NVT PHYBRIDGE

FLEX24 Switch User Guide

Version 7.1.0

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NVT Phybridge FLEX Switch Hardware Installation Guide

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Warranty Information

All statements in this document concerning the NVT Phybridge FLEX switch are for informational purposes only. No part of this document constitutes a warranty, either express or implied, regarding the FLEX switch. Our standard limited warranty is provided with the sales contract and/or product package.

Service and Support

NVT Phybridge is dedicated to customer satisfaction and the high quality of its products. Our technical support team is prepared to assist you in maximizing the efficiency and dependability of your FLEX switch environment and will provide you with an immediate solution should a problem with your product arise. Contact us to discuss a plan of action.

Returning a FLEX Switch

If you must return a FLEX switch, FLEX adapter, or accessory component to NVT Phybridge Inc., ensure that all items are adequately protected with insulating material and packaged in the original carton before shipping. Failure to do so may void the equipment warranty. Consult the warranty statements included with the sales contract and/or product package. Contact us for specific RMA requirements before you ship.

Audience

This document is intended for the use of service technicians, system administrators, information technology experts and other personnel who are qualified to install, configure and maintain the FLEX switch in the IP network environment. The tasks and procedures described in this guide require a basic understanding of IP communications, Ethernet LAN networks and the strategies and solutions currently practiced in your network environment. This document assumes that you are familiar with the architecture, specifications and functionality of your network. NVT Phybridge Communications Director (MCD) certification training is required.

Document Conventions

In this document, some instructions are given particular emphasis to denote cautions, warnings and notes.

Cautions

A caution contains an instruction that the reader *must* follow in order to **prevent damage to equipment, network failure or loss of data**.

Example:

CAUTION: Do not expose the FLEX switch or any of its components to a magnetic field or electrostatic charge. Damage to system components could result.

Warnings

A warning contains an instruction that the reader *must* follow in order to **prevent electrical shock, death or serious injury to personnel**.

Example:

WARNING: Ensure that the FLEX switch is independently grounded with a wire securely attached to the ground lug at the rear of the switch.

Notes or Tips

A note or tip provides helpful information related to the topic of discussion.

Examples:

Note: The power supply unit is a field-replaceable part.

Tip: Use the handle on the right side to pull the power supply unit out.

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1. Overview

About this Guide

This user guide provides instructions to manage, control and monitor the switch using the Admin GUI.

This guide is intended for operating personnel (sometimes called craft persons). Users must be familiar with the basic operations of a Layer 2 switch. Access to the hardware interface is by a computer with a telnet terminal.

About the Admin GUI

The Admin GUI provides you with a simple and intuitive tool to manage, control and monitor the switch. Most operations can be performed with a click of the mouse. The Admin GUI also includes a command line interface for managing the switch.

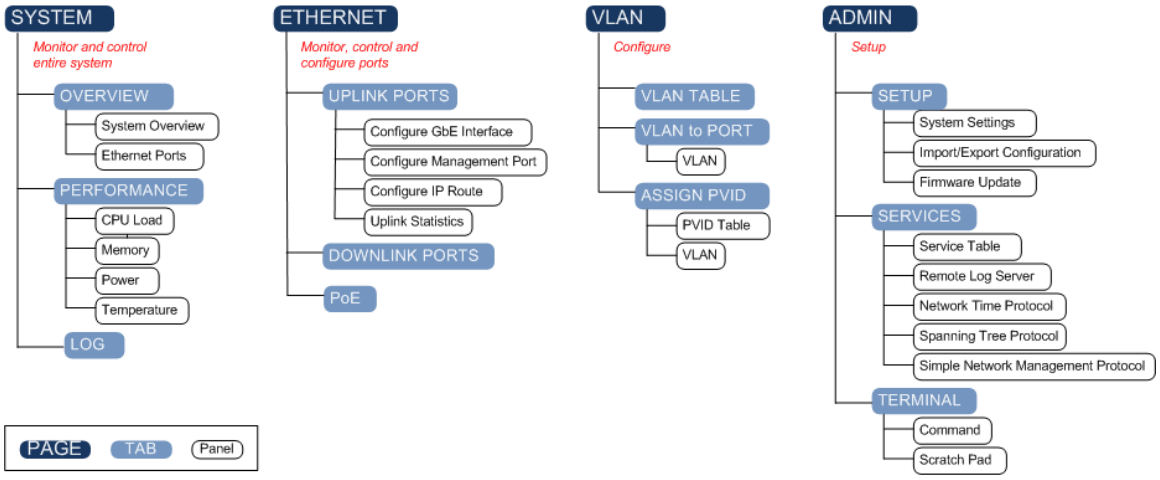
The Admin GUI is divided into four pages, arranged in order of the frequency that you will typically access them:

System Provides a real-time overview of the system, and allows you to control downlink ports and view detailed log activities. See "About the System Page" on page 3.

Ethernet Provides switch configuration and management as well as uplink and downlink port management. See "About the Ethernet Page" on page 13.

VLAN Allows users to view, establish and assign VLANs. See "About the VLAN Page" on page 20.

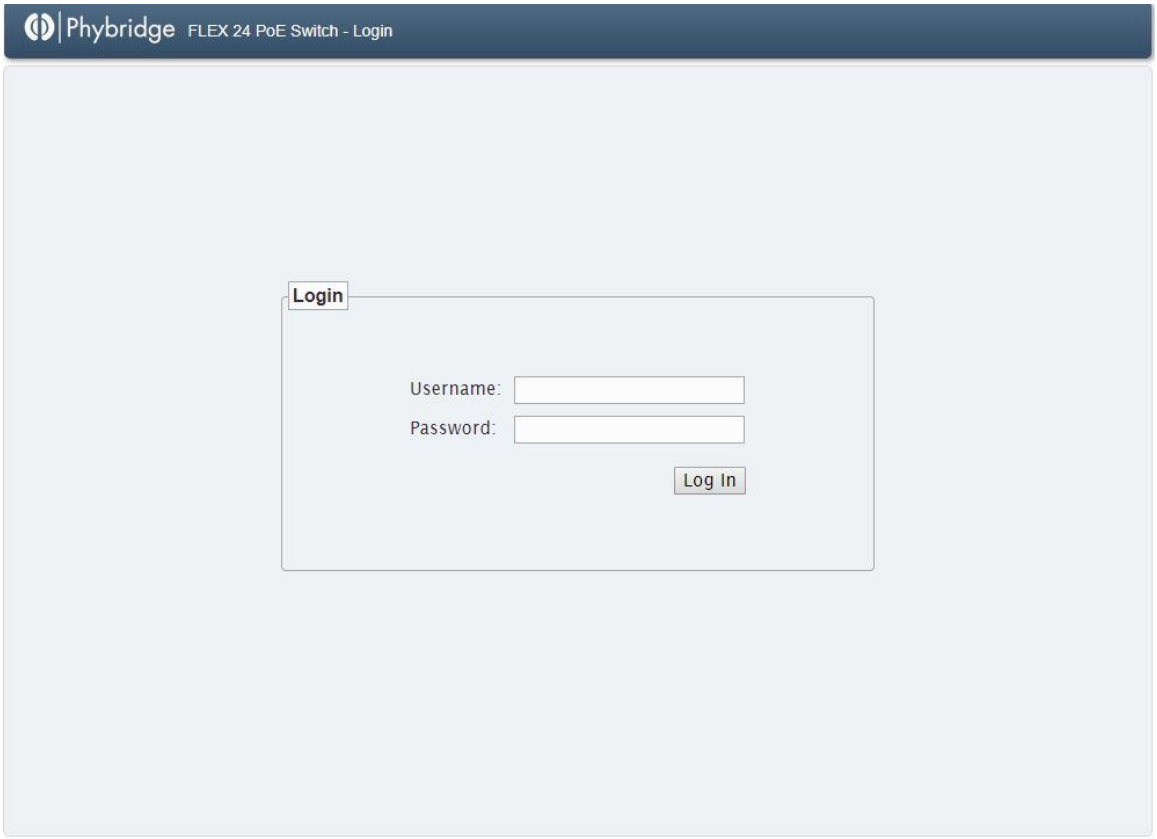
Admin Allows users to setup, configure and manage the switch, enable services and configure the switch using a command line interface. See "About the Admin Page" on page 25.



Software Version

The current version of the switch software is 7.1.0.

Logging into the Switch

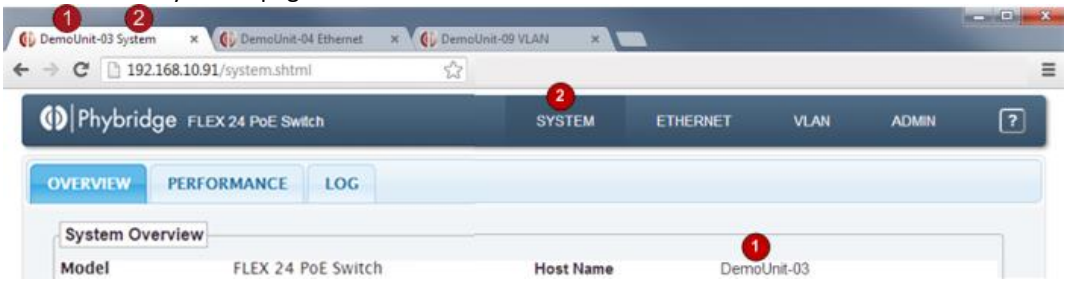


Managing Multiple Switches

When managing multiple switches through the Admin GUI, each switch is shown as a separate browser window or tab. The window/tab title contains the switch hostname, allowing you to easily identify each switch.

Each tab title is composed of:

1. Hostname of the switch
2. Currently active page on the switch.



2. System Page

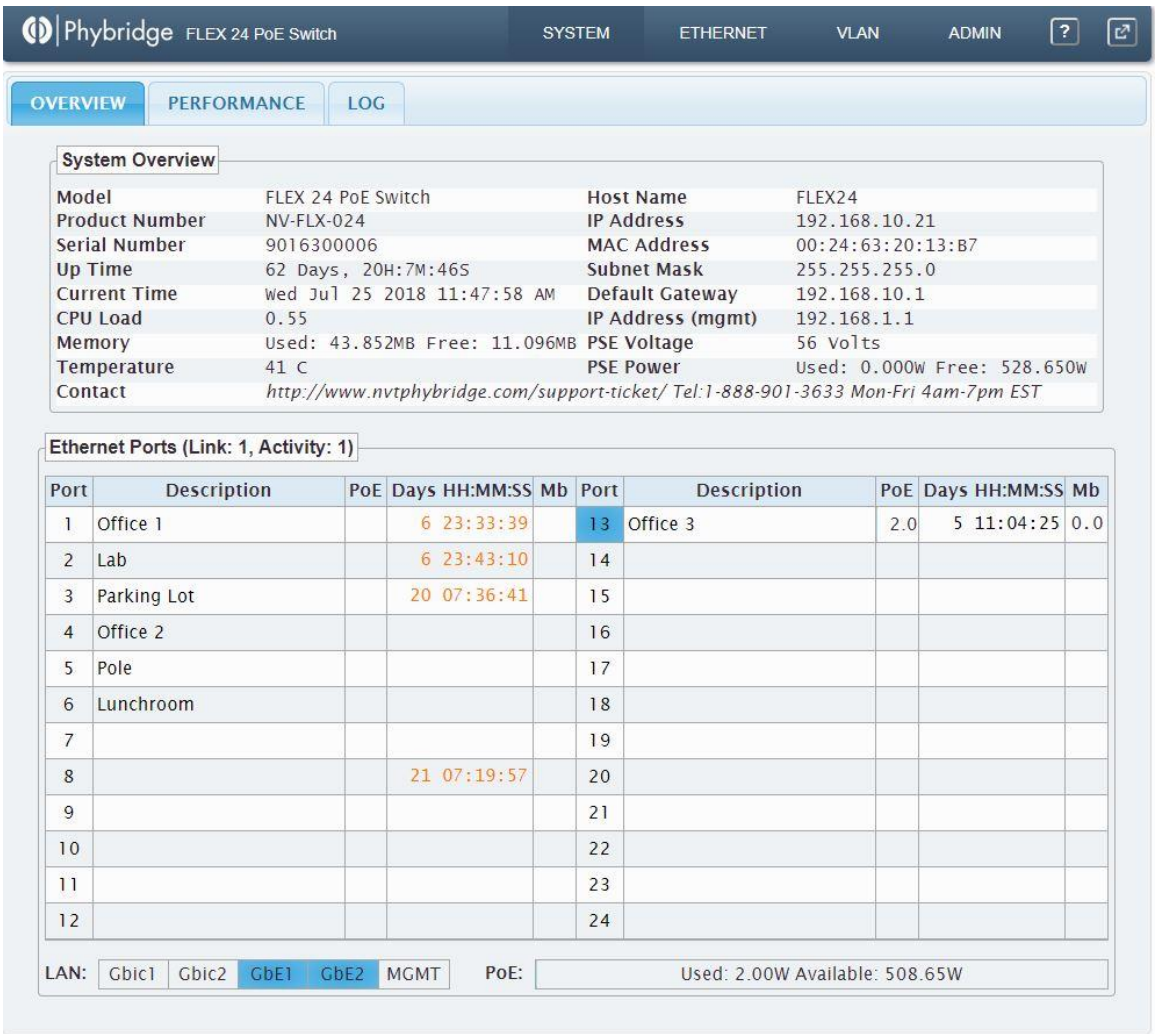
About the System Page

The System page provides high-level switch details, allowing you to monitor the system in real-time. The data provided on the System page is helpful to troubleshoot most issues you may encounter.

