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EPSM-10GX

Ultra-Compact Managed 26-Port Gigabit Ethernet Switch Module



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EPSM-10GX

Managed Gigabit Ethernet Switch Module with
2x 10G SFI, 12x GbE, 3x QSGMII

User Manual rev A3



Revision No	Release Date	Comments
A0	09/07/18	Initial Release
A2	05/24/2019	Updates
A3	10/9/2019	Modified and added content.

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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

Diamond Systems' Boards are designed with complex circuitry and electronic components that are ESD-sensitive. This increases the likelihood of the boards incurring accidental damage during handling, installation and connection to other equipment.

It is highly recommended that the following precautionary measures and best practices be observed in a sequential order:

- Wear an anti-static Wristband/Strap or/and an antistatic Lab Coat or/and Rubber-soled shoes.
- Spread anti-static mats over the table or work surface or/and anti-static mats on the floor.
- Unpack components and remove them from their anti-static bags only when they are ready to be used.
- Avoid ungrounded surfaces such as plastic, carpets, floors, or tables, in the work area.
- Handle boards by the edges and the metal mounting brackets. Avoid touching components on the boards and the edge connectors that connect to expansion slots.

The following information describes common causes of failure found on boards and components returned to Diamond Systems for repair. It is provided as a guideline to avoid accidental damage.

ESD Damage: This type of damage is typically impossible to detect because there is no visible sign of failure or damage. In this type of damage, the board ceases to function entirely due to some defective components. Usually, the fault can be identified and the chip replaced.

To prevent ESD damage, always follow proper ESD-prevention practices when handling computer boards.

Damage During Handling or Storage: Physical damage on boards also occur due to mishandling. A common observation is that of a screwdriver slipping on the board during installation, causing a gouge on the PCB surface, cutting signal traces or damaging components.

Other common observations are damaged board corners, indicating the board was dropped. This may or may not cause damage to the circuitry, depending on components located near the edges. Most DSC boards are designed with minimum 25 mils clearance between the board edge and component pad. The ground/power planes are located minimum 20 mils from the edge to avoid possible shorting from this type of damage. However, these design rules do not prevent damage in all situations.

Sometimes boards are stored in racks with slots that grip the edge of the board. This is a common practice for board manufacturers. Though, DSC boards are resilient to damages, the components located close to the board edges can be damaged or even knocked off the board if the board lies tilted in the rack.

Diamond Systems recommends that all DSC boards be stored only in individual ESD-safe packaging units. If multiple boards are stored together, they should be contained in bins with dividers placed between the boards. Do not pile boards on top of each other or cram too many boards within a small location. This can cause damage to connector pins or fragile components.

Bent Connector Pins: This type of problem can be resolved by re-bending the pins to their original shape using needle-nose pliers.

The most common cause of a bent connector pin is when the board is pulled off the stack by tugging it at angles from one end of the connector to the other, in an effort to release it off the stack. Tugging the board off the stack in this manner can bend the pin(s) significantly.

A similar situation can occur when pulling a ribbon cable off a pin header. If the pins are bent too severely, bending them back can cause them to weaken or break. In this case, the connector must be replaced.

Short Circuit Failures: There are various causes for a short circuit to occur and disrupt the electrical flow of the circuitry, causing the board to malfunction or cease to function entirely.

A short can be difficult to identify since its symptoms are often not visible.

Some common causes such as slipping of a metal screwdriver tip, or a screw dropping onto the board while it is powered-up, can cause a short between a power pin and a signal pin on a component, leading to circuit damage, over-voltage, and power supply problems.

To avoid such damages, assembly operations must be performed when the system is powered off.

Power Supply Wired Backwards: DSC power supplies and boards are not designed to withstand a reverse power supply connection. This will destroy almost all ICs connected to the power supply. In this case the board will most likely be irreparable and must be replaced. A chip destroyed by reverse or excessive power will often have a visible hole or show some deformation on the surface due to vaporization inside the package.

IMPORTANT! Always check twice before Powering Up!

2. INTRODUCTION

2.1 Overview

The EPSM-10GX is a Managed Layer 2+ / Layer 3 Ethernet Switch in an ultra-compact sized module measuring 2.2" x 3.3" (55 x 84 mm). It is designed around the Vitesse / Microsemi / Microchip VSC7444 Ethernet switch and VSC8522 12-port integrated Gigabit Ethernet (GE) PHY. With these components the EPSM-10GX can provide up to 2 10Gbps SFI Ethernet ports and 12 1Gbps copper Ethernet ports. When used with IStax software the EPSM-10GX offers true hardware-accelerated Layer 3 routing performance.

The EPSM-10GX Module requires a carrier board to implement a complete Ethernet switch. The carrier board provides the input power supply, magnetics, I/O connectors, and optional second VSC8512 or VSC8522 PHY for up to 12 additional 1G ports. The EPSM-10GX can be purchased alone and used with a customer-designed carrier board, or it can be purchased as an integrated solution with a Diamond-designed carrier board. Available integrated solutions from Diamond include:

EPS-12000-CM 12x 1Gbps copper Ethernet ports; available with heat sink or heat spreader

EPS-24G2X 24x 1Gbps copper Ethernet ports + 2x 10G SFP+ sockets; heat sink cooling

Diamond Systems can also provide custom carrier board design and manufacturing services to implement a solution precisely tailored to a customer's requirements.

2.2 Key Features

- Vitesse VSC7444 Ethernet Switch with a built-in 500MHz MIPS CPU
- Vitesse VSC8522 12 port Gigabit PHY
- 3x QSGMII Interface for expansion to additional 12 1G ports
- 2x 10Gbps SFI Interface
- Programmable flash with application image
- Compact "COM Express Type 10" form factor: 3.307" x 2.165" / 84mm x 55mm
- +5 VDC input voltage
- -40°C to +85°C ambient operating temperature with proper cooling solution

2.3 Embedded Software

The EPSM-10GX and integrated switch products are available with two software packages:

WebStaX Layer 2+ software, default package included with base models

IStax Layer 3 software including routing and IEEE1588 Precision time Protocol (PTP) capability

2.4 Models

For ordering part numbers please see the table below or visit www.diamondsystems.com for the latest information.

<i>Part Number</i>	<i>1G Ports</i>	<i>10G Ports</i>	<i>Embedded Software</i>	<i>Thermal Solution</i>
EPS-24G2X	24	2	WebStaX Layer 2+	Heat Sink
EPS-24G2X-1588	24	2	iStaX Layer 3	Heat Sink
EPS-12000-CM	12	0	WebStaX Layer 2+	Heat Sink
EPS-12000-CM-1588	12	0	iStaX Layer 3	Heat Sink
EPS-12000-CMH	12	0	WebStaX Layer 2+	Heat Spreader
EPS-12000-CMH-1588	12	0	iStaX Layer 3	Heat Spreader

2.5 Development Kit

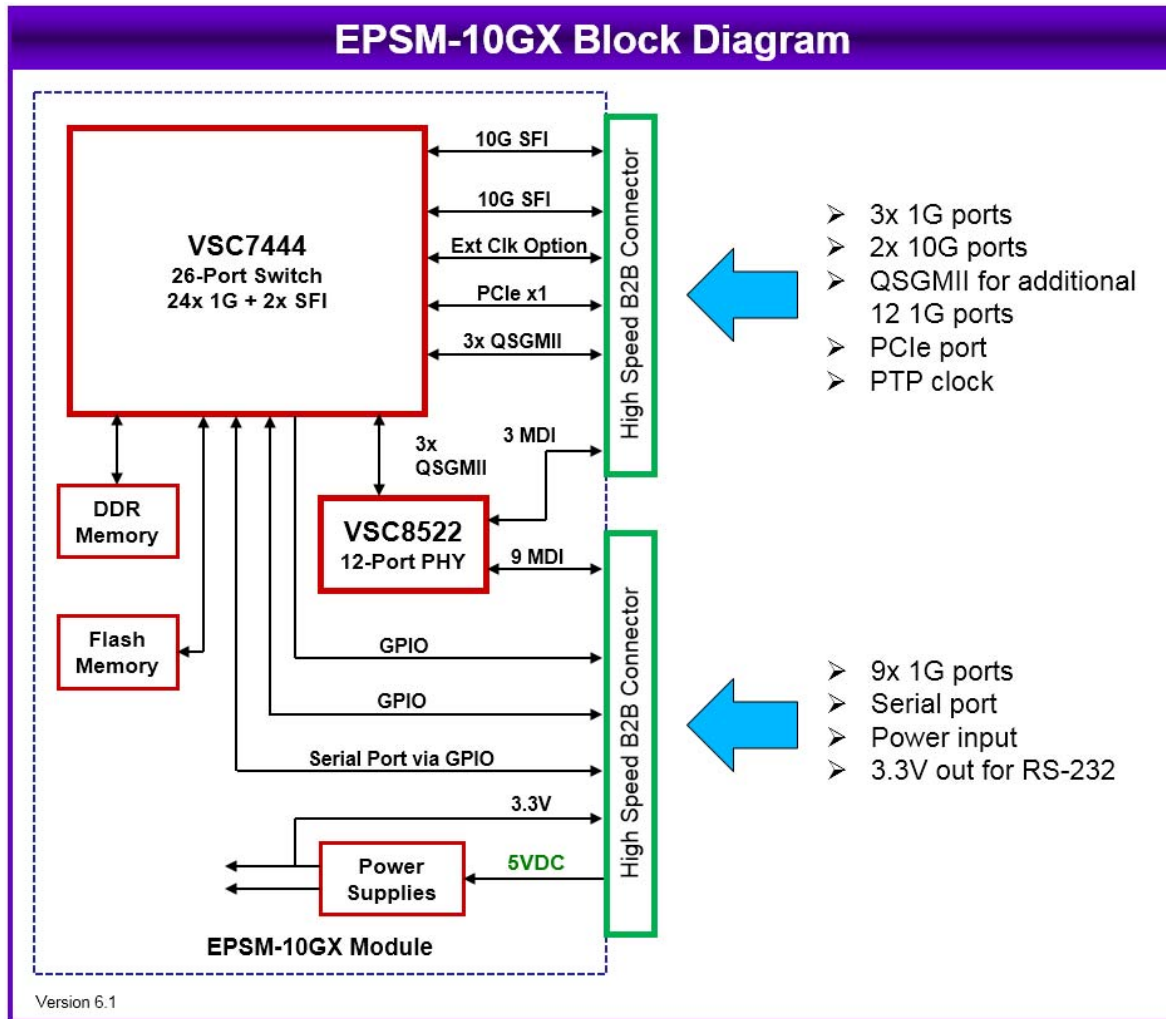
A development kit is available to evaluate the performance of the EPSM-10GX. It provides technical information needed to implement a custom carrier board solution. The development kit consists of the EPSM-10GX module installed on the EPS-24G2X carrier board, offering access to all features of the switch module. The kit includes the following support items:

- Schematics of the EPS-24G2X carrier board
- PCB source file of the EPS-24G2X carrier board
- Bill of Materials for the EPS-24G2X carrier board
- CPLD source code and programming file for the LED logic
- Power supply information
- Mechanical details for mounting the module on the carrier board

