

# 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 HMI's 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

industrial  
automation



# ▶▶▶ 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\*\*

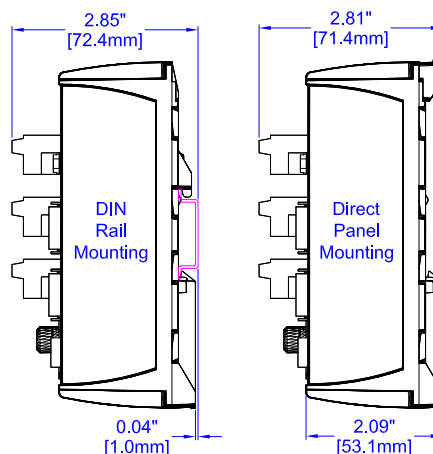
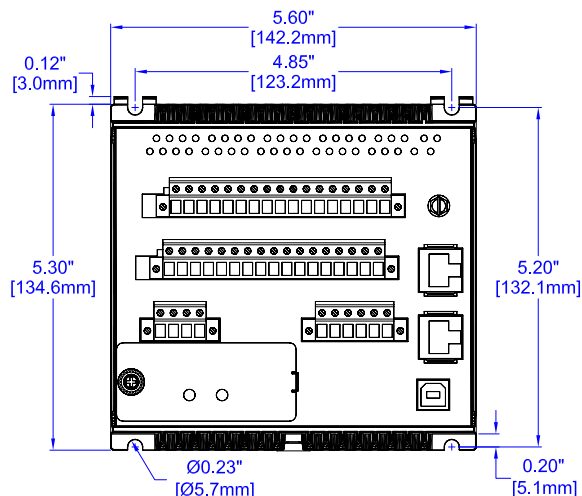
## WARRANTY

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)



## 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 outputs (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 analog inputs (4-20 mA)
E3-10RTD-1			10RTD		10 analog inputs (100 Ohm platinum RTD), range is -200 to 850°C

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