

# Fieldbus System (GW System, 4 Branches)

## EX510 Series

The EX510 series is to be discontinued. When designing new equipment and facilities, consider using another series (EX260/EX600) instead.



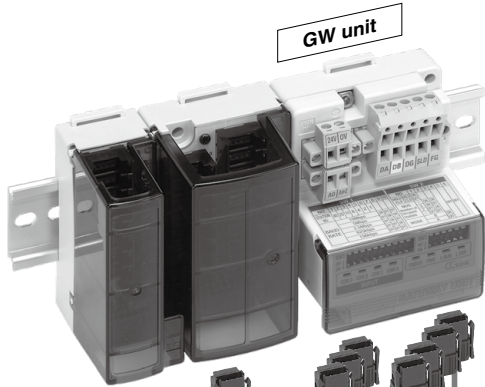
### Compatible Protocols

CC-Link DeviceNet



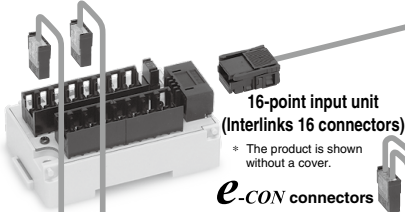
Made to Order

EtherNet/IP

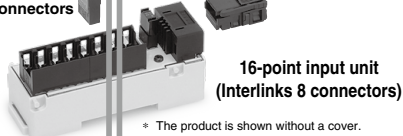


\* Input units with covers

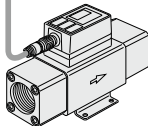
### e-CON connectors



### e-CON connectors

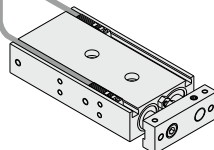


Pressure switch



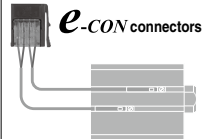
Flow switch

### Input device



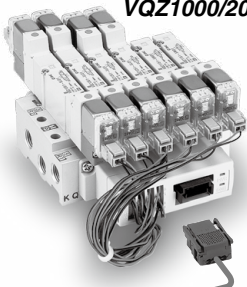
Auto switch

Two 2-wire auto switches can be connected to a single connector.

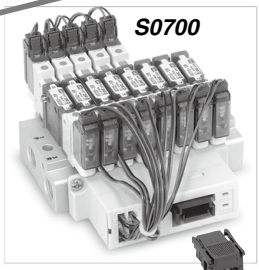


**Manifold valve  
with SI unit**

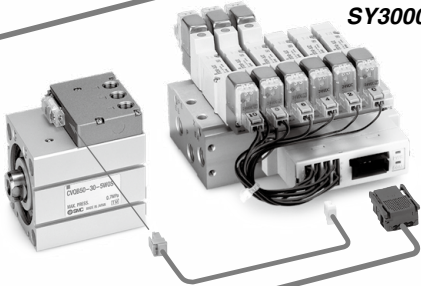
**VQZ1000/2000/3000**



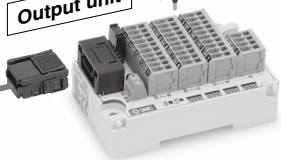
**S0700**



**SY3000/5000/7000/9000**

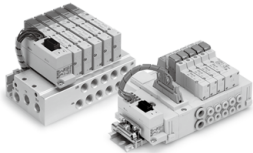


**Output unit**

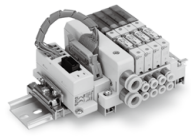


**Manifold Solenoid Valves**

**SY3000/5000 (Plug-in)**



**S0700 (Plug-in)**



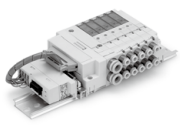
**VQZ1000/2000/3000**



**SYJ3000/5000/7000**



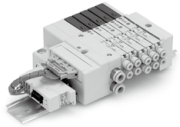
**SJ2000/3000**



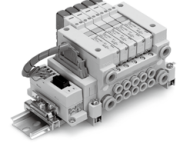
**SZ3000**



**SQ1000/2000**



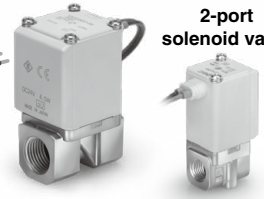
**VQ1000/2000**



**Output equipment**

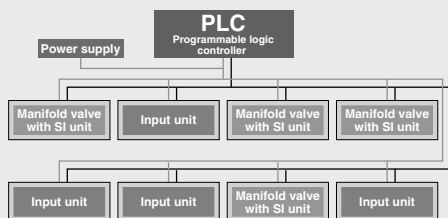
Valves, indicator lights, relays, buzzers, etc., can be connected.

**2-port  
solenoid valve**

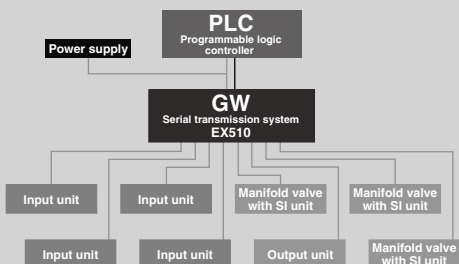


# Features of the EX510 Series

## Current system



## System adopting the EX510 series



### Feature 1 More valves and sensors can be connected.

- By adopting the **EX510** series, it is possible to connect more valves and sensors.

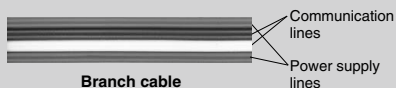
Compatible protocol	Current SI unit model
CC-Link	3 master stations 3 manifolds
DeviceNet®	1 node 1 manifold
PROFIBUS DP	1 node 1 manifold

Compatible protocol	EX510 series
CC-Link	3 master stations 4 manifolds/4 input units
DeviceNet®	1 node 4 manifolds/4 input units
PROFIBUS DP	1 node 4 manifolds/4 input units

### Feature 2 Connector cables (including the power supply cable) allow for reduced wiring.

- A power supply cable for each I/O unit was required in the past.

- For the **EX510** series, only a power supply cable to the GW unit is required. Connected to each unit is a branch cable which combines the cables for communication and power supply.



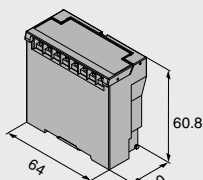
### Feature 3 There is no need to set the address for the SI units, output units, or input units.

- Setting the address for each unit was required in the past.

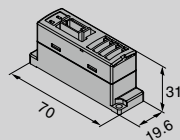
- It is okay to set the address for the GW unit only.

### Feature 4 Compact SI unit

- The SI unit which connects output devices, such as solenoid valves, has a compact design compared with the current model. (Compactness: volume ratio reduced by 60% or more)



Current model (EX120 series)



EX510 series

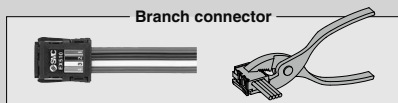
## Feature 5 Allows for the easy change of Fieldbusses

- In the past, all the part numbers of I/O units needed to be changed by returning them to the manufacturer and reordering (re-estimate, redelivery) them.

- For the EX510 series, only the GW unit needs to be changed.

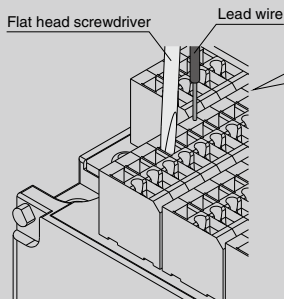
## Feature 6 Adopts connectors which do not require any special tools for installation

No special tools are required for press-fitting the connectors for branch cable connections or for the e-con connectors for sensor connections.



**No need to strip the wires** Only pliers are required for clamping.

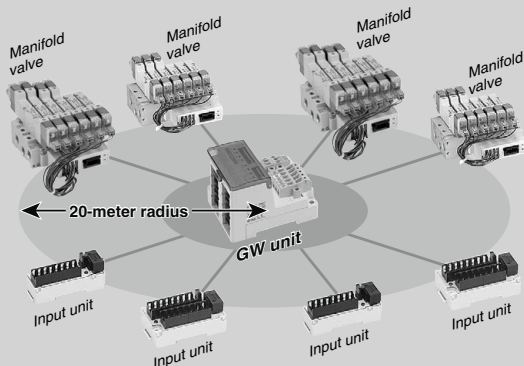
The output unit adopts a spring type terminal box, eliminating the need to tighten any retaining screws.



Torque control and crimping work is unnecessary.  
Screwless construction with no tightening of retaining screws required

## Feature 7 Cable lengths of up to 20 meters are available.

Various units can be connected within a radius of 20 meters around the GW unit.

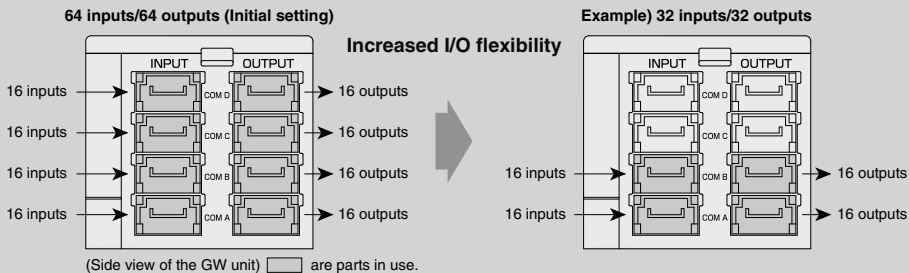


## Feature 8 Delay in transmission of 1 ms or less

The delay in transmission between the GW unit and SI units/output units/input units is 1 ms or less.

## Feature 9 Increased I/O flexibility

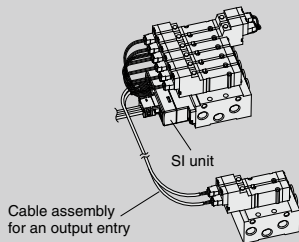
The occupying number of points in the GW unit can be configured flexibly by setting a switch.



\* Setting is different depending on the respective protocol. Refer to the specifications for details.

## Feature 10 Effective use made of the unused points of the SI unit

Valves which are independent from the manifold can be converted to serial transmission without purchasing new SI units.

