

Industrial Automation Guide 2016



Industrial Products & Systems

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Targeted Technologies

Creating maximum output with minimum input

By identifying the many ways of innovation in specific industries we developed the 'targeted technologies' concept. It's a way of thinking about technology in a prioritized format. Prioritized according to our customers' most pressing needs. The result? A set of solutions that make immediate impact on the core of our customers' businesses. A set of solutions that hit the target every time. Take a look at the examples on our website.

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Welcome to our world

Our best-in-class devices for your automation system

Welcome to Omron's world of advanced industrial automation. The INDUSTRIAL AUTOMATION GUIDE is your essential tool to select best-in-class devices for your automation system. It highlights our core competences in sensing, control, visualisation, motion and panel components.

Of course, Omron offers a much larger range of products than you can find on the attached DVD. For more information on services and company competence visit our website.

Here you will find:

- Latest product news
- Technical product specifications
- 2D / 3D CAD Library
- Customer references
- Technology concepts
- Supporting product documentation
- Knowledge Base - "myOmron"
- Events Calendar
- Contact information

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Industrial Automation Guide 2016

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“To the machine the work of the machine,
to man the thrill of further creation.”

Kazuma Tateisi, founder of Omron

Omron at a glance

200.000 products ranging
input, logic and output

Sensing, Control Systems, Visualization, Drives, Robots, Safety,
Quality Control & Inspection, Control and Switching Components

7%

Investment in Research & Development

Innovation track
record of 80 years

Top 150 global patent assignee

1.200 employees dedicated to R&D

11.000 + issued and pending patents

37.000

Employees worldwide

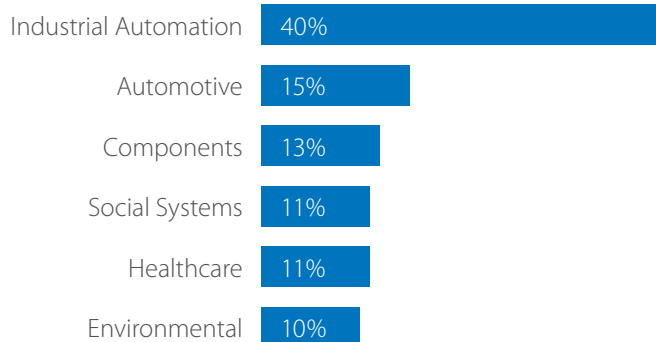
210

Locations worldwide

22

Countries in EMEA

Working for the
benefit of society



Close to your needs

Technical training & seminars, technical support, Automation Technology Centers, online community (MyOmron), online catalogues and technical documentation, customer service & sales support, inter-operability labs (Tsunagi), safety services, repairs.

Your needs, our focus

Solutions perfectly matching your needs

We asked ourselves: 'What do you need in sensors and components?' Well, first you need reliability. Then a variety and choice of performance levels. You may also want advanced functionality, with special features defined by you – or you may want standardized solutions, with highly competitive prices.

Whatever it is, it can all add up to a wish list that is difficult to fulfil. Until now. That's because our new 361° Approach not only provides a complete all-round offer without gaps, it also puts you at the very centre of the product selection process. It's an approach that leads to a Perfect Match – one with the extra degree of confidence that comes from choosing Omron.

361° in one view



Quality



Line-up



Application



Customization



Global availability



Specs

	Quality	Line-up	Application	Customization	Global availability	Specs
PRO^{plus}	Premium	Tailored	Special	Yes	Yes	Application oriented
PRO	Premium	Complete	Advanced	Yes	Yes	Above Standard
LITE	Premium	Standard	Basic	No	No	Basic
	'Quality' refers to the standard of manufacturing and the materials used – this translates into reliability	'Line-up' refers to the number of model types	'Application' indicates the complexity of the automation	'Customization' is the possibility to modify the product		'Specs' refers to the choice of performance levels

The extra degree of advantage

Three distinct lines of sensors and components

Three distinct lines

361° Approach offers three distinct lines within each sensor or component product category. LITE products are cost-effective without any compromise in quality. PRO products represent the “install & forget” option, offering longer lifetime, higher protection, and more features. While PROplus products are designed for specific applications or customer demands.

Optimized reliability

All three lines are backed by the Omron commitment to quality, so even when you need a price-competitive advantage, you can be confident that they will never let you down.

Solutions that perfectly match your needs

The 361° Approach ensures that you can quickly and easily identify the perfect match solution to your needs – nothing more, nothing less.

Optimized costs

Your sensor and component costs are also minimized – because it eliminates over-specification.

Why an extra 1°?

The extra degree is what you get when you do business with Omron, and that means different things to different customers – all depending on their needs. For example, if you need specification advice, the extra degree is ‘service’. But ultimately, to everyone it means “an extra degree of confidence in the perfect match”.



Sysmac: A fully integrated platform

Integration and Functionality

Sysmac is an integrated automation platform dedicated to providing complete control and management of your automation plant. At the core of this platform, the Machine Controller series offers synchronous control of all machine devices and advanced functionality such as motion, robotics and database connectivity. This multidisciplinary concept allows you to simplify solution architecture, reduce programming and optimize productivity.



Machine Automation Controller

FACTORY
AUTOMATION

MACHINE
CONTROL



Motion



Filling line

- Motion Control: Integrated within the IDE, and operating in real-time
- Standard PLCopen Function Blocks plus Omron generated motion FB's
- Direct Synchronous control for Position, Speed and Torque



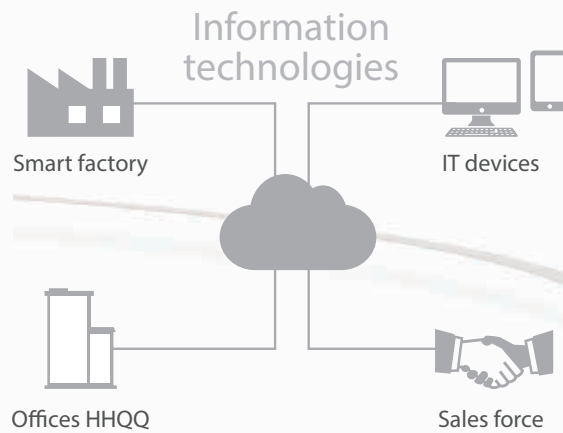
Safety



Assembly

- All safety related data is synchronized with the whole network
- Safety functions such as muting, guard locking, EDM and valve monitoring are simple to manage

- ✓ **One Integrated Development Environment software** for Configuration, Programming, Simulation and Monitoring



Information



Pills blister packing

- Sysmac communicates in real-time with Databases such as SQL
- Secure Data: In the event of a server going down or losing communications, data is automatically stored in internal memory
- Sysmac operates with Databases at high speed [1000 table element/ 100 ms] ensuring realistic Big Data Processing to improve productivity and aid predictive maintenance etc.

✓ Integrated Automation Control:

The Sysmac platform is scalable and provides the performance and functionality for a wide range of solutions from simple machines through to manufacturing cells

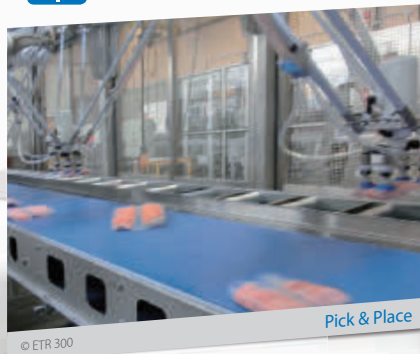
Vision



Quality inspection

- Higher resolution images available without increasing the vision processing time
- Shape search technology: Provides more stable and accurate object detection for Pick & Place projects

Robotics



Pick & Place

© ETR 300

- Up to 8 Delta robots with one controller
- Time-based Robotic Function Blocks make programming easier

Sensing



Presence detection of the rubber seal

- Full control of the process parameter setting and predictive maintenance functions
- High precision detection and positioning data synchronized on the network

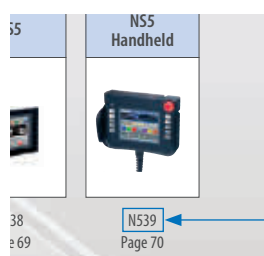
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	96 Motion controllers	112 Servo systems	170 Robots	202 Frequency inverters
Sensing				
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	370 Inspection & Ident systems	426 Measurement sensors		
Safety				
	462 Emergency stop and control devices	472 Safety limit switches	480 Safety door switches	506 Safety sensors
				
	574 Temperature controllers	596 Power supplies	614 Uninterruptible power supplies (UPS)	622 Timers
Switching components				
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Software				

Safety

Find information fast!

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Quick Link

Safety

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Selection table	464	Safety guard switching unit	
Standard pushbutton switches		G9SX-GS/A4EG	554
A16	753	Limited speed monitoring unit	
A22N	755	G9SX-LM	556
Emergency stop pushbutton switches		Standstill monitoring unit	
A16SE	467	G9SX-SM	558
A22E	468	Programmable safety controllers	
Rope pull emergency stop switches		G9SP-N_	559
ER-series rope pulls	469	NX-Safety stand alone modular I/O system	562
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Safety limit switch with metal housing		Compact non-contact door switch/flexible safety unit	
D4B	475	G9SX-NS	544
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D4N	477	Selection table	569
Safety door hinge switch		Free potential outputs	
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Safety limit switch with manual reset		G7S_-E	571
D4N-_R	473	Motion	
Safety door switches	480	MX2	212
Selection table	482	Accurax G5	117
Non-contact switches			
F3S-TGR-N_C	484		
F3S-TGR-N_R	487		
F3S-TGR-N_M/-N_U	490		
F3S-TGR-S_A/-S_D	492		
F3S-TGR-N_X	495		
Safety door switches			
D4NS	497		
D4BS	498		
F3S-TGR-KM15/-KM16/-KH16	499		
Guard-lock safety door switch			
D4NL	501		
D4SL-N	502		
F3S-TGR-KHL1	504		
F3S-TGR-KHL3	505		
Compact non-contact door switch/flexible safety unit			
D40A/G9SX-NS	480		
Safety sensors	506		
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Safety light curtain			
Slim housing			
F3SJ-E	510		
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Safety logic control systems

BREAK THROUGH BARRIERS IN SAFETY DESIGN

Configurable, scalable and simple

Omron safety controllers, offer a wide solution portfolio from safety relay units to a distributed and integrated safety logic control systems. It allows to solve any safety needs from a simple machines through to manufacturing cells.

