



# SabreNet-12000-03

## 12-Port Rugged Ethernet Switch

### User Manual



Revision	Date	Comments
A.01	08/15/22	Initial Release

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## 1. IMPORTANT SAFE HANDLING INFORMATION



### **WARNING!**

#### **ESD-Sensitive Electronic Equipment**

Observe ESD-safe handling procedures when working with this product.

Always use this product in a properly grounded work area and wear appropriate ESD-preventive clothing and/or accessories.

Always store this product in ESD-protective packaging when not in use.

#### **Safe Handling Precautions**

The SabreNet 12000 contains a high density connector with many connections to sensitive electronic components. This creates many opportunities for accidental damage during handling, installation and connection to other equipment. The list here describes common causes of failure found on boards and systems returned to Diamond Systems for repair. This information is provided as a source of advice to help you prevent damaging your Diamond (or any vendor's) boards.

**ESD damage** – This type of damage is usually almost impossible to detect, because there is no visual sign of failure or damage. The symptom is that the board eventually simply stops working, because some component becomes defective. Usually the failure can be identified and the chip can be replaced. To prevent ESD damage, always follow proper ESD-prevention practices when handling computer boards.

**Power supply wired backwards** – Our power supplies and boards are not designed to withstand a reverse power supply connection. This will destroy each IC that is connected to the power supply (i.e. almost all ICs). In this case the board will most likely will be unrepairable and must be replaced. A chip destroyed by reverse power or by excessive power will often have a visible hole on the top or show some deformation on the top surface due to vaporization inside the package. **Check twice before applying power!**

## 2. INTRODUCTION

### 2.1 Description

SABRENET-12000 is a rugged system featuring a 12-port managed Ethernet switch. The system features full IP67 rating and MIL-STD-810G compatibility ideal for vehicle and other harsh environment applications. The system uses the Diamond Systems EPS-12000-CM switch offering 12 10/100/1000Mbps copper ports.

The embedded iStax software provides all switching functionality without any software development. Configuration is manageable by either an “in-band” website embedded in the software or an “out of band” serial port running a command line interface (CLI).

### 2.2 Features

#### 2.2.1 Switch Electronics

- ◆ Dual-board switch module + carrier board design
- ◆ Vitesse VSC7444 Ethernet switch with a built-in 500MHz MIPS CPU
- ◆ Vitesse VSC8522 12 port Gigabit PHY
- ◆ Programmable flash on board preprogrammed with iStax layer 2+ management software
- ◆ 12 10/100/1000 copper ports (derived from VSC8522 12 port Gigabit PHY on main board)
- ◆ Latching internal power and I/O connectors

#### 2.2.2 Mechanical and Environmental

- ◆ Dimensions: 6.40” W x 5.40” D x 3.34” H / 163 x 137 x 85mm
- ◆ 3.0545 lb (1.3854 Kg)
- ◆ 7-34VDC power input
- ◆ Built-in MIL-STD-461 filter
- ◆ -40°C to +85°C ambient operating temperature

Typical power consumption figures are provided below.

Vin (V)	Configuration	Current (A)	Power (W)
12V	No Ports Connected	0.55A	6.6W
	Single port connected	0.6A	7.2W
	12 Ports Connected from Module’s 8522 PHY	0.87A	10.44W

### 3. BLOCK DIAGRAM

SabreNet-12000 utilizes the Diamond Systems EPSM-10GX Ethernet switch module which consists of a Layer 2+ managed Ethernet switch with built-in microcontroller and memory for configuration and management. The flash memory holds dual application images along with the boot code. The NOR Flash holds the configuration parameters.

An RS-232 interface is provided to enable communication between the on-board management microcontroller and a host processor through a command line interface (CLI). The microcontroller is also accessible through one of the Ethernet ports via a web management interface.

Power is provided through the +7V-+34VDC wide-range DC power supply, enabling use with industrial power sources.

Figure 1 below provides an overview of the key functional blocks of the EPS-12000-CMH Ethernet switch, comprising of the EPSM-10GX main module and 12 port carrier board.

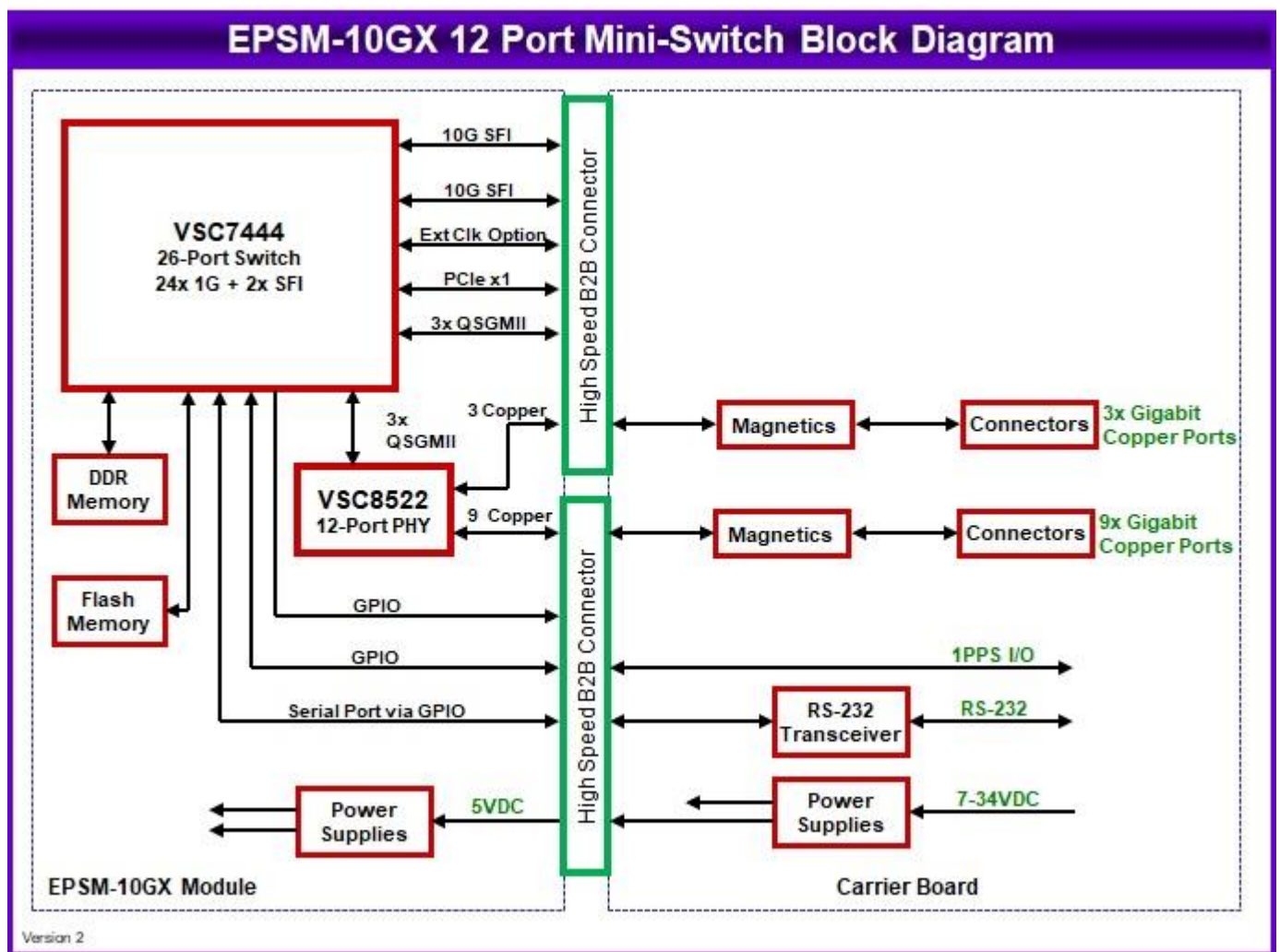
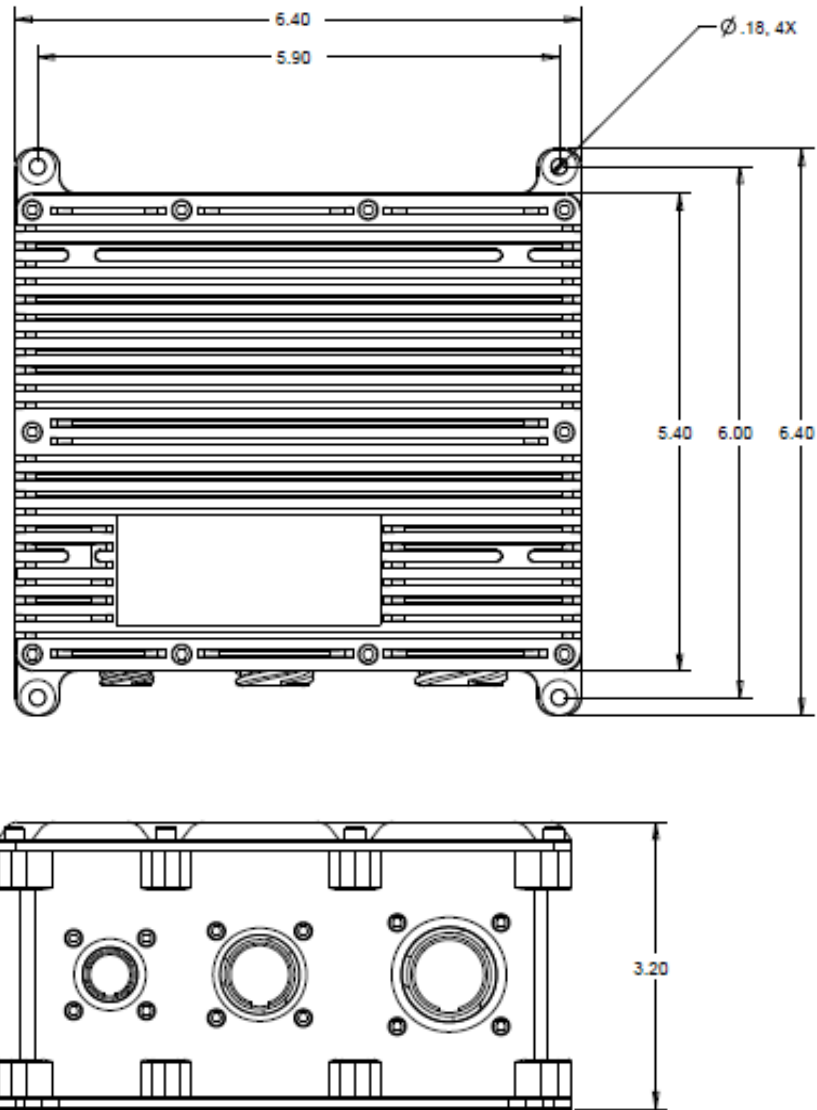


Figure 1: Functional Block Diagram of SabreNet-12000

## 4. MECHANICAL DRAWING



**Figure 2: Enclosure Details**

All dimensions are in inches.

