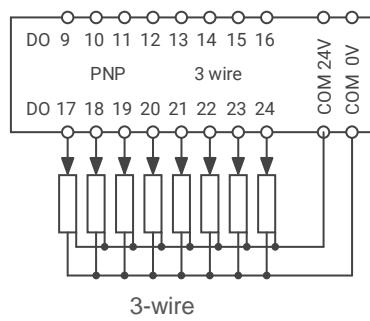
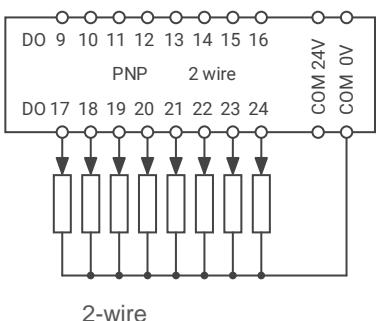
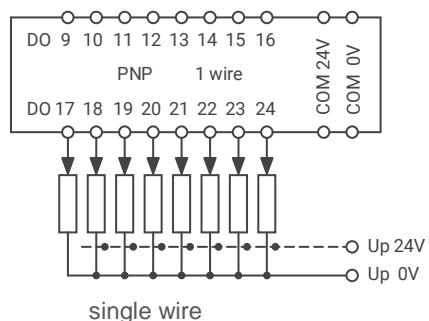
Connector	In-line terminal, manually removed by pressing
Single core wire	0.2 ... 1.5mm ²
Multiple soft wires	0.2 ... 1.5mm ²
Crimp bar terminal	0.2 ... 0.75mm ²

Strip length	8 ... 9mm
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■ Connection Technology
NPN



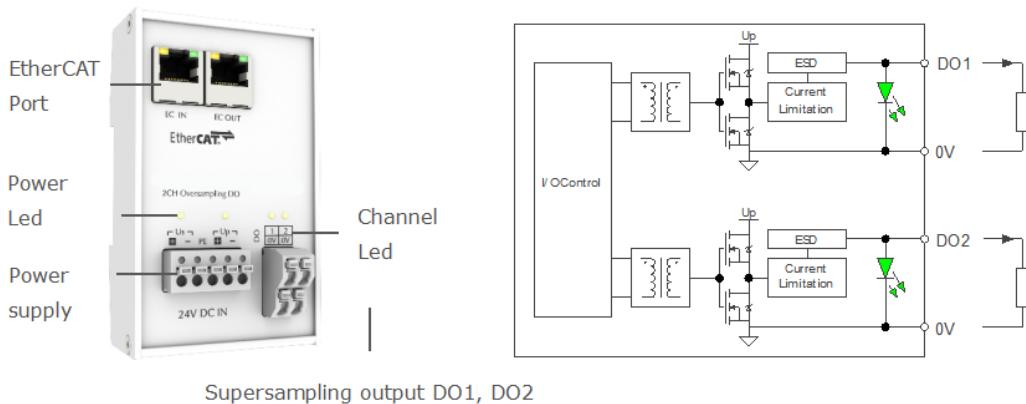
PNP

**3.9 AX-2342-T000**

AX-2342-T000 is an integrated power supply, communication port, digital output set as a whole module. At the same time, the binary signal transmitted by the controller through communication can be output at the wiring port of the module after electrical isolation. And all out signals have corresponding status indicators.

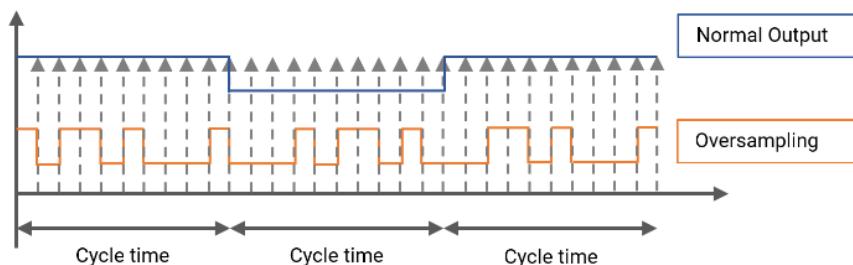
3.9.1 Product Introduction

Channel digital super-sampled output 24V, Push-Pull, 0.5A, T_{on}/T_{off} 1μs



Super-sampling technique:

The distributed clock is n times frequency, and each control cycle is divided into multiple frequency factors, so that more times of signal acquisition or control signal output can be completed in a control cycle.



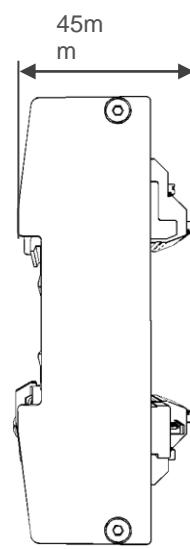
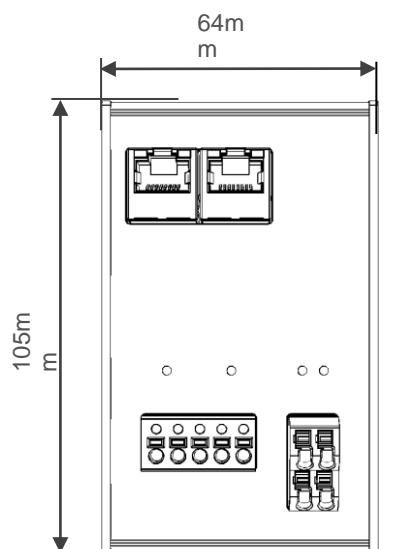
In one bus cycle, AX-2342 gets control data for n microcycles and takes control at the exact time. Combined with the 1μs I/O response speed of the module, the output rate of 1M times /s can be achieved. As a result, signal output such as PWM, monopulse and irregular pulse train can be easily realized. Compared with a single function module, AX-2342 has higher flexibility and wider application scenarios.

3.9.2 Technical data

Technical data	AX-2342-T000
Bus protocol	EtherCAT
Bus interface	2 x RJ45 (IN & OUT)
Distributed clock	64bit, double frequency = 8 x n (n = 1 ... 128) (64bit)
Voltage	24 VDC (-15 %/ +20 %)
Us current	~ 100mA
Up current	max.10A
Digital output signal	Push-Pull
Output channel	2

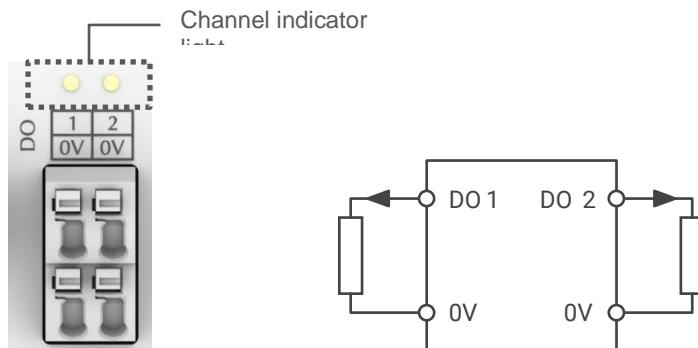
Output drive current	0.5A/channel; Max 1A all channel
Output switch action time	Typically $T_{ON}/T_{OFF} < 1\mu s$
Output pulse frequency	1 M times /s, recommended for signals below 100 KHZ
Output protection	Short circuit protection
Load	Resistors, inductors, capacitors and lamps
Electrical isolation	500V (communication and field voltage)
Connector	In-line terminal
Specification of wire	Hard wire: 0.2 ... 1.5mm ² , multi-strand soft wire: 0.2 ... 1.5mm ² , rod terminal: 0.2 ... 0.75mm ²
Dimensions (W x H x D)	approx 105 x 104 x 45mm
weight	~ 300g
Shell material	Aluminum alloy
Installation	35 mm DIN guide according to EN 60715
Location of installation	35 mm from top to bottom clearance
Operating temperature range	0 ... +60°C
Storage temperature range	-25 ... +70°C
Relative humidity	10 ... 95%
Electromagnetic compatibility	Comply with EN 61000-6-2/EN 61000-6-4
Protection class	IP30
Authentication	CE

3.9.3 Product size



3.9.4 IO wiring instructions

3.9.4.1 DO digital output



■ Interface definition

DO	Direction	Notes
1 ... 2	Output	Digital output 1-2 channels
0V	Output	The output of the power supply Up 0V is used for the power supply of the field digital input equipment

■ Indicator light

Unit 1 DO	Object	Color	Notes
1 ... 2	Digital output 1-2 channels	Green	Off:The input signal is inactivity. On:The input signal is activity.

