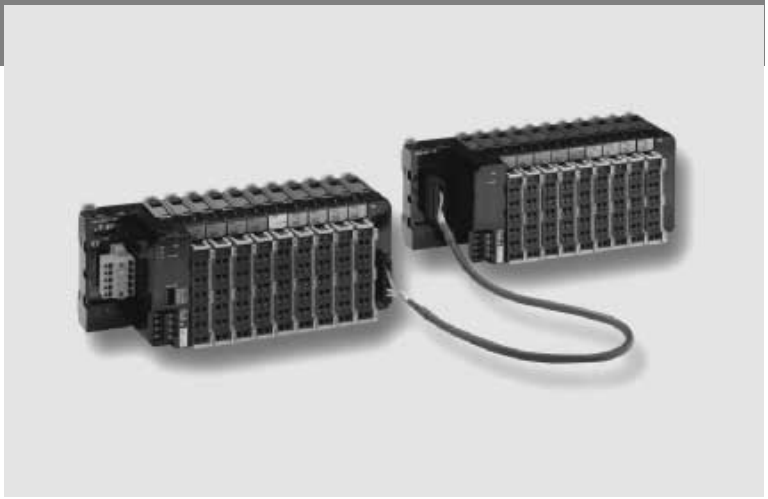
SmartSlice

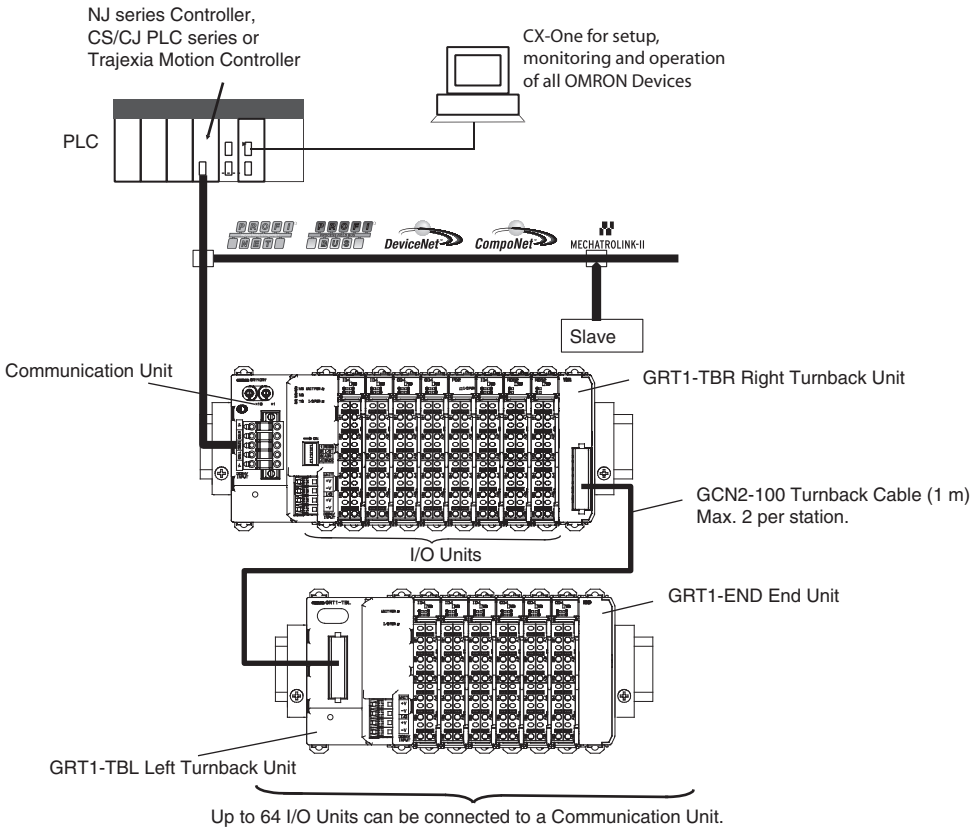


The smartest modular I/O system

OMRON's SmartSlice I/O system is compact, intelligent and easy. When used with OMRON's CS1/CJ1 DeviceNet or CompoNet master units, no configuration tool is required. By using built-in functions such as pre-scaling, totalising, differentiation and alarming in analog I/O units, PLC programming can be minimised. Preventive maintenance data collected by all I/O units can be accessed using CX-Integrator or NS-series Smart Active Parts.

