

# Machine Safety Technology Guide



# Product Lineup

Select the safety input, logic and output components that are suitable for your risk reduction strategy

INPUT

**Guard solutions**

 <b>Safety limit switches</b>	 Small Safety Limit Switch D4N <span style="float: right;">P13</span>	 Small Safety Limit Switch D4F <span style="float: right;">P13</span>	 Safety Limit Switch D4B-cN <span style="float: right;">P13</span>	 Pull-reset Safety Limit Switch D4N-cR <span style="float: right;">P13</span>			
 <b>Guard lock safety-door switches</b>	 Guard Lock Safety-door Switch D4LS-N <span style="float: right;">P14</span>	 Guard Lock Safety-door Switch D4JL <span style="float: right;">P14</span>	 Guard Lock Safety-door Switch D4NL <span style="float: right;">P14</span>	 Guard Lock Safety-door Switch D4BL <span style="float: right;">P14</span>	 RFID Magnetic Locking Safety Switch D40ML <span style="float: right;">P14</span>		
<b>Safety-door switches</b>	 Safety-door Switch D4NS <span style="float: right;">P14</span>	 Slim Safety Door Switch D4GS-N <span style="float: right;">P14</span>	 Safety-door Hinge Switch D4NH <span style="float: right;">P14</span>	 Safety-door Switch D4BS <span style="float: right;">P14</span>			
<b>Non-contact door switches</b>	 Compact Non-contact Door Switch D40A/D40Z <span style="float: right;">P15</span>	 Hall-Effect Coded Magnet Non-Contact Safety Switches D40P <span style="float: right;">P15</span>	 RFID Non-Contact Safety Switches D40R <span style="float: right;">P15</span>	<b>Slide keys</b>	 D4NS/D4JL-mounting Slide Key D4NS-SK/D4JL-SK <span style="float: right;">P15</span>	 D4SL-N-mounting Slide Key D4SL-NSK10-LK <span style="float: right;">P15</span>	
 <b>Safety light curtains</b>	 Safety Light Curtain F3SG-SR <span style="float: right;">P16</span>	 Safety Multi-Light Beam F3SG-PG <span style="float: right;">P16</span>	 Small Safety Light Curtain F3S-A <span style="float: right;">P16</span>	<b>Muting actuators</b>	 Smart Muting Actuator F3W-MA <span style="float: right;">P16</span>	<b>Single-beam sensors</b>	 Single-beam Safety Sensor E3ZS <span style="float: right;">P18</span>

**Presence sensing**

 <b>Safety laser scanners</b>	 Safety Laser Scanner OS32C <span style="float: right;">P17</span>	<b>Safety mats</b>	 Safety Mat UMA Series <span style="float: right;">P17</span>	<b>Safety edges</b>	 Safety Edge/Edge Controller SGE Series <span style="float: right;">P17</span>
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**Emergency stop/enabling devices**

 <b>Emergency stop switches</b>	 Emergency Stop Switch(22-dia. or 25-dia.) A22NE-PD/A22NE-P/A22E <span style="float: right;">P17</span>	 Emergency Stop Switch(16-dia.) A16SE <span style="float: right;">P17</span>	 Emergency Rope Switch ER6022 <span style="float: right;">P17</span>		
 <b>Safety switches</b>	 Enabling Grip Switch A4EG <span style="float: right;">P18</span>	 Enabling Switch A4E <span style="float: right;">P18</span>	 Safety Key Selector Switch A22TK <span style="float: right;">P18</span>	 Guard Lock Safety Key Selector Switch A22LK <span style="float: right;">P18</span>	 TS Capacitive Palm Button TS-20 <span style="float: right;">P18</span>

2

LOGIC

Safety controllers



Controllers for small applications

Safety Relay Unit  
G95A **P19**

Safety Relay Unit  
G95B **P19**

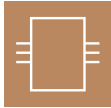
Safety Relay Unit  
G95E **P19**

Controllers for medium-size applications

Global/partial stopping

G9SX series  
Flexible Safety Unit  
G9SX **P19**

Safety Mats / Edge Controller  
SCC1224A **P19**



Controllers for medium-size applications

Programmable  
Safety Controller  
G9SP **P21**

G9SP Configurator  
WS02-G9SP-□-□-□ **P21**



Controllers for large applications

EtherNet/IP (CIP-Safety) **NEW**  
Communication Control Unit  
NX-CSG **P20**

**NX series**  
Safety CPU Unit **NEW**  
NX-SL5 **P20**

Safety I/O Terminal **NEW**  
GI-SMD/SID **P20**

EtherCAT (FSoE) **NEW**  
NX1 CPU Unit  
NX102-CPU **P20**

**NX series**  
Safety CPU Unit **NEW**  
NX-SL5/SL3 **P20**

Safety I/O Unit  
NX-SI/SO **P21**

EtherCAT Coupler Unit  
NX-ECC **P21**

Safety CPU Unit  
NX-SL3 **P21**

Safety I/O Unit  
NX-SI/SO **P21**

Automation Software  
SysmacStudio  
SYSMAC-□ **P21**

DeviceNet Safety **NE1A/NE0A series**  
Safety Network Controller  
NE1A-SCPU **P22**

Safety I/O Terminal  
DST1 series **P22**

Network Configurator  
WS02-CFSC1-J/E **P22**

OUTPUT

Safety relays



Safety relays

Safety relays  
G7SA **P23**

Safety relays  
G7S-□-E **P23**

Safety Power Relays  
G7Z **P23**

Sockets with Push-In Plus technology for G7SA Relays  
P7SA-PU

Safety drives



AC Servomotor/Servo Drive

15 Series AC Servo System with Safety Functionality  
R88M-1A-□/R88D-15AN-□-ECT **P23**

15 Series AC Servo System **NEW**  
R88M-1-□/R88D-15N-□-ECT **P23**

Inverter

MX2-V1 Multi-function Compact Inverter  
3G3MX2-V1 **P23**

3G3RX2 High-function General-purpose Inverter **NEW**  
3G3RX2 **P23**

\* In addition to the safety category, the performance level (PL) of the total system which is built of input, logic and output subsystems needs to be evaluated according to ISO 13849-1:2006 (EN ISO13849-1:2008).

# OEM Safety Solutions

## Omron safety components help improve machine safety

**1**

### Door locking to protect workers

**Guard Lock Safety-door Switch**  
**D4SL-N** P14  
**D4NL** P14  
**D4JL** P14 / **D4BL** P14  
 · Metal or plastic housing

D4BL D4JL  
 D4SL-N TL4019 D4NL

**2**

### Door monitoring

**Slim Safety Door Switch**  
**D4GS-N** P14  
**Safety-door Switch**  
**D4NS** P14 / **D4BS** P14  
 · Metal, plastic, or compact plastic housing

D4GS-N  
 D4NS D4BS



**3**

### Contact sensing to prevent crushing

**Safety Edge/Edge Controller**  
**SGE** P17 / **SCC** P17

SGE SCC

Note: The G9SP Safety Controller can be used instead of the SCC.

**4**

### Door position and open/close detection

**Safety Limit Switch**  
**D4B-□N** P13  
**Small Safety Limit Switch D4N/D4F** P13  
 · Metal or plastic housing

D4B-□N D4N D4F

**5**

### Worker protection in hazardous areas

**Mat for presence sensing**  
**Safety Mat/Controller**  
**UMA** P17 / **SCC** P17

SCC UMA Safety Mats

**6**

### Emergency machine stop

**Emergency Stop Switch**  
**A165E** P17  
**A22NE-PD/A22NE-P/**  
**A22E** P17  
 · A wide range of accessories

A22NE A165E

**7**

### Non-contact door monitoring

**Compact Non-contact Door Switch**

D40A (PLd/Safety Category 3) P15

D40Z (PLe/Safety Category 4) P15



D40R/P    D40A    D40Z

Note: The G9SP/G9SX-NS Controller is required.