■ Wiring specification

Connector	In-line terminal, manually removed by pressing
Single core wire	0.2 ... 1.5mm ²
Multiple soft wires	0.2 ... 1.5mm ²
Crimp bar terminal	0.2 ... 0.75mm ²
Strip length	8 ... 9mm

3.10 Ax-2734

AX-2734 is an EtherCAT interface of four axis servo interface module. Through higher levels of the EtherCAT master controller can simultaneously provide four servo drive with incremental encoder pulse/direction of control signal.

3.10.1 Product Introduction

AX-2734 provides four necessary control and status signals for each shaft channel, such as servo enable, reset, alarm, and ready signals. At the same time, it supports the access of two limit sensors and one origin sensor, and transmits the signal status of the sensors to the master station in real time.

AX-2734 control and status signals, EtherCAT communications interface and power supply interface has a corresponding LED lamp, can quickly state observation and diagnosis signal and instruction.

The rugged metal housing provides excellent electromagnetic shielding and heat dissipation, ensuring reliable applications in harsh environments.

Product Features

2 digital input signals for alarm and readiness
 2 digital output signals for reset and servo enable
 All digital signals can be switched to PNP or NPN
 EtherCAT interface
 Fast interface for limit sensor
 DIN35 guide rail installation

Applications

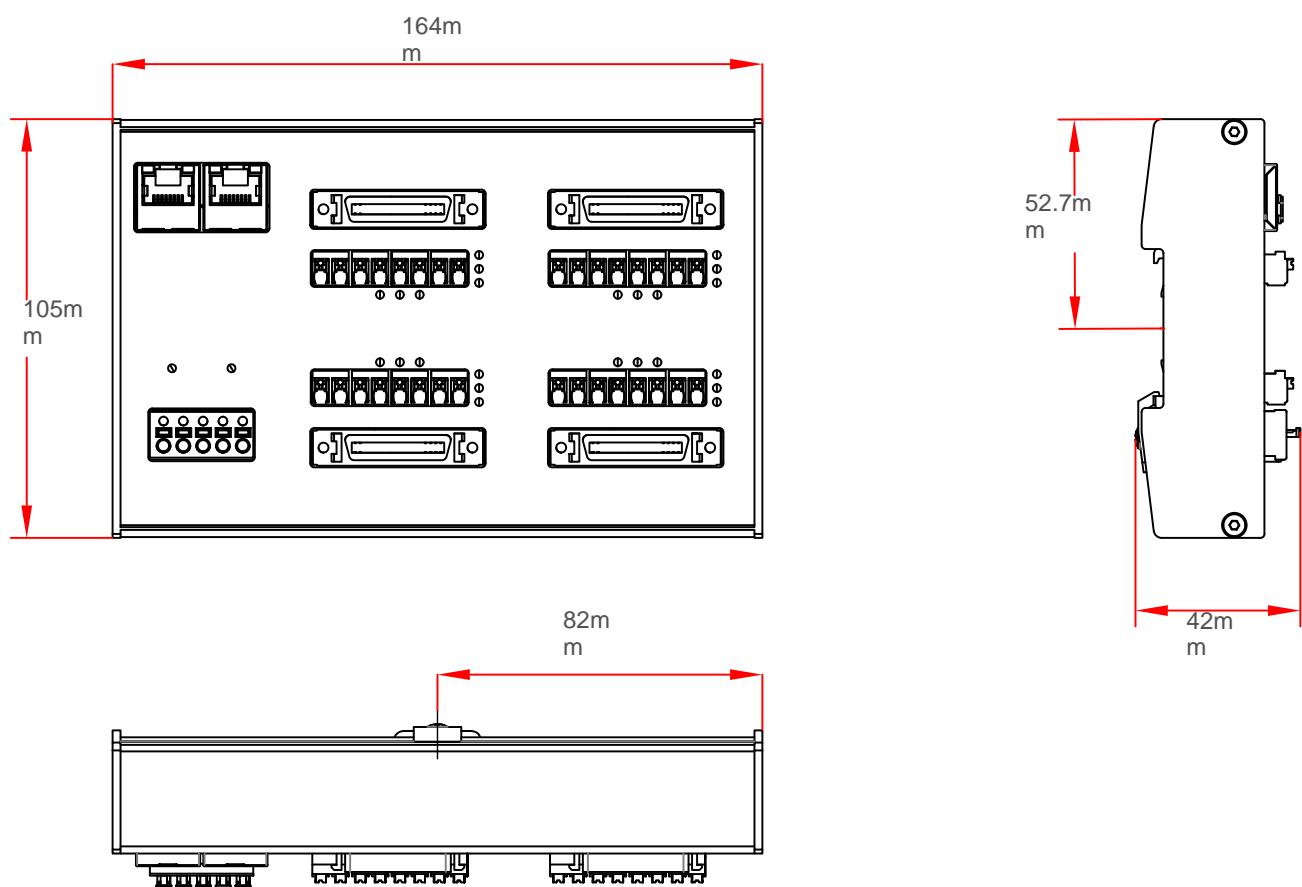
Motion control
 Factory automation

3.10.2 Technical data

Technical data	AX-2734
Voltage	24 VDC (-15 %/ +20 %)
Axis pulse sequence output	DS402
Output	4
Load	RS422 differential input, optical coupler, min 120Ω
Short circuit current	Short circuit protection
Frequency of output	0...1
Support mode	Pulse/direction, CW/CCW, A/B orthogonal
Type of drive	DC/AC servo drive, spindle drive, step drive
Encoder input	Incremental encoder (A/B)
Output channel	4
Encoder counter	32 bits per axis
Maximum input frequency	5
Digital input per axis	5 (Alert ready limit + limit - origin)
Input the “0” range	0~5 (PNP) / 18 ~ 30(NPN)
input the “1” range	11~30 (PNP) / 0 ~ 7(NPN)
Input current limit	Typically 3
Digital output per axis	2 (Servo enable and reset)
Type	NPN / PNP
Output current	Max. 50
Max voltage	60
Distributed clock (64bit)	support
Electrical isolation	500
Protection class	IP30
Operating temperature range	0 ~ + 60
Storage temperature range	- 25 ~ + 85

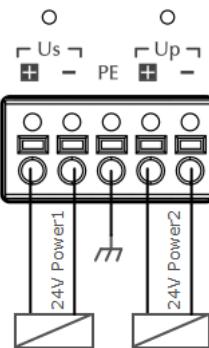
Relative humidity	10 ~ 95
Dimensions (W x H x D)	~ 164x 105 x 43
weight	~ 470
Shell material	Aluminum alloy
Installation	35mm DIN guide rail
EMC immunity/emission	Comply with EN 61000-6-2 / EN 61000-6-4

3.10.3 Product size



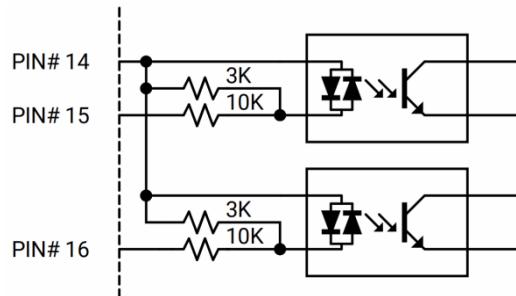
3.10.4 IO wiring instructions

Power supply connection:



The communication unit and the field side are powered separately, which can effectively ensure that the communication system is not affected by the power supply of the field side equipment.

