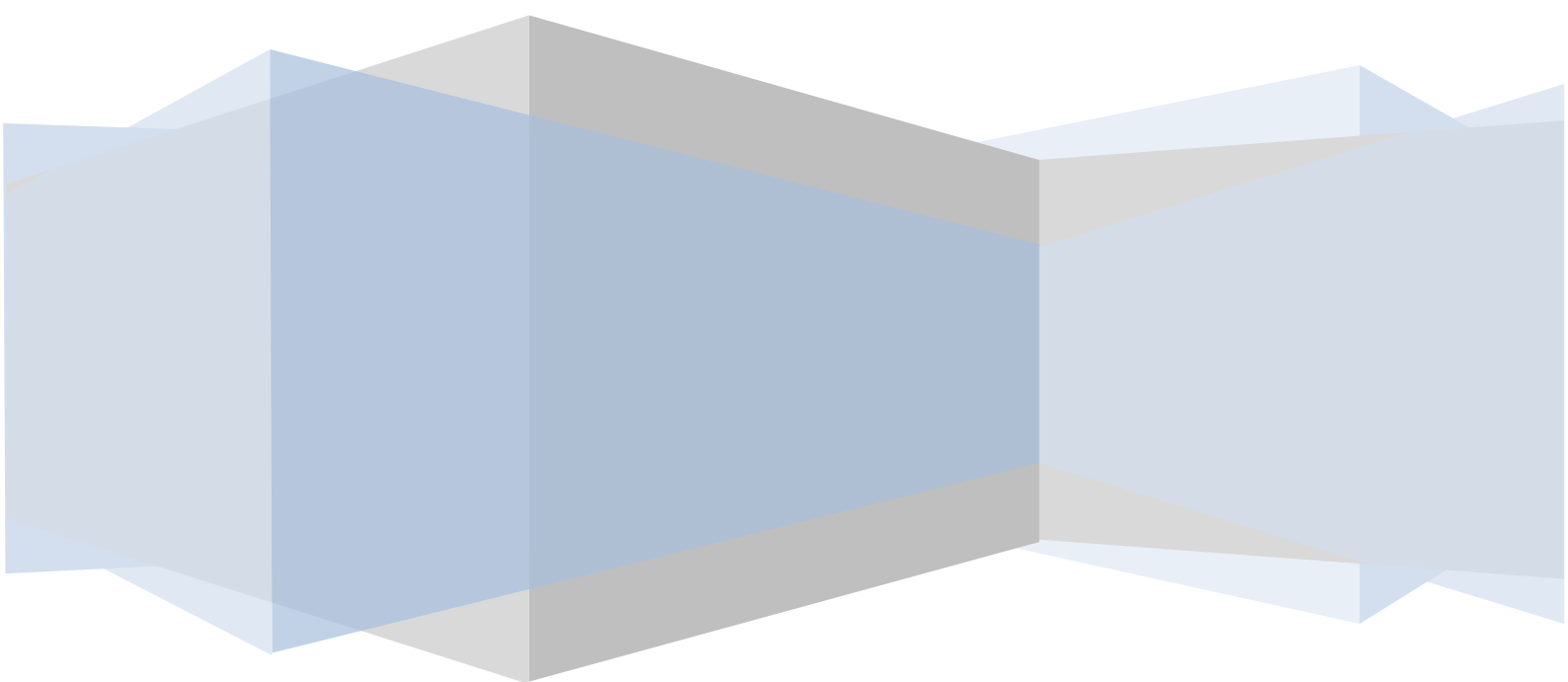


AirTAC

Product Manual

6D-EIP



Contents

Safety Instructions	2
Product Handling	3
1. Appearance	5
2. Specifications	6
3. Power Supply / Connection	7
4. Label, indicator and status	8
5. Manual IP setup	9
6. D-sub configuration	9
7. Environment Settings	10
7.1. Load EDS device description file.....	10
7.2. Hardware configuration: Choose manifold.....	11
7.3. IP address setup.....	13
7.3.1. Use DHCP serve.....	13
7.3.2. Use TCP/IP Interface Object to do static IP distribution.....	14
7.3.3. Setup of fix IP address.....	15
8. Make IO connection through Assembly	16
8.1. Input data analysis (Assembly:100d).....	16
8.2. Output data analysis (Assembly: 150d).....	17
8.3. Channel counter (Assembly: 101d).....	17
8.4. Set counter to 0 (Assembly: 102d).....	17
8.5. Parameters (Assembly: 151d).....	18
9. Ethernet/IP Device Level Ring (DLR) Funcion	19
10. Ethernet/IP Characteristic	19



Safety Instruction

①The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.

Review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

②Only personnel with appropriate training should operate machinery and equipment.

③Do not service or attempt to remove product and machinery/equipment until safety is confirmed.

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.

2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, read and understand the specific product precautions of all relevant products carefully.

3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

④Contact AirTAC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.

2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.

3. An application that could have negative effects on people, property, or animals requiring special safety analysis.

4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

⑤The product is provided for use in manufacturing industries.

1. The product herein described is basically provided for peaceful use in manufacturing industries.

2. If considering using the product in other industries, consult AirTAC beforehand and exchange specifications or a contract if necessary.

3. If anything is unclear, contact your nearest sales branch.



Product handling

Installation

Do not drop, hit or apply excessive shock to the fieldbus system. Otherwise damage to the product can result, causing malfunction.

Wiring

Avoid repeatedly bending or stretching the cables, or placing heavy load on them. Repetitive bending stress or tensile stress can cause breakage of the cable.

Wire correctly, incorrect wiring can break the product.

Do not perform wiring while the power is on. Otherwise damage to the fieldbus system and/or I/O device can result, causing malfunction.

Do not route wires and cables together with power or high voltage cables. Otherwise the fieldbus system and/or I/O device can malfunction due to interference of noise and surge voltage from power and high voltage cables to the signal line.

Route the wires (piping) of the fieldbus system and/or I/O device separately from power or high voltage cables. Confirm proper insulation of wiring.

Poor insulation (interference from another circuit, poor insulation between terminals, etc.) can lead to excess voltage or current being applied to the product, causing damage.