The System page contains three tabs:

- Overview
- Performance
- Log

System > Overview



Port	Description	PoE	Days HH:MM:SS	Mb	Port	Description	PoE	Days HH:MM:SS	Mb
1	Office 1		6 23:33:39		13	Office 3	2.0	5 11:04:25	0.0
2	Lab		6 23:43:10		14				
3	Parking Lot		20 07:36:41		15				
4	Office 2				16				
5	Pole				17				
6	Lunchroom				18				
7					19				
8			21 07:19:57		20				
9					21				
10					22				
11					23				
12					24				

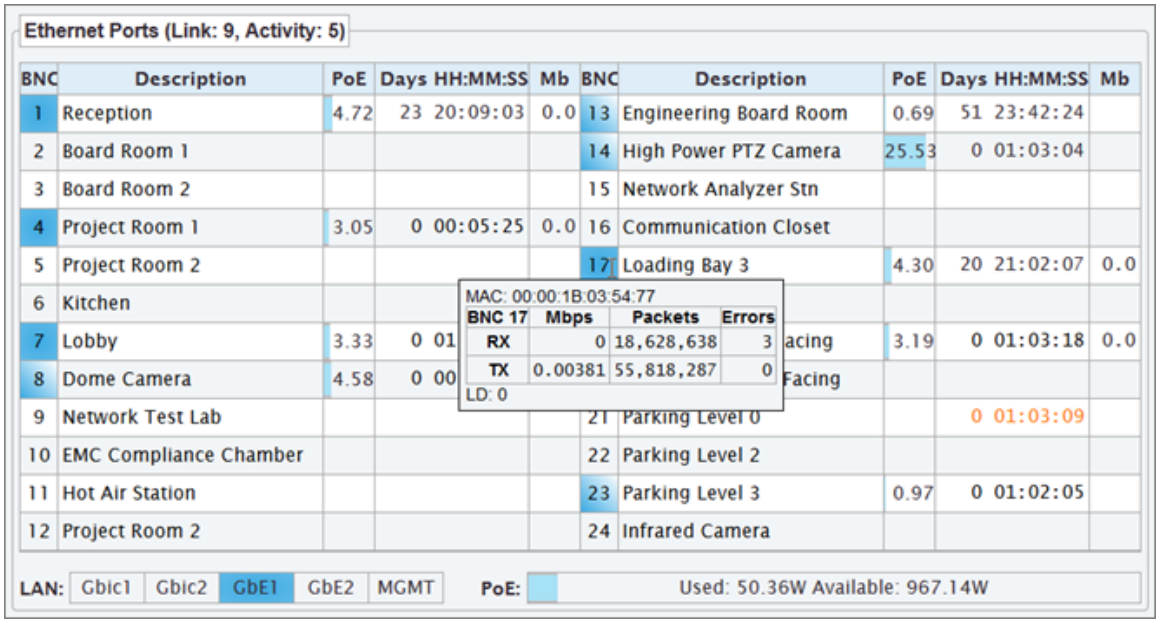
System Overview

Provides an overview of the switch statistics.

Model	Model.
Product Number	Product number.
Serial Number	Serial number.
Software Version	Software version.
Uptime	System uptime. Updated in real-time.
Current Time	Current date and time according to the switch. Updated in real-time.
Memory	Current used and free memory. Updated in real-time.
Temperature	Current temperature. Updated in real-time.
Host Name	Current host name. This field can be configured in Admin > Setup (see page 25).
IP Address	Current IP address. This field can be configured in Ethernet > Uplink Ports (see page 13).
MAC Address	Current MAC address.
Subnet Mask	Current subnet mask. This field can be configured in Ethernet > Uplink Ports (see page 13).
Default Gateway	Current default gateway. This field can be configured in Ethernet > Uplink Ports (see page 13).
IP Address (mgmt)	Current management port IP address. This field can be configured in Ethernet > Uplink Ports (see page 13).
PSU Capacity	Power supply maximum capacity.
POE Budget	Available power remaining at the current set voltage.
Contact	Contact information. This field can be configured in Admin > Setup (see page 25).

Ethernet Port Status

Provides the uplink and downlink port status; allows you to control power to the downlink ports.



A downlink port summary above the port boxes indicates how many adapters are available and how many are connected to endpoints.

BNC	Port number.
Description	Description of the port for easy identification; this is configured in Ethernet > Downlink Ports (see page 16).
PoE	Watts used by the endpoint, displayed as a real-time moving bar graph. The whole width of the field is 100%: the number shown is the percentage and the bar is a visual representation.
Days HH:MM:SS	Length of uptime or downtime; see "Viewing port status" below.
Mb	Megabits per second bandwidth received from the endpoint, displayed as a real-time moving bar graph. The whole width of the field is 100%: the number shown is the percentage and the bar is a visual representation.
LAN	Uplink ports. For a breakdown of the packets received to and sent from these ports, see Ethernet > Uplink Ports (on page 13).
PoE	Total watts used by all endpoints, displayed as a real-time moving bar graph. The whole width of the field is 100%: the number shown is the percentage and the bar is a visual representation.

Viewing port status

- Hover over a port number to view port information (link details, MAC address of the main device and a historical link down count for the port). For a breakdown of the packet information, see Ethernet > Downlink Ports (see page 16).
- The **Days** field shows uptime or downtime of adapter connections: black text = uptime, gold text = downtime. This counter is reset when the port is reset.
- Port status can be easily identified by the colour and shading of the port box and number.

Colour	Port Status
 White box	Port is available with power; nothing is attached to the port.
 Grey shaded box	Port power has been manually disabled.
 Blue shaded box	Adapter is attached to the port; nothing is attached to the adapter.
 Solid blue box	Adapter is attached to the port; an IP device is connected to the adapter. You can lock the port to the currently connected IP device, on the Ethernet > Downlink Ports page (see page 16). When locked, a lock icon (🔒) appears beside the **Description**.
Number changes from **black** to **red**	The port number gradually changes from black to red if there is a cable fault.

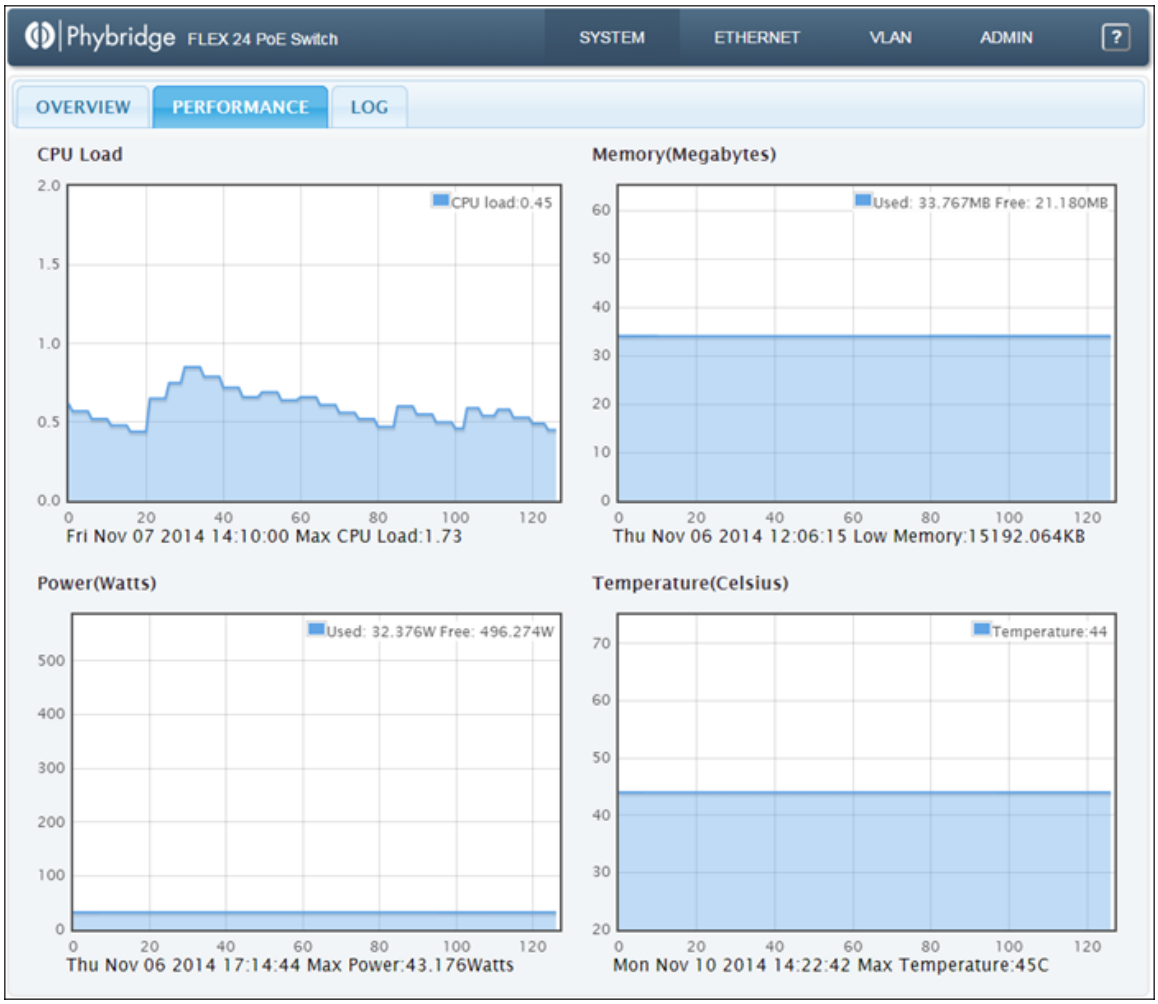
Controlling power to downlink ports

You can turn the power on or off for a port.

1. Double-click a port.
2. Click **OK** to confirm that you want to turn the port power on or off.

System > Performance

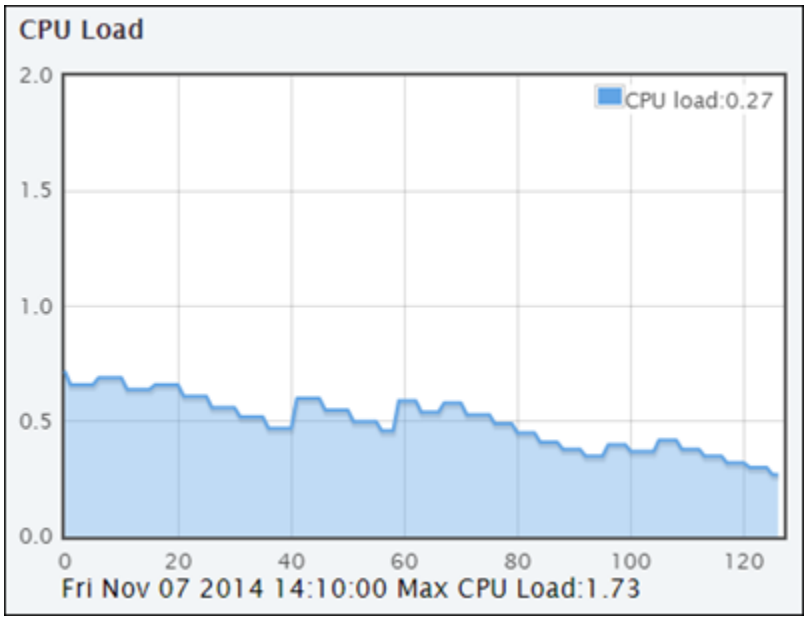
All panels provide current values and the last two minutes of historical data; values are updated in real-time. Below each panel is the defined threshold (minimum or maximum) and date of the last indicator reading.



CPU Load

Legend shows the current CPU load. This value represents the number of processes waiting in queue; in a healthy environment, CPU load should not be consistently above 1.0.

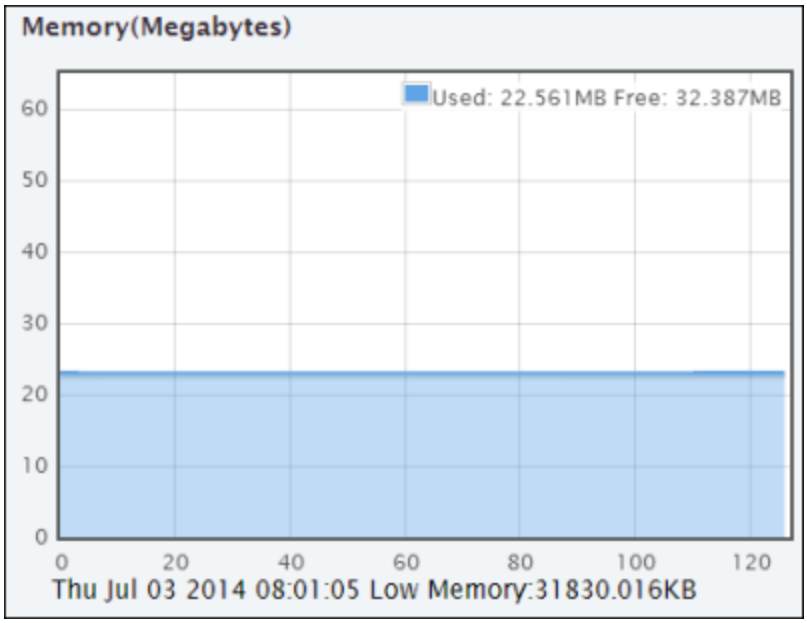
Graph provides an overview of the historical CPU load.



Memory (Megabytes)

Legend shows the current memory usage, allowing you to visualize available memory.

