PLANET
Networking & Communication

User's Manual

POE-1200
POE-2400
POE-1200P2
POE-2400P4

IEEE 802.3af
12 / 24-Port Power over Ethernet
Web Smart Injector Hub

Trademarks

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To avoid the potential effects on the environment and human health as a result of the presence of hazardous substances in electrical and electronic equipment, end users of electrical and electronic equipment should understand the meaning of the crossed-out wheeled bin symbol. Do not dispose of WEEE as unsorted municipal waste and have to collect such WEEE separately

Revision

PLANET IEEE 802.3af Power over Ethernet Web Smart Injector Hub User's Manual

FOR MODELS: POE-1200 / POE-1200P2 / POE-2400 / POE-2400P4

REVISION: 1.0 (JANUARY.2009)

Part No.: 2080-A31120-007

TABLE OF CONTENTS

1. INTRODUCTION

1.1 Package Contents

Check the contents of your package for following parts:

- The PoE Injector Hub x 1
- The Quick Installation Guide x 1
- User's manual CD x 1
- Power Cord x 1
- Rubber feet x 4
- Two rack-mounting brackets with attachment screws x1

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 against to repack the product in case there is a need to return it to us for repair.

In the following section, the term **"PoE Injector Hub"** means the four PoE Injector Hub devices, ie. POE-1200, POE-1200P2, POE-2400, POE-2400P4. Terms with lower case "**injector**" means any IEEE 802.3af power injectors. "**PD**" means the abbreviated from IEEE 802.3af powered device.

1.2 Product Description

The PLANET POE-1200 / POE-1200P2 / POE-2400 / POE-2400P4 are 12 / 24-Port IEEE 802.3af Power over Ethernet Mid-Span injector hub complies with IEEE 802.3, IEEE 802.3u and IEEE 802.3af standards. It is equipped with 12 / 24 10/100Base-TX Fast Ethernet ports that support full 48VDC power for any remote IEEE802.3af powered device (PD) like Wireless LAN Access Point, IP phone, LAN Camera or any other network devices. With support for 130 / 260 watts power supply, POE-1200 / POE-2400 should provide the sufficient power to the 12 / 24 remote devices. The POE-1200P2 / POE-2400P4 provide sufficient 15.4 watts POE power to 12 / 24 remote PD devices with 190 / 380 watts power supply.

The PoE Injector Hub is installed between a regular Ethernet switch and the powered devices, injecting power without affecting the data transmit. It offer a cost effective solution and quickly way to upgrade network system to IEEE 802.3af Power over Ethernet, without replace the existing Ethernet switch.

There are 24 / 48 RJ-45 STP ports on the front panel of PoE Injector Hub, 12 / 24 of them on lower stack are **"Date"** port and the other 12 / 24 ports on upper stack are **"Data + Power output"** port. Each of the **"Data + Power output"** port on upper stack functions as an injector which inserts DC Voltage into the CAT 5 cable allowing the cable between the Injector and Splitter to transfer data and power simultaneously.

To manage your powered devices, the PoE Injector Hub provides both Web management interfaces in which administrators can manage functions such as port Enable/Disable, port priority, system configuration, and Username/Password changing and with smart feature for powered device, the Hub can auto detect the power status on each port and show massages Web management interface. These features also provide a cost-effective way to manage the devices from Internet whenever you are at work or at home.

Power over Ethernet Applications

For the places hard to find the power outlet, the PoE Injector Hub provides the easiest way to power your Ethernet devices such as PLANET Internet Cameras and outdoor Wireless Access Point installed on the top of the building.

To control the power system of your networking devices, the PoE Injector Hub can directly co-work with PoE IP Phone to build VoIP telephony network in the office. Furthermore, the PoE Injector Hub can be directly connected to any third party 802.3af devices and PoE Switches installed 100 meters away.

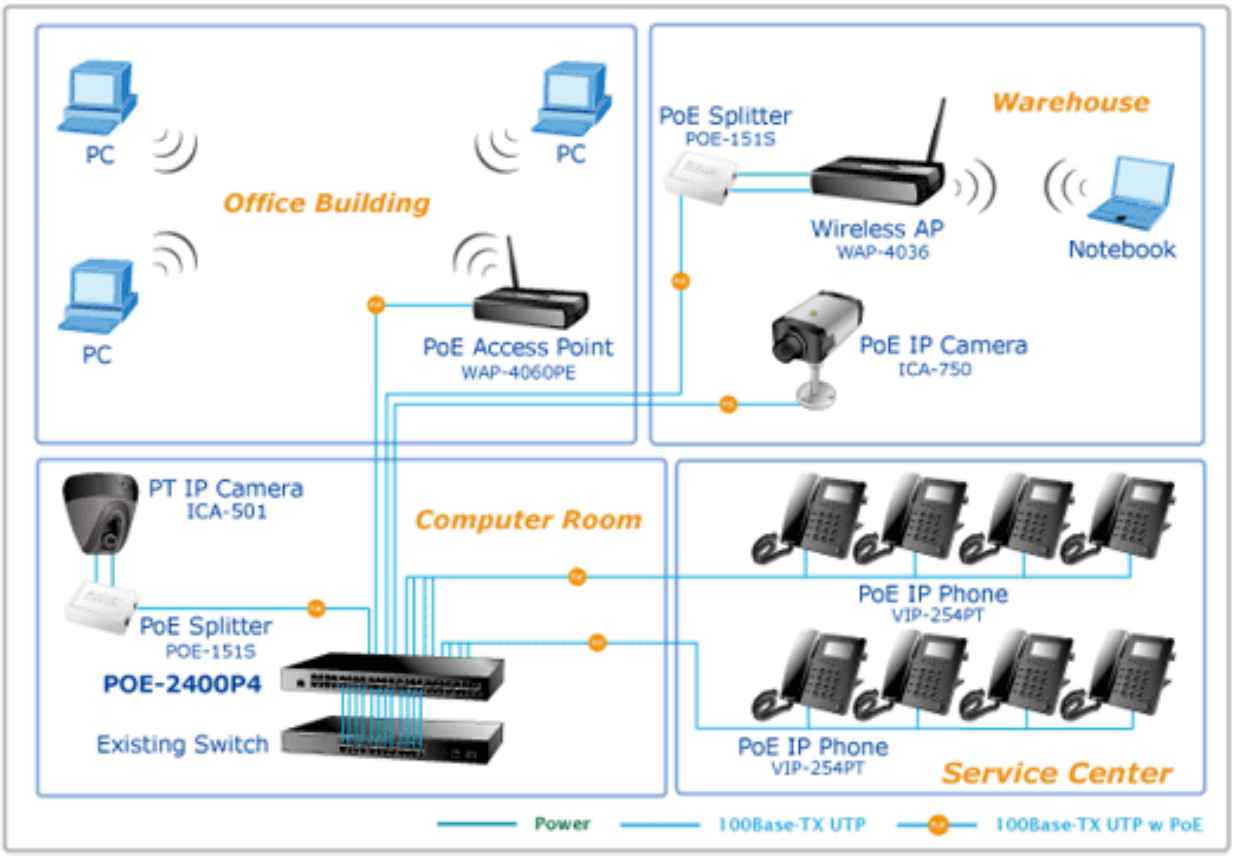


Figure 1 PoE Injector Hub Application

1.3 How to Use This Manual

This IEEE 802.3af Power over Ethernet Web Smart Injector Hub User Manual is structured as follows:

- **Section 2, Installation**

  It explains the functions of PoE Injector Hub and how to physically install the PoE Injector Hub.

- **Section 3, Management**

  It contains information about the software function of the PoE Injector Hub.

- **Section 4, Web Configuration**

  The section explains how to manage the PoE Injector Hub through Web interface.

- **Section 5, Power over Ethernet overview**

  The section explains the IEEE 802.3af Power over Ethernet theories.

- **Section 6, PoE power Provision Process**

  The section explains the PoE power provision process.

- **Section 7, Troubleshooting**

  The section contains troubleshooting guide of the PoE Injector Hub.

- **Appendix A**

  It contains cable information of PoE Injector Hub.

- **Appendix B**

  This section contains the Power over Ethernet compatibility information of the PoE Injector Hub.

1.4 Product Features

- **Interface**
  - 24 / 48-Port RJ-45 STP
    - 12 / 24-Port "**Data input**"
    - 12 / 24-Port "**Data + Power output**"
  - 1 10/100Base-TX Management port with Auto MDI / MDI-X feature

- **PoE**
  - Complies with IEEE 802.3af Power over Ethernet Mid-Span PSE
  - Up to 12/24 IEEE 802.3af devices powered
  - Support PoE Power up to 15.4 watts for each PoE ports
  - Auto detect powered device (PD)
  - Circuit protection prevent power interference between ports
  - Remote power feeding up to 100m

- **PoE Management**
  - Total PoE power budget control
  - Pert port PoE function enable/disable
  - PoE Port Power feeding priority
  - Per PoE port power limit
  - PD classification detection

- **Management**
  - Web interface for remote management
  - Firmware upgrade through Web interface
  - PLANET Smart Discovery utility automatically finds PLANET devices on the network
  - SNMP Trap for alarm notification of events

- **Hardware**
  - 19-inch rack mountable; 1U height
  - Reset button for reset to default setting and system reboot
  - LED indicators for POE ready and POE activity

- **Standard Compliance**
  - IEEE 802.3 10Base-T
  - IEEE 802.3u 100Base-TX
  - IEEE 802.3af Power over Ethernet
  - FCC Part 15 Class A, CE

1.5 Product Specifications

Product		POE-1200	POE-1200P2	POE-2400	POE-2400P4
Hardware Specification					
Interface	"Data" Input Ports	12 x RJ-45 STP		24 x RJ-45 STP	
	"Data+Power" Output Ports	12 x RJ-45 STP		24 x RJ-45 STP	
	Management Port	1 x RJ-45; 10/100Base-TX, auto-negotiation, auto-MDI / MDIX			
LED		System: Power x 1 (Green) Management Port x2: 10/100 (Green / Orange) Per PoE Port: PoE in Use x 1 (Green)			
Network Cable		10Base-T: 2-Pair UTP Cat. 3, 4, 5, up to 100m (328ft) 100Base-TX: 2-Pair UTP Cat. 3, 4, 5, up to 100m (328ft) EIA/TIA- 568 100-ohm STP (100m)			
Dimension (W x D x H)		440 x 200 x 44 mm (1U height)			
Weight		2.7kg		3.3kg	
Power Requirement		100-240V AC, 50/60 Hz			
Power Consumption		130 Watts max.	200 Watts max.	260 Watts max.	400 Watts max.
Operating Temperature		0 ~ 50 Degree C			
Storage Temperature		-40 ~ 70 Degree C			
Humidity		5 ~ 95% (Non-condensing)			
Cooling		Fan x 1		Fan x 2	
Power over Ethernet					
PoE Standard		IEEE 802.3af Power over Ethernet / Mid-Span PSE			
PoE Power supply Type		Mid-Span			
PoE Power Output		Per Port DC 48V 15.4 watts			
Power Pin Assignment		4/5(+), 7/8(-)			
PoE Power Budget		110 Watts	190 Watts	220 Watts	380 Watts
Management					
Management Interface		Web, PLANET Smart Discovery Lite			
PoE Management		Power Limit by Priority and Total Limit Per port power enable/disable Power feeding priority Current usage and status Total power consumption			
Management Feature		System / Management functions setup Web firmware upgrade SNMP Trap for alarm notification of events			
Standards Conformance					
Standards Compliance		IEEE 802.3 10Base-T Ethernet IEEE 802.3u 100Base-TX Fast Ethernet IEEE 802.3af Power over Ethernet			
Regulation Compliance		FCC Part 15 Class A, CE			

2. INSTALLATION

This section describes the hardware features and installation of these PoE Injector Hub on the desktop or rack mount. For easier management and control of the PoE Injector Hub familiarize yourself with its display indicators, and ports. Front panel illustrations in this chapter display the unit LED indicators. Before deploy the PoE Injector Hub, please read this chapter completely.

2.1 Hardware Description

The section describes the hardware of the PoE Injector Hub and gives a physical and functional overview.

2.1.1 Injector Front Panel

The unit front panel provides a simple interface monitoring the PoE Injector Hub. Figure 2-1 & 2-2 & 2-3 &2-4 shows front panel of the PoE Injector Hub.

- **Front Panel of POE-1200**

Figure 2-1 POE-1200 front panel

- **Front Panel of POE-1200P2**

Figure 2-2 POE-1200P2 front panel

- **Front Panel of POE-2400**

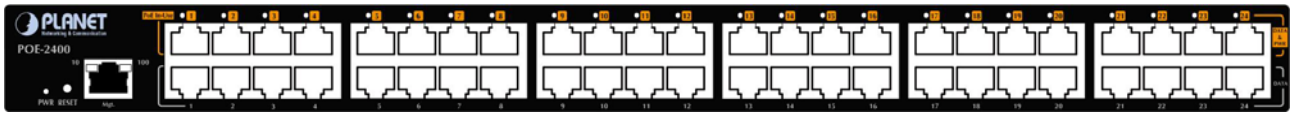


Figure 2-3 POE-2400 front panel

- **Front Panel of POE-2400P4**

Figure 2-4 POE-2400P4 front panel

■ **Reset button**

At the left of front panel, the reset button is designed for reboot the PoE Injector Hub without turn off and on the power.

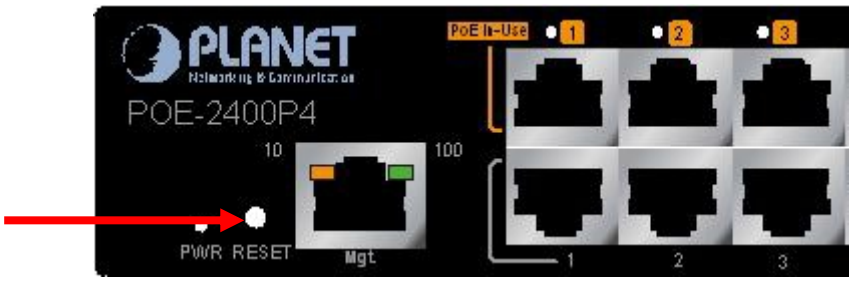


Figure 2-5 Reset button of PoE Injector Hub

The following is the summary table of Reset button functions:

Reset Button Pressed and Released	Function
About **1 second**	Reboot the PoE Injector Hub
Until the **SYS** LED lit **off**	Reset the PoE Injector Hub to Factory Default configuration. The PoE Injector Hub will reboot and load the default IP settings as below: ◦ Default Username: **admin** ◦ Default Password: **admin** ◦ Default IP address: **192.168.0.100** ◦ Subnet mask: **255.255.255.0** ◦ Default Gateway: **192.168.0.254**

Note

To press the RESET button about 10 seconds and then release. The PoE Injector Hub will back to the factory default mode. Be sure that you backup the current configuration of PoE Injector Hub; else the entire configuration will be erased when pressing the ***"RESET"*** button.

