

# RIO2011 Remote I/O Expansion Module for use with the PC2 and PC3 range of Railway Programmable Controllers

## *EN 50155 Compliant Remote I/O Expansion Module*

The RIO2011 is an ideal remote I/O expansion module for the PC2 and PC3 range of Railway Programmable Controllers. The RIO2011 is comprised of the following I/O: 16 digital inputs, 16 digital outputs, and 4 analogue inputs.

The RIO2011 Remote I/O expansion module is programmable via its Master Controller using the iecTeso IEC61131-3 (LD, FBD, SFC, IL, ST) environment or the "C-API" development environment.

### Features and benefits

- One Isolated RS485 port for connection with the Master Controller
- 10 Digital Inputs 5mA @ 24VDC
- 6 Digital Inputs factory configurable as either: 5mA @ 24VDC, or 1.5mA @ 5VDC suitable for use with Dallas DS1820 Digital Temperature sensors
- 16 Digital Outputs 24VDC 0.5A with individual short circuit protection with automatic reset
- 4 Analogue Inputs. Individual analogue input channels are factory configurable as either: 0 to +36VDC; 0 to +10VDC; 0 to 20mA; and NTC Thermistor.
- Suitable for nominal battery voltages of 24VDC in accordance with EN 50155.
- Operating temperature range: -40°C to +85°C
- Conformal Coating
- EN 50155 Compliant

### Applications

- Passenger Vehicle Condition Based Monitoring
- Heating Ventilation Air Conditioning (HVAC) Control Systems
- Locomotive Performance and Condition Monitoring

### Ordering Information

- Part Number: 070-0590



## Preliminary Specification

Description	RIO201 I Remote I/O Expansion Module for use with the PC2 and PC3 range of Railway Programmable Controllers	
Environmental	Operating temperature range: -40°C to +85°C (EN50155 Class TX)	
	Storage temperature range: -40°C to +85°C (EN50155 Class TX)	
	Relative Humidity: 5% to 95% non-condensing	
	Shock and Vibration: EN 61373:1999 Category I – Class B	
Power Supply	Nominal Input Voltage	24 VDC
	Minimum Input Voltage	14 VDC (EN50155 Class C1)
	Maximum Input Voltage	36 VDC
	Nominal Input Current	150 mA
LED's	One (1) Power LED	
	One (1) Communications LED	
Watchdog	Independent Watchdog Timer	
Digital Inputs	Ten (10) digital inputs 5mA @ 24VDC. Current sourcing (low-side switching)	
	Six (6) digital inputs. Current sourcing (low-side switching) Factory configurable as either: 5mA @ 24VDC, or 1.5mA @ 5VDC suitable for use with Dallas DS1820 Digital Temperature sensors	
Digital Outputs	Sixteen (16) digital outputs 24VDC 0.5A. Current sinking (low-side switching). Short circuit protection with automatic reset.	
Analogue Inputs	Four (4) analogue inputs 12 bit resolution Factory configurable as either: 0 to +36 VDC; 0 to +10VDC; 0 to 20mA; NTC Thermistor	
Communication Ports	RS485 isolated port for connection with the Master Controller	Three-wire RS485+, RS485-, GND
Mechanical	Product dimensions (LxWxH): 178mm x 172mm x 41mm	
Enclosure Material	Aluminium with Anodised Screen Printed Lid	
Ingress Protection (IP) Rating	IP20 (in accordance with EN 60529)	
Weight	0.6 kg	
Terminations	Power and I/O: 5.08mm pitch Plug / Socket Connectors	
	RS485 Plug / Socket: Molex Mini-Fit Jr 4.2mm pitch Connector	
Standards	EN 50155:2007	Railway Applications – Electronic Equipment used on Rolling Stock
	EN50121-3-2:2006 IEC 62236-3-2:2008	Railway Applications – Electromagnetic Compatibility Part 3-2: Rolling Stock – Apparatus
	EN 61373:1999	Railway Applications Rolling Stock Equipment Shock and Vibration Tests
	EN 45545-2:2013	Railway Applications – Fire Protection for Railway Vehicles Part 2: Requirements for Fire Behaviour of Materials and Components
Programming	Via the Master Controller using <ul style="list-style-type: none"> <li>● ISaGRAFV5 - IEC61131-3 (SFC, FBD, LD, ST, IL, FC)</li> <li>● "C-API" Programmable</li> </ul>	

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