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SRX300 Series and SRX550 High Memory Gateway Interface Modules Reference

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SRX300 Series and SRX550 High Memory Gateway Interface Modules Reference
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About This Guide

Use this guide to understand the specifications and perform the basic configuration for the interface modules supported on the SRX300 Series and SRX550 High Memory Services Gateways. After understanding the support and compatibility information, and completing the configuration procedures covered in this guide, refer to the Junos OS documentation for information about further software configuration.

RELATED DOCUMENTATION

- Wi-Fi Mini-PIM Installation Guide
- LTE Mini-PIM and Antenna Installation Guide
- Transceivers Supported on SRX Series Services Gateways

CHAPTER 1

Overview

SRX300 Series and SRX550M Interface Modules Support

IN THIS SECTION

SRX300 Series and SRX550 High Memory Services Gateway Interface Overview

Mini-Physical Interface Modules (Mini-PIMs) and Gigabit-Backplane Physical Interface Modules (GPIMs) are field-replaceable network interface cards (NICs), which provide physical connections to a LAN or a WAN. You can easily insert or remove Mini-PIMs and GPIMs from the front slots of the services gateway chassis. The Mini-PIMs and GPIMs receive incoming packets from the network and transmit outgoing packets to the network. During this process, they perform framing and line-speed signaling for the medium type.

The SRX300 Series Services Gateways support only Mini-PIMs. The SRX550 High Memory Services Gateway supports both Mini-PIMs and GPIMs.

SRX300 Series and SRX550 High Memory Services Gateway Mini-Physical Interface Modules Overview

Table 1 on page 3 lists the supported Mini-PIMs and their model numbers.

Table 1: SRX300 Series and SRX550 High Memory Services Gateway Mini-PIM Model Numbers

Mini-PIMs	Model Numbers
Serial Mini-PIM	SRX-MP-1Serial-R
T1/E1 Mini-PIM	SRX-MP-1T1E1-R
VDSL2 Mini-PIM	SRX-MP-1VDSL2-R
LTE Mini-PIM	SRX-MP-LTE-AE (for North America and the European Union) SRX-MP-LTE-AA (for Asia and Australia)
Wi-Fi Mini-PIM	SRX-MP-WLAN-US (for United States) SRX-MP-WLAN-IL (for Israel) SRX-MP-WLAN-WW (for other countries)

The Mini-PIMs are field-replaceable. You can install a Mini-PIM in the Mini-PIM slot on the front panel of the services gateway chassis.

CAUTION: The Mini-PIMs are not hot-swappable. You must power off the services gateway before removing or installing Mini-PIMs.

SRX300 Series and SRX550 High Memory Services Gateway Gigabit-Backplane Physical Interface Modules Overview

A Gigabit-Backplane *Physical Interface Module* (GPIM) is a network interface card (NIC) that installs in the front slots of the SRX550 High Memory Services Gateway to provide physical connections to a LAN

or a WAN. The GPIM receives incoming packets from a network and transmits outgoing packets to a network. These modules complement the onboard Ethernet interfaces to extend the types and port counts of network connections for the LAN or WAN.

Interface module terminology:

- GPIM—Can be installed in one of the single-high, single-wide GPIM front slots of the SRX550 High Memory Services Gateway that have Gigabit connectivity to the system backplane.
- XPIM—Can be installed only in the 10-Gigabit GPIM slot 3 or in the 20-Gigabit GPIM slot 6 on the front panel of the SRX550 High Memory Services Gateway.

  The GPIMs can have one of the following configurations:

  - Single-high, single-wide LAN switch GPIM that uses one slot
  - Double-high, single-wide LAN switch GPIM that uses two standard slots vertically

  NOTE: GPIMs are not supported on the SRX300 Series devices.

Table 2 on page 4 lists the GPIMs and XPIMs and their respective model numbers.

Table 2: SRX550 High Memory Services Gateway GPIM/XPIM Model Numbers

GPIM or XPIM	Model Number
8-Port Gigabit Ethernet SFP XPIM	SRX-GP-8SFP
16-Port Gigabit Ethernet XPIM (with PoE)	SRX-GP-16GE-POE
Dual CT1/E1 GPIM	SRX-GP-DUAL-T1-E1
Quad CT1/E1 GPIM	SRX-GP-QUAD-T1-E1
1-Port Clear Channel DS3/E3 GPIM	SRX-GP-1DS3-E3

Figure 1 on page 5 shows how the slots on the front panel of the SRX550 High Memory Services Gateway are numbered. Slots 1 and 2 are for Mini-PIMs, and slots 3 through 8 are for GPIMs.

Figure 1: SRX550 High Memory Services Gateway Slot Numbers

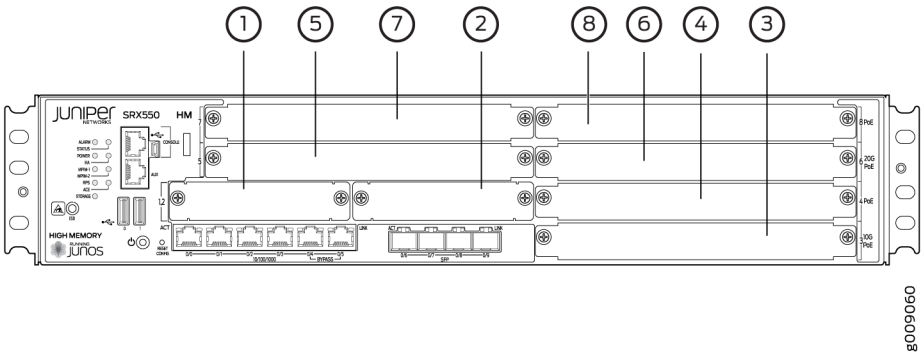


Figure 2 on page 5 and Figure 3 on page 5 show the form factors for the services gateway GPIMs.

Figure 2: Example of a Standard GPIM (Installs in One Standard Slot)

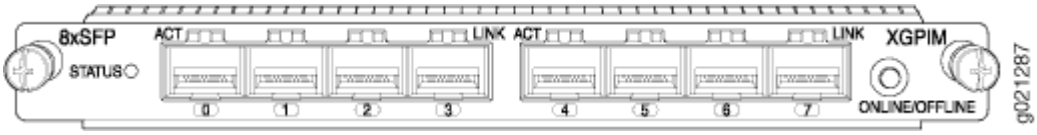
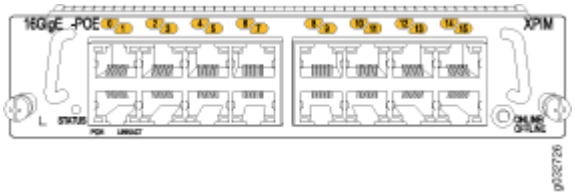


Figure 3: Example of a Double-High, Single-Wide XPIM



Interfaces Port Naming Conventions for the SRX300 Series and SRX550 High Memory Services Gateways

When configuring a port on a Mini-Physical Interface Module (Mini-PIM) or Gigabit-Backplane Physical Interface Module (GPIM), you must know the slot and port number assigned to the Mini-PIM or GPIM. The slot number identifies the slot on the services gateway in which you insert the Mini-PIM or GPIM,

and is typically named 1, 2, 3, and so on. The port number is the port on the Mini-PIM or GPIM that is being configured.

The name of each network interface has the following format to identify the physical device that corresponds to a single physical network connector:

type-slot/pim/port

NOTE: For SRX Series Services Gateways, *pim* equals 0 for the port-naming convention. For the LTE Mini-PIM, *port* equals 0.

Table 3 on page 6 lists the typical interface types and interface numbers.

Table 3: Interface Port Number Examples

Interface Type	Interface Number Example
T1	t1–1/0/0
E1	e1–1/0/0
Serial	se–1/0/0
VDSL2	pt–1/0/0
LTE	cl–1/0/0 **NOTE**: The LTE Mini-PIM can be installed in any one of the Mini-PIM slots on the SRX320, SRX340, SRX345, SRX380, and SRX550 HM Services Gateways.
Wi-Fi Mini-PIM	wl–1/0/0 **NOTE**: The Wi-Fi Mini-PIM can be installed in any one of the Mini-PIM slots on the SRX320, SRX340, SRX345, SRX380, and SRX550 HM Services Gateways.

Table 3: Interface Port Number Examples *(Continued)*

Interface Type	Interface Number Example
8-Port Gigabit Ethernet small form-factor pluggable (SFP) XPIM	ge–3/0/0 through ge–3/0/7 **NOTE**: The SRX550 High Memory Services Gateway has high gigabit and non-high gigabit slots. • In the high gigabit slot, you can achieve a maximum bandwidth of 8 gigabits. • In the non-high gigabit slot, you can achieve a maximum bandwidth of 1 gigabit.
16-Port Gigabit Ethernet XPIM	• SRX550 High Memory Services Gateway—ge–3/0/0 **NOTE**: When installing the 16–Port Gigabit Ethernet XPIM, which uses 2 slots, you must install it in the 10–Gigabit or 20–Gigabit GPIM slots: • SRX550 High Memory Services Gateway—Slots 3 and 6, which refer to the right side bottom two standard slots (slots 3 and 4)) and the right side top two standard slots (6 and 8).
Dual CT1/E1 GPIM	ct1–1/0/0 ce1–1/0/0
Quad CT1/E1 GPIM	ct1–1/0/0 ce1–1/0/0
DS3/E3 GPIM	t3-1/0/0 e3-2/0/0

SRX300 Series and SRX550 High Memory Services Gateway Interface Modules and Compatibility

Table 4 on page 8 shows the types of Mini-Physical Interface Modules (Mini-PIMs) with the SRX Series devices and the Junos OS releases that support them.

Table 4: Mini-PIM Types and Hardware Platform Compatibility

Name	Supported Platforms and the First Junos OS Release Supported					
	SRX300	SRX320	SRX340	SRX345	SRX380	SRX550 High Memory
Serial	Not supported	Junos OS Release 15.1X49-D35	Junos OS Release 15.1X49-D35	Junos OS Release 15.1X49-D35	Junos OS Release 20.1R1	Junos OS Release 15.1X49-D30
T1/E1	Not supported	Junos OS Release 15.1X49-D35	Junos OS Release 15.1X49-D35	Junos OS Release 15.1X49-D35	Junos OS Release 20.1R1	Junos OS Release 15.1X49-D30
VDSL2	Not supported	Junos OS Release 15.1X49-D35	Junos OS Release 15.1X49-D35	Junos OS Release 15.1X49-D35	Junos OS Release 20.1R1	Junos OS Release 15.1X49-D30
LTE	Not supported	Junos OS Release 15.1X49-D100	Junos OS Release 15.1X49-D100	Junos OS Release 15.1X49-D100	Junos OS Release 20.1R1	Junos OS Release 15.1X49-D100
Wi-Fi	Not supported	Junos OS Release 19.4R1	Junos OS Release 19.4R1	Junos OS Release 19.4R1	Junos OS Release 20.1R1	Junos OS Release 19.4R1

Table 5 on page 9 shows the type of Gigabit-Backplane Physical Interface Modules (XPIMs), along with the SRX Series devices and the Junos OS releases that support them.

Table 5: XPIM Types and Hardware Platform Compatibility

Type	Name	First Junos OS Release	
		SRX300 Series Services Gateways	SRX550 High Memory
XPIMs (10 Gigabit Ethernet GPIM)	8-Port Gigabit Ethernet SFP	Not supported	Junos OS Release 15.1X49–D30
	16-Port Gigabit Ethernet	Not supported	Junos OS Release 15.1X49–D30
GPIMs	Dual CT1/E1 GPIM	Not supported	Junos OS Release 15.1X49–D30
	Quad CT1/E1 GPIM	Not supported	Junos OS Release 15.1X49–D30
	DS3/E3 GPIM	Not supported	Junos OS Release 15.1X49–D30

MTU Default and Maximum Values for Physical Interface Modules

Table 6 on page 10 defines the terms that are used in the context of maximum transmission unit (MTU).

Table 6: MTU Terms

Term	Definition
Physical Interface MTU–Default	Default value of the MTU at the physical interface. The maximum value of the MTU at the physical interface includes the protocol overhead. You can configure the default MTU value at the physical interface by using the following command: set interface `interface-name` mtu `mtu-value`
Logical Interface MTU–Default	Default value of the MTU at the logical interface. The default value is configured at the family level and does not include the protocol overhead. You can configure the default MTU value for each logical unit at the logical interface by using the following command: set interface `interface-name` unit `interface-unit-number` family `family-name` mtu `mtu-value`
Maximum MTU	Maximum MTU is the size, measured in bytes, of the largest physical packet that a network can transmit. Any message larger than the MTU is divided into smaller packets before it is sent to its final destination.

Table 7 on page 10 lists the MTU values for the SRX300 Series and SRX550 High Memory Services Gateway Physical Interface Modules (PIMs).

Table 7: MTU Values for the SRX300 Series and SRX550 High Memory PIMs

PIM	Physical Interface MTU (Bytes)–Default	Logical Interface MTU (Bytes)–Default	Maximum MTU (Bytes)
Serial Mini-PIM	1504	1500	2000
T1/E1 Mini-PIM	1504	1500	2000
8–Port Gigabit Ethernet small form–factor pluggable (SFP) XPIM	1514	1500	9192

Table 7: MTU Values for the SRX300 Series and SRX550 High Memory PIMs *(Continued)*

PIM	Physical Interface MTU (Bytes)–Default	Logical Interface MTU (Bytes)–Default	Maximum MTU (Bytes)
16–Port Gigabit Ethernet XPIM	1514	1500	9192
Dual CT1/E1 GPIM	1504	1500	9000
Quad CT1/E1 GPIM	1504	1500	9000
1-Port Clear Channel DS3/ES3 GPIM	1504	1500	9192

NOTE: The LTE Mini-PIM uses the MTU value reported by the modem.

Table 8 on page 11 lists maximum transmission unit (MTU) values for VDSL- Mini-PIM AT mode (Encapsulation).

Table 8: MTU Values for VDSL- Mini-PIM AT mode (Encapsulation)

Mini-PIM	Physical Interface MTU (Bytes)–Default	Logical Interface MTU (Bytes)–Default	Maximum MTU (Bytes)
VDSL- Mini-PIM AT mode (Encapsulation)			
atm-snap	1514	1506	1514
atm-vcmux	1514	1514	1514
atm-nlpid	1514	1510	1514
atm-cisco-nlpid	1514	1512	1514

Table 8: MTU Values for VDSL- Mini-PIM AT mode (Encapsulation) ***(Continued)***

Mini-PIM	Physical Interface MTU (Bytes)–Default	Logical Interface MTU (Bytes)–Default	Maximum MTU (Bytes)
ether-over-atm-llc	1514	1490	1524
atm-ppp-llc	1514	1508	1514
atm-ppp-vcmux	1514	1512	1514
atm-mlppp-llc	1514	1500	1514
ppp-over-ether-over-atm-llc	1514	1482	1514
VDSL- Mini-PIM PT mode	1514	1500	1514

Power over Ethernet Support on SRX550 High Memory Services Gateway Interfaces

Power over Ethernet (PoE) supports the implementation of the IEEE 802.3 af and IEEE 802.3 at standards, which allow both data and electric power to pass over a copper Ethernet LAN cable.

The PoE ports supply electric power over the same ports that are used for connecting network devices. PoE ports allow you to plug in devices that require both network connectivity and electric power, such as voice over IP (VoIP), IP phones, and wireless access points.

The PoE ports for the SRX550 High Memory Services Gateway reside on the individual XPIMs. The SRX550 High Memory Services Gateway supports the 16-Port Gigabit Ethernet XPIM with PoE.

The active Services and Routing Engine manages the overall system PoE power. You can configure the services gateway to act as power sourcing equipment to supply the power to the GPIMs connected on the designated PoE ports.

Table 9 on page 13 lists the PoE specifications for the SRX550 High Memory Services Gateway.

Table 9: PoE Specifications for the SRX550 High Memory Services Gateway

Power Management Schemes	SRX550 High Memory Services Gateway
Supported standards	• IEEE 802.3 af • IEEE 802.3 at • Legacy
Supported slots/ports	PoE is supported on the front panel slots 3,4,6, and 8.
Total PoE power sourcing capacity	The 645 W AC and 645 W DC power supplies support the following capacities: • 255 W —PoE on a single power supply, or with redundancy using the two-power-supply option • 510 W —PoE using the two-power-supply option operating as nonredundant
Per-port power limit	31.2 W
Power management modes	• Static: Power allocation for each interface can be configured. • Class: Power for interfaces is allocated based on the class of powered device connected.

SRX300 Series and SRX550 High Memory Services Gateway Interfaces Power and Heat Requirements

Table 10 on page 14 shows the power consumption values of each Physical Interface Module (PIM).

Table 10: PIM Power Consumption Values

PIM Model	Power Consumption (Watts)
Serial Mini-PIM	4.29
T1/E1 Mini-PIM	1.92
VDSL2 Mini-PIM	9.80
LTE Mini-PIM	4.8
Wi-Fi Mini-PIM	7.12
8-Port Gigabit Ethernet SFP XPIM	22
16-Port Gigabit Ethernet XPIM	40 (without PoE)
Dual CT1/E1 GPIM	16.81
Quad CT1/E1 GPIM	16.81
1-Port Clear Channel DS3/E3 GPIM	22.89

1-Port Serial Mini-Physical Interface Module (SRX-MP-1SERIAL-R)

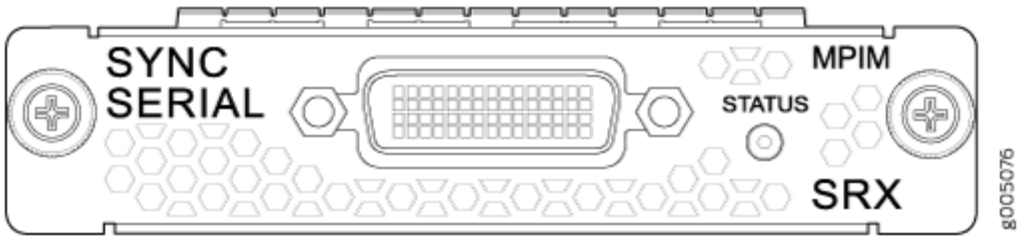
IN THIS SECTION

1-Port Serial Mini-Physical Interface Module (SRX-MP-1SERIAL-R) Overview

Serial WAN links are bidirectional links and require very few control signals. In a basic serial setup, the data circuit-terminating equipment (DCE) is responsible for establishing, maintaining, and terminating a connection. A modem is a typical DCE device. A serial cable connects the DCE to a telephony network where, ultimately, a link is established with data terminal equipment (DTE). DTE is typically where a link terminates.

Figure 4 on page 15 shows the front panel of the 1-Port Serial Mini-*Physical Interface Module* (Mini-PIM).

Figure 4: 1-Port Serial Mini-PIM (SRX-MP-1SERIAL-R) Front Panel



The 1-Port Serial Mini-*Physical Interface Module* (Mini-PIM) provides the following key features:

- Autoselection of operational modes based on DTE or DCE cables
- Local and remote loopback diagnostics

- Configurable clock rate for the transmit (TX) clock and receive (RX) clock
- Complete configuration and management by using the CLI and the J-Web interface

The 1-Port Serial Mini-Physical Interface Module (Mini-PIM) supports the following standards:

- TIA/EIA 530
- V.35
- X.21
- RS-232
- RS-449

1-Port Serial Mini-Physical Interface Module (SRX-MP-1SERIAL-R) Hardware Specifications

Table 11 on page 16 lists the physical specifications of the 1-Port Serial Mini-Physical Interface Module (Mini-PIM).

Table 11: 1-Port Serial Mini-PIM (SRX-MP-1SERIAL-R) Physical Specifications

Description	Value
Dimensions (H x W x L)	0.8 in. x 3.75 in. x 5.9 in. (2.0 cm x 9.5 cm x 14.5 cm)
Weight	3.04 oz (86 g)
Connector type	60-pin Synchronous Serial (socket)
Form factor	Mini-PIM

1-Port Serial Mini-Physical Interface Module (SRX-MP-1SERIAL-R) LEDs

The 1-Port Serial Mini-Physical Interface Module (Mini-PIM) has one LED located to the right of the serial port. Table 12 on page 17 describes the LED states.

Table 12: 1-Port Serial Mini-PIM (SRX-MP-1SERIAL-R) LED States

Name	Color	State	Description
STATUS	Green	On	Online with no alarms or failures.
		Off	Device has detected a failure.

1-Port Serial Mini-Physical Interface Module Interface Cables

Table 13 on page 17 lists the cables that you can order from Juniper Networks to connect to a port on the synchronous 1-Port Serial Mini-Physical Interface Module (Mini-PIM). The device to which you are connecting and the serial interface types determine which type of cable you need.

Table 13: Juniper Networks Serial Cables

Product Number	Interface Type	Length	Connector Type
JX-CBL-EIA530-DCE	EIA530 cable (DCE)	3.04 m (10 ft)	Socket
JX-CBL-EIA530-DTE	EIA530 cable (DTE)	3.04 m (10 ft)	Plug
JX-CBL-RS232-DCE	RS232 cable (DCE)	3.04 m (10 ft)	Socket
JX-CBL-RS232-DTE	RS232 cable (DTE)	3.04 m (10 ft)	Plug
JX-CBL-RS449-DCE	RS449 cable (DCE)	3.04 m (10 ft)	Socket

Table 13: Juniper Networks Serial Cables *(Continued)*

Product Number	Interface Type	Length	Connector Type
JX-CBL-RS449-DTE	RS449 cable (DTE)	3.04 m (10 ft)	Plug
JX-CBL-V35-DCE	V.35 cable (DCE)	3.04 m (10 ft)	Socket
JX-CBL-V35-DTE	V.35 cable (DTE)	3.04 m (10 ft)	Plug
JX-CBL-X21-DCE	X.21 cable (DCE)	3.04 m (10 ft)	Socket
JX-CBL-X21-DTE	X.21 cable (DTE)	3.04 m (10 ft)	Plug

EIA-530A DCE and DTE Cable Pinouts

IN THIS SECTION

EIA-530A DCE Cable Pinouts for the 1-Port Serial Mini-Physical Interface Module

Table 14 on page 18 gives the EIA-530A DCE cable pinouts.

Table 14: EIA-530A DCE Cable Pinouts for the 1-Port Serial Mini-PIM

LFH-60 Pin	DB-25 Pin	LFH-60 Pairing	Description
15	1	-	Shield Ground

Table 14: EIA-530A DCE Cable Pinouts for the 1-Port Serial Mini-PIM *(Continued)*

LFH-60 Pin	DB-25 Pin	LFH-60 Pairing	Description
1	2	2	Transmit Data (A)
60	3	59	Receive Data (A)
37	4	38	Request to Send (A)
48	5	47	Clear to Send (A)
33	6	-	Data Set Ready (A)
57	7	-	Signal Ground
13	8	14	Received Line Signal Detector (A)
51	9	52	Receive Clock (B)
14	10	13	Received Line Signal Detector (B)
6	11	5	Terminal Timing (B)
55	12	56	Transmit Clock (B)
47	13	48	Clear to Send (B)
2	14	1	Transmit Data (B)
56	15	55	Transmit Clock (A)
59	16	60	Receive Data (B)

Table 14: EIA-530A DCE Cable Pinouts for the 1-Port Serial Mini-PIM *(Continued)*

LFH-60 Pin	DB-25 Pin	LFH-60 Pairing	Description
52	17	51	Receive Clock (A)
45	18	-	Local Loopback
38	19	37	Request to Send (B)
9	20	-	Data Terminal Ready (A)
4	23	-	Signal Ground
5	24	6	Terminal Timing (A)
26 to 25	-	-	-
30 to 29	-	-	-

EIA-530A DTE Cable Pinouts for the 1-Port Serial Mini-Physical Interface Module

Table 15 on page 20 gives the EIA-530A DTE cable pinouts.

Table 15: EIA-530A DTE Cable Pinouts for the 1-Port Serial Mini-PIM

LFH-60 Pin	DB-25 Pin	LFH-60 Pairing	Description
15	1	-	Shield Ground
60	2	59	Transmit Data (A)
1	3	2	Receive Data (A)

Table 15: EIA-530A DTE Cable Pinouts for the 1-Port Serial Mini-PIM *(Continued)*

LFH-60 Pin	DB-25 Pin	LFH-60 Pairing	Description
48	4	47	Request to Send (A)
37	5	38	Clear to Send (A)
9	6	-	Data Set Ready (A)
57	7	-	Signal Ground
13	8	14	Received Line Signal Detector (A)
6	9	5	Receive Clock (B)
14	10	13	Received Line Signal Detector (B)
51	11	52	Terminal Timing (B)
55	12	56	Transmit Clock (B)
38	13	37	Clear to Send (B)
59	14	60	Transmit Data (B)
56	15	55	Transmit Clock (A)
2	16	1	Receive Data (B)
5	17	6	Receive Clock (A)
41	18	-	Local Loopback

Table 15: EIA-530A DTE Cable Pinouts for the 1-Port Serial Mini-PIM *(Continued)*

LFH-60 Pin	DB-25 Pin	LFH-60 Pairing	Description
47	19	48	Request to Send (B)
33	20	-	Data Terminal Ready (A)
4	23	-	Signal Ground
52	24	51	Terminal Timing (A)
26 to 25	-	-	-
30 to 29	-	-	-
18 to 17	-	-	-

RS-232 DCE and DTE Cable Pinouts

IN THIS SECTION

RS-232 DCE Cable Pinouts for the 1-Port Serial Mini-Physical Interface Module

Table 16 on page 23 gives the RS-232 DCE cable pinouts.