2.1.2 LED Indicators

The front panel LEDs indicates instant status of system power, Management port Link/Active and PoE port links, helps monitor and troubleshoot when needed.

LED	Color	Function
POWER	**Green**	**Lights** to indicate power on.
Manage	**Amber**	**Lights** to indicate the port is running in 10Mbps speed **Blink**: indicate that the PoE Injector Hub is actively sending or receiving data over that port.
	Green	**Lights** to indicate the port is running in 100Mbps speed **Blink**: indicate that the PoE Injector Hub is actively sending or receiving data over that port
PoE In-use	**Green**	**Lights** to indicate that the port is in use and supplying 48V DC power

2.1.3 Injector Rear Panel

The rear panel of the PoE Injector Hub indicates an AC inlet power socket, which accepts input power from 100 to 240V AC, 50/60Hz. Figure 2-6 & 2-7 shows rear panel of the PoE Injector Hub.

Figure 2-6 POE-1200 / POE-1200P2 Rear Panel

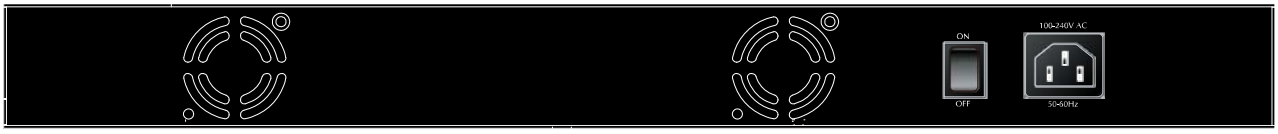


Figure 2-7 POE-2400 / POE-2400P4 Rear Panel

Power Notice:

1. The device is a power-required device, it means, it will not work till it is powered. If your networks should active all the time, please consider using UPS (Uninterrupted Power Supply) for your device. It will prevent you from network data loss or network downtime.
2. In some area, installing a surge suppression device may also help to protect your device from being damaged by unregulated surge or current to the PoE Injector Hub or the power adapter.

2.2 Installing the PoE Injector Hub

This section describes how to install your PoE Injector Hub and make connections to the PoE Injector Hub. Please read the following topics and perform the procedures in the order being presented. PLANET PoE Injector Hub do not need software configuration. To install the PoE Injector Hub on a desktop or shelf, simply complete the following steps.

2.2.1 Desktop Installation

To install a PoE Injector Hub on a desktop or shelf, simply complete the following steps:

Step1: Attach the rubber feet to the recessed areas on the bottom of the PoE Injector Hub.

Step2: Place the PoE Injector Hub on a desktop or shelf near an AC power source.

Step3: Keep enough ventilation space between the PoE Injector Hub and the surrounding objects.

Note

When choosing a location, please keep in mind the environmental restrictions discussed in Chapter 1, Section 5, in Specification.

Step4: Connect your PoE Injector Hub to network 802.3af powered devices (PD) and Switch.

- **A.** Connect one end of a standard network cable to the upper stack 10/100 RJ-45 ports on the front of the PoE Injector Hub.
- **B.** Connect the other end of the cable to the 802.3 powered devices (PD) such as IP phone, wireless access point, IP camera, splitter, or switch…etc.
- **C.** Connect the one end of a standard network cable to the relative lower stack 10/100 RJ-45 port on the front of the PoE Injector Hub.
- **D.** Connect the other end of the cable to the port of switch.

Note

Connection to the PoE Injector Hub requires UTP Category 5 network cabling with RJ-45 tips. For more information, please see the Cabling Specification in Appendix A.

Step5: Supply power to the PoE Injector Hub.

A. Connect one end of the power cable to the PoE Injector Hub.

B. Connect the power plug of the power cable to a standard wall outlet.

When the PoE Injector Hub receives power, the Power LED should remain solid Green.

2.2.2 Rack Mounting

To install the PoE Injector Hub in a **19-inch** standard rack, follow the instructions described below.

Step1: Place your PoE Injector Hub on a hard flat surface, with the front panel positioned towards your front side.

Step2: Attach a rack-mount bracket to each side of the PoE Injector Hub with supplied screws attached to the package. Figure 2-8 shows how to attach brackets to one side of the PoE Injector Hub.

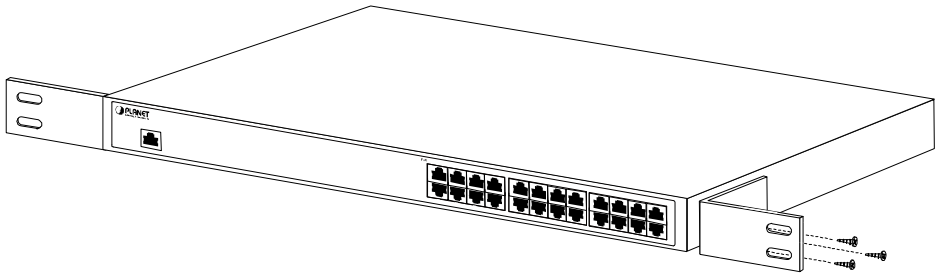


Figure 2-8 Attaching the brackets to the PoE Injector Hub

You must use the screws supplied with the mounting brackets. Damage caused to the parts by using incorrect screws would invalidate the warranty.

Step3: Secure the brackets tightly.

Step4: Follow the same steps to attach the second bracket to the opposite side.

Step5: After the brackets are attached to the Injector, use suitable screws to securely attach the brackets to the rack, as shown in Figure 2-9.

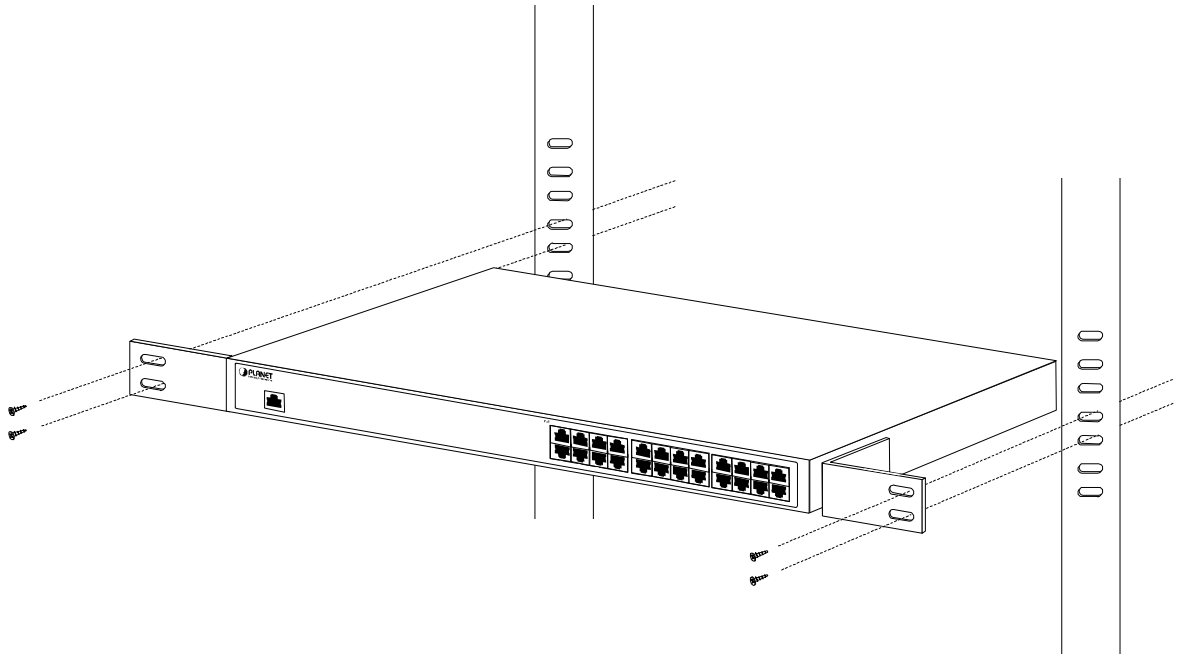


Figure 2-9 Mounting thePoE Injector Hub in a Rack

Step6: Proceeds with the steps 4 and steps 5 of session **2.2.1 Desktop Installation** to connect the network cabling and supply power to your PoE Injector Hub.

2.2.3 Network Application Installation

The PoE Injector Hub is not equipment with data switching function between data ports. To inject PoE power and transmit data packets to PDs, the PoE Injector Hub is usually link to an Ethernet switch. Typically, the Mid-Span Injector is installed between regular Ethernet switch and PDs, and mostly it is located close to the Ethernet switch side.

To install an PoE Injector Hub on a network environment, simply complete the following steps:

Step1: Power on the PoE Injector Hub and connect the RJ-45 cable from the **"data"** port to the Ethernet switch port.

Step2: Connect the RJ-45 cable from the **"data + power"** ports to the PDs, such as VoIP phone, IP camera.

Step3: Check the link status on both PD and Ethernet switch, once the Injector start to deliver 48V power over RJ-45 cables to PDs, the PoE In-Use LED of the PoE Injector Hub lights.

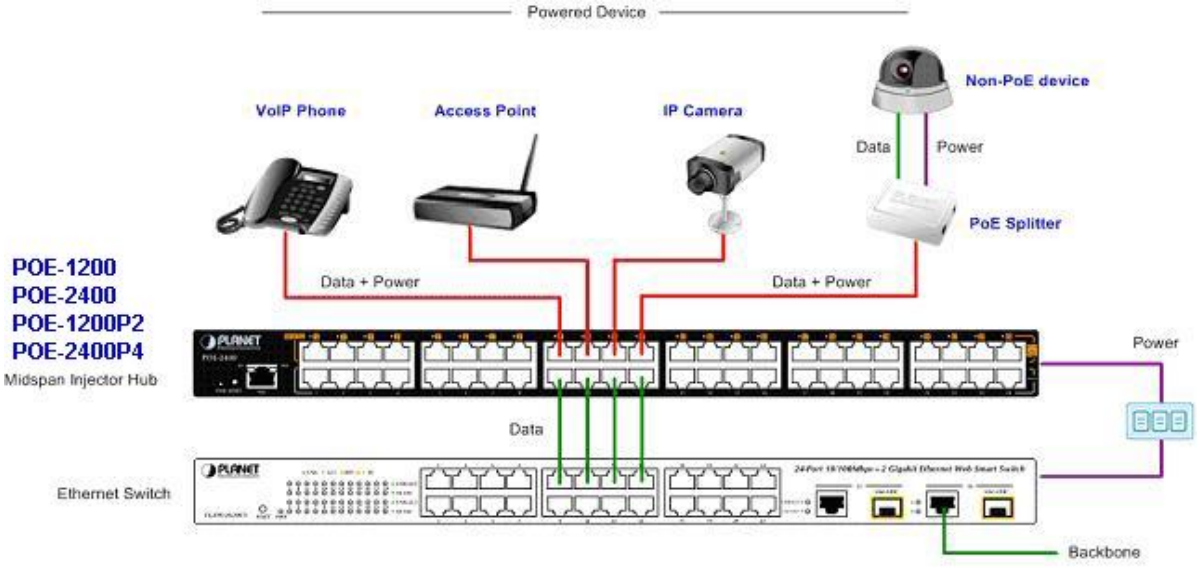


Figure 2-10 Network application installation

The PoE Injector Hub supports Data passive mode, that is, even the PoE Injector Hub is manual power off, the data between **"DATA"** port and **"DATA+PoE"** port can still be transmitted without data loss.

Note

The PLANET Mid-Span PoE Injector Hub doesn't support Gigabit data rate. The Ethernet switches or PoE PDs with Gigabit interface will operate at 100Mpbs Full Duplex mode when connect to the Mid-Span PoE Injector Hub.

2.2.4 Power over Ethernet Powered Device

 **3~5 watts**	**Voice over IP phones** Enterprise can install POE VoIP Phone, ATA and other Ethernet/non-Ethernet end-devices to the central where UPS is installed for un-interrupt power system and power control system.
 **6~12 watts**	**Wireless LAN Access Points** Museum, Sightseeing, Airport, Hotel, Campus, Factory, Warehouse can install the Access Point any where with no hesitation
 **10~12 watts**	**IP Surveillance** Enterprise, Museum, Campus, Hospital, Bank, can install IP Camera without limits of install location – no need electrician to install AC sockets.
 **3~12 watts**	**PoE Splitter** PoE Splitter split the PoE 48V DC over the Ethernet cable into 5/9/12V DC power output. It frees the device deployment from restrictions due to power outlet locations, which eliminate the costs for additional AC wiring and reduces the installation time.

3 MANAGEMENT

This chapter describes how to manage the Web Smart PoE Injector Hub. Topics include:

- Overview

- Management method

- Logging on to the Web Smart PoE injector Hub

3.1 Overview

The Web Smart PoE injector Hub provides a user-friendly, Web interface. Using this interface, you can perform various device configuration and management activities, including:

- **System**
- **Power over Ethernet**
- **Tools**

3.2 Requirements

- Network cables.

  Use standard network (UTP) cables with RJ45 connectors.

- Subscriber PC installed with Ethernet NIC (Network Card)
- Workstations of subscribers running Windows 98/ME, NT4.0, 2000/2003/XP, MAC OS X or later, Linux, UNIX or other platform compatible with TCP/IP protocols.
- Above PC installed with WEB Browser and JAVA runtime environment Plug-in

It is recommended to use **Internet Explore 6.0** or above to access Web Smart PoE Injector Hub.

3.3 Management Method

User can manage the Web Smart PoE injector Hub by Web Management via a network connection.

3.3.1 Web Management

The PoE Injector Hub can be configured through an Ethernet connection, make sure the manager PC must be set on same the **IP subnet address** with the PoE Injector Hub.

For example, if you have changed the default IP address of the Device to **192.168.99.123** with subnet mask **255.255.255.0** via console, then the manager PC should be set at **192.168.99.x** (where x is a number between 2 and 254) with subnet mask **255.255.255.0**. Or you can use the factory default IP address **192.168.0.100** to do the relative configuration on manager PC.

1. Use Internet Explorer 5.0 or above Web browser. Enter IP address **http://192.168.0.100** (the factory-default IP address or that you have changed via console) to access the Web interface.