Take appropriate measures against noise, such as using a noise filter, when the fieldbus system is incorporated into equipment. Otherwise noise can cause malfunction. Separate the power line for output devices from the power line for control. Otherwise noise or induced surge voltage can cause malfunction.

Environment

Select the proper type of protection according to the environment of operation.

(1)The units are connected properly with fieldbus cable with M12 connector and power cable with M12 (M8) connector.

(2)Suitable mounting of each unit and manifold valve.

If using in an environment that is exposed to water splashes, please take measures such as using a cover.

If the product is to be used in an environment containing oils or chemicals such as coolant or cleaning solvent, even for a short time, it may be adversely affected (damage, malfunction etc.).

Do not use the product in an environment where corrosive gases or fluids could be splashed. Otherwise damage to the product and malfunction can result.



Do not use in an area where surges are generated. If there is equipment which generates a large amount of surge (solenoid type lifter, high frequency induction furnace, motor, etc.) close to the fieldbus system, this may cause deterioration or breakage of the internal circuit of the fieldbus system.

When a surge-generating load such as a relay or solenoid is driven directly, use a fieldbus system with a built-in surge absorbing element. Direct drive of a load generating surge voltage can damage the fieldbus system.

The product is CE marked, but not immune to lightning strikes. Take measures against lightning strikes in the system.

Prevent foreign matter such as remnants of wires from entering the fieldbus system to avoid failure and malfunction.

Mount the product in a place that is not exposed to excessive vibration or impact. Otherwise failure or malfunction can result.

Do not use the product in an environment that is exposed to temperature cycles. Heat cycles other than ordinary changes in temperature can adversely affect the inside of the product.

Adjustment and Operation

Perform settings suitable for the operating conditions. Incorrect settings can cause operation failure.

Please refer to the PLC manufacturer's manual etc. for details of programming and addresses. For the PLC protocol and programming refer to the relevant manufacturer's documentation.

Maintenance

Do not use solvents such as benzene, thinner, etc. to clean each unit. They could damage the surface of the body and erase the markings on the body.

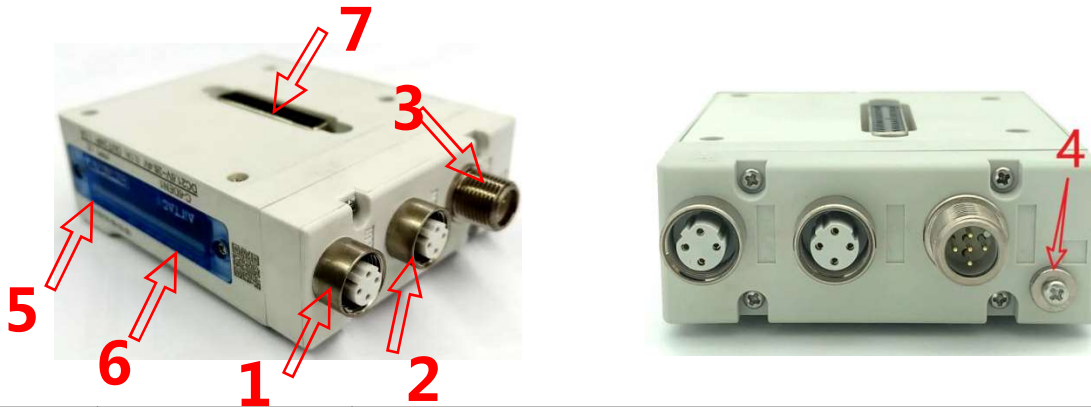
Use a soft cloth to remove stains.

For heavy stains, use a cloth soaked with diluted neutral detergent and fully squeezed, then wipe up the stains again with a dry cloth.

In case of a module failure, please contact the manufacturer for professional inspection and maintenance.



1. Appearance



No.	Name	Function
1	P2	Ethernet IP Connection PORT 2. BUS OUT (M12 4-pin Socket, D-coded)
2	P1	Ethernet IP Connection PORT 1. BUS IN (M12 4-pin Socket, D-coded)
3	Power Input	Power Supply (M12 5-pin Plug, A-coded)
4	Ground	Functional Ground
4	Setting	Working Status Setting
6	Indicator	Indicator of status
7	Output	Output signal for valve manifold , D-Sub, 25-PIN socket



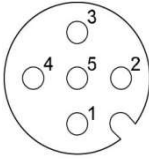
2. Specification

Item	Specification
Power Supply	DC 24 V \pm 10%
Sudden power cut	>10ms
Protection	Dustproof
Power consumption	<100mA
Withstand voltage	Refer to GBT24344 500 VAC for 1 minute between external terminals and FE
Insulation resistance	Refer to GBT24343 500 VDC, 10 M Ω or more between external terminals and FE
Ambient temperature	-10 ~ 60 °C
Ambient humidity	35% ~ 85%RH
Impact resistance	EN 60068-2-6, 5G, 10~150Hz, for non-stop 2 hours
EMI	CLASS A
Voltage inspection	Support
Reverse connection and over voltage protection	Yes
Number of outputs	24 outputs
Output Load	Maximum output 1.5A
Transmission speed	100M bps
Network topology	Daisy chain
Voltage inspection	Support
DLR	Yes
Detection	Short circuit protection, Short circuit detection, counts of numbers of opens

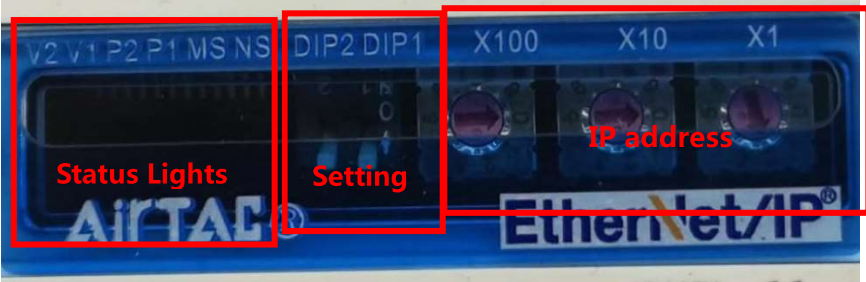


3. Power Supply / Connection

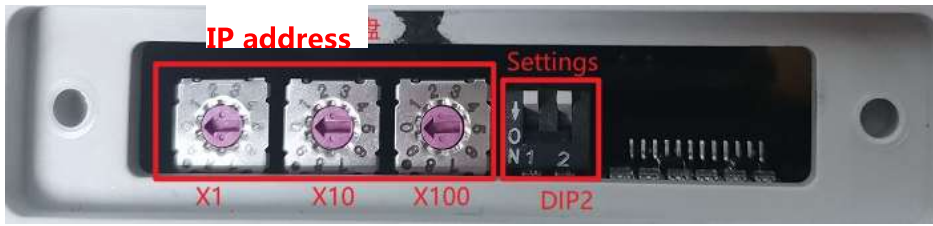
A body equips 1 power supply plug , 2 EtherNet IP outputs (P1, P2).

