



# IES-0853

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4 x 802.3at PoE + 3 FE + 1 MM SC Web Smart Switch -40 to 75C, DIN-rail

## User Manual

# Preface

This manual describes how to install and use the Hardened Web-Smart PoE & High Power PoE Ethernet Switch. This switch introduced here is designed to deliver full scalability with web-based management functions. Capable of operating at temperature extremes of -40°C to +75°C, this is the switch of choice for harsh environments constrained by space.

Port 1 to port 4 on this switch supports IEEE802.3af Power over Ethernet (PoE) Power Sourcing Equipment (PSE) and can detect an IEEE802.3af compliant Powered Device (PD). Using external 48VDC power inputs through Terminal Block or Power Jack, data and power can be transmitted to a Powered Device (PD) over the same twisted-pair Ethernet cable through port 1 to port 4 on the switch.

Port 1 to port 4 on this switch also supports High Power PoE Power Sourcing Equipment (PSE) and can detect a Powered Device (PD). Using external 55VDC power inputs through Terminal Block or Power Jack, data and power can be transmitted to a Powered Device (PD) over the same twisted-pair Ethernet cable through port 1 to port 4 on the switch.

To get the most out of this manual, you should have an understanding of Ethernet networking concepts.

In this manual, you will find:

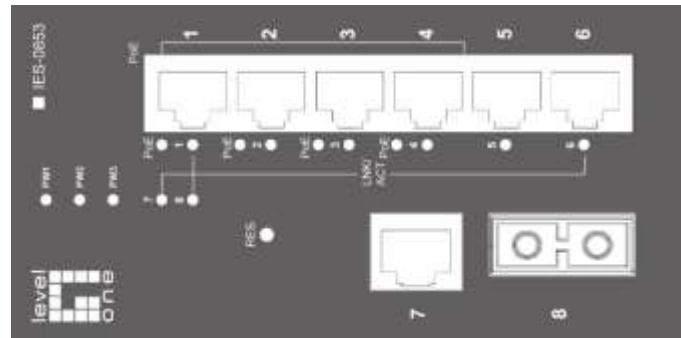
- Features on the Hardened Web-Smart PoE Ethernet Switch
- Illustrative LED functions
- Installation instructions
- Management Configuration
- Specifications

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# Overview

## Hardened Web-Smart PoE Ethernet Switch



LevelOne IES-0853 Industry Ethernet Switch provides 4 PoE ports of 10/100Base-TX plus 3 ports of 10/100Base-TX Ethernet plus 1 port 100FX Multimode SC fiber to enable high speed network at mission-critical environment. This device is designed to be mounted on an industry standard DIN-rail, plus the clearly visible status LEDs provide simple monitoring of port link activity.

### High Reliability

All components are built to withstand harsh environment applications without compromise where humidity, temperature variation and even shock vibration are concerns, including Electric & Utility, Critical Infrastructure, Transportation and Surveillance Security. This device operates under -40 to 75 Celsius (-40 to 167 Fahrenheit) temperature.

### Web Management

Web-based GUI management features implementation of Port-based VLAN, IEEE802.1p QoS, Prioritised DSCP, set up Admin Password with ease. Plus, the Power over Ethernet ports can be On / Off and limits the power budget remotely

### Power over Ethernet

This switch is Power Sourcing Equipment (PSE), and it is fully complied with IEEE 802.3at PoE standard at maximum 30W power budget per port. It helps to save infrastructure wiring costs dramatically by eliminating electric wiring and less UPS needed. Also, it is compatible with IEEE802.3af standard PD devices.

### Safety

This device has been tested under UL508 standard for Industrial Control Equipment to **endurance under test turn on and off 6,000 times while loaded, with no single failure.** It's highly reliability and safety measurement to ensure field hardened, especially for the harsh environment.

