E3 I/O™ Modules

Red Lion Automation Series

▶▶▶ Rugged High-Density I/O Modules

Red Lion's E3 I/O modules provide a robust and reliable platform for local and distributed monitoring and control of processes and equipment in harsh industrial environments.



The highly rugged E3 I/O modules feature discrete, analog and temperature I/O, dual Ethernet ports, an RS-485 serial port and one USB port. Configured via web interface or Red Lion's award winning Crimson® 3.0 software, E3 I/O modules are easy to setup and deploy. The high-density I/O modules compliment HMIs or can be used as standalone I/O concentrators in industries including oil & gas, water/wastewater, utilities, transportation, mining and maritime. Red Lion's DIN-rail mountable modules support open-standard protocols simplifying integration into existing or newly installed networks. Replacing external devices such as switches, data concentrators and protocol converters, E3 I/O modules cost-effectively streamline systems and improve reliability.

APPLICATIONS

- Mining
- Oil & Gas
- Power & Energy
- Transportation
- Water/Wastewater

PRODUCT HIGHLIGHTS

- Configurable via Crimson 3.0 or Web Interface
- Wide Variety of Mixed I/O Configurations
- Industrial Design Supporting Deployment in Extreme Environments
- Real-Time Ring and Dual-Ethernet Ports for Powerful Network Redundancy
- Built-in Security Proactively Blocks Unwanted Access

FEATURES & BENEFITS

- Wide Variety of I/O Configurations
  - 17 models with various discrete, analog and temperature I/O
- Powerful Networking Capabilities
  - Built-in two port Ethernet switch for daisy chaining, redundancy, or pass-through
  - Modbus protocol support for industrial monitoring and communications
- Built-in Security for Proactively Blocking Unwanted Access
- RS-485 Port for Connecting Serial Devices to Ethernet Network
- Industrial Design Supporting Deployment in Extreme Environments
  - Hardened metal enclosure with both DIN-rail and panel mount options
  - Wide -40° to 75°C operating temperature range
  - UL/cUL Class 1, Division 2 Listed
- Configured via Crimson software for easy point-and-click configuration or through built-in web interface

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▶▶▶ E3 I/O Module Specifications

SWITCH PROPERTIES
Operation: Monitored
IEEE Compliance: 802.3, 802.3u, 802.3ab, 802.3x 802.1d/D/w, 802.1p, 802.1Q, 802.1x
Protocols: TCP/IP, ARP, UDP, ICMP, DHCP, HTTP, Modbus TCP, Modbus UDP (slave or master), Sixnet TCP, Sixnet UDP (slave or master)
Latency (typical): 5 us @ 100 Mbps
Switching Method: Store-and-Forward
Networks: 1 or 2 independent with unique MAC and IP addresses
Real-Time Ring: 30 ms + 5ms per hop
MDIX Auto Sensing Cable
Auto Sensing Speed and Flow Control

POWER INPUT*
Input Voltage: 10-30 VDC (12-24 Nominal)
Steady Input Current:
Maximum: 355mA @ 24VDC no loads
Average: 190mA @ 24VDC no loads
Minimum: 150mA @ 24VDC no loads
Max Inrush: 5 A /100 us @ 24 VDC
BTU/HR: 8 (typical)

CONNECTORS
Ethernet Ports: Two (2) 10/100Base-T(X) RJ45 ports
Serial Port: One (1) RS-485 screw block (485+, 485-, GND; 2-wire half-duplex, non-isolated)
RS-485 Networking: Up to 32 (full load) stations
RS-485 Distance: Up to 0.5 miles (baud-rate dependent)
Baud Rates: 300 to 57,600 baud
Protocols: Master and slave; Sixnet and Modbus RTU/ASCII

NETWORK MEDIA
10Base-T: ≥ Cat3 cable
100Base-T(X): ≥ Cat5 cable

DISCRETE INPUTS*
Voltage Range: 10-30 VDC or 60-140 VAC
Input Resolution: 150 volts (16 channel modules only)
Input Resistance: 10 Kohms
Slow Response: 25 ms (20 Hz max count rate)
Fast Response: 1 ms (400 Hz max count rate)
Special Fast Counting: Up to 50 KHz (channel 1 & 2)
Count Up: Pulse timing and pulse rate 16 or 32-bit reporting

DISCRETE OUTPUTS*
Output Voltage Range: 10-30 VDC or VDC/AC
Maximum Output Power: Up to .6 A per channel
Short Circuit Protection: Self-reset fuses
Input Isolation: 150 V (16 channel modules only)
Channel Scan Rate: 1 ms

ANALOG INPUTS*
Input Range: 4-20 mA, 0-10 VDC, RTD, thermocouple and 250 mV
Analog/Discrete Resolution: 16 bits (0.003%); 10 bits (1 ms fast option)
Input Impedance (Resistance): 100 ohms or 200 Kohms
Fuses: Self-resetting short circuit protection (4-20 mA inputs)
DMRR (Differential Mode): 66 db at 50/60 Hz
Update Time: 880 ms to 1 ms (configurable)
Temperature Accuracy: +/-0.5°C uncalibrated (typical)
RTD Type: 100 Ohm platinum
RTD Alpha: 0.00385 or 0.00392
RTD Connections: 2 or 3-wire
RTD Input Range: -200° to 850°C