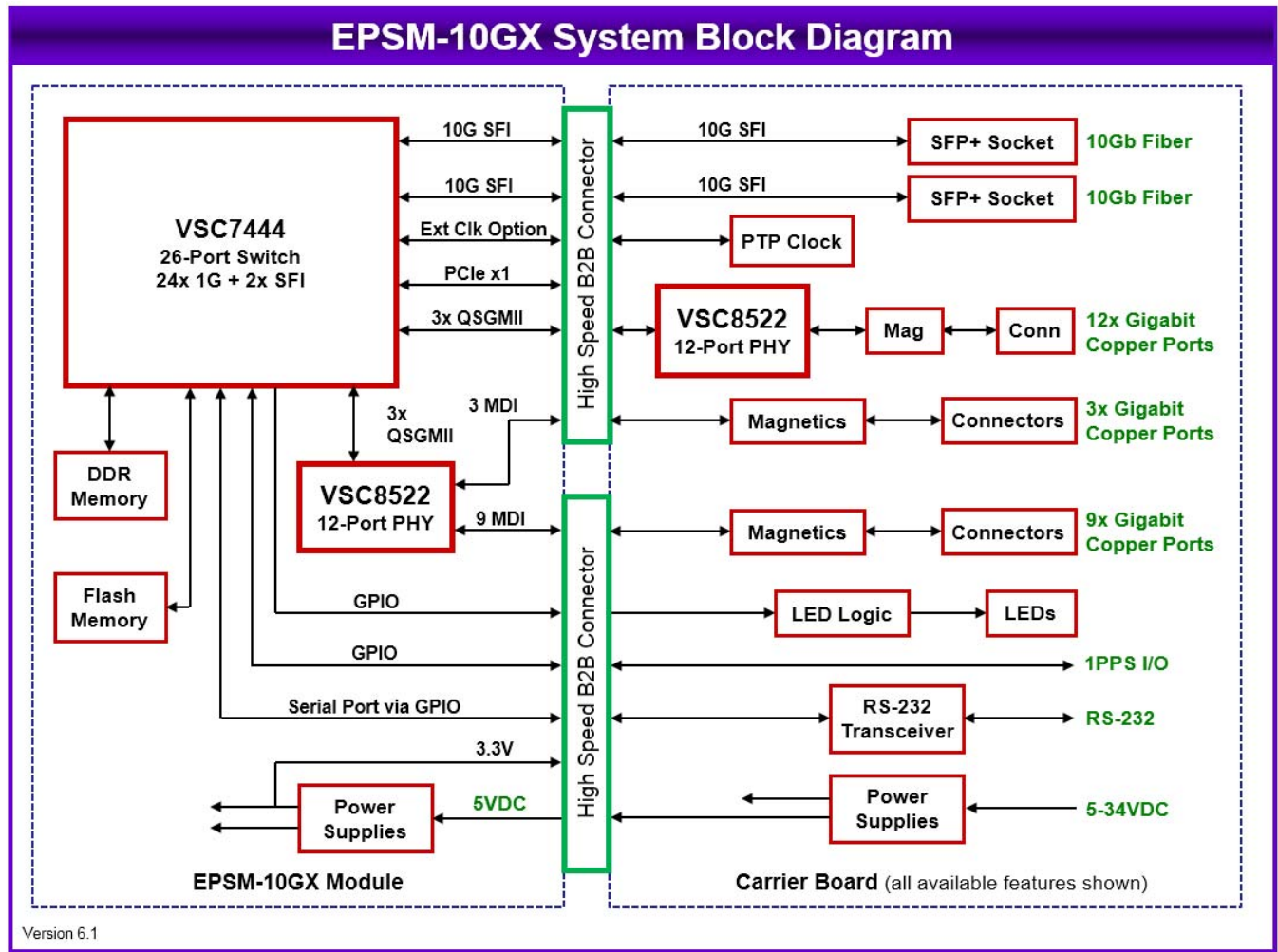
Purchase of a development kit is strongly recommended to assist in rapid development of a custom solution with reduced opportunity for design errors.

3. BLOCK DIAGRAMS

The below diagram illustrates the main features and architecture of the EPSM-10GX module.



The below diagram illustrates the overall system architecture of the module installed in a carrier board. The carrier board may implement any subset of the features shown.



4. PERIPHERAL CIRCUITS

4.1 LED Indicators

A serial data stream provides LED signals for the 1G and 10G ports are available on the board-to-board connector **J1**. The following schematic diagrams represent the required logic to utilize the serial data stream. CPLD code to implement this logic is available from Diamond Systems via the EPSM-10GX development kit.

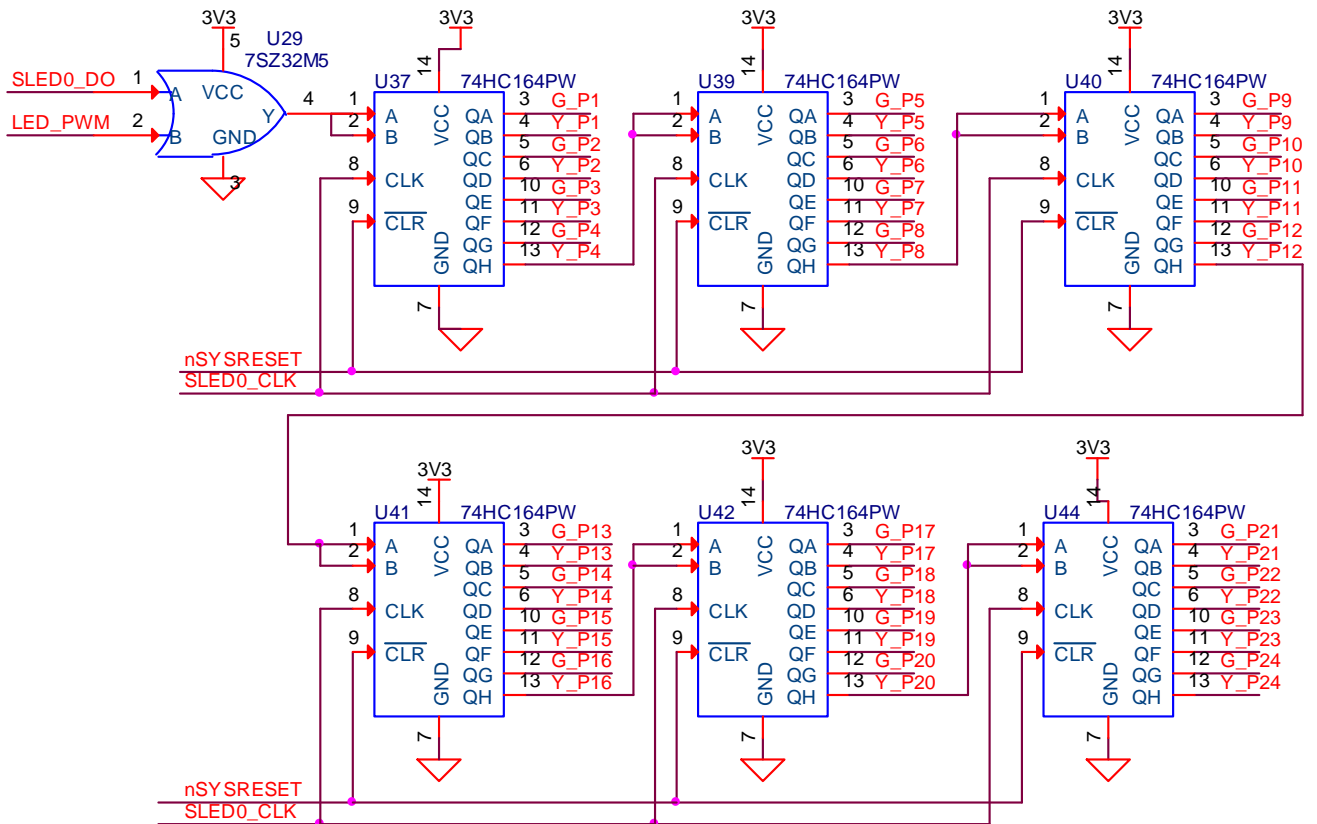


Figure 4-1: Ethernet LED Logic Specification

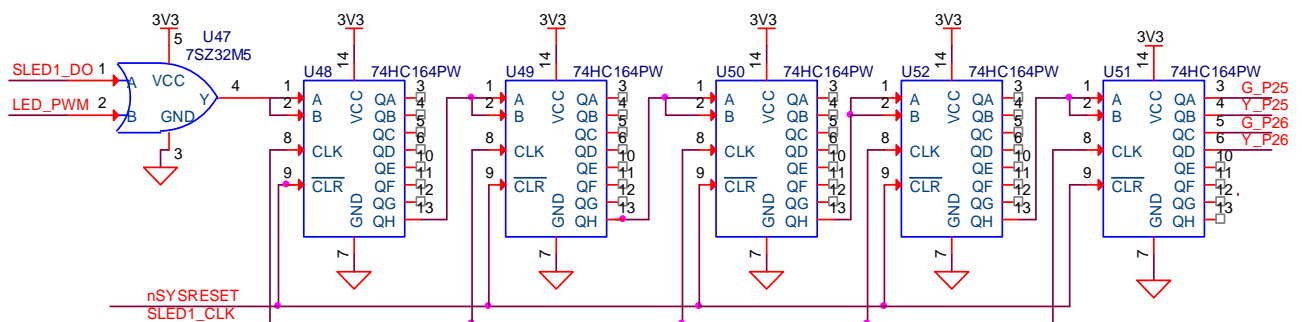


Figure 4-2: SFP LED Logic Specification

4.2 Small Form Factor Pluggable Sockets

The EPSM-10GX Module provides two 10Gbps SFI ports which may be used to drive two Small Form Factor Pluggable (SFP+) sockets on the carrier board. The circuit below shows the recommended interface circuit for the SFP+ sockets.

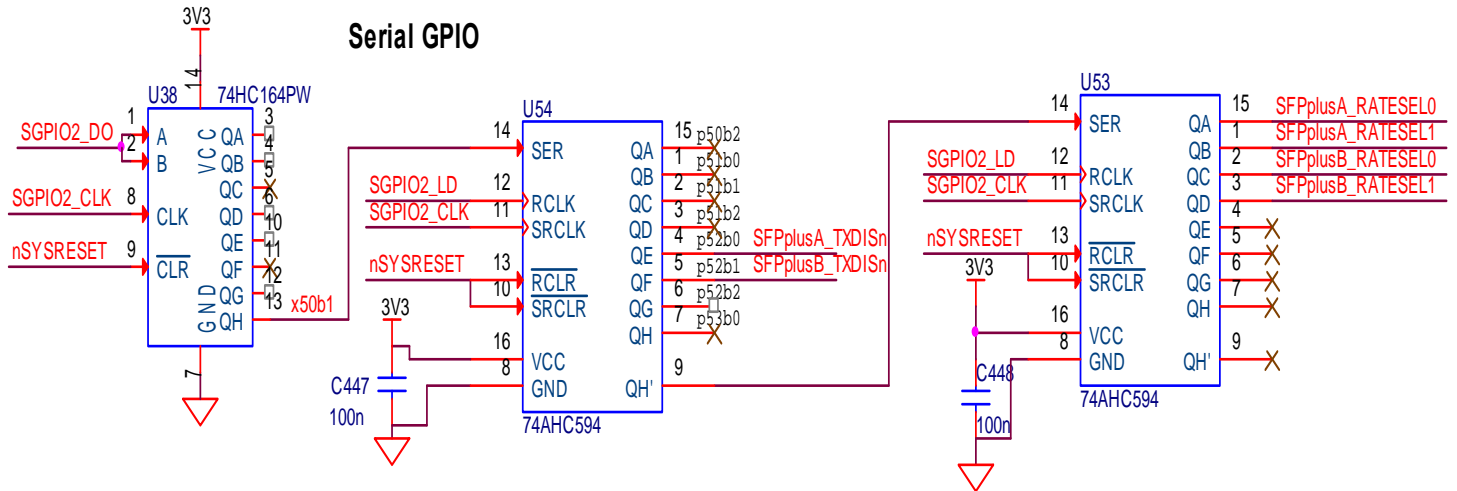


Figure 4-3: Small Form Factor Pluggable Socket Transceiver Module

Inverting buffers required to output disable SFPs during reset

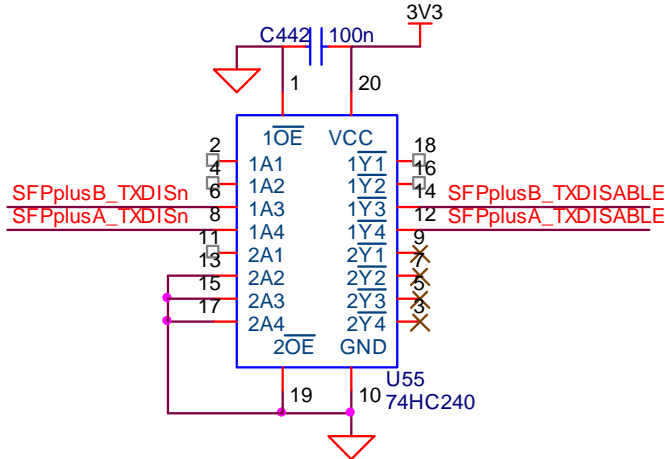


Figure 4-4: SFP Control Logic Module

4.3 Serial Port

A serial port is provided on the EPSM-10GX to enable remote management via a command line interface using a text-based program such as Hyperterminal. The serial port requires an RS-232 transceiver to convert between the 3.3V logic level signals on the module and RS-232 voltage levels. Only signals RX and TX are provided.

4.3.1 SERDES 10G Transceiver

The VSC7444 integrates a 10G Transceiver. The transceiver supports the following modes:

- 100BASE-FX
- SGMII
- SFP
- 1000BASE-KX
- 2.5G
- 10GBASE-KR
- SFP+ (SFI)

4.3.2 QSGMII Interface Connector

The Quad Serial Gigabit Media-Independent Interface (QSGMII) interfaces are implemented using transceivers. QSGMII line ports operate in quad 10/100/1000 Mbps.

The QSGMII interface connects to an external copper PHY device on the Carrier Board through **J2** board-to-board connector.

In this mode, auto negotiation is supported for link speed, duplex and pause settings, and remote fault signaling. Full-duplex is supported for all speeds, while half-duplex is supported for 10/100 Mbps. to connect a Fast Ethernet (i.e., 100 Mbit/s) media access control (MAC) block to a PHY chip.

The installed firmware supports Vitesse VSC8522 12 port Gigabit PHY.

4.4 Thermal Solution

The EPSM-10GX Switch Module contains components to optimize thermal management.

DSC Main and Carrier Board Models accommodate thermal accessories that are either preinstalled on the board or optional.

The Heat Sink and Heat Spreader accessories are designed in full compliance with Board dimensions, to enable a smooth installation. Both accessories provide board-level cooling solutions by dissipating heat and circulating air-flow effectively to maintain and meet the Board's rated temperature.

