

ACX4000 Universal Metro Router Interface Module Reference

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ACX4000 Universal Metro Router Interface Module Reference
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YEAR 2000 NOTICE

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| [ACX4000 Hardware Guide](#)

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Overview

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MICs Supported on ACX Series Routers

The ACX4000 has two slots on the front of the router that accept MICs. [Table 1 on page 2](#) lists the MICs supported by the ACX4000 router.

Table 1: MICs Supported by ACX4000 Routers

| MIC Name | MIC Model Number | Ports | First Junos OS Release |
|--|--------------------------|-------|------------------------|
| "Channelized OC3/STM1 (Multi-Rate) Circuit Emulation MIC with SFP" on page 5 | ACX-MIC-4COC3-1COC12CE | 4 | 12.3R2 |
| "Gigabit Ethernet Copper/SFP MIC" on page 9 | ACX-MIC-6GE-CU-SFP-COMBO | 6 | 12.3R2 |
| "Channelized E1/T1 Circuit Emulation MIC" on page 11 | ACX-MIC-16CHE1-T1-CE | 16 | 12.3R2 |

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Determining Transceiver Support and Specifications

You can find information about the pluggable transceivers supported on your Juniper Networks device by using the Hardware Compatibility Tool. In addition to transceiver and connector type, the optical and cable characteristics—where applicable—are documented for each transceiver. The Hardware Compatibility Tool allows you to search by product, displaying all the transceivers supported on that device, or category, displaying all the transceivers by interface speed or type. The Hardware Compatibility Tool is located at <https://apps.juniper.net/hct/>.

Some transceivers support additional monitoring using the operational mode CLI command **show interfaces diagnostics optics**. Use the Hardware Compatibility Tool to determine if your transceiver

supports monitoring. See the Junos OS documentation for your device for a description of the monitoring fields.



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.

RELATED DOCUMENTATION

[show interfaces diagnostics optics \(Gigabit Ethernet, 10-Gigabit Ethernet, 40-Gigabit Ethernet, 100-Gigabit Ethernet, and Virtual Chassis Port\)](#)

[show interfaces diagnostics optics \(SONET\)](#)

[show interfaces diagnostics optics](#)

[show interfaces diagnostics optics](#)

[show interfaces diagnostics optics](#)

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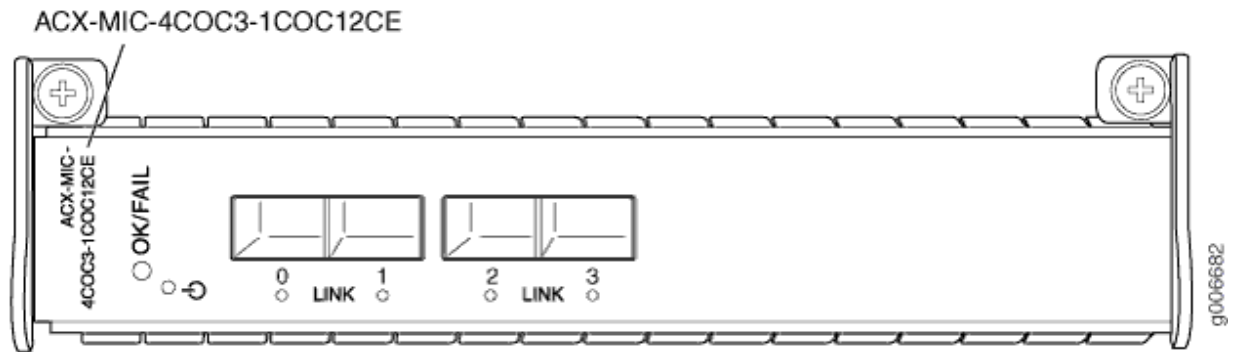
MIC Descriptions

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Channelized OC3/STM1 (Multi-Rate) Circuit Emulation MIC with SFP



