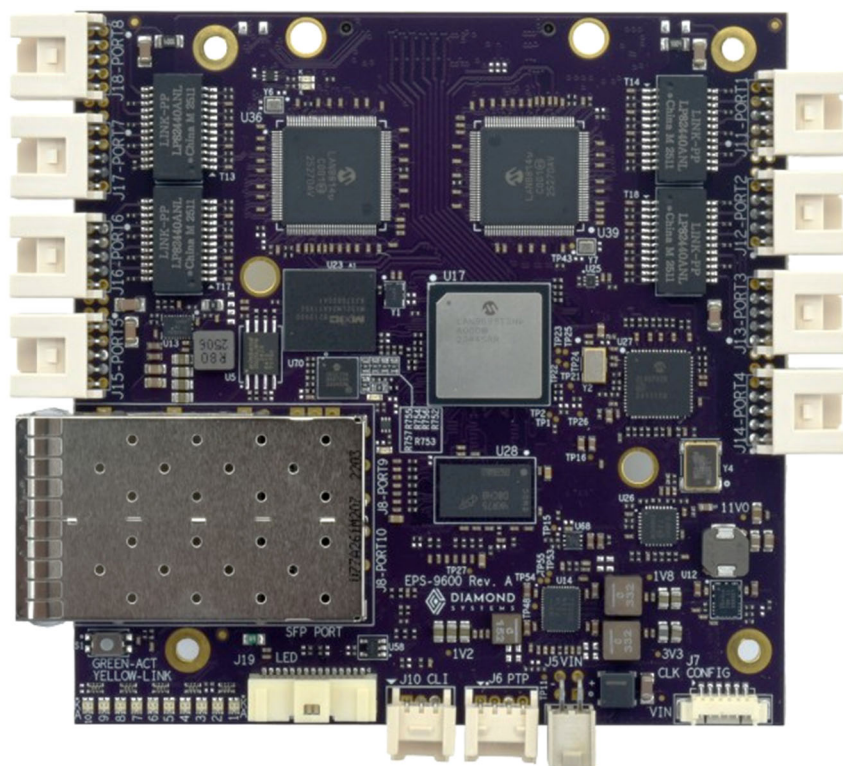


EPS-9600 Series

Rugged Ethernet Switch

User Manual

Revision 1.03



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Notices

Technical Support

Please use the Technical Support Request form to request assistance with a product you have already purchased.

Product and Sales Inquiry

Please use the Sales Inquiry form to request assistance with selecting a product for your application, or to obtain further information about products and service.

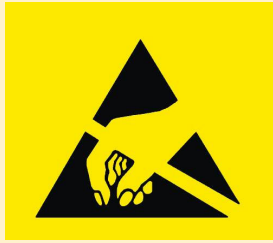
Limited Warranty

Diamond Systems Corporation provides a Limited Warranty for all items in this guide that it manufactures and sells, pursuant to terms provided in the Diamond Systems Corporation Limited Warranty. No other warranty, express or implied, is included. Please download the warranty for additional information.

Trademarks

All trademarks, logos and brand names are the property of their respective owners.

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 EPSM-10GX4 Ethernet switch and components contain I/O connectors with connections to sensitive electronic components. This creates many opportunities for accidental damage during handling, installation, and connection to other equipment.

This section provides critical, best practice suggestions to avoid damage to your products. It includes descriptions of many common causes of damage – all of which can void your warranty.

Please follow these guidelines to be aware of common causes of damage and take the necessary precautions to prevent damage to your Diamond Systems' (or any vendor's) embedded computer boards.

Damage from incorrect handling or storage

- Physical and electronic damage can occur from mishandling. The following are frequent scenarios.
- An electrostatic discharge (ESD) causes a board to malfunction or stop working entirely. If ESD occurs, typically there is no visual sign of damage. While it is often difficult to identify faulty component(s), if the fault is identified there is a good chance that the board can be repaired.
- A screwdriver slips during installation, causing a gouge in the PCB surface and cutting signal traces or damaging components.
- A board is dropped, causing damage to the circuitry near the point of impact. Most of our boards are designed with at least 25 mils clearance between the board edge and any component pad, and ground / power planes are at least 20 mils from the edge. These design rules can minimize but cannot always prevent damage from impact.
- A short occurs when a metal screwdriver tip slips, or a screw drops onto a board while it is powered on. This can cause overvoltage or power supply problems described below.
- A storage rack with slots to hold boards can damage components near the board edge. Many boards have components that are close to the board edge, which are subject to damage in racks.
- Connector pins are bent by improperly dis-assembling attached boards or ribbon cables from a pin header, or from physical impact or improper storage. Typically, bent pins can be repaired one at a time with needle-nose pliers. Severely bent or frequently repaired pins may require the replacement of the connector.

Best Practices to avoid damage during handling or storage

- To prevent ESD damage, always follow proper ESD-prevention practices when handling any electronic components.
- To prevent physical damage from impact, handle all boards with care and work in a safe, spacious environment.
- To prevent short circuit damage from a metallic tool or dropped screw, perform assembly operations ONLY when the system is powered off.

- To prevent damage to fragile components and connector pins in storage, always store boards in individual ESD-safe sleeves in sturdy bins with dividers between boards. Do NOT use racks with slots, or stack boards in a pile or in close proximity.
- To prevent damage to connector pins during assembly or dis-assembly, use caution to align connectors and especially when force is needed to disassemble components and wires. Do not 'rock' connectors back and forth or pull any component at the wrong angle.

Damage due to incorrect voltage or connections

Power supply wired backwards

Diamond Systems power supplies and boards are not designed to withstand a reverse power supply connection. Reverse power will destroy nearly every IC that is connected to the power supply. Reverse power damage is rarely repairable. Check twice before applying power!

Board not installed properly in PC/104 stack

If a PC/104 board is accidentally shifted by 1 row or 1 column (of pins) it is possible for power and ground signals on the bus to contact the wrong pins. For example, this can damage components attached to the data bus because it puts the $\pm 12\text{V}$ power supply lines directly on data bus lines.

Overvoltage on analog input

If a voltage applied to an analog input exceeds the design specification of the board, the input multiplexor and/or parts behind it can be damaged. Most of our boards will withstand an erroneous connection of up to $\pm 35\text{V}$ on the analog inputs, even when the board is powered off, but not all boards, and not in all conditions.

Overvoltage on analog output

If an analog output is accidentally connected to another output signal or a power supply voltage, the output can be damaged. On most of our boards, a short circuit to ground on an analog output will not cause trouble.

Overvoltage on digital I/O line

If a digital I/O signal is connected to a voltage above the maximum specified voltage, the digital circuitry can be damaged. On most of our boards the acceptable range of voltages connected to digital I/O signals is 0-5V, and they can withstand about 0.5V beyond that (-0.5 to 5.5V) before being damaged. However, logic signals at 12V and even 24V are common, and if one of these is connected to a 5V logic chip, the chip will be damaged, and damage may extend past that chip to others in the circuit.

Best Practices to avoid damage due to incorrect voltage or connections

- Ensure all power supply connections are correct and not reversed!
- Ensure all pins are aligned properly before and after assembling boards and components!
- Ensure proper voltage is supplied to all analog inputs!
- Ensure all analog voltage outputs do not connect to another signal output or power supply output!
- Ensure all voltages for digital I/O lines are proper and with range, and that higher voltage signals (24V or 12V) are not supplied to lower voltage circuits (12V or 5V)!