Table 16: RS-232 DCE Cable Pinouts for the 1-Port Serial Mini-PIM

LFH-60 Pin	DB-25 Pin	LFH-60 Pairing	Description
15	1	-	Frame Ground
1	2	-	Transmit Data
60	3	-	Receive Data
37	4	-	Request to Send
48	5	-	Clear to Send
33	6	-	Data Set Ready
57	7	-	Signal Ground
13	8	-	Data Carrier Detect
56	15	-	Transmit Clock
52	17	-	Receive Clock
45	18	-	Local Loopback
9	20	-	Data Terminal Ready
5	24	-	Terminal Clock
22 to 21	-	-	-

RS-232 DTE Cable Pinouts for the 1-Port Serial Mini-Physical Interface Module

Table 17 on page 24 gives the RS-232 DTE cable pinouts.

Table 17: RS-232 DTE Cable Pinouts for the 1-Port Serial Mini-PIM

LFH-60 Pin	DB-25 Pin	LFH-60 Pairing	Description
15	1	-	Frame Ground
60	2	-	Transmit Data
1	3	-	Receive Data
48	4	-	Request to Send
37	5	-	Clear to Send
9	6	-	Data Set Ready
57	7	-	Signal Ground
13	8	-	Data Carrier Detect
56	15	-	Transmit Clock
5	17	-	Receive Clock
41	18	-	Local Loopback
33	20	-	Data Terminal Ready
52	24	-	Terminal Clock

Table 17: RS-232 DTE Cable Pinouts for the 1-Port Serial Mini-PIM *(Continued)*

LFH-60 Pin	DB-25 Pin	LFH-60 Pairing	Description
22 to 21	-	-	-
18 to 17	-	-	-

RS-422/449 (EIA-449) DCE and DTE Cable Pinouts

IN THIS SECTION

RS-422/449 (EIA-449) DCE Cable Pinouts for the 1-Port Serial Mini-Physical Interface Module

Table 18 on page 25 gives the RS-422/449 DCE cable pinouts.

Table 18: RS-422/449 DCE Cable Pinouts for the 1-Port Serial Mini-PIM

LFH-60 Pin	DC-37 (DB-37) Pin	LFH-60 Pairing	Description
15	1	-	Shield Ground
1	4	2	Send Data (A)
56	5	55	Send Timing (A)
60	6	59	Receive Data (A)

Table 18: RS-422/449 DCE Cable Pinouts for the 1-Port Serial Mini-PIM *(Continued)*

LFH-60 Pin	DC-37 (DB-37) Pin	LFH-60 Pairing	Description
37	7	38	Request to Send (A)
52	8	51	Receive Timing (A)
48	9	47	Clear to Send (A)
45	10	-	Local Loopback
33	11	34	Data Mode (A)
9	12	10	Terminal Ready (A)
13	13	14	Receive Ready (A)
5	17	6	Terminal Timing (A)
36	19	-	Signal Ground
4	20	-	Receive Common
2	22	1	Send Data (B)
55	23	56	Send Timing (B)
59	24	60	Receive Data (B)
38	25	37	Request to Send (B)
51	26	52	Receive Timing (B)

Table 18: RS-422/449 DCE Cable Pinouts for the 1-Port Serial Mini-PIM *(Continued)*

LFH-60 Pin	DC-37 (DB-37) Pin	LFH-60 Pairing	Description
47	27	48	Clear to Send (B)
34	29	33	Data Mode (B)
10	30	9	Terminal Ready (B)
14	31	13	Receiver Ready (B)
6	35	5	Terminal Timing (B)
57	37	-	Send Common
26 to 25	-	-	-

RS-422/449 (EIA-449) DTE Cable Pinouts for the 1-Port Serial Mini-Physical Interface Module

Table 19 on page 27 gives the RS-422/449 DTE cable pinouts.

Table 19: RS-422/449 DTE Cable Pinouts for the 1-Port Serial Mini-PIM

LFH-60 Pin	DC-37 (DB-37) Pin	LFH-60 Pairing	Description
15	1	-	Shield Ground
60	4	59	Send Data (A)
56	5	55	Send Timing (A)
1	6	2	Receive Data (A)

Table 19: RS-422/449 DTE Cable Pinouts for the 1-Port Serial Mini-PIM *(Continued)*

LFH-60 Pin	DC-37 (DB-37) Pin	LFH-60 Pairing	Description
48	7	47	Request to Send (A)
5	8	6	Receive Timing (A)
37	9	38	Clear to Send (A)
41	10	-	Local Loopback
9	11	10	Data Mode (A)
33	12	34	Terminal Ready (A)
13	13	14	Receive Ready (A)
52	17	51	Terminal Timing (A)
36	19	-	Signal Ground
4	20	-	Receive Common
59	22	60	Send Data (B)
55	23	56	Send Timing (B)
2	24	1	Receive Data (B)
47	25	48	Request to Send (B)
6	26	5	Receive Timing (B)

Table 19: RS-422/449 DTE Cable Pinouts for the 1-Port Serial Mini-PIM *(Continued)*

LFH-60 Pin	DC-37 (DB-37) Pin	LFH-60 Pairing	Description
38	27	37	Clear to Send (B)
10	29	9	Data Mode (B)
34	30	33	Terminal Ready (B)
14	31	13	Receiver Ready (B)
51	35	52	Terminal Timing (B)
57	37	-	Send Common
26 to 25	-	-	
18 to 17	-	-	

V.35 DCE and DTE Cable Pinouts

IN THIS SECTION

V.35 DCE Cable Pinouts for the 1-Port Serial Mini-Physical Interface Module

Table 20 on page 30 gives the V.35 DCE cable pinouts.

Table 20: V.35 DCE Cable Pinouts for the 1-Port Serial Mini-PIM

LFH-60 Pin	M/34 Pin	LFH-60 Pairing	Description
15	A	-	Frame Ground
57	B	-	Signal Ground
37	C	-	Request to Send
48	D	-	Clear to Send
33	E	-	Data Set Ready
13	F	-	Received Line Signal Detector
9	H	-	Data Terminal Ready
45	K	-	Test Mode
1	P	2	Transmit Data (A)
60	R	59	Receive Data (A)
2	S	1	Transmit Data (B)
59	T	60	Receive Data (B)
5	U	6	Terminal Timing (A)
52	V	51	Receive Timing (A)
6	W	5	Terminal Timing (B)

Table 20: V.35 DCE Cable Pinouts for the 1-Port Serial Mini-PIM *(Continued)*

LFH-60 Pin	M/34 Pin	LFH-60 Pairing	Description
51	X	52	Receive Timing (B)
56	Y	55	Transmit Timing (A)
55	AA	56	Transmit Timing (B)
22 to 21	-	-	-
26 to 25	-	-	

V.35 DTE Cable Pinouts for the 1-Port Serial Mini-Physical Interface Module

Table 21 on page 31 describes the V.35 DTE cable pinouts.

Table 21: V.35 DTE Cable Pinouts for the 1-Port Serial Mini-PIM

LFH-60 Pin	M/34 Pin	LFH-60 Pairing	Description
15	A	-	Frame Ground
57	B	-	Signal Ground
48	C	-	Request to Send
37	D	-	Clear to Send
9	E	-	Data Set Ready
13	F	-	Received Line Signal Detector

Table 21: V.35 DTE Cable Pinouts for the 1-Port Serial Mini-PIM *(Continued)*

LFH-60 Pin	M/34 Pin	LFH-60 Pairing	Description
33	H	-	Data Terminal Ready
41	K	-	Test Mode
60	P	59	Transmit Data (A)
1	R	2	Receive Data (A)
59	S	60	Transmit Data (B)
2	T	1	Receive Data (B)
52	U	51	Terminal Timing (A)
5	V	6	Receive Timing (A)
51	W	52	Terminal Timing (B)
6	X	5	Receive Timing (B)
56	Y	55	Transmit Timing (A)
55	AA	56	Transmit Timing (B)
22 to 21	-	-	-
26 to 25	-	-	-
18 to 17	-	-	-

X.21 DCE and DTE Cable Pinouts

IN THIS SECTION

X.21 DCE Cable Pinouts for the 1-Port Serial Mini-Physical Interface Module

Table 22 on page 33 gives the X.21 DCE cable pinouts.

Table 22: X.21 DCE Cable Pinouts for the 1-Port Serial Mini-PIM

LFH-60 Pin	DB-15 Pin	LFH-60 Pairing	Description
15	1	-	Shield Ground
1	2	2	Transmit Data (A)
37	3	38	Control (A)
60	4	59	Receive (A)
48	5	47	Indicate (A)
52	6	51	Signal Element Timing (A)
57	8	-	Signal Ground
2	9	1	Transmit Data (B)
38	10	37	Control (B)

Table 22: X.21 DCE Cable Pinouts for the 1-Port Serial Mini-PIM *(Continued)*

LFH-60 Pin	DB-15 Pin	LFH-60 Pairing	Description
59	11	60	Receive (B)
47	12	48	Indicate (B)
51	13	52	Signal Element Timing (B)
30 to 29	-	-	-

X.21 DTE Cable Pinouts for the 1-Port Serial Mini-Physical Interface Module

Table 23 on page 34 gives the X.21 DTE cable pinouts.

Table 23: X.21 DTE Cable Pinouts for the 1-Port Serial Mini-PIM

LFH-60 Pin	DB-15 Pin	LFH-60 Pairing	Description
15	1	-	Shield Ground
60	2	59	Transmit Data (A)
48	3	47	Control (A)
1	4	2	Receive (A)
37	5	38	Indicate (A)
5	6	6	Signal Element Timing (A)
57	8	-	Signal Ground

Table 23: X.21 DTE Cable Pinouts for the 1-Port Serial Mini-PIM *(Continued)*

LFH-60 Pin	DB-15 Pin	LFH-60 Pairing	Description
59	9	60	Transmit Data (B)
47	10	48	Control (B)
2	11	1	Receive (B)
38	12	37	Indicate (B)
6	13	5	Signal Element Timing (B)
30 to 29	-	-	-
18 to 17	-	-	-

1-Port Serial Mini-Physical Interface Module (SRX-MP-1SERIAL-R) Basic Configuration

IN THIS SECTION

To enable the 1-Port Serial Mini-Physical Interface Module (Mini-PIM) installed on the services gateway, you must configure the basic settings for the PIM. You can perform the configuration tasks for this using either the J-Web interface or the CLI.

Using the J-Web Interface

To perform basic configuration of the 1-Port Serial Mini-PIM and to configure network interfaces for the services gateway using the J-Web interface:

1. In the J-Web interface, select **Configure>Interfaces**.

   The Interfaces page displays and lists the network interfaces present on the services gateway, along with configuration information (if configured).
2. Select the interface name (**se-1/0/0**) and click **Add > Logical Interfaces**. Enter the details and click **OK**. To use the port on the Mini-PIM, assign an IP address to the port and assign it to a security zone, other than the Null zone. If there are no security zones listed, proceed to the next step to add a security zone.
3. Add a security zone to the interface:
   a. Select **Configure>Security>Zones/Screens**.
   b. Add or select a security zone other than Null; for example, **Trust**. Assign the interface to the zone.
   c. For Host Inbound Traffic-Zone, set the following:
      - System Services=**Allow All**
      - Protocols=**Allow All**
   d. Click **OK** to save changes, and select **Commit>Commit** to apply the configuration and other pending changes (if any).
4. To use the port on the Mini-PIM, you must also set security policies. Select the following settings:
   a. Select **Configure>Security>Security Policy**.
   b. Select **Global Options > Policy Options**.
   c. Set Policy Action: Default Policy Action=**Permit-All**.
   d. Click **OK** to save changes, and select **Commit>Commit** to apply the configuration and other pending changes (if any).

Using the CLI

To perform basic configuration for the 1-Port Serial Mini-PIM and to configure network interfaces for the services gateway with the CLI:

1. Verify that the serial interface is installed on the device:

   ```
   show chassis hardware
   ```

2. Verify the status of the interface:

   ```
   show interfaces terse
   ```

3. Assign the port an IP address:

```
set interfaces se-1/0/0 unit 0 family inet address interface address/destination prefix
```

4. Add or select a security zone; for example, Trust:

```
set security zones security-zone trust interfaces se-1/0/0.0 host-inbound-traffic system-services
all
```

5. Add or select security zones for host inbound traffic protocol options:

```
set security zones security-zone trust interfaces se-1/0/0.0 host-inbound-traffic protocols all
```

6. Set security policies:

```
set security policies default-policy permit-all
```

RELATED DOCUMENTATION

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1-Port T1/E1 Mini-Physical Interface Module (SRX-MP-1T1E1-R)

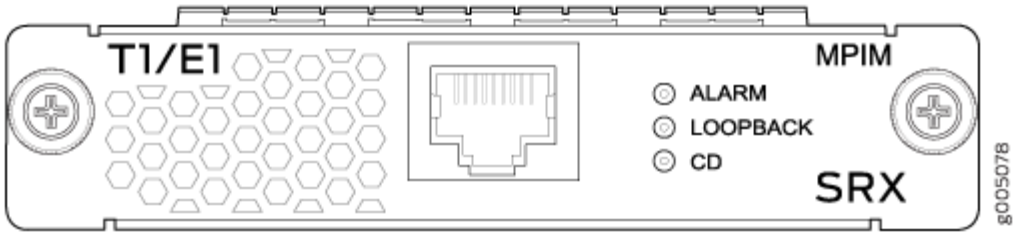
IN THIS SECTION

1-Port T1/E1 Mini-Physical Interface Module (SRX-MP-1T1E1-R) Overview

The 1-Port T1/E1 Mini-*Physical Interface Module* (Mini-PIM) provides the physical connection to T1 or E1 network media types and also performs T1 or E1 framing and line-speed signaling.

Figure 5 on page 38 shows the front panel of the 1-Port T1/E1 Mini-PIM (SRX-MP-1T1E1-R).

Figure 5: 1-Port T1/E1 Mini-Physical Interface Module (SRX-MP-1T1E1-R) Front Panel



The 1-Port T1/E1 Mini-*Physical Interface Module* (Mini-PIM) provides the following key features:

- Channel service unit/data service unit (CSU/DSU) to eliminate the need for a separate external device
- 56-Kbps and 64-Kbps operating modes
- Independent internal and external clocking option
- Alarm reporting with a 24-hour history maintained
- Loopback, BERT, FDL (T1 only), and Long Buildout (T1 only) diagnostics
- Multilink Frame Relay and Multilink PPP support

The 1-Port T1/E1 Mini-Physical Interface Module (Mini-PIM) supports the following standards:

- ANSI TI.107, TI.102
- GR 499-core, GR 253-core
- AT&T Pub 54014
- ITU G.751, G.703

1-Port T1/E1 Mini-Physical Interface Module (SRX-MP-1T1E1-R) Hardware Specifications

Table 24 on page 39 gives the physical specifications of the 1-Port T1/E1 Mini-Physical Interface Module (Mini-PIM).

Table 24: 1-Port T1/E1 Mini-PIM (SRX-MP-1T1E1-R) Physical Specifications

Description	Value
Dimensions (H x W x L)	0.80 in. x 3.75 in. x 5.9 in. (2.0 cm x 9.5 cm x 14.5 cm)
Weight	2.88 oz (82 g)
Connector type	RJ-48
Form factor	Mini-PIM
Environmental operating temperature	32°F through 104°F (0°C through 40°C)
Storage temperature	–40°F through 158°F (–40°C through 70°C)
Relative humidity	5% to 90% noncondensing

1-Port T1/E1 Mini-Physical Interface Module (SRX-MP-1T1E1-R) LEDs

The 1-Port T1/E1 Mini-Physical Interface Module (Mini-PIM) has three LEDs. Table 25 on page 40 describes the LED states.

Table 25: 1-Port T1/E1 Mini-PIM (SRX-MP-1T1E1-R) LED States

LED	Color	State	Description
ALARM	Yellow	On	Indicates that there is a local or remote alarm; device has detected a failure.
		Off	Indicates that there are no alarms or failures.
LOOPBACK	Yellow	On	Indicates that a loopback or line state is detected.
		Off	Indicates that the loopback is not active.
CD (Carrier Detector)	Green	On	Indicates that the Mini-PIM link is up.
		Off	Indicates that carrier detect is not active.

1-Port T1/E1 Mini-Physical Interface Module (SRX-MP-1T1E1-R) Supported Loopback Diagnostics

The 1-Port T1/E1 Mini-Physical Interface Module (Mini-PIM) has the following loopback diagnostics:

- 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

1-Port T1/E1 Mini-Physical Interface Module (SRX-MP-1T1E1-R) Network Interface Specifications

The 1-Port T1/E1 Mini-Physical Interface Module (Mini-PIM) has the network interface specifications given in Table 26 on page 41.

Table 26: 1-Port T1/E1 Mini-PIM (SRX-MP-1T1E1-R) Network Interface Specifications

Specification	T1 Specification	E1 Specifications
Network interface specifications		
Transmit bit rate	1.544 Mbps	2.048 Mbps
Receive bit rate	1.544 Mbps	2.048 Mbps
Line encoding	AMI/B8ZS	HDB3
Mode	Framed Clear Channel	Framed Clear Channel, Unframed Clear Channel
Fractional Framing	Superframe (D4/SF), Extended Superframe (ESF)	G704 without CRC4 Unframed

Table 26: 1-Port T1/E1 Mini-PIM (SRX-MP-1T1E1-R) Network Interface Specifications *(Continued)*

Specification	T1 Specification	E1 Specifications
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	16/32
Shared Flag	Supported	Supported
Idle flag/fill	Supported	Supported
Counters:	Runts, Giants, FCS, Error, Abort Error, Align Error	Runts, Giants, FCS, Error, Abort Error, Align Error

Cable Specifications and Pinouts

IN THIS SECTION

RJ-48 Connector to RJ-48 Connector Pinouts for the 1-Port T1/E1 Mini-Physical Interface Module (SRX-MP-1T1E1-R)

The 1-Port T1/E1 Mini-Physical Interface Module (Mini-PIM) uses an RJ-48 cable, which is not supplied with the Mini-PIM.

CAUTION: To maintain agency approvals, use only a properly constructed, shielded cable.

Table 27 on page 43 lists the RJ-48 connector to RJ-48 connector (straight) pinouts.

Table 27: RJ-48 Connector to RJ-48 Connector (Straight) Pinouts

RJ-48 Pin (on 1-Port T1/E1 Mini-PIM)	RJ-48 Pin (Data Numbering Form)	Signal
1	1	RX, Ring, –
2	2	RX, Tip, +
4	4	TX, Ring, –
5	5	TX, Tip, +
3	3	Shield/Return/Ground
6	6	Shield/Return/Ground
7	No connect	No connect
8	No connect	No connect

Table 28 on page 43 lists the RJ-48 connector to RJ-48 connector (crossover) pinouts for the 1-Port T1/E1 Mini-Physical Interface Module (Mini-PIM).

Table 28: RJ-48 Connector to RJ-48 Connector (Crossover) Pinouts

RJ-48 Pin (on T1/E1 Mini-PIM)	RJ-48 Pin (Data Numbering Form)	Signal
1	4	RX/Ring/– <––>TX/Ring/–

Table 28: RJ-48 Connector to RJ-48 Connector (Crossover) Pinouts *(Continued)*

RJ-48 Pin (on T1/E1 Mini-PIM)	RJ-48 Pin (Data Numbering Form)	Signal
2	5	RX/Tip/+ <-->TX/Tip/+
4	1	TX/Ring/– <-->RX/Ring/–
5	2	TX/Tip/+ <-->RX/Tip/+
3	3	Shield/Return/Ground
6	6	Shield/Return/Ground
7	No connect	No connect
8	No connect	No connect

RJ-48 Connector to DB-15 Connector Pinouts for the 1-Port T1/E1 Mini-Physical Interface Module (SRX-MP-1T1E1-R)

Table 29 on page 44 lists the RJ-48 connector to DB-15 connector (straight) pinouts.

Table 29: RJ-48 Connector to DB-15 Connector (Straight) Pinouts

RJ-48 Pin (on T1/E1 Mini-PIM)	DB-15 Pin (Data Numbering Form)	Signal
1	11	RX/Ring/– <-->RX/Ring/–
2	3	RX/Tip/+ <-->RX/Tip/+
4	9	TX/Ring/– <-->TX/Ring/–
5	1	TX/Tip/+ <-->TX/Tip/+

Table 29: RJ-48 Connector to DB-15 Connector (Straight) Pinouts *(Continued)*

RJ-48 Pin (on T1/E1 Mini-PIM)	DB-15 Pin (Data Numbering Form)	Signal
3	4	Shield/Return/Ground
6	2	Shield/Return/Ground
7	No connect	No connect
8	No connect	No connect
9	No connect	No connect
10	No connect	No connect
11	No connect	No connect
12	No connect	No connect
13	No connect	No connect
14	No connect	No connect
15	No connect	No connect

Table 30 on page 45 lists the RJ-48 connector to DB-15 connector (crossover) pinouts.

Table 30: RJ-48 Connector to DB-15 Connector (Crossover) Pinouts

RJ-48 Pin (on T1/E1 Mini-PIM)	DB-15 Pin (Data Numbering Form)	Signal
1	9	RX/Ring/– <–––>TX/Ring/–

Table 30: RJ-48 Connector to DB-15 Connector (Crossover) Pinouts *(Continued)*

RJ-48 Pin (on T1/E1 Mini-PIM)	DB-15 Pin (Data Numbering Form)	Signal
2	1	RX/Tip/+ <––>TX/Tip/+
4	11	TX/Ring/– <––>RX/Ring/–
5	3	TX/Tip/+ <––>RX/Tip/+
3	4	Shield/Return/Ground
6	2	Shield/Return/Ground
7	No connect	No connect
8	No connect	No connect
9	No connect	No connect
10	No connect	No connect
11	No connect	No connect
12	No connect	No connect
13	No connect	No connect
14	No connect	No connect
15	No connect	No connect

1-Port T1/E1 Mini-Physical Interface Module (SRX-MP-1T1E1-R) Basic Configuration

IN THIS SECTION

To enable the 1-Port T1/E1 Mini-Physical Interface Module (Mini-PIM) installed on the services gateway, you must configure the basic settings for the PIM. You can perform the configuration tasks for this using either the J-Web interface or the CLI.

Using the J-Web Interface

To perform basic configuration for the 1-Port T1/E1 Mini-Physical Interface Module (SRX-MP-1T1E1-R) and to configure network interfaces for the services gateway using the J-Web interface:

1. In the J-Web interface, select **Configure>Interfaces**.

   The Interfaces page displays and lists the network interfaces present on the services gateway, along with configuration information (if configured).
2. Select the interface name (**t1-1/0/0 or e1–1/0/0**) and click **Add > Logical Interfaces**. Enter the details and click **OK**. To use the port on the Mini-PIM, assign an IP address to the port and assign it to a security zone, other than the Null zone. If there are no security zones listed, proceed to the next step to add a security zone.
3. Add a security zone to the interface:
   a. Select **Configure>Security>Zones/Screens**.
   b. Add or select a security zone other than Null; for example, **Trust**. Assign the interface to the zone.
   c. For Host Inbound Traffic-Zone, set the following:
      - System Services=**Allow All**
      - Protocols=**Allow All**
   d. Click **OK** to save changes, and select **Commit>Commit** to apply the configuration and other pending changes (if any).
4. To use the port on the Mini-PIM, you must also set security policies. Select the following settings:
   a. Select **Configure>Security>Security Policy**.
   b. Select **Global Options > Policy Options**.

c. Set Policy Action: Default Policy Action=**Permit-All**.

d. Click **OK** to save changes, and select **Commit>Commit** to apply the configuration and other pending changes (if any).

Using the CLI

To perform basic configuration for the 1-Port T1/E1 Mini-PIM (for the T1 interface) and to configure network interfaces for the services gateway with the CLI:

1. Verify that the T1/E1 interface is installed on the device:

```
show chassis hardware
```

2. Verify the status of the interface:

```
show interfaces terse
```

3. Assign the port an IP address:

   For T1 interfaces:

```
set interfaces t1-1/0/0 unit 0 family inet address interface address/destination prefix
```

   For E1 interfaces:

```
set interfaces e1-1/0/0 unit 0 family inet address interface address/destination prefix
```

4. Add or select a security zone; for example, Trust:

   For T1 interfaces:

```
set security zones security-zone trust interfaces t1-1/0/0.0 host-inbound-traffic system-services
all
```

   For E1 interfaces:

```
set security zones security-zone trust interfaces e1-1/0/0.0 host-inbound-traffic system-services
all
```

5. Add or select security zones for host inbound traffic protocol options:

   For T1 interfaces:

```
set security zones security-zone trust interfaces t1-1/0/0.0 host-inbound-traffic protocols all
```

   For E1 interfaces:

```
set security zones security-zone trust interfaces e1-1/0/0.0 host-inbound-traffic protocols all
```

6. Set security policies:

```
set security policies default-policy permit-all
```

NOTE: You can use the CLI commands `set interfaces t1-1/0/0` or `set interfaces e1-1/0/0` to enable the 1-Port T1/E1 Mini-PIM to function as a T1 or an E1 interface.