## 5. SYSTEM LAYOUT

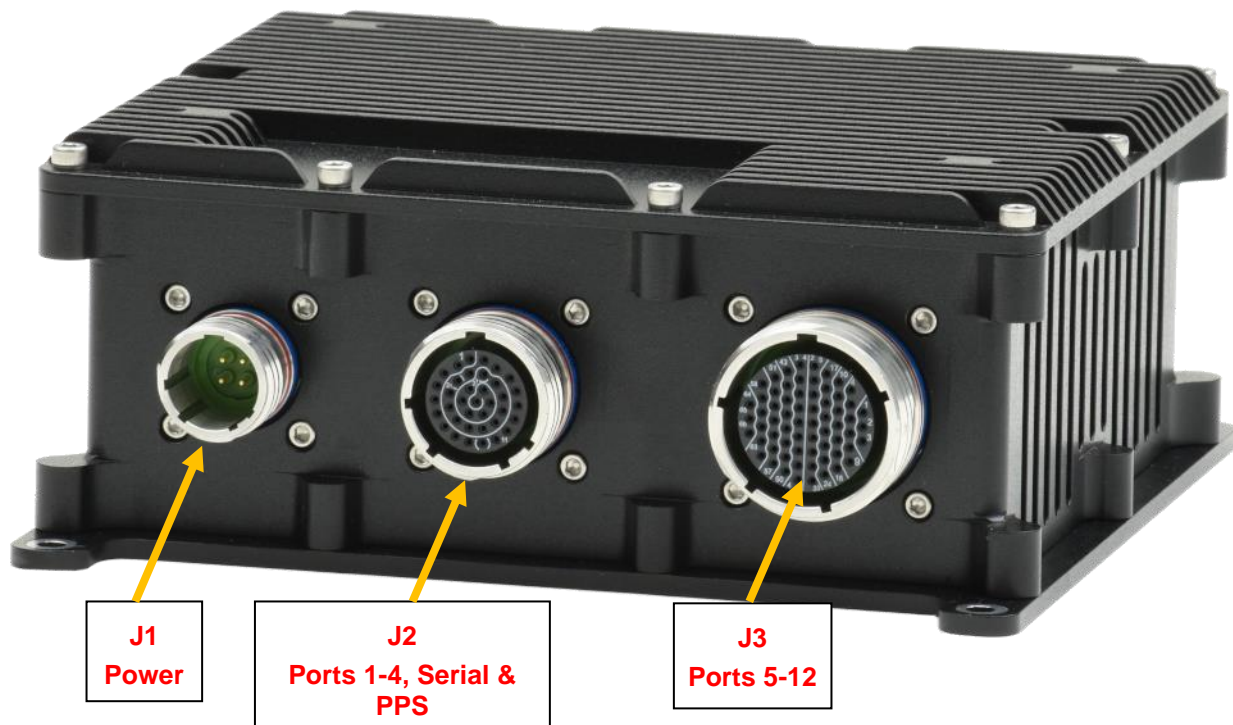


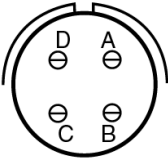
Figure 3 System Layout (front View)



## 6. CONNECTOR PINOUT AND DESCRIPTION

The SabreNet 12000 contains 3 I/O connectors of type MIL-DTL-38999 series III with olive drab cadmium finish. All D38999 connectors are wall mount type and are installed from the inside of the box with sealing gaskets and nut plates.

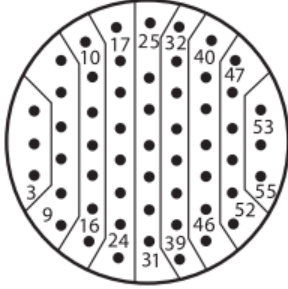
### 6.1 Power Connector J1

System connector	Connector type	MIL D38999/20JB4PN
	Description	Shell size B/11, Finish J/Cadmium olive drab, insert style 4, qty 4 size 20 pins, normal keying
	Illustration Viewed from exterior	
Mating connector	Connector type	MIL D38999/26FB4SN or equivalent
	Description	Shell size B/11, Finish F / electroless nickel plated aluminum, insert style 4, qty 4 size 20 sockets, normal keying (material / finish are user-selectable)

#### Connector pinout

D38999 Pin no.	Signal
B	Vin (+7-34V)
C	GND
A	Vin (+7-34V)
D	GND

## 6.2 I/O Connector J2

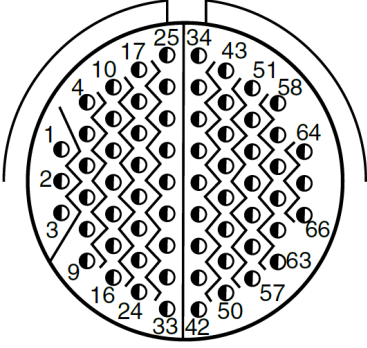
System connector	Connector type	MIL D38999/20WE35SN
	Description	Shell size D/15, Finish J/Cadmium olive drab, insert style 35, qty 55 size 22 sockets, normal keying
	Illustration Viewed from exterior	
Mating connector	Connector type	MIL D38999/26FD35PN or equivalent
	Description	Shell size D/15, Finish F / electroless nickel plated aluminum, insert style 35, qty 55 size 22 pins, normal keying (material / finish are user-selectable)

### J2 Connector pinout

D38999 Pin no.	Signal	Description
4	Port 1 3P	Port 1 Bi-directional pair D+
5	Port 1 3N	Port 1 Bi-directional pair D-
10	Port 1 2P	Port 1 Bi-directional pair C+
11	Port 1 2N	Port 1 Bi-directional pair C-
18	Port 1 1P	Port 1 Bi-directional pair B+
19	Port 1 1N	Port 1 Bi-directional pair B-
26	Port 1 0P	Port 1 Bi-directional pair A+
27	Port 1 0N	Port 1 Bi-directional pair A-
7	Port 2 3P	Port 2 Bi-directional pair D+
8	Port 2 3N	Port 2 Bi-directional pair D-
13	Port 2 2P	Port 2 Bi-directional pair C+
14	Port 2 2N	Port 2 Bi-directional pair C-
15	Port 2 1P	Port 2 Bi-directional pair B+
16	Port 2 1N	Port 2 Bi-directional pair B-
23	Port 2 0P	Port 2 Bi-directional pair A+
24	Port 2 0N	Port 2 Bi-directional pair A-
33	Port 3 3P	Port 3 Bi-directional pair D+
34	Port 3 3N	Port 3 Bi-directional pair D-
40	Port 3 2P	Port 3 Bi-directional pair C+
41	Port 3 2N	Port 3 Bi-directional pair C-
47	Port 3 1P	Port 3 Bi-directional pair B+

48	Port 3 1N	Port 3 Bi-directional pair B-
53	Port 3 0P	Port 3 Bi-directional pair A+
54	Port 3 0N	Port 3 Bi-directional pair A-
30	Port 4 3P	Port 4 Bi-directional pair D+
31	Port 4 3N	Port 4 Bi-directional pair D-
38	Port 4 2P	Port 4 Bi-directional pair C+
39	Port 4 2N	Port 4 Bi-directional pair C-
45	Port 4 1P	Port 4 Bi-directional pair B+
46	Port 4 1N	Port 4 Bi-directional pair B-
51	Port 4 0P	Port 4 Bi-directional pair A+
52	Port 4 0N	Port 4 Bi-directional pair A-
17	Ground	Digital Ground
25	TXD	RS232 Transmit output
32	RXD	RS232 Receive input
1	PPS-0	1 PPS clock Output
2	GND	Digital Ground
3	PPS-1	PPS clock Input
9	GND	Digital Ground
6	Unused	
12	Unused	
20	Unused	
21	Unused	
22	Unused	
28	Unused	
29	Unused	
35	Unused	
36	Unused	
37	Unused	
42	Unused	
43	Unused	
44	Unused	
49	Unused	
50	Unused	
55	Unused	

### 6.3 I/O Connector J3

System connector	Connector type	MIL D38999/20JF35SN
	Description	Shell size F/19, Finish J/Cadmium olive drab, insert style 35, 66 size 20 sockets, normal keying
	Illustration Viewed from exterior	
Mating connector	Connector type	MIL D38999/26FF35PN or equivalent
	Description	Shell size F/19, Finish K / passivated stainless steel, insert style 35, 66 size 22 pins, normal keying (material / finish are user-selectable)

#### J3 Connector pinout

D38999 Pin no.	Signal	Description
33	Port 5 3P	Port 5 Bi-directional pair D+
24	Port 5 3N	Port 5 Bi-directional pair D-
23	Port 5 2P	Port 5 Bi-directional pair C+
32	Port 5 2N	Port 5 Bi-directional pair C-
31	Port 5 1P	Port 5 Bi-directional pair B+
22	Port 5 1N	Port 5 Bi-directional pair B-
21	Port 5 0P	Port 5 Bi-directional pair A+
30	Port 5 0N	Port 5 Bi-directional pair A-
28	Port 6 3P	Port 6 Bi-directional pair D+
20	Port 6 3N	Port 6 Bi-directional pair D-
19	Port 6 2P	Port 6 Bi-directional pair C+
27	Port 6 2N	Port 6 Bi-directional pair C-
26	Port 6 1P	Port 6 Bi-directional pair B+
18	Port 6 1N	Port 6 Bi-directional pair B-
17	Port 6 0P	Port 6 Bi-directional pair A+
25	Port 6 0N	Port 6 Bi-directional pair A-
15	Port 7 3P	Port 7 Bi-directional pair D+
16	Port 7 3N	Port 7 Bi-directional pair D-
8	Port 7 2P	Port 7 Bi-directional pair C+
9	Port 7 2N	Port 7 Bi-directional pair C-
3	Port 7 1P	Port 7 Bi-directional pair B+

7	Port 7 1N	Port 7 Bi-directional pair B-
13	Port 7 0P	Port 7 Bi-directional pair A+
14	Port 7 0N	Port 7 Bi-directional pair A-
4	Port 8 3P	Port 8 Bi-directional pair D+
10	Port 8 3N	Port 8 Bi-directional pair D-
11	Port 8 2P	Port 8 Bi-directional pair C+
5	Port 8 2N	Port 8 Bi-directional pair C-
6	Port 8 1P	Port 8 Bi-directional pair B+
12	Port 8 1N	Port 8 Bi-directional pair B-
1	Port 8 0P	Port 8 Bi-directional pair A+
2	Port 8 0N	Port 8 Bi-directional pair A-
56	Port 9 3P	Port 9 Bi-directional pair D+
57	Port 9 3N	Port 9 Bi-directional pair D-
62	Port 9 2P	Port 9 Bi-directional pair C+
63	Port 9 2N	Port 9 Bi-directional pair C-
54	Port 9 1P	Port 9 Bi-directional pair B+
55	Port 9 1N	Port 9 Bi-directional pair B-
66	Port 9 0P	Port 9 Bi-directional pair A+
61	Port 9 0N	Port 9 Bi-directional pair A-
64	Port 10 3P	Port 10 Bi-directional pair D+
65	Port 10 3N	Port 10 Bi-directional pair D-
60	Port 10 2P	Port 10 Bi-directional pair C+
59	Port 10 2N	Port 10 Bi-directional pair C-
52	Port 10 1P	Port 10 Bi-directional pair B+
53	Port 10 1N	Port 10 Bi-directional pair B-
58	Port 10 0P	Port 10 Bi-directional pair A+
51	Port 10 0N	Port 10 Bi-directional pair A-
42	Port 11 3P	Port 11 Bi-directional pair D+
50	Port 11 3N	Port 11 Bi-directional pair D-
49	Port 11 2P	Port 11 Bi-directional pair C+
41	Port 11 2N	Port 11 Bi-directional pair C-
40	Port 11 1P	Port 11 Bi-directional pair B+
48	Port 11 1N	Port 11 Bi-directional pair B-
47	Port 11 0P	Port 11 Bi-directional pair A+
39	Port 11 0N	Port 11 Bi-directional pair A-
37	Port 12 3P	Port 12 Bi-directional pair D+
46	Port 12 3N	Port 12 Bi-directional pair D-
45	Port 12 2P	Port 12 Bi-directional pair C+
36	Port 12 2N	Port 12 Bi-directional pair C-
35	Port 12 1P	Port 12 Bi-directional pair B+
44	Port 12 1N	Port 12 Bi-directional pair B-
43	Port 12 0P	Port 12 Bi-directional pair A+

---

34	Port 12 0N	Port 12 Bi-directional pair A-
29	Unused	
38	Unused	

## 7. GETTING STARTED

This section provides the steps necessary to set up the SabreNet-12000.