Refer to [Section 14: Thermal Management](#) for more details on DSC thermal accessories available for specific models.

5. MECHANICAL DRAWING

Figures 7-1 and 7-2 show the Top and Bottom schematic views of the EPSM-10GX Module.

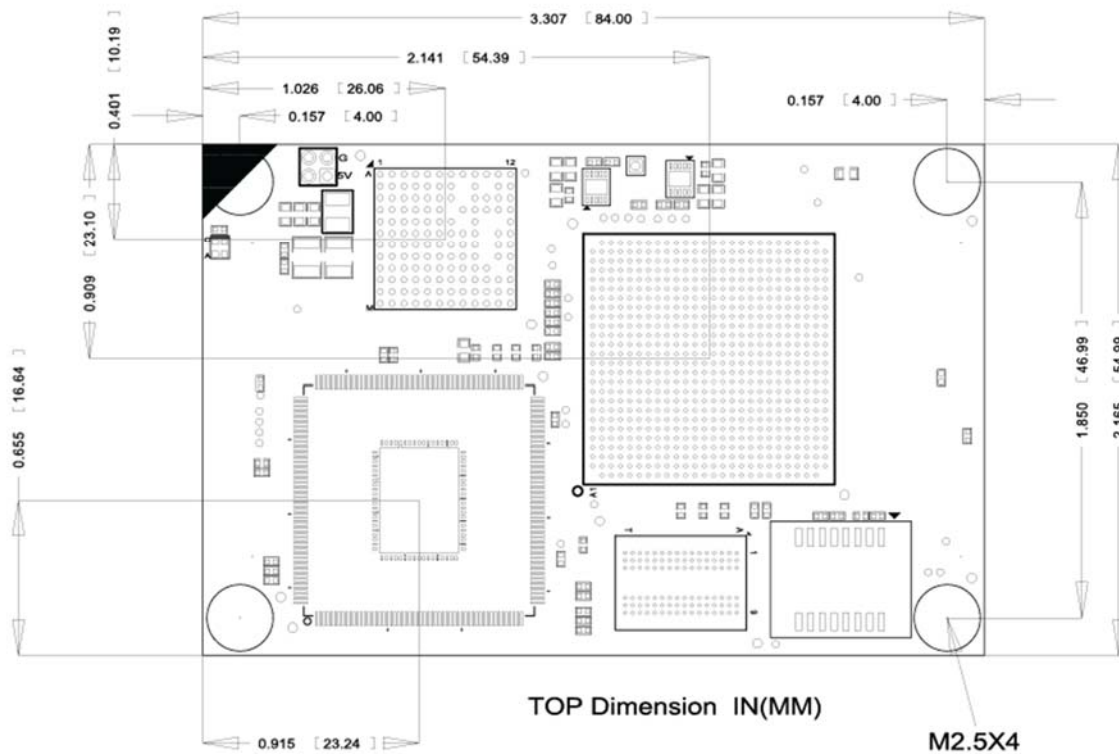


Figure 5-1: Top View of EPSM-10GX Module

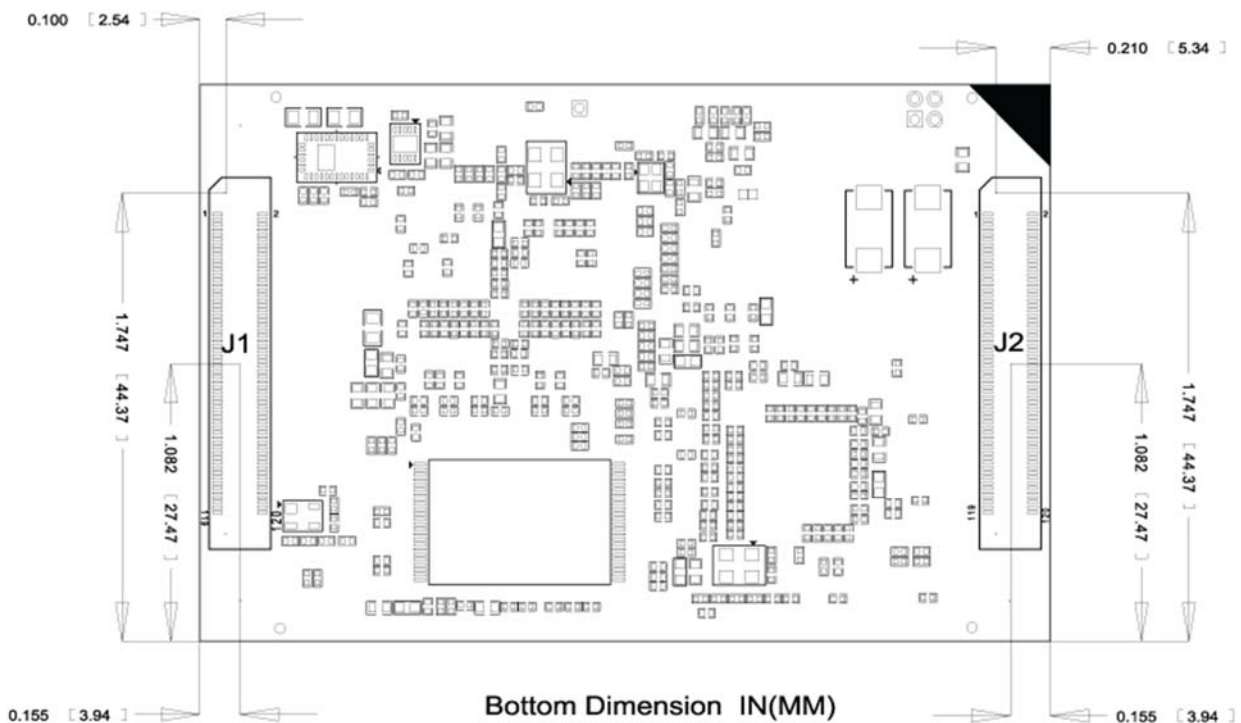


Figure 5-2: Bottom View of EPSM-10GX Module

6. EPSM-10GX MODULE BOARD LAYOUT

Figures 8 1 and 8 2 show the Top and Bottom Layouts on the EPSM-10GX Switch. A description of the Key Integrated Circuits and Connectors is tabulated below.

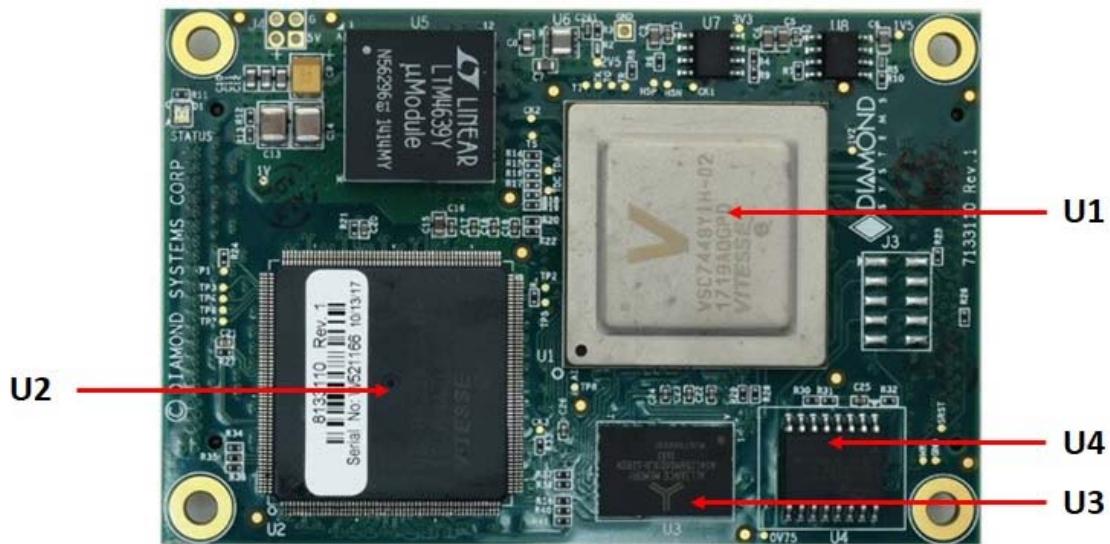


Figure 6-1: Top View of Key ICs on EPSM-10GX

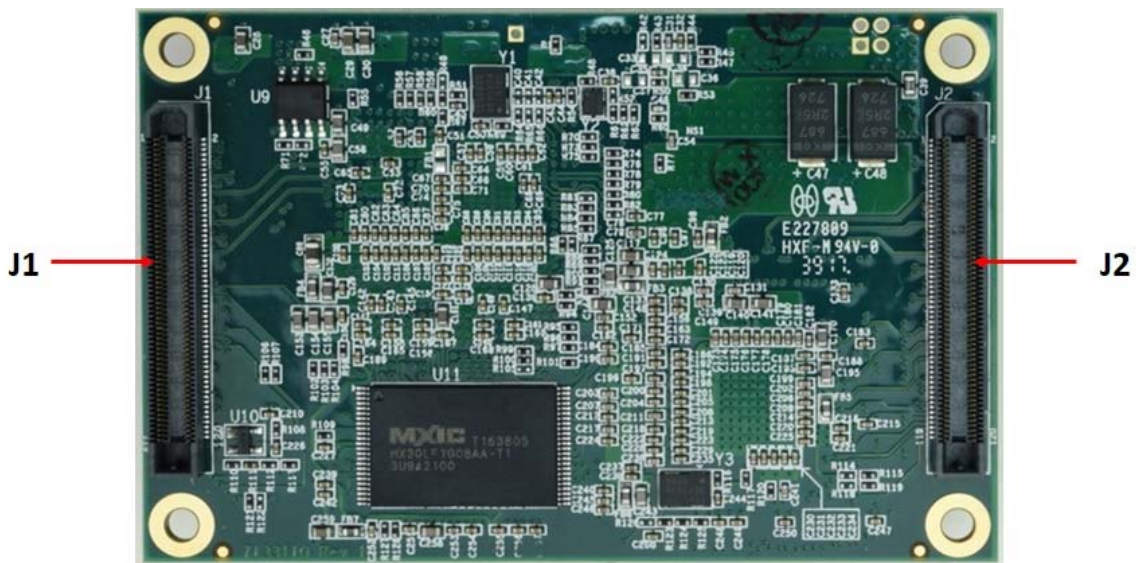


Figure 6-2: Bottom View of J-Pin Connectors on EPSM-10GX

Key Integrated Circuits and Connectors:

<i>Item</i>	<i>Feature</i>
U1	Vitesse VSC7444 Ethernet Switch
U2	Vitesse VSC8522 PHY
U3	DDR3 Memory
U4	SPI Flash with application code
J1, J2	High speed Board-to-Board (B2B) connectors

7. BOARD TO BOARD CONNECTORS

The EPSM-10GX makes all interconnections to the carrier board and the outside world via two high speed, high density I/O connectors. The main signal groups for each connector are shown in the block diagrams above. Both connectors are identical:

Module Connector: Samtec ERF5-060-05.0-L-DV-K-TR

Mating Connector: Samtec ERM5-060-05.0-L-DV

J1

Description	Signal Name	Type	Pin#	Pin#	Type	Signal Name	Description
Digital Ground	GND_SIGNAL	Power	1	2	Power	GND_SIGNAL	Digital Ground
SFP Port A Receive +	SFPPLUSA_RXD_N	I	3	4	I	SFPPLUSB_RXD_N	SFP Port B Receive +
SFP Port A Receive -	SFPPLUSA_RXD_P	I	5	6	I	SFPPLUSB_RXD_P	SFP Port B Receive -
Digital Ground	GND_SIGNAL	Power	7	8	Power	GND_SIGNAL	Digital Ground
SFP Port A Transmit +	SFPPLUSA_TXD_N	O	9	10	O	SFPPLUSB_TXD_N	SFP Port B Transmit +
SFP Port A Transmit -	SFPPLUSA_TXD_P	O	11	12	O	SFPPLUSB_TXD_P	SFP Port B Transmit -
Digital Ground	GND_SIGNAL	Power	13	14	Power	GND_SIGNAL	Digital Ground
PCIe Transmit +	B_PCIE_T_P	O	15	16	I	QSGMII_P21_P24_RX	Port 21-24, QSGMII
PCIe Transmit -	B_PCIE_T_N	O	17	18	I	QSGMII_P21_P24_RX	Port 21-24, QSGMII
Digital Ground	GND_SIGNAL	Power	19	20	Power	GND_SIGNAL	Digital Ground
PCIe Receive +	B_PCIE_R_P	I	21	22	O	QSGMII_P21_P24_TX	Port 21-24, QSGMII
PCIe Receive -	B_PCIE_R_N	I	23	24	O	QSGMII_P21_P24_TX	Port 21-24, QSGMII
Digital Ground	GND_SIGNAL	Power	25	26	Power	GND_SIGNAL	Digital Ground
125MHz Clock Output-1	CLK125_1	O	27	28	I	QSGMII_P17_P20_RX	Port 17-20, QSGMII
Digital Ground	GND_SIGNAL	Power	29	30	I	QSGMII_P17_P20_RX	Port 17-20, QSGMII
125MHz Clock Output-2	CLK125_2	O	31	32	Power	GND_SIGNAL	Digital Ground
Digital Ground	GND_SIGNAL	Power	33	34	O	QSGMII_P17_P20_TX	Port 17-20, QSGMII
125MHz Clock Output-3	CLK25MHZ3	O	35	36	O	QSGMII_P17_P20_TX	Port 17-20, QSGMII
Digital Ground	GND_SIGNAL	Power	37	38	Power	GND_SIGNAL	Digital Ground
SFP Port A I2C Clock	SFPPLUSA_SCL	O	39	40	I	QSGMII_P13_P16_RX	Port 13-16, QSGMII
SFP Port A Loss of Signal Indication	SFPPLUSA_LOS	I	41	42	I	QSGMII_P13_P16_RX	Port 13-16, QSGMII
SFP Port B I2C clock	SFPPLUSB_SCL	O	43	44	Power	GND_SIGNAL	Digital Ground
SFP Port B Loss of Signal Indication	SFPPLUSB_LOS	I	45	46	O	QSGMII_P13_P16_TX	Port 13-16, QSGMII
No Connect	NC	-	47	48	O	QSGMII_P13_P16_TX	Port 13-16, QSGMII
MDIO for External PHY	MII2_MDIO	I/O	49	50	Power	GND_SIGNAL	Digital Ground
Management Data Clock Output	MII2_MDC	O	51	52	-	NC	No Connect
Internal PHY Interrupt Output	NINT_PHY0	O	53	54	-	NC	No Connect
General I2C Clock Output	I2C_SCL	O	55	56	-	NC	No Connect
General I2C Data Input/output	I2C_SDA	I/O	57	58	-	NC	No Connect
No Connect	NC	-	59	60	O	SGPIO2_LD	SGPIO Load
No Connect	NC	-	61	62	O	SGPIO2_CLK	SGPIO Clock
SGPIO Data Out	SGPIO2_DO	O	63	64	O	SLED1_DO	SLED1 Data Out
SGPIO Data In	SGPIO2_DI	I	65	66	O	SLED1_CLK	SLED1 Clock Out
COMA Mode Output	COMA_MODE	O	67	68	O	SLED0_CLK	SLED0 Data Out

Description	Signal Name	Type	Pin#	Pin#	Type	Signal Name	Description
PWM Output from On-Board	LED_PWM	O	69	70	O	SLED0_DO	SLED0 Clock Out
No Connect	NC	-	71	72	Power	GND_SIGNAL	Digital Ground
No Connect	NC	-	73	74	O	PCIEWAKE	PCIe Wake output
No Connect	NC	-	75	76	I/O	GPIO1	3.3V GPIO-1
No Connect	NC	-	77	78	I/O	GPIO2	3.3V GPIO-2
External PHY Interrupt Input	NINT_PHY1	I	79	80	I/O	GPIO3	3.3V GPIO-3
System Reset Output	NSYSRESET	O	81	82	I/O	GPIO4	3.3V GPIO-4
Digital Ground	GND_SIGNAL	Power	83	84	Power	GND_SIGNAL	Digital Ground
Port 9, Bi-directional Pair D-	RTX9DN	I/O	85	86	I/O	RTX9BN	Port 9, Bi-directional Pair
Port 9, Bi-directional Pair D+	RTX9DP	I/O	87	88	I/O	RTX9BP	Port 9, Bi-directional Pair
Digital Ground	GND_SIGNAL	Power	89	90	Power	GND_SIGNAL	Digital Ground
Port 9, Bi-directional Pair C-	RTX9CN	I/O	91	92	I/O	RTX9AN	Port 9, Bi-directional Pair
Port 9, Bi-directional Pair C+	RTX9CP	I/O	93	94	I/O	RTX9AP	Port 9, Bi-directional Pair
Digital Ground	GND_SIGNAL	Power	95	96	Power	GND_SIGNAL	Digital Ground
Port 10, Bi-directional Pair D-	RTX10DN	I/O	97	98	I/O	RTX10BN	Port 10, Bi-directional
Port 10, Bi-directional Pair D+	RTX10DP	I/O	99	100	I/O	RTX10BP	Port 10, Bi-directional
Digital Ground	GND_SIGNAL	Power	101	102	Power	GND_SIGNAL	Digital Ground
Port 10, Bi-directional Pair C-	RTX10CN	I/O	103	104	I/O	RTX10AN	Port 10, Bi-directional
Port 10, Bi-directional Pair C+	RTX10CP	I/O	105	106	I/O	RTX10AP	Port 10, Bi-directional
Digital Ground	GND_SIGNAL	Power	107	108	Power	GND_SIGNAL	Digital Ground
Port 11, Bi-directional Pair D-	RTX11DN	I/O	109	110	I/O	RTX11BN	Port 11, Bi-directional
Port 11, Bi-directional Pair D+	RTX11DP	I/O	111	112	I/O	RTX11BP	Port 11, Bi-directional
Digital Ground	GND_SIGNAL	Power	113	114	Power	GND_SIGNAL	Digital Ground
Port 11, Bi-directional Pair C-	RTX11CN	I/O	115	116	I/O	RTX11AN	Port 11, Bi-directional
Port 11, Bi-directional Pair C+	RTX11CP	I/O	117	118	I/O	RTX11AP	Port 11, Bi-directional
Digital Ground	GND_SIGNAL	Power	119	120	Power	GND_SIGNAL	Digital Ground

J2

Description	Signal Name	Type	Pin#	Pin#	Type	Signal Name	Description
Digital Ground	GND_SIGNAL	Power	1	2	Power	GND_SIGNAL	Digital Ground
Port 0, Bi-directional Pair D-	RTX0DN	I/O	3	4	I/O	RTX0BN	Port 0, Bi-directional Pair B-
Port 0, Bi-directional Pair D+	RTX0DP	I/O	5	6	I/O	RTX0BP	Port 0, Bi-directional Pair B+
Digital Ground	GND_SIGNAL	Power	7	8	Power	GND_SIGNAL	Digital Ground
Port 0, Bi-directional Pair C-	RTX0CN	I/O	9	10	I/O	RTX0AN	Port 0, Bi-directional Pair A-
Port 0, Bi-directional Pair C+	RTX0CP	I/O	11	12	I/O	RTX0AP	Port 0, Bi-directional Pair A+
Digital Ground	GND_SIGNAL	Power	13	14	Power	GND_SIGNAL	Digital Ground
Port 1, Bi-directional Pair D-	RTX1DN	I/O	15	16	I/O	RTX1BN	Port 1, Bi-directional Pair B-
Port 1, Bi-directional Pair D+	RTX1DP	I/O	17	18	I/O	RTX1BP	Port 1, Bi-directional Pair B+
Digital Ground	GND_SIGNAL	Power	19	20	Power	GND_SIGNAL	Digital Ground
Port 1, Bi-directional Pair C-	RTX1CN	I/O	21	22	I/O	RTX1AN	Port 1, Bi-directional Pair A-
Port 1, Bi-directional Pair C+	RTX1CP	I/O	23	24	I/O	RTX1AP	Port 1, Bi-directional Pair A+
Digital Ground	GND_SIGNAL	Power	25	26	Power	GND_SIGNAL	Digital Ground
Port 2, Bi-directional Pair D-	RTX2DN	I/O	27	28	I/O	RTX2BN	Port 2, Bi-directional Pair B-
Port 2, Bi-directional Pair D+	RTX2DP	I/O	29	30	I/O	RTX2BP	Port 2, Bi-directional Pair B+
Digital Ground	GND_SIGNAL	Power	31	32	Power	GND_SIGNAL	Digital Ground
Port 2, Bi-directional Pair C-	RTX2CN	I/O	33	34	I/O	RTX2AN	Port 2, Bi-directional Pair A-
Port 2, Bi-directional Pair C+	RTX2CP	I/O	35	36	I/O	RTX2AP	Port 2, Bi-directional Pair A+
Digital Ground	GND_SIGNAL	Power	37	38	Power	GND_SIGNAL	Digital Ground
Port 3, Bi-directional Pair D-	RTX3DN	I/O	39	40	I/O	RTX3BN	Port 3, Bi-directional Pair B-
Port 3, Bi-directional Pair D+	RTX3DP	I/O	41	42	I/O	RTX3BP	Port 3, Bi-directional Pair B+
Digital Ground	GND_SIGNAL	Power	43	44	Power	GND_SIGNAL	Digital Ground
Port 3, Bi-directional Pair C-	RTX3CN	I/O	45	46	I/O	RTX3AN	Port 3, Bi-directional Pair A-
Port 3, Bi-directional Pair C+	RTX3CP	I/O	47	48	I/O	RTX3AP	Port 3, Bi-directional Pair A+
Digital Ground	GND_SIGNAL	Power	49	50	Power	GND_SIGNAL	Digital Ground
Port 4, Bi-directional Pair D-	RTX4DN	I/O	51	52	I/O	RTX4BN	Port 4, Bi-directional Pair B-
Port 4, Bi-directional Pair D+	RTX4DP	I/O	53	54	I/O	RTX4BP	Port 4, Bi-directional Pair B+
Digital Ground	GND_SIGNAL	Power	55	56	Power	GND_SIGNAL	Digital Ground
Port 4, Bi-directional Pair C-	RTX4CN	I/O	57	58	I/O	RTX4AN	Port 4, Bi-directional Pair A-
Port 4, Bi-directional Pair C+	RTX4CP	I/O	59	60	I/O	RTX4AP	Port 4, Bi-directional Pair A+
Digital Ground	GND_SIGNAL	Power	61	62	Power	GND_SIGNAL	Digital Ground
Port 5, Bi-directional Pair D-	RTX5DN	I/O	63	64	I/O	RTX5BN	Port 5, Bi-directional Pair B-
Port 5, Bi-directional Pair D+	RTX5DP	I/O	65	66	I/O	RTX5BP	Port 5, Bi-directional Pair B+
Digital Ground	GND_SIGNAL	Power	67	68	Power	GND_SIGNAL	Digital Ground
Port 5, Bi-directional Pair C-	RTX5CN	I/O	69	70	I/O	RTX5AN	Port 5, Bi-directional Pair A-
Port 5, Bi-directional Pair C+	RTX5CP	I/O	71	72	I/O	RTX5AP	Port 5, Bi-directional Pair A+
Digital Ground	GND_SIGNAL	Power	73	74	Power	GND_SIGNAL	Digital Ground
Port 6, Bi-directional Pair D-	RTX6DN	I/O	75	76	I/O	RTX6BN	Port 6, Bi-directional Pair B-
Port 6, Bi-directional Pair D+	RTX6DP	I/O	77	78	I/O	RTX6BP	Port 6, Bi-directional Pair B+
Digital Ground	GND_SIGNAL	Power	79	80	Power	GND_SIGNAL	Digital Ground
Port 6, Bi-directional Pair C-	RTX6CN	I/O	81	82	I/O	RTX6AN	Port 6, Bi-directional Pair A-
Port 6, Bi-directional Pair C+	RTX6CP	I/O	83	84	I/O	RTX6AP	Port 6, Bi-directional Pair A+
Digital Ground	GND_SIGNAL	Power	85	86	Power	GND_SIGNAL	Digital Ground

Description	Signal Name	Type	Pin#	Pin#	Type	Signal Name	Description
Port 7, Bi-directional Pair D-	RTX7DN	I/O	87	88	I/O	RTX7BN	Port 7, Bi-directional Pair B-
Port 7, Bi-directional Pair D+	RTX7DP	I/O	89	90	I/O	RTX7BP	Port 7, Bi-directional Pair B+
Digital Ground	GND_SIGNAL	Power	91	92	Power	GND_SIGNAL	Digital Ground
Port 7, Bi-directional Pair C-	RTX7CN	I/O	93	94	I/O	RTX7AN	Port 7, Bi-directional Pair A-
Port 7, Bi-directional Pair C+	RTX7CP	I/O	95	96	I/O	RTX7AP	Port 7, Bi-directional Pair A+
1 PPS clock Output	1PPS_0	O	97	98	Power	3V3	+3.3V Output Supply
Port 8, Bi-directional Pair D-	RTX8DN	I/O	99	100	I/O	RTX8BN	Port 8, Bi-directional Pair B-
Port 8, Bi-directional Pair D+	RTX8DP	I/O	101	102	I/O	RTX8BP	Port 8, Bi-directional Pair B+
+5V Input Supply	5V0	Power	103	104	Power	5V0	+5V Input Supply
Port 8, Bi-directional Pair C-	RTX8CN	I/O	105	106	I/O	RTX8AN	Port 8, Bi-directional Pair A-
Port 8, Bi-directional Pair C+	RTX8CP	I/O	107	108	I/O	RTX8AP	Port 8, Bi-directional Pair A+
RS232 Receive	RS232_RXD	I	109	110	Power	5V0	+5V Input Supply
RS232 Transmit	RS232_TXD	O	111	112	Power	5V0	+5V Input Supply
1 PPS Clock Input	1PPS_1	I	113	114	Power	5V0	+5V Input Supply
Daughterboard Configuration	DB CONFIG1	I	115	116	Power	5V0	+5V Input Supply
Daughterboard Configuration	DB CONFIG2	I	117	118	Power	5V0	+5V Input Supply
Manual Reset Input (Active Low)	/MR_RST	I	119	120	Power	5V0	+5V Input Supply

8. WEB INTERFACE

This section provides instructions on managing the EPSM-10GX via the web interface.

