Industrial 1-port Ultra PoE to 2-port 802.3bt/at Gigabit PoE Extender

IPOE-E172

User's Manual

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Revision

PLANET Industrial 1-Port Ultra PoE to 2-Port 802.3bt/at Gigabit PoE Extender User's Manual

FOR MODEL: IPOE-E172

REVISION: 1.0 (SEPTEMBER, 2017)

Part No: EM-IPOE-E172_v1.0 (2350-AF0590-000)

Table of Contents

1. Introduction

1.1 Package Contents

Check your package for the following parts:

Industrial PoE Extender	User's Manual	Waterproof RJ45 Connector
		

If any of these are missing or damaged, please contact your dealer immediately; if possible, retain the carton including the original packing material, and use them again to repack the product in case there is a need to return it to us for repair.

1.2 Product Features

➢ **Physical Port**

- **3 10/100/1000BASE-T** Gigabit RJ45 interface
  - ♦ 1-port **data + power input**
  - ♦ 2-port **data + power output**

➢ **Power over Ethernet**

- 1-port data + power input
  - ♦ Complies with IEEE 802.3bt/at Power over Ethernet end-span/ mid-span PD
  - ♦ Supports PoE input power up to 95 watts

- 2-port data + power output
  - Complies with IEEE 802.3af/IEEE 802.3at Power over Ethernet/ end-span PSE
  - Up to 1 IEEE 802.3bt device powered
  - Up to 2 IEEE 802.3af/802.3at devices powered
  - Supports total PoE budget of up to 60 watts for 2 PoE output ports
  - Auto detects powered device (PD)
- Extends the range of PoE to an additional 100 meters (328ft.)
- Forwards both Ethernet **data** and **PoE** power to remote device

➢ Layer 2 Features

- Hardware-based 10/100Mbps, half/full duplex and 1000Mbps full duplex mode, flow control, auto-negotiation and auto MDI/MDI-X
- Features Store-and-Forward mode with wire-speed filtering and forwarding rates
- IEEE 802.3x flow control for full duplex operation and back pressure for half duplex operation
- Integrates address look-up engine, supporting 2K absolute MAC addresses
- 9K jumbo frame support in 1000Mbps duplex mode
- Automatic address learning and address aging

➢ Industrial Case and Installation

- IP63 aluminum case
- Wall-mount design
- Waterproof and dustproof
- Supports EFT protection of 2000 VDC for power line
- Supports 2000 VDC Ethernet ESD protection
- -40 to 75 degrees C operating temperature

- No external power cable required for installation
- **Plug and Play** installation


Note

PSE (Power Sourcing Equipment) is a device (switch or injector for instance) that provides power in a PoE setup. Maximum allowed continuous output power per such device in IEEE 802.3af is 15.4W, in IEEE 802.3at is 30W, and in IEEE 802.3bt is 60W.

PDs (Powered Devices) like PoE IP phones, PoE IP cameras, PoE wireless access points, etc. are PoE-enabled terminals that consume energy via PSE.

1.3 Product Specifications

Model	IPOE-E172
Hardware Specifications	
Network Connector	**PoE In Port** 1 x 10/100/1000BASE-T Ethernet with 802.3bt/at PoE **"Data + Power"** in, auto MDI/MDI-X, auto-negotiation RJ45 connector **PoE Out Port** 2 x 10/100/1000BASE-T Ethernet with IEEE 802.3af/at/bt PoE **"Data + Power"** out, auto MDI/MDI-X, auto-negotiation RJ45 connector
Switch Architecture	Store-and-Forward switch architecture
MAC Address Table	2K MAC address table with auto learning function
Data Buffer	1Mbit
Switch Fabric	6Gbps
Switch Throughput	4.46Mpps @ 64 bytes
Flow Control	IEEE 802.3x pause frame for full duplex Back pressure for half duplex
Jumbo Frame	9KB
ESD Protection	2KV DC