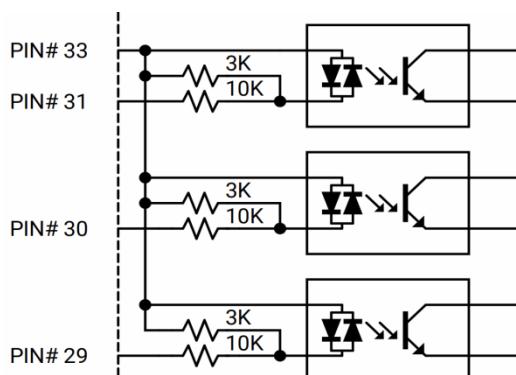
Servo signal input wiring:



Short connect PIN#14 and 0V to switch servo alert (PIN#15) and servo ready (PIN#16) to PNP (source type) input.

Short connect PIN#14 and 24V to switch servo alert (PIN#15) and servo ready (PIN#16) to NPN (leaky) input.

Sensor signal input wiring:

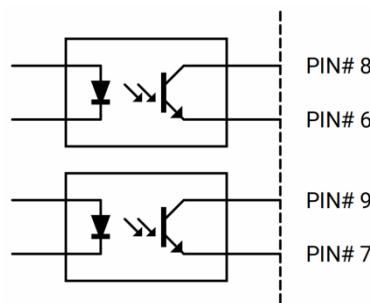


Short connect PIN#33 and 0V to switch the sensor signal (PIN#29\30\31) to PNP (source type) input.

Short connect PIN#33 and 24V to switch sensor signal (PIN#29\30\31) to NPN (leaky type) input.

* It is also possible to switch the input type of the sensor signal using the terminal.

Servo signal output wiring:



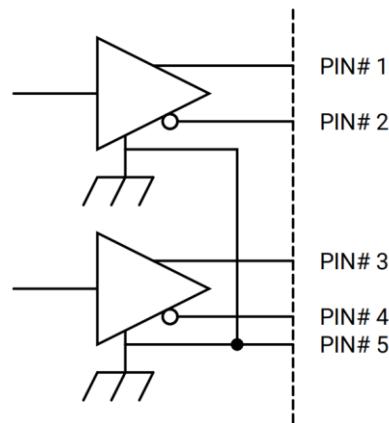
Short connect PIN#8 and 24V to switch servo alarm reset (PIN#6) to PNP (source type) output.

Short connect PIN#6 and 0V to switch servo alarm reset (PIN#8) to NPN (leaky) output.

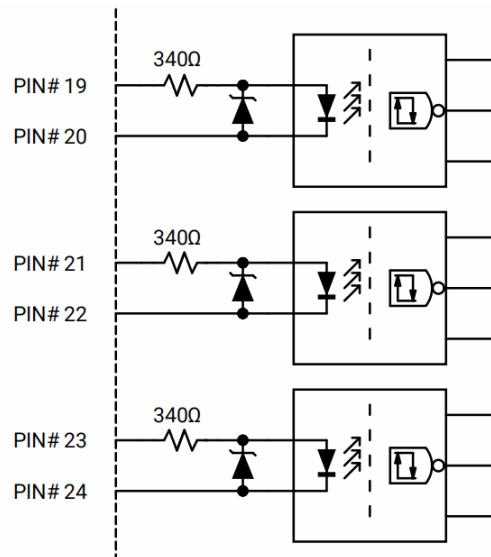
Short connect PIN#9 and 24V to turn on the servo (PIN#6) as PNP (source type) output.

Short connect PIN#7 and 0V to turn on the servo (PIN#8) as NPN (leakage type) output.

Pulse output wiring:



Encoder input wiring:



3.10.5 CoE object dictionary

Servo configuration object:

[Index 2n20 Servo control method axis n \(n=0... 3\)](#)

Index(hex)	Name	Description	Data Type	Permissions	Default values (hex)
2n20:00	Servo Control Method Axis n	Servo control configuration	UINT16	RW	0000
Bit 0	Ignore Fault	0: Check the fault input in the CiA 402 state machine 1: Ignore the fault input in the CiA 402 state machine	BOOL	RW	0
Bit 1	Ignore Ready	0: Check the ready input in the CiA 402 state machine 1: Ignore the ready input in the CiA 402 state machine	BOOL	RW	0

Index 2n22 Servo encoder feedback method axis n (n=0... 3)

Index(hex)	Name	Description	Data Type	Permissions	Default values (hex)
2n22:00	Servo Encoder Feedback Method Axis n	Encoder feedback configuration	UINT16	RW	0000
Bit 0	Direction	0: - 1: Reverse the encoder counter direction	BOOL	RW	0
Bit 1	No Feedback	0: Encoder signal feedback 1: Pulse command feedback (open loop)	BOOL	RW	0
Bit 2	Open loop PSO	0: Encoder signal feedback 1: Pulse command feedback (open loop)	BOOL	RW	0

Index 2n23 Servo pulse generation method axis n (n=0... 3)

Index(hex)	Name	Description	Data Type	Permissions	Default values (hex)
2n23:00	Servo Pulse Generation Method	Pulse generation configuration	UINT16	RW	0000
Bit 0	Direction	0: - 1: Reverse direction	BOOL	RW	0
Bit 1-3	-	-	BOOL	RW	0
Bit 4-5	Pulse generation type	00: CW/CCW 01: PLS/DIR 10: A/B	BOOL	RW	00

Index 2n30 Servo state polarity axis n (n=0... 3)

Index(hex)	Name	Description	Data Type	Permissions	Default values (hex)
2n30:00	Servo Status Polarity Axis n	Servo state polarity configuration	UINT16	RW	0001
Bit 0	Fault Polarity	0: On	BOOL	RW	1

		1: Off			
Bit 1	Ready Polarity	0: On 1: Off	BOOL	RW	0

Servo status monitoring object:*Index 5n30 Servo state axis n (n=0... 3)*

Index(hex)	Name	Description	Data Type	Permissions	Default values (hex)
5n30:00	Servo Status Axis n	Servo state	UINT16	RO	0000
Bit 0	Fault	0: Normal 1: Servo alarm	BOOL	RO	0
Bit 1	Ready	0: Servo ready 1: servo not ready	BOOL	RO	0

Index 5n31 Servo command axis n (n=0... 3)

Index(hex)	Name	Description	Data Type	Permissions	Default values (hex)
5n31:00	Servo Command Axis n	Servo command monitor	UINT16	RO	0000
Bit 0	Reset	0: Normal 1: Servo reset	BOOL	RO	0
Bit 1	Servo On	0: Servo enabled 1: Servo shutdown	BOOL	RO	0

Servo control object:

Index(hex)	Name	Description	Data Type	Permissions	PDO Mapping	Default values (hex)
6n40	Control word Axis n (for n=0...3 [Axis 0...3])	CiA402 Compatible objects	UINT16	RW	RxPDO	0000
6n41	Status word Axis n (for n=0...3 [Axis 0...3])		UINT16	RO	TxPDO	0000
6n60	Modes of Operation		UINT8	RW	-	0008
6n61	Modes of Operation Display		UINT8	RO	-	0008
6n64	Actual Position Value Axis n (for n=0...3 [Axis 0...3])		INT32	RO	TxPDO	00000000
6n7A	Target Position Value Axis n (for n=0...3 [Axis 0...3])		INT32	RO	RxPDO	00000000

Standard objects:

The standard object has the same meaning for all EtherCAT slaves.

