

KOGANEI

EtherNet/IP-Compliant

I/O Terminal YS8

User's Manual

Ver.1.0

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2. Revision History

Date of revision	Description of revision
12/2/2022	First printing



CAUTION

With regard to the handling of and precautions for solenoid valves, be sure to read the Safety Precautions and Handling Instructions and General Precautions in the catalog on the Koganei website before use.

3. Safety Precautions (I/O Terminal)

Please read these Safety Precautions carefully before selecting a model and using the product in question, and make sure to use it properly.

The following precautions are intended to ensure safe and proper product usage and to prevent any harm coming to you, other people, or property.

Be sure to observe them in conjunction with the ISO 4414 (Pneumatic fluid power - General rules and safety requirements for systems and their components) and JIS B 8370 (General rules for pneumatic systems) safety regulations.

The instructions are divided into "Danger," "Warning," "Caution," and "Request" categories in accordance with the degree of danger and impairment.

	DANGER	Indicates a clear, predictable hazard. Failure to avoid this hazard may result in death or serious injury. Damage or destruction of property may also occur.
	WARNING	Indicates a hazard that, while not an immediate threat, may become a threat under certain circumstances. Failure to avoid this hazard may result in death or serious injury. Damage or destruction of property may also occur.
	CAUTION	Indicates a hazard that, while not an immediate threat, may become a threat under certain circumstances. Failure to avoid this hazard may result in light or moderate injury. Damage or destruction of property may also occur.
	REQUEST	While there is no potential for injury, this should be observed to use the product properly.

■ This product was designed and manufactured to be a component for general industrial machinery.

- When selecting and handling the equipment, be sure to have the system designer, or someone in charge with sufficient knowledge and experience, read the "Safety Precautions, Catalog, User's Manual, and other materials before handling the equipment. Handling it improperly is dangerous.
- After reading the catalog, user manual, and other materials, be sure to keep them someplace where they can be read at any time by whoever is using the product.
- If the product is transferred or loaned, be sure to include the catalog, user's manual, and other materials in a conspicuous spot on the product so that the new owner will know how to use the product safely and properly.
- The hazard, warning, and caution items listed in this Safety Precautions section do not cover all cases. Please read the catalog and user manual carefully and always prioritize safety.



DANGER

Intended Uses

- Do not use this product for the following applications.
 1. Medical equipment related to the maintenance, management, or otherwise of human life and the human body
 2. Mechanisms and mechanical devices intended for moving or transporting people
 3. Important safety components for machinery

The product in question was not planned or designed for applications requiring a high degree of safety. Such applications may result in loss of human life.

Installation

- When installing the product, be sure it is securely held and fastened (including the workpiece). Injury may occur if the product falls over, drops, or operates in an abnormal manner.
- While the installation position is left up to the user, do not directly subject the main unit to strong shocks or vibrations.
- Do not splash water onto the product.
Splashing water onto the product, washing it, or using it underwater may result in injury, electric shock, or fire due to abnormal operation.
- Do not use the product in the presence of hazardous materials such as ignitable or flammable materials. This product is not

explosion-proof. It is possible for it to ignite either spontaneously or with an ignition source.

Wiring

- Be sure to turn off the power when wiring, installing, or inspecting the product. Failure to do so may result in accidents, electric shock, or malfunctions.
- Wire the product properly as indicated in this manual.
Thoroughly check the configuration of the wiring, switches, and so on before turning on the power.
- For the module's input and output power supplies, use a stabilized DC power supply within the rated range that is insulated from AC currents. Uninsulated power supplies may result in electric shock. An unregulated power supply may cause the peak value to exceed the rated value, damage the module, or cause its accuracy to deteriorate.

Disassembly and Modification

- Never modify the product. Doing so may result in injury, electric shock, or fire due to abnormal operation.
- Do not disassemble, reassemble, or repair the product in an inappropriate manner that affects its fundamental structure, performance, or functions. Doing so may result in injury, electric shock, or fire.

During Operation

- Do not touch or place your hand or body near the product while it is in operation. In addition, do not adjust any built-in or attached mechanisms (e.g. attaching/detaching modules, wiring connectors, etc.) while the product is in operation. Doing so may result in injury.

 **WARNING****How to Use**

- Do not exceed the scope of the product specifications when using the product.
Exceeding the scope of the product specifications may cause it to malfunction, stop functioning, or sustain damage.
It may also cause a significant decrease in the service life of the product.
- Do not throw the product into fire. The product may explode or generate toxic gases.
- Do not climb onto the product, use it as a foothold, or place objects onto it. Doing so may result in falls, injury due to the product falling or tipping over, product damage, malfunctions due to damage, unpredictable movement, and so on.

Installation

- Be sure to turn off the power when installing modules. Failure to turn off the power may result in module malfunctions or damage.
- Do not drop the product or subject it to abnormal vibrations or shock. Doing so may result in product failure or burnout.

Wiring

- Be sure to turn off the power when performing wiring work. Failure to do so may result in electric shock.
- After wiring is completed, confirm that there are no errors in the wiring.
- Do not use the same wiring route as power lines or high-voltage lines. Malfunctions may occur due to noise/surge interference in the signal line from the power lines or high-voltage lines.
- Do not connect the power supply in the reverse direction. Doing so may result in malfunction or burnout.
- Perform wiring for the input line and output line separately. Failure to do so may result in malfunctions.
- Do not subject the cables to repeated bending, pulling, pressure from heavy objects, or applications of force.
Wiring that subjects cables to repeated bending stress or tensile force may result in the cables snapping.
- Install noise filters or other adequate noise suppression measures when incorporating the product into equipment or devices. Malfunctions may occur due to noise interference.
- The frame ground should be as dedicated and as close to the module as possible. Too long of a distance may result in malfunctions due to noise interference.

While Supplying Power

- Do not connect or disconnect connectors with the power on. In addition, do not apply unnecessary stress on the connectors. Doing so may result in injury, equipment damage, or electric shock due to equipment malfunctions.
- Do not touch the terminals while power is being supplied. Doing so may cause result in electric shock.
- The input voltage and current must fall within the specified range. Use of a voltage or current in excess of the rated value may result in malfunctions or fire.
- Do not short-circuit the load. Doing so may result in malfunction or burnout.

Fail-safe

- Output may remain on or off due to welding or burnout of the output relays, destruction of the output transistors, or other factors. If this occurs, take external measures to ensure that the system operates on the safe side.
- When a communication failure occurs or an abnormality is detected in the internal state, output will occur in accordance with the settings. If this occurs, take external measures to ensure that the system operates on the safe side.
- When an abnormality is detected, output will occur in accordance with the settings, but the output will be turned off when the unit power supply (for control and input) is turned off, even if the output power supply is turned on. If this occurs, take external measures to ensure that the system operates on the safe side.

 **CAUTION****How to Use**

- The input and output power supplies to the module should be separate power supplies. Operation cannot be guaranteed if they are operated from the same power supply.
- For the input and output power supplies to the module, make 0V the standard. Failure to do so may result in malfunctions.
- When increasing or decreasing the number of modules, do not exceed 2A of input or output supply power. Ensure that the sum of the current consumed by each module, the sensor supply current, and the load current does not exceed 2A. Exceeding 2A of current may result in malfunction or burnout.
- Use products with built-in surge absorbing elements for loads such as relays, bulbs, and lamps when directly driving loads that generate surge voltages. Failure to do so may result in malfunctions.

Installation

- Do not install or store the product in the following types of environments. Doing so may cause burnout, a cease in operation, or malfunctions.
 - Locations with direct exposure to sunlight
 - Locations where ambient temperature or relative humidity exceed the operating range
 - Locations subject to rapid temperature changes and condensation
 - Locations where corrosive or flammable gases are present
 - Locations where there is a lot of dust, dirt, salt, or iron powder
 - Locations exposed to splashes of water, oil, chemicals, etc.
 - Locations where the main unit is exposed to direct vibrations or shock
- When using the product in the following types of locations, take sufficient measures to shield it.
 - Near equipment that generates powerful high-frequency noise
 - Locations where noise is generated by static electricity, etc.
 - Locations where strong electric or magnetic fields are generated
 - Locations where there is a risk of radiation exposure
 - Locations with power lines nearby
- Discharge static electricity from your body by touching a grounded metal object before touching the product.
- Be sure to ground the product during installation.

Installation

- To protect the module, be sure to attach the module connection cover at the end of the module. Failure to do so may result in malfunction or failure.
- When attaching a module, be careful not to touch or bump against the connector terminals. If a module is installed and energized while the connector terminals are deformed, malfunctions may result due to poor contact.
- Tighten the screws at the connector with the torque specified in this manual. Loose screws may cause malfunctions.
- Please secure a working space for attaching the product. Failure to secure a working space will prevent daily inspections and maintenance, leading to the equipment stopping and product damage.

While Supplying Power

- Pay attention to the inrush current when the power is turned on. Depending on the connected load, the initial charging current may trigger the overcurrent protection function, causing the module to malfunction.

EtherCAT Connection

- The communication distance and the number of devices/connection method must be within the specifications. Also, do not connect to other networks such as EtherNet/IP or general in-house LAN.

EtherNet/IP Communication

- The communication distance and the number of devices/connection method must be within the specifications. Also, do not connect to other networks such as EtherCAT. Doing so may result in network downtime or malfunctions due to overloading.

 **RERQUEST****EMC Commands**

- While this product complies with EMC standards (EN61000-6-2, EN55011), this is to ensure that machines and equipment incorporating the product can comply with EMC standards, and does not guarantee that all equipment incorporating the product will meet the essential requirements of the EMC standards. Final confirmation of conformity to EMC standards should be performed by the customer themselves.

General

- If you intend to use the product under conditions or in environments not described in the catalog, user's manual, and other materials, or if you intend to use the products for applications where safety is especially essential, such as air navigation facilities, combustion equipment, entertainment equipment, safety equipment, or other applications where a significant impact on human life or property is likely, please leave sufficient leeway for ratings and performance when using the product and implement fail-safes and other safety measures. Please be sure to consult with one of our sales representatives.
- This product is intended for use in Japan. If using the product overseas, it is necessary to check the safety standards of the country in question. Please contact the nearest sales office.
- Unused or obsolete products and consumables should be appropriately disposed of as industrial waste.
- Third-party software is embedded in this product. Refer to <https://official.koganei.co.jp/common/html/3rd-party-license.html> for information about licenses and copyrights related to this software.

- For hazards, warnings, and precautions not listed in this Safety Precautions section, refer to Safety Precautions (shared between air valves and other control equipment and between thermal refining, auxiliary, and vacuum equipment) in the web catalog (<https://official.en.koganei.co.jp/product/safety>).
- For product inquiries, please contact our nearest sales office or technical service center. The address and telephone number are shown at the end of this document.

 **Other**

- Please observe the following items.
1. When assembling a pneumatic system using this product, use genuine parts or compliant parts (recommended parts). When performing maintenance and servicing, use genuine parts or compliant parts (recommended parts). Observe the designated techniques and methods.
 2. Do not disassemble or reassemble the product in an inappropriate manner that affects its fundamental structure, performance, or functions.

We assume no responsibility for any failure to observe all safety precautions.

Warranty and Disclaimers**1. Warranty Period**

The warranty period for our products is one year after delivery. *Some products have a 2-year warranty. Please contact our nearest sales office or technical service center for details.

2. Warranty Scope and Disclaimers

- (1) If a product purchased from us or an authorized dealer or distributor fails through fault of our own within the warranty period, we will repair or replace the product free of charge. Even when within the warranty period, some products have a specified lifetime in terms of number of operations and other aspects, so confirm with the nearest sales office or technical service center.
- (2) Our product warranties are for the products themselves. Therefore, we are not liable for any incidental damages (e.g. costs incurred for repair or replacement of the product) resulting from product failure or a deterioration in its functions or performance.
- (3) We shall not be liable for any damage induced by or resulting from failures of our products, any deterioration in our products' function or performance, or any damage caused to other equipment due to said failures or deterioration.
- (4) We shall not be liable for any damage that results from use or storage of our products beyond the scope of the product specifications described in our catalogs and instruction manuals, or from actions other than those described in the precautions for installation, installation, adjustment, maintenance, and so on.
- (5) We shall not be liable for any damage caused by fire, natural disasters, the actions of a third party, or intentional or negligent actions of a customer that are not the responsibility of our company.

4. Glossary

Terminology	Description
Scanner	With EtherNet/IP, the master in the master/slave system is called a scanner.
Adapter	With EtherNet/IP, the slave in the master/slave system is called an adapter.
Communication protocol	Defines the communication procedures and protocols for communications on a network.
CIP (Common Industrial Protocol)	Communication protocol that can be shared between DeviceNet, ControlNet, EtherNet/IP, and CompoNet.
IP address	Number for identifying devices on a network. It is configured from the network address and host address.
Network address	Number for identifying a network itself.
Host address	Number for identifying devices within a network.
BOOTP (Bootstrap Protocol)	Communication protocol used by devices on a network to automatically acquire IP addresses from a server.
DHCP (Dynamic Host Configuration Protocol)	Protocol with expanded backward compatibility for BOOTP.
Connection	Method for communications between devices and PLC. This is used for periodic I/O data communications.
EDS file	Information about connections to EtherNet/IP devices.
Flash memory	Memory device that keeps data, even if the power is turned off.
Network topology	Format of connections between devices on a network.
Vendor ID	A unique identifier for the manufacturer. It differs for each communication standard.
MAC address	Identification number that is physically assigned to devices on a network to uniquely identify the devices. They are in a 48-bit format.
10BASE-T, 100BASE-TX	Ethernet standard regulated by IEEE802.3. Twisted-pair cables (UTP category 5 or better, STP) are used for this standard.
RPI (Requested Packet Interval)	The interval at which packets are requested. This is set by the communication cycle of the I/O data.
Exclusive Owner	One of the connection methods for I/O data communication. Other connection requests are rejected during connections.
UCMM	This stands for Unconnected Message Manager. It uses message communications without using communication methods called connections.

Terminology	Description
Full duplex communication	Communications are sent and received simultaneously.
Half duplex communication	Communications in which receiving cannot be done while sending, and sending cannot be done while receiving.
Auto-negotiation	Function to automatically optimize communication method and communication speed with a connected party.
Default gateway	Function that knows the method that packets are transmitted to other networks.
MDI, MDI-X, Auto-MDIX	These are communication connector specifications that define types of cables (straight, cross, etc.). The product has an automatic switching function, so it is not necessary to determine how to use cables or differentiate specifications.
ACD (Address Conflict Detection)	Function to detect conflicting IP addresses.
HTTP (Hypertext Transfer Protocol)	Communication protocol used between web browsers and web servers.
I/O expansion module	A generic term for components that extend the input/output functions of a communication module.
Unit	A collection of communication modules and I/O expansion modules connected to a communication module.

5. Overview

I/O terminals are devices that can be connected to various open field networks to reduce the amount of wiring and enable distributed installation of input/output devices. Up to 20 F10 and F15 series manifold solenoid valves (32 control points) and up to 8 I/O expansion modules can be connected.

6. Specifications

This section describes the specifications for the communication modules and I/O expansion modules that comprise the I/O terminal.