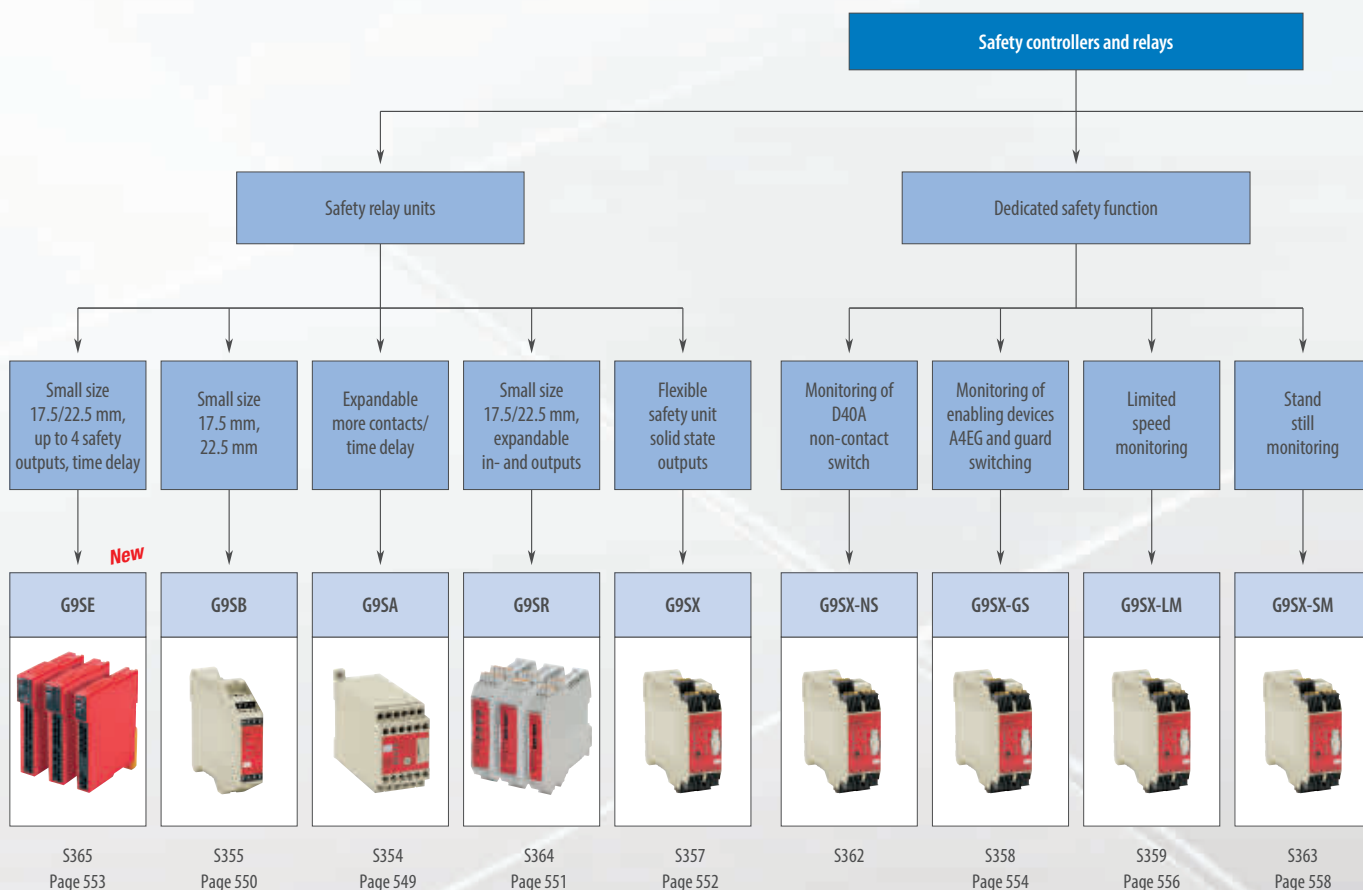
Safety relay units covers the most exigent safety wired needs. The compact safety controller is simple to configure and setup and overcomes limitations of hard-wired solutions by adding flexibility of a software - based solution. The expandable and programmable modular safety controller series provides a complex logic solution for stand alone designs. The distributed safety, allows to manage all safety complexity and integrated architecture types reducing your engineering time.

Omron provides from dedicated safety network such as DeviceNet Safety to Integrated and distributed safety like Fail Safe over EtherCAT.

- EN ISO 13849-1 (PLe) and IEC 61508 (SIL3) certification for future-proof design of the safety system
- Predefined and validated function blocks for simple configuration
- Scalable safety solution for compact, distributed and fully integrated safety systems



Safety relay unit





Distributed and integrated Programmable safety controller

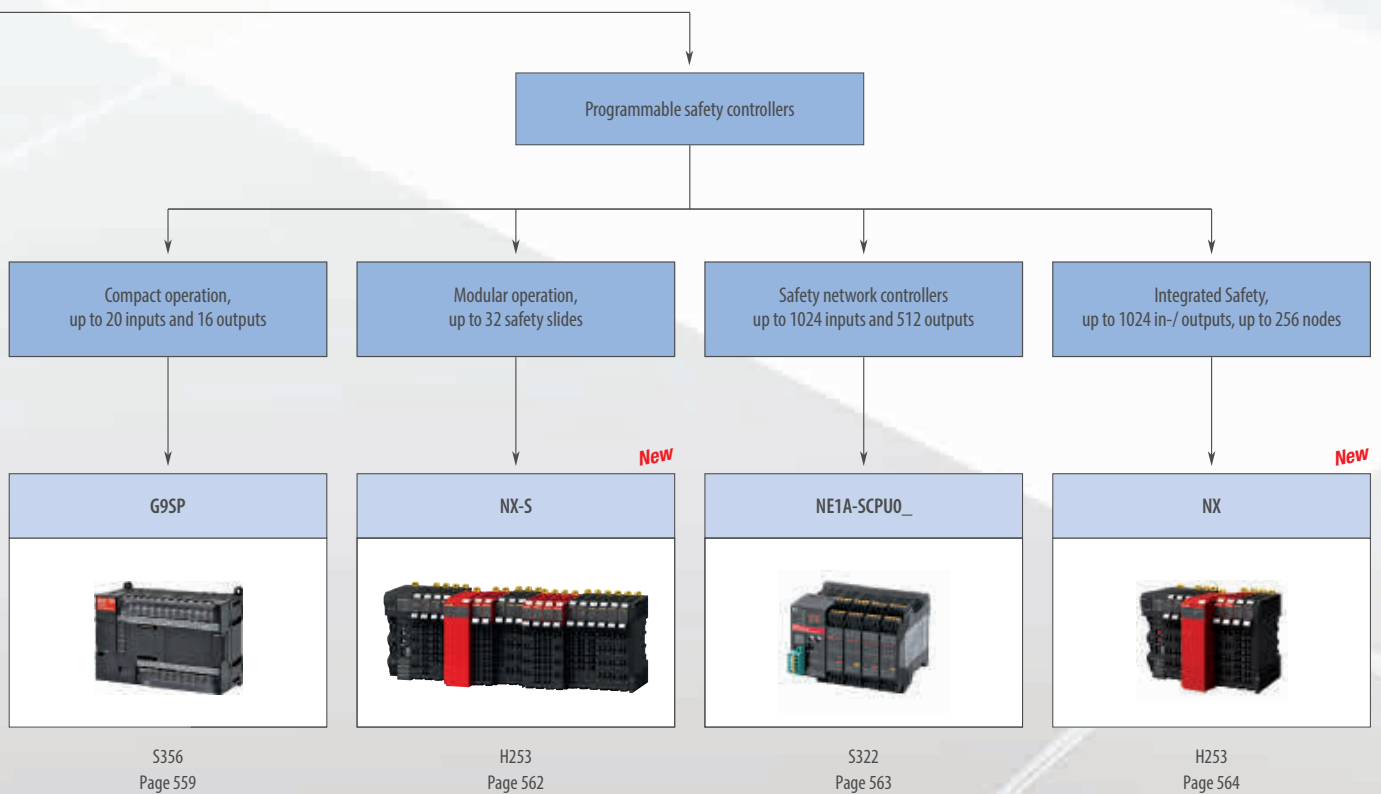
SYSMAC
always in control








Modular Programmable safety controller







Compact Programmable safety controller



Selection table

		Safety relay units				
						
Model		G9SE	G9SA	G9SB	G9SR	G9SX
Selection criteria	Performance level	up to PLe acc. EN ISO 13849-1 depending on application				
	Safety integrity level (IEC 61508)	SIL 3	–	–	SIL 3	SIL 3
	Reaction time	max. 15 ms	max. 10 ms	max. 10 ms	depend on safety application	15 ms
	DeviceNet safety Bus interface	–	–	–	–	–
	Standard DeviceNet Bus interface	–	–	–	–	–
	EDM function	■	■	■	■	■
	Interlock function	■	■	■	■	■
	Logical 'AND' connection	–	–	–	■	■
	Relay expansion units	–	■	–	–	■
	Housing	Plastic	Plastic	Plastic	Plastic	Plastic
	Operating temperature	–10 to 55°C	–25 to 55°C	–25 to 55°C	–10 to 55°C	–10 to 55°C
	Flux-tight	–	–	–	–	–
Features	Number of poles	–	–	–	–	–
	Gold clad contacts	–	–	–	–	–
	Relay socket	–	–	–	–	–
	Detachable cage clamp terminals	–	–	–	■	■
	Screw terminals	–	■	■	optional	■
	Push-in terminals	■	–	–	–	–
	Safe timing functions	off-delay	■	–	on-delay and off-delay	■
	USB-interface	–	–	–	–	–
Application	Programming software	–	–	–	–	–
	E-Stop application	■	■	■	■	■
	Door switch monitoring	■	■	■	■	■
	Safety light curtain monitoring	■	■	■	■	■
	EDM monitoring	■	■	■	■	■
	Interlock function	■	■	■	■	■
	Logic function blocks	–	–	–	■	–
	Safe ON delay timer	–	–	–	■	–
	Safe OFF delay timer	■ (Off delay)	■	–	■	■
	Two-Hand control	–	■	–	–	–
	Manual/automatic reset	■	■	■	■	■
	Non-contact switches monitoring	■	–	–	■	■
	Guard switching/enabling function	–	–	–	■	■
	limited speed monitoring	–	–	–	–	■
	standstill monitoring	–	–	–	–	■
	General safety application	■	■	■	■	■
Supply voltage	24 VDC	■	■	■	■	■
	100 VAC to 240 VAC	–	■	–	–	–
In- and outputs	Safety inputs	–	■	■	■	■
	Test signal output	–	–	–	■	■
	Solid state safety outputs	–	–	–	■	■
	Safety relay outputs	DPST-NO, 4PST-NO	3PST-NO, 5PST-NO	DPST-NO, 3PST-NO	DPST-NO, 3PST-NO	■
	Auxiliary outputs	Solid state, SPST-NO	SPST-NC	SPST-NC	Solid state, SPST-NO	■
	4PST-NO + DPST-NC	–	–	–	–	–
	3PST-NO + 3PST-NC	–	–	–	–	–
	3PST-NO + SPST-NC	–	–	–	–	–
	DPST-NO + DPST-NC	–	–	–	–	–
	5PST-NO + SPST-NC	–	–	–	–	–
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Programmable safety system				
				
