Industrial 1-port 802.3at PoE+ to 2-port 802.3af PoE Extender

IPOE-E202

User's Manual

Trademarks

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Revision

PLANET Industrial 1-Port 802.3at PoE+ to 2-Port 802.3af PoE Extender User's Manual

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1. Introduction

1.1 Package Contents

Check your package for the following parts:

- Industrial PoE Extender x 1
- User's Manual x 1
- Waterproof RJ45 Connector x 3
- Wall-mounted Kit x 1

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 How to Use This Manual

This Industrial PoE Extender User Manual is structured as follows:

Chapter 2 Installation

The chapter explains the feature, functionality and the physical installation of the Industrial PoE Extender.

Chapter 3 Customer Support

The chapter explains how to get support from PLANET.

Appendix A

This chapter contains cable information of the Industrial PoE Extender.

1.3 Product Features

➢ **Physical Port**

- 3-port 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 802.3at Power over Ethernet Plus end-span/mid-span PD
  - ♦ Supports PoE input power up to 30.8 watts
- 2-port data + power output
  - ♦ Complies with IEEE 802.3af/IEEE 802.3at Power over Ethernet/ end-span PSE
  - ♦ Up to 2 IEEE 802.3af/802.3at devices powered
  - ♦ Supports PoE power up to 25 watts for each PoE port
  - ♦ 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 8K absolute MAC addresses
- 9K jumbo frame support in 1000Mbps duplex mode
- Automatic address learning and address aging
- Supports CSMA/CD protocol

➢ Industrial Case/Installation

- IP63 aluminum case protection
- 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

➢ Standard Compliance

- IEEE 802.3 10BASE-T
- IEEE 802.3u 100BASE-TX
- IEEE 802.3ab 1000BASE-T
- IEEE 802.3x Flow Control
- IEEE 802.3at Power over Ethernet Plus
- IEEE 802.3af Power over Ethernet
- FCC Part 15 Class A, CE

Note

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

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

1.4 Product Specifications

Model	**IPOE-E202**
Hardware Specifications	
Network Connector	**PoE In Port** 1 x 10/100/1000BASE-T Ethernet with High 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 PoE **"Data + Power"** out, auto MDI/MDI-X, auto-negotiation RJ45 connector
Switch Architecture	Store-and-Forward switch architecture
MAC Address Table	8K 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
EFT Protection	2KV DC
Enclosure	IP63 aluminum case
Installation	Wall-mount kit
LED Display	System: PWR (Green) PoE Input Port: LNK/ACT (Orange) PoE Input Port: 1000 (Green) Budget Alert (Orange) Per PoE Output Port: LNK/ACT (Green) Per PoE Output Port: 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	320g
Power Consumption	30 watts/102.3BTU (Full loading with PoE function)
Power over Ethernet	
PoE Standard	**PoE In Port** IEEE 802.3at Power over Ethernet Plus end-span/mid-span PD class 4 PD **Per PoE Out Port** IEEE 802.3at Power over Ethernet Plus end-span PSE IEEE 802.3af Power over Ethernet end-span PSE
PoE Power	**PoE In Port** 50~57V DC, max. 30.8 watts **Per PoE Out Port** 44~55V DC, max. 25 watts
Power Pin Assignment	**PoE In Port** 1/2(+), 3/6(-); 4/5(+), 7/8(-) **Per PoE Out Port** 1/2(+), 3/6(-)
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
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)

1.5 Power over Ethernet Budget

The following table lists how many PoE devices can be powered by IPOE-E202:

Power Source	PoE Output Budget*	Max. Number of PDs supported	
IEEE 802.3at PoE+ PSE	25 watts max.	Class 4 PD@25 watts	1 unit
		Class 3 PD@15 watts	2 units
		Class 2 PD@7 watts	2 units
IEEE 802.3af PoE PSE	10 watts max.	Class 2 PD@7 watts	1 unit

Remarks	The PoE output budget means the 2-port PD aggregated power output. The aggregated power consumption will be below 30 watts if with PoE+ PSE.

1.6 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.