9. COMMAND LINE INTERFACE

The Command Line Interface (CLI) is a command Line tool or Text-Based-User Interface with no screen editing capabilities. In this interface a User types commands and responds to prompts using Syntax and Parameters which are promptly executed by the system.

The CLI can be accessed directly via the RS-232 serial connection. The User must login before CLI commands can be executed.

The Web Interface offers an alternate User Interface to CLI.

The Web Interface is In-band mode and requires the use of any one Ethernet port which provides simultaneous Web management and normal usage.

Both the CLI and Web Interfaces provide the same functionality.

10. USING THE CLI INTERFACE

10.1 Making an Initial Connection

Serial Line Requirements:

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

10.2 Login Information

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

The board is configured with the default IP address **192.168.1.60** to enable access to the Web Interface. On access, it enables the User to enter the Admin panel and change/modify settings.

The IP address, mask and gateway, must be configured according to the environment.

For example, if the environment includes a DHCP server, to enable both, the IP and DHCP, enter the code depicted below.

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

The example below depicts the configuration of a 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
```

The IP address is displayed as depicted below.

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

10.3 Login/Logout Procedures

To access CLI, the User must be authenticated. On system prompt:

- Enter a user name and password, which can be configured.
- Enter **Exit** command to Log out at any time and at any context level.

10.4 Accessing Help

For assistance press the question mark **?** symbol or type **Help** on the keyboard or type the full or partial command followed by a question mark (?).

The help information displayed depends on the context in which help has been requested. The content is displayed in the following format:

- On the Top level, a list of Command Groups is displayed.
- At the 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 is displayed.

10.5 Entering Commands

- Commands are not case-sensitive.
- To navigate the page horizontally, use the arrow keys ← and → to move the cursor within the command line parameters being entered.
- To navigate the page vertically, use the arrow keys ↑ and ↓ to scroll through a command history buffer of the latest twenty commands that were issued.
- Use the **Backspace** key to delete characters from the command being entered.

NOTE: Deleting character(s) is possible only if a User is using a terminal that is BS (8) character compatible. The backspace key uses the ASCII set when pressed to complete the **Delete** request.

10.6 Global Commands

The following Global Commands are available in the Command Line Interface (CLI).

```
# ?
clear          Reset functions
configure      Enter configuration mode
copy           from source to destination
debug          Debugging functions
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           from EXEC mode
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         system
send           a message to other tty lines
show           running system information
terminal       Set terminal line parameters
#
```

10.6.1 Resetting System to Factory Defaults

The `default` command in association with different parameters, executes specific functions, such as resetting the configuration of the Switch to factory defaults while retaining other configurations, or resetting all configurations to default settings.

The following syntax resets the configuration of the Switch to factory defaults.

```
# reload defaults
```

NOTE: On execution only the IP configuration is retained.

The `# reload defaults` command is also issued to restore the Switch to factory defaults in the following events:

- a. A blocked Web site or missing IP address, and with an active connection to a serial port.

NOTE: On execution, a system Reboot is required. This will erase all configurations and reset the Switch to factory default settings.

- b. A blocked Web site or missing IP address and with no access to the Web Management page.

To resolve this:

1. Connect a LAN cable from Port 1 to Port 2 of the Switch.
2. Power-cycle the Switch.

NOTE: To load the Factory Default configuration including the IP Address using the Web Interface follow the instructions described in [Section 13.1.10](#).

To retain specific configurations, enter:

```
factory default [keep-basic] [keep-connect] [keep-monitor]
```

keep-basic Resets system settings to factory defaults and retains basic configurations.

keep-connect: Resets settings system to factory defaults and retains connectivity.

keep-monitor: Resets settings system to factory defaults and retains monitoring data.

NOTE: On execution Network settings will be retained.

10.6.2 IP Commands

The following command syntaxes should be issued to enable Secure HTTP Web redirect and Secure HTTP Web Server.

Secure Web redirection cannot be enabled until the Secure Web Server is enabled. To enable Secure Web Server, enter the syntax as follows:

```
(config)# ip http secure-server
(config)# ip http secure redirect
```

The following is a list of commonly used syntaxes for reference purposes.

1. To view the status of both HTTP Web Server and Web redirection:

```
# show ip http server secure status
```

2. To disable the secure HTTP Web redirect and secure HTTP Web server:

```
(config)# no ip http secure redirect
(config)# no ip http secure server
```

3. To enable the Global IGMP snooping and unregistered IPMCv4 traffic flooding:

```
(config)# ip igmp snooping
(config)# ip igmp snooping vlan <v_vlan_list>
(config)# ip igmp unknown-flooding
```

4. To view the IGMP snooping and 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 ]
```

5. 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
```

6. To configure the IP route, view IP interface, route and statistics, clear the IP route, and 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> ]
```

10.6.3 MAC Commands

The MAC Address Table can be configured using the following command syntaxes and parameters.

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 syntaxes:

```
(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> ] ) ]
```

10.6.4 VLAN/PVLAN Commands

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

Private VLANs can be added or deleted. Port members of each Private VLAN can be added or removed.

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 ]
```

10.6.5 IEEE Standard for Port-based Network Access Control: dot1x

The IEEE 802.1X Standard defines a port-based Access Control Procedure which prevents unauthorized access to a network by requiring Users to first submit credentials for authentication. One or more central servers and back-end servers determine if the user is allowed to access the network.

The Network Access Control commands allow the User to enable or disable the NAS on the Switch. If it is disabled, all ports are allowed frame forwarding.

The following command syntaxes can also be used to configure the time interval or/and check activity on successfully authenticated MAC addresses. They can be used 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 will determine a time 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 ]
```

10.6.6 LACP Commands

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

```
(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 }
```

10.6.7 LLDP Commands

The following command syntaxes are used to configure the LLDP hold-time, the time taken to reinitialize LLDP after a shutdown, the time interval between each LLDP frame and 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 transmission-delay can be disabled using the following syntaxes:

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

The following syntaxes can be used to view LLDP neighbors and 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> ] ) ]
```

10.6.8 Access Management Commands

The Switch will be allowed access only if the Application Type matches any one of the Access Management types.

Below are the syntaxes 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 issued to define the Interface (WEB, SNMP or TELNET) from which the Host can access the Switch.

To accomplish this, the Host IP address should match the IP address entered in the syntax.

```
(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> ]
```

10.6.9 Access-List Commands

The following command syntaxes can be used to set the Access List Ace ID, rate Limiter in pps or kbps, disable or clear Access List statistics, and view Access List Ace status and statistics.

```
(config)# access-list ace <AceId : 1-256>
(config)# access-list rate-limiter [ <rate_limiter_list> ] { pps <pps_rate>
| 100pps <pps100_rate> | kpps <kpps_rate> | 100kbps <kbps100_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> ]
```

10.6.10 Logging Commands

The following command syntaxes can be issued to enable or disable server mode operations and to determine the kind of messages which can be sent to the Syslog Sever.

The logging level must be set to privileges such as an Administrator to execute the command.

```
(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> ]
```

10.6.11 Spanning Tree Commands

The User can enable or disable Spanning-Tree protocol mode to select:

- STP: Spanning Tree Protocol
- RSTP: Rapid Spanning Tree Protocol
- MSTP: Multiple Spanning Tree Protocol

The Spanning-Tree mode verifies whether a port explicitly configured as EDGE, will transmit and receive Bridge Protocol Data Unit (BPDUs) or disable itself upon reception of BPDUs.

In BPDU state a port enters the error-disabled state and is removed from the active topology. There is a time interval before the port can be enabled. To enable the port, a number of BPDU's a bridge port can send per second, must be set. If the number is exceeded, the transmission of the next BPDU will be delayed.

The following command syntaxes can be issued to enable or disable Spanning Tree mode.

To set an interval time before a port in the error-disabled state can be enabled:

```
(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> ] ) ] } ] } ]
```

10.6.12 Green-Ethernet Commands

Green Ethernet command syntaxes are used to configure and optimize LED 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 receives data to be transmitted, all circuits are powered up. The time taken to power up the circuits is termed **wake-up time**.

The default **wake-up time** is 17us for 1 GBit links and 30us for other link speeds.

EEE devices must agree upon the value of the **wake-up time** in order to ensure that both, the receiving and transmitting devices, have all circuits powered up when traffic is transmitted. When a port is powered down in **power-save** mode, outgoing traffic is stored in a buffer until the port is powered up again.

The following commands help the Switch optimize EEE for either optimum power saving mode or least traffic latency. They can be issued to set the interval at which the LED's intensity will reflect the corresponding intensity when the LED is **ON** or to set the interval to correspond to a specified intensity.

If no intensity is specified for the next hour, the intensity is set to the default intensity.

To set the interval at which the LED's intensity will correspond to a specified 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 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> ]
) ]
```

10.6.13 Thermal-Protect Commands

The following command syntaxes 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 reduce the power consumption. It is possible to configure the ports with different priorities. Each priority can be specified at a temperature when the corresponding ports will 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

The following command syntaxes are used to inspect the current Loop Protection configurations, change, or set the interval between individual loop protection PDU sent on each port, and set the period for which a port will be kept disabled, in the event a loop is detected and shuts down the port.

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

To disable 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> ] ) ]
```

10.6.14 Quality of Service (QoS) Commands

To limit the QoS bandwidth for Unicast, Multicast or Broadcast of the received frames, 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> ] } ]
```

10.6.15 Privilege Commands

The following Privilege commands are limited to the O/S implemented on the board.

Both, Linux and Windows CLI are Text-Based-User Interface and execute tasks based on similar CLI principles. However, though the command parameters and syntaxes are similar and perform the same functions on some levels, they differ in many ways.

Windows O/S emulates command line abilities through the Command Prompt or DOS Prompt to execute tasks. Linux CLI is Unix-based and consists of a more extensive range of commands than Windows, because the shell is the primary interface.

```
(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
```

10.6.16 SNMP Commands

The following command syntaxes are used to enable SNMP or to enable or disable the Trap mode, set the Version, Group Name and the Security modes. The Read and Write access strings to permit access to the SNMP Agent can be set for SNMPv1 or SNMPv2c versions.

For SNMPv3 the community string will be associated with the SNMPv3 Communities Table.

For SNMPv3 User configuration, the commands will include the User-Name, Engine ID, Authentication Protocol: privacy protocol and password.

NOTE: Changing the Engine ID will clear all original Local Users from the system.

```
(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> ]
```

10.6.17 SNMP Commands

The following command syntaxes are used to enable or disable the SNMP Client mode operation and 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
```

10.6.18 Radius Server Commands

The following command syntaxes 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-character long is used as an Attribute 32 in RADIUS Access-Request packets.

A Global Secret Key, which is shared between the RADIUS server and the Switch can be set.

Other options that can be configured are:

- Global Timeout to wait for a reply from the RADIUS server before re-transmitting the request.
- Global Retransmit number for which RADIUS request is sent to a server that has stopped responding.
- Dead Time Interval for which no new RADIUS requests are sent to a sever which has failed to respond to previous requests.

NOTE: Setting the deadtime will stop the Switch from continually trying to contact a server which has been determined to be 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 syntaxes are used to set the IP address of the RADIUS server and instruct the UDP port to authenticate the RADIUS server. The commands execute the following functions:

- Authentication and accounting
- Setting an optional timeout

NOTE: Setting optional retransmit and optional key overrides the global time out, global retransmit number and global key.

```
(config)# radius-server host <host_name> [ auth-port <auth_port> ] [ acct-port
<acct_port> ] [ timeout <seconds> ] [ retransmit <retries> ] [ key <key> ]
```

The following command syntaxes can be used to view the RADIUS server running status and statistics, and disable all 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 ]
```

10.6.19 Banner Commands

A Banner is a message presented to a User and can be configured when the message is displayed.

It can be defined before and after Login using the following 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
```

10.6.20 Terminal Commands

The following commands are generic Terminal syntaxes which are issued to set or modify Terminal settings.

```
(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>
```

10.6.21 Reload Command

Use the following syntax to Restore defaults or Reset system settings.

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

10.6.22 Firmware Commands

The following command syntaxes can be used to upgrade the firmware from a given FTP server path and to swap the actual and backup firmware images.

```
# firmware swap
# firmware upgrade <tftpserver_path_file>
```

10.6.23 Ping Commands

The following syntax is used to ping the device.

```
# ping ip <v_ip_addr> [ repeat <count> ] [ size <size> ] [ interval <seconds> ]
```

10.6.24 Debug Commands

The following syntaxes are used to debug the board.