Model	G9SP	NX-Safety stand alone modular I/O system	NE1A	NX-Safety
Safety Architecture	Compact	Modular	Distributed	Distributed and Integrated
Programing Language	FBs	IEC 61131-3	FB's	IEC 61131-3
PL (Performance Level)	PL e (EN ISO 13849-1)	PL e (EN ISO 13849-1)	PL e (EN ISO 13849-1)	PL e (EN ISO 13849-1)
SIL (Safety Integrity Level)	SIL3 (IEC 61508) SILCL3 (EN 62061)	SIL3 (IEC 61508) SILCL3 (EN 62061)	SIL3 (IEC 61508) SILCL3 (EN 62061)	SIL3 (IEC 61508) SILCL3 (EN 62061)
PFH	9.4E-11	3.1E-10	5.1E-10	3.0E-10
TM Mission time	20 years (ISO 13849)	20 years (ISO 13849)	20 years (ISO 13849)	20 years (ISO 13849)
Approvals	TÜV- Rheinland; CE,UL, CSA, KOSHA	TÜV- Rheinland; CE,UL, CSA, cULus, ANSI, C-Tick, KC,	TÜV- Rheinland; CE,UL, CSA, ANSI, KOSHA	TÜV- Rheinland; CE,UL, CSA, cULus, ANSI, C-Tick, KC,
Safety Network	Non	Non	Device Net Safety	FSOE EtherCAT safety
No. of safety connections	non	32	32	128
Safety I/O Refreshing mode	–	yes	–	yes
Standard Fieldbus/Industrial Network	via gateway: EtherNet/IP	on board: EtherNet/IP	on board: DeviceNet	On system: EtherCAT, EtherNet/IP
Programing Software tool	G9SP Configurator	Sysmac Studio	DeviceNet Network Configurator	Sysmac Studio
Safety Zones	1	Multiple	Multiple	Multiple
Simulation	yes	yes	yes	yes
Housing	Plastic	Plastic	Plastic	Plastic
Operating Temperature	0 to +55°C	0 to +55°C	0 to +55°C	0 to +55°C
Programing connection	USB	USB	USB	USB/EtherNet
Safety memory for user program	cassette	internal 512 KB	internal	internal up to 2 MB
Terminal type	Screw	Clamp	Clamp	Clamp
Power Supply	24 VDC	24 VDC	24 VDC	24 VDC
Safety Digital Inputs (S-DI's)	10/10/20	up to 256	up to 1024	up to 1024
Test Signal Outputs	yes	yes	yes	yes
Safety Digital Outputs (S-DO's)	4/16/8	up to 256	up to 512	up to 512
Safety Relay Outputs	–	–	yes	–
Enclosure rating	IP20	IP20	IP20	IP20
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Expandable safety relay unit

G9SA-family offers a complete line-up of compact and expandable safety relay units. Modules with safe OFF-delay timing are available as well as a two-hand controller. Simple multiplication of safety contacts is possible by using the connection on the front.

- 45 mm-wide housing, expansion units are 17.5 mm wide
- Safe OFF-delay timer
- Simple expansion connection
- Certification up to PLe according to EN ISO 13849-1 depending on the application

Ordering information

Emergency-stop units

Main contacts	Auxiliary contact	Number of input channels	Rated voltage	Order code
3PST-NO	SPST-NC	1 channel or 2 channels possible	24 VAC/VDC 100 to 240 VAC	G9SA-301
5PST-NO	SPST-NC	1 channel or 2 channels possible	24 VAC/VDC 100 to 240 VAC	G9SA-501

Emergency-stop OFF-delay units

Main contacts	OFF-delay contacts	Auxiliary contact	Number of input channels	OFF-delay time	Rated voltage	Order code
3PST-NO	DPST-NO	SPST-NC	1 channel or 2 channels possible	7.5 s	24 VAC/VDC 100 to 240 VAC	G9SA-321-T075
				15 s	24 VAC/VDC 100 to 240 VAC	G9SA-321-T15
				30 s	24 VAC/VDC 100 to 240 VAC	G9SA-321-T30

Two-hand controller

Main contacts	Auxiliary contact	Number of input channels	Rated voltage	Order code
3PST-NO	SPST-NC	2 channels	24 VAC/VDC 100 to 240 VAC	G9SA-TH301

Expansion unit

The expansion unit connects to a G9SA-301, G9SA-501, G9SA-321, or G9SA-TH301.

Main contacts	Auxiliary contact	Category	Order code
3PST-NO	SPST-NC	4	G9SA-EX301

Expansion units with OFF-delay outputs

The expansion unit connects to a G9SA-301, G9SA-501, G9SA-321, or G9SA-TH301.

Main contact form	Auxiliary contact	OFF-delay time	Order code
3PST-NO	SPST-NC	7.5 s	G9SA-EX031-T075
		15 s	G9SA-EX031-T15
		30 s	G9SA-EX031-T30

Specifications

Power input

Item	G9SA-301/TH301 / G9SA-501 / G9SA-321-T_
Power supply voltage	24 VAC/VDC: 24 VAC, 50/60 Hz, or 24 VDC 100 to 240 VAC: 100 to 240 VAC, 50/60 Hz
Operating voltage range	85 to 110% of rated power supply voltage

Inputs

Item	G9SA-301/321-T_/TH301	G9SA-501
Input current	40 mA max.	60 mA max.

Contacts

Item	G9SA-301/501/321-T_/TH301/EX301/EX031-T_
	Resistive load (cosφ= 1)
Rated load	250 VAC, 5 A
Rated carry current	5 A

Characteristics

Item		G9SA-301/TH301 / G9SA-501/321-T_ / G9SA-EX301/EX031-T_
Operating time		30 ms max. (not including bounce time)
Response time *1		10 ms max. (not including bounce time)
Durability	Mechanical	5,000,000 operations min. (at approx. 7,200 operations/hr)
	Electrical	100,000 operations min. (at approx. 1,800 operations/hr)
Minimum permissible load (reference value)		5 VDC, 1 mA
Ambient temperature		Operating: –25 to 55°C (with no icing or condensation) Storage: –25 to 85°C (with no icing or condensation)

*1 The response time is the time it takes for the main contact to open after the input is turned OFF.



Slim-size safety unit

G9SB is a family of slender safety relay units, providing two safety contacts in a 17.5 mm- and three safety contacts in a 22.5mm-wide housing.

- 17.5 mm- and 22.5 mm-wide housing
- 1- and 2-input channel units
- Manual and automatic reset units
- Certification up to PLe according to EN ISO 13849-1 depending on the application

Ordering information

Main contacts	Auxiliary contact	Number of input channels	Reset mode	Input type	Rated voltage	Size (H×W×D)	Order code
DPST-NO 2 safety contacts	None	2 channels	Auto-reset	Inverse	24 VAC/VDC	100 mm × 17.5 mm × 112 mm	G9SB-2002-A
		1 channel or 2 channels		+ common			G9SB-200-B
		2 channels	Manual-reset	Inverse			G9SB-2002-C
		1 channel or 2 channels		+ common			G9SB-200-D
3PST-NO 3 safety contacts	SPST-NC	None (direct breaking)	Auto-reset	–	24 VDC	100 mm × 17.5 mm × 112 mm	G9SB-3010
		2 channels		Inverse	24 VAC/VDC	100 mm × 22.5 mm × 112 mm	G9SB-3012-A
		1 channel or 2 channels		+ common			G9SB-301-B
		2 channels	Manual-reset	Inverse			G9SB-3012-C
		1 channel or 2 channels		+ common			G9SB-301-D
		2 channels		Inverse			G9SB-3012-C

Specifications

Power input

Item	G9SB-200 _ _	G9SB-3010	G9SB-301 _ _
Power supply voltage	24 VAC/VDC: 24 VAC, 50/60 Hz, or 24VDC 24 VDC: 24 VDC		
Operating voltage range	85 to 110% of rated power supply voltage		
Power consumption	1.4 VA/1.4 W max.	1.7 W max.	1.7 VA/1.7 W max.

Inputs

Item	G9SB-200 _ _	G9SB-3010	G9SB-301 _ _
Input current	25 mA max.	60 mA max. (See note.)	30 mA max.

Note: Indicates the current between terminals A1 and A2.

Contacts

Item	G9SB-200 _ _	G9SB-3010	G9SB-301 _ _
Resistive load (cosφ= 1)			
Rated load	250 VAC, 5 A		
Rated carry current	5 A		

Characteristics

Item		G9SB-200 _ _	G9SB-3010	G9SB-301 _ _
Response time *1		10 ms max.		
Durability	Mechanical	5,000,000 operations min. (at approx. 7,200 operations/hr)		
	Electrical	100,000 operations min. (at approx. 1,800 operations/hr)		
Minimum permissible load (reference value)		5 VDC, 1 mA		
Ambient operating temperature		-25°C +55°C (with no icing or condensation)		

*1 The response time is the time it takes for the main contact to open after the input is turned OFF.