1. Connect the serial cable between the connector **J2** on the carrier board and a PC's serial port. Open the HyperTerminal application with baud rate set to 115200bps.
2. Connect the Ethernet cables from PC's Ethernet port/ Ethernet Switch, to any of the connectors **J2 or J3** on the SabreNet 12000 system, depending on the number of active ports used.
3. Connect a LAN cable between the PC to any one of the desired ports on the cable(s) connected to the system in step 2.
4. The SabreNet 12000 works on a wide range of voltages from +7V to +34V. Connect the power cable between the connector **J1** and a regulated power supply.
5. Switch on the power supply and view the messages on the hyper terminal. The default user id is **admin** with no password.
6. Set the default gateway as 192.168.1.60 to access the Web interface.

## 8. USING THE CLI INTERFACE

### 8.1 Making an Initial Connection

Serial line configuration:

- 115200 baud
- 8-bit data
- No parity
- 1 stop bit

Login information

```
Username: admin
Password: {none}
```

The board is shipped with an IP address of 192.168.1.60. This allows the WEB interface to be accessed at that address.

The IP address, mask and gateway must be set according to the environment, or can enable IP and DHCP if the environment includes a DHCP server. For example:

```
# configure terminal
(config)# interface vlan 1
(config-if-vlan)# ip address dhcp
(config-if-vlan)# end
```

Below example depicts configuration of static IP address,

```
# configure terminal
(config)# interface vlan 1
(config-if-vlan)# ip address 192.168.1.60 255.255.0.0
(config-if-vlan)# end
```

Display the IP address to confirm:

```
# show ip interface brief
Vlan Address                Method  Status
-----
  1 192.168.1.60             Manual  UP
#
```

### 8.2 Login/Logout Procedures

To get access to the CLI, the user must login by entering a username and password. The user will automatically be queried about the password. The password is configurable. Log out at any time and at any context level using the exit command.



### 8.3 Help Utility

Help is provided when the ? key or entering *help* is pressed. The help information depends on the context:

- At top level, a list of command groups is displayed.
- At group level, a list of the command syntaxes for the current group is displayed.
- If the help command is issued for a specific command, the command syntax and a description of the command are shown.

### 8.4 Entering Commands

- Commands are not case-sensitive.
- Use the horizontal arrow keys, ← and →, to move the cursor within the command being entered.
- Use the backspace key (provided the user is using a terminal that sends the BS (8) character when the backspace key is pressed) to delete characters from the command being entered.
- Use the vertical arrow-keys, ↑ and ↓, to scroll through a command history buffer of the latest twenty commands issued.

### 8.5 General Command Groups

The following groups of general commands are available in the command line interface (CLI).

```
# ?
clear          Reset functions
configure     Enter configuration mode
copy          Copy from source to destination
debug         Debugging functions
delete        Delete one file in flash: file system
dir           Directory of all files in flash: file system
disable       Turn off privileged commands
do            To run exec commands in config mode
dot1x         IEEE Standard for port-based Network Access Control
enable        Turn on privileged commands
exit          Exit from EXEC mode
firmware      Firmware upgrade/swap
help          Description of the interactive help system
ip            IPv4 commands
logout        Exit from EXEC mode
more          Display file
no            Negate a command or set its defaults
ping          Send ICMP echo messages
reload        Reload system.
send          Send a message to other tty lines
show          Show running system information
terminal      Set terminal line parameters
#
```

## 8.5.1 IP Commands

1. The following commands should be used to enable the secure HTTP web redirect and secure HTTP web server. Secure web redirection cannot be enabled until the secure web server is enabled.
  - (config)# ip http secure-redirect
  - (config)# ip http secure-server
2. View status of both HTTP web server and web redirection.
  - # show ip http server secure status
3. To disable the secure HTTP web redirect and secure HTTP web server.
  - (config)# no ip http secure-redirect
  - (config)# no ip http secure-server
4. To enable the Global IGMP snooping. Unregistered IPMCv4 traffic flooding can also be enabled.
  - (config)# ip igmp snooping
  - (config)# ip igmp snooping vlan <v\_vlan\_list>
  - (config)# ip igmp unknown-flooding
5. To view the IGMP snooping and to view the IGMP router port status.
  - # show ip igmp snooping [ vlan <v\_vlan\_list> ] [ group-database [ interface ( <port\_type> [ <v\_port\_type\_list> ] ) ] [ sfm-information ] ] [ detail ]
  - # show ip igmp snooping mrouter [ detail ]
6. To disable the IGMP snooping and flooding.
  - (config)# no ip igmp snooping
  - (config)# no ip igmp snooping vlan [ <v\_vlan\_list> ]
  - (config)# no ip igmp unknown-flooding
7. To configure the IP route, to view the IP interface, route and statistics, to clear the IP route, IGMP snooping and IP statistics.
  - (config)# ip route <v\_ipv4\_addr> <v\_ipv4\_netmask> <v\_ipv4\_gw>
  - (config)# no ip route <v\_ipv4\_addr> <v\_ipv4\_netmask> <v\_ipv4\_gw>
  - # show ip arp
  - # show ip interface brief
  - # show ip route
  - # show ip statistics [ system ] [ interface vlan <v\_vlan\_list> ] [ icmp ] [ icmp-msg <type> ]
  - # clear ip arp
  - # clear ip igmp snooping [ vlan <v\_vlan\_list> ] statistics
  - # clear ip statistics [ system ] [ interface vlan <v\_vlan\_list> ] [ icmp ] [ icmp-msg <type> ]

## 8.5.2 MAC Commands

The MAC address table can be configured using the following commands. By default, dynamic entries are removed from the MAC table after 300 seconds. However, the aging time of the dynamic MAC table can be configured using the commands as well.

- (config)# mac address-table aging-time <v\_0\_10\_to\_1000000>
- (config)# no mac address-table aging-time
- (config)# no mac address-table aging-time <v\_0\_10\_to\_1000000>

The static MAC address-table can be configured, viewed and cleared using the following commands.

- (config)# mac address-table static <v\_mac\_addr> vlan <v\_vlan\_id> interface ( <port\_type> [ <v\_port\_type\_list> ] )
- (config)# no mac address-table static <v\_mac\_addr> vlan <v\_vlan\_id> interface ( <port\_type> [ <v\_port\_type\_list> ] )
- # clear mac address-table
- # show mac address-table [ conf | static | aging-time | { { learning | count } [ interface ( <port\_type> [ <v\_port\_type\_list> ] ) ] } | { address <v\_mac\_addr> [ vlan <v\_vlan\_id> ] } | vlan <v\_vlan\_id\_1> | interface ( <port\_type> [ <v\_port\_type\_list\_1> ] ) ]

## 8.5.3 VLAN/PVLAN Commands

The following commands can be used to configure the VLAN of Access Ports which is the Access VLANs. Ports in other modes are members of all VLANs specified in the Allowed VLANs field.

Private VLANs can be added or deleted here. Port members of each Private VLAN can be added or removed here. Private VLANs are based on the source port mask, and there are no connections to VLANs. This means that VLAN IDs and Private VLAN IDs can be identical. A port must be a member of both a VLAN and a Private VLAN to be able to forward packets. By default, all ports are VLAN unaware and members of VLAN 1 and Private VLAN. A VLAN unaware port can only be a member of one VLAN, but it can be a member of multiple Private VLANs.

- (config)# interface vlan <vlist>
- (config)# vlan <vlist>
- (config)# vlan ethertype s-custom-port <etype>
- (config)# no interface vlan <vlist>
- (config)# no vlan { { ethertype s-custom-port } | <vlan\_list> }
- # show interface vlan [ <vlist> ]
- # show pvlan [ <pvlan\_list> ]
- # show pvlan isolation [ interface ( <port\_type> [ <plist> ] ) ]
- # show vlan [ id <vlan\_list> | name <name> | brief ]
- # show vlan status [ interface ( <port\_type> [ <plist> ] ) ] [ combined | admin | nas | mvr | voice-vlan | mstp | erps | vcl | evc | gvrp | all | conflicts ]

## 8.5.4 dot1x (IEEE Standard for port-based Network Access Control)

The IEEE 802.1X standard defines a port-based access control procedure that prevents unauthorized access to a network by requiring users to first submit credentials for authentication. One or more central servers, the back-end servers, determine whether the user is allowed access to the network.

The network access control commands allow the user to enable or disable the NAS on the switch. If disabled all ports are allowed forwarding of frames.

The commands can also be used to configure the time interval to check for the activity on the successfully authenticated MAC address, to configure the re-authentication interval for 802.1X-enabled ports to detect if a

new device is plugged into a switch port or if a supplicant is no longer attached. The re-authentication period would determine an interval after which a connected client must be re-authenticated.

- (config)# dot1x system-auth-control
- (config)# dot1x re-authentication
- (config)# dot1x authentication timer inactivity <v\_10\_to\_100000>
- (config)# dot1x authentication timer re-authenticate <v\_1\_to\_3600>
- (config)# dot1x timeout quiet-period <v\_10\_to\_1000000>
- (config)# dot1x timeout tx-period <v\_1\_to\_65535>
- (config)# no dot1x authentication timer inactivity
- (config)# no dot1x authentication timer re-authenticate
- (config)# no dot1x re-authentication
- (config)# no dot1x system-auth-control
- (config)# no dot1x timeout quiet-period
- (config)# no dot1x timeout tx-period
- # clear dot1x statistics [ interface ( <port\_type> [ <v\_port\_type\_list> ] ) ]
- # dot1x initialize [ interface ( <port\_type> [ <plist> ] ) ]
- # show dot1x statistics { eapol | radius | all } [ interface ( <port\_type> [ <v\_port\_type\_list> ] ) ]
- # show dot1x status [ interface ( <port\_type> [ <v\_port\_type\_list> ] ) ] [ brief ]

### 8.5.5 LACP Commands

LACP commands can be used to configure the aggregation ID, Partner's ID, Partner's Key and Priority of the partner's port. The status of the ID's and the connectivity to the partner port can be viewed and cleared as well.

- (config)# lacp system-priority <v\_1\_to\_65535>
- (config)# no lacp system-priority <v\_1\_to\_65535>
- # clear lacp statistics
- # show lacp { internal | statistics | system-id | neighbour }

### 8.5.6 LLDP Commands

The following commands can be used to configure the LLDP hold-time, to configure the time taken to reinitialize LLDP after a shutdown, to configure the interval between each LLDP frame, to configure the transmission delay to transmit the new LLDP frame due to some configuration changes.

- (config)# lldp holdtime <val>
- (config)# lldp reinit <val>
- (config)# lldp timer <val>
- (config)# lldp transmission-delay <val>

Similarly, hold-time, reinit time, timer and the transmission delay can be disabled using the following commands.