**8**

### Standalone monitoring

Safety Relay Unit G9SA/G9SE P19

Flexible Safety Unit G9SX P19

Safety Controller G9SP P21

Machine Automation Controller NX102 P21

Safety CPU Unit NX-SL5 P20

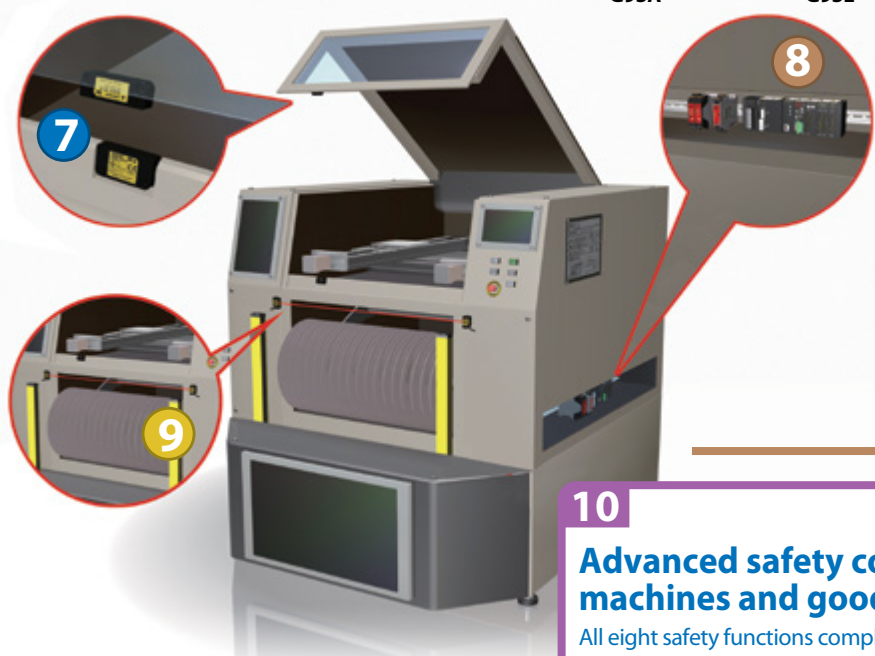
Safety I/O Unit NX-SI/SO P20



G9SA    G9SE    G9SX

G9SP

**NEW**  
NX102/  
NX-SL5/SI/SO



**9**

### Ensuring the safety of openings

Safety Light Curtain

F3SG-SR P16

**NEW**  
F3SG-SR



**10**

### Advanced safety control of people, machines and goods

All eight safety functions compliant with IEC61800-5-2 are supported

- AC Servo System with Safety Functionality 1S series Available soon  
R88M-1A□/R88D-1SAN□-ECT 

### Safe machine shutdown

Safety function: STO


- AC Servo System 1S Series  
R88M-1□/  
R88D-1SN□-ECT
- MX2-V1 Multi-function Compact Inverter **NEW** **NEW**  
3G3MX2-V1    3G3RX2    R88M-1□/  
R88D-1SN□-ECT
- High-function General-purpose Inverter 3G3RX2



# Machine Safety Application Examples

## Omron safety components help protect workers at manufacturing sites

**1**



**Presence sensing for frequently accessed areas and wide openings**

**Safety Light Curtain**  
F3SG-SR P16

**NEW**  
F3SG-SR

**2**

**Prevent collisions and entrapment by detecting workers and contacts**

**Safety Laser Scanner**  
OS32C P17

**Safety Edge/Edge Controller**  
SGE/SCC <sup>1</sup> P17

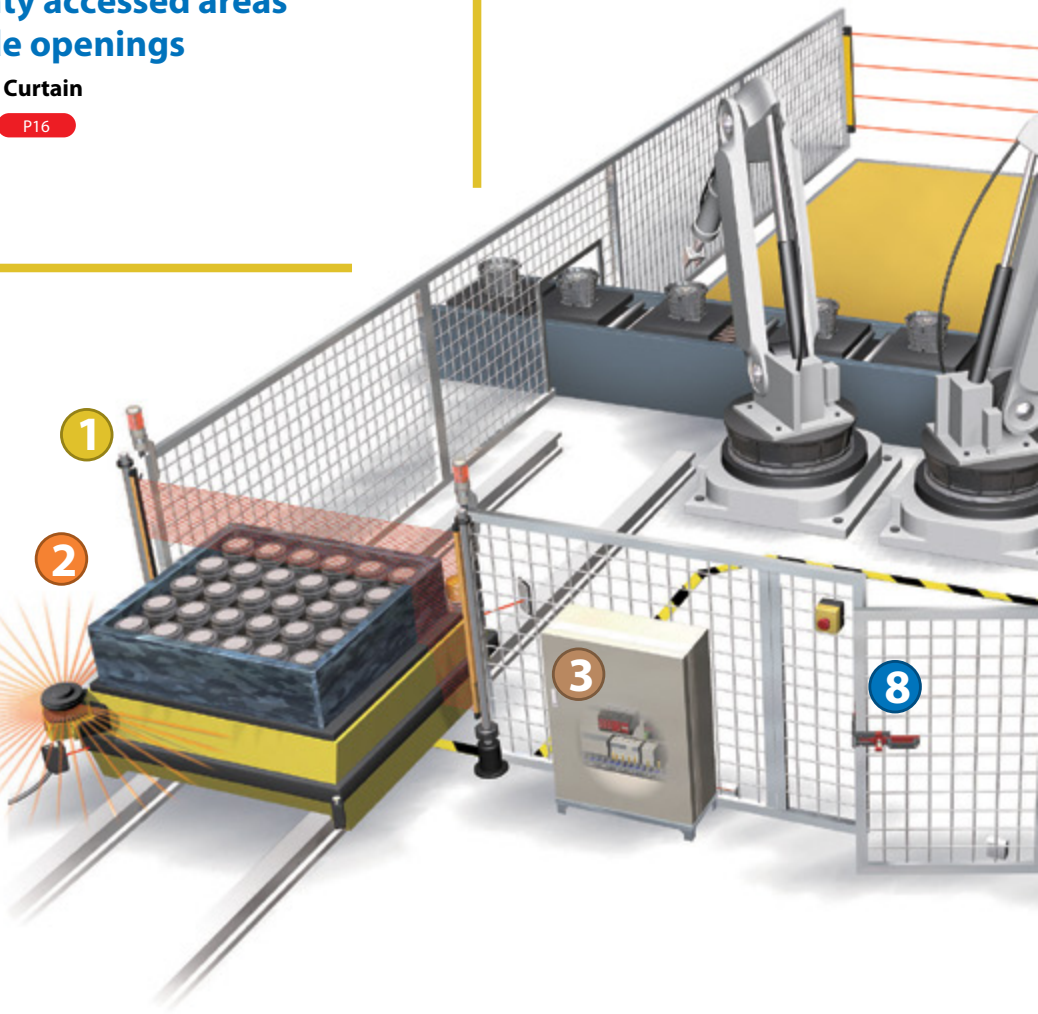


OS32C

SCC

SGE

<sup>1</sup>The G9SP Safety Controller can be used instead of the SCC.



