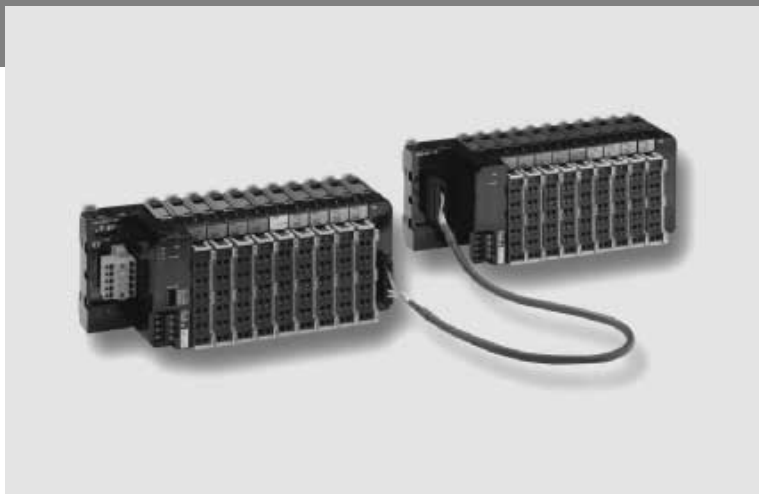


# SmartSlice

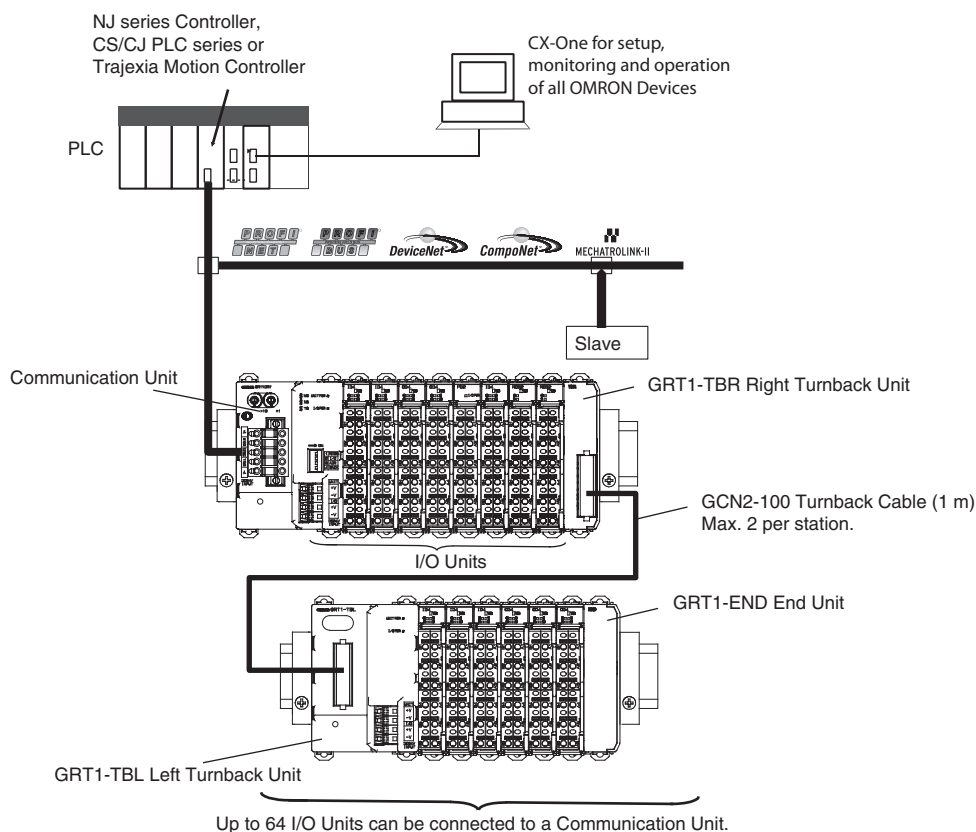
## The smartest modular I/O system

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 screw-driver 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 <sup>2</sup> |
| Shock resistance                 | 150 m/s <sup>2</sup> , 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