- (config)# no lldp holdtime
- (config)# no lldp reinit
- (config)# no lldp timer
- (config)# no lldp transmission-delay

The following commands can be used to view LLDP neighbors, to view or clear the LLDP statistics.

- # clear lldp statistics
- # show lldp eee [ interface ( <port\_type> [ <v\_port\_type\_list> ] ) ]
- # show lldp neighbors [ interface ( <port\_type> [ <v\_port\_type\_list> ] ) ]
- # show lldp statistics [ interface ( <port\_type> [ <v\_port\_type\_list> ] ) ]

## 8.5.7 Access Management Commands

The switch will be allowed to access only if the application's type matches any one of the access management. Below are the commands to configure the access management table, where access ID, access VLAN ID, start IP address, End IP address can be set. The command can also be used to define the interface (WEB, SNMP or TELNET) from which the host can access the switch. For this to happen, the host IP address should match the IP address provided in the command.

- (config)# access management <access\_id> <access\_vid> <start\_addr> [ to <end\_addr> ] { [ web ] [ snmp ] [ telnet ] | all }
- (config)# no access management
- (config)# no access management <access\_id\_list>
- # clear access management statistics
- # show access management [ statistics | <access\_id\_list> ]

## 8.5.8 Access-list Commands

The following commands can be used to set the Access list ace ID, to set the rate limiter in pps or kbps, to disable the access list, to clear the access list statistics, and to view the access list ace status and statistics.

- (config)# access-list ace <Aceld : 1-256>
- (config)# access-list rate-limiter [ <rate\_limiter\_list> ] { pps <pps\_rate> | 100pps <pps100\_rate> | kpps <kpps\_rate> | 100kbps <kpbs100\_rate> }
- (config)# default access-list rate-limiter [ <rate\_limiter\_list> ]
- (config)# no access-list ace <ace\_list>
- # clear access-list ace statistics
- # show access-list [ interface [ ( <port\_type> [ <v\_port\_type\_list> ] ) ] ] [ rate-limiter [ <rate\_limiter\_list> ] ] [ ace statistics [ <ace\_list> ] ]
- # show access-list ace-status [ static ] [ link-oam ] [ loop-protect ] [ dhcp ] [ ptp ] [ upnp ] [ arp-inspection ] [ evc ] [ mep ] [ ipmc ] [ ip-source-guard ] [ ip-mgmt ] [ conflicts ] [ switch <switch\_list> ]

## 8.5.9 Logging Commands

The following commands can be used to enable or disable the server mode operations, and to determine the kind of messages which can be sent to the syslog sever which is possible when the logging level is set.

- (config)# logging host <v\_word45>
- (config)# logging level { info | warning | error }
- (config)# logging on
- (config)# no logging host
- (config)# no logging on
- # clear logging [ info ] [ warning ] [ error ] [ switch <switch\_list> ]
- # show logging <log\_id> [ switch <switch\_list> ]
- # show logging [ info ] [ warning ] [ error ] [ switch <switch\_list> ]

## 8.5.10 Spanning-Tree Commands

Spanning-tree commands can be used to enable or disable the spanning-tree mode enabling the user to select the protocol (STP, RSTP, MSTP), to control whether a port explicitly configured as EDGE will transmit and receive BPDUs or will disable itself upon reception of BPDU (port will enter the error-disabled state, and will be removed from the active topology), to set the interval before a port in the error-disabled state can be enabled, to set the number of BPDU's a bridge port can send per second (when exceeded, transmission of the next BPDU will be delayed).

- (config)# spanning-tree aggregation
- (config)# spanning-tree mode { stp | rstp | mstp }
- (config)# spanning-tree edge bpdu-filter
- (config)# spanning-tree edge bpdu-guard
- (config)# spanning-tree recovery interval <interval>
- (config)# spanning-tree transmit hold-count <holdcount>

To disable the Spanning-tree configurations, clear its statistics and view the spanning-tree summary.

- (config)# no spanning-tree edge bpdu-filter
- (config)# no spanning-tree edge bpdu-guard
- (config)# no spanning-tree mode
- (config)# no spanning-tree recovery interval
- (config)# no spanning-tree transmit hold-count
- # clear spanning-tree { { statistics [ interface ( <port\_type> [ <v\_port\_type\_list> ] ) ] } | { detected-protocols [ interface ( <port\_type> [ <v\_port\_type\_list\_1> ] ) ] } }
- # show spanning-tree [ summary | active | { interface ( <port\_type> [ <v\_port\_type\_list> ] ) } | { detailed [ interface ( <port\_type> [ <v\_port\_type\_list\_1> ] ) ] } | { mst [ configuration | { <instance> [ interface ( <port\_type> [ <v\_port\_type\_list\_2> ] ) ] } ] } }

## 8.5.11 Green-Ethernet Commands

Green Ethernet commands are used to configure the LEDs and to optimize their power consumption. EEE is a power saving option that reduces the power usage when there is low or no traffic utilization. EEE works by powering down circuits when there is no traffic. When a port gets data to be transmitted all circuits are powered up. The time it takes to power up the circuits is named wake-up time. The default wake-up time is 17us for 1Gbit links and 30us for other link speeds. EEE devices must agree upon the value of the wake-up time in order to make sure that both the receiving and transmitting device has all circuits powered up when traffic is transmitted. When a port is powered down for saving power, outgoing traffic is stored in a buffer until the port is powered up again.

These commands help the switch optimize EEE for either best power saving or least traffic latency, to set the interval at which the LED's intensity shall be set to the corresponding intensity, to set the interval for which the LED is ON corresponding to the particular intensity. If no intensity is specified for the next hour, the intensity is set to the default intensity.

- (config)# green-ethernet eee optimize-for-power
- (config)# green-ethernet led interval <v\_0\_to\_24> intensity <v\_0\_to\_100>
- (config)# green-ethernet led on-event { [ link-change <v\_0\_to\_65535> ] [ error ] }\*1

The following commands can be used to disable the EEE optimizations for the LEDs and also to view the status of the Green-Ethernet LEDs.

- (config)# no green-ethernet eee optimize-for-power
- (config)# no green-ethernet led interval <0~24>
- (config)# no green-ethernet led on-event [ link-change ] [ error ]
- # show green-ethernet [ interface ( <port\_type> [ <port\_list> ] ) ]
- # show green-ethernet eee [ interface ( <port\_type> [ <port\_list> ] ) ]
- # show green-ethernet energy-detect [ interface ( <port\_type> [ <port\_list> ] ) ]
- # show green-ethernet short-reach [ interface ( <port\_type> [ <port\_list> ] ) ]

### 8.5.12 Thermal-protect Commands

These commands are used to configure the current settings for controlling the thermal protection. When the temperature exceeds the configured thermal protection temperature, ports will be turned off in order to decrease the power consumption. It is possible to arrange the ports with different priorities. Each priority can be given a temperature at which the corresponding ports shall be turned off.

- (config)# no thermal-protect prio <prio\_list>
- (config)# thermal-protect prio <prio\_list> temperature <new\_temp>
- # show thermal-protect [ interface ( <port\_type> [ <port\_list> ] ) ]
- Loop-protect Commands

To inspect the current Loop Protection configurations, and possibly change them as well, to set the interval between each loop protection PDU sent on each port, to set the period for which a port will be kept disabled in the event of a loop is detected (and the port action shuts down the port).

- (config)# loop-protect
- (config)# loop-protect shutdown-time <t>
- (config)# loop-protect transmit-time <t>

To disable the loop protection for the ports and to view the loop-protect interface and its status.

- (config)# no loop-protect
- (config)# no loop-protect shutdown-time
- (config)# no loop-protect transmit-time
- # show loop-protect [ interface ( <port\_type> [ <plist> ] ) ]

### 8.5.13 QoS Commands

To set how the bandwidth of the received frames are limited (unicast, multicast or broadcast) accordingly the rate should also be set, to set the QCE ID which determines the QoS class, the following commands can be used.

- (config)# qos storm { unicast | multicast | broadcast } { { <rate> [ kfps ] } { 1024 kfps } }
- (config)# no qos qce <qce\_id\_range>
- (config)# no qos storm { unicast | multicast | broadcast }
- # show qos [ { interface [ ( <port\_type> [ <port> ] ) ] } | wred | { maps [ dscp-cos ] [ dscp-ingress-translation ] [ dscp-classify ] [ cos-dscp ] [ dscp-egress-translation ] } | storm | { qce [ <qce> ] } ]

## 8.5.14 Privilege Commands

These commands are limited to the OS running in the board.

- (config)# privilege { exec | configure | config-vlan | line | interface | if-vlan | ipmc-profile | snmps-host | stp-aggr | dhcp-pool | rfc2544-profile } level <privilege> <cmd>
- (config)# no privilege { exec | configure | config-vlan | line | interface | if-vlan | ipmc-profile | snmps-host | stp-aggr | dhcp-pool | rfc2544-profile } level <0-15> <cmd>
- # show privilege

## 8.5.15 SNMP Commands

To enable the SNMP, set the version, set the group name and security mode, and to enable or disable the Trap mode. The read and write access strings to permit access to the SNMP agent can also be set for SNMPv1 or SNMPv2c versions. As for SNMPv3 the community string will be associated with SNMPv3 communities table.

For SNMPv3 user configuration the command will include the user-name, engine ID, authentication protocol and password, privacy protocol and password. Please note that change of the engine ID will clear all original local users.

- (config)# snmp-server
- (config)# snmp-server version { v1 | v2c | v3 }
- (config)# snmp-server security-to-group model { v1 | v2c | v3 } name <security\_name> group <group\_name>
- (config)# snmp-server access <group\_name> model { v1 | v2c | v3 | any } level { auth | noauth | priv } [ read <view\_name> ] [ write <write\_name> ]
- (config)# snmp-server community v2c <comm> [ ro | rw ]
- (config)# snmp-server community v3 <v3\_comm> [ <v\_ipv4\_addr> <v\_ipv4\_netmask> ]
- (config)# snmp-server contact <v\_line255>
- (config)# snmp-server engine-id local <engineID>
- (config)# snmp-server host <conf\_name>
- (config)# snmp-server location <v\_line255>
- (config)# snmp-server trap
- (config)# snmp-server user <username> engine-id <engineID> [ { md5 <md5\_passwd> | sha <sha\_passwd> } [ priv { des | aes } <priv\_passwd> ] ]
- (config)# snmp-server view <view\_name> <oid\_subtree> { include | exclude }

To view or disable the set SNMP server settings:

- (config)# no snmp-server
- (config)# no snmp-server version
- (config)# no snmp-server security-to-group model { v1 | v2c | v3 } name <security\_name>
- (config)# no snmp-server access <group\_name> model { v1 | v2c | v3 | any } level { auth | noauth | priv }
- (config)# no snmp-server community v2c
- (config)# no snmp-server community v3 <community>
- (config)# no snmp-server contact
- (config)# no snmp-server engine-id local
- (config)# no snmp-server host <conf\_name>
- (config)# no snmp-server location
- (config)# no snmp-server trap
- (config)# no snmp-server user <username> engine-id <engineID>
- (config)# no snmp-server view <view\_name> <oid\_subtree>
- # show snmp
- # show snmp access [ <group\_name> { v1 | v2c | v3 | any } { auth | noauth | priv } ]
- # show snmp community v3 [ <community> ]



- # show snmp host [ <conf\_name> ] [ system ] [ switch ] [ interface ] [ aaa ]
- # show snmp mib context
- # show snmp mib ifmib ifIndex
- # show snmp security-to-group [ { v1 | v2c | v3 } <security\_name> ]
- # show snmp user [ <username> <engineID> ]
- # show snmp view [ <view\_name> <oid\_subtree> ]

### 8.5.16 SNMP Commands

These commands are used to enable or disable the SNMP client mode operation and to set the IPv4 or IPv6 address of a SNMP server.