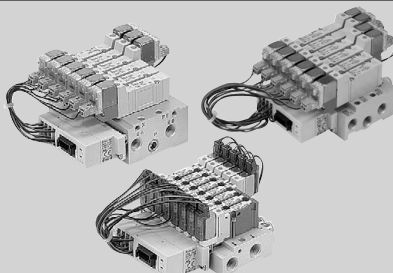
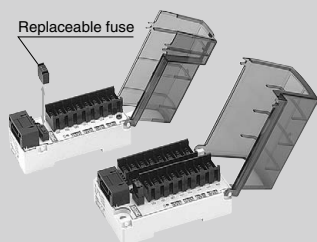


## Feature 11 Protection

Each unit is protected against short-circuits from power supply loads.

Input/output unit fuses are replaceable.

The short-circuit protection is integrated into the SI unit.

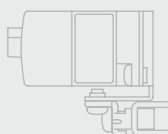
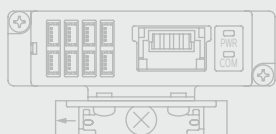
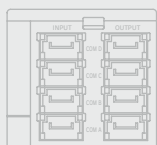
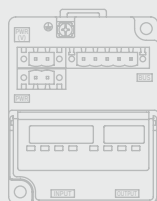


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Fieldbus System (GW System, 4 Branches)

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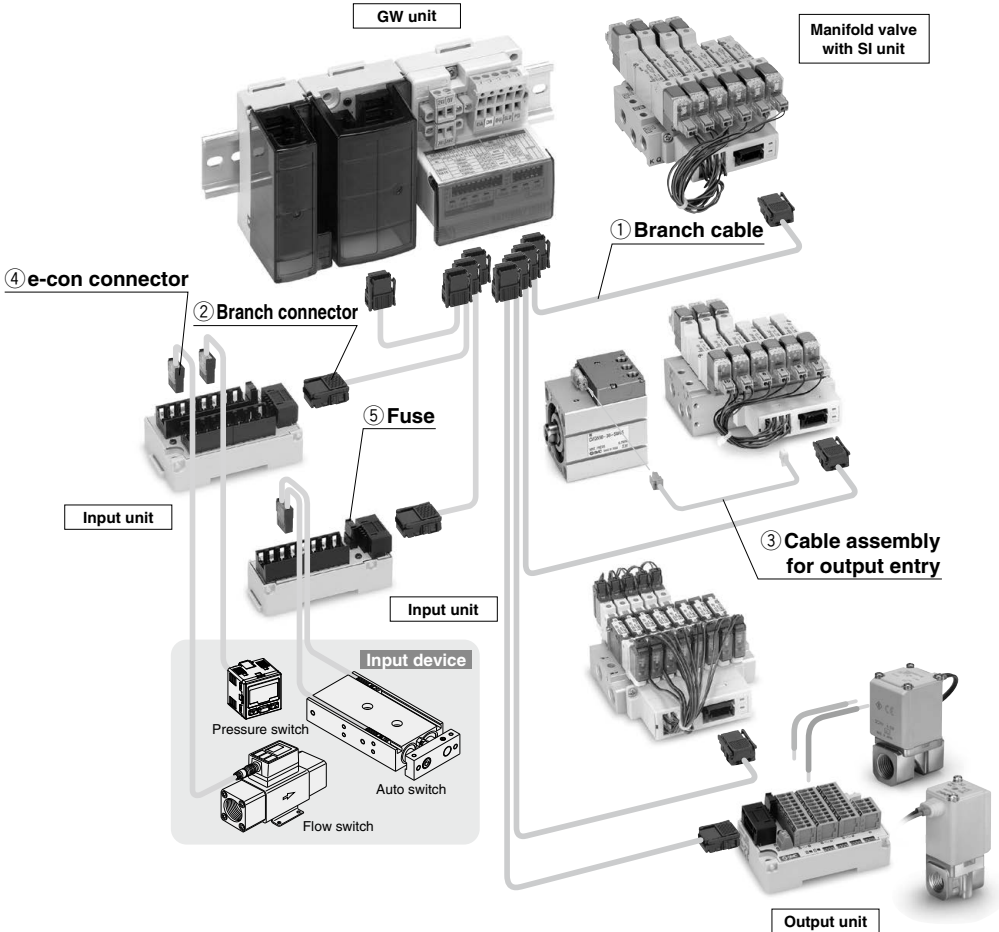
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# Fieldbus System GW System, 4 Branches

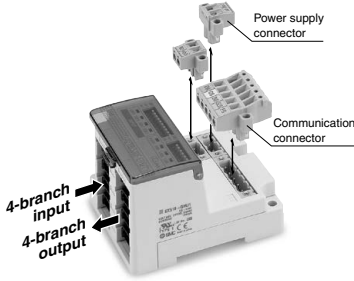
# EX510 Series



## Composition



**GW Unit**



**How to Order**

**EX510-G MJ1 -**   

	Protocol
<b>MJ1</b>	CC-Link
<b>DN1</b>	DeviceNet®
<b>PR1</b>	PROFIBUS DP

● **Made to Order** (Refer to page 1503.)

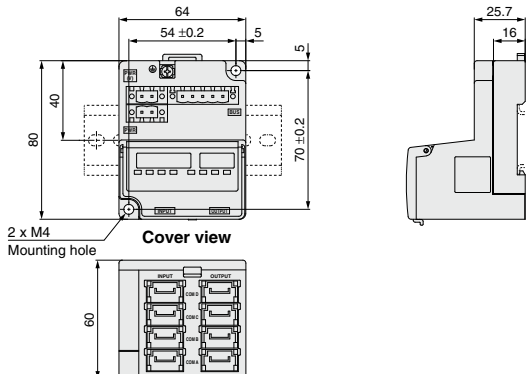
EtherNet/IP™ compatible, 64 outputs (16 inputs 4-branch)
PROFINET compatible, 64 outputs (16 inputs 4-branch)

**Specifications**

Model		EX510-GMJ1	EX510-GDN1	EX510-GPR1
Communication	Applicable system	CC-Link	DeviceNet®	PROFIBUS DP
	Protocol	Ver. 1.10	Release 2.0	DP-V0
	Version*1			
	Communication speed	156 k/625 k/ 2.5 M/5 M/10 Mbps	125 k/250 k/ 500 kbps	9.6 k/19.2 k/45.45 k/ 93.75 k/187.5 k/500 k/ 1.5 M/3 M/6 M/12 Mbps
	Configuration file*2	CSP+ file	EDS file	GSD file
I/O occupation area (Inputs/Outputs)	96/96 <small>(3 stations, remote device station) * Possible to change depending on the switch setting</small>	64/64 * Possible to change depending on the switch setting		
Terminating resistor	Not provided			Provided
Power supply voltage	For unit	24 VDC ±10%	11 to 25 VDC <small>(Supplied by DeviceNet® circuit, 50 mA or less)</small>	24 VDC ±10%
	For sensors		24 VDC ±10%	
	For valve	24 VDC ±10%/−5%		
	Internal current consumption	100 mA or less (single GW unit)		
Input	Number of inputs	64 inputs (16 inputs x 4 branches) * Possible to change depending on the switch setting		
	Connection input device	The EX510 series input unit (connection from communication port A to D)		
	Supply voltage	24 VDC		
	Supply current	Max. 4 A (Max. 1 A per branch)		
Output	Number of outputs	64 outputs (16 outputs x 4 branches) * Possible to change depending on the switch setting		
	Connection output device	The EX510 series SI unit manifold and output unit (connection from communication port A to D)		
	Supply voltage	24 VDC		
	Supply current	Max. 6 A (Max. 1.5 A per branch)		
Branch cable length	20 m or less			
Environmental resistance	Enclosure	IP20		
	Operating temperature range	−10 to 50°C		
	Operating humidity range	35 to 85%RH (No condensation)		
	Withstand voltage	500 VAC for 1 minute between whole external terminal and FG		
Insulation resistance	10 MΩ or more (500 VDC) between whole external terminal and FG			
Standards	CE/UKCA marking (EMC directive/RoHS directive), UL (CSA)			
Weight	160 g (including accessories)			
Accessory	Communication connector 1 pc., Power supply connector 2 pcs.			Communication connector 1 pc., Power supply connector 2 pcs., Terminating resistor 1 pc.

- \*1 Please note that the version is subject to change.
- \*2 The setting file can be downloaded from SMC website, <https://www.smcworld.com>
- \* For detailed specifications other than the above, refer to the operation manual that can be downloaded from SMC website, <https://www.smcworld.com>

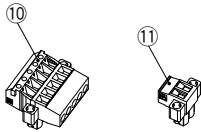
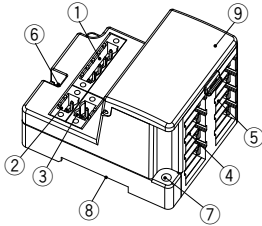
**Dimensions**





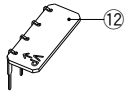
# EX510 Series

## Parts Description



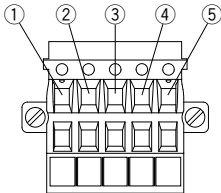
Communication connector (1 pc.)

Power supply connector (2 pcs.)