Index 1000 device type

Index(hex)	Name	Description	Data Type	Permissions	Default values (hex)
1000:0	Device type	CiA402 slave device type	UNIT32	RO	402

Index 1001 Device name

Index(hex)	Name	Description	Data	Permissions	Default values
------------	------	-------------	------	-------------	----------------

			Type		(hex)
1001:0	Device name	Device name of EtherCAT slave	STRING	RO	
<i>Index 1009 hardware version</i>					
Index(hex)	Name	Description	Data Type	Permissions	Default values (hex)
1009:0	Hardware version	Hardware version of EtherCAT slave	STRING	RO	
<i>Index 100A software version</i>					
Index(hex)	Name	Description	Data Type	Permissions	Default values (hex)
100A:0	Software version	Firmware version of EtherCAT slave	STRING	RO	
<i>Index F008 parameter processing</i>					
Index(hex)	Name	Description	Data Type	Permissions	Default values (hex)
F008:0	Parameter Handling	Save or restore Settings	UINT8	RO	4
F008:01	Save Current Parameters	Input the parameters of the "0x1234" save changes	UINT16	RW	0000
F008:02	Restore Default Parameters	Input "0x1234" to reset all parameters to their delivery state. This object will then be reset to 0	UINT16	RW	0000
F008:03	Checksum		UINT16	RW	0000
F008:04	Vendor Reserve	reserve	UINT16	RW	0000

3.11 AX-3x25

AX-3x25-T000(AX-3125-T000/AX-3225-T000)is an integrated power supply, communication port, digital output set as a whole module. It can be used to collect common standard 0 to +10V, -10V to +10V, 0 to 20mA and 4 to 20mA analog voltage or current signals at the field end to convert into binary digital signals, and transmit to the controller through communication after electrical isolation.

At the same time, the binary digital signal transmitted by the controller through communication can be electrically isolated in the wiring port of the module for ordinary standard 0 to +10V, -10V to +10V, 0 to 20mA and 4 to 20mA analog voltage or current signal output.

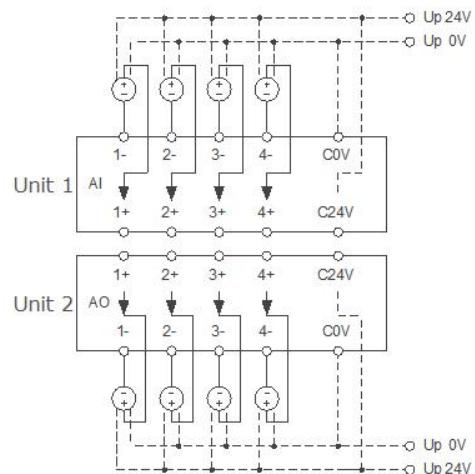
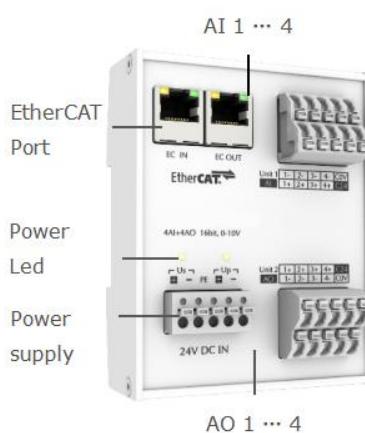
The digital circuit and the analog signal part of the module adopt strict isolation design, so that the analog signal can be more stable and accurate to be collected and output. The integrated power supply output wiring port can be easily adapted to different sensor and load types, providing a rich and flexible wiring scheme.

3.11.1 Product Introduction

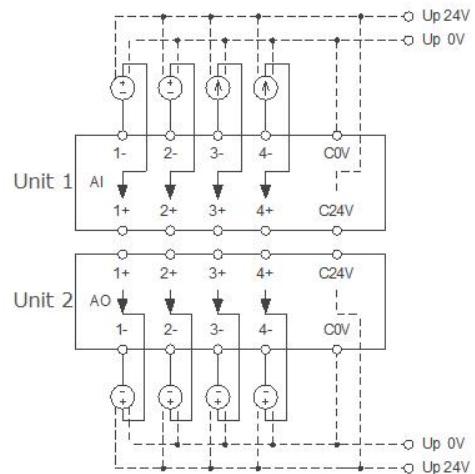
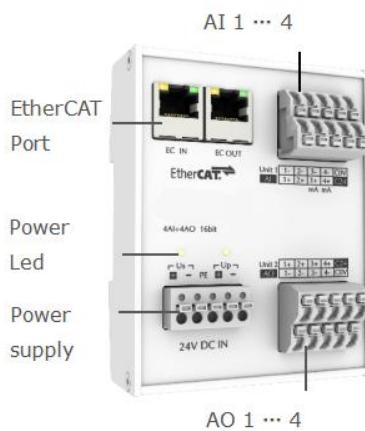
AX-3125-T000/AX-3225-T000 analog input ports, can to 0 to +10 v voltage of the single collection of signal is a 16-bit resolution, can be directly connected to the analog signal is negative side. The analog output port can perform 16-bit resolution 0 to +10V single-terminal voltage signal output, and the minimum load capacity of 2kΩ can meet the vast majority of load equipment. At the same time, all the output ports are designed to over-current protection, in the case of short circuit, the output circuit can close the port, after the short circuit state removed, back to normal state. As a result, the module will not suffer damage.

The analog input port of AX-3125-T042 can collect the single-terminal voltage signal of 0 to +10V and the single-terminal current signal of 0-20mA with 16-bit resolution, and the negative end of the signal can be directly connected to the analog ground. The analog output port can perform 16-bit resolution 0 to +10V single-terminal voltage signal output, and the minimum load capacity of 2k Ω can meet the vast majority of load equipment. At the same time, all the output ports are designed to over-current protection, in the case of short circuit, the output circuit can close the port, after the short circuit state removed, back to normal state. As a result, the module will not suffer damage.