- (config)# snmp
- (config)# snmp server ip-address { <ipv4\_var> }
- (config)# no snmp
- (config)# no snmp server
- # show snmp status

### 8.5.17 Radius Server Commands

These commands are used to configure the NAS-IP-Address (Attribute 4) and NAS-Identifier (Attribute 32). The IPv4 address is used as attribute 4 in RADIUS Access-Request packets. The identifier-up to 253 characters long is used as attribute 32 in RADIUS Access-Request packets.

Using the below commands a Global Secret Key, which is shared between the RADIUS server and the switch, can be set, Other features that can be set are the Global Timeout to wait for a reply from the RADIUS server before re-transmitting the request, a Global Retransmit number for which RADIUS request is sent to a server which is not responding, and the Dead Time interval for which no new RADIUS requests are sent to a sever which has failed to respond to the previous requests. Setting the Dead time will stop the switch from continually trying to contact a server that it has already determined as dead.

- (config)# radius-server attribute 32 <id>
- (config)# radius-server attribute 4 <ipv4>
- (config)# radius-server key <key>
- (config)# radius-server retransmit <retries>
- (config)# radius-server timeout <seconds>
- (config)# radius-server deadtime <minutes>

The following command is used to set the IP address of the RADIUS server, to set the UDP port to use on the RADIUS server for authentication and accounting, and to set an optional timeout, optional retransmit and optional key which overrides the global time out, global retransmit number and global key following commands can be used.

- (config)# radius-server host <host\_name> [ auth-port <auth\_port> ] [ acct-port <acct\_port> ] [ timeout <seconds> ] [ retransmit <retries> ] [ key <key> ]

The following commands can be used to view the RADIUS server running status and its statistics, and to disable all the RADIUS server settings.

- (config)# no radius-server attribute 32
- (config)# no radius-server attribute 4
- (config)# no radius-server deadtime
- (config)# no radius-server host <host\_name> [ auth-port <auth\_port> ] [ acct-port <acct\_port> ]
- (config)# no radius-server key
- (config)# no radius-server retransmit
- (config)# no radius-server timeout

- # show radius-server [ statistics ]
- # show running-config [ all-defaults ]
- # show running-config feature <feature\_name> [ all-defaults ]
- # show running-config interface ( <port\_type> [ <list> ] ) [ all-defaults ]
- # show running-config interface vlan <list> [ all-defaults ]
- # show running-config line { console | vty } <list> [ all-defaults ]
- # show running-config vlan <list> [ all-defaults ]

### 8.5.18 Banner Commands

A banner can be defined before and after log in using these commands.

- (config)# banner [ motd ] <banner>
- (config)# banner exec <banner>
- (config)# banner login <banner>
- (config)# no banner [ motd ]
- (config)# no banner exec
- (config)# no banner login

### 8.5.19 Terminal Commands

These commands are generic terminal commands used to change the settings of the terminal.

- (config)# no terminal editing
- (config)# no terminal exec-timeout
- (config)# no terminal history size
- (config)# no terminal length
- (config)# no terminal width
- # terminal editing
- # terminal exec-timeout <min> [ <sec> ]
- # terminal help
- # terminal history size <history\_size>
- # terminal length <lines>
- # terminal width <width>

### 8.5.20 Reload

```
reload { { cold | warm } [ sid <usid> ] } | { defaults [ keep-ip ] }
```

### 8.5.21 Firmware Commands

These commands can be used to upgrade the firmware through a given FTP server path and to swap the between the actual and the backup firmware images.

- # firmware swap
- # firmware upgrade <tftpserver\_path\_file>

## 8.5.22 Ping Commands

Use this command to ping the device.

- # ping ip <v\_ip\_addr> [ repeat <count> ] [ size <size> ] [ interval <seconds> ]

## 8.5.23 Debug Commands

Use these commands to debug the board.

- (config)# no debug prompt
- (config)# line { <0~16> | console 0 | vty <0~15> }
- # no debug prompt
- # debug prompt <debug\_prompt>

## 8.5.24 Security Commands

These commands can be used to set the password in encrypted form or unencrypted form or can be set to NONE, to enable or disable the AAA authentication login (console, telnet, ssh or http) and to enable or disable the execution level of the password.

- (config)# password encrypted <enry\_password>
- (config)# password none
- (config)# password unencrypted <password>
- (config)# aaa authentication login { console | telnet | ssh | http } { { local | radius | tacacs } [ { local | radius | tacacs } ] [ { local | radius | tacacs } ] }
- (config)# enable password [ level <priv> ] <password>
- (config)# enable secret { 0 | 5 } [ level <priv> ] <password>
- (config)# no aaa authentication login { console | telnet | ssh | http }
- (config)# no enable password [ level <priv> ]
- (config)# no enable secret { [ 0 | 5 ] } [ level <priv> ]
- # show aaa
- # show port-security port [ interface ( <port\_type> [ <v\_port\_type\_list> ] ) ]
- # show port-security switch [ interface ( <port\_type> [ <v\_port\_type\_list> ] ) ]

## 8.5.25 Monitor

- (config)# monitor destination interface <port\_type> <in\_port\_type>
- (config)# monitor source { { interface ( <port\_type> [ <v\_port\_type\_list> ] ) } | { cpu [ <cpu\_switch\_range> ] } } { both | rx | tx }
- (config)# no monitor destination
- (config)# no monitor source { { interface ( <port\_type> [ <v\_port\_type\_list> ] ) } | { cpu [ <cpu\_switch\_range> ] } }

## 8.5.26 POE

Power management mode and the Reserved Power of Power over Ethernet can be set using these commands. To determine the amount of power a port may use, you should define the amount of power a power source can deliver, which can also be set ranging from 0 to 2000 watts.

- (config)# poe management mode { class-consumption | class-reserved-power | allocation-consumption | allocation-reserved-power | lldp-consumption | lldp-reserved-power }
- (config)# poe supply sid <v\_1\_to\_24> <v\_1\_to\_2000>
- (config)# no poe management mode
- (config)# no poe supply [ sid <v\_1\_to\_12> ]
- # show poe [ interface ( <port\_type> [ <v\_port\_type\_list> ] ) ]

## 8.5.27 Examples

### 8.5.28 IP Configuration

Below example depicts configuration of static IP address,

```
# configure terminal
(config)# interface vlan 1
(config-if-vlan)# ip address 192.168.1.60 255.255.0.0
(config-if-vlan)# end
```

Display the IP address to confirm:

```
# show ip interface brief
Vlan Address                Method  Status
-----
  1 192.168.1.60            Manual  UP
#
```

### 8.5.29 Port Configuration

Individual ports can be configured to different speeds. The following example shows configuring speed as 100 Mbps for port 1.

```
# configure terminal
(config)# interface GigabitEthernet 1/1
(config-if)# speed ?
  10          10Mbps
  100         100Mbps
  1000        1Gbps
  auto        Auto negotiation
(config-if)# speed 100
(config-if)# end
#
```

### 8.5.30 Change Switch Password

The following example shows setting of a new password,

```
# configure terminal
(config)# password unencrypted <password>
(config)# exit
#
```

### 8.5.31 Set up VLANs

Virtual LANs (VLANs) are used to divide the network into separate logical areas. VLANs can also be considered as broadcast domains.

The following example shows setting up VLAN2 and VLAN3 with switch port mode set to access.

```
#configure terminal
(config)# vlan 2
(config)# vlan 3
```

Set access port, in this case it's assumed that port 1~3 are connected to PC. The PVID of each port is different.

```
#configure terminal
(config)# interface GigabitEthernet 1/2
(Config-if)# switchport mode access
```

```
(Config-if)# switchport access vlan 2
(config)# exit
(config)# interface GigabitEthernet 1/3
(Config-if)# switchport mode access
(Config-if)# switchport access vlan 3
(config)# exit
```

To verify a created VLAN

```
# show vlan
VLAN  Name                               Interfaces
----  -
1      default                                Gi 1/1,4-8
2      VLAN0002                               Gi 1/2
3      VLAN0003                               Gi 1/3
```

As shown above, VLAN2 is created with the name VLAN0002 and a port 2 assigned to VLAN2. Similarly port 3 assigned to VLAN0003. Remaining ports 1 & 4 to 8 are by default assigned to VLAN 1

### 8.5.32 SNMP configuration

The following example depicts the configuration of SNMP.

To enable the SNMP mode operation

```
# configure terminal
(config)# snmp-server
(config)# exit
#
```

SNMP Trap configuration

```
# configure terminal
(config)# snmp-server host Example
(config-snmp-host)# host 192.168.1.20
(config-snmp-host)# exit
(config)# exit
#
```

### 8.5.33 Mirroring

For debugging network problems or monitoring network traffic, the switch system can be configured to mirror frame from multiple ports to a mirror port. The following example depicts the mirroring of Port 2, Port 3 (RX), and Port 4 traffic to 8 (Rx) to Port 1.

```
# configure terminal
(config)# monitor destination interface GigabitEthernet 1/1
(config)# monitor source interface GigabitEthernet 1/2-3 rx
(config)# monitor source interface GigabitEthernet 1/4-8 tx
```

### 8.5.34 Setup QoS

Quality of Service (QoS) refers to the capability of a network to provide better service to selected network traffic over various technologies, including Frame Relay, Asynchronous Transfer Mode (ATM), Ethernet and 802.1 networks, SONET, and IP-routed networks that may use any or all of these underlying technologies.

The following example shows setting up the QoS. All traffic coming on Port 1 is mapped to QoS class (CoS) 2 and PCP is set as 1.

```
# configure terminal
(config)# interface GigabitEthernet 1/1
(config-if)# qos cos 2
(config-if)# qos pcp 1
(config-if)# end
```

### 8.5.35 Firmware Upgrade

A new WebStax image can be downloaded using the CLI. Copy the EPSM-10GX.dat file to a TFTP server and use the firmware upgrade command to download the file.

```
# firmware upgrade tftp://<ip_address>/<path>/EPSM-10GX.dat
#
```

### 8.5.36 Factory defaults

User can reset the configuration of the switch by below command. Only the IP configuration is retained.

```
# reload defaults
#
```

Note: To load the factory default configuration including the IP address, follow steps explained in section 10.6.1

### 8.5.1 Board Version Commands

User can verify board type by below command.