RELATED DOCUMENTATION

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1-Port VDSL2 Annex A Mini-Physical Interface Module (SRX-MP-1VDSL2-R)

IN THIS SECTION

1-Port VDSL2 Annex A Mini-Physical Interface Module (SRX-MP-1VDSL2-R) Overview

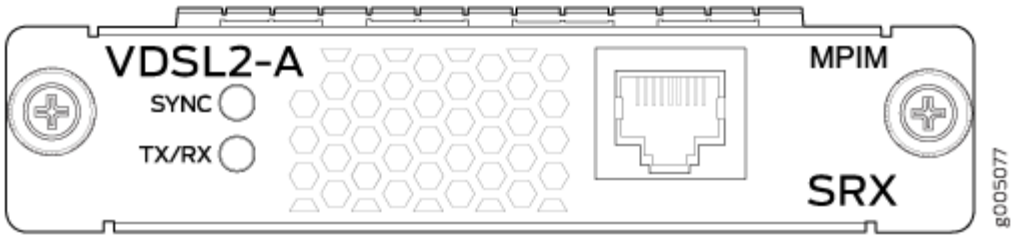
Very-high-bit-rate digital subscriber line (VDSL) technology is part of the xDSL family of modem technologies, which provide faster data transmission over a single flat untwisted or twisted pair of copper wires. The 1-Port VDSL2 Annex A Mini-PIM carries the Ethernet backplane. When the Mini-PIM is plugged into the chassis, the Mini-PIM connects to one of the ports of the baseboard switch. The 1-

Port VDSL2 Annex A Mini-PIM on the SRX Series Services Gateway provides ADSL backward compatibility.

The 1-Port VDSL2 Annex A Mini-PIM is compatible with the ITU-T G.993.2 (VDSL2) standard.

Figure 6 on page 50 shows the 1-Port VDSL2 Annex A (SRX-MP-1VDSL2-R) Mini-PIM.

Figure 6: VDSL2 Annex A (SRX-MP-1VDSL2-R) Mini-PIM



The following features are supported on the 1-Port VDSL2 Annex A Mini-*Physical Interface Module* (Mini-PIM):

- ADSL/ADSL2/ADSL2+ backward compatibility with Annex-A, Annex-M support
- Packet Mode Transfer (PTM) or Ethernet in the First Mile (EFM) (802.3ah) support
- Operation, Administration, and Maintenance (OAM) support for ADSL/ADSL2/ADSL2+ mode
- Asynchronous Transfer Mode (ATM) *quality of service* (QoS) (supported only when the VDSL2 Mini-PIM is operating in ADSL2 mode)
- Multilink Point-to-Point Protocol (MLPPP) (supported only when the VDSL2 Mini-PIM is operating in ADSL2 mode)
- Support for a maximum of 10 permanent virtual connections (PVCs) (only in ADSL/ADSL2/ADSL2+ mode)
- Dying Gasp support (ADSL and VDSL2 mode)

1-Port VDSL2 Annex A Mini-Physical Interface Module (SRX-MP-1VDSL2-R) Hardware Specifications

Table 31 on page 51 gives the hardware specifications of the 1-Port VDSL2 Annex A Mini-Physical Interface Module (Mini-PIM).

Table 31: 1-Port VDSL2 Annex A (SRX-MP-1VDSL2-R) Mini-PIM Hardware Specifications

Description	Value
Dimensions (H x W x L)	3.75 in. x 5.9 in. x 0.80 in. (9.5 cm x 14.5 cm x 2.0 cm)
Weight	4.0 oz (114 g)
Connector type	RJ-11
Form factor	Mini-PIM
Environmental operating temperature	32°F through 113°F (0° C through 40° C)
Storage temperature	–40°F through 158°F (–40° C through 70° C)
Relative humidity	5% to 90% noncondensing

1-Port VDSL2 Annex A Mini-Physical Interface Module (SRX-MP-1VDSL2-R) LEDs

The 1-Port VDSL2 Annex A Mini-Physical Interface Module (Mini-PIM) has two LEDs. Table 32 on page 51 describes the LED states.

Table 32: 1-Port VDSL2 Annex A (SRX-MP-1VDSL2-R) Mini-PIM LED States

LED	Color	State	Description
SYNC	Green	On	Indicates that the VDSL interface is trained.
		Blinking	Indicates training is in progress.

Table 32: 1-Port VDSL2 Annex A (SRX-MP-1VDSL2-R) Mini-PIM LED States *(Continued)*

LED	Color	State	Description
TX/RX	Green	Blinking	Indicates that traffic is passing through.
		Off	Indicates that no traffic is passing through.

1-Port VDSL2 Annex A Mini-Physical Interface Module (SRX-MP-1VDSL2-R) Supported Profiles

A profile is a table that contains a list of preconfigured VDSL2 settings. Table 33 on page 52 lists the different profiles supported on the 1-Port VDSL2 Annex A Mini-PIM, along with their data rates.

Table 33: Supported Profiles on the 1-Port VDSL2 Annex A (SRX-MP-1VDSL2-R) Mini-PIM

Profiles	Data Rate
8a	50
8b	50
8c	50
8d	50
12a	68
12b	68
17a	100

Table 33: Supported Profiles on the 1-Port VDSL2 Annex A (SRX-MP-1VDSL2-R) Mini-PIM *(Continued)*

Profiles	Data Rate
Auto	Auto mode (default)

1-Port VDSL2 Annex A (SRX-MP-1VDSL2-R) Mini-Physical Interface Module Cable Specifications

The 1-Port VDSL2 (Annex A) Mini-Physical Interface Module (Mini-PIM) requires a standard RJ-11 cable.

Figure 7 on page 53 shows the RJ-11 cable design.

Figure 7: RJ-11 Cable Pinout for 1-Port VDSL2 Annex A (SRX-MP-1VDSL2-R) Mini-PIM

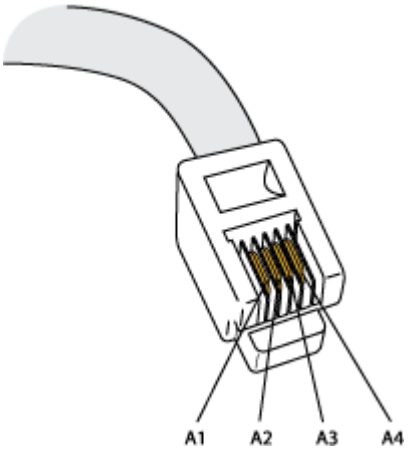


Table 34 on page 53 shows the pin assignments of the RJ-11 cable.

Table 34: RJ-11 Cable Pinout Details for 1-Port VDSL2 Annex A (SRX-MP-1VDSL2-R) Mini-PIM

Pin	Signal
A1	Ground
A2	RX (data input)

Table 34: RJ-11 Cable Pinout Details for 1-Port VDSL2 Annex A (SRX-MP-1VDSL2-R) Mini-PIM *(Continued)*

Pin	Signal
A3	Tx (data output)
A4	Vcc (power)

1-Port VDSL2 Annex A Mini-Physical Interface Module (SRX-MP-1VDSL2-R) Basic Configuration

IN THIS SECTION

To enable the 1-Port VDSL2 Annex A Mini-Physical Interface Module (Mini-PIM) installed on the services gateway, you must configure the basic settings for the PIM. You can perform the configuration tasks for this using either the J-Web interface or the CLI.

Using the J-Web Interface

To perform basic configuration for the 1-Port VDSL2 (Annex A) Mini-Physical Interface Module (Mini-PIM) and to configure network interfaces for the services gateway using the J-Web interface:

1. In the J-Web interface, select **Configure>Interfaces**.

   The Interfaces page displays and lists the network interfaces present on the services gateway, along with configuration information (if configured).
2. Select the interface name (**pt-1/0/0**) and click **Add > Logical Interfaces**. Enter the details and click **OK**. To use the port on the Mini-PIM, assign an IP address to the port and assign it to a security zone, other than the Null zone. If there are no security zones listed, proceed to the next step to add a security zone.
3. Add a security zone to the interface:

a. Select **Configure>Security>Zones/Screens**.

b. Add or select a security zone other than Null; for example, **Trust**. Assign the interface to the zone.

c. For Host Inbound Traffic-Zone, set the following:

- System Services=**Allow All**
- Protocols=**Allow All**

d. Click **OK** to save changes, and select **Commit>Commit** to apply the configuration and other pending changes.

4. To use the port on the Mini-PIM, you must also set security policies. Select the following settings:

a. Select **Configure>Security>Security Policy**

b. Select **Global Options > Policy Options**.

c. Set Policy Action: Default Policy Action=**Permit-All**

d. Click **OK** to save changes, and select **Commit>Commit** to apply the configuration and other pending changes (if any).

For more information, in the J-Web interface, select **Configure>Interfaces** and click **Help**.

Using the CLI

To perform basic configuration of the 1-Port VDSL2 Annex A Mini-PIM and to configure network interfaces for the services gateway with the CLI:

1. Verify that the 1-Port VDSL2 interface is installed on the device:

```
show chassis hardware
```

2. Verify the status of the interface:

```
show interfaces terse
```

3. Assign the port an IP address:

```
set interfaces pt-1/0/0 unit 0 family inet address interface address/destination prefix
```

4. Add or select a security zone; for example, Zone1:

```
set security zones security-zone trust interfaces pt-1/0/0.0 host-inbound-traffic system-services
all
```

5. Add or select security zones for host inbound traffic options protocols:

```
set security zones security-zone trust interfaces pt-1/0/0.0 host-inbound-traffic protocols all
```

6. Set security policies:

```
set security policies default-policy permit-all
```

Upgrading the Firmware on the VDSL2 Mini-PIM

To upgrade the firmware on the VDSL2 Mini-PIM using the CLI:

1. Identify the currently installed firmware (jfirmware) version.

```
user@host > show system firmware
```

> **NOTE**: Ensure that you upgrade the firmware on the Mini-PIM to the latest version.

The `Current version` field in the output displays the firmware version that is currently installed on the Mini-PIM. If there is a newer version of the firmware at https://www.juniper.net/support/downloads/?p=junos-srx#sw, then proceed to the next step to download the latest firmware.

```
Part                Type           Tag Current     Available     Status
                                       version      version
FPC 2
PIC 0             VDSLBCM           10  2.16.0          0           OK
Routing Engine 0 RE BIOS            0   3.1             3.6         OK
Routing Engine 0 RE BIOS Backup     1   3.1             3.6         OK
```

2. Download the appropriate firmware version from https://www.juniper.net/support/downloads/?p=junos-srx#sw.

```
user@host > request system software add /var/tmp/jfirmware-<version>-signed.tgz
```

> **NOTE**: Ensure that the Junos OS version installed on the device is the same as the firmware version or later. To know the Junos OS version, issue the `show version` command.

3. Ensure that the latest firmware version is downloaded to the Mini-PIM by verifying the `Available version` field. The `Available version` field should list the latest firmware version that was downloaded in Step 2.

```
user@host > show system firmware
```

```
Part               Type           Tag Current     Available     Status
                                       version     version
FPC 2
PIC 0            VDSLBCM           10  2.16.0          2.20.0        OK
Routing Engine 0 RE BIOS           0   3.1             3.6           OK
Routing Engine 0 RE BIOS Backup    1   3.1             3.6           OK
```

4. Upgrade the firmware on the device.

```
user@host > request system firmware upgrade pic fpc-slot <fpc-slot-number>
```

```
Part          Type           Tag Current          Available         Status
                                    version           version
FPC 2
PIC 0         VDSLBCM        10   2.16.0             2.20.0           OK
Perform indicated firmware upgrade ? [yes,no] (no) yes

Firmware upgrade initiated, use "show system firmware" to monitor status.
```

5. Verify that the firmware is upgraded successfully.

```
user@host > show system firmware
Part               Type           Tag Current     Available     Status
                                       version     version
FPC 2
PIC 0            VDSLBCM           10  2.16.0      2.20.0     UPGRADED
                                                              SUCCESSFULLY
Routing Engine 0 RE BIOS           0   3.0         3.6        OK
Routing Engine 0 RE BIOS Backup    1   3.0         3.6        OK
```

6. Restart the FPC slot in which the VDSL PIM is installed.

```
user@host > restart fpc <fpc-slot-number>
```

7. Verify the firmware version. The `Current Version` field should show the latest firmware version and the `Status` should show `OK`.

```
user@host > show system firmware
Part               Type           Tag Current     Available     Status
                                      version      version
FPC 2
PIC 0            VDSLBCM           10  2.20.0      2.20.0      OK
Routing Engine 0 RE BIOS           0   3.0         3.6         OK
Routing Engine 0 RE BIOS Backup    1   3.0         3.6         OK
```

RELATED DOCUMENTATION

Maintaining the SRX Series Interface Modules | 163

LTE Mini-Physical Interface Module

IN THIS SECTION

LTE Mini-Physical Interface Module

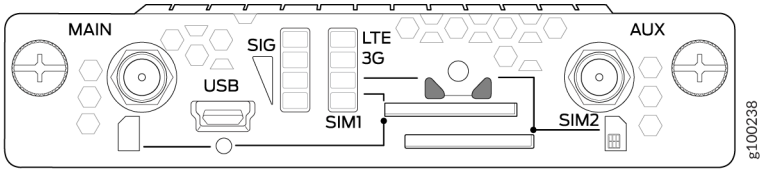
The LTE Mini-Physical Interface Module (Mini-PIM) provides wireless WAN support on the SRX300 Series and SRX550 High Memory Services Gateways. The Mini-PIM contains an integrated modem and operates over 3G and 4G networks. The Mini-PIM supports up to two SIM cards and can be installed in any of the Mini-PIM slots on the services gateways.

The Mini-PIM supports the following features:

- Automatic switchover between service providers through dual SIMs
- Storage support for multiple service provider and access point name (APN) profiles
- LTE carrier aggregation
- SIM lock and unlock capability
- Always-on, dial-on-demand, and backup modes
- Over-the-Air upgrade for modem firmware

Figure 8 on page 59 shows the front panel of the LTE Mini-PIM.

Figure 8: LTE Mini-PIM Front Panel



The LTE Mini-PIM ships with a SIM slot cover as shown in Figure 9 on page 59.

Figure 9: LTE Mini-PIM Front Panel (with the SIM Slot Cover)

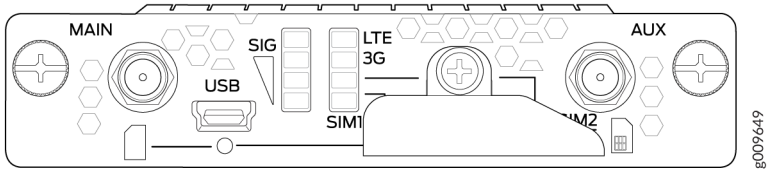


Table 35 on page 60 lists the components on the front panel of the Mini-PIM.

Table 35: LTE Mini-PIM Front Panel Components

Component	Description
Antenna connectors	Two SubMiniature version A (SMA) connectors.
Mini-USB port	Mini-USB Type-B port for monitoring and troubleshooting.
SIM slots	Two slots, **SIM1** and **SIM2**, for inserting the SIM cards. The LTE Mini-PIM supports mini, micro, and nano SIMs. The mini-SIM can be inserted directly in the SIM slot. To insert micro and nano SIMs, use the SIM adapters supplied with the Mini-PIM. The Mini-PIM is shipped with two SIM adapters. **CAUTION**: SIM cards are not hot-swappable. You must power off the services gateway before removing or inserting a SIM card.
LEDs	Indicate the status at a glance. For details on the LED indications, see *LTE Mini-Physical Interface Module LEDs*.

CAUTION: The LTE Mini-PIM is not hot-swappable. You must power off the services gateway before removing or installing the Mini-PIM.

The LTE Mini-PIM supports two multi-band swivel-mount dipole antennas, which can be rotated 360 °. You can rotate the antennas and select the angle at which the signal strength is high. Table 36 on page 60 lists the specifications for the antenna.

Table 36: Specifications for the LTE Mini-PIM Antenna

Specification	Value
Part number	EDA-2010-4G0R2-A2 (Vendor: MAG.LAYERS)
Operating frequency range	• 704~960 MHz • 1710~2700 MHz

Table 36: Specifications for the LTE Mini-PIM Antenna *(Continued)*

Specification	Value
Voltage Standing Wave Ratio (VSWR)	5 (maximum)
Impedance	50 ohm
Radiation	Omnidirectional
Peak gain	• 2.45 dBi (704~960 MHz) • 4.51 dBi (1710~2700 MHz)
Input power	1 W
Polarization	Linear, vertical
Operating temperature	–4° F (–20° C) to 149° F (65° C)
Connector type	SMA
Length	203 mm

The antenna is connected to the services gateway through the magnetic antenna base. Table 37 on page 61 lists the specifications for the antenna base.

Table 37: Antenna Base Specifications

Specification	Value
Part number	BS-05SF-174-3M-0102 (Vendor: Chang Hong)
Cable length	3 m

Table 37: Antenna Base Specifications *(Continued)*

Specification	Value
Connector type	SMA
Dimensions (H x W x L)	29.50 mm x 73 mm x 73 mm

Table 38 on page 62 provides a summary of the different models of the Mini-PIM.

Table 38: LTE Mini-PIM Models

Model	Mode	Operating Region	Frequency Band
SRX-MP-LTE-AE	• LTE • HSPA+	• North America • European Union	For LTE: • Bands 1 through 5, 7, 8, 12, 13, 20, 25, 26, 29, 30, and 41 For 3G (HSPA+): • Bands 1 through 5, and 8
SRX-MP-LTE-AA	• LTE • HSPA+	• Asia • Australia	For LTE: • Bands 1,3, 5, 7, 8, 18, 19, 21, 28, 38, 39, 40, and 41 For 3G (HSPA+): • Bands 1, 5, 6, 8, 9, and 19

The Mini-PIM can be configured in three modes:

- Always-on—The Mini-PIM connects to the 3G/4G network after booting. The connection is always maintained, as long as there are no network or connectivity problems.
- Dial-on-demand—The Mini-PIM initiates a connection when it receives traffic.
- Backup—The Mini-PIM connects to the 3G/4G network when the primary connection fails.

The LTE Mini-PIM supports the following wireless standards:

- FCC Part 2

- FCC Part 22
- FCC Part 24, Part 27 and Part 90
- RSS 129 and RSS 133, RSS 130, RSS 199, and RSS 139
- RSS 132 and RSS 133
- EN 301 511 GSM
- EN 301 908-1
- EN 301 908-2
- The Certification and Engineering Bureau of Industry Canada (IC)
- Radio Equipment (RE) Directive of the European Union
- GCF
- CTIA-PTCRB

LTE Mini-Physical Interface Module LEDs

Figure 10 on page 63 shows the LEDs on the LTE Mini-PIM.

Figure 10: LTE Mini-PIM LEDs

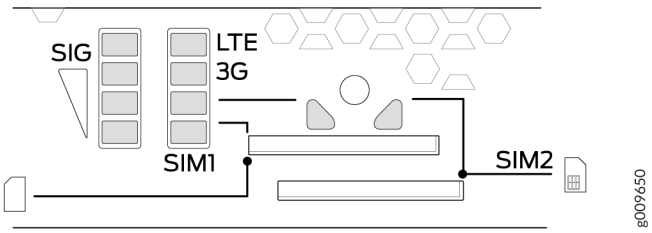


Table 39 on page 64 lists the LEDs on the LTE Mini-PIM and their indications.

Table 39: LTE Mini-PIM LED States

LED	Description
SIG (Received Signal Strength Indicator)	Solid green (one bar)—Low signal strength (<= –99 dBm).
	Solid green (two bars)—Low signal strength (from –98 dBm to –87 dBm).
	Solid green (three bars)—Low signal strength (from –86 dBm to –76 dBm).
	Solid green (four bars)—High signal strength (>= –75 dBm).
	Unlit—No signal
3G	Solid green—3G connection is established.
	Blinking green—Connecting to a 3G network.
LTE	Solid green—LTE connection is established.
	Blinking green—Connecting to an LTE network.
SIM1	Solid green—SIM1 is active.
SIM2	Solid green—SIM2 is active.

NOTE: If all the LEDs are blinking, it indicates that firmware updates are in progress. Do not power off the services gateway before the updates complete.

LTE Mini-Physical Interface Module Hardware Specifications

Table 40 on page 65 provides the hardware specifications for the LTE Mini-PIM.

Table 40: LTE Mini-PIM Hardware Specifications

Description	Value
Dimensions (H x W x L)	0.80 in. x 3.75 in. x 5.9 in. (2.0 cm x 9.5 cm x 14.5 cm)
Weight	0.23 lb (0.106 kg)
Connector type	SMA
Form factor	Mini-PIM
Environmental operating temperature	32° F through 104° F (0° C through 40° C)
Storage temperature	-40° F through 158° F (-40° C through 70° C)
Relative humidity	5% to 90% noncondensing

LTE Mini-Physical Interface Module Installation and Configuration

IN THIS SECTION

Installing the LTE Mini-PIM

The LTE Mini-PIM can be installed in any of the Mini-PIM slots on the services gateway.

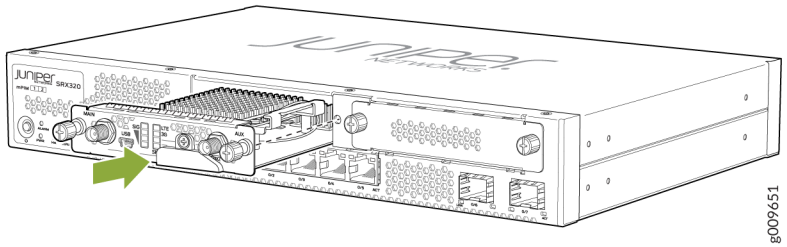
NOTE: You can install only one LTE Mini-PIM in a services gateway.

To install the LTE Mini-PIM in a services gateway:

1. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to the grounding point on the back of the services gateway.
2. Power off the services gateway by briefly pressing the **Power** button on the front panel. Wait for the **Power** LED to turn off before proceeding. Disconnect the services gateway from the power source.
3. Remove the blank Mini-PIM installed on the services gateway:
   a. Loosen the screws on the faceplate of the blank Mini-PIM.
   b. Grasp the screws on each side and remove the blank Mini-PIM.
4. Remove the LTE Mini-PIM from the electrostatic bag.
5. Grasp the screws on each side of the Mini-PIM faceplate and align the notches in the connector at the rear of the Mini-PIM with the notches in the Mini-PIM slot in the services gateway.

   CAUTION: Slide the Mini-PIM straight into the slot to avoid damaging the components on the Mini-PIM.
6. Slide the Mini-PIM in until it lodges firmly in the services gateway. See *Figure 4*.

Figure 11: Installing the LTE Mini-PIM

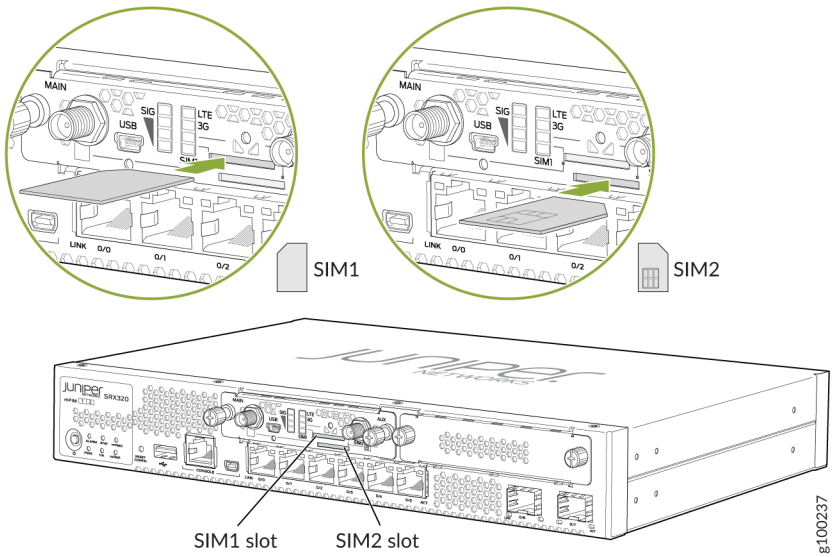


7. Using a 1/8-in. (3-mm) flat-blade (–) screwdriver, tighten the screws on each side of the Mini-PIM faceplate.
8. Remove the SIM slot cover. Insert the SIM card into the SIM slot, **SIM 1**.

You can use the other slot, **SIM 2**, for installing a secondary or backup SIM.

NOTE: When you insert SIM cards into the respective slots, make sure to orient the cards correctly. Insert SIM1 into its slot with the connector side (SIM card chip) facing down and the notch on the left. Insert SIM2 into its slot with the connector side facing up and the notch on the right. See *Figure 5*.

Figure 12: Inserting the SIM Card

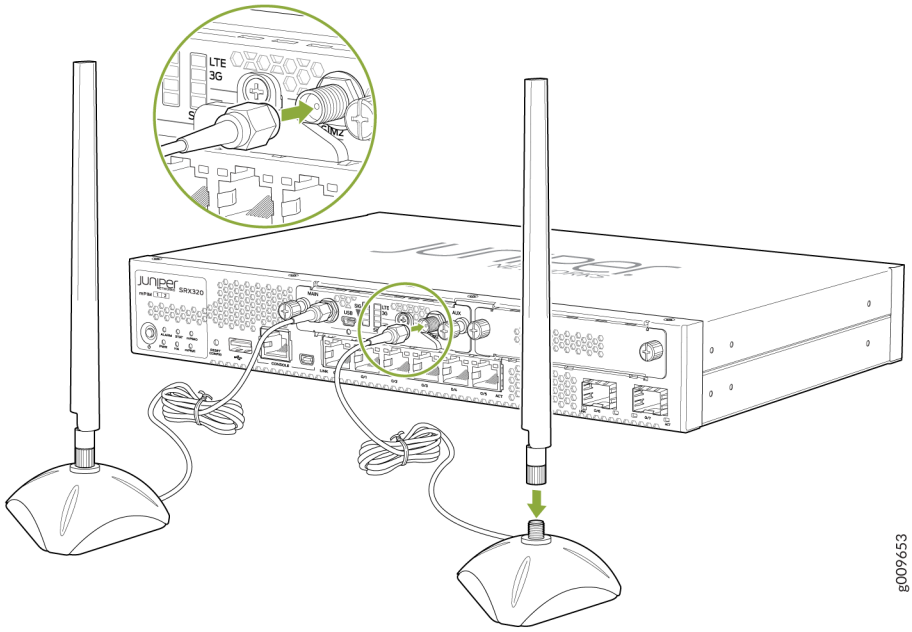


To remove a SIM card from its slot, press the edge of the card projecting out of the slot.