Terminating resistor (1 pc.)  
\* Attached to EX510-GPR1 only

### Accessories



### GW Unit

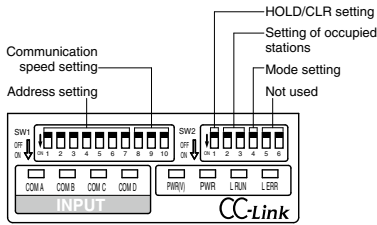
No.	Description	Applications
1	<b>Communication socket (BUS)</b>	For connecting with a network, using the communication connector (10), which is part of the accessories
2	<b>Power supply socket (PWR(V))</b>	Supplies power for output devices, which have a power supply connector (11), such as a solenoid valve
3	<b>Power supply socket (PWR)</b>	Supplies power for input devices, which have a power supply connector (11), such as a sensor
4	<b>Branch connector (for input) on GW unit side</b>	Connects input units, etc., using a branch cable (EX510-FC□□)
5	<b>Branch connector (for output) on GW unit side</b>	Connects the SI unit (manifold valves) etc., using the branch cable (EX510-FC□□)
6	<b>FG terminal</b>	Used for grounding
7	<b>Mounting hole</b>	Used for mounting the unit with two M4 screws
8	<b>Mounting groove for DIN rail</b>	Used for mounting the unit to a DIN rail
9	<b>Display, Switch setting part</b>	Displays the LED corresponding to the unit's condition, address setting, and the communication speed for the switches
10	<b>Communication connector</b>	Used for connecting the network cable
11	<b>Power supply connector</b>	Used for connecting the power supply cable
12	<b>Terminating resistor</b>	Connects the terminating resistor to both ends of a unit in the transmission line

### Communication Connector Pin Assignment

Part no.	Communication protocol	Pin assignment and the corresponding wire color				
		①	②	③	④	⑤
<b>EX510-GMJ1</b>	CC-Link	DA (Blue)	DB (White)	DG (Yellow)	SLD	FG
<b>EX510-GDN1</b>	DeviceNet®	V- (Black)	CAN_L (Blue)	Drain	CAN_H (White)	V+ (Red)
<b>EX510-GPR1</b>	PROFIBUS DP	VP	RxD/TxD-N (Green)	DGND	RxD/TxD-P (Red)	SHIELD

## LED Indicator

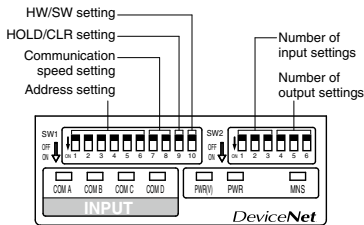
### EX510-GMJ1 (CC-Link)



Display	Contents	Indicator light condition
<b>PWR(V)</b>	The output power supply voltage is supplied as specified. The output power supply voltage is not supplied as specified.	Light is turned on. Light is turned off.
<b>PWR</b>	When the input and the power for the gateway is being supplied When the input and the power for the gateway is not being supplied	Light is turned on. Light is turned off.
<b>L RUN</b>	When transmission is working properly When transmission is interrupted	Light is turned on. Light is turned off.
<b>L ERR</b>	When there is an error in the transmission When setting the station number while being energized When the transmission speed setting switch is changed When the transmission is working properly	Light is turned on. Light is turned on. (Blinks at 0.4 second intervals) Light is turned off.
<b>COM A to D</b>	When COM A to D are receiving data When COM A to D are not receiving data	Light is turned on.*1 Light is turned off.

\*1 Input unit (Input device) is connected and will illuminate when communication is working properly.

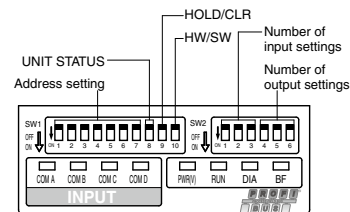
### EX510-GDN1 (DeviceNet®)



Display	Contents	Indicator light condition
<b>PWR(V)</b>	The output power supply voltage is supplied as specified. The output power supply voltage is not supplied as specified.	Light is turned on. Light is turned off.
<b>PWR</b>	When the input and the power for the gateway is being supplied When the input and the power for the gateway is not being supplied	Light is turned on. Light is turned off.
<b>MNS</b>	When the power supply is OFF, off-line, or checking the MAC ID duplication When I/O connection is on stand by (On-line state) I/O connection installation is completed (On-line state) I/O connection, time-out (communication irregularity in light degrees) MAC ID duplication error, or BUS OFF error (communication error in serious conditions)	Light is turned off. Green light blinks. Green light is turned on. Red light blinks. Red light is turned on.
<b>COM A to D</b>	When COM A to D are receiving data When COM A to D are not receiving data	Light is turned on.*1 Light is turned off.

\*1 Input unit (Input device) is connected and will illuminate when communication is working properly.

### EX510-GPR1 (PROFIBUS DP)



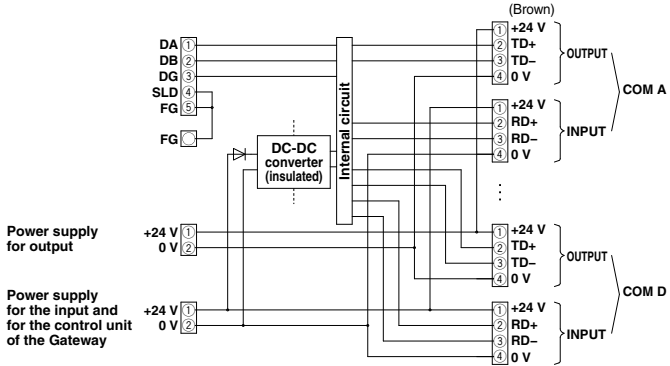
Display	Contents	Indicator light condition
<b>PWR(V)</b>	The output power supply voltage is supplied as specified. The output power supply voltage is not supplied as specified.	Light is turned on. Light is turned off.
<b>RUN</b>	When the input and the power for the gateway is being supplied When the input and the power for the gateway is not being supplied	Light is turned on. Light is turned off.
<b>DIA</b>	When the extended diagnostic information is available When the extended diagnostic information is not available	Light is turned on. Light is turned off.
<b>BF</b>	When PROFIBUS DP communication is working improperly When PROFIBUS DP communication is working properly	Light is turned on. Light is turned off.
<b>COM A to D</b>	When COM A to D are receiving data When COM A to D are not receiving data	Light is turned on.*1 Light is turned off.

\*1 Input unit (Input device) is connected and will illuminate when communication is working properly.

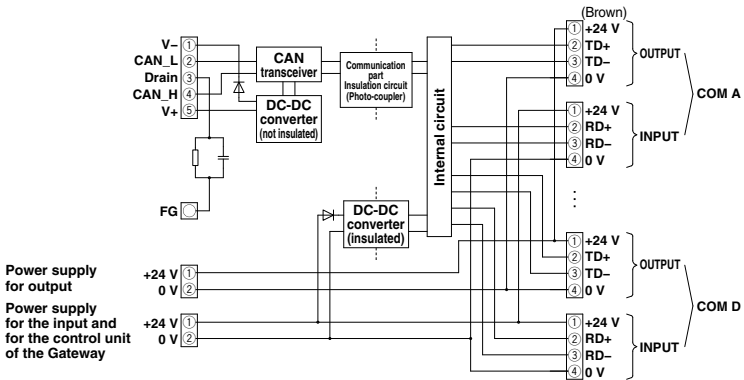
# EX510 Series

## Internal Circuit

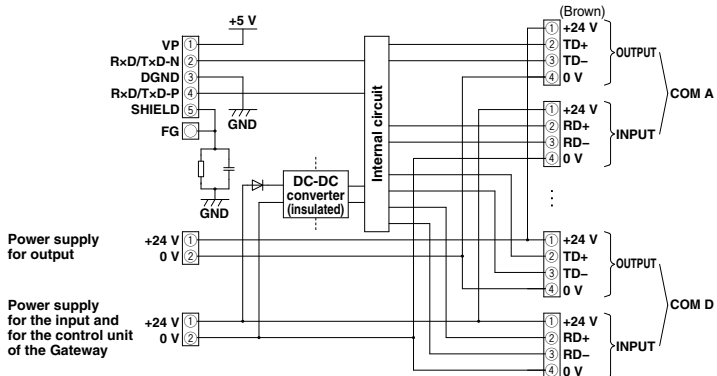
### EX510-GMJ1 (CC-Link)



### EX510-GDN1 (DeviceNet®)



### EX510-GPR1 (PROFIBUS DP)

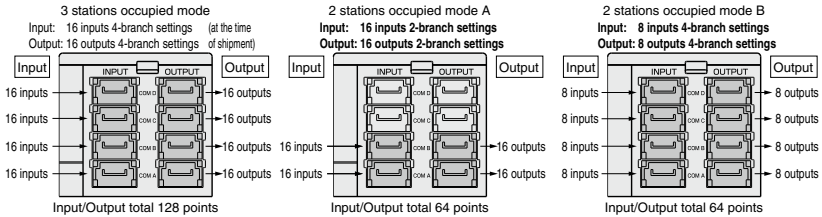


## Flexible I/O Setting Examples

### EX510-GMJ1 (CC-Link)

The occupying number of the Gateway units can be changed flexibly by setting a switch. Refer to the Operation Manual for details.

(Side view of the Gateway unit)  
■ are parts in use.

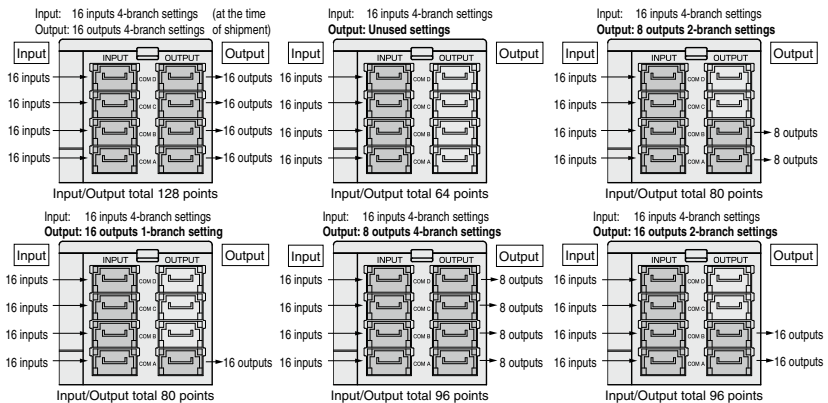


### EX510-GDN1 (DeviceNet®)

The occupying number of points in the Gateway units can be changed flexibly by setting a switch.

The occupying number of inputs and outputs can be set respectively. (Figures below are examples of the flexibility of setting the output occupied numbers.) Refer to the Operation Manual for details.

(Side view of the Gateway unit)  
■ are parts in use.