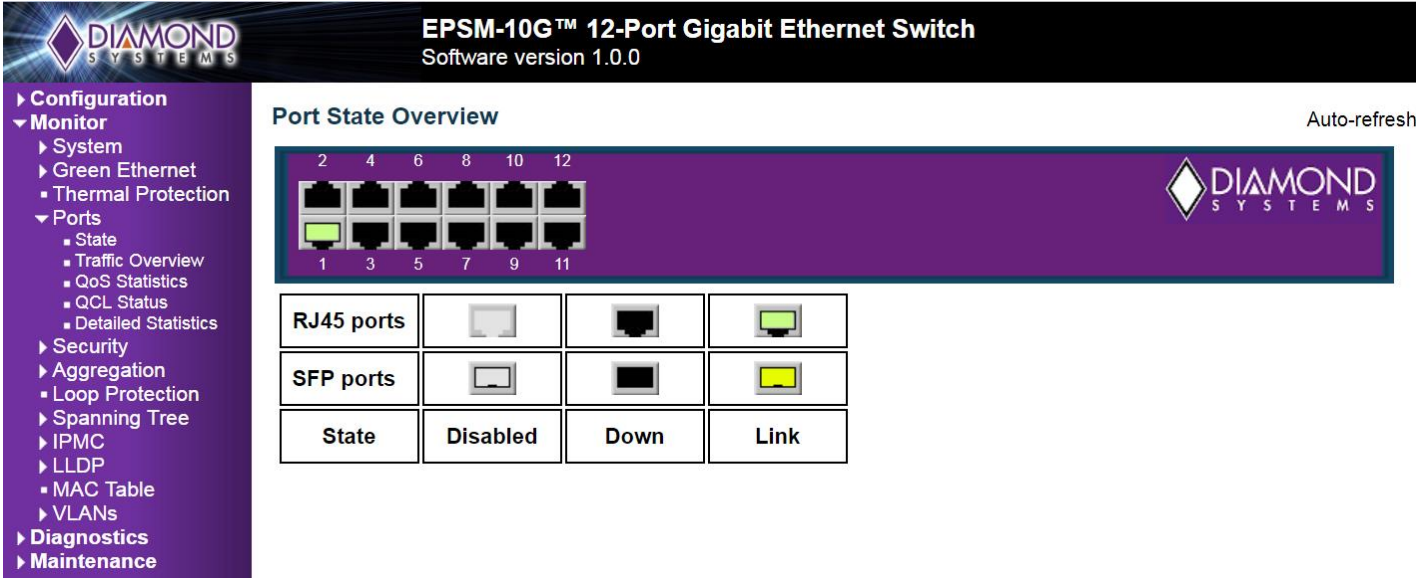
```
# show board
#
```

## 9. USING THE WEB INTERFACE

Using the web interface following functionalities can be performed:

- Set port mode
- Enable/disable flow control
- Configure simple port-based VLAN
- Configure aggregation groups
- Configure LACP parameters
- Configure QoS
- Configure SNMP
- Mirroring
- Read and clear statistics counters
- Monitor LACP status
- Configure and monitor 802.1X
- Configure and monitor IGMP snooping (if defined for switch device)
- Configure source-IP address and DHCP server filter
- Upgrade software

The GUI screens will change depending upon the number of ports connected. For EPS-12000-CM board, which has 12 ports, the GUI will be as shown below in Figure 2.



**EPSM-10G™ 12-Port Gigabit Ethernet Switch**  
Software version 1.0.0

**Port State Overview** Auto-refresh







RJ45 ports			
SFP ports			
State	Disabled	Down	Link

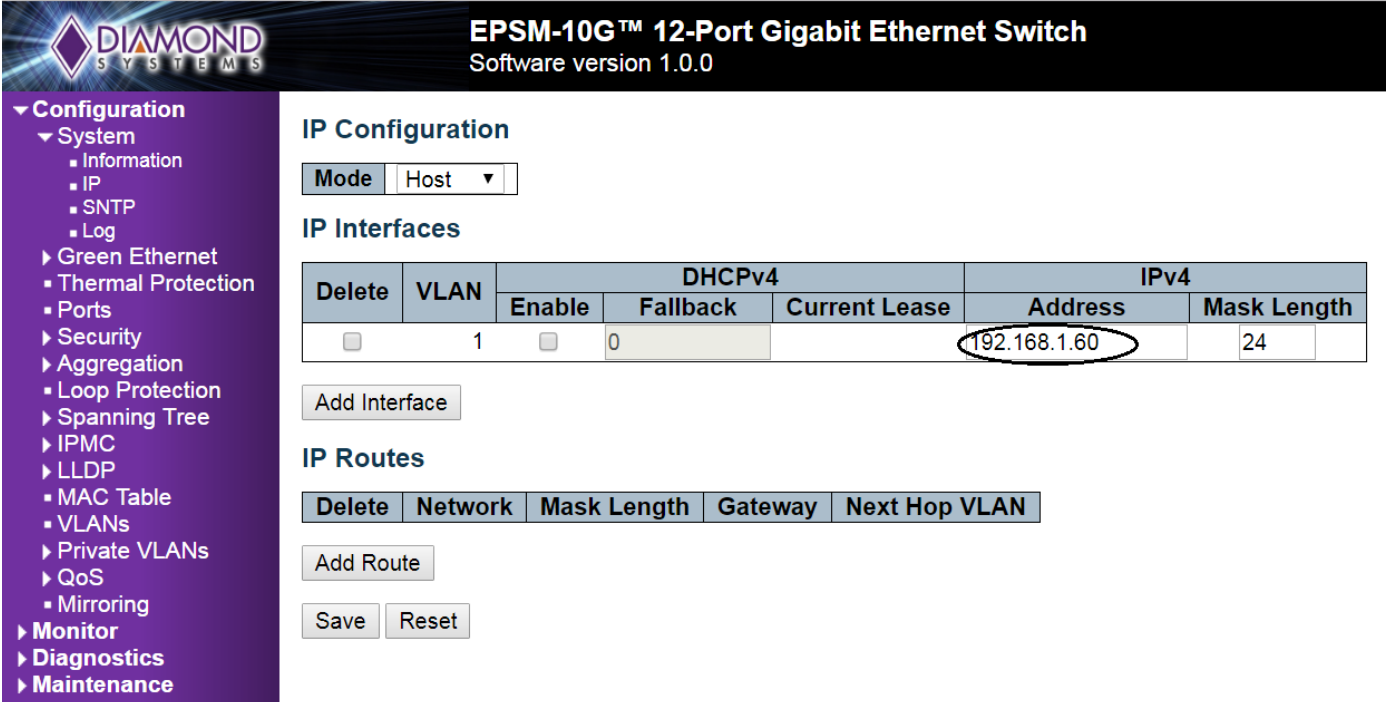
Figure 2 Home page of EPS-12000-CM carrier board.

## 9.1 Examples

### 9.1.1 IP configuration

The IP address of the switch can be configured as follows:

1. Connect to the web interface of EPS-12000-CM switch
2. Navigate to Configuration -> System -> IP
3. Modify the IP Address in IPv4 Address column
4. Click on Save.
5. Navigate to Maintenance -> Configuration -> Save Startup-Config and click on Save Configuration



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**Configuration**

- System
  - Information
  - IP
  - SNTF
  - Log
- Green Ethernet
- Thermal Protection
- Ports
- Security
- Aggregation
  - Loop Protection
  - Spanning Tree
- IPMC
- LLDP
- MAC Table
- VLANs
  - Private VLANs
  - QoS
  - Mirroring
- Monitor
- Diagnostics
- Maintenance

**IP Configuration**

Mode: Host

**IP Interfaces**

Delete	VLAN	DHCPv4			IPv4	
		Enable	Fallback	Current Lease	Address	Mask Length
<input type="checkbox"/>	1	<input type="checkbox"/>	0		192.168.1.60	24

Add Interface

**IP Routes**

Delete	Network	Mask Length	Gateway	Next Hop VLAN
--------	---------	-------------	---------	---------------

Add Route

Save Reset

Figure 3 IP Configuration



## 9.1.2 Port Configuration

Individual ports can be configured as follows:

1. Connect to the web interface of EPS-12000-CM switch
2. Navigate to Configuration -> Ports
3. Each port can be set for one of the following configurations,
  - a. Disabled – Disables the switch port operation
  - b. Auto – Port auto negotiating speed with the link partner and selects the highest speed that is compatible with the link partner
  - c. 10 Mbps HDX – Forces the cu port in 10Mbps half-duplex mode
  - d. 10 Mbps FDX – Forces the cu port in 10Mbps full-duplex mode
  - e. 100 Mbps HDX – Forces the cu port in 100Mbps half-duplex mode
  - f. 100 Mbps FDX – Forces the cu port in 100Mbps full duplex mode
  - g. 1 Gbps FDX – Forces the port in 1Gbps full duplex
4. After port configuration is done click on save
5. To save these settings permanently navigate to Maintenance -> Configuration -> Save Startup-config click on Save startup configuration

Port	Description	Link	Speed		Adv Duplex		Adv speed			Flow Control			PFC		Maximum Frame Size	Excessive Collision Mode	Frame Length Check
			Current	Configured	Fdx	Hdx	10M	100M	1G	Enable	Curr Rx	Curr Tx	Enable	Priority			
*				<>													
1		10hdx	10hdx	100Mbps HDX	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0-7	10240	<>
2		Down	Down	Auto	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0-7	10240	Discard
3		Down	Down	1Gfdx	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0-7	10240	Discard
4		Down	Down	1Gfdx	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0-7	10240	Discard
5		Down	Down	Auto	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0-7	10240	Discard
6		Down	Down	Disabled	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0-7	10240	Discard
7		Down	Down	10Mbps HDX	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0-7	10240	Discard
8		Down	Down	10Mbps FDX	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0-7	10240	Discard
9		Down	Down	100Mbps HDX	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0-7	10240	Discard
10		Down	Down	100Mbps FDX	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0-7	10240	Discard
11		Down	Down	1Gbps FDX	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0-7	10240	Discard
12		Down	Down	Auto	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0-7	10240	Discard

Figure 4 Port configuration

### 9.1.3 Change Switch Password

The switch login password can be changed as follows:

1. Connect to the web interface of EPS-12000-CM switch
2. Navigate to Configuration -> Security ->Switch -> Password
3. Enter the Old password and New Password and click on Save
4. Navigate to Maintenance -> Configuration -> Save Startup-Config and click on Save Configuration

