



1 and 2 Port 60W POE Extenders and Power Extender

Hardware Manual
TC-96231-IP Rev F

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Table of Contents

Safety Notice	1
Consigne de sécurité.....	3
Sicherheitshinweis	5
CE NOTICE	7
FCC NOTICE.....	7
Return Product Procedure	7
WEEE	7
Product User Guide	7
1 Introduction	9
Why Protect Remotely Powered Circuits?	10
2 Package Contents	11
3 Installation	13
SFP Configuration.....	15
Ethernet Cables Installation	16
Powered Fiber Cable Installation	18
DC Power Cable Installation	23
Sealing the Unit.....	23
Mounting the Unit.....	24
Solar Shield.....	26
4 Detailed Specifications.....	27
Copyright, Trademarks and Commercial Disclaimer	31

Safety Notice

In support of the EC directive 2006/95/EC, this notice contains safety information important for the correct installation and operation of this equipment.

Note, the term SELV (Safety Extra Low Voltage) used in this addendum is defined strictly in accordance with EN 60950

Electrical Safety

1. This equipment is intended for installation by trained service personnel only.
2. The safety requirements for Information Technology equipment is only valid if the building installation is in compliance with relevant national or international safety standards and in accordance with good engineering practice.
3. Remove the DC supply from the supply cable at source before changing supply connections to this product.
4. For safety requirements it is necessary to connect the earth point on the product to a reliable earth. This is a discharge path in the event of surges or lightning events on the supply or Ethernet cables.
5. Unless otherwise specifically stated in the equipment installation manual, all data and control ports are connected to ES1/SELV/NEC Class 2 conformant circuits inside the enclosure. To maintain all the ports on the equipment at SELV/NEC Class 2, it is essential that if any connection is made to any of these ports by other equipment, the other equipment must maintain its relevant port at ES1/SELV/NEC Class 2.

For products that are rack mounted:

6. For a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Ensure that the equipment environmental temperature does not exceed the maximum ambient temperature specified by the manufacturer. Ensure that air flow required for safe operation of the equipment is not compromised.
7. Mounting of the equipment in the rack must not cause it to topple or other mechanical hazard.
8. Ensure that the accumulative power requirements of equipment installed in the rack do not exceed the power supply wiring capacity of the rack. Use the equipment nameplate ratings to establish total requirements.
9. Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).

General

10. Unless otherwise stated in the equipment manual, there are no user serviceable parts inside this equipment.
11. If this equipment has a laser, observe the precautions stated in the installation manual.
12. Ultimate disposal of this equipment must be carried out according to relevant national laws.
13. The equipment should be installed by suitably trained personnel, and installation should follow good working practice.

Consigne de sécurité

À l'appui de la directive de la Commission européenne n° 2006/95.EC, cet avis comporte des informations capitales pour procéder à une installation et à exploitation en bonne et due forme de cet équipement de sécurité.

À noter, le terme SELV (Safety Extra Low Voltage) utilisé dans le présent additif est défini le strict respect des exigences de la norme EN 60950.

Sécurité Electrique

1. Cet équipement doit être installé par du personnel d'entretien formé à la tâche.
2. Les exigences de sécurité équipements de technologies de l'information sont uniquement valables si l'installation du bâtiment est conforme aux normes de sécurité nationales ou internationales pertinentes et aux bonnes pratiques d'ingénierie.
3. Veuillez débrancher l'alimentation en c.c. du câble d'alimentation à la source avant de changer les raccordements d'alimentation à ce produit.
4. Pour les exigences de sécurité, il est nécessaire de connecter le point de mise à la terre au produit via une terre fiable. Il s'agit d'un trajet de décharge prévu en cas de surtensions ou de phénomènes de foudre sur l'alimentation ou les câbles Ethernet.
5. Sauf indication contraire figurant dans le guide d'installation de l'équipement, l'ensemble des données et ports de contrôle sont raccordés à des circuits conformes à la de classe 2 SELV/NEC/ES1 à l'intérieur de l'enceinte. Pour maintenir tous les ports de l'équipement en classe 2 SELV/NEC/ES1, il est indispensable qu'en cas de raccordement établi vers l'un quelconque de ces ports par tout autre équipement, ce dernier puisse maintenir son port correspondant en classe 2 SELV/NEC/ES1.