Software release • Junos OS Release 12.3 and later

| | |
|-------------|--|
| Description | <ul style="list-style-type: none">• Four OC3/STM1 ports• Rate-selectable using one of the following rates:<ul style="list-style-type: none">• 4-port OC3/STM1• 1-port OC12/STM4• One channelized OC12/STM4 port (down to DS0)• SONET or SDH is configurable on a MIC level• SONET channelization:<ul style="list-style-type: none">• 4 OC3 channel• 336 DS1 channels• 2016 DS0 channels (combination of nxDS0)• SDH channelization:<ul style="list-style-type: none">• 4 STM1 channel• 252 E1 channels• 2016 DS0 channels (combination of nxDS0)• Power requirement: 2.21 A @ 12 V (26.56 W)• Weight: 1.67 lb (0.76 kg)• Model number: ACX-MIC-4COC3-1COC12CE |
|-------------|--|

| | |
|-------------------|--|
| Hardware features | <ul style="list-style-type: none">• Ports are numbered 0 through 3 |
|-------------------|--|

| | |
|-------------------|--|
| Software features | <ul style="list-style-type: none">• Per-MIC SONET/SDH framing• Internal and loop clocking• Encapsulations:<ul style="list-style-type: none">• Pseudo Wire Emulation Edge-to-Edge (PWE3) Architecture (RFC 3985)• Requirements for Pseudo-Wire Emulation Edge-to-Edge (PWE3) (RFC 3916)• Structure-Agnostic Time Division Multiplexing (TDM) over Packet (SAToP) (RFC 4553)• Structure-Aware Time Division Multiplexed (TDM) Circuit Emulation Service over Packet Switched Network (CESoPSN) (RFC 5086)• Pseudowire Emulation Edge-to-Edge (PWE3) Control Word for Use over an MPLS PSN (RFC 4385) |
|-------------------|--|

| | |
|-----------------------|---|
| Cables and connectors | <p>TIP: You can use the Hardware Compatibility Tool to find information about the pluggable transceivers supported on your Juniper Networks device.</p> <p>NOTE: To extend the life of the laser, when a MIC is not being actively used with any valid links, take the MIC offline until you are ready to establish a link to another device. For information about taking a MIC offline, see the request chassis pic offline command in the <i>Junos OS System Basics and Services Command Reference</i>.</p> |
|-----------------------|---|

| | |
|------|--|
| LEDs | <p>OK/FAIL LED, one bicolor:</p> <ul style="list-style-type: none">• Green—MIC is functioning normally• Red—MIC has failed <p>LINK LED, one tricolor per port:</p> <ul style="list-style-type: none">• Off—Not enabled• Green—Online with no alarms or failures• Yellow—Online with alarms for remote failures• Red—Active with a local alarm; router has detected a failure |
|------|--|

Alarms, errors, and events

Structure-agnostic alarms for T1 and E1 interface:

- Alarm indication signal (AIS)
- Loss of signal (LOS)
- Line code violation (LCV)
- Errored seconds (ES)
- Line-errored seconds (LES)
- Severely errored seconds (SES)
- Unavailable errored seconds (UAS)

Structure aware alarms for T1 and E1 interface:

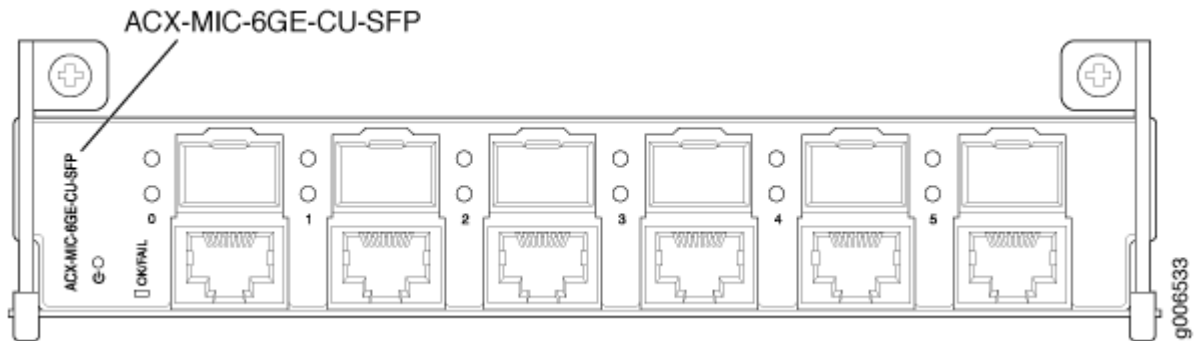
- Severely errored frame (SEF)
- Block error event (BEE)
- Loss of frame (LOF)
- Yellow alarm (remote alarm indication RAI)
- Path code violation (PCV)
- Severely errored frame seconds (SEFS)
- Bursty errored seconds (BES)

