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

industrial
automation

CE FC c(UL)us PG RoHS compliant

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)
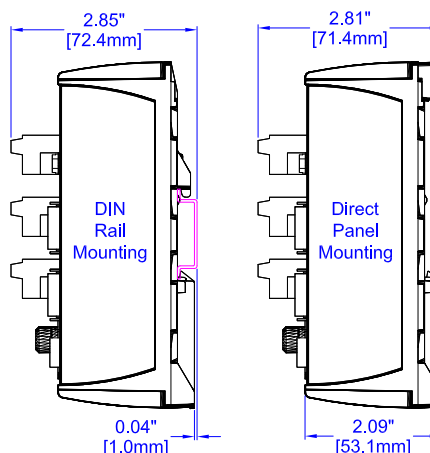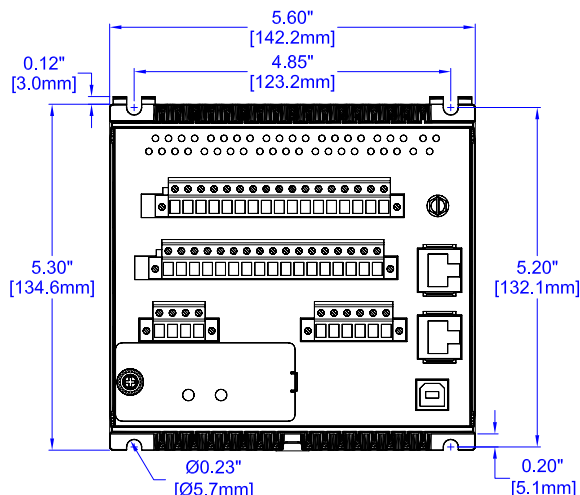Weight: 2.5 lb.s (1.3 kg)
Mount: DIN Rail 35 mm
MTBF: >1M Hours**

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)*

5.60" [142.2mm]
4.85" [123.2mm]
0.12" [3.0mm]
5.30" [134.6mm]
5.20" [132.1mm]
Ø0.23" [Ø5.7mm]
0.20" [5.1mm]

2.85" [72.4mm]
2.81" [71.4mm]
DIN Rail Mounting
Direct Panel Mounting
0.04" [1.0mm]
2.09" [53.1mm]

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.

RED LION™
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Connect. Monitor. Control.

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As the global experts in communication, monitoring and control for industrial automation and networking, Red Lion has been delivering innovative solutions for over forty years. Our automation, Ethernet and cellular M2M technology enables companies worldwide to gain real-time data visibility that drives productivity. Product brands include Red Lion, N-Tron and Sixnet. With headquarters in York, Pennsylvania, the company has offices across the Americas, Asia-Pacific and Europe. Red Lion is part of Spectris plc, the productivity-enhancing instrumentation and controls company. For more information, please visit www.redlion.net.