NXR-S series Simple Logic Safety I/O Block for CIP Safety

NXR-SXD1204□-CST

One safety I/O block for every machine – standardized, scalable, and easy to deploy

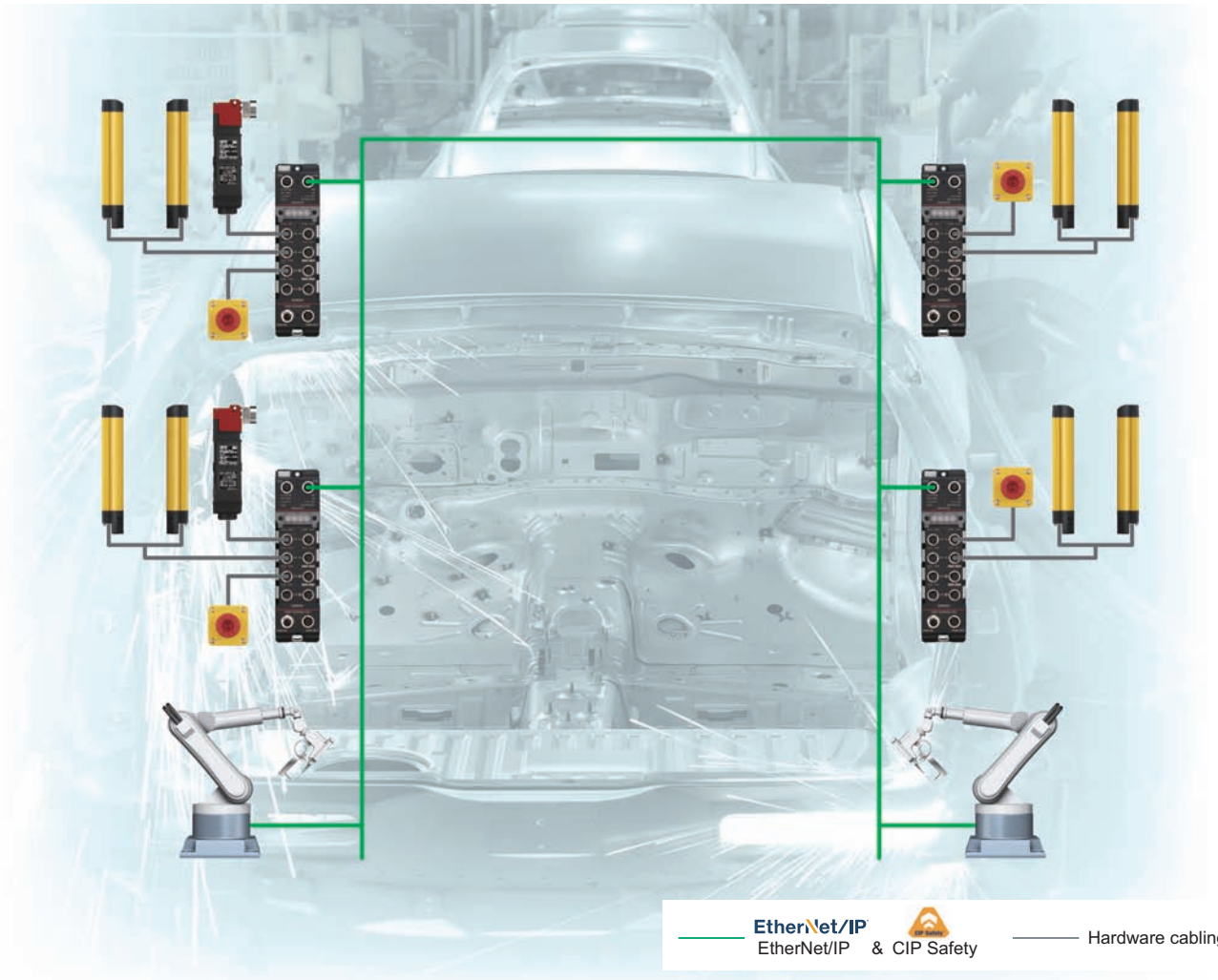
- As a safety I/O Block, the setup, startup, and operation management have all been simplified to maximize the reduction in person hours
- As a CIP Safety™ target device, it realizes the integration of distributed control and centralized management
- As a functional safety product, it is designed to follow the evolution of standards and achieve sustainable global expansion

Be sure to read the Common Precautions for Safety Warning at the following URL: http://www.ia.omron.com/.
Be sure to read the following user's manual for other details required for correct use of the Safety CPU Unit.



For safety certification, please refer to the OMRON website.

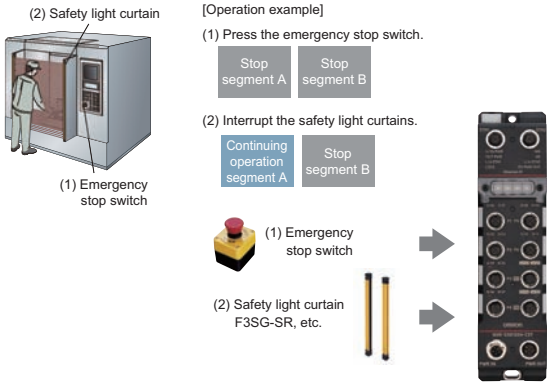
System Configuration Example



Features

As a safety I/O Block, the setup, startup, and operation management have all been simplified to reduce person hours

- Single-cable connection for both power and safety signals for light curtains
  Smartclick design ensures proper fastening
  - no torque wrench needed
- Built-in pre-defined, add-on user-defined ✻1, and logic functions simplify design and commissioning
  - no specialized expertise required.
- No need for dedicated software, built-in Web UI enables troubleshooting and unit replacement, etc.



- **All ports utilize Smartclick connectors**

Smartclick

- **Operation can be performed with Select&Work**

SETTING



Used to select the safety application.
Operation is performed when the values of SW1 and SW2 are the same.

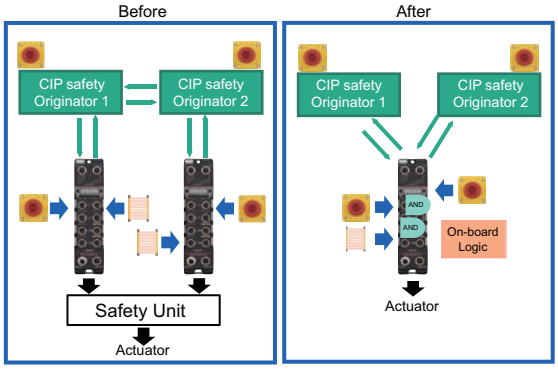
SW1 = SW2 (hexadecimal)	Operating mode
=0	Remote I/O mode
1 to 3	Fixed application
4 to 7	Reserved
8	IP address indication
9 to D	Add-on application
E	Wiring checking function
F	User-defined application

- **Equipped with the Web UI**



As a CIP Safety target device, it supports the integration of distributed control and centralized management

- System flexibility and manageability co-exist through the utilization of various communication types (Type1, Type2a, Type2b ✻2) depending on the startup, operation, and modification phase
- In addition to IO Block parameters, logic (user-defined) can be set automatically by Type1, thus integrating distributed control by targets and centralized management by originators
- A single NXR-S can communicate with multiple originators over CIP Safety, simplifying the architecture by eliminating redundant safety devices and reducing the number of NXR-S units required.