Pour Les Produits Montés en Rack:

6. Pour un rack fermé ou dispositif à plusieurs racks, la température ambiante de fonctionnement de l'environnement du rack peut être supérieure à celle de la température ambiante. Assurez-vous que la température de l'environnement de l'équipement ne soit pas supérieure à la température ambiante maximale indiquée par le fabricant. Veiller à ce que le débit d'air nécessaire au bon fonctionnement de l'équipement ne soit pas compromis.
7. Le montage du matériel dans le rack ne doit pas provoquer de basculement ni aucun autre danger mécanique.
8. Veiller à ce que les exigences d'alimentation cumulées de l'équipement installé dans le rack ne soient pas supérieures à la capacité de câblage d'alimentation du rack. Utilisez les cotes de la plaque signalétique de l'équipement pour mettre en place toutes les exigences.
9. Il convient de maintenir une mise à la terre fiable d'équipement monté en rack. Il convient de faire particulièrement attention aux raccordements d'alimentation autres que ceux directement en contact avec le circuit de dérivation (p. ex., utiliser des bars d'alimentation).

Dispositions Générales

10. Sauf indication contraire figurant dans le manuel de l'équipement, ce dernier ne comporte aucune pièce susceptible de réparation par l'utilisateur de l'équipement.
11. Si cet équipement comporte un dispositif laser, veuillez respecter les précautions indiquées à cet égard dans le guide d'installation.
12. La suppression définitive de cet équipement devra être effectuée conformément aux lois nationales pertinentes.
13. L'équipement doit être installé par du personnel parfaitement qualifié, et l'installation devra être conforme aux bonnes pratiques.

Sicherheitshinweis

Im Rahmen der EU-Richtlinie 2006/95/EC enthält dieser Hinweis wichtige Sicherheitsinformationen für die korrekte Installation und den Betrieb dieser Geräte.

Beachten Sie, dass der hier verwendete Begriff SELV (Safety Extra Low Voltage - Schutzkleinspannung) streng nach EN 60950 definiert ist.

Elektrische Sicherheit

1. Dieses Gerät ist ausschließlich für den Einbau durch geschultes Servicepersonal vorgesehen.
2. Diese Sicherheitsanforderungen für IT-Ausrüstung sind nur dann gültig, wenn die Gebäudeinstallation den einschlägigen nationalen und internationalen Sicherheitsstandards sowie den allgemein anerkannten Regeln der Technik entspricht.
3. Vor Änderung der Versorgungsanschlüsse dieses Geräts muss die DC-Stromversorgung zu den Versorgungskabeln getrennt werden.
4. Aus Sicherheitsgründen muss der Erdungspunkt des Produktes mit einer zuverlässigen Erde verbunden werden. Diese dient als Entladungsweg bei Überspannungen oder Blitzereignissen, die sich auf Versorgungs- oder Ethernet-Kabel auswirken.
5. Sofern im Installationshandbuch nicht ausdrücklich anders vermerkt, sind alle Datenschnittstellen und Steueranschlüsse mit ES1/SELV/NEC Class 2 konformen Schaltkreisen im Inneren des Gehäuses verbunden. Damit alle Ports des Geräts mit ES1/SELV/NEC Class 2 konform bleiben, ist es wichtig, dass die Ports verbundener Geräte ebenfalls ES1/SELV/NEC Class 2 entsprechen.

Für Geräte, die in einem Rack montiert werden:

6. Bei Einbau in eine geschlossene oder aus mehreren Geräten bestehende Rack-Einheit kann die Betriebsumgebungstemperatur im Rack höher als die Raumtemperatur sein. Stellen Sie sicher, dass die Umgebungstemperatur der Geräte die vom Hersteller angegebene maximale Umgebungstemperatur nicht überschreitet. Achten Sie darauf, dass der für den sicheren Betrieb des Geräts erforderliche Luftstrom nicht beeinträchtigt wird.
7. Bei Montage der Geräte in einem Rack darf keine Gefahr durch Kippen oder andere mechanische Einflüsse entstehen.
8. Stellen Sie sicher, dass der Gesamtleistungsbedarf der im Rack installierten Geräte die Stromversorgungskapazität des Racks nicht überschreitet. Nutzen Sie die Angaben auf den Typenschildern, um die Gesamtlast zu ermitteln.
9. Es muss eine zuverlässige Erdung der Rack-Geräte gegeben sein. Besondere Aufmerksamkeit gilt dabei der indirekten Anbindung an Zweigstromkreise (z. B. Verwendung von Mehrfachsteckerleisten).

Allgemeines

10. Sofern nicht anders im Gerätehandbuch angegeben, enthält dieses Gerät keine zu wartenden Teile.
11. Wenn dieses Gerät mit einem Laser ausgestattet ist, beachten Sie die in der Installationsanleitung angegebenen Vorsichtsmaßnahmen.
12. Die Entsorgung dieses Geräts muss nach den einschlägigen nationalen Rechtsvorschriften erfolgen.
13. Das Gerät muss durch entsprechend geschultes Personal installiert werden. Bei der Installation ist auf gute Arbeitspraxis zu achten.