## Features

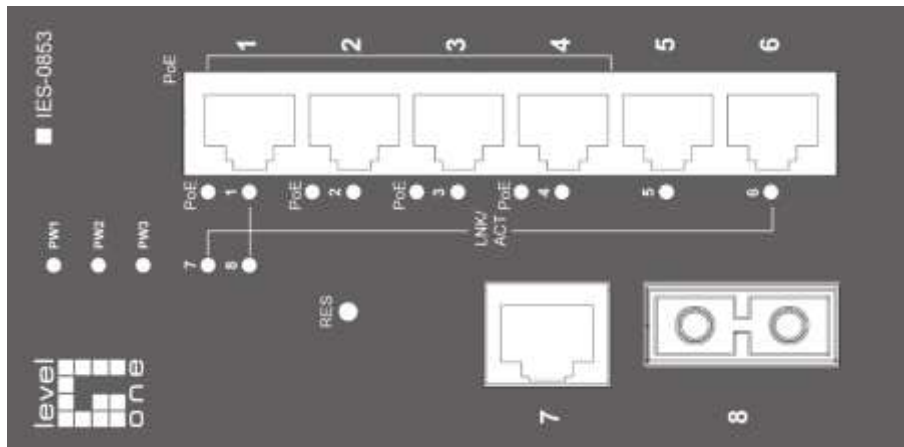
- Complies with NEMA TS1/TS2 Environmental requirements such as temperature, shock, and vibration for traffic control equipment.
- Complies with EN61000-6-2 & EN61000-6-3 EMC Generic standard immunity for Industrial environment.
- Manageable via Web browser interface.
- Supports IEEE802.3af Power over Ethernet (PoE) Power Sourcing Equipment (PSE).
- High Power PoE design up to 30W (enhancement of IEEE802.3af PoE).
- Supports IEEE802.3/802.3u/802.3x. Auto-negotiation: 10/100Mbps-full/half-duplex; Auto MDI/MDIX.
- 100Base-FX: Multi mode SC or ST type, Single mode SC or ST type. 100Base-BX: WDM Single mode SC type.
- Supports 1024 MAC addresses. Provides 1M bits memory buffer.
- Store-and-forward mechanism.
- Full wire-speed forwarding rate.
- Alarms for power and port link failure by relay output.
- PoE: Redundant 48VDC Terminal Block power inputs and 48VDC DC JACK power input for 15.4W per PoE port. Operating voltage and Max. current consumption: 1.5A @ 48VDC. Power consumption: 72W Max.
- High Power PoE: Redundant 55VDC Terminal Block power inputs and 55VDC DC JACK power input for 30W per High Power PoE port. Operating voltage and Max. current consumption: 2.3A @ 55VDC. Power consumption: 130W Max.
- -40°C to 75°C (-40°F to 167°F) operating temperature range. Tested for functional operation @ -40°C to 85°C (-40°F to 185°F). Web-Smart function operating temperature @ -20°C to 85°C (-4°F to 185°F).
- Reset button on front panel.
- Front panel port status LEDs.
- Hardened aluminum case.
- Supports DIN-Rail, Panel, or Rack Mounting installation.

## Package Contents

When you unpack the product package, you shall find the items listed below. Please inspect the contents, and report any apparent damage or missing items immediately to your authorized reseller.

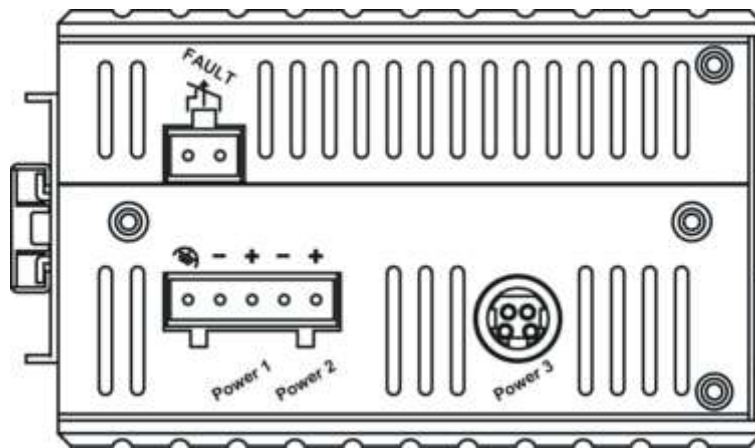
- IES-0853 Hardened Web-Smart High Power PoE Ethernet Switch
- Quick Installation Guide
- CD User Manual