Enclosure	IP63 aluminum case
Installation	Wall-mount kit
LED Display	System: PWR (Green) Budget Alert (Red) PoE Input Port: LNK/ACT (Green) 1000 (Green) Per PoE Output Port: LNK/ACT (Green) PoE-in-Use (Orange)
Cable	Twisted-pair cable: 10BASE-T: 2-pair UTP Cat. 3, 4, 5 up to 100 meters 100BASE-TX: 2-pair UTP Cat. 5, 5e up to 100 meters 1000BASE-T: 4-pair UTP Cat. 5e, 6 up to 100 meters
Dimensions (W x D x H)	199.6 x 81 x 40 mm
Weight	373g
Power Consumption	60 watts/204BTU (Full loading with PoE function)
Power over Ethernet	
PoE Standard	**PoE In Port** IEEE 802.3bt/at Power over Ethernet end-span/mid-span PD class 4 PD **Per PoE Out Port** IEEE 802.3bt 4-pair Power over Ethernet end-span + mid-span PSE IEEE 802.3at Power over Ethernet Plus end-span + mid-span PSE IEEE 802.3af Power over Ethernet end-span + mid-span PSE
PoE Power	**PoE In Port** 44~57V DC, max. 95 watts **Per PoE Out Port** 44~55V DC, max. 60 watts
Power Pin Assignment	**PoE In Port** 1/2(+), 3/6(-); 4/5(+), 7/8(-) **Per PoE Out Port** 1/2 (-), 3/6 (+); 4/5 (+), 7/8 (-)

Standards Conformance	
Regulatory Compliance	FCC Part 15 Class A, CE
Stability Testing	IEC 60068-2-32 (Free fall) IEC 60068-2-27 (Shock) IEC 60068-2-6 (Vibration)
Standards Compliance	IEEE 802.3 Ethernet IEEE 802.3u Fast Ethernet IEEE 802.3ab Gigabit Ethernet IEEE 802.3x Flow Control IEEE 802.3af Power over Ethernet IEEE 802.3at Power over Ethernet Plus IEEE 802.3bt 4-pair Power over Ethernet
Environment	
Operating	Temperature: -40 ~ 75 degrees C Relative Humidity: 5 ~ 95% (non-condensing)
Storage	Temperature: -40 ~ 85 degrees C Relative Humidity: 5 ~ 95% (non-condensing)
Accessory	
Standard Accessories	User's Manual x 1 Waterproof RJ45 Connector x 3 Wall-mount Kit x 1

1.4 Power over Ethernet Budget

The following table lists how many PoE devices can be powered by IPOE-E172 under 1m distance:

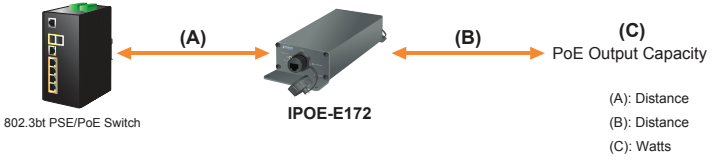
Power Source	PoE Output Budget*	Max. Number of PDs supported	
IEEE 802.3bt PoE PSE	60 watts max.	Class 6 PD@51 watts	1 unit
		Class 5 PD@40 watts	1 unit
		Class 4 PD@25.5 watts	2 units
		Class 3 PD@12.9 watts	2 units
		Class 2 PD@6.5 watts	2 units
		Class 1 PD@3.8 watts	2 units

IEEE 802.3at PoE+ PSE	30 watts max.	Class 4 PD@25.5 watts	1 unit
		Class 3 PD@12.9 watts	2 units
		Class 2 PD@6.5 watts	2 units
		Class 1 PD@3.8 watts	2 units

Remarks	
	1. The PoE output budget means the 2-port PD aggregated power output. 2. The aggregated power consumption will be below 60 watts if with PoE+ PSE.

1.5 Power over Ethernet Capability

With different distance and different PoE input source, it will inflect the PoE output capability. Please refer to the table below.