ANALOG OUTPUTS*
Analog Output Range: 4-20 mA
Analog/Discrete Resolution: 16 bits (less than 1 uA)
Full Scale Accuracy: +/-0.02% (@20°C)
Span and Offset Temperature: +/- 50 ppm per °C
Load Resistance: 0-750 Ohms @ 24 VDC
Current Limiting Short Circuit Protection

RECOMMENDED WIRING CLEARANCE
Front: 2" (5.08 cm)
Top: 1" (2.54 cm)

ENVIRONMENTAL
Operating Temperature Range: -40° to +75°C
Storage Temperature: -40° to 85°C
Operating Humidity: 10% to 95% (Non Condensing)
Shock: IEC60068-2-6
Vibration: IEC60068-2-27

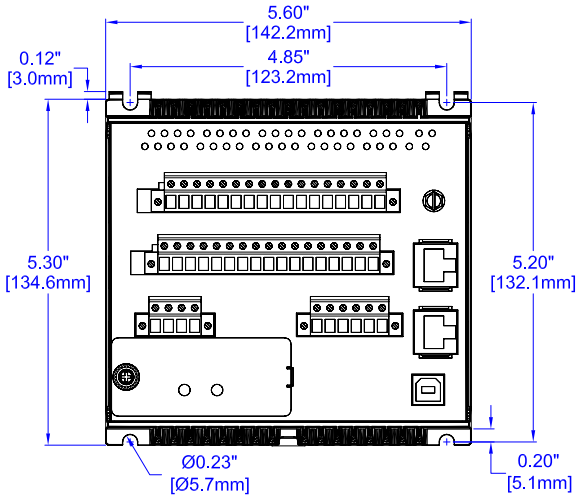
CERTIFICATION & COMPLIANCE
Hazardous Locations: ANSI/ISA 12.12.01-2013 Edition (Class I, Div. 2, Groups A, B, C, and D), CSA C22.2/213;
Marine/Offshore: Rated per ABS, DNV and Lloyds
Electrical Safety: UL 508, CSA C22.2/142, EN/IEC61010-1, CE
EMI Emissions: FCC part 15, ICES-003, Class A, EN-55022; EN6100-6-4, CE
EMC Immunity: EN61000-6-2, CE (EN61000-4-2,3,4,5,6,8); CE
Flammability: UL 94V-0 materials

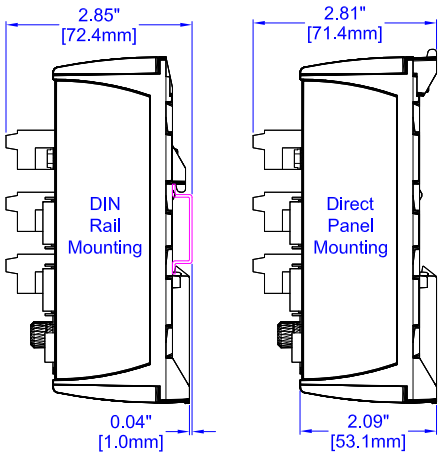
MECHANICAL
Case Dimensions:
Height: 5.30" (134.6 mm)
Width: 5.60" (142.2 mm)
Depth: 2.85" (72.4 mm)
Weight: 2.5 lb.s (1.3 kg)
Mount: DIN Rail 35 mm
MTBF: >1M Hours**

WARRANTY
3 years on design and manufacturing defects

* See manual for model specific specifications
** Note: See Hardware Manual for model specific MTBF ratings.

DIMENSIONS *in inches (mm)*





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E3 I/O Module Order Guide

ORDERING GUIDE

PART NUMBER	DI	DO	AI	AO	DESCRIPTION
E3-MIX24880-1	24*	8*	8		32 channel combination I/O with 1 isolated input counter
E3-MIX24882-1	24*	8*	8	2	34 channel combination I/O with 2 analog outputs
E3-MIX20884-1	24*	8*	8	4	32 channel combination I/O with 4 analog outputs and 4 isolated input counters
E3-32DI24-1	32				32 discrete inputs (10-30 VDC) including 16 multifunction counters
E3-16DI24-1	16				16 individually isolated discrete inputs (10-30 VDC) with counters
E3-16DIAC-1	16				16 individually isolated discrete inputs (120 VAC nominal; 10-30 VDC) with counters
E3-32DO24-1		32			32 discrete outputs (10-30 VDC) 0.5 Amp each, 8 Amps total
E3-16DO24-1		16			16 individually isolated discrete ouputs (10-30VDC) 1 Amp outputs, 16 Amps total
E3-16DORLY-1		16			16 individually isolated discrete outputs (10-30VDC/VAC relay) 1 Amp outputs, 16 Amps total
E3-32AI20M-1			32		32 analog inputs (4-20 mA) with 16-bit accuracy
E3-32AI10V-1			32		32 analog inputs (0-10VDC)
E3-16AI20M-1			16		16 analog inputs (4-20 mA)
E3-8AO20M-1				8	8 analog outputs (4-20 mA)
E3-16AI-8AO-1			16	8	24 channel combination, 16 analog inputs (4-20 mA) and 8 analog outputs (4-20 mA)
E3-16ISOTC-1			16TC		16 individually isolated analog inputs (thermocouple and +/- 250 mV) with J, K, E, R, T, C, N, S
E3-16ISO20M-1			16		16 individually isolated analgo inputs (4-20 mA)
E3-10RTD-1			10RTD		10 analog inputs (100 Ohm platinum RTD), rang is -200 to 850°C

* Shared DI/DO combination ports. See manual for more information.

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