# Front Panel Display



LED	Status	Description
PW 1,2,3	Steady	Power On
	Off	Power Off
10/100Base-TX or 100Base-FX/BX		
LNK/ACT	Steady	Network connection is established
	Flashing	Transmitting or Receiving data
PoE (High Power)	Steady	Power Device (PD) is connected
	Off	Power Device (PD) is disconnected

# Power Input



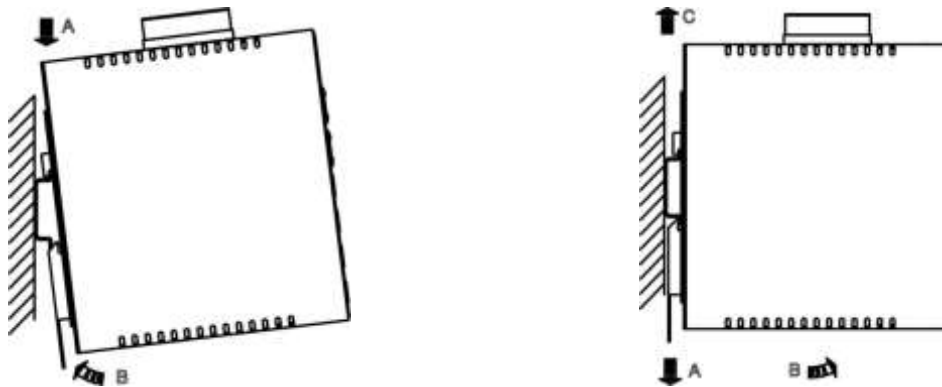
Terminal Block	PW1	+	48, 55VDC (High Power)
		-	Power Ground
	PW2	+	48, 55VDC (High Power)
		-	Power Ground
	PW3	DC Jack	48, 55VDC (High Power)
		Earth Ground	
	Relay Output	0.1A @ 24VDC	
<p>*Warning signal disable for following:</p> <ol style="list-style-type: none"> <li>1. The relay contact closes if Power1 and Power2 are both failed but Power3 on.</li> <li>2. The relay contact closes if Power3 is failed but Power1 and Power2 are both on.</li> </ol>			

DC Jack	PW3	DC Jack	48, 55VDC (High Power)
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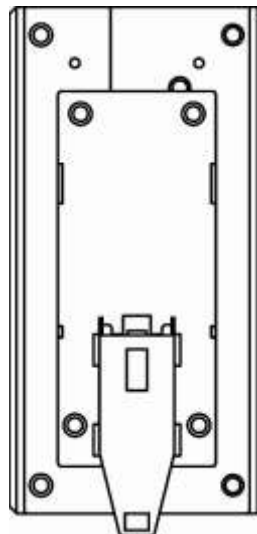
### Special Note:

The relay output is normal open position when there is no power to the switch. Please do not connect any power source to this terminal to prevent shorting your power supply.

# DIN rail Mount



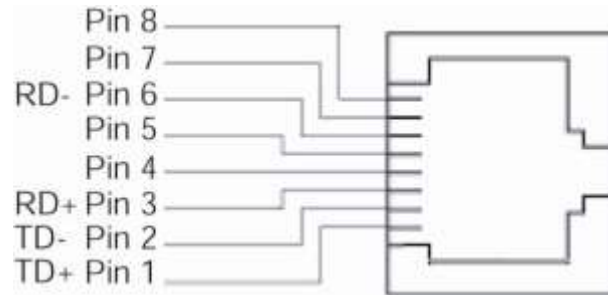
- Fix the DIN rail attachment plate to the back panel of the switch.
- Installation: Place the switch on the DIN rail from above using the slot. Push the front of the switch toward the mounting surface until it audibly snaps into place.
- Removal: Pull out the lower edge and then remove the switch from the DIN rail.





# 10/100Base-TX Connector

The following lists the pin-out of 10/100Base-TX ports.



Pin	PoE Port (1 to 4)	Standard Port (5)
1	Output Transmit Data +	Input Receive Data +
2	Output Transmit Data -	Input Receive Data -
3	Input Receive Data +	Output Transmit Data +
4	Positive (VCC+)	NC
5	Positive (VCC+)	NC
6	Input Receive Data -	Output Transmit Data -
7	Negative (VCC-)	NC
8	Negative (VCC-)	NC

# Connecting to Your Network

## Cable Type & Length

It is necessary to follow the cable specifications below when connecting the switch to your network. Use appropriate cables that meet your speed and cabling requirements.