1.5.1 When PSE/PoE Switch Output is DC 52V

A (Distance)	B (Distance)	C (Watts)
60M	2M	33
60M	20M	30
60M	60M	25
60M	100M	21
100M	2M	28
100M	20M	26
100M	60M	21
100M	100M	19

1.5.2 When PSE/PoE Switch Output is DC 56V

A (Distance)	B (Distance)	C (Watts)
60M	2M	50
60M	20M	48
60M	60M	39
60M	100M	34
100M	2M	44
100M	20M	39
100M	60M	33
100M	100M	28

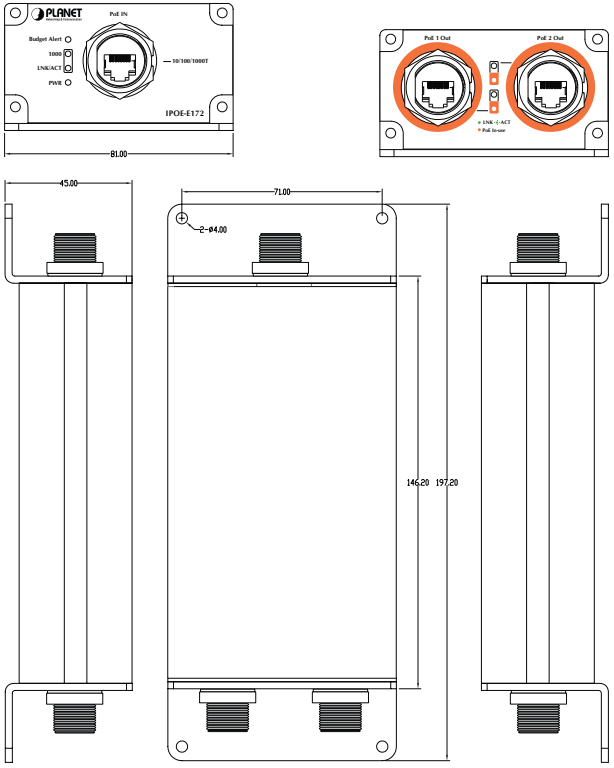
The table list shown here is for your reference only. The actual performance should be related to your environment.

2. Installation

This section describes the functionalities of the Industrial Ultra PoE Extender's components and guides you to how to install it. Basic knowledge of networking is assumed. Please read this chapter completely before continuing.

2.1 Physical Dimensions

IPOE-E172 industrial 1-port Ultra PoE+ to 2-port 802.3bt/at Gigabit PoE Extender dimensions: (W x D x H): 199.6 x 80 x 40 mm



2.2 Front Panel

Figure 2-1 shows the front panel of Industrial Ultra PoE Extender.

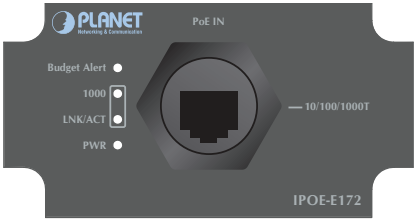


Figure 2-1: IPOE-E172 Front Panel

System

LED	Color	Function
PWR	Green	**Lights** to indicate the IPOE-E172 has power.

PoE Input Port

LED	Color	Function
LNK/ACT	Orange	**Blinks** to indicate that the IPOE-E172 is actively sending or receiving data over that port.
1000	Green	**Lights** to indicate the IPOE-E172 is successfully connecting to the network at 1000Mbps.
		Off to indicate the IPOE-E172 is successfully connecting to the network at 10Mbps or 100Mbps.

Budget Alert Port

LED	Color	Function
Budget Alert	Red	**Lights** to indicate the IPOE-E172 PoE output power is 50 watts or over.
		Off to indicate that the IPOE-E172 PoE output power is not over 50 watts.
		Blinking 4 times to indicate the IPOE-E172 is powered on by Ultra PoE.
		Blinking 2 times to indicate the IPOE-E172 is powered on by 802.3at PoE+.