**3**

**Expanding safety I/O through networks**

**NX Series Communication Control Unit NX-CSG** P20

**Safety CPU Unit NX-SL5** P20

**Safety I/O Terminal GI-SMD/SID** P20



**NEW** NX-CSG  
NX-SL5/SI/SO

**NEW** GI-SMD/SID

4

### Perimeter protection around equipment

Safety Multi-Light Beam  
F3SG-PG

P16

Scheduled for release

F3SG-PG

4



5

### Full system emergency stop

Emergency Stop Switch A22NE

P17

· Emergency Stop switch with Integrated Control Box



A22NE-M-P□  
Emergency Stop Switch  
with Integrated Control Box

6

### Worker protection in hazardous areas

Safety Laser Scanner OS32C

P17

Safety Mat/Controller

UMA

P17

/ SCC

P17

· Mat for presence sensing



UMA Safety Mats

OS32C

SCC

7

### Emergency stop during teaching in hazardous areas

Enabling Grip Switch A4EG

P18

Enabling Switch A4E

P18

· Horizontal or vertical mounting



A4E



A4EG

8

### Door open/close detection and locking

Safety-door Hinge Switch D4NH

P14

Guard Lock Safety-door Switch

D4SL-N

P14

/D4NL

P14

/D4JL

P14

· Hinge switch for open/close detection

· Guard lock switch for locking doors



D4NH

D4JL



D4SL-N



D4SL-NSK10-LK□



D4JL-SK40



D4NS-SK30

D4NS/D4JL-mounting Slide Key

D4NS-SK30/D4JL-SK40

P15

D4SL-N-mounting Slide Key D4SL-NSK10-LK

P15

# Safety Application Examples

## Applications by Industry 1. Automotive

**1**

**Worker protection in hazardous areas**  
Laser scanner for presence sensing

**Safety Laser Scanner OS32C** P17



OS32C

**2**

**Emergency stop during teaching in hazardous areas**

**Enabling Grip Switch A4EG** P18



A4EG

**A22E** P18



A22E

**3**

**Presence detection in harsh environments**

**Safety Light Curtain F3SG-SR** P16  
Cutting oil resistant Robust type IP67G

**Safety Mat / Controller UMA** P17 / **SCC** P17



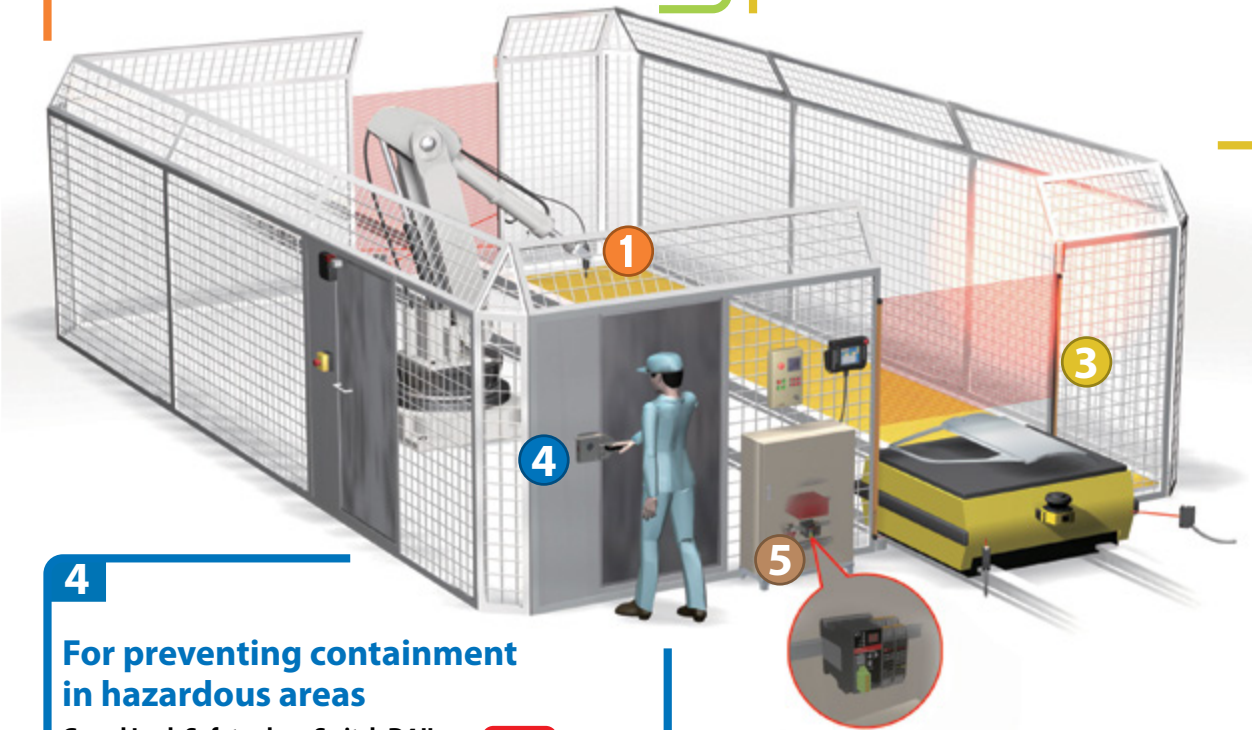
SCC



UMA Safety Mats



F3SG-SR **NEW**



**4**

**For preventing containment in hazardous areas**

**Guard Lock Safety-door Switch D4JL** P14



D4JL

**Rear release button to unlock**  
Unlock from inside to get out of hazardous area



D4JL-SK40

**D4JL-mounting Slide Key D4JL-SK40** P15

**5**

**Programming for safety control**

**NX Series Communication Control Unit NX-CSG** P20

**Safety CPU Unit NX-SL5** P20

**Safety I/O Terminal GI-SMD/SID** P20



**NEW**  
NX-CSG  
NX-SL5/SI/SO



**NEW**  
GI-SMD/SID



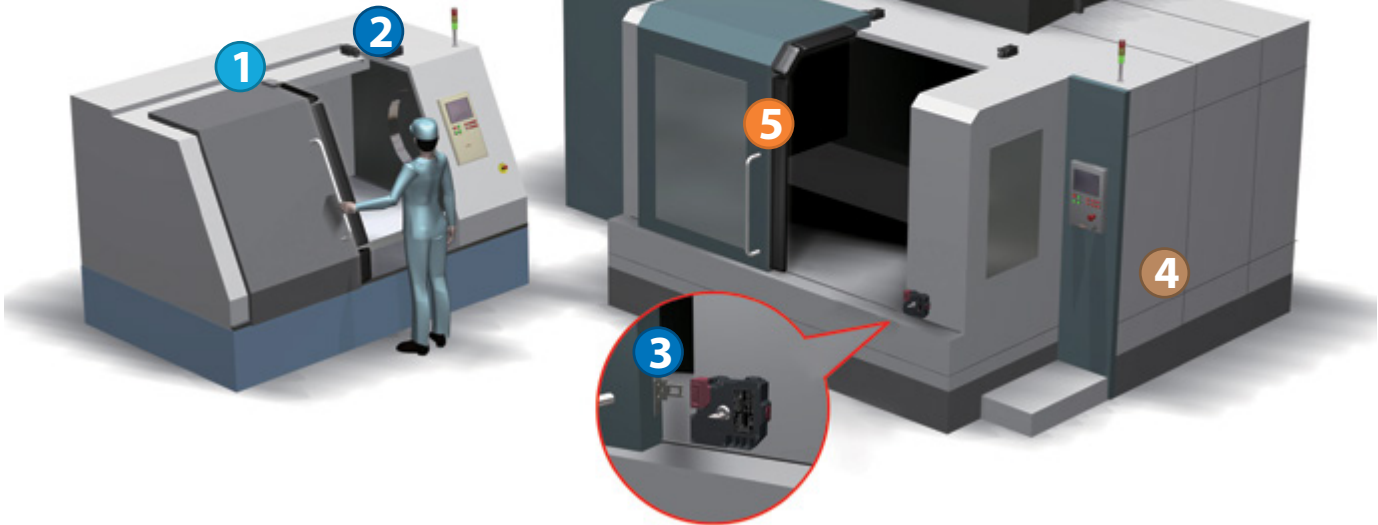
Applications by Industry **2. Machine Tool**

**1** **Door position and open/close detection**  
**Safety Limit Switch D4B-□N** P13  
**Small Safety Limit Switch D4N** P13 / **D4F** P13  
 · Metal or plastic housing