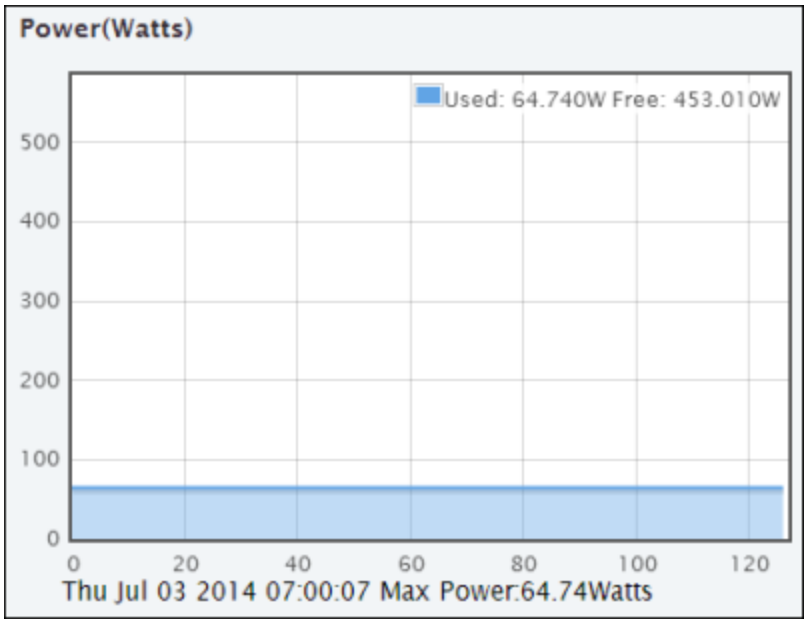
Graph provides an overview of historical memory usage. A flat line with few peaks and valleys is normal in a healthy system. If memory usage keeps increasing, this may cause system instability. If this occurs, note the used and free values in the legend and call system support.



Power (Watts)

Legend shows the current total power consumption. Use the legend to identify the free power availability and manage it accordingly.

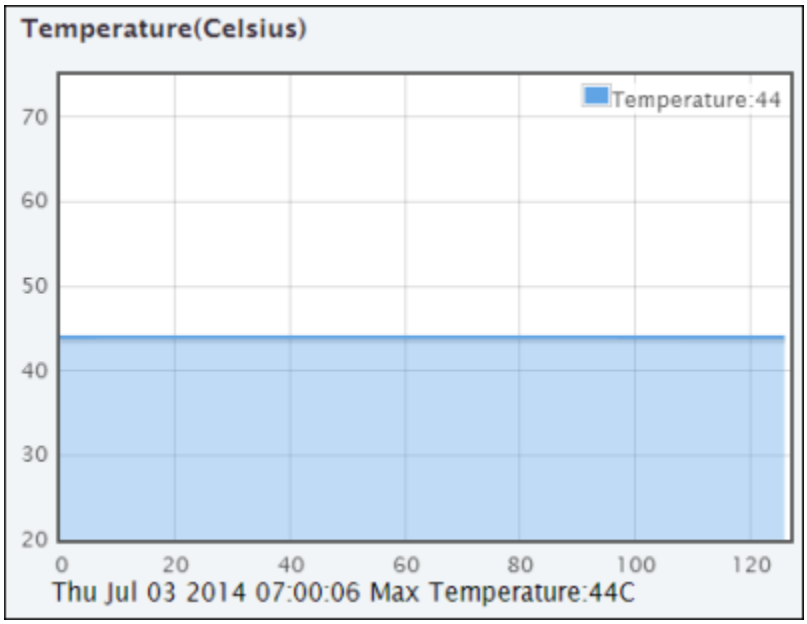
Graph provides an overview of the historical total power consumed by the switch and all devices connected to it. Expect variations as activities on the switch change. Peaks and valleys are normal as devices are added and removed.



Temperature (Celsius)

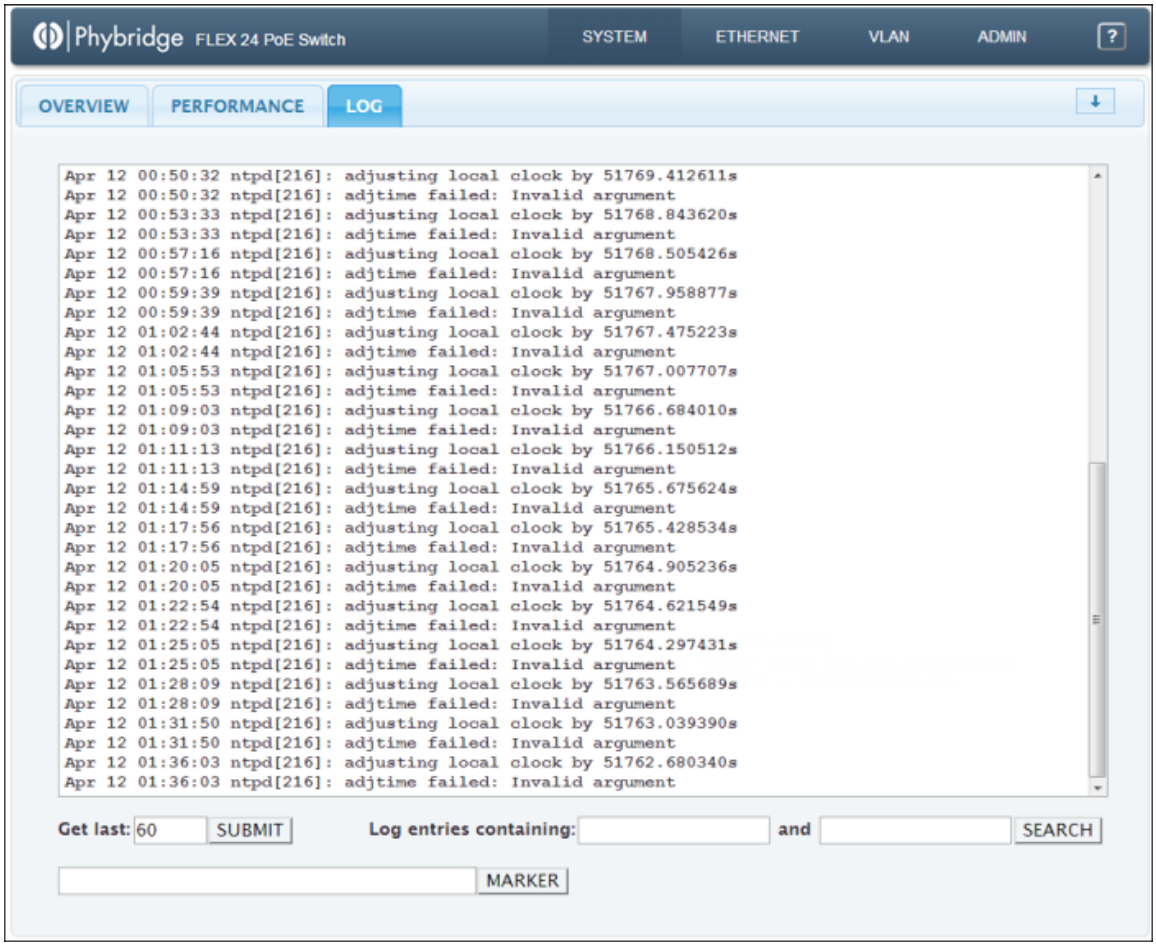
Legend shows the current switch temperature.

Graph provides an overview of the historical switch temperature. A flatline with few peaks and valleys is normal in a healthy system as long as the temperature remains below 55. If the temperature remains above 55, observe the physical switch environment to ensure proper ventilation and cooling.



System> Log

Use to view the system log with real-time updates. You can also add markers to the log and download the log file.

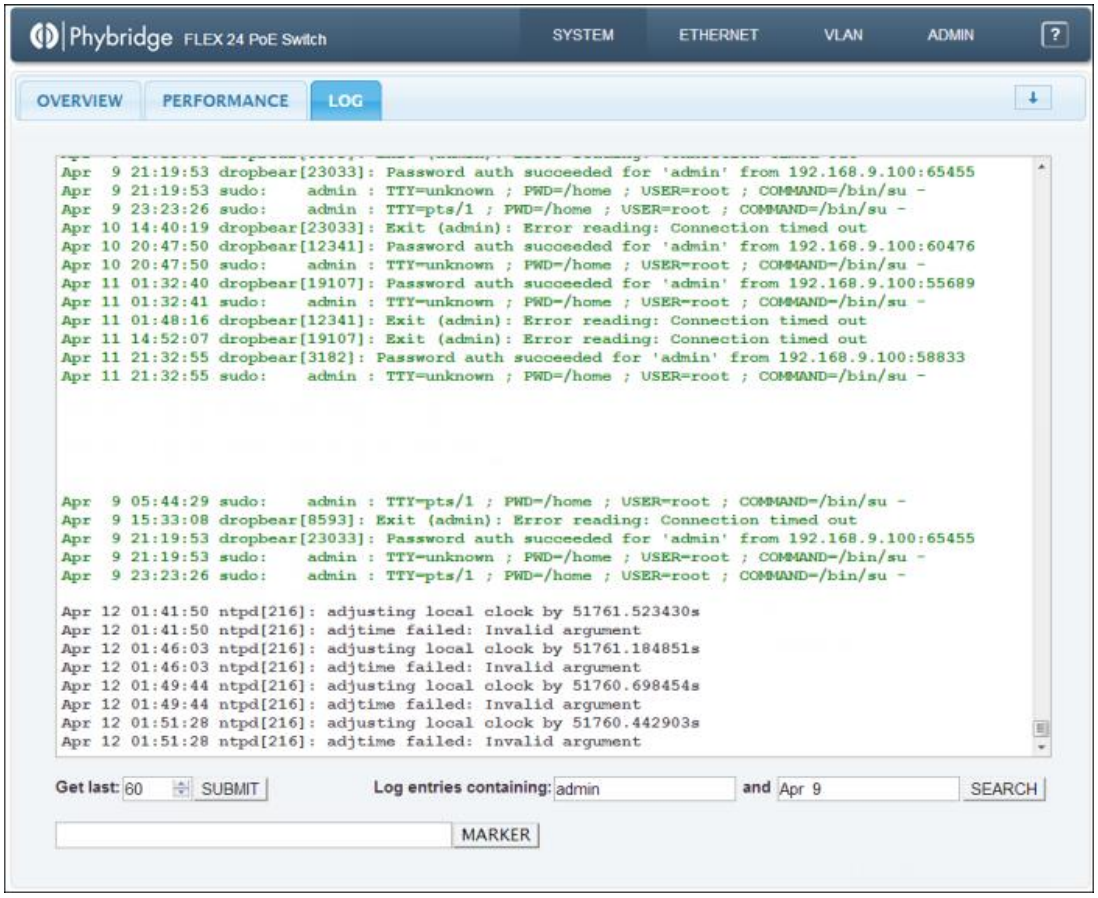


Selecting the number of events to display

1. In the **Get last** list, select the number of events to display on the Log tab. You can enter a value or use the arrows to increase/decrease the value in increments of 10.
2. Click **SUBMIT**. The Log tab is updated immediately.

Searching Log entries

1. You can enter multiple search terms in the “Log entries containing” window. Search terms are case sensitive and spaces are significant.
2. Click **SEARCH**. The Log tab is updated immediately.
3. Search results are shown in green text and the log entries are in black.



Adding markers to the log

You can add markers to mark particular points in the log. For example, you could use markers to mark the start and end points of certain events you would like to monitor. Markers are added to the log shown on the Log tab and also to the log stored on the remote log server.

1. Enter the marker text.
2. Click **MARKER**. The marker is added to the log.

Downloading the log file

Click **DOWNLOAD LOG FILE** to save a copy of the log file shown on the Log tab. The filename for the exported file uses the convention **<hostname>.log** (example: switch.log). This allows you to easily identify which switch the file was exported from.

NOTE
You can continue using the Admin GUI while the file is downloading.

3. Ethernet Page

About the Ethernet Page

The Ethernet page allows you to monitor the health of the network, configure the switch network interface, and manage uplink and downlink ports.