2.3 Rear Panel

Figure 2-2 shows the rear panel of the industrial Power over Ethernet extender

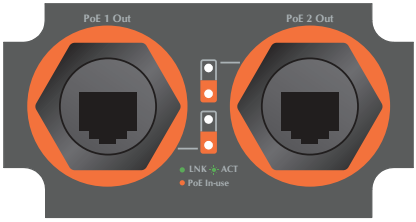


Figure 2-2: IPOE-E172 Rear Panel

PoE Output Port (Port 1 ~ 2)

LED	Color	Function
LNK/ACT	Green	**Lights** to indicate the port is linked up at 10/100/1000Mbps.
		Blinks to indicate that the IPOE-E172 is actively sending or receiving data over that port.
PoE-in-Use	Orange	**Lights** to indicate the port is providing PoE power.
		Off to indicate the connected device is not a PoE powered device (PD).

2.4 Mounting Installation

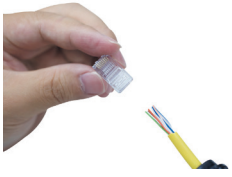
This section describes how to install the Industrial Ultra PoE Extender and make connections to it. Please read the following topics and perform the procedure in the order being presented.

2.4.1 Making Waterproof RJ45 Cable

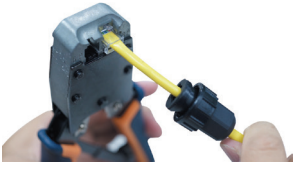
Step 1: Take a waterproof RJ45 jack out from the IPOE-E172 box and prepare one RJ45 cable.

Step 2: Insert the RJ45 cable through the waterproof RJ45 jack.

Step 3: Prepare an RJ45 connector.



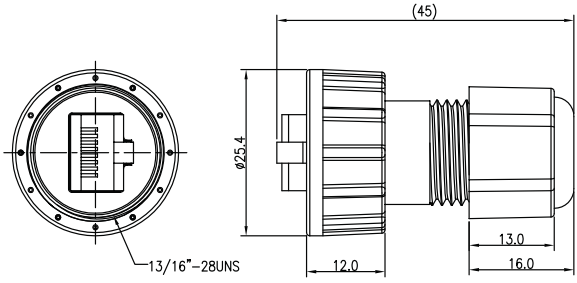
Step 4: Put the RJ45 connector in place with cable crimper.



Step 5: To lock in the RJ45 connector, pull back the cable till the connector nicely fit into the waterproof connector hole.

Note

1. Use only the waterproof RJ45 connector provided in the package of the IPOE-E172.
2. If the waterproof RJ45 connector is found missing or damage, please contact your local reseller where you purchased from. If the new waterproof RJ45 connector is obtained from PLANET, make sure its dimensions are the same.



3. Never use any waterproof RJ45 connector that is not purchased from PLANET or doesn't have the same dimensions of the IPOE-E172; it will damage the device permanently.

2.4.2 Wall Mounting

To install the Industrial Ultra PoE Extender on the wall, please follow the instructions described below.

Step 1: Take the four screws from the box.

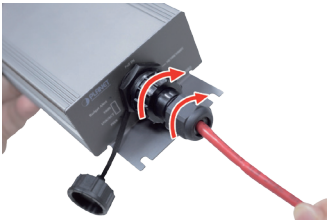
Step 2: Place the IPOE-E172 on the wall.

Step 3: Use a screwdriver to screw them into the wall.

2.4.3 Connecting Waterproof RJ45 Connector to the IPOE-E172

Step 1: Insert the waterproof RJ45 connector into the port of the IPOE-E172.

Step 2: Turn clockwise to tighten the screw nut.

