EISC Configurable Switching Hubs

- **Configurable via a console port**
- **10BASE-T/100BASE-TX/100BASE-FX compliant**
- **Auto-negotiation is supported on twisted-pair ports**
- **Broadcast storm control**
- **Modbus interface**
- **Port virtual LAN support**
- **Trunking for high-speed backbone**
- **Quality of Service (QoS) support**
- **Programmable fault relay**
- **Signal strength indicator for twisted-pair ports**
- **Easy panel or DIN-rail installation**
- **Powered from an unregulated DC power source (10–36 V) or from an AC power source (8–24 V, 47–63 Hz). Power is provided through a quick-disconnect terminal strip.**
- **LEDs for link/activity/data rate**
- **Easy panel or DIN-rail mounted installation**
- **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**

PRODUCT OVERVIEW

The EISC family provides capabilities beyond those found in standard PnP switches such as Port VLAN, trunking, Quality of Service (QoS), and a programmable fault relay that can be connected to a supervisory system.

Port VLAN allows the configuration of the physical network into multiple VLANs — limiting the broadcast/multicast domains and improving performance.

Trunking allows for ports to be grouped in fours so as to function as a high-speed backbone to another EISC configurable switch.

QoS provides priority to messages received by the switch. Three schemes are supported: port-based priority, IP packet priority (RFC 2474), and IEEE 802.1p priority.

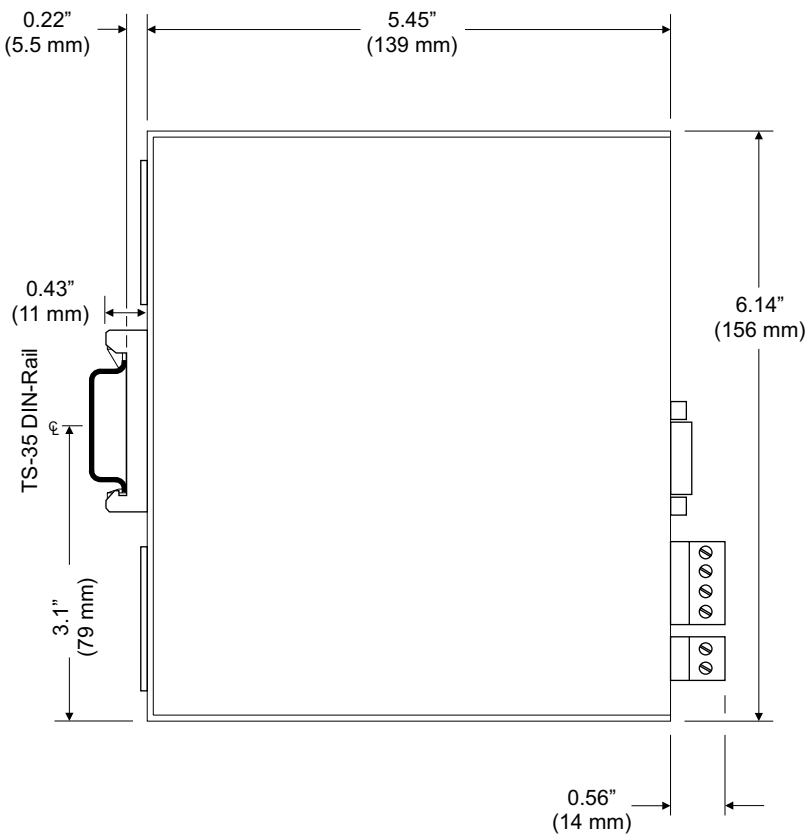
Programmable Fault Relay provides a dry contact to supervisory systems upon a fault condition sensed by the switch. The fault condition can be "loss of link" or "addition of link."

Configuration of the EISC is accomplished via a console port connected to a Windows-based configuration program included with the product. The console port utilizes the Modbus protocol for communication and register information is published in the manual so that the switch can be configured or its status can be monitored by a Modbus master device. Individual port parameters (data rate, duplex, and flow control) can be manually set or can be automatically set through the auto-negotiation process. A unique feature of the EISC is that the signal strength of each twisted-pair port can be monitored on one of the configuration screens. A small bar graph provides a dynamic view of each port's received signal strength which is handy for troubleshooting.