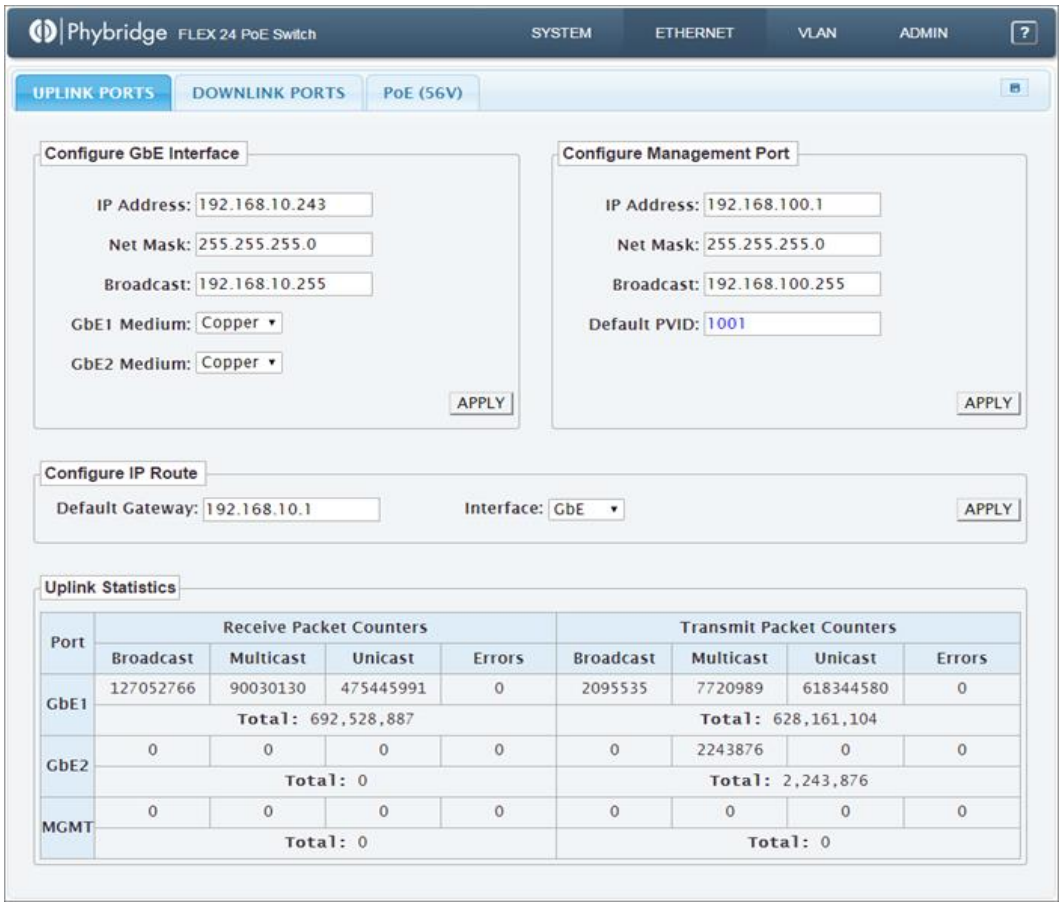
The Ethernet page contains three tabs:

- Uplink Ports
- Downlink Ports
- PoE

Ethernet > Uplink Ports

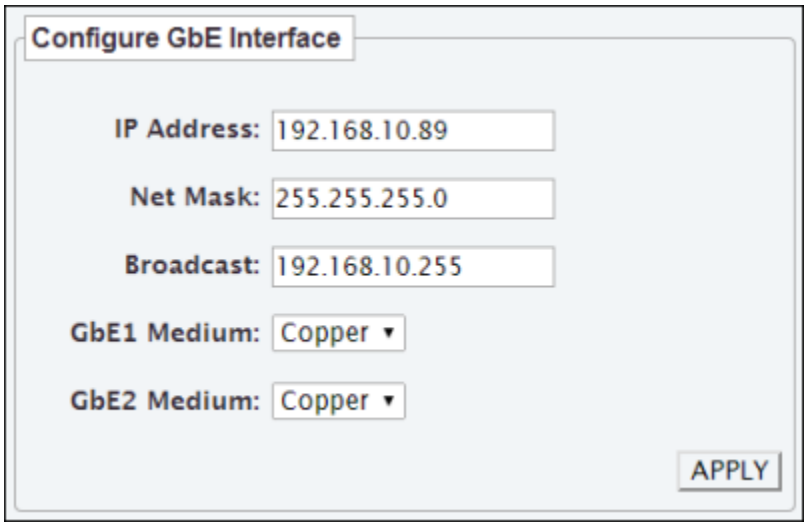
IMPORTANT

Changes that you apply are temporary. If you do not click  to save changes, any changes made on this tab will be lost after a system reboot.



Configure GbE Interface

Use to configure the switch network interface.



1. Modify any of the fields (**IP Address**, **Net Mask**, **Broadcast**, **GbE1 Medium**, **GbE2 Medium**).

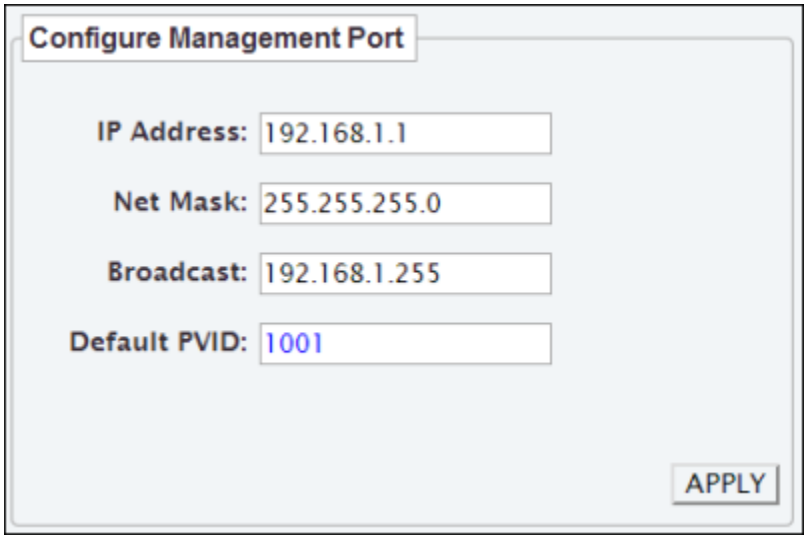
   Notes:

   - If the IP address is changed, the new IP address will be required to log back into the box.
   - The management port IP address and the uplink port IP address should never be on the same subnet. This ensures the management port can still be reached if the data LAN experiences issues.

2. Click **APPLY**.

Configure Management Port

Use to configure the management port IP address.



1. Modify any of the fields (**IP Address**, **Net Mask**, **Broadcast**, **Default PVID**).

   Notes:

   - If the IP address is changed, the new IP address will be required to log back into the box via the management port.
   - The management port IP address and the uplink port IP address should never be on the same subnet. This ensures the management port can still be reached if the data LAN experiences issues.
   - The default PVID (which is the default VLAN ID for the management port) can be changed using the command line interface in Admin > Terminal (see page 31).
2. Click **APPLY**.

Configure IP Route

Use to configure the default gateway IP address and to select the interface to apply it to.

1. Modify any of the fields (**Default Gateway**, **Interface**).

   Notes:

   - The Default Gateway can be assigned to only one interface. The interface can be either GbE or Mgmt.
   - If the IP address is changed, the new IP address will be required to log back into the box via the management port.
   - The management port IP address and the uplink port IP address should never be on the same subnet. This ensures the management port can still be reached if the data LAN experiences issues.
2. Click **APPLY**.

Viewing Uplink Statistics

Displays a breakdown of packets received to and transmitted from the LAN ports.

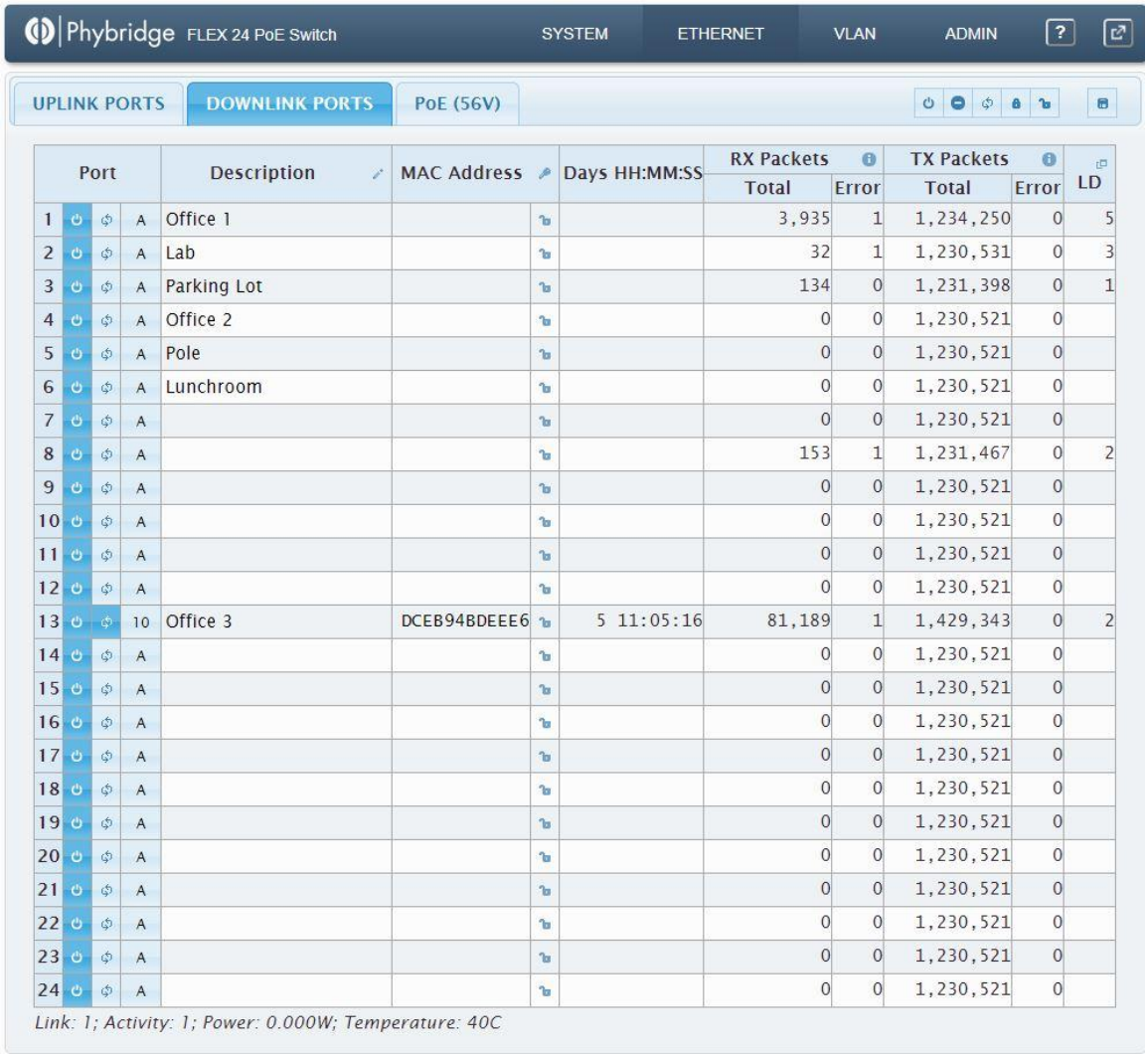
Uplink Statistics

Port	Receive Packet Counters				Transmit Packet Counters			
	Broadcast	Multicast	Unicast	Errors	Broadcast	Multicast	Unicast	Errors
GbE1	116870	2593	527090	0	99429	286721	522730	0
	Total: 646,553				Total: 908,880			
GbE2	0	0	0	0	0	6	0	0
	Total: 0				Total: 6			
MGMT	0	0	0	0	0	0	0	0
	Total: 0				Total: 0			

Ethernet > Downlink Ports

IMPORTANT

Changes that you apply are temporary. If you do not click to save changes, any changes made on this tab will be lost after a system reboot.



Port				Description	MAC Address	Days HH:MM:SS	RX Packets		TX Packets		LD
							Total	Error	Total	Error	
1			A	Office 1			3,935	1	1,234,250	0	5
2			A	Lab			32	1	1,230,531	0	3
3			A	Parking Lot			134	0	1,231,398	0	1
4			A	Office 2			0	0	1,230,521	0	
5			A	Pole			0	0	1,230,521	0	
6			A	Lunchroom			0	0	1,230,521	0	
7			A				0	0	1,230,521	0	
8			A				153	1	1,231,467	0	2
9			A				0	0	1,230,521	0	
10			A				0	0	1,230,521	0	
11			A				0	0	1,230,521	0	
12			A				0	0	1,230,521	0	
13			10	Office 3	DCEB94BDEEE6	5 11:05:16	81,189	1	1,429,343	0	2
14			A				0	0	1,230,521	0	
15			A				0	0	1,230,521	0	
16			A				0	0	1,230,521	0	
17			A				0	0	1,230,521	0	
18			A				0	0	1,230,521	0	
19			A				0	0	1,230,521	0	
20			A				0	0	1,230,521	0	
21			A				0	0	1,230,521	0	
22			A				0	0	1,230,521	0	
23			A				0	0	1,230,521	0	
24			A				0	0	1,230,521	0	

Link: 1; Activity: 1; Power: 0.000W; Temperature: 40C

Ports 1–24

Used to manage the downlink ports.

Viewing adapter information

Adapter summary information is shown below the port details table and includes the number of adapters connected, the number of endpoints connected to the adapters, the total power being consumed, and the temperature of the switch. This information is updated in real-time.