As a functional safety product, it is designed to evolve with global safety standards and support long-term worldwide deployment.

- Compliance with evolving International Safety Standards IEC 61508 and ISO 13849-1: 2023 (4th edition)
- Compliance with North American Standards
  Compliance with UL FSPC, etc.
- Compliance with European Standards
  Meets the Machinery Directive, etc.



TÜVRheinland CERTIFIED
CERTIFIED
CE

✻1 User-defined logic requires Sysmac Studio.
✻2 Type1: A Type1 SafetyOpen has all of the data necessary for the configuration of a safety device.
Type2a: When a target receives a Type2 SafetyOpen (no configuration data) accompanied by a non-zero Safety Configuration ID (SCID), it shall compare it against the SCID of the configuration and only accept the connection if they match.
Type2b: When a target receives a Type2 SafetyOpen (no configuration data) accompanied by a zero value SCID, it skips the check.

Ordering Information

Environment-resistive Remote Terminal NXR-S series Simple Logic Safety I/O Block for CIP Safety

No.	Communications protocol	Maximum number of connections	Number of safety inputs/outputs			Number of I/O Block ports			Unit version	Model
			Number of inputs	Number of test outputs	Number of outputs	Safety input ports	Safety output ports	Safety I/O ports		
[1]	CIP Safety	5	12	12	4	5 pins × 6 ports	5 pins × 2 ports	0	Ver. 1.00	NXR-SXD1204-CST
						5 pins × 4 ports	0	8 pins × 2 ports		NXR-SXD1204B-CST

Accessories
Identification marker: 1 sheet (10 pcs)

Specifications

The general specifications, communication specifications, safety specifications, and unit specifications of the safety I/O Block are as follows.

General Specifications

Item		Specifications
Degree of protection		IP67
Operating environment	Ambient operating temperature	-10 to 55°C
	Ambient operating humidity	25% to 85% (with no condensation)
	Atmosphere	Must be free from corrosive gases.
	Storage temperature	-25 to 65°C
	Storage humidity	25% to 85% (with no condensation)
	Altitude	2,000 m max.
	Pollution degree	3 or less: Conforms to IEC 61010-2-201
	Noise immunity	2 kV on power supply line (Conforms to IEC 61000-4-4)
	Overvoltage category	Category II: Conforms to IEC 61010-2-201
	EMC immunity level	Zone B
	Vibration resistance	10 to 60 Hz with amplitude of 0.35 mm, 60 to 150 Hz, and 50 m/s^2 80 min each in X, Y, and Z directions
	Shock resistance	150 m/s^2, 3 times each in 6 directions along X, Y, and Z axes
	Dielectric strength	600 VAC (between isolated circuits)
	Insulation resistance	20 MΩ min. (between isolated circuits)
Conformance to standards ✻	TÜV Rheinland	• EN 61508 parts 1-3 • EN ISO 13849-1 • EN ISO 13849-2 • EN IEC 61131-2 • IEC 61326-3-1 • EN 60529 • EN 61131-6
	UL	• NRAQ/NRAQ7 • UL 61010-1 and UL 61010-2-201 • CSA C22.2 No. 61010-1 and CSA C22.2 No. 61010-2-201 • FSPC (IEC 61508 parts 1-3 and ISO 13849-1)
	ODVA	• CIP Safety on EtherNet/IP • EtherNet/IP
	Other	• EU: EN 61131-2, RCM • UKCA • KC: KC Registration • Machinery Directive or Machinery Regulation

✻For safety certification, please refer to the OMRON website.

Communications Specifications

Item		Specifications
Physical specifications	**Port**	Layer-2 switch port
	Physical layer	10BASE-T/100BASE-TX Auto negotiation or fixed settings
	Media access method	CSMA/CD
	Modulation	Baseband
	Topology	Line, star, tree, ring
	Baud rate	100 Mbps (100BASE-TX)
	Transmission media	Category 5 or higher twisted-pair cable (Recommended cable: double-shielded cable with aluminum tape and braiding)
	Transmission distance	100 m or less (Distance between nodes and between hub and node)
CIP Safety	**CIP Safety target**	Supported
	Maximum number of connections	5 (Input 2/Output 3) Input connections can share the same data with up to 8 CIP Safety originators by using Multicast communication.
	Packet interval	5 to 500 ms
	Maximum data size	Input: 9 bytes Output: 3 bytes
EtherNet/IP communications	**EtherNet/IP target**	Supported (Exclusive Owner, Input Only, Listen Only)
	Maximum number of connections	2 (Input 2/Output 0)
	Packet interval	5 to 10,000 ms
	Maximum data size	Input: 9 bytes
	DLR	Ring nodes supported
CIP message communications	**Protocol**	Class3/UCMM
	Maximum number of connections (Class 3)	5
	Data size	504 bytes
CIP communications	**Quick Connect**	Not supported
HTTPS communications	**TLS version**	TLS 1.2 and TLS 1.3 is supported. TLS 1.0, TLS 1.1, and SSL are not supported.
	Authentication method	Server authentication (X.509) and session authentication by safety password

The following table shows whether a communications path encryption function is available, whether enabled or disabled by default, and whether switchable between enable and disable for each external interface.

External interface		Communications path encryption	Enabled/disabled by default	Whether enable/disable switchable
Ethernet port	CIP Safety	No	Enabled	Not possible
	HTTPS	Yes	Enabled	Not possible
	SNTP	No	Disabled	Possible by Sysmac Studio, Web server function, and CIP message
	DHCP	No	Disabled	Possible by Sysmac Studio, Web server function, and CIP message
	EtherNet/IP	No	Enabled	Not possible
	CIP messages	No	Enabled	Not possible
Physical interface	**Rotary switches**	Not applicable	Enabled	Not possible

Safety Specifications

Item	Specifications			
	Safety input		Safety output	
	Dual channel	Single channel	Dual channel	Single channel
PL	Up to PL e	Up to PL d	Up to PL e	Up to PL c
Category	Up to Cat.4	Up to Cat.2	Up to Cat.4	Up to Cat.2
MTTF$_D$	>100 years	>100 years	>100 years	>100 years
Mission Time	20 years	20 years	20 years	20 years
DCavg	98.61%	98.60%	98.60%	98.60%
SIL	Up to SIL 3	Up to SIL 2	Up to SIL 3	Up to SIL 1
PFH	4.6×10^{-10} 1/h	4.6×10^{-10} 1/h	4.6×10^{-10} 1/h	4.6×10^{-10} 1/h

Note: Refer to the *User's Manual* (Man.No.W546) for details.