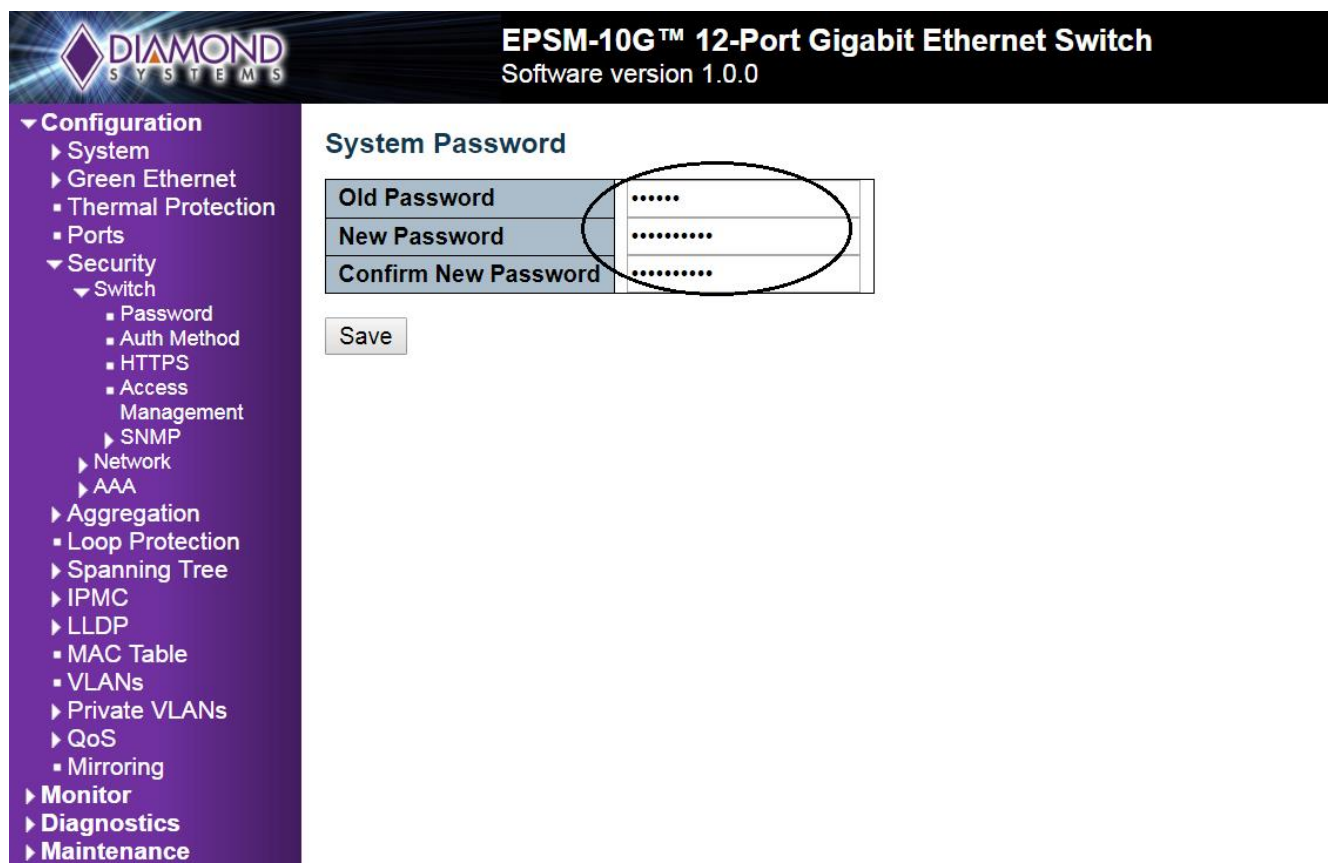
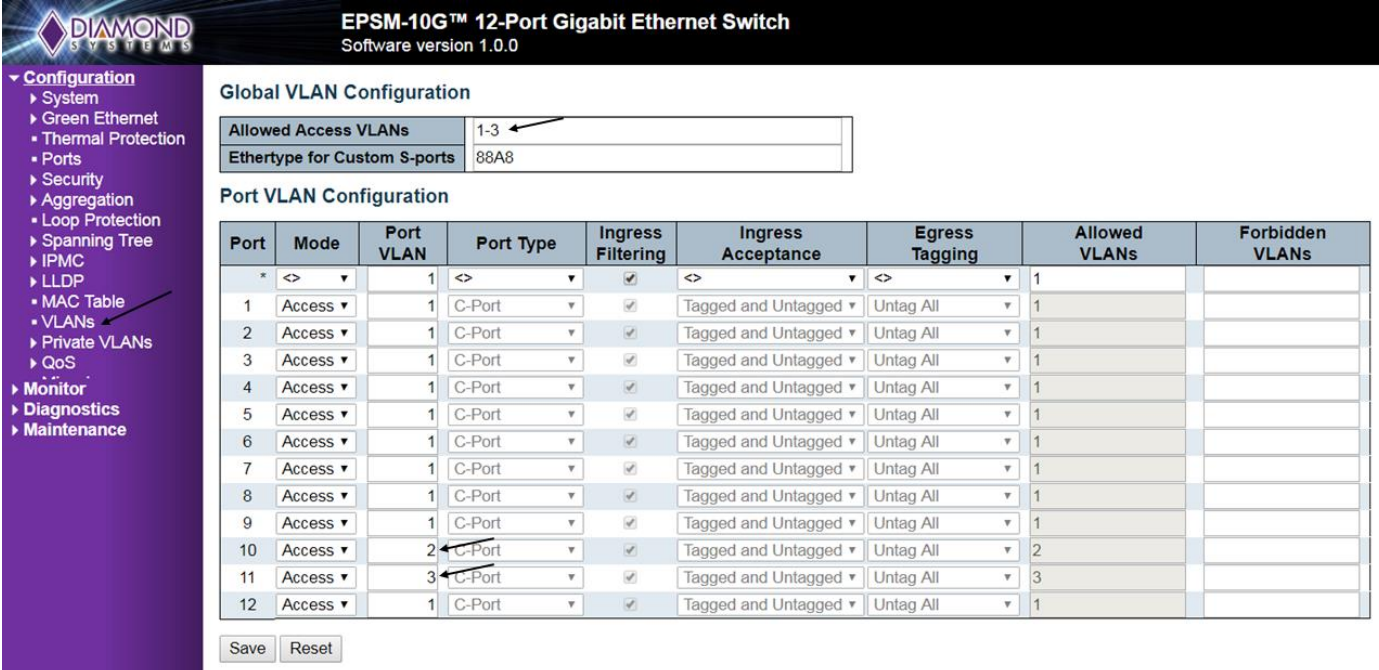


Figure 5 Changing Password

## 9.1.4 Set up VLANs

The following example shows how to configure a VLAN:

1. Connect to the web interface of EPS-12000-CM switch
2. Navigate to Configuration -> VLANS
  1. In the allowed access VLANs enter number of LANs to be created. In this example 1-3, that creates VLAN2 and VLAN3
  2. By default mode is access, it can be changed to trunk or hybrid by changing Mode drop down list
  3. Assign a ports to the virtual LANs by changing the values in the Port VLAN column
  4. Click on Save to save the VLAN configuration
  5. To save VLAN settings permanently navigate to Maintenance -> Configuration -> Save startup-config click on save startup configuration



**Global VLAN Configuration**

Allowed Access VLANs	1-3
Ethertype for Custom S-ports	88A8

**Port VLAN Configuration**

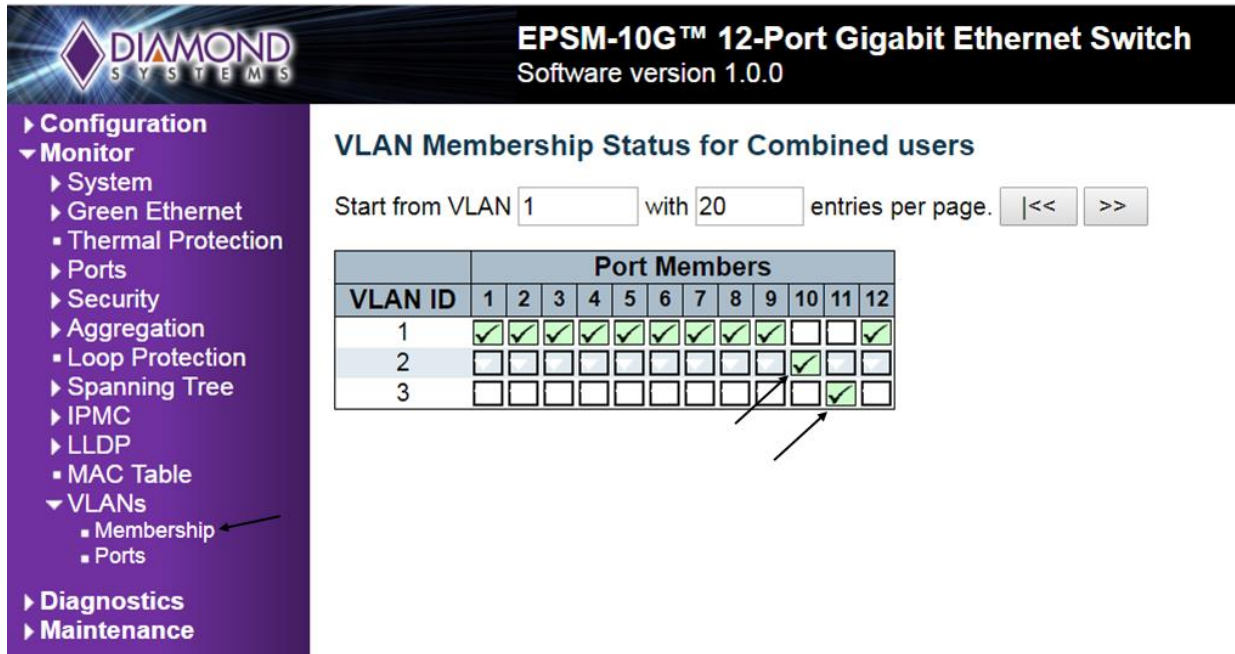
Port	Mode	Port VLAN	Port Type	Ingress Filtering	Ingress Acceptance	Egress Tagging	Allowed VLANs	Forbidden VLANs
*	<>	1	<>	<input checked="" type="checkbox"/>	<>	<>	1	
1	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag All	1	
2	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag All	1	
3	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag All	1	
4	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag All	1	
5	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag All	1	
6	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag All	1	
7	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag All	1	
8	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag All	1	
9	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag All	1	
10	Access	2	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag All	2	
11	Access	3	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag All	3	
12	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag All	1	

Save Reset

Figure 6 VLAN Setup

After saving the VLAN configuration, VLAN membership status can be verified as follows,

1. Navigate to Monitor -> VLANs -> Membership
2. Ports 1 to 9 and port 12 are assigned to VLAN ID 1, Port 10 is assigned to VLAN ID 2 and Port 11 is assigned to VLAN ID 3



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**VLAN Membership Status for Combined users**

Start from VLAN  with  entries per page.

VLAN ID	Port Members											
	1	2	3	4	5	6	7	8	9	10	11	12
1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Navigation menu (left sidebar):

- ▶ Configuration
- ▼ Monitor
  - ▶ System
  - ▶ Green Ethernet
    - Thermal Protection
  - ▶ Ports
  - ▶ Security
  - ▶ Aggregation
    - Loop Protection
  - ▶ Spanning Tree
  - ▶ IPMC
  - ▶ LLDP
    - MAC Table
  - ▼ VLANs
    - Membership
    - Ports
- ▶ Diagnostics
- ▶ Maintenance

Figure 7 VLAN Membership

### 9.1.5 SNMP configuration

The following procedure describes the SNMP configuration:


1. Connect to the web interface of EPS-12000-CM switch
2. Navigate to Configuration -> Security -> Switch -> SNMP -> System, and Enable the Mode and set the SNMP version (example: SNMP v1, SNMP v2c & SNMP v3)

Note: - *SNMP Trap configuration feature is not available currently unable to enter SNMP trap destination port address using Web UI. Please refer [SNMP configuration](#) section to configure this.*

## 9.1.6 Mirroring

For debugging network problems or monitoring network traffic, the switch system can be configured to mirror frames from multiple ports to a mirror port. The following example shows how to mirror the traffic of Port 1 (Tx) & 2(Rx) to Port 6.

1. Connect to the web interface of EPS-12000-CM switch
2. Navigate to Configuration -> Mirroring
3. Click on Save to save the mirroring configuration.