IMPORTANT! Always check twice before Powering Up!

1. Introduction

1.1. Product Overview

The EPS-9600 is a compact, managed Layer 3 Ethernet switch in a standalone, all-in-one design measuring 4.00" × 4.00" (101.6 × 101.6 mm), conforming to the PC/104 form factor outline. Unlike switch module products that require a separate carrier board, the EPS-9600 integrates all switch electronics, magnetics, I/O connectors, and power regulation on a single board, making it a complete, ready-to-deploy switching solution for embedded and rugged applications such as drones, ground vehicles, underwater systems, and robotics platforms.

The EPS-9600 is built on the Microchip LAN9698TSN (LAN969x family) Ethernet switch SoC and provides eight 10/100/1000 Mbps copper Ethernet ports via two LAN8814 quad-port PHYs, plus two 10 Gbps SFP+ sockets. The SoC integrates a dual-core 1 GHz ARM® Cortex®-A53 CPU with MMU, DDR4 SDRAM controller, and eMMC memory for full on-board management and advanced industrial applications.

An on-board daughterboard expansion connector (J20) enables future port expansion to additional 1G, 2.5G, and 10G ports. No daughterboard product is currently available; one is planned for future release by Diamond Systems.

The EPS-9600 runs the Microchip IStax Layer 3 routing / switching software stack, providing hardware-accelerated Layer 3 routing performance. All features are manageable via a graphical web interface accessible through any Ethernet port or via a command line interface (CLI) using the RS-232 serial port.

The EPS-9600 is designed for vehicle and field environments, featuring an operating temperature range of -40°C to +85°C with an appropriate cooling solution, latching I/O connectors for vibration resistance, and IEEE 1588 PTP and TSN support for time-sensitive networking applications. The board is tested to MIL-STD-202G shock/vibration resistance levels. Two thermal management options are available: a heat sink for convection-cooled installations, and a heat spreader for conduction-cooled installations where the system chassis serves as the thermal path.

1.2. EPS-9600 Ordering Guide

The table below lists the available part numbers for the EPS-9600 series. Models are differentiated by TSN capability and thermal solution.

Boards:

DSC Part Number	1G Ports	SFP+ Sockets	Software	TSN	Thermal
EPS-9610-HSK	8	2	IStax L3		Heat sink
EPS-9610-HSP	8	2	IStax L3		Heat spreader
EPS-9610-TSN-HSK	8	2	IStax L3	✓	Heat sink
EPS-9610-TSN-HSP	8	2	IStax L3	✓	Heat spreader

Cable kit: **CK-EPS9600-01**

DSC Part Number	Quantity	Description
6981052	8	1Gbe cable with RJ-45 jacket, TIA568B color code
6981507	1	Power cable, Samtec IPD1 2x2 latching socket to tinned leads
6981050	1	RS-232 cable, Molex 3 pin latching socket to tinned leads
6981049	1	PPS cable, Molex Sherlock 1x4 socket to tinned leads