Unit Specifications

Item		Specifications	
		NXR-SXD1204-CST	NXR-SXD1204B-CST
Unit name		Environment-resistive Remote Terminal NXR-S series Simple Logic Safety I/O Block for CIP Safety	
Dimensions [mm]		60 × 240 × 34.2 mm (W × H × D) (The depth is 46.65 mm when the connectors are included.)	
Mounting method		Mounting with M5 screws	
Mounting strength		100 N	
Mounting orientation and restrictions		Mounting orientations: Six orientations Restriction: None	
Available connectors		• EtherNet/IP communications connectors: M12 (D-coding, female) • Power supply connectors: M12 (L-coding, female), M12 (L-coding, male) • I/O connectors: M12 (A-coding, female)	
Connector strength		30 N Applicable to all connectors	
Screw tightening torque		• Unit mounting (M5 screw): 1.47 to 1.96 N·m • Rotary switch cover (M3 screw): 0.4 to 0.6 N·m	
Weight		710 g	700 g
Unit/input power supply voltage		24 VDC (19.2 to 28.8 VDC)	
Output power supply voltage		24 VDC (19.2 to 28.8 VDC)	
Isolation method		Digital isolator isolation	
Isolation inside the Unit		Isolate between the Unit/input power supply and output power supply	
Insulation resistance		20 MΩ min. between isolated circuits (at 100 VDC)	
Maximum power supply current		9 A	
Unit current consumption		• Unit/Input power supply: 220 mA • Output power supply: 40 mA	
Number of safety I/O Block	**Number of safety input terminals**	12	
	Number of test output terminals	12	
	Number of safety output terminals	4	
Number of I/O ports	**Safety input port**	5 pins × 6 ports	5 pins × 4 ports
	Safety output port	4 pins × 2 ports	0
	Safety I/O Ports	0	8 pins × 2 ports
Number of terminals per I/O port	**Safety input port**	• Safety inputs: 2 • Test outputs: 2 • Unit/input power supply -: 1	
	Safety output ports	• Safety outputs: 2 • Output power supply -: 2	---
	Safety I/O Ports	---	• Safety inputs: 2 • Test outputs: 2 • Safety outputs: 2 • Unit/input power supply -: 1 • Output power supply -: 1

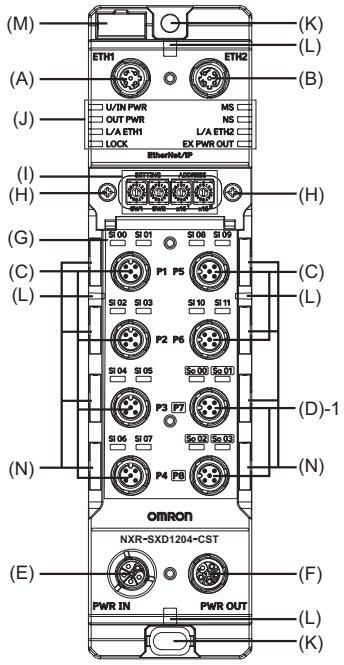
Item	Specifications	
	NXR-SXD1204-CST	NXR-SXD1204B-CST
Safety input current	4.5 mA typical	
Safety input ON voltage	11 VDC min.	
Safety input OFF voltage/OFF current	5 VDC max./1 mA max.	
Test output type	Sourcing outputs (PNP)	
Test output rated current	0.7 A/point	
Test output ON residual voltage	1.2 V max. (Unit/input power supply + and each output terminal)	
Test output leakage current	0.1 mA max.	
Safety output internal I/O common	PNP (sourcing outputs)	
Safety output maximum load current	2.0 A/point 9.0 A/Unit	0.7 A/point 9.0 A/Unit
Safety output ON residual voltage	1.2 V max. (between output power supply + and each output terminal)	
Safety output OFF residual voltage	2 V max. (between output power supply - and each output terminal)	
Safety application function	Fixed applications, add-on applications, and user-defined applications	

Part Names and Functions

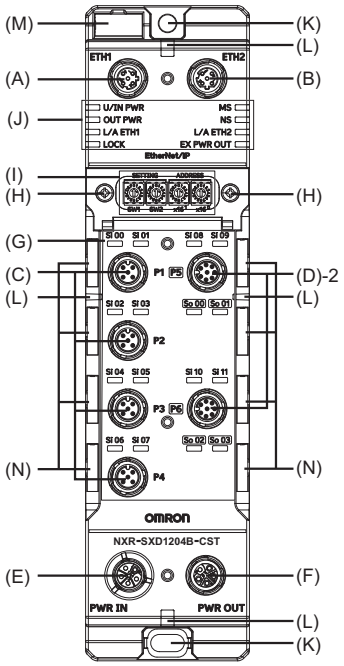
Parts and Names

This section describes the names of the parts of the Simple Logic Safety I/O Block.

NXR-SXD1204-CST



NXR-SXD1204B-CST



Letter	Name	Function
(A)	EtherNet/IP communications connector 1	The connector for EtherNet/IP port 1. The connector is an M12 connector (D-coding, female, Smartclick support). Connect a communications cable.
(B)	EtherNet/IP communications connector 2	The connector for EtherNet/IP port 2. The connector is an M12 connector (D-coding, female, Smartclick support). Connect a communications cable.
(C)	I/O connectors (for safety input ports)	These connectors are for connecting safety input devices. Affix removable markers to the sides of the I/O connectors. The connectors are M12 connectors (A-coding, female, 5-pin, Smartclick support). Connect I/O cables (5-wire).
(D)-1	I/O connectors (for safety output ports)	These connectors are for connecting safety output devices. Affix removable markers to the sides of the I/O connectors. The connectors are M12 connectors (A-coding, female, 5-pin, Smartclick support). Connect I/O cables (5-wire).
(D)-2	I/O connectors (for safety I/O ports)	These connectors are for connecting safety input devices and safety output devices. Affix removable markers to the sides of the I/O connectors. The connectors are M12 connectors (A-coding, female, 8-pin, Smartclick support). Connect I/O cables (8-wire).
(E)	Power supply connector (input)	This connector is for supplying Unit/input power and output power. The connector is an M12 connector (L-coding, male, Smartclick support). Connect the power supply cable for connecting to an external power supply.
(F)	Power supply connector (output)	This connector is for supplying Unit/input power and output power from the local node to another node. Use this connector when the power supply method is power supply with through-wiring. The connector is an M12 connector (L-coding, female, Smartclick support).
(G)	I/O indicators	These indicators indicate the status of the safety input or safety output for the terminal of each port.
(H)	Cover mounting holes	These screw holes are for mounting the rotary switch cover. They are provided in two locations. The figure above shows the holes when the cover is mounted with screws.
(I)	Rotary switches	These switches are for selecting the safety application and setting the IP address.
(J)	Status indicators	These indicators indicate the current operating status of the Safety I/O Terminal.
(K)	Unit mounting holes	These holes are for mounting the Unit. They are provided in two locations. Mount the Unit with M5 screws.
(L)	Unit identification indicator	This indicator provides notification by illuminating when using the Unit identification function.
(M)	Unit identification marker	This marker is for identifying the Safety I/O Terminal. It is white.
(N)	I/O identification marker	This marker is for identifying the I/O terminal. It is white.

