TE(C,U)-F Series

ETHERNET OVER COPPER EXTENDER WITH PASS-THROUGH POE UP TO 15 WATTS

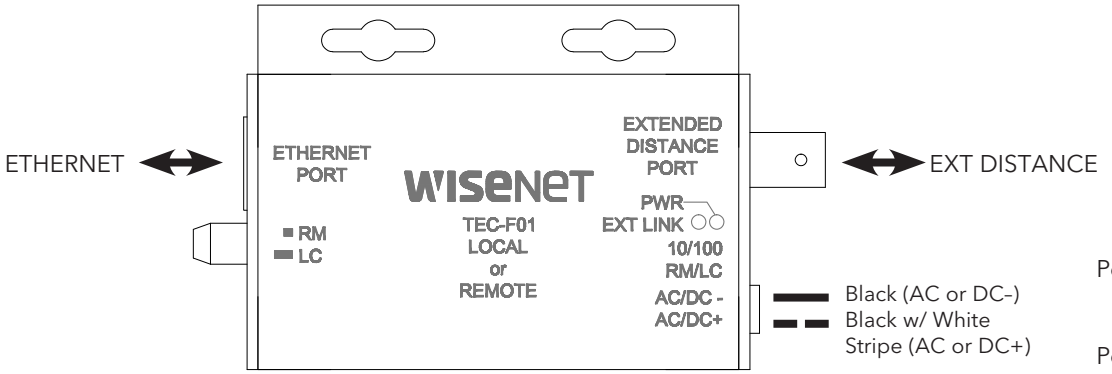
This manual serves the following Model Names:

TEC-F01
TEC-F04
TEC-F16
TEU-F01
TEU-F04
TEU-F16

The Ethernet over copper line supports up to sixteen channels of 10/100Mbps Ethernet with Pass-through PoE over twisted pair cable (CAT-5, UTP), or over coaxial cable. The single channel units may be powered by a PoE switch or the included power supply. Four and sixteen channel units operate from local power. These units provide the ultimate flexibility for extending a powered device (PD) over long distance copper. DIP switches are provided for user-selection of local or remote, 10 or 100Mbps, and 1 pair or 4 pair (UTP) settings.

The TE(C,U)-F16 are 1RU rack mountable units. The TE(C,U)-F04 units are interchangeable between stand-alone or card mount configurations, or may be DIN-rail mounted by the addition of model SBP-UDR. The TE(C,U)-F01 units are stand-alone, or may be DIN-rail mounted by the addition of model SBP-UDR adaptor.

FIGURE 1 – TEC-F01 SINGLE CHANNEL COAX UNIT



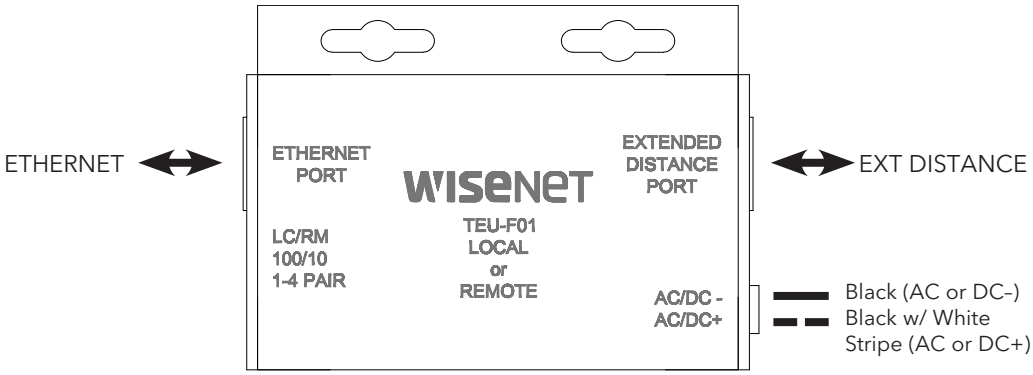
Power: Operates on PoE power
OR 9 to 36 VDC
OR 24 VAC
Power Consumption: 1.5 W

FIGURE 2 – TEC-F01 SINGLE CHANNEL COAX UNIT

Switch	UP	DOWN
Local/Remote	Remote	Local
10/100	10 Mbps	100 Mbps

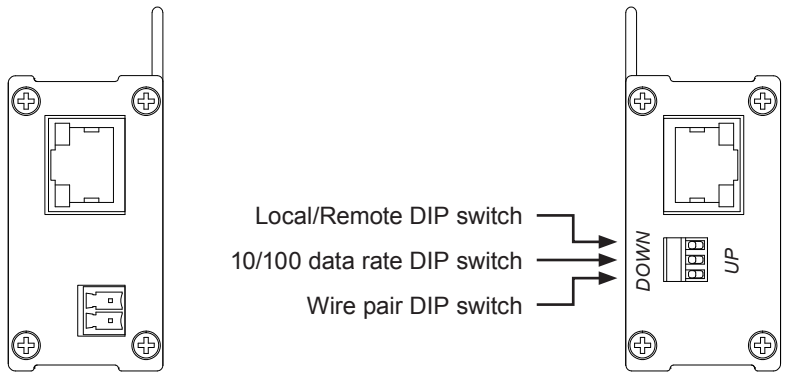
See Installation Instructions for more information