RELATED DOCUMENTATION

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Gigabit Ethernet Copper/SFP MIC



Software release • Junos OS Release 12.3x51-D10 and later

Description

- 6 tri-speed (10/100/1000 Mbps) ports, either RJ-45 or SFP
- Supports large Ethernet frame sizes for more efficient throughput across the intra-POP network
- Power requirement without PoE: 1.5 A @ 12 V (18 W)
- Weight: 1.2 lb (0.54 kg)
- Model number: ACX-MIC-6GE-CU-SFP

Hardware features

- High-performance throughput on each port at speeds up to 1 Gbps
- Autonegotiation between Gigabit Ethernet circuit partners
- Full-duplex mode
- Maximum transmission units (MTUs) of up to 9192 bytes
- PoE Gigabit Ethernet ports that provide 32 W of electrical current per port to devices (limited to 170 W per chassis).
- Ports are numbered **0** through **5**

- Software features
- Optical diagnostics and related alarms
 - Virtual Router Redundancy Protocol (VRRP) support
 - IEEE 802.1Q virtual LANs (VLANs) support
 - Remote monitoring (RMON) EtherStats
 - Source MAC learning
 - MAC accounting and policing—Dynamic local address learning of source MAC addresses
 - Flexible Ethernet encapsulation
 - Multiple tag protocol identifiers (TPID)

Cables and connectors

RJ-45 ports:

- Connector: Four-pair, Category 5 shielded twisted-pair connectivity through an RJ-45 connector
- Pinout: MDI, MDI crossover
- Maximum distance: 328 ft/100 m
- Supported interface standards:
 - 1000BASE-T
 - 10/100/1000BASE-T

TIP: You can use the [Hardware Compatibility Tool](#) to find information about the pluggable transceivers supported on your Juniper Networks device.

NOTE: To extend the life of the laser, when a MIC is not being actively used with any valid links, take the MIC offline until you are ready to establish a link to another device. For information about taking a MIC offline, see the **request chassis pic offline** command in the [CLI Explorer](#).

LEDs

OK/FAIL LED, one bicolor:

- Green—MIC is functioning normally
- Red—MIC has failed

Port link LEDs:

- Activity—If the LED is blinking green, the port is sending or receiving data; if there is no light, the port is down or is not active.
- Link—If the LED is yellow, the port link is up; if there is no light, the port links is down.

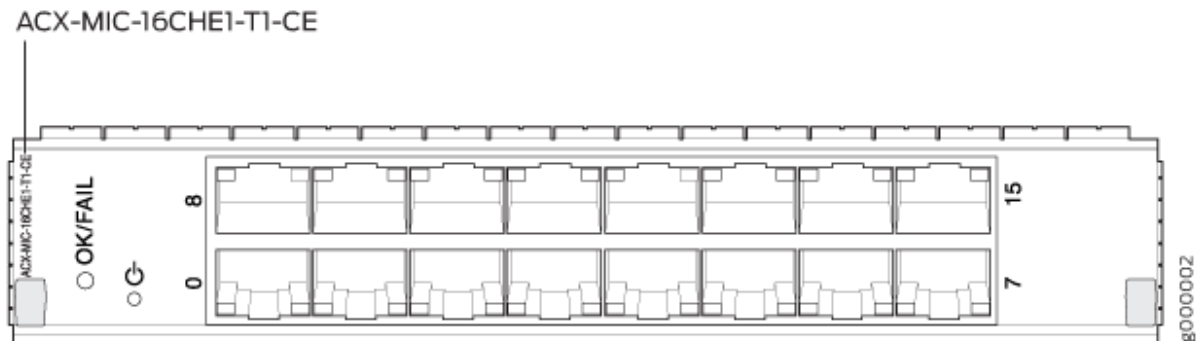
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Channelized E1/T1 Circuit Emulation MIC

