

## EISX\_M Managed CTRLink® Series — Extended Temperatures



### Flexibility in Design

- Up to eight 10/100 Mbps copper ports
- 8/0 or 6/2 copper/fibre models
- Fibre options include multimode and single-mode versions, ST and SC connectors
- Extended temperatures:  $-40^{\circ}\text{C}$  to  $+75^{\circ}\text{C}$

### Management Functionality

- Managed via the SNMP protocol
- IGMP snooping & query functionality
- Redundancy using RapidRing®, trunking or RSTP
- Virtual LAN support (Port VLAN and 802.1Q)
- Quality of Service (QoS) support (802.1p, DiffServ, TOS, Port-based, MAC-based)
- Port mirroring
- Rate limiting (broadcast storm control option)
- Port security

### Simple Installation

- Compact size (5.2" H x 3.4" D x 3.8" W; 130 mm x 85mm x 95 mm)
- Easy panel or DIN-rail installation
- 10–36 VDC or 8–24 VAC, 47–63 Hz  
Power is provided through a quick-disconnect terminal strip.
- Provisions for redundant power connections
- LEDs for link/activity, data rate, power and status
- Configured using resident web page
- Field-upgradeable firmware
- Programmable fault relay

### Standards Compliant

- Industrial environment EMC compatible
- UL 508 Listed, Industrial Control Equipment
- C-UL Listed, CSA 22.2 No. 14-M91, Industrial Control Equipment
- CE Mark
- RoHS compliant

## EISX\_M Managed CTRLink® Series — Extended Temperatures

### Product Overview

The EISX\_M series of compact managed switches, supporting both copper and fibre optics, provides management functionality in situations where outdoor temperatures are expected. Network management is significant in an outdoor scenario because in many cases the location of the switch or switches may not be easily accessible, making troubleshooting difficult. These switches allow the user to remotely diagnose the network, modify the configuration if required and restore service.

Designed with the conventional features in standard PnP switches, the EISX\_M series includes such important benefits such as IGMP snooping & query functionality, RapidRing, VLAN, Quality of Service (QoS), port mirroring, rate limiting, trunking, port security, the Simple Network Management Protocol (SNMP), and the Rapid Spanning Tree Protocol (RSTP).

IGMP snooping automatically limits IP multicast traffic to ports that require this traffic. This inhibits multicast traffic from overwhelming devices that should not receive this traffic — an important issue in EtherNet/IP™ networks. The switch can also act as the IGMP query device for the network.

For applications requiring redundancy, the EISX\_M family of product offers RapidRing. RapidRing allows building a redundant Ethernet network that will self heal in less than 300 ms if any segment of the RapidRing is broken.

Virtual LANs or VLANs can be used to isolate traffic between groups of ports. This helps to conserve system bandwidth because broadcasts on one VLAN cannot reach other VLANs.

This product also supports overlapped VLANs. This still provides isolation between VLANs, but also allows multiple VLANs to share one device without needing the use of a router.

Rate limiting allows users to set a maximum bandwidth for each port of the switch — preventing certain devices from using too much system bandwidth.

Rate limiting can restrict bandwidth for specific types of messages such as broadcast messages or multicast messages. This can be used to stop broadcast storms.

Port security allows traffic limiting on specific ports to only those devices that have been granted access — imparting extra security to communications carried by the switch. This can be used to restrict which devices from an outside network can communicate through the switch.

The SNMP agent is comprised of a collection of managed objects that can be queried by a SNMP manager to indicate the status of the switch or any SNMP-aware switch connected to the network. When the data is displayed at a central location, operators and maintenance personnel can check the entire network by observing selected devices and detect potential problems before they occur.

RSTP is a standardised method of creating redundant paths for data transmissions to create a higher level of reliability. RSTP typically allows more redundant paths than proprietary ring networks. Recovery time is typically one second or more.