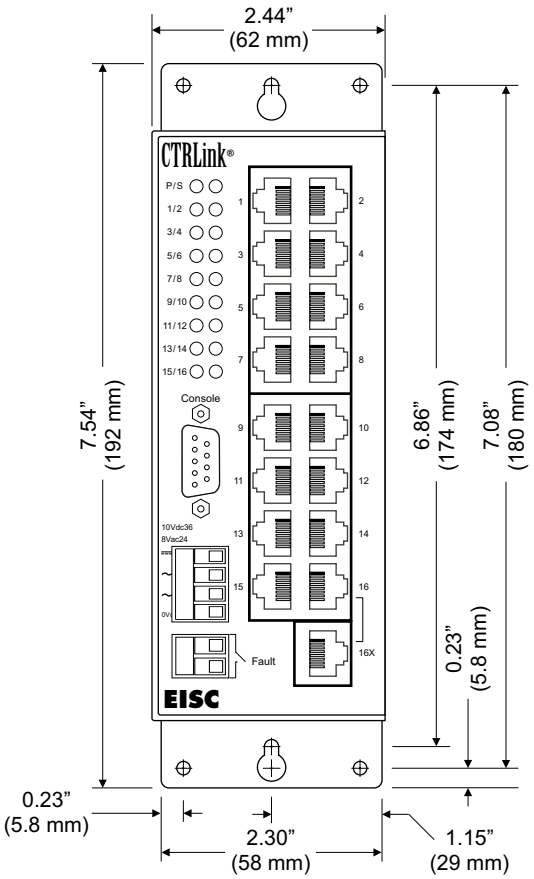
Each unit accepts wide-range, low-voltage AC or DC power and redundant power can be connected.

CONTEMPORARY CONTROLS

Mechanical

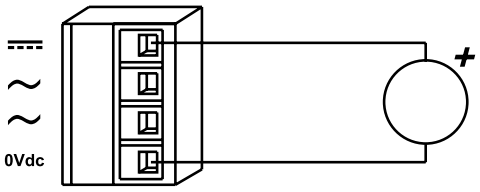


Side View showing DIN-rail Clip (Mounting Brackets Retracted)

