OMRON

Safety Controller G9SP

Software-based standalone controller family

» Reconfigure to every need

» Flexible range suits any system

» Simple set-up and clear diagnosis

realizing

Sti SAFETY, TECHNOLOGY & INNOVATION

Modular safety control

The Omron G9SP is a new range of configurable safety controllers suited to the packaging, food, automotive components, injection moulding and printing industries. Because it isn't hardwired into your system, you benefit from a new flexibility, easily reconfiguring the unit when new safety features are added to your set-up. Three different models are available, with a range of I/O lines, so you can choose the one most suitable for your system. Each controller is compatible with the Omron configuration tool, recognised by industry as one of the most simple and accessible on the market.

Omron G9SP: Global safety levels, lower TCO
- Configurable unit makes it ideal for building multiple stand-alone systems with the same specifications, or reconfiguring an existing set-up
- Handles function blocks for non-contact switches, single-beam sensors and safety mat inputs
- Faster and easier integration compared to hardwired systems
- Single simple GUI for configuration, simulation, testing and validation
- Greatly reduced set-up time
- EN ISO 13849-1 ready (PLe)
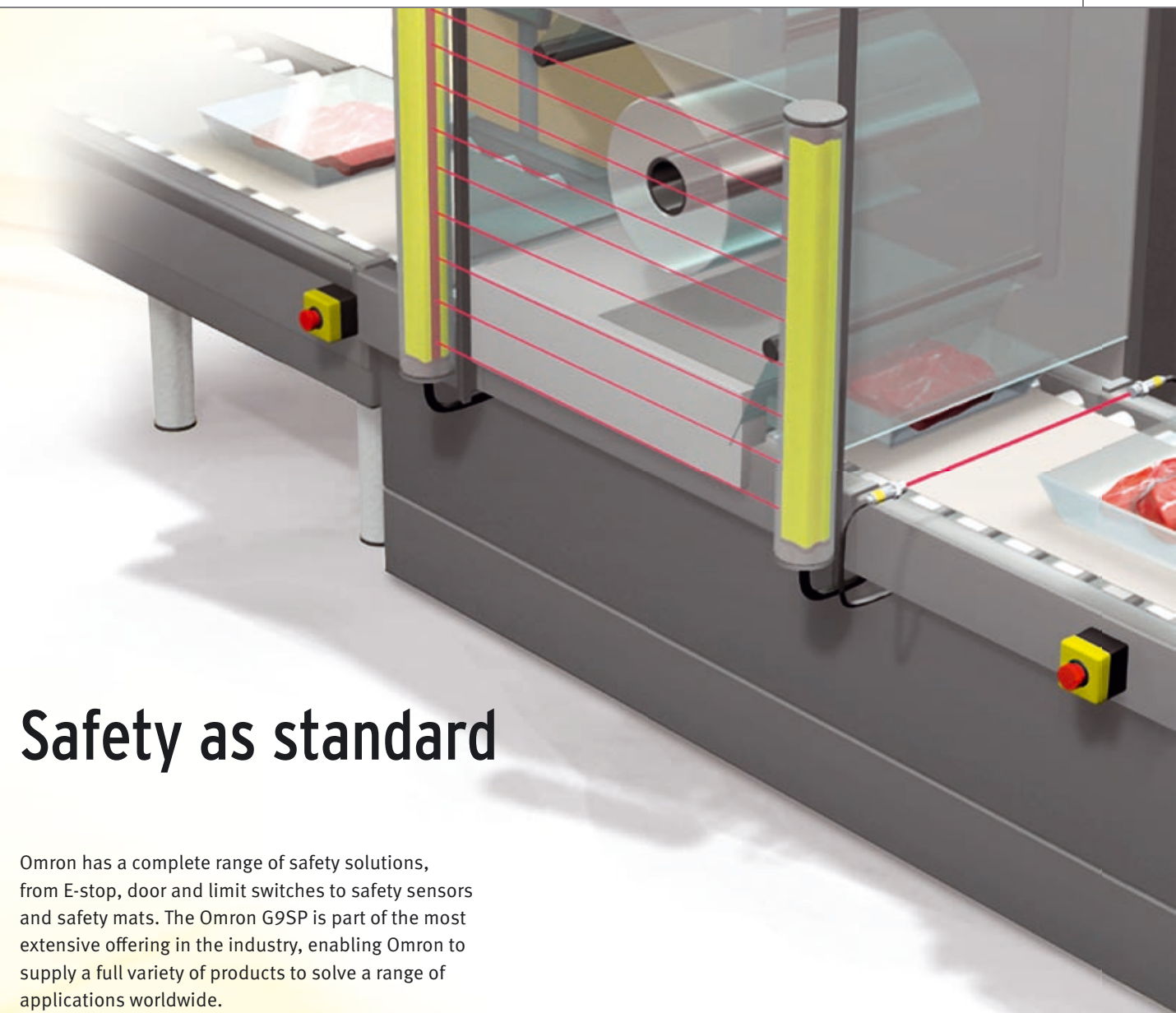
Safety as standard

Omron has a complete range of safety solutions, from E-stop, door and limit switches to safety sensors and safety mats. The Omron G9SP is part of the most extensive offering in the industry, enabling Omron to supply a full variety of products to solve a range of applications worldwide.