### Cable Specifications

Speed	Connector	Port Speed Half/Full Duplex	Cable	Max. Distance
10Base-T	RJ-45	10/20 Mbps	2-pair UTP/STP Cat. 3, 4, 5	100 m
100Base-TX	RJ-45	100/200 Mbps	2-pair UTP/STP Cat. 5	100 m
100Base-FX	ST, SC	100/200 Mbps	MMF (50 or <b>62.5<math>\mu</math>m)</b> )	2 km
100Base-FX	ST, SC	100/200 Mbps	SMF (9 or <b>10<math>\mu</math>m)</b> )	20, 40, or 75 km

## Cabling

**Step 1:** First, ensure the power of the switch and end devices are turned off.

<Note> Always ensure that the power is off before any installation.

**Step 2:** Prepare cable with corresponding connectors for each type of port in use.

**Step 3:** Consult Cable Specifications Table on previous page for cabling requirements based on connectors and speed.

**Step 4:** Connect one end of the cable to the switch and the other end to a desired device.

**Step 5:** Once the connections between two end devices are made successfully, turn on the power and the switch is operational.

# Web Management

The switch provides a browser interface that lets you configure and manage the switch remotely.

After you set up your IP address for the switch, you can access the switch's web interface applications directly in your web browser by entering the IP address of the switch. You can then use your web browser to list and manage switch configuration parameters from one central location, just as if you were **directly connected to the switch's console port**.

## Web-Based Browser Management

The switch provides a web-based browser interface for configuring and managing the switch. This interface allows you to access the switch using a preferred web browser.

This chapter describes how to configure the switch using its web-based browser interface.

## Default Setting

IP address: 192.168.1.10

User Name: admin

Password: [Blank]

# Logging on to the switch



## **SWITCH IP ADDRESS**

In your web browser, specify the IP address of the switch. Default IP address is 192.168.1.10.

## **USER NAME**

Enter the factory default user name: admin.

## **PASSWORD**

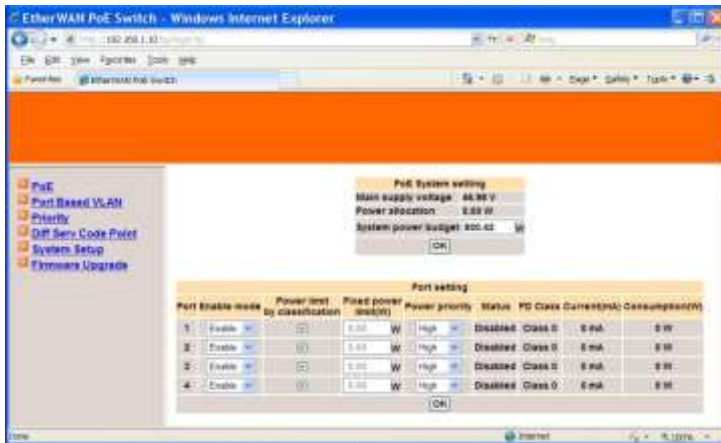
Enter the factory default password (no password).

Or enter a user-defined password if you followed the instructions later and changed the factory default password.

Then click on the "OK" button to log on to the switch.

# Browser Interface

The web browser interface provides groups of point-and-click buttons at the left field of the screen for configuring and managing the switch.



## PoE

## Port Based VLAN

## Priority

## Diff Serv Code Point

Bit 0 ~ 31, Bit 32 ~ 63

## System Setup

## Firmware Upgrade

# PoE



## PoE

1. System power budget: Click in "System power budget" text box and type a new system power budget.
2. OK: Click "OK" button to update your settings.
3. Enable mode: Click "Enable mode" drop-down menu to choose "Enable" or "Disable" from the "Enable mode" drop-down list to enable or disable Port 1 ~ Port 4 to discover Powered Device (PD) connected to Port 1 ~ Port 4 of the Switch.
4. Power limit by classification: Check or uncheck "Power limit by classification" to enable or disable Port 1 ~ Port 4 to provide power to PD according to classification of maximum power range used by PD.
5. Fixed power limit(W): First uncheck "Power limit by classification" to disable Port 1 ~ Port 4 to provide power to PD according to classification of maximum power range used by PD. Then click in "Fixed power limit(W)" text box and type a new fixed power limit for Port 1 ~ Port 4 to provide power to PD.
6. Power priority: Click "Power priority" drop-down menu to choose "Low", "Middle", or "High" from the "Power priority" drop-down list to determine power priority of Port 1 ~ Port 4.
7. OK: Click "OK" button to update your settings.