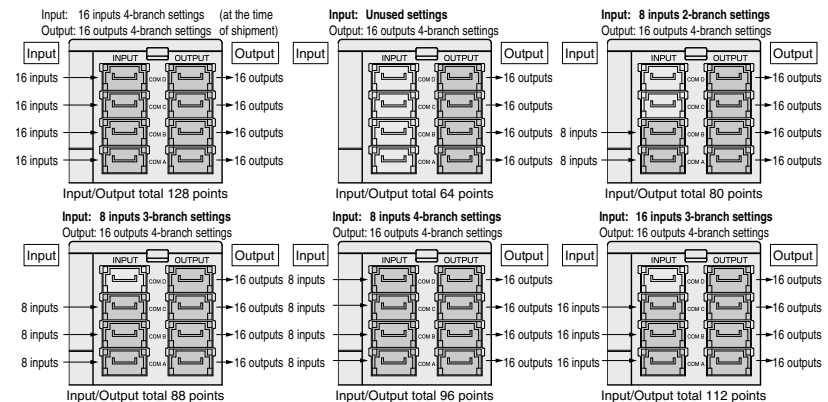


### EX510-GPR1 (PROFIBUS DP)

The occupying number of points in the Gateway units can be changed flexibly by setting a switch.

The occupying number of inputs and outputs can be set respectively. (Figures below are examples of the flexibility of setting the output occupied numbers.) Refer to the Operation Manual for details.

(Side view of the Gateway unit)  
■ are parts in use.



# EX510 Series

SI Unit

## How to Order

EX510-S□0□1□□

### Output specifications

0	Sink/NPN (Positive common)
1	Source/PNP (Negative common)

### Applicable valve manifold

1	Plug-lead manifold
2	Plug-in manifold

### Mounting specifications

Nil	Screw mounting
A	Mounting on DIN rail vertically
B	Mounting on DIN rail horizontally
C	Mounting on DIN rail horizontally (Dedicated for the SJ manifold)*1

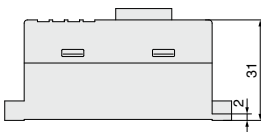
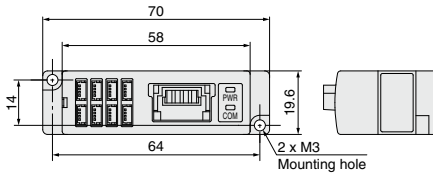
\*1 Applicable for EX510-S□02 only

## Specifications

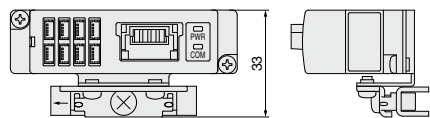
Model	EX510-S001□, S002□	EX510-S101□, S102□
Output type	Sink/NPN (Positive common)	Source/PNP (Negative common)
Number of outputs	16 outputs	
Rated load voltage	24 VDC	
Max. load current	Meet the following 3 conditions: 1. 0.25 A or less per point 2. 1.4 A or less per unit 3. Total current for OUT 0 to 7 must be 1 A or less. Total current for OUT 8 to 15 must be 1 A or less.	
Enclosure	Short-circuit protection	
Current consumption	50 mA or less (SI unit internal parts)	
Environmental resistance	Enclosure	IP20
	Operating temperature range	-10 to 50°C
	Operating humidity range	35 to 85%RH (No condensation)
	Withstand voltage	500 VAC for 1 minute between whole external terminal and FG
	Insulation resistance	10 MΩ or more (500 VDC) between whole external terminal and FG
Standards	CE/UKCA marking, UL (CSA)	
Weight	EX510-S□01: 40 g	EX510-S□01A, B: 80 g EX510-S□02: 50 g
		EX510-S□02A, B, C: 90 g (including accessories)*1

## Dimensions

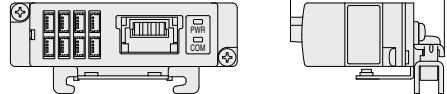
EX510-S□01



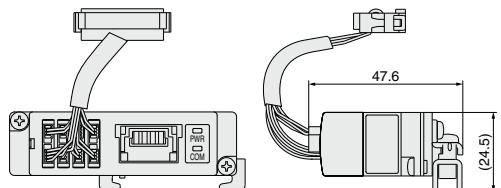
EX510-S□01A



EX510-S□01B



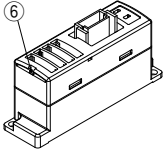
EX510-S□02C



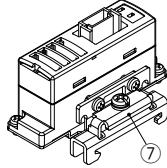
## Parts Description/LED Indicator

You can place an order for the manifold (valve series mentioned below) with the SI unit. For further information, please refer to the individual valve/manifold catalog. Also, you can change the system of your device by retrofitting the SI unit with the manifold already purchased.

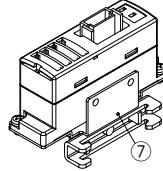
**EX510-S□01**  
(SY, SYJ, S0700, VQZ series)



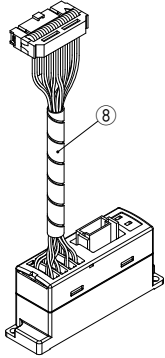
**EX510-S□01A**  
(SY series (Type 45))



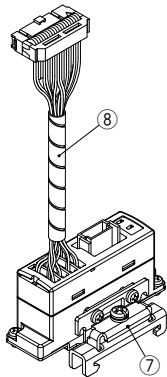
**EX510-S□01B**



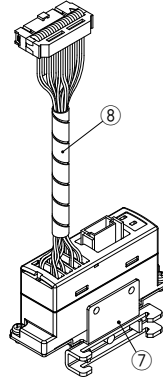
**EX510-S□02**



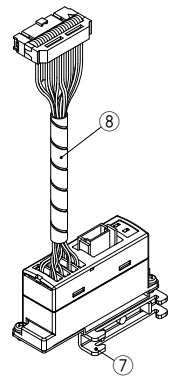
**EX510-S□02A**  
(SY, VQ series)



**EX510-S□02B**  
(SZ, SQ series)



**EX510-S□02C**  
(SJ series)



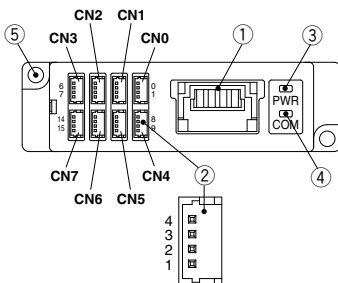
### Accessories



**Branch connector (2 pcs.)**  
(EX510-LC1)



**Connector lock pin**  
(1 pc.)



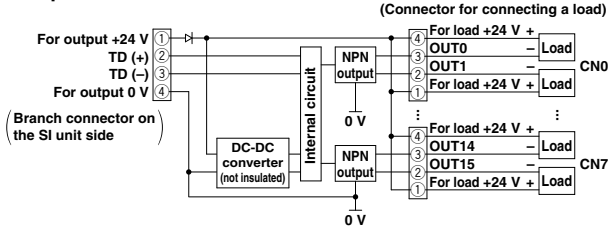
### SI Unit

No.	Description	Applications
1	<b>Branch connector on the SI side unit</b>	For press-fitting the branch connector (9) to the branch cable (EX510-FC□□) for connecting with the GW unit
2	<b>Connector for connecting a load</b>	Connects an output device such as a solenoid valve
3	<b>LED for power supply</b>	Light ON: Power supply ON (Normal) state Light OFF: Power supply OFF state
4	<b>LED for communications</b>	Light ON: When receiving data Light OFF: When there is no communication data
5	<b>Mounting hole</b>	Used for mounting the unit with two M3 screws
6	<b>Connector lock pin insertion part</b>	Used for attaching a unit with a connector lock pin (10) (EX510-S□02□ is inserted.)
7	<b>Mounting bracket</b>	Can be mounted on DIN rail
8	<b>Conversion cable assembly</b>	The cable assembly used for connecting to the plug-in valve manifold (MIL connector, 20 pins, socket)

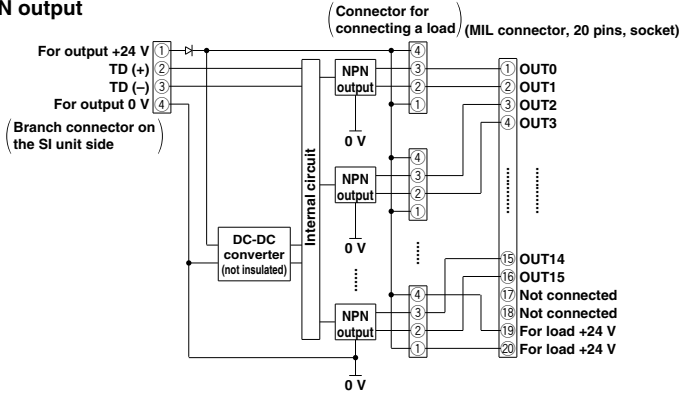
# EX510 Series

## Internal Circuits and Wiring Examples

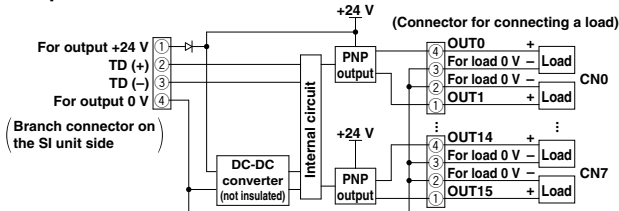
### EX510-S001/NPN output



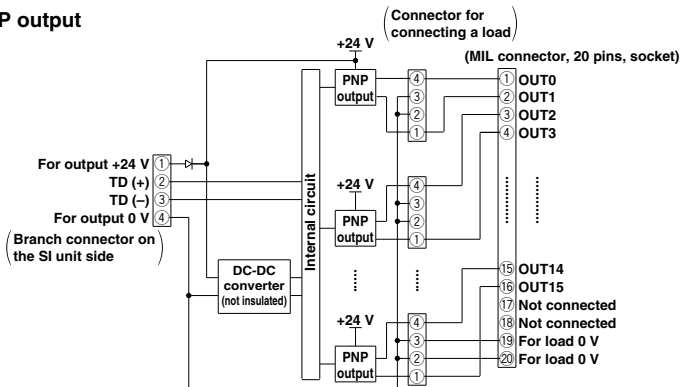
### EX510-S002/NPN output



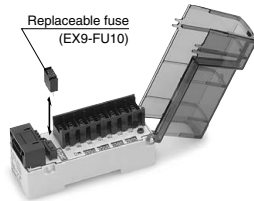
### EX510-S101/PNP output



### EX510-S102/PNP output



## Input Unit



1 connector, 2-input type



1 connector, 1 input type

## How to Order

**EX510-DX** **N** **1**

Compatible sensor

<b>N</b>	NPN output
<b>P</b>	PNP output
<b>B</b>	2-wire type

Unit type

<b>1</b>	1 connector, 2-input type
<b>2</b>	1 connector, 1 input type

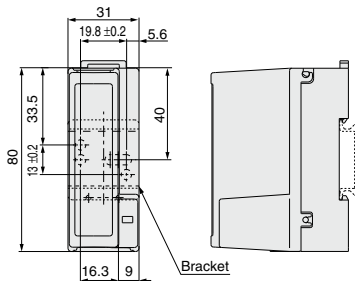
\* B (2-wire type) is available with 1 connector, 2-input type only.