D4B-□N    D4N    D4F

**2** **For preventing access to inertial hazards**  
**Guard Lock Safety-door Switch D4SL-N/D4NL** P14

D4NL    D4SL-N



**3** **For preventing containment inside the equipment**  
**Guard Lock Safety-door Switch D4JL** P14

D4JL

Trapped key to prevent getting trapped

**4** **Standalone operation**  
**Flexible Safety Unit G9SX** P19  
**Safety Controller G9SP** P21  
**Machine Automation Controller NX102** P20  
**Safety CPU Unit NX-SL5** P20  
**Safety I/O Unit NX-SI/SO** P20

G9SX    G9SP    NX102    **NEW**  
 NX-SL5/SI/SO

**5** **For preventing containment inside the equipment**  
**Safety Edge/Edge Controller SGE** P17  
**SCC** P17

SCC    SGE

# Safety Application Examples

## Applications by Industry 3. FPD Manufacturing Equipment

**1**

**Intrusion detection for wide openings**

Safety Light Curtain  
F3SG-SR P16

Safety Light Curtain  
F3SJ-A P16



**NEW**  
F3SG-SR      F3SJ-A

**2**

**Entry and Exit access control**

Guard Lock Safety-door Switch  
D4SL-N P14

D4SL-N-mounting Slide Key  
D4SL-NSK10-LK□ P15



D4SL-N  
D4SL-NSK10-LK□



**3**

**For multiple hazard zones**

Safety Controller G9SP P21

Machine Automation Controller NX102 P20

Safety CPU Unit NX-SL5 P20

Safety I/O Unit NX-SI/SO P20



G9SP      **NEW** NX102/  
NX-SL5/SI/SO

Applications by industry 4. Semiconductor manufacturing equipment

**1**

**For a small opening**

Safety Light Curtain  
**F3SG-SR** P16

Safety Light Curtain  
**F3SJ-A** P16

**NEW**  
**F3SG-SR** **F3SJ-A**



**2**

**For movable guards in a clean room**

Particle free

**Compact Non-contact Door Switch**

**D40A (PLd/Safety Category 3)** P15

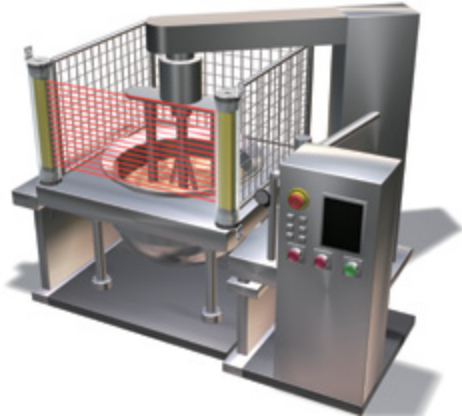
**D40Z (PLe/Safety Category 4)** P15

**D40R (PLe/Safety Category 4)** P15

**D40A** **D40R**

# Safety Application Examples

## Applications by Industry 5. Food Production Equipment



**1**

### For Washdown Environments

**Safety Light Curtain F3SG-SR** P16

Applicable to IP67G for waterproof and oil proofing

- IP69K model

The IP69K model also supports high-pressure cleaning

**Safety Light Curtain F3SJ-A**

- **Water-resistant Case F39-EJ** P16

(For F3SJ-A)

IP67 compliant with environment-resistant case

**F3SJ-A,**  
**F39-EJ** P16



Water resistance  
**IP69K**


**NEW**  
**F3SG-SR**  
• **IP67K model**



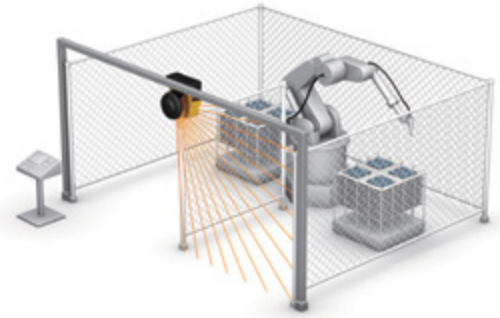
**2**

### For Guarding Large Openings

**Safety Laser Scanner OS32C** P17



**OS32C**



**3**

### Non-contact door detection for doors in wash-down environments

**Compact Non-contact Door Switch**

**D40A (PLd/Safety Category 3)** P15

**D40R/P (PLe /Safety Category 4)** P15



**D40A**







**D40R/P**












# Product Lineup



## ■ Safety limit switches

Model	Appearance	Features
<b>D4N</b> Small Safety Limit Switch		<ul style="list-style-type: none"> <li>Lineup with up to 3 contacts: 1NC/1NO, 2NC, 2NC/1NO, 3NC, 1NC/1NO MBB and 2NC/1NO MBB</li> <li>M12 connector type for quick wiring and easy replacement</li> <li>Standardized gold-clad contacts for high contact reliability</li> <li>For standard loads and micro loads</li> </ul>
<b>D4F</b> Small Safety Limit Switch		<ul style="list-style-type: none"> <li>World's smallest class housing with direct opening mechanism (4 contacts)</li> <li>High sensitivity</li> <li>2 and 4 contact types</li> <li>IP67 protection</li> </ul>
<b>D4B-□N</b> Safety Limit Switch		<ul style="list-style-type: none"> <li>Direct opening mechanism (NC contacts only) opens contacts when faults occur</li> <li>Indicates applicable operating zone</li> <li>Push-button switching to control left and right motion</li> <li>IP67 protection</li> </ul>
<b>D4N-□R</b> Pull-reset Safety Limit Switch		<ul style="list-style-type: none"> <li>Lineup with up to 3 contacts: 1NC/1NO, 2NC, 2NC/1NO and 3NC</li> <li>M12 connector type for quick wiring and easy replacement</li> <li>Standardized gold-clad contacts for high contact reliability</li> <li>For standard loads and micro loads</li> </ul>

# Product Lineup












## ■ Safety door switches

Model	Appearance	Features
<b>D4NS</b> Safety-door Switch		<ul style="list-style-type: none"> <li>Lineup with up to 3 contacts: 1NC/1NO, 2NC, 2NC/1NO and 3NC</li> <li>M12 connector type for quick wiring and easy replacement</li> <li>Standardized gold-clad contacts for high contact reliability</li> <li>For standard loads and micro loads</li> <li>Metal head types available</li> </ul>
<b>D4GS-N</b> Slim Safety Door Switch		<ul style="list-style-type: none"> <li>Slim housing only 17 mm wide (3 contacts)</li> <li>Reversible design allows front or rear mounting</li> <li>Lineup with up to 3 contacts: 1NC/1NO, 2NC, 2NC/1NO and 3NC</li> <li>IP67 protection</li> </ul>
<b>D4BS</b> Safety-door Switch		<ul style="list-style-type: none"> <li>Direct opening mechanism opens switch contact when protective cover is opened</li> <li>Wide temperature range: -40 to 80°C</li> <li>IP67 rated switch box (EN 60947-5-1)</li> </ul>
<b>D4SL-N</b> Guard Lock Safety-door Switch		<ul style="list-style-type: none"> <li>Reduced wiring time with one-touch attachment and removal</li> <li>4, 5 and 6 contact types</li> <li>Key holding force: 1,300 N</li> <li>Turning key insertion point without detaching head</li> <li>Drive solenoid directly from the controller</li> </ul>
<b>D4JL</b> Guard Lock Safety-door Switch		<ul style="list-style-type: none"> <li>Strong key holding force: 3,000 N (plastic housing)</li> <li>2 safety circuits and 2 monitor contacts for various monitoring patterns</li> <li>Trapped key and rear release button prevent workers from getting trapped inside hazardous areas</li> <li>IP67 protection</li> </ul>
<b>D4NL</b> Guard Lock Safety-door Switch		<ul style="list-style-type: none"> <li>Built-in switches with multiple-contact construction are available.</li> <li>Key holding force: 1,300N</li> <li>For standard loads and micro loads</li> <li>Various conduit types, e.g. M20</li> <li>IP67 protection</li> </ul>
<b>D4BL</b> Guard Lock Safety-door Switch		<ul style="list-style-type: none"> <li>Automatic mechanical locking by inserting operation key</li> <li>Release by applying voltage to solenoid</li> <li>Auxiliary release key for emergency unlock</li> <li>IP67 protection</li> </ul>
<b>D40ML</b> RFID Magnetic Locking Safety Switch		<ul style="list-style-type: none"> <li>RFID provides a high degree of tamper resistance.</li> <li>Three case materials - Plastic, diecast metal, 316 stainless steel</li> <li>Clean/Sanitize in Place stainless steel versions are rated IP69K.</li> <li>LEDs support easy fault diagnosis.</li> <li>Install up to 20 switches in series.</li> </ul>
<b>D4NH</b> Safety-door Hinge Switch		<ul style="list-style-type: none"> <li>Lineup with up to 3 contacts: 1NC/1NO, 2NC, 2NC/1NO, 3NC, 1NC/1NO MBB and 2NC/1NO MBB</li> <li>M12 connector type for quick wiring and easy replacement</li> <li>Standardized gold-clad contacts for high contact reliability</li> <li>For standard loads and micro loads</li> </ul>