Because operator safety is paramount in every system, we have invested our expertise in developing a full range of fully compatible products. Our comprehensive selection of safety products help ensure maximum up-time, minimum interruption, and a fully protected workplace.

What's more, our global network of offices, worldwide product availability, and unrivalled aftersales support give Omron customers a clear advantage. Help and expert advice on installation, operation and maintenance are always available, wherever you are.
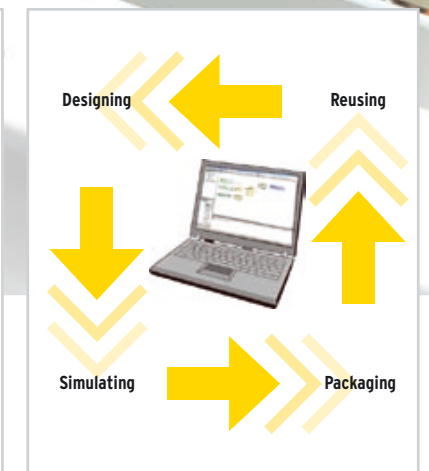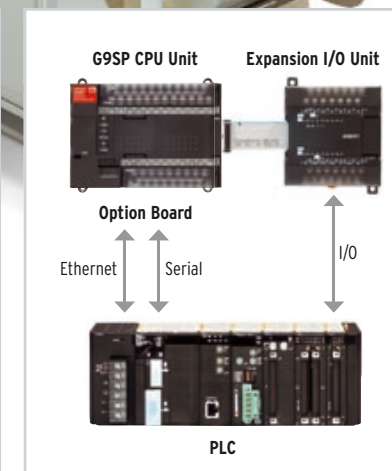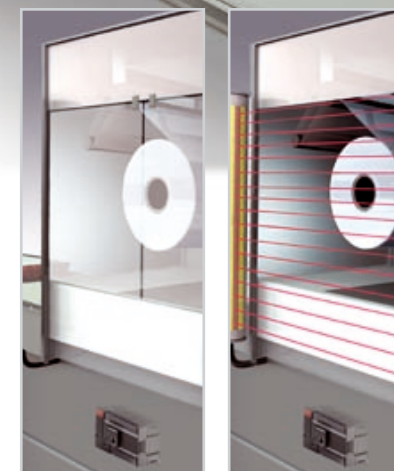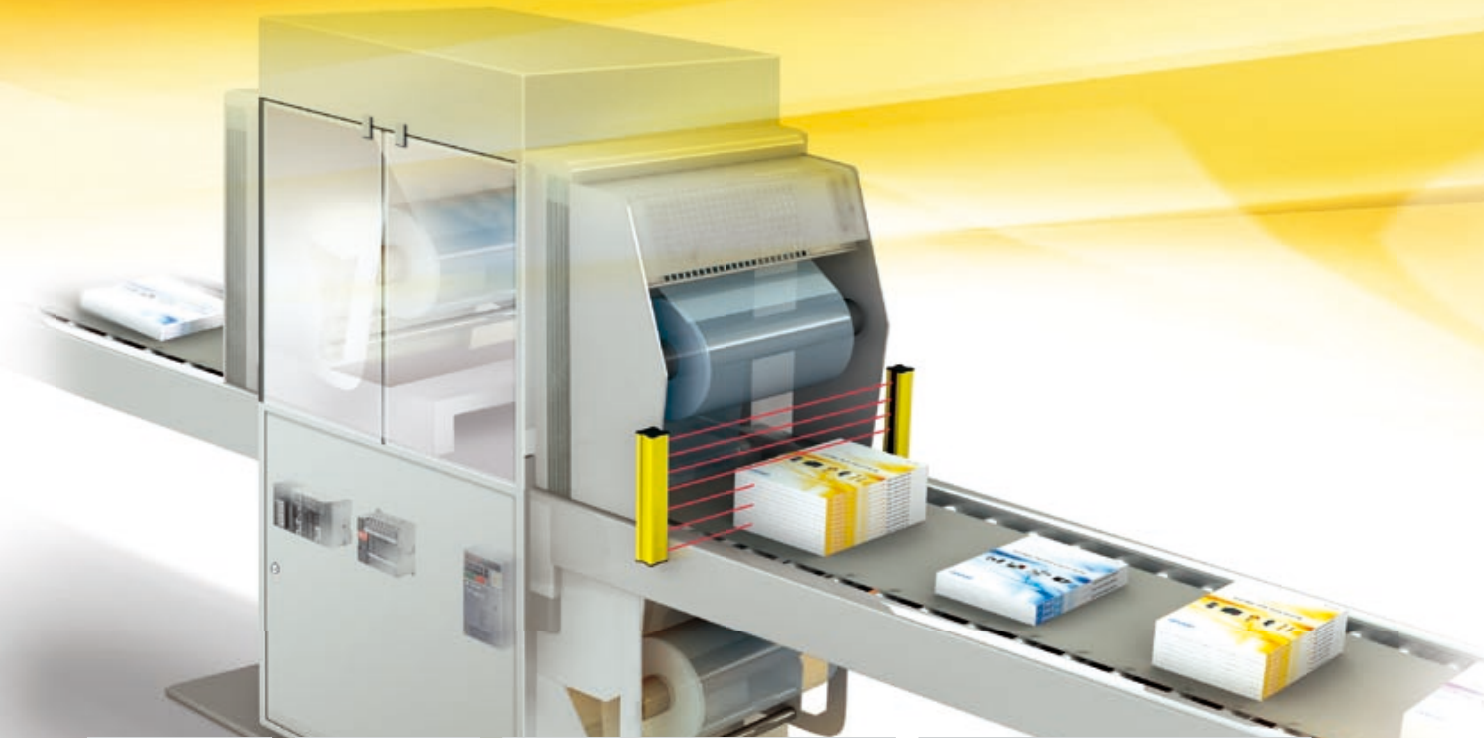
	Stand-alone Controller	Safety Network Controller
Programmable	G9SP	NE1A
Hard-wired		G9SX
	G9SA/SB	
Small	**< Application size >**	**Large**