Compact safety relay unit family

G9SR family modules operate standalone and as a system with input and output extension. All modules are simple to set up using DIP-switches and provide clear diagnosis via LEDs on the front.

- Three modules for all safety relay unit applications
- 17.5 or 22.5 mm width to save mounting space
- Solid-state outputs for long life and high current safety relay outputs
- Detailed LED indications enable easy diagnosis
- Safe on- and off-delay function up to PLe
- Up to PLe according to EN ISO 13849-1 and SIL 3 according to EN 61508

Ordering information

Advanced unit

Safety outputs	Auxiliary outputs	No. of input channels	Rated voltage	Terminal block type	Order code
Instantaneous					
2 PST-NO (contact)	1 PNP transistor output	1 or 2 channels	24 VDC	removable cage clamp terminals	G9SR-AD201-RC

Basic unit

Safety outputs	Auxiliary outputs	No. of input channels	Rated voltage	Terminal block type	Order code
Instantaneous					
2 P channel MOS FET transistor output	1 PNP transistor output	1 or 2 channels	24 VDC	removable cage clamp terminals	G9SR-BC201-RC

Expansion unit

Safety outputs		Auxiliary outputs	Rated voltage	Terminal block type	Order code
Instantaneous	ON/OFF-delayed				
—	3 PST-NO (contact) ^{*1}	1 (solid state) PNP transistor outputs	24 VDC	removable cage clamp terminals	G9SR-EX031-T90-RC

^{*1} The ON/OFF delay time can be set in 16 steps as follows: 0/0.1/0.2/0.5/1/1.5/2/2.5/5/10/20/30/45/60/75/90 s

Specifications

Power input

Item	G9SR-AD_	G9SR-BC_	G9SR-EX_
Rated supply voltage	19.2 to 28.8 VDC (24 VDC ±20%)		

Inputs

Item	G9SR-AD_	G9SR-BC_	G9SR-EX_
Safety input	Operating voltage: 17 VDC to 28.8 VDC, internal impedance: Approx. 3 kΩ		
Feedback/reset input			

Outputs

Item	G9SR-BC_	G9SR-AD_	G9SR-EX_
Instantaneous safety output	P channel MOS FET transistor output Load current (Using 2 outputs): 2 A DC max.	—	
Auxiliary output	PNP transistor output Load current: 500 mA max.		
Rated load	—	250 VAC, 5 A AC15 (inductive load)	
Rated carry current	—	5 A	
Maximum switching voltage	—	250 VAC	

Characteristics

Item		G9SR-BC_	G9SR-AD_	G9SR-EX_
Operating time (OFF to ON)		150 ms max.		
Response time (ON to OFF)		50 ms max.		
Durability	Electrical	–	100,000 cycles min.	
	Mechanical	–	10,000,000 cycles min.	
Ambient temperature		–10 to 55°C (with no icing or condensation)		



Flexible safety unit

G9SX-family modules can be connected by a logical “AND” function to implement partial/global stopping of a machine. Solid-state outputs, detailed LED diagnosis and clever feedback signals help to keep maintenance easy. The line-up is completed by expansion units with safe timing functions.

- Clear and transparent segmentation of safety functions by use of unique “AND” connection
- Solid-state outputs for long life and relay outputs in extension box available
- Detailed LED indications enable easy diagnosis
- Clever feedback signals for easy maintenance
- PLe according to EN ISO 13849-1 and SIL 3 according to EN 61508

Ordering information

Advanced unit

Safety outputs		Auxiliary outputs	No. of input channels	Max. OFF-delay time ^{*1}	Rated voltage	Terminal block type	Order code
Instantaneous	OFF-delayed						
3 P channel MOS-FET transistor output	2 P channel MOS-FET transistor output	2 PNP transistor outputs	1 or 2 channels	0 to 15 sec in 16 steps	24 VDC	Screw terminals	G9SX-AD322-T15-RT
						Cage clamp terminals	G9SX-AD322-T15-RC
2 P channel MOS-FET transistor output	2 P channel MOS-FET transistor output	2 PNP transistor outputs	1 or 2 channels	0 to 150 sec in 16 steps	24 VDC	Screw terminals	G9SX-AD-322-T150-RT
						Cage clamp terminals	G9SX-AD-322-T150-RC
				0 to 15 sec in 16 steps	24 VDC	Screw terminals	G9SX-ADA-222-T15-RT
						Cage clamp terminals	G9SX-ADA-222-T15-RC
				0 to 150 sec in 16 steps	24 VDC	Screw terminals	G9SX-ADA-222-T150-RT
						Cage clamp terminals	G9SX-ADA-222-T150-RC

^{*1} The OFF-delay time can be set in 16 steps as follows: T15: 0/0.2/0.3/0.4/0.5/0.6/0.7/1/1.5/2/3/4/5/7/10/15 s, T150: 0/10/20/30/40/50/60/70/80/90/100/110/120/130/140/150 s.

Basic unit

Safety outputs		Auxiliary outputs	No. of input channels	Rated voltage	Terminal block type	Order code
Instantaneous	OFF-delayed					
2 P channel MOS FET transistor output	–	2 PNP transistor output	1 or 2 channels	24 VDC	Screw terminals	G9SX-BC202-RT
					Cage clamp terminals	G9SX-BC202-RC

Expansion unit

Safety outputs		Auxiliary outputs	OFF-delay time	Rated voltage	Terminal block type	Order code
Instantaneous	OFF-delayed					
4 PST-NO (contact)	–	2 (solid state) PNP transistor outputs	–	24 VDC	Screw terminals	G9SX-EX401-RT
					Cage clamp terminals	G9SX-EX401-RC
–	4 PST-NO (contact)		Synchronized with G9S-X-AD - unit		Screw terminals	G9SX-EX041-T-RT
					Cage clamp terminals	G9SX-EX041-T-RC

Specifications

Power input

Item	G9SX-AD_	G9SX-BC202-_	G9SX-EX_
Rated supply voltage	20.4 to 26.4 VDC (24 VDC -15% +10%)		

Inputs

Item	G9SX-AD_	G9SX-BC202-_
Safety input	Operating voltage: 20.4 VDC to 26.4 VDC, internal impedance: Approx. 2.8 kΩ	
Feedback/reset input		

Outputs

Item	G9SX-AD_	G9SX-BC202-_
Instantaneous safety output	P channel MOS FET transistor output	P channel MOS FET transistor output
OFF-delayed safety output	Load current: Using 2 outputs or less: 1 A DC max. Using 3 outputs or more: 0.8 A DC max.	Load current: Using 1 output: 1 A DC max. Using 2 outputs: 0.8 A DC max.
Auxiliary output	PNP transistor output Load current: 100 mA max.	

Expansion unit

Item	G9SX-EX_
Rated load	250 VAC, 3A/30 VDC, 3A (resistive load)
Rated carry current	3 A
Maximum switching voltage	250 VAC, 125 VDC

Characteristics

Item	G9SX-AD_	G9SX-BC202-_	G9SX-EX_
Operating time (OFF to ON state)	50 ms max. (Safety input: ON) 100 ms max. (Logical AND connection input: ON)	50 ms max. (Safety input: ON)	30 ms max.
Response time (ON to OFF state)	15 ms max.		10 ms max.
Durability	Electrical	–	100,000 cycles min.
	Mechanical	–	5,000,000 cycles min.
Ambient temperature	–10°C +55°C (with no icing or condensation)		



Compact safety relay units for general safety monitoring applications

G9SE-family offers a complete line-up of compact units. Modules with two safety contacts, four safety contacts and OFF-delay timing are available on slim-size housing.

- Simple front side wiring using screw-less terminals.
- 17.5 or 22.5 mm width to save mounting space
- 15 ms max. response time
- Safe OFF delay function up to PLe
- Easy maintenance with status indicators
- Approved standards:
EN ISO13849-1: 2008 PLe Safety Category 4, IEC/EN 60947-5-1, IEC/EN 62061 SIL3, EN 81-1, EN81-2, UL508, CAN/CSA C22.2 No.14

Ordering information

Safety outputs		Auxiliary outputs ^{*1}	Max. OFF-delay time ^{*2}	Rated voltage	Order code
Instantaneous	OFF-delayed	1 PNP transistor output		24 VDC	
DPST-NO	–		–		G9SE-201
4PST-NO	–		5 s		G9SE-401
DPST-NO	DPST-NO		30 s		G9SE-221-T05
DPST-NO	DPST-NO				G9SE-221-T30

^{*1} PNP transistor output

^{*2} The OFF-delay time can be set in 16 steps as follows:
T05: 0/0.1/0.2/0.3/0.4/0.5/0.6/0.7/0.8/1/1.5/2/2.5/3/4/5 s
T30: 0/1/2/4/5/6/7/8/9/10/12/14/16/20/25/30 s

Specifications

Ratings

Power Input

Item	G9SE-201	G9SE-401	G9SE-221-T_
Rated supply voltage	24 VDC		
Operating voltage range	–15% to 10% of rated supply voltage		
Rated power consumption ^{*1}	3 W max.	4 W max.	

^{*1} Power consumption of loads not included.

Outputs

Item	G9SE-201	G9SE-401	G9SE-221-T_
Safety output	Contact output		
OFF-delayed safety output	250 VAC 5 A 30 VDC 5 A (resistance load)		
Auxiliary output	PNP transistor output Load current: 100 mA DC max.		

Characteristics

Item		G9SE-201	G9SE-401	G9SE-221-T_
Operating time (OFF to ON state) *1		100 ms Max. *2		
Response time (ON to OFF state) *3		15 ms Max.		
Inputs	Input current	5 mA Min.		
	ON voltage	11 VDC Min.		
	OFF voltage	5 VDC Max.		
	OFF current	1 mA Max.		
	Maximum cable length	100 m Max.		
	Reset input time	250 ms Min.		
Contact outputs	Contact resistance *4	100 mΩ		
	Mechanical durability	5,000,000 operations Min.		
	Electrical durability	50,000 operations Min.		
	Switching specification Inductive load (IEC/EN60947-5-1)	AC15: 240 VAC 2 A DC13: 24 VDC 1.5 A		
	Minimum applicable load	24 VDC 4 mA		
	Conditional short-circuit current (IEC/EN60947-5-1)	100A *5		
Surrounding air temperature		−10 to 55°C (No freezing or condensation)		

^{*1} The operating time is the time it takes for the safety contact to close after the safety inputs and feedback-reset input are turned ON. Not including bounce time.