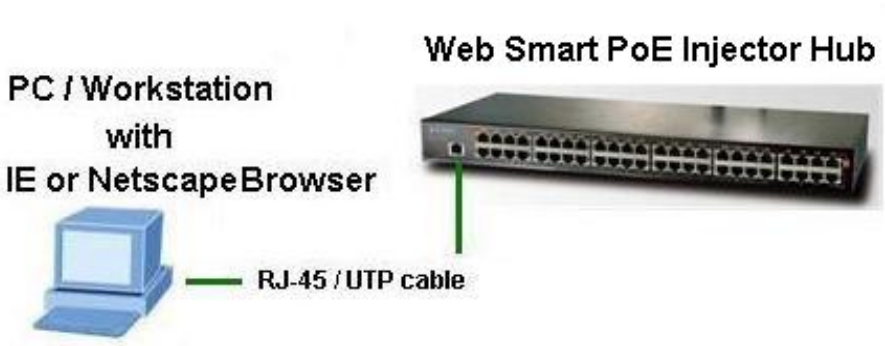


Figure 3-1 Web Management over Ethernet

2. When the following login screen appears, please enter the default username **"admin"** and password **"admin"** (or the password you have changed via console) to login the main screen of PoE Injector Hub. The login screen in Figure 3-2 appears.

Default IP Address: **192.168.0.100**

Default Account: **admin**

Default Password: **admin**

Note

The following screen based on POE-2400P4, for POE-1200 / POE-1200P2 / POE-2400 the display will be the same to POE-2400P4.

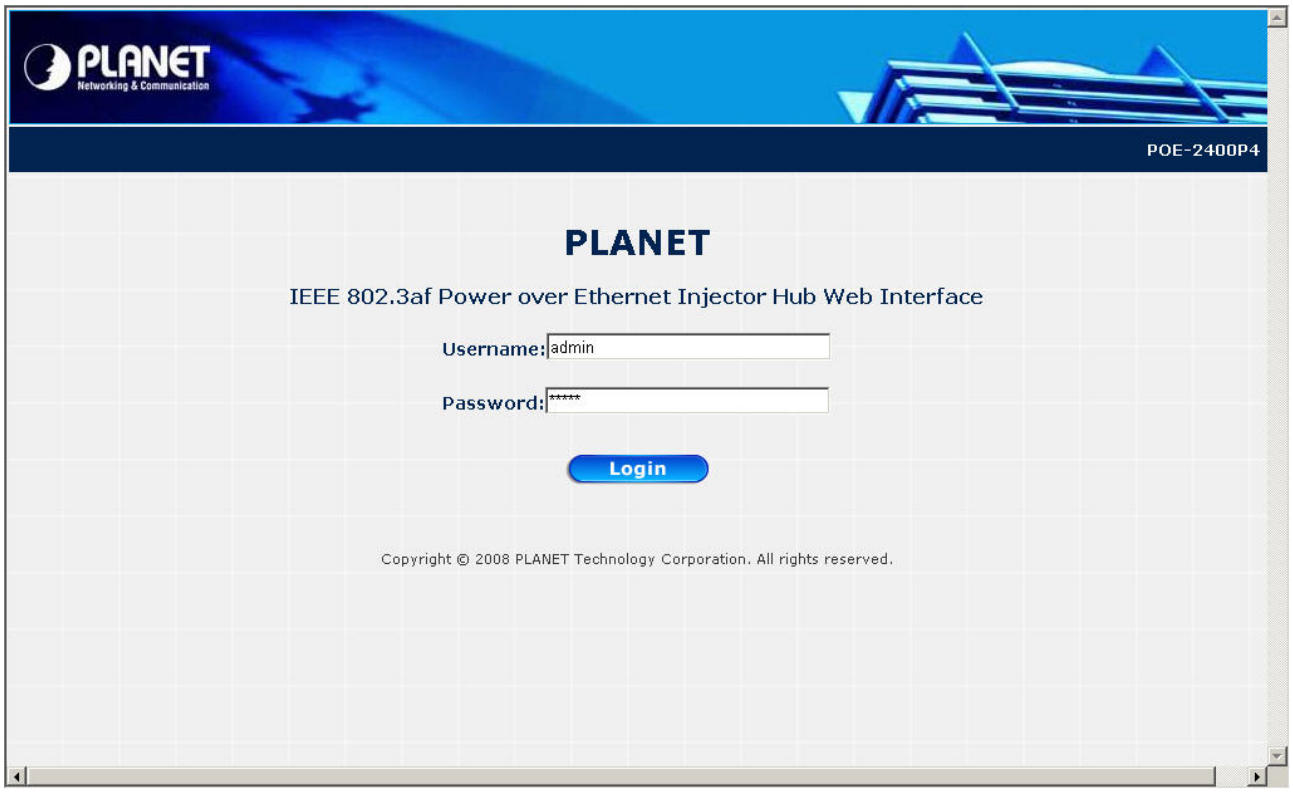


Figure 3-2 PoE Injector Hub Web Login screen

Note

1. For security reason, please change and memorize the new password after this first setup.
2. Only accept command in lowercase letter under Web interface.

3.3.2 PLANET Smart Discovery Utility

For easily list the PoE Injector Hub in your Ethernet environment, the Planet Smart Discovery Utility from user's manual CD-ROM is an ideal solution.

The following install instructions guiding you for run the Planet Smart Discovery Utility.

1. Deposit the Planet Smart Discovery Utility in administrator PC.
2. Run this utility and the following screen appears.

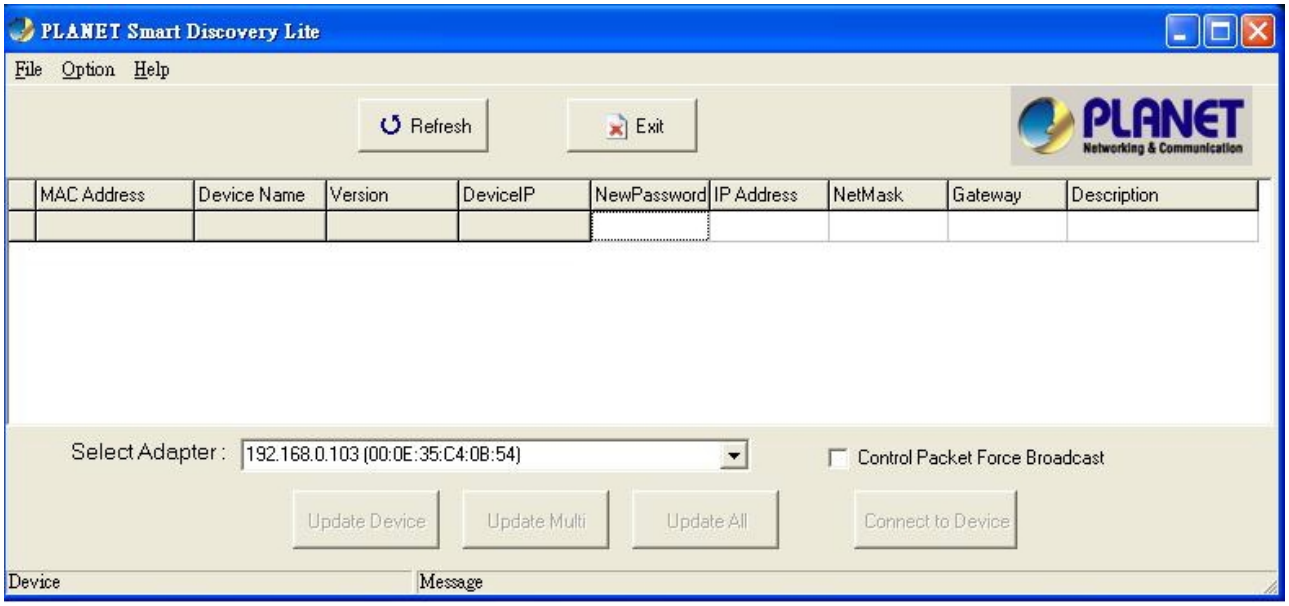


Figure 3-3 Planet Smart Discovery Utility Screen

Note

If there are two LAN cards or above in the same administrator PC, choose different LAN card by use the **"Select Adapter"** tool.

3. Press **"Refresh"** button for list current connected devices in the discovery list, the screen is shown as follow.

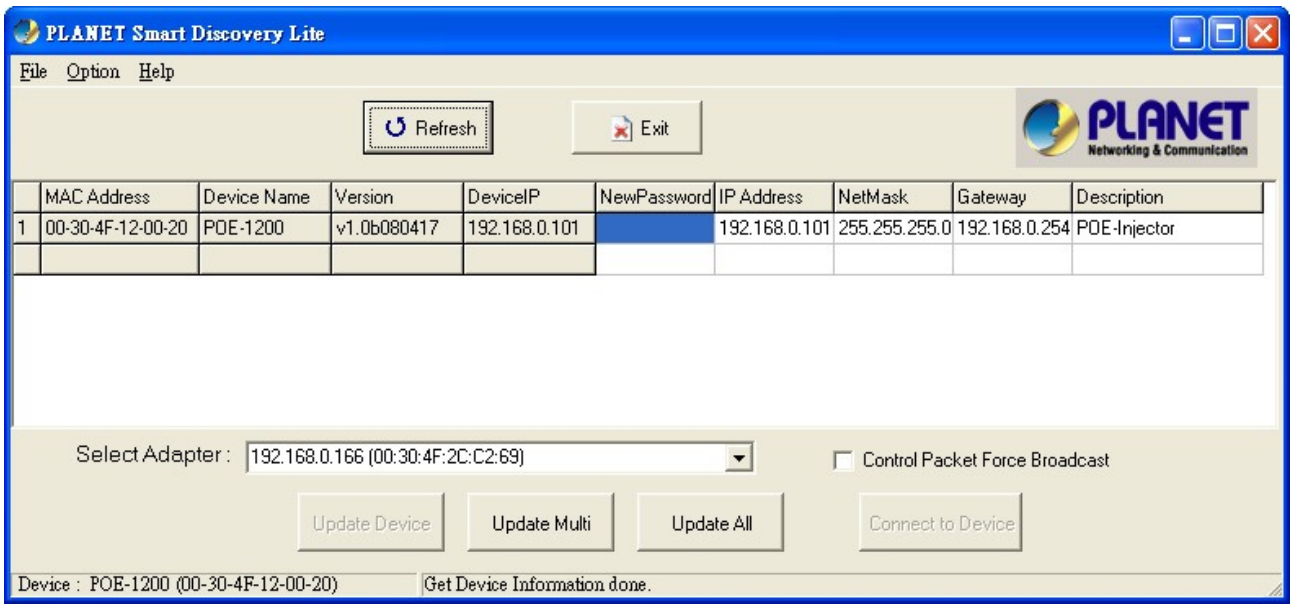


Figure 3-4 Planet Smart Discovery Utility Screen

4. This utility show all necessary information from the devices, such as MAC Address, Device Name, firmware version, Device IP Subnet address, also can assign new password, IP Subnet address and description for the devices.

5. After setup completed, press **"Update Device"**, **"Update Multi"** or **"Update All"** button to take affect. The meaning of the 3 buttons above are shown as below:

   Update Device: use current setting on one single device.

   Update Multi: use current setting on choose multi-devices.

   Update All: use current setting on whole devices in the list.

   The same functions mentioned above also can be finding in **"Option"** tools bar.

6. To click the **"Control Packet Force Broadcast"** function, it can allow assign new setting value to the PoE Injector Hub under different IP subnet address.

7. Press **"Connect to Device"** button then the Web login screen appears in Figure 3-2.

8. Press **"Exit"** button to shutdown the planet Smart Discovery Utility.

4 WEB CONFIGURATION

The PoE Injector Hub provide Web interface for PoE smart function configuration and make the PoE Injector Hub operate more effectively - They can be configured through the Web Browser. A network administrator can manage and monitor the PoE Injector Hub from the local LAN. This section indicates how to configure the PoE Injector Hub to enable its smart function.

Note

The following screen based on POE-2400P4, for POE-1200 / POE-1200P2 / POE-2400 the display will be the same to POE-2400P4.

4.1 Manin Menu

After a successful login, the main screen appears. The main screen displays the product name the function menu, and the main information in the center. As showed in Figure 4-1.

Figure 4-1 Web Main Menu screen

The four items and it description shown as below:

- **System:** Provide System information of PoE Injector Hub. **Explained in section 4.3.**
- **PoE Configuration :** Provide PoE Management configuration of PoE Injector Hub. **Explained in section 4.4.**
- **Tools:** Provide configuration of PoE Injector Hub. **Explained in section 4.5.**
- **Logout:** Provide Logout function of PoE Injector Hub. **Explained in section 4.6.**

4.2 Web Panel

At the top of the Web management page, the active panel displays the link status of management port and PoE ports.

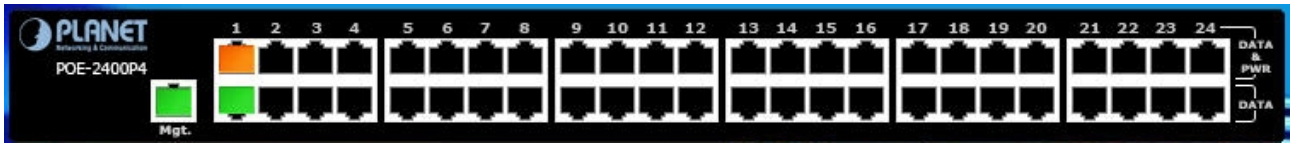


Figure 4-2 Web panel screen

- **Green lit is the network data send or receiver,**
- **Orange lit is the PoE in use.**

4.3 System

The System function allows viewing system information, IP Configuration and Password Setting. As showed in Figure 4-3.