Configurable, flexible, simple:
the key to safety

Every safety system relies on correct set up and the most suitable equipment. The Omron G9SP makes this easier than ever. The features of this product range give your new or existing set-up a range of benefits.

Configurations matrix

❶ Safety controller G9SP
❷ Expansion I/O Units
❸ Memory cassette
❹ Ethernet option board
❺ RS-232C option board
❻ Compact non-contact door switch
❼ Safety mats
❽ CJ1/PLC
❾ Relays with forcibly guided contacts
❿ Configurator

G9SP CPU Unit   **Expansion I/O Unit**

Option Board

Ethernet   Serial   I/O

PLC

Designing   Reusing

Simulating   Packaging
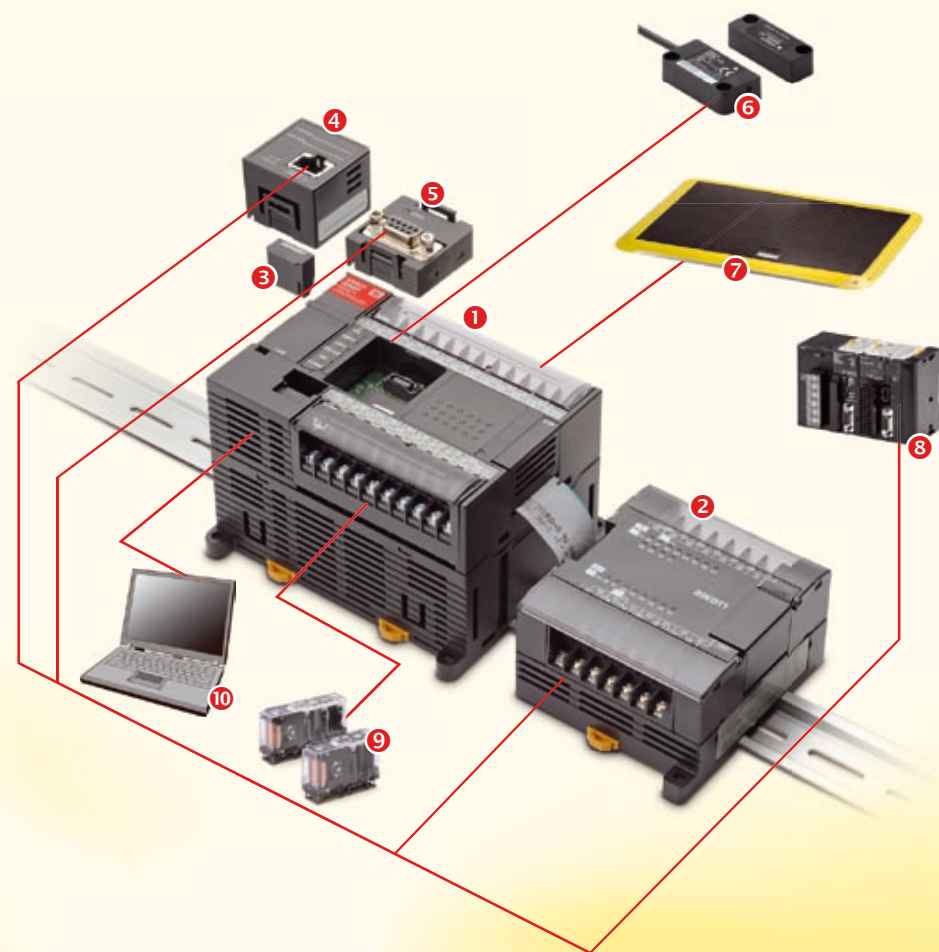
Reconfigurable
With the Omron Configuration Tool, all aspects of input and output to the unit can be defined, simulated, tested and validated with an easy-to-use graphical user interface. If you are building with a make-once/use-many profile, configurations can be copied and applied to all systems. If you are reconfiguring an existing set-up, it's just as simple. When user needs change, the set-up can be adapted quickly and easily to meet those needs.