1.6.1 When PSE/PoE Switch output is DC 52V

A (Distance)	B (Distance)	C (Watts)
2M	2M	26
2M	20M	25.5
2M	60M	19.6
2M	100M	14.6

20M	2M	25.8
20M	20M	24.8
20M	60M	18
20M	100M	13.2
60M	2M	18
60M	20M	16.7
60M	60M	13
60M	100M	10.3
100M	2M	13.2
100M	20M	12.4
100M	60M	9.8
100M	100M	8.9

1.6.2 When PSE/PoE Switch output is DC 56V

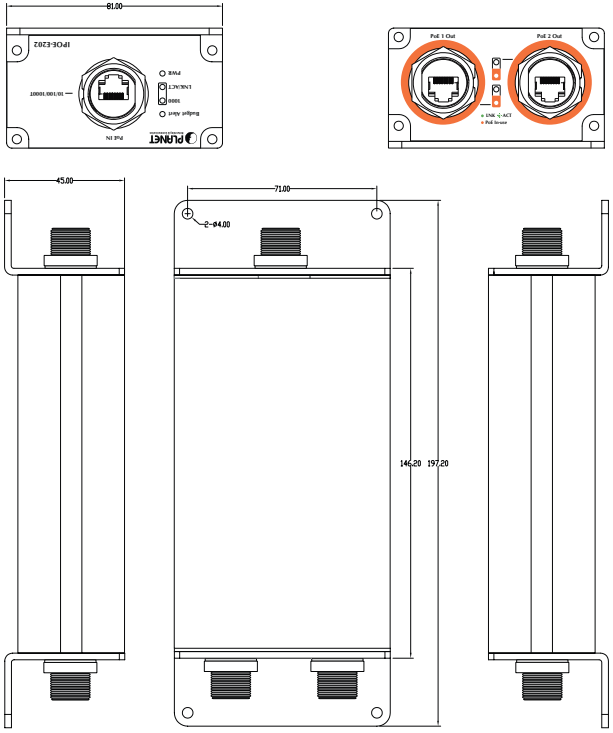
A (Distance)	B (Distance)	C (Watts)
2M	2M	26
2M	20M	25.8
2M	60M	24.7
2M	100M	23.5
20M	2M	25.7
20M	20M	25.4
20M	60M	24.4
20M	100M	22.2
60M	2M	24.5
60M	20M	24.2
60M	60M	21.7
60M	100M	17.5
100M	2M	22.2
100M	20M	20.9
100M	60M	17.2
100M	100M	15.4

2. Installation

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

2.1 Physical Dimensions

IPOE-E202 industrial 1-port 802.3at PoE+ to 2-port 802.3af 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 Power over Ethernet extender

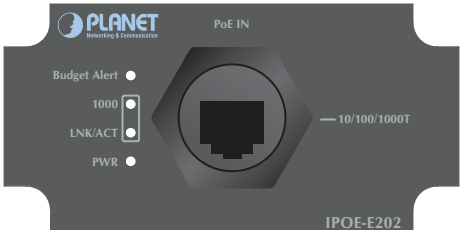


Figure 2-1: IPOE-E202 Front Panel

System

LED	Color	Function
PWR	Green	**Lights** to indicate the IPOE-E202 has power.

PoE Input Port

LED	Color	Function
LNK/ACT	Orange	**Blinks** to indicate that the IPOE-E202 is actively sending or receiving data over that port.
1000	Green	**Lights** to indicate the IPOE-E202 is successfully connecting to the network at 1000Mbps.
		Off to indicate the IPOE-E202 is successfully connecting to the network at 10Mbps or 100Mbps.

Budget Alert Port

LED	Color	Function
Budget Alert	Orange	**Lights** to indicate the IPOE-E202 PoE output power is over 20 watts.
		Off to indicate that the IPOE-E202 PoE output power is not over 20 watts.

2.3 Rear Panel

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

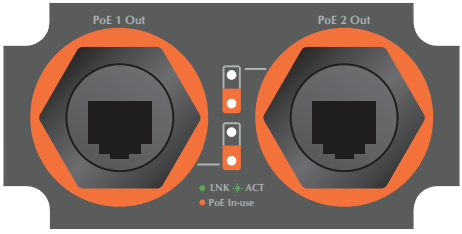


Figure 2-2: IPOE-E202 Rear Panel

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-E202 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

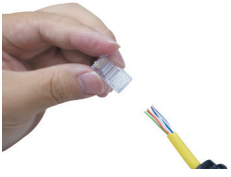
This section describes how to install the industrial PoE extender and make connections to it. Please read the following topics and perform the procedures in the order being presented.

2.4.1 Making Waterproof RJ45 Cable

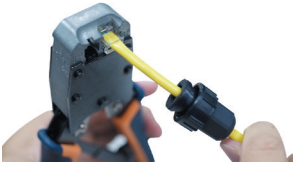
Step 1: Take a waterproof RJ45 jack out from the IPOE-E202 box and prepare one RJ45 cable.