6-1. General Specifications

Operating temperature range	5 to 50 °C
Operating humidity range	35 to 85% RH (non-condensation)
Operating atmosphere	No corrosive gases and no excessive dust
Vibration resistance	49.0m/s ²
Shock resistance	98.1m/s ²
Dielectric strength	1000 VAC for 1 minute (between all external terminals and the case)
Noise resistance	IEC61000-4-4 compliant, level 3
Insulation resistance	10 MΩ or more (between all external terminals and the case, using a 500 VDC insulation resistance tester)
Standard	CE marking compliant

6-2. Communication Module

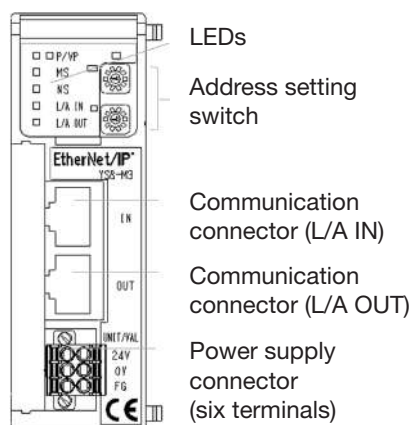
This section describes the specifications, names, and functions for the EtherNet/IP-Compliant communication module YS8-M3.

6-2-1. Specifications

Model	YS8-M3	
Internal current consumption	100mA or less (excluding I/O modules and solenoid valves)	
Input power supply	DC24V \pm 10%, 2A	
Output power supply	DC24V \pm 10%, 2A	
Vendor ID	429	
Input I/O connection size	40 byte	
Output I/O connection size	28 byte	
Communication interface	RJ45 8-pole modular connector \times 2	
Physical layer	10BASE-T, 100BASE-TX	
Transmission medium	Category 5 (100BASE-TX) or higher, shielded Twisted pair cable recommended	
Maximum cable length	100m	
CIP cyclic communications	Connection	Exclusive Owner, Listen Only, Input Only
	RPI	1ms and above
CIP Explicit message	Connection	UCMM: 8
Communication speed	10, 100 Mbps, full duplex, half duplex, auto-negotiate	
MDI	MDI, MDI-X, Auto-MDIX	
IP address settings	Fixed, BOOTP, DHCP	
Switching functions	Supported	
ACD	Supported	
DLR	Supported	
Supported protocols	CIP, HTTP	
Port numbers	CIP: 44818, 2222 HTTP: 80	
EthterNet/IP	CT18 compliant	
Mass	117g	

6-2-2. Major Parts and Functions

YS8-M3 (Front)

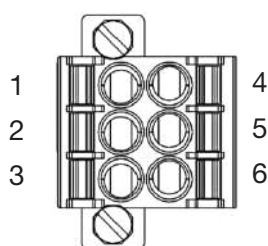


LED displays and descriptions

Name	Details	
P	<input type="checkbox"/> Not lit	No power supply for the unit
	<input checked="" type="checkbox"/> Lit green	Power being supplied to the unit
VP	<input type="checkbox"/> Not lit	Output power off
	<input checked="" type="checkbox"/> Lit green	Output possible
MS	<input type="checkbox"/> Not lit	No module power supply
	<input checked="" type="checkbox"/> Flashing green	IP address not set
	<input checked="" type="checkbox"/> Lit green	Operating normally
	<input checked="" type="checkbox"/> Flashing red	Minor abnormality detected
NS	<input checked="" type="checkbox"/> Lit red	Major abnormality detected
	<input type="checkbox"/> Not lit	Connection not established
	<input checked="" type="checkbox"/> Flashing green	Connection not established (communication in progress)
	<input checked="" type="checkbox"/> Lit green	Connection established
L/A	<input checked="" type="checkbox"/> Flashing red	Connection timeout
	<input checked="" type="checkbox"/> Lit red	Duplicate IP address set
	<input type="checkbox"/> Not lit	No connection
	<input checked="" type="checkbox"/> Lit green	Normal communication

For details, refer to "17. What to do in the event of an abnormality."

Power supply (applicable wire: AWG24-16)



Pin No.	Signal name	Pin No.	Signal name
1	UNIT 24V (For units)	4	VAL 24V (For output)
2	UNIT 0V (For units)	5	VAL 0V (For output)
3	FG	6	FG

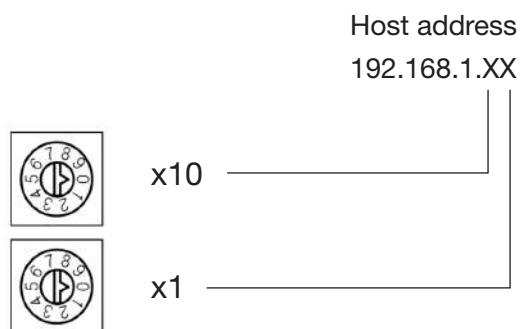
Power supply for units: Supplies power to the communication module, I/O modules, and the channels of the input module.

Power supply for outputs: Supplies power to the valve and the channels of the output module.

6-2-3. Hardware Switch

Address setting switch

The address setting switches can set the host address in the IP address.



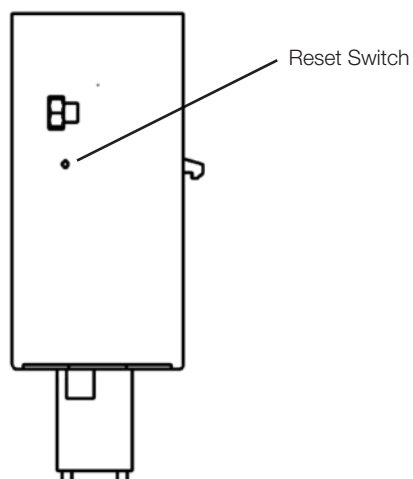
Setting value	Description
00 ^{*1}	<ul style="list-style-type: none"> · Sets the IP address according to the software. Refer to "8 IP address settings" for details. · Acquires IP address from DHCP server.
01-99	Sets the host address.

^{*1} Factory setting

Reset Switch

YS8-M3 settings can be restored to the factory default settings by pressing and holding the reset switch for more than four seconds while power is supplied to the control and input power supplies. Refer to the list of factory default settings for the factory default settings.

YS8-M3 (Top)



6-2-4. Connectable I/O Expansion Modules

Four I/O expansion modules of the same type can be connected to the communication module, for a total of up to eight I/O expansion modules.

The table below shows the types of I/O expansion modules that can be connected.

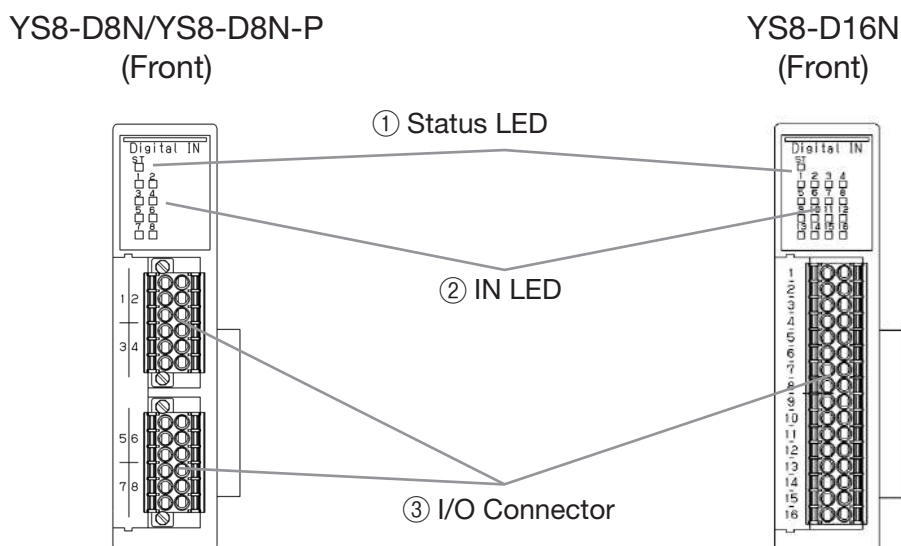
Type	Model	Maximum number of connections
Digital input	YS8-D16N YS8-D8N YS8-D8N-P	4
Analog input	YS8-A4N	4
Digital output	YS8-D8S YS8-D8S-M	4
Analog output	YS8-A2S	4

*If nine or more I/O expansion modules are connected and the communication module is turned on, the communication module will not connect to the host controller. Review the number of I/O expansion module connections.

6-3. Digital Input Module

This section describes the names and specifications for the various parts of I/O expansion modules YS8-D8N/YS8-D8N-P/YS8-D16N.

6-3-1. Major Parts and Functions



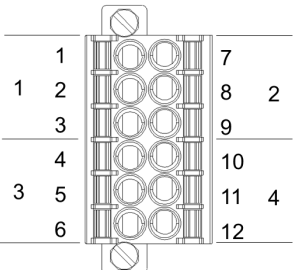
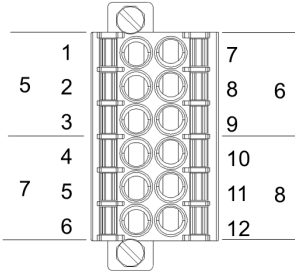
	Name	Description
①	Status LED (ST-LED)	Indicates the module status <input type="checkbox"/> Not lit : Unit power is off <input checked="" type="checkbox"/> Lit green: Normal state <input checked="" type="checkbox"/> Lit red : Overcurrent detected
②	IN LED	Indicates the input status <input type="checkbox"/> Not lit : Non-conducting state <input checked="" type="checkbox"/> Lit green: Conducting state
③	I/O Connector	Input connector For the wiring method, refer to the terminal assignment and circuit diagram

6-3-2. Specifications

Model	YS8-D16N	YS8-D8N	YS8-D8N-P
Input specifications	NPN		PNP
Number of input points	16 points	8 points	
Maximum sensor supply current	—	1A/Module	
Rated input current	7.5mA or less (at 26.4V) *per point		
ON voltage/ON current	15V or more/3.9mA or more (When NPN input occurs, between input terminal and +24V) (When PNP input occurs, between input terminal and 0V)		
OFF voltage/OFF current	5V or less/1mA or less (When NPN input occurs, between input terminal and +24V) (When PNP input occurs, between input terminal and 0V)		
Input resistance	3.6KΩ		
Protective function	Overcurrent detection		
Internal current consumption	10mA or less (excluding sensor supply current)		
Mass	90g		

*When an overcurrent is detected, the input is forcibly turned off and the connection to the PLC is disconnected. Even if the cause of the overcurrent is addressed, the unit will not automatically recover. Disconnect the power supply, address the cause, and then turn it on again.

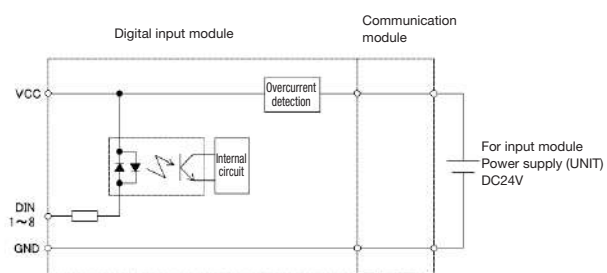
6-3-3. Terminal Assignments and Internal Circuitry**YS8-D8N / YS8-D8N-P**

Shape	Channel	Pin No.	Signal name	Channel	Pin No.	Signal name
	1	1	VCC1	2	7	VCC2
		2	DIN1		8	DIN2
		3	GND1		9	GND2
	3	4	VCC3	4	10	VCC4
		5	DIN3		11	DIN4
		6	GND3		12	GND4
	5	1	VCC5	6	7	VCC6
		2	DIN5		8	DIN6
		3	GND5		9	GND6
	7	4	VCC7	8	19	VCC8
		5	DIN7		11	DIN8
		6	GND7		12	GND8

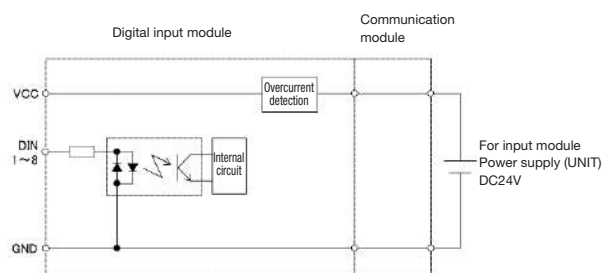
*VCC is shared internally.

*GND is shared internally.

YS8-D8N internal circuit



YS8-D8N-P internal circuit

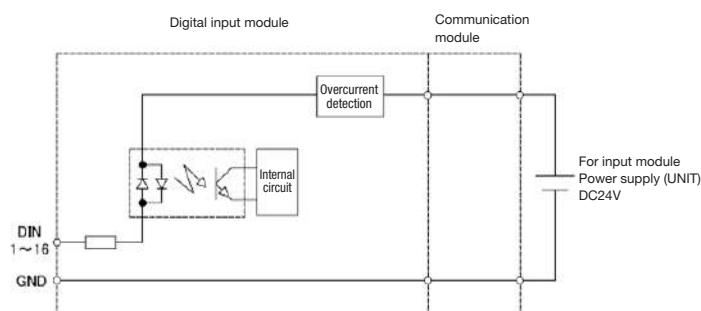


YS8-D16N pin assignments

Shape	Channel	Pin No.	Signal name	Pin No.	Signal name
	1	1	DIN1	17	GND
	2	2	DIN2	18	GND
	3	3	DIN3	19	GND
	4	4	DIN4	20	GND
	5	5	DIN5	21	GND
	6	6	DIN6	22	GND
	7	7	DIN7	23	GND
	8	8	DIN8	24	GND
	9	9	DIN9	25	GND
	10	10	DIN10	26	GND
	11	11	DIN11	27	GND
	12	12	DIN12	28	GND
	13	13	DIN13	29	GND
	14	14	DIN14	30	GND
	15	15	DIN15	31	GND
	16	16	DIN16	32	GND

*GND is shared internally.

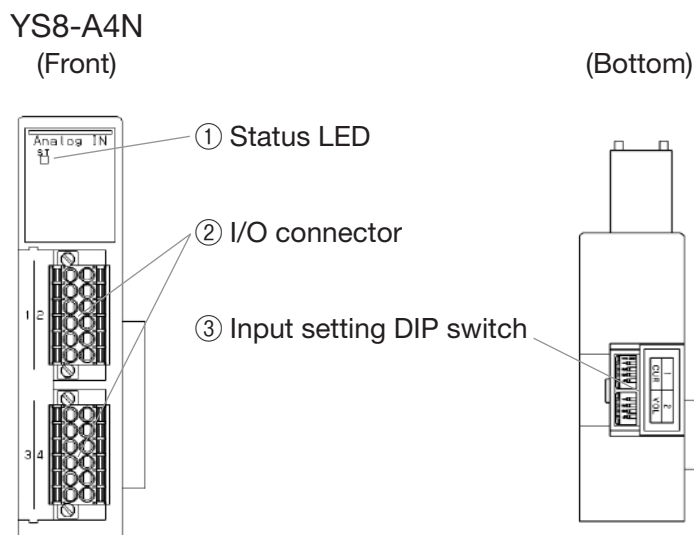
YS8-D16N Internal circuit



6-4. Analog Input Module

This section describes the names and specifications for the various parts of the YS8-A4N I/O expansion module.