Flexible
Unlike hard-wired safety relays, the Omron G9SP can be reconfigured to multiple purposes. Because it is a solid-state, software driven unit, all aspects of its operation can be reconfigured, with direct connection to non-contact switches or safety mats. Three I/O sizes are available: 20/8, 10/16 and 10/4. Covering the full range of typical small to mid sized systems, the Omron G9SP also comes with optional expansion units for standard I/O signals (12/8 and 0/32). Function blocks up to 128pcs complete this fully flexible range, so you can always be sure of a needs-match solution.

Simple
Above all, the Omron G9SP is simple to use and configure. With the Omron Configuration Tool, you can quickly define all inputs, outputs, scope, testing, simulation, validation and operation of your system. On-screen text and icon-driven menus guide the user quickly through all aspects of set-up. Clear alerts and system status give any operator an instant overview at every stage of operation.

Reconfigure and reuse for real TCO savings

Modern production lines must be flexible to cater to changing customer needs. This often means being able to change machine set-up at short notice, for custom jobs or additional requirements. With the Omron G9SP, it couldn't be easier. Function blocks can be redesigned and replaced using the simple GUI, swiftly incorporating any application changes or additions.

Even the most complex controls can be configured easily. Clear programming guidance is provided for new users, and modification and maintenance have been simplified too. Settings can be saved to memory cassette for off-line diagnostics, and any programming changes can be restored instantly into the Omron G9SP from the same memory cassette.

Safety in automotive component manufacture
A change in machine operation can easily be covered by reconfiguring the application program. Certified function blocks for all kinds of safety functions are already on board and ready to use.

G9SP CPU Unit   Expansion I/O Unit

Option Board

Ethernet   Serial   I/O

PLC
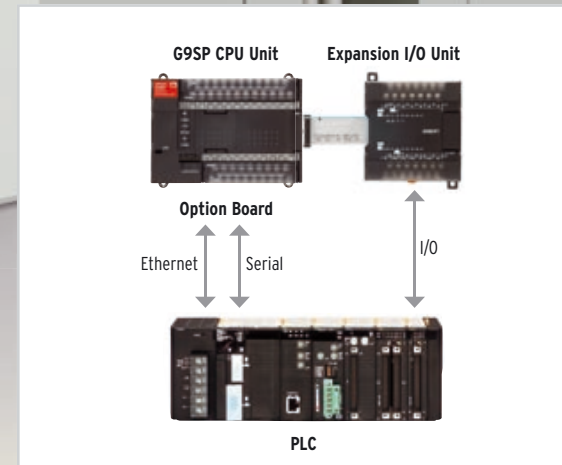
Transparent diagnosis
Connection to PC/PLC via Ethernet makes the G9SP fully accessible. Diagnosis, troubleshooting and program modification is simple, thanks to the USB programming interface and removable memory cassette.

Old   New

Easy maintenance without tools
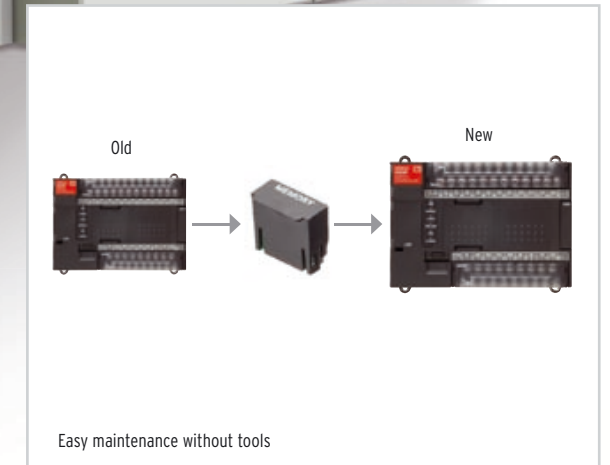
Simple unit replacement
Because the G9SP is a software-based controller, replacement is effortless. All settings, parameters and function blocks can be saved on a PC or stored on the memory cassette for easy transfer from one unit to another.