Model	Appearance	Features
<b>D40A</b> Compact Non-contact Door Switch		<ul style="list-style-type: none"> <li>• Stable operation reduces controller errors caused by unstable doors</li> <li>• Connect up to 30 non-contact door switches with LED to one controller</li> <li>• Reversible switch provides flexibility in installation</li> <li>• Two color LED indicator for easy maintenance</li> <li>• PLd/Safety Category 3</li> </ul>
<b>D40Z</b> Compact Non-contact Door Switch		<ul style="list-style-type: none"> <li>• Conforms to ISO 13849-1 (PLe/Safety Category 4)</li> <li>• Switch's LED indication patterns for easy troubleshooting</li> </ul>
<b>D40P</b> Hall-Effect Coded Magnet Non-Contact Safety Switches		<ul style="list-style-type: none"> <li>• Hall effect coded magnet non-contact switches monitor the status of guarding doors.</li> <li>• Diverse housing material: plastic, stainless steel, hygienic designed stainless steel and special food type stainless steel housing</li> <li>• Conforms to safety categories up to PLe acc. EN ISO13849-1</li> <li>• Operates with all OMRON safety controllers, up to 20 switches in series, up to PLd acc. EN ISO 13849-1</li> </ul>
<b>D40R</b> RFID Non-Contact Safety Switches		<ul style="list-style-type: none"> <li>• Provides a high degree of tamper resistance, options with basic and unique coding makes</li> <li>• Clean/Sanitize in Place, IP69K pre-wired versions with a resin body resist most chemicals and make them suitable for high pressure cleaning and CIP/SIP processes in food and beverage applications.</li> <li>• Operates with all OMRON Safety Controllers, up to 20 switches in series.</li> <li>• Conforms to ISO 13849-1 (PLe / Category 4)</li> </ul>
<b>D4SL-NSK10-LK</b> □ D4SL-N-mounting Slide Key		<ul style="list-style-type: none"> <li>• Lockout key prevents workers from getting trapped inside hazardous areas</li> <li>• Vertical D4SL-N Guard Lock Safety-door Switch can be easily mounted on a 40 x 40 mm aluminum frame</li> <li>• Plastic housing suitable for lightweight doors</li> </ul>
<b>D4NS-SK</b> <b>D4JL-SK</b> D4NS/D4JL-mounting Slide Key		<ul style="list-style-type: none"> <li>• Door switch attachments for doors in various sizes from 20 x 20 mm aluminum frames to large guards around robots</li> <li>• Shortens design time for door switch mounting part</li> </ul>




# Product Lineup

## ■ Safety sensors






Model	Appearance	Features
<b>F3SG-SR</b> Safety Light Curtain	 <b>NEW</b>	<ul style="list-style-type: none"> <li>• 3 color Area Beam Indicators (ABIs) for easy alignment and troubleshooting</li> <li>• IO-Link communication capable</li> <li>• Environmental resistance and rugged structure for use in any environment (IP67, IP67G *1)</li> <li>• One of the Industry's broadest line-up from finger protection to body protection</li> <li>• Flexible height model for easy integration into machines and lines</li> </ul> <p>*1. IEC 60529/JIS C 0920 Annex 1</p>
<b>F3SG-PG</b> Safety Multi-Light Beam	 <b>Scheduled for release</b>	
<b>F3SG-RE</b> Safety Light Curtain (Easy type)		<ul style="list-style-type: none"> <li>• Provides basic on/off safety functions</li> <li>• Simple wiring with only 4 wires</li> <li>• Fast response time of 5 ms</li> </ul>
<b>F3SJ-A</b> Safety Light Curtain (ADVANCED Type)		<ul style="list-style-type: none"> <li>• Omron's most compact size</li> <li>• Series connection up to 4 sets</li> <li>• Multiple resolutions and protective heights available</li> </ul>
<b>F3SG-RA</b> Safety Light Curtain (Advanced type)		<ul style="list-style-type: none"> <li>• All Models designed for global use. PNP/NPN selection by DIP Switch</li> <li>• Rugged and compact models</li> <li>• New Muting function to increase both productivity and safety</li> </ul>
<b>F3SG-RR</b> Safety Light Curtain (Robust type)		<ul style="list-style-type: none"> <li>• Mechanical seal structure prevents cutting oil from intrusion, IP67G rated</li> <li>• Special materials and cables significantly enhance oil resistance</li> <li>• Rugged and compact housing to fit any application</li> </ul>
<b>F3SJ-B</b> Safety Light Curtain (BASIC Type)		<ul style="list-style-type: none"> <li>• Cascade up to three sets for either U-shaped or L-shaped protection area</li> <li>• LED indicators to check the wiring status</li> <li>• Muting function available</li> </ul>
<b>F3SJ-E</b> Safety Light Curtain (EASY Type)		<ul style="list-style-type: none"> <li>• Provides basic on/off safety functions</li> <li>• Simple and affordable hand protection models</li> <li>• Good noise immunity</li> </ul>
<b>F3W-MA</b> Smart Muting Actuator		<ul style="list-style-type: none"> <li>• Integrated sensor system utilizing multiple beam sensor technology</li> <li>• Configure muting systems in combination with safety light curtains</li> <li>• Chattering/void space prevention mode to prevent impact of small object holes</li> </ul>
<b>E3ZS</b> Single-beam Safety Sensor		<ul style="list-style-type: none"> <li>• For hazardous gaps in machines</li> <li>• Used together with G9SP Safety Controller</li> <li>• Sensing distance of 3m</li> </ul>
<b>F3SP-B1P</b> Control Unit for safety sensors		<ul style="list-style-type: none"> <li>• Control unit for F3SG-RA/F3SJ-B/F3SJ-A Safety Light Curtain</li> <li>• Quick connection to light curtains using double-end connector cables</li> <li>• Easy connection to light curtains (Use Double-Ended Cables)</li> </ul> <p>Note: The F3SP-B1P in combination with F3SG-RA/F3SJ-B/F3SJ-A conforms to standards.</p>