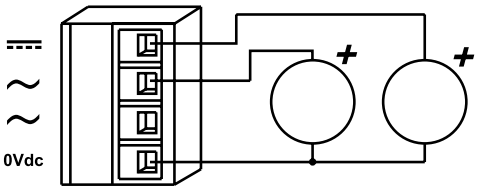


Front View with Mounting Brackets Extended

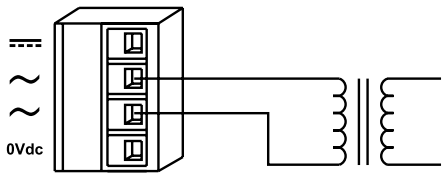
Power Diagrams



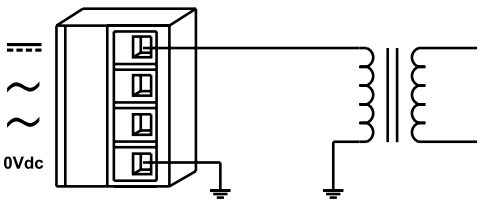
DC Powered



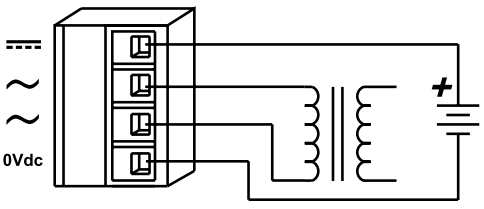
Redundant DC Powered



AC Powered



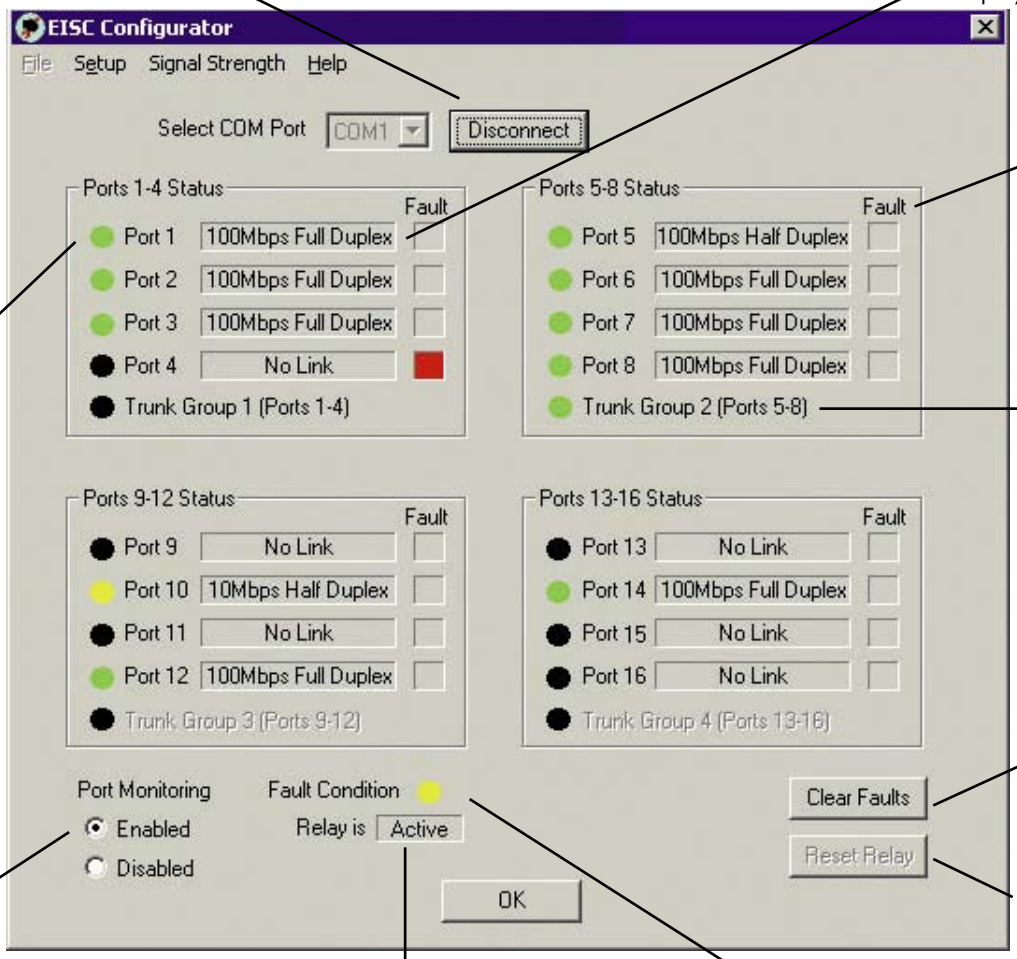
AC Powered (grounded secondary)