FIGURE 3 – TEU-F01 SINGLE CHANNEL UTP UNIT



Power: Operates on PoE power
OR 9 to 36 VDC
OR 24 VAC
Power Consumption: 1.5 W

FIGURE 4 – TEU-F01 SINGLE CHANNEL UTP UNIT



Switch	UP	DOWN
Local/Remote	Remote	Local
10/100	10 Mbps	100 Mbps
Wire Pair	4 Pair	1 Pair

See Installation Instructions for more information

FIGURE 3 – TEC-F04 FOUR CHANNEL SURFACE OR RACK MOUNT COAX UNIT

Operating Power: 9 to 15 VDC
Power Consumption: 5W

FIGURE 4 – TEC-F04 FOUR CHANNEL SURFACE OR RACK MOUNT COAX UNIT

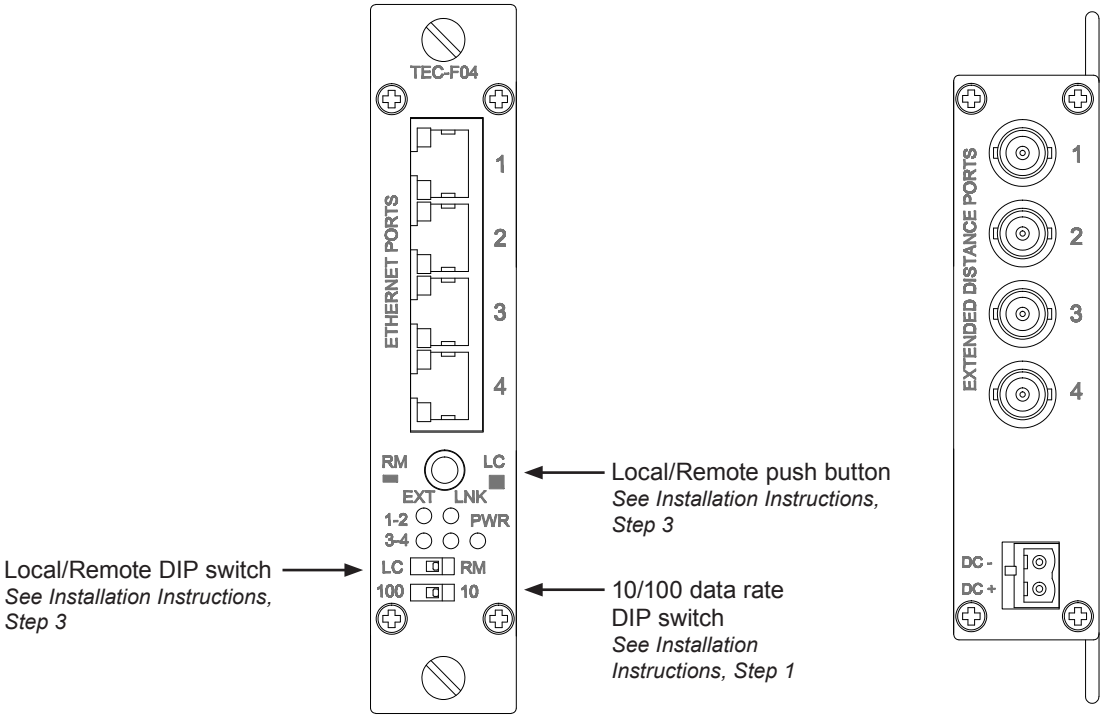
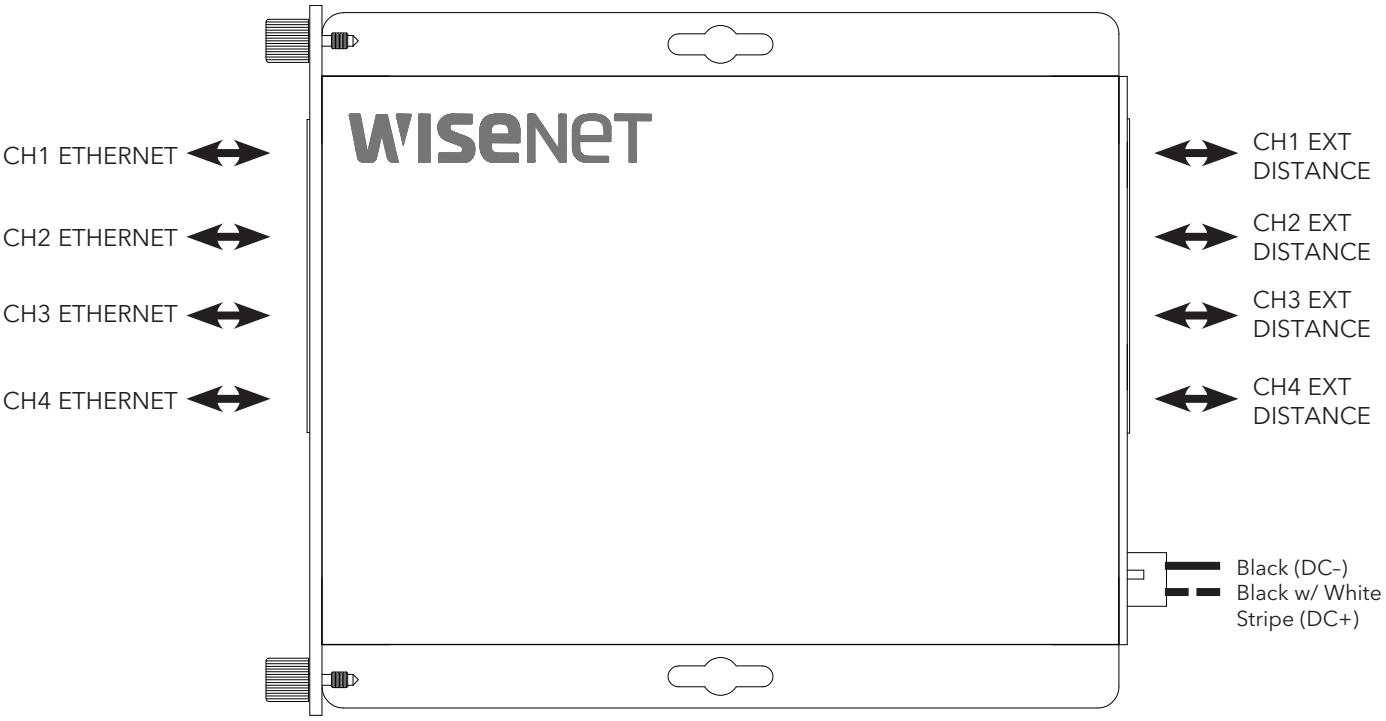


