



GIO212 Universal Input/Output Module

The GIO212 is a module that can measure and output various types of signals. Each channel can be used as analog or digital output or input. With the standard signals current (0/4 to 20 mA) and voltage (± 10 V), various sensors and actuators can be connected. A resolution of 16 bits allows measurement results from signals that do not completely use the measuring range (e.g. 0 to 5 V). Temperatures are playing a significant role in ever more processes, which is why this module supports Pt100/Pt1000 in 2-, 3-, and 4-wire measurement, as well as all standard type thermoelements. Similarly, the channels can be used as digital inputs, which can also be configured as interrupt input and digital 32-bit counters. The values of the pulse length or period measurement can be buffered in a FIFO (1022 values).

The quick digital 24 V output can be selected as Push-Pull, High-Side or Low-Side. The output can be controlled as simple output or as PWM / frequency output. The frequency mode allows the control of the stepper motor output stage via the output of the number of pulses or freely selectable profiles (FIFO).

Up to two signal types can be used simultaneously per channel. This allows up to 24 channels per GIO212. Analog sensors can be supplied via the digital output (short circuit-proof and monitored), actuator signals read back and digital signals monitored analog. Thus, this is a single universal module for countless applications instead of different modules for each signal type. A cost-effective solution that simplifies logistics and service.

Various modes can be combined and set easily via a configuration wizard in the SolutionCenter engineering tool.

| Item | Item-No. |
|-----------|-------------|
| GIO212 | 00020620-00 |
| GIO212 CC | 00020623-00 |

- 12 channels
- Analog and digital inputs and outputs
- Modes that can be selected per channel:
 - Analog voltage input ± 10 V to ± 10 mV
 - Analog current input 0(4) to 20 mA
 - Temperature sensor Pt elements as 2-, 3-, 4-wire
 - Thermoelements type J, K, T, N, E, R, S, B
 - Analog voltage output ± 10 V
 - Analog current output 0(4) to 20 mA
 - Digital input 24 V
 - Digital 32-bit counter, A and A/B operation
 - Digital output 100 mA
 - Low-Side, High-Side, Push-Pull
 - Digital output as 16-bit PWM / frequency modulation
- Resolution: Input 16-bit with filter, output 14-bit
- Filter adjustable from 4 kHz to 0.5 Hz per channel
- Digital status display for analog channels
- Digital inputs in accordance with IEC 61131 Type 1,2,3
- Digital outputs up to 10 kHz
- All outputs overload, short circuit and external voltage-proof
- Measuring range monitoring freely adjustable (± 105 %)
- Error message on overload and overtemperature and undervoltage of the supply
- Galvanic isolation from the system 500 V
- Condensation-proof ColdClimate design (✳)

| GIO212 | | |
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| Inputs/Outputs | | |
| Quantity | 12 channels, individually configurable as input or output | |
| Modes per channel | Analog input Temperature measurement input for Pt elements and thermoelements Analog output Digital input Counter input Digital output PWM output | |
| SYNC signal | In | Analog input, digital input, temperature measurement, counter (depending on the mode) |
| | Out | Analog output, digital output |
| Analog inputs in general | | |
| Digital resolution | 16-bit | |
| Measuring range | ± 105 % of nominal range | |
| Measuring range monitoring | Lower and upper measuring range limit, error message as status or measuring range monitoring | |
| Allowed common mode voltage | Max. ± 1 V | |
| Refresh cycle time | 100 μ s | |
| Cut-off frequency | 4 kHz to 0.5 Hz adjustable channel by channel | |
| Filtering slope | > 80 dB/decade | |
| Voltage inputs | | |
| Input voltage | ± 10 V, ± 1 V, ± 100 mV, ± 10 mV | |
| Basic accuracy at 25 °C | Range ± 10 V: ± 0.05 %FS Range ± 1 V: ± 0.05 %FS Range ± 100 mV: ± 0.05 %FS Range ± 10 mV: ± 0.2 %FS | |
| Current inputs | | |
| Input current | ± 20 mA or 0 to 20 mA or 4 to 20 mA | |
| Basic accuracy at 25 °C | Range ± 20 mA: ± 0.1 %FS Range 0 to 20 mA: ± 0.2 %FS Range 4 to 20 mA: ± 0.2 %FS | |
| Input impedance | Typ. 250 Ohm Max. 300 Ohm | |
| Shunt short-circuit proof | To +24 V | |
| Interference voltage strength | +24 V | |
| Temperature inputs PTC | | |
| Temperature inputs | Pt100/Pt1000 | |
| Connection type | 2-, 3- or 4-wire, optional | |
| Input impedance | > 100 kOhm | |
| Temperature range | -100 to +800 °C | |
| Basic accuracy at 25 °C | Pt100/Pt1000: 0.15 % of 900 ° (measuring range -100 to 800 °C) | |
| Value of the LSB | 0.1 K, measurement values in 1/10 Kelvin | |

