

INSTALLATION AND OPERATION MANUAL

COPPERLINE®

CL(L,R)FE(X)POE(C,U) Series

ETHERNET-OVER-COPPER EXTENDER WITH 30W PSE POE+



This manual serves the following ComNet Model Numbers:

CLLFE1POEC
CLRFE1POEC
CLLFE1POEU
CLRFE1POEU
CLLFE4POEC
CLRFE4POEC
CLLFE4POEU
CLRFE4POEU
CLLFE8POEC
CLLFE8POEU
CLLFE16POEC
CLLFE16POEU

The ComNet™ CopperLine® Ethernet over copper line supports up to sixteen channels of 10/100Mbps Ethernet with PoE+ Power Injection and Pass-through PoE+ over twisted pair cable (CAT-5, UTP) or over coax. With the ability to connect directly to a PoE+ switch, or the ability to generate PoE+ power with a 48 to 56 V input to either the Local or Remote ends, these units provide the ultimate flexibility for extending a powered device (PD) over long distance copper. A complete set includes both a Local and Remote module. Remote units are available in small package sizes that include one or four channels, and Local modules are available in the same packages as well as a 1RU rack for larger channel counts.

Bi-color (Red/Green) LED indicators are provided for rapidly ascertaining equipment operating status. **Table 2** on **Page 11** describes the LED indicators for each light on the unit.

The CLLFE8POE(C,U) and CLLFE16POE(C,U) are 1RU rack mountable units. The CL(L,R)FE4POE(C,U) units are interchangeable between stand-alone or card mount configurations, or may be DIN-rail mounted by the addition of ComNet model DINBKT1 or DINBKT4 adaptor plate. The CL(L,R)FE1POE(C,U) units are stand-alone, or may be DIN-rail mounted by the addition of ComNet model DINBKT4 adaptor. See **Figures A** through **C** on **Page 14** for mounting instructions.

FIGURE 1 – CLLFE1POEC SINGLE CHANNEL COAX LOCAL UNIT

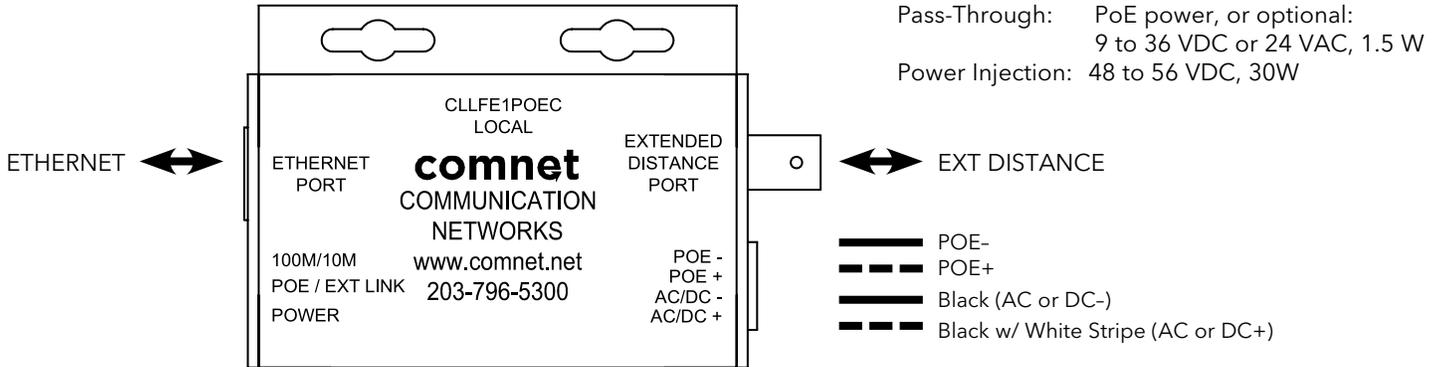


FIGURE 2 – CLRFE1POEC SINGLE CHANNEL COAX REMOTE UNIT

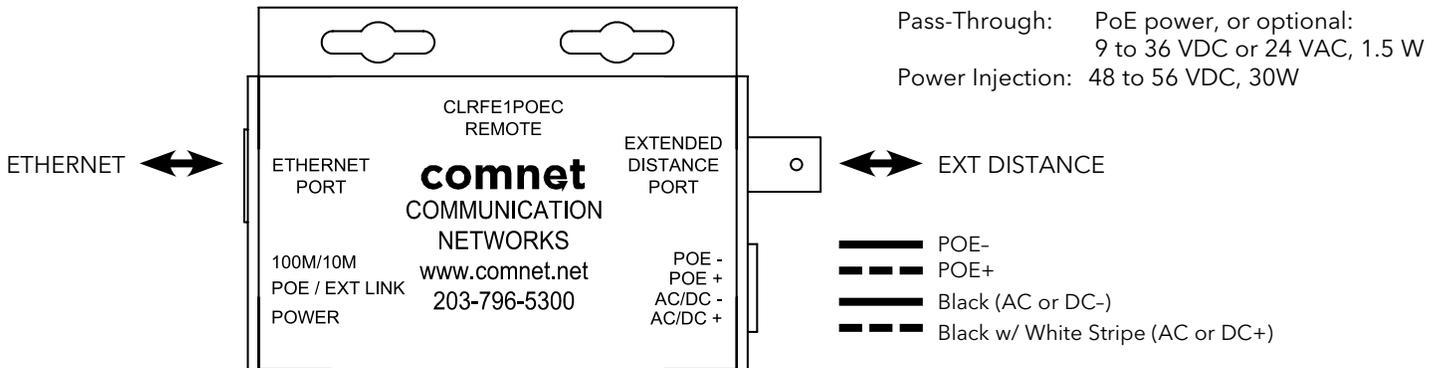
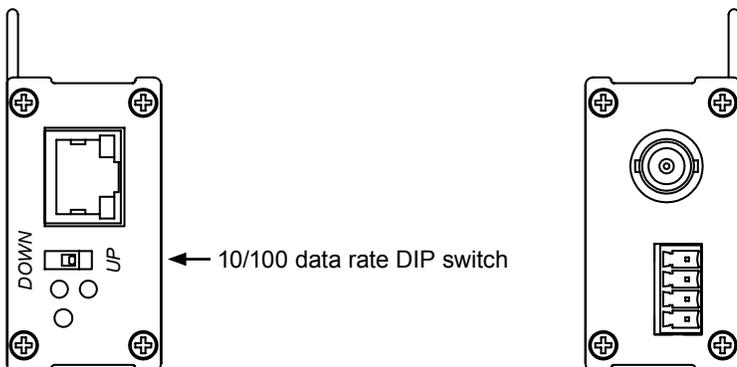