# High Power PoE Operation

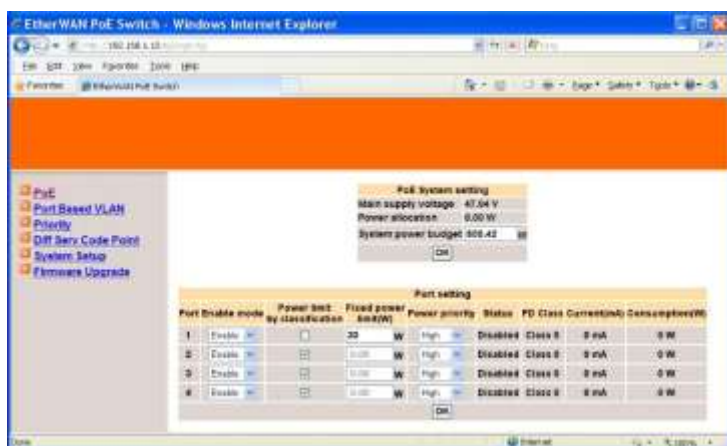
This Industrial Web-Smart PoE & High Power PoE Ethernet switch is compliant with the 802.3af and 802.3at High Power standard, providing 30W of pure power to power demanding devices such as pan-tilt-zoom (PTZ) network cameras, wireless access bridge/routers and large-screen network video phones et cetera.

This 802.3af High Power switch's PoE operation with 802.3at based PD is highly versatile and adaptable. Normally, when an 802.3at PD is connected to an 802.3af High Power compliant switch, the switch will detect that the PD's power requirement is based on class 4 classification outlined in the IEEE802.3at standard, and only attempt to provide 15.4W of power, which is insufficient to power a 30W 802.3at PD. This is due to the reason that the 30W of power in 802.3af High Power is classified as class 0. However, this 802.3af High Power switch can support 30W 802.3at PD by setting the switch explicitly to provide a fixed rate of 30W power to 30W 802.3at PD.

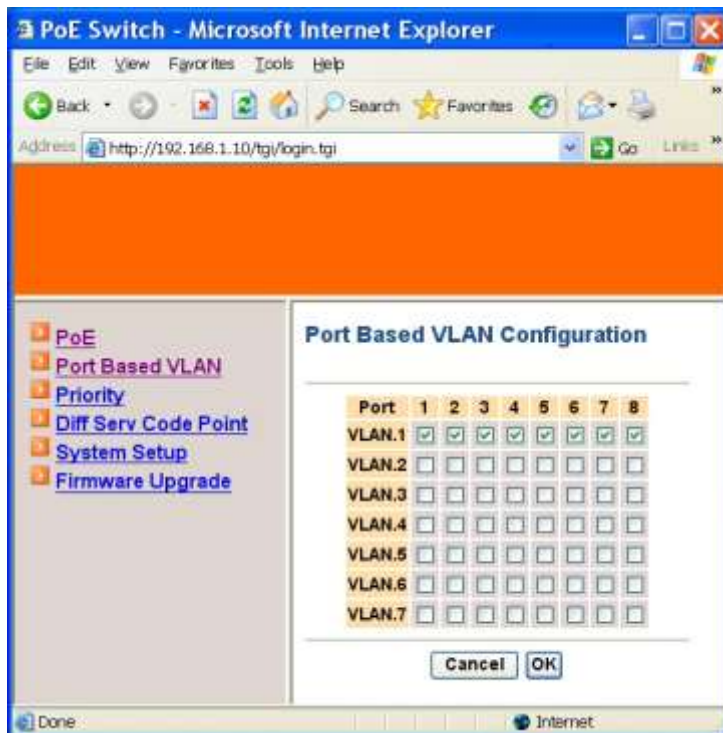
Power limit by classification: Uncheck "Power limit by classification" to disable Port 1 ~ Port 4 to provide power to 30W 802.3at PD according to classification of maximum power range used by PD.