^{*2} This is in normal operation. When executing non-regular self-diagnosis for Safety output circuit, G9SE operating time become 500 ms max..

^{*3} The response time is the time it takes for the safety main contact to open after the safety input is turned OFF. Includes bounce time.

^{*4} This is initial value using the voltage-drop method with 1 A at 5 VDC.

^{*5} Use an 8 A fuse that conforms to IEC 60127 as a short-circuit protection device. This fuse is not included with the G9SE.



Flexible safety unit

The safety controller to support maintenance mode of machinery in the safe way.

- Two operation modes to support:
 - Auto switching for applications where machine and worker co-operate.
 - Manual switching for applications with limitation in operation like maintenance.
- Clear and transparent segmentation of safety functions by use of unique "AND" connection
- Clear LED diagnosis of all in- and output signals for easy maintenance
- PLe according to EN ISO 13849-1 and SIL 3 according to EN 61508.

Ordering information

Enabling grip switches

Contact form			Order code
Enabling switch	Monitor switch	Pushbutton switch	
Two contacts	1NC (grip output)	None	A4EG-C000041
Two contacts	None	Emergency stop switch (2NC)	A4EG-BE2R041
Two contacts	None	Momentary operation switch (2NO)	A4EG-BM2B041

Safety guard switching units

Safety outputs *1		Auxiliary outputs *2	Logical AND connection input	Logical AND connection output	Max. OFF delay time *3	Rated voltage	Terminal block type	Order code
Instantaneous	OFF-delayed *4							
2 (Semi-conductors)	2 (Semi-conductors)	6 (Semi-conductors)	1	1	15 s	24 VDC	Screw terminals	G9SX-GS226-T15-RT
							Spring-cage terminals	G9SX-GS226-T15-RC

*1 P channel MOS FET transistor output

*2 PNP transistor output

*3 The OFF-delay time can be set in 16 steps as follows:

T15: 0, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 1, 1.5, 2, 3, 4, 5, 7, 10 or 15 s

*4 The OFF-delayed output becomes an instantaneous output by setting the OFF-delay time to 0 s.

Specifications

Ratings of guard switching unit

Power input

Item	G9SX-GS226-T15-__	G9SX-EX-__
Rated supply voltage	24 VDC	

Inputs

Item	G9SX-GS226-T15-__
Safety input	Operating voltage: 20.4 VDC to 26.4 VDC, internal impedance: approx. 2.8 kΩ
Feedback/reset input	
Mode selector input	

Outputs

Item	G9SX-G9SX-GS226-T15-__
Instantaneous safety output	P channel MOS FET transistor output
OFF-delayed safety output	Load current: 0.8 A DC max.
Auxiliary output	PNP transistor output Load current: 100 mA max.
External indicator outputs	P channel MOS FET transistor outputs Connectable indicators <ul style="list-style-type: none"> • Incandescent lamp: 24 VDC, 3 W to 7 W • LED lamp: 10 to 300 mA DC

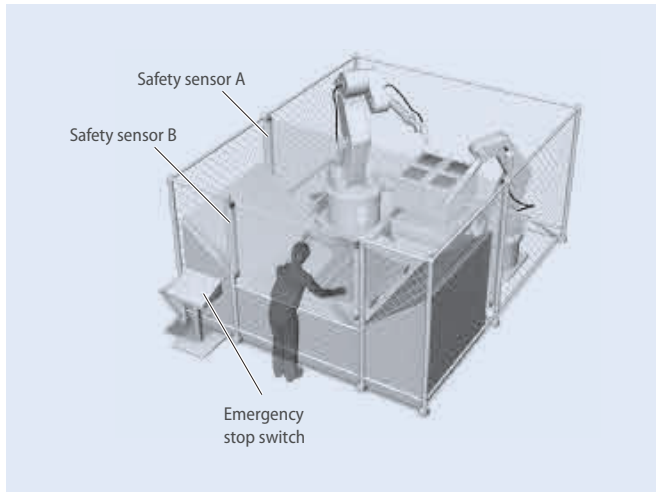
Application example

Automatic switching mode

Worker is loading and unloading the machine manually. When loading is finished, robot cycle is started manually by the worker. When robots return to their home position, loading cycle is selected automatically.

Loading condition: Safety sensor B is not active, safety sensor A is active because the robots are not allowed to move to the loading area while the worker loads the machine. So the worker is safe because safety sensor A is active.

Robot work condition: Safety sensor B is active, safety sensor A is not active because the worker is not allowed to move to the loading area when the robots work. So the worker is safe because safety sensor B stops the machine if he moves to the loading area.



Manual switching mode

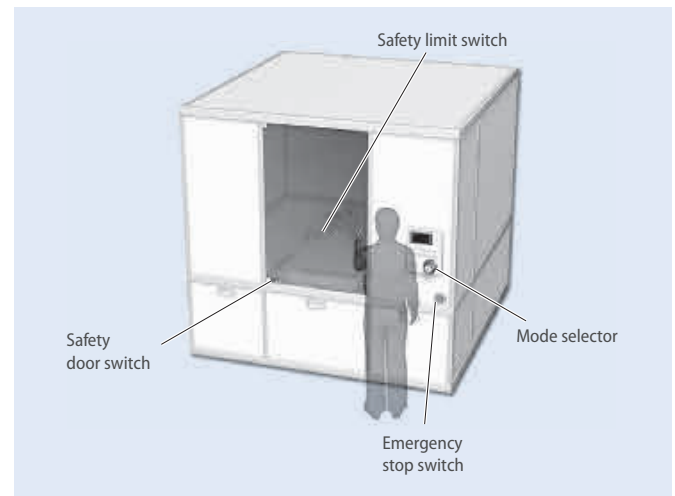
Worker has to do maintenance in this machine. While maintenance, it is necessary to move the machine in a limited way. The worker has to select automatic mode or manual mode manually by using the mode selector switch.

Operation steps:

- 1) Select maintenance mode by using the mode selector
- 2) Open the door to do the maintenance while the machine still is able to operate in a limited way (monitoring of limited movement by using the safety limit switch).
- 3) Close the cover after finishing maintenance
- 4) Select automatic mode by using the mode selector

E-Stop conditions:

- a) open the door while not in maintenance mode
- b) the machine actuates the limit switch (breaks the limit).
- c) the Enabling grip switch A4EG is actuated to stop the machine in emergency condition.



Flexible safety unit

Safe limited speed monitoring unit for complete support of maintenance mode in machinery.

- Preset of limited speed frequency by using integrated preset switches
- Easy integration in G9SX-Systems by using unique logical "AND" connection
- Clear LED diagnosis of all in- and output signals for easy maintenance
- Applicable up to PLd according to EN ISO 13849-1 using Omron proximity sensors



Ordering information

Proximity sensors

Classification			Order code
Proximity sensor	Shielded	M8	E2E-X1R5F1
		M12	E2E-X2F1
		M18	E2E-X5F1
	Unshielded	M8	E2E-X2MF1
		M12	E2E-X5MF1
		M18	E2E-X10MF1

Ratings of limited speed monitoring unit

Safety outputs ^{*1}	Auxiliary outputs ^{*2}	Logical AND connection input	Rated voltage	Sensor power supply terminals	Terminal block type	Order code
Instantaneous						
4 (Semi-conductors)	4 (Semi-conductors)	1	24 VDC	2	Screw terminals	G9SX-LM224-F10-RT
					Spring-cage terminals	G9SX-LM224-F10-RC

