Safety Controller

G9SP

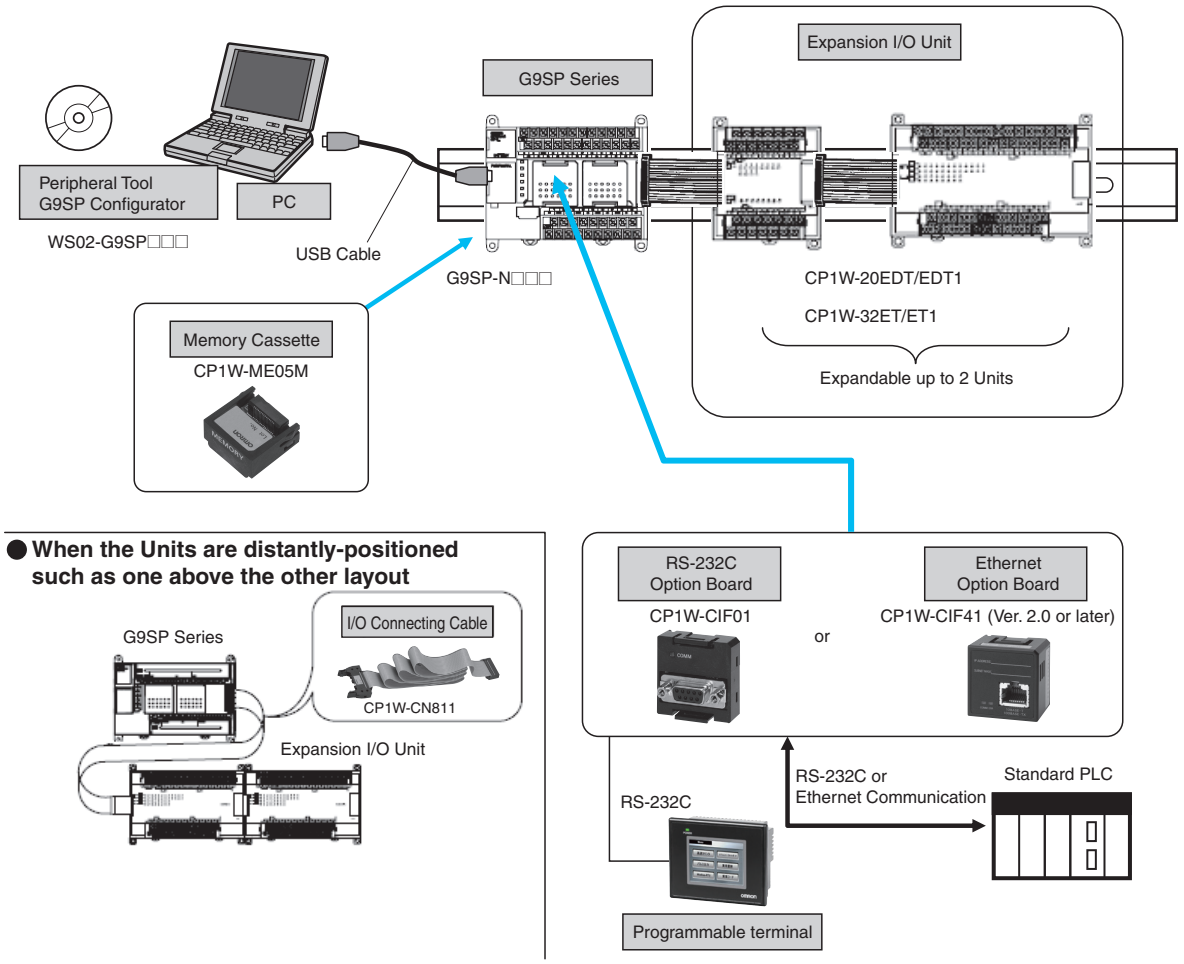
Easy programming for complex safety control

- Stand-alone Safety Controller for small and mid-sized machinery
- Three types of CPU with different I/O size to suit the application
- Four types of Expansion I/O Units for hard-wired diagnosis or standard signals
- Clear diagnosis and monitoring via Ethernet or Serial connection
- Various kinds of safety devices directly connectable like non-contact switches and safety mats
- Easy design, verification, standardization and reusage of safety control by unique programming software
- ISO 13849-1 (PLe/Category 4), IEC61508 (SIL3) certified

⚠ Refer to "*Safety Precautions*" on page 25.

For the most recent information on models that have been certified for safety standards, refer to your OMRON website.

Example of the system configuration



Ordering Information

G9SP Series

Name	Number of I/O				Unit version	Model
	Safety inputs	Test outputs	Safety outputs	Standard outputs		
Safety Controller	10	4	Solid-state outputs: 4	4	Ver.2.0	**G9SP-N10S**
	10	6	Solid-state outputs: 16	-		**G9SP-N10D**
	20	6	Solid-state outputs: 8	-		**G9SP-N20S**

Expansion I/O Unit (for standard machine control)

Name	Type	Number of I/O		Model
		Inputs	Outputs	
Expansion I/O Unit	Sinking type	12	Solid-state outputs: 8	**CP1W-20EDT**
	Sourcing type			**CP1W-20EDT1**
	Sinking type	-	Solid-state outputs: 32	**CP1W-32ET**
	Sourcing type			**CP1W-32ET1**

Note: CP1W-CN811 I/O Connecting Cable is available.
Refer to the Datasheet of CP1H Programmable Controller (Cat. No. P080-E1) for details.