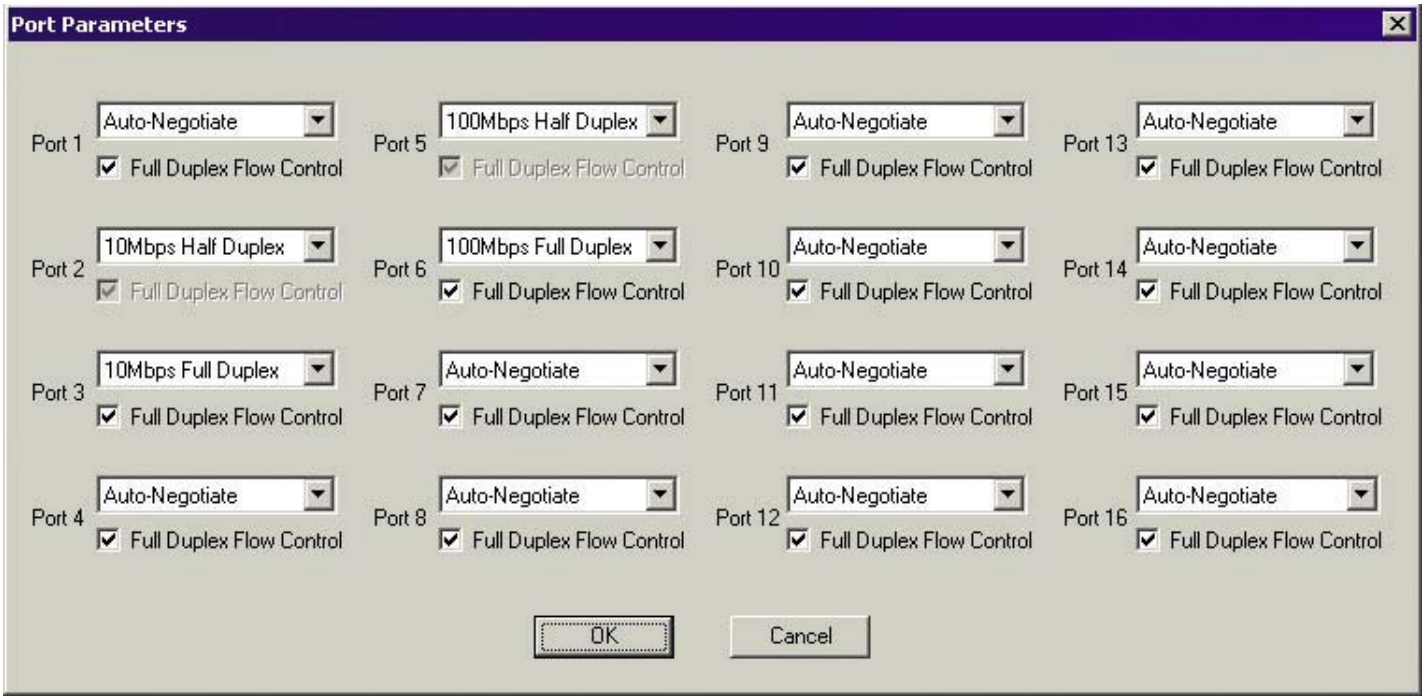
AC Powered with Battery Backup

EISC Series

Main Configuration Screen

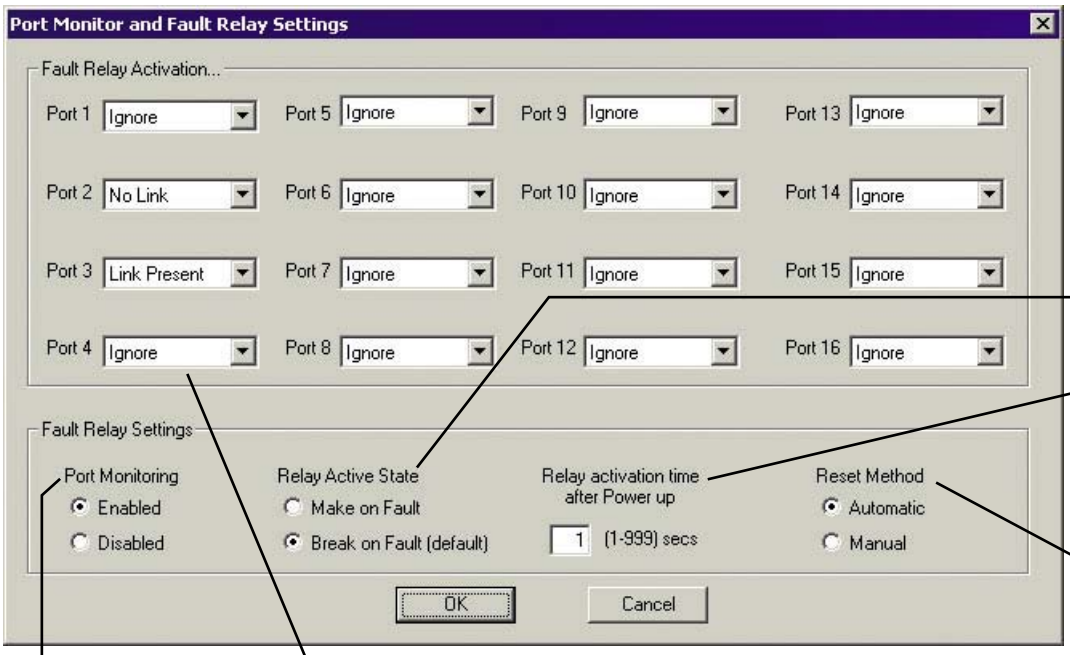


Port Parameters



Each port can be configured for auto-negotiation, 10 or 100 Mbps data rate and either half- or full-duplex 802.3x flow control can be enabled in full-duplex mode.

Fault Relay Settings



Contact sense is programmable.