9. Replace the cover over the SIM slots.

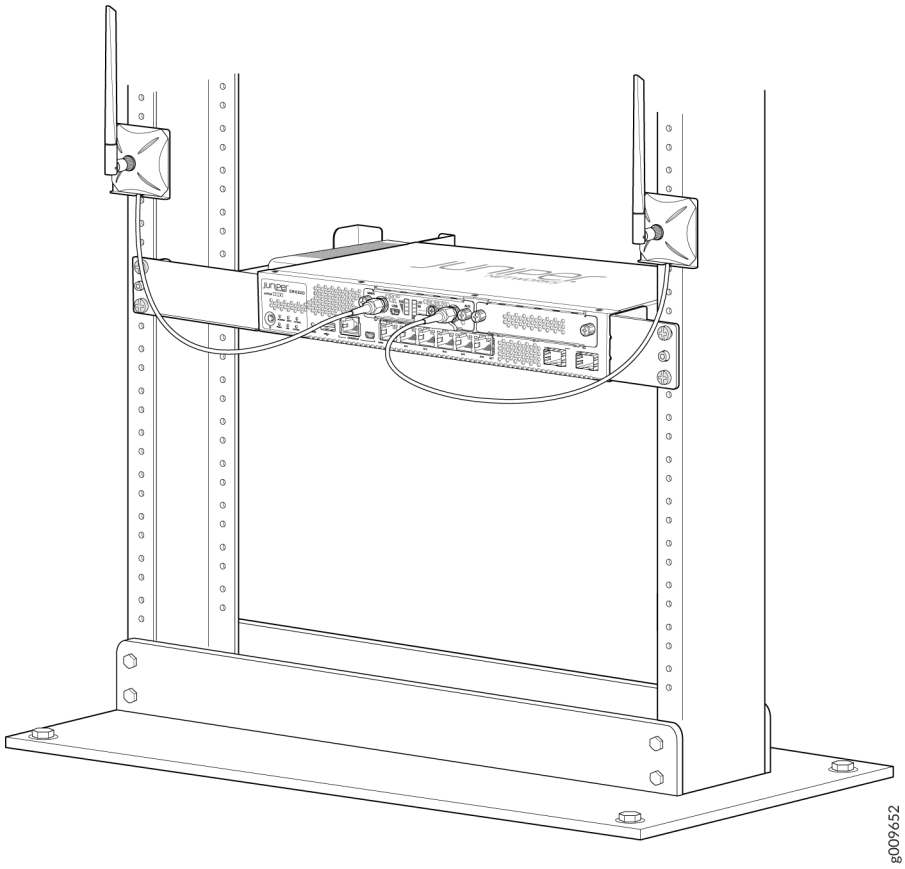
10. Attach the antennas to the antenna base. Connect the cables from each antenna base to the SMA connectors on the Mini-PIM. See *Figure 6*.

Figure 13: Attaching the Antennas



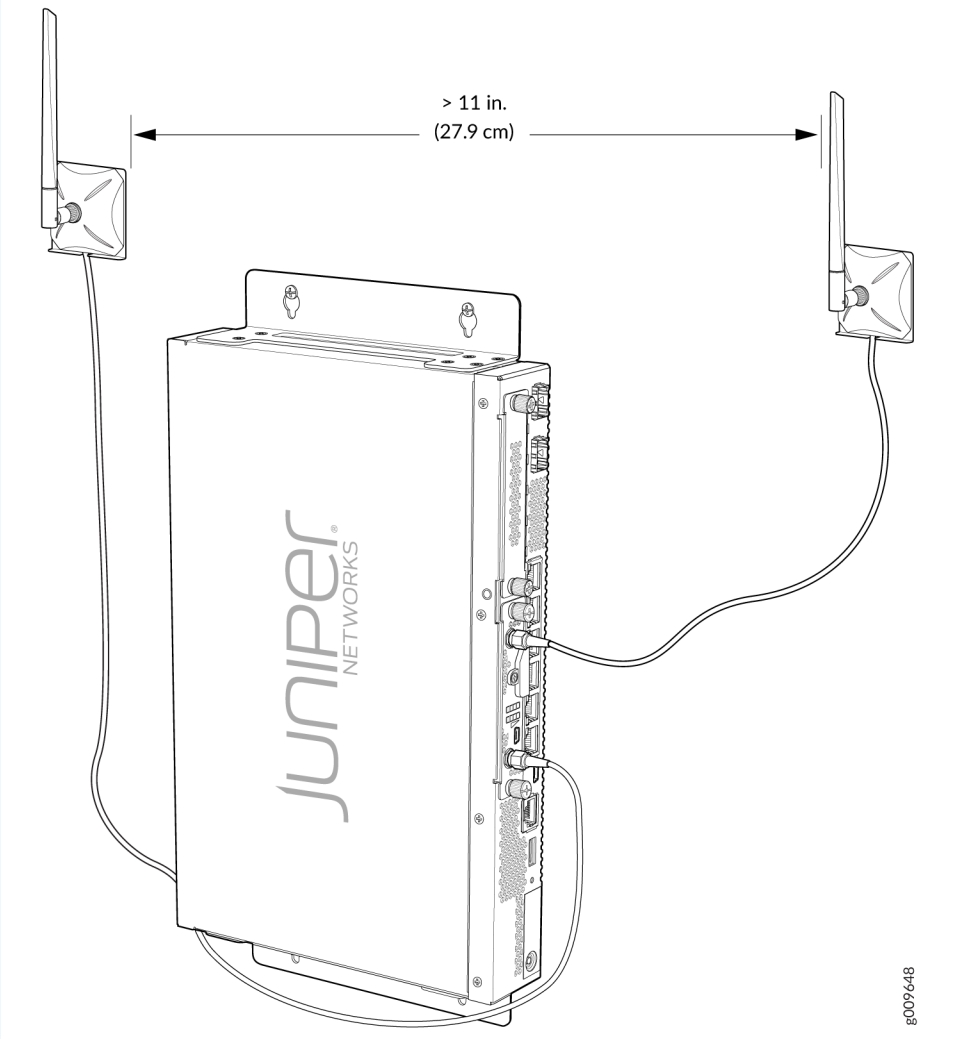
The antenna base is magnetic and can be attached to the rack directly, if the rack is metallic. Else, you can mount the antenna base on the rack using the mounting brackets. See *Figure 7*.

Figure 14: Mounting the Antennas on a Rack



NOTE: For SRX320 Services Gateways, which can be mounted on a wall, the antennas can be mounted as shown in *Figure 8*.

Figure 15: Mounting the Antennas on a Wall



11. Power on the services gateway.

Configuring the LTE Mini-PIM

NOTE: If a services gateway with factory-default settings is powered on with the LTE Mini-PIM installed in slot 1, the dialer interface is triggered to dial automatically. This functionality is

applicable only if the Mini-PIM is installed in slot 1. If the Mini-PIM is installed in any other slot, then you will need to manually configure the *cl-slot-number/0/0* interface to be associated with the dialer interface.

To configure the Mini-PIM:

1. Configure the dialer pool:

   ```
   user@host# set interfaces cl-slot-number/0/0 dialer-options pool number priority number
   ```

2. Configure the profile:

   ```
   user@host# request modem wireless create-profile profile-id profile-id access-point-name
   l3vpn.corp authentication-method chap sip-user-id user@myvpn.net sip-password password
   ```

3. Activate the SIM:

   ```
   user@host# set interfaces cl-slot-number/0/0 act-sim sim-slot-number
   ```

4. Select the profile and configure the radio access type for the SIM card:

   ```
   user@host# set interfaces cl-slot-number/0/0 cellular-options sim sim-slot-number profile-id
   profile-id

   user@host# set interfaces cl-slot-number/0/0 cellular-options sim sim-slot-number radio-access
   automatic
   ```

   NOTE: If a SIM card is installed in the second slot, then select the profile and configure the radio access type for the secondary SIM card as well.

5. Configure the dialer interface:

   - Always-on mode:

     ```
     user@host# set interfaces dl0 unit 0 family inet negotiate-address

     user@host# set interfaces dl0 unit 0 family inet6 negotiate-address

     user@host# set interfaces dl0 unit 0 dialer-options pool dialer-pool-number

     user@host# set interfaces dl0 unit 0 dialer-options dial-string dial-number

     user@host# set interfaces dl0 unit 0 dialer-options always-on
     ```

   - Dial-on-demand mode:

     ```
     user@host# set interfaces dl0 unit 0 family inet negotiate-address

     user@host# set interfaces dl0 unit 0 family inet6 negotiate-address

     user@host# set interfaces dl0 unit 0 family inet filter dialer dialer-filter-name
     ```

```
user@host# set interfaces dl0 unit 0 dialer-options pool dialer-pool-number

user@host# set interfaces dl0 unit 0 dialer-options dial-string dial-number
```

- Backup mode:

```
user@host# set interfaces dl0 unit 0 family inet negotiate-address

user@host# set interfaces dl0 unit 0 family inet6 negotiate-address

user@host# set interfaces dl0 unit 0 dialer-options pool dialer-pool-number

user@host# set interfaces dl0 unit 0 dialer-options dial-string dial-number

user@host# set interfaces interface-name unit 0 backup-options interface dl0.0
```

Configuring a Static Route on the Dialer Interface

A static route enables the dialer interface to forward packets to a specific destination other than the default route. Static routes are manually configured and entered into the routing table. You can configure a static route on the dialer interface by using the `set interfaces dl0 unit 0 dialer-options route` *destination-ip-address* command.

After you configure a static route, make sure that the route appears in the routing table of the device by using the `show route` command. Note that the static route appears in the routing table only after the LTE Mini-PIM is connected to the network.

Sample output:

```
user@host> show route
inet.0: 10 destinations, 10 routes (10 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both
0.0.0.0/0          *[Access-internal/12] 4d 03:23:52, metric2 0
                    >  to 10.14.5.137 via dl0.0
10.22.22.22/32 *[Access-internal/12] 00:01:03, metric2 0
                    >  to 10.14.5.137 via dl0.0
```

Firmware Upgrade on the LTE Mini-Physical Interface Module

IN THIS SECTION

Mini-PIM Firmware Upgrade Using the CLI

To upgrade the firmware on the Mini-PIM, using the CLI:

NOTE: When you upgrade the firmware on the Mini-PIM, the modem firmware is also upgraded.

1. Identify the currently installed firmware (jfirmware) version:

   ```
   user@host > show system firmware
   ```

   NOTE: Ensure that you upgrade the firmware on the Mini-PIM to the latest version.

   The `Current version` field in the output displays the firmware version that is currently installed on the Mini-PIM. If there is a newer version of the firmware at https://www.juniper.net/support/downloads/?p=junos-srx#sw, then proceed to the next step to download the latest firmware.

   ```
   Part             Type           Tag Current   Available Status
                                       version   version
   FPC 1
     PIC 0          MLTE_FW        1   17.2.91             OK
   Routing Engine 0 RE BIOS        0   3.2       3.2       OK
   Routing Engine 0 RE BIOS Backup 1   3.2       3.2       OK
   ```

2. Download the appropriate firmware version from https://www.juniper.net/support/downloads/?p=junos-srx#sw:

   ```
   user@host > request system software add /var/tmp/jfirmware-<version>-signed.tgz
   ```

NOTE: Ensure that the Junos OS version installed on the device is the same as the firmware version or later. To know the Junos OS version, issue the `show version` command.

3. Ensure that the latest firmware version is downloaded to the Mini-PIM by verifying the `Available version` field. The `Available version` field should list the latest firmware version that was downloaded in Step *2*.

```
user@host > show system firmware
```

```
Part             Type           Tag Current   Available Status
                                    version   version
FPC 1
  PIC 0          MLTE_FW        1   17.2.91   17.5.517      OK
Routing Engine 0 RE BIOS        0   3.2       3.2       OK
Routing Engine 0 RE BIOS Backup 1   3.2       3.2       OK
```

4. Upgrade the firmware on the device:

```
user@host > request system firmware upgrade pic fpc-slot <fpc-slot-number>
```

```
Part          Type           Tag Current          Available         Status
                                   version           version
FPC 1
PIC 0         MLTE_FW        1   17.2.91             17.5.517            OK
Perform indicated firmware upgrade ? [yes,no] (no) yes

Firmware upgrade initiated, use "show system firmware" to monitor status.
```

5. Verify that the firmware is upgraded successfully. The status should show `OK`.

```
user@host > show system firmware
Part               Type           Tag Current     Available     Status
                                       version     version
FPC 1
PIC 0              MLTE_FW          1   17.2.91   17.5.517     UPGRADED
                                                               SUCCESSFULLY
Routing Engine 0 RE BIOS            0   3.0         3.6              OK
Routing Engine 0 RE BIOS Backup     1   3.0         3.6              OK
```

```
user@host > show system firmware
Part               Type           Tag Current     Available     Status
                                      version      version
FPC 1
PIC 0            MLTE_FW           1   17.5.517   17.5.517            OK
Routing Engine 0 RE BIOS           0   3.0         3.6               OK
Routing Engine 0 RE BIOS Backup    1   3.0         3.6               OK
```

6. Reboot the device after the firmware is upgraded. Note that if you issue the `show system firmware` command after the reboot, the `Current Version` field shows the latest firmware version and the `Available Version` field shows zero(0).

Modem Firmware Upgrade Through Over-the-Air (OTA)

Over-the-Air (OTA) firmware upgrade enables automatic and timely upgrade of modem firmware when new firmware versions are available. The OTA upgrade can be enabled or disabled on the 4G/LTE Mini-PIM. OTA is disabled by default.

1. Enable OTA upgrade status on the LTE Mini-PIM:

   `user@host > request modem wireless fota enable`

2. Initiate the firmware upgrade:

   `user@host > request modem wireless upgrade cl-`*`slot number`*`/0/0`

3. Verify the firmware upgrade status:

   `user@host > show modem wireless firmware cl-`*`slot number`*`/0/0`

```
root> show modem wireless firmware cl-1/0/0
LTE mPIM firmware details
  Product name: Junos LTE mPIM
  Serial number: AG50071902
  Hardware version: AcceleratedConcepts/sprite
  Firmware version: 17.2.91
  MAC: 00:00:5e:00:53:c5
  System uptime: 429 seconds
Wireless modem firmware details
  Modem firmware version: 9999999_9904609_SWI9X30C_02.23.00.00_00_GENERIC_002.018_000
  Modem Firmware build date: 22/10/2016
  Card type: MC7430
  Modem manufacturer: Sierra Wireless, Inc
  Hardware version: 1.0
  Temperature & Power: Normal 3328 mV, Normal 33.00 C
```

```
OTA status
  State: Disabled
  New firmware available: No
Number of SIM: 1
Slot of active: 2
Status of SIM 1
  SIM state: SIM absent
  Modem PIN security status: Disabled
  SIM status: SIM Okay
  SIM user operation needed: No Op
  Retries remaining: 0
```

4. Check the LTE Mini-PIM connection status:

```
user@host > show modem wireless network cl-slot number/0/0
```

```
root> show modem wireless network cl-1/0/0
LTE Connection details
  Connected time: 147
  IP: 172.16.52.4
  Gateway: 172.16.52.5
  DNS: 123.123.123.123
  Input bps: 0
  Output bps: 0
  Bytes Received: 1308
  Bytes Transferred: 1164
  Packets Received: 10
  Packets Transferred: 10
Wireless Modem Network Info
  Current Modem Status: Connected
  Current Service Status: Normal
  Current Service Type: PS
  Current Service Mode: LTE
  Current Band: B3
  Network: UNICOM
  Mobile Country Code (MCC): 460
  Mobile Network Code (MNC): 1
  Location Area Code (LAC): 65534
  Routing Area Code (RAC): 0
  Cell Identification: 4865903
  Access Point Name (APN): ctnet
  Public Land Mobile Network (PLMN): CHN-UNICOM
  Physical Cell ID (PCI): 333
```

```
International Mobile Subscriber Identification (IMSI): **************
International Mobile Equipment Identification (IMEI/MEID): *************
Integrate Circuit Card Identity (ICCID): 89860114721100697502
Reference Signal Receiving Power (RSRP): -97
Reference Signal Receiving Quality (RSRQ): -16
Signal to Interference-plus-Noise Ratio (SiNR): 0
Signal Noise Ratio (SNR): 0
Energy per Chip to Interference (ECIO): 0
```

Wi-Fi Mini-Physical Interface Module

IN THIS SECTION

Wi-Fi Mini-Physical Interface Module Overview

IN THIS SECTION

The Wi-Fi Mini-Physical Interface Module (Mini-PIM) for branch SRX Series Services Gateways provides a branch-in-a-box solution (which includes an SRX Series device, LTE, and wi-fi) for retail and small office deployments. The Mini-PIM has an embedded enterprise-class wireless system-on-chip (SOC) that supports the 802.11ac Wave 2 wireless standards. The Mini-PIM is backward-compatible with 802.11a, 802.11b, 802.11g, and 802.11n.

The Mini-PIM supports the following key features:

- 2x2 MU-MIMO—Enables transmission of data to multiple clients simultaneously.
- Dual radios—Provides concurrent dual bands of 2.4 GHz and 5 GHz. The radios operate in any one of the supported radio modes. You can configure each radio to support connectivity from one type of client or different types of clients.
- Virtual access points (VAPs)—Allows you to segment the WLAN into multiple broadcast domains that are the wireless equivalent of Ethernet VLANs. A single access point is segregated into multiple individual VAPs, simulating multiple access points in a single system.

  NOTE: You can configure up to eight VAPs on each radio.

- Configurable transmit power—Enables you to configure the transmit power for each radio on a percentage basis. By default, the Mini-PIM assigns 100 percent power to each radio at startup to provide maximum coverage.
- Wireless security for client authentication—The Mini-PIM supports the following authentication methods:
  - Wi-Fi Protected Access (WPA) Personal, which includes AES-CCMP with preshared key authentication.
  - WPA Enterprise, which includes AES-CCMP with RADIUS server authentication.
  - MAC authentication, where wireless clients are allowed or denied network access based on their MAC address.

The Mini-PIM is supported on the SRX320, SRX340, SRX345, and SRX550M devices and can coexist with other Mini-PIMs supported on these devices.

Front Panel Components

Figure 1 shows the front panel of the Wi-Fi Mini-PIM.

Figure 16: Wi-Fi Mini-PIM Front Panel

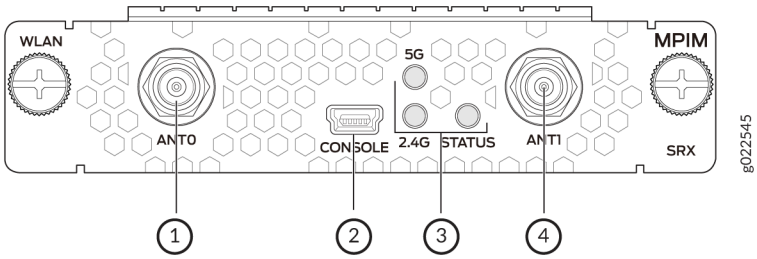


Table 1 lists the components on the front panel.

Table 41: Wi-Fi Mini-PIM Front Panel Components

Sl. No.	Component	Description
1, 4	Antenna connectors	Two Reverse Polarity SubMiniature version A (RP-SMA) connectors
2	Console	Mini-USB Type-B port for debugging purposes

Table 41: Wi-Fi Mini-PIM Front Panel Components *(Continued)*

Sl. No.	Component	Description
3	LEDs	Indicate the status of the Mini-PIM: **2.4 GHz** • Solid green—2G WLAN connection is established • Blinking green—Data activity **5 GHz** • Solid green—5G WLAN connection is established • Blinking green—Data activity **STATUS** • Solid green—The Mini-PIM is operational • Blinking green—Powering on or running diagnostics

Wi-Fi Mini-PIM Models

Three models are available based on the regional wireless standards (see Table 42 on page 80):

Table 42: Wi-Fi Mini-PIM Models

Model or SKU	Supported Region	Notes
SRX-MP-WLAN-US	United States	This model is based on the wireless standards supported in the United States. The country code is fixed and cannot be changed.
SRX-MP-WLAN-IL	Israel	This model is based on the wireless standards supported in Israel. The country code is fixed and cannot be changed.

Table 42: Wi-Fi Mini-PIM Models *(Continued)*

Model or SKU	Supported Region	Notes
SRX-MP-WLAN-WW	Other countries	You can set the country code using the `set wlan access-point` *`ap-name`* `access-point-options country` *`country code`* command. For information on country codes, see

Physical Interface

The physical interface for the Wi-Fi Mini-PIM uses the name wl-*x*/0/0, where x is the slot on the services gateway where the Mini-PIM is installed. You can install the Mini-PIM in any of the Mini-PIM slots on the services gateway.

Wi-Fi Mini-PIM Hardware Specifications

IN THIS SECTION

Table 43 on page 81 provides the hardware specifications for the Mini-PIM.

Table 43: Wi-Fi Mini-PIM Hardware Specifications

Description	Value
Dimensions	H x W x L: 0.79 in. x 3.70 in. x 5.29 in. (2.0 cm x 9.4 cm x 13.43 cm)
Weight	0.29 lb (0.13 kg)

Table 43: Wi-Fi Mini-PIM Hardware Specifications *(Continued)*

Description	Value
Form factor	Mini-PIM
Connector type	RP-SMA
Environmental operating temperature	32° F through 104° F (0° C through 40° C)
Storage temperature	-40° F through 158° F (-40°C through 70° C)
Relative humidity	5% to 90% noncondensing
Operating altitude	6,000 feet (1828 meters)

Antenna Specifications

The Mini-PIM supports two multi-band swivel-mount dipole antennas, which can be rotated 360 degrees. You can rotate the antennas and select the angle at which the signal strength is high. Table 44 on page 82 lists the specifications for the antenna.

Table 44: Specifications for the Wi-Fi Mini-PIM Antenna

Specification	Value
Part number	EDA-1713-25GR2-A3 (Vendor: MAG.LAYERS)
Operating frequency range	• 2.4~2.5 GHz • 5.15~5.85 GHz
Impedance	50 ohm
Voltage standing wave ratio (VSWR)	2 (maximum)

Table 44: Specifications for the Wi-Fi Mini-PIM Antenna *(Continued)*

Specification	Value
Return loss	10 dB (maximum)
Radiation	Omnidirectional
Peak gain	5dBi +/-0.5
Polarization	Linear
Operating temperature	–4° F (–20° C) to 149° F (65° C)
Connector type	RP-SMA

Channels and Frequencies Supported on the Wi-Fi Mini-PIM

IN THIS SECTION

The Wi-Fi Mini-PIM supports channel bandwidths of 20 MHz, 40 MHz, and 80 MHz. The 2.4 GHz radio supports 20 MHz and 40 MHz channel bandwidths, and the 5 GHz radio supports 20 MHz, 40 MHz, and 80 MHz channel bandwidths. You can configure the bandwidth by using the `set wlan access-point` *`ap-name`* `radio [1|2] radio-option channel bandwidth` *`bandwidth`* command.

NOTE: You can configure the 80 MHz channel bandwidth only on the 5 GHz radio.

The default channel bandwidth is 20 MHz for the 2.4 GHz radio and 40 MHz for the 5 GHz radio. Setting the bandwidth to 40 MHz or 80 MHz reduces the number of available channels for use.

Table 45 on page 84 lists the channels supported on the 2.4 GHz radio.

Table 45: Channels Supported on the 2.4 GHz Radio (20 MHz and 40 MHz Bandwidth)

Band	Channel Number	Center Frequency (MHz)
2400~2483.5 MHz	1	2412
	2	2417
	3	2422
	4	2427
	5	2432
	6	2437
	7	2442
	8	2447
	9	2452
	10	2457
	11	2462
	12	2467
	13	2472

Table 46 on page 85 through Table 48 on page 87 list the channels supported on the 5 GHz radio.

Table 46: Channels Supported on the 5 GHz Radio (20 MHz Bandwidth)

Band	Channel Number	Center Frequency MHz
5150~5250 MHz	36	5180
	40	5200
	44	5220
	48	5240
5250~5350 MHz	52	5260
	56	5280
	60	5300
	64	5320
5470~5725 MHz	100	5500
	104	5520
	108	5540
	112	5560
	116	5580
	120	5600
	124	5620

Table 46: Channels Supported on the 5 GHz Radio (20 MHz Bandwidth) *(Continued)*

Band	Channel Number	Center Frequency MHz
	128	5640
	132	5660
	136	5680
	140	5700
5725~5850 MHz	144	5720
	149	5745
	153	5765
	157	5785
	161	5805
	165	5825

Table 47: Channels Supported on the 5 GHz Radio (40 MHz Bandwidth)

Band	Channel Number	Center Frequency MHz
5150~5250 MHz	38	5190
	46	5230
5250~5350 MHz	54	5270

Table 47: Channels Supported on the 5 GHz Radio (40 MHz Bandwidth) *(Continued)*

Band	Channel Number	Center Frequency MHz
	62	5310
5470~5725 MHz	102	5510
5725~5850 MHz	110	5550
	118	5590
	126	5630
	134	5670
	142	5710
	151	5755
	159	5795

Table 48: Channels Supported on the 5 GHz Radio (80 MHz Bandwidth)

Band	Channel Number	Center Frequency MHz
5150~5250 MHz	42	5210
5250~5350 MHz	58	5290
5470~5725 MHz	106	5530
	122	5610

Table 48: Channels Supported on the 5 GHz Radio (80 MHz Bandwidth) ***(Continued)***

Band	Channel Number	Center Frequency MHz
5725~5850 MHz	138	5690
	155	5775

Dynamic Frequency Selection

Dynamic Frequency Selection (DFS) enables use of 5 GHz frequencies that are typically reserved for radars. In countries where DFS is required, the Wi-Fi card performs appropriate checks for radar. If radar is detected on a channel, the access point selects a radar-free channel and performs a 60-second availability check before operating on that channel.

