

Cisco CRS-1 Series 2 Port 10 Gigabit Ethernet WAN/LAN-PHY Flexible Interface Module

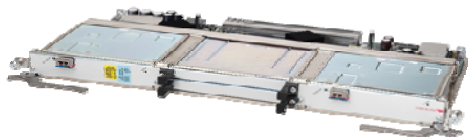
The Cisco® CRS-1 Carrier Routing System is the industry's first carrier router offering continuous system operation, unprecedented service flexibility, and system longevity. The Cisco CRS-1 is powered by Cisco IOS® XR Software, a unique self-healing, distributed operating system. As part of a video-enabled IP Next-Generation Network (NGN), the Cisco CRS-1 Series delivers continuous, always-on operation that easily scales to support the massive bandwidth requirements of visual networking experiences such as high-definition IPTV and Cisco TelePresence™. These services demand a platform that delivers predictable forwarding performance and efficient, intelligent fabric-based multicast replication. The Cisco CRS-1 Series enables the Internet and NGNs to handle the approaching zettabyte era of carrier IP communications while protecting network investments for decades to come.

Product Overview

The Cisco CRS-1 Series 2 Port 10 Gigabit Ethernet WAN/LAN-PHY Flexible Interface Module (Figure 1) provides two ports of IEEE 802.3ae-compliant 10 Gigabit Ethernet WAN/LAN-physical (PHY) layer interfaces and two available Cisco I-Flex shared port adapter (SPA) slots. By providing service intelligence, modularity, and configuration flexibility with fully compatible SPAs, the Cisco I-Flex design offers carriers long-term savings and the ability to handle evolving service delivery requirements, such as SONET-to- Ethernet.

The SPAs can be a mix of Ethernet or Packet over SONET/SDH (PoS), and are identical to the SPAs used in other Cisco platforms such as the Cisco XR 12000 Series and the Cisco CRS-1 Carrier Routing System. Gigabit Ethernet physical interface characteristics can be selected using different modular Small Form-Factor Pluggable (SFP) optics: short, long, extra long, and copper interfaces are supported. Extensive per-port and per-VLAN counters simplify network performance monitoring and troubleshooting.

Figure 1. Cisco CRS-1 Series 2 Port 10 Gigabit Ethernet WAN/LAN Flexible Interface Module



Features and Benefits

- Two 10 GE WAN/LAN-PHY interfaces
- Two half-height SPA bays
- Per-port flexibility for distance, selected using the appropriate SFP optical or copper modules
- Compatible with all Cisco CRS-1 Series chassis
- Supports in-use insertion and removal without the need to power down the chassis
- Simple configuration, monitoring, and maintenance

Product Specifications

Table 1. Product Specifications

Feature	Description
Chassis compatibility	Compatible with both 4-slot and 8-slot Cisco CRS-1 chassis Requires one of the following forwarding engines: CRS-FP40, CRS-MS-40G-B
Software compatibility	Cisco IOS XR Software Release 3.8.1 or later
Interface types	Integrated Gigabit Ethernet using SFPs for physical interfaces XFPs supported: <ul style="list-style-type: none"> • LR (10 km), ER (40 km), and ZR (80 km) SPAs can be Packet over SONET/SDH (PoS) or Ethernet. The following SPAs are supported: <ul style="list-style-type: none"> • SPA-5X1GE-V2 • SPA-8X1GE • SPA-8X1GE-V2 • SPA-10X1GE-V2 • SPA-1X10GE-L-V2 • SPA-1X10GE-WL-V2 • SPA-4XOC3-POS • SPA-8XOC12-POS • SPA-2XOC48POS/RPR • SPA-4XOC48POS/RPR • SPA-OC192POS-VSR • SPA-OC192POS-XFP
Port density	Two ports of integrated 10 Gigabit Ethernet WAN/LAN-PHY per card, each using XFP physical interfaces Two normal-height SPAs or one double-height SPA
Ethernet	IEEE 802.3ae WAN/LAN-PHY Encapsulations: ARPA, IEEE 802.2/SAP, IEEE 802.3/SNAP IEEE 802.3x flow control Jumbo frames (9188 bytes) IEEE 802.1p tagging Source/destination MAC accounting and VLAN accounting <ul style="list-style-type: none"> • Autonegotiation • Full-duplex operation • 802.1Q VLAN termination • Per-port byte and packet counters for policy drops; oversubscription drops; cyclic redundancy check (CRC) error drops; packet sizes; and unicast, multicast, and broadcast packets • Per-VLAN byte and packet counters for policy drops; oversubscription drops; and unicast, multicast, and broadcast packets • Per-port byte counters for good bytes and dropped bytes
Ethernet LED indicators	LED off: Port is not enabled by software LED: Port is enabled by software, but there is a problem with the Ethernet link LED green: Port is enabled by software, and there is a valid Ethernet link
Reliability and availability	Online insertion and removal (OIR) without affecting system traffic Field-replaceable XFP optical modules
Network management	Cisco IOS XR Software command-line interface (CLI) Simple Network Management Protocol (SNMP) Extensible Markup Language (XML) interface
Physical dimensions	Occupies one PLIM slot Weight: 8.4 lb (3.8 kg) Height: 20.6 in. (52.2 cm) Depth: 11.2 in. (28.4 cm) Width: 1.8 in. (4.49 cm)
Power	110 W