CE NOTICE

Note: This is a class B product.

FCC NOTICE

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules.

Modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment under FCC rules.

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la class B est conforme à la norme ICES-003 du Canada

Return Product Procedure

If the unit is found to be defective, please contact Technical Support via <http://www.commscope.com/SupportCenter>

WEEE

Instructions for recycling of items at end of life can be found at www.CommScope.com by searching for

'WEEE'. At time of printing this is

<http://www.commscope.com/About-Us/Corporate-Responsibilityand-Sustainability/Environment/Recycling/> where information for customers and recyclers is available.

Product User Guide

This document details the physical features of the following 60W PoE/Power Extenders:

- Two-port PoE Extender
- Single-port PoE Extender
- 48V Power Extender
- 12V Power Extender

1. Introduction

The PoE/Power Extenders are components of CommScope's® powered fiber cable system, a hybrid optical fiber/copper cable system for remote powering of network access devices. It is designed to simply and easily function with the powered fiber cable system to extend the distance of PoE (Power over Ethernet) enabled devices as well as devices requiring 12VDC or 48VDC power. The extenders encompass four primary elements:

1. Environmentally sealed closure
2. Electrical power management
3. Circuit protection electronics
4. Optical to electrical Media Conversion

When coupled with any standard NEC Class 2 48V DC power supply, CommScope's Powered Fiber Cable system can power and communicate with PoE standard devices at far greater distances than "category style" copper cabling systems (typically limited to 90 meters) while still meeting NEC Class 2 and SELV standards, eliminating the need for qualified electricians during installation.

The extenders contain circuit protection and DC/DC conversion electronics which automatically condition electrical voltage to the correct level needed for PoE/DC powered end devices such as small cells, high definition security cameras, Wi-Fi hot spots, etc...

Why Protect Remotely Powered Circuits?

Long length DC low voltage electrical systems are at increased risk of:

- Noise from high voltage cables
- Higher current in the event of a short circuit
- Strong electrical surges due to lightning strikes or other EM events in close vicinity

The PoE Extender provides multiple levels of electrical protection:

- Primary Protection:
 - 4.5kA Metal oxide varistors - operate for slower surges as well as fast surges
 - Protects both differential and common mode
- Secondary Protection:
 - MOV and Inductors - reduce surge voltage down to ~100-150
- Tertiary Protection:
 - Transient voltage suppressors - work at relatively low/slow surges, adds an extra layer of protection against voltage spikes
 - Protects differential mode only
 - Clamps voltage spikes to 80-100V

Additional protection elements include:

- Cross-polarity protection to simplify installation - the circuit will work regardless of the input polarity
- AC cross protection:
- 4A non replaceable fuses
- No exposed high voltage pads
- High power inductors used as coordinating elements to maximize energy efficiency
- Enhanced PoE port protection compliant with more stringent ITU K.45 2016 requirements
- Sealed enclosure for environmental protection

2. Package Contents

One of the following 60W PoE/Power Extenders

- PFU-P-C-O-060-01, One-port PoE Extender
- PFU-P-C-O-060-02, Two-port PoE Extender
- PFU-48-C-O-060-01, 48V Power Extender
- PFU-12-C-O-060-01, 12V Power Extender

The PoE/Power Extender is supplied ready for cable installation with the solar shield attached..

Also Required (Not Included)

- 3mm and 4mm Allen wrench
- 1 or 2, 100Base-X or 1000Base-X SFP transceiver(s), Single-mode or Multi-mode
- 25mm Torque or adjustable spanner/wrench
- 30mm Torque or adjustable spanner/wrench
- Phillips or Pozidriv screwdriver
- Silicone grease
- Loctite 222
- Sharp knife for initial separation of the hybrid cable component parts
- 12 AWG or 2mm diameter wire stripper for 12 AWG cable
- 16 AWG or 1.2mm wire diameter stripper for the 16 AWG cable
- Fastenings for wall or pole mounting

3. Installation

Installation of the PoE Extender should be completed in the following order.