- Most compact in the market (84 mm high)
- Easy set-up, backup and restore functions
- Diagnostics and preventive maintenance data at I/O level
- Detachable terminal blocks allow hot-swapping without re-wiring
- 3-wire I/O connection with 'push-in' technology, no screwdriver required

System Configuration



Specifications

General Specifications

Common SmartSlice Specifications	
Unit power supply voltage	24 VDC (20.4 to 26.4 VDC)
I/O power supply voltage	24 VDC (20.4 to 26.4 VDC)
I/O connection	Screwless push-in technology
Noise immunity	Conforms to IEC61000-4-4, 2.0 kV (power supply line)
Vibration resistance	10 to 60 Hz: 0.7 mm double amplitude 60 to 150 Hz: 50 m/s^2
Shock resistance	150 m/s^2, 3 times in each direction
Dielectric strength	500 VAC (between isolated circuits)
Insulation resistance	20 MΩ min. (between isolated circuits)
Ambient operating temperature	-10 to 55°C (with no icing or condensation)
Ambient operating humidity	25% to 85%
Operating environment	No corrosive gases
Ambient storage temperature	-25 to 65°C (with no icing or condensation)
Mounting	35 mm DIN rail

Communication Units

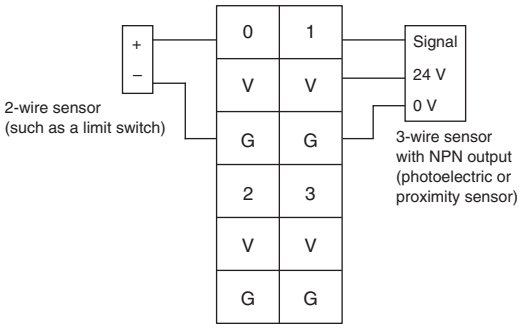
Model name	GRT1-PNT	GRT1-PRT	GRT1-DRT	GRT1-CRT	GRT1-ML2	GRT1-ECT
Network Specification	PROFINET-IO	PROFIBUS-DPV1	DeviceNet	CompoNet	MECHATROLINK-II for Trajexia	EtherCAT for Trajexia and Sysmac (NJ)
Network connector	2 x RJ45, built-in switch with support for MRP redundancy.	9-pin D-Sub	Open-style DeviceNet connector, dual screwless push-in dual connections.	4-pin CompoNet	2 x ML-II	2 x RJ45
Network interface power supply	Internal		External, 11 to 25 VDC, 22 mA	Internal		External 24 VDC (+10% - 15%)
Number of I/O points	1,024 inputs and outputs max. (128 bytes total)			32 bytes input + 32 bytes output max.	1,024 inputs and outputs max. (128 bytes total)	1,024 inputs and outputs max. (128 bytes total)
Number of connectable Units	64 SmartSlice I/O Units max.					
I/O power supply	24 VDC, 4 A max.					
Status flags	1 word for Communications Unit status flags					
Parameter backup and restore	up to 2 KB of data per I/O Unit.					

Digital Input Units

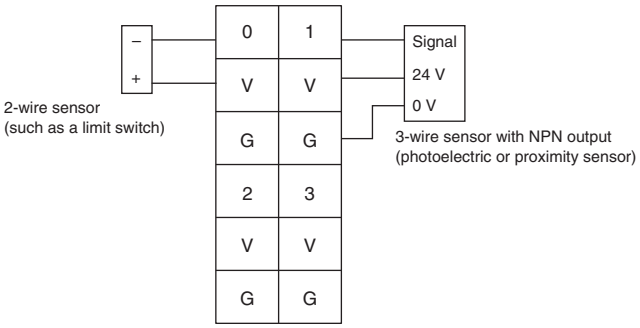
Model name	GRT1-ID4	GRT1-ID4-1	GRT1-ID8	GRT1-ID8-1
Signal type	DC input (for sinking outputs, NPN type)	DC input (for sourcing outputs, PNP type)	DC input (for sinking outputs, NPN type)	DC input (for sourcing outputs, PNP type)
Number of input points	4 inputs		8 inputs	
Power terminals	4 x V (24 V) + 4 x G (0 V)		4 x G (0 V)	4 x V (24 V)
ON voltage	15 VDC min.			
ON current	6 mA max./point (at 24 VDC)		4 mA max./point (at 24 VDC)	
OFF voltage	5 VDC max.			
OFF current	1 mA max.			
ON delay / OFF delay	1.5 ms max.			