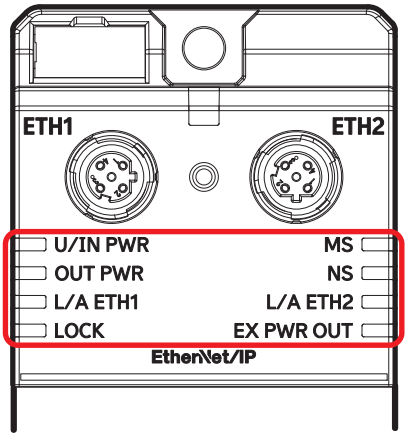
Indicators

The Safety I/O Block has the following indicators. This section describes them.

- Status Indicators
- I/O indicators

Status Indicators

These indicators indicate the current operating status of the Safety I/O Block.



U/IN PWR Indicator

This indicator shows the status of the Unit/input power supply.

Color	Status		Description
Green		Lit	The Unit/input power is supplied.
---		Not lit	The Unit/input power is not supplied.

OUT PWR Indicator

This indicator shows the status of the output power supply.

Color	Status		Description
Green		Lit	The output power is supplied.
---		Not lit	The output power is not supplied.

MS Indicator

This is the module status indicator. It shows the operating status of the Safety I/O Block.

Color	Status		Description
Green		Lit	Normal operating status (Executing)
		Flashing	Normal operation standby status (Idle)
Red		Lit	Critical error occurred (Critical Fault)
		Flashing	Operation stopped error (Abort)
Green/ Red		Flashing	Initializing (Self-Testing), TUNID setting wait state (Waiting for TUNID), or configuration wait state (Configuring)
---		Not lit	IP address indication function executing (IP Address Display), I/O wiring check function executing (I/O Wiring Checking), or power supply is OFF.

NS Indicator

This is the network status indicator. It shows the communications status of the Safety I/O Block.

Color	Status		Description
Green		Lit	Connection established for one of CIP Safety, EtherNet/IP, and CIP message communications.
		Flashing	Connection not established for any of CIP Safety, EtherNet/IP, and CIP message communications.
Red		Lit	A critical fault that affects the network occurred. Example: IP address is duplicated.
		Flashing	A timeout error occurred with one of the connections in CIP Safety and EtherNet/IP communications.
---		Not lit	The IP address is not set or the power supply is OFF.

L/A ETH1 Indicator

This is the Link/Activity indicator for EtherNet/IP port 1. It shows the linked status and communications status of EtherNet/IP port 1.

Color	Status		Description
Green		Lit	Link established
		Flashing	Link established and communications are active
---		Not lit	No link established

L/A ETH2 Indicator

The Link/Activity indicator for EtherNet/IP port 2. This indicator shows the linked status and communications status of EtherNet/IP port 2.

Color	Status		Description
Green		Lit	Link established
		Flashing	Link established and communications are active
---		Not lit	No link established

LOCK Indicator

This indicator shows the user authentication status for setting data of the Safety I/O Block. The user is recommended to set the locked state for use after the application operation check.

Color	Status		Description
Yellow		Lit	Configuration locked
		Flashing	Configuration unlocked and can be locked
---		Not lit	Configuration unlocked and cannot be locked

EX PWR OUT Indicator

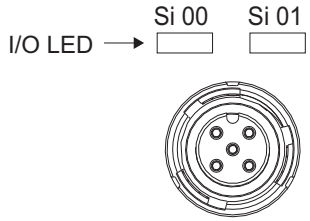
This indicator shows the status of the output power supply of the through-wiring.

Color	Status		Description
Green		Lit	The output power of the through-wiring is supplied.
---		Not lit	The output power of the through-wiring is not supplied.

I/O Indicators

The I/O LEDs on the Safety I/O Block indicate the status of the safety input terminals and safety output terminals.

Example: Safety Input Indicator



Safety Input Indicator

This indicator shows the status of the safety input terminal.

Color	Status		Description
Yellow		Lit	The safety input terminal is ON (operating normally).
Red		Lit	One of the following errors was detected. • External Test Signal Failure at Safety Input • Internal Circuit Error at Safety Input • Discrepancy Error at Safety Input
		Flashing	An error occurred in the safety input terminal for the other channel of the dual channels.
---		Not lit	The safety input terminal is OFF (operating normally).

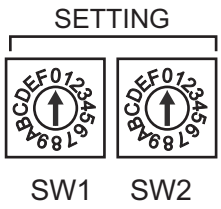
Safety Output Indicator

This indicator shows the status of the safety output terminal.

Color	Status		Description
Yellow		Lit	The safety output terminal is ON (operating normally)
Red		Lit	One of the following errors was detected. • Short Circuit Detected at Safety Output • Stuck-at-high Detected at Safety Output • Internal Circuit Error at Safety Output • Data error between dual channel outputs • EDM error
		Flashing	An error occurred in another related safety output terminal.
---		Not lit	The safety output terminal is OFF (operating normally)

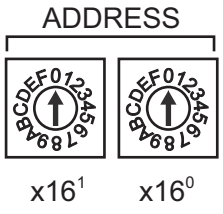
Rotary Switches

Rotary switches have the following settings.



Select from the safety application, IP address indication function, and I/O wiring checking function.
Operation is performed when SW1 = SW2.

SW1 = SW2 (hexadecimal)	Operating mode	Description
0	Remote I/O mode	Operates as remote I/O without using logic functions.
1 to 3	Fixed application	Use a Pre-defined application built into the safety I/O Block.
4 to 7	Reserved	Reserved
8	IP address indication function	Starts the IP address indication function.
9 to D	Add-on application	Use the applications which are added (Add-on) by the user.
E	I/O wiring checking function	Check the continuity of the I/O wiring.
F	User-defined application	Use the safety application that is configured from the CIP Safety originator.



Use the two rotary switches to set the IP address.
The IP address is 192.168.250.□, with the first to third digits being fixed, and the fourth digit □ is to be set.

Setting name	Set value (hex)	IP address setting method
Software setting	[00]	Configure the IP address using Sysmac Studio or Web UI.
Hardware setting	[01] to [FE]	192.168.250.□ ✻1
	[FF]	Obtain the IP address from the DHCP server.

✻1 "□" is the setting value of the rotary switches.

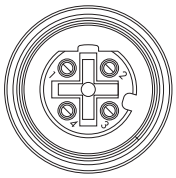
Connectors

The Safety I/O Block has the following connectors.

- EtherNet/IP communications connectors
- Power supply connectors
- I/O connectors

EtherNet/IP Communications Connectors

The EtherNet/IP communications connectors are used for EtherNet/IP communications. In this manual, they are sometimes referred to as “communications connectors.”



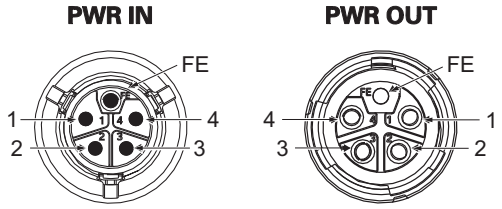
The specifications are as follows.

- Electrical specifications
  Conforms to IEEE 802.3 standards.
- Connector structure
  M12 connector (D-coding, female, Smartclick support, shielded) ×2
- Pin arrangement

Pin No.	Signal name	Description
1	TD+	Send data +
2	RD+	Receive data +
3	TD-	Send data -
4	RD-	Receive data -

Power Supply Connectors

These connectors are for supplying power to the Safety I/O Block.