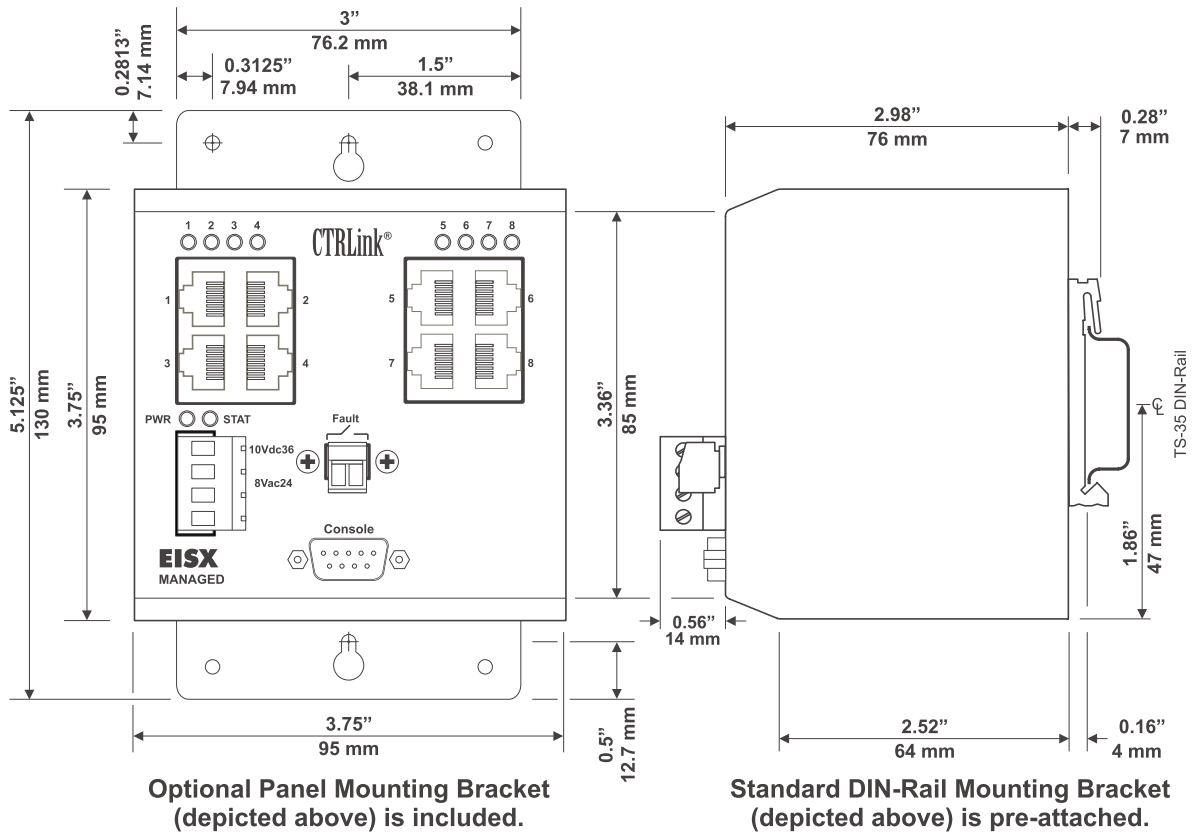
Configuration is accomplished through a web browser via any Ethernet port or by using the terminal mode via the local console port. Port parameters, feature configuration, and device status can be modified and monitored by these access methods.

Either straight-through or crossover cables may be used to connect any of the Auto-MDIX ports to stations or another hub. In addition to one power LED and one status LED, each port has LEDs showing link/activity/data rate by colour: green for 100 Mbps and yellow for 10 Mbps. Flashing indicates port activity.

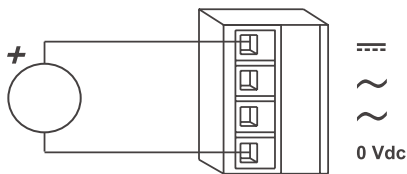
The EISX\_M series is shipped with a DIN-rail clip for installation on a TS-35 DIN-rail. If direct mounting to a sub-panel is needed, an optional panel mounting bracket, shipped with the product, can be installed after removing the DIN-rail clip.

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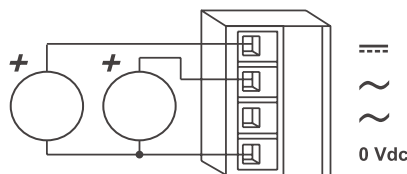
## Mechanical