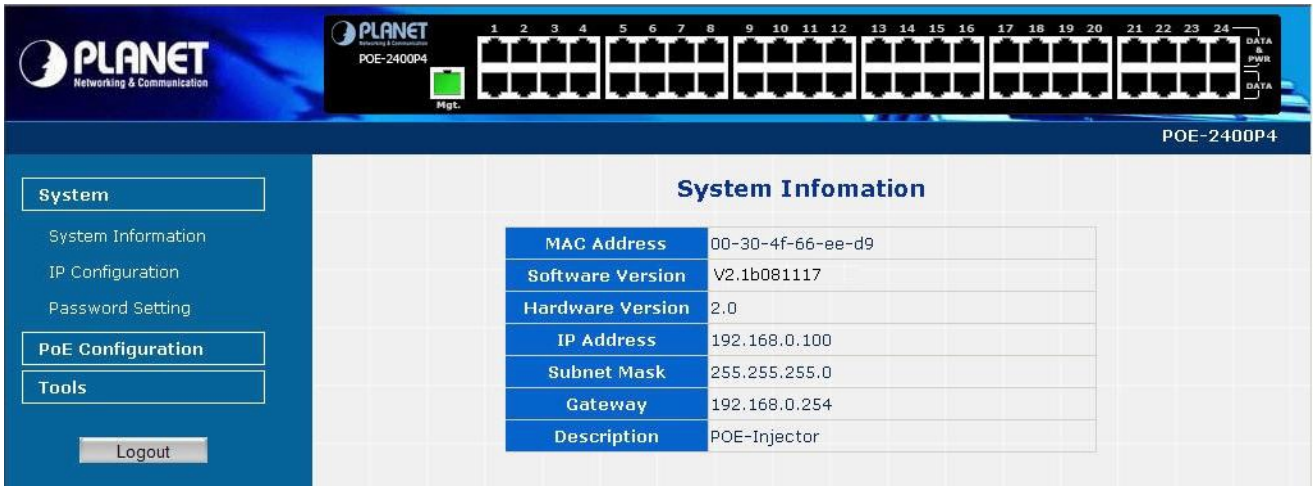


Figure 4-3 System screen

The page includes the following information:

Object	Description
System Information	Display the MAC address, Software Version, Hardware Version, IP Address, Subnet Mask, Gateway and Description. **Explained in section 4.3.1.**
IP Configuration	Allow to change the IP subnet address of PoE Injector Hub. **Explained in section 4.3.2.**
Password Setting	Allow to change the username and password of PoE Injector Hub. **Explained in section 4.3.3.**

4.3.1 System Information

The System information allows viewing system MAC Address, Software Version, Hardware Version, IP Address, Subnet Mask, Gateway and Description. As showed in Figure 4.4

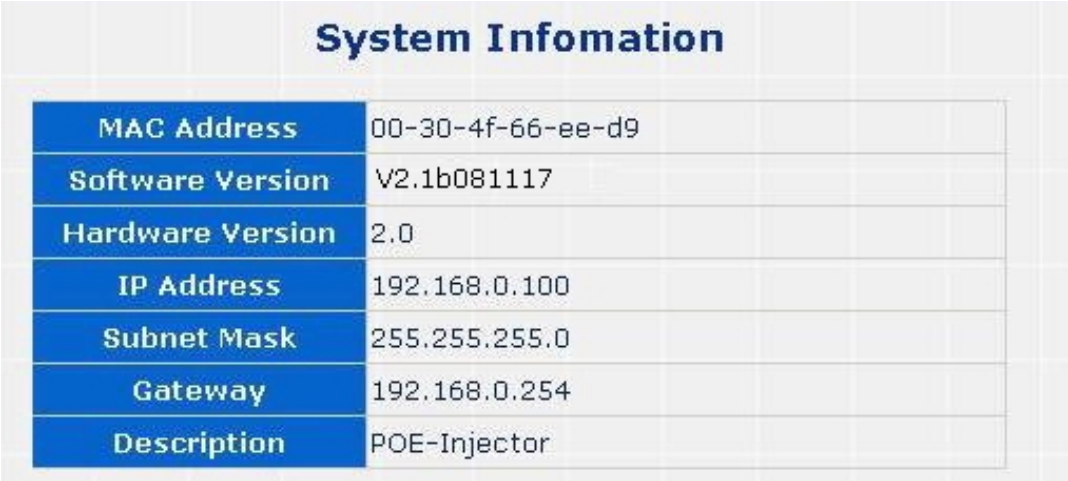


Figure 4-4 System Information screen

The page includes the following fields:

Object	Description
MAC Address	Specifies the PoE Injector Hub MAC address.
Software Version	The current software version running on the PoE Injector Hub.
Hardware Version	The current hardware version of the PoE Injector Hub.
IP Address	The current IP Address of the PoE Injector Hub.
Subnet Mask	The current IP Subnet Mask value of the PoE Injector Hub.
Gateway	The current Gateway value of the PoE Injector Hub.
Description	Display the current description of the PoE Injector Hub.

4.3.2 IP Configuration

This section provides DHCP Client, change the IP Address, Subnet Mask, Gateway and Description, the screen in Figure 4-5 appears.

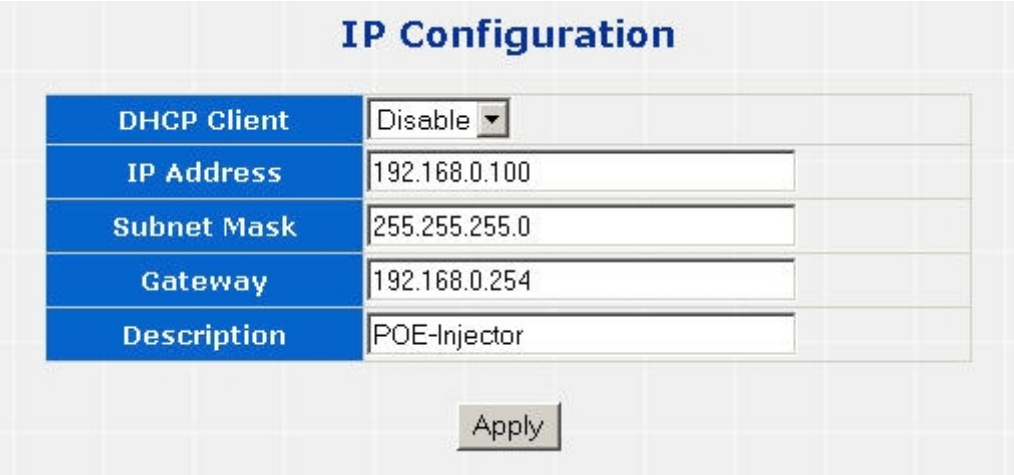


Figure 4-5 IP Configuration screen

The page includes the following configurable data:

Object	Description
DHCP Client	Choose what the PoE Injector Hub should do following power-up: transmit a DHCP request, or manual setting (Disable). The DHCP client function only works if you haven't assigned a static IP address that different than the PoE Injector Hub default IP. Once the default IP has been changed the DHCP will not effective and the PoE Injector Hub will continue using the manually entered static IP. If you have changed thePoE Injector Hub to a static IP address, you can set the IP address back to its default IP address or you can reset the PoE Injector Hub back to factory default. And then you can enable the DHCP client function to work. The factory default is **Disable**.
IP Address	The IP address of the PoE Injector Hub.. The factory default value is **192.168.0.100**.
Subnet Mask	The IP subnet mask of the PoE Injector Hub.. The factory default value is **255.255.255.0**.
Gateway	The default gateway of the PoE Injector Hub.. The factory default value is **192.168.0.254**.
Description	This field helps to identify the description of PoE Injector Hub.

4.3.3 Password Setting

This function allows changing admin password, fill the form and click on the **"Apply"** button. As showed in Figure 4-6

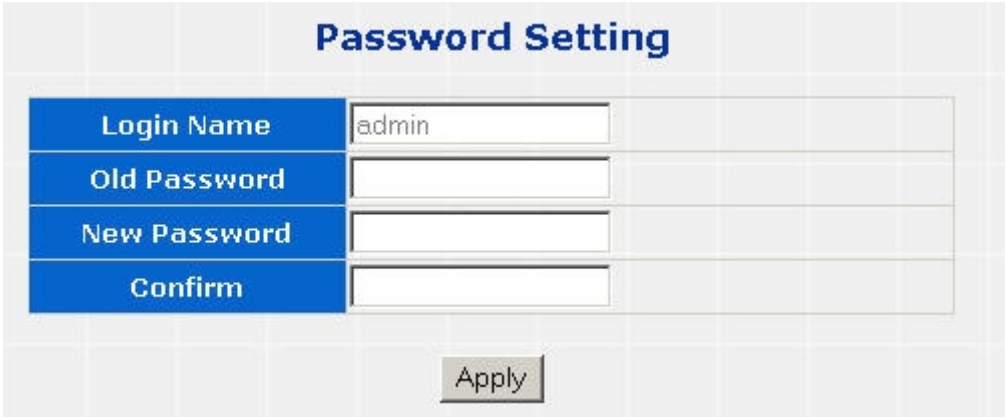


Figure 4-6 Password Setting screen

The page includes the following configurable data:

Object	Description
Login Name	Displays the login user name.
Old Password	Enter the old password is required before entering the new password.
New Password	Specifies the new password. The password is not displayed. As it entered an "•" corresponding to each character is displayed in the field. (The maximum length is 16 characters)
Confirm	This confirms the new password. The password entered into this field must be exactly the same as the password entered in the Password field.

4.4 PoE

■ Power Management:

In a power over Ethernet system, operating power is applied from a power source (PSU-power supply unit) over the LAN infrastructure to powered devices (PDs), which are connected to ports. Under some conditions, the total output power required by PDs can exceed the maximum available power provided by the PSU. The system may a prior be planed with a PSU capable of supplying less power than the total potential power consumption of all the PoE ports in the system. In order to maintain the majority of ports active, power management is implemented.

The PSU input power consumption is monitored by measuring voltage and current .The input power consumption is equal to the system's aggregated power consumption .The power management concept allows all ports to be active and activates additional ports, as long as the aggregated power of the system is lower than the power level at which additional PDs cannot be connected .When this value is exceeded, ports will be deactivated, according to user-defined priorities. The power budget is managed according to the following user-definable parameters: maximum available power, ports priority, maximum allowable power per port.

This section provides PoE (Power over Ethernet) Configuration and PoE output status of PoE Injector Hub, screen in Figure 4-7 appears.

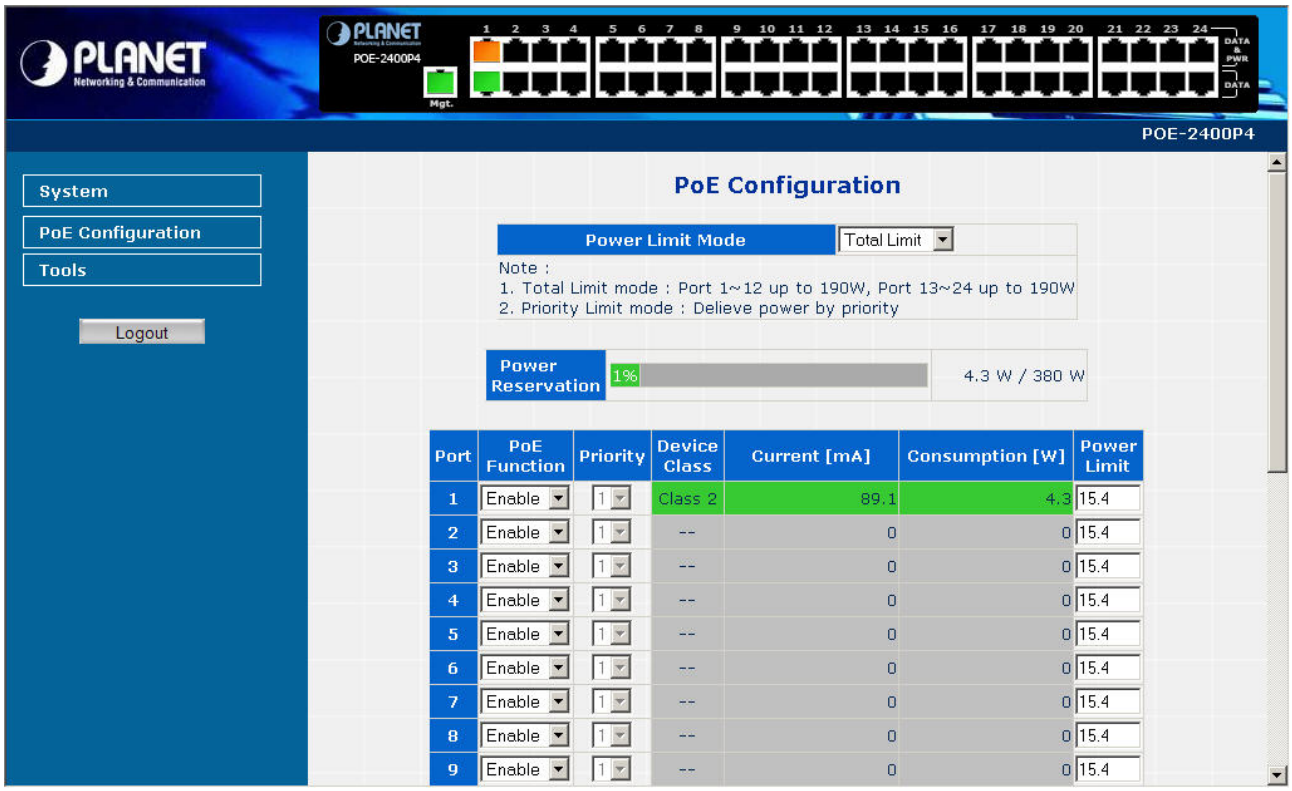


Figure 4-7 PoE Configuration screen

Object	Description
Power limit mode	Allow to configure power limit mode of Web Smart Device. It can choose : ■ **Port Priority** Deliver PoE power by port priority setting ■ **Total Limit**. Set limit value of the total POE port provided power to the PDs. For POE-1200, the total PoE power reservation from Port-1~12 is up to 110W For POE-2400, the total PoE power reservation from Port-1~24 is up to 220W For POE-1200P2, the total PoE power reservation from Port-1~12 is up to 190W For POE-2400P4, the total PoE power reservation from Port-1~24 is up to 380W

Power reservation	Show the total Watts usage of PoE Injector Hub.
PoE Function	Can enable or disable the PoE function.
Priority	Set port priority for the POE power management It can choose the **"port priority"**, value is **"1~4"**. High priority is **"1"**.
Device class	Class 0 is the default for PDs. However, to improve power management at the PSE, the PD may opt to provide a signature for Class 1 to 3. The PD is classified based on power. The classification of the PD is the maximum power that the PD will draw across all input voltages and operational modes. A PD shall return Class 0 to 3 in accordance with the maximum power draw as specified by **Table 4.1**.
Current(mA)	It shows the PoE device current Amp.
Consumption [W]	It shows the PoE device current watt.
Power Limit	It can limit the port PoE supply watts. Per port maximum value must less **15.4,** total ports values must less than the Power Reservation value. Once power overload detected, the port will auto shut down and keep on detection mode until PD's power consumption lower than the power limit value.

- **PD Classifications**

A PD may be classified by the PSE based on the classification information provided by the PD. The intent of PD classification is to provide information about the maximum power required by the PD during operation. Class 0 is the default for PDs. However, to improve power management at the PSE, the PD may opt to provide a signature for Class 1 to 3.