Power supply connector (input)

Power supply connector (output)

Power Supply Connector (Input)

This connector is for supplying Unit/input power and output power. Connect the power supply cable of an external power supply.

Power Supply Connector (Output)

This is the connector for supplying output power from the local node to another node. Use it to supply power with through-wiring.

Specifications

The specifications are as follows.

a. Connector structure
Power supply connector (input): M12 connector (L-coding, male, Smartclick support)
Power supply connector (output): M12 connector (L-coding, female, Smartclick support)

b. Pin arrangement
Both the power supply connector (input) and power supply connector (output) have the following pin arrangement.

Pin No.	Signal name	Description	Cable color
1	U/IN P+	Unit/input power supply +	BN
2	OUT P-	Output power supply -	WH
3	U/IN P-	Unit/input power supply -	BU
4	OUT P+	Output power supply +	BK
FE (Functional Earth)	FG	Frame ground	GY

I/O Connectors

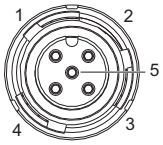
Connectors for connecting safety input and safety output devices.

Safety Input Ports

I/O connectors with test outputs and safety input terminals are called safety input ports.
The number of safety input ports and their locations differ depending on the model.

- For NXR-SXD1204-CST: Ports P1 to P6
- For NXR-SXD1204B-CST: Ports P1 to P4

The following shows the pin arrangement of safety input ports.

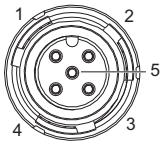


- Connector structure
  M12 connectors (A-coding, female, 5-pin, Smartclick support).
  Connect I/O cables (5-wire).

Pin No.	Signal name	Description
1	T (n)	Test output terminal T00/02/04/06/08/10
2	Si (n)	Safety input terminal Si00/02/04/06/08/10
3	U/IN P-	Unit/Input power supply -
4	Si (n+1)	Safety input terminal Si01/03/05/07/09/11
5	T (n+1)	Test output terminal T01/03/05/07/09/11

Safety Output Ports

I/O connectors with safety output terminals are called safety output ports.
There are safety output ports on NXR-SXD1204-CST only.
The safety output ports are ports P7 to P8.
The following shows the pin arrangement of safety output ports.

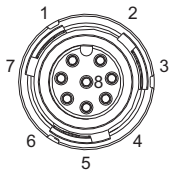


- Connector structure
  M12 connectors (A-coding, female, 5-pin, Smartclick support).
  Connect I/O cables (5-wire).

Pin No.	Signal name	Description
1	NC	NC
2	So (n)	Safety output terminal So00/02
3	OUT P-	Output power supply -
4	So (n+1)	Safety output terminal So01/03
5	OUT P-	Output power supply -

Safety I/O Ports

I/O connectors with safety input terminals and safety output terminals are called safety I/O ports.
There are safety I/O ports on NXR-SXD1204B-CST only.
The safety I/O ports are ports P5 to P6.
The following shows the pin arrangement of safety I/O ports.



- Connector structure
  M12 connectors (A-coding, female, 8-pin, Smartclick support).
  Connect I/O cables (8-wire).

Pin No.	Signal name	Description
1	T (n)	Test output terminal T08/10
2	Si (n)	Safety input terminal Si08/10
3	U/IN P-	Unit/input power supply -
4	Si (n+1)	Safety input terminal Si09/11
5	T (n+1)	Test output terminal T09/11
6	So (n)	Safety output terminal So00/02
7	So (n+1)	Safety output terminal So01/03
8	OUT P-	Output power supply -

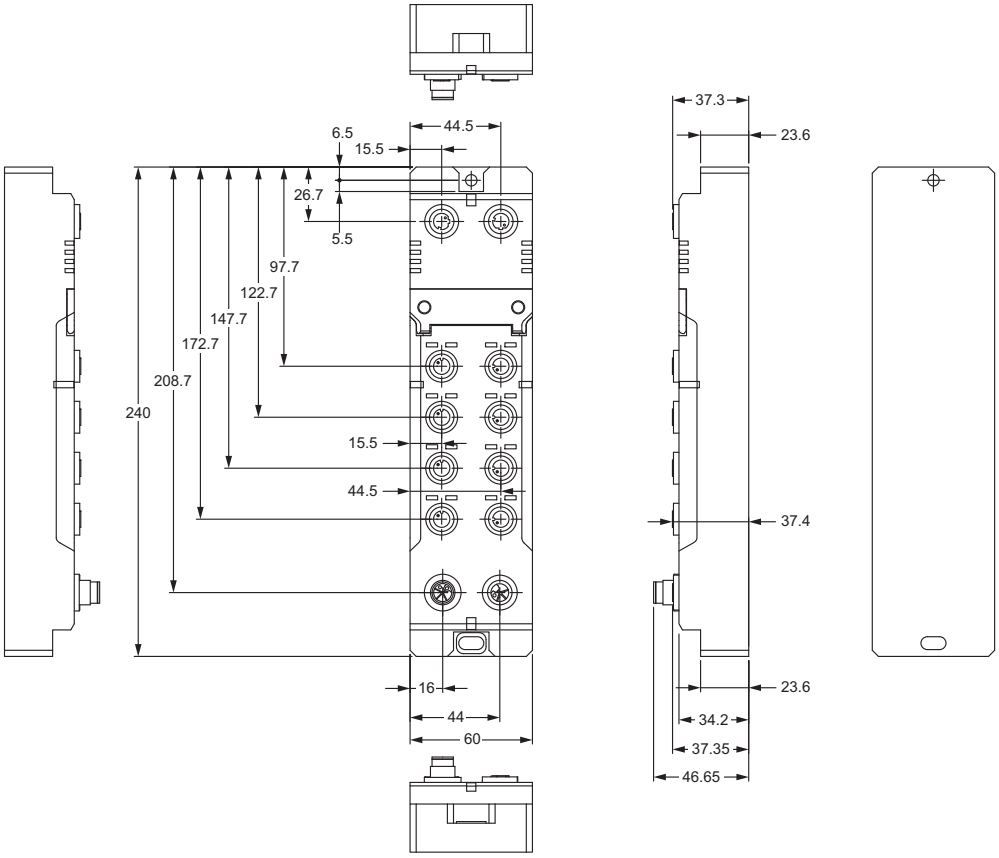
NXR-SXD1204□-CST

Dimensions

(Unit: mm)