2. Product Photos

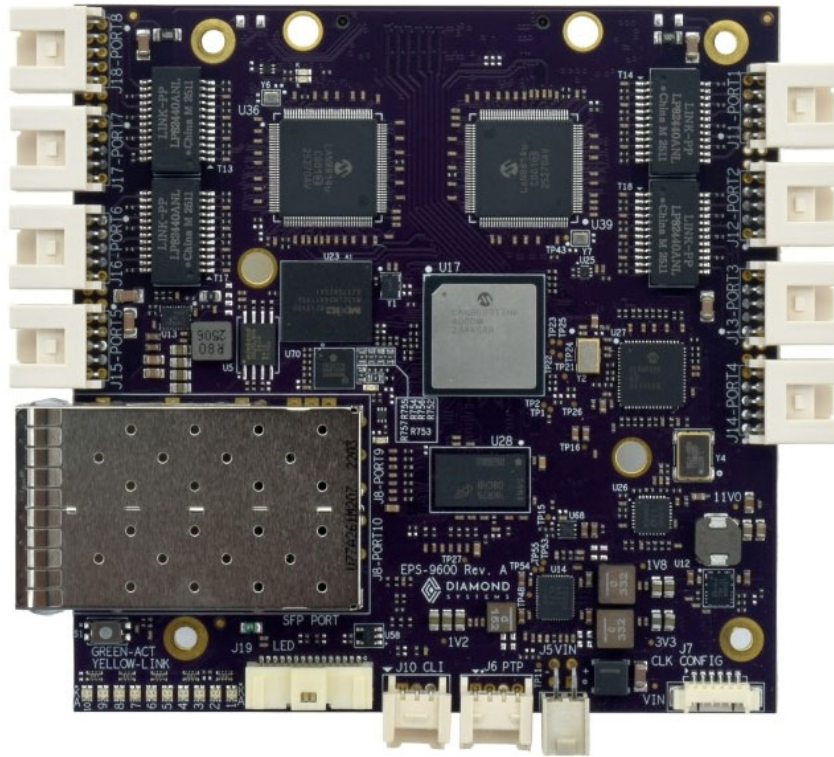


Figure 2-1: EPS-9600 Top Side with Thermal Solution Removed

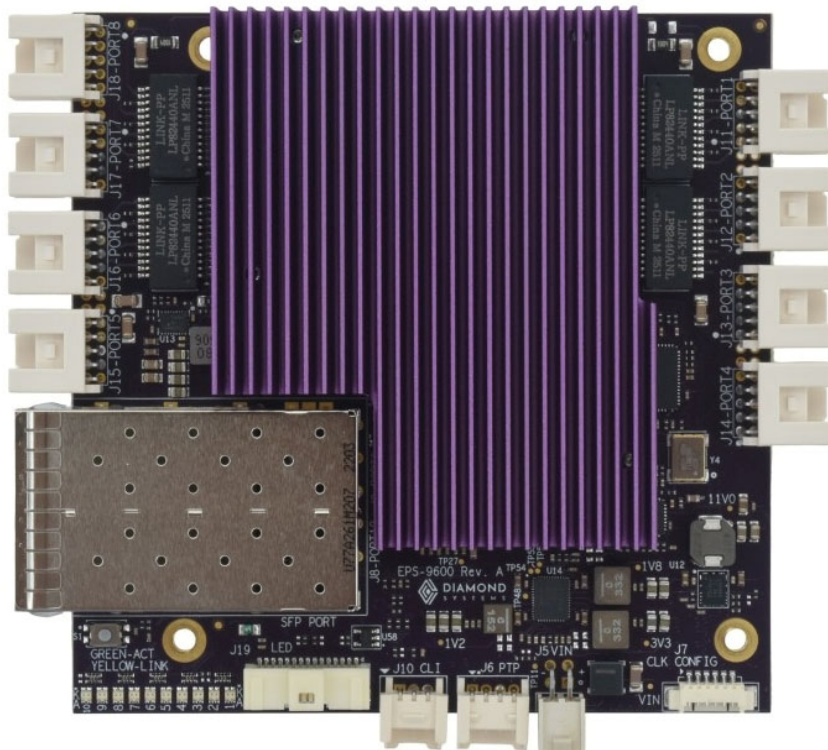


Figure 2-2: EPS-9600 with Heat Sink Installed

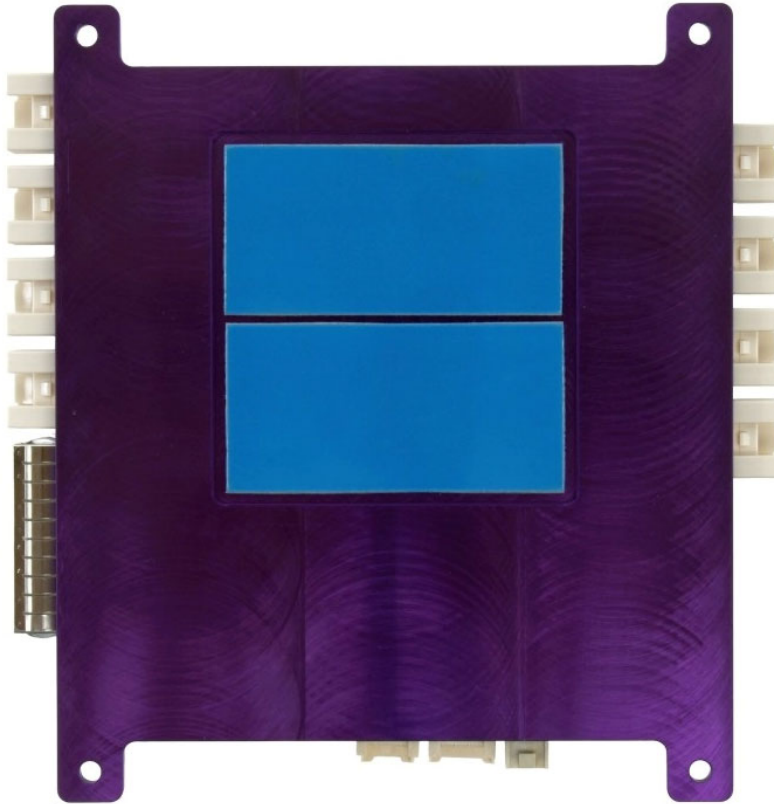


Figure 2-3: EPS-9600 with Heat Spreader Installed (bottom side view)

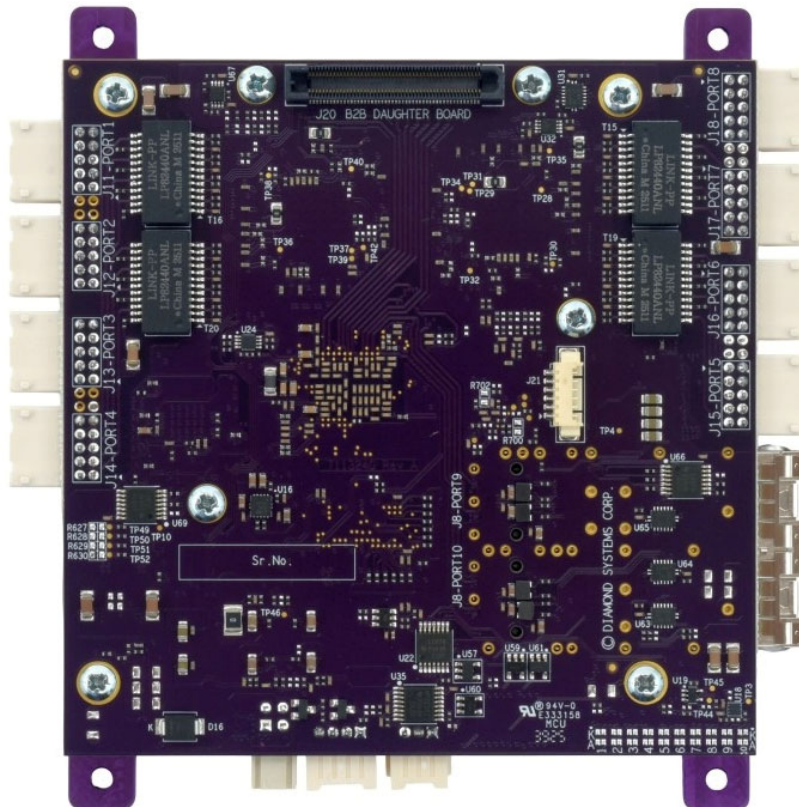


Figure 2-4: EPS-9600 with Heat Spreader — Top Side View

3. Block Diagram

The following diagram illustrates the main functional blocks and port architecture of the EPS-9600, including the division of features between the EPS-9600 main board and the optional daughterboard.