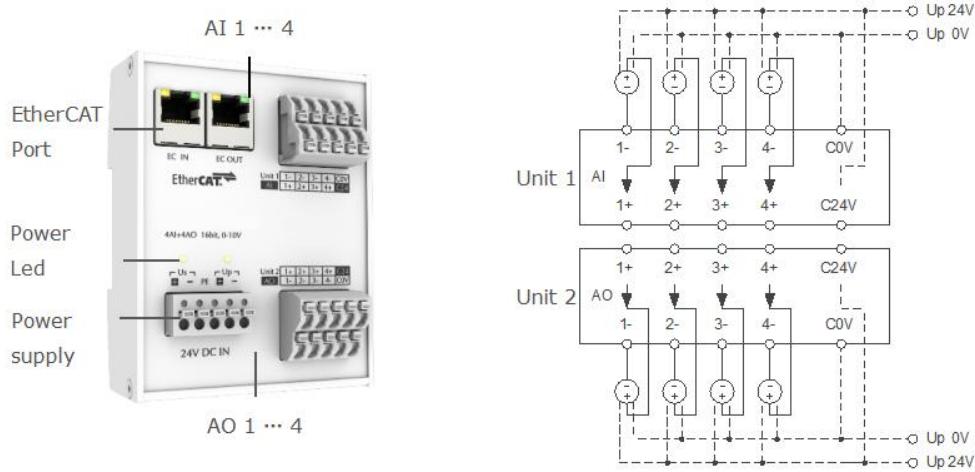
AX-3125-T000:



AX-3125-T042



AX-3225-T000



3.11.2 Technical data

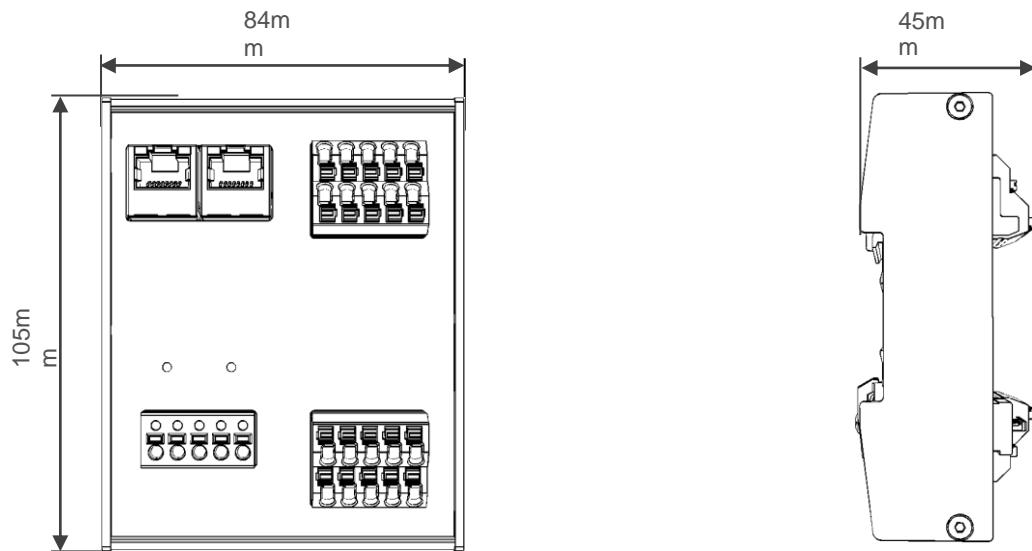
Technical data	AX-3125-T000	AX-3225-T000
Bus protocol	EtherCAT	
Bus interface	2 x RJ45 (IN & OUT)	
Distributed clock (64bit)	-	
Voltage	24V DC (-15 %/ +20 %)	
Us current	~ 120mA	
Up current	max.2A	
Analog input signal	0 ... +10V	-10 ... +10V
Input channels	4 (single end)	
Resolution	16bit	
Input acquisition accuracy	< 0.1% (0 ~ 55°C, Relative to full scale value)	
Input conversion time	~ 200μs	
Input filtering	10kHz	
Input impedance	~ 10MΩ	
Analog output signal	0 ... +10V	-10 ... +10V
Output channels	4 (single end)	
Resolution	16bit	
Output acquisition accuracy	< 0.1% (0 ~ 55°C, Relative to full scale value)	
Output conversion time	~ 200μs	
Output drive load	> 2kΩ	
Output protection	Short circuit protection	

Electrical isolation	500V (communication and field voltage)
Connector	In-line terminal
Specification of wire	Hard wire: 0.2 ... 1.5mm ² , multi-strand soft wire: 0.2 ... 1.5mm ² , rod terminal: 0.2 ... 0.75mm ²
Dimensions (W x H x D)	~ 105 x 84 x 45mm
weight	~ 300g
Shell material	Aluminum alloy
Installation	35 mm DIN guide according to EN 60715
Location of installation	35 mm from top to bottom clearance
Operating temperature range	0 ... +60°C
Storage temperature range	-25 ... +70°C
Relative humidity	10 ... 95%
Electromagnetic compatibility	Comply with EN 61000-6-2/EN 61000-6-4
Protection class	IP30
Authentication	CE

Technical data	AX-3125-T042	
Bus protocol	EtherCAT	
Bus interface	2 x RJ45 (IN & OUT)	
Distributed clock (64bit)	-	
Voltage	24V DC (-15 %/ +20 %)	
Us current	~ 120mA	
Up current	max.2A	
Analog input signal	0 ... +10V	0...20mA
Input channels	2 (single end)	2 (single end)
Resolution	16bit	
Input acquisition accuracy	< 0.1% (0 ~ 55°C, Relative to full scale value)	
Input conversion time	~ 200μs	
Input filtering	10kHz	
Input impedance	~ 10MΩ (0 ... +10V)	200Ω (0 ... 20mA)
Analog output signal	0 ... +10V	
Output channels	4 (single end)	
Resolution	16bit	
Output acquisition	< 0.1% (0 ~ 55°C, Relative to full scale value)	

accuracy	
Output conversion time	~ 200µs
Output drive load	> 2kΩ
Output protection	Short circuit protection
Electrical isolation	500V (communication and field voltage)
Connector	In-line terminal
Specification of wire	Hard wire: 0.2 ... 1.5mm ² , multi-strand soft wire: 0.2 ... 1.5mm ² , rod terminal: 0.2 ... 0.75mm ²
Dimensions (W x H x D)	~ 105 x 84 x 45mm
weight	~ 300g
Shell material	Aluminum alloy
Installation	35 mm DIN guide according to EN 60715
Location of installation	35 mm from top to bottom clearance
Operating temperature range	0 ... +60°C
Storage temperature range	-25 ... +70°C
Relative humidity	10 ... 95%
Electromagnetic compatibility	Comply with EN 61000-6-2/EN 61000-6-4
Protection class	IP30
Authentication	CE

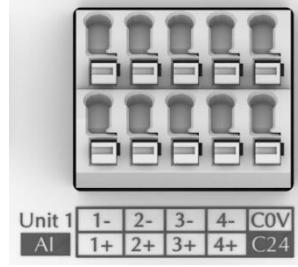
3.11.3 Product size



3.11.4 IO wiring instructions

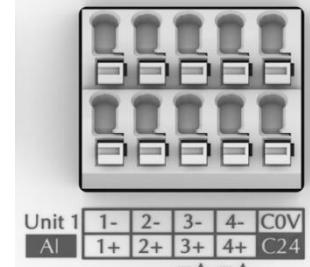
3.11.4.1 AI analog signal input

AX-3125-



AX-3225-

AX-3125-



The sensor can be powered by COM port to realize single wire/two-wire/three-wire system wiring, thus simplifying the electrical wiring design. COM port is powered by Up.

Users can choose to use COM port power supply according to the actual situation, or use other same source potential distribution for peripheral power supply.