FIGURE 5 – TEU-F04 FOUR CHANNEL SURFACE OR RACK MOUNT UTP UNITS



Operating Power: 9 to 15 VDC
Power Consumption: 5W

FIGURE 6 – TEU-F04 FOUR CHANNEL SURFACE OR RACK MOUNT UTP UNITS

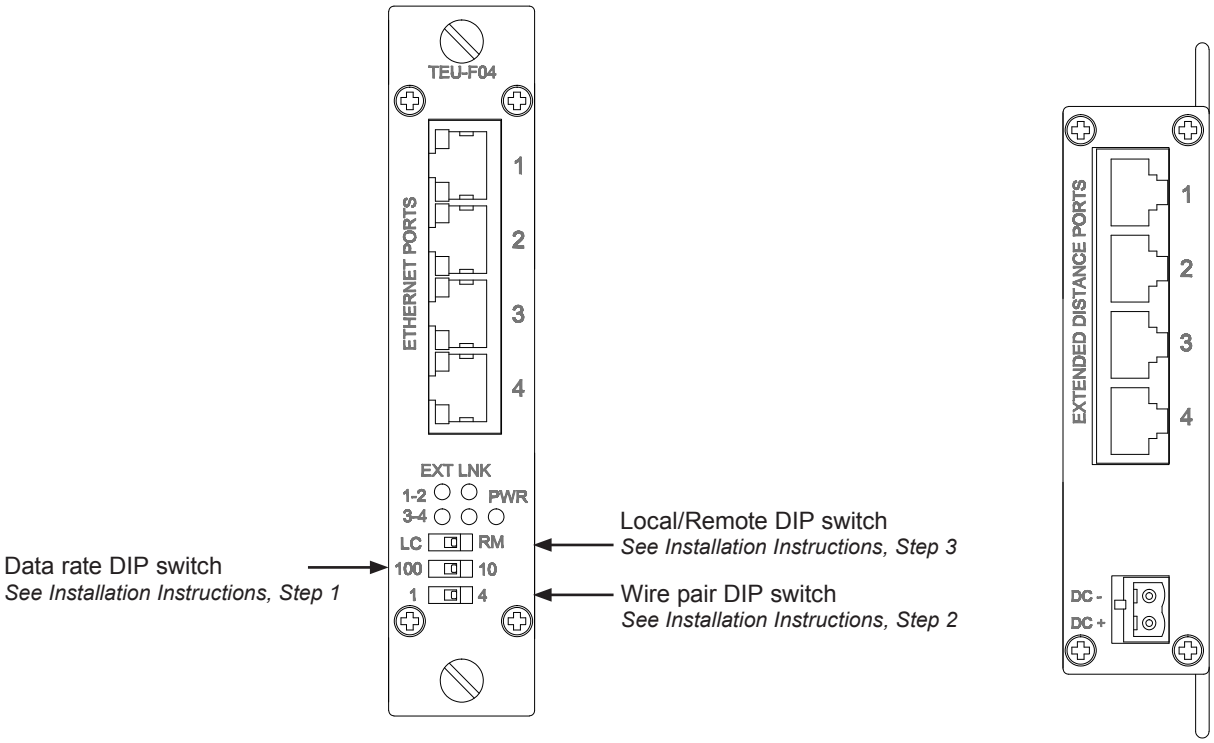


FIGURE 7 – TEC-F16 MULTICHANNEL RACK COAX UNITS

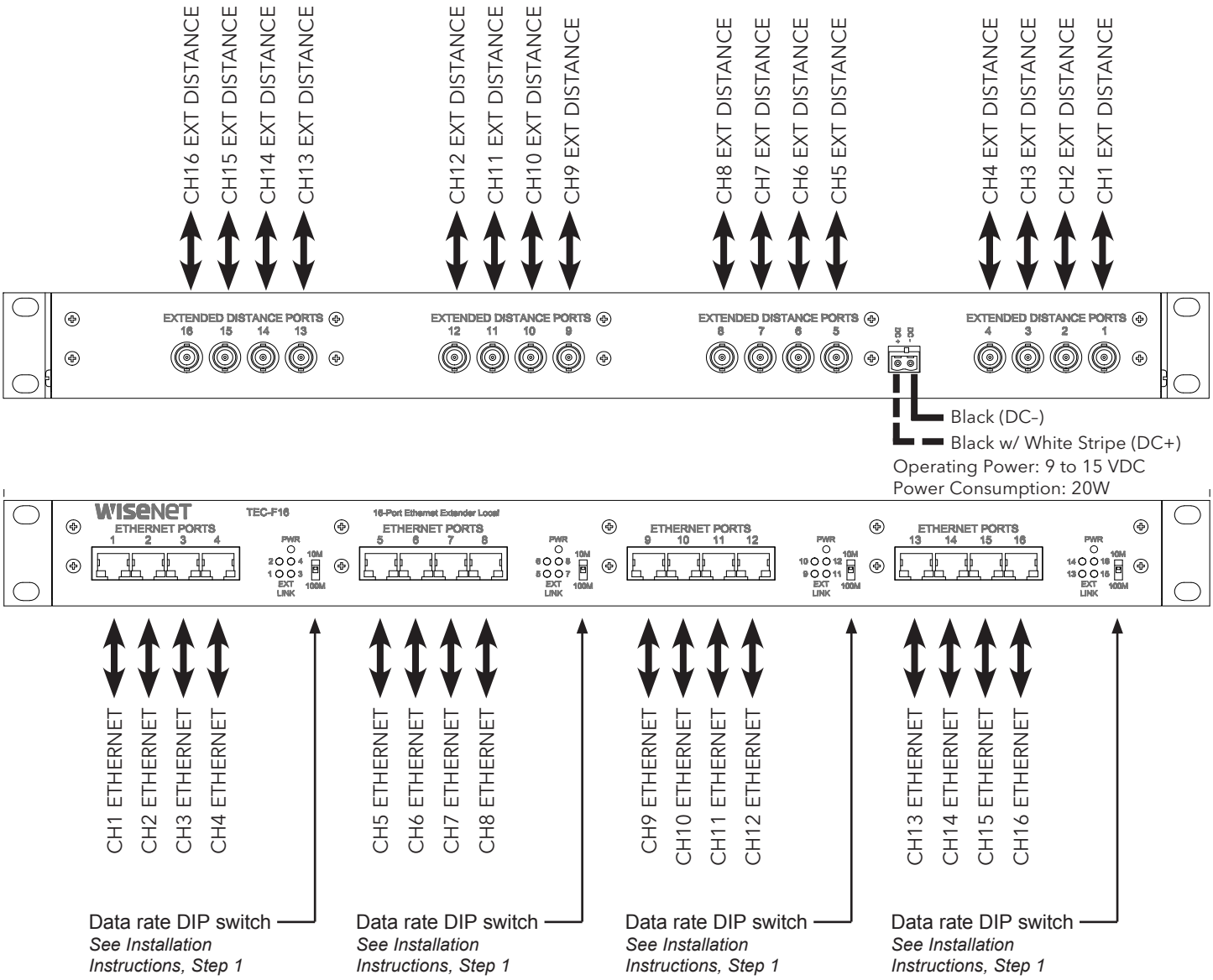
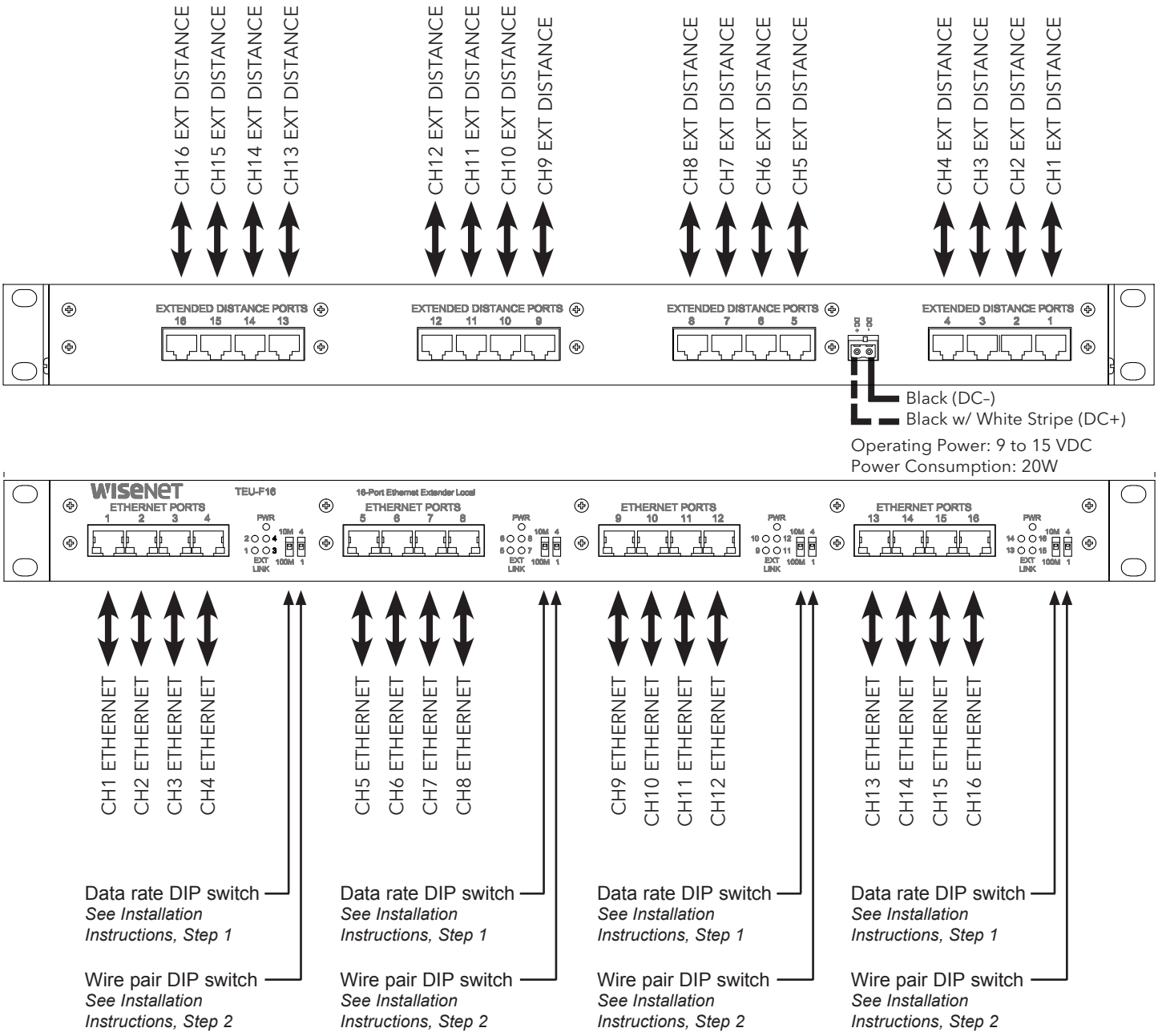
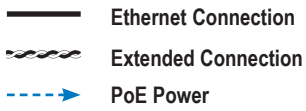


