



DS3 AND E3 PHYSICAL INTERFACE MODULES

Product Overview

The DS3 and E3 Physical Interface Modules (PIMs) are for use with Juniper Networks J4350 and J6350 Services Routers and the secure Juniper Networks SSG500 line of services gateways. These PIMs include either one physical DS3 or E3 port with integrated data service unit (DSU).

Product Description

The Juniper Networks® DS3 and E3 PIMs provide the physical connection to DS3 or E3 network media types, receiving incoming packets from the network and transmitting outgoing packets to the network. Both DS3 and E3 PIMs are 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 framing and line-speed signaling.

When installed in the Juniper Networks SSG500 line of services gateways running ScreenOS®, the dedicated network processor forwards traffic to the SSG520M or SSG550M CPU where traffic decisions are made based upon the security policy.

Features and Benefits

DS3 and E3 PIMs provide the following benefits:

- High-speed DS3 and E3 interfaces can support the WAN access needs of large regional or corporate sites.
- The integrated DSU eliminates the need to deploy a separate external device, saving valuable space and simplifying management.

Features

- Fully integrated DSU
- Onboard network processor
- Subrate and scrambling options with support for major DSU vendors
- Independent clock
- Loopback, bit error rate test (BERT), and far-end alarm and control (FEAC) diagnostics

Specifications

Product Specifications

Dimensions and Weight (W x H x D)

- 5.45 x 0.63 x 6.5 in (13.8 x 1.6 x 16.5 cm)

Network Interface Specifications

- High-Level Data Link Control (HDLC) features
 - Shared flag
 - Idle flag/fill (0x7e or all ones)
 - Counters: runts, giants, frame check sequence (fcs) error, abort error, align error
 - Maximum transmission unit (MTU): Normal (4500 bytes) or Jumbo (max 9192 bytes)
- Subrate and scrambling support for major DSU vendors:
 - DS3: Verilink, Kentrox, Digital Link, Larscom, Adtran
 - E3: Digital Link, Kentrox
- Interface connector: DSX3 interface with dual female 75-ohm BNC coaxial connectors (separate Rx/Tx)
- System timing: Internal, LoopData interface

Environmental

- Operating temperature: 0° to 40° C
- Storage temperature: -40° to 70° C
- Relative humidity: 5 to 90% noncondensing

Diagnostics

Loopbacks

- DS3: Local, remote, payload
- E3: Local, remote

Test Patterns (BERT)

- All ones
- All zeros
- Alternating ones and zeros (AA/55)
- PRBS 2¹⁵-1 (as specified in ITU-T O.151)
- PRBS 2²⁰-1 (as specified in ITU-T O.153)
- QRSS 2²⁰-1 (as specified in ITU-T O.151)
- PRBS 2²³-1 (as specified in ITU-T O.151)
- PRBS 2⁹-1
- PRBS 2¹¹-1
- PRBS 2²⁹-1
- PRBS 2³¹-1

Note: E3 BERT support available in unframed mode only

Network Alarms

- DS3 alarms in conformance with the ANSI specification:
 - Loss of signal (LOS)
 - Out of frame (OOF)
 - Loss of frame (LOF)
 - Alarm indication signal (AIS)
 - Remote defect indication (RDI)
- E3 alarms in conformance with the ITU-T specification:
 - Loss of signal (LOS)
 - Out of frame (OOF) (for framed mode only)
 - Alarm indication signal (AIS)
 - Remote defect indication (RDI) (for framed mode only)
 - Phase-locked loop (PLL) alarm

Error Counters (DS3/E3)

- Line code violations (LCV)
- P-bit code violations (PCV)
- C-bit code violations (CCV)
- Line errored seconds (LES)
- P-bit errored seconds (PES)
- C-bit errored seconds (CES)
- Severely errored framing seconds (SEFS)
- P-bit severely errored seconds (PSES)
- C-bit severely errored seconds (CSES)
- Unavailable seconds (UAS)
- C-bit coding violations-far end (CCV-FE) [FEFE]
- C-bit errored seconds-far end (CES-FE)
- Unavailable seconds-far end (UAS-FE)
- Error Counters (E3 only):
 - Frame alignment error (FAE)
 - Bipolar coding violations (BCV)
 - Excessive zeros (EXZ)
 - Line code violations (LCV)
 - Line errored seconds (LES)
 - Severely errored framing seconds (SEFS)
 - Unavailable seconds (UAS)

LEDs

PIM LEDs 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.
Yellow	On steadily	Remote RDI/yellow alarm

Management Capabilities

Telnet/Console/JWeb:

Remote and local configuration, monitoring, and troubleshooting
Standards and Compliance

Safety

- CAN/CSA-C22.2 No. 60950-1-03 - UL 60950-1 Safety of Information Technology Equipment
- EN 60950-1 Safety of Information Technology Equipment

EMC Emissions

- AS/NZS 3548 Class B
- EN55022 Class B
- FCC Part 15 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

European Telecommunications Standardization Institute (ETSI)

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

DS3 Standards

- ANSI T1.102
- ANSI T1.107
- ANSI T1.404
- Telcordia GR-449-CORE
- ACCUNET TR54014 (Accunet T-45)

E3 Standards

- ITU-T G.751
- ITU-T G.703
- ITU-T G.823
- Telcordia GR-449-CORE

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Ordering Information

MODEL NUMBER	DESCRIPTION
JX-IDS3-S	DS3 PIM
JX-IE3-S	E3 PIM

Juniper Networks Junos® Operating System Release

- The DS3 PIM is supported in Junos OS 7.0 or greater on the J Series Services Routers.
- The E3 PIM is supported in Junos OS 7.3 or greater on the J Series Services Routers.

Juniper Networks ScreenOS Software Release

- The DS3 PIM is supported in ScreenOS 5.1 on the SSG500 line.
- The E3 PIM is supported in ScreenOS 6.0 on the SSG500 line.

About Juniper Networks

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.

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