Model name	GRT1-IA4-1	GRT1-IA4-2
Signal type	AC input, 110 V	AC input, 230 V
Number of input points	4 inputs	
Power terminals	None	
Input voltage	100 to 120 VAC –15% to +10%, 50/60 Hz	200 to 240 VAC –15% to +10%, 50/60 Hz
ON voltage	70 VAC min.	120 VAC min.
ON current	4 mA min.	
OFF voltage	20 VAC max.	
OFF current	2 mA max.	
ON delay / OFF delay	10 ms max./55 ms max.	10 ms max./40 ms max.

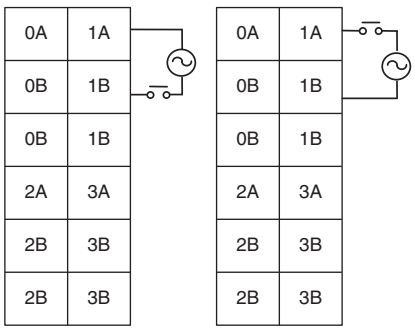
GRT1-ID4 (NPN)



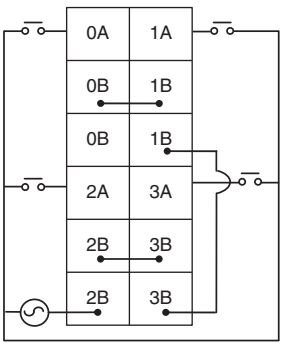
GRT1-ID4 -1 (PNP)



GRT1-IA4-1/GRT1-IA4-2

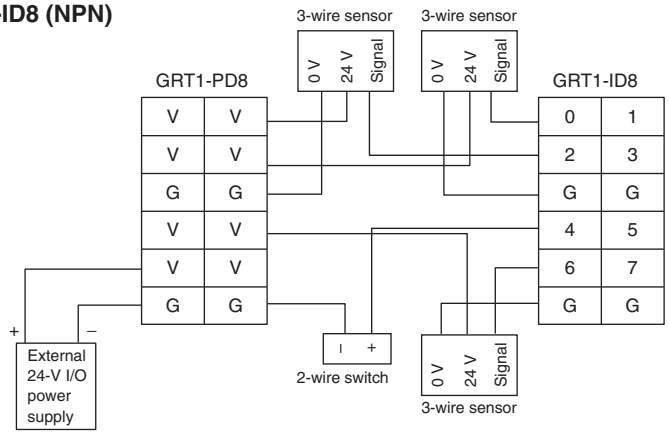


Note: No common signal for inputs.

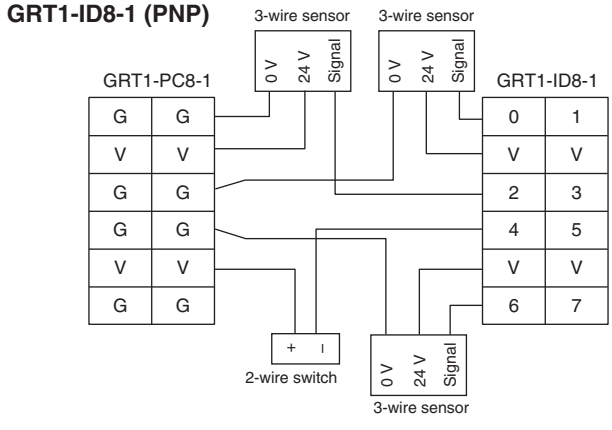


Note: Common signal for four inputs.

GRT1-ID8 (NPN)



GRT1-ID8-1 (PNP)