Increased flexibility means decreased TCO

Modern packaging machines must be flexible to match changing customer needs. With the Omron G9SP, application flexibility is built in. Choose from three standalone safety controller CPU types, then combine with any communication interface or 2 additional standard I/O signals. All G9SP units support direct connections of all kinds of safety sensors, including safety mats, non-contact door monitoring systems and single-beam sensors.

The Omron G9SP can be monitored and configured from a standard control console via Ethernet, serial board or standard I/O lines. For multiple applications of a single configuration, the Omron G9SP memory cassette can be used. This means that system designers only need to program the unit once, and use the memory cassette to install settings into each identical system.

Presence detection
Omron has a variety of pressure safety mats in a range of sizes. Useful in any area where personnel may be at risk, mats instantly alert the Omron G9SP, which can immediately sound an alert or close down any dangerous machinery.

Door monitoring
Direct connection of all Omron non-contact door monitoring solutions is supported by the G9SP family for maximum flexibility and minimum effort in set-up and maintenance.

Safety inputs   Standard inputs

Safety outputs   Standard outputs

Copy configuration without tools
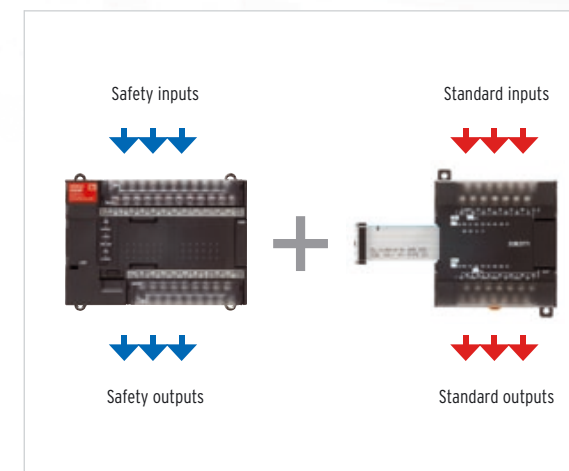
Standard I/O
The G9SP family offers a range of easily-connected standard I/O units. This instant interface between safety and standard controls can be used to configure standard control signals into the complete safety configuration. Monitoring is simple too, via standard I/O units or Ethernet/serial boards for advanced monitoring.
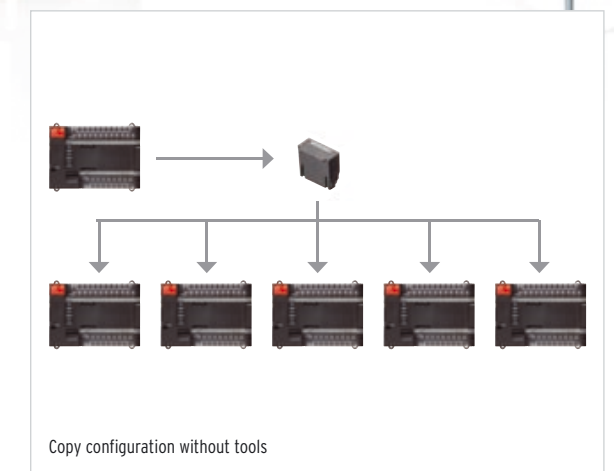
Memory cassette for fast, simple ease of use
Designing safety systems is no longer the complex task it used to be. As well as a clear and simple programming interface, the Omron G9SP offers the advantage of a memory cassette. Programs can be quickly modified and restored, with no additional effort.

Configuration made simple

When designing or updating a safety system, configuration used to be one of the most time-consuming tasks. Not with the Omron G9SP.