FIGURE 3 – CL(L,R)FE1POEC SINGLE CHANNEL COAX UNITS



Switch	UP	DOWN
10/100	10 Mbps	100 Mbps

See Installation Instructions for more information

FIGURE 4 – CLLFE1POEU SINGLE CHANNEL UTP LOCAL UNIT

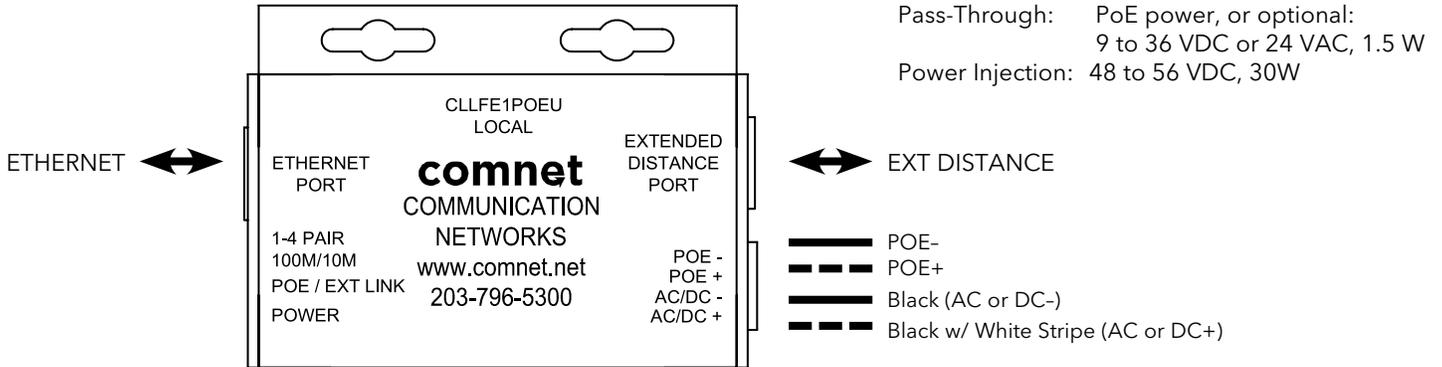


FIGURE 5 – CLRFE1POEU SINGLE CHANNEL UTP REMOTE UNIT

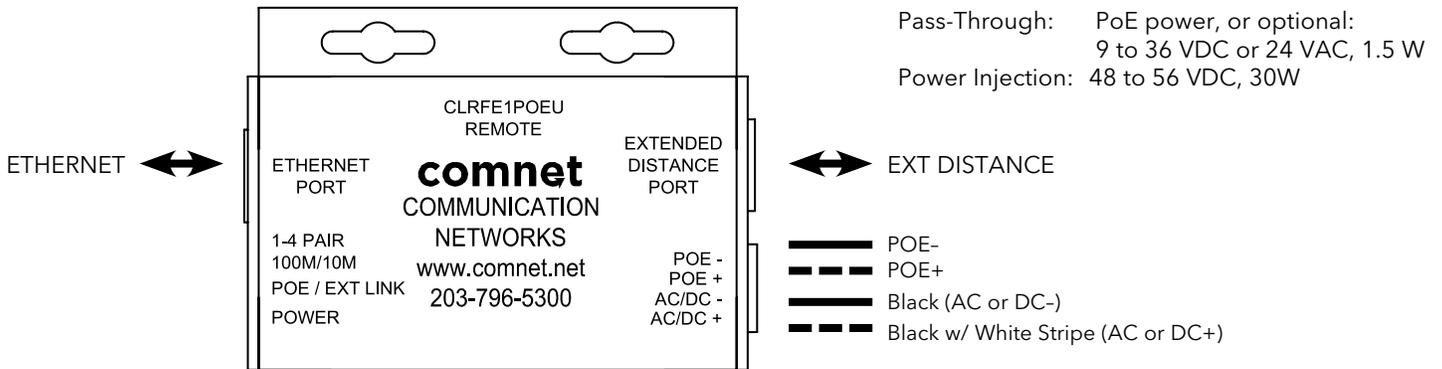
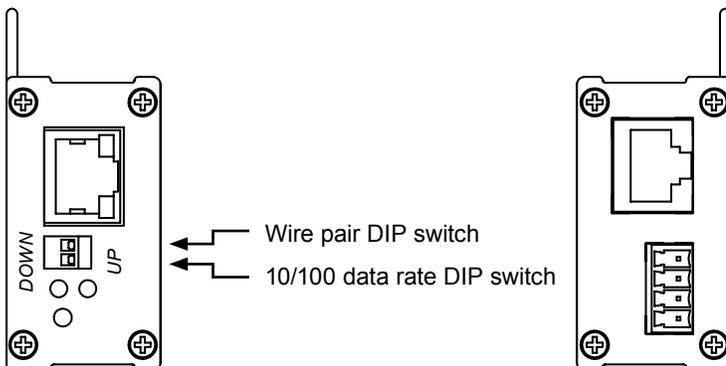