Remove Heat Shield

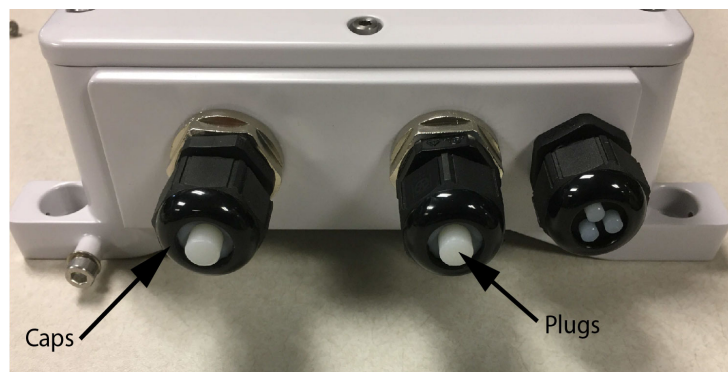
Remove the 4 bolts attaching the heat shield to the PoE Extender with a 3mm Allen key. Slide the heat shield off the retaining lugs and put to one side.

Remove Seal Caps and Grommets

The Two-port PoE Extender has 2 x M25 and 1 x M20 cable glands 60W

The Single-port PoE Extender has 1 x M25 and 1 x M20 cable gland

Power Extenders have 3 x M20 cable glands.



Unscrew the caps and then remove the plugs and grommets from all of the needed pass-through connectors.

Note 1: Do not unscrew the pass-throughs from metal body of the extender. These have been factory fitted and sealed to the correct torque setting.

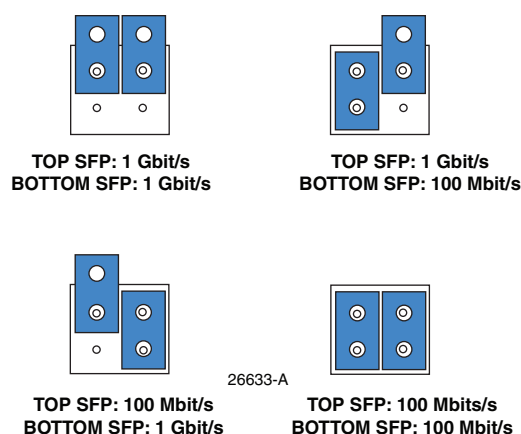
SFP Configuration

Using a 3mm Allen key, unscrew the 8 captive screws on the enclosure lid until they are clear of the base. Do not remove the screws from the lid. A pre-installed cable tie-lanyard is provided to keep the lid attached the base. This may be cut and removed if desired.

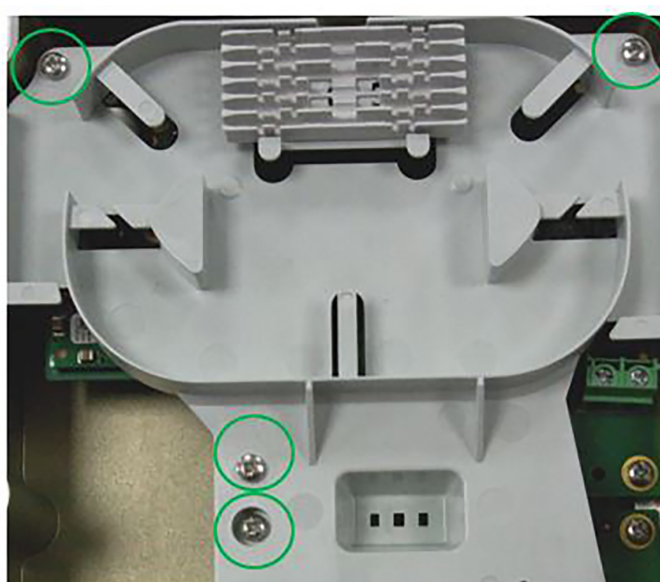
Note: The delivered unit is preconfigured for 1Gb/s use.

To configure for 100Mb/s use only

Using a Phillips screwdriver, remove the fiber splice tray. Identify the pin-header and reposition the link as shown below.



Replace the fiber splice tray, apply Locite 222 to all screws before fitting. Ensure all screws are filled (see below).



Ethernet Cables Installation

Cat5e or better shielded patch cords are recommended for the PoE connection(s). It is generally easiest to install the cables in order from left to right, starting with the leftmost PoE or DC power connection and ending with the hybrid cable:

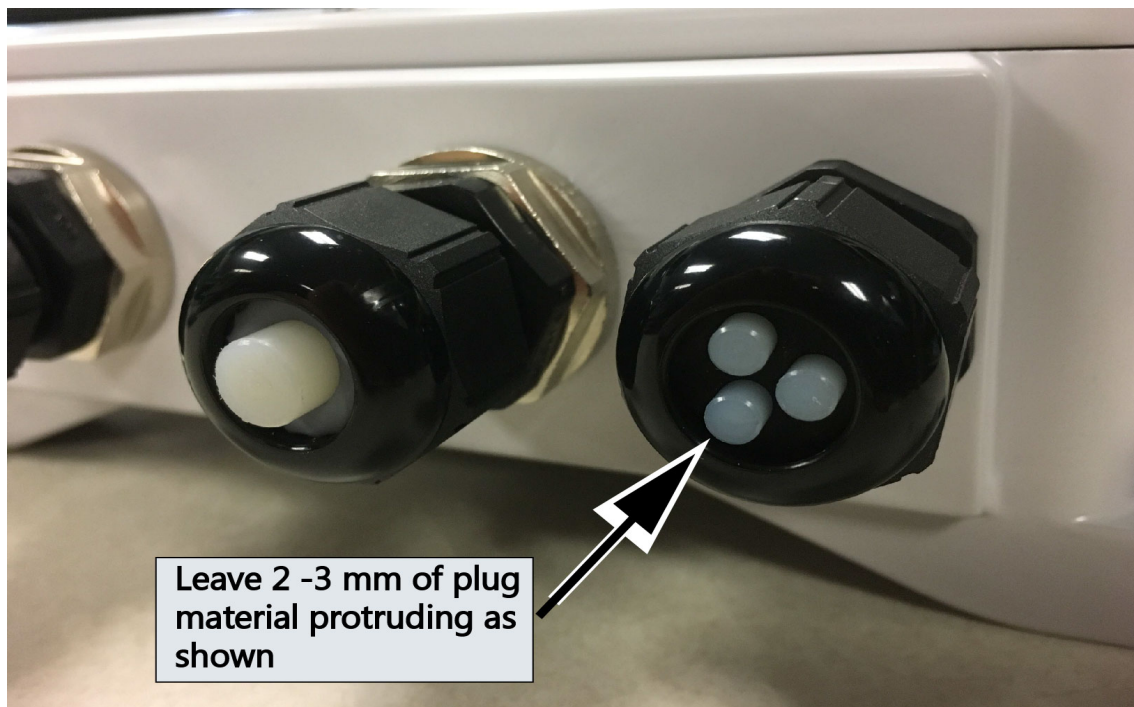
1. Thread the seal cap and grommet on to the cable as shown below.

Note: If using a pre-terminated Ethernet cable, it may be necessary to remove the boot. In some cases, it may also be necessary to cut the cable and re-terminate a new plug after threading the cable through the grommet.



2. Before tightening the seal cap, insert the RJ45 plug into the jack with the lock tab facing up.

3. Tighten the cap against the pass through. The recommended torque is 2.50Nm (22.1 in lbf).
4. If applicable, repeat steps 1-3 for the second PoE connection.
5. For unused glands, verify that the plugs have been properly inserted leaving 2 - 3 mm of plug material protruding from the gland. Gland nuts should be tightened to 4 Nm



ATTENTION: TO PREVENT MOISTURE AND DUST FROM ENTERING THE UNIT, ALL UNUSED PORTS SHOULD HAVE PLUGS INSTALLED AT ALL TIMES.

FAILURE TO DO SO COULD RESULT IN UNIT FAILURE

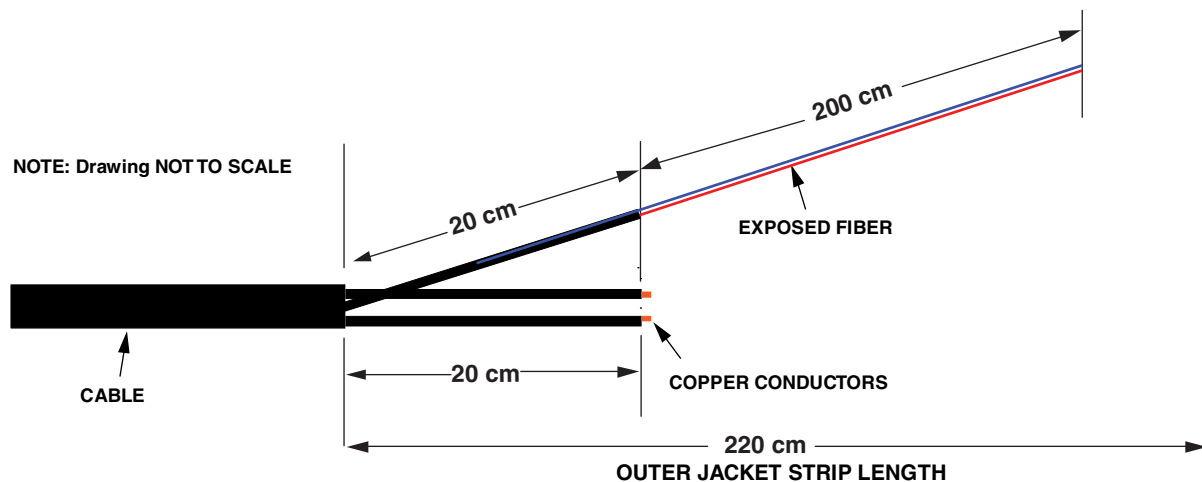
Powered Fiber Cable Installation

The CommScope Powered Fiber Cable consists of 2 insulated copper power conductors and a central tube containing the optical fiber. Separate the three cores to allow the power to be connected to the screw terminals, and the fiber thread to be connected to a fiber terminal, which is then inserted into the SFP.