The PD is classified based on power. The classification of the PD is the maximum power that the PD will draw across all input voltages and operational modes.

A PD shall return Class 0 to 3 in accordance with the maximum power draw as specified by Table 4-1.

Class	Usage	Range of maximum power used by the PD
0	Default	0.44 to 12.95 Watts
1	Optional	0.44 to 3.84 Watts
2	Optional	3.84 to 6.49 Watts
3	Optional	6.49 to 12.95 Watts
4	Not Allowed	Reserved for Future Use

Table 4.1 Device class

Class 4 is defined but is reserved for future use. A Class 4 signature cannot be provided by a compliant PD.

4.5 Tools

This function displays the PoE Injector Hub tools; include **“Firmware upgrade”**, “**Configuration Setting**”, “**Configuration Backup**”, “**Alert trap Configuration**” and **“System Reboot”**. As showed in Figure 4-8.

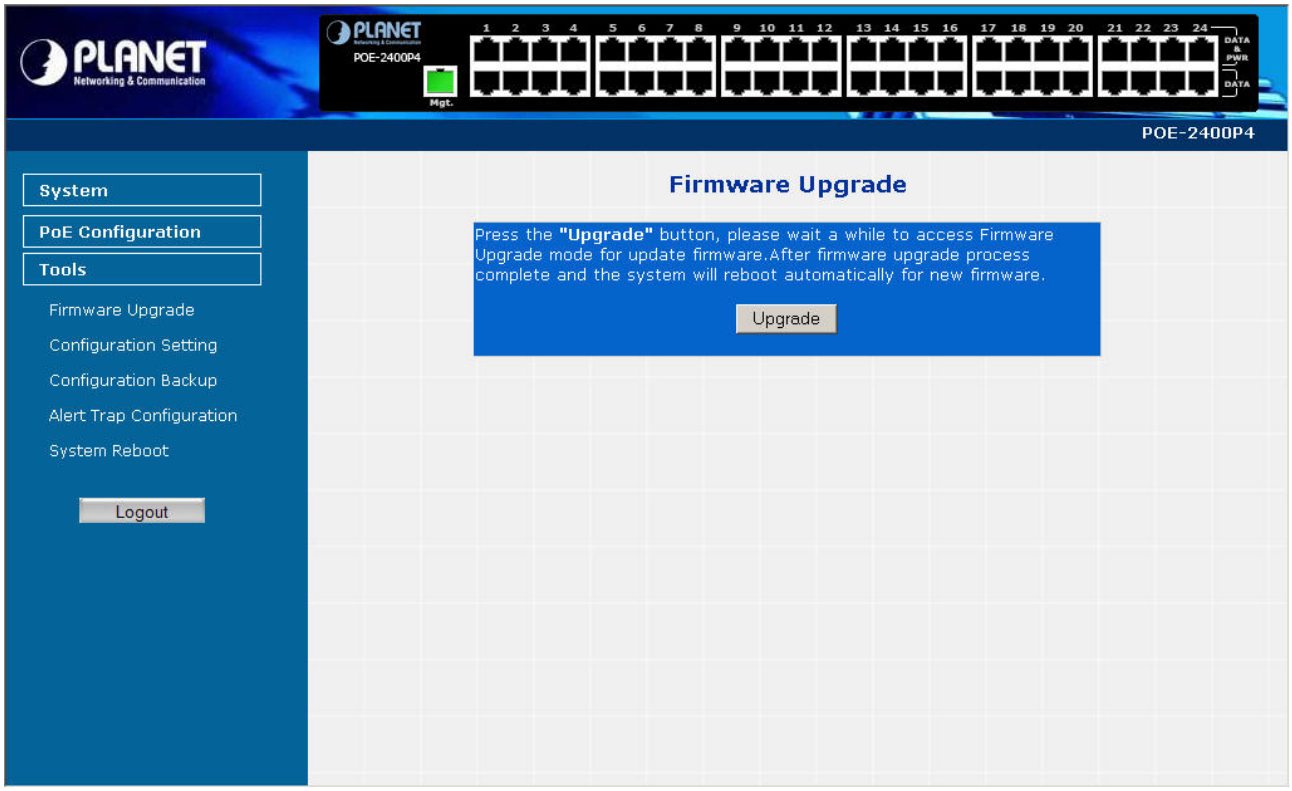


Figure 4-8 Tools screen

Object	Description
Firmware Upgrade	Allow to upgrade firmware of PoE Injector Hub. **Explained in section 4.5.1.**
Configuration Setting	Allow to configuration setting of PoE Injector Hub. **Explained in section 4.5.2.**
Configuration Backup	Allow to configuration setting of PoE Injector Hub. **Explained in section 4.5.3.**
Alert Trap configuration	Allow to configuration the alert trap of PoE Injector Hub. **Explained in section 4.5.4.**
System Reboot	Allow to reboot the PoE Injector Hub. **Explained in section 4.5.5.**

4.5.1 Firmware Upgrade

This section provides firmware upgrade of PoE Injector Hub, after choose this function and the following screen appears in Figure 4-9. Please press **"Upgrade"** button to continue following firmware upgrade process.

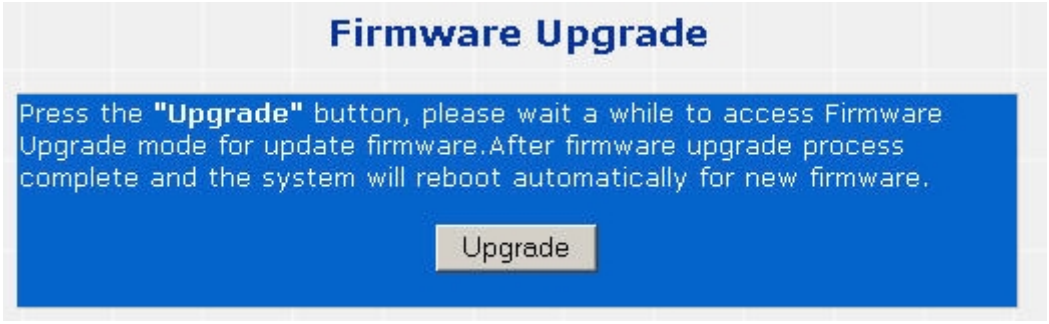


Figure 4-9 Firmware Upgrade screen

Please wait for two seconds and the page will show to next firmware upgrade web page, the screen in Figure 4-10 appears.

Figure 4-10 Firmware Upgrade screen

Please press **"Browse"** to locate the latest firmware of PoE Injector Hub that deposit in your PC and press **"Upgrade"** to start the firmware upgrade process. The screen in Figure 4-11 appears.

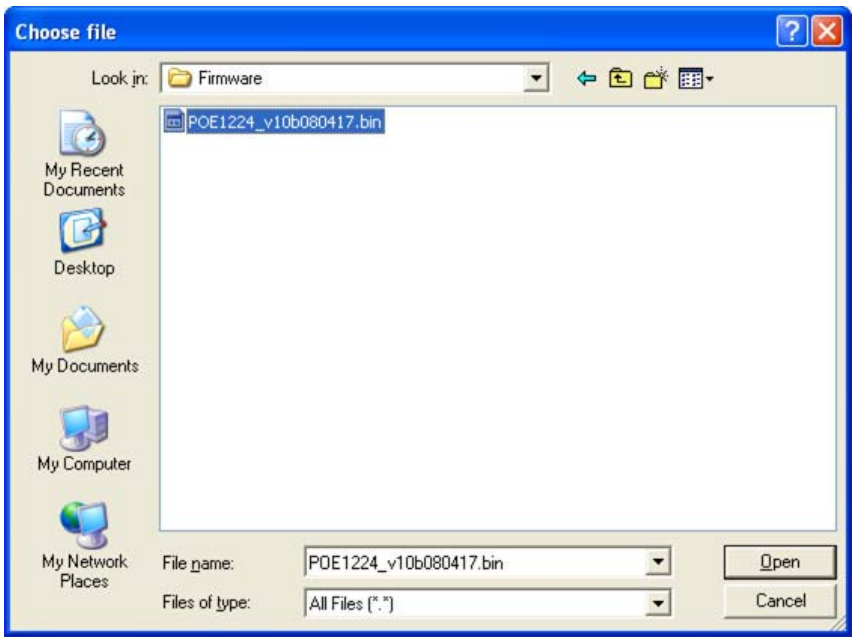


Figure 4-11 Firmware Upgrade screen

Note

Do not power off the PoE Injector Hub until the update progress is complete.

Note

Do not quit the Firmware Upgrade page without press the **"Upgrade"** button - after the image is loaded. Or the system won't apply the new firmware. Users have to repeat the firmware upgrade processes again.

4.5.2 Configuration Setting

This function allows backup and restore the current configuration of PoE Injector Hub, or reset the converter to factory default. The description of the three items as follow and screen in Figure 4-12 appears.

- **Backup -** To backup/save the current configuration to the storage block on this PoE Injector Hub.
- **Restore –** To restore the previous backup configuration from the storage block.
- **Factory –** To reset the PoE Injector Hub back to the factory default mode.

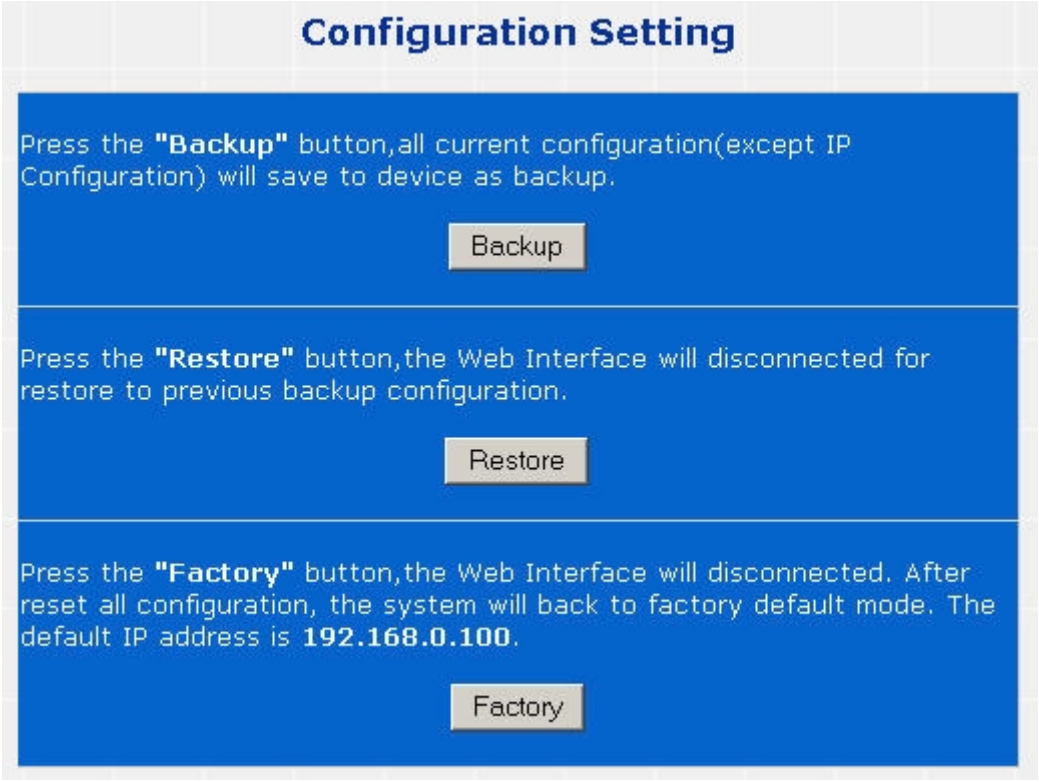


Figure 4-12 Configuration Setting screen

■ Backup

All current configurations (except IP Configuration and password setting) will save to PoE Injector Hub as backup once the "**Backup**" button is pressed.

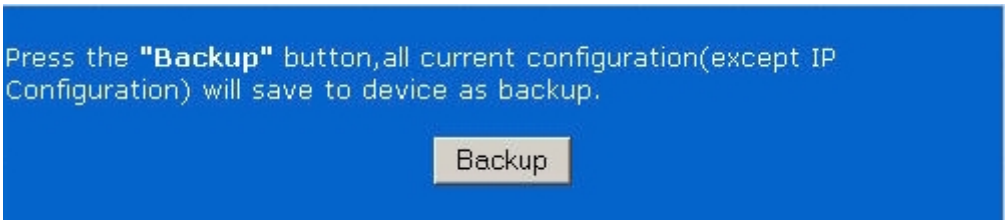


Figure 4-13 Backup screen

After the "**Backup**" button is pressed and success backup current configuration, the screen in Figure 4-14 appears

Figure 4-14 Configuration backup successes screen

■ Restore

The PoE Injector Hub will restore to previous backup/saved configuration while the "**Restore**" button be pressed. And please note that once the Restore button be pressed, Web interface will disconnected for a while. Reload the Web browser to re-login the system.

Figure 4-15 Configuration restore screen

■ Factory Reset

The **Factory** Reset button can reset the PoE Injector Hub back to the Factory default mode. Be aware that the entire configuration will be reset, and the IP address of the PoE Injector Hub will be set to "**192.168.0.100"**.

Figure 4-16 Factory Reset screen

Once the Factory Reset item is pressed, the screen in Figure 4-17 appears.

Figure 4-17 Factory Reset screen

4.5.3 Configuration Backup

This function allows output the current PoE Injector Hub configuration as a file, and upload it to other PoE injector Hub for quick multi-devices setting. The description of the procedure and screens in following appears. The screen in Figure 4-18 appears.