Fieldbus	2×M12(Socket), 4-pin, D-coded	 <p>P1: M12 4-pin socket,D-coded</p> <table border="1" data-bbox="802 353 1418 521"> <thead> <tr> <th>No.</th> <th>Designation</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>TD+</td> <td>Transmit Data + (TD+)</td> </tr> <tr> <td>2</td> <td>RD+</td> <td>Receive Data + (RD+)</td> </tr> <tr> <td>3</td> <td>TD-</td> <td>Transmission Data – (TD-)</td> </tr> <tr> <td>4</td> <td>RD-</td> <td>Receive Data – (RD-)</td> </tr> </tbody> </table>  <p>P2: M12 4-pin socket,D-coded</p> <table border="1" data-bbox="802 607 1418 775"> <thead> <tr> <th>No.</th> <th>Designation</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>TD+</td> <td>Transmit Data + (TD+)</td> </tr> <tr> <td>2</td> <td>RD+</td> <td>Receive Data + (RD+)</td> </tr> <tr> <td>3</td> <td>TD-</td> <td>Transmission Data – (TD-)</td> </tr> <tr> <td>4</td> <td>RD-</td> <td>Receive Data – (RD-)</td> </tr> </tbody> </table>	No.	Designation	Description	1	TD+	Transmit Data + (TD+)	2	RD+	Receive Data + (RD+)	3	TD-	Transmission Data – (TD-)	4	RD-	Receive Data – (RD-)	No.	Designation	Description	1	TD+	Transmit Data + (TD+)	2	RD+	Receive Data + (RD+)	3	TD-	Transmission Data – (TD-)	4	RD-	Receive Data – (RD-)
No.	Designation	Description																														
1	TD+	Transmit Data + (TD+)																														
2	RD+	Receive Data + (RD+)																														
3	TD-	Transmission Data – (TD-)																														
4	RD-	Receive Data – (RD-)																														
No.	Designation	Description																														
1	TD+	Transmit Data + (TD+)																														
2	RD+	Receive Data + (RD+)																														
3	TD-	Transmission Data – (TD-)																														
4	RD-	Receive Data – (RD-)																														
Power Supply	1xM12(Plug), 5-pin, A-coded	 <p>PWR : M12 5-pin plug,A-coded</p> <table border="1" data-bbox="790 846 1409 1043"> <thead> <tr> <th>No.</th> <th>Designation</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>V1 24V</td> <td>+24V for solenoid valve</td> </tr> <tr> <td>2</td> <td>V1 0V</td> <td>0V for solenoid valve</td> </tr> <tr> <td>3</td> <td>V2 24V</td> <td>+24V for V2 unit operation</td> </tr> <tr> <td>4</td> <td>V2 0V</td> <td>0V for V2 unit operation</td> </tr> <tr> <td>5</td> <td>FE</td> <td>Functional earth</td> </tr> </tbody> </table>	No.	Designation	Description	1	V1 24V	+24V for solenoid valve	2	V1 0V	0V for solenoid valve	3	V2 24V	+24V for V2 unit operation	4	V2 0V	0V for V2 unit operation	5	FE	Functional earth												
No.	Designation	Description																														
1	V1 24V	+24V for solenoid valve																														
2	V1 0V	0V for solenoid valve																														
3	V2 24V	+24V for V2 unit operation																														
4	V2 0V	0V for V2 unit operation																														
5	FE	Functional earth																														
Valve Manifold	D-Sub , 25 PIN	Refer to D-sub configuration																														

4. Label, indicator and status

Appearance	 <p>The image shows a blue Ethernet/IP module with several components highlighted by red boxes and labels: 'Status Lights' (a row of three LEDs), 'Setting' (two DIP switches), and 'IP address' (three rotary switches). Labels above the module include V2, V1, P2, P1, MS, NS, DIP2, DIP1, X100, X10, and X1. The AirTAC logo and 'Ethernet/IP' are also visible.</p>	
NS IP Address	Lights off	No IP address nor power supply
	Green light on	Connected
	Green light twinkling	No connection
	Red light twinkling	Connection over time
MS Module Status	Lights off	No power supply
	Green light on	Normal working
	Green light twinkling	Standby N/A
	Red light twinkling	Recoverable error
	Red light on	Irrecoverable error
P1 Port IN	Lights off	Network is not connected
	Yellow light on / Green light twinkling	Network is connecting
	Yellow light on	Network is connected
P2 Port OUT	Lights off	Network is not connected
	Yellow light on / Green light twinkling	Network is connecting
	Yellow light on	Network is connected
V1 Manifold- power supply	Green light on	Normal power supply
	Red light twinkling	Insufficient power
	Red light on	Over supply
V2 Fieldbus - power supply	Green light on	Normal power supply
	Red light twinkling	Insufficient power
	Red light on	Over supply

5. Manual IP dial



Manual IP dial	Settings-choose corresponding IP address Switch 2(represent DIP 2)
000 : Remote control IP	Switch 2 need to be ON: Effective IP address: From 192.168.1.001 to 192.168.1.254
255 : IP address is decided by DHC	Switch 2 need to be OFF: Effective IP address: From 192.168.0.001 to 192.168.0.254
001-254: Manual set IP address, from 192.168.*.001 to 192.168.*.254 "" is decided by "setting switch 2"	Note: 001-254 is decided by dial Switch 2 is not functional in remote and DHCP mode. Switch 1 keep.