Figure 1: Channelized E1/T1 Circuit Emulation MIC



Software
release

- Junos OS Release 12.3x52-D11 and later

| | |
|-------------------|---|
| Description | <ul style="list-style-type: none">• Sixteen E1 or T1 ports• Per-MIC E1/T1 framing• DS1 channelization per MIC:<ul style="list-style-type: none">• 1 DS1 channel• 24 DS0 channels• E1 channelization per PIC:<ul style="list-style-type: none">• 1 E1 channel• 32 DS0 channels• Internal and loop clocking• Power requirement: 2.21 A @ 12 V (26.55 W)• Weight: 1.57 lb (0.71 kg)• Model number: ACX-MIC-16CHE1-T1-CE |
| Hardware features | <ul style="list-style-type: none">• Ports are numbered:<ul style="list-style-type: none">• Top row: 8 and 15 from left to right• Bottom row: 0 and 7 from left to right |

| | |
|-----------------------|--|
| Software features | <ul style="list-style-type: none"> • Full bit error rate test (BERT) • DS1 and E1 interfaces are selectable on a per-port granularity • Per-port framing is not supported • You can configure the following framing modes using the CLI: <ul style="list-style-type: none"> • T1—SF, ESF, D4/superframe, ESF (extended superframe) • E1—G704, G704-no-crc4, unframed • Local, remote, and per-port loopback diagnostics • Encapsulations: <ul style="list-style-type: none"> • Pseudowire Emulation Edge to Edge (PWE3) Architecture (RFC 3985) • Requirements for Pseudowire Emulation Edge to Edge (PWE3) (RFC 3916) • Structure-Agnostic Time Division Multiplexing (TDM) over Packet (SAToP) (RFC 4553) • Structure-Aware Time Division Multiplexed (TDM) Circuit Emulation Service over Packet-Switched Network (CESoPSN) (RFC 5086) • Pseudowire Emulation Edge to Edge (PWE3) Control Word for Use over an MPLS PSN (RFC 4385) |
| Cables and connectors | <ul style="list-style-type: none"> • RJ-48 connector |

LEDs

OK/FAIL LED, one bicolor:

- Green—MIC is functioning normally.
- Yellow—MIC has failed.

One tricolor per port:

- Off—Not enabled.
 - Green—Online with no alarms or failures.
 - Yellow—Online with alarms for remote failures.
 - Red—Active with a local alarm; router has detected a failure.
-

Alarms, errors,
and events

- Structure-agnostic alarms for T1 and E1 interface:
 - Alarm indication signal (AIS)
 - Loss of signal (LOS)
- Structure-aware alarms for T1 and E1 interface:
 - Loss of signal (LOS)
 - Alarm indication signal (AIS)
 - Loss of frame (LOF)
 - Remote alarm indication signal (RAIS)
- Structure-agnostic error detection for T1 and E1 interface:
 - Errored seconds (ES)
 - Line code violation (LCV)
 - Line errored seconds (LES)
 - Severely errored seconds (SES)
 - Unavailable seconds (UAS)
 - Loss of signal seconds (LOSS)
- Structure-aware error detection for T1 and E1 interface:
 - Severely errored frame (SEF)
 - Block error event (BEE)
 - Line code violation (LCV)
 - Path code violation (PCV)
 - Line errored seconds (LES)
 - Errored seconds (ES)
 - Severely errored seconds (SES)
 - Severely errored frame seconds (SEFS)

- Bursty errored seconds (BES)
 - Unavailable seconds (UAS)
 - Loss of signal seconds (LOSS)
 - Loss of framing seconds (LOFS)
 - Far-end block error (FEBE) (E1 only)
 - CRC errors (E1 only)
-

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