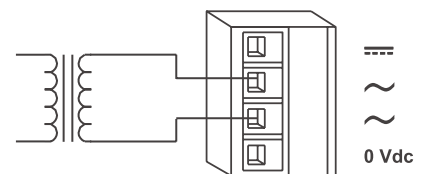
## Power Diagrams



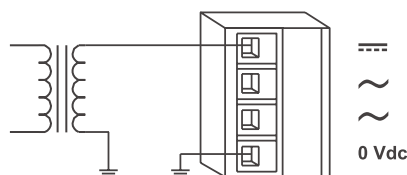
DC Powered



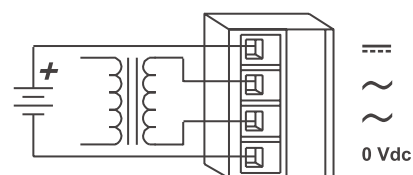
Redundant DC Powered



AC Powered



AC Powered with Grounded Secondary



AC Powered with Battery Backup

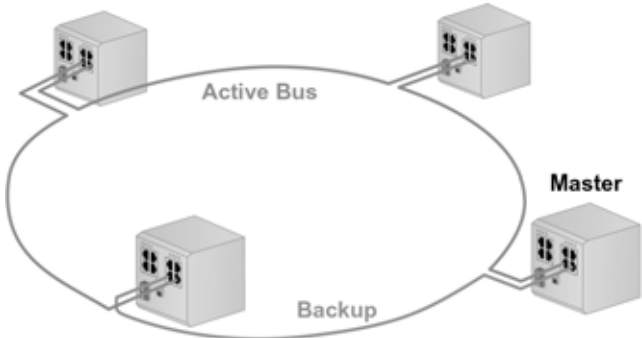
# EISX\_M Managed CTRLink® Series — Extended Temperatures

## Industrial Ethernet Redundancy

In applications requiring maximum uptime for an Industrial Ethernet communication network, Contemporary Controls provides three solutions: **RapidRing**, **Trunking** and **RSTP (Rapid Spanning Tree Protocol)**.

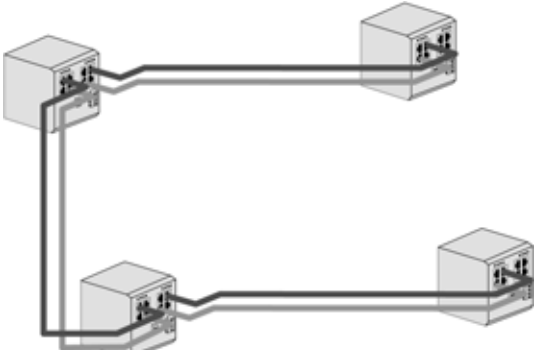
RapidRing Redundancy

- Allows switched networks to be wired in a ring utilizing fibre or copper
- Any break in the ring will be recovered in less than 300 ms
- Relay contacts, flashing LEDs and SNMP traps help to quickly identify broken links
- Supports dual-ring structures
- Compatible with EICP\_M, EISX\_M and EISB\_M products



Trunking Redundancy

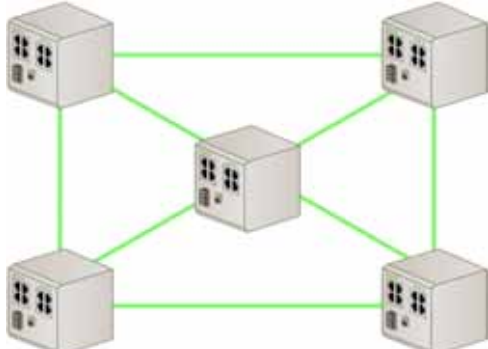
- Any break in the trunk will be recovered in less than **10 ms**
- Relay contacts, flashing LEDs and SNMP traps help to quickly identify the broken links
- Trunking also provides more bandwidth between switches
- Compatible with EICP\_M, EISX\_M and EISB\_M products



Both RapidRing and trunking are configured using browser software.

RSTP Redundancy

- Updated form of STP and is backward compatible
- RSTP provides faster recovery time, generally in 1 to 2 seconds
- Operates with ring or mesh topologies
- Compatible with EICP\_M, EISX\_M and EISB\_M products