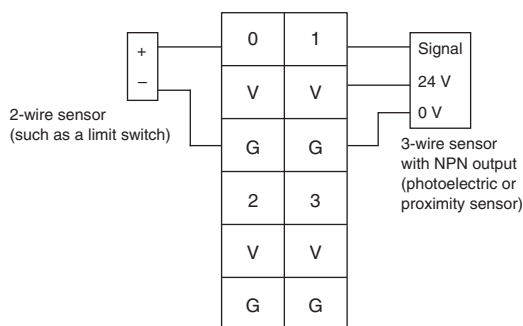
| Model name                     | GRT1-PNT                                                   | GRT1-PRT      | GRT1-DRT                                                                 | GRT1-CRT                              | GRT1-ML2                                        | GRT1-ECT                                        |
|--------------------------------|------------------------------------------------------------|---------------|--------------------------------------------------------------------------|---------------------------------------|-------------------------------------------------|-------------------------------------------------|
| 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

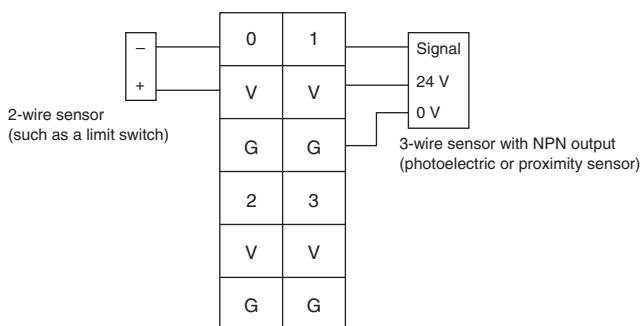
| Model name             | GRT1-ID4                                  | GRT1-ID4-1                                | GRT1-ID8                                  | GRT1-ID8-1                                |
|------------------------|-------------------------------------------|-------------------------------------------|-------------------------------------------|-------------------------------------------|
| Signal type            | DC input (for sinking out-puts, NPN type) | DC input (for sourcing outputs, PNP type) | DC input (for sinking out-puts, 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<br>-15% to +10%, 50/60 Hz | 200 to 240 VAC<br>-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.                    |

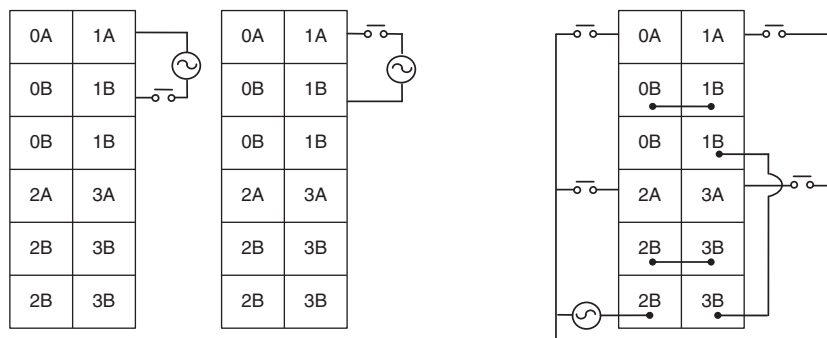
### GRT1-ID4 (NPN)



### GRT1-ID4 -1 (PNP)



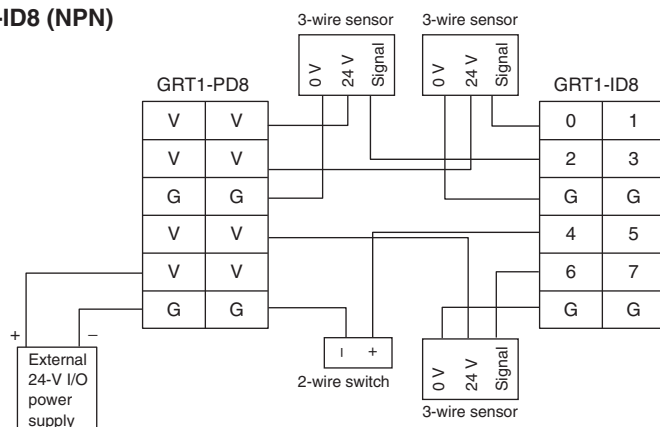
### GRT1-IA4-1/GRT1-IA4-2



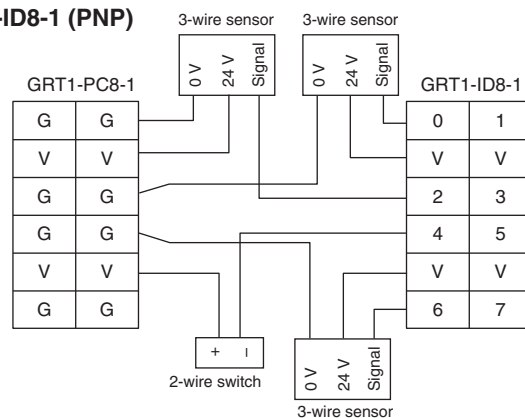
**Note:** No common signal for inputs.