6-4-1. Major Parts and Functions



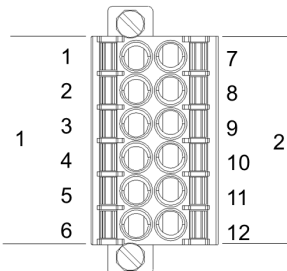
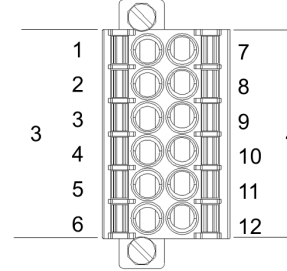
	Name	Description						
①	Status LED (ST-LED)	Indicates the module status <input type="checkbox"/> Not lit : Unit power is off <input checked="" type="checkbox"/> Lit green: Normal state <input checked="" type="checkbox"/> Lit red : Overcurrent detected						
②	I/O Connector	Input connector For the wiring method, refer to the terminal assignment and the circuit diagram						
③	Input setting DIP switch	DIP switch to select input mode. <table border="1"> <thead> <tr> <th>0 – 5V (Factory setting)</th><th>0 – 10V</th><th>0 – 20mA</th></tr> </thead> <tbody> <tr> <td> </td><td> </td><td> </td></tr> </tbody> </table> <p>*The power must be off when switching the DIP switches.</p>	0 – 5V (Factory setting)	0 – 10V	0 – 20mA			
0 – 5V (Factory setting)	0 – 10V	0 – 20mA						

6-4-2. Specifications

Model	YS8-A4N	
Input specifications	Voltage	Current
Number of input points	Four points	
Maximum sensor supply current	1A/Module	
Rated input voltage/current	15V	40mA
Input impedance	1MΩ	250Ω
Input signal range	0-5V/0-10V	0-20 mA
Resolution	12bit	
Conversion accuracy (25°C)	±0.5%F.S.	
Protective function	Overcurrent detection	
Internal current consumption	30mA or less (excluding sensor supply current)	
Mass	90g	

*When an overcurrent is detected, the input is forcibly turned off and the connection to the PLC is disconnected. Even if the cause of the overcurrent is addressed, the unit will not automatically recover. Disconnect the power supply, address the cause, and then turn it on again.

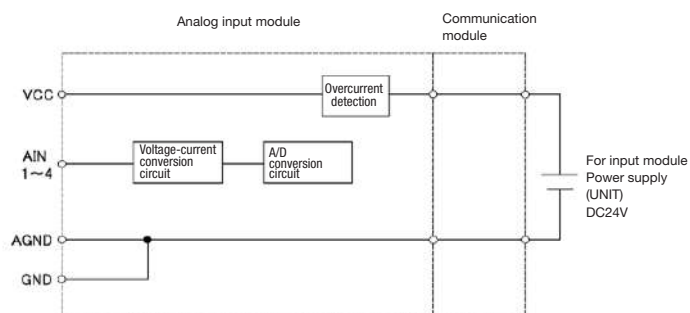
6-4-3. Terminal Assignments and Internal Circuitry**YS8-A4S pin assignments**

Shape	Channel	Pin No.	Signal name	Channel	Pin No.	Signal name
	1	1	VCC1	2	7	VCC2
		2	AIN1		8	AIN2
		3	AGND1		9	AGND2
		4	GND1		10	GND2
		5	N.C.		11	N.C.
		6	N.C.		12	N.C.
	3	1	VCC3	4	7	VCC4
		2	AIN3		8	AIN4
		3	AGND3		9	AGND4
		4	GND3		10	GND4
		5	N.C.		11	N.C.
		6	N.C.		12	N.C.

*VCC is shared internally.

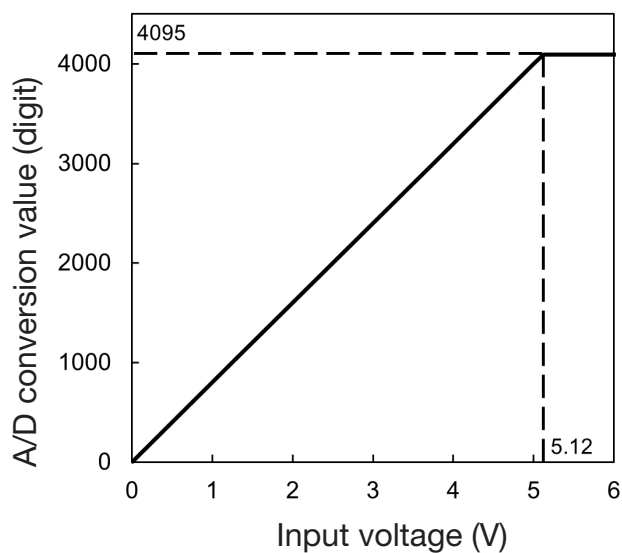
*AGND and GND are shared internally.

YS8-A4N circuit diagram



6-4-4. A/D conversion table

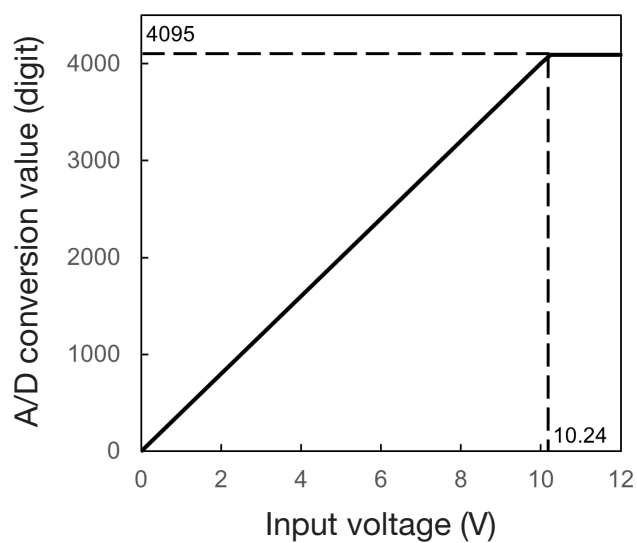
Input range 0-5V



Input voltage (V)	A/D conversion value
0	0
0.5	400
1	800
1.5	1200
2	1600
2.5	2000
3	2400
3.5	2800
4	3200
4.5	3600
5	4000

*The A/D conversion value is 4095 for inputs of 5.12V or higher.

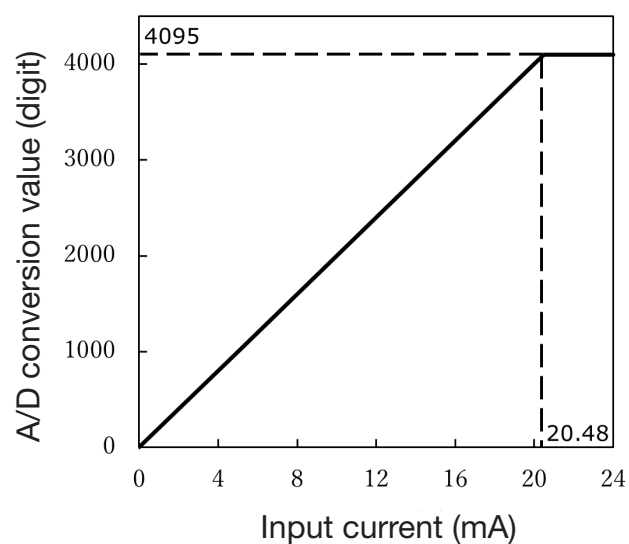
Input range 0-10V



Input voltage (V)	A/D conversion value
0	0
1	400
2	800
3	1200
4	1600
5	2000
6	2400
7	2800
8	3200
9	3600
10	4000

*The A/D conversion value is 4095 for inputs above 10.24V.

Input range 0-20mA



Input current (mA)	A/D conversion value
0	0
2	400
4	800
6	1200
8	1600
10	2000
12	2400
14	2800
16	3200
18	3600
20	4000

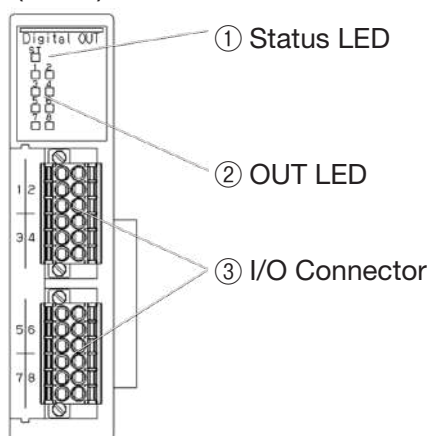
*The A/D conversion value is 4095 for inputs of 20.48mA or more.

6-5. Digital Output Module

This section describes the part names and specifications for the YS8-D8S/YS8-D8S-M I/O expansion modules.

6-5-1. Major Parts and Functions

YS8-D8S/YS8-D8S-M
(Front)



	Name	Description
①	Status LED (ST-LED)	Indicates the module status <input type="checkbox"/> Not lit : Power supply for output OFF <input checked="" type="checkbox"/> Lit green: Normal state <input checked="" type="checkbox"/> Lit red : Overcurrent detected
②	OUT LED	Indicates the output status <input type="checkbox"/> Not lit : Non-conducting state <input checked="" type="checkbox"/> Lit green: Conducting state
③	I/O Connector	Output connector For the wiring method , refer to the terminal assignment and circuit diagram

6-5-2. Specifications

Model	YS8-D8S	YS8-D8S-M
Output Specifications	Sink	Source
Number of output points	8 points	
Maximum load current	0.5A/channel, 1A/module	
Protective function	Overcurrent detection, output short-circuit protection	
Internal current consumption	30mA or less (excluding sensor supply current)	
Mass	90g	

*When an overcurrent is detected, the output is forcibly turned off and the connection to the PLC is disconnected. Even if the cause of the overcurrent is addressed, the unit will not automatically recover. Disconnect the power supply, address the cause, and then turn it on again.

6-5-3. Pin Assignments and Internal Circuitry

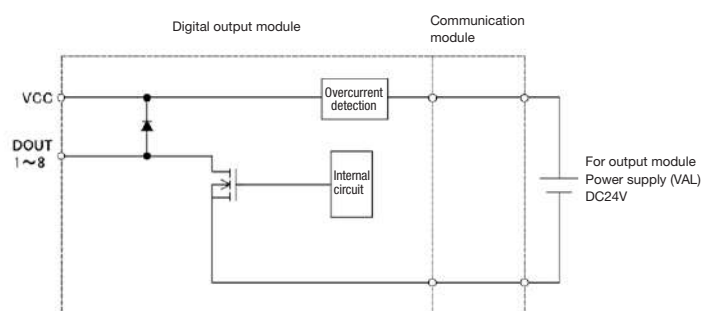
YS8-D8S pin assignments

Shape	Channel	Pin No.	Signal name	Channel	Pin No.	Signal name
	1	1	VCC1	2	7	VCC2
		2	DOUT1		8	DOUT2
		3	N.C.1		9	N.C.2
	3	4	VCC3	4	10	VCC4
		5	DOUT3		11	DOUT4
		6	N.C.3		12	N.C.4
	5	1	VCC5	6	7	VCC6
		2	DOUT5		8	DOUT6
		3	N.C.5		9	N.C.6
	7	4	VCC7	8	19	VCC8
		5	DOUT7		11	DOUT8
		6	N.C.7		12	N.C.8

*VCC is shared internally.

*The VCC connected to the load should be connected to the same module as the DOUT.

YS8-D8S internal circuit

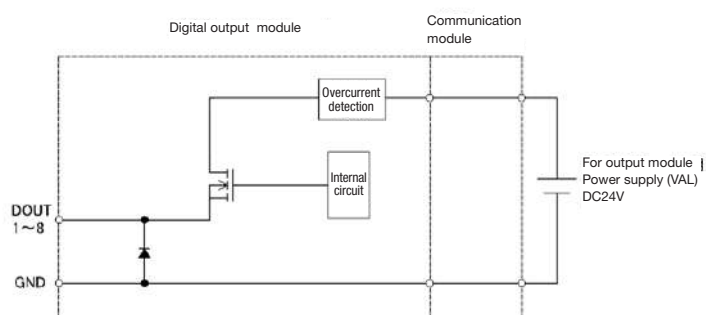


YS8-D8S-M pin assignments

Shape	Channel	Pin No.	Signal name	Channel	Pin No.	Signal name
	1	1	N.C.1	2	7	N.C.2
		2	DOUT1		8	DOUT2
		3	GND1		9	GND2
	3	4	N.C.3	4	10	N.C.4
		5	DOUT3		11	DOUT4
		6	GND3		12	GND4
	5	1	N.C.5	6	7	N.C.7
		2	DOUT5		8	DOUT7
		3	GND5		9	GND7
	7	4	N.C.6	8	19	N.C.8
		5	DOUT6		11	DOUT8
		6	GND6		12	GND8

*GND is shared internally.

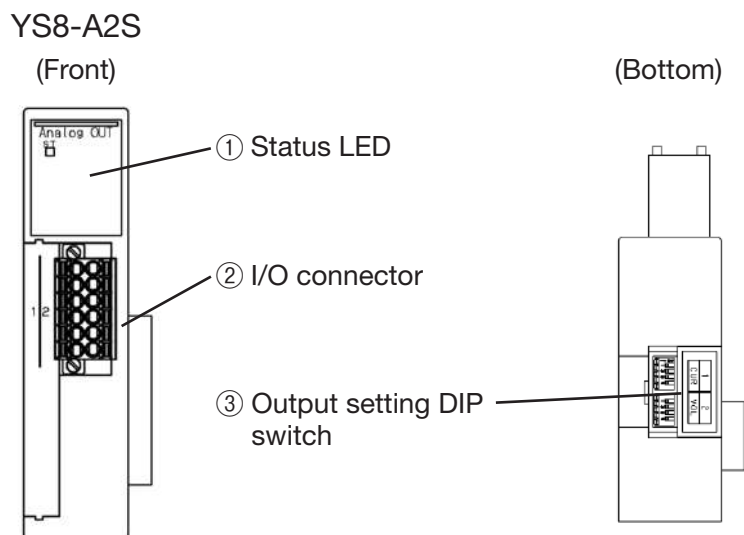
YS8-D8S-M Internal circuit



6-6. Analog Output Module

This section describes the names and specifications of the various parts of the YS8-A2S I/O expansion module.

