

Remote I/O Expansion Modules

I/O Expansion Modules for Railway Applications

LEADING THE EMBEDDED FUTURE



- Designed for railway applications
- Wide range of I/O options
- High-level I/O integration enables complex control
- RS485 isolated port for connection with the Master Controller
- Scalable design for easy configuration adaptation
- Suitable for nominal battery voltages of 24 V DC
- Connections via cage clamp plug socket connectors
- Operating temperature range: -40 °C to +70 °C (+85 °C for 10 minutes)
- EN 50155 compliant



Applications

The RIO3 I/O modules support applications like Passenger Vehicle Condition Based Monitoring, HVAC Control Systems or onboard controls for fire protection, power packs and doors.

Flexible Design for Railway Subsystems

If the standard PC3 does not cover all I/O needs for your configuration, duagon can create a RIO3 Remote I/O module, which will work as slave system and will communicate with the Master Controller via a RS485 isolated port. RIO3 is also suitable when is more convenient to allocate the I/O module close to the actuators in the train configuration.

I/O Modules

To create the RIO3 Remote I/O module, up to nine PC3 I/O modules can be selected and combined. Once you have chosen your configuration, the RIO3 is quickly manufactured resulting in a railway compliant product. Our wide range of certified off-the-shelf modules are listed in the following table. If your requirements are slightly different to our standard product offering, we can provide our ISO 9001 accredited design services to customize the RIO3 Remote I/O module to suit your application.

Data Sheet



I/O Module	Power Supply	Digital Inputs	Digital Outputs	Analog Inputs	Analog Outputs
IO3000	24 V DC	16	-	-	-
IO3010	110 V DC	16	-	-	-
IO3010R	110 V DC	16 (RIA-12)	-	-	-
IO3020	110 V DC	8 Isolated	-	-	-
IO3030	24 V DC	8 Isolated	-	-	-
IO3100	24 V DC	-	8	-	-
IO3130	110 V DC	-	12	-	-
IO3200	24 V DC	-	-	14 ¹⁾	-
IO3210	24 V DC	-	-	8 ¹⁾	-
IO3220	24 V DC	-	-	8 ¹⁾ Isolated	-
IO3300	24 V DC	-	-	-	4 ²⁾
IO3310	24 V DC	-	-	-	8 ²⁾
IO3400	24 V DC	8	8	-	-
IO3410	110 V DC	8	8	-	-
IO3500	24 V DC	4	4	4 ¹⁾	-
IO3510	24 V DC	24	10	8 ¹⁾	2 ²⁾
IO3520	24 V DC	-	-	4 ¹⁾	4 ²⁾
IO3530	24 V DC	-	-	6 ¹⁾	2 ²⁾
IO3545	24 V DC	24	18	8 ¹⁾	2 ²⁾

1) Configurable inputs. See analog input technical data.

2) Configurable outputs. See analog output technical data.

Technical Data

Digital Inputs	- Channels configurable via software - Input voltage 24 V DC nom. or 110 V DC nom. - Input current 5 mA, nominal - Input type - High-side switch (load to ground)
Digital Outputs	- Output type - High-side switch (load to ground)
Analog Inputs	- Channels with 12-bit resolution - Configurable as: - Current: 0 to 20 mA or - Voltage: 0 to 10 V DC 8 RTD input channels, 2-wire RTD, RTD sensors supported, PT100 or PT1000 -50 °C to 500 °C temperature range
Analog Outputs	- Channels with 12-bit resolution - Configurable as: - Voltage: 0 to 12 V DC
Interfaces	- Serial: 1 × RS485, isolated, D-Sub, 9-pin, receptacle - Earthing connection: M4 screw
Electrical Specifications	Supply voltage: 24 V DC nom. or 110 V DC nom.
Mechanical Specifications	- Dimensions: (W) depending on selected quantity of modules, (D) 192 mm, (H) 55.2 mm - Mounting: Wall/flat surface - Protection rating: IP20
Product Compliance: Rail - Rolling Stock	- Operating temperature: -40 °C to +70 °C, +85 °C for 10 min (EN 50155:2017, class OT4, ST1) - Storage temperature: -40 °C (EN 50155:2017) to +85 °C (EN 60068-2-2, Bb) - Altitude: +2000 m max. (EN 50125-1:2014, class AX) - Shock: 30 ms @ 50 m/s² (EN 61373:2010/AC:2017-09, vehicle body, cat. 1, class B) - Vibration: 10 min @ 1.01 m/s² (functional) and 5 h @ 5.72 m/s² (long-life) (EN 61373:2010/AC:2017-09, vehicle body, cat. 1, class B) - Fire protection: EN 45545-2:2013 + A1:2015, HL1 - EMC emission: EN 50121-3-2:2016 + A1:2019 - EMC immunity: EN 50121-3-2:2016 + A1:2019