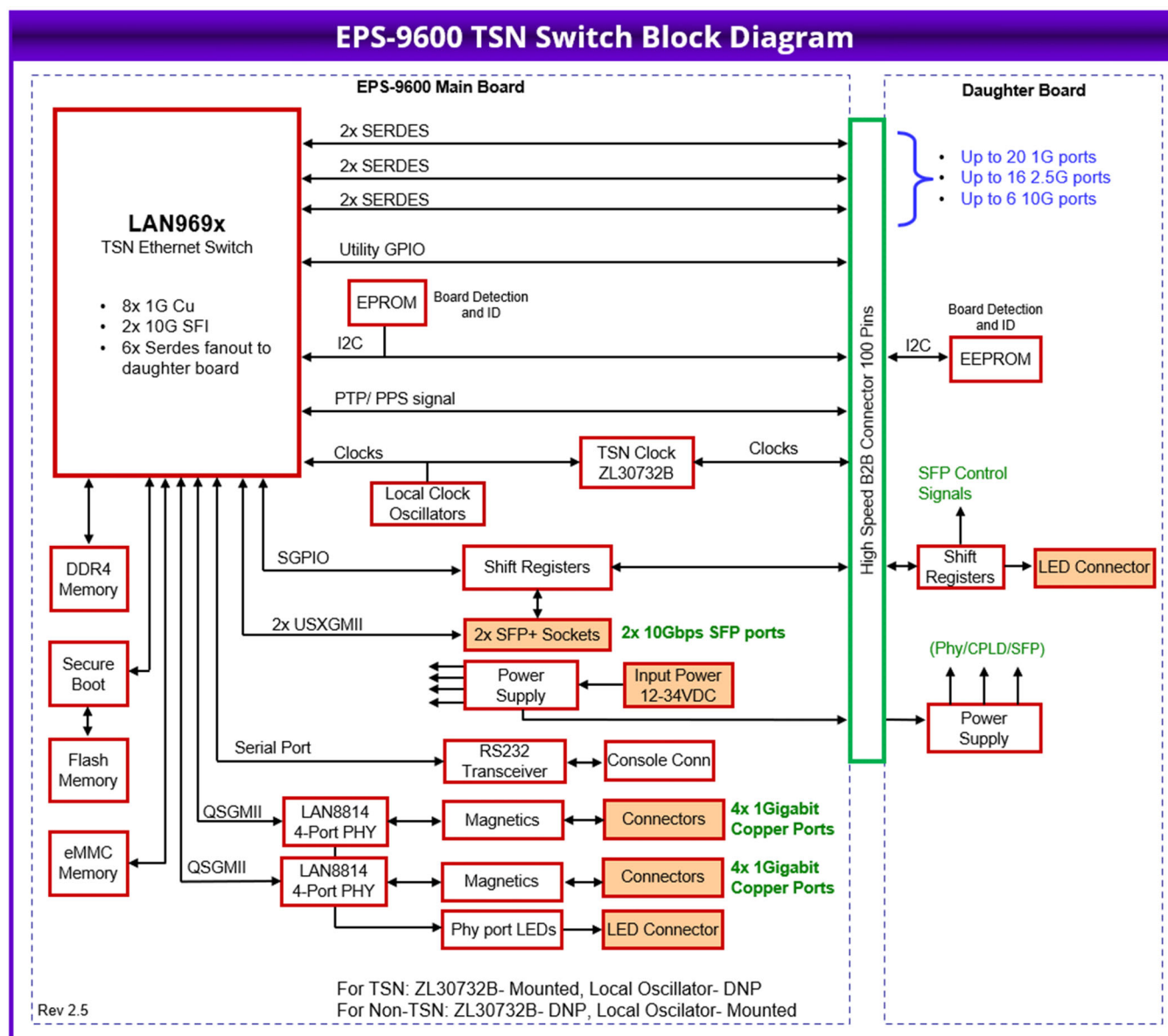


Figure 3-1: EPS-9600 Block Diagram

4. Features

4.1. Feature Overview

- Complete, standalone managed Ethernet switch — no carrier board required
- Compact form factor: 4.00" × 4.00" (101.6 × 101.6 mm) with PC104 compatible mounting holes
- Microchip LAN9698TSN Ethernet switch SoC with integrated dual-core 1 GHz ARM® Cortex®-A53 CPU
- 8× 10/100/1000 Mbps copper Ethernet ports (4 twisted pairs) via two LAN8814 quad-port PHYs
- 2× 10 Gbps SFP+ sockets for fiber or copper transceivers
- Daughterboard connector for expansion up to 30 total ports (combination of 1G / 2.5G / 10G)
- DDR4 SDRAM and eMMC on-board memory
- IEEE 1588 PTP / TSN support with 1PPS input/output
- Web GUI and RS-232 serial port with command line interface
- IStax Layer 3 routing and switching software
- Thicker PCB and latching I/O connectors for shock and vibration resistance
- Heat sink (convection) and heat spreader (conduction) cooling options
- Operating temperature: -40°C to +85°C
- Input voltage: +12V DC nominal; supported range 12V–36V DC
- RoHS compliant

4.2. Time-Sensitive Networking (TSN) Features

Time-Sensitive Networking (TSN) is a set of IEEE 802.1 standards designed to ensure low-latency, deterministic, and highly reliable communication over Ethernet networks. TSN is particularly useful in industrial automation, automotive, telecom, and real-time applications where precise timing and guaranteed data delivery are required. In an Ethernet switch IC, TSN features allow real-time traffic to coexist with standard network traffic without delays or packet loss.

The EPS-9600 supports the following IEEE TSN standards:

- IEEE 802.1AS / IEEE 1588v2 — gPTP/PTP: Generalized Precision Time Protocol
- IEEE 802.1Qbv — TAS: Time-Aware Shaper
- IEEE 802.1Qch (CQF) — Cyclic Queuing and Forwarding
- IEEE 802.1Qav — CBS: Credit-Based Shaper traffic shaping
- IEEE 802.1CB — FRER: Frame Replication and Elimination for Reliability
- IEEE 802.1Qci — PSFP: Per-Stream Filtering and Policing
- IEEE 802.1Qbu / IEEE 802.3br — Frame Preemption

4.3. LED Indicators

The EPS-9600 provides LED indicator signals for all eight copper Ethernet ports (P0–P7) and both SFP+ ports. LED signals, along with additional control signals, are routed to connector J19 to enable use elsewhere on the system such as the front panel.

4.4. Small Form Factor Pluggable Sockets (SFP+)

The EPS-9600 provides two 10 Gbps capable SFP+ sockets for connecting fiber or copper transceivers. The SFP+ sockets support standard SFP+ modules per SFF-8431. LED control signals for the SFPs are included on the LED connector.

SFP+ transceiver modules are not included with the EPS-9600 and must be ordered separately.

4.5. Daughterboard Expansion Connector

The EPS-9600 includes a 100-pin board-to-board expansion connector (J20) on the bottom side of the board for port expansion. The connector is a Samtec ERF5-050-05.0-L-DV-K-TR 100-pin, 0.5 mm pitch high-speed connector. The mating connector on a daughterboard is the Samtec ERM5-050-05.0-L-DV. Multiple board-to-board stacking heights are available in the ERM5/ERF5 family. The recommended part provides the maximum 10mm stacking height, which allows for use of 1Gbps magnetics on the inner surfaces of both the main board and daughterboard.

Port expansion is limited by two factors:

- The maximum number of ports supported is 30, including the 10 ports on the main board.
- The cumulative bandwidth of all ports on both main board and daughterboard is limited by the switch chip used on the board. All current models use LAN9698 with **100Gbps** maximum total bandwidth.

The daughterboard connector carries the following signal groups:

- SERDES2–7 TX/RX differential pairs — for additional SFP+ ports on a daughterboard
- PHY reference clocks — REF_CLK125 for PHY-2, PHY-3, and PHY-4
- PTP_IN and PPS_OUT — IEEE 1588 timing signals
- PHY 1PPS clock inputs — PHY2.PPS, PHY3.PPS, PHY4.PPS
- CK_PTP2, CK_PTP3, CK_PTP4 — PTP clock inputs
- SFP+3–8 I²C SCL signals — SFP transceiver management interface
- TWI2 I²C interface (TWI2_SCL, TWI2_SDA)
- SGPIO2 serial GPIO — Latch Data, Clock, Output, Input
- MDIO_0 / MDC_0 — Ethernet PHY management bus
- nSYSRESET — system reset output from the main board
- nPHYRESET — PHY reset output from the main board
- B2B_PHY_RCVRD_CLK1, B2B_PHY_RCVRD_CLK2 — recovered clocks from PHY
- PHY#2_nINT, PHY#3_nINT, PHY#4_nINT — PHY interrupt signals
- VIN_11V0 — 11V power supply (12 pins, pins 89–100) from carrier/daughterboard to switch module
- GND — ground (distributed throughout connector)