6-6-1. Major Parts and Functions



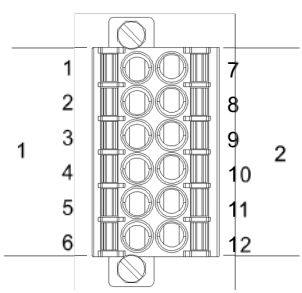
	Name	Description						
①	Status LED (ST-LED)	Indicates the module status <div> <div>□ Not lit</div> : Power supply for output OFF <div>■ Lit green</div>: Normal state <div>■ Lit red</div> : Overcurrent detected </div>						
②	I/O Connector	Output connector Refer to the circuit diagram for wiring to the connector.						
③	Output setting DIP switch	The DIP switch for selecting the output mode. <table border="1"> <thead> <tr> <th>0 – 5V (Factory setting)</th><th>0 – 10V</th><th>0 – 20mA</th></tr> </thead> <tbody> <tr> <td> </td><td> </td><td> </td></tr> </tbody> </table> <p>*The output power must be off when switching the DIP switches.</p>	0 – 5V (Factory setting)	0 – 10V	0 – 20mA			
0 – 5V (Factory setting)	0 – 10V	0 – 20mA						

6-6-2. Specifications

Model	YS8-A2S	
Output Specifications	Voltage	Current
Number of output points	Two points	
Maximum load current	1A/Module	
Load impedance	1k Ω or more	600 Ω or less
Output signal range	0-5V/0-10V	0-20 mA
Resolution	12bit	
Conversion accuracy (25°C)	$\pm 0.5\%$ F.S.	
Protective function	Overcurrent detection, output short-circuit protection	
Internal current consumption	30mA or less (excluding sensor supply current)	
Mass	90g	

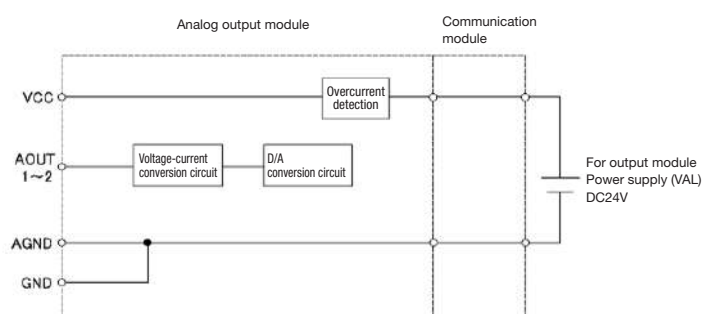
*When an overcurrent is detected, the connection to the PLC is disconnected. Even if the cause of the overcurrent is addressed, the unit will not automatically recover. Disconnect the power supply, address the cause, and then turn it on again.

6-6-3. Pin Assignments and Internal Circuitry**YS8-A2S Pin assignments**

Shape	Channel	Pin No.	Signal name	Channel	Pin No.	Signal name
	1	1	VCC1	2	7	VCC2
		2	AOUT1		8	AOUT2
		3	AGND1		9	AGND2
		4	GND1		10	GND2
		5	N.C.		11	N.C.
		6	N.C.		12	N.C.

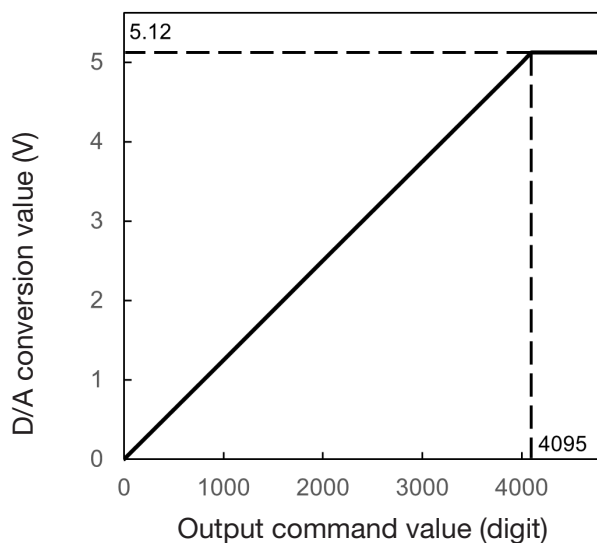
*VCC is shared internally.

*AGND and GND are shared internally.

YS8-A2S internal circuit

6-6-4. D/A Conversion Table

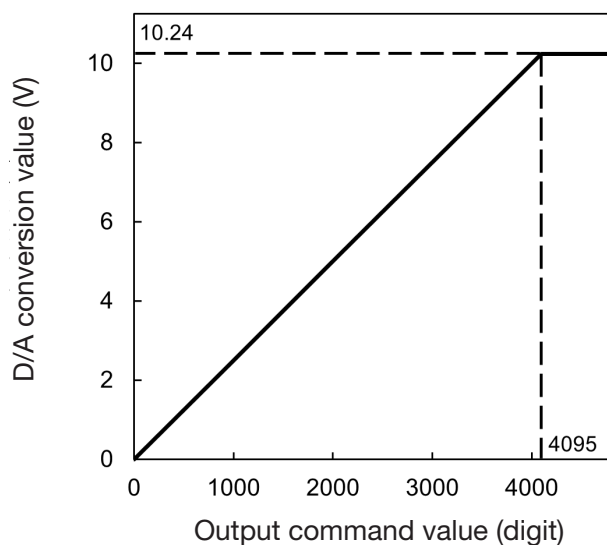
Output range 0-5V



Output command value	D/A conversion value (V)
0	0
400	0.5
800	1
1200	1.5
1600	2
2000	2.5
2400	3
2800	3.5
3200	4
3600	4.5
4000	5

*Output is 5.12V for outputs specified at 4095 or above.

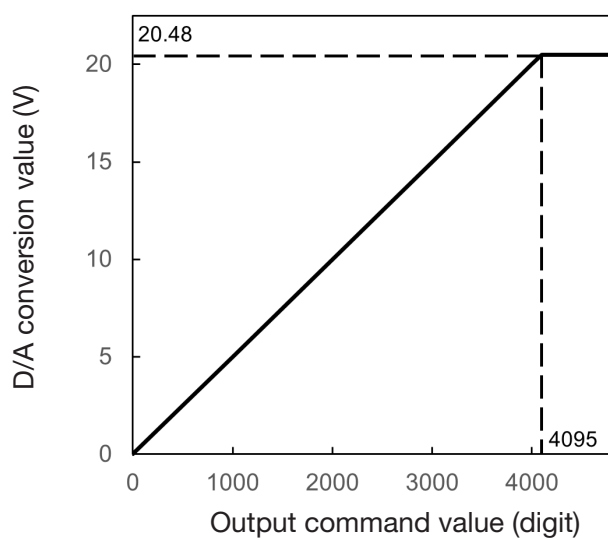
Output range 0-10V



Output command value	D/A conversion value (V)
0	0
400	1
800	2
1200	3
1600	4
2000	5
2400	6
2800	7
3200	8
3600	9
4000	10

*10.24V output for output commands of 4095 or higher

Output range 0-20mA



Output command value	A/D conversion value (mA)
0	0
400	2
800	4
1200	6
1600	8
2000	10
2400	12
2800	14
3200	16
3600	18
4000	20

*Output is 20.48mA for output commands of 4095 or above.

7. EDS File

Download from <https://official.en.koganei.co.jp/>.

8. IP Address Settings

Please select the setting method according to the address you wish to set.

Address to be set	Setting method
192.168.1.1 - 99	8-1 Setup Using Physical Switch <recommended>
Other than the above	8-2 Setup Using Support Software



8-1 Setup Using Physical Switch

Specify the host address directly using the address switch.

1	Make sure that the I/O terminal power is off.											
2	Change the address setting switch. The following is the range that can be set.											
	<table><tr><th>Address setting switch</th><th>IP address</th><th>Subnet mask</th><th>Gateway</th></tr><tr><td><div><div><div>0123456789</div><div>1</div></div><div>x10</div></div><div><div><div>0123456789</div><div>1</div></div><div>x1</div></div><div>Combination of 1 - 99</div></td><td>192.168.1.1 - 192.168.1.99</td><td>255.255.255.0</td><td>0.0.0.0 (disabled)</td></tr></table>	Address setting switch	IP address	Subnet mask	Gateway	<div><div><div>0123456789</div><div>1</div></div><div>x10</div></div> <div><div><div>0123456789</div><div>1</div></div><div>x1</div></div> <div>Combination of 1 - 99</div>	192.168.1.1 - 192.168.1.99	255.255.255.0	0.0.0.0 (disabled)			
Address setting switch	IP address	Subnet mask	Gateway									
<div><div><div>0123456789</div><div>1</div></div><div>x10</div></div> <div><div><div>0123456789</div><div>1</div></div><div>x1</div></div> <div>Combination of 1 - 99</div>	192.168.1.1 - 192.168.1.99	255.255.255.0	0.0.0.0 (disabled)									
The setting will be reflected the next time the power is turned on.												

8-2. Setup Using Support Software

Setting the address setting switch to "00" allows you to set the address to any desired address.

1	Make sure that the I/O terminal power is off.
2	<p>Change the address setting switch to "00".</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0; text-align: center;">Address setting switch</div> <div style="display: flex; justify-content: center; align-items: center; gap: 20px;"> <div style="text-align: center;">  <p>x10</p> </div> <div style="text-align: center;">  <p>x1</p> </div> </div>
3	<p>Use the PLC vendor's support software to configure the address. For details, refer to the manual of the PLC being used.</p> <ul style="list-style-type: none"> •OMRON Corporation: NJ, NX series •KEYENCE: KV7500, KV8000 <p>For anything other than the above, please use Rockwell's BOOTP/DHCP Tool.</p>

8-2-1. Relationship Between IP Address and Subnet Mask


An IP address consists of a network portion and a host portion. The network portion refers to a group of connected devices, and the host portion refers to the devices within it. The subnet mask is used to distinguish between the network and host portions.

IP address


Network portion	Host portion
-----------------	--------------

Example: IP address 192.168.250.10
Subnet mask 255.255.255.0

192.	168.	250.	10
255.	255.	255.	0



Network portion



Host portion



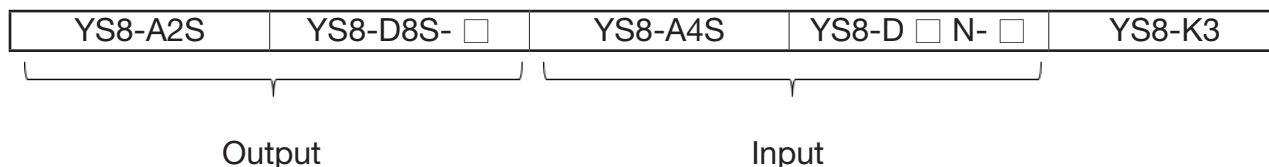
The 1s (binary) in the subnet mask indicate the network portion.

11111111.	11111111.	11111111.	00000000
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9. Increasing/Decreasing Number of I/O Expansion Modules

9-1. Precautions for Increasing/Decreasing Number of Modules

- Be sure to turn off the power to the communication module before increasing or decreasing the number of I/O expansion modules. Attaching or detaching modules with the power on may result in malfunctions.
- Please work on a horizontal plane when increasing or decreasing the number of I/O expansion modules.
- The connecting rods (additional parts YS8Z-1 - YS8Z-8) used to connect the communication module and the I/O expansion module cannot be increased or decreased in number. Please prepare connecting rods that match the number of I/O expansion modules before connecting the I/O expansion modules.
- Be sure to attach the cover (additional part YS8Z-C) to the connection of the leftmost module when operating. Operating without the cover may cause a malfunction.
- While there are no restrictions on the order in which I/O expansion modules are installed, the following configuration is recommended to make it easier to understand the relationship between the I/O data allocation and the I/O expansion modules.
 - Modules should be grouped together by type.
 - The analog output should be at the end, followed by digital output, analog input, and digital input.



9-2. How to Increase/Decrease Number of I/O Expansion Modules

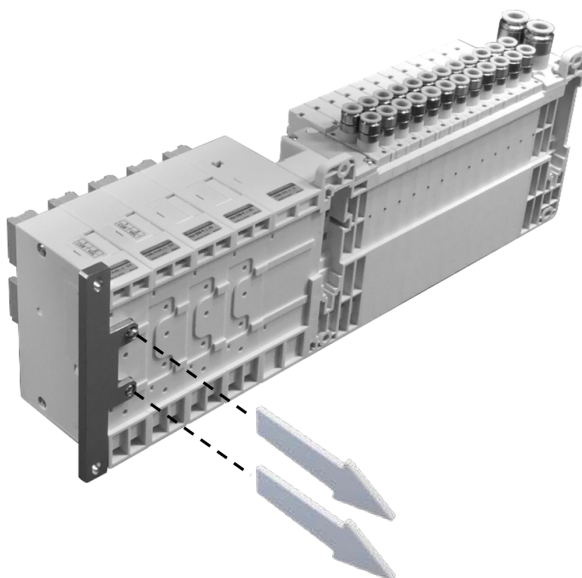
As an example of how to increase or decrease the number of modules, we will explain how to increase the number of I/O terminals by adding a digital input module (YS8-D8N) to an I/O terminal with the following initial configuration.

Initial configuration: YS8EK3-4 mod.1-2: YS8-D8N, mod.3-4: YS8-A4N

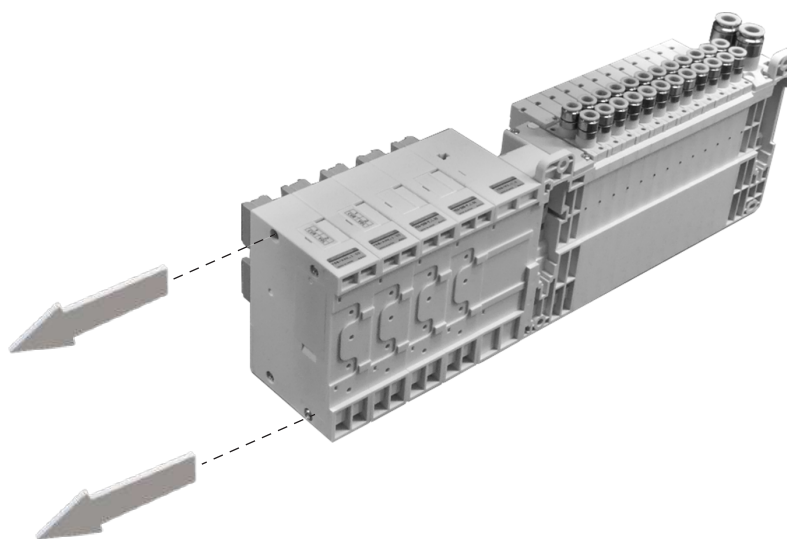
Items required for additional connections: Digital output module (YS8-D8S)

connecting rod for 5-series (additional part YS8Z-5)

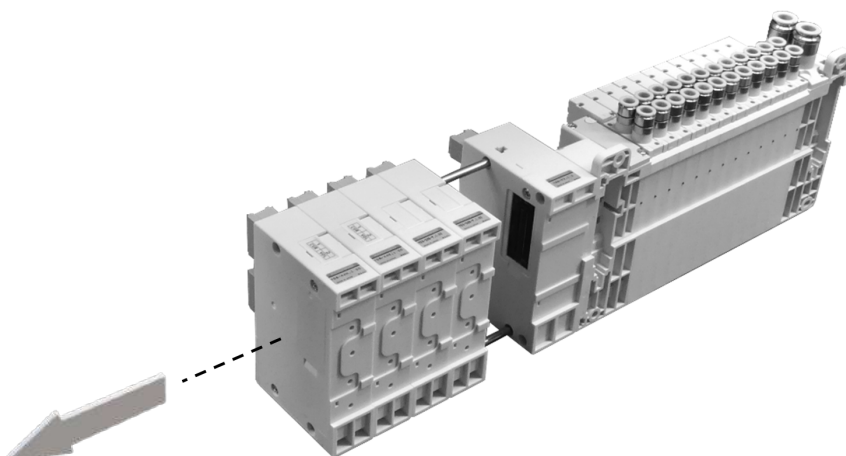
- ① To add an I/O expansion module to the I/O terminal end, remove the screws at the positions shown in the figure below and remove the mounting brackets.