^{*1} P channel MOS FET output

^{*2} PNP transistor output

Specifications

Ratings of limited speed monitoring unit

Power input

Item	G9SX-LM224-F10-__
Rated supply voltage	24 VDC

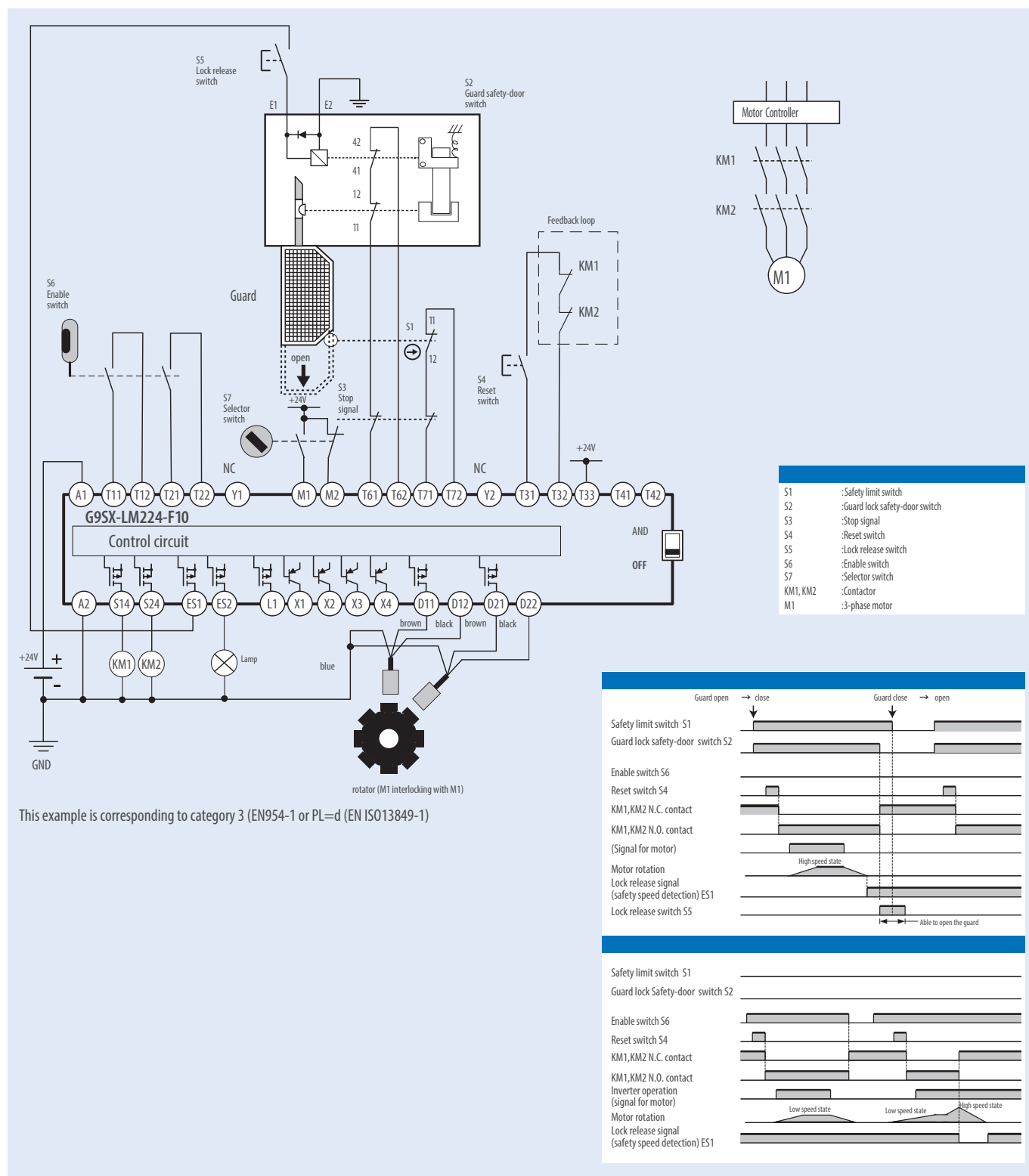
Inputs

Item	G9SX-LM224-F10-__
Safety input	Operating voltage: 20.4 VDC to 26.4 VDC
Feedback/reset input	Internal impedance: approx. 2.8 kΩ
Mode selector input	
Rotation detection input	Operating voltage 20.4 VDC to 26.4 VDC Internal impedance: approx. 2.8 kΩ Input frequency: 1 kHz max.

Outputs

Item	G9SX-LM224-F10-__
Safety solid state output	P channel MOS FET transistor output Load current: 0.8 A DC max.
Safety speed detection output	P channel MOS FET transistor output Load current: 0.3 A DC max.
External indicator output	PNP transistor output Load current: 100 mA max.

Safe limited speed





Flexible safety unit

- Safe standstill monitoring unit based on Back-EMF operation for two- and three-phase systems.
- Ready to use – covering all standard applications without additional setup
 - Easy integration in star- and delta wiring
 - Clear LED diagnosis of all in- and output signals for easy maintenance
 - Applicable up to PLe according to EN ISO 13849-1

Ordering information

Safety standstill monitoring unit				
Safety outputs *1	Auxiliary outputs *1	Power input	Terminal block type	Order code
Instantaneous		Rated supply voltage		
3 (Semi-conductors)	2 (Semi-conductors)	24 VDC	Screw terminals	G9SX-SM032-RT
			Spring-cage terminals	G9SX-SM032-RC

*1 PNP transistor output

Specifications

Ratings of standstill monitoring unit

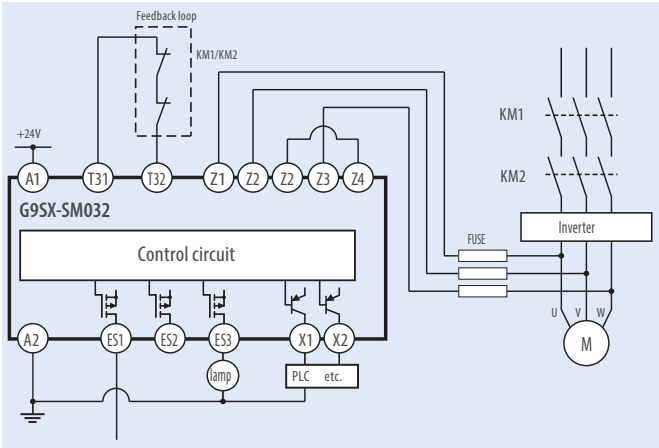
Item	G9SX-SM032-__
Rated supply voltage	24 VDC

Item	G9SX-SM032-__
Input voltage	Standstill detection input (Z1-Z2/Z3-Z4) AC 415 Vrms + 10% max.
Maximum power supply frequency for AC induction motor	60 Hz max.
Internal impedance	Standstill detection input: approx. 660 kΩ EDM input: approx. 2.8 kΩ

Item	G9SX-SM032-__
Safety standstill detection output	Sourcing output (PNP) Load current: 300 mA DC max.
Auxiliary output	Sourcing output (PNP) Load current: 100 mA DC max.

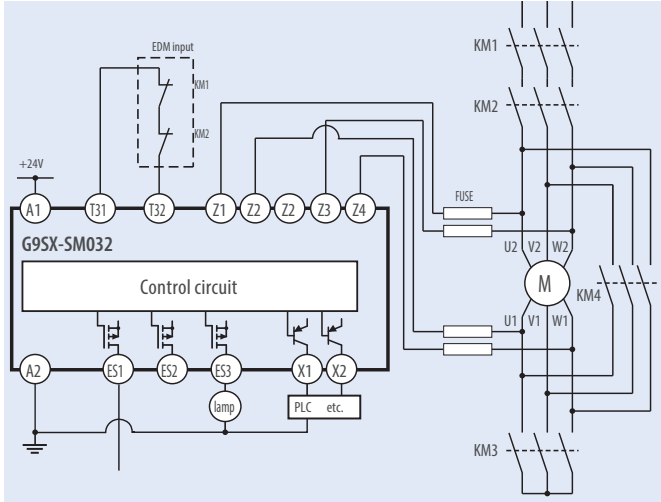
Application example

3-phase motor



Standstill detected

3-phase motor with star-delta wiring



Standstill detected



Standalone safety controller

The G9SP safety controller provides all local safety based in- and outputs and controls the safety application.

- Three CPU-types to suit different applications
- Clear diagnosis and monitoring via Ethernet or serial connection
- Memory cassette for easy duplication of configuration
- Unique programming software to support easy design, verification, standardization and reuse of the program.
- Certified according to PLe (EN ISO 13849-1) and SIL 3 (IEC 61508)

Ordering information

Appearance	Appearance description	Order code
Standalone safety controller	10 PNP safety inputs 4 PNP safety outputs 4 test outputs 4 PNP standard outputs	G9SP-N10S
	10 PNP safety inputs 16 PNP safety outputs 6 test outputs	G9SP-N10D
	20 PNP safety inputs 8 PNP safety outputs 6 test outputs	G9SP-N20S

Software

Appearance	Media	Applicable OS	Order code
G9SP configurator	Setup disk 1 license	Windows 2000	WS02-G9SP01-V1
	Setup disk 10 licenses	Windows XP	WS02-G9SP10-V1
	Setup disk 50 licenses	Windows Vista	WS02-G9SP50-V1
	Setup disk Site license	Windows 7	WS02-G9SPXX-V1

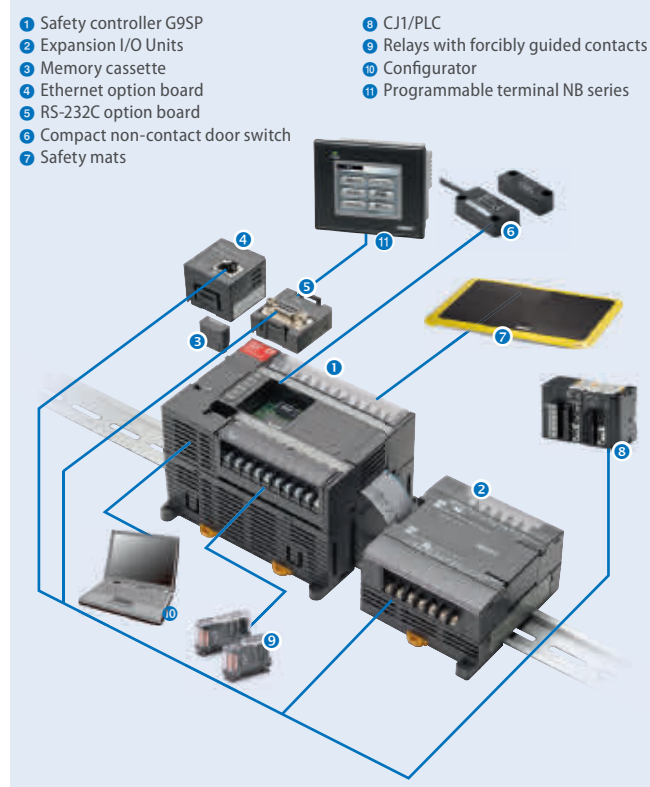
Expansion units (standard I/O)

Appearance	Type	Number of I/O		Model
		In	Out	
Expansion I/O unit	Sinking	12	8 (solid state)	CP1W-20EDT
	Sourcing	12	8 (solid state)	CP1W-20EDT1
	Sinking	–	32 (solid state)	CP1W-32ET
	Sourcing	–	32 (solid state)	CP1W-32ET1
I/O Connecting cable, 80 cm long				CP1W-CN811

Option units

Appearance	Order code
RS-232 option board	CP1W-CIF01
Ethernet option board (Ver. 2.0 or later)	CP1W-CIF41
Memory cassette	CP1W-ME05M
G9SP Status Display Touchscreen with 1.8 m cable	82614-0010 H-T40M-P
G9SP-N10S Display Kit (G9SP, Touchscreen, cable, CP1W-CIF01)	82612-0010 G9SP-N10S-SDK
G9SP-N10D Display Kit (G9SP, Touchscreen, cable, CP1W-CIF01)	82612-0020 G9SP-N10D-SDK
G9SP-N20S Display Kit (G9SP, Touchscreen, cable, CP1W-CIF01)	82612-0030 G9SP-N20S-SDK
G9SP-N10S kit with EtherNet/IP module	82608-0010 G9SP-N10S-EIP
G9SP-N10D kit with EtherNet/IP module	82608-0020 G9SP-N10D-EIP
G9SP-N20S kit with EtherNet/IP module	82608-0030 G9SP-N20S-EIP