**Note:** Common signal for four inputs.

### GRT1-ID8 (NPN)



### GRT1-ID8-1 (PNP)

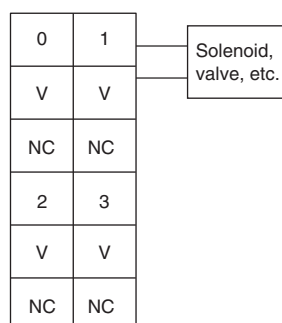


## Digital Output Units

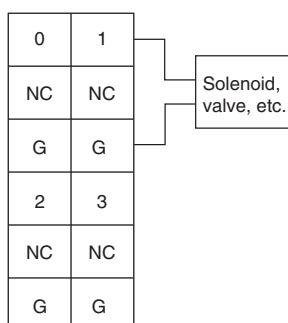
| Model name              | GRT1-OD4                              | GRT1-OD4-1                             | GRT1-OD4G-1                                                           | GRT1-OD4G-3                                               |
|-------------------------|---------------------------------------|----------------------------------------|-----------------------------------------------------------------------|-----------------------------------------------------------|
| 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 current         | 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 current            | 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.                          |

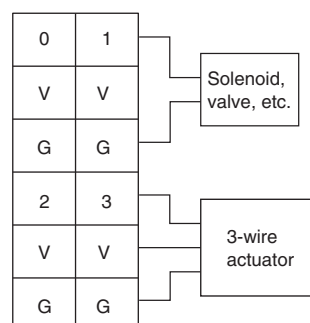
### GRT1-OD4



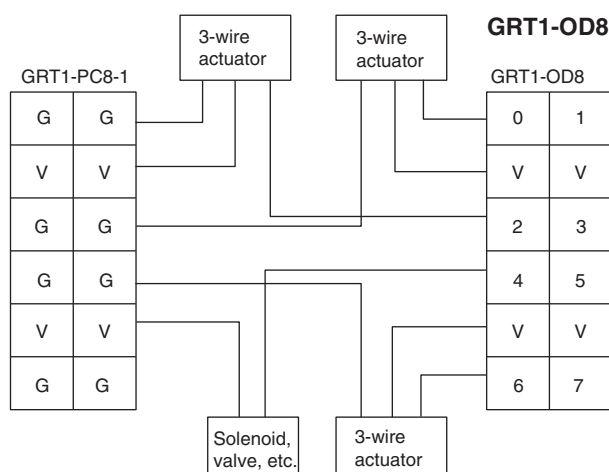
### GRT1-OD4-1



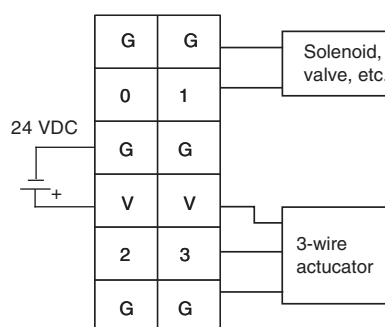
### GRT1-OD4G-1 (PNP)

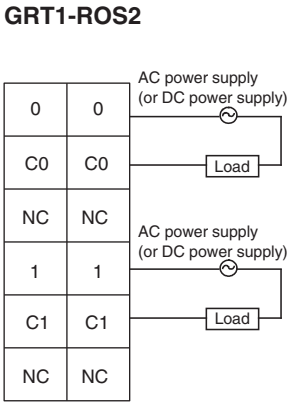
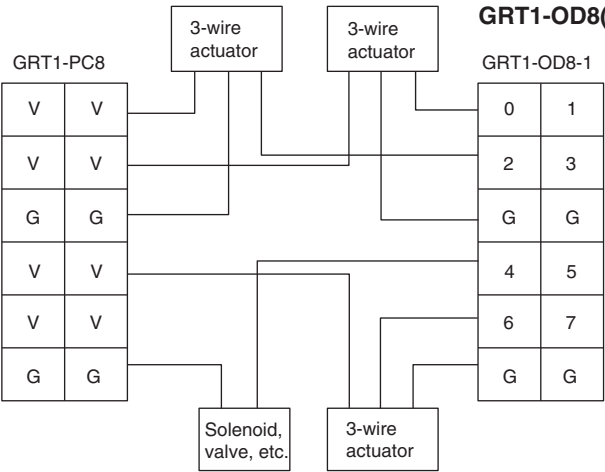