- ② Remove the screws and washers from the I/O terminal at the positions shown in the figure below.

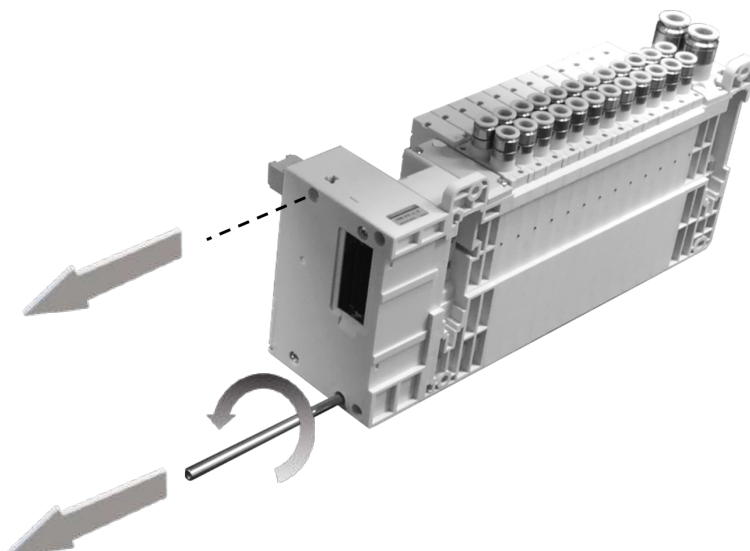


- ③ Disconnect the I/O expansion module from the communication module.

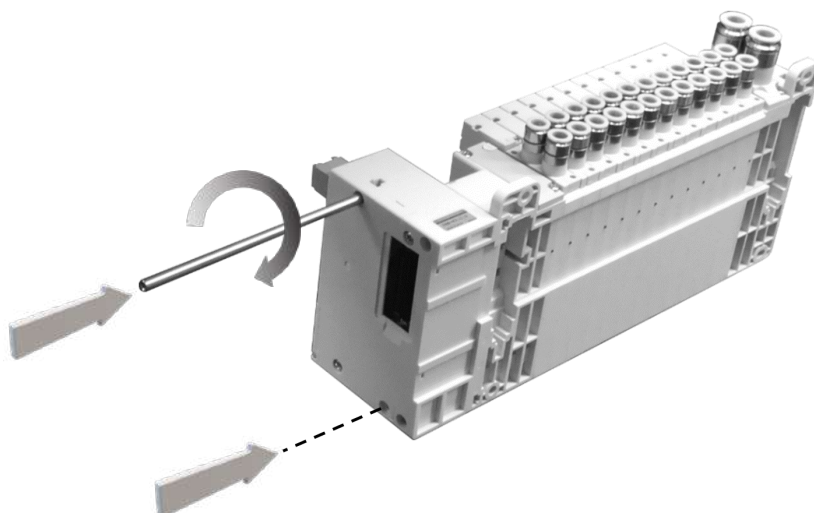


- ④ Remove the connecting rod from the communication module.

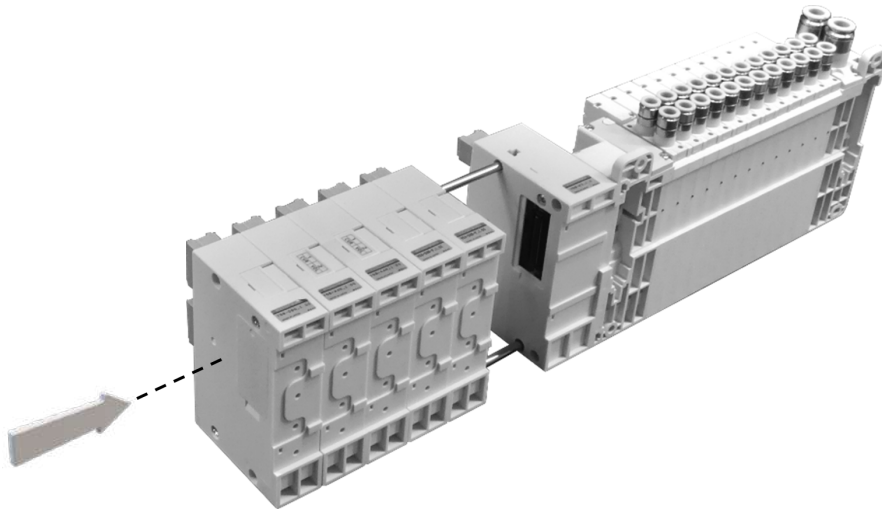
*Keep the connecting rod together with the screws and washers shown in ②. It will be used when reverting to the original number of connections.



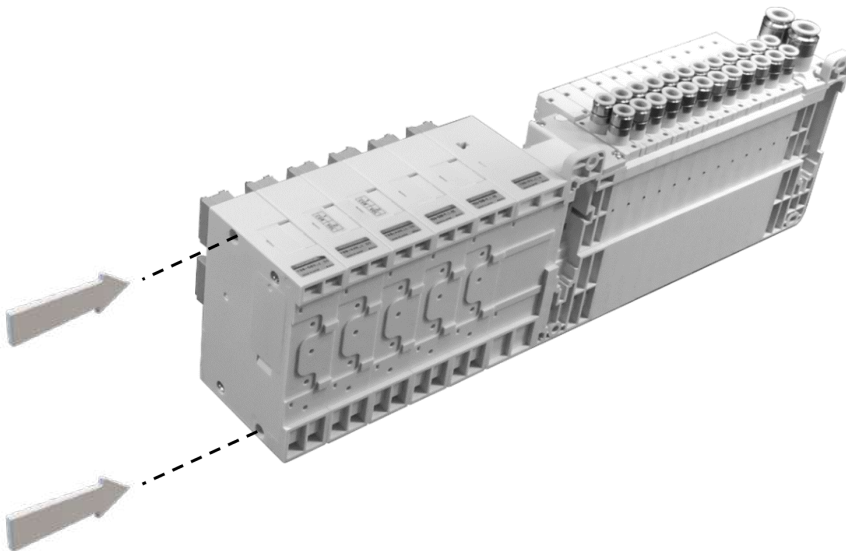
- ⑤ Connect the connecting rod of additional part YS8Z-5 to the communication module.



- ⑥ Insert the expansion I/O module along the connecting rod and connect it to the communication module.

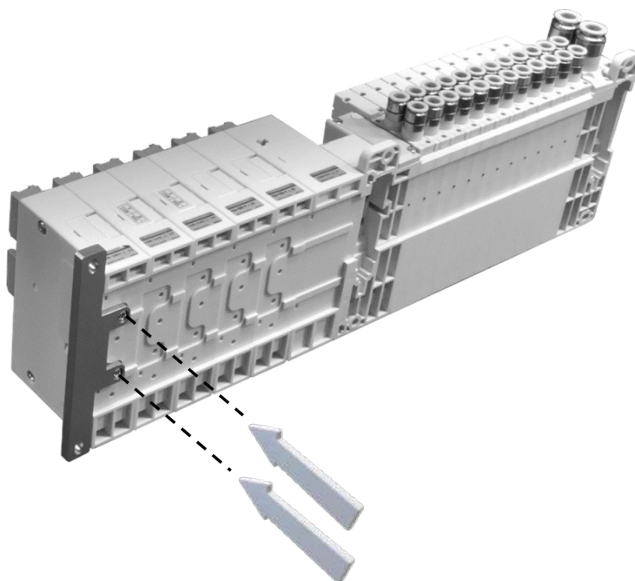


- ⑦ Prepare the washers and screws included with the additional part YS8Z-5 and screw them into the positions shown in the figure below. [Tightening torque 0.49 N·m \pm 20%]

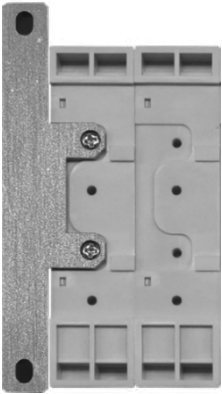
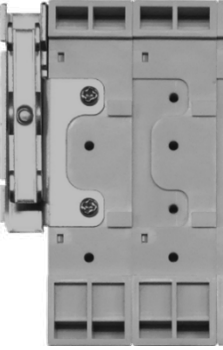



- ⑧ If an expansion I/O module is added to the end, install the mounting bracket removed in ① and screw it in the same way using the screws removed in ①. Refer to the table below for the installation positions of the metal fittings.

[Tightening torque 0.49 N-m \pm 20%]



Fitting mounting position

Direct mount	DIN fittings	DIN fittings (When F15 split type manifold is connected)
		

*Refer to F series solenoid valve catalog No. V3155 for information on how to remove or install manifold solenoid valves.

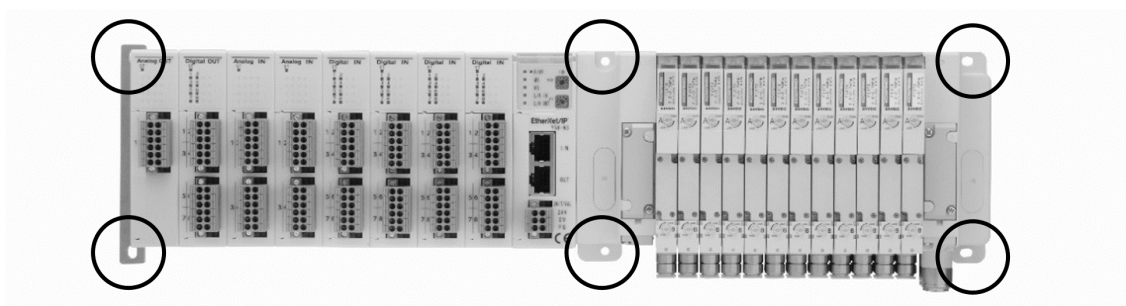
10. Installation

This section describes how to install I/O terminals.

10-1. Installation via Direct Mounting

Obtain M4 screws and screw them perpendicularly to the mounting holes.

[Tightening torque $1.47 \text{ N} \cdot \text{m} \pm 15\%$]

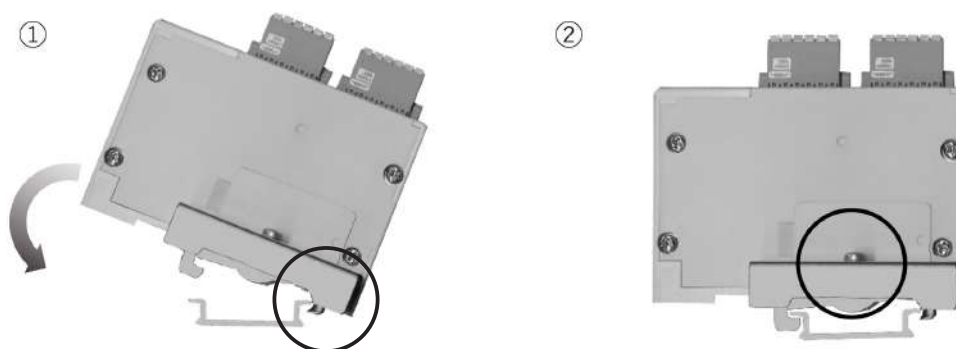


10-2. Installation to DIN rail

- ① Install the I/O terminal to the DIN rail.

First hook the lower hook of the DIN rail fitting to the DIN rail, then push the I/O terminal body down and fit it into the DIN rail.

- ② Fasten the DIN rail mounting bracket with screws. [Tightening torque $1.47 \text{ N} \cdot \text{m} \pm 15\%$]



*Refer to F series solenoid valve catalog No. V3155 for information on how to remove or install manifold solenoid valves.

11. Wiring Precautions

- Be sure to **turn off** the power supply when wiring to the connectors or inserting/removing the connectors.

Wiring with the power on may result in electric shock or product failure.

- Wiring for both power supply connectors and connectors for I/O expansion modules should be performed according to the following specifications.

Wire size	AWG24-16
Length of bare wire	10.0mm

- When wiring with stranded wires, twist the wires so that there are no whiskers.
- Do not solder the wire ends.
- When removing the connectors from the modules, loosen the connector screws (except with YS8-D16N) and pull the connector straight out of the module.
- When installing the connectors to the modules, be sure to fasten the connector screws.
(except with YS8-D16N)
[Tightening torque 0.12 ±15%]

12. I/O Data Allocation

Performs fixed-size, fixed-address I/O data allocation regardless of the type or serial number of the valves connected to the communication module or the type or connection location of the I/O expansion module.

12-1. Relationship Between I/O Expansion Data Assignment and I/O Modules

The input data size is fixed at 40 bytes, and the output data size is fixed at 28 bytes.

The following configuration is an example of the relationship between I/O data allocation and I/O expansion modules.

Assign module numbers for each module type in order from right to left.

YS8-A2S	YS8-D8S- <input type="checkbox"/>	YS8-D8S- <input type="checkbox"/>	YS8-A4S	YS8-A4S	YS8-D <input type="checkbox"/> N- <input type="checkbox"/>	YS8-D <input type="checkbox"/> N- <input type="checkbox"/>	YS8-D <input type="checkbox"/> N- <input type="checkbox"/>	YS8-M3	Valve
Analog Output 1 (AO1)	Digital Output 2 (DO2)	Digital Output 1 (DO1)	Analog Input 2 (AI2)	Analog Input 1 (AI1)	Digital Input 3 (DI3)	Digital Input 2 (DI2)	Digital Input 1 (DI1)	Communication Module	

Input data area address assignment for input modules

	AI4				AI3				AI2				AI1				DI4	DI3	DI2	DI1
Word	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Byte	38	36	34	32	30	28	26	24	22	20	18	16	14	12	10	8	6	4	2	0

Output data area address assignment for valves and output modules

	AO4		AO3		AO2		AO1		DO4	DO3	DO2	DO1	VALVE
Word	13	12	11	10	9	8	7	6	5	4	3	2	0
Byte	26	24	22	20	18	16	14	12	10	8	6	4	0

 : Unused area

12-2. Relationship Between I/O Data Allocation and Solenoid Valves

The relationship between the solenoid valves and the allocation of I/O data varies according to the "wiring specifications" specified in the order number of the manifold.

"Blank" wiring specifications (packed wiring): The wiring is matched to the specifications of the valve being installed.

-W (double wiring): All wiring is for double solenoids, regardless of the specifications of the mounted valves.