```
(config)# no debug prompt
(config)# line { <0~16> | console 0 | vty <0~15> }
# no debug prompt
# debug prompt <debug_prompt>
```

10.6.25 Security Commands

The password can also be set to **NONE** to enable or disable the **AAA** authentication login in CONSOLE, TELNET, SSH or HTTP protocols and to enable or disable the execution level of the password.

The following command syntaxes are used to:

- Encrypt or decrypt the password. Set the password to **NONE**.
- Enable or disable **AAA** authentication on Console, Telnet, SSH or HTTP Logins.
- Enable or disable the execution level of the password.

```
(config)# password encrypted <encry_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>
] ) ]
```

10.6.26 Monitor Commands

The following command syntaxes are used to configure the monitor destination interface and the source ports.

```
(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_switch_range> ] } }
```

10.6.27 POE Commands

Power Management mode and the Reserved Power of Power over Ethernet can be set using the following command syntaxes.

To determine the range of power a port may use, the User must define the amount of power a power source can deliver. The values range 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_24> ]
# show poe [ interface ( <port_type> [ <v_port_type_list> ] ) ]
```

10.7 Command Parameter and Syntax Examples

10.7.1 IP Configuration

The following block depicts the configuration of a 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
```

The following block displays the IP address to confirm.

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

10.7.2 Port Configuration

Individual ports can be configured at different speeds. The following example depicts the speed configured at 100 Mbps for Port 1.

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

10.7.3 Change the Switch Password

The following block depicts the syntax to create a new password.

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

10.7.4 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 depicts VLAN2 and VLAN3 set up with Switch port mode set to **Access**.

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

Set Access Port

In the following example it is assumed that Ports 1~3 are connected to the PC and 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
```

Verify VLAN Settings

The following example depicts the verification of 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
```

In the above example, **VLAN 2** is created with the ID **VLAN0002** and Port **2** is assigned to **VLAN 2**.

Similarly, Port **3** is assigned to **VLAN0003**. The remaining ports **1** and **4** to **8** are assigned to **VLAN 1** by default.

10.7.5 SNMP Configuration

The following block depicts SNMP configuration.

To enable the SNMP mode operation:

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

To configure SNMP Trap:

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

10.7.6 Mirror Network Traffic

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 block 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
```

10.7.7 Setup QoS

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

The following block shows syntaxes to setup a QoS.

In this example, all traffic routed on Port 1 is mapped to QoS, Class CoS 2 with PCP set to 1.

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

10.7.8 Firmware Upgrade

A new WebStax image can be downloaded using the following CLI parameters. To do so:

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
#
```

10.7.9 Board Version Commands

The User can verify the Board Type and Version by entering the syntax shown below.