FIGURE 6 – CL(L,R)FE1POEU SINGLE CHANNEL UTP UNITS



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

See Installation Instructions for more information

FIGURE 7 – CL(L,R)FE4POEC FOUR CHANNEL SURFACE OR RACK MOUNT COAX UNIT

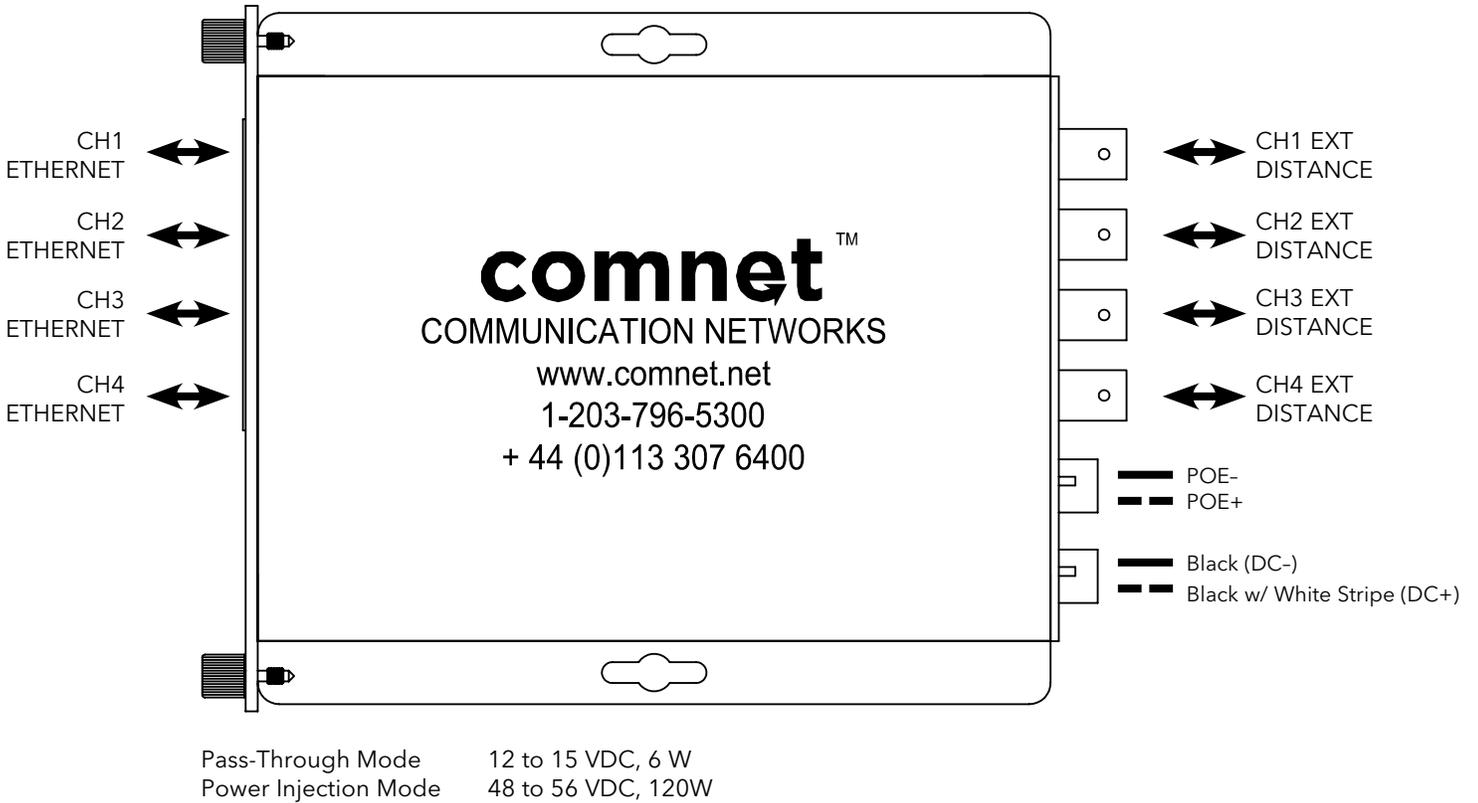


FIGURE 8 – CL(L,R)FE4POEC FOUR CHANNEL SURFACE OR RACK MOUNT COAX UNIT