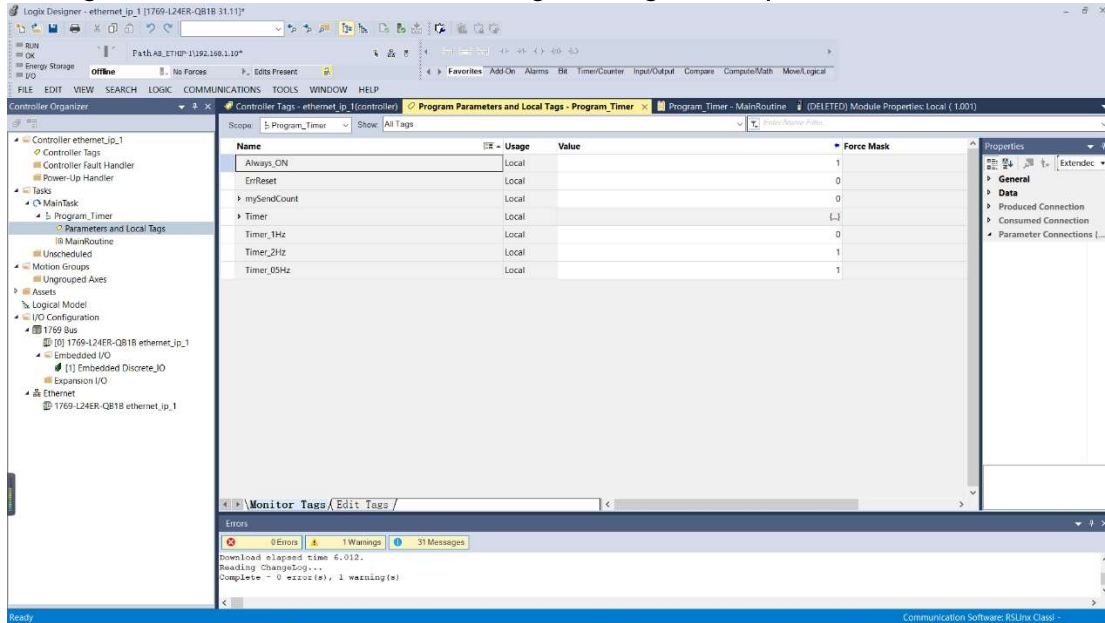
6. D-sub configuration

D-sub configuration	
Output type	Source/PNP (-Common)
Number of outputs	24 outputs
Load	24VDC per valve 1.5W
V1 Voltage and current supply	24VDC±10% , Max. 1.5A (24 points)

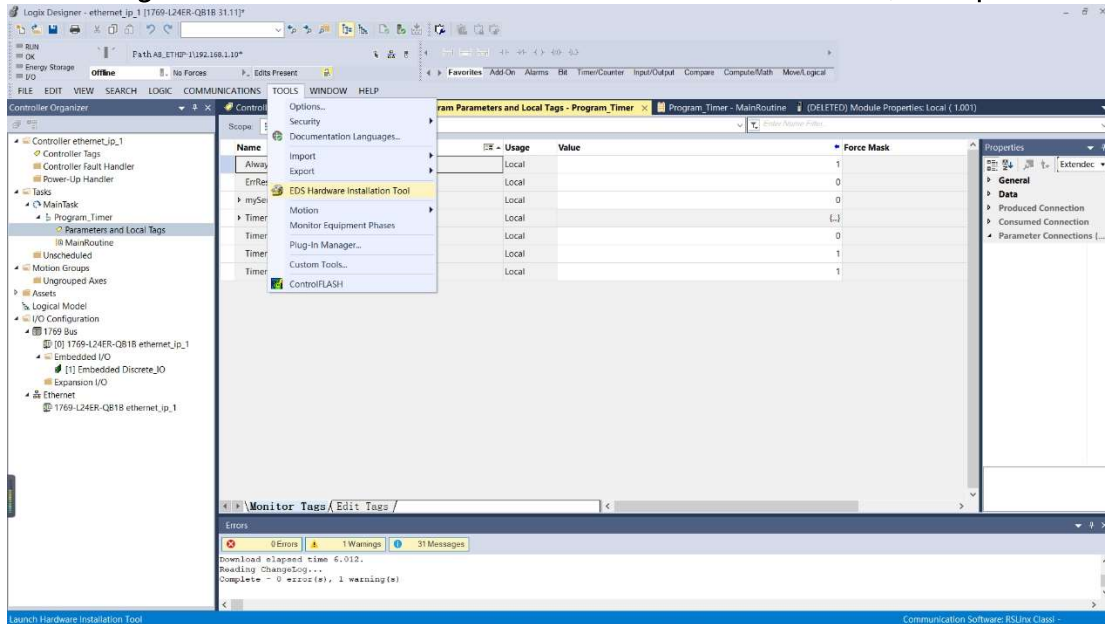
7. Environment Setting

7.1. Load EDS device description file

EDS file describe information of Ethernet IP device and adding logo of supplier icon file. Follow image shows environment when Logix Designer is opened:

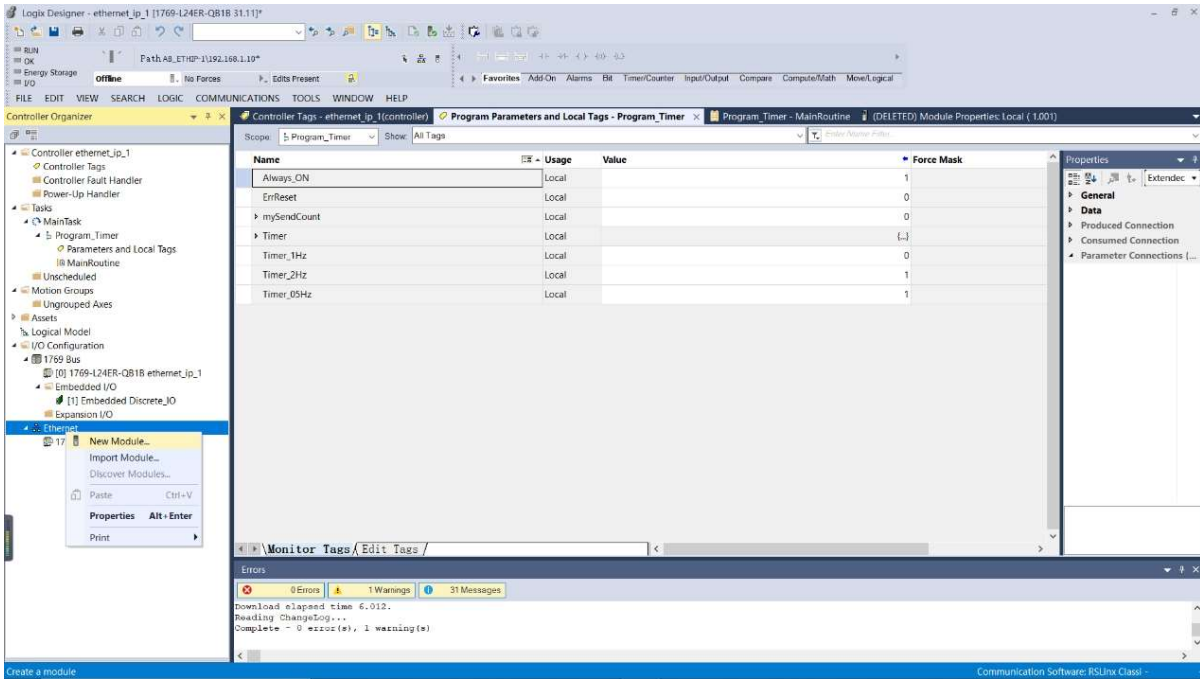


Choose "TOOLS", "EDS Hardware Installation Tool" then upload EDS file. Choose supplier Logo when installing. Be noted that it need to choose the newest version, then press install.

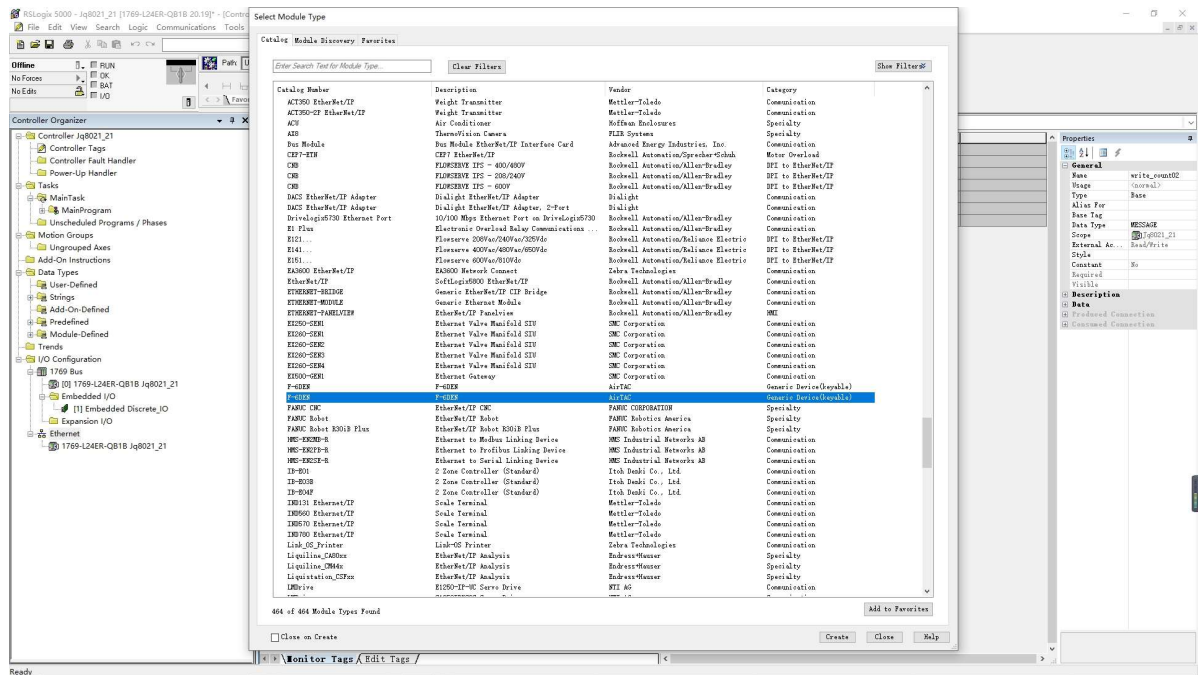


7.2. Hardware configuration: Choose manifold

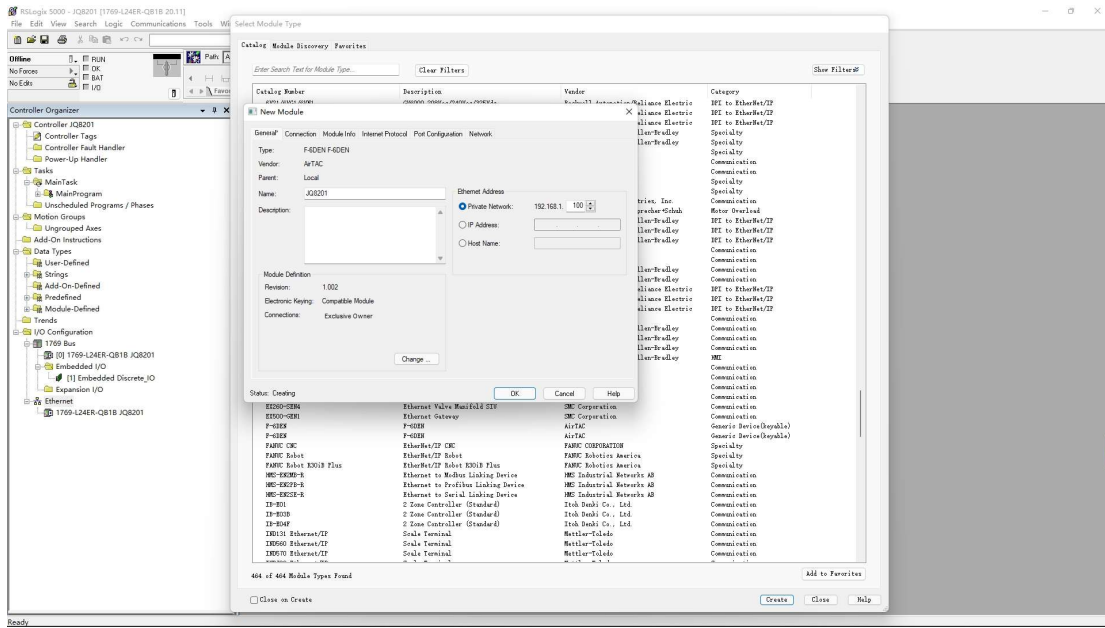
In I/O Configuration, choose Ethernet and right click, choose New Module:



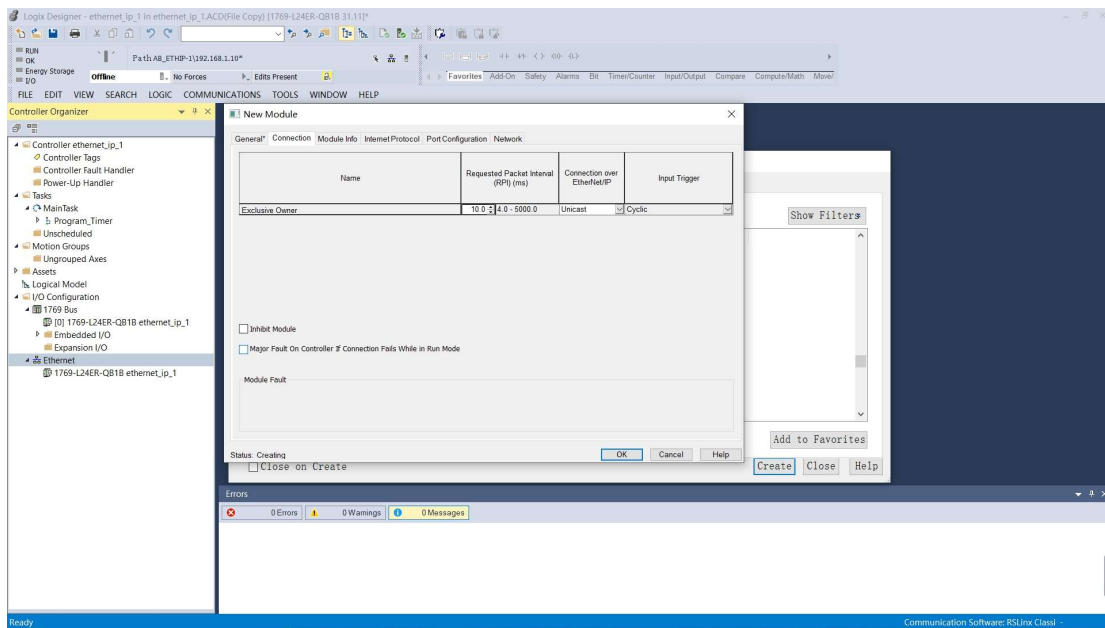
New window will pop up, then choose corresponding device based on model:



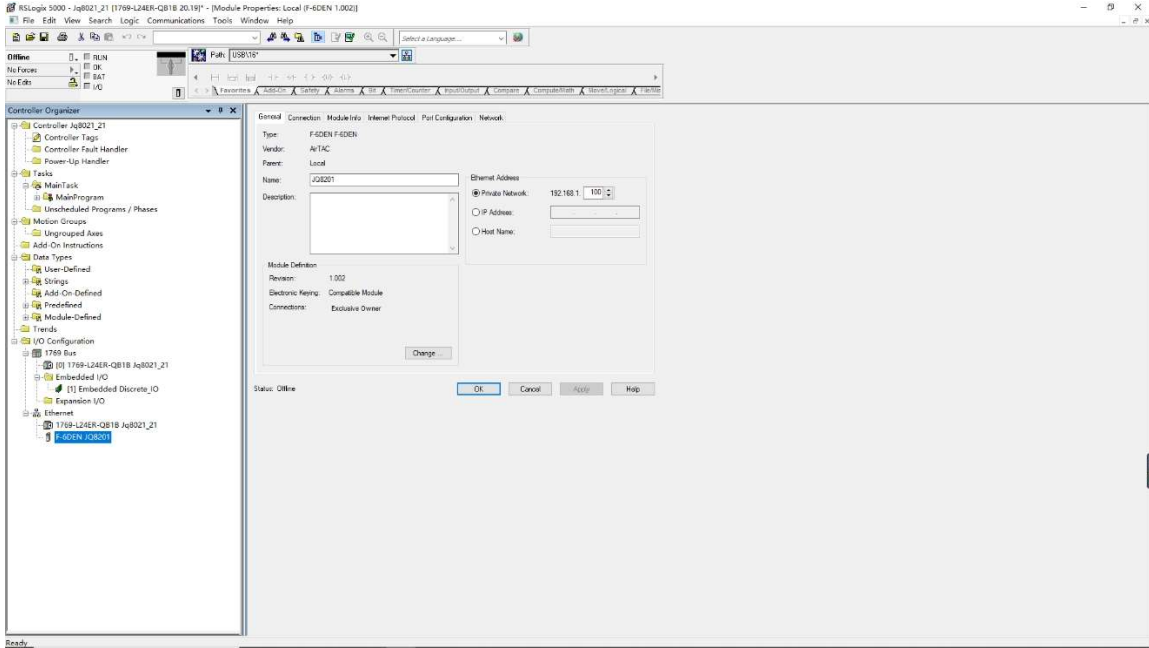
Enter device name and IP address



Set working cycle:



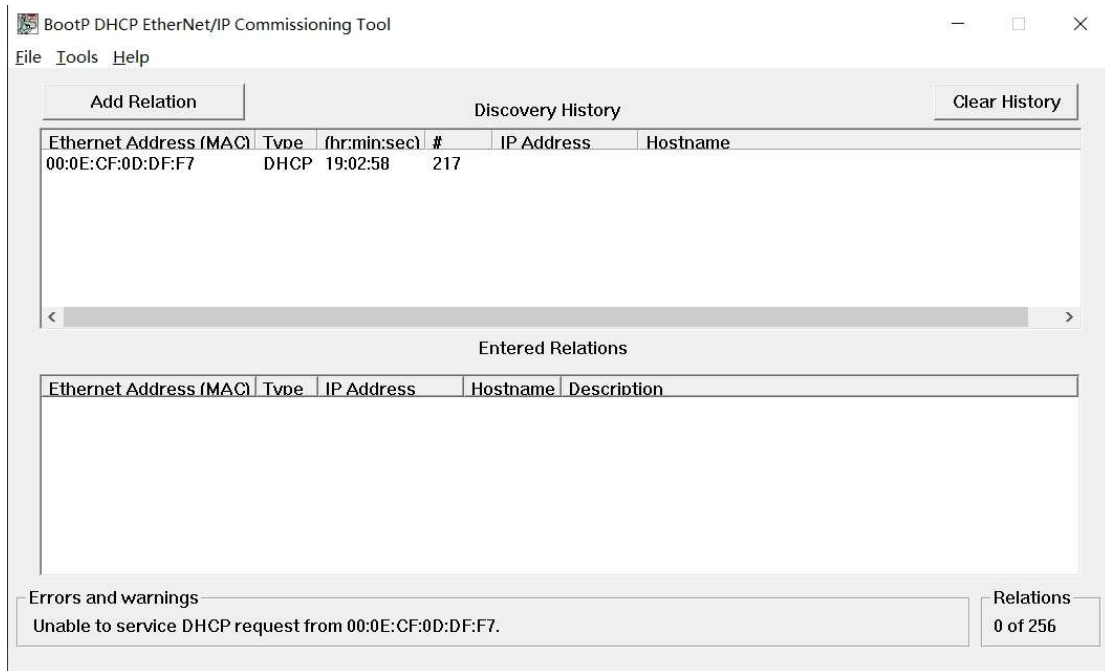
After setting up, click Create and the entered module will be added:



7.3. IP address setup

7.3.1. Use DHCP Server

Set module in DHCP mode, which mean Ethernet IP address is manually dial to 255. When PLC and manifold are both functionally working, open up “BootP DHCP EtherNet/IP Commissioning Tool”, “MAC address”. Device should be shown in the list of “Discovery History”



Double click MAC, following window will pop up and allow IP information to be entered. If information is correct, the distributed IP address will show in “Discovery History”.

The screenshot shows a 'New Entry' dialog box with the following fields and values:

- Server IP Address: 192.168.1.125
- Client Address (MAC): 00:0E:CF:0D:DF:F7
- Client IP Address: 192 . 168 . 1 . 100
- Hostname: (empty)
- Description: (empty)

Buttons: OK, Cancel

7.3.2. Use TCP/IP Interface Object to do static IP distribution

Dial Ethernet IP address all to 0. It means now the IP distribution will be static address. The address is valid even after power is cut-off.

Use TCP/IP Interface Object to read and write through Explicit Messages communication. Set bits 0-3 of attribute 3 to 0 when using static IP address.

Bit(s):	Called:	Definition	
0-3	Configuration Method	Determines how the device shall obtain its IP-related configuration	0 = The device shall use statically-assigned IP configuration values. 1 = The device shall obtain its interface configuration values via BOOTP. 2 = The device shall obtain its interface configuration values via DHCP. 3-15 = Reserved for future use.
4	DNS Enable	If 1 (TRUE), the device shall resolve host names by querying a DNS server.	
5-31	Reserved	Reserved for future use and shall be set to zero.	

Set TCP/IP parameters by attribute 5. IP address and Network mask must be set.

Name	Meaning
IP address	The device's IP address.
Network mask	The device's network mask. The network mask is used when the IP network has been partitioned into subnets. The network mask is used to determine whether an IP address is located on another subnet.
Gateway address	The IP address of the device's default gateway. When a destination IP address is on a different subnet, packets are forwarded to the default gateway for routing to the destination subnet.
Name server	The IP address of the primary name server. The name server is used to resolve host names. For example, that might be contained in a CIP connection path.
Name server 2	The IP address of the secondary name server. The secondary name server is used when the primary name server is not available, or is unable to resolve a host name.
Domain name	The default domain name. The default domain name is used when resolving host names that are not fully qualified. For example, if the default domain name is "odva.org", and the device needs to resolve a host name of "plc", then the device will attempt to resolve the host name as "plc.odva.org".

Following table show consists of attribute 5:

5	STRUCT of:	Interface Configuration
	UDINT	IP Address
	UDINT	Network Mask
	UDINT	Gateway Address
	UDINT	Name Server
	UDINT	Name Server 2
	STRING	Domain Name
	USINT	Pad ¹

7.3.3. Setup of fix IP address

Dial Ethernet IP address randomly in 1~254. This will be the PLC communication IP. When PLC is loading module, the setup IP address should be the same as Ethernet IP setup to ensure function.

Refer to "Manual IP dial" to see how to set Ethernet IP module.

In IP address of "192.168.Y.X", Y is decided by DIP SW2, X is decided by dial.



8. Make IO connection through Assembly

8.1. Input data analysis (Assembly:100d)

	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
BYTE 0		OC	SC	COR	UV-V2	OV-V2	UV-V1	OV-V1
BYTE 1	SC-7	SC-6	SC-5	SC-4	SC-3	SC-2	SC-1	SC-0
BYTE 2	SC-15	SC-14	SC-13	SC-12	SC-11	SC-10	SC-9	SC-8
BYTE 3	SC-23	SC-22	SC-21	SC-20	SC-19	SC-18	SC-17	SC-16
BYTE 4	OC-7	OC-6	OC-5	OC-4	OC-3	OC-2	OC-1	OC-0
BYTE 5	OC-15	OC-14	OC-13	OC-12	OC-11	OC-10	OC-9	OC-8
BYTE 6	OC-23	OC-22	OC-21	OC-20	OC-19	OC-18	OC-17	OC-16
BYTE 7	COUNT-7	COUNT-6	COUNT-5	COUNT-4	COUNT-3	COUNT-2	COUNT-1	COUNT-0
BYTE 8	COUNT-15	COUNT-14	COUNT-13	COUNT-12	COUNT-11	COUNT-10	COUNT-9	COUNT-8
BYTE 9	COUNT-23	COUNT-22	COUNT-21	COUNT-20	COUNT-19	COUNT-18	COUNT-17	COUNT-16