FIGURE 8 – TEU-F16 MULTICHANNEL RACK UTP UNITS

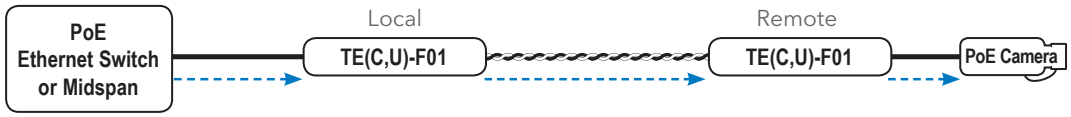


APPLICATION DIAGRAMS

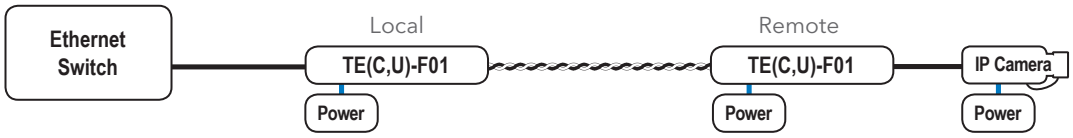
Note: Coaxial applications use TEC modules; UTP applications use TEU modules.



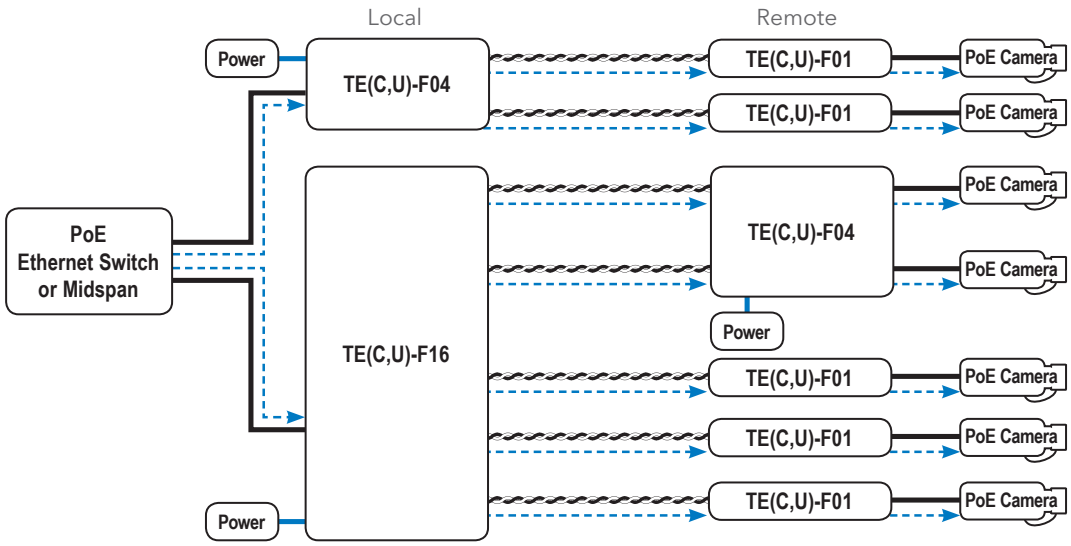
PoE Pass-Through Mode



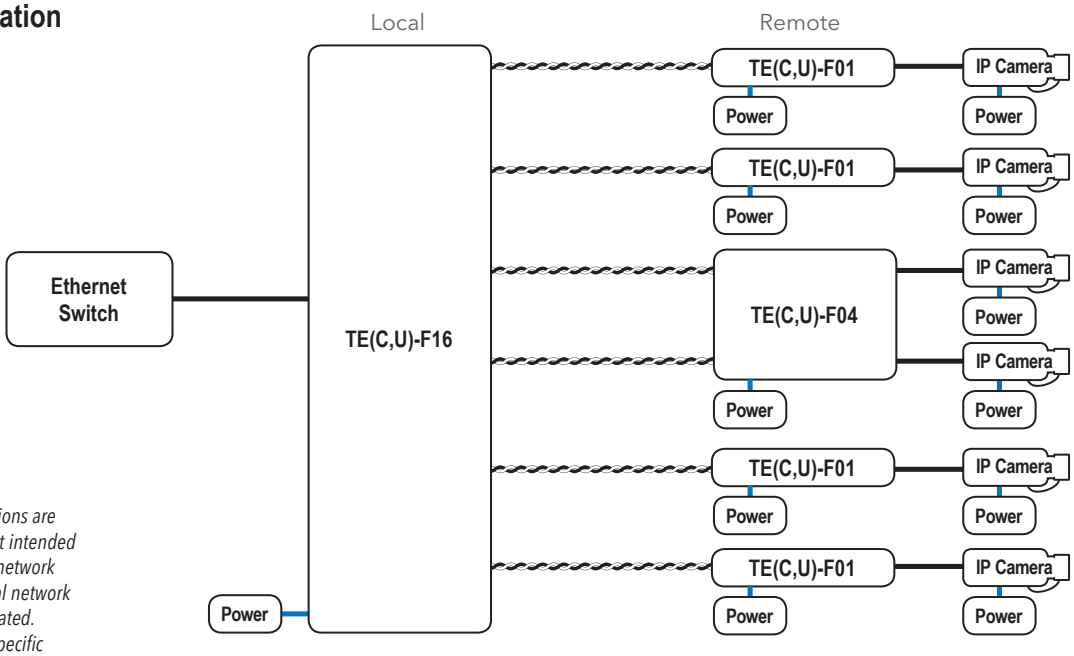
Non-PoE Mode



Multichannel PoE Application



Multichannel Non-PoE Application



IMPORTANT NOTE. PLEASE READ. *The applications are shown as general representations only and are not intended to show detailed network topologies. Your actual network will differ, requiring changes or perhaps additional network equipment to accommodate the systems as illustrated. Please contact Technical Support to discuss your specific requirements.*

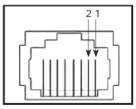
INSTALLATION INSTRUCTIONS

1 - SET 10/100 SWITCH

Locate the 10/100 data rate DIP switch on the unit.
Set the data rate according to bandwidth required.
NOTE: The data rate must be set the same on both the local and remote units.

2 - SET WIRE PAIR DIP SWITCHES (UTP MODELS ONLY, FOR COAX MODELS SKIP TO STEP 3)

Locate the wire pair DIP switch on the unit.
Set the pair according to number of twisted wire pairs used (1 or 4).
NOTE: The number of pairs selected must be set the same on both the local and remote units. PoE Pass-Through mode is only available in 4-pair mode and requires a PD device connected to the remote unit to operate.



For 1-pair mode, use the first pair of pins (pins 1 and 2) of the "Extended Ethernet" RJ-45 port.

3 - SET LOCAL/REMOTE SWITCHES (1 AND 4 CHANNEL UNITS ONLY, FOR RACK UNITS SKIP TO STEP 4)