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.

2.4.2 Wall Mounting

To install the industrial 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-E202 on the wall.

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

2.4.3 Connecting waterproof RJ45 connector to the IPOE-E202

Step 1: Insert the waterproof RJ45 connector into the port of the IPOE-E202.

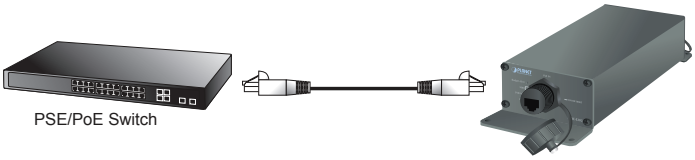
Step 2: Turn clockwise to tighten the screw nut.

2.5 Connecting IPOE-E202 to Power Source Equipment (PSE)

This section describes how to install industrial Power over Ethernet extender and make connection to it. Please read the following topics and perform the procedures in the order being presented.

There are 3 RJ45 ports in the industrial Power over Ethernet 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-E202.



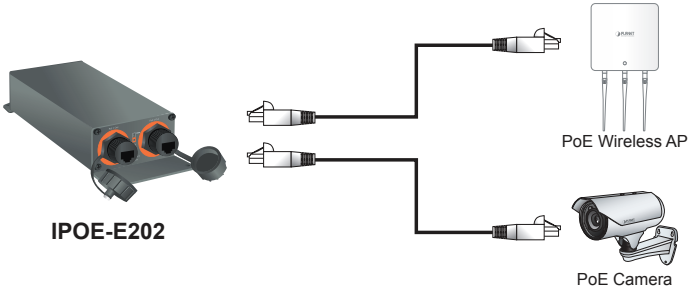
Step 2: The PSE delivers both Ethernet Data and PoE power over UTP cable to the IPOE-E202 and the **"PoE IN"** LED will be lit steadily.

Note

1. When the LED turns steady green, it means the IPOE-E202 is being powered successfully with PoE.
2. 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 802.3at device such as the target PD, check whether the power injection is correct.
3. Never connect any **non-standard** POE PSE to the IPOE-E202; it will damage the device permanently.

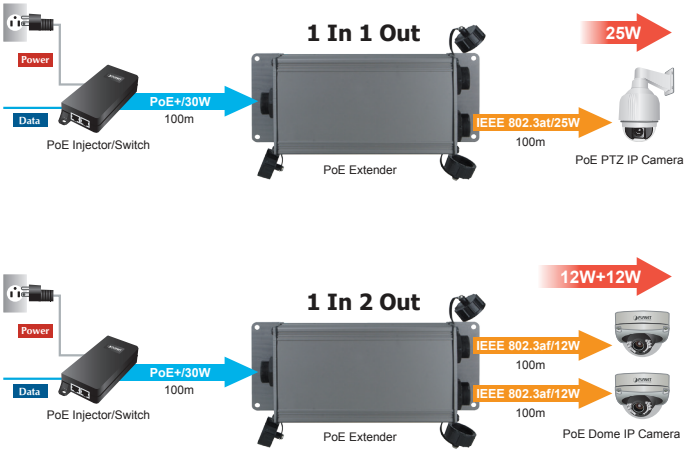
2.6 Connecting IPOE-E202 to Powered Device (PD)

Step 1: Connect the additional Cat5e/6 cable that will be used to connect to the remote **Powered Device (PD)** to the **"PoE-in-Use"** port of the IPOE-E202.



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-E202 detects the existence of an IEEE 802.3at/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 802.3af/at standard or in-line power device, the PoE-in-Use LED indicator of the IPOE-E202 will not be lit steadily.
2. According to IEEE 802.3af/at standard, the IPOE-E202 will not inject power to the cable if not connected to a standard IEEE 802.3af/at device.
3. **DO NOT** connect any PSE to port 1 ~ port 2 of the IPOE-E202, 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_switch@planet.com.tw

APPENDIX A: Networking Connection

A.1 Switch's RJ45 Pin Assignments

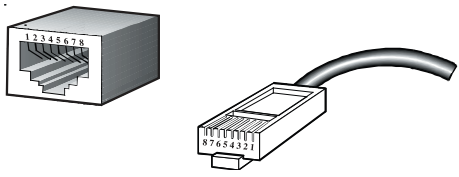
1000Mbps, 1000BASE-T

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.