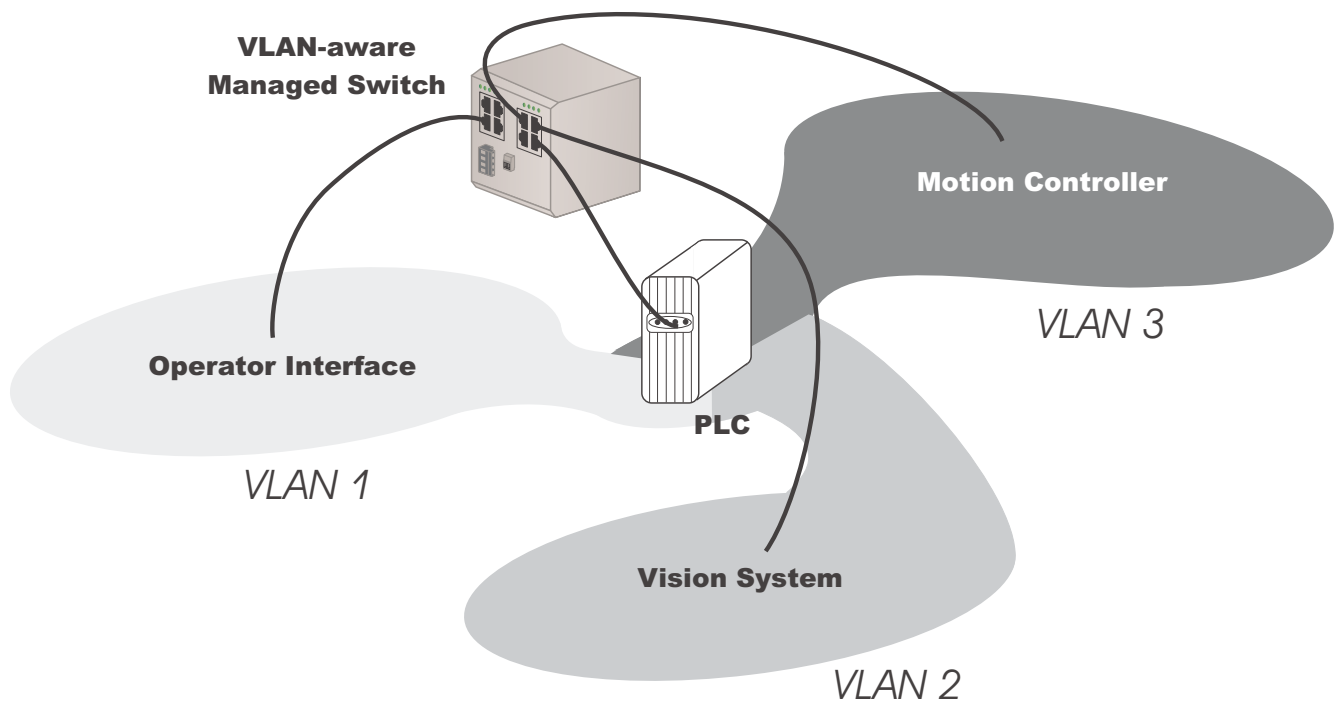


## EISX\_M Managed CTRLink® Series — Extended Temperatures

### Virtual LANs (VLANs) Provide Improved Network Performance

A VLAN allows for the logical separation of network traffic — providing higher performance and higher network security. Ports on the switch may be assigned to individual VLANs, thereby restricting VLAN traffic.

For example, let us build a work cell that contains a programmable logic controller (PLC), operator interface (OI), vision system (VS) and motion controller (MC).



In our work cell example, there is no reason for the OI, vision system or motion system to communicate to each other. They only need to communicate to the PLC. By using the VLAN function, message forwarding can be restricted so that only the PLC will be involved in communications with the OI, vision and motion systems. Because of the selective VLAN message forwarding, there is no communication clutter of useless messages between the OI, vision and motion control systems, thereby improving the overall bandwidth of the network.

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### Fault Annunciation Using Relay Output

By using the browser software, each port can be monitored for a required status. Each port can be configured to annunciate a fault when a data link is present, no data link is present, or the data link status can be ignored.

The relay can be configured to make or break contact when a fault occurs. Fault status can also be ignored during switch startup to help ignore nuisance faults that could occur as ports auto-negotiate. The fault can be set to automatically clear its status when the fault is recovered or to require a manual reset to allow tracking of faults.

Settings:	
Port Monitoring	<input checked="" type="radio"/> <i>Enable</i> <input type="radio"/> <i>Disable</i>
Relay State	<input checked="" type="radio"/> Break on Fault <input type="radio"/> Make on Fault
Relay Automation Time After Power Up	<input type="text" value="1"/> (1-999 seconds)
Relay Reset Method	<input checked="" type="radio"/> Automatic <input type="radio"/> Manual <a href="#">Clear Relay</a>

Apply

Monitor Fault Condition:								
Port	1	2	3	4	5	6	7	8
Ignore	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
No Link	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Link Present	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Current Faults	OK	OK	OK	OK	OK	OK	OK	OK

Apply

By monitoring the port status, operating personnel can quickly solve communications problems by responding to the faults.