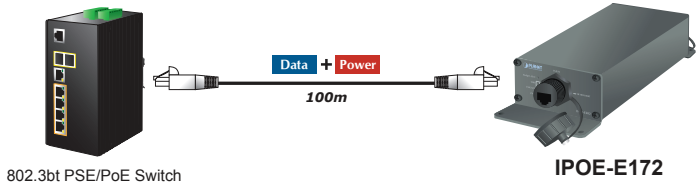


2.5 Connecting IPOE-E172 to Power Source Equipment (PSE)

This section describes how to install Industrial Ultra PoE Extender and make connection to it. Please read the following topics and perform the procedure in the order being presented.

There are 3 RJ45 ports in the Industrial Ultra PoE Extender of which the **"PoE IN"** port functions as **"PoE (Data and Power) input"** and the **"PoE-in-Use"** port on the other side functions as **"PoE (Data and Power) output"**.

Step 1: Connect a standard Cat5e/6 UTP cable from **power source equipment (PSE)**, such as PoE switch, PoE injector hub and single port PoE injector, to the **"PoE IN"** port of the IPOE-E172.



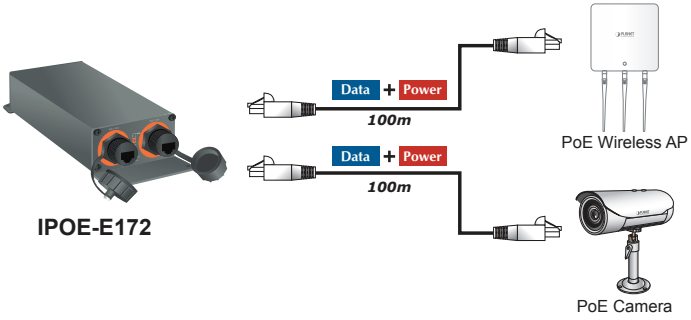
Step 2: The PSE delivers both Ethernet Data and PoE power over UTP cable to the IPOE-E172 and the **"PoE IN"** LED will be lit steadily.

Note

1. The IPOE-E172 Budget Alert will blink 4 times when the IPOE-E172 is powered on by Ultra PoE.
2. The IPOE-E172 Budget Alert will blink 2 times when the IPOE-E172 is powered on by 802.3at PoE+.
3. When the LED turns steady green, it means the IPOE-E172 is being powered successfully with PoE.
4. If the LED is not lit, please check the remote PSE or the cable connecting to a PC or a network device to see if the cable is correct. Or with an 802.3bt/ at device such as the target PD, check whether the power injection is correct.
5. Never connect any non-standard POE PSE to the IPOE-E172; it will damage the device permanently.

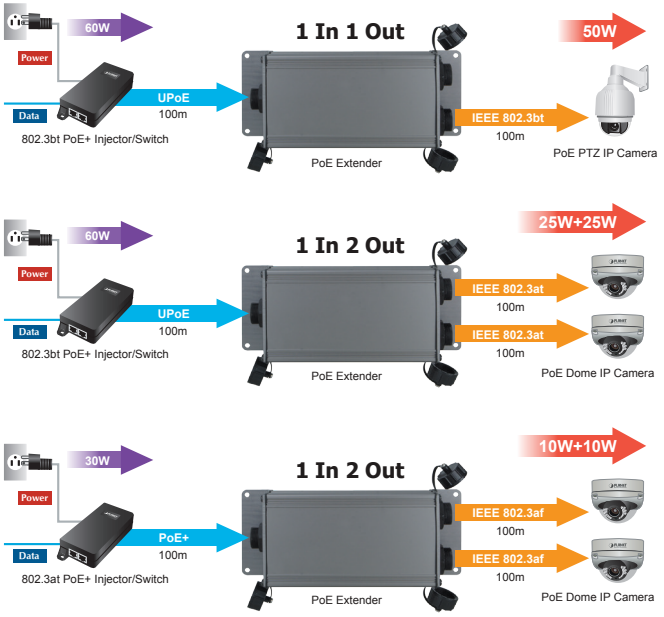
2.6 Connecting IPOE-E172 to Powered Device (PD)

Step 1: Connect the additional Cat5e/6 cable that will be used to connect to the remote **PD** to the **"PoE-in-Use"** port of the IPOE-E172.