DFS is enabled by default. You can disable DFS by using the `dfs-off` option:

```
set wlan access-point ap-name radio
1 radio-options dfs-off
```

NOTE: Only the 5 GHz radio (radio 1) supports DFS.

You can configure the DFS settings in any of the following ways based on your requirement:

DFS enabled (default)

- If you set the `channel number` to `auto`, the access point selects the channel from the list of DFS and non-DFS channels. If the access point selects a DFS channel and detects radar on the channel, it switches to another channel automatically.
- If you set the `channel number` manually to a DFS channel and if the access point detects a radar on this channel, it switches to another channel automatically;

DFS disabled (dfs-off configured)

- If you set the `channel number` to `auto`, the access point selects the channel from the list of non-DFS channels.
- If you set the `channel number` manually, you can configure either a DFS or non-DFS channel. If you configure a DFS channel with DFS disabled, a warning message appears when you commit the configuration.

Country Codes and Regulatory Domains

Table 49 on page 90 lists the country codes and regulatory domains supported on the Wi-Fi Mini-PIM.

Table 49: Country Codes and Regulatory Domains

Country and Country Code	Model	Radio 1 (5 GHz)				Radio 2 (2.4 GHz)		
		Regulatory Domain (5 GHz)	20 MHz	40 MHz	80 MHz	Regulatory Domain (2.4 GHz)	20 MHz	40 MHz
Australia (AU)	SRX-MP-WLAN-WW	FCC6	36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112 116, 132, 136, 140, 144, 149, 153, 157, 161, 165	38, 46, 54, 62, 102, 110, 134, 142, 151, 159	42, 58, 106, 138, 155	WORLD	1 to 13	1 to 13

Table 49: Country Codes and Regulatory Domains *(Continued)*

Country and Country Code	Model	Radio 1 (5 GHz)				Radio 2 (2.4 GHz)		
		Regulatory Domain (5 GHz)	20 MHz	40 MHz	80 MHz	Regulatory Domain (2.4 GHz)	20 MHz	40 MHz
Canada (CA)	SRX-MP-WLAN-WW	FCC6	36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112 116, 132, 136, 140, 144, 149, 153, 157, 161, 165	38, 46, 54, 62, 102, 110, 134, 142, 151, 159	42, 58, 106, 138, 155	FCCA	1 to 11	1 to 11

Table 49: Country Codes and Regulatory Domains *(Continued)*

Country and Country Code	Model	Radio 1 (5 GHz)				Radio 2 (2.4 GHz)		
		Regulatory Domain (5 GHz)	20 MHz	40 MHz	80 MHz	Regulatory Domain (2.4 GHz)	20 MHz	40 MHz
China (CN)	SRX-MP-WLAN-WW	APL14	36, 40, 44, 48, 52, 56, 60, 64, 149, 153, 157, 161, 165	38, 46, 54, 62, 151, 159	42, 58, 155	WORLD	1 to 13	1 to 13

Table 49: Country Codes and Regulatory Domains *(Continued)*

Country and Country Code	Model	Radio 1 (5 GHz)				Radio 2 (2.4 GHz)		
		Regulatory Domain (5 GHz)	20 MHz	40 MHz	80 MHz	Regulatory Domain (2.4 GHz)	20 MHz	40 MHz
European Union	SRX-MP-WLAN-WW	ETSI11	36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140, 149, 153, 157, 161, 165	38, 46, 54, 62, 102, 110, 118, 126, 134	42, 58, 106, 122	WORLD	1 to 13	1 to 13

Table 49: Country Codes and Regulatory Domains *(Continued)*

Country and Country Code	Model	Radio 1 (5 GHz)				Radio 2 (2.4 GHz)		
		Regulatory Domain (5 GHz)	20 MHz	40 MHz	80 MHz	Regulatory Domain (2.4 GHz)	20 MHz	40 MHz
India (IN)	SRX-MP-WLAN-WW	APL15	36, 40, 44, 48, 52, 56, 60, 64, 149, 153, 157, 161, 165	38, 46, 54, 62, 151, 159	42, 58, 155	WORLD	1 to 13	1 to 13
Indonesia (ID)	SRX-MP-WLAN-WW	APL2	149, 153, 157, 161, 165	151, 159	155	ETSIC	1 to 13	1 to 13

Table 49: Country Codes and Regulatory Domains *(Continued)*

Country and Country Code	Model	Radio 1 (5 GHz)				Radio 2 (2.4 GHz)		
		Regulatory Domain (5 GHz)	20 MHz	40 MHz	80 MHz	Regulatory Domain (2.4 GHz)	20 MHz	40 MHz
Israel (IL)	SRX-MP-WLAN-IL	ETSI3	36, 40, 44, 48, 52, 56, 60, 64	38, 46, 54, 62	42, 58	WORLD	1 to 13	1 to 13
Japan (JP)	SRX-MP-WLAN-WW	MKK5	36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112 116, 120, 124, 128, 132, 136, 140	38, 46, 54, 62, 102, 110, 118, 126, 134	42, 58, 106, 122	MKKC	1 to 13	1 to 13

Table 49: Country Codes and Regulatory Domains *(Continued)*

Country and Country Code	Model	Radio 1 (5 GHz)				Radio 2 (2.4 GHz)		
		Regulatory Domain (5 GHz)	20 MHz	40 MHz	80 MHz	Regulatory Domain (2.4 GHz)	20 MHz	40 MHz
Malaysia (MY)	SRX-MP-WLAN-WW	FCC11	36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112 116, 120, 124, 128, 149, 153, 157, 161, 165	38, 46, 54, 62, 102, 110, 118, 126, 151, 159	42, 58, 106, 122, 155	WORLD	1 to 13	1 to 13

Table 49: Country Codes and Regulatory Domains *(Continued)*

Country and Country Code	Model	Radio 1 (5 GHz)				Radio 2 (2.4 GHz)		
		Regulatory Domain (5 GHz)	20 MHz	40 MHz	80 MHz	Regulatory Domain (2.4 GHz)	20 MHz	40 MHz
Mexico (MX)	SRX-MP-WLAN-WW	FCC3	36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112 116, 120, 124, 128, 132, 136, 140, 144, 149, 153, 157, 161, 165	38, 46, 54, 62, 102, 110, 118, 126, 134, 142, 151, 159	42, 58, 106, 122, 138, 155	ETSIC	1 to 13	1 to 13

Table 49: Country Codes and Regulatory Domains *(Continued)*

Country and Country Code	Model	Radio 1 (5 GHz)				Radio 2 (2.4 GHz)		
		Regulatory Domain (5 GHz)	20 MHz	40 MHz	80 MHz	Regulatory Domain (2.4 GHz)	20 MHz	40 MHz
New Zealand (NZ)	SRX-MP-WLAN-WW	FCC3	36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112 116, 120, 124, 128, 132, 136, 140, 144, 149, 153, 157, 161, 165	38, 46, 54, 62, 102, 110, 118, 126, 134, 142, 151, 159	42, 58, 106, 122, 138, 155	ETSIC	1 to 13	1 to 13

Table 49: Country Codes and Regulatory Domains *(Continued)*

Country and Country Code	Model	Radio 1 (5 GHz)				Radio 2 (2.4 GHz)		
		Regulatory Domain (5 GHz)	20 MHz	40 MHz	80 MHz	Regulatory Domain (2.4 GHz)	20 MHz	40 MHz
South Korea (KR)	SRX-MP-WLAN-WW	APL9	36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112 116, 120, 124, 128, 132, 136, 140, 149, 153, 157, 161, 165	38, 46, 54, 62, 102, 110, 118, 126, 134, 151, 159	42, 58, 106, 122, 155	WORLD	1 to 13	1 to 13

Table 49: Country Codes and Regulatory Domains *(Continued)*

Country and Country Code	Model	Radio 1 (5 GHz)				Radio 2 (2.4 GHz)		
		Regulatory Domain (5 GHz)	20 MHz	40 MHz	80 MHz	Regulatory Domain (2.4 GHz)	20 MHz	40 MHz
United States (US)	SRX-MP-WLAN-US	FCC8	36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140, 144, 149, 153, 157, 161, 165	38, 46, 54, 62, 102, 110, 118, 126, 134, 142, 151, 159	42, 58, 106, 122, 138, 155	FCCA	1 to 11	1 to 11

Table 49: Country Codes and Regulatory Domains *(Continued)*

Country and Country Code	Model	Radio 1 (5 GHz)				Radio 2 (2.4 GHz)		
		Regulatory Domain (5 GHz)	20 MHz	40 MHz	80 MHz	Regulatory Domain (2.4 GHz)	20 MHz	40 MHz
Vietnam (VN)	SRX-MP-WLAN-WW	FCC3	36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112 116, 120, 124, 128, 132, 136, 140, 144, 149, 153, 157, 161, 165	38, 46, 54, 62, 102, 110, 118, 126, 134, 142, 151, 159	42, 58, 106, 122, 138, 155	WORLD	1 to 13	1 to 13

RF Specifications for the Wi-Fi Mini-PIM

Table 50 on page 102 lists the radio frequency (RF) specifications.

Table 50: RF Specifications for the Wi-Fi Mini-PIM

Operating Mode	Data Rate	Receive Sensitivity (+/-2 dBm) Per Chain	Target Power (+/-2 dBm) Per Chain
802.11ac (VHT20)	MCS0	-88	16.5
	MCS8	-67	11.5
802.11ac (VHT40)	MCS0	-87	16
	MCS9	-64	11
802.11ac (VHT80)	MCS0	-83	15.5
	MCS9	-59	10.5
802.11a	6 Mbps	-88	16.5
	54 Mbps	-72	13
802.11b	1 Mbps	-94	18
	11 Mbps	-85	18
802.11g	6 Mbps	-89	18
	54 Mbps	-71	15
802.11n (HT20) 2G	MCS0	-88	18

Table 50: RF Specifications for the Wi-Fi Mini-PIM *(Continued)*

Operating Mode	Data Rate	Receive Sensitivity (+/-2 dBm) Per Chain	Target Power (+/-2 dBm) Per Chain
	MCS7	-70	15
802.11n (HT20) 5G	MCS0	-88	16.5
	MCS7	-71	13
802.11n (HT40) 2G	MCS0	-86	17
	MCS7	-68	15
802.11n (HT40) 5G	MCS0	-86	16
	MCS7	-69	12

Installing the Wi-Fi Mini-PIM in an SRX Series Services Gateway

You can install the Mini-PIM in any of the Mini-PIM slots on the services gateway.

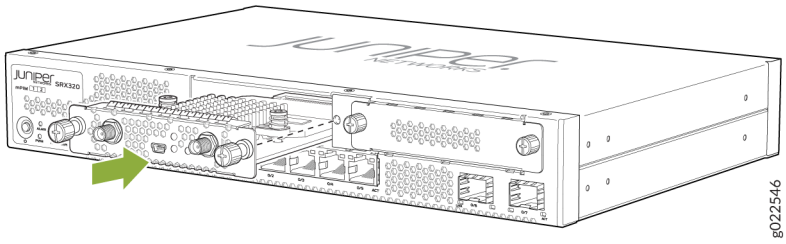
NOTE: You can install only one Wi-Fi Mini-PIM in a services gateway.

To install the Mini-PIM in a services gateway:

1. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to the grounding point on the back of the services gateway.
2. Power off the services gateway by briefly pressing the **Power** button on the front panel. Wait for the **Power** LED to turn off before proceeding. Disconnect the services gateway from the power source.

3. Slide the Mini-PIM in the slot until it lodges firmly in the services gateway. Tighten the screws on each side of the Mini-PIM faceplate. See Figure 17 on page 104.

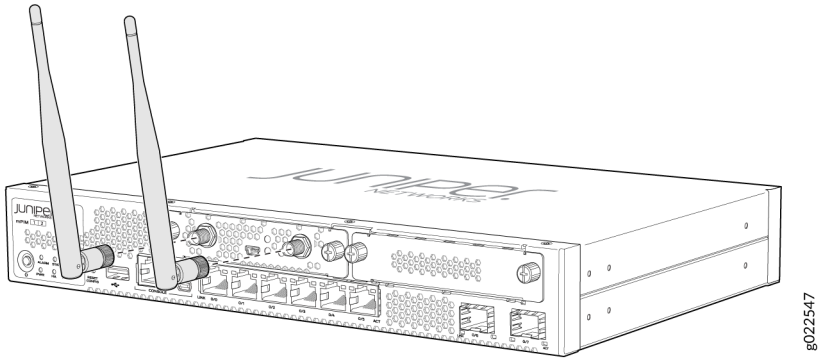
Figure 17: Installing the Wi-Fi Mini-PIM



4. Attach the antennas to the front panel of the Mini-PIM. You can attach the antenna by using one of the following methods:

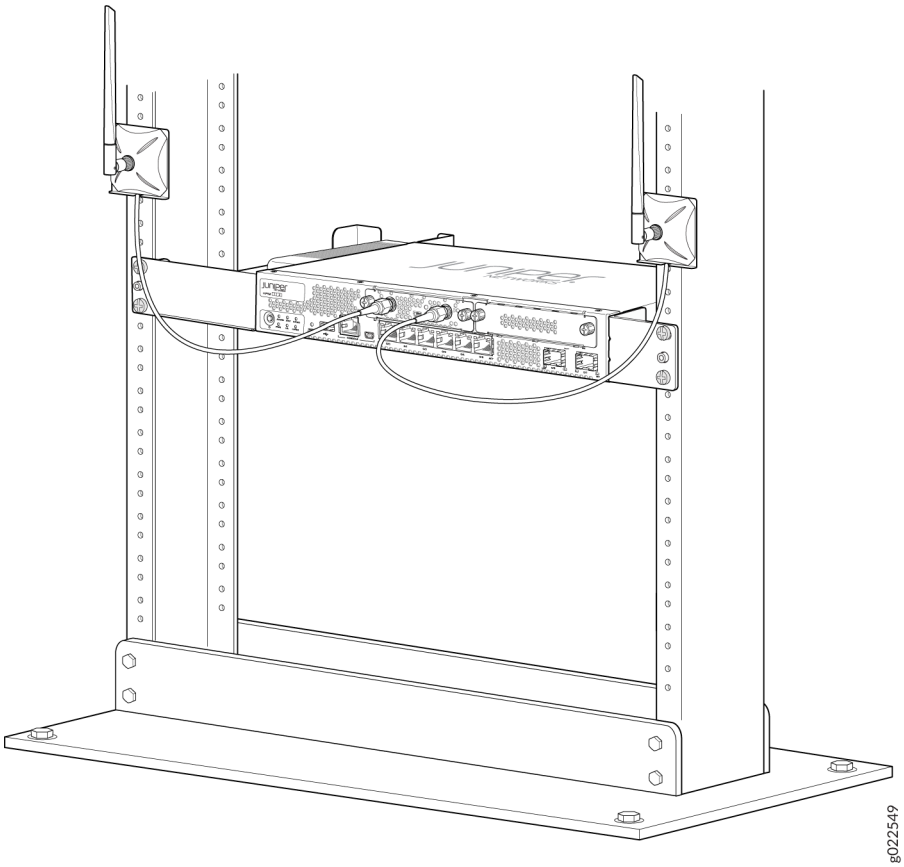
   - Direct mounting—Attach the antennas to the RP-SMA connectors on the front panel (see Figure 18 on page 104).

Figure 18: Attaching the Antennas (Direct Mounting)



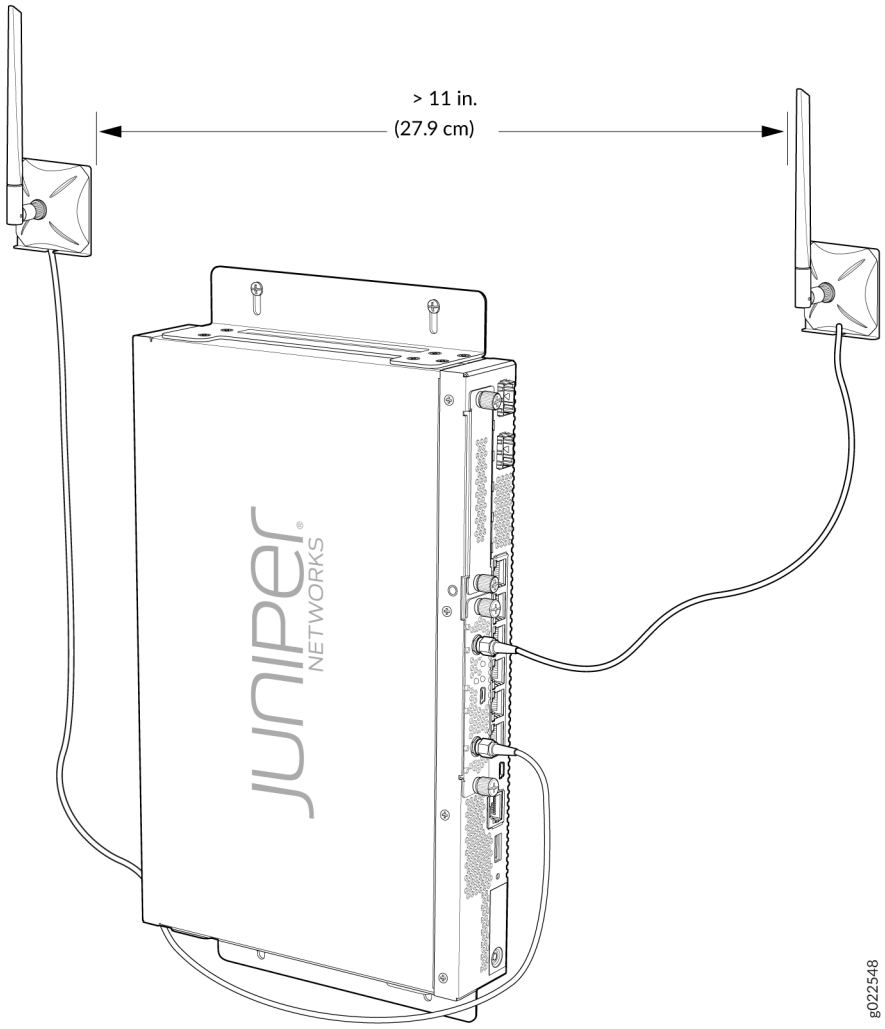
- Using an external antenna base—Attach the antennas to the antenna base. Connect the cables from each antenna base to the RP-SMA connectors on the front panel (see Figure 19 on page 105).

Figure 19: Attaching the Antennas Using an Antenna Base (Rack Mounting)



For SRX320 Services Gateways, which can be mounted on a wall, you can mount the antennas on a wall as shown in Figure 20 on page 106.

Figure 20: Attaching the Antennas Using an Antenna Base (Wall Mounting)



5. Power on the services gateway.

Configuring the Wi-Fi Mini-PIM on an SRX Series Services Gateway

IN THIS SECTION

Wi-Fi Mini-PIM Configuration Overview

Before you configure the Mini-PIM, configure the network settings on the SRX Series device and connect the device to your network. For details, see the Hardware Guide for your SRX Series device.

Configure the following settings for the access point:

- Name for the access point
- Interface—The interface name for the AP is denoted as wl-x/0/0, where **x** is the slot on the services gateway in which the Mini-PIM is installed.
- Country code—The country code setting identifies the regulatory domain in which the access point operates.

  The country code affects the radio modes, list of channels, and radio transmission power that the access point can support. Ensure that you select the correct code for the country in which the access point operates so that the access point complies with the regulations in that country.
- Location

Radio Configuration Overview

Radios on the Wi-Fi Mini-PIM are enabled by default. You can disable a radio. When a radio is disabled, the Mini-PIM does not send messages to the connected wireless clients.

Configure the following options for each radio:

- Channel number—If you select `auto`, then the Mini-PIM chooses the channel automatically.
- Mode—You can configure the radio to support either one type of wireless client or a mixed mode. In mixed mode, different types of clients can connect to the radio. Table 51 on page 108 lists the modes supported on each radio.

Table 51: Supported Modes on the Wi-Fi Mini-PIM radios

Radio	Supported Modes
Radio 1 (5.0 GHz)	• an—802.11a and 802.11n clients operating on 5 GHz frequency can connect to the access point • acn—802.11a, 802.11n and 802.11ac clients operating on 5 GHz frequency can connect to the access point
Radio 2 (2.4 GHz)	• gn—802.11g, and 802.11n clients operating in 2.4 GHz frequency can connect to the access point. This is the default mode for this radio. • g (supported from Junos OS Release 20.4R1)—802.11g clients operating in 2.4 GHz frequency can connect to the access point.

- Bandwidth—Radio 1 supports 20 MHz, 40 MHz, and 80 MHz bandwidths, whereas Radio 2 supports only 20 MHz and 40 MHz bandwidths.
- Transmit power—You can configure transmit power on a per-radio basis. By default, the access point assigns 100 percent power to each radio at startup.

  To increase the network capacity, place access points closer together and reduce the value of the transmit power. This helps reduce overlap and interference among access points. A lower transmit power setting can also keep your network more secure because weaker wireless signals are less likely to propagate outside the physical location of your network.

Virtual Access Point Configuration Overview

Virtual access points (VAPs) allow different security mechanisms for different clients on the same access point. Each VAP is identified by a configured service set identifier (SSID) and a unique basic service set identifier (BSSID). The access point supports multiple VLANs, which can be distributed across VAPs and radios.

You can enable or disable each VAP independently. If you do not configure the VAPs, the radio is turned on if you configured the radio settings. The radio is off if you do not configure the radio settings or if you turned off the radio using the `radio-off` option.

A VAP is configured on a per-radio basis. You can configure up to eight VAPs per radio. You can map up to 16 ESSIDS to individual VLANs.

Configure the following options for each VAP:

- Description (maximum length is 64)
- SSID value for the VAP

  The SSID value can include letters, numerals, and the special characters - . _ @ #. The minimum length is 2 characters and maximum length is 32 characters.
- VLAN ID for the VAP

  The value can be in the range of 1 through 4094.
- The maximum number of clients that can connect to the VAP

  The value can be in the range of 1 through 127.
- Security for the access point

  The access point supports several types of authentication methods that are used by clients to connect to the access point. Each of these methods and their associated parameters are configurable on a per-VAP basis. By default, no security is in place on the access point, and therefore any wireless client can associate with it and access your LAN. You configure secure wireless client access for each VAP.

  - None—The data transferred between clients and the access point is not encrypted. This method allows clients to associate with the access point without any authentication.
  - Wi-Fi Protected Access (WPA) Enterprise—A Wi-Fi Alliance standard that uses RADIUS server authentication with AES-CCMP cipher suite. This mode allows the use of high security encryption along with centrally managed user authentication. Only the WPA2 standard is supported.
  - Wi-Fi Protected Access (WPA) Personal—A Wi-Fi Alliance standard that uses preshared key (PSK) authentication with AES-CCMP cipher suite. Only the WPA2 standard is supported.

Configure the Wi-Fi Mini-PIM

To configure the Wi-Fi Mini-PIM:

1. Configure the Wi-Fi interface:
   a. Configure an IP address for the Wi-Fi interface:

      `user@host#` **set interfaces wl-*x*/0/0 unit 0 family inet address *ip-address***

   b. Configure the address pool. The DHCP address pool and the Wi-Fi interface must be in the same network.

      `user@host#` **set access address-assignment pool *dhcp-pool* family inet network *ip-address***

      `user@host#` **set access address-assignment pool *dhcp-pool* family inet range *range* low *ip-address***

```
user@host# set access address-assignment pool dhcp-pool family inet range range high ip-address
```

```
user@host# set access address-assignment pool dhcp-pool family inet dhcp-attributes router ip-address
```

c. Enable DHCP server on the interface:

```
user@host# set system services dhcp-local-server group group interface wl-x/0/0.0
```

The eth0 interface on the Mini-PIM enables the DHCP client. If the DHCP server is enabled on the wl interface, the server assigns an IP address to the eth0 interface. You can view the binding information by issuing the `show dhcp server binding` command.

d. Assign the interface to a security zone:

```
user@host# set security zones security-zone zone interfaces wl-x/0/0.0
```

2. Configure the access point settings:

a. Configure the interface:

```
user@host# set wlan access-point name interface wl-x/0/0
```

b. Set the country code (applicable only for SRX-MP-WLAN-WW models):

```
user@host# set wlan access-point name access-point-options country country-code
```

> **NOTE**: If you do not set the country code for the SRX-MP-WLAN-WW models, the Mini-PIM considers the country code as US. You cannot set the country code for the SRX-MP-WLAN-US and SRX-MP-WLAN-IL models.

c. Set the location:

```
user@host# set wlan access-point name location location
```

d. Commit the configuration:

```
user@host# commit
```

3. Configure the radio settings.

Note that radio 1 operates at 5 GHz and radio 2 operates at 2.4 GHz.

> **NOTE**: Changing the radio settings can cause the access point to stop and restart system processes. If this occurs, wireless clients that are connected to the access point will

temporarily lose connectivity. We recommend that you change radio settings when WLAN traffic is low.

a. Configure the radio mode. Radio 1 supports acn and an modes. Radio 2 supports only gn.

   For radio 1:

   `user@host#` **set wlan access-point *name* radio 1 radio-options mode [acn|an]**

   For radio 2:

   `user@host#` **set wlan access-point *name* radio 2 radio-options mode gn**

   Starting from Junos OS Release 20.4R1, radio 2 supports two modes, g and gn.

b. Configure the channel number.