■ Presence sensing devices

Model	Appearance	Features
<b>OS32C</b> Safety Laser Scanner		<ul style="list-style-type: none"> <li>• Small size (104.5 mm) and lightweight (1.3 kg)</li> <li>• Safety zone up to 4 m, warning zone up to 15 m, and detection angle up to 270°</li> <li>• Monitor operating status and data measurement over EtherNet/IP/TM</li> <li>• Low-power consumption (5 W) extends operation time of battery powered systems like AGVs</li> </ul>
<b>UMA/SCC</b> Safety Mat/ Controller		<ul style="list-style-type: none"> <li>• 1 and 2 cable types</li> <li>• Meets EN ISO 13849-1 (PLd/Safety Category 3) and EN ISO 13856-1</li> <li>• Can be used with MC3 Safety Mat Controller or NX Safety Controller</li> <li>• Complies with North American safety standards including ANSI/RIA 15.06</li> <li>• A wide variety of mat sizes and trims</li> </ul>
<b>SGE/SCC</b> Safety Edge/ Edge Controller		<ul style="list-style-type: none"> <li>• SGE Safety Edge in combination with SCC Edge Controller meets Safety Category 3 when built-in relays directly block hazards</li> <li>• Simple one-unit structure integrating sensor and cover</li> <li>• Side force resistant</li> <li>• Various sensor lengths (150 to 6,100 mm) and heights (34 to 80 mm)</li> <li>• Compliant with EN1760-2 (Safety edge standard)</li> </ul>

■ Emergency stop switches





Model	Appearance	Features
<b>A165E</b> Emergency Stop Switch (16-dia.)		<ul style="list-style-type: none"> <li>• Direct opening mechanism opens contacts in emergencies</li> <li>• Safety lock mechanism prevents misuse</li> <li>• Modular construction; easy installation using snap-in switch</li> <li>• 3 contacts built into a single block (A165E-U)</li> </ul>
<b>A22NE-PD</b> Emergency Stop Pushbutton Switch (22-dia. or 25-dia.)		<p><b>Push-in Plus Terminal Block Model with Lock-lever-linked Contact Function</b></p> <ul style="list-style-type: none"> <li>• Lock-lever-linked Contact function detects improper installation of switch unit</li> <li>• Compact design and changed wiring direction reduce control panel size</li> <li>• Push-in plus terminals provide vibration resistant connections, reducing maintenance work</li> <li>• Lineup with up to 4 contacts</li> <li>• IP65 oil-resistant (non-lighted)/IP65 (lighted)/IP69K for high-temperature, high-pressure washdown (pull-reset)</li> </ul>
<b>A22NE-P</b> Emergency Stop Pushbutton Switch (22-dia. or 25-dia.)		<p><b>Push-in Plus Terminal Block Model</b></p> <ul style="list-style-type: none"> <li>• Compact design and changed wiring direction reduce control panel size</li> <li>• Push-in plus terminals provide vibration resistant connections, reducing maintenance work</li> <li>• Lock lever for easy mounting</li> <li>• Lineup with up to 6 contacts</li> <li>• P65 oil-resistant (non-lighted)/IP65 (lighted)/IP69K for high-temperature, high-pressure washdown (pull-reset)</li> </ul>
<b>A22E</b> Emergency Stop Pushbutton Switch (22-dia. or 25-dia.)		<p><b>Screw Terminal Block Model</b></p> <ul style="list-style-type: none"> <li>• Increased wiring efficiency with 3-row mounting of switch blocks (Non-lighted model: 3 switch blocks can be mounted for multiple contacts)</li> <li>• Round or forked crimp terminals can be used for installation</li> <li>• IP65 oil-resistant (non-lighted)/IP65 (lighted)</li> <li>• Bundled lock plate fixes lever to prevent operation unit and switch blocks from separating</li> </ul>
<b>ER6022</b> Rope Pull Emergency Stop Switch		<ul style="list-style-type: none"> <li>• Rope spans up to 80 m (262 ft.) means fewer number of switches required per application with tension indicator and reset button</li> <li>• Tension indicator makes system setup and rope tension maintenance easy</li> <li>• Contact arrangements of 2 N/C + 1 N/O, 3 N/C + 1 N/O or 2 N/C + 2 N/O</li> <li>• IP67 (NEMA 6) enclosure enables the ER6022 switch to withstand water washdown cleaning</li> </ul>

# Product Lineup






## ■ Enabling devices

Model	Appearance	Features
<b>A4EG</b> Enabling Grip Switch		<ul style="list-style-type: none"> <li>• 3-position switch with clicking feel</li> <li>• Configure safety circuits easily by combining with G9SX-GS Safety Guard Switching Unit</li> <li>• Models with emergency stop switch or momentary operation switch available</li> <li>• Optional holding key (sold separately) to change modes</li> </ul>
<b>A4E</b> Enabling Switch		<ul style="list-style-type: none"> <li>• 3-position switch with clicking feel</li> <li>• Complies with American national standard ANSI/RIA R15.06-1999</li> <li>• Can be mounted in two directions</li> </ul>
<b>A22LK</b> Guard Lock Safety Key Selector Switch		<ul style="list-style-type: none"> <li>• Secure equipment activation during maintenance</li> <li>• Guard lock of operation unit prevents misuse</li> <li>• The key has the same shape as the following key                             <ul style="list-style-type: none"> <li>- Key of A22TK Safety Key Selector Switch</li> <li>- Trapped key of D4JL Guard Lock Safety-door Switch</li> <li>- Lockout key of D4SL-NSK10-LK Slide Key</li> </ul> </li> </ul>
<b>A22TK</b> Safety Key Selector Switch		<ul style="list-style-type: none"> <li>• Secure equipment activation during maintenance</li> <li>• 30 key types prevent locking devices from being easily disabled</li> <li>• Key has the same shape as trapped key of D4JL Guard Lock Safety-door Switch and lockout key of D4SL-NSK10-LK Slide Key. These units can be combined to improve safety (Specify the same key type)</li> <li>• Common to switch blocks of A22E Emergency Stop Switch (Non-lighted model only)</li> </ul>

■ Safety relay units

Model	Appearance	Features
<b>G9SA</b> Safety Relay Unit		<ul style="list-style-type: none"> <li>• Compact design</li> <li>• Two-hand controller available</li> <li>• Simple expansion connection</li> <li>• Fast response time: 10 ms</li> <li>• Operating status indicators</li> <li>• Finger protection construction</li> <li>• Modules with 3 or 5 safety contacts and OFF-delay timing</li> </ul>
<b>G9SB</b> Safety Relay Unit		<ul style="list-style-type: none"> <li>• 17.5 mm- and 22.5 mm-wide housing</li> <li>• Connectable with safety area sensors</li> <li>• Fast response time: 10 ms</li> <li>• Operating status indicators</li> <li>• Finger protection construction</li> </ul>
<b>G9SE</b> Safety Relay Unit		<ul style="list-style-type: none"> <li>• 17.5 or 22.5 mm width to save mounting space</li> <li>• Simple wiring using Push-In Plus terminal block</li> <li>• Easy maintenance with status indicators</li> <li>• One unit for various safety devices, from contact input to PNP input</li> </ul>
<b>SCC1224-A</b> Safety Mat / Edge Controller		<ul style="list-style-type: none"> <li>• Monitored manual or automatic reset modes</li> <li>• Two safety outputs, 1 auxiliary output for signaling and delayed Auxiliary Output</li> <li>• External Device Monitoring - EDM is standard</li> </ul>




