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

Pass-Through: PoE power, or optional: 9 to 36 VDC or 24 VAC, 1.5 W
Power Injection: 48 to 56 VDC, 30W

FIGURE 2 – CLRFE1POEC SINGLE CHANNEL COAX REMOTE UNIT

Pass-Through: PoE power, or optional: 9 to 36 VDC or 24 VAC, 1.5 W
Power Injection: 48 to 56 VDC, 30W

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

<table>
<thead>
<tr>
<th>Switch</th>
<th>UP</th>
<th>DOWN</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/100</td>
<td>10 Mbps</td>
<td>100 Mbps</td>
</tr>
</tbody>
</table>

See Installation Instructions for more information
Pass-Through:  PoE power, or optional: 9 to 36 VDC or 24 VAC, 1.5 W
Power Injection:  48 to 56 VDC, 30W

---

Pass-Through:  PoE power, or optional: 9 to 36 VDC or 24 VAC, 1.5 W
Power Injection:  48 to 56 VDC, 30W

---

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

Pass-Through Mode  12 to 15 VDC, 6 W
Power Injection Mode  48 to 56 VDC, 120W

FIGURE 8 – CL(L,R)FE4POEC FOUR CHANNEL SURFACE OR RACK MOUNT COAX UNIT
FIGURE 9 – CL(L,R)FE4POEU FOUR CHANNEL SURFACE OR RACK MOUNT UTP UNIT

Comnet™
COMMUNICATION NETWORKS
www.comnet.net
1-203-796-5300
+ 44 (0)113 307 6400

Pass-Through Mode  12 to 15 VDC, 6 W
Power Injection Mode  48 to 56 VDC, 120W

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

10/100 data rate DIP switch
See Installation Instructions, Step 2
Wire pair DIP switch
See Installation Instructions, Step 1

LOCAL
REMOTE

POE+ POE−
BLACK (DC−)
BLACK w/ WHITE STRIPE (DC+)
FIGURE 11 – CLLFE8EOC MULTICHANNEL RACK COAX UNITS

Data rate DIP switch
See Installation Instructions, Step 1

Data rate DIP switch
See Installation Instructions, Step 1

Black w/ White Stripe (DC+)
Black (DC–)
POE–
POE+
Pass-Through 12 to 15 VDC, 24 W
Power Injection 48 to 56 VDC, 480 W
FIGURE 12 – CLLFE8EOU MULTICHANNEL RACK UTP UNITS

Pass-Through 12 to 15 VDC, 24 W
Power Injection 48 to 56 VDC, 480 W

Data rate DIP switch
See Installation Instructions, Step 1

Wire pair DIP switch
See Installation Instructions, Step 2

Data rate DIP switch
See Installation Instructions, Step 1

Wire pair DIP switch
See Installation Instructions, Step 2

Black w/ White Stripe (DC+)
Black (DC-)
FIGURE 13 – CLLFE16EOC MULTICHLANNEl RACK COAX UNITS

Data rate DIP switch
See Installation Instructions, Step 1

Pass-Through 12 to 15 VDC, 24 W
Power Injection 48 to 56 VDC, 480 W

Black w/ White Stripe (DC+)
POE-
POE+

CH1 ETHERNET
CH2 ETHERNET
CH3 ETHERNET
CH4 ETHERNET

CH5 ETHERNET
CH6 ETHERNET
CH7 ETHERNET
CH8 ETHERNET

CH9 ETHERNET
CH10 ETHERNET
CH11 ETHERNET
CH12 ETHERNET

CH13 ETHERNET
CH14 ETHERNET
CH15 ETHERNET
CH16 ETHERNET
FIGURE 14 – CLLFE16EOU MULTICHANNEL RACK UTP UNITS

Data rate DIP switch
See Installation Instructions, Step 1

Wire pair DIP switch
See Installation Instructions, Step 2
APPLICATION DIAGRAMS

Note: Coaxial applications use CL(L,R)FE(X)POE(C,U) modules; UTP applications use CL(L,R)FE(X)POE(U) 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:

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

   **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.

<table>
<thead>
<tr>
<th>Indicating LEDs</th>
<th>PWR</th>
<th>POE</th>
<th>Link (Ethernet Port)</th>
<th>Activity (Ethernet Port)</th>
<th>EXT LNK</th>
</tr>
</thead>
<tbody>
<tr>
<td>GREEN</td>
<td>Power Applied</td>
<td>PoE Applied</td>
<td>–</td>
<td>–</td>
<td>10M or 100M Link Detected</td>
</tr>
<tr>
<td>YELLOW</td>
<td>–</td>
<td>–</td>
<td>Link Detected</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>OFF</td>
<td>Power Off</td>
<td>No PoE Present</td>
<td>No Link</td>
<td>–</td>
<td>No Link</td>
</tr>
<tr>
<td>BLINK</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>Data Activity</td>
<td>Data Activity</td>
</tr>
</tbody>
</table>

APPLICATION NOTES

1  Mixed PoE and Non-PoE systems can be implemented.
2  All Non-PoE systems require local power.
3  PoE power injection can be applied to Local or Remote units.
4  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.
5  Lower data rates generally provide longer operating distances.
6  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.
7  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 DISTANCES\(^1\)

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

\(^1\) 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

<table>
<thead>
<tr>
<th>Problem</th>
<th>Steps to Take</th>
</tr>
</thead>
</table>
| 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 (Tma) 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.

TECH SUPPORT: 1.888.678.9427
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 Wurth 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

![Dimensions for a small size module]

FIGURE B
Dimensions are for a ComFit module

![Dimensions for a ComFit module]

FIGURE C
Dimensions are for a 19" Rack Unit

![Dimensions for a 19" Rack Unit]