```
# show board
# show version
```

11. USING THE WEB INTERFACE

The following functions can be performed when using the Web Interface:

- Set Port Mode
- Enable/disable Flow Control
- Configure Simple Port-Based VLAN
- Configure Aggregation Groups
- Configure LACP Parameters
- Configure QoS
- Mirror Network Traffic and Frames
- Read and Clear Statistics Counters
- Monitor LACP Status
- Configure and Monitor 802.1X
- Configure and Monitor IGMP Snooping
- Configure source-IP Address and DHCP Server Filter
- Upgrade the Software

The GUI screens will interchange depending upon the number of connected ports.

The Screen below displays the Web Interface for the full featured EPSM-10GX Board which is equipped with 26 ports.

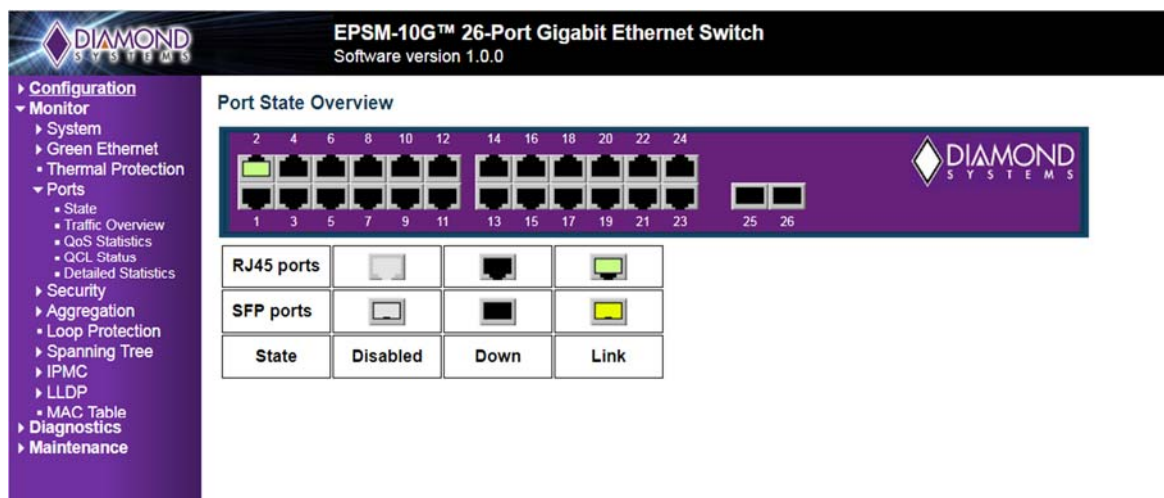


Figure 11-1: EPSM-10GXCarrier Board Home Page

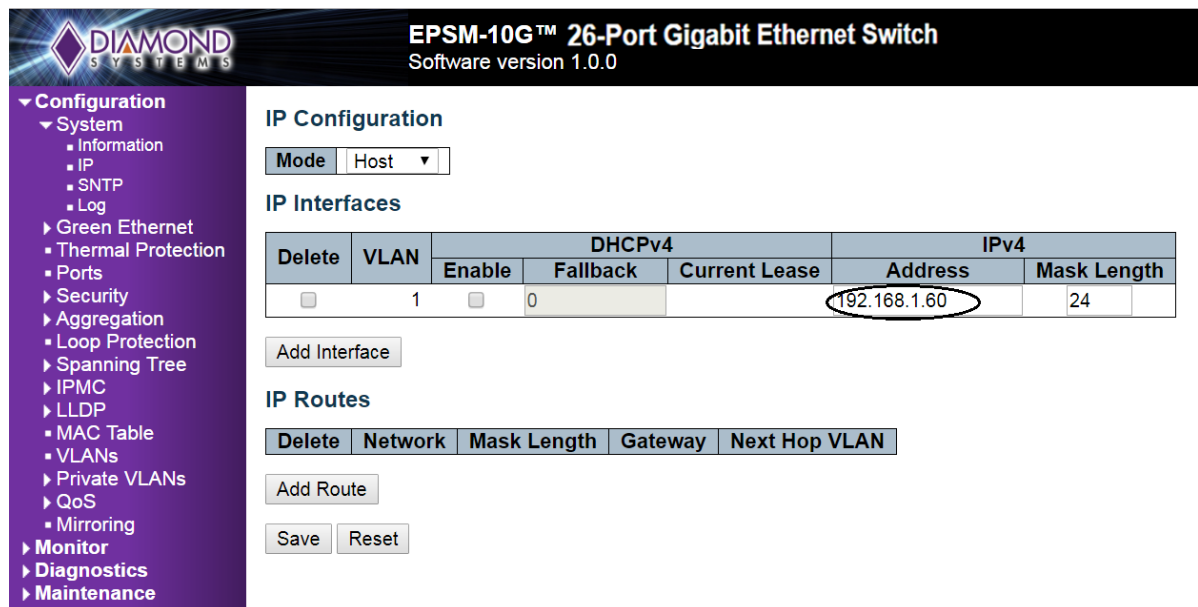
11.1 Web Interface Configuration Examples

11.1.1 IP Configuration

To configure the IP address of the Switch:

1. Connect EPSM-10GX Switch to the Web Interface.
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 select the **Save Configuration** button.

The IP Configuration Screen is depicted below.



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 11-2: IP Configuration Screen

11.1.2 Port Configuration

To configure Individual ports:

1. Connect EPSM-10GX Switch to the Web Interface.
2. Navigate to **Configuration** -> **Ports**.

Each port can be set to one of the following configurations:

<i>State</i>	<i>Configuration</i>
Disabled	Disables the Switch Port Operation
Auto	Port Auto Negotiating Speed Function with the Link
10 Mbps	Forces the Cu Port In 10Mbps Half-Duplex Mode
10 Mbps	Forces the Cu Port In 10Mbps Full-Duplex Mode
100 Mbps	Forces the Cu Port In 100Mbps Half-Duplex Mode
100 Mbps	Forces the Cu Port In 100Mbps Full Duplex Mode
1 Gbps	Forces the Port In 1Gbps Full Duplex

Once the port has been configured:

3. Click **Save**.

To save the settings permanently:

4. Navigate to **Maintenance -> Configuration -> Save Startup-Config**.
5. Click **Save Startup Configuration**.

The IP Configuration Screen is depicted below.

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		Auto										0-7	10240	<>	
2		Down		Auto								X	X		10240	Discard	
3		1Gfdx		100Mbps HDX								X	X		10240	Discard	
4		1Gfdx		100Mbps HDX								X	X		10240	Discard	
5		Down		Disabled								X	X		10240	Discard	
6		Down		Auto								X	X		10240	Discard	
7		Down		10Mbps HDX								X	X		10240	Discard	
8		Down		10Mbps FDX								X	X		10240	Discard	
9		Down		10Mbps FDX								X	X		10240	Discard	
10		Down		Auto								X	X		10240	Discard	
11		Down		Auto								X	X		10240	Discard	
12		Down		Auto								X	X		10240	Discard	
13		Down		Auto								X	X		10240	Discard	
14		Down		Auto								X	X		10240	Discard	
15		Down		Auto								X	X		10240	Discard	
16		Down		Auto								X	X		10240	Discard	
17		Down		Auto								X	X		10240	Discard	
18		Down		Auto								X	X		10240	Discard	
19		Down		Auto								X	X		10240	Discard	
20		Down		Auto								X	X		10240	Discard	
21		Down		Auto								X	X		10240	Discard	
22		Down		Auto								X	X		10240	Discard	
23		Down		Auto								X	X		10240	Discard	
24		Down		Auto								X	X		10240	Discard	
25		Down		10Gbps FDX								X	X		10240	Discard	
26		Down		10Gbps FDX								X	X		10240	Discard	

Figure 11-3: Port Configuration Screen

11.1.3 Change System Password

To change the system login password:

1. Connect EPMS-10GX Switch to the Web Interface.
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**.

The System Password Screen is depicted below.

Figure 11-4: Changing the System Password

11.1.4 VLAN Configuration

The following example describes how to configure a VLAN.

1. Connect EPSM-10GX Switch to the Web Interface.
2. Navigate to **Configuration -> VLANS**.
3. In the **Allowed Access VLANs** enter the number of LANs to be created.

In the following example VLANs 1-3 have been reassigned as VLAN2 and VLAN3.

By default, the **Mode** field is **Access**. It can be changed to **Trunk** or **Hybrid** using the **Mode** drop down list.

Ports can be assigned to the virtual LANs by changing the values in the **Port VLAN** column.

4. Click on **Save** to save the VLAN configuration.

To save VLAN settings permanently:

5. Navigate to **Maintenance -> Configuration -> Save Startup-Config**.
6. Click **Save Startup 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	Access	1	C-Port	✓	Tagged and Untagged	Untag All	1	
2	Access	1	C-Port	✓	Tagged and Untagged	Untag All	1	
3	Access	1	C-Port	✓	Tagged and Untagged	Untag All	1	
4	Access	1	C-Port	✓	Tagged and Untagged	Untag All	1	
5	Access	1	C-Port	✓	Tagged and Untagged	Untag All	1	
6	Access	1	C-Port	✓	Tagged and Untagged	Untag All	1	
7	Access	1	C-Port	✓	Tagged and Untagged	Untag All	1	
8	Access	1	C-Port	✓	Tagged and Untagged	Untag All	1	
9	Access	1	C-Port	✓	Tagged and Untagged	Untag All	1	
10	Access	1	C-Port	✓	Tagged and Untagged	Untag All	1	
11	Access	1	C-Port	✓	Tagged and Untagged	Untag All	1	
12	Access	1	C-Port	✓	Tagged and Untagged	Untag All	1	
13	Access	1	C-Port	✓	Tagged and Untagged	Untag All	1	
14	Access	1	C-Port	✓	Tagged and Untagged	Untag All	1	
15	Access	1	C-Port	✓	Tagged and Untagged	Untag All	1	
16	Access	1	C-Port	✓	Tagged and Untagged	Untag All	1	
17	Access	1	C-Port	✓	Tagged and Untagged	Untag All	1	
18	Access	1	C-Port	✓	Tagged and Untagged	Untag All	1	
19	Access	1	C-Port	✓	Tagged and Untagged	Untag All	1	
20	Access	1	C-Port	✓	Tagged and Untagged	Untag All	1	
21	Access	2	C-Port	✓	Tagged and Untagged	Untag All	2	
22	Access	3	C-Port	✓	Tagged and Untagged	Untag All	3	
23	Access	1	C-Port	✓	Tagged and Untagged	Untag All	1	
24	Access	1	C-Port	✓	Tagged and Untagged	Untag All	1	
25	Access	1	C-Port	✓	Tagged and Untagged	Untag All	1	
26	Access	1	C-Port	✓	Tagged and Untagged	Untag All	1	

Save Reset

Figure 11-5: VLAN Setup Screen

After saving the VLAN configuration, the VLAN membership status can be verified as shown in the screen below.

To verify:

1. Navigate to **Monitor -> VLANs -> Membership**.
2. Confirm the settings.

In the following screen:

Ports **1** to **20** and **23** to **26** are assigned to **VLAN ID 1**. **Port 21** is assigned to **VLAN ID 2** and **Port 22** is assigned to **VLAN ID 3**.

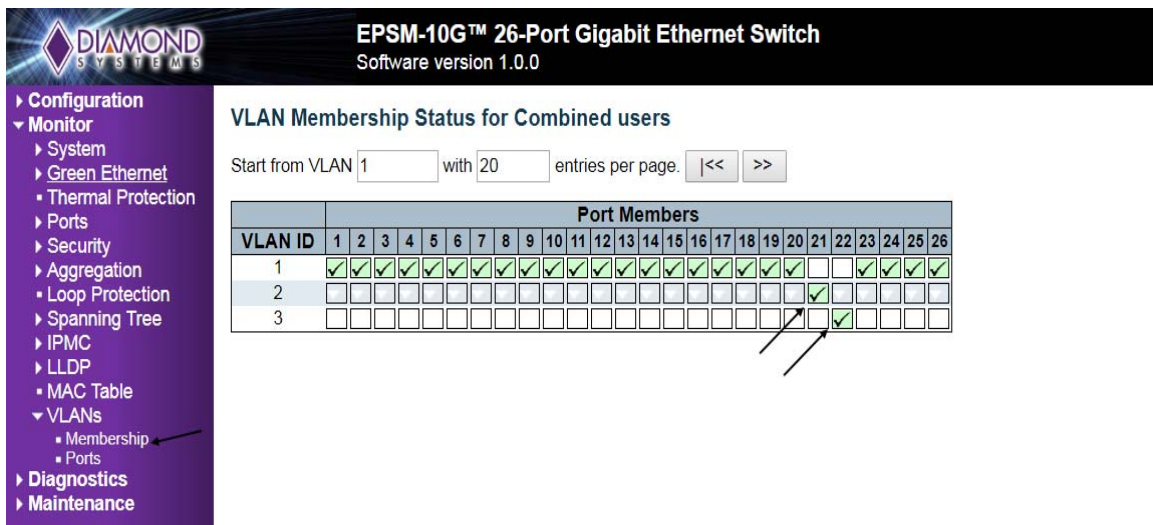


Figure 11-6: VLAN Membership Verification Screen

11.1.5 Mirror Frames Configuration

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 on **Port 1 (Tx) & Port 2 (Rx) to Port 6**.

1. Connect EPISM-10GX Switch to the Web Interface.
2. Navigate to **Configuration -> Mirroring**.
3. Click -> **Save** to save the mirroring configuration.

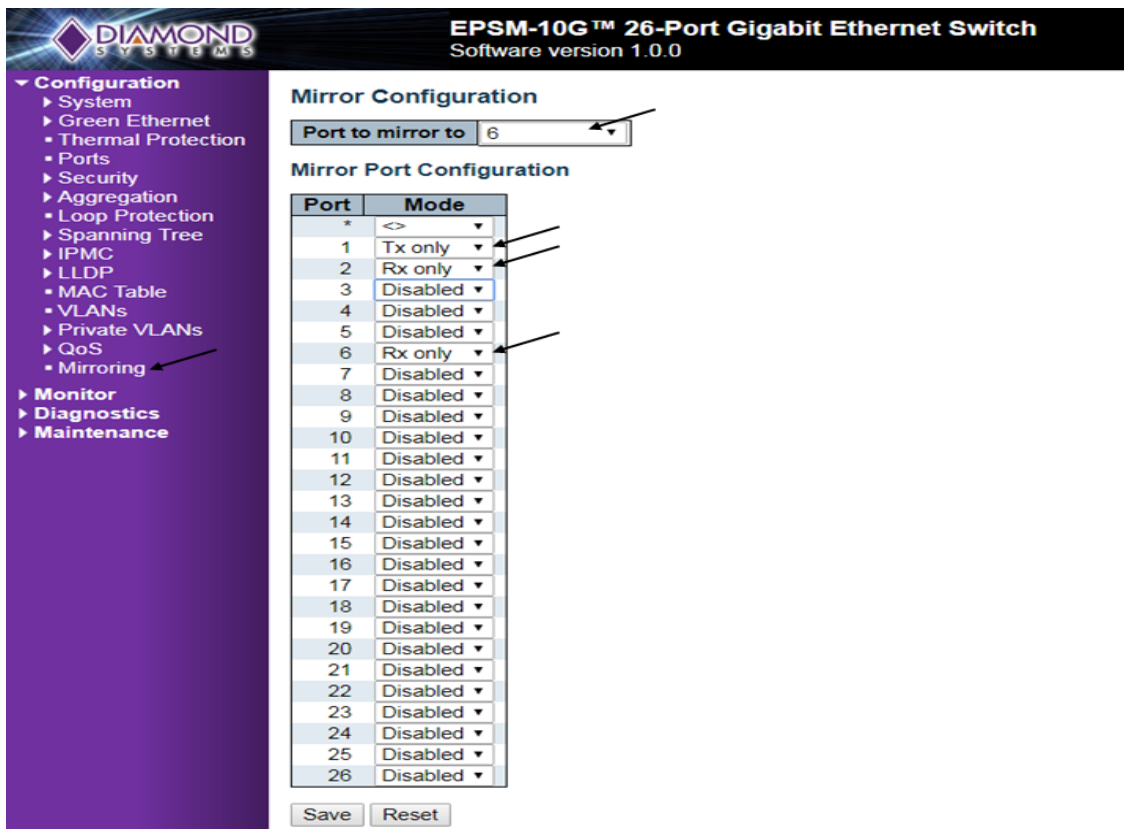


Figure 11-7: Mirror Frames Screen

Other Mirror Options

The port which displays mirroring data 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. The button **Disabled** disables mirroring functions.

Mirror Mode Description

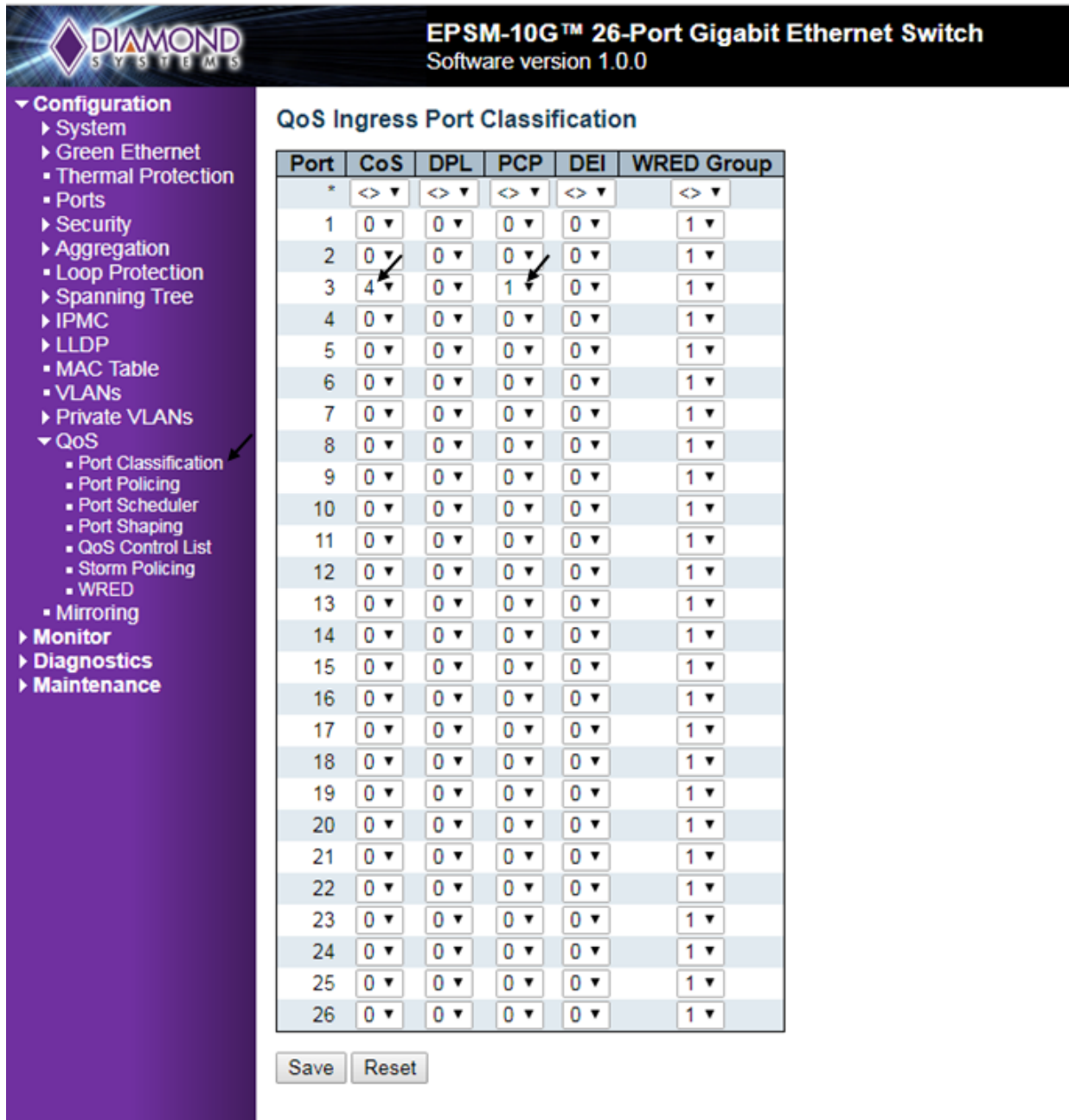
1. **RX only** - Frames received on this port are mirrored on the mirror port. Frames transmitted are not mirrored.
2. **TX only** - Frames transmitted on this port are mirrored on the mirror port. Frames received are not mirrored.
3. **Disabled** - Neither frames transmitted nor frames received are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

11.1.6 QoS Classification Configuration

Basic QoS classification configuration can be set 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 where all traffic routed on Port 3 is mapped to **Cos 4** and **PCP** is set as 1.

1. Navigate to **Configuration -> QoS -> Port Classification**.
2. Under **Port** row 3 **CoS** select 4 from the drop-down list.
3. Under **PCP** select 1 from the drop-down list.



EPISM-10G™ 26-Port Gigabit Ethernet Switch
Software version 1.0.0

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
13	0	0	0	0	1
14	0	0	0	0	1
15	0	0	0	0	1
16	0	0	0	0	1
17	0	0	0	0	1
18	0	0	0	0	1
19	0	0	0	0	1
20	0	0	0	0	1
21	0	0	0	0	1
22	0	0	0	0	1
23	0	0	0	0	1
24	0	0	0	0	1
25	0	0	0	0	1
26	0	0	0	0	1

Save Reset

Figure 11-8: QoS Classification Screen

11.1.7 Web Interface Activation/Deactivation

Web access to the Web Interface can be activated and deactivated either through Command Line Interface or the Web Control Panel.

Using the Web Control Panel:

1. Navigate to the **Configuration** screen.
2. Select **Security** -> **Switch** -> **Access Management Configuration**.
3. Ensure that **Mode**, which is the default mode, is set to **Disabled**. If it is not **Disabled**, select **Disabled** from the drop-down option.
4. Click the **Save** button.

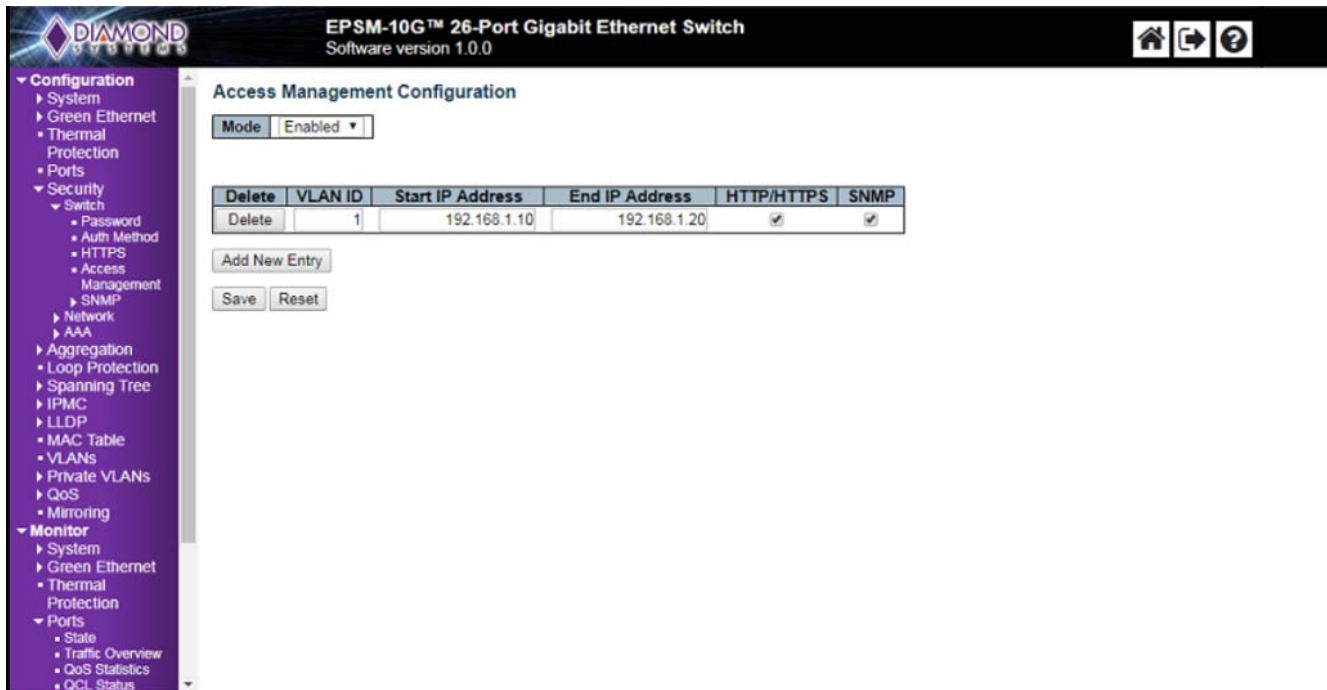


Figure 11-9: Activation/Deactivation Screen

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