If wiring specifications are "blank" (packed wiring)

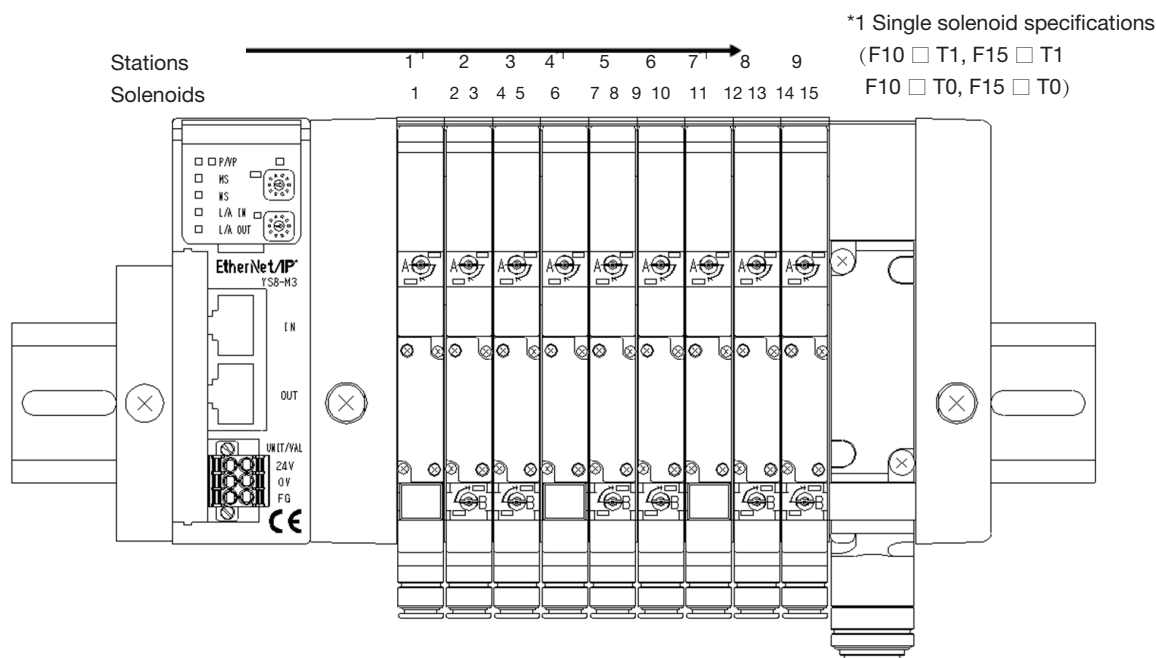
The valves specified in the single solenoid specifications^{*1} when ordering are wired to solenoid A only, and are not wired to solenoid B because wiring is done according to specifications for the mounted valves.

This means that it cannot function as a double solenoid valve after it is delivered because no current flows to solenoid B, even if it is switched from a single solenoid valve to a double solenoid valve.

When wiring specifications are "-W" (double wiring)

All wiring is for double solenoids.

Assign in order from left to right.



(Example of above configuration) F10M9TJ-JR-M3

stn. 1	F10T1-A1 DC24V
stn. 2, 3	F10T2-A1 DC24V
stn. 4	F10T1-A1 DC24V
stn. 5, 6	F10T2-A1 DC24V
stn. 7	F10T1-A1 DC24V
stn. 8, 9	F10T2-A1 DC24V

Output supported by example configuration

Bits b15 b14 b13 b12 b11 b10 b9 b8 b7 b6 b5 b4 b3 b2 b1 b0

VALVE 1															
VALVE 2															

Blank (packed wiring)

Stations	-	9		8		7	6		5		4	3		2		1
Solenoids	-	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Stations	-	-		-		-		-		-		-		-		-
Solenoids	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

-W (double wiring)

Stations	8		7		6		5		4		3		2		1	
Solenoids	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Stations	-		-		-		-		-		-		-		9	
Solenoids	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18	17

 : Unused area

12-3. Input Data Allocation Details [I/O Terminal → Scanner]

The following table shows the correspondence between addresses and I/O expansion modules in the 40-byte input data area, as well as the channel allocation within the areas allocated to the various modules.

Name	Address		Bit							
	Word	Byte	7	6	5	4	3	2	1	0
Digital Input 1	0	0	Ch8	Ch7	Ch6	Ch5	Ch4	Ch3	Ch2	Ch1
		1	Ch16	Ch15	Ch14	Ch13	Ch12	Ch11	Ch10	Ch9
Digital Input 2	1	2	Ch8	Ch7	Ch6	Ch5	Ch4	Ch3	Ch2	Ch1
		3	Ch16	Ch15	Ch14	Ch13	Ch12	Ch11	Ch10	Ch9
Digital Input 3	2	4...5	—							
Digital Input 4	3	6...7	—							
Analog Input 1	4	8	Ch1							
		9	Reserved				Ch1			
	5	10	Ch2							
		11	Reserved				Ch2			
	6	12	Ch3							
		13	Reserved				Ch3			
	7	14	Ch4							
		15	Reserved				Ch4			
Analog Input 2	8	16	Ch1							
		17	Reserved				Ch1			
	9	18	Ch2							
		19	Reserved				Ch2			
	10	20	Ch3							
		21	Reserved				Ch3			
	11	22	Ch4							
		23	Reserved				Ch4			
Analog Input 3	12...15	24...31	—							
Analog Input 4	16...19	32...39	—							

Precautions for I/O Data Allocation for Input Modules

- While YS8-D8N and YS8-D8N-P have 8-channel specifications, note that the I/O area uses 2 bytes (16 channels). The latter byte is a reserved area and cannot be used.
- The YS8-A4N channels store the AD conversion value in the first 12 bits of the allocated 2-byte I/O area. The high-order 4 bits cannot be used.

12-4. Output Data Allocation Details [Scanner → I/O Terminal]

The following table shows the correspondence between addresses and I/O expansion modules and valves in the 28-byte output data area, as well as the channel allocation within the areas allocated to the various modules.

Name	Address		Bit							
	Word	Byte	7	6	5	4	3	2	1	0
Valve	0	0	Ch8	Ch7	Ch6	Ch5	Ch4	Ch3	Ch2	Ch1
		1	Ch16	Ch15	Ch14	Ch13	Ch12	Ch11	Ch10	Ch9
	1	2	Ch24	—						Ch17
		3	Ch32	—						Ch25
Digital Output 1	2	4	Ch8	Ch7	Ch6	Ch5	Ch4	Ch3	Ch2	Ch1
		5	Reserved							
Digital Output 2	3	6	Ch8	Ch7	Ch6	Ch5	Ch4	Ch3	Ch2	Ch1
		7	Reserved							
Digital Output 3	4	8...9	—							
Digital Output 4	5	10...11	—							
Analog Output 1	6	12	Ch1							
		13	Reserved				Ch1			
	7	14	Ch2							
		15	Reserved				Ch2			
Analog Output 2	8	16	Ch1							
		17	Reserved				Ch1			
	9	18	Ch2							
		19	Reserved				Ch2			
Analog Output 3	10...11	20...23	—							
Analog Output 4	12...13	24...27	—							

Precautions for I/O Data Allocation for Output Modules

- While YS8-D8S and YS8-D8S-M have 8-channel specifications, note that the I/O area uses 2 bytes (16 channels). The latter byte is a reserved area and cannot be used.
- The YS8-A2S channels performs DA conversion of the value stored in the first 12 bits of the allocated 2-byte I/O area. The high-order 4 bits cannot be used.

13. Parameter Settings

YS8-M3 has parameters that can be set for each module/channel. The various parameters can be set using the support software provided by the PLC vendor or Explicit Message communication.

Support software is provided by the PLC vendor. For details, refer to the manual of the PLC being used.

- OMRON Corporation: NJ, NX series
- KEYENCE: KV7500, KV8000

Refer to CIP Class Objects when configuring with Explicit Message communication.

13-1. Parameter Definitions

No	Parameter Name	Definition	Target	Setting value	Setting Details
1	Valve Failure Reaction	Sets the output state of the valve when a communication error occurs.	Valve	0 (Initial value)	Turns the output off.
				1	Maintains the output when a communication error occurs.
2	Digital Input On Delay Time 1 - 4	Sets the input delay time for each channel.	Digital input module	0 (Initial value)	No delay time.
				1	3 msec
				2	10 msec
				3	25 msec
3	Analog Input Filter Measured Value 1 ~ 4	Sets the analog filter moving average frequency for each channel.	Analog input module	0 (Initial value)	No filter applied.
				1	Two moving averages
				2	Four moving averages
				3	Eight moving averages
4	Digital Output Group Failure Reaction 1 - 4	Sets the digital output state for each module when a communication error occurs.	Digital output module	0 (Initial value)	Turns the output off.
				1	Maintains the output when a communication error occurs.
5	Analog Output Group Failure Reaction 1 - 4	Sets the analog output state for each module when a communication error occurs.	Analog output module	0	Turns the output off.
				1 (Initial value)	Maintains the output when a communication error occurs.

*The parameter settings are maintained even after the power is turned off.
After changing the settings, do not turn off the power for one second.

13-2. Parameter Description

13-2-1. [Valve / Digital Output Group / Analog Output Group] Failure Reaction

Intended Uses

Maintains or clears the output state when a communication error is detected.

Examples

- Disconnection of communication cable during communication with PLC.
- Communication error due to emergency stop during PLC operation, etc.
- Overcurrent detection in I/O expansion modules.

Applicable Modules

Communication module: YS8-M3 (valve output)

Digital output module: YS8-D8S, YS8-D8S-M

Analog output module: YS8-A2S

*Settings can be configured on a module-by-module basis.

13-2-2. Digital Input On Delay Time

Intended Uses

Prevents data changes and stabilizes input when the contact state is unstable due to chattering or noise.

Details

Sets the input ON delay time. The input is turned ON only if it remains ON for the set time after the input is turned ON. The input ON delay time can be set to 0 ms (no input ON delay), 3 ms, 10 ms, or 25 ms.

Applicable Modules

Digital input module: YS8-D8N, YS8-D8N-P, YS8-D16N

*Parameters can be set for each channel.

13-2-3. Analog Input Filter Measured Value

Intended Uses

When the input value fluctuates and is unstable due to noise and other factors, the input value is stabilized by taking a moving average.

Details

Set the number of times sampling is performed when calculating the moving average of the analog input value. Sampling is performed for the set number of times in 3 ms cycles, and the average of the sampled data is used as the analog input value. The number of sampling times can be set to 1 (no moving average), 2, 4, or 8 times.

Applicable Modules

Analog input module: YS8-A4N

*Can be set for each channel.

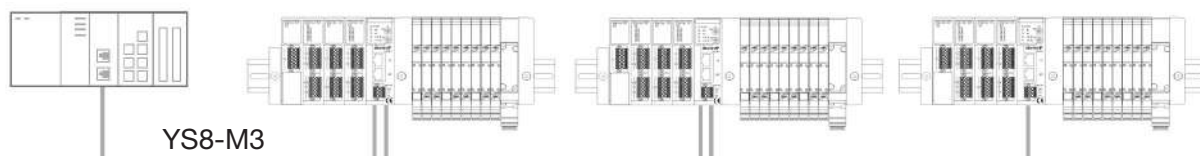
14. Network Topology

The YS8-M3 supports the following connection formats.

- Line format
- Star format
- Device level ring format

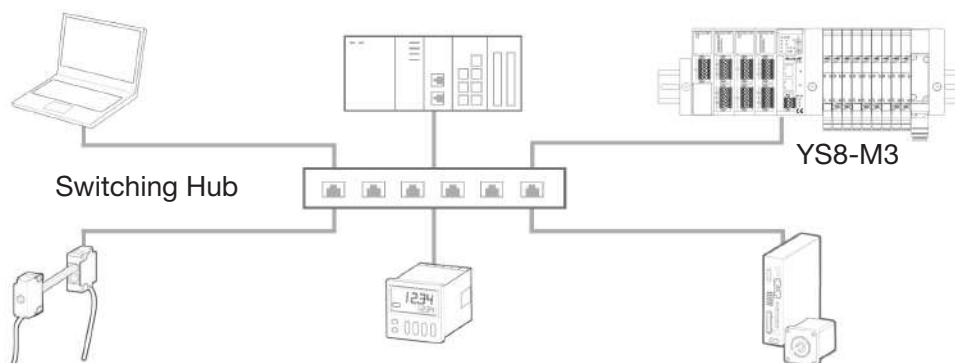
14-1. Line Format

A line format network connects devices in a daisy chain format. Switching hubs are not needed, and the total length of the LAN cable can be reduced.



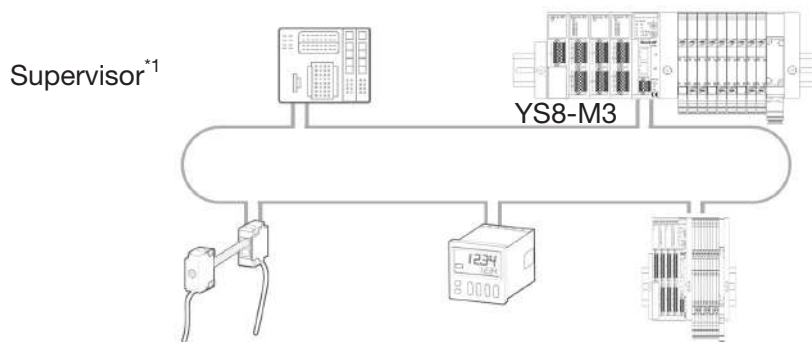
14-2. Star Format

A star format network connects the various devices from switching hubs.



14-3. Device Level Ring Format

A device level ring (hereafter DLR) format network is resilient to breakdowns. The connections are maintained by switching to line format communications if a line is cut or a device in the ring malfunctions. A control device known as a supervisor must be installed on the network.



*1 Rockwell CompactLogix, etc.

Basically, you must configure a DLR format network so that all the devices you connect support DLR. Refer to the PLC manual for more details.

15. CIP Class Objects

Name of object	Class code	Description
Identity	01 hex	Provides information that identifies a product.
TCP/IP Interface	F5 hex	Provides the interface for the TCP/IP network.
Ethernet Link	F6 hex	Provides information for the IEEE802.3 communications interface.
Device Level Ring	47 hex	Provides information about the status of the device level ring.
Quality of Service	48 hex	Provides information about priority order of Ethernet frame.
LLDP Management	109 hex	Provides management information for the Link Layer Discovery Protocol.
Statistical Data	A0 hex	Provides statistical information about a product. (Vendor expansion)
Valve Point	B1 hex	Provides information for individual valve outputs.
Digital Input Point	B2 hex	Provides information for individual digital inputs.
Analog Input Point	B4 hex	Provides information for individual analog inputs.
Valve Point Group	B6 hex	Provides parameter information for valve outputs.
Digital Output Group	B7 hex	Provides parameter information for digital outputs.
Analog Output Group	B8 hex	Provides parameter information for analog outputs.

15-1. Identity (Class Code: 01 Hex)**15-1-1. Service Code**

Service code	Name
01 hex	Get_Attribute_All
05 hex	Reset
0E hex	Get_Attribute_Single

15-1-2. Attribute

Instance ID	Attribute	Access	NV ^{*1}	Name	Description	Data format
0	1	Get		Revision	Revision of identity object	UINT
0	2	Get		Max Instance	Maximum number of instances	UINT
1	1	Get		Vendor ID	Product vendor identification number	UINT
1	2	Get		Device Type	General type of device	UINT
1	3	Get		Product Code	Identification number for product	UINT
1	4	Get		Revision	Revision of product	Structure
				Major Revision	Major revisions Revision number for large changes that affect users.	USINT
				Minor Revision	Minor revisions Revision number for small changes that do not affect users.	USINT
1	5	Get		Status	State of communications with devices	WORD
1	6	Get		Serial Number	Number that identifies products of specific vendors	UDINT
1	7	Get		Product Name	Product name	SHORT_STRING
1	8	Get		State	State of device 0 = Nonexistent 1 = Device Self Testing 2 = Standby 3 = Operational 4 = Major Recoverable Fault 5 = Major Unrecoverable Fault 255 = Default Value	USINT

15-1-3. Reset Service

Data	Description
0	Executes the same operation as a power reset. Default behavior for when data is omitted.
1	Executes the same operation as power reset and returns settings to factory defaults.

