

Repeating Hubs



Benefits

- Plug and Play operation
- 10BASE-T and 10BASE-FL compliant
- Shielded RJ-45 or ST-style fiber optic connectors
- IEEE 802.3 repeater unit compliant
- Wide-range, low-voltage AC or DC powered
- Provision for redundant power connections
- Activity, link, collision and power LEDs
- Easy panel or DIN-rail installation
- Industrial environment EMC compatible
- CE Mark
- UL 508 Listed

Applications

- Interconnection of Ethernet PLCs, operator interface, motion control
- Machine monitoring
- Environmental control
- Test and measurement
- Process control
- Remote data acquisition
- Communication gateway

The EI Series of Industrial Ethernet Interconnect hubs in the CTRLink® family allows for the expansion of 10 Mbps shared Ethernet networks on the plant floor. A hub is essential to expanding a 10BASE-T system beyond two nodes or to increase network distances beyond the 100-meter limit of the 10BASE-T specification. To maximize distance, the typical network uses twisted-pair wiring for the end devices and fiber cables for the inter-hub links. Each twisted pair can be as long as 100 m and the total length of inter-hub fiber can be as much as 2000 m. The network diameter cannot exceed 2400 m. In a shared Ethernet environment the length of each fiber segment depends upon the number of hubs used.

Two EI Series models provide expansion through twisted-pair cabling — the four-port EI4-10T and the popular eight-port EI8-10T. The line is enhanced with its fiber optic versions — the five-port EI5-10T/F and the six-port EI6-10T/F. The EI6-10T/F has four ports for twisted-pair that support the signaling standards of 10BASE-T and the two fiber ports support the 10BASE-FL interface using ST connectors. The EI5-10T/F has one less fiber port.

Fiber optic segments make it ideal for building control and industrial control applications where distance and robustness are important. The hubs fiber optic links also provide a layer of isolation and increased immunity to electrical noise and other external influences usually encountered in an industrial environment.

The EI Series follows the standards for IEEE 802.3 repeater units. These standards include preamble regeneration, symmetry and amplitude compensation. Repeaters must retiming signals so that jitter, introduced by transceivers and cabling, does not accumulate over multiple segments. These devices detect runt packets and collisions and react by generating a Jam signal. They automatically partition jabbering ports to maintain network operability.

All hubs provide digital pre-emphasis to transmitting ports to compensate for the inherent signal strength roll-off of twisted-pair cable. Each twisted-pair segment can be up to 100 m in length. Shielded RJ-45 connectors accommodate either UTP or STP cabling. The Link integrity function is supported — confirming that a functioning adapter or hub is on the other end of the segment. Hubs can be cascaded using a crossover cable.

For more accurate troubleshooting the EI Series incorporates LED indicators. Besides one common collision LED, each port has a pair of LEDs to indicate link status and port activity.

All units operate from a wide-range, low-voltage AC or DC power source. Provisions exist for redundant power connections.

The EI series is intended for Industrial Ethernet applications and complies with the EMC standards for immunity and emissions to withstand the rigors of harsh industrial environments.

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Specifications

Electrical	DC	AC
Input voltage	10–36 Volts	8–24 Volts
Input power	4 Watts	4 VA
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 to 95% non-condensing	
Functional		
Compliance	ANSI/IEEE 802.3	
Data rate	10 Mbps	
Signaling	10BASE-T/10BASE-FL	
Port connectors	Shielded RJ-45 or ST-style	
Segment length (max)	10BASE-T	100 m
	10BASE-FL	2 km
LED indicators	ACTIVITY—yellow LINK—green COLLISION—red	
Approvals	CE Mark, UL 508 Industrial Control Equipment	

Electromagnetic Compatibility

Standard	Test Method	Description	Test Levels
EN 55024	EN 61000-4-2	Electrostatic Discharge	8 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 to L & 2 kV L to Earth
EN 55024	EN 61000-4-6	Conducted Immunity	10 Volts(rms)
EN 55024	EN 61000-4-11	Voltage Dips & Interruptions	1 Line Cycle @ 100% Dip 1 to 5 Seconds @ 100% Dip
EN 55022	CISPR 22	Radiated Emissions	Class A
EN 55022	CISPR 22	Conducted Emissions	Class A
CFR 47: 15	ANSI C63.4	Radiated Emissions	Class A

MDI-X¹ 10BASE-T Port Pin Assignments

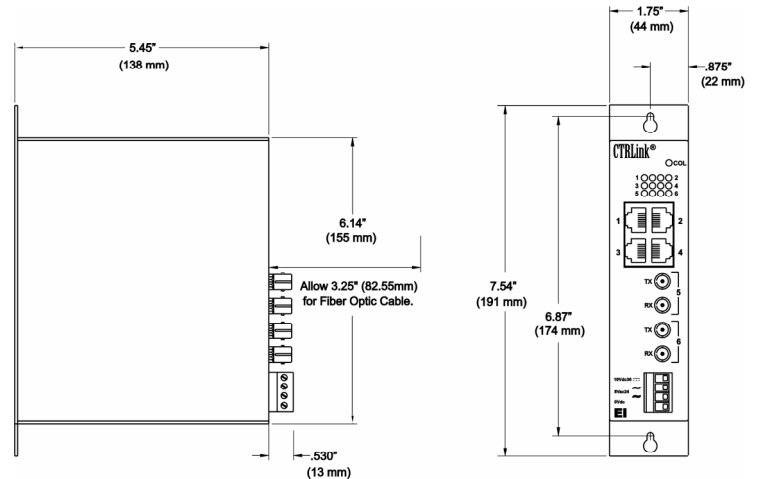
RJ-45	Usage
1	TD+
2	TD–
3	RD+
4	Not Used
5	Not Used
6	RD–
7	Not Used
8	Not Used

¹ The EI series implements the crossover function internally — allowing straight cables to connect to network interface modules.

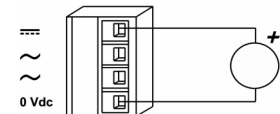
Ordering Information

Model	Description
EI4-10T	Four-port 10BASE-T repeating hub
EI8-10T	Eight-port 10BASE-T repeating hub
EI5-10T/F	Four-port 10BASE-T/one-port fiber 10BASE-FL repeating hub
EI6-10T/F	Four-port 10BASE-T/two-port fiber 10BASE-FL repeating hub
Accessories	
Model	Description
AI-XFMR	Wall-mount plug-in transformer 120V AC (nom) input/24V AC (nom) output
AI-XFMR-E	Wall-mount plug-in transformer 230V AC (nom) input/24V AC (nom) output
AI-DIN	DIN-rail mounting kit for standard panel mount units

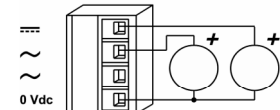
Mechanical



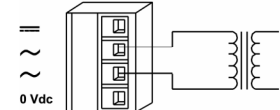
Power Options



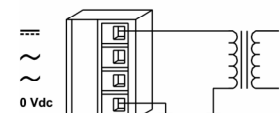
DC Powered



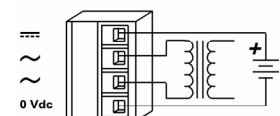
Redundant DC Powered



AC Powered



AC Powered with Grounded Secondary



AC Powered with Battery Backup

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