| GIO212 | | |
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| Temperature inputs TE | | |
| Temperature elements | Types J, K, T, N, E, R, S, B can be selected | |
| Temperature ranges per type | J | -100 to +1200 °C |
| | K | -100 to +1370 °C |
| | T | -100 to +400 °C |
| | N | -100 to +1300 °C |
| | E | -100 to +1000 °C |
| | R | -50 to +1768 °C |
| | S | -50 to +1768 °C |
| | B | +600 to +1820 °C |
| Ground | Up to ±3 V | |
| Basic accuracy at 25 °C | Input range max. ±0.15 % of the measuring range (S, R, T, B max. ±0.3 %) | |
| Value of the LSB | 0.1 K, measurement values in 1/10 Kelvin | |
| Analog outputs in general | | |
| Digital resolution | 14-bit | |
| Output signal range | ±105 % nominal range | |
| Voltage outputs | | |
| Output voltage | ±10 V | |
| Output current | Max. 10 mA | |
| Basic accuracy at 25 °C | Min. 1 kOhm, max. ±0.05 % of the output current range | |
| Current outputs | | |
| Output current | 0(4) to 20 mA | |
| Basic accuracy at 25 °C | Max. ±0.2 %FS of the output current range | |
| Apparent ohmic resistance | Up to 600 Ohm | |
| Digital inputs | | |
| Input voltage | Nom. 24 VDC | |
| Low level | 0 to 5 V | |
| High-level | +11 to +34 V | |
| According to IEC 61131-2 input current at 24 V | Type 1 | 2 to 6 mA |
| | Type 2 | 6 to 10 mA |
| | Type 3 | 2 to 6 mA |
| Input type "source" | 2 to 6 mA | |
| Input type "comparator" | Typ. 1.2 V (TTL compatible) | |
| Prof. filter for digital inputs | 16 µs to 262 ms, default 1 ms | |
| Digital counter | | |
| Modes | 1, 2, 4-fold evaluation | |
| | Period duration measurement | |
| | Pulse duration measurement | |
| | Combination with 2nd channel: pulse/direction mode or quadrature encoder | |
| | FIFO mode for period/pulse measurement (1022 values) | |
| Counter | Counter up or down (in combination with 2nd channel) | |
| | 32-bit | |
| Count frequency | 125 kHz (500 kHz at 4-fold evaluation) | |

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| Digital counter | | |
| Input type | 24 V, like digital input | |
| Trigger (2nd channel) | Save value | |
| Reset (2nd channel) | Reset counter | |
| Digital output | | |
| Output type | Low-Side, High-Side or Push-Pull (half bridge) | |
| Output current / channel | 0.1 A (briefly 0.5 A for <10 s) | |
| Short-circuit current/channel | 800 mA | |
| Max. switching frequency | 10 kHz | |
| Broken wire detection | Yes | |
| Short circuit, overload | Yes | |
| PWM output | | |
| Output | Specification like digital output | |
| Mode | PWM | |
| | Frequency modulation (frequency, number of pulses, FIFO profile) | |
| Frequency range | 0.95 Hz to 10 kHz | |
| Pulse range | 100 μ s (10 μ s) to 8.192 ms | |
| Frequency resolution | 16 bit (LSB is 125 ns or 16 μ s) | |
| Internal power supplyvvvv | | |
| Supply internal | Via backplane BS2xx | |
| Current consumption internal | 80 mA | |
| Power supply external | | |
| Voltage range external | 18 to 34 VDC | |
| Current consumption external 24 V | Typically 200 mA without external load | |
| Galvanic isolation from the system | 500 V | |
| Approvals / Certificates | | |
| General | CE, cULus, CCC | |
| Marine | DNV, LR, ABS, BV | |
| Ambient conditions | | |
| | Standard | ColdClimate (❄) |
| Operating temperature | -30 to +60 °C | |
| Rel. humidity operation | 5 to 95 % without condensation | 5 to 95 % with condensation |
| Storage temperature | -40 to +85 °C | |
| Rel. humidity storage | 5 to 95 % with condensation | 5 to 95 % with condensation |
| Pollution degree (IEC 60664-1) | 2 (without condensation) | 2 |

| Order Codes | | |
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| Item | Item No. | Description |
| GIO212 | 00020620-00 | Universal input/output module; 12x analog In \pm 10V \pm 20mA Pt TC; 16bit; analog Out \pm 10V 20mA; 14bit; digital In DI 5V / 24V, 125kHz, sink/source, counter; digital Out 24V/100mA, 10kHz, highside/lowside/pushpull, pwm; configurable DI/AI filter; 100 μ s sample and refresh time; threshold monitoring; isolated |
| GIO212 CC | 00020623-00 | Like GIO212; ColdClimate (❄) |
| Accessories | | |
| KS-GIO212 B+C | 00023145-00 | Terminal set cage clamp small (4 x KS 35/15; 1 x KZ 51/02) with labeling strip and coding elements |