CLLFE4POEC Local Unit Front Panel

CLRFE4POEC Remote Unit Front Panel

CL(L,R)FE4POEC Rear Panel

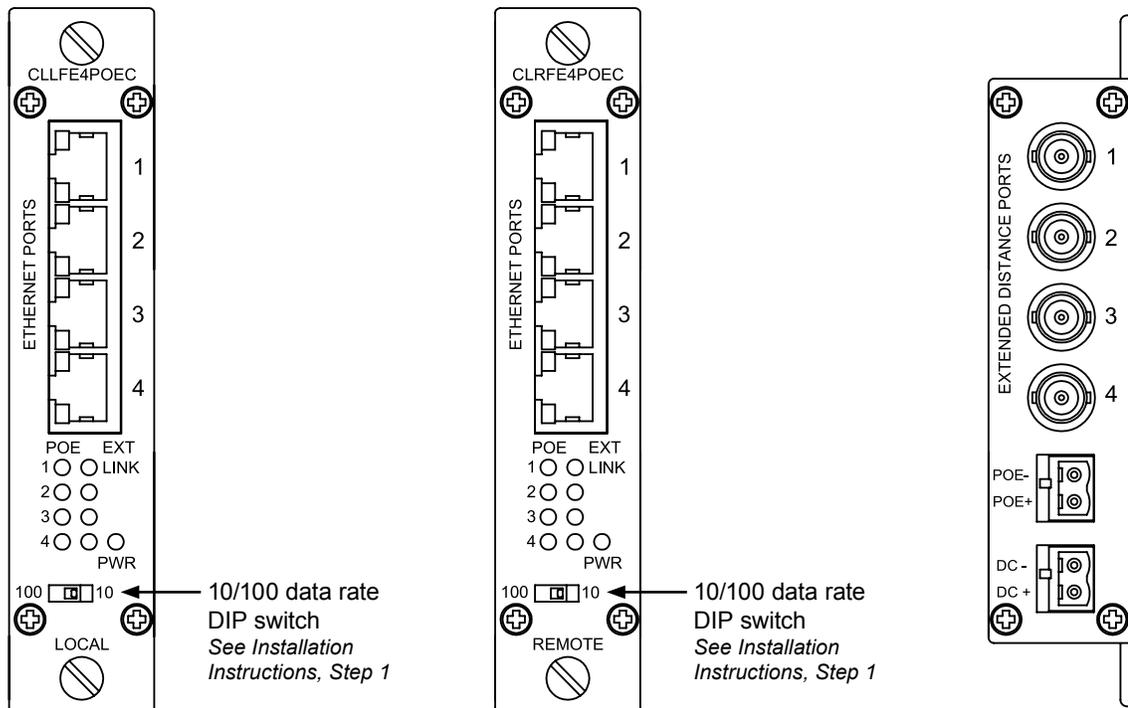


FIGURE 9 – CL(L,R)FE4POEU FOUR CHANNEL SURFACE OR RACK MOUNT UTP UNIT

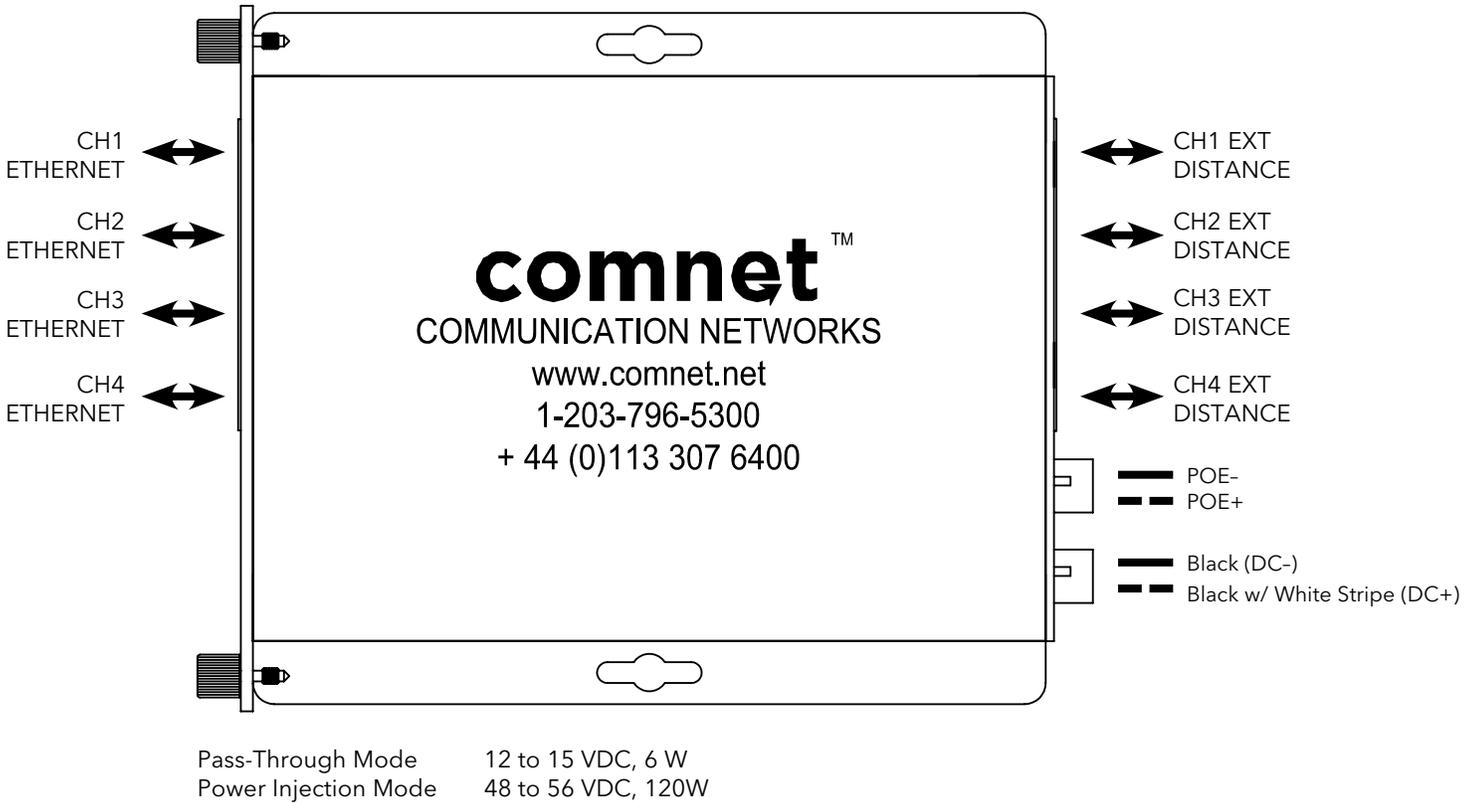


FIGURE 10 – CL(L,R)FE4POEU FOUR CHANNEL SURFACE OR RACK MOUNT UTP UNIT