Step 2: The **"PoE-in-Use"** port is also the power injector which transmits DC voltage to the Cat5e/6 cable and transfer data and power simultaneously between the PSE and PD.

Step 3: Once the IPOE-E172 detects the existence of an IEEE 802.3bt/at/af device, the **"PoE-in-Use"** LED indicator will be lit steadily, showing it is providing power.



Note

1. If the connected device is not fully complying with IEEE 802.3bt/at/af standard or in-line power device, the PoE-in-Use LED indicator of the IPOE-E172 will not be lit steadily.
2. According to IEEE 802.3bt/at/af standard, the IPOE-E172 will not inject power to the cable if not connected to a standard IEEE 802.3bt/at/af device.
3. **DO NOT** connect any PSE to port 1~ port 2 of the IPOE-E172, it may damage the device permanently.

3. Customer Support

Thank you for purchasing PLANET products. You can browse our online FAQ resource and user's manual on PLANET web site first to check if it could solve your issue. If you need more support information, please contact PLANET switch support team.

PLANET online FAQ:
http://www.planet.com.tw/en/support/faq.php?type=1

Switch support team mail address:
support@planet.com.tw

APPENDIX A: Networking Connection

A.1 Switch's RJ45 Pin Assignments

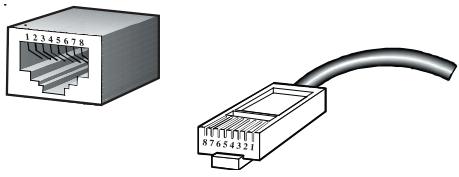
1000Mbps, 1000BASE-T

Contact	MDI	MDI-X
1	BI_DA+	BI_DB+
2	BI_DA-	BI_DB-
3	BI_DB+	BI_DA+
4	BI_DC+	BI_DD+
5	BI_DC-	BI_DD-
6	BI_DB-	BI_DA-
7	BI_DD+	BI_DC+
8	BI_DD-	BI_DC-

10/100Mbps, 10/100BASE-TX

RJ45 Connector pin assignment		
Contact	MDI Media Dependent Interface	MDI-X Media Dependent Interface-Cross
1	Tx + (transmit)	Rx + (receive)
2	Tx - (transmit)	Rx - (receive)
3	Rx + (receive)	Tx + (transmit)
4, 5	Not used	
6	Rx - (receive)	Tx - (transmit)
7, 8	Not used	

A.2 RJ45 Cable Pin Assignments



The standard RJ45 receptacle/connector

There are 8 wires on a standard UTP/STP cable and each wire is color-coded. The following shows the pin allocation and color of straight-through cable and crossover cable connection:

Straight Cable		SIDE 1	SIDE 2
1 2 3 4 5 6 7 8 1 2 3 4 5 6 7 8	SIDE 1 SIDE 2	1 = White/Orange 2 = Orange 3 = White/Green 4 = Blue 5 = White/Blue 6 = Green 7 = White/Brown 8 = Brown	1 = White/Orange 2 = Orange 3 = White/Green 4 = Blue 5 = White/Blue 6 = Green 7 = White/Brown 8 = Brown
Crossover Cable		**SIDE 1**	**SIDE 2**
1 2 3 4 5 6 7 8 1 2 3 4 5 6 7 8	SIDE 1 SIDE 2	1 = White/Orange 2 = Orange 3 = White/Green 4 = Blue 5 = White/Blue 6 = Green 7 = White/Brown 8 = Brown	1 = White/Green 2 = Green 3 = White/Orange 4 = Blue 5 = White/Blue 6 = Orange 7 = White/Brown 8 = Brown

Figure A-1: Straight-through and Crossover Cable

Please make sure your connected cables are with same pin assignment and color as the above picture before deploying the cables into your network.