G9SP configuration



Specifications

General specifications			
Power supply voltage		20.4 to 26.4 VDC (24 VDC -15% +10%)	
Consumption current	G9SP-N10S	400 mA (V1: 300 mA, V2: 100 mA)	
	G9SP-N10D	500 mA (V1: 300 mA, V2: 200 mA)	
	G9SP-N20S	500 mA (V1: 400 mA, V2: 100 mA)	
Mounting method		35-mm DIN track	
Ambient operating temperature		0°C to 55°C	
Ambient storage temperature		-20°C to 75°C	
Degree of protection		IP20 (IEC 60529)	

Safety input specifications	
Input type	Sinking inputs (PNP)
ON voltage	11 VDC min. between each input terminal and G1
OFF voltage	5 VDC max. between each input terminal and G1
OFF current	1 mA max.
Input current	6 mA

Safety output specifications	
Output type	Sourcing outputs (PNP)
Rated output current	0.8 A max. per output*
Residual voltage	1.2 V max. between each output terminal and V2

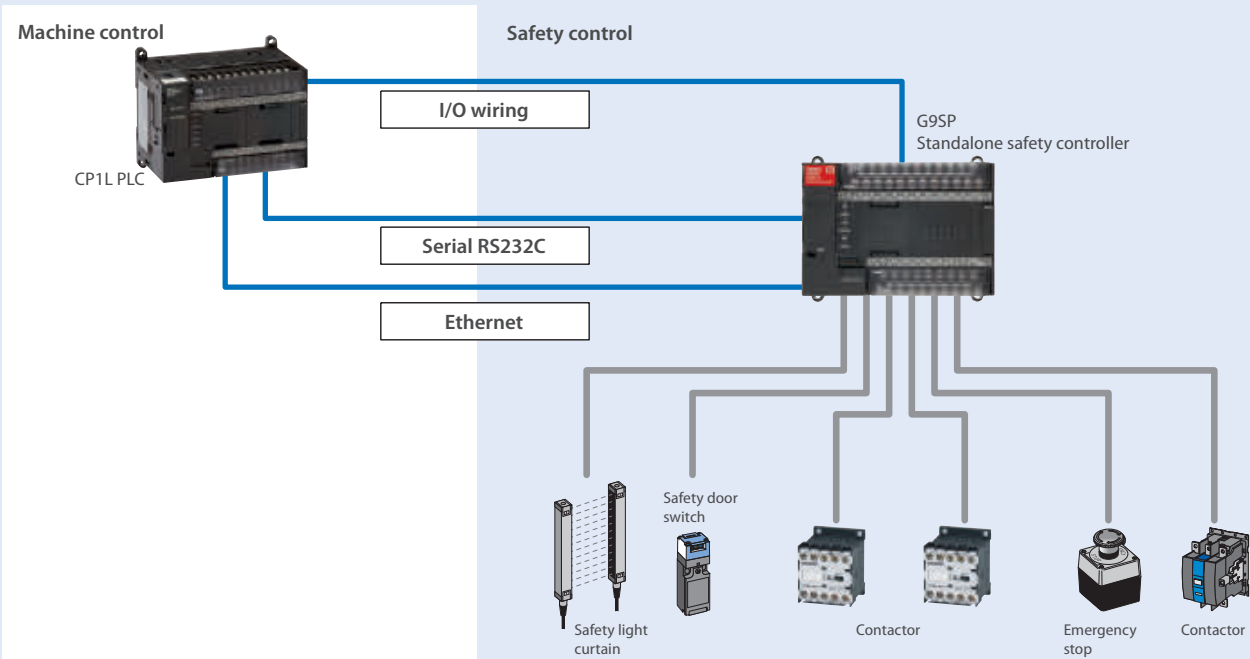
Test output specifications	
Output type	Sourcing outputs (PNP)
Rated output current	0.3 A max. per output*
Residual voltage	1.2 V max. between each output terminal and V1

Standard output specifications (G9SP-N10S)	
Output type	Sourcing outputs (PNP)
ON Residual voltage	1.5 V max. (between each output terminal and V2)
Rated output current	100 mA max.*

*For details on the rated output current, please refer to the user manual of G9SP.

Control system integration

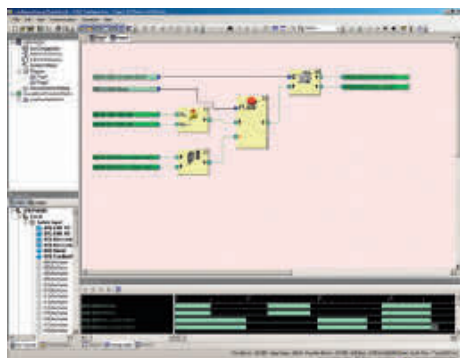
Safety - I/O-status becomes transparent
The standalone safety controller offers diagnosis information in 3 ways:
1) via parallel wiring
2) via serial RS232C interface (option)
3) via Ethernet interface (option).
Information of all safety in- and outputs on the standard control system ensure minimum downtime of the machine.



G9SP configuration tool

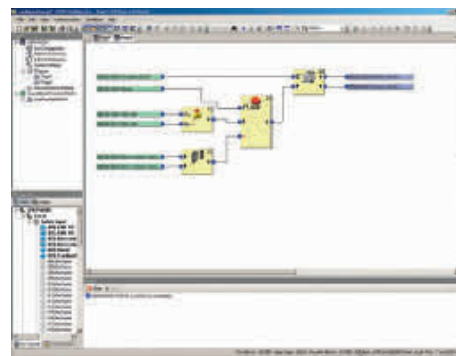


Easy setup and configuration is provided by a setup wizard supporting the hardware selection.



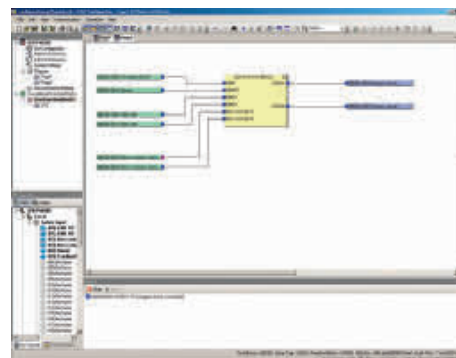
Integrated Simulator

All functions can be tested and simulated in the Configuration Tool, so there's no unnecessary additional workload for the engineer. In addition, on-line diagnosis reduces debug time to a minimum during implementation in the machine control system.



User-defined function blocks

Approved configuration elements such as a tested door monitoring circuit can be easily stored as a user defined function block and re-used in future projects. This minimises the time it takes to create a new system configuration.



Knowledge-building

Existing configurations are the basis for new projects. The G9SP Configuration Tool supports re-use of existing and proven know-how in safety control, as well as user-defined function blocks. Which means no more repetition of effort, instead a growing library of safety solutions.

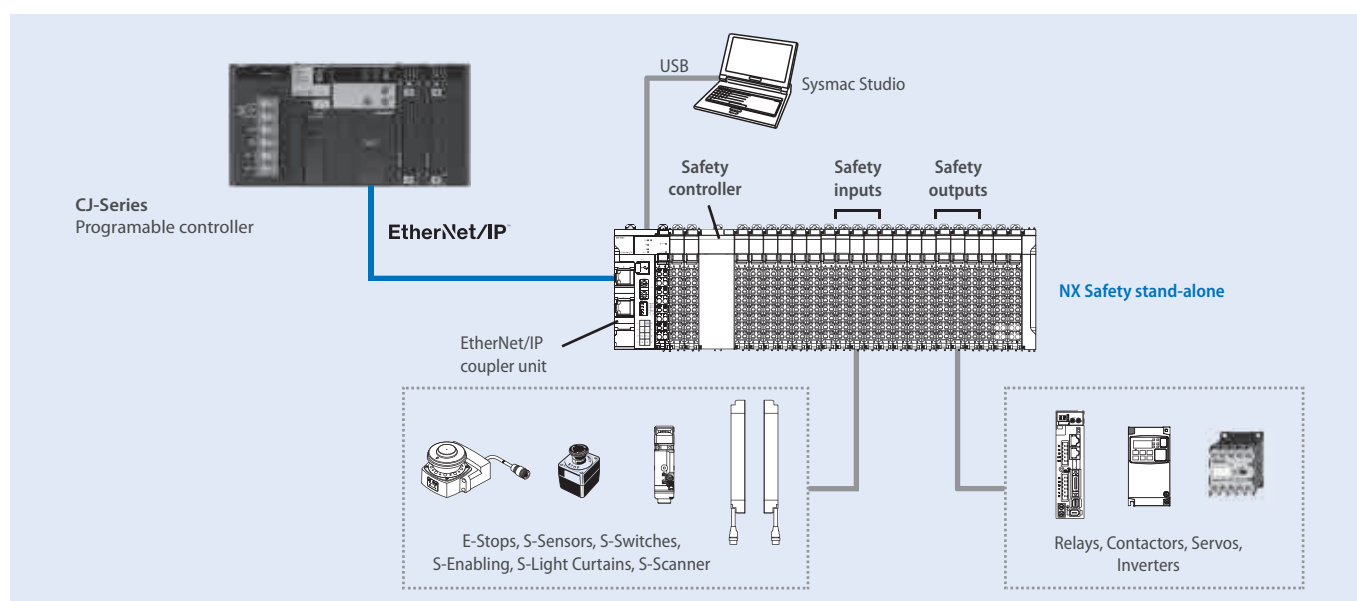


Modular Standalone controller

NX-Safety stand-alone is a powerful, modular and easily commissioned safety controller which, due to its scalability, can be efficiently adapted to the requirements of a wide variety of safety applications. Thanks to this modular and expandable hardware, the compact safety controller grows with its task slice-by-slice – right up to the highest safety level. You can grow up to 256 I/O points in one single Safety CPU. The design of safe system solutions is thus considerably simplified.