Thanks to a clear and simple user interface, designing your system is easier than ever. Step-by-step instructions guide you through every aspect of design. A simulation tool allows you to test and correct settings before your system goes live. Then, thanks to user-defined function blocks, you can re-use any aspect of your design in future systems.
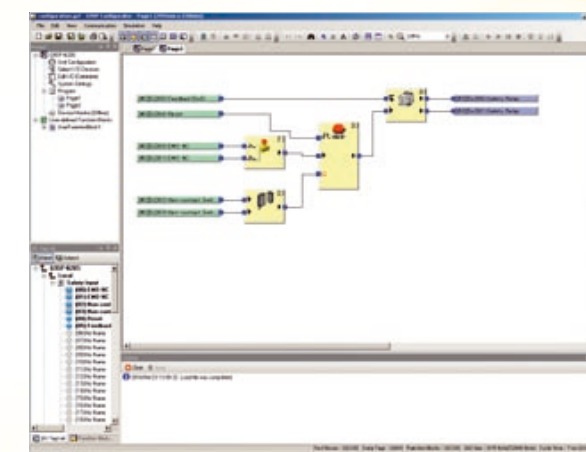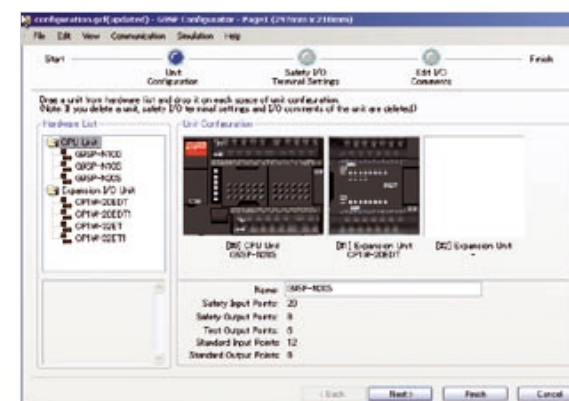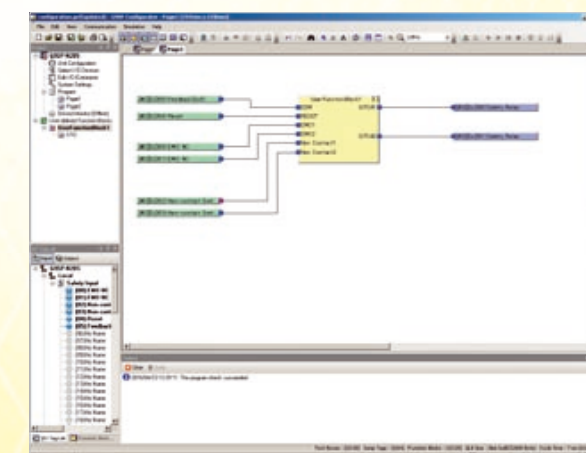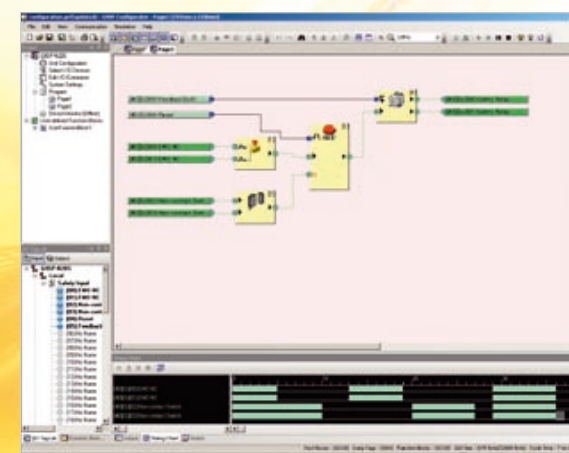

Easy configuration
All safety functions are ready to use in the G9SP. Certified function blocks can be easily selected in the graphical user interface and customized to fit your application.

User-defined function blocks
Approved configuration elements such as a tested door monitoring solution 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.

Simulation
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.

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.

G9SP

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 monitring via Ethernet or Serial connection
- Memory cassette for easy duplication of configuration
- Unique programming software to support easy design, verfication, standardization and reusage 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 Windows XP Windows Vista	WS02-G9SP01-V1
	Setup disk 10 licenses		WS02-G9SP10-V1
	Setup disk 50 licenses		WS02-G9SP50-V1
	Setup disk Site license		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 configuration

❶ Safety controller G9SP
❷ Expansion I/O Units
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❺ RS-232C option board
❻ Compact non-contact door switch
❼ Safety mats
❽ CJ1/PLC
❾ Relays with forcibly guided contacts
❿ Configurator
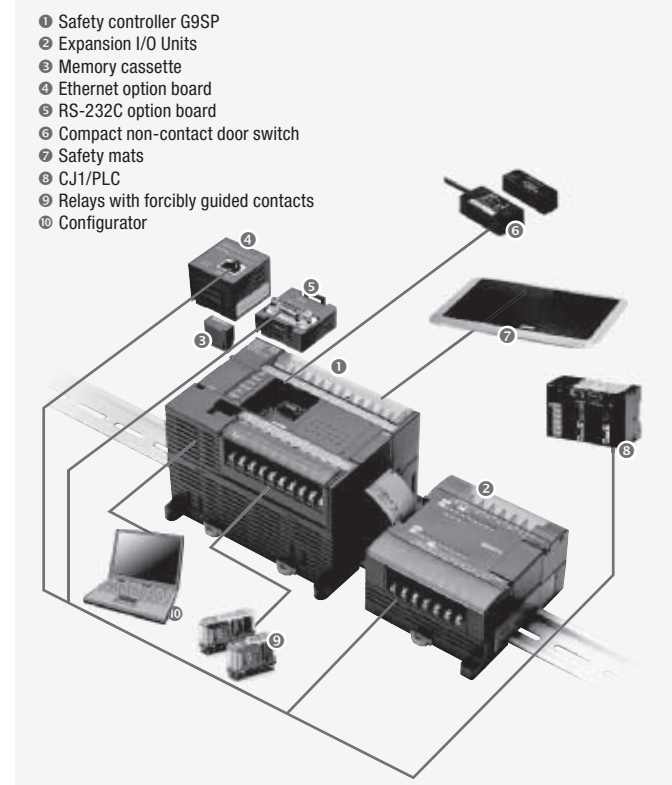
Specifications