   `user@host#` **set wlan access-point *name* radio [1|2] radio-options channel number *number***

c. Configure the channel bandwidth. The default channel bandwidth is 20 MHz for the 2.4 GHz radio and 40 MHz for the 5 GHz radio.

   `user@host#` **set wlan access-point *name* radio [1|2] radio-options channel bandwidth [20|40|80]**

d. Configure the transmit power:

   `user@host#` **set wlan access-point *name* radio [1|2] radio-options transmit-power *percent***

e. Commit the configuration:

   `user@host#` **commit**

4. Configure the virtual access point (VAP) settings.

   a. Enter an ID and description for the VAP:

      `user@host#` **set wlan access-point *name* radio [1|2] virtual-access-point *id* description *description***

   b. Enter the SSID value:

      `user@host#` **set wlan access-point *name* radio [1|2] virtual-access-point *id* ssid *ssid***

   c. Configure one of the following security authentication methods for the VAP:

      - `none`—The data transferred between clients and the access point is not encrypted. Clients can associate with the access point without any authentication.

        `user@host#` **set wlan access-point *name* radio [1|2] virtual-access-point *id* security none**

      - `wpa-enterprise`—The device authenticates through an 802.1X-compliant RADIUS server.

```
user@host# set wlan access-point name radio [1|2] virtual-access-point id security wpa-enterprise cipher-suites ccmp

user@host# set wlan access-point name radio [1|2] virtual-access-point id security wpa-enterprise radius-server ip-address

user@host# set wlan access-point name radio [1|2] virtual-access-point id security wpa-enterprise radius-port port

user@host# set wlan access-point name radio [1|2] virtual-access-point id security wpa-enterprise radius-key secret-key

user@host# set wlan access-point name radio [1|2] virtual-access-point id security wpa-enterprise wpa-version v2
```

- `wpa-personal`—The device uses preshared keys (PSKs) or a passphrase for authentication and encryption. Keys are stored on the device and on all wireless clients. You do not need to configure a separate authentication server.

  ```
  user@host# set wlan access-point name radio [1|2] virtual-access-point id security wpa-personal cipher-suites ccmp

  user@host# set wlan access-point name radio [1|2] virtual-access-point id security wpa-personal key-type [ascii|hex]

  user@host# set wlan access-point name radio [1|2] virtual-access-point id security wpa-personal key key

  user@host# set wlan access-point name radio [1|2] virtual-access-point id security wpa-personal wpa-version v2
  ```

d. Specify the upload and download rate limits:

```
user@host# set wlan access-point name radio [1|2] virtual-access-point id upload-limit upload-limit-rate

user@host# set wlan access-point name radio [1|2] virtual-access-point id download-limit download-limit-rate
```

e. Specify the maximum number of clients that can be connected to the VAP:

```
user@host# set wlan access-point name radio [1|2] virtual-access-point id maximum-stations number
```

f. Commit the configuration:

```
user@host# commit
```

Verify the Status of the Wi-Fi Mini-PIM

Table 52 on page 114 lists the commands that you can use to verify and monitor the status of the Wi-Fi Mini-PIM:

Table 52: Commands to Verify and Monitor the Status of the Wi-Fi Mini-PIM

Command	Purpose

`show wlan access-points` *`ap-name`* `detail`	Displays the status of the specific access point.
	
	Sample output:
	
	`Active access point detail information`
	
	`Access Point : wap3`
	`Type : Internal`
	`Location : Default Location`
	`Serial Number : EV1119AF0030`
	`Firmware Version : v1.2.7`
	`Alternate Version : v1.1.0`
	`Country : US`
	`Access Interface : wl-2/0/0`
	`System Time : Mon Dec 23 06:50:50 UTC 2019`
	`Packet Capture : Off`
	`Ethernet Port:`
	`MAC Address : 00:00:5e:00:53:c0`
	`Radio1:`
	`Status : On`
	`MAC Address : 00:00:5e:00:53:12`
	`Temperature : 44`
	`Mode : IEEE 802.11a/n/ac`
	`Channel : 120`
	`Bandwidth : 40`
	`Transmit Power : 100`
	`Radio2:`
	`Status : On`
	`MAC Address : 00:00:5e:00:53:56`
	`Temperature : 45`
	`Mode : IEEE 802.11g/n`
	`Channel : 11`
	`Bandwidth : 20`
	`Transmit Power : 100`

Table 52: Commands to Verify and Monitor the Status of the Wi-Fi Mini-PIM *(Continued)*

Command	Purpose

`show wlan access-points`	Displays the details of all the access points configured on the Mini-PIM.
	Sample:
	`Active access points information`
	
	`Access-Point Type Interface Radio-mode/Channel/Bandwidth`
	`wap3 Int wl-2/0/0 acn/120/40, gn/11/20`

`show wlan access-points` *`ap-name`* `client-associations`	Displays the details about the clients connected to the access point.
	
	`Access point client associations information`
	
	`Access point: wap3`
	`VAP Client MAC Address Auth Packets Rx/Tx Bytes Rx/Tx`
	`Radio1:5g_vap1 00:00:5e:00:53:a3 NO 3/0 510/0`

Table 52: Commands to Verify and Monitor the Status of the Wi-Fi Mini-PIM *(Continued)*

Command	Purpose

`show wlan access-points` *`ap-name`* `virtual-access-points all`	Displays details about the virtual access points.
	
	`Virtual access points information`
	
	`Access point name: wap3`
	`Radio1:`
	`  VAP1:`
	`    SSID : 5g_vap1`
	`    MAC Address : 00:00:5e:00:53:12`
	`    Maximum Station : 127`
	`    Broadcast SSID : Enable`
	`    Station Isolation : Disable`
	`    Upload Limit : Disable`
	`    Download Limit : Disable`
	`    VLAN ID : 0`
	`    Station MAC Filter : Disable`
	`    Traffic Statistics:`
	`      Input Bytes : 0`
	`      Output Bytes : 0`
	`      Input Packets : 0`
	`      Output Packets : 0`
	`  VAP2:`
	`    SSID : 5g_vap2`
	`    MAC Address : 00:00:5e:00:53:12`
	`    Maximum Station : 100`
	`    Broadcast SSID : Enable`
	`    Station Isolation : Disable`
	`    Upload Limit : Disable`
	`    Download Limit : Disable`
	`    VLAN ID : 0`
	`    Station MAC Filter : Disable`
	`    Traffic Statistics:`
	`      Input Bytes : 0`
	`      Output Bytes : 0`
	`      Input Packets : 0`
	`      Output Packets : 0`
	`Radio2:`

Table 52: Commands to Verify and Monitor the Status of the Wi-Fi Mini-PIM *(Continued)*

Command	Purpose
	VAP0: SSID : 2.4g MAC Address : 00:00:5e:00:53:56 Maximum Station : 127 Broadcast SSID : Enable Station Isolation : Disable Upload Limit : Disable Download Limit : Disable VLAN ID : 0 Station MAC Filter : Disable Traffic Statistics: Input Bytes : 10802142 Output Bytes : 6228524 Input Packets : 100266 Output Packets : 36413

Upgrading the Firmware on the Wi-Fi Mini-PIM

To upgrade the firmware on the Mini-PIM using the CLI:

1. Identify the currently installed firmware (jfirmware) version:

   ```
   user@host > show system firmware
   ```

   NOTE: Ensure that you upgrade the firmware on the Mini-PIM to the latest version.

   The `Current version` field in the output displays the firmware version that is currently installed on the Mini-PIM. If there is a newer version of the firmware at https://www.juniper.net/support/downloads/?p=junos-srx#sw, then proceed to the next step to download the latest firmware.

   ```
   Part              Type          Tag Current     Available     Status
                                       version      version
   FPC 2
   PIC 0           MWAP_FW          1   1.1.2         0             OK
   ```

```
Routing Engine 0 RE BIOS           0   3.0         3.6              OK
Routing Engine 0 RE BIOS Backup    1   3.0         3.6              OK
```

2. Download the appropriate firmware version from https://www.juniper.net/support/downloads/?p=junos-srx#sw:

   ```
   user@host > request system software add /var/tmp/jfirmware-<version>-signed.tgz
   ```

   NOTE: Ensure that the Junos OS version installed on the device is the same as the firmware version or later. To know the Junos OS version, issue the `show version` command.

3. Ensure that the latest firmware version is downloaded to the Mini-PIM by verifying the `Available version` field. The `Available version` field should list the latest firmware version that was downloaded in Step 2.

   ```
   user@host > show system firmware
   ```

   ```
   Part               Type           Tag Current     Available     Status
                                          version      version
   FPC 2
   PIC 0            MWAP_FW           1   1.1.8       1.2.1            OK
   Routing Engine 0 RE BIOS           0   3.0         3.6              OK
   Routing Engine 0 RE BIOS Backup    1   3.0         3.6              OK
   ```

4. Upgrade the firmware on the device:

   ```
   user@host > request system firmware upgrade pic fpc-slot <fpc-slot-number>
   ```

   ```
   Part          Type           Tag Current          Available         Status
                                      version           version
   FPC 2
   PIC 0         MWAP_FW        1   1.1.8            1.2.1             OK
   Perform indicated firmware upgrade ? [yes,no] (no) yes

   Firmware upgrade initiated, use "show system firmware" to monitor status.
   ```

5. Verify that the firmware is upgraded successfully. The status should show `OK`.

   ```
   user@host > show system firmware
   Part               Type           Tag Current     Available     Status
                                          version      version
   FPC 2
   ```

```
PIC 0            MWAP_FW           1   1.1.8       1.2.1     PROGRAMMING (0%)
Routing Engine 0 RE BIOS           0   3.0         3.6               OK
Routing Engine 0 RE BIOS Backup    1   3.0         3.6               OK
```

```
user@host > show system firmware
Part               Type           Tag Current     Available     Status
                                       version     version
FPC 2
PIC 0            MWAP_FW           1   1.1.8       1.2.1     PROGRAMMING (25%)
Routing Engine 0 RE BIOS           0   3.0         3.6               OK
Routing Engine 0 RE BIOS Backup    1   3.0         3.6               OK
```

```
user@host > show system firmware
Part               Type           Tag Current     Available     Status
                                       version     version
FPC 2
PIC 0            MWAP_FW           1   1.1.8       1.2.1     PROGRAMMING (100%)
Routing Engine 0 RE BIOS           0   3.0         3.6               OK
Routing Engine 0 RE BIOS Backup    1   3.0         3.6               OK
```

```
user@host > show system firmware
Part               Type           Tag Current     Available     Status
                                       version     version
FPC 2
PIC 0            MWAP_FW           1   1.1.8       1.2.1     UPGRADED
                                                               SUCCESSFULLY
Routing Engine 0 RE BIOS           0   3.0         3.6               OK
Routing Engine 0 RE BIOS Backup    1   3.0         3.6               OK
```

```
user@host > show system firmware
Part               Type           Tag Current     Available     Status
                                       version     version
FPC 2
PIC 0            MWAP_FW           1   1.2.1       1.2.1             OK
```

```
Routing Engine 0 RE BIOS          0   3.0         3.6              OK
Routing Engine 0 RE BIOS Backup   1   3.0         3.6              OK
```

The device reboots after the firmware is upgraded. Note that if you issue the `show system firmware` command after the reboot, the `Current Version` field shows the latest firmware version and the `Available Version` field shows zero(0).

8-Port Gigabit Ethernet SFP XPIM

IN THIS SECTION

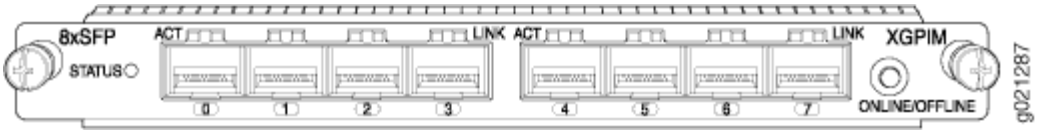
8-Port Gigabit Ethernet SFP XPIM Overview

The ports of the 8-Port Gigabit Ethernet small form-factor pluggable Gigabit-Backplane *Physical Interface Module* (SFP XPIM) can be used for connecting to Ethernet WAN service as well as for local server connectivity at Gigabit Ethernet speeds. The XPIM enables Layer 2 line-rate Gigabit switching and system-processor dependent Layer 3 service with connection of up to eight SFP Gigabit Ethernet ports. The 8-Port Gigabit Ethernet SFP XPIM complements the on-board 10/100/1000 Mbps Ethernet interfaces with extended WAN connectivity. It supports a variety of transceivers. This XPIM can be used in copper and optical environments to provide maximum flexibility when upgrading from an existing infrastructure to Metro Ethernet.

The 8-Port Gigabit Ethernet XPIM can be installed only in XPIM slots 3 and 6 on the SRX550 High Memory Services Gateways.

Figure 21 on page 121 shows the front panel of the 8-Port Gigabit Ethernet SFP XPIM.

Figure 21: 8-Port Gigabit Ethernet SFP XPIM Front Panel



The 8-Port Gigabit Ethernet small form-factor pluggable XPIM (SFP XPIM) has the following key features:

- 8 triple-speed (10/100/1000 Mbps) Ethernet ports, single-high card
- PoE not supported
- PCI-Express interface for control and management
- I2C interface for module monitor and identification
- Maximum module power of 40 W without PoE
- JTAG support for boundary scan test

CAUTION: If you face a problem running a Juniper Networks device that uses a third-party optic or cable, the Juniper Networks Technical Assistance Center (JTAC) can help you diagnose the source of the problem. Your JTAC engineer might recommend that you check the third-party optic or cable and potentially replace it with an equivalent Juniper Networks optic or cable that is qualified for the device.

8-Port Gigabit Ethernet SFP XPIM Components

The 8-Port Gigabit Ethernet small form-factor pluggable Gigabit-Backplane Physical Interface Module (SFP XPIM) contains the components listed in Table 53 on page 122.

Table 53: 8-Port Gigabit Ethernet SFP XPIM Components

Component	Location	Description
ONLINE/OFFLINE button	Right side of the XPIM	Use the ONLINE/OFFLINE button to gracefully shut down the XPIM. Press and hold the button for 4 to 5 seconds, and then release. The XPIM gracefully shuts down and turns off the power supply units (PSUs). To power up the XPIM (if the Services and Routing Engine [SRE] is off), press and hold the ONLINE/OFFLINE button for 4 to 5 seconds.
Two captive screws	One on each side of the XPIM	Use the captive screws to hold the XPIM in place.

8-Port Gigabit Ethernet SFP XPIM Hardware Specifications

Table 54 on page 122 provides the physical specifications of the 8-Port Gigabit Ethernet small form-factor pluggable XPIM (SFP XPIM).

Table 54: 8-Port Gigabit Ethernet SFP XPIM Physical Specifications

Description	Value
Dimensions (H x W x L)	0.78 in. x 6.72 in. x 8.1 in. (1.98 cm x 17.1 cm x 20.57 cm)
Weight	17.6 oz (0.499 kg)
Connector type	SFP
Form factor	XPIM

Table 54: 8-Port Gigabit Ethernet SFP XPIM Physical Specifications *(Continued)*

Description	Value
Environmental operating temperature	32° F through 104° F (0° C through 40° C)
Relative humidity	5% to 90% noncondensing
Altitude	Up to 10,000 ft (3000 m)

8-Port Gigabit Ethernet SFP XPIM LEDs

The 8-Port Gigabit Ethernet small form-factor pluggable XPIM (SFP XPIM) has two LEDs for each port — LINK and ACT. Each XPIM has a STATUS LED, which indicates the status of the XPIM. The LEDs are listed in Table 55 on page 123. See "8-Port Gigabit Ethernet SFP XPIM Overview" on page 120 for more information.

Table 55: 8-Port Gigabit Ethernet SFP XPIM LED States

LED	Color	State	Description
LINK	Green	On	Port is online.
		Off	Port is offline.
ACT	Green	Blinking	Port is receiving or sending data.
		Off	Port might be online, but is not receiving or sending data.
STATUS	Green	On	The GPIM is functioning normally.

Table 55: 8-Port Gigabit Ethernet SFP XPIM LED States *(Continued)*

LED	Color	State	Description
	Yellow		The GPIM is starting up, running diagnostics, or going offline.
	Red		The GPIM has failed.
		Off	The GPIM is not powered on, is offline, or is not configured.

8-Port Gigabit Ethernet SFP XPIM Supported Transceivers

You can customize the Ethernet interface type by using different 1-port small form-factor pluggable (SFP) transceivers. Table 56 on page 124 lists the SFP transceivers and cables supported on the 8-port Gigabit Ethernet SFP modules for XPIMs.

Table 56: 8-Port Gigabit Ethernet SFP XPIM Supported Modules

Juniper Product Number	Connector Type (SFP Transceiver)	Cable
SRX-SFP-FE-FX EX-SFP-1FE-FX	100BASE-FX	LC
SRX-SFP-1GE-LH EX-SFP-1GE-LH	1000BASE-LH	LC
SRX-SFP-1GE-LX EX-SFP-1GE-LX	1000BASE-LX	LC
SRX-SFP-1GE-SX EX-SFP-1GE-SX	1000BASE-SX	LC

Table 56: 8-Port Gigabit Ethernet SFP XPIM Supported Modules *(Continued)*

Juniper Product Number	Connector Type (SFP Transceiver)	Cable
SRX-SFP-1GE-T EX-SFP-1GE-T	1000BASE-T, Copper Transceiver	CAT-5e
EX-SFP-GE10KT13R14	1000BASE-BX10, at 10 km (TX 1310 nm / RX 1490 nm)	LC
EX-SFP-GE10KT13R15	1000BASE-BX10, at 10 km (TX 1310 nm / RX 1550 nm)	LC
EX-SFP-GE10KT14R13	1000BASE-BX10, at 10 km (TX 1490 nm / RX 1310 nm)	LC
EX-SFP-GE10KT15R13	1000BASE-BX10, at 10 km (TX 1550 nm / RX 1310 nm)	LC
EX-SFP-FE20KT13R15	100Base-BX Fast Ethernet Optics, at 20 km (TX 1310 nm / RX 1550 nm)	LC
EX-SFP-FE20KT15R13	100Base-BX Fast Ethernet Optics, at 20 km (TX 1550 nm / RX 1310 nm)	LC
EX-SFP-GE40KT13R15	1000BASE-BX, at 40 km (TX 1310 nm / 1550 nm)	LC
EX-SFP-GE40KT15R13	1000BASE-BX, at 40 km (TX1550 nm / RX1310 nm)	LC

CAUTION: If you face a problem running a Juniper Networks device that uses a third-party optic or cable, the Juniper Networks Technical Assistance Center (JTAC) can help you diagnose the source of the problem. Your JTAC engineer might recommend that

you check the third-party optic or cable and potentially replace it with an equivalent Juniper Networks optic or cable that is qualified for the device.

8-Port Gigabit Ethernet SFP XPIM Network Interface Specifications

Table 57 on page 126 provides the network interface specifications of the 8-Port Gigabit Ethernet small form-factor pluggable XPIM (SFP XPIM).

Table 57: 8-Port Gigabit Ethernet SFP XPIM Network Interface Specifications

Network Interface Specification	Value
Operating modes	Full-duplex and half-duplex
Operating speed	10/100/1000 Mbps
VLAN support	802.1Q virtual LANs
Class-of-service support	Supported
Encapsulations	DIX, LLC/SNAP, CCC, TCC, and VLAN-CCC
Loopback diagnostic feature	Supported
Autonegotiation	Supported

8-Port Gigabit Ethernet SFP XPIM Basic Configuration

The 8-Port Gigabit Ethernet small form-factor pluggable Gigabit-Backplane Physical Interface Module (SFP XPIM) provides connectivity to a single Gigabit Ethernet device or to a network. After you install the XPIM in the services gateway, you configure a network interface on the XPIM.

NOTE: The SRX550 High Memory Services Gateway does not support hot-swappable functionality for GPIMs.

To configure a network interface on the 8-Port Gigabit Ethernet SFP XPIM :

1. Verify that the 8-Port Gigabit Ethernet SFP XPIM is installed in the services gateway:

   ```
   user@host >show chassis hardware
   ```

   ```
   Hardware inventory:
   Item             Version  Part number  Serial number     Description
   Chassis                                DA3515AK0016      SRX550M
   Midplane         REV 03   750-063950   ACMW7426
   Routing Engine   REV 03   711-062269   ACMT8374          RE-SRX550M
   FPC 0                                                   FPC
     PIC 0                                                 6x GE, 4x GE SFP Base PIC
       Xcvr 6       REV 02   740-011613   PLN4Q4R           SFP-SX
       Xcvr 7       REV 02   740-011613   PLH5R83           SFP-SX
       Xcvr 8       REV 02   740-011613   PPF68ZA           SFP-SX
       Xcvr 9       REV 02   740-011613   AM1301SZEZL       SFP-SX
   FPC 1            REV 00   750-064611   ACMX2090          FPC
     PIC 0                                                 1x T1E1 mPIM (RoHS)
   FPC 2            REV 00   750-064613   ACMW2386          FPC
     PIC 0                                                 1x Serial mPIM (RoHS)
   FPC 3            REV 00   750-064614   ACMZ1330          FPC
     PIC 0                                                 16x GE POE gPIM (RoHS)
   FPC 6            REV 02   750-064615   ACMS8119          FPC
     PIC 0                                                 8x SFP gPIM (RoHS)
       Xcvr 0       REV 01   740-013111   92244027          SFP-T
       Xcvr 1       REV 02   740-011613   PLH5KLM           SFP-SX
       Xcvr 2       REV 02   740-011613   PPF68YU           SFP-SX
       Xcvr 3       REV 02   740-011613   PN356ST           SFP-SX
       Xcvr 4       REV 02   740-011613   PLN54T1           SFP-SX
       Xcvr 5       REV 01   740-020465   DDK2008229        SFP-1000BASE-BX10-D
       Xcvr 6       REV 02   740-011613   PPF68YV           SFP-SX
       Xcvr 7       REV 02   740-011613   PPF68YW           SFP-SX
   Power Supply 0   Rev 04   740-028131   WG02251           PS 645W DC
   Power Supply 1   Rev 04   740-028131   WH02925           PS 645W DC
   ```

2. Verify that the PIC on the XPIM is online:

```
user@host> show chassis fpc pic-status
```

3. Verify that the network interface that you want to configure on the XPIM is up:

```
user@host> show interfaces terse
```

4. Assign the interface an IP address:

```
[edit]
user@host# set interfaces interface-name unit 0 family inet address interface address/destination
prefix
```

5. Add or select a security zone; for example, Trust:

```
[edit]
user@host# set security zones security-zone trust interfaces ge-0/0/x.0 host-inbound-traffic
system-services all
```

   where x is less than or equal to 16

6. Add or select security zones for host inbound traffic protocol options:

```
[edit]
user@host# set security zones security-zone trust interfaces ge-0/0/x.0 host-inbound-traffic
protocols all
```

   where x is less than or equal to 8

7. Set security policies:

```
[edit]
user@host# set security policies default-policy permit-all
```

RELATED DOCUMENTATION

Maintaining the SRX Series Interface Modules | 163

16-Port Gigabit Ethernet XPIM (PoE)

IN THIS SECTION

16-Port Gigabit Ethernet XPIM (PoE) Overview

The 16-Port Gigabit Ethernet XPIM is a double-high, single-wide LAN switch Gigabit-Backplane *Physical Interface Module* (GPIM) that uses two standard slots vertically. It is available with or without Power over Ethernet (PoE) support. The SRX550 High Memory Services Gateway supports the PoE model. The PoE GPIMs provide ports that supply electric power over the same ports that are used to connect network devices. For more information about PoE, see "Power over Ethernet Support on SRX550 High Memory Services Gateway Interfaces" on page 12.

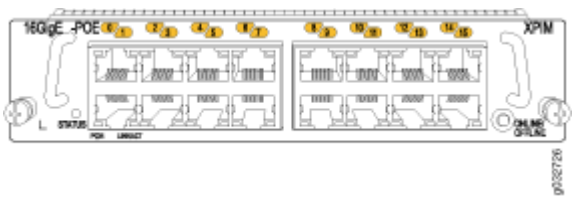
The 16-Port Gigabit Ethernet XPIM must be installed in one of the following 20-Gigabit slots on the SRX550 High Memory Services Gateway:

- Slot 3
- Slot 6

NOTE: The 16-Port Gigabit Ethernet XPIM is supported on both slot 3 and slot 6 of the SRX550 High Memory Services Gateway. However, the performance (bandwidth) in slot 3 will be limited as it has a 10G back link.

NOTE: The SRX550 High Memory Services Gateway does not support hot-swappable functionality for GPIMs.

Figure 22: 16-Port Gigabit Ethernet with PoE XPIM



The 16-Port Gigabit Ethernet XPIM has the following key features:

- 16 triple-speed (10/100/1000 Mbps) Ethernet ports, double-high card
- PoE support for all ports
- PCI-Express interface for control and management
- I2C interface for module monitor and identification
- Maximum module power of 40 W without PoE
- JTAG support for boundary scan test

16-Port Gigabit Ethernet XPIM (PoE) Components

The 16-Port Gigabit Ethernet XPIM contains the components listed in Table 58 on page 130.

Table 58: 16-Port Gigabit Ethernet XPIM Components

Component	Location	Description
XPIM ONLINE/OFFLINE button The SRX550 High Memory Services Gateway does not support hot-swappable functionality for GPIMs.	Right side of the XPIM	Use the XPIM ONLINE/OFFLINE button to gracefully shut down the XPIM.
16 PoE ports labeled 0 to 15	Middle of the XPIM	Each port on the 16-Port Gigabit Ethernet with PoE XPIM supports Power over Ethernet (PoE).
Captive screws	One on each side of the XPIM	Use the captive screws to hold the XPIM in place in the services gateway.
Handles	One on each side of the XPIM	Use the handles to grasp the XPIM for installation or removal.