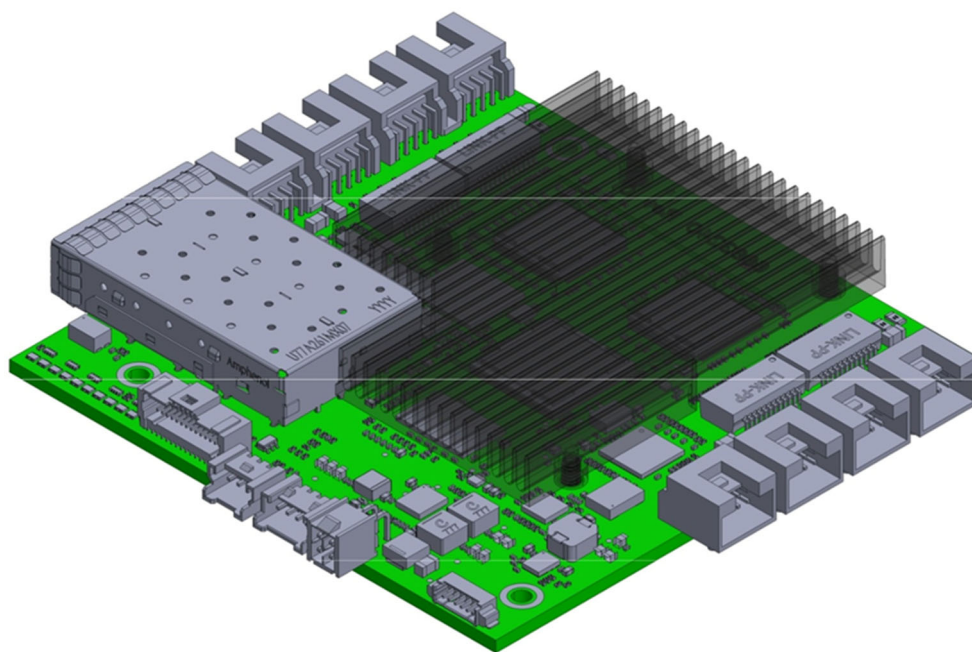


Figure 5-2: EPS-9600 with Heat Sink — 3D Isometric Drawing

5.2. Heat Spreader Models

The following drawing shows the EPS-9600 board assembly with the heat spreader installed. The assembly overall dimensions are 4.72" × 4.72" (120.0 × 120.0 mm), extending beyond the PCB footprint on all sides to accommodate the mounting flanges.

The heat spreader mounting holes are compatible with #4 and M3 fasteners. An integrated thermal pad is included to provide efficient thermal coupling between the heat spreader and the enclosure wall. The 1mm thick pad is recessed 0.8mm into the outer surface of the heat spreader to provide for a 20% compression when the heat spreader is properly installed to achieve metal-to-metal contact at all 4 mounting holes.

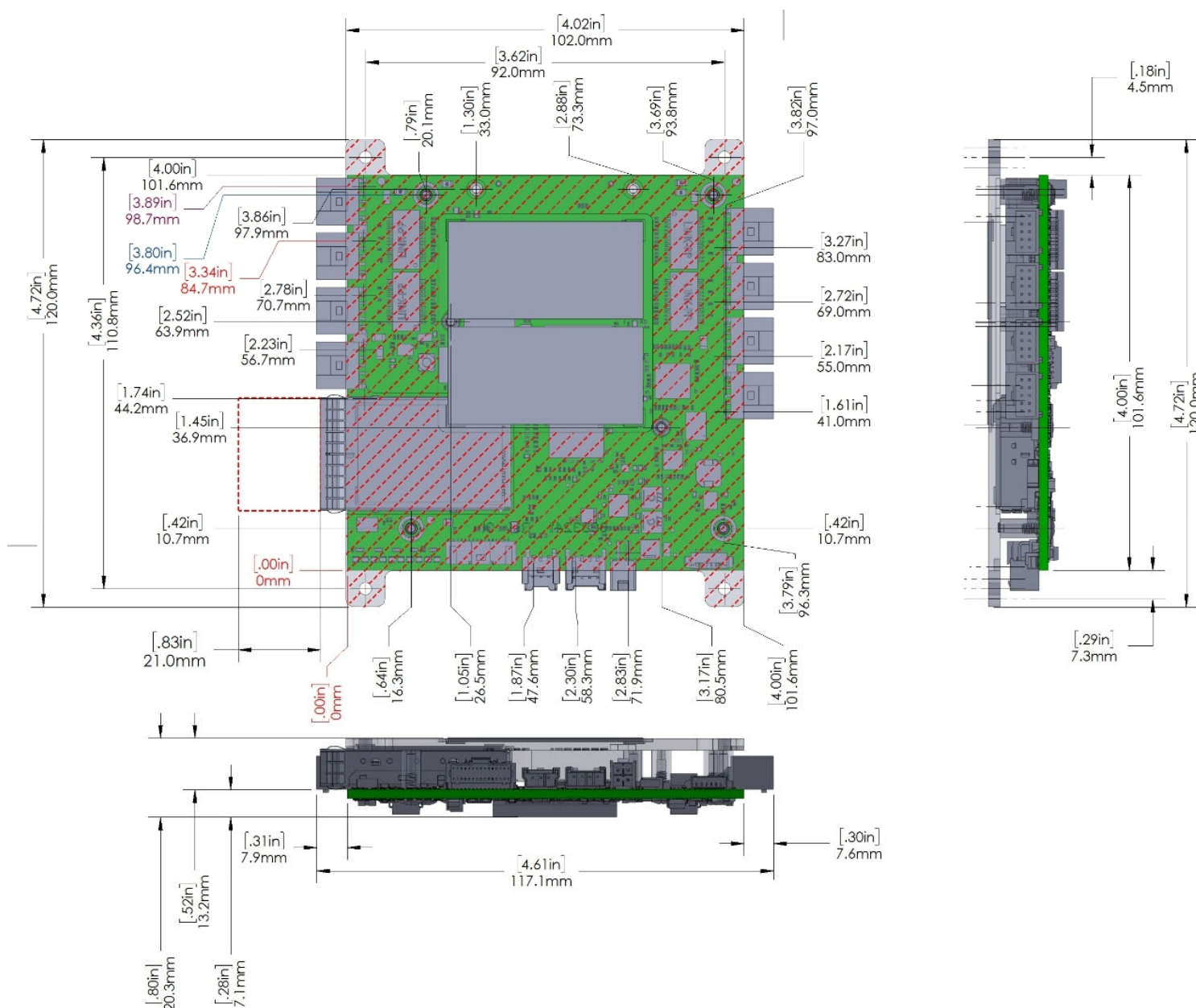


Figure 5-3: EPS-9600 with Heat Spreader — Top and Side View with Dimensions

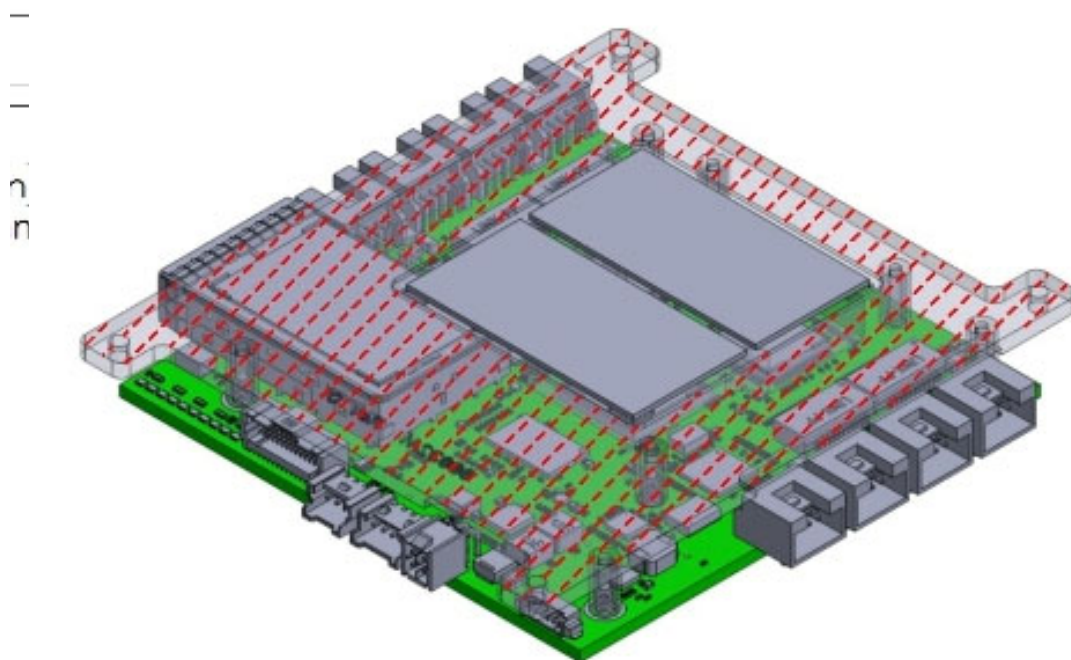


Figure 5-4: EPS-9600 with Heat Spreader — Top and Side View with Dimensions

6. IStax Embedded Software

The EPS-9600 uses the Microchip IStax Layer 3 routing and switching software stack. IStax provides hardware-accelerated Layer 3 routing performance and a comprehensive set of Layer 2 and Layer 3 switching and routing features. The EPS-9600 does not support the WebStax Layer 2 software stack.

