

General Features

The i201 and i202 are intelligent digital I/O modules for the ionia™ system. i201 has 16 digital input channels whereas i202 has 8 digital input channels and 8 combined input/output channels. i202 has output read back functionality for implementing safety relevant applications.

All high current inputs (HCI) provide a sampling mechanism to discharge parasitic capacitances. The HCI feature can be switched on and off by the application software. Additionally, selected inputs can be configured as frequency or counter inputs.

Every output is short circuit protected and reports directly to the central unit. Moreover, selected output channels can be configured as PWM output channels.

The configuration registers and all input/output states are ac-

cessible by the central unit through a fast and secure point-to-point connection (duagon serial star slave)

i201 and i202 have independent supply voltage feeds, which allows separately fused I/O circuits.

A built-in supervisory mechanism called «Condition Monitoring» can detect and report different informations like the supply voltage, the temperature on the module, overcurrent of the separate channel, etc. In this way the CPU is able to detect any off-limit usage.

Configuring the i201/i202 is done easily and time saving by using one of the five methods defined by IEC 61131.

The i201 and i202 are designed for harsh rolling stock environments and is fully compliant to EN 50155.

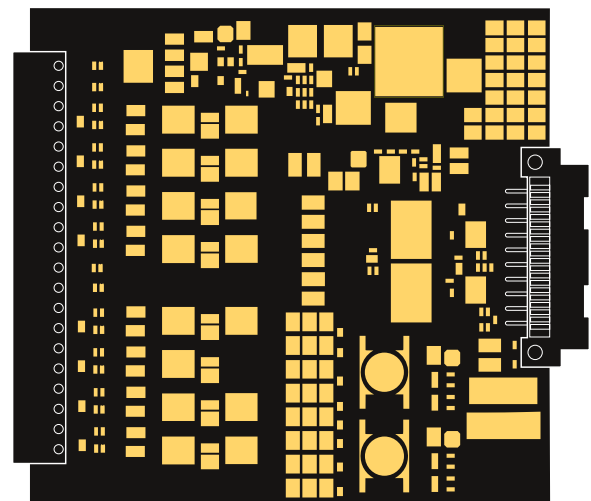
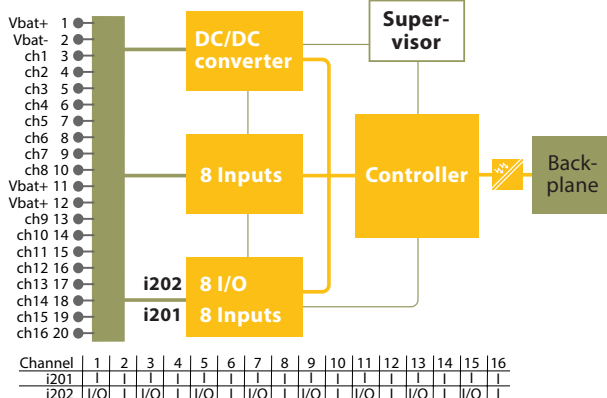
Key Benefits

- Intelligent controller features such as PWM, frequency counter, etc.
- Configurable status LEDs on each channel for easy diagnostics
- Independent supply voltage feeds, enable separately fused circuits
- driving direction and velocity measurement
- «Condition Monitoring» for detailed diagnostics
- No capacitor replacement necessary
- No need for physical addressing (duagon serial star controller)
- Complies to EN 50155, EN 50121, IEC 61373

Application Examples

- General input / output controller
- Frequency measurement for speed measurement or PWM input detection
- PWM output functions
- Battery monitoring

i201, i202 Hardware Architecture



Life Cycle Cost

The i201 and i202 have been strictly designed without electrolytic capacitor and without any optocoupler to avoid service cost for changing capacitors and to reduce the life cycle cost of the system. The use of

an FPGA with included duagon soft-IP minimizes the risk and costs in case of component obsolescence. Any firmware upgrade can be done via the central unit, without the need of removing the device.

Technical Data

Input Channels	<ul style="list-style-type: none"> – 16 (i201) / 8 (i202) current sink input channels with switching current circuit – Inputs with 10mA current sink (HCl) – Nominal high level input current during scan idle time: 0.024 mA @ 24V, 0.11 mA @ 110V – Minimal input voltage high recognition: 0.30* V_{bat+} – Maximal input voltage low recognition: 0.17* V_{bat+} – Configurable as frequency input 0.1 Hz to 200 kHz
Bidir Channels	<ul style="list-style-type: none"> – 8 (i202) high side (FET) from battery voltage – Read back on every output channel (alternatively usable as inputs instead of output) – Fail safe operation on every output channel – Overcurrent detection per channel – Output short circuit protection – Nominal load current continuous: max. 1 A – Surge current allowed: 6 A – Nominal output switch on resistance: 0.2Ω – Configurable as 16bit PWM 16 Hz to 10 kHz
Supply Voltage	<ul style="list-style-type: none"> – 24 Vdc to 110 Vdc (14.4 to 154 for 1s) – Reverse polarity, overvoltage and short circuit protected – 1000 Vac galvanic isolation – Interruption class S2 with ceramic capacitors
Programming	<ul style="list-style-type: none"> – Programmable by the central unit using IEC 61131 LD, FBD, ST, IL and SFC – Firmware update handled by the central unit
Security / Watchdog	<ul style="list-style-type: none"> – External supervisor for voltage, current and temperature monitoring → «Condition Monitoring» – Communication Link with watchdog supervision

Backplane Communication	<ul style="list-style-type: none"> – 100 Mbit duagon serial star slave – Secure communication protocol – Configurable status scan cycle time minimum: 1 ms
Diagnostic/ Service	<ul style="list-style-type: none"> – Configurable diagnostic LEDs for each channel indicating the status of the channel or a user-defined functionality – LEDs for visual status information (power on, running, communicating, failure, I/O, ...) – Diagnostic information readable through the central unit's service interfaces (see i101/i102/i103 for further information about these possibilities)
Power Consumption	<ul style="list-style-type: none"> – P_{max} < 1.5 W (internal logic only)
Operating Conditions	<ul style="list-style-type: none"> – Ambient temperature: –40 to +85 °C (EN 50155) – Relative humidity: 75%, max 95% for 30 days per year (conformal coating) EN 60068 – Shock and vibration: According to IEC 61373 category 1, class B – EMI: According to EN 50121 and EN 50155
Dimensions/ Weight	<ul style="list-style-type: none"> – 3TE × 92 × 86 mm, fitting the ionia™ housing – <100 g
Cabling	<ul style="list-style-type: none"> – Connector type: FMC 1,5/ 20-STF-3,5 or similar – Wire cross section: 0.2mm² to 1.5mm²
Environment	<ul style="list-style-type: none"> – Fully compliant to RoHS and REACH

d-006321-017378

Order Code and HW Options

Product Type: **i** - - EXAMPLE: i201-F or i202-N-P

Config		Frequency measurement	PWM
16 inputs	i201	no on 8 channels	N F
8 in / 8 out	i202	no on 8 channels	N F no on 8 channels N P

Related Documents

Data Sheet i201/i202  d-006040-nnnnnn.pdf
available at www.duagon.com

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