Locate the Local/Remote Dip switch and set to "LC" at the head end or "RM" at the camera end.
Locate the Local/Remote push button switch (coax units only), and set to the same setting as the dip switch.
The TE(C,U)-F16 units are preconfigured as Local devices.

4 - CONNECT EXTENDED WIRING

Connect Extended Distance Port to field wiring.

5 - CONNECT NETWORK WIRING

Using CAT5/5e cabling, connect Local unit to network and Remote unit to camera.

6 - CONNECT POWER

Connect power to unit per the following table:

Power Connections per Use Case

Unit	Local Power	Pass-Through PoE
TE(C,U)-F01	9 to 36 VDC or 18 to 32 VAC	No external power required
TE(C,U)-F04	9 to 15 VDC (9 VDC† when in a SBP-C03 or SBP-C14 rack)	
TE(C,U)-F16	9 to 15 VDC	

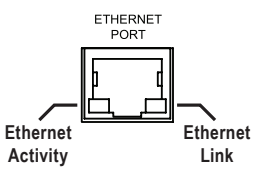
† Contact pre-sales support, or refer to the appropriate installation and operation manual when configuring and specifying power for a deployment.

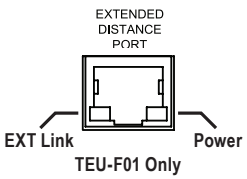
7 - VERIFY FUNCTIONALITY

See LED table below and Troubleshooting Guide if corrective action is needed. See figures beginning on page 6 for LED configurations for each model.

Indicating LEDs

	PWR	Ethernet Link	Ethernet Activity	EXT LNK
GREEN	Power Applied	–	Activity Detected	10Mbps
YELLOW	–	Link Established	–	100Mbps
OFF	Power Off	No Link	No Activity	No Link





APPLICATION NOTES

1 Mixed PoE and Non-PoE systems can be implemented.

2 All Non-PoE systems require local power.

3 PoE powered operation requires that a PoE Camera be connected, and that the camera power requirements are understood.

4 Multiple Channel units (TE(C,U)-F04, TE(C,U)-F16) require 9 to 15 VDC for proper operation. The TE(C,U)-F04 can be used in a SBP-C14 or SBP-C03.