BYTE0:

BIT7	Remain	
BIT6	1: Open circuit detected 0: No open circuit	
BIT5	1: Short circuit detected 0: No short circuit	
BIT4	1: Counter reach limit 0: Counter hasn't reach limit	
BIT3:BIT2	0:0	Normal power supply
	0:1	Over power supply
	1:0	Insufficient power supply
BIT1:BIT0	0:0	Normal power supply
	0:1	Over power supply
	1:0	Insufficient power supply



BYTE1 ~ BYTE3:

SC-0 shows short circuit status of channel 0, SC-23 shows for channel 23 and same for others.
Bit = 1 indicates short circuit, 0 means not short circuit.

BYTE4 ~ BYTE6:

OC-0 shows open circuit status of channel 0, OC-23 shows for channel 23 and same for others.
Bit = 1 indicates open circuit, 0 means not open circuit.

BYTE7 ~ BYTE9:

COUNT-0 shows counter limit status of channel 0, COUNT-23 shows for channel 23.

Bit = 1 indicates counter reach limit, 0 means not reach limit yet.

8.2. Output data analysis (Assembly: 150d)

	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
BYTE0	O-7	O-6	O-5	O-4	O-3	O-2	O-1	O-0
BYTE1	O-15	O-14	O-13	O-12	O-11	O-10	O-9	O-8
BYTE2	O-23	O-22	O-21	O-20	O-19	O-18	O-17	O-16

O-0 ~ O-23: O-0 means channel 0, O-23 means channel 23 and same for others.

8.3. Channel counter (Assembly: 101d)

	DINT	DINT	DINT	DINT	DINT	DINT	DINT	DINT
Count[7] -> Count[0]	CNT-7	CNT-6	CNT-5	CNT-4	CNT-3	CNT-2	CNT-1	CNT-0
Count[15] -> Count[8]	CNT-15	CNT-14	CNT-13	CNT-12	CNT-11	CNT-10	CNT-9	O-8
Count[23] -> Count[16]	CNT-23	CNT-22	CNT-21	CNT-20	CNT-19	CNT-18	CNT-17	CNT-16

CNT-0 ~ CNT-23 shows counts from each channel counter. Corresponding class is 4, attribute is 3.

8.4. Set counter to 0 (Assembly: 102d)

	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
BYTE0	CLR-7	CLR-6	CLR-5	CLR-4	CLR-3	CLR-2	CLR-1	CLR-0
BYTE1	CLR-15	CLR-14	CLR-13	CLR-12	CLR-11	CLR-10	CLR-9	CLR-8
BYTE2	CLR-23	CLR-22	CLR-21	CLR-20	CLR-19	CLR-18	CLR-17	CLR-16

CLR-0 ~ CLR-23 can clear out all the counts from channel counter, 1 is to clear, 0 is to remain.

Corresponding class is 4, attribute is 3.



8.5. Parameters (Assembly: 151d)

Cycle Count Limit 0	Set counter limit for channel 0
Cycle Count Limit 1	Set counter limit for channel 1
Cycle Count Limit 2	Set counter limit for channel 2
Cycle Count Limit 3	Set counter limit for channel 3
Cycle Count Limit 4	Set counter limit for channel 4
Cycle Count Limit 5	Set counter limit for channel 5
Cycle Count Limit 6	Set counter limit for channel 6
Cycle Count Limit 7	Set counter limit for channel 7
Cycle Count Limit 8	Set counter limit for channel 8
Cycle Count Limit 9	Set counter limit for channel 9
Cycle Count Limit 10	Set counter limit for channel 10
Cycle Count Limit 11	Set counter limit for channel 11
Cycle Count Limit 12	Set counter limit for channel 12
Cycle Count Limit 13	Set counter limit for channel 13
Cycle Count Limit 14	Set counter limit for channel 14
Cycle Count Limit 15	Set counter limit for channel 15
Cycle Count Limit 16	Set counter limit for channel 16
Cycle Count Limit 17	Set counter limit for channel 17
Cycle Count Limit 18	Set counter limit for channel 18
Cycle Count Limit 19	Set counter limit for channel 19
Cycle Count Limit 20	Set counter limit for channel 20
Cycle Count Limit 21	Set counter limit for channel 21
Cycle Count Limit 22	Set counter limit for channel 22
Cycle Count Limit 23	Set counter limit for channel 23
Open Load Diagnostics 0	Open circuit status for channel 0 ~ 7
Open Load Diagnostics 1	Open circuit status for channel 8 ~ 15
Open Load Diagnostics 2	Open circuit status for channel 16 ~ 23
Fail Safe State 0	Setting of Fail Safe State for channel 0 ~ 7
Fail Safe State 1	Setting of Fail Safe State for channel 8 ~ 15
Fail Safe State 2	Setting of Fail Safe State for channel 16 ~ 23



Counter count limit can set from 0 to 0xFFFFFFFF; when set bit=1, it will activate detection of open circuit status, Otherwise, detection will be off. When set Fail Safe State bit=1, it will keep output when error occurs, otherwise it will output.

9. Ethernet/IP Device Level Ring(DLR) Function

DLR function can fulfill ring topology. Advantage of DLR is that it can be quick to resume communication if error happened anywhere in ring network.

To use DLR, all the nodes in the ring are needed to be set as DLR.

DLR function is implanted by Ring Supervisor, it doesn't need to set every Ethernet/IP device.

Refer to Ring Supervisor for more application details.

10. Ethernet/IP Characteristic

Item		Note
Numbers of Port	2	--
Connecting speed	100Mbit/s	--
Network type	Full duplex	--
DLR Mode	Yes	Device Level Ring
EtherNet/IP(ODVA Certification)	Volume1(Edition3.29) Volume2(Edition1.26)	--
IP Address modes	Static, DHCP	--
EDS language	EN	--