Viewing port information

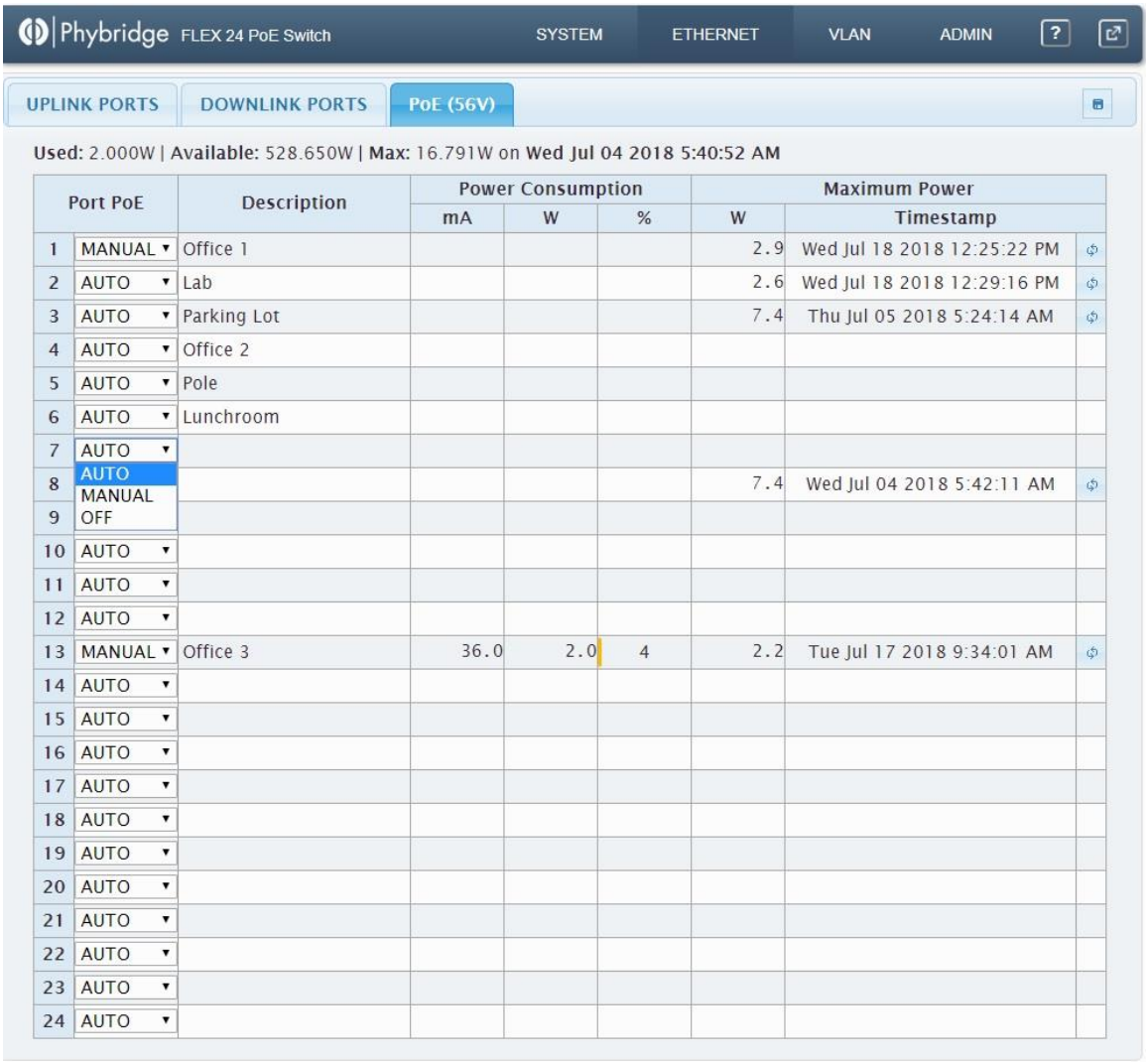
The following information is shown for each port:

BNC	Port number. Click to view ethernet statistics for the port. These statistics include non-zero data only (does not include inactive). **Ethernet Statistics - Port 20** 8078796 snmpIfInOctets (stat 0) 23556 snmpIfInNUcastPkts (stat 2) 263 snmpIfInDiscards (stat 3) 30578158 snmpIfOutOctets (stat 6) 12 snmpIfOutUcastPkts (stat 7) 87508 snmpIfOutNUcastPkts (stat 8) 23556 snmpDot1dTpPortInFrames (stat 18) 87520 snmpDot1dTpPortOutFrames (stat 19) 47239 snmpEtherStatsMulticastPkts (stat 22) 63825 snmpEtherStatsBroadcastPkts (stat 23) 3391 snmpEtherStatsPkts64Octets (stat 26)
	Control power to the port. Click to turn the power on or off. Dark blue = on, light blue = off. or Click  or  at the top right of the tab to turn all ports on or off.
	Indicates the link status. Dark blue = linked, light blue = not linked. Click to reset the port. or Click  at the top right of the tab to reset all ports at once.
Description	Description of the port for easy identification on the System > Overview page; click on a description to edit it. The Description is shown in blue text while editing. Remember to save any changes. 
MAC Address	MAC address of the IP device connected to the adapter associated with this port.
 or 	Indicates whether a read-only link exists between the adapter and the switch. Click to lock or unlock MAC address to the port. or Click  or  at the top right of the tab to lock/unlock all ports at once.
Days HH:MM:SS	Length of time the device has been connected to the adapter.

RX Packets **TX Packets**	Number of packets received and transmitted from this port, and number of errors, captured in real-time and updated approximately every second. Error counts should be low in comparison to the number of packets. Any negative values should be interpreted as zero. Hover over the **Total** to see a breakdown of Multicast, Broadcast, and Unicast packets.
LD	Number of link-down events (these occur when the adapter goes through a link transition). A high number may indicate physical errors. Click to view link transition statistics for the port. This historical information can help you to identify patterns of downtime (e.g. frequency, consistent time, duration, etc.).

Ethernet > PoE

The PoE tab displays the current PoE voltage.



Port PoE		Description	Power Consumption			Maximum Power	
			mA	W	%	W	Timestamp
1	MANUAL	Office 1				2.9	Wed Jul 18 2018 12:25:22 PM
2	AUTO	Lab				2.6	Wed Jul 18 2018 12:29:16 PM
3	AUTO	Parking Lot				7.4	Thu Jul 05 2018 5:24:14 AM
4	AUTO	Office 2					
5	AUTO	Pole					
6	AUTO	Lunchroom					
7	AUTO						
8						7.4	Wed Jul 04 2018 5:42:11 AM
9							
10	AUTO						
11	AUTO						
12	AUTO						
13	MANUAL	Office 3	36.0	2.0	4	2.2	Tue Jul 17 2018 9:34:01 AM
14	AUTO						
15	AUTO						
16	AUTO						
17	AUTO						
18	AUTO						
19	AUTO						
20	AUTO						
21	AUTO						
22	AUTO						
23	AUTO						
24	AUTO						

Ports 1–24

Used to display power usage per port.

Viewing port information

The following information is shown for each port:

	Power Consumption
BNC	Port number. Click to view ethernet statistics for the port. These statistics include non-zero data only (does not include inactive).
Description	Description of the port for easy identification on the System > Overview page.
mA	Current power consumption in milliamps of the port.
W	Current power consumption in watts of the port.
%	Percentage of power usage. The whole width of the field is 100%: the number shown is the percentage and the bar is a visual representation.
	Maximum Power
W	Maximum power in watts that the port had consumed.
Timestamp	Timestamp of when the maximum power on that port has been consumed.
	Click to reset the Maximum power statistic.

4. VLAN Page

About the VLAN Page

The VLAN page simplifies the management of VLANs, reducing the potential for error.

The VLAN page contains three tabs:

- VLAN TABLE
- VLAN to PORT
- ASSIGN PVID

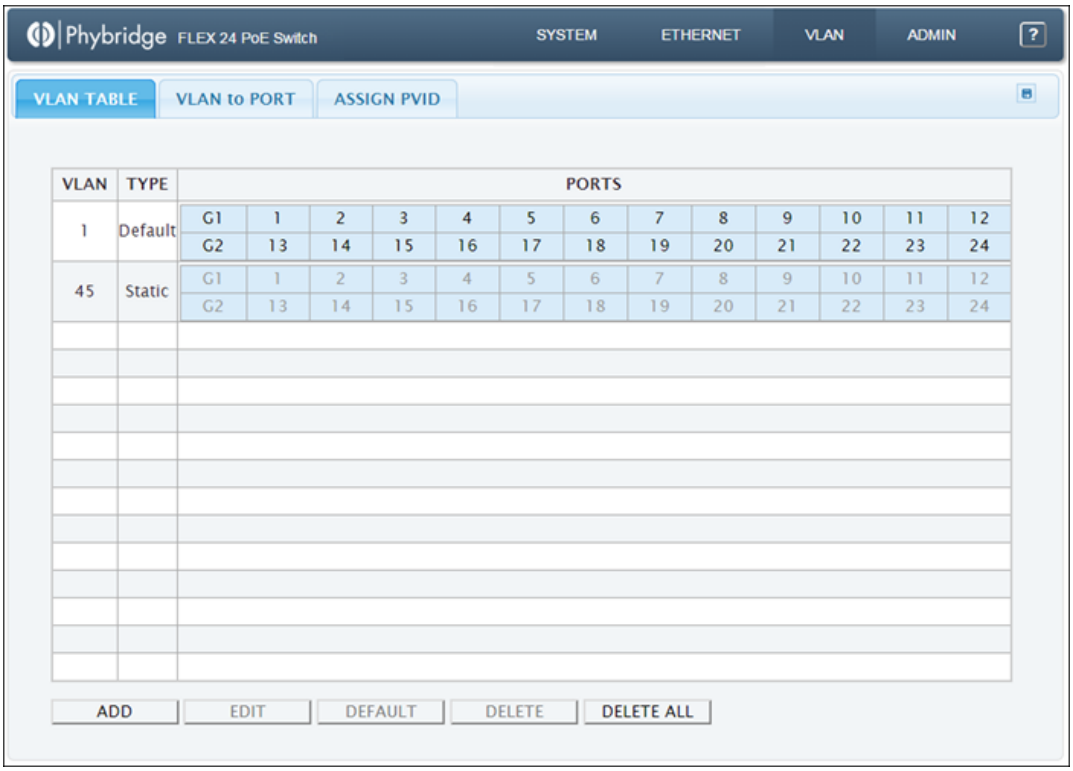
VLAN > VLAN Table

Use to add or delete a VLAN or to change the default VLAN. For each VLAN, the VLAN number, type and ports are shown.

IMPORTANT
Do not use VLAN 0. There is potential in the VLAN specification to interpret the standard for VLAN 0 in different ways, which can lead to incompatibility between different vendor units.

IMPORTANT

Changes that you apply are temporary. If you do not click  to save changes, any changes made on this tab will be lost after a system reboot.



NOTE
WHITE BACKGROUND — Port is not a member.
BLUE BACKGROUND — Port is a member.
BLACK TEXT — Port is a PVID.
GREY TEXT — Port is only a member of the VLAN.

Adding a VLAN

You can add a new static VLAN.

1. Click **ADD**.
2. Enter the VLAN number and click **OK**.
3. Click  to save your changes.
4. To assign ports to the VLAN, click the VLAN and click **EDIT**.

   The VLAN to PORT tab appears with the VLAN panel open. You can now assign ports to the VLAN (see "VLAN > VLAN To Port" on page 21).

Editing a VLAN

1. Click a VLAN. The selected VLAN will now be enclosed in a black border.
2. Click **EDIT**.

   The VLAN to PORT tab appears with the VLAN panel open. You can now assign ports to the VLAN (see "VLAN > VLAN To Port" on page 21).

Setting the default VLAN

The default VLAN is used for ports not assigned to any other VLAN. VLAN 1 is the system default; however, you can select a different default VLAN if desired.

1. Click the VLAN you want to set as the default.
2. Click **DEFAULT**.
3. Click  to save your changes.

Deleting VLANs

You can delete a static VLAN; you cannot delete the default VLAN.

1. Click the VLAN you want to delete, then click **DELETE**.

   or

   Click **DELETE ALL** to delete all static VLANS.

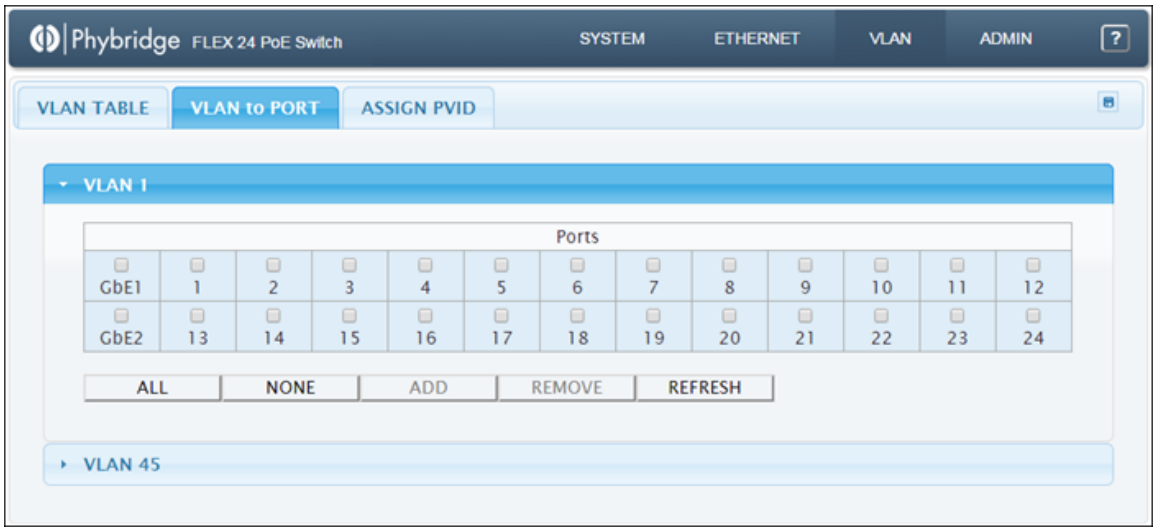
2. Click  to save your changes.

VLAN > VLAN To Port

Use to assign ports to VLANs. You can add/remove individual ports from a VLAN or you can add/remove all ports at once.

NOTE
Use the VLAN Table tab to create and remove VLANs (see page 20).

IMPORTANT
Changes that you apply are temporary. If you do not click to save changes, any changes made on this tab will be lost after a system reboot.



Viewing VLAN port details

Each VLAN is shown as a separate panel.

1. Click the panel header (the VLAN number) to expand the panel.
2. A table with all ports is shown. The ports that are members of the VLAN have a shaded background. Ports that are not members have a white background.

Assigning ports to a VLAN

1. Click one or more ports in the VLAN panel.

   or

   Click **ALL** to select all ports. (Click **NONE** to clear all ports.)

   A checkmark is shown on selected ports.
2. Click **ADD**. The added ports now have a shaded background.
3. Click to save your changes.