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 +55°C
Ambient storagetemperature	-20°C +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.*

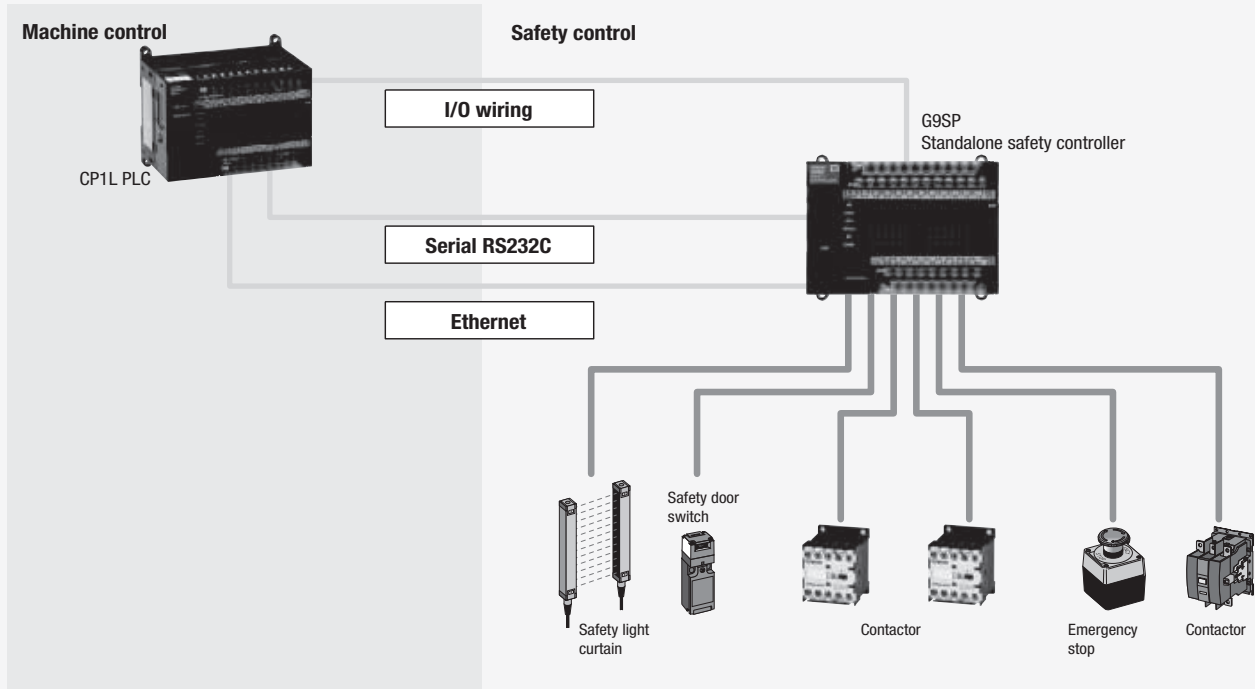*For details on the rated output current, please refer to the user manual of G9SP.

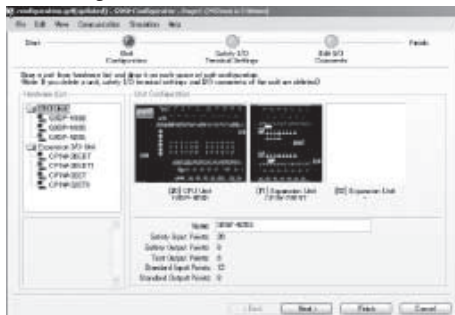## Control system integration
Safety - I/O-status becomes transparent

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).
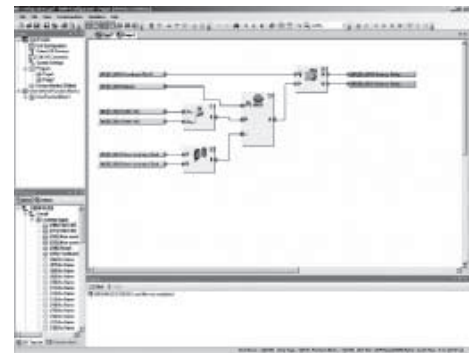Information of all safety in- and outputs on the standard control system ensure minimum downtime of the machine.

