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

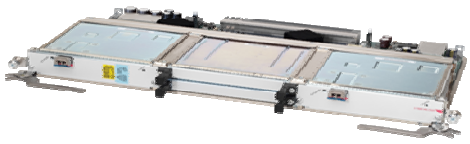
The Cisco® CRS-1 Carrier Routing System is the industry's first carrier router offering continuous system operation, unprecedented service flexibility, and system longevity. The Cisco CRS-1 is powered by Cisco IOS® XR Software, a unique self-healing, distributed operating system. As part of a video-enabled 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 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 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 all Cisco CRS-1 and CRS-3 chassis Requires one of the following forwarding engines (for CRS-1 chassis): CRS-FP40 (on CRS-4/S and CRS-8/S only), CRS-MSC-40G-B (on CRS-4/S, CRS-8/S, CRS-16/S, and CRS Multi-chassis)
Software compatibility	Cisco IOS XR Software Release 3.8.1 or later for CRS-1 Cisco IOS XR Software Release 4.0.0 or later for CRS-3
Interface types	Integrated Gigabit Ethernet using SFPs for physical interfaces XFPs supported: • 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: • 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 • 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	**Storage temperature:** –40 to 70°C (–40 to 158°F) **Operating temperature:** Normal: 5 to 40°C (41 to 104°F) Short-term: –5 to 50°C (23 to 122°F) short-term **Relative humidity:** Normal: 5% to 85% Short-term: 5% to 90%, but not to exceed 0.024 kg water/kg of dry air 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.)

Approvals and Compliance

Table 2. Compliance and Agency Approvals

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

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

Service and Support

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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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