Fixed power limit(W): Click in "Fixed power limit(W)" text box and type a new fixed power limit 30W for Port 1 ~ Port 4 to provide power to 30W 802.3at PD.

OK: Click "OK" button to update your settings.



## Port Based VLAN

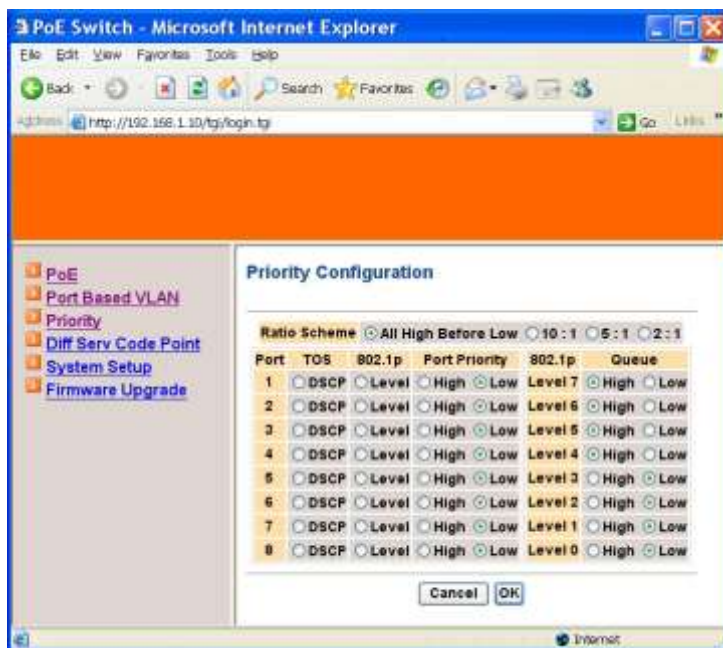


### Port Based VLAN

1. VLAN.1 ~ VLAN.7: Click and choose Port 1 ~ Port 8 to be added into VLAN.1 ~ VLAN.7.
2. Cancel: Click "Cancel" button to cancel your settings.
3. OK: Click "OK" button to update your settings.



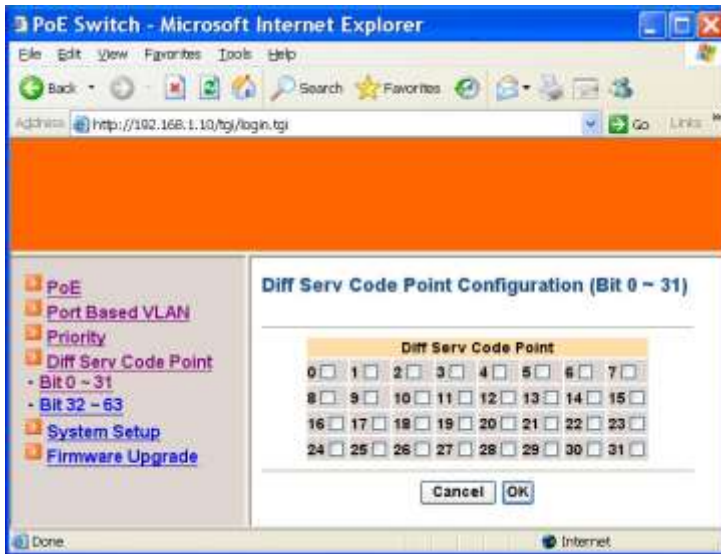
# Priority



## Priority

1. Ratio Scheme: Click and choose "All High Before Low", "10:1", "5:1", or "2:1" ratio scheme.
2. Port 1 ~ Port 8: Click and choose "TOS", "802.1p", or "Port Priority" ("High" or "Low") for Port 1 ~ Port 8.
3. 802.1p Level 7 ~ Level 0: Click and set "High" or "Low" priority to queue of 802.1p Level 7 ~ Level 0.
4. Cancel: Click "Cancel" button to cancel your settings.
5. OK: Click "OK" button to update your settings.