```
#copy running-config startup-config
```

To disable Web access on the Switch in the Control Panel:

1. Navigate to **Configuration** -> **Security** -> **Switch** -> **Access Management Configuration** screen.
2. Change the mode to **Enabled**.
3. Click **Save**.

This disables access to the Switch using the Web Interface.

Using the CLI Interface:

To store this command as the standard configuration on Flash memory to enable it to load on startup, enter the following syntax in the CLI:

```
#copy running-config startup-config
```

To enable Web access on the Switch, enter the following syntax in CLI:

```
#copy startup-config flash:backup_config
#copy flash:{filename} startup-config
```

Reboot the Switch.

11.1.8 Firmware Upgrade

The following section describes the steps for upgrading the firmware.

1. Connect EPSM-10GX Switch to the Web Interface and navigate to **Maintenance -> Software -> Upload**.
2. Choose the file to be uploaded and click -> **Upload**.

The existing firmware will be erased and upgraded with the new firmware version.

When the upgrade is complete the Switch will automatically reboot.



Figure 11-10: Firmware Upload Screen

11.1.9 Save Startup Configuration

To ensure that the currently active startup configuration will be executed at the next reboot the command parameters running- config to startup- config, must be copied and saved.

The following Section describes the steps for saving the file.

1. Connect EPSM-10GX Switch to the Web Interface.
2. Navigate to **Maintenance -> Configuration -> Save Startup-Config**.
3. Click -> **Save Configuration**.

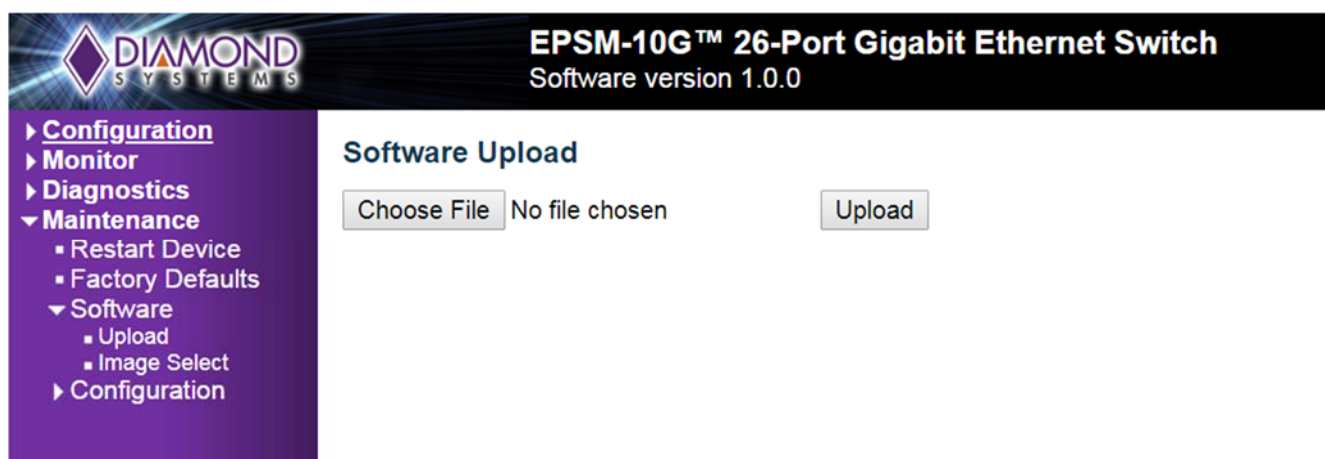


Figure 11-11: Saving Startup Configuration Screen

11.1.10 Factory Default Settings

The user can reset the configuration of the Switch on the screen page depicted below.

Only the IP configuration is retained. The new configuration is updated instantly.

To reset the system to Factory Defaults:

1. Connect EPSM-10GX Switch to the Web Interface.
2. Navigate to **Maintenance** -> **Factory Defaults**.
3. Click -> **Yes** button.
4. A confirmation message as shown below will be displayed.
- 5.

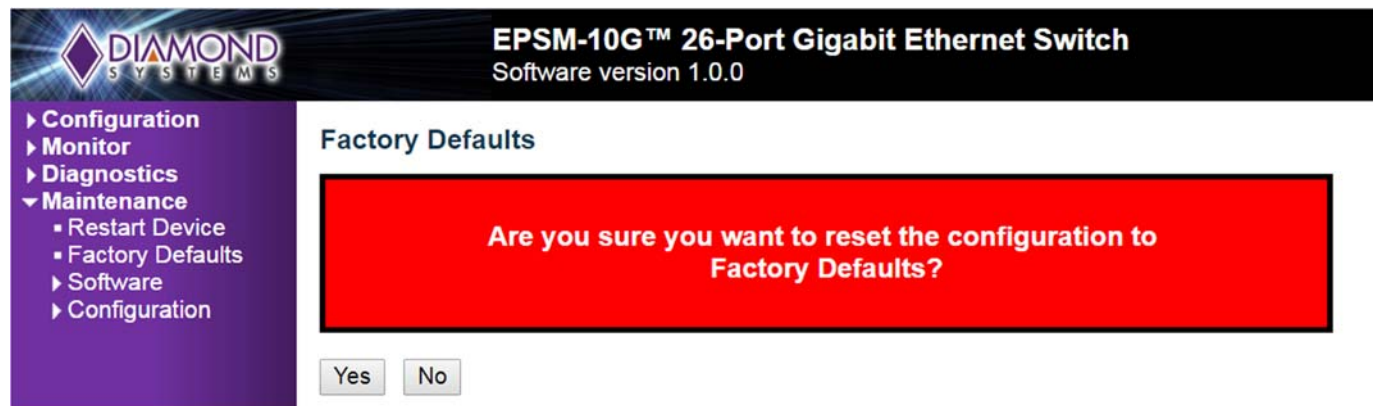


Figure 11-12: Resetting Switch to Factory Defaults Screen

12. THERMAL MANAGEMENT

Two cooling options, a heat sink and a heat spreader, are available for the EPSM-10GX to facilitate installation of the module in the end equipment. Both options offer full 85°C performance under proper conditions, however the heat spreader is generally the preferred option since it conducts the heat to the system chassis instead of to the internal air of the system. The heat sink and heat spreader are accessory items and must be ordered separately.

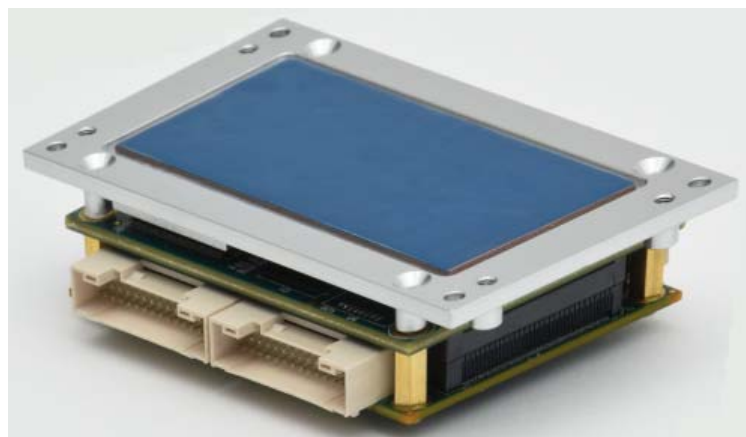
12.1 Heat Sink

The heat sink, DSC part no. 6883111, is 16.6mm high and is the same size as the module, 55x84mm. It is mounted on the top of the board using the four corner mounting holes. The heat sink holes are clear to facilitate the use of M2.5 screws inserting through the heat sink and catching in the threaded spacers installed below the module. Height is measured from the top of the EPSM-10GX PCB. A STEP file and mechanical drawing are available. An image of the heat sink mounted on the EPSM-10GX is shown below.



12.2 Heat Spreader

The heat spreader, DSC part no. 6883114, provides a flat surface for installation onto the interior surface of the system enclosure. A thermal pad embedded in the top of the heat spreader provides improved contact for reduced thermal resistance between the heat spreader and the enclosure surface. The thermal pad contains a protective film which must be removed prior to installation. Flanges on the heat spreader enable installation of the module from either the interior or the exterior of the enclosure. Overall dimensions of the heat spreader are 55mm H x 104mm W x 7.6mm H. Height is measured from the top of the EPSM-10GX PCB. A STEP file and mechanical drawing are available. An image of the heat spreader installed on the EPS-120000-CMH product is shown below.



13. HARDWARE SPECIFICATIONS

The Specifications for EPSM-10GX Switch are summarized in the following Table.

Ethernet Switch	24-port Layer 2/3 Switch Built-in 500MHz MIPS 24KEC Microcontroller for Configuration and Management
Number of Ports	24 10/100/1000Mbps Ethernet Ports with Non-Blocking Wire-Speed Performance
On-board Memory	4 Mb Packet Memory Shared Memory Buffer with Per-Port & CoS Memory Management
MEF	Hierarchical MEF Compliant Policing and Scheduling; MEF E-Lane, E-Line, and E-Tree Services
Frame Buffer	Jumbo frame Support at all Speeds
Network Management	SNMP v1/v2c/v3 Web GUI Command Line Interface (CLI)
VLAN	IEEE 802.1Q VLAN Switch with 32K MACs and 4K VLANs Push/Pop up to Three VLAN Tags Independent & Shared VLAN Learning (IVL, SVL)
Multicast	IPv4/IPv6 Uni & 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	EEE 802.3 ad
RSTP	Rapid Spanning Tree Protocol (IEEE 802.1W) and MTSP
MIBs	Support for WebStax
Power Management	ActiPHY and PerfectReach Power Management; VeriPHY Cable Diagnostics
Serial Port	1 RS-232 Port for Host Interface
Indicator Lights	24 Status LEDs, Two Per Port; 2 General Purpose
Standalone Cable	Standalone Network Switch or in Combination with a Host Computer

14. LIMITED WARRANTY

Diamond Systems Corporation (DSC) warrants that DSC products will be free from defects and errors in material and workmanship and perform in full accordance with the technical specifications stated in the description of the product for a duration of 2-Year Period from the Date of Shipment.

Unless otherwise stated, DSC Limited Warranty Policy covers the following criterion.

- It is extended to the original Purchaser/Consumer.
- Under Terms and Conditions of the Warranty, DSC, at its sole discretion, will repair or replace any defective parts or components of its product.
- The product must be returned to DSC in DSC-approved packaging, pre-authorized with a DSC-assigned Return Material Authorization (RMA) Number which is referenced on the shipping document.
- The Customer will prepay the shipment cost of the product to the DSC designated site.
- DSC will prepay the return shipment cost of the repaired or replaced RMA product.

DSC Limited Warranty Policy does not cover product defects or damages incurred due to:

- Attempts by Customer to repair or resolve any product issues without the prior consent of DSC.
- Mishandling, misuse, neglect, normal wear and tear, or accident.
- DIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM ANY BREACH OF WARRANTY OR CONDITION, OR UNDER ANY OTHER LEGAL THEORY, INCLUDING BUT NOT LIMITED TO LOST PROFITS, DOWNTIME, GOODWILL, DAMAGE TO OR REPLACEMENT OF EQUIPMENT AND PROPERTY, ANY COSTS OF RECOVERING, REPROGRAMMING, OR REPRODUCING ANY PROGRAM OR DATA STORED IN OR USED WITH DSC PRODUCTS, AND ANY FAILURE TO MAINTAIN THE CONFIDENTIALITY OF DATA STORED ON THE PRODUCT.

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