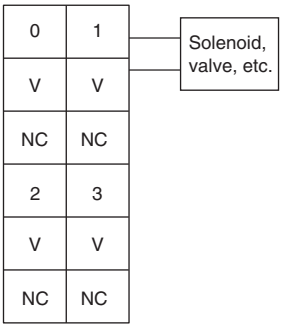


Digital Output Units

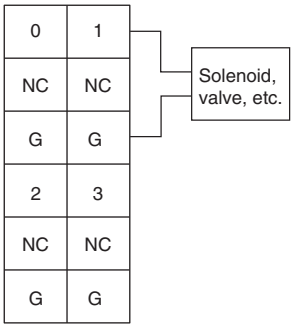
Model name	GRT1-OD4	GRT1-OD4-1	GRT1-OD4G-1	GRT1-OD4G-3
Signal type	Transistor output (NPN type, sinking)	Transistor output (PNP type, sourcing)	Transistor output (PNP type, sourcing), with short-circuit protection	
Number of output points	4 outputs			
Power terminals	4 x V (24 V)	4 x G (0 V)	4 x V (24 V) + 4 x G (0 V)	
Rated voltage	24 VDC (20.4 to 26.4 VDC)			24 V I/O power supply via the front terminal of the unit.
Rated output current	500 mA max./point			from 4 x 2.0 A at 30 °C to 4 x 1.0 A at 55 °C
Residual voltage	1.2 VDC max. (at 500 mA)			1.2 VDC max. (at 2 A)
Leakage cuurent	0.1 mA max.			
ON delay / Off delay	0.5 / 1.5 ms max.			

Model name	GRT1-OD8	GRT1-OD8-1	GRT1-OD8G-1	GRT1-ROS2
Signal type	Transistor output (NPN type, sinking)	Transistor output (PNP type, sourcing)	Transistor output (PNP type, sourcing), with short-circuit protection	Relay output (normally open)
Number of output points	8 outputs			2 outputs (with 2 terminals per connection)
Power terminals	4 x V (24 V)	4 x G (0 V)		n.a.
Rated voltage	24 VDC (20.4 to 26.4 VDC)			250 VAC / 24 VDC
Rated output current	500 mA max./point			2 A (min. 1 mA @ 5 VDC)
Residual voltage	1.2 VDC max. (at 500 mA)			–
Leakage cuurent	0.1 mA max.			–
ON delay / Off delay	0.5 / 1.5 ms max.			15 ms max.
Mechanical life expectancy	–			20,000,000 times min.
Electrical life expectancy	–			100,000 times min.

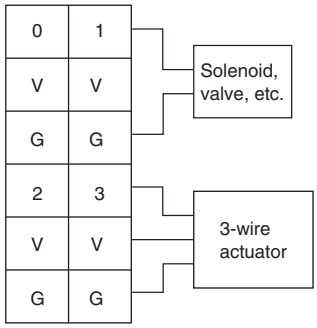
GRT1-OD4



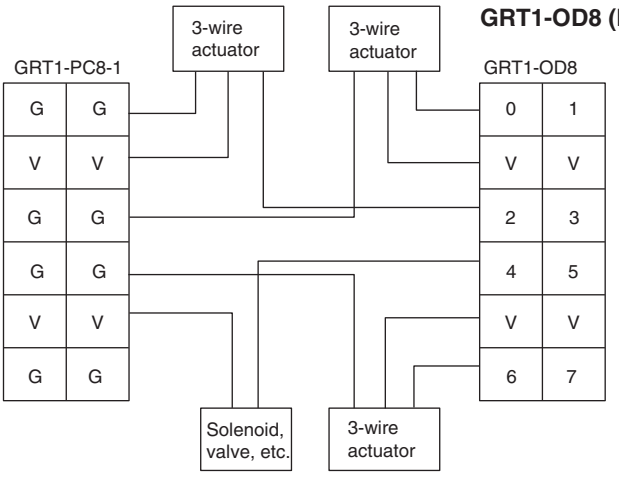
GRT1-OD4-1



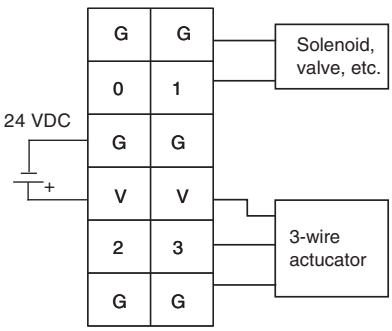
GRT1-OD4G-1 (PNP)

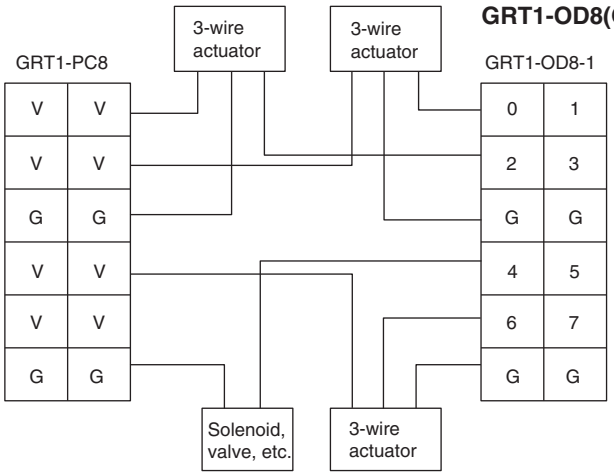


GRT1-OD8 (NPN)