5 Single Channel units (TE(C,U)-F01) require power for all Non-PoE applications. Local power can be used in PoE application to minimize PoE consumption.

6 Lower data rates generally provide longer operating distances.

7 Rack units (TE(C,U)-F16) are pre-configured for Local (LC) and have no configurable Local/Remote switch. Any unit connected to one of these rack units via an extended distance port must be configured as Remote (RM) for proper operation.

APPROXIMATE MAXIMUM EXTENDED DISTANCES[1]

Media	COAX - RG59/U				UTP - 4 pair				UTP - 1 pair	
Data Rate	10M		100M		10M		100M		10M	100M
Source Power	15W	30W	15W	30W	15W	30W	15W	30W	N/A	
Non-PoE Max.Distance[1]	5,000 ft 1,524 m		2,000 ft 610 m		3,000 ft 914 m		2,000 ft 610 m		3,000 ft 914 m	1,000 ft 305 m
PoE CLASS2 (6.5W)[1]	3,000 ft 914 m	3,000 ft 914 m	2,000 ft 610 m	2,000 ft 610 m	3,000 ft 914 m	3,000 ft 914 m	2,000 ft 610 m	2,000 ft 610 m	N/A	
PoE CLASS3 (13W)[1]	750 ft 228 m	850 ft 259 m	750 ft 228 m	850 ft 259 m	750 ft 228 m	850 ft 259 m	750 ft 228 m	850 ft 259 m	N/A	

[1] Distance figures are based on a 50 V PSE PoE power source, and external power supplies for the extenders. Distance figures are obtained using in-house testing mirroring installations. Factors such as coaxial and copper cable quality, the number of connectors and splices in the cable run, the use of PoE, and environmental conditions encountered within the installation might affect the actual transmission distance and should be taken into consideration. Due to advanced negotiation signaling required in IEEE802.3at applications, pass-through applications are limited to IEEE802.3af PD devices only. When using UTP models Pass-Through PoE is only possible in 4-pair mode.

TROUBLESHOOTING GUIDE

Problem	Steps to Take
Indicating LEDs not lighting	Non-PoE: Check that power is properly applied to the unit PoE: Check that PoE camera is connected, PoE source is enabled.
No Communication	Check Ethernet Link LEDs, Extended Link LEDs, All Connections, Local/Remote and 10/100 switches are set properly. Verify that Local units are installed at the head end and that Remote units are installed in the field.
Bad Video	Make sure Data Rate Switch is set properly, and the extended distance is within specifications (see Table "Approximate Maximum Extended Distances").
PoE Not Supplied to PD	Make sure camera is IEEE 802.3af rated, PoE Source switch is set properly, and the extended distance is within specifications (see Table "Approximate Maximum Extended Distances").
Units not reaching estimated max distances over COAX or CAT5/UTP	Check extended distance cable and connections. Try connection on a short cable to eliminate possibility of faulty cabling. Check that the extended distance wire is connected to Extended Distance Port. Verify that there is no additional equipment (e.g. surge protector) on the Extended Link. The cable should be continuous from end to end, with no active components.