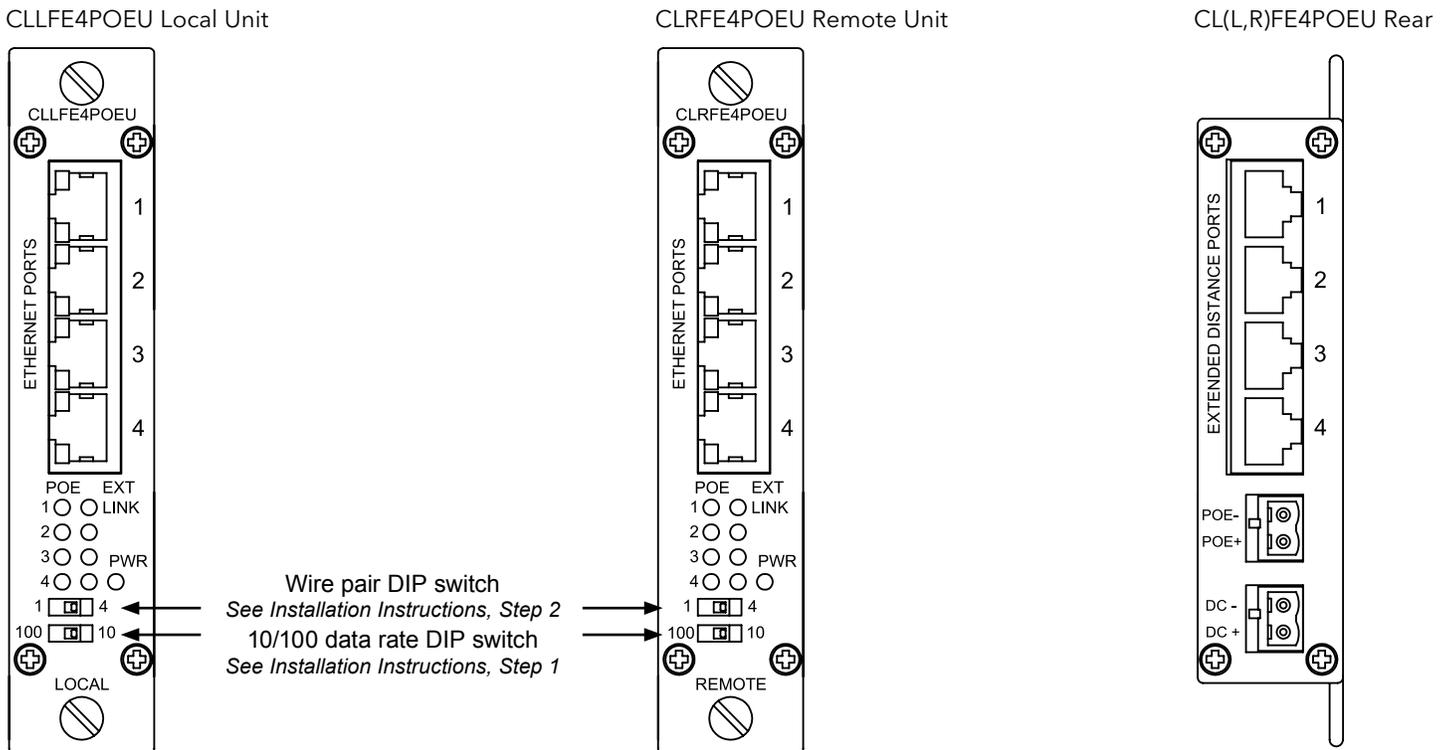


FIGURE 11 – CLLFE8EOC MULTICHANNEL RACK COAX UNITS

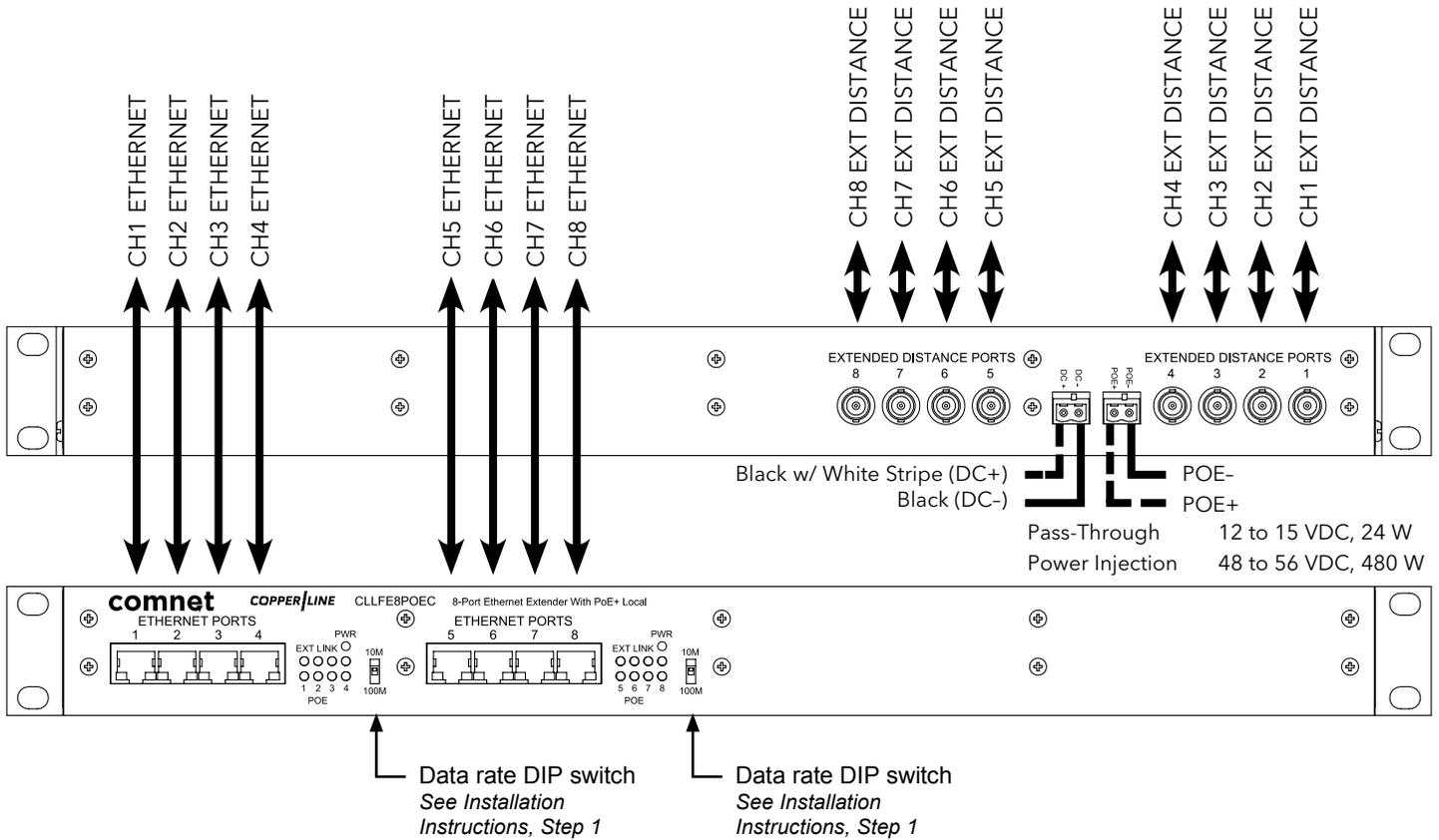


FIGURE 12 – CLLFE8EOU MULTICHANNEL RACK UTP UNITS

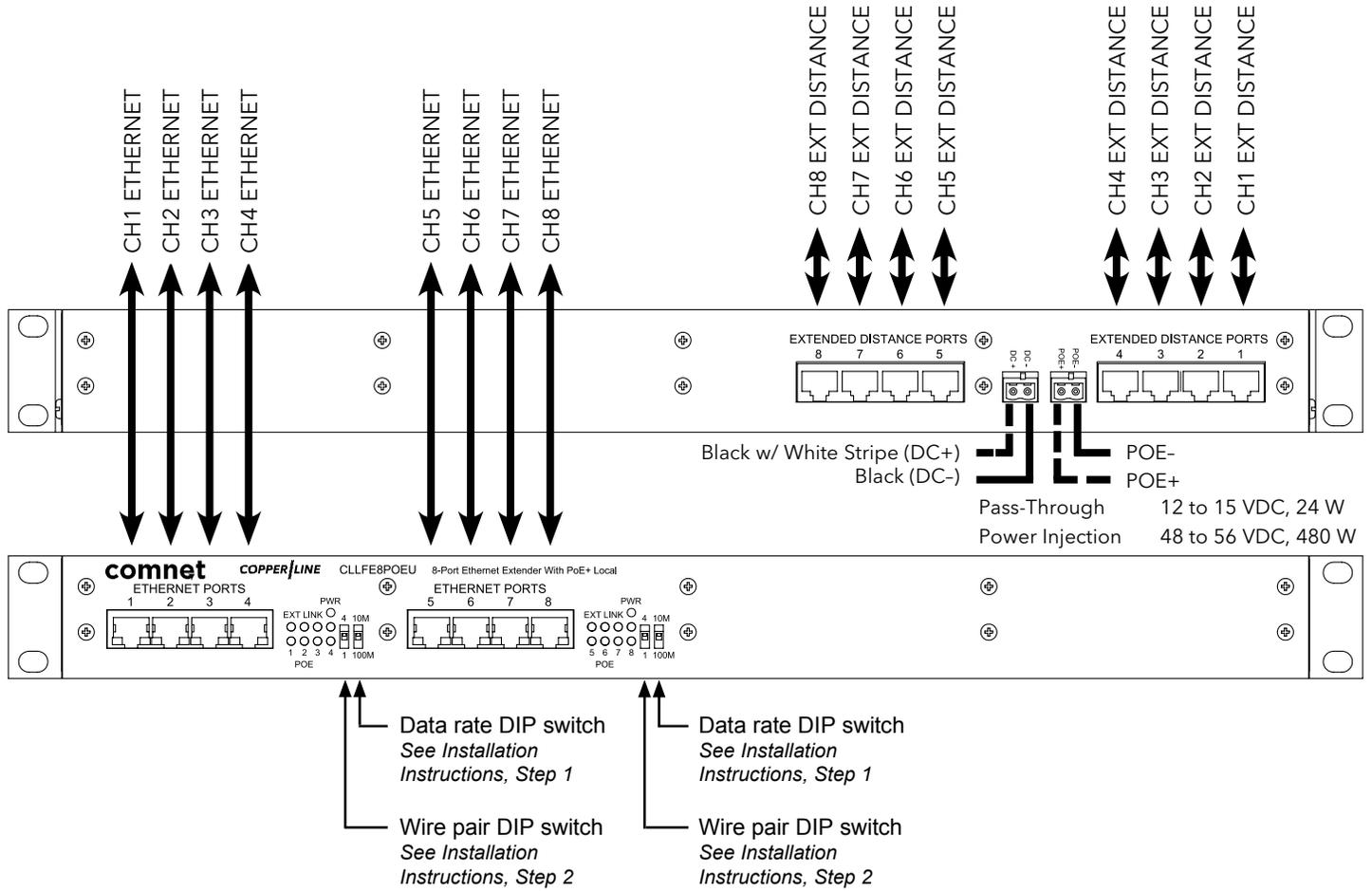


FIGURE 13 – CLLFE16EOC MULTICHANNEL RACK COAX UNITS

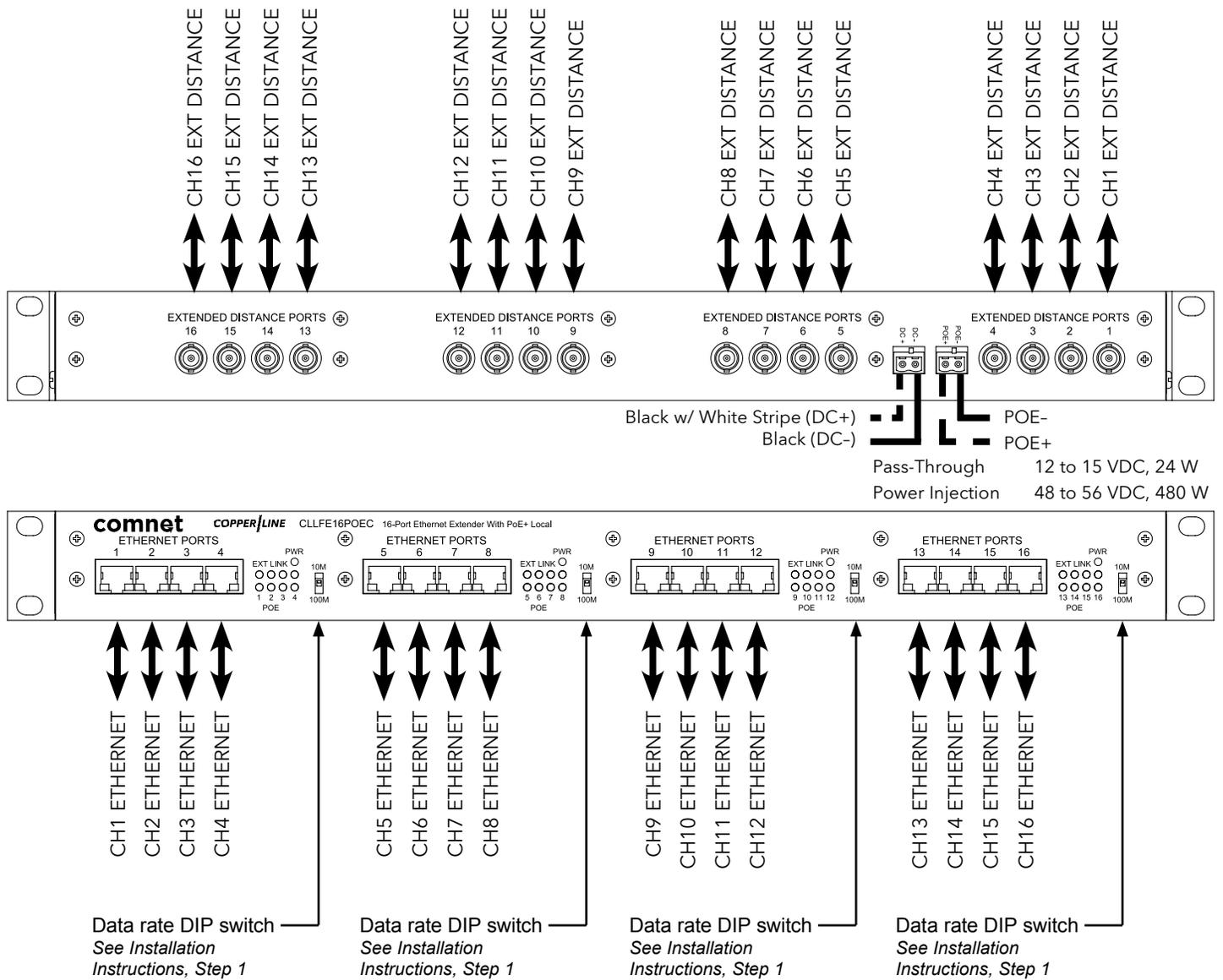