■ Flexible safety units G9SX Series

Model	Appearance	Features
<b>G9SX</b> Flexible Safety Unit		<ul style="list-style-type: none"> <li>• Logical "AND" function to implement partial/global stopping of a machine</li> <li>• Solid-state outputs (excluding expansion units)</li> <li>• Clear LED diagnosis of all inputs and outputs</li> </ul>
<b>G9SX-NS</b> Non-Contact Door Switch Controller		<ul style="list-style-type: none"> <li>• Connect up to 30 D40A/D40Z Compact Non-Contact Door Switches to one controller</li> <li>• Logical "AND" function to implement partial or global stopping of a machine</li> <li>• No programming required</li> <li>• Both non-contact door switches and conventional key-type safety-door switches can be input to G9SX-NSA</li> </ul>
<b>G9SX-GS</b> Safety Guard Switching Unit		<ul style="list-style-type: none"> <li>• Two operation modes to support auto switching and manual switching</li> <li>• External indicator outputs to indicate switching status of two safety input devices</li> <li>• Auxiliary outputs for monitoring of safety inputs, safety outputs, and errors</li> <li>• Clear LED diagnosis of all inputs and outputs</li> <li>• Clear and transparent segmentation of safety functions by use of unique logical "AND" connection</li> </ul>
<b>G9SX-SM</b> Standstill Monitoring Unit		<ul style="list-style-type: none"> <li>• Based on Back EMF operation</li> <li>• Ready to use - covering all standard applications without additional setup</li> <li>• User Configuration for fine-tuning of sensitivity</li> <li>• Clear LED diagnosis of all inputs and outputs</li> <li>• Up to Cat. 4 according to EN 954-1, PLd according to EN ISO 13849-1, and SIL 3 according to IEC/EN 62061</li> </ul>
<b>G9SX-LM</b> Low-speed Monitoring Unit		<ul style="list-style-type: none"> <li>• Motor rotation speed detected by proximity sensor</li> <li>• Monitors and confirms that speed does not exceed the preset level</li> <li>• Enabling switch input for maintenance</li> <li>• Clear LED diagnosis of all inputs and outputs</li> <li>• Up to Cat. 3 according to EN 954-1, PLd according to EN ISO 13849-1, and SIL 3 according to IEC/EN 62061</li> </ul>

# Product Lineup





## ■ Safety Network Controller NX Series EtherNet/IP (CIP-Safety)

Model	Appearance	Features
<b>NX-CSG320/ SL5/SI/SO</b> Communication Control Unit/ Safety CPU Unit/ Safety Input Unit/ Safety Output Unit	 <i>NEW</i>	<ul style="list-style-type: none"> <li>• CIP Safety on EtherNet/IP Is Supported</li> <li>• Feature EtherNet/IP Communications Port</li> <li>• The Standard Unit of NX-series Available</li> <li>• Excellent Connectability with OMRON Safety I/O Devices</li> <li>• Support for the IEC 61131-3 Programming Environment</li> <li>• Program Languages Based on the IEC 61131-3 International Standard</li> <li>• Programming with Variables</li> <li>• Complete Advanced Validation</li> <li>• Checking Safety Programs and Safety Parameters</li> <li>• Debugging</li> </ul>
<b>GI-SMD/SID</b> Safety I/O Terminal GI-S Series	 <i>NEW</i>	<ul style="list-style-type: none"> <li>• Support for CIP Safety on EtherNet/IP</li> <li>• Standard-feature EtherNet/IP port</li> <li>• Easy programming with Sysmac Studio</li> </ul>
<b>SYSMAC-SE/FE</b> Automation Software Sysmac Studio		<ul style="list-style-type: none"> <li>• One software for motion, logic, safety, drives , vision and HMI</li> <li>• Fully compliant with open standard IEC 61131-3 and Japanese standard JIS B3503</li> <li>• Supports Ladder, Structured Text and Function Block programming with a rich instruction set</li> <li>• CAM editor for easy programming of complex motion profiles</li> <li>• One simulation tool for sequence and motion in a 3D environment</li> <li>• Advanced security function with 32 digit security password</li> </ul>

## ■ Integrated Safety Controller




### NX Series EtherCAT (FSoE) + EtherNet/IP (CIP-Safety)





Model	Appearance	Features
<b>NX102-□□□□</b> NX1 CPU Unit <b>NX-SL5</b> Safety CPU Unit SL5 <b>NX-SI/SO</b> Safety CPU Unit/ Safety Input Unit/ Safety Output Unit	 <i>NEW</i>	<ul style="list-style-type: none"> <li>• Fast and accurate control by synchronizing all machine devices with the PLC and Motion Engines</li> <li>• Three built-in industrial Ethernet ports</li> <li>• OPC UA server functionality</li> <li>• Up to 12 axes of control via EtherCAT</li> <li>• Up to 32 local NX I/O Units</li> <li>• DC power supply without battery backup</li> <li>• Fully conforms to IEC 61131-3 standard programming</li> <li>• PLCopen Function Blocks for Motion Control allow users to create complex programs quickly and easily</li> <li>• Direct connection to a database, with no special unit, software, or middleware required (NX102-□□20)</li> </ul>
<b>SYSMAC-SE</b> Automation Software Sysmac Studio		<ul style="list-style-type: none"> <li>• One software for motion, logic, safety, drives , vision and HMI</li> <li>• Fully compliant with open standard IEC 61131-3 and Japanese standard JIS B3503</li> <li>• Supports Ladder, Structured Text and Function Block programming with a rich instruction set</li> <li>• CAM editor for easy programming of complex motion profiles</li> <li>• One simulation tool for sequence and motion in a 3D environment</li> <li>• Advanced security function with 32 digit security password</li> </ul>





■ Safety Controller NX Series EtherCAT (FSoE)

Model	Appearance	Features
<p><b>NX102/SL3/SI/SO</b> NX1 CPU Unit, Safety Control Units</p>		<ul style="list-style-type: none"> <li>• Support for the IEC 61131-3 Programming Environment</li> <li>• Program Languages Based on the IEC 61131-3 International Standard</li> <li>• Programming with Variables</li> <li>• Complete Advanced Validation</li> <li>• Checking Safety Programs and Safety Parameters</li> <li>• Debugging</li> </ul>
<p><b>NX701/102-, NJ501/301/101 -CPU</b> NX/NJ Series CPU Unit <b>NX-ECC/SL3/SI/ SO</b> EtherCAT Coupler Unit, Safety Control Units</p>		<ul style="list-style-type: none"> <li>• Integrated safety into machine automation possible by connecting with the NX-series EtherCAT Coupler.</li> <li>• The Safety CPU Unit controls up to 128 Safety I/O Units.</li> <li>• 4 or 8 points per Safety Input Unit. The 4-point Safety Input Unit can be directly connected with OMRON Non-contact Switches and Singlebeam Sensors.</li> <li>• 2 or 4 points per Safety Output Unit. The 2-point Safety Output Unit is characterized by large output breaking current of 2.0 A.</li> <li>• The Safety Units can be freely allocated in any combination with standard NX I/O.</li> <li>• Compliant with IEC61131-3</li> <li>• Safety programs can be standardized and reused efficiently by using POU's for design and operation.</li> </ul>
<p><b>SYSMAC-SE</b> Automation Software Sysmac Studio</p>		<ul style="list-style-type: none"> <li>• One software for motion, logic, safety, drives, vision and HMI</li> <li>• Fully compliant with open standard IEC 61131-3 and Japanese standard JIS B3503</li> <li>• Supports Ladder, Structured Text and Function Block programming with a rich instruction set</li> <li>• CAM editor for easy programming of complex motion profiles</li> <li>• One simulation tool for sequence and motion in a 3D environment</li> <li>• Advanced security function with 32 digit security password</li> </ul>

■ Safety Controller NX Series Stand-alone System





Model	Appearance	Features
<p><b>NX-EIC202/SL3/ SI/SO</b> EtherNet/IP Coupler Unit, Safety Control Units</p>		<ul style="list-style-type: none"> <li>• Up to 63 NX-I/O Units can be connected to one EtherNet/IP Coupler Unit. Standard and high-performance units can be mixed1. *</li> <li>• Each Coupler plus its I/O form just a single EtherCAT node on the network.</li> <li>• I/O control and safety control can be integrated by connecting Units for safety.</li> <li>• The IP address can be found on the label on the Unit, without using software.</li> <li>• Slave configuration by Sysmac Studio can be done centrally via the controller, or on-the-spot using the Coupler's built-in USB port.</li> </ul> <p>* Input per Coupler Unit: Maximum 504 bytes, Output per Coupler Unit: Maximum 504 bytes</p>
<p><b>SYSMAC-SE/NE/ FE</b> Automation Software Sysmac Studio</p>		<ul style="list-style-type: none"> <li>• One software for motion, logic, safety, drives, vision and HMI</li> <li>• Fully compliant with open standard IEC 61131-3 and Japanese standard JIS B3503</li> <li>• Supports Ladder, Structured Text and Function Block programming with a rich instruction set</li> <li>• CAM editor for easy programming of complex motion profiles</li> <li>• One simulation tool for sequence and motion in a 3D environment</li> <li>• Advanced security function with 32 digit security password</li> </ul>