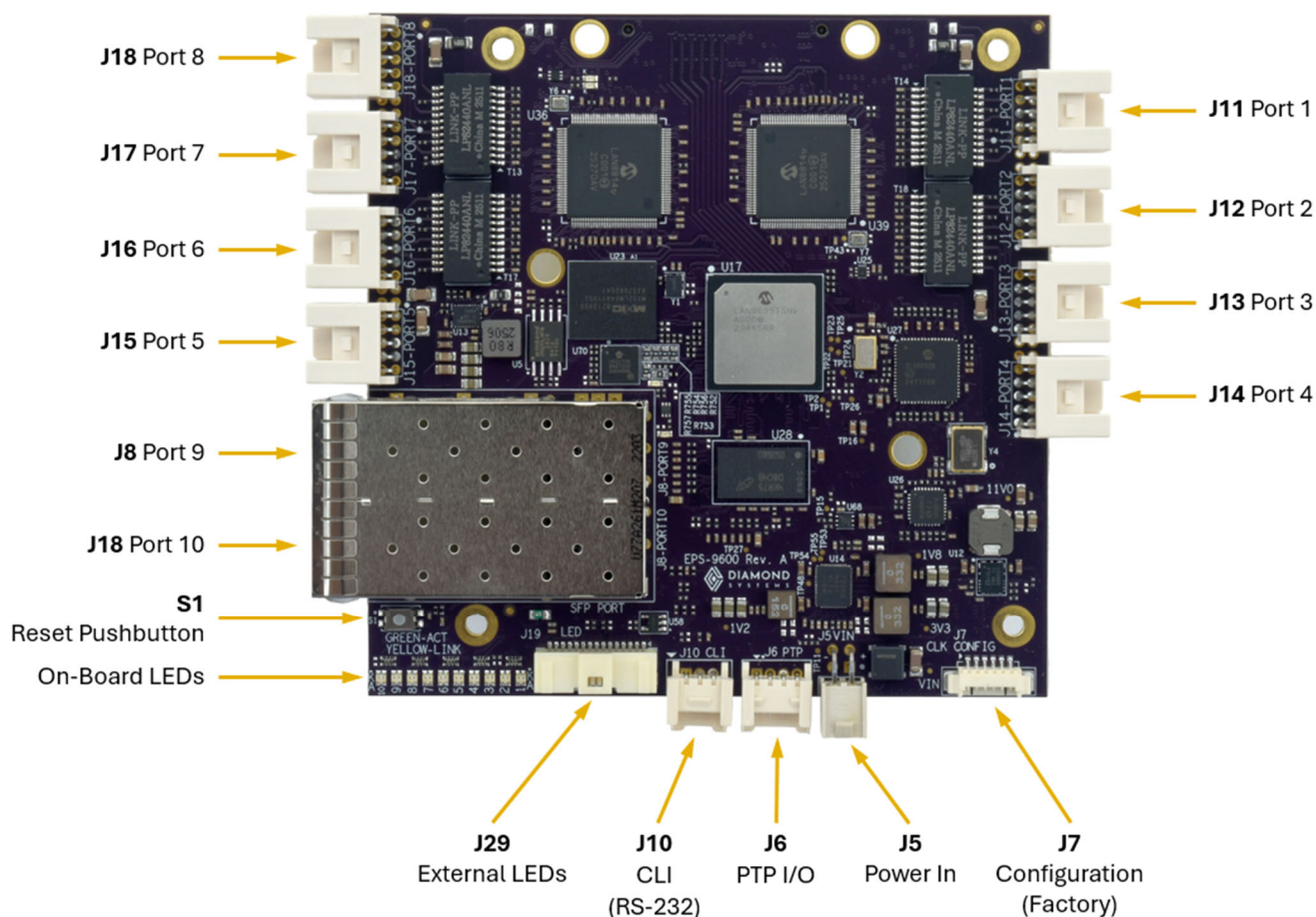
IStax Layer 3 software feature highlights:

- 8K MAC addresses and 4K VLANs (IEEE 802.1Q); IVL/SVL learning
- 8K IPv4 and IPv6 multicast group support
- Jumbo frame support at all speeds
- Flexible link aggregation (IEEE 802.3ad) based on Layer 2–4 information
- Multicast and broadcast storm control and flooding control
- Rapid Spanning Tree Protocol (RSTP, IEEE 802.1w) and MSTP (IEEE 802.1s)
- Multiple protocol support: IEEE 802.1d, 802.1w, 802.1s, 802.1X
- 8 priorities and 8 QoS queues per port; strict or deficit-weighted round-robin (DWRR) scheduling
- Hardware- and software-based IPv4/IPv6 Layer 3 static routing
- OSPFv2 dynamic routing (RFC 2328)
- IEEE 1588 Precision Time Protocol (PTP) and full TSN feature set (see Section 2.5)
- RADIUS accounting
- Port and queue policers
- SSH access for secure remote CLI management
- SNMP v1/v2c/v3 network management
- Web GUI and ICLI command line interface

NOTE: For a complete and current list of IStax software features, refer to the Microchip Ethernet Switch Software Features documentation. Contact Diamond Systems for the software documentation package applicable to the EPS-9600.

7. I/O Connectors and Pinouts

7.1. Connector List and Layout



Reference	Description
J11–J14	Ethernet Ports 1–4 (10/100/1000 Mbps)
J15–J18	Ethernet Ports 5–8 (10/100/1000 Mbps)
J8-PORT 9	SFP+ Port 1 socket (10 Gbps)
J8-PORT 10	SFP+ Port 2 socket (10 Gbps)
J20	100-pin B2B daughterboard expansion connector (bottom side, not shown)
J19	30-pin external LEDs and control
J10	CLI RS-232 serial port
J6	PTP/1PPS I/O
J5	Power input
J7	Clock configuration—factory use only

7.2. Power Input Connector — J5

Connector J5 accepts a wide-range DC input voltage of 12V–36V DC (+12V DC nominal). An on-board wide-range DC/DC power supply converts the input to all voltages required internally. Overvoltage protection is provided by a TVS diode on the input rail. The pinout diagram below represents the pinout of the connector as viewed looking down on the board with the connector pointing down. Pin 1 is marked with a square pad.