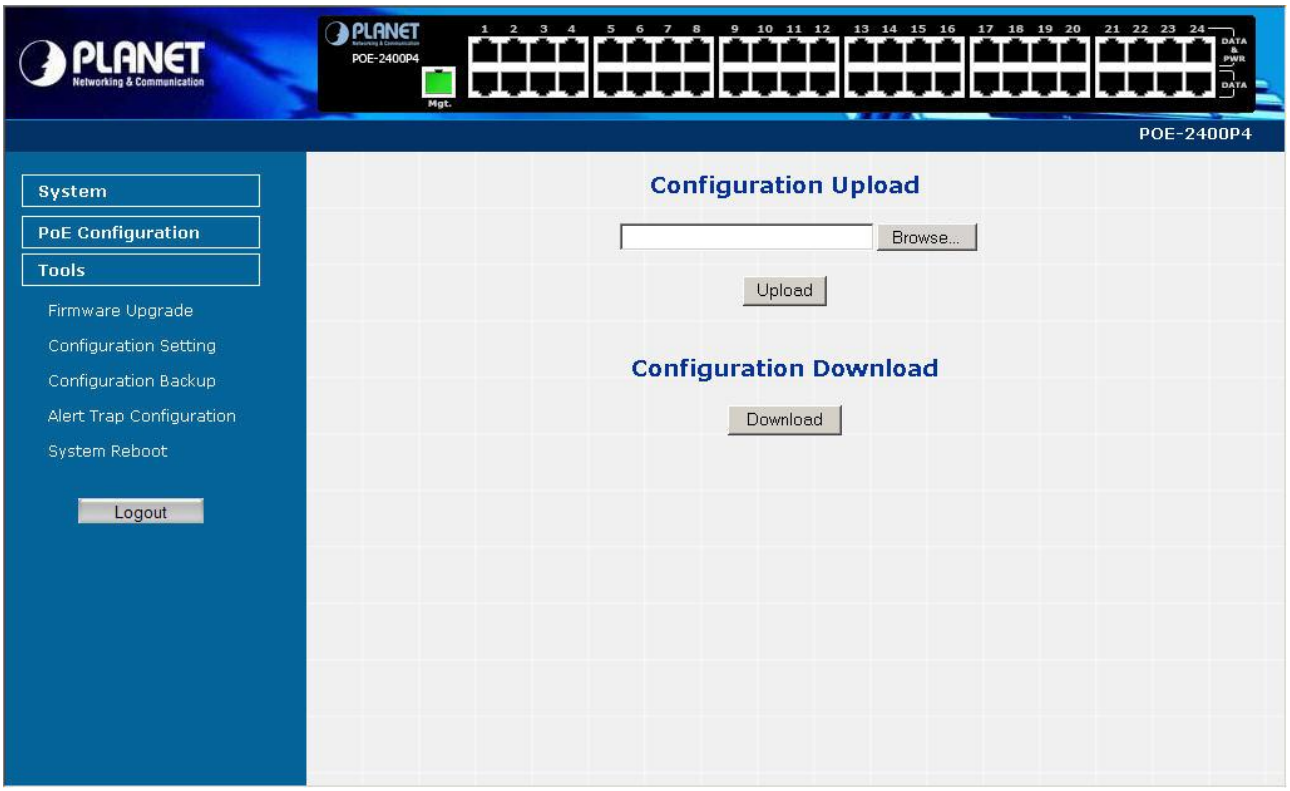


Figure 4-18 Configuration Backup screen

■ Configuration Download

All current configurations (except IP Configuration) will output as a configuration file once the "**Download**" button is pressed, save the current configuration in manager workstation and the screen in Figure 4-19 appears.

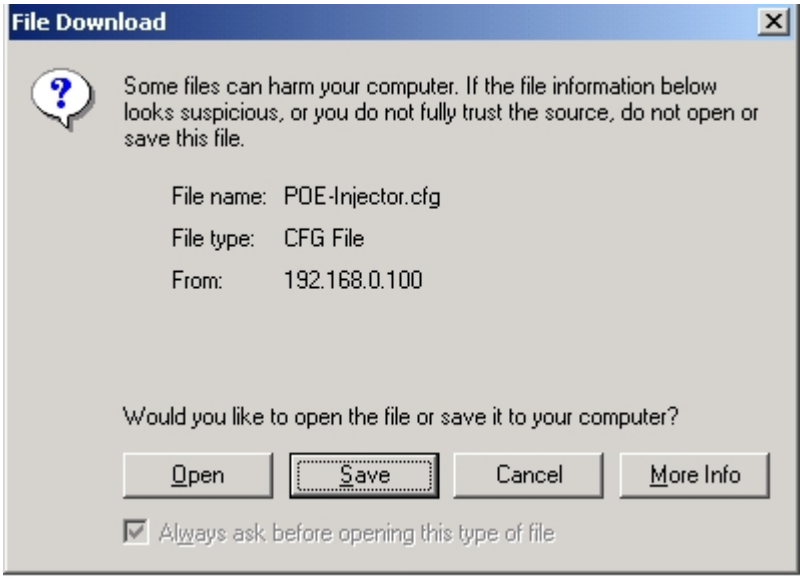


Figure 4-19 File Download screen

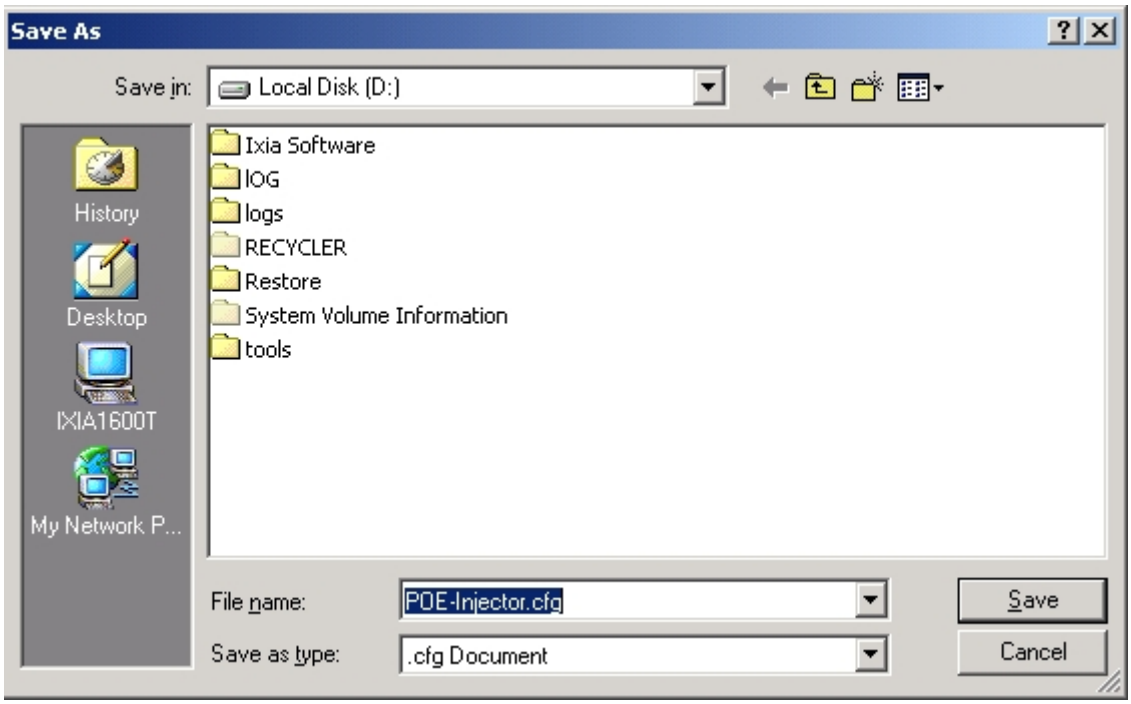


Figure 4-20 File save screen

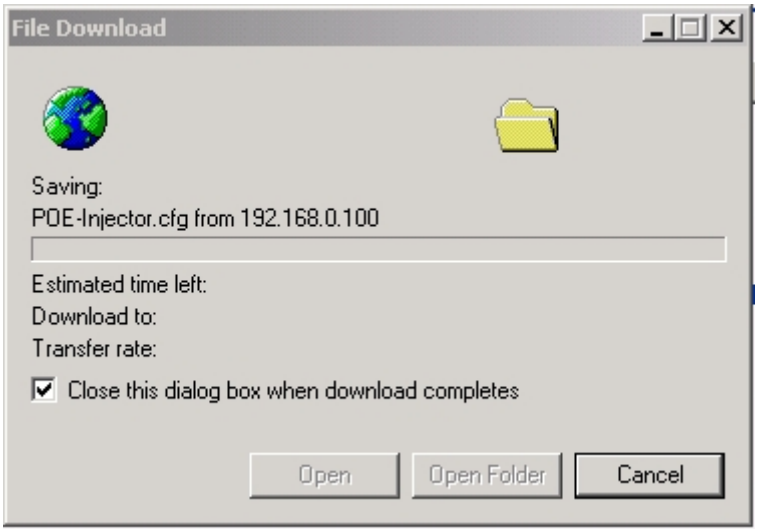


Figure 4-21 File save screen

■ Configuration Upload

Click the “**Browse**” button of the Configuration Backup Web page, the system would pop up the file selection screento choose saved configuration. The screen in Figure 4-22 appears.

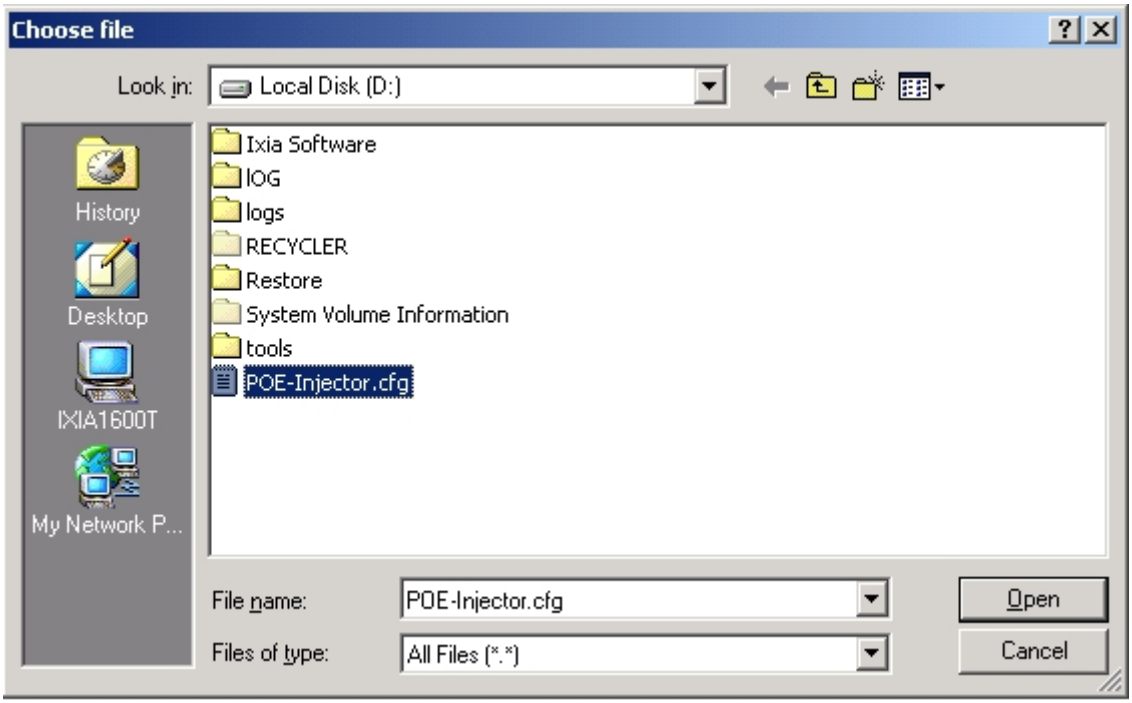


Figure 4-22 Windows file selection screen

Select on the configuration file then click “**Upload**”, the system would pop up the Upload Configuration confirm screen and in Figure 4-23 & 4-24 appears.

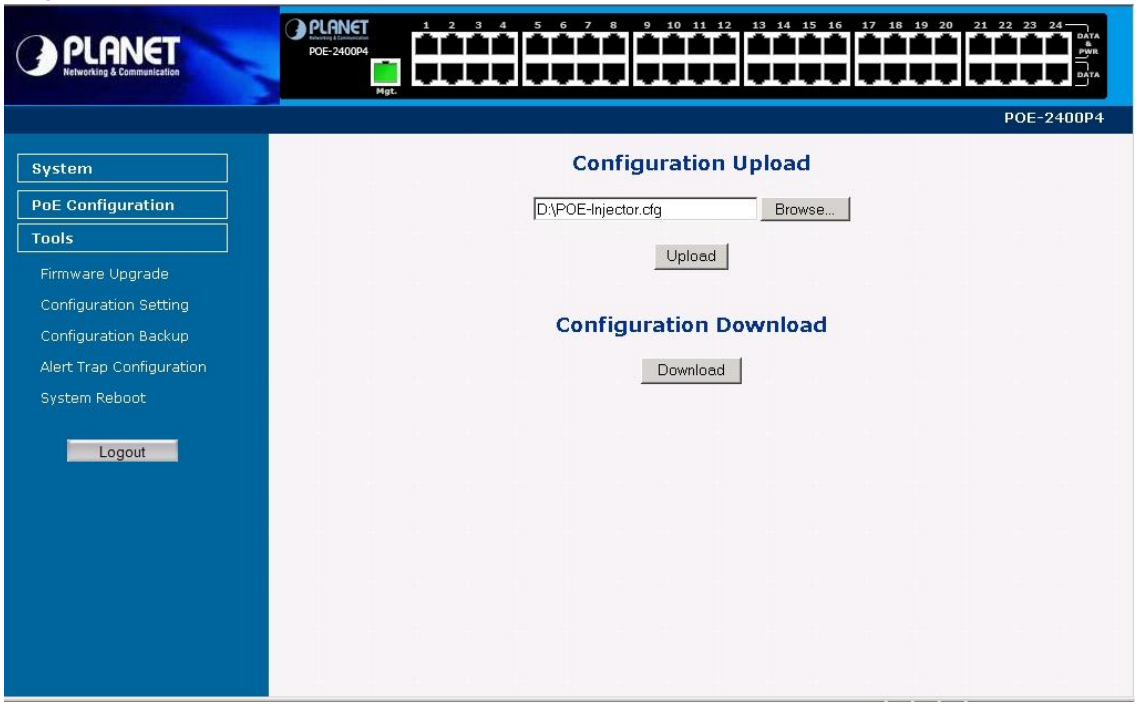


Figure 4-23 Configuration Upload screen

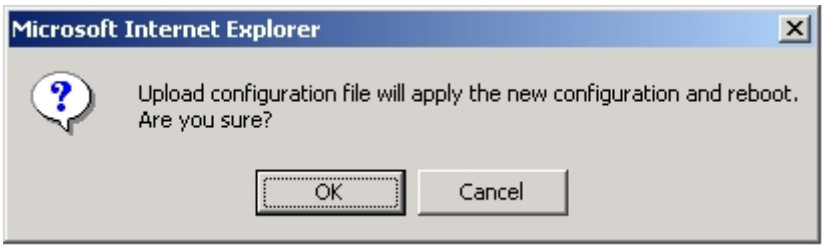


Figure 4-24 Configuration Upload screen

Then the following Configuration file Uploading screen appears in Figure 4-25. When the Web login screen appears, please re-login Web interface of PoE Injector Hub for previous system configuration.