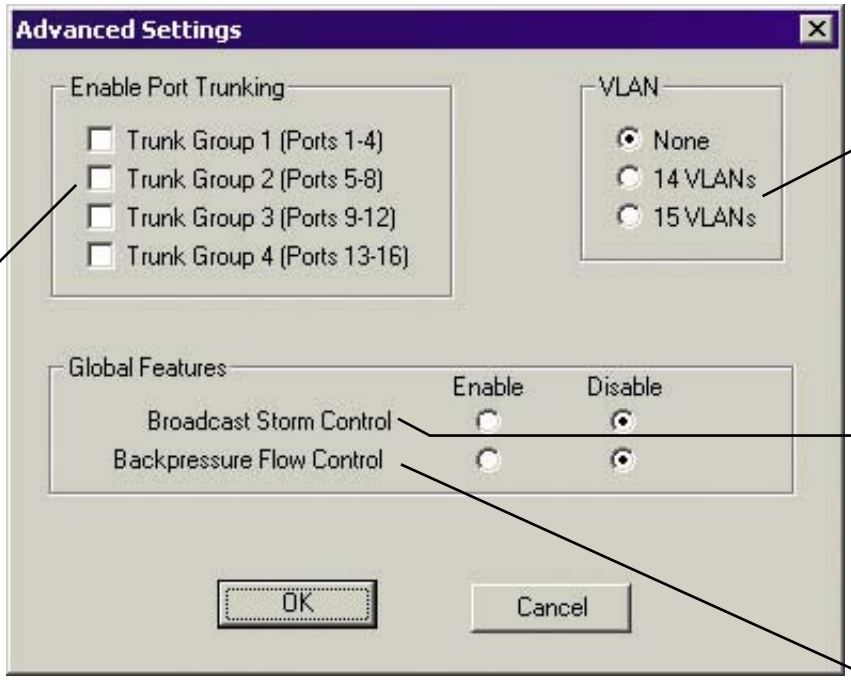
Port monitoring can be delayed until the control system stabilizes.

Fault relay can be cleared once conditions return to normal or can be cleared manually.

Port monitoring can be disabled.

The fault relay can be programmed to trip based upon conditions of individual ports. Conditions include loss of link or the establishment of link. Unused ports or ports of no interest can be ignored.

Advanced Settings



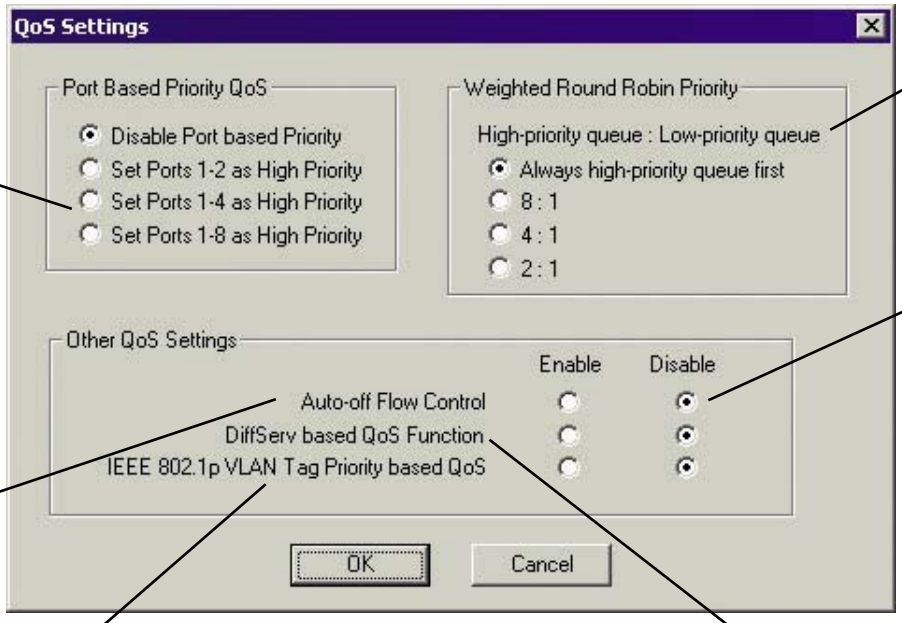
A total of either 14 or 15 separate Port VLANs are possible. Ports 15 and 16 are common to all VLANs.

Trunking is possible in groups of four — providing a high-speed backbone to another EISC.

Broadcast storm control limits the number of broadcast messages accepted on a particular port.

Backpressure flow control can be enabled for ports that are operating in half-duplex mode.

Quality of Service (QoS) Settings



Priorities can be assigned to a group of ports.

There are two priority queues. Precedence is given to the high-priority queue in the ratios indicated.