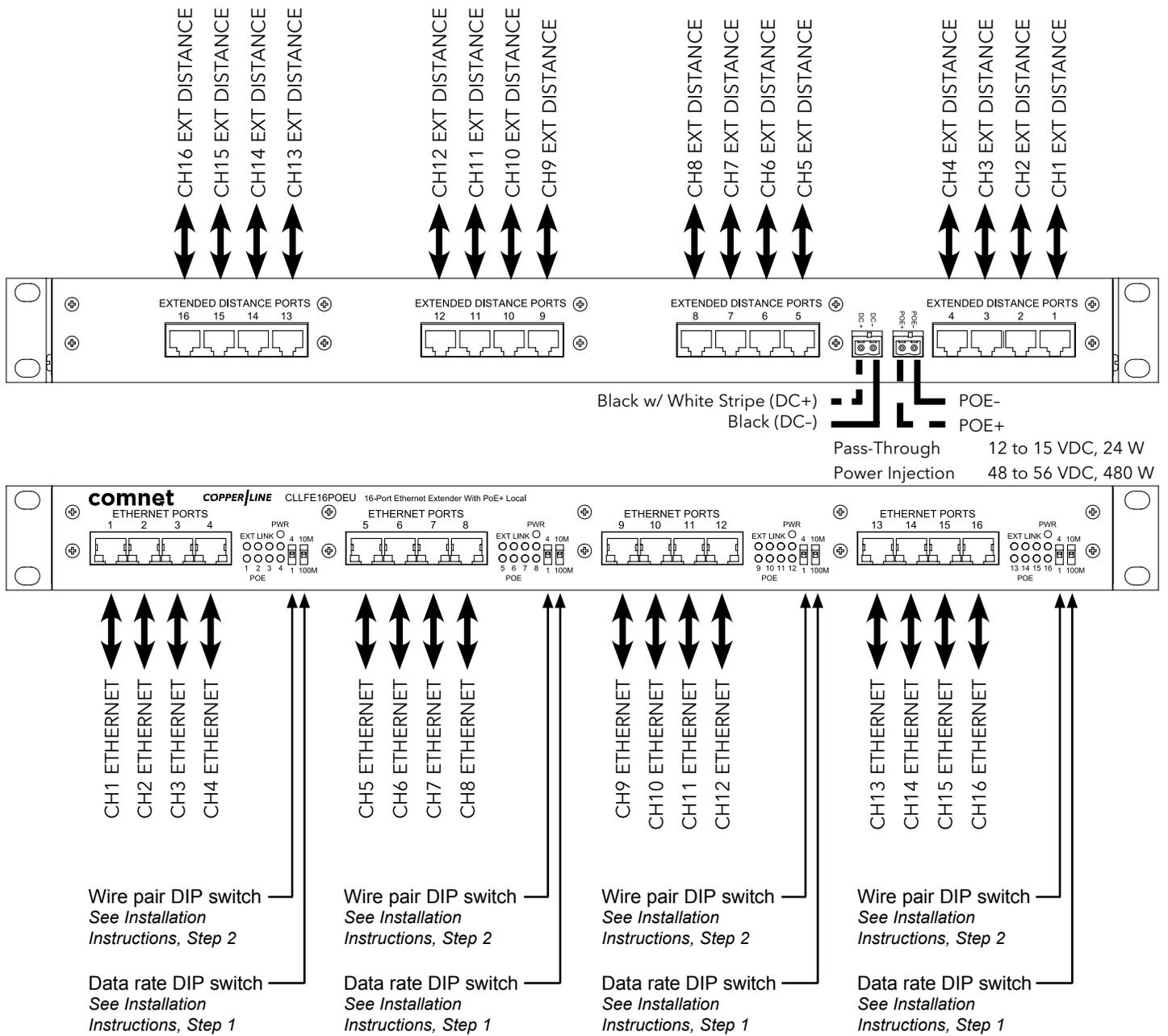
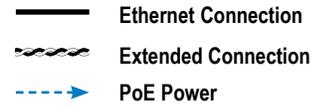


FIGURE 14 – CLLFE16EOU MULTICHANNEL RACK UTP UNITS

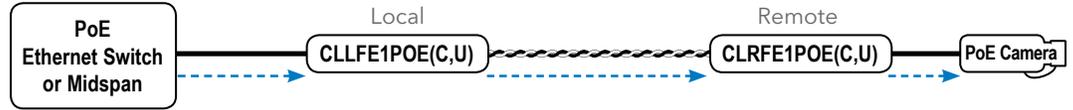


APPLICATION DIAGRAMS

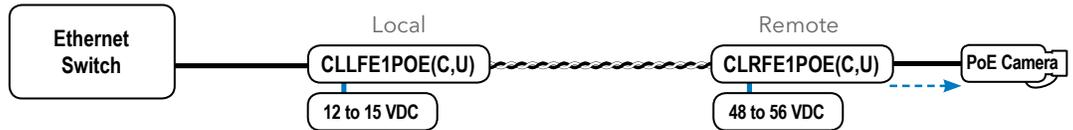
Note: Coaxial applications use CL(L,R)FE(X)POEC modules; UTP applications use CL(L,R)FE(X)POEU modules.