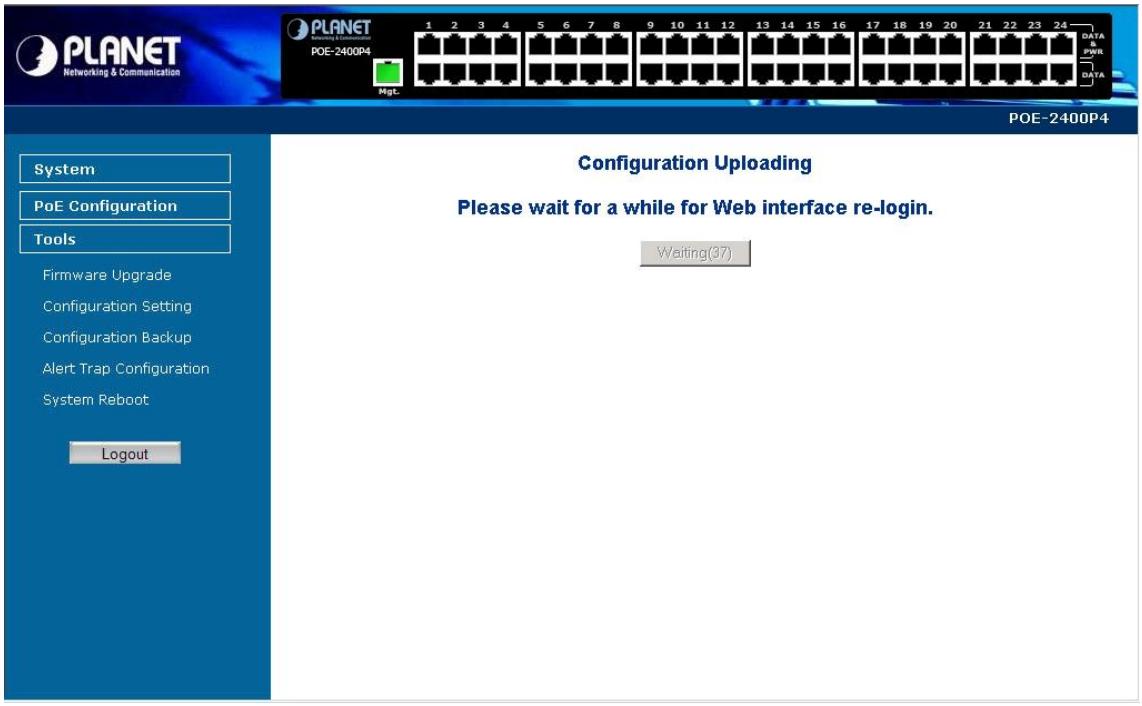


Figure 4-25 Configuration Uploading screen

Note

The Configuration Backup function only appears on POE-1200P2 / POE-2400P4.

4.5.4 Alert Trap Configuration

This function displays the PoE Injector Hub alert trap configuration; include **"enable"** or **"disable"** the trap mode and set the alert IP address. As showed in Figure 4-26.

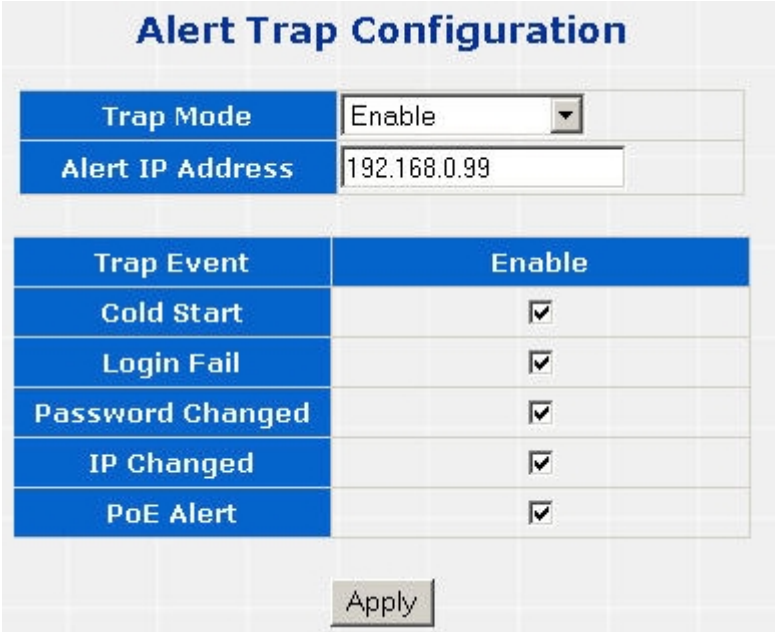


Figure 4-26 Alert Trap Configuration screen

Object	Description
Trap mode	Can choose enable/disable to get the trap.
Alert IP address	Assign one IP address of host to get SNMP trap.
Trap event	Can choose which event can send the SNMP trap. The trap events include: ☐ Cold Star ☐ Login Fail ☐ Password changed ☐ IP Changed ☐ PoE Alert

PoE SNMP Trap event

- **PoE Port On** PoE port is supplying the power to the PD
- **PoE AC Disconnect Port Off** PoE port was turned off, due to AC Disconnect function
- **PoE DC Disconnect Port Off** PoE port was turned off, due to DC Disconnect function
- **PoE Overload Port Off** PoE port off due to overload event
- **PoE Short Circuit Port Off** PoE port off due to short circuit event

4.5.5 System Reboot

This function displays the PoE Injector Hub system reboot. As showed in Figure 4-27.

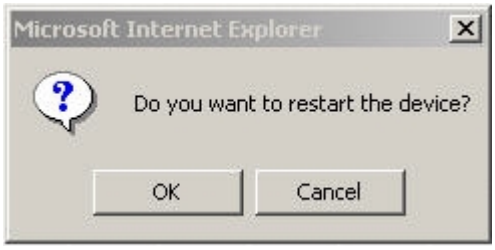


Figure 4-27 System Reboot screen

4.6 Logout

Press this function; the Web interface will go back to login screen. The screens in Figure 4-28 and Figure 4-29 appears.

Figure 4-28 Logout dialogues screen

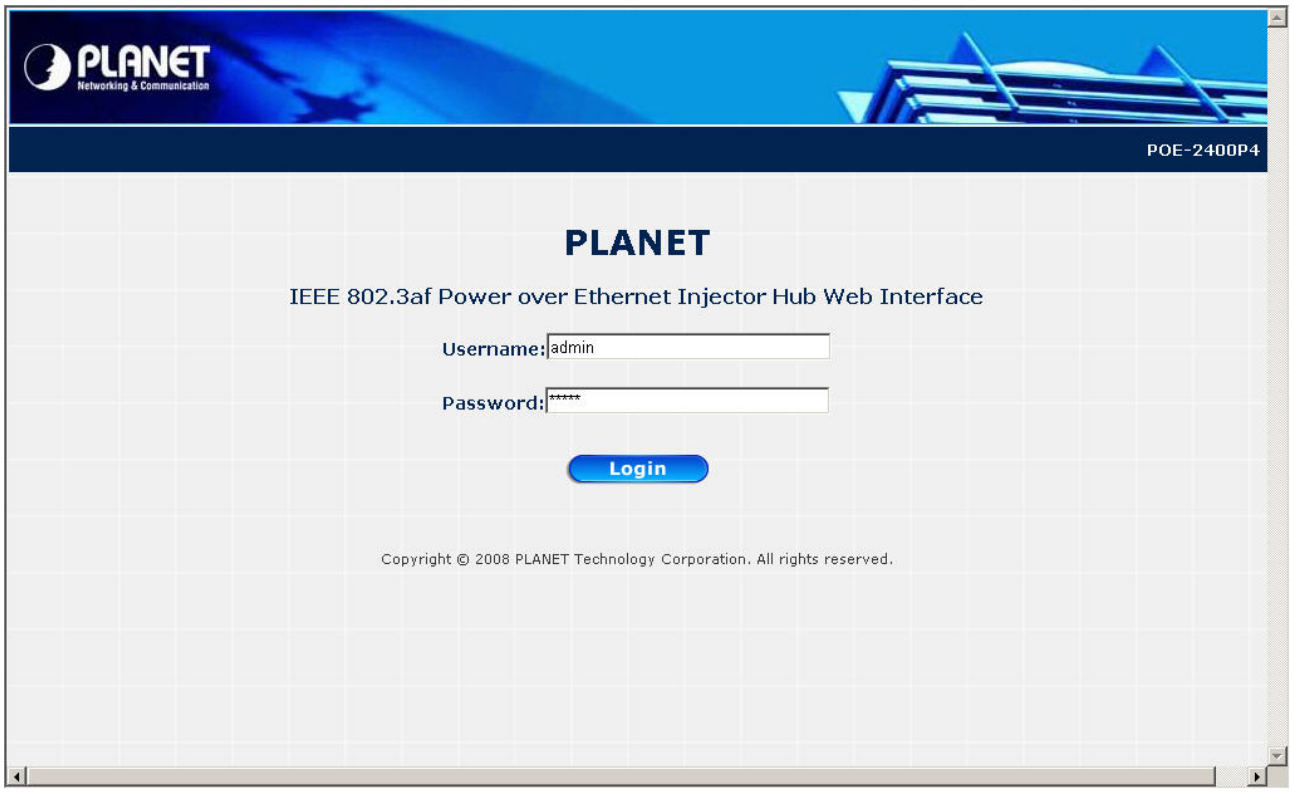


Figure 4-29 Login screen

5. POWER OVER ETHERNET OVERVIEW

What is PoE?

Based on the global standard IEEE 802.3af, PoE is a technology for wired Ethernet, the most widely installed local area network technology adopted today. PoE allows the electrical power necessary for the operation of each end-device to be carried by data cables rather than by separate power cords. New network applications, such as IP Cameras, VoIP Phones, and Wireless Networking, can help enterprises improve productivity. It minimizes wires that must be used to install the network for offering lower cost, and less power failures.

IEEE802.3af also called Data Terminal equipment (DTE) power via Media dependent interface (MDI) is an international standard to define the transmission for power over Ethernet. The 802.3af is delivering 48V power over RJ-45 wiring. Besides 802.3af also define two types of source equipment: Mid-Span and End-Span.

- **Mid-Span**

  Mid-Span device is placed between legacy switch and the powered device. Mid-Span is tap the unused wire pairs 4/5 and 7/8 to carry power, the other four is for data transmit.

- **End-Span**

  End-Span device is direct connecting with power device. End-Span could also tap the wire 1/2 and 3/6.

PoE System Architecture

The specification of PoE typically requires two devices: the **Powered Source Equipment (PSE)** and the **Powered Device (PD)**. The PSE is either an End-Span or a Mid-Span, while the PD is a PoE-enabled terminal, such as IP Phones, Wireless LAN, etc. Power can be delivered over data pairs or spare pairs of standard CAT-5 cabling.

How Power is Transferred Through the Cable

A standard CAT5 Ethernet cable has four twisted pairs, but only two of these are used for 10BASE-T and 100BASE-T. The specification allows two options for using these cables for power, shown in Figure 2 and Figure 3:

The spare pairs are used. Figure 2 shows the pair on pins 4 and 5 connected together and forming the positive supply, and the pair on pins 7 and 8 connected and forming the negative supply. (In fact, a late change to the spec allows either polarity to be used).

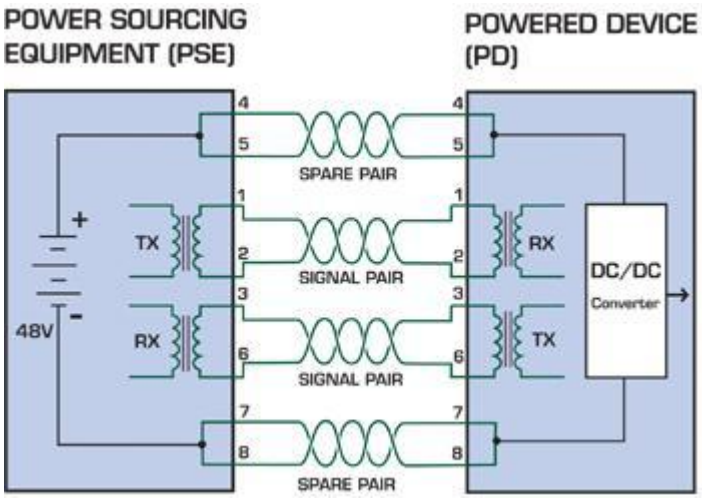


Figure 1 - Power Supplied over the Spare Pins

The data pairs are used. Since Ethernet pairs are transformer coupled at each end, it is possible to apply DC power to the center tap of the isolation transformer without upsetting the data transfer. In this mode of operation the pair on pins 3 and 6 and the pair on pins 1 and 2 can be of either polarity.

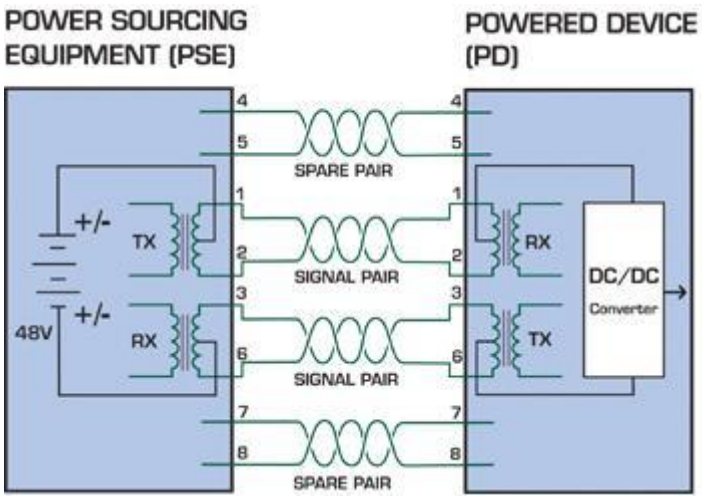


Figure 2 - Power Supplied over the Data Pins

When to install PoE?

Consider the following scenarios:

• You're planning to install the latest VoIP Phone system to minimize cabling building costs when your company moves into new offices next month.

• The company staff has been clamoring for a wireless access point in the picnic area behind the building so they can work on their laptops through lunch, but the cost of electrical power to the outside is not affordable.

• Management asks for IP Surveillance Cameras and business access systems throughout the facility, but they would rather avoid another electrician's payment.