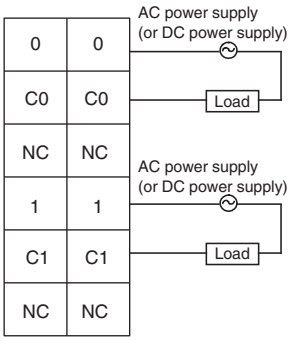
GRT1-OD4G-3 (PNP)





GRT1-OD8(G)-1 (PNP)

GRT1-ROS2



Pulse I/O Units

Model name	GRT1-CT1	GRT1-CT1-1	GRT1-CP1-L
Counter input	A/B incremental encoder, or pulse/direction, or pulse up/down	A/B incremental encoder, or pulse/direction, or pulse up/down	A/B/Z incremental encoder, or pulse/direction/reset
Counter signal type	24 VDC, NPN type	24 VDC, PNP type	24 VDC, PNP type, or RS422 Line driver levels
Max. frequency	60 kHz		100 kHz
Counter range	32 bit double signed integer		
Comparison values	1 range (2 comparison values)		2 independent ranges
Control Input	IN0, DC input (NPN type)	IN0, DC input (PNP type)	
Control Input functions	Capture, Preset, Reset		Capture, Preset, Reset, Z enable
Control Outputs	OUT0, Transistor Output (NPN, sinking)	OUT0, Transistor Output (PNP, sourcing)	OUT0, OUT1, Transistor Output (PNP, sourcing)
Control Output functions	Range comparison, manual override		
Additional functions	On-the-fly reconfiguration, Frequency measurement		

Note: Pulse I/O Units are not supported by GRT1-ML2 and GRT1-ECT.

GRT1-CT1(-1)

GRT1-CT1 (NPN)

A	OUT
B	V
Z/IN	N.C.
N.C.	N.C.
V	V
G	G

GRT1-CT1-1 (PNP)

A	OUT
B	N.C.
Z/IN	G
N.C.	N.C.
V	V
G	G

GRT1-CP1-L

24-V rotary encoder (all DIP switch pins ON)

A	N.C.
B	N.C.
Z	N.C.
IN	OUT0
V	OUT1
G	G

Line driver rotary encoder (all DIP switch pins OFF)

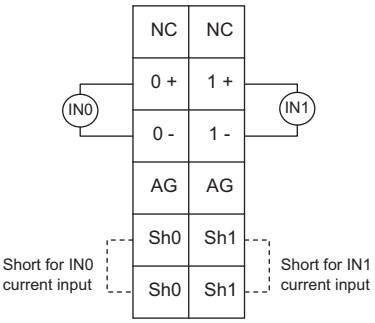
A+	A–
B+	B–
Z+	Z–
IN	OUT0
V	OUT1
G	G

Analog I/O Units

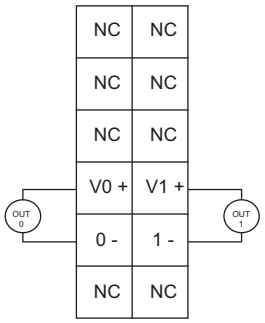
Model name	GRT1-AD2	GRT1-DA2V	GRT1-DA2C
Signal type	Analog Input: 0-20mA, 4-20mA, ±10V, 0-10V, 0-5V, 1-5V	Analog Output: ±10V, 0-10V, 0-5V, 1-5V	Analog Output: 0-20mA, 4-20mA,
Number of points	2 inputs	2 outputs	
Resolution	1/6000 full scale		
Conversion time	2ms / 2points		