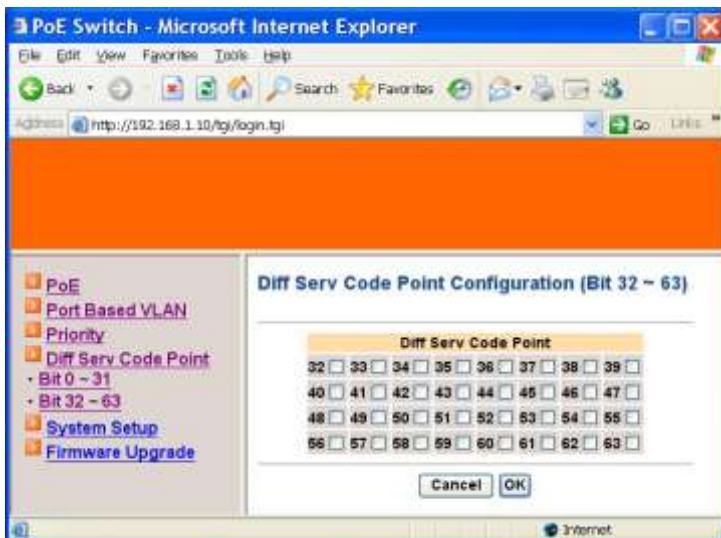
# Diff Serv Code Point



## Diff Serv Code Point

Bit 0 ~ 31:

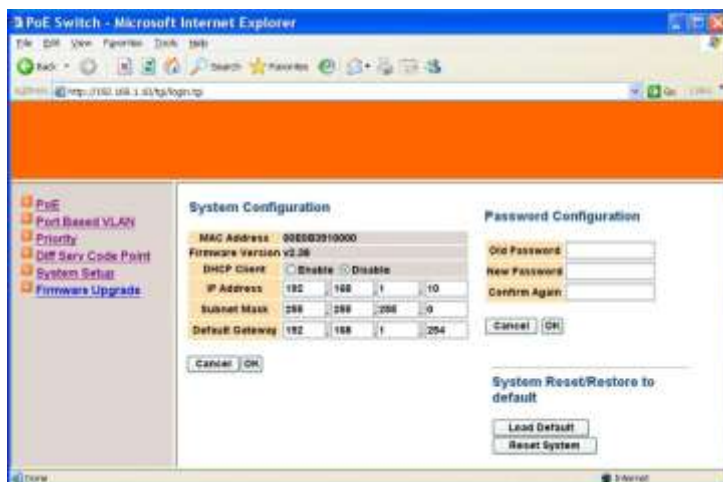
1. Diff Serv Code Point: Check and set Bit 0 ~ 31 of Diff Serv Code Point to high priority.
2. Cancel: Click "Cancel" button to cancel your settings.
3. OK: Click "OK" button to update your settings.



Bit 32 ~ 63:

1. Diff Serv Code Point: Check and set Bit 32 ~ 63 of Diff Serv Code Point to high priority.
2. Cancel: Click "Cancel" button to cancel your settings.
3. OK: Click "OK" button to update your settings.

# System Setup



## System Setup

### System Configuration:

1. DHCP Client: Click and choose “Enable” or “Disable” to enable or disable the Switch as DHCP client to be automatically supplied an IP address, gateway address, and subnet mask from DHCP server.
2. IP Address: Click in “IP Address” text box and type a new address to change the IP Address.
3. Subnet Mask: Click in “Subnet Mask” text box and type a new address to change the Subnet Mask.
4. Default Gateway: Click in “Default Gateway” text box and type a new address to change the Default Gateway.
5. Cancel: Click “Cancel” button to cancel your settings.
6. OK: Click “OK” button to update your settings.