■ Interface definition

Unit 1 AI	Direction	Notes
1+ ... 4+	Input	Analog 1... 4-channel single-ended signal input
1- ... 4-	Input	Analog 1... 4-channel single-ended signal ground (internal to Up 0V single-point ground)
C0V	Output	The output of the power supply Up 0V is used for the power supply of the field digital input equipment
C24V	Output	The output of the power supply Up 24V is used for the power supply of the field digital input equipment

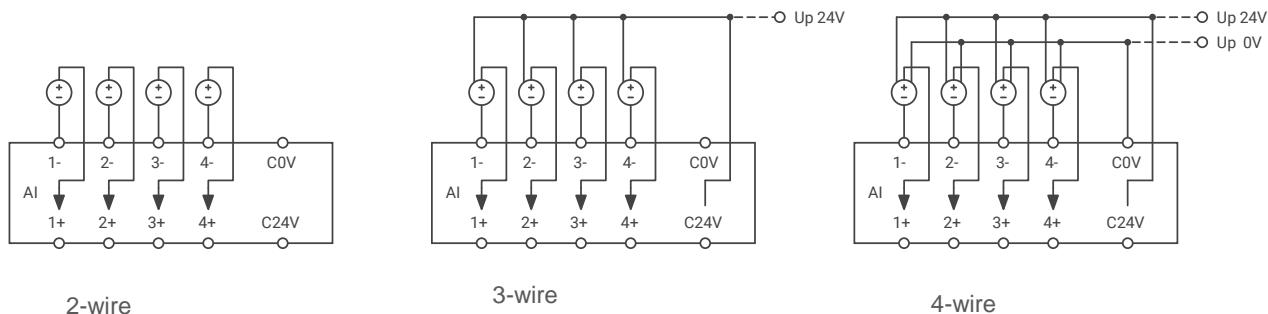
■ Wiring specification

Connector	In-line terminal, manually removed by pressing
Single core wire	0.2 ... 1.5mm ²

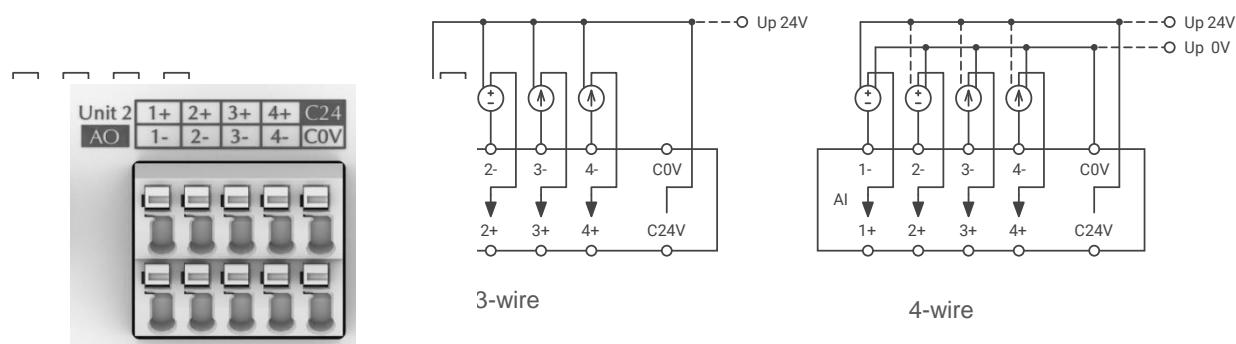
Multiple soft wires	0.2 ... 1.5mm ²
Crimp bar terminal	0.2 ... 0.75mm ²
Strip length	8 ... 9mm

■ Connection Technology

4 channel voltage:



2 channel voltage +2 channel current



3.11.4.2 AO analog signal output

The actuator can be powered by COM port to realize single wire/two-wire/three-wire system wiring, thus simplifying the electrical wiring design. COM port is powered by Up.

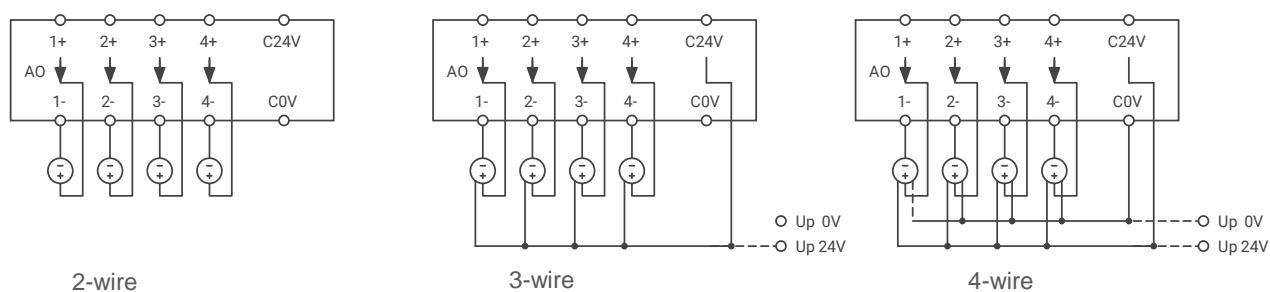
Users can choose to use COM port power supply according to the actual situation, or use other same source potential distribution for peripheral power supply

■ Interface definition

Unit 2 DO	Direction	Notes
1+ ... 4+	Output	Analog 1... 4-channel single-ended signal output Analog 1... 4-channel single-ended signal ground (internal to Up 0V single-point ground)
1- ... 4-	Output	Analog 1... 4-channel single-ended signal output Analog 1... 4-channel single-ended signal ground (internal to Up 0V single-point ground)
C0V	Output	The output of the power supply Up 0V is used for the power supply of the field digital input equipment

C24V	Output	The output of the power supply Up 24V is used for the power supply of the field digital input equipment
■ Wiring specification		
Connector	In-line terminal, manually removed by pressing	
Single core wire	0.2 ... 1.5mm ²	
Multiple soft wires	0.2 ... 1.5mm ²	
Crimp bar terminal	0.2 ... 0.75mm ²	
Strip length	8 ... 9mm	

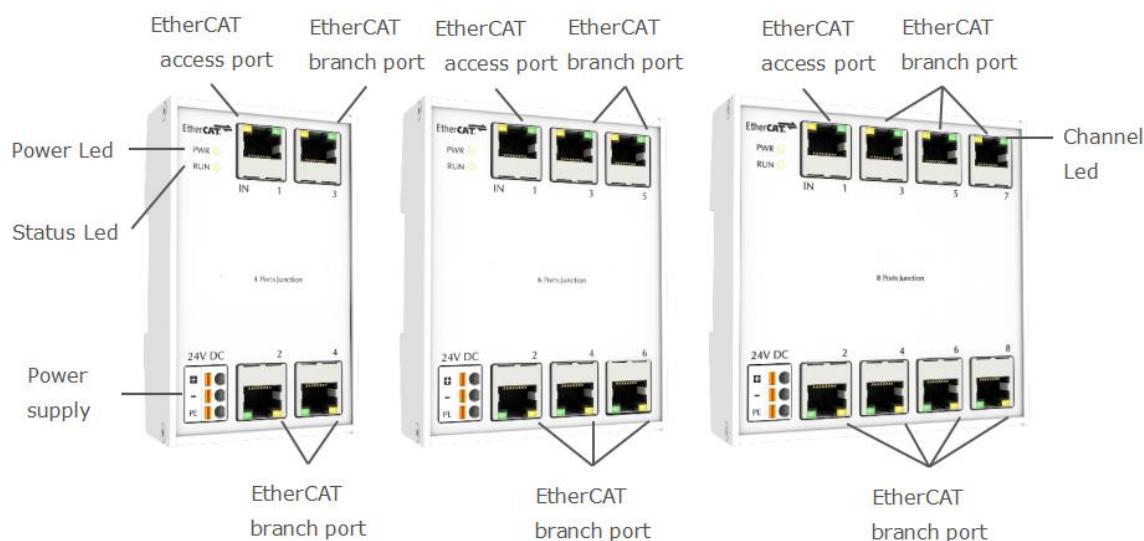
■ Connection Technology



3.12 AX-912x-0000

AX-9124, AX-9126, and AX-9128 bus branches provide 4, 6, and 8 port EtherCAT network cascade schemes, respectively, allowing easy and fast network segmentation and topology, enabling EtherCAT bus to support almost any topology structure such as line, tree, or star. DIN rail installation is in line with the needs of industrial installation. The flat structure can effectively reduce the outlet height of the Ethernet cable, and more installation locations can be selected. The rugged metal housing provides excellent electromagnetic shielding and heat dissipation, ensuring reliable applications in harsh environments.