Model name	GRT1-TS2P	GRT1-TS2PK	GRT1-TS2T
Signal type	Temperature input, Pt100, (2-wire, 3-wire)	Temperature input, Pt1000, (2-wire, 3-wire)	Thermocouple, R, S, K, J, T, E, B, N, L, U, W, or PL2
Number of points	2 inputs		
Indication range	–200 to +200 °C / –200 to +850 °C		Depends on thremocouple type
Accuracy	±0.3% of PV or ±0.8 °C* (whichever is larger) ±1 digit max. * (or ±0.5 °C for –200 °C to +200 °C input range)		±2°C ±1 digit max. Mounting restrictions apply. See Operation Manual W455
Resolution	0.1 °C, 16-bit signed integer, or 0.01 °C, 32-bit signed double integer		
Conversion time	250 ms / 2 points		

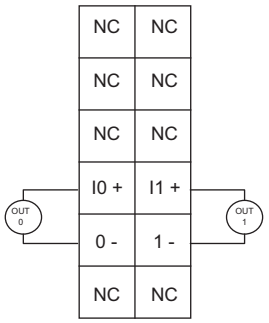
GRT1-AD2



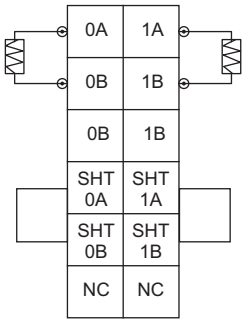
GRT1-DA2V



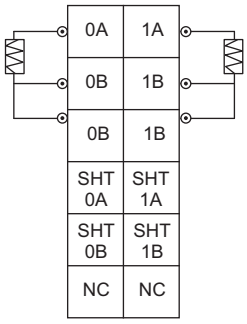
GRT1-DA2C



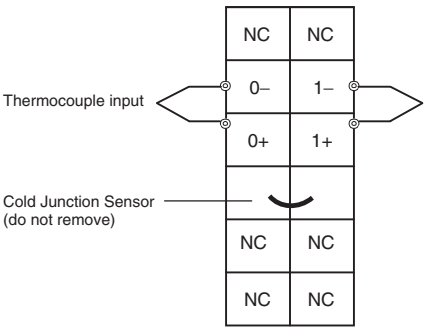
GRT1-TS2P/PK (2-wire)



GRT1-TS2P/PK (3-wire)