Ground	4	3	Vin 12-36VDC
Ground	2	1	Vin 12-36VDC

Connector Part Number: Samtec IPL1-102-01-D-RA-K

Mating Connector: Housing: Samtec IPD1-02-D-K Crimp terminal: CC79R-2024-01-F

Mating Cable: DSC no. 6981507

7.3. Ethernet Port Connectors – J11–J18

The eight 10/100/1000 Mbps copper Ethernet ports use 2 mm pitch dual-row right-angle latching pin header connectors. Each connector supports one Ethernet port with four differential signal pairs per IEEE 802.3. Magnetics are included on the EPS-9600, so direct connection to cat5e twisted pair cabling is supported.

DD+	1	2	DD-
DC+	3	4	DC-
DB+	5	6	DB-
DA+	7	8	DA-
Shield Gnd	9	10	Shield Gnd

Connector Type: JST PUD series 2mm dual row right-angle, locking pin header with tin plating

Mating Connector: JST Sales America PUDP-10V-S housing with SPUD-002T-P0.5 terminals

Mating Cable: DSC part number 6981052 (Note: the Shield pins on the board connector are not connected on this cable.)

7.4. Serial Port Connector (CLI) — J10

Connector J10 provides the RS-232 out-of-band management serial port. Only TX and RX signals are connected. Serial port settings: 115200 bps, 8 data bits, no parity, 1 stop bit.

1	Ground
2	TxD Out
3	RxD In

Connector Type: Molex 35363-0360 2mm single row right-angle, locking pin header

Mating Connector: Molex Connector 35507-0300 housing with 50212-8100 terminals

Mating Cable: DSC part number 6981050

7.5. PTP/1PPS Connector — J6

Connector J6 (labeled PTP on the board silkscreen) provides IEEE 1588 timing signals: a 1 Pulse Per Second (1PPS) input and a 1PPS output. These signals are used for external time synchronization in applications using IEEE 1588 Precision Time Protocol.

1	PPS In
2	Ground
3	PPS Out
4	Ground

Connector: Molex 35363-0460 2mm single row right-angle, locking pin header

Mating Connector: Molex Connector 35507-0400 housing with 50212-8100 terminals

Mating Cable: DSC no. 6981049

7.6. LED and Control Connector — J19

Connector J19 is a 30-pin Molex connector (part number 5015713007) providing LED indicator signals for all eight copper ports, both SFP+ ports, two control signals, the 3.3V supply input, and ground.

P1 LED1	1	2	P1 LED2
P2 LED1	3	4	P2 LED2
P3 LED1	5	6	P3 LED2
P4 LED1	7	8	P4 LED2
P5 LED1	9	10	P5 LED2
P6 LED1	11	12	P6 LED2
P7 LED1	13	14	P7 LED2
P8 LED1	15	16	P8 LED2
SFP1 Green	17	18	SFP1 Yellow
SFP2 Green	19	20	SFP2 Yellow
IP Reset	21	22	Reset Button (Board)
NC	23	24	NC
NC	25	26	NC
NC	27	28	NC
3.3V (500mA polyfuse)	29	30	Ground

Connector: Molex Pico-Clasp 5015713007 dual row right-angle locking pin header

Mating Connector: Molex Pico-Clasp 5011893010

Mating Connector Terminals: Molex 5011937000 / 5011938000 crimp terminals or 0797581018 pre-crimped wires

Mating Cable: Build from above parts

7.7. Daughterboard Expansion Connector — J20

Connector J20 is the 100-pin expansion connector on the bottom side of the EPS-9600 main board. It uses a Samtec ERF5-050-05.0-L-DV-K-TR connector. The mating connector on a daughterboard can be any compatible model of the equivalent ERM5 connector. The recommended connector is Samtec ERM5-050-05.0-L-DV, providing 10mm board-to-board spacing.

Pin Function	Signal	Pin	Pin	Signal	Pin Function
SFP I2C Interface Serial Clock	SFP8_SCL	1	2	SFP7_SCL	SFP I2C Interface Serial Clock
	SFP6_SCL	3	4	SFP5_SCL	
	SFP4_SCL	5	6	SFP3_SCL	
I2C Interface	TWI2_SCL	7	8	TWI2_SDA	I2C Interface
Ground	GND	9	10	GND	Ground
SGPIO Data out to D.B.	SG0_DO	11	12	SG0_LD	SGPIO Latch Data
SGPIO Data in from D.B	SG0_DI	13	14	SG0_CLK	SGPIO Clock
Ground	GND	15	16	GND	Ground
SERDES_7 - TXD	SERDES7_TX_P	17	18	SERDES7_RX_P	SERDES_7 - RXD
	SERDES7_TX_N	19	20	SERDES7_RX_N	
Ground	GND	21	22	GND	Ground
SERDES_6 - TXD	SERDES6_TX_P	23	24	SERDES6_RX_P	SERDES_6 - RXD
	SERDES6_TX_N	25	26	SERDES6_RX_N	
Ground	GND	27	28	GND	Ground
SERDES_4 - TXD	SERDES4_TX_P	29	30	SERDES4_RX_P	SERDES_4 - RXD
	SERDES4_TX_N	31	32	SERDES4_RX_N	
Ground	GND	33	34	GND	Ground
SERDES_3 - TXD	SERDES3_TX_P	35	36	SERDES3_RX_P	SERDES_3 - RXD
	SERDES3_TX_N	37	38	SERDES3_RX_N	
Ground	GND	39	40	GND	Ground
SERDES_2 - RXD	SERDES2_TX_P	41	42	SERDES2_RX_P	SERDES_2 - RXD
	SERDES2_TX_N	43	44	SERDES2_RX_N	
Ground	GND	45	46	GND	Ground
SERDES_1 - RXD	SERDES1_TX_P	47	48	SERDES1_RX_P	SERDES_1 - RXD
	SERDES1_TX_N	49	50	SERDES1_RX_N	
Ground	GND	51	52	GND	Ground
Reference Clock for Phy-3	PHY3_CLK125_P	53	54	PHY2_CLK125_P	Reference Clock for Phy-2
	PHY3_CLK125_N	55	56	PHY2_CLK125_N	
Ground	GND	57	58	GND	Ground
Recovered clock from Phy	PHY_RCVRD_CLK1	59	60	PHY4_CLK125_P	Reference Clock for Phy-4
	PHY_RCVRD_CLK2	61	62	PHY4_CLK125_N	
Ground	GND	63	64	GND	Ground
PTP Input	PTP_IN	65	66	SYS_RST_N	Reset output from Ethernet Switch Main board
PPS Output	PTP_OUT	67	68	PHY_RST_N	Ethernet Phy Reset output from Main board

Pin Function	Signal	Pin	Pin	Signal	Pin Function
Ground	GND	69	70	GND	Ground
PPS CLK Input	PHY2_1PPS	71	72	MDIO_3V3	Ethernet PHY serial interface extension to D.B
	PHY3_1PPS	73	74	MDC_3V3	
	PHY4_1PPS	75	76	GND	Ground
Ground	GND	77	78	PHY2_INT_N	Ethernet PHY Interrupt input extension from Daughter board
PTP CLK Input	CLK_PTP_2	79	80	PHY3_INT_N	
	CLK_PTP_3	81	82	PHY4_INT_N	Test GPIO (FU)
	CLK_PTP_4	83	84	TEST_GPIO	
Ground	GND	85	86	GND	Ground
	NC	87	88	NC	
	NC	89	90	NC	
	NC	91	92	NC	
	NC	93	94	NC	
11V Supply to D.B.	VIN_11V0	95	96	VIN_11V0	11V Supply to D.B.
	NC	97	98	NC	
11V Supply to D.B.	VIN_11V0	99	100	VIN_11V0	11V Supply to D.B.