Removing ports from a VLAN

1. Click one or more ports in the VLAN panel.

   or

   Click **ALL** to select all ports. (Click **NONE** to clear all ports.)

A checkmark is shown on selected ports.

2. Click **REMOVE**. The removed ports now have a white background.
3. Click  to save your changes.

Refreshing VLAN information

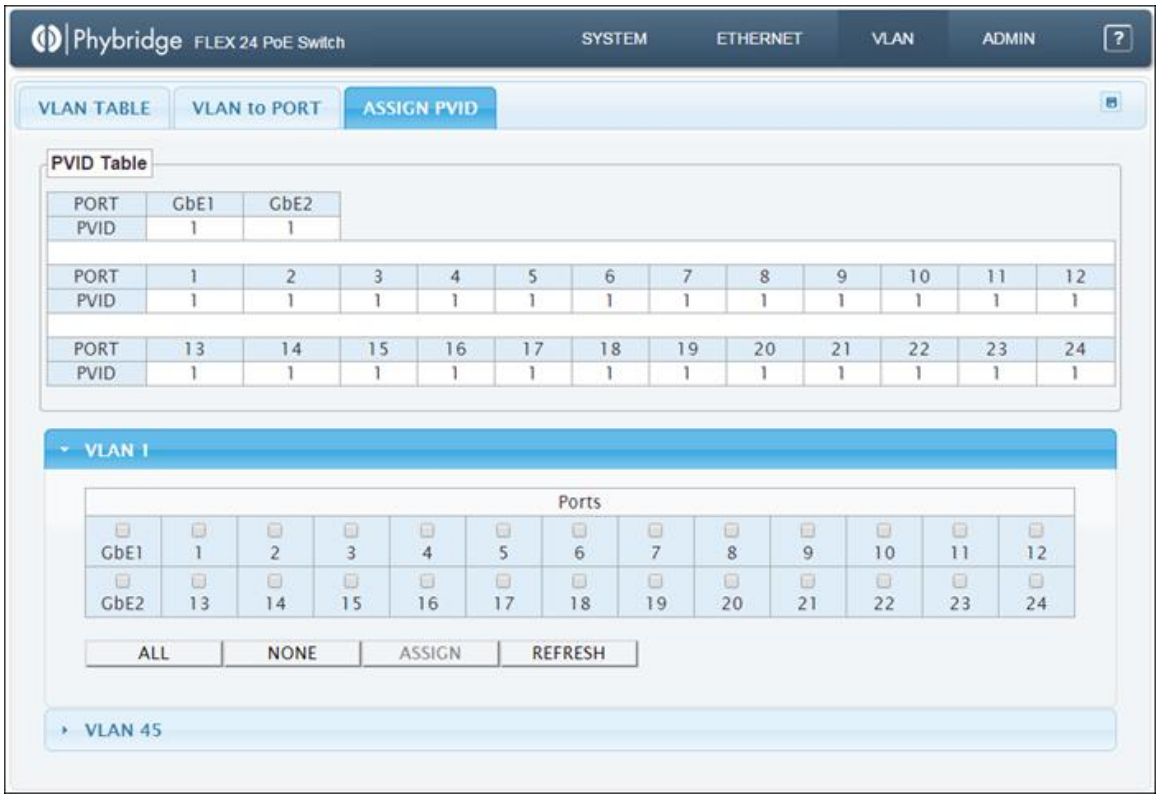
VLAN information on this tab is not updated in real-time. Click **REFRESH** to update the information (for example, to see any changes made by other users).

VLAN > Assign PVID

Use to assign the primary VLAN ID to ports. VLANs created in the VLAN Table tab can be used for PVID tagging. For details on adding and removing VLANs, see "VLAN > VLAN Table" on page 20.

IMPORTANT

Changes that you apply are temporary. If you do not click  to save changes, any changes made on this tab will be lost after a system reboot.



PVID Table

Static panel showing each port's PVID. Each port has only one PVID. By default, every port is assigned the system default VLAN as the PVID. (The default VLAN is set on the VLAN Table tab; see page 20.)

Viewing port PVID details for a VLAN

Each VLAN is shown as a separate panel.

1. Click the panel header (the VLAN number) to expand the panel.
2. A table with all ports is shown. The ports that belong to the PVID have a shaded background. Ports that do not belong to the PVID have a white background.

Adding or modifying a port PVID

IMPORTANT
The switch may lose connectivity if you change the PVID of the GbE ports. Use caution when considering making changes to these ports.

1. Click one or more ports in the VLAN panel.

   or

   Click **ALL** to select all ports, with the exception of GbE1 and GbE2. (Click **NONE** to clear all ports.)

   A checkmark is shown on selected ports.
2. Click **ASSIGN**. The new PVID is established and the added ports now have a shaded background.
3. Click  to save your changes.

Refreshing VLAN information

VLAN information on this tab is not updated in real-time. Click **REFRESH** to update the information (for example, to see any changes made by other users).

5. Admin Page

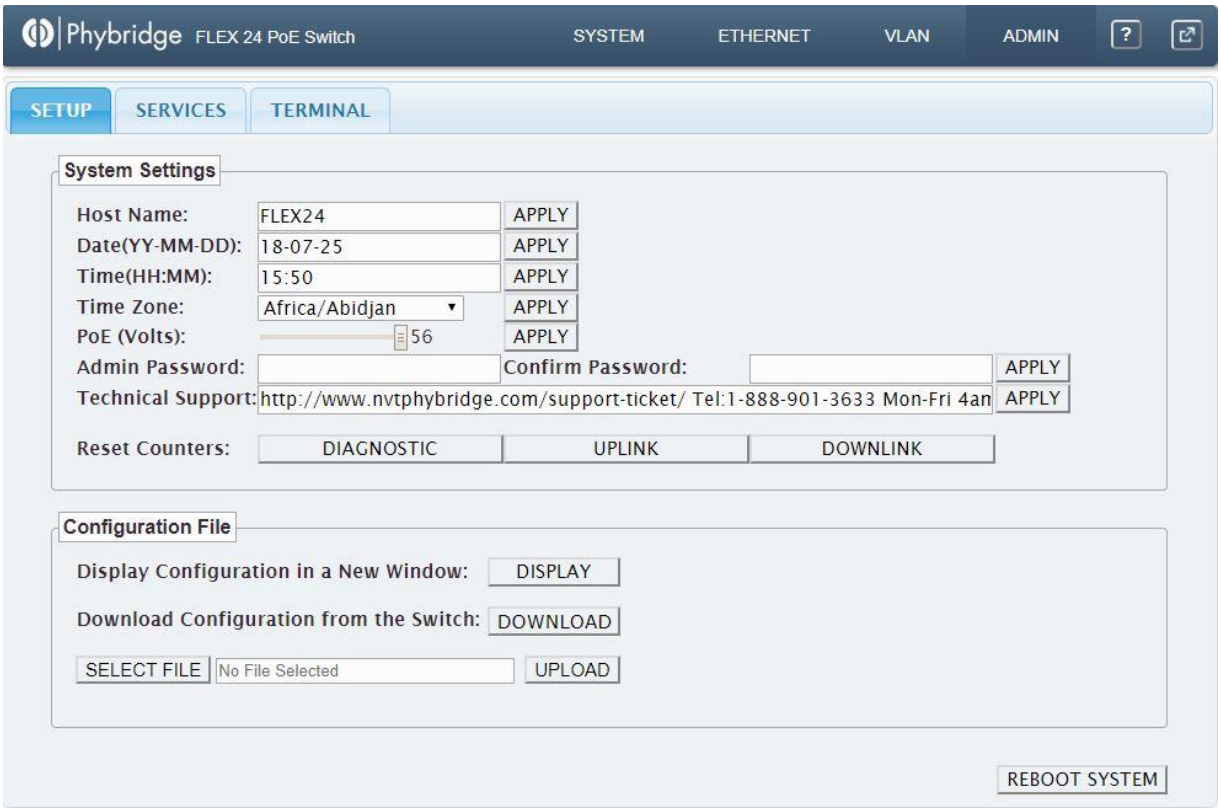
About the Admin Page

The Admin page allows you to configure switch settings, control services, configure servers, and use the command line interface.

The Admin page contains three tabs:

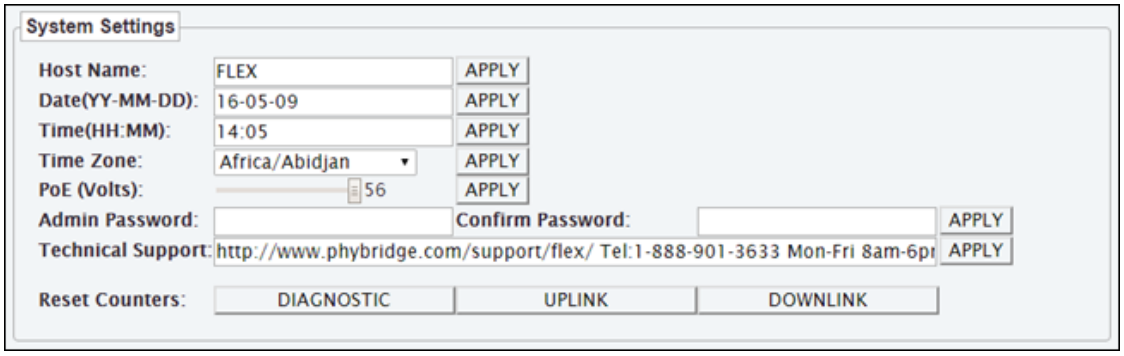
- Setup
- Services
- Terminal

Admin > Setup



System Settings

Use to configure basic switch settings. After modifying a setting, click **APPLY**. The updates will be applied immediately to the switch.

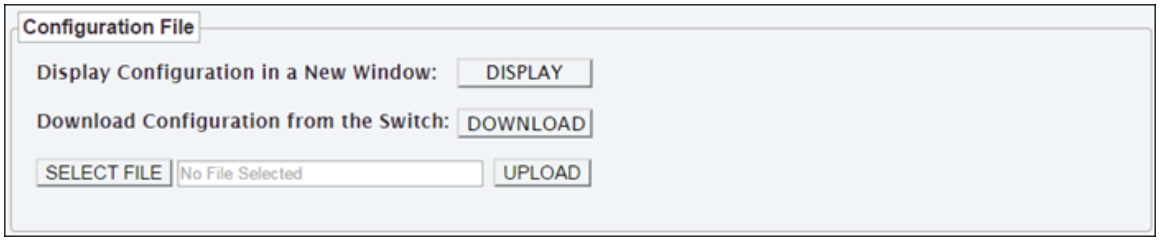


Host Name	Switch host name.
Date **Time** **Time Zone**	Switch date (YY-MM-DD), time (HH:MM), and time zone.
PoE Voltage	Adjust the power available to the device connected. Defaults to 56V which is the recommended voltage for PoE. Range from 48 – 56V; use slider to adjust. Click **APPLY**.
Admin Password **Confirm Password**	Admin GUI password. To change the password, enter the new password in both of these fields, then click **APPLY**. **NOTE** You will be prompted to log back into the Admin GUI after changing the password.
Technical Support	Technical Support contact information.
Reset Diagnostic Counters	Reset only the diagnostic counters.
Reset Uplink Counters	Reset all counters for the gigabit ports (transmit/receive counts, errors, broadcasts, and multicasts).
Reset Downlink Counters	Reset all downlink counters (transmit/receive counts and errors).

Import/Export Configuration

You can import or export the current switch configuration. This allows you to download the existing configuration, make changes, and then upload the new configuration.

IMPORTANT
When editing the configuration file, the existing syntax must be strictly followed or you may lose access to the switch. The file must be saved in Unix file format; using a program such as dos2unix/unix2dos or Notepad++ to edit the file is recommended.



View the switch configuration

To view the current switch configuration, click **DISPLAY**. You can copy the text from this window to paste into another application or document.