- Compatible with all Sysmac safety family, one software tool for the entire machine or production cell
- Harmony and integration between safety and standard
- Open communication and open safety programming standards
- EtherNet/IP connectivity

Ordering information



Communication and control units

Module Type	Protocol	Connection	Specification	Width	Order Code
Communication coupler	EtherNet/IP Slave	2 RJ45 ports with built-in switch	Up to 63 I/O units. Max. 512 bytes in + 512 bytes out Supports local safety communication Free Run I/O refresh mode only I/O power supply up to 10 A	46 mm	NX-EIC202
Safety controller	NX-Bus	32 Safety connections	512 KB Safety program capacity Up to 63 Safety/Standard slices Max. 32 Safety slices Up to 256 safety I/O points Safety and standard digital/analog slices can be connected	30 mm	NX-SL3300

Safety digital I/O units

Module type	Channels, Signal type	Performance ^{*1} , I/O Refresh Mode	Connection type	Width	Order Code
Safety Digital Input	4 inputs + 2 test outputs	Free Run	Screwless push-in (NX-TBA082)	12 mm	NX-SIH400
	8 inputs + 2 test outputs	Free Run	Screwless push-in (NX-TBA162)	12 mm	NX-SID800
Safety Digital Output	2 outputs, 2.0 A	Free Run	Screwless push-in (NX-TBA082)	12 mm	NX-SOH200
	4 outputs, 0.5 A	Free Run	Screwless push-in (NX-TBA082)	12 mm	NX-SOD400

^{*1} Digital I/O performance

Note: For selecting the compatible NX Digital and Analog I/O units, please refer to the NX-series modular I/O system chapter from this catalogue, check the Sysmac Studio Software I/O edition software tool or visit our website. As this selection is technically not easy, is better to contact our Omron support.



Safety network controller NE1A

The NE1A hosts the safety application program. All local and DeviceNet safety-based in- and outputs are monitored and controlled by the NE1A. It manages up to 32 DeviceNet safety slaves and can be seamlessly integrated in a standard DeviceNet system.

- Safety Multi-master system
- Removable cage-clamp terminals for easy installation
- Predefined and certified function blocks for easy programming
- LED display and status LEDs for advanced diagnostics
- System status on DeviceNet for easy troubleshooting and predictive maintenance
- Easy scalability through the addition of DeviceNet safety devices

Ordering information

Appearance	Appearance description	Interface	Order code
Safety network controller	16 PNP inputs 8 PNP outputs 4 test outputs 254 function block programming removable cage clamp terminals	USB and DeviceNet safety	NE1A-SCPU01-V1
		Ethernet/IP and DeviceNet safety	NE1A-SCPU01-EIP
	40 PNP inputs 8 PNP outputs 8 test outputs 254 function block programming removable cage clamp terminals	USB and DeviceNet safety	NE1A-SCPU02
		Ethernet/IP and DeviceNet safety	NE1A-SCPU02-EIP

Software

Appearance	Appearance description	Order code
Safety network configurator	Installation disk (CD-ROM) IBM PC/AT compatible Windows 2000, Windows XP, Windows 7	WS02-CFSC1-E

Accessories

Appearance	Appearance description	Order code
Network router	Ethernet/IP - DeviceNet router	NE1A-EDR01
Programming console	CF-Card slot to store configuration USB-Interface for maintenance Touchscreen for easy troubleshooting	NE1A-HDY

Specifications

General specifications

DeviceNet communications power supply voltage		11 to 25 VDC (supplied from communications connector)
Unit power supply voltage		20.4 to 26.4 VDC (24 VDC -15% +10%)
I/O power supply voltage		
Consumption current	Communications power supply	24 VDC, 15 mA
	Internal circuit power supply	24 VDC, 230 mA
Mounting method		35-mm DIN track
Ambient operating temperature		-10 to 55°C
Ambient storage temperature		-40 to 70°C
Degree of protection		IP20 (IEC 60529)

Safety input specifications

Input type	Sinking inputs (PNP)
ON voltage	11 VDC min. between each input terminal and G1
OFF voltage	5 VDC max. between each input terminal and G1
OFF current	1 mA max.
Input current	4.5 mA

Safety output specifications

Output type	Sourcing outputs (PNP)
Rated output current	0.5 A max. per output
Residual voltage	1.2 V max. between each output terminal and V2

Test output specifications

Output type	Sourcing outputs (PNP)
Rated output current	0.7 A max. per output (see note.)
Residual voltage	1.2 V max. between each output terminal and V1



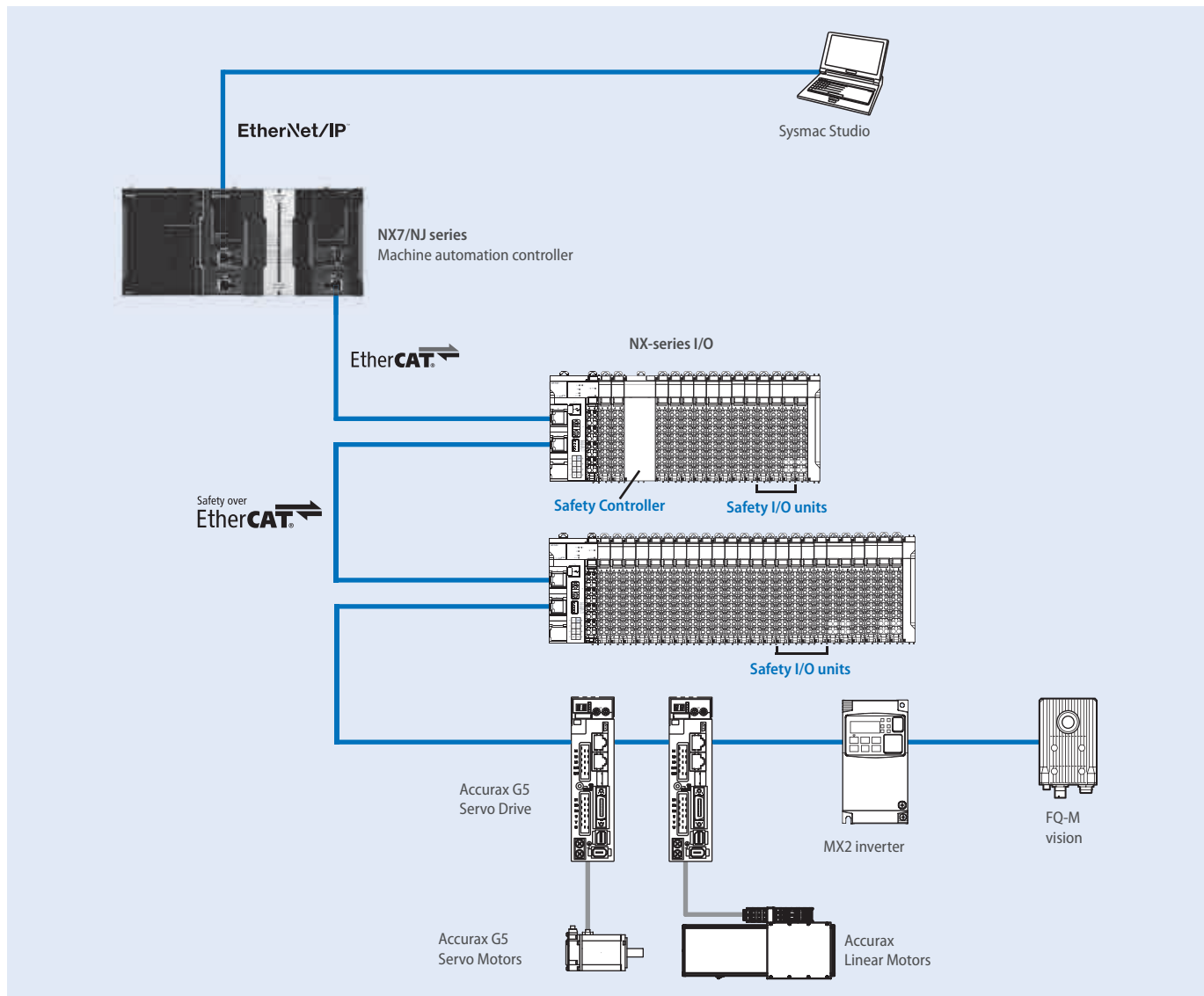
Safety Integrated and Distributed saves your time

The powerful combination of both standard functions and safety functions within the programming software tool Sysmac Studio, both simplifies and reduces the overall system development time.

- Safety program capacity - 512 KB/2 MB
- System safety I/O points - 256/1024
- PLCopen Safety compatible function blocks and instruction

The integrated safety solution allows information sharing directly between the safety program and the standard program without extra work, just by defining the variables in the safety area.

Ordering information



Communication and control units

Module Type	Protocol	Connection	Specification	Width	Order Code
Communication coupler	EtherCAT Slave	2 RJ45 ports (in + out)	Up to 63 I/O units. Max. 1,024 bytes in + 1,024 bytes out Supports distributed clock I/O power supply up to 10 A	46 mm	NX-ECC203
Safety controller integrated	NX-Bus	128 Safety connections	Up to 2 MB Safety program capacity Up to 128 Safety slices Up to 1024 safety I/O points Safety and standard digital/analog slices can be connected	30 mm	NX-SL3500
		32 Safety connections	512 KB Safety program capacity Up to 32 Safety slices Up to 256 safety I/O points Safety and standard digital/analog slices can be connected	30 mm	NX-SL3300

Safety Digital I/O units

Module type	Channels, Signal type	Performance ^{*1} , I/O Refresh Mode	Connection type	Width	Order Code
Safety Digital Input	4 inputs + 2 test outputs	Free Run	Screwless push-in (NX-TBA082)	12 mm	NX-SIH400
	8 inputs + 2 test outputs	Free Run	Screwless push-in (NX-TBA162)	12 mm	NX-SID800
Safety Digital Output	2 outputs, 2.0 A	Free Run	Screwless push-in (NX-TBA082)	12 mm	NX-SOH200
	4 outputs, 0.5 A	Free Run	Screwless push-in (NX-TBA082)	12 mm	NX-SOD400

^{*1} Digital I/O performance

Note: For a standard I/O unit please check the chapter NX-I/O.

Software tool

To program the NX-Series use the Sysmac studio software tool, please have a look on the section Software to select your licence