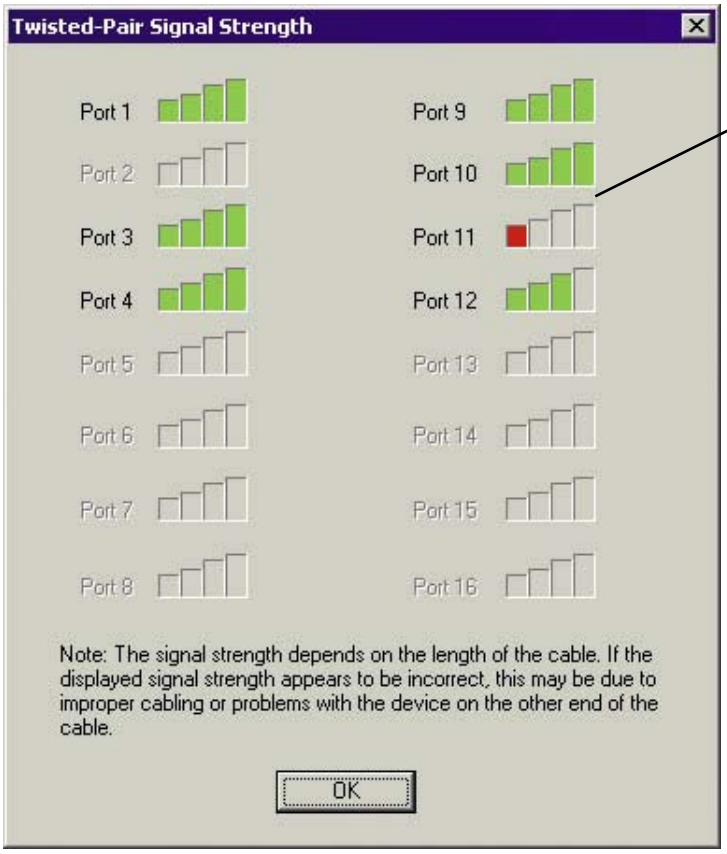
Priority schemes can be individually enabled or disabled.

Momentarily disables any flow control on a port that has received a high-priority frame.

Based upon the priority field in a 802.1Q VLAN tag.

Based upon RFC 2474 and the contents of the Type of Service field in the IPv4 packet.

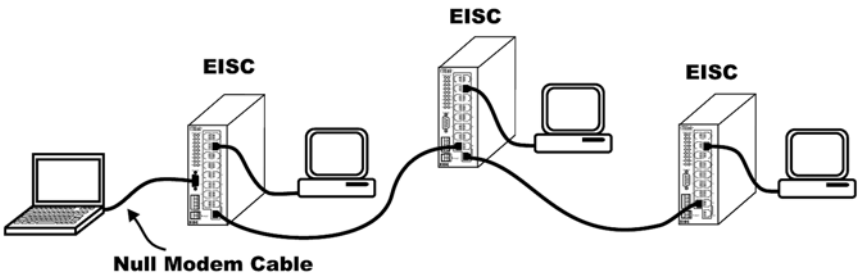
Signal Strength



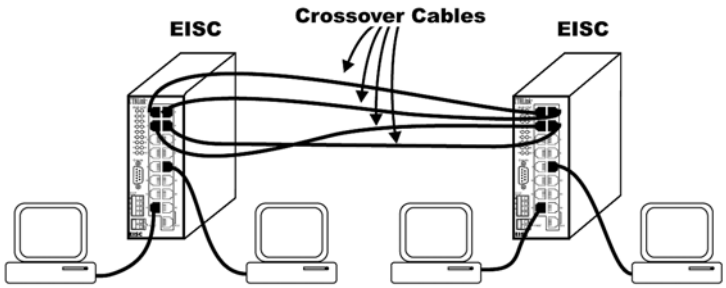
Signal strength indicators are present on all twisted-pair ports to aid in troubleshooting cabling problems. This feature is restricted in 100 Mbps ports.

Applications

The EISC16 has an internal crossover port (16X) which is used to connect to another switch or hub using straight-through cables. If port 16X is used, port 16 cannot be used on the same switch. All twisted-pair segment lengths are limited to 100 m. The EISC has an EIA-232 console port wired as a DTE. In order to connect to either a Windows-based desktop or laptop PC for configuration purposes, a null modem cable not exceeding 50 ft. in length must be used.