^{*1} NV: Indicates the attribute that stores the value in non-volatile memory.

Factory Settings List

Item	Initial value	Name of object	Attribute
How to Set IP Addresses	2 = DHCP	TCP/IP Interface	Configuration Method
IP address	0.0.0.0		Configuration Control
Subnet mask	0.0.0.0		
Default gateway	0.0.0.0 (disabled)		
TTL for multicast	1		
Multicast How to Specify Addresses	0 = Automatic allocation		
Multicast Start address	0.0.0.0 (disabled)		Mcast Config
ACD enabled/disabled	1 = enabled		SelectAcd
ACD information	0		LastConflictDetected
Communication speed	0 = Auto-negotiate (automatic setting)	Ethernet Link	Interface Control
DSCP Scheduled	47	QoS	DSCP Scheduled
DSCP Explicit	27		DSCP Explicit
LLDP Enable Array Length	3	LLDP	LLDP Enable
LLDP Enable Array	7		
msgTxInterval	30		msgTxInterval
msgTxHold	4		msgTxHold
Accumulated operating time	0	Statistical Data	Total power on time
Valve output count	0	Valve Point	Count
Digital input Input constant	0 = 0 ms	Digital Input Point	On Delay Time
Analog input Moving average	0 = 0 times	Analog Input Point	Filter Measured Value
Output setting for communication errors	0 = Clear	Valve Point Group	Failure Reaction
Output setting for communication errors	0 = Clear	Digital Output Group	Failure Reaction
Output setting for communication errors	1 = Hold	Analog Output Group	Failure Reaction

15-2. TCP/IP Interface (Class Code: F5 Hex)**15-2-1. Service Code**

Service code	Name
01 hex	Get_Attribute_All
0E hex	Get_Attribute_Single
10 hex	Set_Attribute_Single

15-2-2. Attribute

Instance ID	Attribute	Access	NV	Name	Description	Data format
0	1	Get		Revision	Revision of TCP/IP interface object	UINT
0	2	Get		Max Instance	Maximum number of instances	UINT
1	1	Get		Status	State of TCP/IP network Bit0-3: Interface Configuration Status 1 = Established by BOOTP, DHCP, or NV 2 = Established by rotary switch Bit4-31: 0 fixed	DWORD
1	2	Get		Configuration Capability	Settings function Bit0: BOOTP Client Bit1: Reserved Bit2: DHCP Client Bit3: Reserved Bit4: Configuration Settable Bit5: Hardware Configurable Bit6: Reserved Bit7: ACD Capable Bit8-31: Reserved	DWORD
1	3	Get/Set	NV	Configuration Control	How to set IP addresses Bit0-3: Configuration Method 0 = Fixed IP address 1 = BOOTP 2 = DHCP Bit4-31: 0 fixed	DWORD
1	4	Get		Physical Link Object	Path to object linked on physical layer	Structure
				Path Size	Size of path fixed as 0002 hex	UINT
				Path	Logical segment that identifies object linked on physical layer 20 F6 24 01 hex fixed	EPATH
1	5	Get/Set	NV	Interface Configuration	Settings for TCP/IP network	Structure
				IP Address	IP address	UDINT
				Network Mask	Subnet mask	UDINT
				Gateway Address	Default gateway	UDINT
				Name Server	Primary name server	UDINT
				Name Server 2	Secondary name server	UDINT
				Domain Name	Name of domain	STRING
1	6	Get/Set	NV	Host Name	Name of host	STRING
1	8	Get/Set	NV	TTL Value	Time to live for multicast	USINT

Instance ID	Attribute	Access	NV	Name	Description	Data format
1	9	Get/Set	NV	Mcast Config	Multicast address settings	Structure
				Alloc Control	Method to allocate multicast address	USINT
				Reserved	Reserved	USINT
				Num Mcast	Number of multicast addresses	UINT
				Mcast Start Addr	Multicast start address	UDINT
1	10	Get/Set	NV	SelectAcd	ACD enabled/disabled	BOOL
1	11	Get/Set	NV	LastConflictDetected	Most recently detected conflict information	Structure
				AcdActivity	State of ACD when conflict was detected	USINT
				RemoteMAC	Conflicting MAC address	ARRAY of 6 USINT
				ArpPdu	ARP message when conflict occurred	ARRAY of 28 USINT

15-3 Ethernet Link (Class Code: F6 Hex)**15-3-1 Service Code**

Service code	Name
01 hex	Get_Attribute_All
0E hex	Get_Attribute_Single
10 hex	Set_Attribute_Single

15-3-2 Attribute

Instance ID	Attribute	Access	NV	Name	Description	Data format
0	1	Get		Revision	Revision of Ethernet link object	UINT
0	2	Get		Max Instance	Maximum number of instances	UINT
1-2	1	Get		Interface Speed	Speed of communications at IN port	UDINT
1-2	2	Get		Interface Flags	Status of IN port	DWORD
1-2	3	Get		Physical Address	MAC address	ARRAY of 6 USINT
1-2	4	Get		Interface Counters	Number of packets sent and received at interface	Structure
				In Octets	Number of octets received at interface	UDINT
				In Ucast Packets	Number of unicast packets received at interface	UDINT
				In NUcast Packets	Number of non-unicast packets received at interface	UDINT
				In Discards	Number of incoming packets that were discarded	UDINT
				In Errors	Number of packets that had errors (not counting the In Discards)	UDINT
				In Unknown Protos	Number of packets with unknown protocols	UDINT
				Out Octets	Number of octets sent	UDINT
				Out Ucast Packets	Number of unicast packets sent	UDINT
				Out NUcast Packets	Number of non-unicast packets sent	UDINT
				Out Discards	Number of sent packets that were discarded	UDINT
				Out Errors	Number of packets that had errors	UDINT

Instance ID	Attribute	Access	NV	Name	Description	Data format
1-2	5	Get		Media Counters	Ethernet media counter	Structure
				Alignment Errors	Number of received frames whose lengths were not octets	UDINT
				FCS Errors	Number of frames received that did not match FCS	UDINT
				Single Collisions	Number of sent frames for which one collision occurred	UDINT
				Multiple Collisions	Number of sent frames for which more than one collision occurred	UDINT
				SQE Test Errors	Number of SQE test error messages that were generated	UDINT
				Deferred Transmissions	Number of frames whose first transmission was delayed because the media was busy	UDINT
				Late Collisions	Number of collisions detected after 512 bit time slot	UDINT
				Excessive Collisions	Number of frames that failed to be sent due to too many collisions	UDINT
				MAC Transmit Errors	Number of frames that failed to be sent due to errors in MAC sublayer	UDINT
				Carrier Sense Errors	Number of errors or losses of carrier sense	UDINT
				Frame Too Long	Number of frames received that exceeded maximum allowable frame size	UDINT
				MAC Receive Errors	Number of frames that failed to be received because of errors in MAC sublayer	UDINT
1-2	6	Get/Set	NV	Interface Control	Control for interface	Structure
				Control Bits	Specify full duplex mode for auto negotiations	WORD
				Forced Interface Speed	Communication speed when full duplex mode is specified	UINT
1-2	7	Get	NV	Interface Type	Type of physical interface	USINT
1-2	8	Get		Interface State	Interface status	USINT
1-2	9	Get/Set	NV	Admin State	Whether interface is enabled or disabled	USINT
1-2	10	Get	NV	Interface Label	Name that identifies interface	SHORT_STRING

15-4. Device Level Ring (Class Code: 47 Hex)

15-4-1 Service Code

Service code	Name
0E hex	Get_Attribute_Single

15-4-2. Attribute

Instance ID	Attribute	Access	NV	Name	Description	Data format
0	1	Get		Revision	Revision of Device Level Ring object	UINT
0	2	Get		Max Instance	Maximum number of instances	UINT
1	1	Get		Network Topology	Format of connections in a network	USINT
1	2	Get		Network Status	Format of a network	USINT
1	10	Get		Active Supervisor Address	Address supervisor that is operating	Structure
				Supervisor IP Address	IP address of supervisor	UDINT
				Supervisor MAC Address	MAC address of supervisor	ARRAY of 6 USINT

15-5. Quality of Service (Class Code: 48 Hex)**15-5-1. Service Code**

Service code	Name
0E hex	Get_Attribute_Single
10 hex	Set_Attribute_Single

15-5-2. Attribute

Instance ID	Attribute	Access	NV	Name	Description	Data format
0	1	Get		Revision	Revision of Quality of Service object	UINT
0	2	Get		Max Instance	Maximum number of instances	UINT
1	5	Get/Set	NV	DSCP Scheduled	Scheduled priority for CIP transport class 0/1 message	USINT
1	8	Get/Set	NV	DSCP Explicit	UCMM CIP transport class 2/3 Other message priorities	USINT

15-6. LLDP Management (Class Code: 109 Hex)**15-6-1. Service Code**

Service code	Name
0E hex	Get_Attribute_Single
10 hex	Set_Attribute_Single

15-6-2. Attribute

Instance ID	Attribute	Access	NV	Name	Description	Data format
0	1	Get		Revision	LLDP Management Object Revision	UINT
0	2	Get		Max Instance	Maximum number of instances	UINT
1	1	Get/Set	NV	LLDP Enable	LLDP Enable/Disable	Structure
				LLDP Enable Array Length	Number of Elements in LLDP Enable Array	UINT
				LLDP Enable Array	Bit0 = General Enable/Disable Bit1 = IN Port Enable/Disable Bit2 = OUT Port Enable/Disable Bit3-7 = Reserved 0 =Disable, 1 = Enable	USINT
1	2	Get/Set	NV	msgTxInterval	LLDP frame transmission interval (secs)	UINT
1	3	Get/Set	NV	msgTxHold	Multiplier that determines Time To Live (TTL) of information conveyed via LLDP TTL = msgTxInterval x msgTxHold	USINT

15-7. Statistical Data (Class Code: A0 Hex)**15-7-1. Service Code**

Service code	Name
0E hex	Get_Attribute_Single

15-7-2. Attribute

Instance ID	Attribute	Access	NV	Name	Description	Data format
1	3	Get		Power on time	Time from power on to operation	LTIME
1	4	Get		Power on days	(units are days)	UINT
1	5	Get		Power on hours	(units are hours)	UDINT
1	6	Get		Power on minutes	(units are minutes)	UDINT
1	7	Get		Power on seconds	(units are seconds)	UDINT
1	8	Get	NV	Total power on time	Accumulated operating time	LTIME
1	9	Get	NV	Total power on days	(units are days)	UINT
1	10	Get	NV	Total power on hours	(units are hours)	UDINT
1	11	Get	NV	Total power on minutes	(units are minutes)	UDINT
1	12	Get	NV	Total power on seconds	(units are seconds)	UDINT

15-8. Valve Point (Class Code: B1 Hex)

15-8-1. Service Code

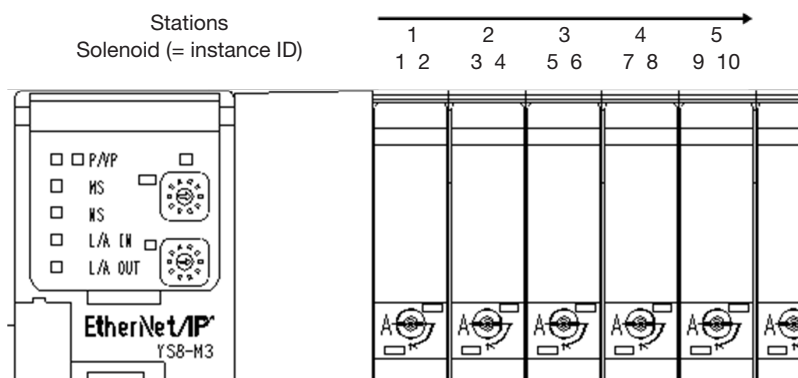
Service code	Name
0E hex	Get_Attribute_Single
10 hex	Set_Attribute_Single

15-8-2. Attribute

Instance ID	Attribute	Access	NV	Name	Description	Data format
1-32	3	Get/Set		Value	Output value 0 = off, 1 = on	BOOL
1-32	100	Get/Set	NV	Count	Number of outputs	UDINT

15-8-3. About the Number of Outputs

Counts the number of times the output command goes from off to on. The instance ID is the same as the solenoid number. Refer to "0 Relationship between I/O data allocation and solenoid valves" for the relationship between the solenoid numbers and the I/O data.



*For double solenoids

15-9. Digital Input Point (Class Code: B2 Hex)**15-9-1. Service Code**

Service code	Name
0E hex	Get_Attribute_Single
10 hex	Set_Attribute_Single

15-9. Attribute

Instance ID	Attribute	Access	NV	Name	Description	Data format
1-32	3	Get		Value	Input value 0 = off, 1 = on	BOOL
1-32	100	Get/Set	NV	On Delay Time	Input constant 0 = 0 ms (default) 1 = 3 ms 2 = 10ms 3 = 25ms	UINT

15-10. Analog Input Point (Class Code: B4 Hex)**15-10-1. Service Code**

Service code	Name
0E hex	Get_Attribute_Single
10 hex	Set_Attribute_Single

15-10-2. Attribute

Instance ID	Attribute	Access	NV	Name	Description	Data format
1-16	3	Get		Value	Input value	USINT
1-16	100	Get/Set	NV	Filter Measured Value	Moving average 0 = No (default) 1 = 2 values 2 = 4 values 3 = 8 values	UINT

15-11. Valve Point Group (Class Code: B6 Hex)

15-11-1. Service Code

Service code	Name
0E hex	Get_Attribute_Single
10 hex	Set_Attribute_Single

15-11-2. Attribute

Instance ID	Attribute	Access	NV	Name	Description	Data format
1	7	Get/Set	NV	Failure Reaction	Output setting for communication errors 0 = Clear (default) 1 = Hold	BOOL

15-12. Digital Output Point Group (Class Code: B7 Hex)

15-12-1. Service Code

Service code	Name
0E hex	Get_Attribute_Single
10 hex	Set_Attribute_Single

15-12-2. Attribute

Instance ID	Attribute	Access	NV	Name	Description	Data format
1	7	Get/Set	NV	Failure Reaction	Output setting for communication errors 0 = Clear (default) 1 = Hold	BOOL

15-13. Analog Output Point Group (Class Code: B8 Hex)

15-13-1. Service Code

Service code	Name
0E hex	Get_Attribute_Single
10 hex	Set_Attribute_Single

15-13-2. Attribute

Instance ID	Attribute	Access	NV	Name	Description	Data format
1	10	Get/Set	NV	Failure Reaction	Output setting for communication errors 0 = Clear 1 = Hold (default)	BOOL

16. Web Page

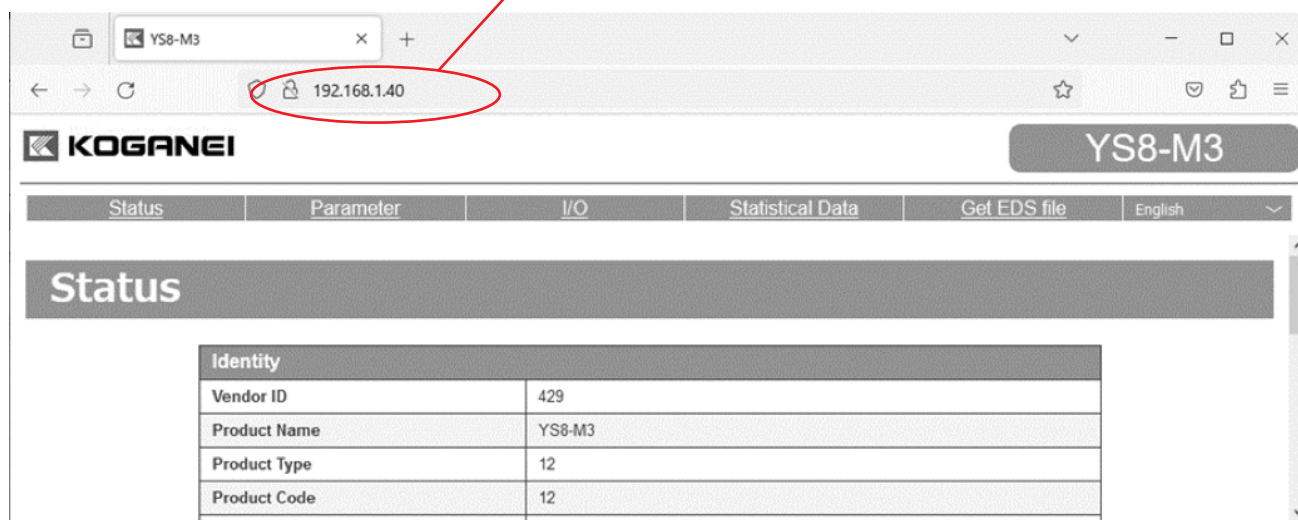
You can check the internal status of the YS8-M3 EtherNet/IP-compatible communication module from the web page.