References:

IEEE Std 802.3af-2003 (Amendment to IEEE Std 802.3-2002, including IEEE Std 802.3ae-2002), 2003 Page(s):0_1-121

White Paper on Power over Ethernet (IEEE802.3af)

http://www.poweroverethernet.com/articles.php?article_id=52

Microsemi /PowerDsine

http://www.microsemi.com/PowerDsine/

Linear Tech

http://www.linear.com/

6. THE POE PROVISION PROCESS

While adding PoE support to networked devices is relatively painless, it should be realized that power cannot simply be transferred over existing CAT-5 cables. Without proper preparation, doing so may result in damage to devices that are not designed to support provision of power over their network interfaces.

The PSE is the manager of the PoE process. In the beginning, only small voltage level is induced on the port's output, till a valid PD is detected during the Detection period. The PSE may choose to perform classification, to estimate the amount of power to be consumed by this PD. After a time-controlled start-up, the PSE begins supplying the 48 VDC level to the PD, till it is physically or electrically disconnected. Upon disconnection, voltage and power shut down.

Since the PSE is responsible for the PoE process timing, it is the one generating the probing signals prior to operating the PD and monitoring the various scenarios that may occur during operation.

All probing is done using voltage induction and current measurement in return.

Stages of powering up a PoE link

Stage	Action	Volts specified per 802.3af	Volts managed by chipset
Detection	Measure whether powered device has the correct signature resistance of 15–33 kΩ	2.7-10.0	1.8–10.0
Classification	Measure which power level class the resistor indicates	14.5-20.5	12.5–25.0
Startup	Where the powered device will startup	>42	>38
Normal operation	Supply power to device	36-57	25.0–60.0

6.1 Line Detection

Before power is applied, safety dictates that it must first be ensured that a valid PD is connected to the PSE's output. This process is referred to as "line detection", and involves the PSE seeking a specific, 25 KΩ signature resistor. Detection of this signature indicates that a valid PD is connected, and that provision of power to the device may commence.

The signature resistor lies in the PD's PoE front-end, isolated from the rest of the the PD's circuitries till detection is certified.

6.2 Classification

Once a PD is detected, the PSE may optionally perform classification, to determine the maximal power a PD is to consume. The PSE induces 15.5-20.5 VDC, limited to 100 mA, for a period of 10 to 75 ms responded by a certain current consumption by the PD, indicating its power class.

The PD is assigned to one of 5 classes: 0 (default class) indicates that full 15.4 watts should be provided, 1-3 indicate various required power levels and 4 is reserved for future use. PDs that do not support classification are assigned to class 0. Special care must be employed in the definition of class thresholds, as classification may be affected by cable losses.

Classifying a PD according to its power consumption may assist a PoE system in optimizing its power distribution. Such a system typically suffers from lack of power resources, so that efficient power management based on classification results may reduce total system costs.

6.3 Start-up

Once line detection and optional classification stages are completed, the PSE must switch from low voltage to its full voltage capacity (44-57 Volts) over a minimal amount of time (above 15 microseconds).

A gradual startup is required, as a sudden rise in voltage (reaching high frequencies) would introduce noise on the data lines.

Once provision of power is initiated, it is common for inrush current to be experienced at the PSE port, due to the PD's input capacitance. A PD must be designed to cease inrush current consumption (of over 350 mA) within 50 ms of power provision startup.

6.4 Operation

During normal operation, the PSE provides 44-57 VDC, able to support a minimum of 15.4 watts power.

Power Overloads

The IEEE 802.3af standard defines handling of overload conditions. In the event of an overload (a PD drawing a higher power level than the allowed 12.95 Watts), or an outright short circuit caused by a failure in cabling or in the PD, the PSE must shut down power within 50 to 75 milliseconds, while limiting current drain during this period to protect the cabling infrastructure. Immediate voltage drop is avoided to prevent shutdown due to random fluctuations.

6.5 Power Disconnection Scenarios

The IEEE 802.3af standard requires that devices powered over Ethernet be disconnected safely (i.e. power needs be shut down within a short period of time following disconnection of a PD from an active port).

When a PD is disconnected, there is a danger that it will be replaced by a non-PoE-ready device while power is still on. Imagine disconnecting a powered IP phone utilizing 48 VDC, then inadvertently plugging the powered Ethernet cable into a non-PoE notebook computer. What's sure to follow is not a pretty picture.

The standard defines two means of disconnection, DC Disconnect and AC Disconnect, both of which provide the same functionality - the PSE shutdowns power to a disconnected port within 300 to 400ms. The upper boundary is a physical human limit for disconnecting one PD and reconnecting another.

DC Disconnect

DC Disconnect detection involves measurement of current. Naturally, a disconnected PD stops consuming current, which can be inspected by the PSE. The PSE must therefore disconnect power within 300 to 400 ms from the current flow stop. The lower time boundary is important to prevent shutdown due to random fluctuations.

AC Disconnect

This method is based on the fact that when a valid PD is connected to a port, the AC impedance measured on its terminals is significantly lower than in the case of an open port (disconnected PD).

AC Disconnect detection involves the induction of low AC signal in addition to the 48 VDC operating voltage. The returned AC signal amplitude is monitored by the PSE at the port terminals. During normal operation, the PD's relatively low impedance lowers the returned AC signal while a sudden disconnection of this PD will cause a surge to the full AC signal level and will indicate PD disconnection.

7 TROUBLESHOOTING

This chapter contains information to help you solve problems. If the Device is not functioning properly, make sure the Ethernet Injector Hub was set up according to instructions in this manual.

What is the power output of each IEEE 802.af PoE port?

Solution:

Each PoE port supports **48VDC, 350mA, max 15.4 watts** power output. Detect and inject by the standard of IEEE 802.3af.

How to let my non IEEE 802.3af network devices can work with POE-series Injector Hub?

Solution:

You can use PLANET Power over Ethernet Splitter, such as PLANET POE-151S to work as a power transformer between POE Injector Hub and non IEEE 802.3af devices. Two types of POE-151S are available for different voltage, 5V DC and 12V DC.

The PoE LED is not lit

Solution:

Check the cable connection between POE Injector Hub and IEEE 802.3af device.

Why I connect my PoE device to POE-series Injector Hub and it cannot power on?

Solution:

1. Please check the cable type of the connection from POE Injector Hub to the other end. The cable should be an 8-wire UTP, Category 5/5e, EIA568 cable within 100 meters. A cable with only 4-wire, short loop or over 100 meters, all will affect the power supply.
2. Please check and assure the device that fully complied with IEEE 802.3af standard.
3. The POE Injector Hub is a Mid-Span PSE device, please make sure the connected PD supports PoE power input via RJ-45 pin 4/5(+), 7/8(-). If the connected PD supports power input only from 1/2(+), 3/6(-), it will not be powered on.

My network device can use both PoE and power adapter, how do I use the device to work with POE-series Injector Hub?

Solution:

No need to use power adapter when the device work with POE Injector Hub.

Once the POE Injector Hub power off, you can use the power adapter to support power to your device. The network connection pass through POE Injector Hub is still available to backend switch.

Will the PLANET PoE Injector burn / damage the non-PoE device or Pre-Standard PoE device?

Solution:

The PLANET PoE PSE (Power Source Equipment) device complies with IEEE 802.3af standard. It will enter line detection mode and measure whether powered device has the correct signature resistance. It will not energize the unused pairs unless an 802.3af compliant PD (Powered Device) signals the PSE that it is ready to receive power.

APPENDIX A

A.1 MDI Settings

The Medium-Dependant Interface (MDI or RJ-45) serves as the data/power interface between Ethernet elements. As such, it has two optional connection methods, to carry the power. named Alternative A & B. Table 1 details the two power feeding alternatives.

Pin	Alternative A	Alternative B
1	Vport Negative	
2	Vport Negative	
3	Vport Positive	
4		Vport Positive
5		Vport Positive
6	Vport Positive	
7		Vport Negative
8		Vport Negative

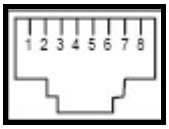
Table -1 Alternative Table

Delivering power through an RJ-45 connector's center tap ("Phantom Feeding") guarantees that bi-directional data flow is maintained, regardless of a module's power status.

A.2 Power Device Classification values

Class	PD Current – Classification Period [mA]	PD Power – Operation Period [W]	Note
0	0 – 4	0.44 – 12.95	Default
1	9 – 12	0.44 – 3.84	Optional
2	17 -20	3.84 – 6.49	Optional
3	26 – 30	6.49 – 12.95	Optional
4	36 - 44	Future use	Future use

A.3 DATA OUT PoE Injector RJ-45 Port Pin Assignments



PIN NO	RJ-45 SIGNAL ASSIGNMENT
1	Output Transmit Data +
2	Output Transmit Data -
3	Receive Data +
4	Power +
5	Power +
6	Receive Data -
7	Power -
8	Power -

- **A.4 RJ-45 pin assignment of non-802.3af standard PD with PD with Mid-Spain POE Mid-Span RJ-45 assignment**

Pin out of Cisco non-802.3af standard PD out of POE Mid-Spain

PIN NO	SIGNAL
1	RX+
2	RX-
3	TX+
4	VCC+
5	VCC+
6	TX-
7	VCC-
8	VCC-

Pin

PIN NO	SIGNAL
1	RX+
2	RX-
3	TX+
4	VCC-
5	VCC-
6	TX-
7	VCC+
8	VCC+

Before you powered PD, please check the RJ-45 connector pin assignment follow IEEE 802.3af standard, otherwise you may need change one of the RJ-45 connector pin assignment, which attacted with the UTP cable.

APPENDIX B

B.1 Power over Ethernet Compatibility test

No.	PDs	PoE Output	Note
1	[PLANET POE-151S-12V] + [PLANET ICA-500]	9.6W	
2	[PLANET POE-151S-12V] + PLANET ICA310	6.4W	Standby
3	[PLANET POE-152S-12V] + [PLANET ICA-500]	7.3W	
4	[PLANET POE-151S-5V] + [Sparklan A+G AP]	5.7W~7.6W	
5	[PLANET POE-151S-12] + IR338	5.1W	LED Off
6	[PLANET POE-151S-12] + IR338	13.5W~14.3W	LED On
7	PLANET VIP-155PT	3W	
8	PLANET VIP-154PT	4.9W~5.6W	
9	PLANET VIP-550PT	4~4.5W	
10	PLANET WAP-4060PE	4.3W	Standby
11	PLANET FSD-803PE	2.2W	Standby
12	PLANET IVS-110	6.1W	Standby
13	PLANET ICA-510	4.2W	Standby
14	PLANET ICA-700	3.7W	Standby
15	PLANET ICA-750	5.2W	Standby
16	PLANET ICA-107P	5.1W	Standby
17	PLANET ICA-310	11.2W	Standby

EC Declaration of Conformity

For the following equipment:

*Type of Product: 12-Port IEEE802.3af Injector Hub
*Model Number: POE-1200 / POE-1200P2

* Produced by:
Manufacturer's Name : **PLANET Technology Corp.**
Manufacturer's Address: 11F, No. 96, Min Chuan Road,
Hsin Tien, Taipei, Taiwan, R.O.C.

is herewith confirmed to comply with the requirements set out in the Council Directive on the Approximation of the Laws of the Member States relating to Electromagnetic Compatibility Directive on (89/336/EEC).
For the evaluation regarding the EMC, the following standards were applied:

Conducted / Radiated	EN 55022	(1998 + A1: 2000 + A2: 2003, Class A)
Harmonic	EN 61000-3-2	(edition 2: 2000)
Flicker	EN 61000-3-3	(1995 + A1: 2001)
Immunity	EN 55024	(1998 + A1: 2001 + A2: 2003)
ESD	EN 61000-4-2	(1995 + A1: 1998 + A2: 2001)
RS	EN 61000-4-3	(2002 + A1: 2002)
EFT/ Burst	EN 61000-4-4	(1995 + A1: 2001 + A2: 2001)
Surge	EN 61000-4-5	(1995 + A1: 2001)
CS	EN 61000-4-6	(2004)
Magnetic Field	EN 61000-4-8	(1993 + A1: 2001)
Voltage Disp	EN 61000-4-11	(1994 + A1: 2001)

Responsible for marking this declaration if the:

☒ **Manufacturer** ☐ **Authorized representative established within the EU**

Authorized representative established within the EU (if applicable):

Company Name: **Planet Technology Corp.**

Company Address: **11F, No.96, Min Chuan Road, Hsin Tien, Taipei, Taiwan, R.O.C**

Person responsible for making this declaration

Name, Surname **Kent Kang**

Position / Title : **Product Manager**

Taiwan	**5st Dec., 2008**	Kent Kang
Place	*Date*	*Legal Signature*

EC Declaration of Conformity

For the following equipment:

*Type of Product: 24-Port IEEE802.3af Injector Hub
*Model Number: POE-2400 / POE-2400P4

* Produced by:
Manufacturer's Name : **PLANET Technology Corp.**
Manufacturer's Address: 11F, No. 96, Min Chuan Road,
Hsin Tien, Taipei, Taiwan, R.O.C.

is herewith confirmed to comply with the requirements set out in the Council Directive on the Approximation of the Laws of the Member States relating to Electromagnetic Compatibility Directive on (89/336/EEC).
For the evaluation regarding the EMC, the following standards were applied:

Conducted / Radiated	EN 55022	(1998 + A1: 2000 + A2: 2003, Class A)
Harmonic	EN 61000-3-2	(edition 2: 2000)
Flicker	EN 61000-3-3	(1995 + A1: 2001)
Immunity	EN 55024	(1998 + A1: 2001 + A2: 2003)
ESD	EN 61000-4-2	(1995 + A1: 1998 + A2: 2001)
RS	EN 61000-4-3	(2002 + A1: 2002)
EFT/ Burst	EN 61000-4-4	(1995 + A1: 2001 + A2: 2001)
Surge	EN 61000-4-5	(1995 + A1: 2001)
CS	EN 61000-4-6	(2004)
Magnetic Field	EN 61000-4-8	(1993 + A1: 2001)
Voltage Disp	EN 61000-4-11	(1994 + A1: 2001)

Responsible for marking this declaration if the:

☒ **Manufacturer** ☐ **Authorized representative established within the EU**

Authorized representative established within the EU (if applicable):

Company Name: **Planet Technology Corp.**

Company Address: **11F, No.96, Min Chuan Road, Hsin Tien, Taipei, Taiwan, R.O.C**

Person responsible for making this declaration

Name, Surname **Kent Kang**

Position / Title : **Product Manager**

Taiwan	**5st Dec., 2008**	Kent Kang
Place	*Date*	*Legal Signature*

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