## Specifications

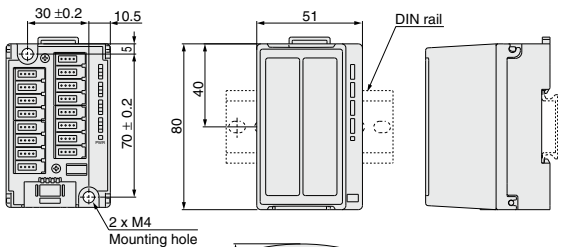
Model	EX510-DX□	EX510-DXP□	EX510-DXB1																				
<b>Input type</b>	NPN sensor input	PNP sensor input	2-wire type																				
<b>Number of inputs</b>	16 inputs																						
<b>Sensor supply voltage</b>	24 VDC																						
<b>Max. sensor supply current</b>	0.2 A/Point, 0.9 A/Unit																						
<b>Consumption current</b>	100 mA (Input unit internal parts)																						
<b>Input resistance</b>	5.6 kΩ																						
<b>Rated input current</b>	Approx. 4 mA																						
<b>ON voltage/ON current</b>	17 V or greater/2.5 mA or greater (Between input terminal and for sensor + 24 VDC)	17 V or greater/2.5 mA or greater (Between input terminal and for sensor 0 VDC)																					
<b>OFF voltage/OFF current</b>	7 V or less/1 mA or less (Between input terminal and for sensor + 24 VDC)	7 V or less/1 mA or less (Between input terminal and for sensor 0 VDC)																					
<b>Display</b>	Green LED (illuminated when turned ON)																						
<b>Environment</b>	<table border="1"> <tr> <td><b>Enclosure</b></td> <td colspan="3">IP10</td> </tr> <tr> <td><b>Operating temperature range</b></td> <td colspan="3">-10 to 50°C</td> </tr> <tr> <td><b>Operating humidity range</b></td> <td colspan="3">35 to 85%RH (No condensation)</td> </tr> <tr> <td><b>Withstand voltage</b></td> <td colspan="3">500 VAC for 1 minute between whole external terminal and FG</td> </tr> <tr> <td><b>Insulation resistance</b></td> <td colspan="3">10 MΩ or more (500 VDC) between whole external terminal and FG</td> </tr> </table>			<b>Enclosure</b>	IP10			<b>Operating temperature range</b>	-10 to 50°C			<b>Operating humidity range</b>	35 to 85%RH (No condensation)			<b>Withstand voltage</b>	500 VAC for 1 minute between whole external terminal and FG			<b>Insulation resistance</b>	10 MΩ or more (500 VDC) between whole external terminal and FG		
<b>Enclosure</b>	IP10																						
<b>Operating temperature range</b>	-10 to 50°C																						
<b>Operating humidity range</b>	35 to 85%RH (No condensation)																						
<b>Withstand voltage</b>	500 VAC for 1 minute between whole external terminal and FG																						
<b>Insulation resistance</b>	10 MΩ or more (500 VDC) between whole external terminal and FG																						
<b>Standards</b>	CE/UKCA marking, UL (CSA)																						
<b>Weight</b>	EX510-DX□1: 90 g EX510-DX□2: 110 g (including accessories)																						

## Dimensions

### EX510-DX□1



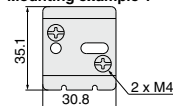
### EX510-DX□2



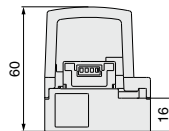
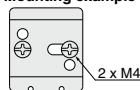
Shown with cover removed

### Bracket (accessory for EX510-DX□1)

Mounting example 1



Mounting example 2

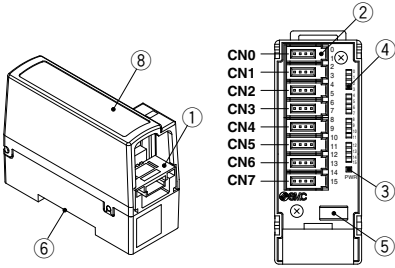




# EX510 Series

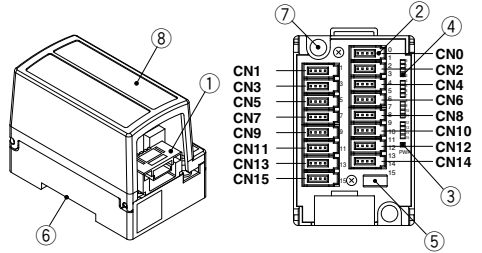
## Parts Description/LED Indicator

EX510-DX□1



Shown with cover removed

EX510-DX□2



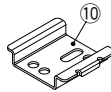
Shown with cover removed

No.	Description	Applications
1	<b>Branch connector on the input unit side</b>	For press-fitting the branch connector (9) to the branch cable (EX510-FC□□) for connecting with the GW unit
2	<b>e-con connector</b>	Connecting sensor, etc.
3	<b>LED for power supply</b>	Light ON: Power supply ON (Normal) state Light OFF: Power supply OFF state
4	<b>LED for display</b>	Light ON: When the input for sensor signal is turned ON Light OFF: When the input for sensor signal is turned OFF
5	<b>Fuse</b>	Replaceable fuse (EX9-FU10)
6	<b>Mounting groove for DIN rail</b>	For attaching to a DIN rail or when mounting with screws to an accessory bracket (10)
7	<b>Mounting hole</b>	Used for mounting the unit with two M4 screws
8	<b>Cover</b>	For protecting the sensor cables. Place a marker label (11) on the top of the body.

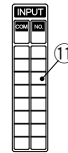
### Accessories



**Branch connector (2 pcs.)**  
(EX510-LC1)



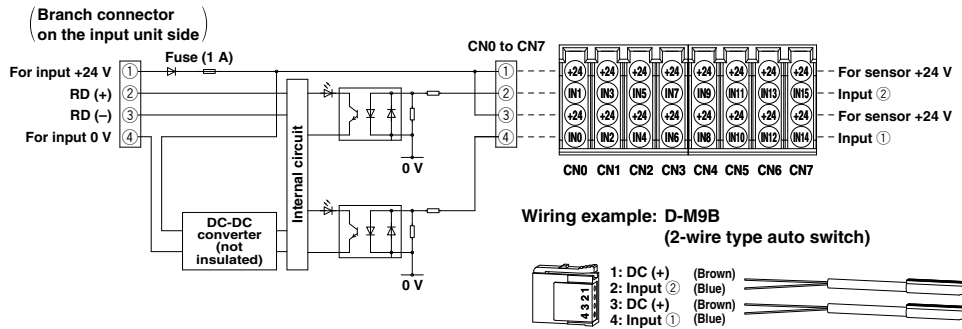
**Bracket**  
\* Attached to  
EX510-DX□1 only



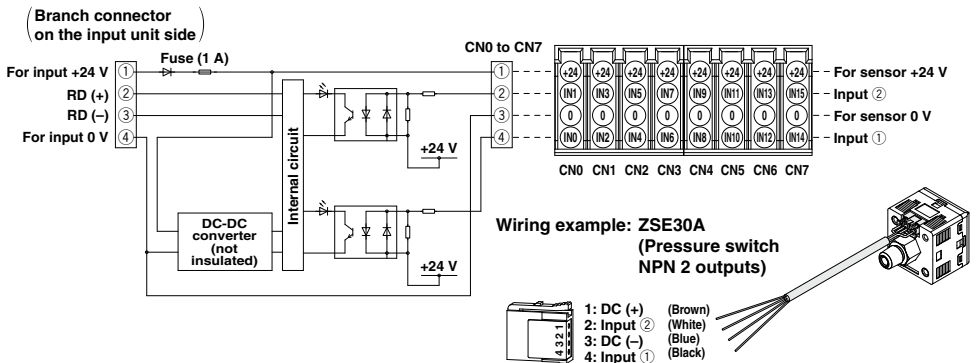
**Marker label**

## Internal Circuits and Wiring Examples

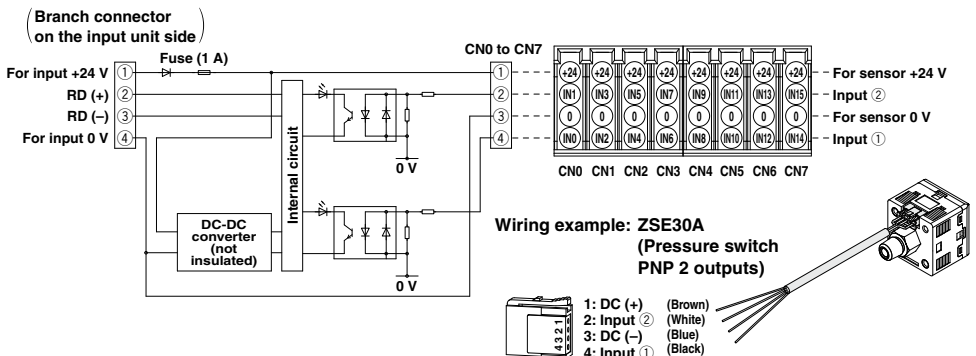
### EX510-DXB1/Input unit for 2-wire type (1 connector, 2-input type)