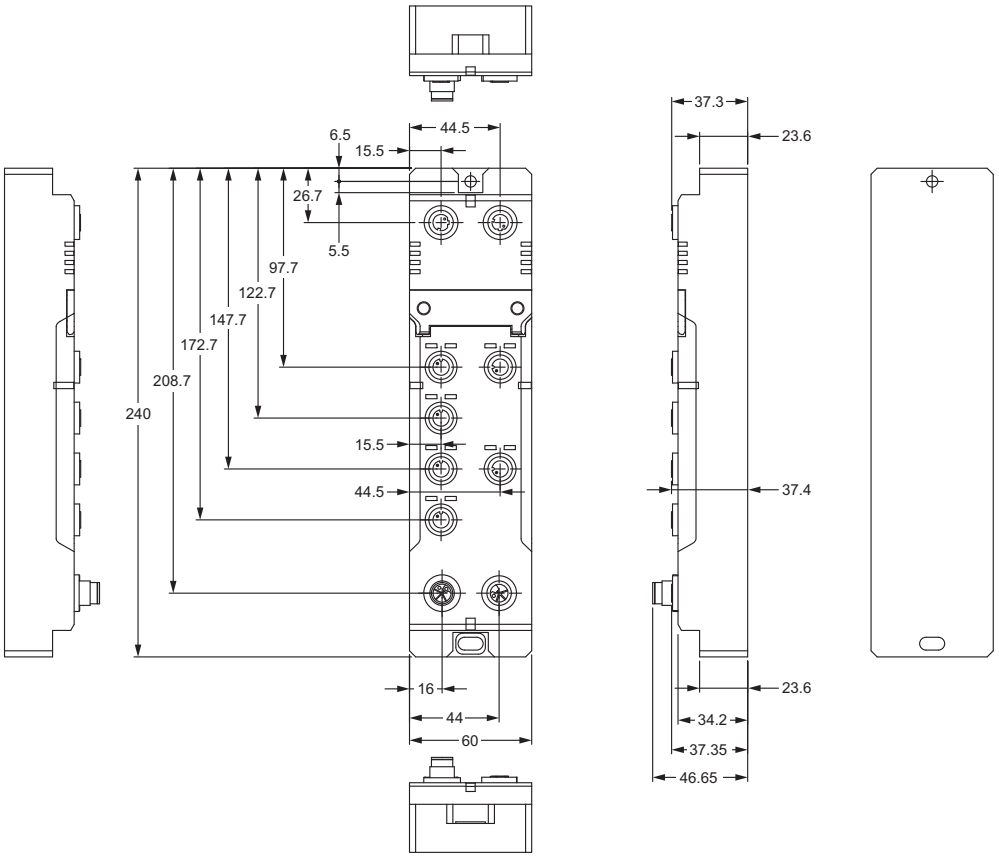
NXR-SXD1204-CST





NXR-SXD1204B-CST





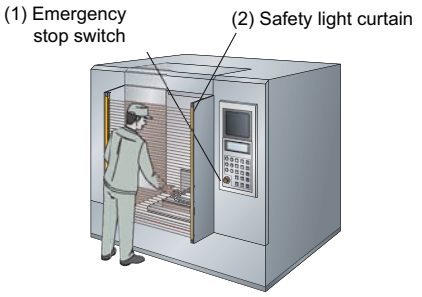
Example of Pre-defined application

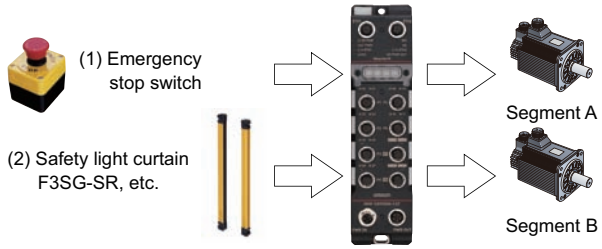
No.1 partial stop + entire stop application

Purpose of use

To realize a partial stop and entire stop application.

- When the emergency stop switch is pressed, the entire device stops.
- When the safety light curtains are interrupted, only the operating part of the segment B stops partially.





[Operation example]

(1) Press the emergency stop switch.



(2) Interrupt the safety light curtains.



Logic

When the emergency stop switch is pressed, the entire device stops.
When the safety light curtains are interrupted, only So02/So03 stops partially.
The following table shows the logic settings.

Input	Device	Input type	Reset type	So00	So02
Si00	Emergency stop switch	---	Manual (Si06)	0	0
Si02	Safety light curtain	---	Manual (Si06)	1	0

I/O Block settings

The following tables show the I/O Block settings of the partial stop + entire stop application.

Safety input terminals

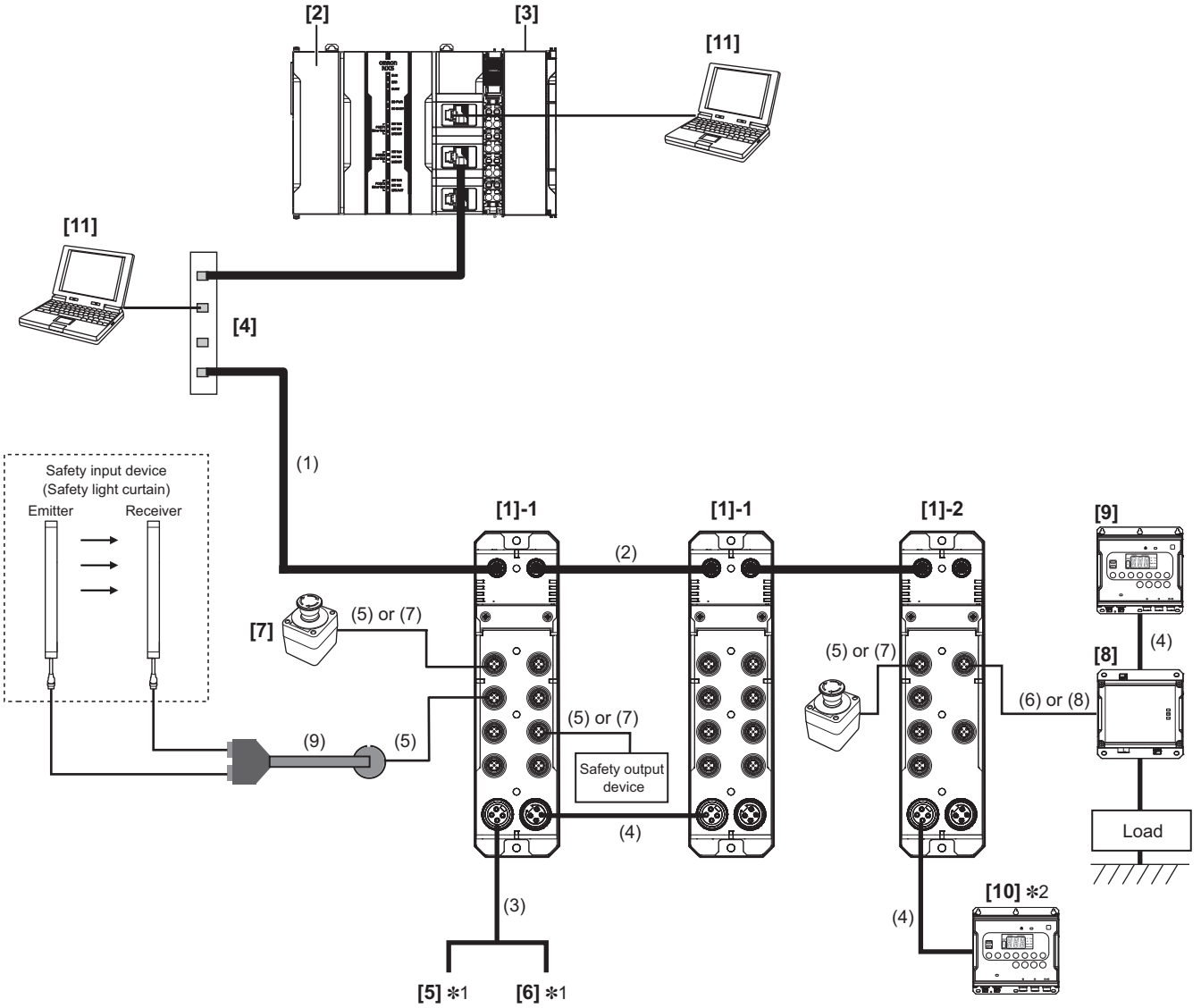
Terminal number	Connection component	Channel mode	Dual mode	Test terminal	Test terminal mode
Si00	Emergency stop switch	Test pulse input	Dual (same value)	T0	Test pulse output
Si01		Test pulse input	Dual (same value)	T1	Test pulse output
Si02	Safety light curtain	Safety input	Dual (same value)	T2	Power supply
Si03		Safety input	Dual (same value)	T3	Standard output
Si04	---	---	---	---	---
Si05	---	---	---	---	---
Si06	Reset input	Test pulse input	Single	T6	Test pulse output
Si07	---	---	---	T7	Standard output
Si08	---	---	---	---	---
Si09	---	---	---	---	---
Si10	---	---	---	---	---
Si11	---	---	---	---	---