3.12.1 Product Introduction



4, 6, 8 port splitter, EtherCAT, 100Mbit/s, 24V DC, RJ45

All branches of port 1 is EtherCAT network input port, the port is branches extend interface, used to connect an additional node from the stand, such as I/O module, coupler, drives, etc. All RJ45 ports are equipped with LED indicators to display the network connection status. With the appropriate master AX-9124, AX-9126, AX-9128 bus splicer can be used to connect and disconnect the hot connection function when the network is running, but the bus splicer can not be used as a normal switch, only suitable for the branch topology of the EtherCAT network. With AX flat integrated I/O module and MK5 distributed I/O module, distributed slave routing can be realized, which effectively reduces the number of network cables in traditional connection mode.

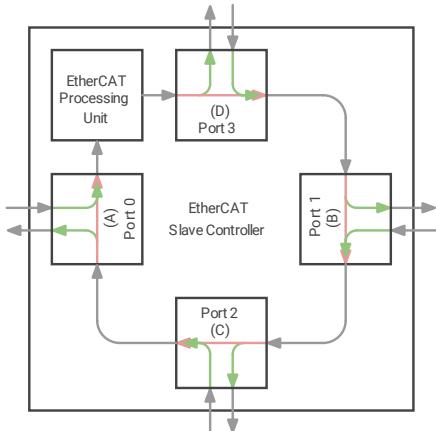
Module	Branchable port	Connector	Notes
AX-9124-0000	2/3		
AX-9126-0000	2/3/4/5	RJ45	
AX-9128-0000	2/3/4/5/6/7		

3.12.2 Technical data

Technical data	AX-9124-0000	AX-9126-0000	AX-9128-0000
Bus protocol	EtherCAT		
Role in the system	EtherCAT topology Coupling branch		
Bus interface	4 x RJ45	6 x RJ45	8 x RJ45
Transmission medium	Ethernet/EtherCAT shielded cable no less than CAT 5		
Distributed clock (64bit)	support		
Delay	~ 1 µs per port		
Voltage	24 VDC (-15 %/ +20 %)		
Us current	~ 100mA	~ 140mA	~ 180mA
Power supply mode	Through the 3P connection terminal (+, -, PE)		
Specification of wire	Hard wire: 0.2 ... 1.5mm ² , multi-strand soft wire: 0.2 ... 1.5mm ² , rod terminal: 0.2 ... 0.75mm ²		
Dimensions (W x H x D)	~ 105 x 64 x 33mm	~ 105 x 84 x 33mm	~ 105 x 104 x 33mm
weight	~ 185g	~270g	~350g
Shell material	Aluminum alloy		
Installation	35 mm DIN guide according to EN 60715		
Location of installation	35 mm from top to bottom clearance		
Operating temperature range	0 ... +60°C		
Storage temperature range	-25 ... +70°C		
Relative humidity	10 ... 95%		
Electromagnetic	符合 EN 61000-6-2/EN 61000-6-4		

compatibility	
Protection class	IP30
Authentication	CE

3.12.3 Branching technique

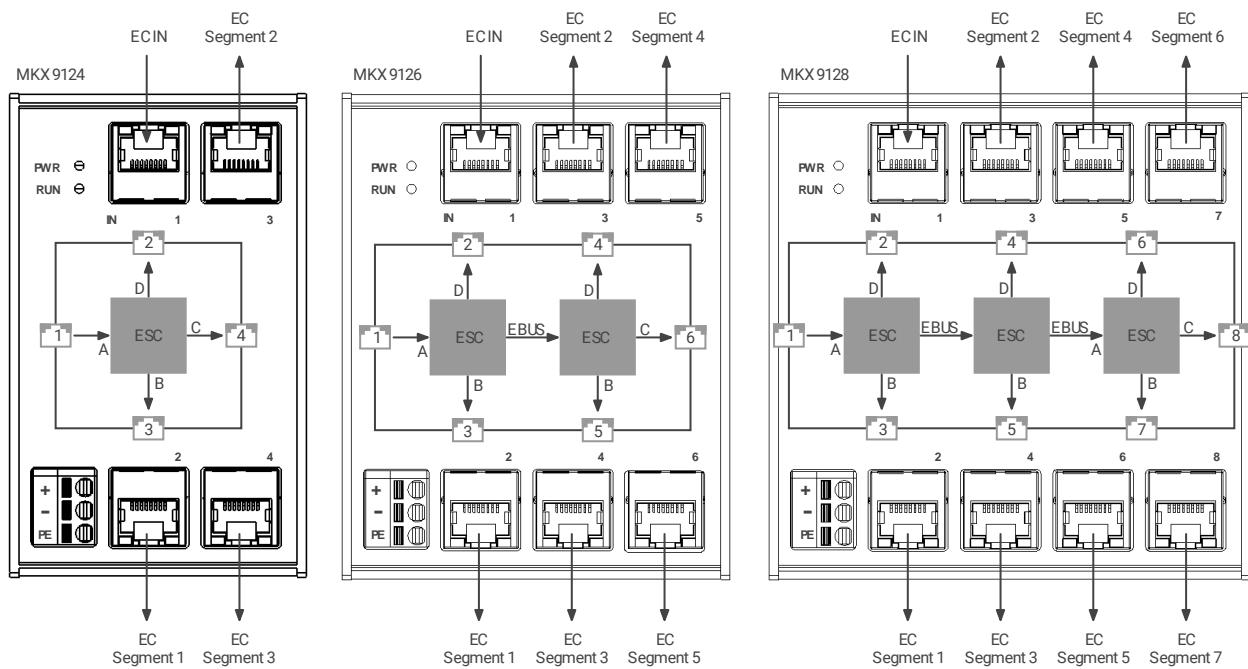


EtherCAT branchers use the branch technology based on the port forwarding feature of ESC. A multi-port brancher consists of multiple ESCs internally cascaded together. For example, AX-9126 is composed of two ESC cascades internally, and AX-9128 is composed of three ESC cascades internally. Since the data flow inside the ESC limits the port direction, data must be input from port A, so the first port of all branchers must flow into the port as the data flow of EtherCAT.