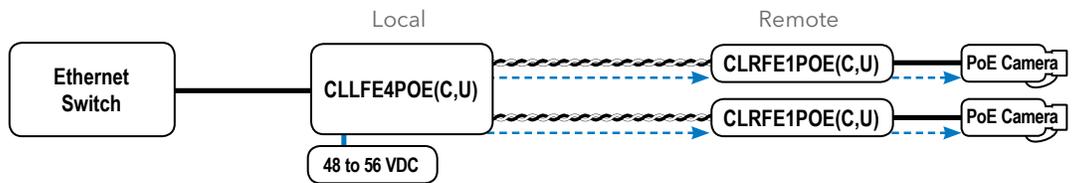
PoE Pass-Through Mode



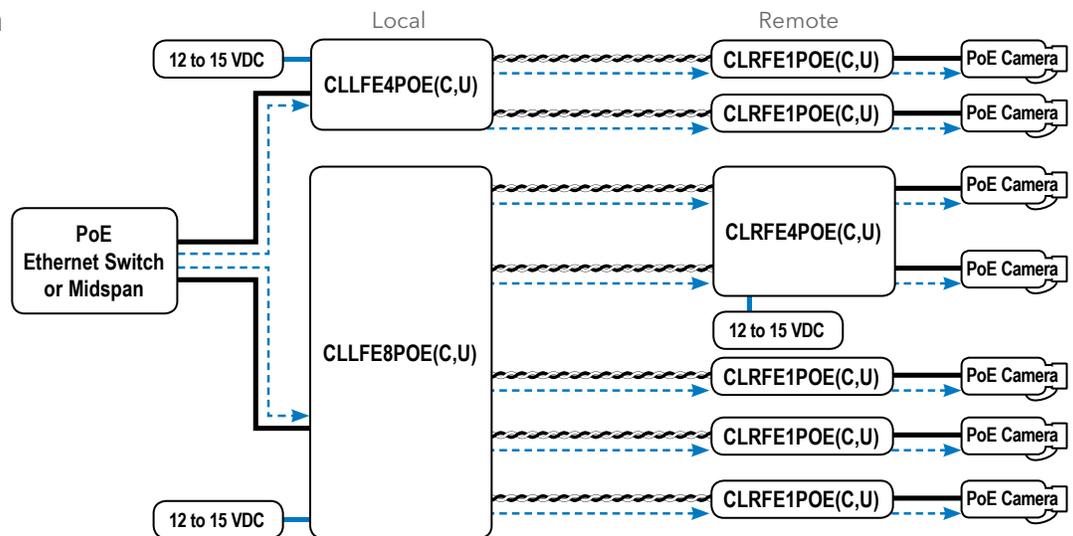
Remote PoE Injection Mode



Local PoE Injection Mode



Multichannel 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 ComNet's Design Center to discuss your specific requirements.

INSTALLATION INSTRUCTIONS

1 - SET DATA RATE DIP SWITCHES

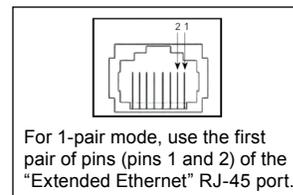
Locate the 10/100 data rate DIP switch on the unit.
Set the data rate according to bandwidth required.

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.**



3 - CONNECT EXTENDED WIRING

Connect Extended Distance Port to field wiring.

4 - CONNECT NETWORK WIRING

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

5 - CONNECT POWER

Connect power to unit per the following table:

Power Connections per Use Case

Unit	Local Power	Pass-Through PoE	PoE Injection
CL(L,R)FE1POE(C,U)	9 to 36 VDC or 18 to 32 VAC Connect to AC/DC- and AC/DC+	No external power required	48 to 56 VDC Connect to POE- and POE+
CL(L,R)FE4POE(C,U)	12 to 15 VDC (9 VDC† when in a C1 or C2 rack) Connect to DC- and DC+		48 to 56 VDC Connect to POE- and POE+
CLLFE8POE(C,U) CLLFE16POE(C,U)	12 to 15 VDC Connect to DC- and DC+		48 to 56 VDC Connect to POE- and POE+ 8 to 15 VDC Connect to DC- and DC+

Note: Use only one of the two power connectors, based on the power requirements of your application.

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

6 - VERIFY FUNCTIONALITY

See LED table below and Troubleshooting Guide if corrective action is needed.

Indicating LEDs					
	PWR	POE	Link (Ethernet Port)	Activity (Ethernet Port)	EXT LNK
GREEN	Power Applied	PoE Applied	–	–	10M or 100M Link Detected
YELLOW	–	–	Link Detected	–	–
OFF	Power Off	No PoE Present	No Link	–	No Link
BLINK	–	–	–	Data Activity	Data Activity

APPLICATION NOTES

- Mixed PoE and Non-PoE systems can be implemented.
- All Non-PoE systems require local power.
- PoE power injection can be applied to Local or Remote units.
- Single Channel units (CL(L,R)FE1POE(C,U)) require power for all Non-PoE applications. Local power can be used in PoE application to minimize PoE consumption.
- Lower data rates generally provide longer operating distances.
- Rack units (CLLFE8POE(C,U), CLLFE16POE(C,U)) are pre-configured for Local (L), therefore only speed switch and pair select (UTP only) are configurable. Any unit connected to one of these rack units via an extended distance port, must be configured as Remote (R) for proper operation.
- The Extended Distance ports are suitable for connection to outside Plant leads (TNV-1) only when unit is operated in power pass through mode or the unit is operating in non-POE mode and powered by local 12VDC only and the equipment connected to the Ethernet ports has been evaluated for connection to outside plant leads.

APPROXIMATE MAXIMUM EXTENDED DISTANCES¹

Media	COAX - RG59/U				UTP - 4 pair				UTP - 1 pair	
	10M		100M		10M		100M		10M	100M
Source Power	15W	30W	15W	30W	15W	30W	15W	30W		
Non-PoE Camera 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
Remote Injection	5,000 ft 1,524 m		2,000 ft 610 m		3,000 ft 914 m		2,000 ft 610 m			
PoE CLASS2 Camera (6.5W) ¹	3,000 ft 914 m		2,000 ft 610 m		3,000 ft 914 m		610 m (2,000 ft)			
PoE CLASS3 Camera(13W) ¹ (10W in Pass-Through mode)	850 ft 259m		850 ft 259m		850 ft 259m		850 ft 259m			
PoE CLASS4 Camera (25.5W) ¹ (22W in Pass-Through mode)	n/a	335 ft 102m	n/a	335 ft 102m	n/a	n/a	n/a	n/a		

¹ Distance figures are based on a 50V 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/copper cable quality, the number of connectors/splices in the cable run, the use of PoE, and environmental conditions encountered within the installation may affect the actual transmission distance, and should be taken into consideration.