■ Safety Controller G9SP Series

Model	Appearance	Features
<p><b>G9SP</b> Safety Controller</p>		<ul style="list-style-type: none"> <li>• Easy programming for complex safety control</li> <li>• Unique programming software to support easy design and verification</li> <li>• Memory cassette for easy duplication of configuration</li> </ul>
<p><b>WS02- G9SP□□-V□</b> G9SP Configurator</p>		<p>G9SP configuration tool</p> <ul style="list-style-type: none"> <li>• Easy setup and configuration</li> <li>• Simulation for easy verification</li> <li>• User-defined Function Blocks greatly reduce design time</li> </ul>


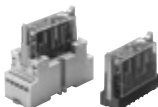

# Product Lineup

## ■ Safety Network Controller DeviceNet Safety NE1A/NE0A Series

Model	Appearance	Features
<b>NE1A-SCPU(-EIP) Series</b> Safety Network Controller		<p><b>Achieve Safety Control through Programming.</b>  <b>NE1A-SCPU</b></p> <ul style="list-style-type: none"> <li>• Compact Safety Controller.</li> <li>• Reduced wiring with safety networks. Connect up to 32 Safety Terminals.</li> <li>• Monitor the safety system from Standard Controllers across the network.</li> <li>• ISO13849-1 (PLe) and IEC 61508 SIL3 certification.</li> </ul> <p><b>NE1A-SCPU-EIP</b></p> <ul style="list-style-type: none"> <li>• Monitors safety systems via EtherNet/IP.</li> <li>• Equipped with master functions of CIP Safety on DeviceNet.</li> <li>• Does not require external devices for connecting Safety Network Controller and EtherNet/IP.</li> </ul>
<b>NE0A-SCPU Series</b> Safety Network Controller		<p>Ideal for safety applications with up to 12 inputs</p> <ul style="list-style-type: none"> <li>• Safety category compliant circuits can be built easily</li> <li>• Reusable user-defined safety circuit templates for easy standardization</li> <li>• TÜV-certified templates available</li> <li>• NE0A operating status can be monitored by standard DeviceNet master</li> <li>• Network distribution in combination with NE1A Safety Controller</li> </ul>
<b>DST1 Series</b> Safety I/O Terminal		<ul style="list-style-type: none"> <li>• Terminals for distributed safety components reduce wiring</li> <li>• Up to 12 inputs for safety signals</li> <li>• Up to 8 safety outputs (solid state or relay)</li> <li>• Safety system can be monitored by standard controller via networks</li> <li>• Up to Cat. 4 according to EN 954-1/ISO 13849-1 and SIL 3 according to IEC 61508</li> <li>• DST1-XD0808SL-1 with built-in logic functions for high-speed processing in applications requiring partial stopping of safety systems</li> </ul>
<b>NE1A-EDR01</b> EtherNet/IP-DeviceNet Router		<p>Allows safety system to be monitored via Ethernet</p> <ul style="list-style-type: none"> <li>• Remote operation of safety system from PC</li> <li>• Monitors safety system by other vendor's PLC via Ethernet</li> <li>• UDP packet messages supported</li> </ul>

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■ Safety Relays

Model	Appearance	Features
<b>G7SA</b> Relay with Forcibly Guided Contacts		<ul style="list-style-type: none"> <li>Relays with forcibly guided contacts (EN 50205 Class A, certified by VDE)</li> <li>Compact and slim design</li> <li>4- and 6-pole relays available</li> <li>Terminals are arranged for easy PCB layout</li> <li>Reinforced insulation between inputs, outputs and poles</li> </ul>
<b>G7S-□-E</b> Relay with Forcibly Guided Contacts		<ul style="list-style-type: none"> <li>NO contacts: 10 A at 250 VAC and 10 A at 30 VDC, NC contacts: 6 A at 250 VAC and 6 A at 30 VDC (for resistive loads)</li> <li>Relays with forcibly guided contacts (EN 50205 Class A, certified by VDE)</li> <li>Supports CE marking of machinery (Machinery Directive)</li> <li>Track-mounting and back-mounting sockets available</li> </ul>
<b>G7Z</b> Power Relay		<ul style="list-style-type: none"> <li>Switching current 160 A (40 A rating/4-pole/IEC-AC1)</li> <li>Relay in combination with auxiliary contact block meets EN 60947-4-1</li> <li>Safety function with mirror contacts in various configurations</li> <li>Reduced openings to protect against dust and foreign matters</li> <li>Compact, cost efficient solution for applications such as inverters, UPS, solar and fuel-cell battery circuits</li> </ul>

■ Safety Drives

Model	Appearance	Features
<b>R88M-1A□/ R88D-1SAN□-ECT</b> AC Servo System with Safety Functionality	 <p style="text-align: center; color: red; font-weight: bold;">Available soon</p>	<ul style="list-style-type: none"> <li>Advanced safety functions: STO/SS1/SS2/SOS/SLS/SLP/SDI/SBC</li> <li>Servo drive for rotary motors</li> <li>Up to 3 kW</li> <li>Battery-free absolute encoder</li> <li>Power, encoder and brake in one pre-assembled cable</li> </ul>
<b>R88M-1□/ R88D-1SN□-ECT</b> AC Servo System	 <p style="text-align: center; color: red; font-weight: bold;">NEW</p>	<ul style="list-style-type: none"> <li>Safety function: STO</li> <li>Servo drive for rotary motors</li> <li>Up to 15 kW</li> <li>Battery-free absolute encoder</li> </ul>
<b>3G3MX2-V1</b> Multi-function Compact Inverter		<ul style="list-style-type: none"> <li>Safety function: STO</li> <li>PM motor control helps save energy</li> <li>Positioning functionality</li> <li>Up to 15 kW</li> <li>Drive Programming</li> </ul>
<b>3G3RX2</b> High-function General-purpose Inverter	 <p style="text-align: center; color: red; font-weight: bold;">NEW</p>	<ul style="list-style-type: none"> <li>Safety function: STO</li> <li>PM motor control helps save energy</li> <li>Triple rating: Normal Duty (ND), Low Duty (LD), and Very Low Duty (VLD)</li> <li>Up to 132 kW</li> <li>Drive Programming</li> </ul>

# Safety products brochures

Click on the brochure cover for a link to the brochure, or search the catalog number on [automation.omron.com](http://automation.omron.com)



## Safety Network Controller

NX Series

Cat. No. S641



## Safety Light Curtain

F3SG-SR/PG Series

Cat. No. F1051



## Safety Scanner

OS32C Series

Cat. No. OS32C



## RFID Safety Switches

D40ML Series

Cat. No. C4241



## Safety Relay

G9SE Series

Cat. No. J771



## Safety Relay Unit

G9SA Series

Cat. No. J481



## Safety Relay

G9SX Series

Cat. No. J671



## Safety Relay

SCC-1224A

Cat. No. F541



## Safety Mats

UMA Series

Cat. No. F3231



## Door Switches

D40R/P Series

Cat. No. C4281



## Emergency stop

A22E/A22NE Series

Cat. No. A2631



## Rope Switch

ER6022

Cat. No. C571

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