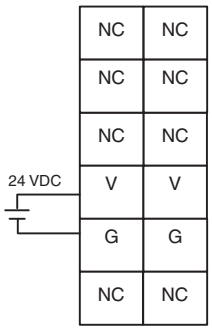


GRT1-TS2T

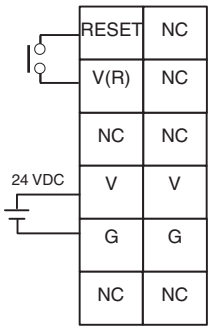


Power Feed and Distribution Units

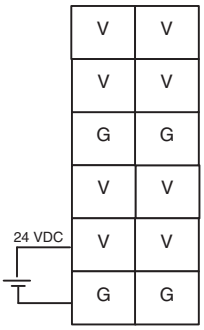
GRT1-PD2



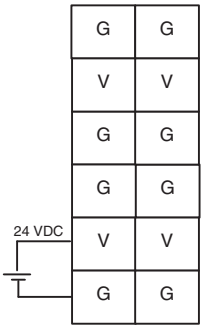
GRT1-PD2G



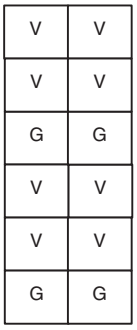
GRT1-PD8



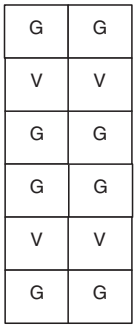
GRT1-PD8-1



GRT1-PC8

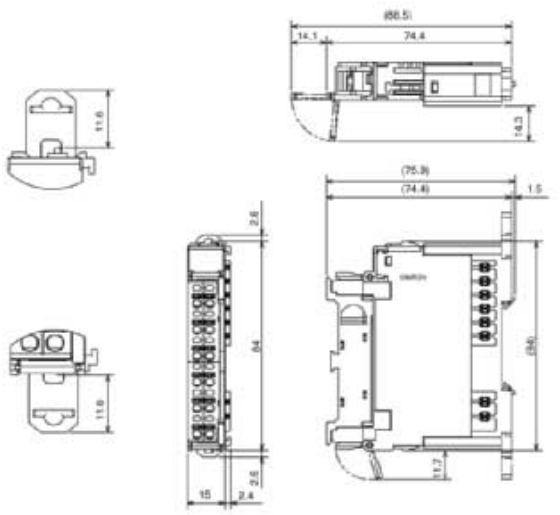


GRT1-PC8-1



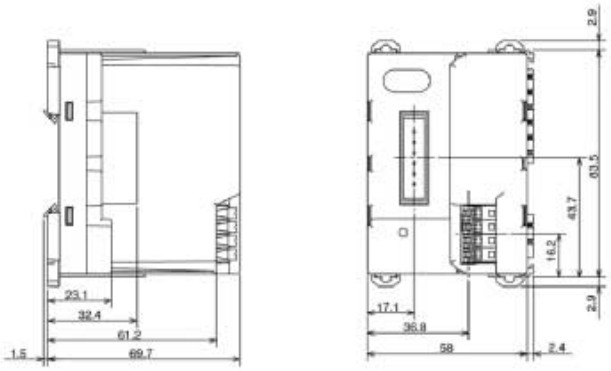
Dimensions

I/O-units



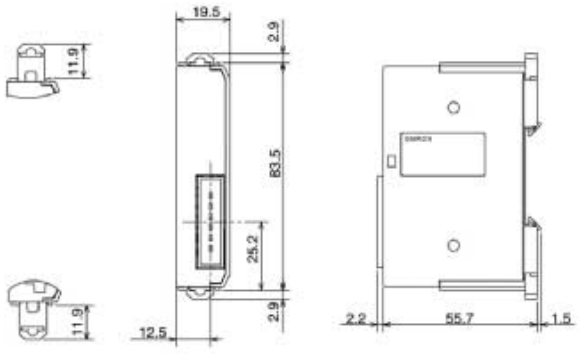
Communication Units

GRT1-CRT
GRT1-DRT
GRT1-ECT
GRT1-ML2
GRT1-PNT
GRT1-PRT
GRT1-TBL



End units

GRT1-END
GRT1-END-M
GRT1-TBR



Ordering Information

Communication Units

Function	Specification		Model code
DeviceNet interface unit	For up to 64 I/O units	84x58x70	GRT1-DRT
CompoNet interface unit	For up to 64 I/O units (limited to 32 byte in + 32 byte out)	84x58x70	GRT1-CRT
PROFIBUS-DP interface unit	For up to 64 I/O units	84x58x70	GRT1-PRT
PROFINET-IO interface unit	For up to 64 I/O units	84x58x70	GRT1-PNT
MECHATROLINK-II interface unit	For up to 64 I/O units (slave to Trajexia motion controller)	84x58x70	GRT1-ML2
EtherCAT interface unit	For up to 64 I/O units (slave to Trajexia and Sysmac controllers)	84x58x70	GRT1-ECT
End plate	One unit required per bus interface	84x20x58	GRT1-END
End plate with memory function	Supports toolless replacement of PROFINET-IO interface unit	84x20x58	GRT1-END-M

I/O units

Function	Specification		Model code
4 NPN inputs	24 VDC, 6 mA, 3-wire connection	84x15x74	GRT1-ID4
4 PNP inputs	24 VDC, 6 mA, 3-wire connection	84x15x74	GRT1-ID4-1
8 NPN inputs	24 VDC, 4 mA, 1-wire connection + 4xG	84x15x74	GRT1-ID8
8 PNP inputs	24 VDC, 4 mA, 1-wire connection + 4xV	84x15x74	GRT1-ID8-1
4 AC inputs	110 VAC, 2-wire connection	84x15x74	GRT1-IA4-1
4 AC inputs	230 VAC, 2-wire connection	84x15x74	GRT1-IA4-2
4 NPN outputs	24 VDC, 500 mA, 2-wire connection	84x15x74	GRT1-OD4
4 PNP outputs	24 VDC, 500 mA, 2-wire connection	84x15x74	GRT1-OD4-1
4 PNP outputs with short-circuit protection	24 VDC, 500 mA, 3-wire connection	84x15x74	GRT1-OD4G-1
4 PNP outputs with short-circuit protection	24 VDC, 2 A, 2-wire connection	84x15x74	GRT1-OD4G-3
8 NPN outputs	24 VDC, 500 mA, 1-wire connection + 4xV	84x15x74	GRT1-OD8
8 PNP outputs	24 VDC, 500 mA, 1-wire connection + 4xG	84x15x74	GRT1-OD8-1
8 PNP outputs with short-circuit protection	24 VDC, 500 mA, 1-wire connection + 4xG	84x15x74	GRT1-OD8G-1
2 relay outputs	240 VAC, 2A, normally-open contacts	84x15x74	GRT1-ROS2
60 kHz Counter unit, NPN	A+B encoder inputs + 1 Z/control input + 1 output (NPN-type)	84x15x74	GRT1-CT1
60 kHz Counter unit, PNP	A+B encoder inputs + 1 Z/control input + 1 output (PNP-type)	84x15x74	GRT1-CT1-1
100 kHz Counter / Positioner unit	A+B+Z encoder inputs (line driver or 24 V selectable) + 1 control input + 2 outputs (PNP-type)	84x15x74	GRT1-CP1-L
2 analog inputs, current/voltage	±10 V, 0-10 V, 0-5 V, 1-5 V, 0-20 mA, 4-20 mA	84x15x74	GRT1-AD2
2 analog outputs, voltage	±10 V, 0-10 V, 0-5 V, 1-5 V	84x15x74	GRT1-DA2V
2 analog outputs, current	0-20 mA, 4-20 mA	84x15x74	GRT1-DA2C
2 Pt100 inputs	Pt100, 2-wire or 3-wire connection	84x15x74	GRT1-TS2P
2 Pt1000 inputs	Pt1000, 2-wire or 3-wire connection	84x15x74	GRT1-TS2PK
2 Thermocouple inputs	Types B, E, J, K, N, R, S, T, U, W, PL2, with cold junction compensation	84x15x74	GRT1-TS2T