The Powered Fiber Cable is designed to be prepared for use with only a knife, a typical pair of wire strippers and, optionally, a wire cutter or snip. To split the cable successfully, follow this process.

As detailed below, only use the knife to separate the parts for the first 20mm or so. It is important that subsequent stripping is performed by simply pulling the conductors away from the fiber tube so that the edges are clean and smooth. The dimensions of the strip lengths are shown below.

Cable Split Dimensions



1. Snip the cable end at the indentations in the cable jacket between the center fiber element and the two outer conductor elements

8. For the center fiber element, simply place the strippers at the desired strip location, close the wire strippers fully once, then open. Now, by hand you may pull the center element jacket off, revealing the aramid and optical fibers.
9. Remove excess aramid as desired for termination.

Connecting the Powered Fiber Cable

1. Thread the strands through the cap, then thread the strands through the supplied grommet; the grommet should be positioned approximately 5cm from where the cable component parts are split out. Use some silicone grease on the grommet, which helps pulling the strands through the grommet, and provides a seal against water ingress.



2. When threading the cable through the pass through, ensure the fiber strand is uppermost when pushing the grommet in to the pass through.
3. Use tape or heat shrink to prevent the cables splitting further than the required length.
4. Using the Torque wrench, tighten the screw cap on the pass through. Tighten to torque 5Nm (3.69 ft-lb).

Connecting the Power Strands

1. Cut the two power strands to length. Remove 5mm of sheath from the two cables.
2. For the 12 AWG cable, use a proper 12 AWG or 2MM diameter wire stripper. For the 16AWG, use a 16 AWG or 1.2mm wire diameter stripper.
3. Use tape or heat shrink to prevent the cables splitting further than the required length. Thread the two cables in to the power connectors and tighten the screws.

Note: Due to the cross-polarity protection, the circuit will work regardless of the input polarity.

Connecting the fiber

1. Insert the SFPs in place.

Note: Insert the bottom SFP in place first. This SFP is inserted upside down. The SFPs should only be inserted or removed with the power off.

2. Remove the sheath from the fibers, allowing 14cm of sheath from the initial cable split, as in Figure . Place the strippers at the desired strip location, close the wire strippers fully once, then open. Now, by hand you may pull the center element jacket off, revealing the aramid and optical fibers.
3. Remove excess aramid as desired for termination. This allows the sheath to rest on the beginning of the splice tray.
4. The fibers should wrap around the splice tray several times to allow for future resplicing.
5. The splice to the fiber connectors should sit in the splice island in the tray as below.

6. The fiber LC/UPC pigtails should wrap around the splice tray once, then connect to the SFPs as below.

Note: Field installable connectors such as LightCrimp Plus can be used. A clip to connect two LC simplex to one LC duplex is recommended.

DC Power Cable Installation

The Power Extender option provide a 12V/48V output with fiber pass through for powering devices which do not support PoE.

The output power connection is provided through the center pass through. A round jacketed 2 core cable with external diameter between 3mm and 10 mm is required.

1. Feed the cable through the pass through.
2. Remove 5mm of sheath from the 2 cables and insert into the lever arm connectors. Ensure the correct polarity of the connections.
3. Tighten the cap against the pass through. The recommended torque is 2.50Nm (22.1 in lbf).

The output fiber cable is provided through the left pass through.

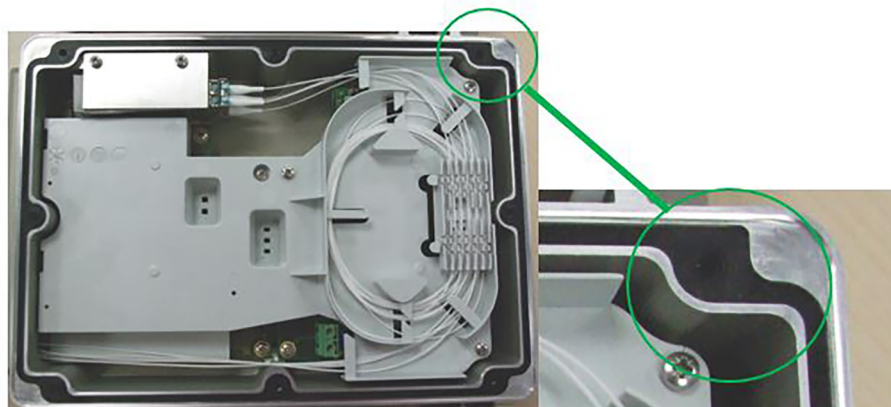
The fiber cable must be round and have an external diameter between 3mm and 10mm.