Export configuration from the switch

1. Click **DOWNLOAD** to save a copy of the current switch configuration.

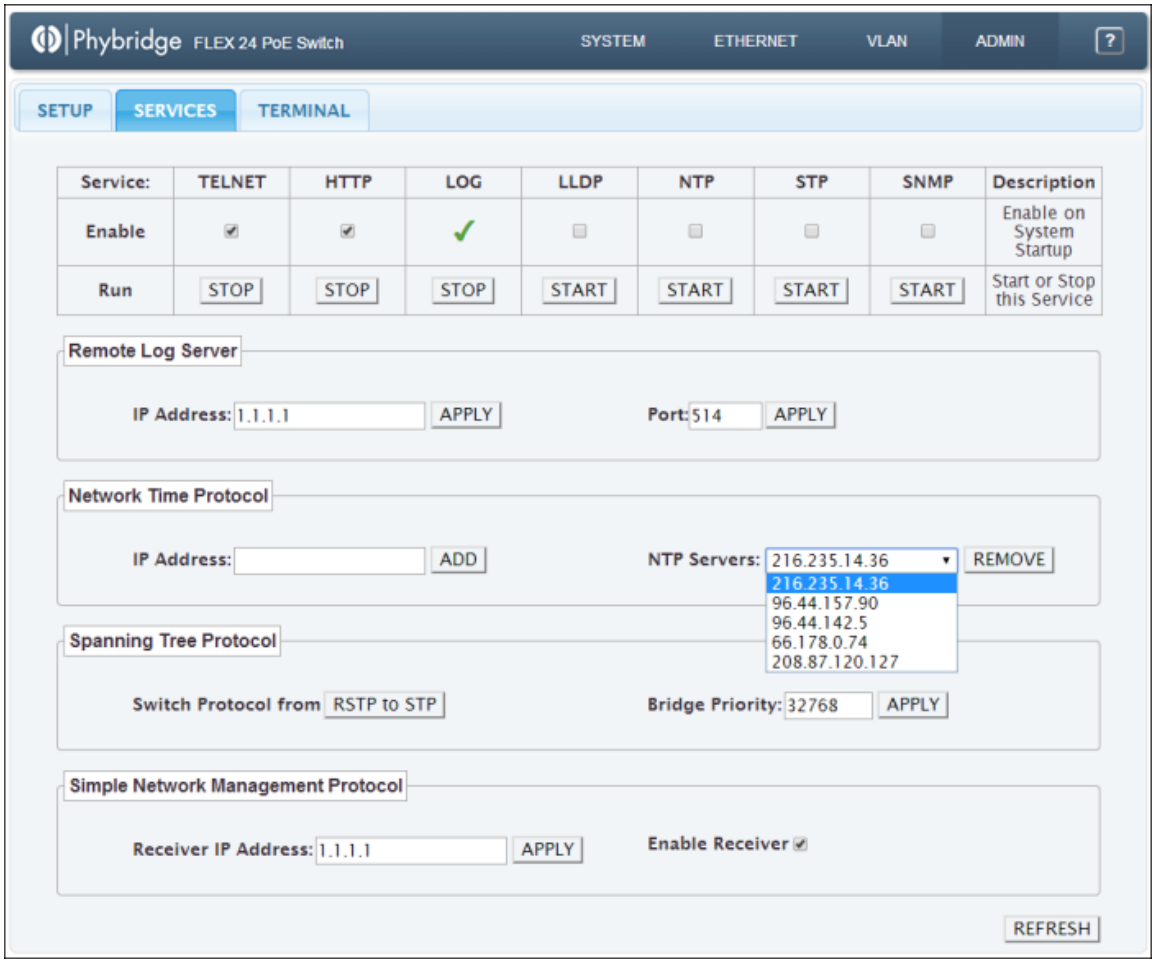
   The filename for the exported file uses the convention **<hostname>.cfg** (example: switch.cfg). This allows you to easily identify which switch the file was exported from.

2. You can modify the following settings in the configuration file:
   - switch host name and IP address
   - information for the NTP Server, SNMP Service, Syslog Server, and VLAN, and Port Enable/Disable

Import configuration to the switch

1. To import or upload the modified configuration file to the switch, click **SELECT FILE** and select the configuration file to upload.
2. Verify that you have selected the correct file and click **UPLOAD**. When the upload is complete, the configuration changes are applied immediately to the switch.

Admin > Services



Services

Use to control all the services for the switch including TELNET, HTTP, LOG, LLDP, NTP, STP and SNMP.

Service:	TELNET	HTTP	LOG	LLDP	NTP	STP	SNMP	Description
Enable	☑	☑	✓	☐	☐	☐	☐	Enable on System Startup
Run	STOP	STOP	STOP	START	START	START	START	Start or Stop this Service

Enable	Click to enable/disable a service. This determines whether the service is enabled or disabled on system startup. The Log service is always enabled. **IMPORTANT** If you disable the HTTP service, the Admin GUI will not function after a reboot. If you stop the HTTP service, you will instantly lose connectivity to the Admin GUI.
Run	Click to start or stop a service. Note that the start or shutdown of services is not instantaneous and may take up to one minute.

Remote Log Server

Use to set up a remote log server. Changes are applied immediately.

1. Enter the IP address of the remote log server and click **APPLY**.
2. (Optional) Change the port number and click **APPLY**. The default port number is 514.

Network Time Protocol

Use to configure multiple NTP servers.

1. To add a server, enter the IP address and click **ADD**.
2. To remove a server, select a server from the list and click **REMOVE**.

Spanning Tree Protocol

Use to change the spanning tree protocol. The switch supports classic STP and RSTP (rapid spanning tree protocol); the default is RSTP.

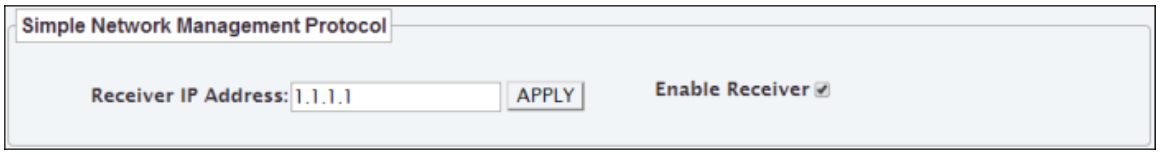
1. To change the protocol, click the **Switch Protocol** button.

   The button name changes based on the currently selected protocol. For example, if the current protocol is RSTP, the option "Switch Protocol from RSTP to STP" will be shown.
2. To change the bridge priority, use the up and down arrows to increase/decrease the priority in increments of 4096, then click **APPLY**.

CAUTION
Enabling STP in a live network will cause service disruptions to end users while the network is converging. To avoid impacting users, enabling of STP should be conducted outside of core hours or during a scheduled maintenance period. Consult the MCD Resiliency Guidelines for information on how to optimally configure STP/RSTP.

Simple Network Management Protocol

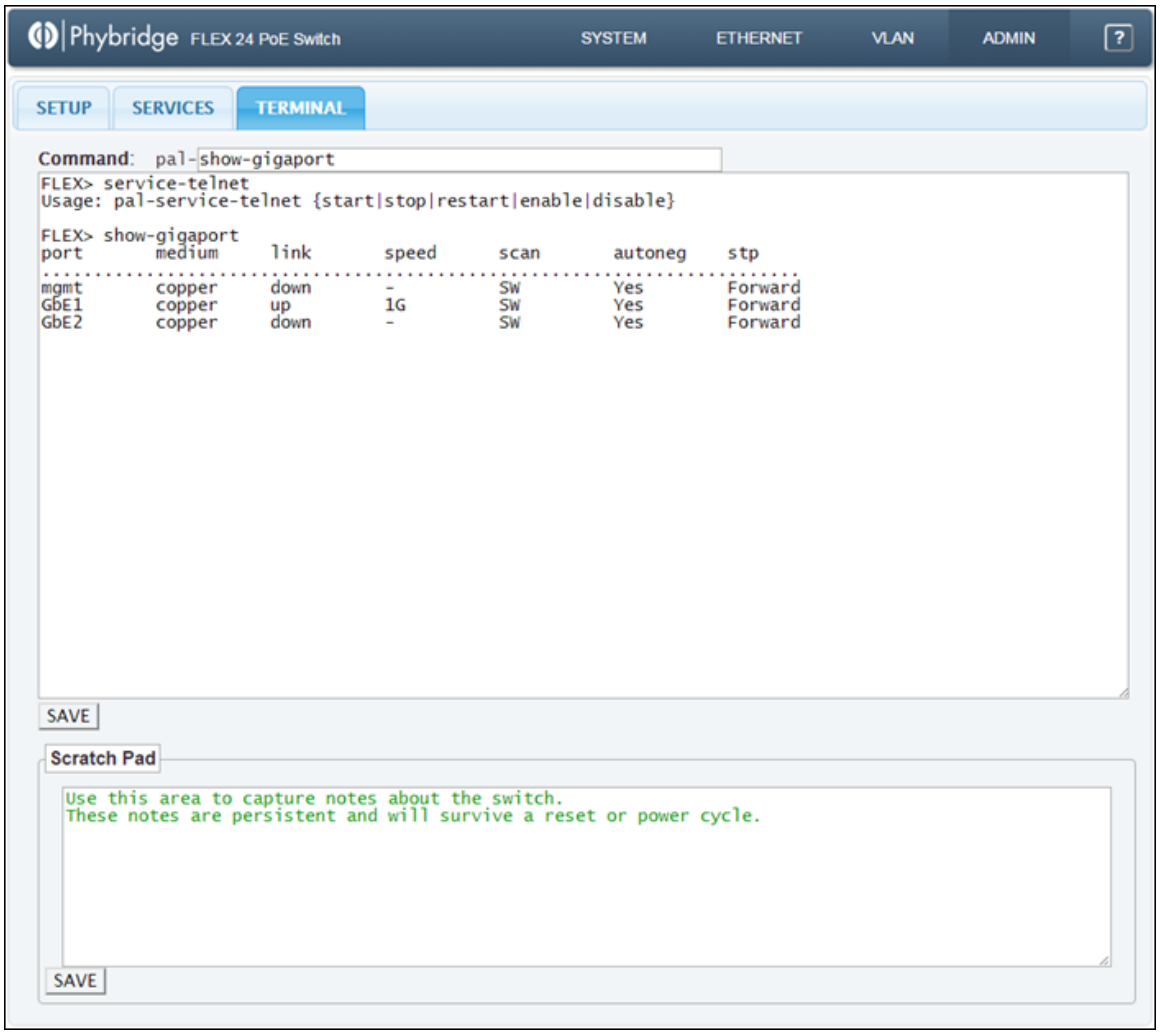
Use to modify the simple network management protocol.



1. To change the receiver IP address, enter the address and click **APPLY**.
2. To enable/disable the receiver, click the **Enable Receiver** checkbox.

Admin > Terminal

The Terminal tab provides you with a command line interface you can use to configure the switch and diagnose switch issues. You can also use this tab to add notes to the switch.



Using the Command Line Interface

1. Double-click in the **Command** field to see a list of available commands, or type the first few characters of a command to filter the list.
2. Click a command in the list to select it.
3. If necessary, enter any options for the command.

> **NOTE**
> See "Command Reference" on page 33 for a list of command options and syntax.

4. Press **ENTER** to run the command.

The results of the command appear in the area below the command. When a new command is run, the results are appended to the results from the previous command.

You can now do the following:

- Modify the text in the results area (make changes, delete text, add comments, copy and paste, etc.). Right-click in the results area to view editing options such as copy, paste and spell-check.
- Click **SAVE** to save the results in a text file. The filename for the exported file uses the convention **hostname_terminal_date_time.txt**. This allows you to easily identify which switch the file was exported from.

Adding notes to the switch

You can save notes on the switch. These notes are seen by all operators with access to the Admin GUI.

1. Type a note in Scratch Pad area. You can modify the note the same way you can modify the command results (make changes, delete text, add comments, copy and paste, etc.). Right-click in the Scratch Pad area to view editing options such as copy, paste and spell-check.
2. Click **SAVE**.

6. Command Line Interface

Command Reference

The following commands can be used in the command line interface in Admin > Terminal (see page 31).

Notes:

- Commands must be entered exactly as shown in the Usage column.
- <> denote single-value entries of a specific item, as explained within the brackets.
- { } denote a set or list or range of entries for a specific item.
- [ ] denote an optional entry.
- If you enter a command using incorrect syntax, the correct syntax will be shown.
- If you enter incorrect values for a command, you will receive a message stating that the values are not within the acceptable range.

Command	Purpose	Usage	Usage Notes
pal	Main interface for PAL.	pal help {cmd|short|long|configure|examine|persistent}	
pal-conf-edit	Modify user persistent configuration.	pal-conf-edit {show|clear} pal-conf-edit delete<LINENUMBER>	**<LINENUMBER>** is a single-value entry of the line number you wish to delete.
pal-conf-export	Export/import persistent user configuration into/from tmp/switch.cfg.	pal-conf-export {export|import}	
pal-conf-save	Save the configuration of the switch.	pal-conf-save	
pal-service-http	Enable or disable HTTP service on the switch.	pal-service-http {start|stop|restart|enable|disable}	
pal-service-lldp	Enable or disable LLDP service on the switch.	pal-service-lldp {start|stop|restart|show|enable|disable} pal-service-lldpshow {1-24|all}	

Command	Purpose	Usage	Usage Notes
pal-service-log	Configure, enable or disable LOG service on the switch.	pal-service-log {start|stop|restart} pal-service-log remote-syslog-show pal-service-log remote-syslog-ip <IP> pal-service-log remote-syslog-port <PORT>	**<IP>** is a single-value entry of the IP address of the target syslog server. **<PORT>** is a single-value entry of the syslog port number on the remote syslog server. The default is port 514. **NOTE** If you change the syslog remote IP, you are required to restart the log service.
pal-service-ntp	Enable or disable NTP service on the switch.	pal-service-ntp {start|stop|restart|enable|disable}	
pal-service-snmp	Enable or disable SNMP service on the switch.	pal-service-snmp {start|stop|restart|enable|disable} pal-service-snmp receiver {enable|disable|show} pal-service-snmp receiver-ip <ADDRESS>	
pal-service-stp	Enable or disable STP service on the switch.	pal-service-stp {GbE1|GbE2} {enable|disable} pal-service-stp service {start|stop|enable|disable} pal-service-stp proto {stp|rstp} pal-service-stp port-priority <VALUE> pal-service-stp showbridge pal-service-stp showcfg {all|bridge-priority|protocol|age|forward-delay|GbE1-cost|GbE2-cost} pal-service-stp age <6-40> pal-service-stp forward-delay <4-30> pal-service-stp port-cost {GbE1|GbE2} <0-65536>	**<VALUE>** is a single-value entry of the priority you wish to assign. This value ranges from 0-61440 and can be incremented by 4096. The default is 32768.