### EX510-DXN1/Input unit for NPN (1 connector, 2-input type)



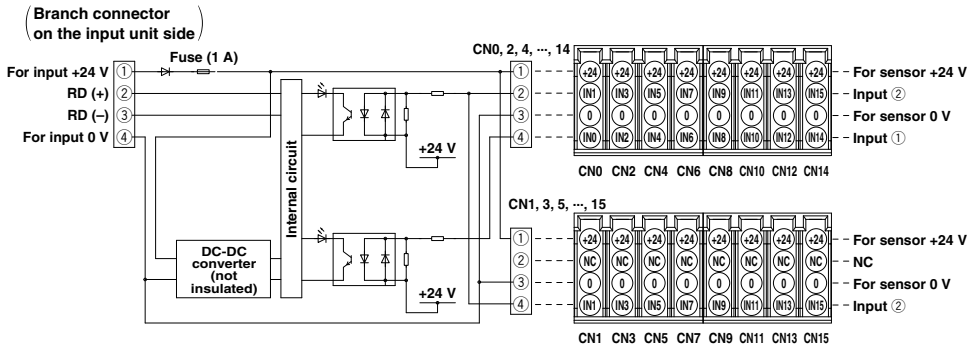
### EX510-DXP1/Input unit for PNP (1 connector, 2-input type)



# EX510 Series

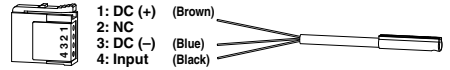
## Internal Circuits and Wiring Examples

### EX510-DXN2/Input unit for NPN (1 connector, 1 input type)

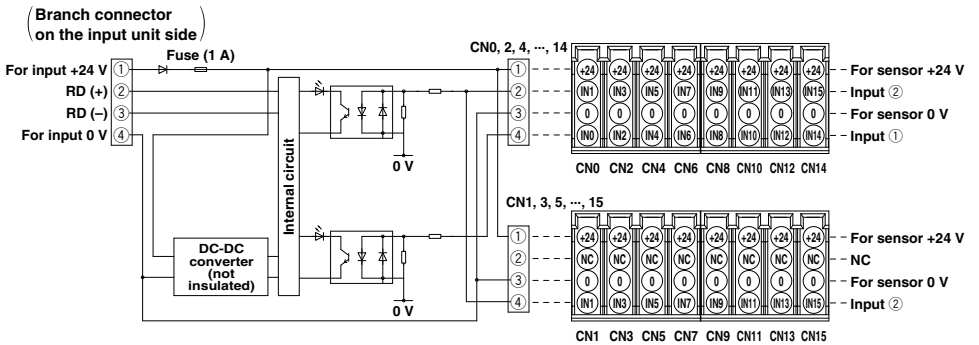


#### Wiring example: D-M9N

(3-wire type auto switch, NPN output)



### EX510-DXP2/Input unit for PNP (1 connector, 1 input type)

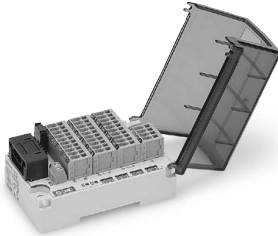


#### Wiring example: D-M9P

(3-wire type auto switch, PNP output)



**Output Unit**



**How to Order**

**EX510-DY P 3**

**Output specifications**

<b>N</b>	Sink/NPN output
<b>P</b>	Source/PNP output

**Connector type**

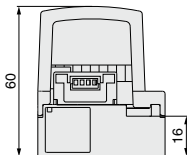
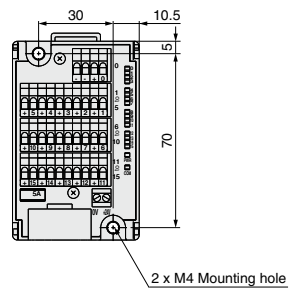
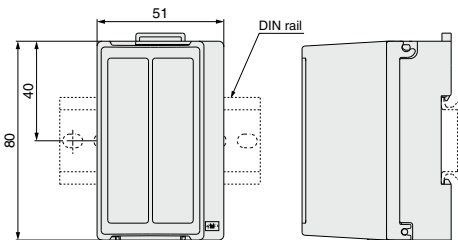
<b>3</b>	Terminal box type (Internal power supply)
<b>4</b>	Terminal box type (External power supply)

**Specifications**

Model	EX510-DYN3	EX510-DYP3	EX510-DYN4	EX510-DYP4
<b>Output type</b>	Sink/NPN (Positive common)	Source/PNP (Negative common)	Sink/NPN (Positive common)	Source/PNP (Negative common)
<b>Rated load voltage</b>	24 VDC			
<b>Power supply type</b>	Internal power supply (supplied by GW unit)		External power supply (supplied by power supply connector)	
<b>Applicable cable for power supply connector</b>	—		0.14 to 1.5 mm <sup>2</sup> (AWG16 to 26)	
<b>Number of outputs</b>	16 outputs			
<b>Output connector type</b>	Spring type			
<b>Applicable cable</b>	0.08 to 1.5 mm <sup>2</sup> (AWG16 to 28)			
<b>Max. load current</b>	Meet the following 3 conditions: 1. 0.5 A or less per point 2. 1 A or less per unit 3. The total current for OUT0 to 7 must be 1 A or less. The total current for OUT8 to 15 must be 1 A or less.		Meet the following 3 conditions: 1. 0.5 A or less per point 2. 3 A or less per unit 3. The total current for OUT0 to 7 must be 1.5 A or less. The total current for OUT8 to 15 must be 1.5 A or less.	
<b>Protection</b>	Short-circuit protection			
<b>Current consumption</b>	50 mA or less (inside a unit)			
<b>Environmental resistance</b>	<b>Enclosure</b>	IP10		
	<b>Operating temperature range</b>	-10 to 50°C		
	<b>Operating humidity range</b>	35 to 85%RH (No condensation)		
	<b>Withstand voltage</b>	500 VAC for 1 minute between whole external terminal and FG		
<b>Insulation resistance</b>	10 MΩ or more (500 VDC) between whole external terminal and FG			
<b>Standards</b>	CE/UKCA marking, UL (CSA)			
<b>Weight</b>	130 g (including accessories)			

**Dimensions**

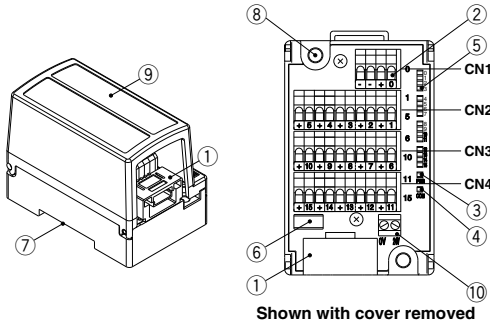
**EX510-DY□□**



**Shown with cover removed**

# EX510 Series

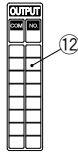
## Parts Description/LED Indicator



### Accessories



Branch connector (2 pcs.)  
(EX510-LC1)



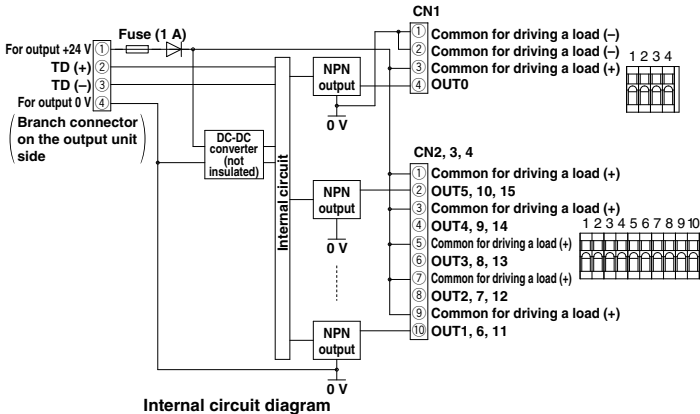
Marker label

### Output Unit

No.	Description	Applications
1	Branch connector on the output unit side	For press-fitting the branch connector (11) to the branch cable (EX510-FC□□) for connecting with GW unit
2	Output terminal box	Connect the output load, etc.
3	LED for power supply	Light ON: Power supply ON (Normal) state Light OFF: Power supply OFF state
4	LED for communications	Light ON: When receiving data Light OFF: When there is no communication data
5	LED for display	Light ON: When the output signal is turned ON Light OFF: When the output signal is turned OFF
6	Fuse	Replaceable fuse
7	Mounting groove	Used for mounting the unit on the DIN rail
8	Mounting hole	Used for mounting the unit with two M4 screws
9	Cover	For protecting the output load cable Place a marker label (12) on the top of the body.
10	Terminal box for external power supply	Terminal for power supply (EX510-DYN4, EX510-DYP4 only)

## Internal Circuits and Wiring Examples

### EX510-DYN3/Output unit for NPN (Internal power supply type)



Internal circuit diagram

### Terminal Block Connector (CN1)

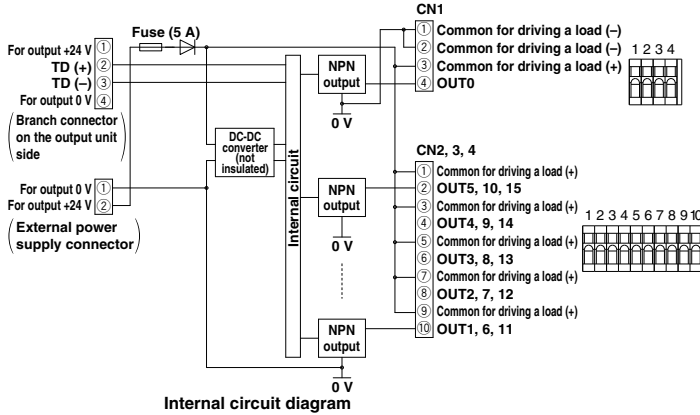
No.	Description	Functions	
		CN1	
1	COM	Common for driving a load (-)	
2	COM	Common for driving a load (-)	
3	COM	Common for driving a load (+)	
4	Output	OUT0	