Feed the fiber through the gland and then strip and splice using the splice tray.

Tighten the cap against the pass through. The recommended torque is 2.50Nm (22.1 in lbf).

Sealing the Unit

1. Ensure the supplied seal ring is properly seated in its channel (it only fits in one orientation) and that all cables are secured.



2. Apply Loctite 222 to all lid bolts.
3. Put the lid back in place.

4. Tighten the screws to torque 2.5Nm (22.1 in-lb). It is recommended that the center screws on each side be tightened first, followed by the corner screws.

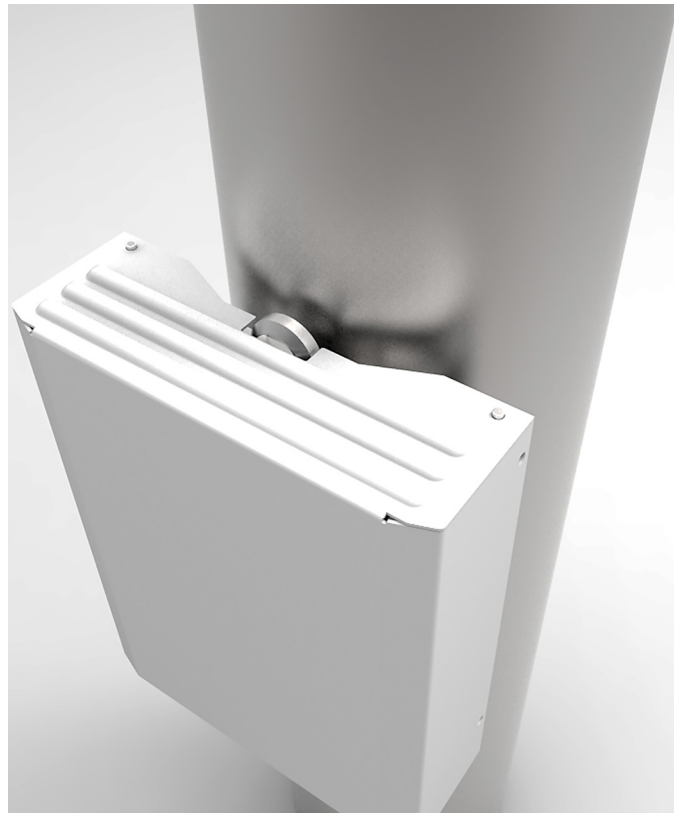
Mounting the Unit

Wall Mount

The PoE extender has 4 holes on the exterior of the device for attaching to a wall or flat surface

Pole Mount

The four slots in the raised sections on the bottom of the device may be used for pole attachment using band clamps (jubilee clips).



PoE pole mounted with solar shield

Grounding

To ensure protection from lightning strikes and other electrical surges, the PoE extender must be earthed. Any end device connected to the PoE extender must also be bonded to earth. Make connections from the enclosure earth point using the M5 bolt and washer provided:

1. A minimum 16AWG bonding connection from the Customer's equipment earth terminal to a reliable earth (ground) point.
2. A minimum 16AWG bonding connection from the PoE Extender to a reliable earth (ground) point, at or close to the earth (ground) point of the Customer's equipment.

PoE Extender Earth Point

Solar Shield

At the top of the Two Port PoE Extender's operating temperature range, the physical temperature of the PoE Extender may exceed 70°C. Ensure the supplied solar shield is in place for protection. See Table 4.2 on page 27 for operating temperature details.

4. Detailed Specifications

Table 4.1: Part Numbers

Version	Catalogue Number
Two Port PoE Extender	PFU-P-C-O-060-02
60W Single Port PoE Extender	PFU-P-C-O-060-01
48V Power Extender	PFU-48-C-O-060-01
12V Power Extender	PFU-12-C-O-060-01

Table 4.2: Climatic Performance

Item	Specification
Storage Temperature	-40°C to +70°C
Installation Temperature	-5°C to +45°C
Operating Temperature	-40°C to +65°C
65°C assumes 45°C ambient air temperature, plus 20°C sun loading.	