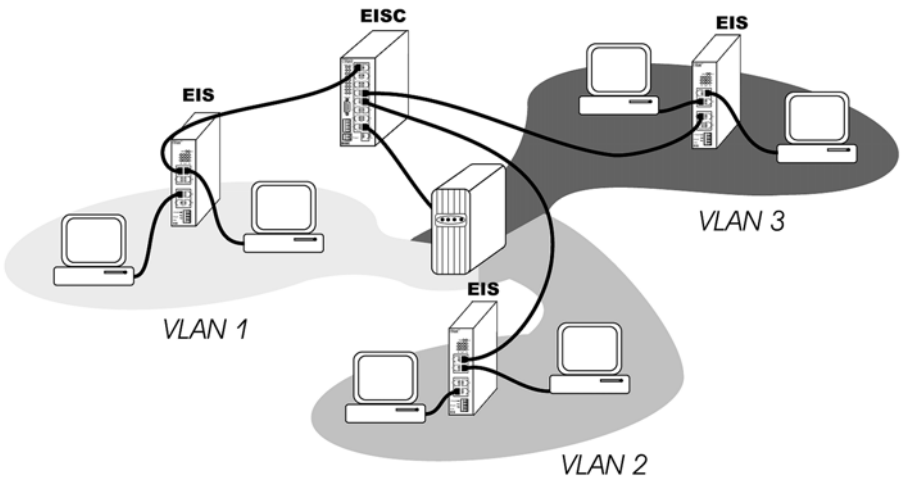
Cascading EISC Switches Using Twisted-Pair Cabling



By dedicating four ports to a trunk, a high-speed backbone between two EISCs can be created. During configuration, ports are assigned to a trunk in groups of four. Data between switches is carried over four segments instead of one; thereby, increasing throughput. Like all other twisted-pair segments, length is limited to 100 m and the trunk segments must be crossover cables. More than one trunk can be created for additional cascading at the cost of reduced ports for device connections.

Trunking EISCs Creates a High-Speed Backbone

The EISC is capable of creating either 14 or 15 separate Port VLANs. Port VLANs allow one physical network to be segmented down to multiple independent "virtual" networks in order to reduce unnecessary traffic, limit broadcast domains and improve security. Each Port VLAN can be expanded using one or more standard hubs or switches and still function independently from the others. The only common connection is through either ports 15 and 16 on the EISC. These ports are members of all Port VLANs and could serve as server connections.



Port Virtual Local Area Networks (VLANs)

Specifications

Electrical	DC	AC
Input voltage	10–36 Volts	8–24 Volts
Input power	11 W (EISC16-100T)	11 VA (EISC16-100T)
	12 W (EISC12-100T/FT, FC, FCS)	12 VA (EISC12-100T/FT, FC, FCS)
Input frequency	N/A	47–63 Hz

Environmental	
Operating temperature	0°C to +60°C
Storage temperature	–40°C to +85°C
Relative humidity	10–95% non-condensing
Protection	IP30

Functionality	
Standards	IEEE 802.3
Process type	Store-and-Forward

Ports	Copper twisted-pair	Fibre 1300 nm
Number of Ports	16 or 10	0 or 2
Interface	10BASE-T/100BASE-TX 10/100 Mbps Auto-negotiate data rate, flow control, full- or half-duplex mode	100BASE-FX 100 Mbps 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 link Flashing — Activity
LED power indicator	Green	
Flow control	Half-duplex (backpressure)	Full-duplex (PAUSE)
Aging	300 seconds typical	

RJ-45 Pin Assignments

MDI-X[1] 10BASE–T/100BASE-TX	
RJ-45	**Usage**
1	TD+
2	TD–
3	RD+
4	Not Used
5	Not Used
6	RD–
7	Not Used
8	Not Used

[1] This product implements the crossover function internally allowing straight-through cables to connect to network interface modules. Port 16X (on the all-copper model) is wired as an MDI allowing its use as an uplink port.

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

[2] Console is port wired as a DTE and therefore requires a null-modem cable to a terminal emulation workstation.

Electromagnetic Compatibility			
Standard	**Test Method**	**Description**	**Test Levels**
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 A
EN 55022	CISPR 22	Conducted Emissions	Class B
CFR 47, Part 15	ANSI C63.4	Radiated Emissions	Class A

Ordering Information

Copper Only

Model	Description
EISC16-100T	Sixteen-port 10BASE-T/100BASE-TX configurable switch

Fibre and Copper

EISC12-100T/FC	Ten-port 100BASE-TX/two-port 100BASE-FX (multimode) switch, SC connectors
EISC12-100T/FT	Ten-port 100BASE-TX/two-port 100BASE-FX (multimode) switch, ST connectors
EISC12-100T/FCS	Ten-port 100BASE-TX/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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