Command	Purpose	Usage	Usage Notes
pal-service-telnet	Enable or disable telnet service on the switch.	pal-service-telnet {start|stop|restart|enable|disable}	
TACACS	Enable or disable TACAS AAA service on the switch.	pal-service-security {show|tacacs} pal-service-security tacacs {show|enable|disable} pal-service-security tacacs server1 <IP_ADDR|IP_ADDR:PORT|HOSTNAME|HOSTNAME:PORT> pal-service-security tacacs secret1 <STRING> pal-service-security tacacs server2 <IP_ADDR|IP_ADDR:PORT|HOSTNAME|HOSTNAME:PORT> pal-service-security tacacs secret2 <STRING> pal-service-security tacacs server3 <IP_ADDR|IP_ADDR:PORT|HOSTNAME|HOSTNAME:PORT> pal-service-security tacacs secret3 <STRING> pal-service-security tacacs server4 <IP_ADDR|IP_ADDR:PORT|HOSTNAME|HOSTNAME:PORT> pal-service-security tacacs secret4 <STRING> pal-service-security tacacs timeout <SECONDS> pal-service-security tacacs accounting {on|off}	
Radius	Enable or disable Radius service on the switch.	pal-service-security {show|radius} pal-service-security radius {show|enable|disable} pal-service-security radius server1 <IP_ADDR|IP_ADDR:PORT|HOSTNAME|HOSTNAME:PORT> pal-service-security radius secret1 <STRING>	

Command	Purpose	Usage	Usage Notes
pal-set-bridged	Switch between managed and unmanaged modes.	pal-set-bridged {bridged/outband/disable}	Bridged Mode: All network services disabled and no management via ethernet. Outband Mode: All network services on GbE disabled. Management available via MGMT port. Disabled: Normal operation.
pal-set-contact	Update the point of contact for the switch.	pal-set-contact <CONTACT>	**<CONTACT>** is a single-value entry of the person's name that will be the point of contact for the switch.
pal-set-gigaport	Enable or disable uplink ports on the switch; switch between copper and fiber interfaces; add, remove, and set the default VLAN of the gigaports.	pal-set-gigaport {GbE1|GbE2|mgmt} {enable|disable} pal-set-gigaport {GbE1|GbE2} {copper|fiber} pal-set-gigaport GbE add-vlan <VLANID> {tagged|untagged} pal-set-gigaport GbE remove-vlan <VLANID> pal-set-gigaport GbE default-vlan <VLANID>	**<VLANID>** is a single-value entry of the VLANID you wish to configure.
pal-set-l2age	Set the value for the L2 age timer.	pal-set-l2age <SECONDS>	
pal-set-port	Enable or disable downlink ports 1-24.	pal-set-port <RANGE> {on|off}	**<RANGE>** is a single-value entry of the port you wish to configure. This value ranges from 1-24.

Command	Purpose	Usage	Usage Notes
pal-set-port-counters-clear	Clear various counters and alarms.	pal-set-port-counters-clear{alarms|uplink|downlink|linkdowns|poe}	
pal-set-snmp	Set SNMP system values.	pal-set-snmp sysdescr <STRING> pal-set-snmp rdcommunity <STRING> pal-set-snmp wrcommunity <STRING> pal-set-snmp location <STRING> pal-set-snmp contact <STRING>	<STRING> can not contain special characters.
pal-set-staticmac	Lock MAC addresses to specific ports.	pal-set-staticmac unlock {<1-24>|all} pal-set-staticmac lock {<1-24>} <MAC> [VLAN] pal-set-staticmac lock all	<MAC> must be specified with xx:xx:xx:xx:xx:xx notation. If VLAN is unspecified, pvid is used.
pal-set-port-vlan	Set and remove VLAN settings from a downlink port. Note that you must first use the command pal-set-vlan create 200.	pal-set-port-vlan <RANGE> add-vlan <VLANID> {tagged|untagged} pal-set-port-vlan <RANGE> remove-vlan <VLANID> pal-set-port-vlan <RANGE> default-vlan <VLANID>	**<RANGE>** is a single-value entry of the port you wish to configure. This value ranges from 1-24. **<VLANID>** is a single-value entry of the VLAN ID you wish to configure.
pal-set-sys-date	Set the date and time on the switch. The clock is a 24 hour clock.	pal-set-sys-date {YYYY-MM-DD}	**{YYYY-MM-DD}** is a range of dates, where YYYY represents the year (e.g. 1988), MM represents the month (e.g. 02 for February), and DD represents the day (e.g. 19).
pal-set-sys-gateway	Set the gateway IP of the switch.	pal-set-sys-gateway {GbE|mgmt} <GATEWAY>	<GATEWAY> can only be assigned to 1 interface at a time.

Command	Purpose	Usage	Usage Notes
pal-set-sys-hardreset **pal-set-sys-reboot**	Reboot the switch.	pal-set-sys-hardreset or pal-set-sys-reboot	
pal-set-sys-hostname	Set the hostname of the switch. Note that the following special characters are not supported: &*()".	pal-set-sys-hostname <HOSTNAME>	**<HOSTNAME>** is a single-value entry of the hostname you wish to configure.
pal-set-sys-ip	Set the IP of the switch.	pal-set-sys-ip GbE <IPADDRESS> <NETMASK> <BROADCAST> pal-set-sys-ip mgmt <IPADDRESS> <NETMASK> <BROADCAST>	**<IPADDRESS>**, **<NETMASK>**, and**<BROADCAST>** are all single-value entries for these addresses.
pal-set-sys-led	Change downlink port LED status meaning on front of the unit..	pal-set-sys-led {off|activity|link}	Off: Disable port LEDs. Activity: LEDs flash with traffic. Link: LEDs solid when link is established.
pal-set-sys-passwd	Change the user password.	pal-set-sys-passwd<USERNAME><PASSWORD>	**<USERNAME>** is a single-value entry of the username of the switch. **<PASSWORD>** is a single-value entry of the new password of the switch.
pal-set-sys-ping	Send ICMP ECHO_REQUEST packets to network hosts to verify IP-level connectivity.	pal-set-sys-ping <IP|HOST>	

Command	Purpose	Usage	Usage Notes
pal-set-sys-stimeout	Set the console session timeout.	pal-set-sys-stimeout <SECONDS>	
pal-set-sys-time	Set the system time of the switch.	pal-set-sys-time {HH:MM}	**{HH:MM}** is a range of times, where HH represents the hour (e.g. 15 is 3:xx pm), and MM represents the minutes (e.g. 45 is x:45).
pal-set-sys-timezone	Set the system timezone of the switch.	pal-set-sys-timezone list pal-set-sys-timezone timezone <TIMEZONE>	Using list will display timezone options, then set using appropriate choice.
pal-set-vlan	Create and delete VLANs on the switch.	pal-set-vlan create <VLANID> pal-set-vlan delete <VLANID> pal-set-vlan default<VLANID> pal-set-vlan clear	**<VLANID>** is a single-value entry of the VLAN ID you wish to configure.
pal-set-voltage	Set the voltage of the downlink ports.	pal-set-voltage <DECIVOLTS>	<DECIVOLTS> must be between 480 and 560. Example: 495 Decivolts is 49.5 Volts.
pal-show-bridged	Display the current bridged mode.	pal-show-bridged	
pal-show-contact	Show the name of the person who is the point of contact for the switch.	pal-show-contact	
pal-show-gigaport	Show uplink port status.	pal-show-gigaport	

Command	Purpose	Usage	Usage Notes
pal-show-l2age	Show the value of the L2 age timer in seconds.	pal-show-l2age	
pal-show-port	Show downlink port status and statistics.	pal-show-port <RANGE>	**<RANGE>** is a single-value entry of a port you wish to configure. This value ranges from 1-24.
pal-show-port-counters	Show port counters.	pal-show-port-counters <RANGE>	**<RANGE>** is a single-value entry of a port you wish to configure. This value ranges from 1-24.
pal-show-port-statistics	Show port statistics.	pal-show-port-statistics <RANGE>	**<RANGE>** is a single-value entry of a port you wish to configure. This value ranges from 1-24.
pal-show-port-status	Show port status.	pal-show-port-status <RANGE>	**<RANGE>** is a single-value entry of a port you wish to configure. This value ranges from 1-24.
pal-show-service-status	Show the current state of a specified service (or all services) on the switch.	pal-show-service-status {all|telnet|http|log|lldp|ntp|stp|snmp}	
pal-show-service-startup	Show the state of a specified service (or all services) at start-up.	-show-service-startup {all|telnet|http|lldp|ntp|stp|snmp}	

Command	Purpose	Usage	Usage Notes
pal-show-snmp	Display the set SNMP system values.	pal-show-snmp {sysdescr|rdcommunity|wrcommunity|location|contact}	
pal-show-staticmac	Show port MAC lock status.	pal-show-staticmac {<1-24>|all}	
pal-show-sys-date	Show the system date and time.	pal-show-sys-date	
pal-show-sys-gateway	Get the gateway of the switch and which port it is bound to.	pal-show-sys-gateway	
pal-show-sys-led	Show the FLEX port LED mode.	pal-show-sys-led	
pal-show-sys-log	Display a detailed system log.	pal-show-sys-log	
pal-show-sys-hostname	Show the hostname of the switch.	pal-show-sys-hostname	
pal-show-sys-ip	Show the IP addressing information from the switch.	pal-show-sys-ip	
pal-show-sys-temp	Show the temperature of the switch.	pal-show-sys-temp	
pal-show-sys-timezone	Display the current timezone of the switch.	pal-show-sys-timezone	
pal-show-vlan	Show VLAN port configuration.	pal-show-vlan	

Command	Purpose	Usage	Usage Notes
pal-show-vlan-default	Show the default VLAN's configuration.	pal-show-vlan-default {<1-24>|all|system}	<1-24> and all are port defaults, where system is the system default.
pal-show-voltage	Show the downlink voltage in Decivolts.	pal-show-voltage	
pal-version	Show the version of the software on the switch.	pal-version	

Upgrade Procedure

Use the command line interface in Admin > Terminal to upgrade, remove, and show the installed software packages on the switch (see page 31).

NOTE
Full packages will be released with every major software release; these packages will not require a certain previous version to be installed. Incremental upgrade packages will constitute non-critical but recommended upgrades. When applying incremental upgrades, all upgrades must be done in order and no upgrades can be skipped.

IMPORTANT
Exporting the switch configuration file is recommended before performing an upgrade. For details, see "Admin > Setup" on page 25.

Command	Purpose	Usage	Usage Notes
pal-pkg	Used to upgrade, remove, and show the installed software packages on the switch.	pal-pkg {show_remote|show_installed|install_all|remove_all} pal-pkginstall<REMOTE_PACKAGE_NAME> pal-pkgremove<LOCAL_PACKAGE_NAME> pal-pkg configure <URI VERSION>	**<REMOTE_PACKAGE_NAME>** is a single-value entry of the remote package name you wish to install, residing on your HTTP or FTP server. **<LOCAL_PACKAGE_NAME>** is a single-value entry of the local package name you wish to remove, residing on your switch. **<URI VERSION>** is a single-value entry of the URL of the files, residing on the server.

Notes:

- Commands must be entered exactly as shown in the Usage column.
- <> denote single-value entries of a specific item, as explained within the brackets.
- { } denote a set or list or range of entries for a specific item.

Displaying the current installed version

When performing an incremental upgrade, you will need to know the current installed version of firmware on the unit so the next upgrade can be installed. When applying incremental upgrades, all upgrades must be done in order and no upgrades can be skipped.

Example usage:

```
# pal-version
X.X.X
#
```

Incremental upgrade

1. On the server, create a directory (using any name) and place the upgrade file into the directory. Supported servers are HTTP and FTP.

   Example usage:

   http://192.168.0.10/upgrade/switch.X.X.X.bin

   http://192.168.0.10/upgrade/sources

2. From the switch command line on the Admin > Terminal tab, configure the package upgrade utility to point it to the upgrade server and subfolder. This is done with the **pal-pkg** command with the configure option **pal-pkg configure <URL><SUBFOLDER>**. In the URL, you must specify the server type (FTP:// or HTTP://) and the IP address.

   Example usage:

```
# pal-pkg configure http://192.168.0.10 upgrade
#
```

3. To verify the upgrade server and switch are now configured properly for upgrade, issue the **pal-pkgshow_remote** command (this will display the upgrade file on the server).

   Example usage:

   ```
   # pal-pkgshow_remote
   switch.X.X.X.bin
   #
   ```

4. Once the switch can access the server, use the **pal-pkg install all** command to perform the upgrade. You will be notified if a restart is required after installing and starting the upgrade. Upgrades in this fashion are done incrementally.

   Example usage:

   ```
   # pal-pkg install switch.X.X.X.bin
   Installing UPGRADE .....[OK]
   Starting UPGRADE .....[OK]
   #
   ```

Upgrade recovery and full version install

It is recommended that all upgrades are done using the incremental method. In case of problems, the following instructions can be followed.

NOTE
Holding down the reset button during the bootup process will reset the unit to the default factory settings.

Example usage:

```
# pal-pkg show
switch.X.X.X.full.bin
# pal-pkg install switch.X.X.X.full.bin
Installing X.X.X.FULL .....[OK]
Starting X.X.X.FULL .....[OK]
Restart is needed
#
```

7. Troubleshooting

Most issues can be identified from the initial System > Overview page.

- Monitor the switch **Temperature** in the System Overview panel. To see temperature pattern and threshold, go to the Performance tab.
- The shading of the port number in the Ethernet Ports table indicates any network issues; see **Viewing port status** on page 6.
- If the port number is in red text and there is a high number in the **Sync** field, there are likely physical errors with the port and/or cable.
- To further investigate a high **Sync** number, double-click on the number to view link transition statistics for the port. This historical information can help you to identify patterns of downtime (e.g. frequency, consistent time, duration, etc.).
- Hover over a port number to see the number of packets received and transmitted. For a breakdown of these, go to the Ethernet > Downlink Ports page and hover over the **Total** number.