



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

## Product Description

The Juniper Networks 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 a T1 or E1 PIM is installed in a ScreenOS-based SSG Family security appliance, the dedicated network processor will forward traffic to the SSG CPU where traffic decisions are made based upon security policies.

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

- Dual-port form factor allows for increased bandwidth capabilities while making effective use of the J-series and SSG modular interface slots.
- 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
JX-2E1-RJ48-S	Dual-port E1 PIM

### JUNOS Software Release

The Dual-port T1 and E1 PIMs are supported on J-series routers in JUNOS 7.0 and greater releases.

### ScreenOS Software Release

The T1/E1 PIM is supported in ScreenOS 5.1 and greater releases on the SSG 500 Series, ScreenOS 6.0/r2 and greater releases on the SSG 300 Series and ScreenOS 5.4 and greater releases on the SSG 140

### 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

*Juniper Networks Dual-port T1 and E1 Physical Interface Modules (PIMs) are for use with the J2320, J2350, J4300, J4350, J6300, and J6350 Services Routers as well as the Secure Services Gateway 140 (SSG 140), SSG 300 Series, and SSG 500 Series security appliances.*

## Data Interface

### 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 to 40°C  
Storage temperature: -40 to 70°C  
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 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

## About Juniper

Juniper Networks, Inc. is the leader in high-performance networking. Juniper offers a high-performance network infrastructure that creates a responsive and trusted environment for accelerating the deployment of services and applications over a single network. This fuels high-performance businesses. Additional information can be found at [www.juniper.net](http://www.juniper.net)



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