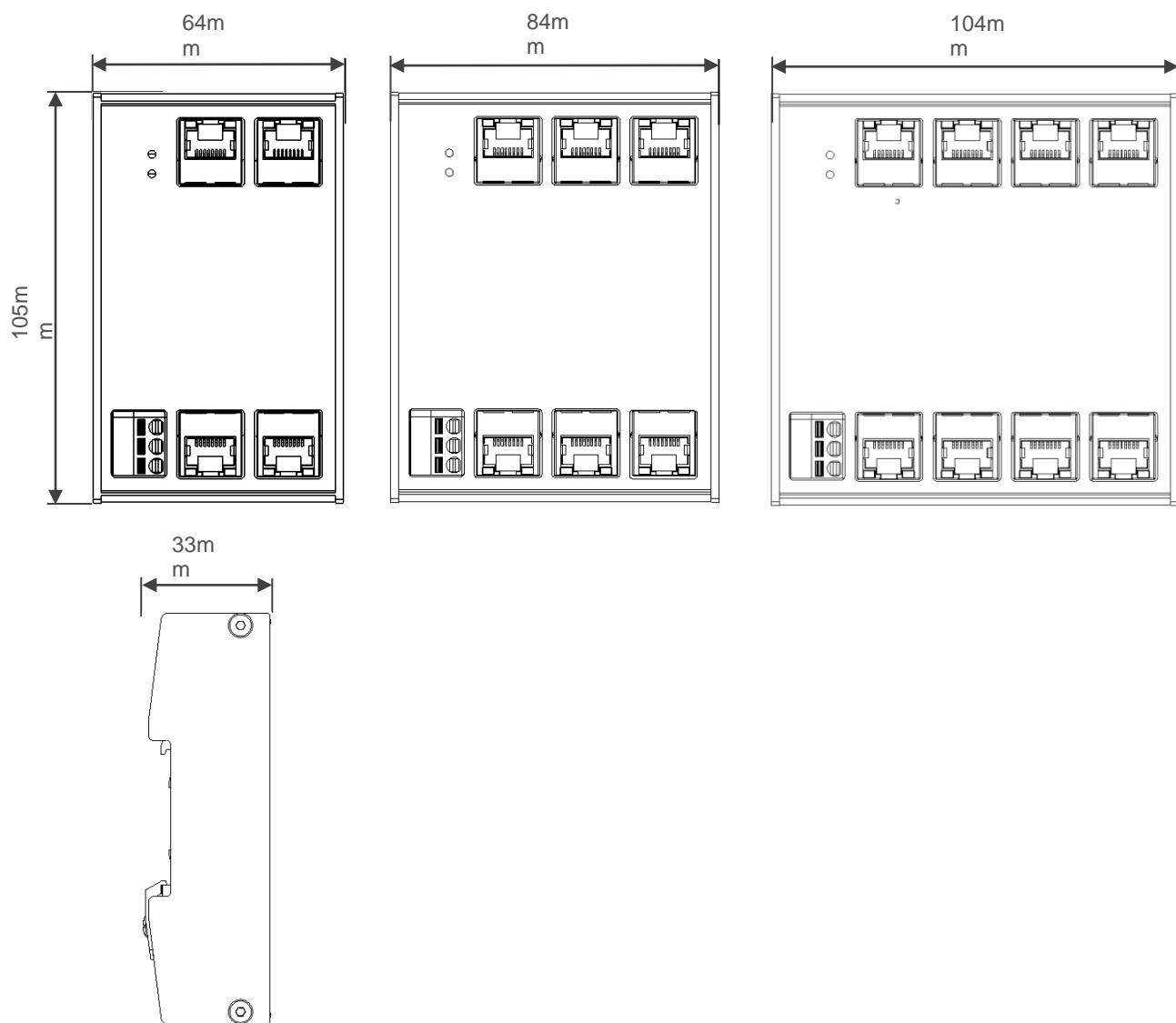
AX-912x is a splitter has no operational input and output function of the system, so the splitter can only be used for:

- As a fast Ethernet branch node in the EtherCAT network, it is used to connect other EtherCAT I/O, drives, or any other EtherCAT slave device
- As the reference clock for distributed clocks (usually using the clock of the first slave device in the EtherCAT network as the reference clock)

AX-912x so label represents the flow of data sequence, and also is the branch of the data stream transmission sequence. The following diagram illustrates the correspondence between the brancher port and the ESC port.



3.12.4 Product size

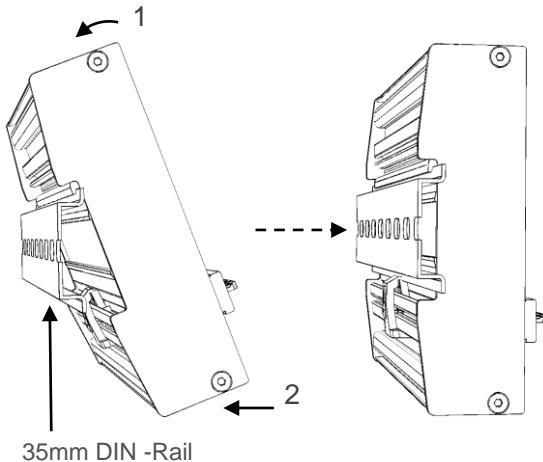


4. Disassembly and installation

Please power off the system before installation or disassembly. Do not operate with electricity.

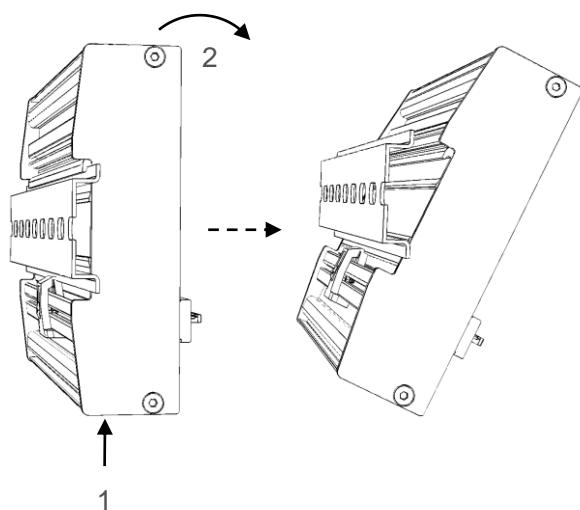
4.1 Installation

1. Hook the upper edge of the DIN rail with the bottom of the module and hang it on the upper edge of the DIN rail
2. Press the lower part of the module in the direction of the guide rail, so that the bottom nylon buckle slides into the rear of the guide rail and locks the buckle;



4.2 Disassembly

1. Push up from the bottom of the module, so that the bottom hook of the module is higher than the top edge of the DIN guide rail;
2. Pull the upper part of the module out from the DIN guide rail to complete the disassembly;



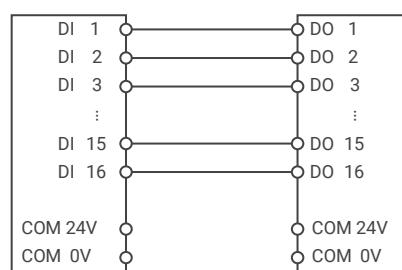
5. Application description

5.1 First configuration

When used for the first time, it is necessary to import the XML configuration file from the slave into the master. For the specific scheme, please refer to the master manual of each manufacturer.

5.2 Wiring and power supply

1. Install and connect the cable, connect the power supply, and use the shielded CAT5 Ethernet cable to connect the module to the master.
2. Docking the input and output channels of the module, refer to below.



Input output docking

3. Start the power supply and scan the slave through the master.
4. The master sets 1 to 16 bits of DO through PDO operation.
5. Observe the corresponding channels of input and output indicator on the module as the main operating light in turn
6. Through the master monitoring DI corresponding 16 bit, as the output of the operation, in turn, get 1.

6. FAQ