### Terminal Block Connector (CN2, CN3, CN4)

No.	Description	Functions		
		CN2	CN3	CN4
1	COM	Common for driving a load (+)		
2	Output	OUT5	OUT10	OUT15
3	Output	OUT3	OUT8	OUT13
4	Output	OUT4	OUT9	OUT14
5	COM	Common for driving a load (+)		
6	Output	OUT3	OUT8	OUT13
7	COM	Common for driving a load (+)		
8	Output	OUT2	OUT7	OUT12
9	COM	Common for driving a load (+)		
10	Output	OUT1	OUT6	OUT11

## Internal Circuits and Wiring Examples

### EX510-DYN4/Output unit for NPN (External power supply type)



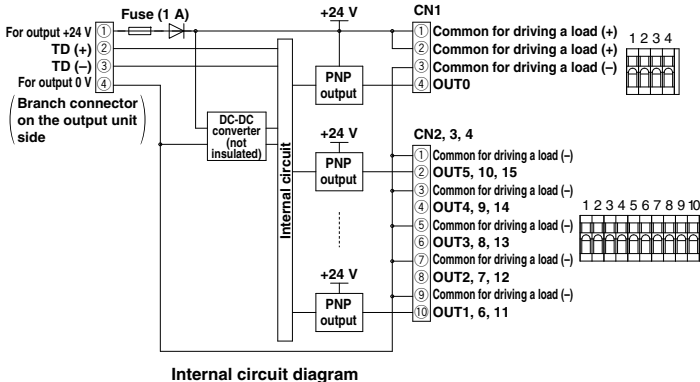
#### Terminal Block Connector (CN1)

No.	Description	Functions
CN1		
1	COM	Common for driving a load (-)
2	COM	Common for driving a load (-)
3	COM	Common for driving a load (+)
4	Output	OUT0

#### Terminal Block Connector (CN2, CN3, CN4)

No.	Description	Functions		
		CN2	CN3	CN4
1	COM	Common for driving a load (+)		
2	Output	OUT5	OUT10	OUT15
3	COM	Common for driving a load (+)		
4	Output	OUT4	OUT9	OUT14
5	COM	Common for driving a load (+)		
6	Output	OUT3	OUT8	OUT13
7	COM	Common for driving a load (+)		
8	Output	OUT2	OUT7	OUT12
9	COM	Common for driving a load (+)		
10	Output	OUT1	OUT6	OUT11

### EX510-DYP3/Output unit for PNP (Internal power supply type)



#### Terminal Block Connector (CN1)

No.	Description	Functions
CN1		
1	COM	Common for driving a load (+)
2	COM	Common for driving a load (+)
3	COM	Common for driving a load (-)
4	Output	OUT0

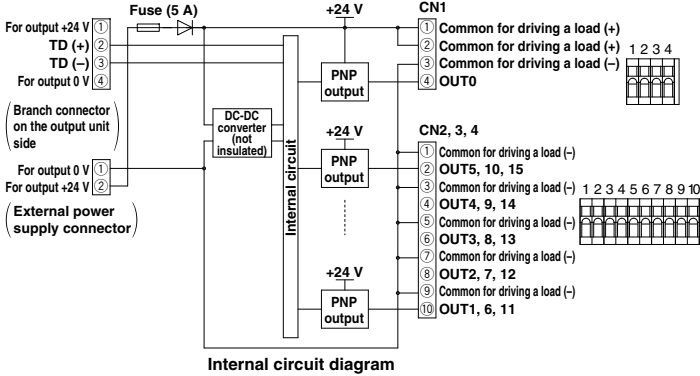
#### Terminal Block Connector (CN2, CN3, CN4)

No.	Description	Functions		
		CN2	CN3	CN4
1	COM	Common for driving a load (-)		
2	Output	OUT5	OUT10	OUT15
3	COM	Common for driving a load (-)		
4	Output	OUT4	OUT9	OUT14
5	COM	Common for driving a load (-)		
6	Output	OUT3	OUT8	OUT13
7	COM	Common for driving a load (-)		
8	Output	OUT2	OUT7	OUT12
9	COM	Common for driving a load (-)		
10	Output	OUT1	OUT6	OUT11

# EX510 Series

## Internal Circuits and Wiring Examples

### EX510-DYP4/Output unit for PNP (External power supply type)



### Terminal Block Connector (CN1)

No.	Description	Functions	
		CN1	
1	COM	Common for driving a load (+)	
2	COM	Common for driving a load (+)	
3	COM	Common for driving a load (-)	
4	Output	OUT0	

### Terminal Block Connector (CN2, CN3, CN4)

No.	Description	Functions		
		CN2	CN3	CN4
1	COM	Common for driving a load (-)		
2	Output	OUT5	OUT10	OUT15
3	COM	Common for driving a load (-)		
4	Output	OUT4	OUT9	OUT14
5	COM	Common for driving a load (-)		
6	Output	OUT3	OUT8	OUT13
7	COM	Common for driving a load (-)		
8	Output	OUT2	OUT7	OUT12
9	COM	Common for driving a load (-)		
10	Output	OUT1	OUT6	OUT11

## Connection to Output Equipment

The output unit can be connected to 2-port solenoid valves such as the VX, VCW, VDW series and other 3-port valves. Pay attention to the applicable cable and maximum load current for selecting a solenoid valve. The 2-port valves other than shown below can be used as long as they meet the conditions; operating environment (enclosure, etc.), applicable cable and the **maximum load current**. Shown below is the typical 2-port solenoid valve. Additionally, we recommend a model with surge voltage suppressor is used for the 2-port solenoid valve.

Example) In the case of using 5 VX23 series (rated voltage: 24 VDC/ power consumption: 10.5 W) (calculated under the condition with 5 valves turned on simultaneously)

Operating current per point for a valve  
 $10.5 \text{ (W)} \div 24 \text{ (V)} = 0.44 \text{ (A)}$  ..... Meets the output unit **load current requirement 1**.

Therefore, the total current of the output unit is:  
 $10.5 \text{ (W)} \div 24 \text{ (V)} \times 5 \text{ (pcs.)} = 2.2 \text{ (A)}$  ..... Only the external power supply type can meet the **requirement 2**. The internal power supply type cannot be used.

Based on the **requirement 3**, The total current for OUT0 to 7 and OUT8 to 15 are **1.5 (A)** respectively.

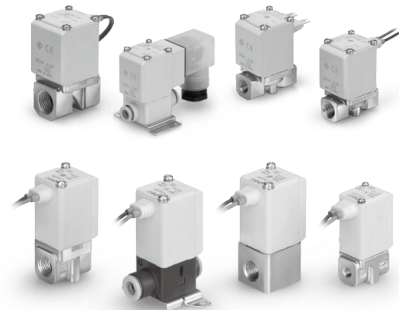
Therefore, 3 VX valves are wired for either 3 points of OUT0 to 7. (**1.32 (A)** for OUT0 to 7)  
 2 VX valves are wired for either 2 points of OUT8 to 15. (**0.88 (A)** for OUT8 to 15)

Other outputs can be made available by reducing the total number of the occupied points for simultaneous operation.

### Load Current Requirement

Model	EX510-DYN3	EX510-DYP3	EX510-DYN4	EX510-DYP4
Output type	Sink/NPN (Positive common)	Source/PNP (Negative common)	Sink/NPN (Positive common)	Source/PNP (Negative common)
Power supply type	Internal power supply (supplied by GW unit)	Internal power supply (supplied by GW unit)	External power supply (supplied by power supply connector)	External power supply (supplied by power supply connector)
Max. load current	Meet the following 3 conditions: 1. 0.5 A or less per point 2. 1 A or less per unit 3. Total current for OUT 0 to 7 must be 1 A or less. Total current for OUT 8 to 15 must be 1 A or less.		Meet the following 3 conditions: 1. 0.5 A or less per point 2. 3 A or less per unit 3. Total current for OUT 0 to 7 must be 1.5 A or less. Total current for OUT 8 to 15 must be 1.5 A or less.	

## Direct Operated 2-Port Solenoid Valve



### VX

Series	Body material	Port size	Orifice diameter [mmø]	Power consumption [W]
VX21	Al, Resin C37, Stainless steel	1/8 to 1/2 One-touch fitting: ø6 to ø12	2 to 10	4.5
VX22				7
VX23				10.5

### VDW

Series	Body material	Port size	Orifice diameter [mmø]	Power consumption [W]
VDW10	Al, Resin C37, Stainless steel	M5 to 1/8 One-touch fitting: ø3.2 to 6	1.0 to 3.2	2.5
VDW20				3

## Accessories

### 1 Branch cable

A 4 core flat cable is required for connecting between units.

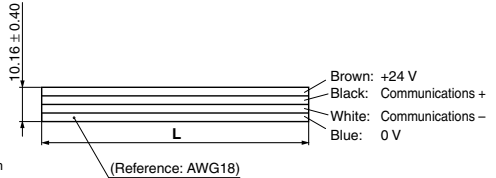
How to Order

**EX510-FC** **10**

● Cable length (L)

01	1 m
02	2 m
05	5 m
10	10 m
20	20 m
60 <sup>*1</sup>	60 m

\*1 Branch cable length is a maximum of 20 m.  
Use the cable by cutting it into lengths of 20 m or shorter.



### 2 Branch connector (Unit 1 pc.)

Connector required for connecting a branch cable to each unit.  
Two branch cables are attached to the SI unit, the input unit and the output unit respectively.

How to Order

**EX510-LC1**



(When press-fitting)

Electrical specifications	
Rated voltage	24 VDC
Rated current	Max. 5.0 A
Contact resistance	20 mΩ or less
Withstand voltage	1000 VAC 1 minute (Leak current 1 mA or less)

### 3 Cable assembly for outputting

Cable assembly for connecting the unused outputs in the SI unit.