Feature	Description
Environmental conditions	<p>Storage temperature: –40 to 70°C (–40 to 158°F)</p> <p>Operating temperature:</p> <p>Normal: 5 to 40°C (41 to 104°F)</p> <p>Short-term: –5 to 50°C (23 to 122°F) short-term</p> <p>Relative humidity:</p> <p>Normal: 5% to 85%</p> <p>Short-term: 5% to 90%, but not to exceed 0.024 kg water/kg of dry air</p> <p>Short-term refers to a period of not more than 96 consecutive hours and a total of not more than 15 days in 1 year. (This refers to a total of 360 hours in any given year, but no more than 15 occurrences during that 1-year period.)</p>

Approvals and Compliance

Table 2. Compliance and Agency Approvals

Feature	Description
Safety standards	<p>UL/CSA/IEC/EN 60950-1</p> <p>IEC/EN 60825 Laser Safety</p> <p>AS/NZS 60950.1</p> <p>FDA – Code of Federal Regulations Laser Safety</p>
EMI	<p>FCC Class A</p> <p>ICES 003 Class A</p> <p>AS/NZS 3548 Class A</p> <p>CISPR 22 (EN55022) Class A</p> <p>VCCI Class A</p> <p>BSMI Class A</p> <p>IEC/EN 61000-3-2: Power Line Harmonics</p> <p>IEC/EN 61000-3-3: Voltage Fluctuations and Flicker</p>
Immunity (basic standards)	<p>IEC/EN-61000-4-2: Electrostatic Discharge Immunity (8 kV Contact, 15 kV Air)</p> <p>IEC/EN-61000-4-3: Radiated Immunity (10 V/m)</p> <p>IEC/EN-61000-4-4: Electrical Fast Transient Immunity (2 kV Power, 1 kV Signal)</p> <p>IEC/EN-61000-4-5: Surge AC Port (4 kV CM, 2 kV DM)</p> <p>IEC/EN-61000-4-5: Signal Ports (1 kV)</p> <p>IEC/EN-61000-4-5: Surge DC Port (1 kV)</p> <p>IEC/EN-61000-4-6: Immunity to Conducted Disturbances (10 Vrms)</p> <p>IEC/EN-61000-4-8: Power Frequency Magnetic Field Immunity (30 A/m)</p> <p>IEC/EN-61000-4-11: Voltage DIPS, Short Interruptions, and Voltage Variations</p>
ETSI and EN	<p>EN300 386: Telecommunications Network Equipment (EMC)</p> <p>EN55022: Information Technology Equipment (Emissions)</p> <p>EN55024: Information Technology Equipment (Immunity)</p> <p>EN50082-1/EN-61000-6-1: Generic Immunity Standard</p>
Network Equipment Building Systems (NEBS)	<p>This product is designed to meet the following requirements (qualification in progress):</p> <p>SR-3580: NEBS Criteria Levels (Level 3)</p> <p>GR-1089-CORE: NEBS EMC and Safety</p> <p>GR-63-CORE: NEBS Physical Protection</p>

Additional Specifications

Table 3. Optical Specifications: Modular XFP Optics

Gigabit Ethernet XFP Optics	Maximum Distance
XFP-10GLR-OC192SR (=)	LR: 10 km
XFP-10GER-OC192IR (=)	ER: 40 km
XFP-10GER-OC192LR (=)	ZR: 80 km

Ordering Information

To place an order, visit the [Cisco Ordering Home Page](#).

Table 4. Ordering Information

Product Part Number	Product Name
2-10GE-WL-FLEX(=)	Cisco CRS-1 Series 2x10GE WAN/LAN Flexible Interface Module
XFP-10GLR-OC192SR (=)	Cisco 10 Gigabit Ethernet LR (10 km) Optics
XFP-10GER-OC192IR (=)	Cisco 10 Gigabit Ethernet ER (40 km) Optics
XFP-10GER-OC192LR (=)	Cisco 10 Gigabit Ethernet ZR (80 km) Optics

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For More Information

For more information about the Cisco CRS-1 Series 2 Port 10Gigabit Ethernet WAN/LAN-PHY Flexible Interface Module, contact your local account representative or visit: www.cisco.com/go/crs.



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