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- ▼ Configuration
  - ▶ System
  - ▶ Green Ethernet
    - Thermal Protection
    - Ports
  - ▶ Security
  - ▶ Aggregation
    - Loop Protection
  - ▶ Spanning Tree
  - ▶ IPMC
  - ▶ LLDP
    - MAC Table
    - VLANs
    - ▶ Private VLANs
  - ▶ QoS
    - Mirroring ←
- ▶ Monitor
- ▶ Diagnostics
- ▶ Maintenance

### Mirror Configuration

Port to mirror to

### Mirror Port Configuration

Port	Mode
*	<> ▼
1	Tx only ←
2	Rx only ←
3	Disabled ▼
4	Disabled ▼
5	Disabled ▼
6	Rx only ←
7	Disabled ▼
8	Disabled ▼
9	Disabled ▼
10	Disabled ▼
11	Disabled ▼
12	Disabled ▼

Figure 8 Mirroring

## Other Mirroring options -

The port displaying the mirroring is also known as the mirror port. Frames from ports that have either source (rx) or destination (tx) mirroring enabled are mirrored on this port. Disabled disables mirroring.

### Mirror Mode Configuration

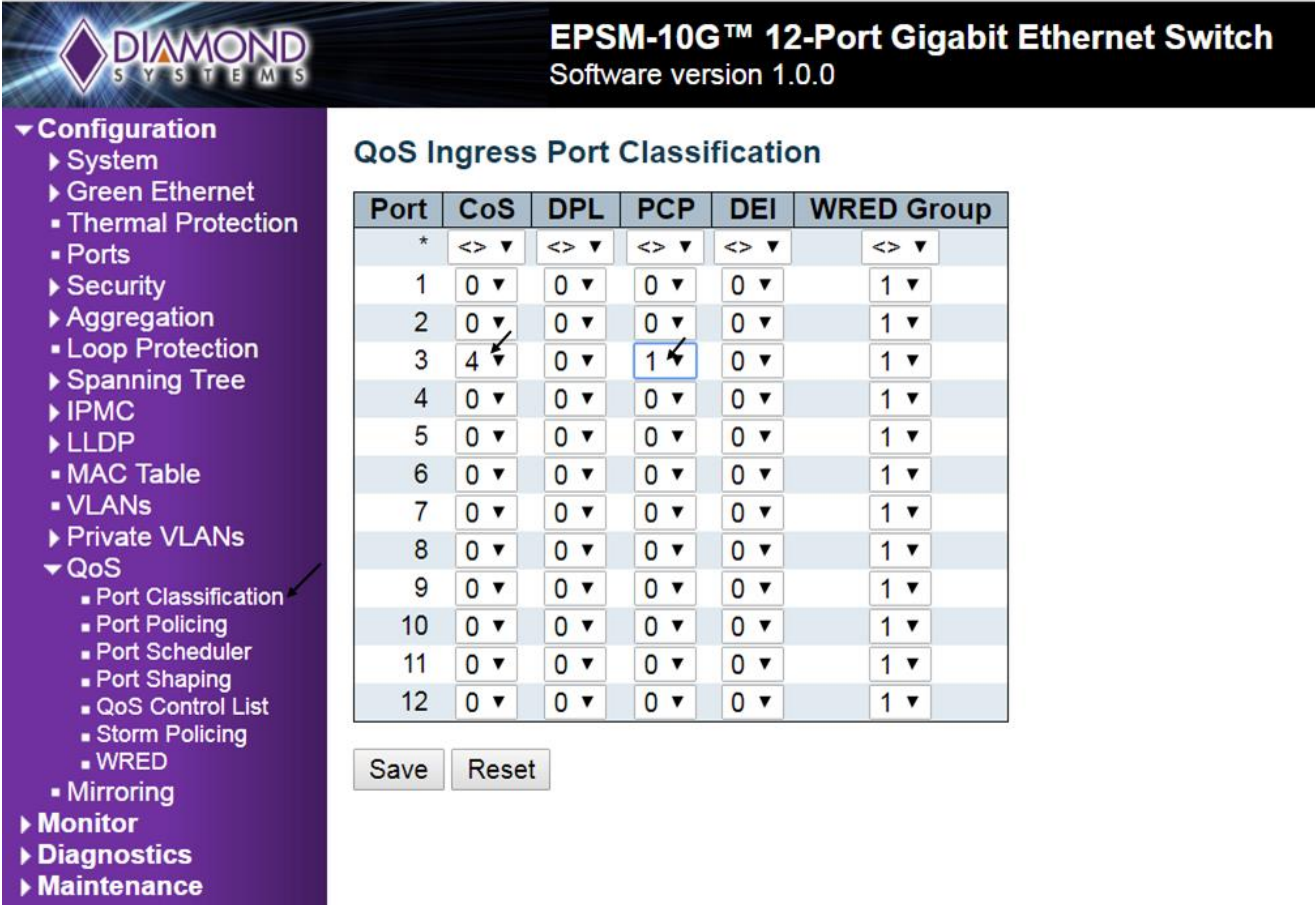
1. Rx only - Frames received on this port are mirrored on the mirror port. Frames transmitted are not mirrored
2. Tx only - Frames transmitted on this port are mirrored on the mirror port. Frames received are not mirrored
3. Disabled - Neither frames transmitted nor frames received are mirrored
4. Enabled - Frames received and frames transmitted are mirrored on the mirror port

## 9.1.7 Setup QoS

Basic QoS classification configuration can be done per port. Ingress traffic coming on each port can be assigned to a QoS class (CoS), PCP, DPL and DEI. The following example depicts the QoS ingress port classification.

All traffic coming on port 3 is mapped to Cos 4 and PCP is set as 1.

Web GUI Configuration: (Navigate to Configuration ->QoS->Port Classification)



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**QoS Ingress Port Classification**

Port	CoS	DPL	PCP	DEI	WRED Group
*	<> ▼	<> ▼	<> ▼	<> ▼	<> ▼
1	0 ▼	0 ▼	0 ▼	0 ▼	1 ▼
2	0 ▼	0 ▼	0 ▼	0 ▼	1 ▼
3	4 ▼	0 ▼	1 ▼	0 ▼	1 ▼
4	0 ▼	0 ▼	0 ▼	0 ▼	1 ▼
5	0 ▼	0 ▼	0 ▼	0 ▼	1 ▼
6	0 ▼	0 ▼	0 ▼	0 ▼	1 ▼
7	0 ▼	0 ▼	0 ▼	0 ▼	1 ▼
8	0 ▼	0 ▼	0 ▼	0 ▼	1 ▼
9	0 ▼	0 ▼	0 ▼	0 ▼	1 ▼
10	0 ▼	0 ▼	0 ▼	0 ▼	1 ▼
11	0 ▼	0 ▼	0 ▼	0 ▼	1 ▼
12	0 ▼	0 ▼	0 ▼	0 ▼	1 ▼

Save Reset

Figure 9 QoS

### 9.1.8 Web Interface Activation / Deactivation

The web interface can be activated and deactivated through either the command line interface or the web Control Panel.

Using the Control Panel, in the Configuration/Security/Switch/Access Management Configuration screen, first ensure the mode is set to Disabled as shown below. This is the default mode. If it is not set to Disabled, set it as Disabled and click Save.

This configuration should be stored on the switch with the following CLI command:

**#copy startup-config flash:{filename}**

To disable web access of the switch, in the Control Panel navigate to the Configuration/Security/Switch/Access Management Configuration screen, change the mode to Enabled and click Save.

Now there is no access to the switch using the web interface. To store this configuration in flash as the standard configuration on startup, enter the following command in the CLI:

**#copy running-config startup-config**

To allow web access of the switch in the future, enter the following commands in the CLI:

**#copy startup-config flash:backup\_config**

**#copy flash:{filename} startup-config**

Then reboot the switch.

### 9.1.9 Firmware upgrade

The following section describes the steps necessary for upgrading the firmware:

1. Connect to the web interface of EPS-12000-CM switch and navigate to Maintenance -> Software -> Upload
2. Choose the file to be uploaded and click on Upload.

Existing firmware shall be erased and new firmware is loaded, once the upgrade completes, the switch reboots automatically.



Figure 10 Firmware Upload



### 9.1.10 Save Startup configuration

This copies running-config to startup-config, thereby ensuring that the currently active configuration will be used at the next reboot. The following example describes saving the startup configuration:

3. Connect to the web interface of EPS-12000-CM switch
4. Navigate to Maintenance -> Configuration -> Save Startup-Config
5. Click on Save Configuration

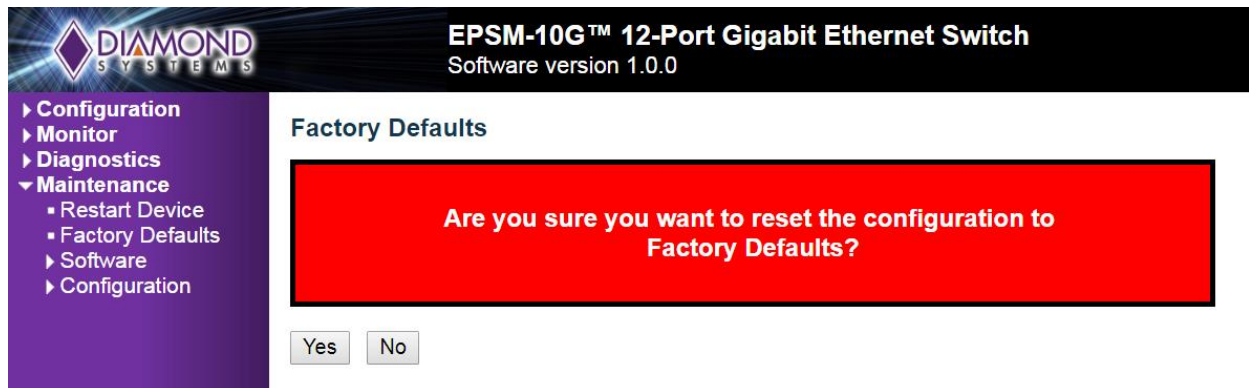


Figure 11 Save startup configuration

### 9.1.11 Factory defaults

The user can reset the configuration of the switch on this page. Only the IP configuration is retained. The new configuration is available immediately. The following procedure describes the steps for resetting the factory defaults:

1. Connect to the web interface of EPS-12000-CM switch
2. Navigate to maintenance -> Factory defaults
3. Click on Yes for a confirmation message



## 10. SOFTWARE FEATURE LIST

Switch Type	12 port Layer 2+ switch
Number of Ports	12 10/100/1000Mbps Ethernet ports with non-blocking wire-speed performance
On-board Memory	4Mb packet memory Shared memory buffer with per-port & CoS memory management
MEF	Hierarchical MEF compliant policing & scheduling MEF E-Lane, E-Line, and E-Tree services
Frame Buffer	Jumbo frame support at all speeds
VLAN	IEEE 802.1Q VLAN switch with 8K MACs and 4K VLANs Push/pop up to two VLAN tags Independent & shared VLAN learning (IVL, SVL)
Multicast	IPv4 and IPv6 multicast group support
Remarking	Dual leaky bucket policers with remarking and statistics
Classifier	8 priorities and 8 CoS queues per port with strict or deficit-weighted round robin scheduling Shaping/policing per queue and per port
Storm Control	Policing with storm control and MC/BC protection
Link Aggregation	IEEE 802.3ad
Security	Advanced security and prioritization available through multistage TCAM engine
RSTP	Rapid Spanning Tree Protocol (IEEE 802.1W) and MSTP
MIBs	Support for both WebStax and CEServices MIBs
Power Management	ActiPHY and PerfectReach power management VeriPHY cable diagnostics
Serial Port	1 RS-232 port for host interface
Standalone Capable	Standalone network switch, or in combination with a host computer