² PoE over extended distance is not available in 1 Pair mode. Remote PoE injection is required for this case.

TROUBLESHOOTING GUIDE

Problem	Steps to Take
Indicating LEDs not lighting	Non-PoE: Check that power is properly applied to the unit using the correct connector pair. Pass-through mode: Check that PoE source is enabled from the network switch.
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 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.

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. **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.

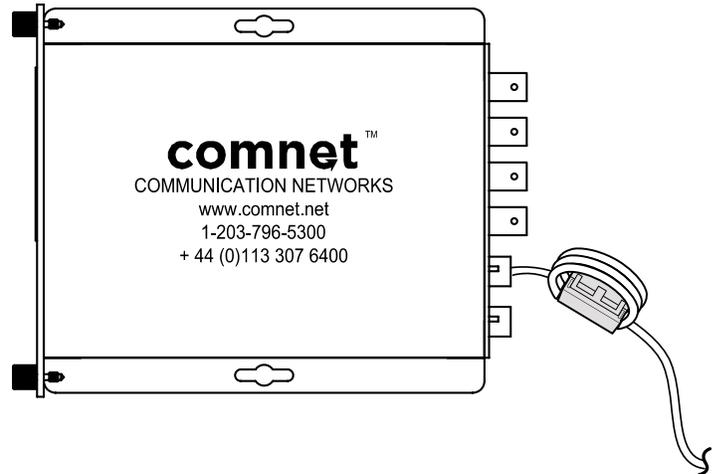
ATTACHING THE FERRITE CORE TO THE POWER CORD OF THE UNIT (Ferrite core not included, must be purchased separately)

When using 24VAC or 48VDC Power Supplies

Attaching the ferrite core to the power cord of the unit helps prevent RF interference from radio signals.

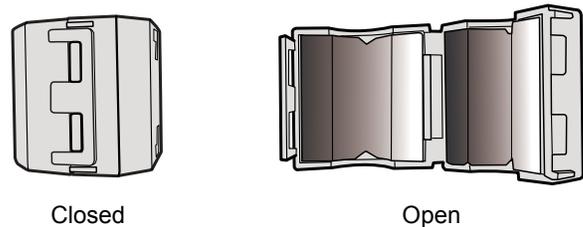
1. Pull the fixing tab of the ferrite core to open it.
2. Make three loops around the core with the power cable of the unit.
3. Attach the ferrite core to the unit power cord as shown and press it until it clicks.

Recommended part is Würth Part 742 711 32 S (Not included). Equivalent parts may be substituted.

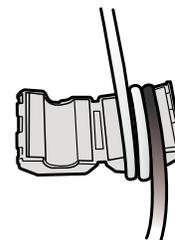


LOOPING THE POWER CABLE AROUND THE FERRITE CORE

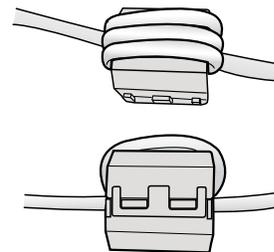
Lift up to release the lock and open the core.



Make three loops around the core with the power cable. Start winding 5 to 10 cm (2 to 3.9 in) away from the power connection.



Close the lock. You may now operate the unit according to instructions.



PRODUCT DIMENSIONS

The CL(L,R)FE1POE(C,U) is supplied as a standalone/surface mount (small size) module. The CL(L,R)FE4POE(C,U) is supplied as a standalone/surface/rack (ComFit) module. The CLLFE8POE(C,U) and CLLFE16POE(C,U) are supplied as 19" wide rack units for standalone or rack installation.

FIGURE A

Dimensions are for a small size module

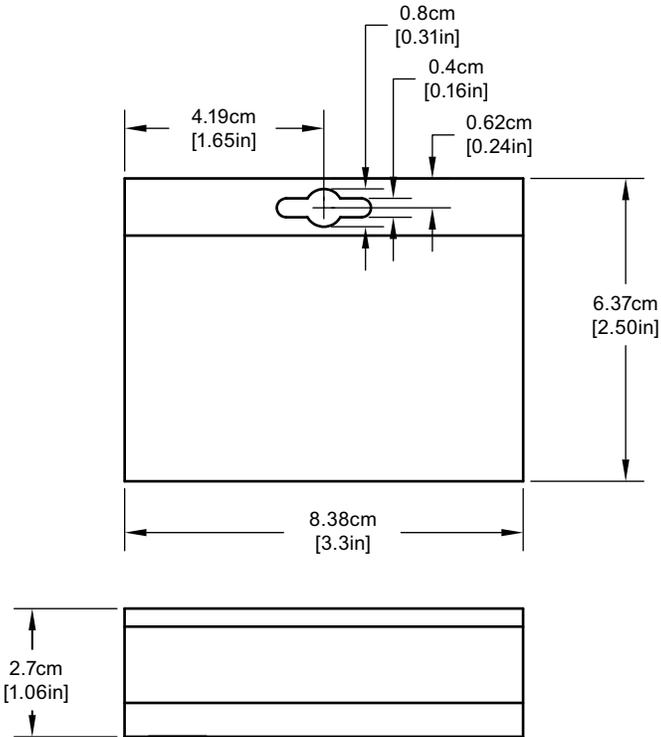


FIGURE B

Dimensions are for a ComFit module

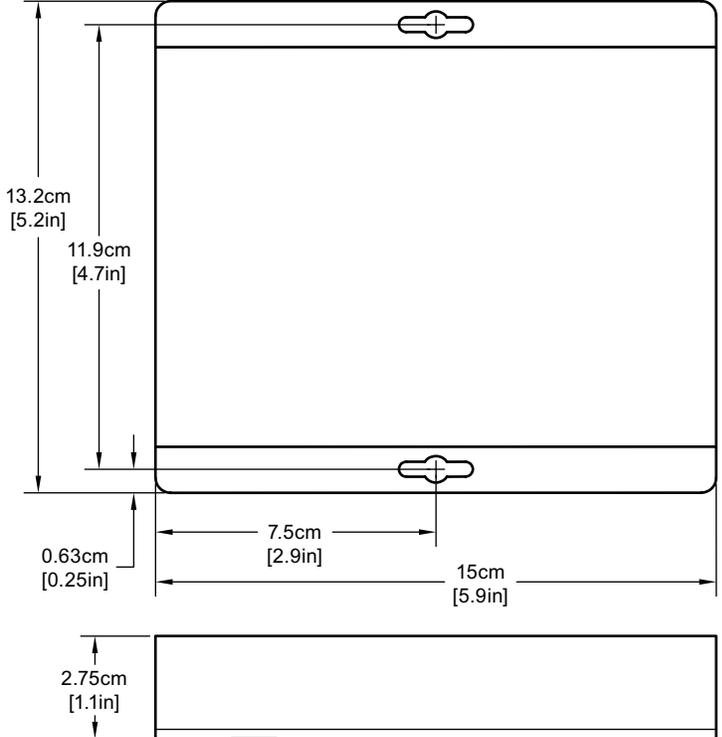


FIGURE C

Dimensions are for a 19" Rack Unit