16-1 How to Use

1. Open a browser.
2. Input the I/O terminal IP address in the URL field.

The web page opens.

YS8-M3 IP address

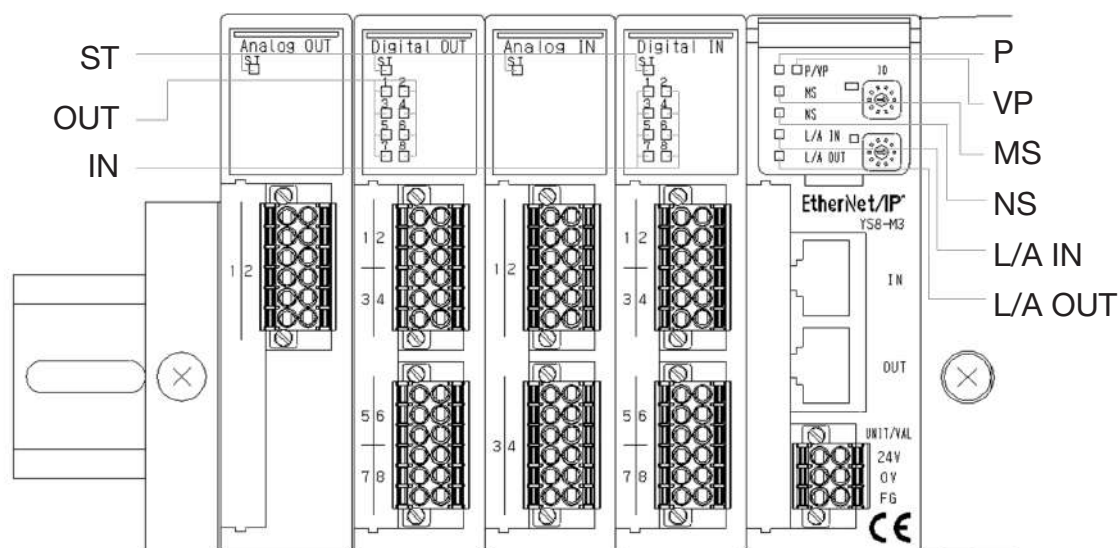


*To check use Microsoft Edge 102.0 or later, Firefox 101.0 or later, or Google Chrome 102.0 or later.

17. Handling Abnormalities

The internal status can be diagnosed using the LEDS on the communication module and the I/O expansion modules.

17-1. LED Positions



P – Power Supply

Status	Causes/Solutions
<input checked="" type="checkbox"/> Lit green	Unit power supply is installed properly.
<input type="checkbox"/> Off	There is no power supply for the unit. Confirm the unit power supply.

VP – Valve Power Supply

Status	Causes/Solutions
<input checked="" type="checkbox"/> Lit green	Output power supply is installed properly.
<input type="checkbox"/> Off	There is no output power supply. Confirm the output power supply.

MS – Module Status / NS – Network Status

MS	NS	Causes/Solutions
■ Lit green	□ Off	Status is normal. The network interface connection is not recognized.
■ Lit green	▣ Flashing green	Status is normal. The network interface connection is recognized. A connection to the scanner device has not been established.
■ Lit green	■ Lit green	Status is normal. A connection to the scanner device has been established.
■ Lit green	▣ Flashing red	The connection timed out. <ul style="list-style-type: none"> Confirm the status of the Ethernet cable wiring. Review the scanner device communication cycle (RPI) and timeout settings.
▣ Flashing red	■ Lit red	Duplicate IP address detected. Do not use duplicate IP addresses on the network.
■ Lit red	□ Off or ▣ Flashing green	A serious abnormality has been detected. Check the following potential causes. <ul style="list-style-type: none"> Check if the ST LED on the I/O expansion module is lit red. The ST LED turns red when an overcurrent is detected. Please check the wiring of the applicable module. An increase or decrease in I/O expansion modules is detected while power is being supplied. Please connect or disconnect I/O modules with the power turned off. An excessive number of connections with the I/O expansion module is detected. You cannot connect more than eight I/O modules. Reset the power supply after addressing the above potential causes. <p>*Note that the YS8-A2S does not detect an increase or decrease in the number of connections.</p>
□ Off	□ Off	There is no power supply for the module. Confirm the module power supply.

L/A IN/OUT - Link Activity

Status	Causes/Solutions
■ Lit green	Status is normal. Communication in progress.
□ Off	No transmission. Confirm the status of the Ethernet cable wiring.

ST - Status

Status	Causes/Solutions
<div>■</div> Lit green	Status is normal.
<div>■</div> Lit red	Overcurrent detected. Confirm the I/O module wiring. Address the cause of the issue and reset the power supply.
<div>□</div> Off	There is no power supply for the module. Confirm the module power supply. For output modules, confirm the output power supply.

IN - Input

Status	Causes/Solutions
<div>■</div> Lit green	Digital input is on.
<div>□</div> Off	Digital input is off. If the input from the externally connected equipment cannot be recognized, check the wiring status.

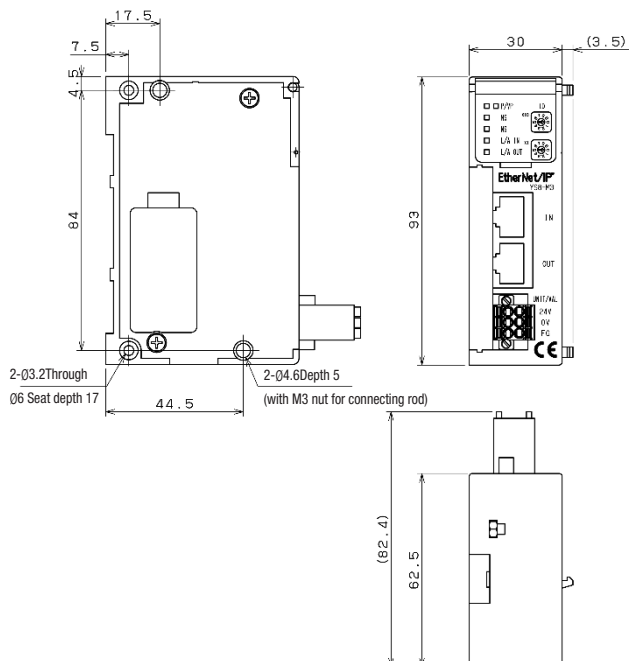
OUT - Output

Status	Causes/Solutions
<div>■</div> Lit green	Digital output is on. If the output cannot be recognized by the externally connected equipment, check the wiring status.
<div>□</div> Off	Digital output is off. Confirm the output power supply.

18. External Dimensions

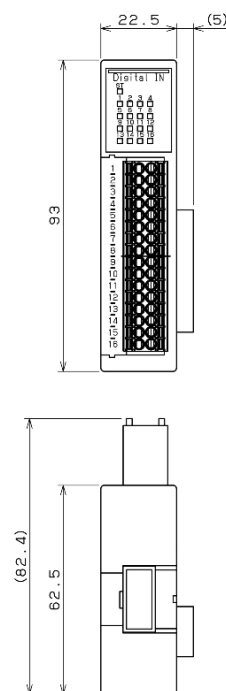
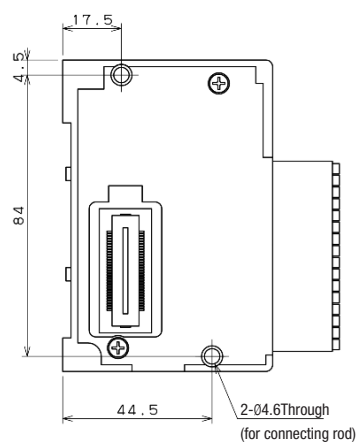
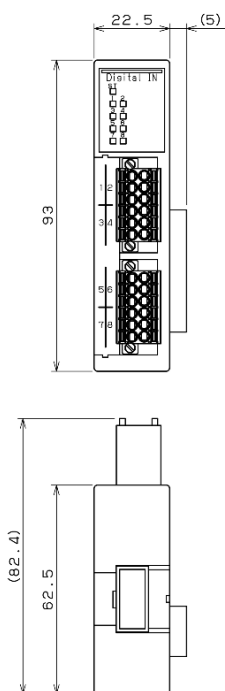
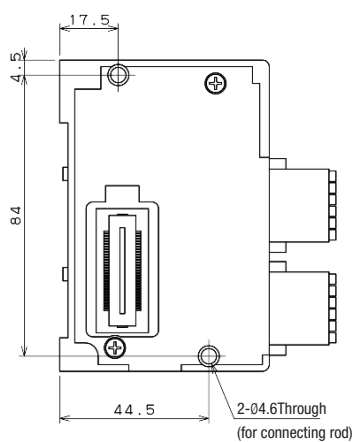
Communication module YS8-M3

(Unit : mm)

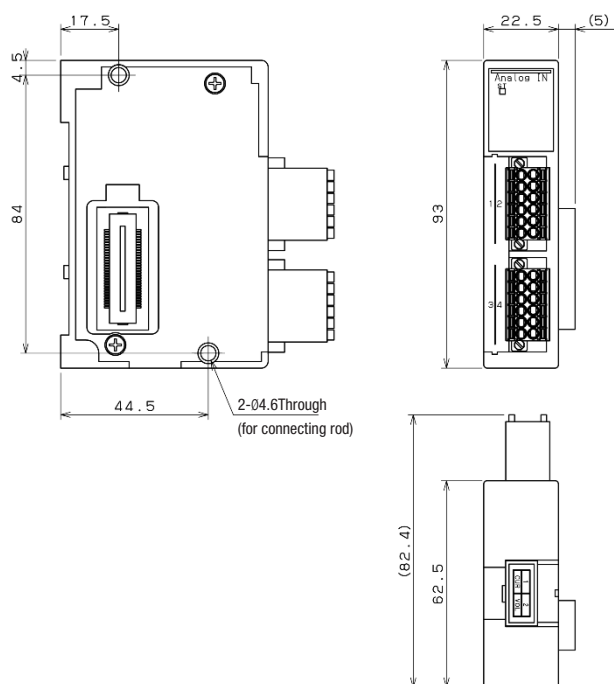


Digital input module YS8-D8N / YS8-D8N-P

YS8-D16N

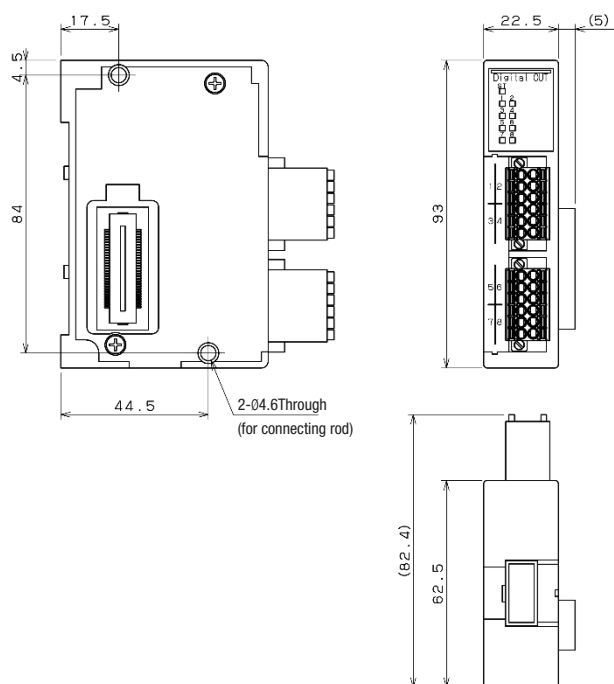


Analog input module YS8-A4N

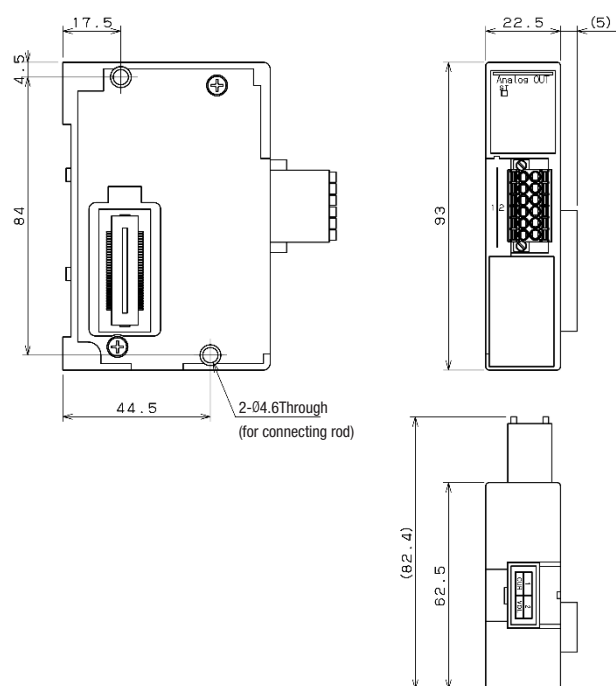


(Unit : mm)

Digital output module YS8-D8S/YS8-D8S-M



Analog output module YS8-A2S



(Unit : mm)

19. Appendix

19-1. Software Licenses and Copyrights

Third-party software is embedded in this product. See <https://official.koganei.co.jp/common/html/3rd-party-license.html> for information about licenses and copyrights for this software.

*For other information, detailed specifications, and precautions,
see the product catalog.

*For inquiries about the product, contact your nearest Koganei
sales office or the Overseas Department noted below.



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