Safety output terminals

Terminal number	Connection component	Dual mode
So00	Safety servo drive	Dual (same value)
So01		Dual (same value)
So02	Safety servo drive	Dual (same value)
So03		Dual (same value)

List of configuration devices

Basic configuration



∗1. When the input power supply and the output power supply are isolated

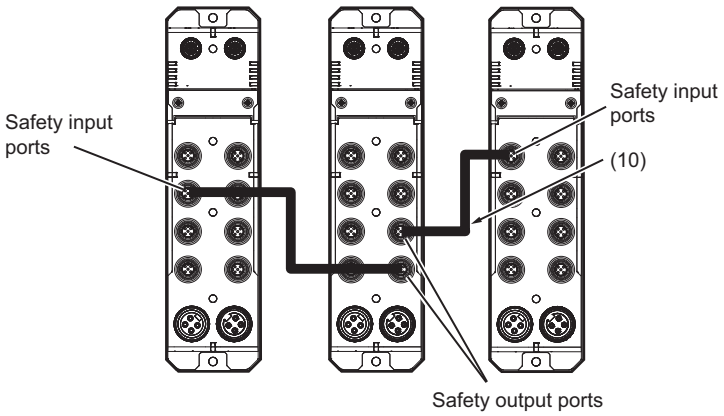
∗2. When the input and output power supplies are not isolated

The following table describes each configuration device.

No.	Configuration device	Product Name	Model name	Description
[1]-1	Target Device (Remote I/O Block)	Simple Logic Safety I/O Block for CIP Safety	NXR-SXD1204-CST	This product
[1]-2			NXR-SXD1204B-CST	
[2]	Originator (EtherNet/IP) Programmable Controller (Built-in EtherNet Port)	NX502 CPU Unit NX102 CPU Unit	NX502-□□□□□ NX102-□□□□□	Used to perform EtherNet/IP communications with the Simple Logic Safety I/O Block, and monitor the operating status of the Simple Logic Safety I/O Block. They operate as the originator for EtherNet/IP communications.
		Communication Control Unit ✻1	NX-CSG320	
[3]	Originator (CIP Safety Communication) Safety Controller	Safety CPU Unit ✻1	NX-SL5□□□	Used to perform CIP Safety communications with the Simple Logic Safety I/O Block, and create and execute safety programs. It operates as the originator for CIP Safety communications.
[4]	Ethernet switch	---	---	A relay device that connects multiple nodes.
[5]	Unit/input power supply	---	---	A power supply used for operation of the Simple Logic Safety I/O Block and for interfacing with safety input devices. Supply power by connecting an external power supply to the power supply connector (input).
[6]	Output power supply	---	---	A power supply used for interfacing with safety output devices. Supply power by connecting an external power supply to the power supply connector (input).
[7]	Safety input device	Safety Light Curtain	F3SG-4SR□□□□-□□	An input device that is designed with special safety measures for use in safety controls. The generic term for devices such as emergency stop switches and safety door switches.
		Emergency Stop Switch	---	
[8]	Safety output device	DC Blocking BOX	S8R-BB□□A□	An output device that is designed with special safety measures for use in safety controls. The generic term for devices such as safety relays.
[9]	Load Power Supply Unit	Environment-resistant IP67 power supply	S8NR-S□□024-A□□□	Power supply to supply the load.
[10]	Unit/Input and Output Power (Non-Isolated)	Environment-resistant IP67 power supply	S8NR-S□□024-A□□□	When the input and output are non-isolated, the power supply that supplies power to the NXR-S.
[11]	Software	Sysmac Studio	SYSMAC-□□□□□□	Software to provide an integrated development environment for the setting, programming, debugging, and maintenance of the Simple Logic Safety I/O Block, NJ/NX-series CPU Unit, NY-series Industrial Panel PC/Industrial Box PC, and Safety CPU Unit.

✻1 It can also be used without CIP Safety communications. In such a case, the NX-SL5□□□ is not required. Also, it is possible to connect the NJ/NX-series CPU Unit or the NY-series Industrial Panel PC/Industrial Box PC.

Example of connection between Units for expanding the number of inputs/outputs without passing through a network



Note: Be sure to use the Web UI or the Sysmac Studio to verify that there are no abnormalities in each unit caused by ground faults, short circuits, overcurrent, incorrect settings, or other issues.

Related products

Automation Software Sysmac Studio

Software to provide an integrated development environment for the setting, programming, debugging, and maintenance of Machine automation controllers including the NJ/NX-series CPU Unit and NY-series Industrial PC, the EtherCAT Slave, and the HMI.

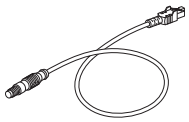
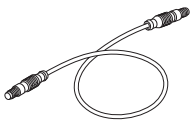
The available standalone license editions for this product are as follows:

- Sysmac Studio Standard Edition Ver.1□□
- Sysmac Studio Safety Edition Ver.1□□

For details, refer to the product information on the OMRON website (www.fa.omron.co.jp/) and *Sysmac Studio Catalog* (Cat.No.P138).