16-Port Gigabit Ethernet XPIM (PoE) Hardware Specifications

Table 59 on page 131 provides the specifications for the 16-Port Gigabit Ethernet XPIM.

Table 59: 16-Port Gigabit Ethernet XPIM Hardware Specifications

Description	Value
Dimensions (H x W x L)	1.58 in. x 6.72 in. x 8.5 in. (4.0 cm x 17.1 cm x 21.6 cm)
Weight	16.5 oz (0.68 kg)
Connector type	16 RJ-45
Form factor	Double-high, single-wide XPIM
Environmental operating temperature	32° F through 104° F (0° C through 40° C)
Storage temperature	-40° F through 158° F (-40° C through 70° C)
Relative humidity	5% to 90% noncondensing

16-Port Gigabit Ethernet XPIM (PoE) LEDs

Table 60 on page 131 lists the LEDs on the 16-Port Gigabit Ethernet XPIM.

Table 60: 16-Port Gigabit Ethernet XPIM LED States

LED	Color	State	Description
STATUS	Green	On	XPIM is online and functioning normally.

Table 60: 16-Port Gigabit Ethernet XPIM LED States *(Continued)*

LED	Color	State	Description
	Yellow	On	XPIM is starting up, running diagnostics, or shutting down.
	Red	On	XPIM has failed.
LINK/ACT	Green	On	Port is online.
		Off	Port is offline.
		Blinking	Port is receiving or sending data.
N/A	N/A	N/A	Not used on the non-PoE XPIM.
PoE	Green	On	Port is PoE enabled and online.
		Off	Port is offline.
		Blinking	Port is PoE enabled and receiving or sending data.

16-Port Gigabit Ethernet XPIM Basic Configuration

To enable the 16-Port Gigabit Ethernet XPIM installed on your services gateway, you must configure its properties. You can perform the same configuration tasks provided in "8-Port Gigabit Ethernet SFP XPIM Basic Configuration" on page 126 using the J-Web interface or the CLI configuration editor. In addition, you can configure a wider variety of options that are encountered less frequently.

RELATED DOCUMENTATION

Maintaining the SRX Series Interface Modules | 163

Dual CT1/E1 GPIM (SRX-GP-DUAL-T1-E1)

IN THIS SECTION

Dual CT1/E1 GPIM Overview

A Gigabit-Backplane *Physical Interface Module* (GPIM) is a network interface card (NIC) that installs in the front slots of the SRX550 or SRX650 Services Gateway to provide physical connections to a LAN or a WAN. The GPIM receives incoming packets from a network and transmits outgoing packets to a network.

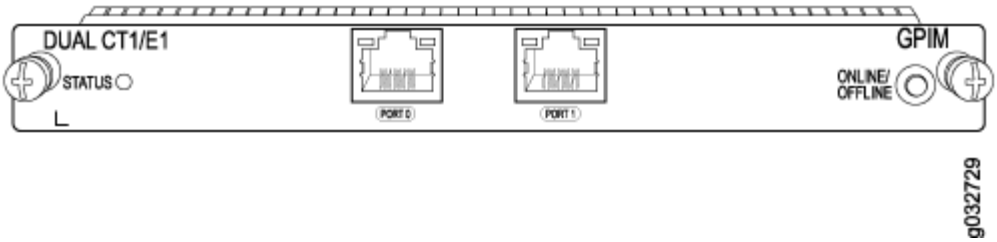
NOTE: The Dual CT1/E1 GPIM does not yet support channelization.

The Dual CT1/E1 GPIM provides the physical connection to T1 or E1 network media types and performs T1 or E1 framing and line-speed signaling.

NOTE: Only the SRX650 Services Gateway supports hot-swappable functionality for GPIMs. The SRX550 Services Gateway does not support hot-swappable functionality for GPIMs.

The Dual CT1/E1 GPIM can be plugged into any GPIM slot on the services gateway. Figure 23 on page 134 shows the Dual CT1/E1 GPIM.

Figure 23: Dual CT1/E1 GPIM



Dual CT1/E1 GPIM Components

The Dual CT1/E1 Gigabit-Backplane Physical Interface Module (GPIM) contains the components listed in Table 61 on page 134.

Table 61: Dual CT1/E1 GPIM Components

Component	Location	Description
GPIM ONLINE/ OFFLINE button Only the SRX650 Services Gateway supports hot-swappable functionality for GPIMs. The SRX550 Services Gateway does not support hot-swappable functionality for GPIMs.	Right side of the GPIM	Use the GPIM ONLINE/OFFLINE button to gracefully shut down the GPIM.

Table 61: Dual CT1/E1 GPIM Components *(Continued)*

Component	Location	Description	
Two fixed T1/E1 ports labeled 0 and 1 Each port can be configured using the CLI in T1 or E1 mode.	Middle of the GPIM	T1 Mode: • Transmit bit rate: 1.544 Mbps • Receive bit rate: 1.544 Mbps	E1 Mode: • Transmit bit rate: 2.048 Mbps • Receive bit rate: 2.048 Mbps
Captive screws	One on each side of the GPIM	Use the captive screws to hold the GPIM in place in the services gateway.	

Dual CT1/E1 GPIM Key Features

The Dual CT1/E1 Gigabit-Backplane *Physical Interface Module* (GPIM) provides the following common key features for both T1 and E1 modes:

- Channel service unit/data service unit (CSU/DSU) to eliminate the need for a separate external device
- 56-Kbps and 64-Kbps operating modes
- Independent internal and external clocking option
- Alarm reporting with a 24-hour history maintained
- Loopback (local and remote) and BERT/PRBS diagnostics
- Multilink Frame Relay and Multilink PPP support
- MTU size of 9000 bytes (maximum)

Dual CT1/E1 GPIM Hardware Specifications

The Dual CT1/E1 Gigabit-Backplane Physical Interface Module (GPIM) has the hardware specifications listed in Table 62 on page 136.

Table 62: Dual CT1/E1 GPIM Hardware Specifications

Description	Value
Dimensions (H x W x L)	0.78 in. H x 6.72 in. W x 8.1 in. L (19.8 mm x 170.8 mm x 205.7 mm)
Weight	15.4 oz (0.44 kg)
Connector type	RJ-45
Form factor	Single-high, single-wide GPIM
Environmental operating temperature	32°F through 104°F (0°C through 40°C)
Storage temperature	-40°F through 158°F (-40°C through 70°C)
Relative humidity	5% to 90% noncondensing

Dual CT1/E1 GPIM Network Interface Specifications

The Dual CT1/E1 Gigabit-Backplane Physical Interface Module (GPIM) provides the network interface specifications specific to T1 or E1 modes, listed in Table 63 on page 136.

Table 63: Dual CT1/E1 GPIM Network Interface Specifications

Description	T1 Mode	E1 Mode
Network Interface Specifications		
Line encoding	AMI/B8ZS	HDB3

Table 63: Dual CT1/E1 GPIM Network Interface Specifications *(Continued)*

Description	T1 Mode	E1 Mode
Mode	Framed clear channel	• Framed clear channel (64 Kbps) • Unframed clear channel
Fractional framing	• Superframe (D4/SF) • Extended Superframe (ESF)	• G704 • G704 with no CRC4 • G703 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	16/32
Shared flag	Supported	Supported
Idle flag/fill	Supported	Supported
Counters:	Runts, Giants, FCS, Error, Abort Error, Align Error	Runts, Giants, FCS, Error, Abort Error, Align Error

Dual CT1/E1 GPIM LEDs

The Dual CT1/E1 Gigabit-Backplane Physical Interface Module (GPIM) has the LED listed in Table 64 on page 138.

Table 64: Dual CT1/E1 GPIM LED States

LED	Color	State	Description
STATUS	Green	On	GPIM is online and functioning normally.
	Amber	On	GPIM is starting up, running diagnostics, or shutting down.
	Red	On	GPIM has failed.

Dual CT1/E1 GPIM Basic Configuration

IN THIS SECTION

To enable the Dual CT1/E1 Gigabit-Backplane Physical Interface Module (GPIM) installed on your SRX Series Services Gateway, you must configure the basic settings for the PIM. You can perform the configuration tasks for this using either the J-Web interface or the CLI.

Using the J-Web Interface

To perform basic configuration for the Dual CT1/E1 GPIM and to configure network interfaces for the services gateway using the J-Web interface:

1. In the J-Web interface, select **Configure>Interfaces>Ports**.

   The Interfaces page lists the network interfaces present on the services gateway. Verify whether the interface has been configured by reviewing the information in the Configured column (**yes/no**).
2. Select the name of the parent interface you want to edit.

NOTE: You must configure the parent CT1 or CE1 interface before you configure the child T1 or E1 interface, respectively.

3. From the CT1/CE1 Interfaces General Configuration page, for the parent CT1 or CE1 interface, select **no** for the Partitioning field.
4. Click **OK** to save changes.
5. Select the name of the child interface (T1 or E1) you want to edit.
6. To use the port on the GPIM, you must assign it to a security zone other than the Null zone. Optionally, you can also assign the port an IP address (for example, 192.168.3.1/24). Enter or select the following settings:
   a. Select **Configure>Security>Zones**.
   b. Add or select a security zone other than Null; for example, **Trust**.
   c. For host inbound traffic, set the following:
      - System Services=**Allow All**
      - Protocols=**Allow All**
   d. Click **OK** to save changes, and click **Commit** to apply the configuration and other pending changes (if any).
7. To use the port on the GPIM, you must also set security policies. Select the following settings:
   a. Select **Configure>Security>Policy>Apply Policy**.
   b. Set Policy Action: Default Policy Action=**Permit-All**.
   c. Click **OK** to save changes, and click **Commit** to apply the configuration and other pending changes (if any).

For advanced configuration information, see the Junos OS Network Interfaces Configuration Guide.

Using the CLI to Configure the CT1 Interface

To perform basic configuration for the Dual CT1/E1 GPIM (for the CT1 interface) and to configure network interfaces for the services gateway with the CLI:

NOTE: You must configure the parent CT1 interface before you can configure the child T1 interface.

- Verify that the Dual CT1/E1 GPIM is installed on the services gateway:

```
show chassis hardware
```

- Verify the FPC status of the interface:

```
show chassis fpc
```

- Configure the parent CT1 interface with no partitioning:

```
set interfaces ct1-3/0/0 no-partition interface-type t1
```

- Configure the child T1 interface and assign an IP address:

```
set interfaces t1-3/0/0 unit 0 family inet address ip4-address/prefix
```

- Assign MTU values to the child T1 interface:

```
set interfaces t1-3/0/0 unit 0 mtu mtu values
```

- Configure a security zone for the child T1 interface and set the configuration for host inbound traffic services and protocols:

```
set security zones security-zone trust interfaces t1-3/0/0 host-inbound-traffic system-services
all
set security zones security-zone trust interfaces t1-3/0/0 host-inbound-traffic protocols all
```

- Set security policies:

```
set security policies default-policy permit-all
```

Using the CLI to Configure the CE1 Interface

To perform basic configuration for the Dual CT1/E1 GPIM (for the CE1 interface) and to configure network interfaces for the services gateway with the CLI:

NOTE: You must configure the parent CE 1 interface before you can configure the child E1 interface.

- Verify that the Dual CT1/E1 GPIM is installed on the services gateway:

```
show chassis hardware
```

- Verify the FPC status of the interface:

```
show chassis fpc
```

- Configure the parent CE1 interface with no partitioning:

```
set interfaces ce1-3/0/0 no-partition interface-type e1
```

- Configure the child E1 interface and assign an IP address:

```
set interfaces e1-3/0/0 unit 0 family inet address ip4-address/prefix
```

- Assign MTU values to the child E1 interface:

```
set interfaces e1-3/0/0 unit 0 mtu mtu values
```

- Configure a security zone for the child E1 interface and set the configuration for host inbound traffic services and protocols:

```
set security zones security-zone trust interfaces e1-3/0/0 host-inbound-traffic system-services
all
set security zones security-zone trust interfaces e1-3/0/0 host-inbound-traffic protocols all
```

- Set security policies:

```
set security policies default-policy permit-all
```

RELATED DOCUMENTATION

Maintaining the SRX Series Interface Modules | 163

Quad CT1/E1 GPIM (SRX-GP-QUAD-T1-E1)

IN THIS SECTION

Quad CT1/E1 GPIM Overview

A Gigabit-Backplane *Physical Interface Module* (GPIM) is a network interface card (NIC) that installs in the front slots of the SRX550 or SRX650 Services Gateway to provide physical connections to a LAN or a WAN. The GPIM receives incoming packets from a network and transmits outgoing packets to a network.

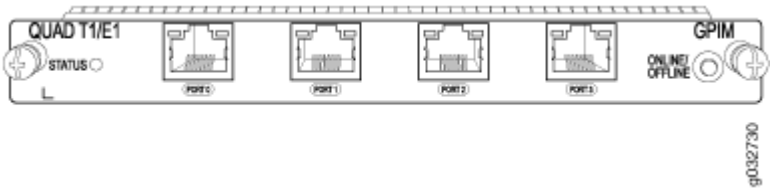
NOTE: The Quad CT1/E1 GPIM does not support channelization.

The Quad CT1/E1 GPIM provides the physical connection to T1 or E1 network media types and also performs T1 or E1 framing and line-speed signaling.

NOTE: Only the SRX650 Services Gateway supports hot-swappable functionality for GPIMs. The SRX550 Services Gateway does not support hot-swappable functionality for GPIMs.

Figure 24 on page 142 shows the Quad CT1/E1 GPIM.

Figure 24: Quad CT1/E1 GPIM



Quad CT1/E1 GPIM Components

The Quad CT1/E1 Gigabit-Backplane Physical Interface Module (GPIM) contains the components listed in Table 65 on page 143.

Table 65: Quad CT1/E1 GPIM Components

Component	Location	Description	
GPIM ONLINE/ OFFLINE button Only the SRX650 Services Gateway supports hot-swappable functionality for GPIMs. The SRX550 Services Gateway does not support hot-swappable functionality for GPIMs.	Right side of the GPIM	Use the GPIM ONLINE/OFFLINE button to gracefully shut down the GPIM.	
Four fixed T1/E1 ports labeled 0–3 Each port can be configured using the CLI in T1 or E1 mode.	Middle of the GPIM	T1 Mode: • Transmit bit rate: 1.544 Mbps • Receive bit rate: 1.544 Mbps	E1 Mode: • Transmit bit rate: 2.048 Mbps • Receive bit rate: 2.048 Mbps
Captive screws	One on each side of the GPIM	Use the captive screws to hold the GPIM in place in the services gateway.	

Quad CT1/E1 GPIM Key Features

The Quad CT1/E1 Gigabit-Backplane *Physical Interface Module* (GPIM) provides the following common key features for both T1 and E1 modes:

- Channel service unit/data service unit (CSU/DSU) to eliminate the need for a separate external device
- 56-Kbps and 64-Kbps operating modes

- Independent internal and external clocking option
- Alarm reporting with a 24-hour history maintained
- Loopback (local and remote) and BERT/PRBS diagnostics
- Multilink Frame Relay and Multilink PPP support
- MTU size of 9000 bytes (maximum)

Quad CT1/E1 GPIM Hardware Specifications

The Quad CT1/E1 Gigabit-Backplane Physical Interface Module (GPIM) has the specifications listed in Table 66 on page 144.

Table 66: Quad CT1/E1 GPIM Hardware Specifications

Description	Value
Dimensions (H x W x L)	0.78 in. H x 6.72 in. W x 8.1 in. L (19.8 mm x 170.8 mm x 205.7 mm)
Weight	15.4 oz (0.44 kg)
Connector type	RJ-45
Form factor	Single-high, single-wide GPIM
Environmental operating temperature	32°F through 104°F (0°C through 40°C)
Storage temperature	-40°F through 158°F (-40°C through 70°C)
Relative humidity	5% to 90% noncondensing

Quad CT1/E1 GPIM LEDs

The Quad CT1/E1 Gigabit-Backplane Physical Interface Module (GPIM) has the LED listed in Table 67 on page 145.

Table 67: Quad CT1/E1 GPIM LED States

LED	Color	State	Description
STATUS	Green	On	GPIM is online and functioning normally.
	Amber	On	GPIM is starting up, running diagnostics, or shutting down.
	Red	On	GPIM has failed.

Quad CT1/E1 GPIM Network Interface Specifications

The Quad CT1/E1 Gigabit-Backplane Physical Interface Module (GPIM) provides the network interface specifications specific to T1 or E1 modes, listed in Table 68 on page 145.

Table 68: Quad CT1/E1 GPIM Network Interface Specifications

Description	T1 Mode	E1 Mode
Network Interface Specifications		
Line encoding	AMI/B8ZS	HDB3
Mode	Framed clear channel	• Framed clear channel (64 Kbps) • Unframed clear channel

Table 68: Quad CT1/E1 GPIM Network Interface Specifications *(Continued)*

Description	T1 Mode	E1 Mode
Fractional framing	• Superframe (D4/SF) • Extended Superframe (ESF)	• G704 • G704 with no CRC4 • G703 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	16/32
Shared flag	Supported	Supported
Idle flag/fill	Supported	Supported
Counters:	Runts, Giants, FCS, Error, Abort Error, Align Error	Runts, Giants, FCS, Error, Abort Error, Align Error

Quad CT1/E1 GPIM Basic Configuration

IN THIS SECTION

To enable the Quad CT1/E1 Gigabit-Backplane Physical Interface Module (GPIM) installed on the SRX Series Services Gateway, you must configure the basic settings for the PIM. You can perform the configuration tasks for this using either the J-Web interface or the CLI.

Using the J-Web Interface

To perform basic configuration for the Quad CT1/E1 GPIM and to configure network interfaces for the services gateway using the J-Web interface:

1. In the J-Web interface, select **Configure>Interfaces>Ports**.

   The Interfaces page lists the network interfaces present on the services gateway. Verify whether the interface has been configured by reviewing the information in the Configured column (**yes/no**).
2. Select the name of the parent interface you want to edit.

   NOTE: You must configure the parent CT 1 or CE1 interface before you configure the child T1 or E1 interface, respectively.
3. From the CT1/CE1 Interfaces General Configuration page, for the parent CT1 or CE1 interface, select **No** for the Partitioning field.
4. Click **OK** to save changes.
5. Select the name of the child interface (T1 or E1) you want to edit.
6. To use the port on the GPIM, you must assign it to a security zone other than the Null zone. Optionally, you can also assign the port an IP address (for example, **192.168.3.1/24**). Enter or select the following settings:
   a. Select **Configure>Security>Zones**.
   b. Add or select a security zone other than Null; for example, **Trust**.
   c. For host inbound traffic, set the following:
      - System Services=**Allow All**
      - Protocols=**Allow All**
   d. Click **OK**, and click **Commit** to apply the configuration and other pending changes (if any).
7. To use the port on the GPIM, you must also set security policies. Select the following settings:
   a. Select **Configure>Security>Policy>FW Policies**.
   b. Set Policy Action: Default Policy Action=**Permit-All**.
   c. Click **OK** to save changes, and click **Commit** to apply the configuration and other pending changes (if any).

For advanced configuration information, see the Junos OS Network Interfaces Configuration Guide.

Using the CLI to Configure the CT1 Interface

To perform basic configuration for the Quad CT1/E1 GPIM (for the CT1 interface) and to configure network interfaces for the services gateway with the CLI:

> **NOTE**: You must configure the parent CT1 interface before you can configure the child T1 interface.

- Verify that the Quad CT1/E1 GPIM is installed on the services gateway:

  ```
  show chassis hardware
  ```

- Verify the FPC status of the interface:

  ```
  show chassis fpc
  ```

- Configure the parent CT1 interface with no partitioning:

  ```
  set interfaces ct1-1/0/0 no-partition interface-type t1
  ```

- Configure the child T1 interface and assign an IP address:

  ```
  set interfaces t1-1/0/0 unit 0 family inet address ip4-address/prefix
  ```

- Assign MTU values to the child T1 interface:

  ```
  set interfaces t1-1/0/0 unit 0 mtu mtu values
  ```

- Configure a security zone for the child T1 interface and set the configuration for host inbound traffic services and protocols:

  ```
  set security zones security-zone trust interfaces t1-1/0/0 host-inbound-traffic system-services
  all
  set security zones security-zone trust interfaces t1-1/0/0 host-inbound-traffic protocols all
  ```

- Set security policies:

  ```
  set security policies default-policy permit-all
  ```

Using the CLI to Configure the CE1 Interface

To perform basic configuration for the Quad CT1/E1 GPIM (for the CE1 interface) and to configure network interfaces for the services gateway with the CLI:

NOTE: You must configure the parent CE1 interface before you can configure the child E1 interface.

- Verify that the Quad CT1/E1 GPIM is installed on the services gateway:

  ```
  show chassis hardware
  ```

- Verify the FPC status of the interface:

  ```
  show chassis fpc
  ```

- Configure the parent CE1 interface with no partitioning:

  ```
  set interfaces ce1-1/0/0 no-partition interface-type e1
  ```

- Configure the child E1 interface and assign an IP address:

  ```
  set interfaces e1-1/0/0 unit 0 family inet address ip4-address/prefix
  ```

- Assign MTU values to the child E1 interface:

  ```
  set interfaces e1-1/0/0 unit 0 mtu mtu values
  ```

- Configure a security zone for the child E1 interface and set the configuration for host inbound traffic services and protocols:

  ```
  set security zones security-zone trust interfaces e1-1/0/0 host-inbound-traffic system-services
  all
  set security zones security-zone trust interfaces e1-1/0/0 host-inbound-traffic protocols all
  ```

- Set security policies:

  ```
  set security policies default-policy permit-all
  ```

RELATED DOCUMENTATION

Maintaining the SRX Series Interface Modules | 163

1-Port Clear Channel DS3/E3 GPIM

IN THIS SECTION

1-Port Clear Channel DS3/E3 GPIM Overview

The 1-Port Clear Channel DS3/E3 GPIM functions as a clear channel interface that can support DS3 (T3) or E3 line rates of 44.796 or 34.368 Mbps, respectively. The device does not support channelization, but it supports a subrate DS3/E3 configuration. The DS3/E3 interface is a popular high-bandwidth WAN interface for large enterprise branch locations that enables high-quality voice, video, and data applications with reduced latency. The clear channel implementation provides such features as subrate and scrambling options used by major DSU vendors. The interface also supports loopback, bit error rate test (BERT), and far-end alarm and control (FEAC) diagnostic capabilities. It supports Frame Relay, Point-to-Point Protocol (PPP), and *High-Speed Data Link Control* (HDLC) serial encapsulation protocols.

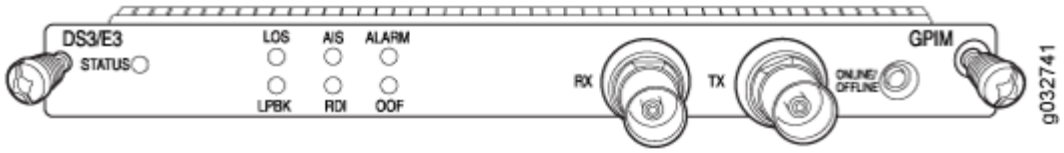
The 1-Port Clear Channel DS3/E3 GPIM is suitable for:

- Branch office and regional sites for medium-sized to large enterprises.
- Corporate headquarters for medium-sized enterprises.

The 1-Port Clear Channel DS3/E3 GPIM supports IP configurations. Using the command-line interface (CLI), you can configure the 1-Port Clear Channel DS3/E3 GPIM to operate in either DS3 or E3 mode.

The 1-Port Clear Channel DS3/E3 GPIM can be plugged into any GPIM slot on the services gateway. Figure 25 on page 151 shows the front panel of the 1-Port Clear Channel DS3/E3 GPIM..

Figure 25: 1-Port Clear Channel DS3/E3 GPIM Front Panel



NOTE: Only the SRX650 Services Gateway supports hot-swappable functionality for GPIMs. The SRX550 Services Gateway does not support hot-swappable functionality for GPIMs.

1-Port Clear Channel DS3/E3 GPIM Components

The 1-Port Clear Channel DS3/E3 GPIM contains the components listed in Table 69 on page 151.

Table 69: 1-Port Clear Channel DS3/E3 GPIM Components

Component	Location	Description
ONLINE/OFFLINE button Only the SRX650 Services Gateway supports hot-swappable functionality for GPIMs. The SRX550 Services Gateway does not support hot-swappable functionality for GPIMs.	Right side of the GPIM	Use the ONLINE/OFFLINE button to gracefully shut down the GPIM. Press down and hold the button for 4 to 5 seconds; then release. The GPIM gracefully shuts down and turns off the power supply units (PSUs). To power up the GPIM (if the Services and Routing Engine [SRE] is off), press and hold the ONLINE/OFFLINE button for 4 to 5 seconds.

Table 69: 1-Port Clear Channel DS3/E3 GPIM Components *(Continued)*

Component	Location	Description
TX and RX coaxial connectors	Middle/right of the GPIM	Dual 75-ohm BNC coaxial socket connectors: TX (transmit) and RX (receive).
Captive screws	One on each side of the GPIM	Use the captive screws to hold the GPIM in place.

1-Port Clear Channel DS3/E3 GPIM Key Features

The 1-Port Clear Channel DS3/E3 Gigabit-Backplane *Physical Interface Module* (GPIM) provides the following key features:

- Framed and unframed DS3/E3 modes
- Line encoding for DS3/E3 modes
- Support for Frame Relay, PPP, and HDLC serial encapsulation protocols
- External and internal clocking support
- Support for DS3/E3 network alarms
- Support for chassis clusters
- Support for anti-counterfeit check
- Loopback (local, remote, and payload) and BERT, PRBS, and QRSS diagnostics support
- Support for generation and detection of loopback control codes (line-loopback activate and deactivate) and FEAC codes
- Maximum transmission unit (MTU) size of 4474 bytes (default) and 9192 bytes (maximum)

1-Port Clear Channel DS3/E3 GPIM Hardware Specifications

The 1-Port Clear Channel DS3/E3 Gigabit-Backplane Physical Interface Module (GPIM) has the hardware specifications listed in Table 70 on page 153.