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## Specifications

### Electrical

Input voltage	DC	AC
Input power	10–36 Volts	8–24 Volts
	6 W (EISX8M-100T)	6 VA (EISX8M-100T)
	10 W (EISX8M-100T/FT, FC, FCS)	10 VA (EISX8M-100T/FT, FC, FCS)
Input frequency	N/A	47–63 Hz
Fault relay contact	24 V AC or DC, 500 mA	

### Environmental

Operating temperature	–40°C to +75°C
Storage temperature	–40°C to +85°C
Relative humidity	10–95%, noncondensing
Protection	IP30

### Functional

Standards	IEEE 802.3
Process type	Store-and-forward

### Ports

	<i>Copper</i>	<i>Fibre 1300 nm</i>
Number of Ports	8 or 6	0 or 2
Interface	10BASE-T/100BASE-TX	100BASE-FX
	10/100 Mbps	100 Mbps
	Auto-negotiated data rate, flow control, full- or half-duplex mode	Full-duplex
Connectors	Shielded RJ-45	SC (on multimode or single-mode models)—ST (only on multimode models)
Maximum segment length	100 m	2 km (multimode), optical budget: 13 dB—15 km (single-mode), optical budget: 19 dB
LED signal indicators	Link LED: Yellow — 10 Mbps Green — 100 Mbps Green flashing — Activity Green/yellow — Fault relay	Green — 100 Mbps Flashing — Activity
LED power indicator	Green	
Flow control	Half-duplex (backpressure)	Full-duplex (PAUSE)
Aging	300 seconds typical	

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## RJ-45 Pin Assignments

MDI-X <sup>1</sup> RJ-45	10BASE-T/100BASE-TX Usage
1	TD+
2	TD-
3	RD+
4	Not Used
5	Not Used
6	RD-
7	Not Used
8	Not Used

<sup>1</sup> This product implements the crossover function internally on copper ports allowing straight-through cables to connect to network interface modules.

## Console Port Pin Assignments

Console Port (EIA-232C)2	
Male D-Sub	Usage
1	Not Used
2	RX
3	TX
4	Not Used
5	Gnd
6	Not Used
7	Not Used
8	Not Used
9	Not Used

<sup>2</sup> Console port is wired as a DTE requiring a null-modem cable for attaching to a terminal emulation workstation.

## Electromagnetic Compatibility

<i>Standard</i>	<i>Test Method</i>	<i>Description</i>	<i>Test Levels</i>
EN 55024	EN 61000-4-2	Electrostatic Discharge	6 kV contact
EN 55024	EN 61000-4-3	Radiated Immunity	10 V/m, 80 MHz to 1 GHz
EN 55024	EN 61000-4-4	Fast Transient Burst	1 kV clamp & 2 kV direct
EN 55024	EN 61000-4-5	Voltage Surge	1 kV L-L & 2 kV L-Earth
EN 55024	EN 61000-4-6	Conducted Immunity	10 Volts (rms)
EN 55024	EN 61000-4-11	Voltage Dips & Interruptions	1 Line Cycle, 1 to 5 s @ 100% dip
EN 55022	CISPR 22	Radiated Emissions	Class B
EN 55022	CISPR 22	Conducted Emissions	Class B
CFR 47, Part 15	ANSI C63.4	Radiated Emissions	Class A

## EISX\_M Managed CTRLink® Series — Extended Temperatures

### Ordering Information

#### Copper Only

Model	Description
EISX8M-100T	Eight-port 10BASE-T/100BASE-TX compact managed switch

#### Fibre and Copper

Model	Description
EISX8M-100T/FC	Six-port 10/100/two-port 100BASE-FX (multimode) switch, SC connectors
EISX8M-100T/FT	Six-port 10/100/two-port 100BASE-FX (multimode) switch, ST connectors
EISX8M-100T/FCS	Six-port 10/100/two-port 100BASE-FX (single-mode) switch, SC connectors

#### Accessories

Model	Description
AI-XFMR	Wall-mount plug-in transformer, 120 VAC input/24 VAC output (nominal values)
AI-XFMR-E	Wall-mount plug-in transformer, 230 VAC input/24 VAC output (nominal values)

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