Signal Group	Signal Name(s)	Description
SERDES Interface	SERDESx_TX_P/N	High-speed differential transmit pair from the main board SoC to the daughter board, intended for SERDES-based interfaces (e.g., Ethernet Phy, SFP+, with high-speed flexible protocols depending on the application)
	SERDESx_RX_P/N	High-speed differential receive pair from the daughter board to the main board SoC, supporting flexible SERDES-based connectivity
I2C Interface	SFPx_SCL	I2C clock signals used for SFP module management. The corresponding SDA signal is shared across multiple SFP modules
	TWI2_SCL / TWI2_SDA	General-purpose I2C interface extended to the daughter board for peripheral communication. (including SFP module)
SGPIO Interface	SG0_DO	SGPIO data output to the daughter board
	SG0_DI	SGPIO data input from the daughter board
	SG_CLK	SGPIO clock signal
	SG_LD	SGPIO latch/load signal
Ethernet Phy Clock Signals	PHYx_CLK125_P/N	125 MHz differential reference clock output for daughter board PHY devices
	PHY_RCVRD_CLKx	Recovered clock output from daughter board PHY to main board PHY devices
	PHYx_1PPS	Pulse-per-second (1PPS) timing input for synchronization.
	CLK_PTP_x	Precision Time Protocol (PTP) reference clock inputs for synchronization
Control & Reset Signals	SYS_RST_N	Active-low system reset output to the daughter board
	PHY_RST_N	Active-low reset signal for external daughter board PHY devices
	PHYx_INT_N	Active-low interrupt input from PHY on the daughter board
MDIO Interface	MDC	Management Data Clock for Ethernet PHY configuration
	MDIO	Bidirectional management data signal for PHY control and status
Power	VIN_11V0	11V power supply provided from the main board to daughter board
Ground	GND	Ground reference
Miscellaneous	TEST_GPIO	General-purpose GPIO or reserved for future use
	NC	No connection

Item Details	
Connector — Main Board	Samtec ERF5-050-05.0-L-DV-K-TR — 100-pin, 0.5 mm pitch, high-speed B2B, bottom side of PCB
Connector — Daughterboard	Samtec ERM5-050-05.0-L-DV
Daughterboard Availability	Contact Diamond Systems for information

8. Getting Started

This chapter describes how to connect and power on the EPS-9600 for the first time and gain initial access to the management interfaces.

8.1. Items Required

- EPS-9600 Ethernet Switch board with thermal solution installed (heat sink or heat spreader; see Chapter 12)
- DC power supply: +12V DC nominal, minimum insert current rating A; or any supply in the 12V–36V DC input range
- Power cable — Diamond Systems part number 6981507
- Ethernet cable(s) — Diamond Systems part number 6981052
- RS-232 serial cable (if CLI interface is desired) — Diamond Systems part number 69891050
- Host computer with terminal emulation software (e.g., PuTTY) and an RS-232 serial port or USB-to-serial adapter, for initial CLI access
- Appropriate mounting hardware (#4 or M3 screws) if mounting to a chassis or enclosure

8.2. Initial Connection — Serial Console

The recommended method for initial configuration of the EPS-9600 is via the RS-232 serial console port. This provides out-of-band CLI access that is independent of the network configuration state of the switch.

1. Ensure the EPS-9600 is not powered on.
2. Connect an RS-232 serial cable from the host computer to the J10 (CLI) connector on the EPS-9600 board edge.
3. Open a terminal emulation program on the host computer and configure the serial port settings: 115200 bps, 8 data bits, no parity, 1 stop bit, no flow control.
4. Apply DC power to the EPS-9600 via the J5VIN power connector.
5. The EPS-9600 will boot. Boot messages will appear in the terminal window.
6. When the boot process is complete, the CLI login prompt will appear.
7. Log in using the default credentials (see Section 9.3).

NOTE: If no output appears in the terminal after power-on, verify the serial cable connection, confirm the COM port selection, and check the serial port settings.

8.3. Default Login Credentials

Interface	Default Username	Default Password
CLI (serial / SSH)	admin	No password
Web GUI	admin	No password

Note: The default password is blank.

WARNING: Change the default password immediately after first login. Using default credentials in a deployed network is a security risk.

8.4. Initial Network Access — Web GUI

After logging in via the serial console and completing initial IP configuration, the EPS-9600 web management interface can be accessed from any host computer connected to one of the copper Ethernet ports (J11–J18).

1. Using the CLI, assign an IP address to the management VLAN interface. Example (verify correct IStax syntax with author flag below):

```
# ip interface vlan 1
```

```
# ip address 192.168.1.100 255.255.255.0
```

2. Connect a host computer to one of the copper Ethernet ports using an Ethernet cable.
3. Configure the host computer network interface on the same subnet (e.g., 192.168.1.x / 255.255.255.0).
4. Open a web browser and navigate to the IP address assigned to the EPS-9600 (e.g., <http://192.168.1.100>).
5. The web management login page will appear. Enter the admin credentials.

9. System Administration

9.1. Command Line Interface (CLI) and Web Interface Overview

The EPS-9600 can be managed through three interfaces: the web graphical user interface (GUI), the command line interface (CLI) via the serial port or SSH, and SNMP. This chapter provides an overview of each management method.

9.2. Management Interfaces

Interface	Access Method	Protocol	Default Access
Web GUI	Browser via any Ethernet port	HTTP / HTTPS	http://<mgmt IP>
CLI	J10 (CLI) RS-232 serial port	RS-232; 115200/8/N/1	Direct serial connection
CLI (remote)	SSH from any networked host	SSH	ssh admin@<mgmt IP>
SNMP	Network management station	SNMP v1/v2c/v3	default community

9.3. User Accounts

The EPS-9600 ships with a single default administrator account. Additional user accounts with configurable privilege levels can be created via the web GUI or CLI.

9.4. Saving Configuration

Configuration changes made via the CLI or web GUI take effect immediately but are not automatically saved to non-volatile memory. To make changes persistent across reboots, save the running configuration using the CLI command below or the equivalent Save option in the web GUI.

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

GUI Path for storing the configurations:

Maintenance -> Configuration -> Save startup-config -> Save Configuration

9.5. Restoring Factory Defaults

The EPS-9600 configuration can be reset to factory defaults using the CLI command below. This will erase all user configuration, including IP addresses, VLANs, and user accounts, and restore all settings to their factory default values. The board will reboot after the reset.

WARNING: Restoring factory defaults will erase all configuration. Ensure any needed configuration is backed up before proceeding.

```
# reload defaults
```

Physical hardware board reset method: The push button switch 'S1' is located in the lower left corner on the top side just below the SFP cages. Press on S1 to reset the switch to its factory default settings.

9.6. Firmware Version

To display the currently running firmware version and system information, use the following CLI command:

```
# show version
```

9.7. SNMP

The EPS-9600 supports SNMP v1, v2c, and v3 for integration with network management systems. SNMP can be configured via the web GUI or CLI. SNMPv3 provides enhanced security with authentication and encryption and is recommended for deployments where network security is required.