How to Order

**EX510-V** **S** **10** **S**

● Output

S	1 point
W	2 points

● Valve connector

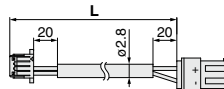
Nil	None
S	For SY, SYJ series
Q	For VQ, VQZ series <sup>*1</sup>

● Cable length (L)

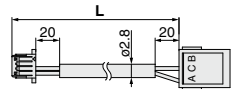
10	1 m
30	3 m

\*1 VQ is compatible with the positive common only.

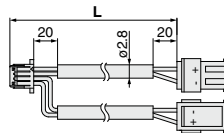
**EX510-VS**□S



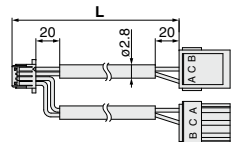
**EX510-VS**□Q



**EX510-VW**□S



**EX510-VW**□Q



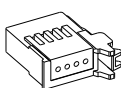
### 4 e-con connector

Connector for connecting a sensor to the input unit (EX510-DX□□).  
For applicable wire, refer to the right table.

How to Order

**ZS-28-C** □ □

e-con



#### Applicable Wire

SMC part no. (1 pc.)	Cover color	Compliant wire diameter (ø)	Nominal cross sectional area (mm <sup>2</sup> ) <sup>*1</sup>	Tyco Electronics Japan G.K. part no.
<b>ZS-28-CA-1</b>	Orange	0.6 to 0.9	0.1 to 0.5 (AWG26 to 20 <sup>*2</sup> )	3-1473562-4
<b>ZS-28-CA-2</b>	Red	0.9 to 1.0		1-1473562-4
<b>ZS-28-CA-3</b>	Yellow	1.0 to 1.15		1473562-4
<b>ZS-28-CA-4</b>	Blue	1.15 to 1.35		2-1473562-4
<b>ZS-28-CA-5</b>	Green	1.35 to 1.60		4-1473562-4
SMC part no. (1 pc.)	Cover color	Compliant wire diameter (ø)	Nominal cross sectional area (mm <sup>2</sup> ) <sup>*1</sup>	3M Japan Limited part no.
<b>ZS-28-C</b>	Red	0.8 to 1.0	0.14 to 0.2 (AWG26 to 24 <sup>*2</sup> )	37104-3101-000FL
<b>ZS-28-C-1</b>	Yellow	1.0 to 1.2		37104-3122-000FL
<b>ZS-28-C-2</b>	Orange	1.2 to 1.6		37104-3163-000FL
<b>ZS-28-C-3</b>	Green	1.0 to 1.2	0.3 to 0.5 (AWG22 to 20 <sup>*2</sup> )	37104-2124-000FL
<b>ZS-28-C-4</b>	Blue	1.2 to 1.6		37104-2165-000FL
<b>ZS-28-C-5</b>	Gray	1.6 to 2.0		37104-2206-000FL
SMC part no. (1 pc.)	Cover color	Compliant wire diameter (ø)	Nominal cross sectional area (mm <sup>2</sup> ) <sup>*1</sup>	OMRON Corp. part no.
—	Clear	UP to 1.5	0.08 to 0.5 (AWG28 to 20 <sup>*2</sup> )	XN2A-1470

\*1 Nominal sectional area is the value provided by the manufacturer.

\*2 AWG size is a reference.



# EX510 Series

## Accessories

### ⑤ Replacement fuse

Replacement fuse for the input unit (EX510-DX□□) and the output unit (EX510-DY□□).

How to Order

EX9-FU **10**

● Fuse rated current

10	1 A
50	5 A

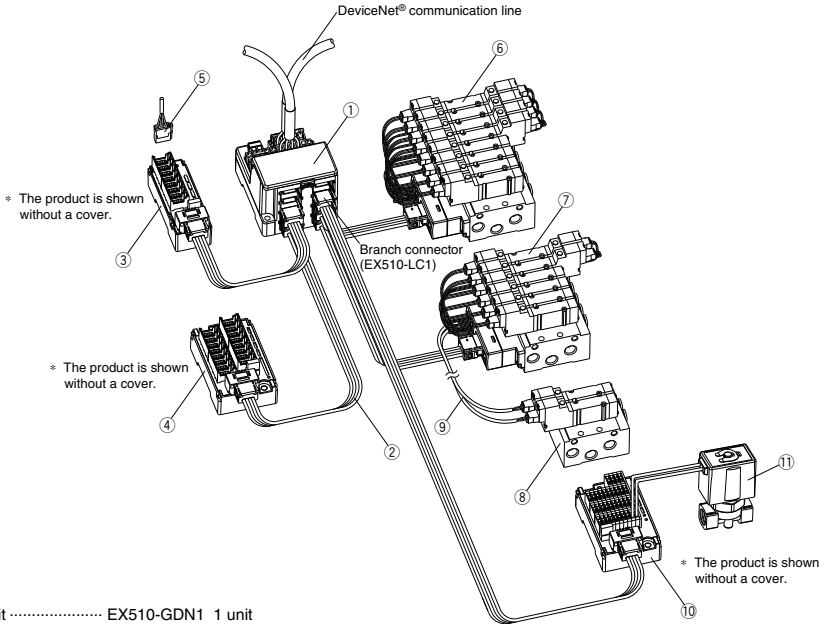
Fuse



Electrical specifications		
Part no.	EX9-FU10	EX9-FU50
Applicable model	EX510-DX□□ EX510-DY□□3	EX510-DY□□4
Rated current	1 A	5 A
Rated insulation capacity	48 VAC/DC 50 A	
Fuse resistance value	0.145 Ω	18 mΩ

## Ordering Examples

Shown is an example for ordering the EX510 series.



① Gateway unit ..... EX510-GDN1 1 unit  
(DeviceNet® compliant)

② Branch cable 20 meters ... EX510-FC20 1 roll

\*① ③ Input unit ..... EX510-DXN1 1 unit  
(1 connector, 2-input type NPN input)

\*① ④ Input unit ..... EX510-DXN2 1 unit  
(1 connector, 1 input type NPN input)

⑤ e-con ..... ZS-28-C□ 24 pcs.

\*① ⑥ SY series manifold ..... SS5Y3-42SA-08-C6 1 unit  
\* SY3140-5LOZ 4 units  
\* SY3240-5LOZ 4 units

\*① ⑦ VQZ series manifold ..... VV5QZ15-SA06C6 1 unit  
\* VQZ1150-5LO1 4 units  
\* VQZ1250-5LO1 2 units

⑧ SY series manifold ..... SS5Y3-42-02-C6 1 unit  
\* SY3140-5LOZ 2 units

⑨ Cable assembly ..... EX510-VW10S 1 pc.  
for output entry

\*① ⑩ Output unit ..... EX510-DYN3 1 unit

⑪ 2-port solenoid valve ..... VX210AA 1 unit

\*① Two branch connectors are attached to the manifold with SI unit and two are attached to the input unit and the output unit respectively. The branch connector (EX510-LC1) is used to connect the individual units.

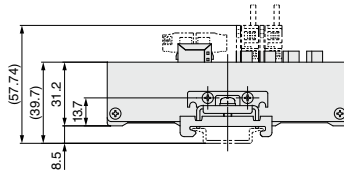
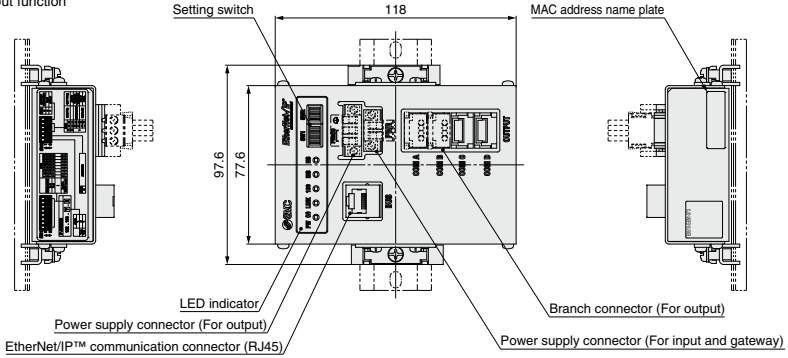
**Made to Order**

Please contact SMC for detailed specifications and lead times.

① **EtherNet/IP™ compatible**

**EX510-GEN1-X73**

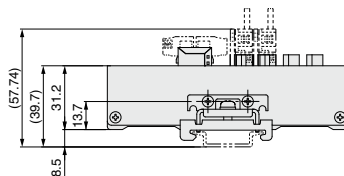
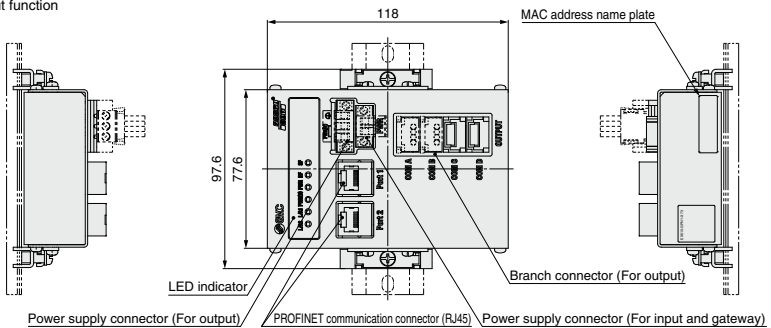
- 64 outputs (16 inputs x 4 branches)
- Without input function



② **PROFINET compatible**

**EX510-GPN1-X73**

- 64 outputs (16 inputs x 4 branches)
- Without input function





## EX510 Series

# Specific Product Precautions

Be sure to read this before handling the products. Refer to page 7 for safety instructions and pages 15 to 17 for fieldbus system precautions.

### Operating Environment

#### Warning

1. **Do not use this product in the presence of dust, particles, water, chemicals, and oil.**

Use with such materials is likely to cause a malfunction or breakage.

### Adjustment / Operation

#### Warning

1. **Do not short-circuit a load.**

If a load is short-circuited, excessive can cause damage to the connected devices. The fuse of the input unit will melt and below. The output and SI unit will activate its overcurrent protection function. However, they cannot cover all modes, so damage is likely to occur.

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