PRODUCT DIMENSIONS

FIGURE A

Dimensions are for a small size module

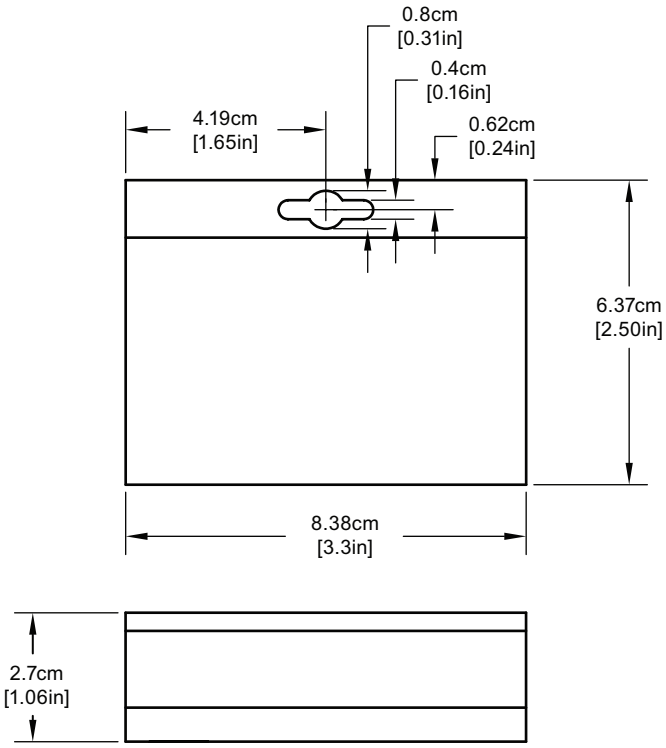


FIGURE B

Dimensions are for a standard module

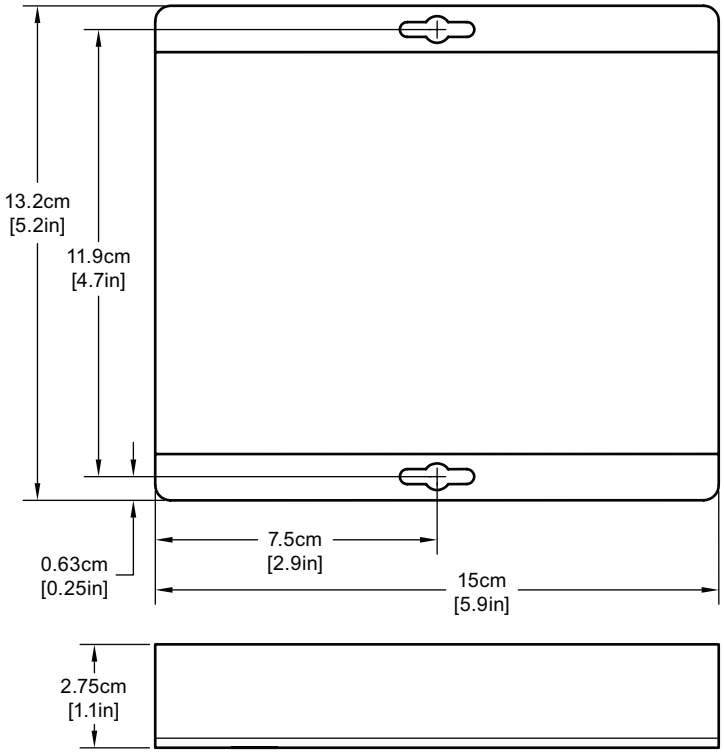
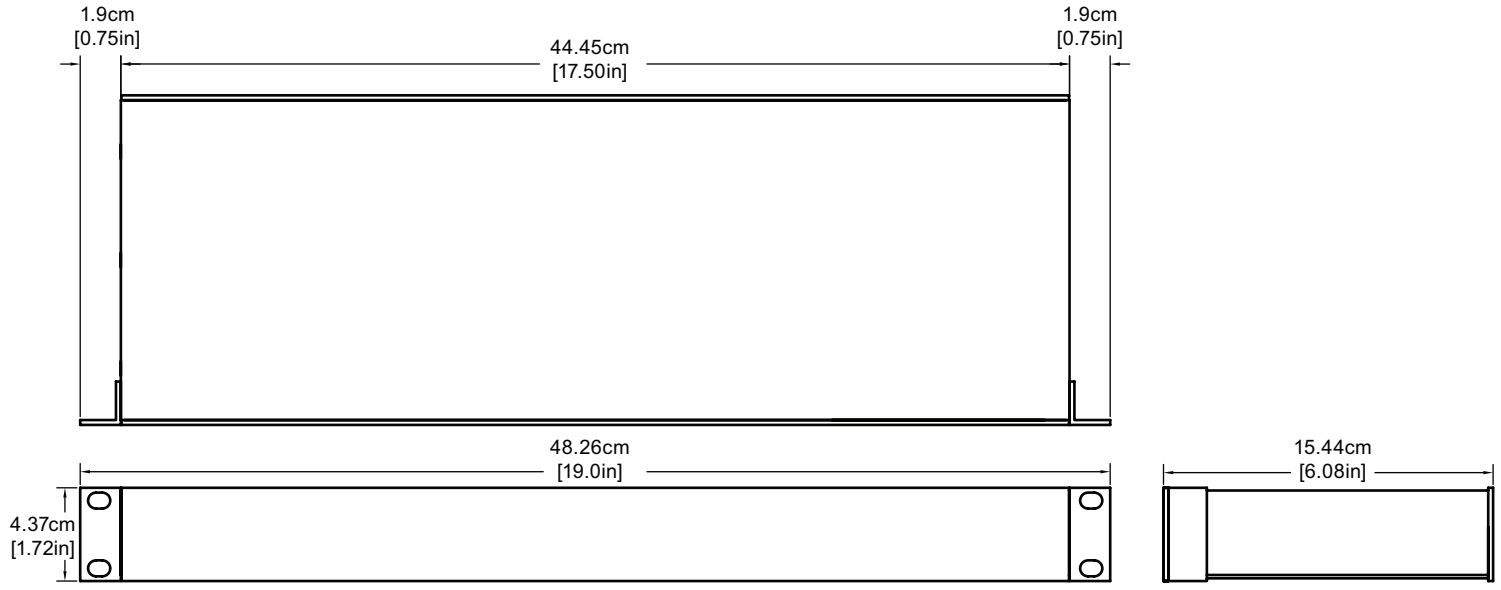


FIGURE C

Dimensions are for a 19" Rack Unit



INSTALLATION CONSIDERATIONS

These units are supplied as Standalone/Rack mounted module. Units should be installed in dry locations protected from extremes of temperature and humidity.

SBP-C14 / SBP-C03 CARD CAGE RACKS

CAUTION: Although the units are hot-swappable and may be installed without turning power off to the rack, Hanwha recommends that the power supply be turned off and that the rack power supply is disconnected from any power source. Note: Remove electrical connector before installing in card cage rack.

1.Make sure that the card is oriented right side up, and slide it into the card guides in the rack until the edge connector at the back of the card seats in the corresponding slot in the rack's connector panel. Seating may require thumb pressure on the top and bottom of the card's front panel.

CAUTION: Take care not to press on any of the LEDs.

2. Tighten the two thumb screws on the card until the front panel of the card is seated against the front of the rack.

WARNING: Unit is to be used with a Listed Class 2 power supply.

IMPORTANT SAFEGUARDS:

A) Elevated Operating Ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (T_{ma}) specified by the manufacturer.

B) Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.