Other units

Function		Model code
I/O power feed unit, separates power supply between groups of I/O units	84x15x74	GRT1-PD2
I/O power feed unit with electronic overload protection, separates power supply between groups of I/O units	84x15x74	GRT1-PD2G
I/O power feed and distribution unit, separates power supply between groups of I/O units, 8xV + 4xG	84x15x74	GRT1-PD8
I/O power feed and distribution unit, separates power supply between groups of I/O units, 4xV + 8xG	84x15x74	GRT1-PD8-1
I/O power connection unit, 8xV + 4xG	84x15x74	GRT1-PC8
I/O power connection unit, 4xV + 8xG	84x15x74	GRT1-PC8-1
Turnback Unit, right-hand side	84x20x58	GRT1-TBR
Turnback Unit, left-hand side	84x58x70	GRT1-TBL
Turnback cable, one meter	1 m	GCN2-100

Accessories

Function	Model code
Replacement front connectors, pack of 5 pcs.	GRT1-BT1-5
PROFIBUS-DP connector, 9-pin D-sub	PROFIBUS Connector 839550
PROFIBUS-DP connector, 9-pin D-sub, with bus termination	PROFIBUS Term. Conn. 846086
CompoNet screw terminal connector (order per 10 pcs)	DCN4-TB4
CompoNet branch line connector (order per 10 pcs)	DCN4-BR4
CompoNet Y-connector (order per 10 pcs)	DCN4-MD4

Master Units

Function	Model code
PROFINET-IO Controller for CJ1-series PLCs	CJ1W-PNT21
PROFIBUS-DP Master Unit for CS1-series PLCs	CS1W-PRM21
PROFIBUS-DP Master Unit for CJ1-series PLCs	CJ1W-PRM21
DeviceNet Master Unit for CS1-series PLCs	CS1W-DRM21-V1
DeviceNet Master Unit for CJ1-series PLCs	CJ1W-DRM21
CompoNet Master Unit for CS1-series PLCs	CS1W-CRM21
CompoNet Master Unit for CJ1-series PLCs	CJ1W-CRM21
MECHATROLINK-II Master Unit for Trajexia (4 stations max.)	TJ1-ML04
MECHATROLINK-II Master Unit for Trajexia (16 stations max.)	TJ1-ML16
EtherCAT Master Unit for Trajexia	TJ2-ECT□□
HMI with PLC and DeviceNet Master	NSJxx-T□□□□-G5D
HMI with PLC and PROFIBUS-DP Master	NSJxx-T□□□□-G5P

Software

Function	Model code
CX-One, Omron's integrated software for programming and configuration of all control system components, including PLCs, remote I/O, HMI, servo drives, inverters, temperature controllers and advanced sensors.	CX-ONE-AL□□ C-E □□ = number of licenses (01, 03, 10)

Cat. No. P15E-EN-03B **In the interest of product improvement, specifications are subject to change without notice.**

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