Table 4.3: Physical Dimensions

Item	Specification
Dimensions including solar shield	283mm x 225mm x 77mm
Weight	3.8kg

Notes:

- Table 4.4a provides a partial listing of the maximum supported hybrid cable distances for a range of NEC Class 2 power supply output voltages, hybrid cable copper gauges, and extender output power levels.
- NEC Class 2 requires a power supply unit (PSU) limited to less than 60V dc. In practice, some commercial 48V power supplies may be configured to output from 48V up to about 57V.
- Pout is the maximum total PoE Extender output power.

Table 4.4a: Maximum Hybrid Cable Lengths

PSU Output Voltage	Cable Gauge (AWG)	Max Cable Length (m) Pout = 60W	Max Cable Length (m) Pout = 45W	Max Cable Length (m) Pout = 30W	Max Cable Length (m) Pout = 15.4W	Max Cable Length (m) Pout = 7W
Maximum (57V)	12	888	1301	1886	3131	4633
	16	351	514	746	1238	1833
Nominal (48V)	12	630	922	1335	2217	3280
	16	249	365	528	877	1297
Minimum (40.5V)	12	448	630	900	1494	2211
	16	177	249	356	591	874

Assumptions:

- Hybrid cable ambient temperature: 20 C (Underground/Ducted)
- CommScope Cat6/6a outdoor patch cord length: 50 m
- Patch cord ambient temperature: 55 C (Sunlight Exposed)

Table 4.4b: Maximum Extender Output Power vs. Powered Device Type

Maximum Extender Output Power		Powered Device A	Power Device B
Port A	Port B		
30W	30W	PoE+ (CLASS 4)	PoE+ (CLASS 4)
15.4W	30W	PoE (CLASS 0 OR 3)	PoE+ (CLASS 4)
15.4W	15.4W	PoE (CLASS 0 OR 3)	PoE (CLASS 0 OR 3)
15.4W		PoE (CLASS 0 OR 3)	
60W ¹		High PoE (Dual Class 4)	

Note 1: Single-port PoE Extender only

Table 4.5: EMI/C, & Safety and Regulatory

Item	Specification
EMC Emissions	CISPR 22/FCC CFR 47 Part 15/ICES-003 EN 55032:2015
Immunity	EN300386/ICES-003 EN 55024:2010 + A1:2015 ITU-T K.45
Safety	IEC 60950-22:2006 IEC 62368-1:2014
Compliance	CE/FCC/CSA/RCM
	SELV
	NEC Class 2 input.
Environmental	ETSI EN 300 019-1-4 V2.3.1 (2013-08) Class 4.1E
	EN 60068-2-52:1996
	REACH SVHC
	RoHS2 2011/65/EU
	EN 60529:1992 + A2:2013 (IP68/3 meters)

Table 4.6: Communications

Item	Specification
Optical Input	Accepts all MSA compliant 100Base-X and 1000Base-X SFP transceivers
Optical Input Singlemode	ITU-T G657.A2
Optical Input 50um Multimode	OM3 or OM4
RJ45 Connector Output	Half and Full Duplex Modes Supported. 10/100/1000Mb Ethernet

Table 4.7: Supported Fiber Cable Types

Catalogue Number	Cable
PFC-S02L12	PFC,Singlemode,2F,I/O,12AWG
PFC-S02L16	PFC,Singlemode,2F,I/O,16AWG
PFC-S02O12	PFC,Singlemode,2F,Outdoor,12AWG
PFC-S02O16	PFC,Singlemode,2F,Outdoor,16AWG
PFC-S04L12	PFC,Singlemode,4F,I/O,12AWG
PFC-S04L16	PFC,Singlemode,4F,I/O,16AWG
PFC-S04O12	PFC,Singlemode,4F,Outdoor,12AWG
PFC-S04O16	PFC,Singlemode,4F,Outdoor,16AWG
PFC-S12L12	PFC,Singlemode,12F,I/O,12AWG
PFC-S12L16	PFC,Singlemode,12F,I/O,16AWG
PFC-S12O12	PFC,Singlemode,12F,Outdoor,12AWG
PFC-S12O16	PFC,Singlemode,12F,Outdoor,16AWG
PFC-302L12	PFC,OM3,2F,I/O,12AWG
PFC-302L16	PFC,OM3,2F,I/O,16AWG
PFC-302O12	PFC,OM3,2F,Outdoor,12AWG
PFC-302O16	PFC,OM3,2F,Outdoor,16AWG
PFC-304L12	PFC,OM3,4F,I/O,12AWG
PFC-304L16	PFC,OM3,4F,I/O,16AWG
PFC-304O12	PFC,OM3,4F,Outdoor,12AWG
PFC-304O16	PFC,OM3,4F,Outdoor,16AWG

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