### GRT1-OD8 (NPN)



### GRT1-OD4G-3 (PNP)





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)

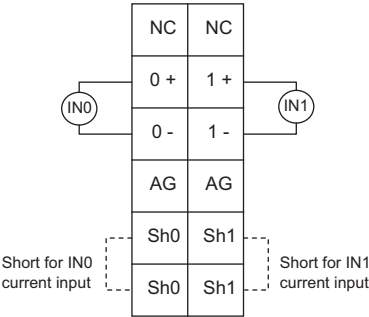
|    |      |
|----|------|
| A+ | A-   |
| B+ | B-   |
| Z+ | Z-   |
| IN | OUT0 |
| V  | OUT1 |
| G  | G    |

Analog I/O Units

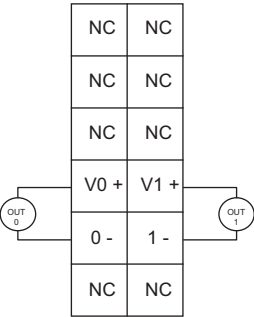
| Model name       | GRT1-AD2                                              | GRT1-DA2V                              | GRT1-DA2C                      |
|------------------|-------------------------------------------------------|----------------------------------------|--------------------------------|
| 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.<br>* (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                                                                                                |                                             |                                                                           |

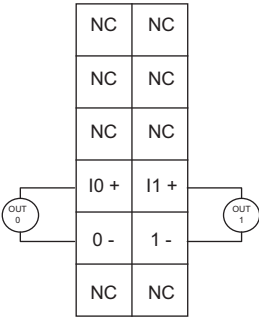
GRT1-AD2



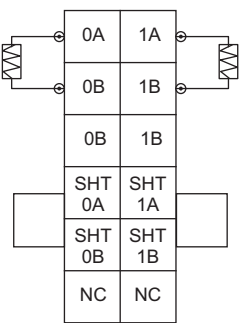
GRT1-DA2V



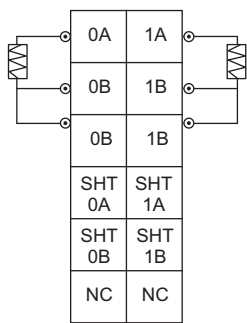
GRT1-DA2C



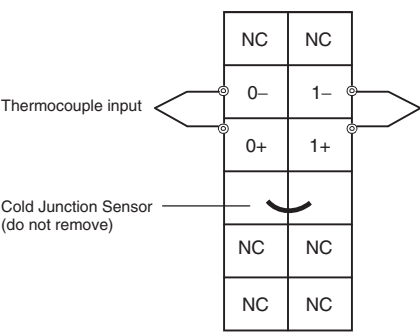
GRT1-TS2P/PK (2-wire)



GRT1-TS2P/PK (3-wire)