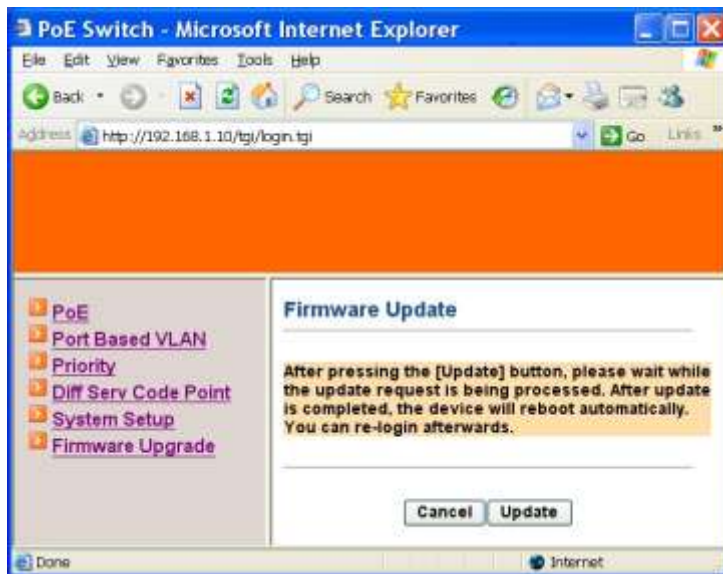
### Password Configuration:

1. Old Password: Click in “Old Password” text box and type in the old password.
2. New Password: Click in “New Password” text box and type in a new password.
3. Confirm Again: Click in “Confirm Again” text box. Type the same password in “New Password” text box again to verify it.
4. Cancel: Click “Cancel” button to cancel your settings.
5. OK: Click “OK” button to update your settings.

### System Reset/Restore to default:

1. Load Default: Click “Load Default” button to restore the default settings of the Switch.
2. Reset System: Click “Reset System” button to restart the Switch.

# Firmware Upgrade



## *Firmware Update*

1. Cancel: Click "Cancel" button to cancel firmware update request.
2. Update: Click "Update" button and wait for firmware update request being processed.

# Specifications

Applicable Standards	IEEE802.3 10Base-T IEEE802.3u 100Base-TX/FX
Switching Method	Store-and-Forward
Forwarding Rate	
10Base-T	10 / 20Mbps half / full-duplex
100Base-TX	100 / 200Mbps half / full-duplex
100Base-FX/BX	200Mbps full-duplex
Performance	14,880pps for 10Mbps 148,810pps for 100Mbps
Cable	
10Base-T	4-pair UTP/STP Cat. 3, 4, 5 Up to 100m (328ft)
100Base-TX	4-pair UTP/STP Cat. 5 Up to 100m (328ft)
100Base-FX	<b>MMF (50 or 62.5µm), SMF (9 or 10µm)</b>
100Base-BX	<b>SMF (9 or 10µm)</b>
LED Indicators	Per unit – Power status (Power1, Power2, Power3) Per port – PoE & High Power PoE: PoE, Link/ACT 10/100TX, 100FX: Link/ACT
Dimensions	68mm (W) x 110mm (D) x 135mm (H) <b>(2.68" (W) x 4.33" (D) x 5.31" (H))</b>
Net Weight	1Kg (2.2lbs.)
Power Input	Terminal Block: 48, 55VDC (High Power) DC Jack: 48, 55VDC (High Power)
Operating Voltage & Max. Current Consumption	PoE: 1.5A @ 48VDC High Power PoE: 2.3A @ 55VDC
Power Consumption	PoE: 72W Max. High Power PoE: 130W Max.
Operating Temperature	-40°C to 75°C (-40°F to 167°F) Tested for functional operation @ -40°C to 85°C (-40°F to 185°F) Web-Smart function operating temperature @ -20°C to 85°C (-4°F to 185°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	5%-95% non-condensing
EMI	FCC Part 15, Class A EN61000-6-3: EN55022, EN61000-3-2, EN61000-3-3
EMS	EN61000-6-2: EN61000-4-2 (ESD Standard) EN61000-4-3 (Radiated RFI Standards) EN61000-4-4 (Burst Standards) EN61000-4-5 (Surge Standards) EN61000-4-6 (Induced RFI Standards) EN61000-4-8 (Magnetic Field Standards)
Environmental Test Compliance	IEC60068-2-6 Fc (Vibration Resistance) IEC60068-2-27 Ea (Shock) IEC60068-2-32 Ed (Free Fall)
NEMA TS1/2 Environmental requirements for traffic control equipment	