Machine control

Safety control

| I/O wiring |

| Serial RS232C |

| Ethernet |

CP1L PLC

G9SP
Standalone safety controller

Safety light curtain

Safety door switch

Contactor

Emergency stop

Contactor

G9SP configuration tool

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

Designing   Reusing

Simulating   Packaging

User-defined function blocks
Approved configuration elements such as a tested door monitoring solution 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.

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.

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.

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Functions

Function Blocks
Logic Functions

Function Block Name	Notation on Function List	Icon
NOT	NOT	
AND	AND	
OR	OR	
NAND	NAND	
NOR	NOR	
Exclusive OR	EXOR	
Exclusive NOR	EXNOR	
RS-FF (Reset SetFlip-Flop)	RS-FF	
Comparator	Comparator	
Comparator 2	Comparator2	

Timer/Counter Functions

Function Block Name	Notation on Function List	Icon
Off-Delay Timer	Off-Delay Timer	
On-Delay Timer	On-Delay Timer	
Pulse Generator	Pulse Generator	
Counter	Counter	
Up-Down Counter	Up-Down Counter	
Serial-Parallel Converter	Serial-Parallel Converter	

Safety Device Function Blocks

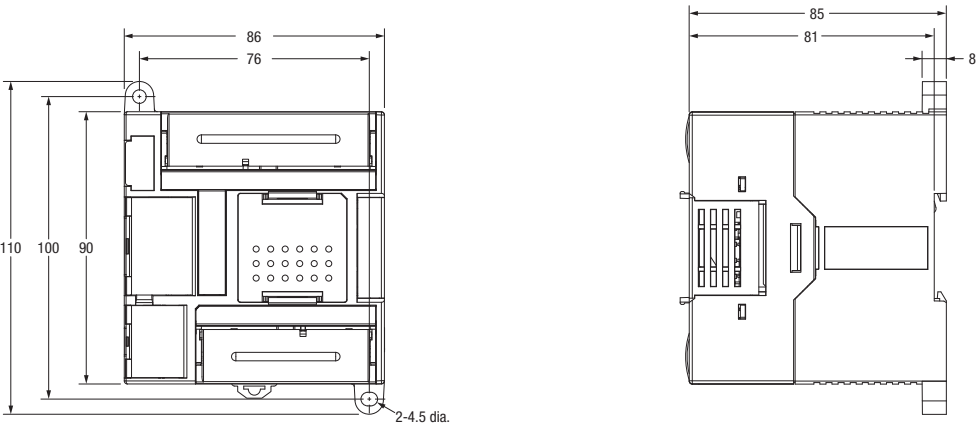| Function Block Name	Notation on Function List	Icon
External Device Monitoring	EDM	
Enable Switch Monitoring	Enable Switch	
Emergency Stop Switch Monitoring	E-Stop	
Light Curtain Monitoring	Light Curtain Monitoring	
Muting	Muting	
Safety Gate Monitoring	Safety Gate Monitoring	
Two Hand Controller	Two Hand Controller	
User Mode Switch Monitoring	User Mode Switch	
Redundant Input Monitoring	Redundant Input	
Single Beam Safety Sensor	Single Beam Safety Sensor	
Non-Contact Door Switch Monitoring	Non-Contact Door Switch	
Safety Mat Monitoring	Safety Mat	

Reset and Restart Function Blocks

Function Block Name	Notation on Function List	Icon
Reset	Reset	
Restart	Restart	

Connector Function Blocks

Function Block Name	Notation on Function List	Icon
Multi Connector	Multi Connector	
Routing	Routing	

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Dimensions

Safety Controller
G9SP-N10S

G9SP-N10D/G9SP-N20S

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Authorised Distributor:

Automation Systems
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• Industrial PC's • Software

Motion & Drives
• Motion controllers • Servo systems • Inverters

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• Temperature controllers • Power supplies • Timers • Counters • Programmable relays
• Digital panel indicators • Electromechanical relays • Monitoring products • Solid-state relays
• Limit switches • Pushbutton switches • Low voltage switch gear

Sensing & Safety
• Photoelectric sensors • Inductive sensors • Capacitive & pressure sensors
• Cable connectors • Displacement & width-measuring sensors • Vision systems
• Safety networks • Safety sensors • Safety units/relay units • Safety door/guard lock switches

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