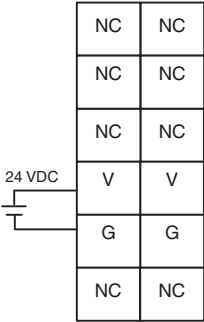


GRT1-TS2T

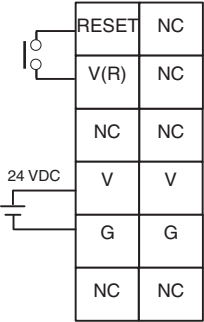


Power Feed and Distribution Units

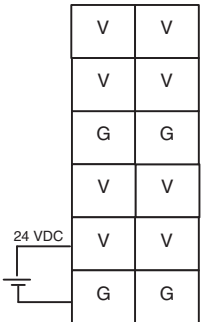
GRT1-PD2



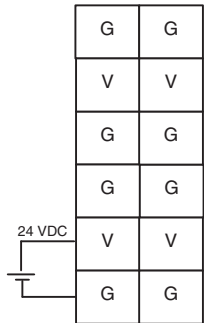
GRT1-PD2G



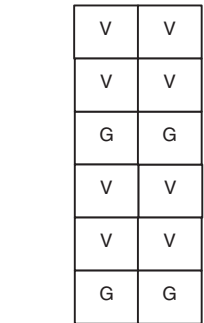
GRT1-PD8



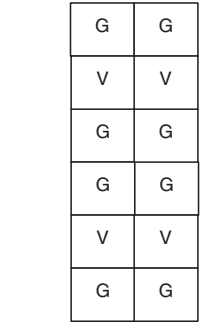
GRT1-PD8-1



GRT1-PC8

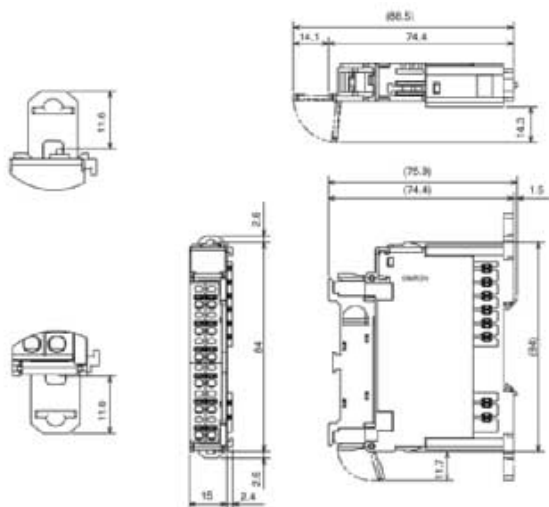


GRT1-PC8-1



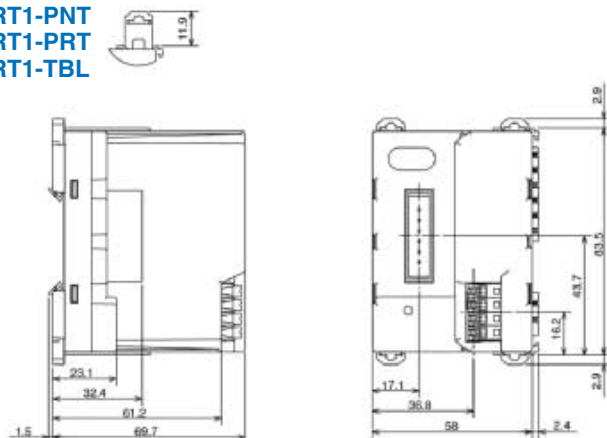
## Dimensions

### I/O-units



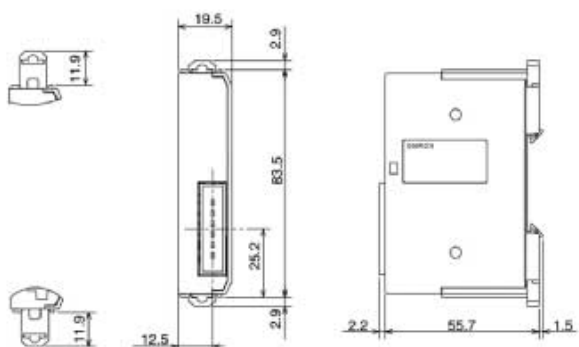
### Communication Units

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

### I/O units

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

### Other units

| Function                                                                                                    | Model code             |
|-------------------------------------------------------------------------------------------------------------|------------------------|
| I/O power feed unit, separates power supply between groups of I/O units                                     | 84x15x74<br>GRT1-PD2   |
| I/O power feed unit with electronic overload protection, separates power supply between groups of I/O units | 84x15x74<br>GRT1-PD2G  |
| I/O power feed and distribution unit, separates power supply between groups of I/O units, 8xV + 4xG         | 84x15x74<br>GRT1-PD8   |
| I/O power feed and distribution unit, separates power supply between groups of I/O units, 4xV + 8xG         | 84x15x74<br>GRT1-PD8-1 |
| I/O power connection unit, 8xV + 4xG                                                                        | 84x15x74<br>GRT1-PC8   |
| I/O power connection unit, 4xV + 8xG                                                                        | 84x15x74<br>GRT1-PC8-1 |
| Turnback Unit, right-hand side                                                                              | 84x20x58<br>GRT1-TBR   |
| Turnback Unit, left-hand side                                                                               | 84x58x70<br>GRT1-TBL   |
| Turnback cable, one meter                                                                                   | 1 m<br>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<br>839550   |
| PROFIBUS-DP connector, 9-pin D-sub, with bus termination | PROFIBUS Term. Conn.<br>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<br>□□ = number of licenses<br>(01, 03, 10) |

Cat. No. P15E-EN-03B

In the interest of product improvement, specifications are subject to change without notice.

## OMRON EUROPE B.V.

Wegalaan 67-69,  
NL-2132 JD, Hoofddorp,  
The Netherlands  
Phone: +31 23 568 13 00  
Fax: +31 23 568 13 88  
www.industrial.omron.eu