

Juniper Networks Dual-port T1/E1 Physical Interface Module (PIM)



The Juniper Dual-port T1/E1 Physical Interface Modules (PIM) is for use with the J4300, J4350, J6300, and J6350 Services Routers as well as the Secure Services Gateway 500 Series Firewall appliance. This PIM includes two physical T1 or E1 ports with integrated CSU/DSU and a license for two physical interface ports.

The Juniper Dual-port T1/E1 PIM provides the physical connection to T1 or E1 network media types, receiving incoming packets from the network and transmitting outgoing packets to the network. The Juniper Dual-port T1/E1 PIM is equipped with a dedicated network processor that forwards incoming data packets to the Routing Engine, and receives outgoing data packets from the Routing Engine. During this process, the PIM performs T1 or E1 framing and line-speed signaling.

When the T1/E1 PIM is installed in the ScreenOS-based Secure Services Gateway 500 Series firewall/VPN appliance, the dedicated network processor will forward traffic to the SSG 500 Series CPU where traffic decisions are made based upon the security policy. The T1/E1 PIM does not require port licenses when deployed in the SSG 500 Series.

The Juniper Dual-port T1/E1 PIM provides the following benefits:

- Dual-port form factor allows for increased bandwidth capabilities while making most effective use of the J-series router modular interface slots.
- Physical port licensing capability creates a cost effective means for quickly activating and turning up additional capacity.
- The Integrated CSU/DSU eliminates the need to deploy a separate external device saving valuable space and simplifying management.

Features

- Fully integrated CSU/DSU
- Full and fractional T1/E1 capabilities
- Onboard Network Processor
- 56K & 64K modes support
- ANSI T1.102, T1.107, T1.403 T1 support
- G.703, G.704, & G.706 E1 support
- Independent Clock
- Loopback, Bert, FDL (T1 only), and Long Buildout diagnostics

Specifications

Product Number	Description
JX-2T1-RJ48-S	Dual-port T1 PIM including two physical interface port licenses
JX-1T1-LTU	One physical interface port license for use with the J-series Dual-port T1 PIM
JX-2E1-RJ48-S	Dual-port E1 PIM including two physical interface port licenses
JX-1E1-LTU	One physical interface port license for use with the J-series Dual-port E1 PIM

JUNOS Software Release

The Dual-port T1/E1 PIM is supported in JUNOS 7.0 or greater on the J-series Services Routers.

ScreenOS Software Release

The T1/E1 PIM is supported in ScreenOS 5.1 on the SSG 500 Series.

Network Interface Specifications

	Dual-port T1	Dual-port E1
Transmit bit rate	1.544 Mbps	2.048 Mbps
Receive bit rate	1.544 Mbps	2.048 Mbps
Line encoding	- AMI - B8ZS	- HDB3
Modes	- Framed Clear Channel - Fractional	- Framed Clear Channel - Unframed Clear Channel - Framed Fractional
Framing	- Superframe (D4/SF) - Extended Superframe (ESF)	- G704 - G704 without CRC4 - Unframed

HDLC Features

- N x 64 Kbps or N x 56 Kbps, nonchannelized data rates (T1:N = 1 to 24, E1:n = 1 to 31)
- CRC 16/32
- Shared Flag
- Idle flag/fill
- Counters: runts, giants, fcs error, abort error, align error

Interface Connector

RJ-48

System timing

- Internal (system clock)
- External (network recovered clocks)

Dimensions and Weight (H x W x D)

- 0.63 in. x 5.45 in. x 6.5 in.
- 1.6 cm. x 13.8 cm. x 16.5 cm.

Environmental

- Operating temperature:** 0-40C
- Storage temperature:** -40 to 70
- Relative humidity:** 5% to 90% non-condensing

Diagnostics

Loopbacks

Local, Remote, Payload

Test patterns (BERT)

- All ones
- All zeros
- Alternating ones and zeros (AA/55)
- 1:3 or 1 in 4 pattern
- 1:7 or 1 in 8 pattern
- 3:24 - 3 bits set in every 24 bits
- QRSS20 (Modified PRBS 2^20-1, with 14 zero suppression)
- PRBS 2^7-1
- PRBS 2^9-1 (as specified in ITU-T O.153)
- PRBS 2^11-1 (as specified in ITU-T O.153)/2047 pattern
- PRBS 2^15-1 (as specified in ITU-T O.151/O.153)
- PRBS 2^20-1 (as specified in ITU-T O.153)
- Programmable word or 32-bit programmable pattern

Network (T1) alarms

LOS, LOF, AIS, YLW

Error Counters

- Controlled Slipped Seconds (CSS or CS)
- Line Errored Seconds (LES)
- Errored Seconds (ES)
- Bursty Errored Seconds (BES)
- Severely Errored Seconds (SES)
- Severely Errored Framing Seconds (SEFS)
- Loss Of Signal Seconds (LOS)
- Loss Of Framing Seconds (LOFS)
- UAS Unavailable Seconds (UAS)

LEDs

PIM LED's indicate port status with the following LED states:

Color	State	Description
Green	On steadily	Online with no alarms or failures.
Red	On steadily	Active with a local alarm; router has detected a failure.

Standards and Compliance

Agency/Regulatory Compliance

Safety

- CAN/CSA-C22.2 No.60950/UL 60950 Third Edition, Safety of Information Technology Equipment
- EN 60950 (2000) Third edition - Safety of Information Technology Equipment

EMC (Emissions)

- FCC Part 15 Class B
- EN 55022 Class B
- AS/NZS 3548 Class B
- VCCI Class B

Immunity

- EN-61000-4-2 ESD
- EN-61000-4-3 Radiated Immunity
- EN-61000-4-4 EFT
- EN-61000-4-5 Surge
- EN-61000-4-6 Low Frequency Common Immunity

ETSI

- ETSI EN-300386-2: Telecommunication Network Equipment. Electromagnetic Compatibility

Telecom

- FCC Part 68/TIA-968
- IC CS-03

Standards

T1 Standards

- ANSI T1.102
- ANSI T1.107
- ANSI T1.403
- Telcordia GR-499-CORE
- ACCUNET TR 62411 (Accunet T1.5)

E1 Standards

- ITU-T G.703
- ITU-T G.704
- ITU-T G.706
- ITU-T G.823
- ITU-T G.826
- CTR 12/13
- ACA TS 016



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