I/O Connecting Cable

Name	Specifications	Model
I/O Connecting Cable	80 cm (for the distantly-positioned units connection)	**CP1W-CN811**

Note: An I/O Connecting Cable (approx. 6 cm) for alongside setting is included in the Expansion I/O Unit package.

Option Unit

Name	Model
RS-232C Option Board	**CP1W-CIF01**
Ethernet Option Board (Unit Ver. 2.0 or later)	**CP1W-CIF41**
Memory Cassette	**CP1W-ME05M**

Note: Refer to the Datasheet of CP1H Programmable Controller (Cat. No. P080-E1) for details.

Configurator

Name	Media	Applicable OS	Model
G9SP Configurator	Setup Disk (CD-ROM: 1 license)	Windows XP Service Pack 3 (32-bit edition) Windows Vista Service Pack 2 (32-bit edition, 64-bit edition) Windows 7 (32-bit edition, 64-bit edition) Windows 8 (32-bit edition, 64-bit edition) Windows 8.1 (32-bit edition, 64-bit edition) Windows 10 (32-bit edition, 64-bit edition)	**WS02-G9SP01-V2**
	Setup Disk (CD-ROM: 10 licenses)		**WS02-G9SP10-V2**
	Setup Disk (CD-ROM: 50 licenses)		**WS02-G9SP50-V2**
	Setup Disk (CD-ROM: Site license)		**WS02-G9SPXX-V2**

Note: Administrator rights are required for installation.

Version Information

The combinations that can be used of the unit versions of the G9SP series and the version of Configurator.

G9SP series	G9SP Configurator	
Unit version Ver.1.□	Ver.1.□□	Ver.2.□□
Unit version Ver.2.0	---	Ver.2.□□

Specifications (Refer to Instruction Manual and Operation Manual (Man.No.Z922) for details.)

G9SP Series

General Specifications

Power supply voltage	24 VDC (20.4 to 26.4 VDC -15% +10%)
Current consumption ✱	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)
Isolation class	Class III (SELV)
Overvoltage category	II
Noise immunity	Conforms to IEC61131-2
Vibration resistance	5 to 8.4 Hz: 3.5 mm, 8.4 to 150 Hz: 9.8 m/s^2
Shock resistance	147 m/s^2: 11 ms
Mounting	DIN track mounting (IEC60715 TH35-7.5/TH35-15) or M4 screws
Ambient operating temperature	0 to +55°C
Ambient operating humidity	10% to 90% (with no condensation)
Ambient storage temperature	-20°C to +75°C
Atmosphere	No corrosive gas
Operating altitude	2,000 m max.
Pollution degree	Pollution degree 2
Degree of protection	IP20 except terminal blocks
Terminal screws	M3 self-rising screws

✱ Not including the current consumption of external devices.

Item / Model	G9SP-N10S	G9SP-N10D	G9SP-N20S
Safety inputs	10	10	20
Safety outputs	4	16	8
Test outputs	4	6	6
Standard outputs	4	-	-
Weight	290 g max.	440 g max.	430 g max.

Safety Input Specifications

Input type	Sinking inputs (PNP)
Input current	6 mA
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.

Test Output Specifications

Output type	Sourcing outputs (PNP)
Rated Output Current	G9SP-N10S T0, T1 : 60 mA max. T2 : 30 mA max. ✱1 T3 : 300 mA max. ✱2 T0-2 total : 60 mA max. G9SP-N10D T0, T1, T2 : 60 mA max. T3 : 300 mA max. ✱2 T4, T5 : 30 mA max. ✱1 Total of T0-2 and T4-5 : 60 mA max. G9SP-N20S T0, T1, T2 : 100 mA max. T3 : 300 mA max. ✱2 T4, T5 : 30 mA max. ✱1 Total of T0-2 and T4-5 : 120 mA max.
ON residual voltage	1.8 V max. (between each output terminal and V1)
Leakage current	0.1 mA max.

✱1. Connection to OMRON D40A/D40Z Non-contact Door Switch is possible.
✱2. With the Muting Lamp Output (open circuit detection)

Safety Output Specifications

Output type	Sourcing outputs (PNP)
Rated output current	0.8 A max./output 1.6 A max./4 outputs (G9SP-N10S/-N20S) ✱1 1.2 A max./4 outputs (G9SP-N10D) ✱2
ON residual voltage	1.2 V max. (between each output terminal and V2)
OFF residual voltage	2 V max.
Leakage current	0.1 mA max.

✱1. Total current for So0 to So3 and So4 to So7
✱2. Total current for So0 to So3, So4 to So7, So8 to So11 and So12 to So15
Note: When a safety output is set as a pulse output, make sure that the connected devices do not malfunction due to the OFF pulse (pulse width: 640 μs).

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.