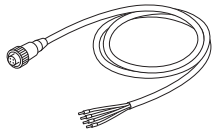
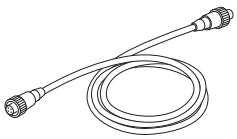
Connection-related equipment

Industrial Ethernet Cables (Shield Strengthening model)

No.	Name and appearance	Manufacturer	Specifications	Available connectors	Cable connection direction	Number of cable conductors	Cable length	Model
(1)	Cable with plug connector on both sides (M12 Smart Click Straight/ RJ45) 	OMRON	M12 plug (D-coding, male) to RJ45	Smartclick connector	Straight/ straight	4	0.5 m	**XS5W-T421-BMC-SS**
							1 m	**XS5W-T421-CMC-SS**
							2 m	**XS5W-T421-DMC-SS**
							3 m	**XS5W-T421-EMC-SS**
							5 m	**XS5W-T421-GMC-SS**
							10 m	**XS5W-T421-JMC-SS**
(2)	Cable with connectors on both sides of the plug (M12 Smart Click Straight/ M12 Smart Click Straight) 	OMRON	M12 plug (D-coding, male) to M12 plug (D-coding, male)	Smartclick connector	Straight/ straight	4	0.5 m	**XS5W-T421-BM2-SS**
							1 m	**XS5W-T421-CM2-SS**
							2 m	**XS5W-T421-DM2-SS**
							3 m	**XS5W-T421-EM2-SS**
							5 m	**XS5W-T421-GM2-SS**
							10 m	**XS5W-T421-JM2-SS**

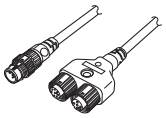
Note: 1. For more information on cables with Ethernet connectors, please refer to *the Industrial Ethernet Connectors Catalogue XS5/XS2/XS6* (Cat.No. G019).

Power supply cables

No.	Name and appearance	Manufacturer	Specifications	Available connectors	Cable connection direction	Number of cable conductors	Cable length	Model
(3)	Connectors with Cables, Socket on One Cable End M12 L-coding power supply cable (M12 straight female to discrete wires) 	OMRON	M12 socket (L-coding, female) to discrete wires	Smartclick connector	Straight/ straight	5	0.5 m	**XS5F-L521-B12-F**
							1 m	**XS5F-L521-C12-F**
							2 m	**XS5F-L521-D12-F**
							3 m	**XS5F-L521-E12-F**
							5 m	**XS5F-L521-G12-F**
							10 m	**XS5F-L521-J12-F**
							15 m	**XS5F-L521-K12-F**
							20 m	**XS5F-L521-L12-F**
(4)	Cable with double-sided socket connector M12 L-coding power supply cable (M12 straight male to M12 straight female) 	OMRON	M12 plug (L-coding, male) to M12 socket (L-coding, female)	Smartclick connector	Straight/ straight	5	0.5 m	**XS5W-L521-B12-F**
							1 m	**XS5W-L521-C12-F**
							2 m	**XS5W-L521-D12-F**
							3 m	**XS5W-L521-E12-F**
							5 m	**XS5W-L521-G12-F**
							10 m	**XS5W-L521-J12-F**
							15 m	**XS5W-L521-K12-F**
							20 m	**XS5W-L521-L12-F**

I/O cables

For direct connection or extension connection

No.	Name and appearance	Manufacturer	Specifications	Available connectors	Cable connection direction	Number of cable conductors	Cable length	Model
(5)	Connectors with Cables, Socket and Plug on Both Cable Ends (M12 socket/M12 plug) 	OMRON	M12 socket (A-coding, female) to M12 plug (A-coding, male), uses DC	Smartclick connector	Straight	5	0.5 m	**XS5W-D521-BG1-F**
							1 m	**XS5W-D521-CG1-F**
							2 m	**XS5W-D521-DG1-F**
							3 m	**XS5W-D521-EG1-F**
							5 m	**XS5W-D521-GG1-F**
							10 m	**XS5W-D521-JG1-F**
							15 m	**XS5W-D521-KG1-F**
							20 m	**XS5W-D521-LG1-F**
(6)	Connectors with Cables, Socket and Plug on Both Cable Ends (M12 socket/M12 plug) 	OMRON	M12 socket (A-coding, female) to M12 plug (A-coding, male), uses DC	Smartclick connector	Straight	8	0.5 m	**XS5W-D821-BK1-F**
							1 m	**XS5W-D821-CK1-F**
							2 m	**XS5W-D821-DK1-F**
							3 m	**XS5W-D821-EK1-F**
							5 m	**XS5W-D821-GK1-F**
							10 m	**XS5W-D821-JK1-F**
							15 m	**XS5W-D821-KK1-F**
							20 m	**XS5W-D821-LK1-F**
(7)	Connectors with Cables, Plug on One Cable End (M12 plug/loose wire) 	OMRON	M12 plug (A-coding, male) to discrete wires	Smartclick connector	Straight	5	0.5 m	**XS5H-D521-BG0-F**
							1 m	**XS5H-D521-CG0-F**
							2 m	**XS5H-D521-DG0-F**
							3 m	**XS5H-D521-EG0-F**
							5 m	**XS5H-D521-GG0-F**
(8)	Connectors with Cables, Plug on One Cable End (M12 plug/loose wire) 	OMRON	M12 plug (A-coding, male) to discrete wires	Smartclick connector	Straight	8	0.5 m	**XS5H-D821-BK0-F**
							1 m	**XS5H-D821-CK0-F**
							2 m	**XS5H-D821-DK0-F**
							3 m	**XS5H-D821-EK0-F**
							5 m	**XS5H-D821-GK0-F**
(9)	Safety Light Curtain Y-Joint Plug/Socket, Connectors on Both Ends  **Note: 1.** When extending the cable, connect the cable with connectors on both sides of (5) to extend it.	OMRON	M12 plug (A-coding, male, 5 pins) -M12 socket (A-coding, female, 5 pins)/ M12 socket (A-coding, female, 8 pins)	Smartclick connector	Straight	5-5/8	0.5 m	**F39-GCNY4**
(10)	For connecting IN-OUT between units (M12 plug/M12 plug)							
	Connectors with Cables, Plug on One Cable End (M12 plug/loose wire) 	OMRON	M12 plug (A-coding, male) to discrete wires	Smartclick connector	Straight	5	0.5 m	**XS5H-D521-BG0-F**
							1 m	**XS5H-D521-CG0-F**
							2 m	**XS5H-D521-DG0-F**
							3 m	**XS5H-D521-EG0-F**
							5 m	**XS5H-D521-GG0-F**
	Sensor I/O Connector (M12 plug)	OMRON	Round Water-resistant Connector, Assembly Connector Plug (male)	Smartclick connector	Straight	5	---	**XS5G-D5S7**

Note: 2. For details on the XS5W, XS5H, and XS5G connectors, refer to *Round Water-resistant Connectors (M12 Smartclick connector) XS5 Datasheet*.

Waterproof covers for connectors

Name and appearance	Manufacturer	Specifications	Available connectors	Model
M12 waterproof covers 	OMRON	• M12 A-coding • M12 D-coding • M12 L-coding	Smartclick connector	**XS5Z-12**

Note: 1. For details on the XS5Z connector, refer to *Round Water-resistant Connectors (M12 Smartclick) XS5 Datasheet*.

Related Manuals

Manual	Man.No.	Model	Application	Description
Environment-resistive Remote Terminal NXR-S series Simple Logic Safety I/O Block for CIP Safety User's Manual	W546	NXR-SXD1204-CST NXR-SXD1204B-CST	To learn the usage method of the Environment-resistive Remote Terminal NXR-S series Simple Logic Safety I/O Block for CIP Safety.	Describes the hardware, setting method, and functions of the Environment-resistive Remote Terminal NXR-S series Simple Logic Safety I/O Block for CIP Safety.

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