Table 70: 1-Port Clear Channel DS3/E3 GPIM Hardware Specifications

Description	Value
Dimensions (H x W x L)	0.76 in. x 6.72 in. x 8.52 in. (19.2 mm x 170.8 mm x 216.4 mm)
Weight	1.11 lb (0.504 kg)
Connector type	DSX3 interface with dual 75-ohm BNC coaxial socket connectors (separate Tx/Rx)
Form factor	Single-high, single-wide GPIM
Environmental operating temperature	32°F through 104°F (0°C through 40°C)
Storage temperature	-40°F through 158°F (-40°C through 70°C)
Relative humidity	5% to 90% noncondensing
Altitude	Up to 10,000 ft (3,000 m)

1-Port Clear Channel DS3/E3 GPIM LEDs

The 1-Port Clear Channel DS3/E3 Gigabit-Backplane Physical Interface Module (GPIM) has the LEDs described in Table 71 on page 154.

Table 71: 1-Port Clear Channel DS3/E3 GPIM LED States

LED	Color	State	Description
STATUS	Green	On	GPIM is online and functioning normally.
	Amber	On	GPIM is starting up, running diagnostics, or shutting down.
	Red	On	GPIM has failed.
		Off	GPIM has no power and can be removed safely.
LOS	Amber	On	Loss of signal online.
LPBK	Amber	On	Loopback is on.
AIS	Amber	On	Port is receiving alarm indication signal (AIS) alarm.
RDI	Amber	On	Port is receiving remote defect indication (RDI) alarm.
ALARM	Green	On	There are no alarms or defects.
	Red	On	An alarm or a defect is present.
OOF	Amber	On	Out-of-frame (OOF) RX multi-frame is not aligned.

1-Port Clear Channel DS3/E3 GPIM Supported Standards

The 1-Port Clear Channel DS3/E3 Gigabit-Backplane Physical Interface Module (GPIM) supports the following standards:

- DS3 mode standards:
  - ANSI TI.102, TI.107, T1.404
  - Telecordia GR 499-CORE, GR 253-CORE, GR 449-CORE
  - Telecordia TR-TSY-000009
  - AT&T Technical Reference 54014
- E3 mode standards:
  - ITU G.751, G.823, G.703
  - Telecordia GR 499-CORE

1-Port Clear Channel DS3/E3 GPIM Supported Loopback Diagnostics

The 1-Port Clear Channel DS3/E3 Gigabit-Backplane Physical Interface Module (GPIM) has the following loopback diagnostics:

- DS3 mode: local, remote, payload
- E3 mode: local and remote
- Test patterns (BERT):
  - All ones
  - All zeros
  - Alternating ones and zeros (AA/55)
  - PRBS 2^15-1 (as specified in ITU-T 0.151)
  - PRBS 2^20-1 (as specified in ITU-T 0.153)
  - PRBS 2^23-1 (as specified in ITU-T 0.151)
  - PRBS 2^9-1
  - PRBS 2^11-1

- PRBS 2^29-1
- PRBS 2^31-1
- QRSS 2^20-1 (as specified in ITU-T 0.151)

- BERT results must be in the following form:
  - Received bit count
  - Received error count

In conformance with ANSI T1.107-1995, the 1-Port Clear Channel DS3/E3 GPIM supports both generation and detection of FEAC codes, as well as line-loopback activate and deactivate control codes.

1-Port Clear Channel DS3/E3 GPIM Network Interface Specifications

The 1-Port Clear Channel DS3/E3 Gigabit-Backplane Physical Interface Module (GPIM) provides the network interface specifications for DS3 or E3 modes, listed in Table 72 on page 156.

Table 72: 1-Port Clear Channel DS3/E3 GPIM Network Interface Specifications

Description	DS3 Mode	E3 Mode
Network Interface Specifications		
Line encoding	B3ZS	HDB3
Framing	• M23 (default) • C-bit	G.751 (default)

Table 72: 1-Port Clear Channel DS3/E3 GPIM Network Interface Specifications *(Continued)*

Description	DS3 Mode	E3 Mode
Substrate and scrambling	Vendor algorithms supported: • Verilink • Kentrox • Digital Link • Larscom • Adtran	Vendor algorithms supported: • Kentrox • Digital Link
Network alarms	Supported in accordance with the ANSI specification: • Loss of Signal (LOS) • Out of Frame (OOF) • Loss of Frame (LOF) • Alarm Identification Signal (AIS) • Remote Defect Identification (RDI)	Supported in accordance with the ITU-T specification: • LOS • OOF • AIS • RDI • Phase Locked Loop (PLL)

Table 72: 1-Port Clear Channel DS3/E3 GPIM Network Interface Specifications *(Continued)*

Description	DS3 Mode	E3 Mode
Error counters	Incremented during a periodic 1-second polling routine: • 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)	Incremented during a periodic 1-second polling routine: • Frame Alignment Error (FAE) • Bipolar Coding Violations (BCV) • Excessive Zeros (EXZ) • LCV • LES • SEFS • UAS
HDLC Features		
MTU	Default (4474 bytes) or maximum jumbo (up to 9192 bytes)	Default (4474 bytes) or maximum jumbo (up to 9192 bytes)
Shared flag	Supported	Supported
Idle flag/fill (0x7e or all ones)	Supported	Supported
Counters	Runts, giants	Runts, giants

1-Port Clear Channel DS3/E3 GPIM Basic Configuration

IN THIS SECTION

To enable the 1-Port Clear Channel DS3/E3 GPIM installed on the SRX Series Services Gateway, you must configure its properties. You can perform the basic configuration tasks using the CLI. In addition, you can configure a wide variety of options that are not encountered frequently.

Using the CLI

To perform basic configuration for the 1-Port Clear Channel DS3/E3 GPIM and to configure network interfaces for the services gateway with the CLI:

- Verify that the 1-Port Clear Channel DS3/E3 GPIM is installed on the services gateway:

  ```
  show chassis hardware
  ```

  ```
  root@srx650r03> show chassis hardware
  Hardware inventory:
  Item             Version  Part number  Serial number     Description
  Chassis                                AJ2210AA0064      SRX650
  Midplane         REV 09   710-023875   AABJ4077
  System IO        REV 08   710-023209   AABK2897          SRXSME System IO
  Routing Engine   REV 18   750-023223   AABJ8853          RE-SRXSME-SRE6
  FPC 0                                                   FPC
    PIC 0                                                 4x GE Base PIC
  FPC 2            REV 03   750-023873   TV4286            FPC
  FPC 5            REV 10   750-023810   AABE1433          FPC
  FPC 6            REV 10   750-023808   AAAJ9355          FPC
    PIC 0                                                 4x CT1E1 gPIM
  FPC 7            REV 10   750-023808   AAAV0753          FPC
  FPC 8            REV 09   750-023810   AAAC6572          FPC
    PIC 0                                                 1x CLR CH T3/E3
  Power Supply 0   Rev 03   740-024283   UE05105           PS 645W AC
  ```

- Verify the FPC status of the interface:

```
show chassis fpc
```

```
root@srx650r03> show chassis fpc
                    Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State           (C)  Total  Interrupt      DRAM (MB) Heap     Buffer
  0  Online          -------------------- CPU less FPC --------------------
  1  Empty           --------------------  Not Usable  --------------------
  2  Offline         ---------- FPC configured offline ----------
  3  Empty           --------------------  Not Usable  --------------------
  4  Empty           --------------------  Not Usable  --------------------
  5  Offline         ---------- FPC configured offline ----------
  6  Online                   0          0       128        14         41
  7  Offline         ---------- FPC configured offline ----------
  8  Online                   0          0       128        14         41
```

- Verify the PIC status:

```
show chassis fpc pic-status
```

```
root@srx650r03> show chassis fpc pic-status
Slot 0   Online       FPC
  PIC 0  Online       4x GE Base PIC
Slot 2   Offline      FPC
Slot 5   Offline      FPC
Slot 6   Online       FPC
  PIC 0  Online       4x CT1E1 gPIM
Slot 7   Offline      FPC
Slot 8   Online       FPC
  PIC 0  Online       1x CLR CH T3/E3
```

- Set the DS3/E3 port mode; for example, DS3 mode:

```
set chassis fpc <fpc no> pic 0 port 0 framing t3/e3
```

> **NOTE**: By default, the PIC comes up in DS3 mode and the t3-*x/y/z* physical interface is created. The port mode chosen for t3 is IFDP_T3, and the port mode chosen for e3 is IFDP_E3.

- Assign the port an IP address:

```
set interfaces t3-3/0/0 unit 0 family inet address interface address/destination prefix
```

- Assign MTU values:

  ```
  set interfaces t3-3/0/0 unit 0 family inet mtu mtu values
  ```

- Enable/disable unframed DS3 mode; for example, unframed:

  ```
  set interfaces t3-3/0/0 t3-options unframed
  ```

- Set encapsulation:

  ```
  set interfaces t3-3/0/0 encapsulation cisco-hdlc
  ```

- Add or select a security zone; for example, trust:

  ```
  set security zones security-zone trust interfaces t3-3/0/0.0 host-inbound-traffic system-services
  all
  ```

- Add or select security zones for host inbound traffic:

  ```
  set security zones security-zone trust interfaces t3-3/0/0.0 host-inbound-traffic protocols all
  ```

- Set security policies:

  ```
  set security policies default-policy permit-all
  ```

2

CHAPTER

Maintaining Interface Modules

Maintaining the SRX Series Interface Modules

IN THIS SECTION

Required Tools and Parts for Replacing Interface Modules

The following tools and parts are required for replacing a Gigabit-Backplane Physical Interface Module (GPIM) or a Mini-Physical Interface Module on the services gateway:

- Electrostatic bag or antistatic mat, for each component
- Electrostatic discharge (ESD) grounding wrist strap
- Flat-blade (–) screwdriver, approximately 1/8 in. (3 mm)
- Phillips (+) screwdrivers, numbers 1 and 2
- Blank panels (if no component will be installed)

Preventing Electrostatic Discharge Damage to the SRX300 Series and SRX550 High Memory Services Gateway

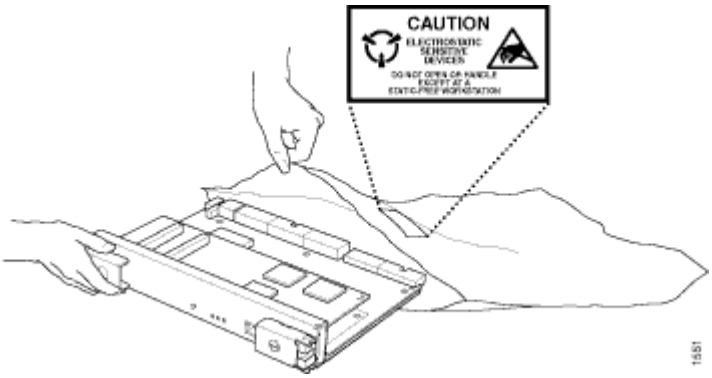
Many services gateway hardware components are sensitive to damage from static electricity. Some components can be impaired by voltages as low as 30 V. You can easily generate potentially damaging static voltages whenever you handle plastic or foam packing material or if you move components across plastic or carpets. Observe the following guidelines to minimize the potential for electrostatic discharge (ESD) damage, which can cause intermittent or complete component failures:

- Always use an ESD wrist strap or ankle strap, and verify that it is in direct contact with your skin.

  CAUTION: For safety, periodically check the resistance value of the ESD strap. The measurement must be in the range of 1 to 10 Mohms.

- When handling any component that is removed from the chassis, verify that the equipment end of your ESD strap is attached to one of the ESD points on the chassis.
- Avoid contact between the component and your clothing. ESD voltages emitted from clothing can damage components.
- When removing or installing a component, always place it component-side up on an antistatic surface, in an antistatic card rack, or in an electrostatic bag. See Figure 26 on page 164. If you are returning a component, place it into an electrostatic bag before packing it.

Figure 26: Placing a Component into an Electrostatic Bag



Replacing Mini-Physical Interface Modules on the SRX300 Series and SRX550 High Memory Services Gateways

IN THIS SECTION

Before you begin, power off the services gateway.

CAUTION: The Mini-Physical Interface Modules (Mini-PIMs) available are not hot-swappable. You must power off the services gateway before removing or installing Mini-PIMs.

To maintain proper airflow through the services gateway, cover any empty Mini-PIM slot with a blank faceplate.

CAUTION: Do not remove a blank faceplate unless you are installing a Mini-PIM in the empty slot.

Removing a Mini-Physical Interface Module

To remove a Mini-PIM from the services gateway:

1. Place an electrostatic bag or antistatic mat on a flat, stable surface on which you intend to place the Mini-PIM.
2. Attach an ESD grounding strap to your bare wrist, and connect the strap to the grounding point on the back of the device.
3. Unplug the power adapter from the services gateway. Verify that the Power LED is off.
4. Label the cables connected to the Mini-PIM so that you can later reconnect each cable to the correct Mini-PIM.
5. Disconnect the cables from the Mini-PIM.
6. If necessary, arrange the cables to prevent them from dislodging or developing stress points.
7. Remove the screws on each side of the Mini-PIM faceplate using a 1/8-in. (3-mm) flat-blade (–) screwdriver.
8. Grasp the screws on each side of the Mini-PIM faceplate and slide the Mini-PIM out of the services gateway.
9. Place the Mini-PIM in the electrostatic bag or on the antistatic mat.
10. If you are not reinstalling a Mini-PIM into the empty slot, install a blank faceplate over the slot to maintain proper airflow.

Installing a Mini-Physical Interface Module

To install a Mini-Physical Interface Module (Mini-PIM) in the services gateway.

1. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to the grounding point on the back of the services gateway.
2. Power off the services gateway by briefly pressing the Power button on the front panel. Wait for the Power LED to turn off before proceeding. Disconnect the services gateway from its power source.
3. Remove the Mini-PIM from the electrostatic bag.
4. Grasp the screws on each side of the Mini-PIM faceplate and align the notches in the connector at the rear of the Mini-PIM with the notches in the Mini-PIM slot in the device.

   CAUTION: Slide the Mini-PIM straight into the slot to avoid damaging the components on the Mini-PIM.
5. Slide the Mini-PIM in until it lodges firmly in the services gateway.
6. Using a 1/8-in. (3-mm) flat-blade (–) screwdriver, tighten the screws on each side of the Mini-PIM faceplate.
7. Insert the appropriate cables into the cable connectors on the Mini-PIM.
8. If necessary, arrange the cables to prevent them from dislodging or developing stress points:
   - Secure the cables so that they are not supporting their own weight as they hang to the floor.
   - Place any excess cables out of the way in neatly coiled loops.
   - Use fasteners to maintain the shape of the cable loops.
9. Reconnect the power adapter to the services gateway. Verify that the Power LED glows steadily green after you press the power button.
10. Verify that the Mini-PIM LED on the system dashboard glows steadily green to confirm that the Mini-PIM is online.

Removing a Blank Mini-Physical Interface Module Faceplate

To remove a blank faceplate from the SRX Series Services Gateway:

1. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to the ESD point on the services gateway.
2. If the device is powered on, power off the device. Verify that the Power LED is off.
3. Loosen the screws on each side of the faceplate.
   - On faceplates with handles, use a 1/8-in. (3-mm) flat-blade (–) screwdriver to loosen but not remove the captive screws.

- On faceplates without handles, use a Phillips number 1 screwdriver to remove the noncaptive screws.

4. Remove the faceplate.

Installing a Blank Mini-Physical Interface Module Faceplate

To install a blank faceplate on the SRX Series Services Gateway:

1. Align the captive screws on the blank faceplate with the screw holes on the chassis.
2. Tighten the screws on each side of the faceplate.
   - On faceplates with handles, use a 1/8-in. (3-mm) flat-blade (–) screwdriver to tighten the captive screws.
   - On faceplates without handles, use a Phillips number 1 screwdriver to tighten the noncaptive screws.

RELATED DOCUMENTATION

Preventing Electrostatic Discharge Damage to the SRX300 Series and SRX550 High Memory Services Gateway | 163

SRX300 Series and SRX550 High Memory Services Gateway Mini-Physical Interface Modules Overview | 3

Replacing Gigabit-Backplane Physical Interface Modules on the SRX300 Series and SRX550 High Memory Services Gateways

IN THIS SECTION

Removing a Gigabit-Backplane Physical Interface Module

To remove a GPIM from the services gateway:

1. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to one of the ESD points on the chassis. For more information about ESD, see *Preventing Electrostatic Discharge Damage to the SRX300 Series and SRX550 High Memory Services Gateway*.
2. Push the OFFLINE button to turn the GPIM offline. After the STATUS LED light turns off, it is safe to remove the GPIM. See *Table 1* for a description of LED indications for hot-swappable GPIM components.

   Table 73: LED Indications for Hot-Swappable GPIM Components

Number	Component	Description
1	STATUS LED	The STATUS LED has the following indicators: • Solid green indicates that the GPIM is functioning normally. • Solid yellow indicates that the GPIM is starting up, running diagnostics, or going offline. • Solid red indicates that the GPIM has failed. • Off indicates that the GPIM is not powered on, is offline, or is not configured.
2	ONLINE/OFFLINE button	Push the button to turn the GPIM offline. After the STATUS LED light goes off, it is safe to remove the GPIM from the services gateway.

3. Label the cables connected to the GPIM so that you can later reconnect each cable to the correct GPIM.
4. Disconnect the cables from the GPIM.
5. If necessary, arrange the cables to prevent them from dislodging or developing stress points.
6. Using a Phillips (+) screwdriver, loosen the captive screws on each side of the GPIM faceplate.
7. Grasp the handles on each side of the GPIM faceplate, and slide the GPIM out of the services gateway.
8. Place the GPIM in an electrostatic bag or on an antistatic mat.
9. If you are not reinstalling a GPIM into an empty slot, install a blank GPIM faceplate in the empty slot to maintain proper airflow.

NOTE: When installing a blank GPIM faceplate, make sure that the padded side of the faceplate is facing up.

Installing a Gigabit-Backplane Physical Interface Module

Before you begin:

- Ensure that the services gateway is powered off.
- Ensure that the GPIM is installed in the appropriate GPIM slot. For information about the appropriate GPIM slots, see *SRX300 Series and SRX550 High Memory Services Gateway Gigabit-Backplane Physical Interface Modules Overview*.

NOTE: To maintain proper airflow through the services gateway, leave blank faceplates in place over slots that do not contain GPIMs. Do not remove a blank faceplate unless you are immediately installing a GPIM in the empty slot.

To install a GPIM:

1. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to one of the ESD points on the chassis. For more information about ESD, see *Preventing Electrostatic Discharge Damage to the SRX300 Series and SRX550 High Memory Services Gateway*.
2. Grasp the handles on each side of the GPIM faceplate, and align the edges of the GPIM circuit board with the guide rails at each side of the GPIM slot.
3. Slide the GPIM into the services gateway until it seats firmly in the device.

   CAUTION: Slide the GPIM straight into the slot to avoid damaging the components on the GPIM.
4. Using a Phillips (+) screwdriver, tighten the captive screws on each side of the GPIM faceplate.
5. Insert the appropriate cables into the cable connectors on the GPIM.
6. If necessary, arrange the cables to prevent them from dislodging or developing stress points:
   - Secure the cable so that it is not supporting its own weight as it hangs to the floor.
   - Place excess cable out of the way in a neatly coiled loop.
   - Use fasteners to maintain the shape of the cable loops.

After the STATUS LED light turns green and glows steadily on, the GPIM is online and functioning normally. See Table 74 on page 170 for hot-swappable components and their descriptions.

Table 74: Hot-Swappable Component Descriptions for GPIMs

Number	Component	Description
1	STATUS LED	The STATUS LED has the following indicator s: • Steady green indicates that the GPIM is functioning normally. • Steady yellow indicates that the GPIM is starting up, running diagnostics, or going offline. • Steady red indicates that the GPIM has failed. • Off indicates that the GPIM is not powered on, is offline, or is not configured.
2	ONLINE/OFFLINE button	**NOTE**: You need not press this button when installing a GPIM. The services gateway automatically recognizes when a GPIM has been inserted into a slot.

Removing a Blank Gigabit-Backplane Physical Interface Module Faceplate

To maintain proper airflow through the services gateway, leave blank faceplates in place over slots that do not contain Gigabit-Backplane Physical Interface Modules (GPIMs). Do not remove a blank faceplate unless you are immediately installing a GPIM in the empty slot.

To remove a blank faceplate:

1. Using a Phillips (+) screwdriver, loosen the captive screws on each side of the blank faceplate.
2. Using a flat-blade (–) screwdriver, gently pry out one side of the faceplate and pull it out.

NOTE: When installing a blank GPIM faceplate, make sure that the padded side of the faceplate is facing up.

Installing a Blank Gigabit-Backplane Physical Interface Module Faceplate

To maintain proper airflow through the services gateway, install blank faceplates in slots that do not contain Gigabit-Backplane Physical Interface Modules (GPIMs).

To install a blank faceplate:

1. Align the captive screws on the blank faceplate with the screw holes on the chassis.
2. Using a Phillips (+) screwdriver, tighten the captive screws on each side of the blank faceplate until the faceplate is flush with the chassis.

CHAPTER 3

Contacting Customer Support and Returning the Module

Returning the SRX Series Modules

IN THIS SECTION

Contacting Customer Support

Once you have located the serial numbers of the device or component, you can return the device or component for repair or replacement. For this, you need to contact Juniper Networks Technical Assistance Center (JTAC).

You can contact JTAC 24 hours a day, 7 days a week, using any of the following methods:

- On the Web: Using the Service Request Manager link at https://support.juniper.net/support/
- By telephone:
  - From the US and Canada: 1-888-314-JTAC
  - From all other locations: 1-408-745-9500

> **NOTE**: If contacting JTAC by telephone, enter your 12-digit service request number followed by the pound (#) key if this is an existing case, or press the star (*) key to be routed to the next available support engineer.

When requesting support from JTAC by telephone, be prepared to provide the following information:

- Your existing service request number, if you have one
- Details of the failure or problem

- Type of activity being performed on the services gateway when the problem occurred
- Configuration data displayed by one or more `show` commands
- Your name, organization name, telephone number, fax number, and shipping address

The support representative validates your request and issues a Return Materials Authorization (RMA) number for return of the device or component.

Return Procedure for SRX Series Services Gateway Hardware Components

Follow the tasks list provided in Table 75 on page 174 to return an SRX services gateways or component to Juniper Networks for repair or replacement.

Table 75: Return Procedure for SRX Series Services Gateways Component

Step	Task	For more information, see
1	Determine the part number and serial number of the services gateway or component.	*Locating the SRX Series Services Gateway Hardware Component Mini-PIM or GPIM Serial Number Label*
2	Obtain a Return Materials Authorization (RMA) number from JTAC.	*Contacting Customer Support*
3	Pack the SRX Series Services Gateway component for shipping.	*Packing the SRX Series Services Gateway Hardware Components for Shipment*

NOTE: Do not return the services gateway or any component to Juniper Networks unless you have first obtained an RMA number. Juniper Networks reserves the right to refuse shipments that do not have an RMA. Refused shipments are returned to the customer via collect freight.

For more information about return and repair policies, see the customer support Web page at https://www.juniper.net/support/guidelines.html.

For product problems or technical support issues, open a support case using the Case Manager link at https://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (outside the United States).

Locating the SRX Series Services Gateway Hardware Component Mini-PIM or GPIM Serial Number Label

IN THIS SECTION

This topic includes the following sections:

SRX Series Services Gateway Mini-PIM Serial Number Label

Mini-Physical Interface Modules (Mini-PIMs) are field-replaceable on the SRX Series Services Gateway. Each Mini-PIM has a unique serial number. The serial number label is located on the right side of the Mini-PIM, when the Mini-PIM is horizontally oriented (as it would be installed on the device). The exact location might be slightly different on different Mini-PIMs, depending on the placement of components on the Mini-PIM.

SRX Series Services Gateway GPIM Serial Number Label

Gigabit-Backplane Physical Interface Modules (GPIMs) are hot-swappable and field-replaceable on the SRX Series Services Gateway. Each GPIM has a unique serial number. The exact location might be slightly different on different GPIMs (XPIMs or GPIMs), depending on the placement of the components on the GPIM.

NOTE: Only the SRX650 Services Gateway supports hot-swappable functionality for GPIMs. The SRX550 Services Gateway does not support hot-swappable functionality for GPIMs.

Required Tools and Parts for Packing the SRX Series Services Gateway Hardware Components

The following tools and parts are required to pack the SRX Series Services Gateway Hardware Components:

- Blank panel to cover empty Mini-PIM slot
- Electrostatic bag or antistatic mat, for each component
- Electrostatic discharge (ESD) grounding wrist strap
- Flat-blade screwdriver, approximately 1/4 in (6 mm)
- Phillips (+) screwdrivers, numbers 1 and 2

Packing the SRX Series Services Gateway Hardware Components for Shipment

IN THIS SECTION

This topic includes the following section:

Packing the Hardware Components for Shipment

Follow these guidelines for packing and shipping individual components of the services gateway:

- When you return a component, make sure that it is adequately protected with packing materials and packed so that the pieces are prevented from moving around inside the carton.
- Use the original shipping materials if they are available.
- Place individual Mini-Physical Interface Modules (Mini-PIMs) in electrostatic bags.
- Write the Return Materials Authorization (RMA) number on the exterior of the box to ensure proper tracking.

CAUTION: Do not stack any of the services gateway components during packing.