

Cisco CRS Series 4-Port 10GE LAN/WAN-PHY 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 4-Port 10GE LAN/WAN-PHY Interface Module (Figure 1) provides four line-rate, IEEE 802.3-compliant 10 Gigabit Ethernet interfaces. Physical connections can be made using modular 10-Gbps Small Form-Factor Pluggable (XFP) pluggable optics.

This data sheet provides detailed product specifications for the Cisco CRS-1 Series 4-Port 10GE LAN/WAN-PHY Interface Module (4-10GBE-WL-XFP). For more information about the Cisco CRS Family or about other available interfaces, visit: <http://www.cisco.com/go/crs>.

Figure 1. Cisco CRS-1 4-Port 10GE LAN/WAN-PHY Interface Module



Features and Benefits

- Four line-rate 10 Gigabit Ethernet full-duplex interfaces
- Per-port flexibility for optical reach—selected using the appropriate XFP pluggable optical modules
- Compatibility with all Cisco CRS Series chassis
- Support for OIR (online insertion and removal) without the need to power down the chassis
- Simple configuration, monitoring, and maintenance

Product Specifications

Table 1 gives specifications for the Cisco CRS-1 4-Port 10GE LAN/WAN-PHY Interface Module.

Table 1. Product Specifications

Feature	Description
Chassis compatibility	<ul style="list-style-type: none"> Compatible with all current Cisco CRS-1 or CRS-3 line-card chassis Compatible with all current Cisco CRS-1 line-card chassis with either 40-Gbps or 140-Gbps fabric cards Requires Cisco 40-Gbps Modular Services Card or Cisco 40-Gbps Forwarding Processor Card for operation
Software compatibility	<ul style="list-style-type: none"> Cisco IOS XR Software Release 3.8.4, 3.9.1 or later for CRS-1 Cisco IOS XR Software Release 4.0 or later for CRS-3
Port density	<ul style="list-style-type: none"> Four ports of 10 Gigabit Ethernet per physical-layer-interface-module (PLIM) slot
Ethernet	<ul style="list-style-type: none"> Encapsulations: ARPA, IEEE 802.2/Service Access Point (SAP), and IEEE 802.3/Subnetwork Access Protocol (SNAP) IEEE 802.x flow control 802.1q VLAN support and Jumbo Frames IEEE 802.1p tagging Source and destination MAC accounting and VLAN accounting 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 10 Gigabit Ethernet configurable LAN/WAN-PHY support Synchronous Ethernet IEEE 1588
Performance	<ul style="list-style-type: none"> 40-Gbps line-rate throughput Maximum number of PLIMs per chassis: 4 slots: 4, 8 slots: 8, and 16 slots: 16
Reliability and availability	<ul style="list-style-type: none"> Line-card online insertion and removal (OIR) support without affecting system
Network management	<ul style="list-style-type: none"> Cisco IOS XR Software command-line interface (CLI) Simple Network Management Protocol (SNMP) XML interface CraftWorks Interface (CWI) Cisco Active Network Abstraction (ANA)
Physical dimensions	<ul style="list-style-type: none"> Occupies one-half slot on a Cisco CRS-3 and CRS-1 chassis Weight: 7.85 lb (3.55 kg) Height: 20.6 in. (52.2 cm) Depth: 11.2 in. (28.4 cm) Width: 1.8 in. (4.49 cm)
Power	150 watts
Environmental conditions	<ul style="list-style-type: none"> Storage temperature: -40 to 70°C (-40 to 158°F) Operating temperature: <ul style="list-style-type: none"> Normal: 5 to 40°C (41 to 104°F) Short-term: -5 to 50°C (23 to 122°F) Relative humidity: <ul style="list-style-type: none"> Normal: 5 to 85% Short-term: 5 to 90% but not to exceed 0.024 kg water/kg of dry air <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 gives standards compliance information for the Cisco CRS-1 4-Port 10GE LAN/WAN-PHY Interface Module.

Table 2. Compliance and Agency Approvals

Feature	Description
Safety standards	<ul style="list-style-type: none"> • UL/CSA/IEC/EN 60950-1 • AS/NZS 60950.1 • IEC/EN 60825 Laser Safety • FDA-Code of Federal Regulations Laser Safety
EMI	<ul style="list-style-type: none"> • FCC Class A • ICES 003 Class A • AS/NZS CISPR 22 Class A • CISPR 22 (EN55022) Class A • VCCI Class A • IEC/EN 61000-3-2: Power Line Harmonics • IEC/EN 61000-3-3: Voltage Fluctuations and Flicker
Immunity (basic standards)	<ul style="list-style-type: none"> • IEC/EN-61000-4-2: Electrostatic Discharge Immunity (8-kV contact, 15-kV air) • IEC/EN-61000-4-3: Radiated Immunity (10V/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 (30A/m) • IEC/EN-61000-4-11: Voltage Dips, Short Interruptions, and Voltage Variations
ETSI and EN	<ul style="list-style-type: none"> • 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 Standards (NEBS)	<p>This product is designed to meet the following requirements (qualification in progress):</p> <ul style="list-style-type: none"> • SR-3580: NEBS Criteria Levels (Level 3) • GR-1089-CORE: NEBS EMC and Safety • GR-63-CORE: NEBS Physical Protection

Additional Specifications

Table 3 gives additional specifications for the Cisco CRS-1 Series 4-Port 10 Gigabit Ethernet LAN/WAN-PHY Interface Module.

Table 3. Additional Specifications

Parameter	Long Reach 1310 nm (LR/LR+)	Extended Reach 1550 nm (ER+)
Connector type	LC	LC
Target distance	10 km	40 km
Transmitter		
Power out (maximum)	0.5 dBm	4 dBm
Power out (minimum)	-8.2 dBm	-4.7 dBm
Receiver		
P (RMax) (overload)	0.5 dBm	-1.0 dBm
P (RMin) (sensitivity)	-14.4 dBm	-15.8 dBm

Parameter	Long Reach 1310 nm (LR/LR+)	Extended Reach 1550 nm (ER+)
Optical link		
Fiber type	G.652 (single-mode fiber [SMF])	G.652 (SMF)
Optical path penalty	3.2 dB	4.1 dB
Compliance	IEEE 802.3ae 10GBASE-LR	IEEE 802.3ae 10GBASE-ER
Gigabit Ethernet XFP Optics		
10 Gigabit Ethernet short-reach (SR) optics (multimode fiber)		300 meters
10 Gigabit Ethernet long-reach (LR) optics (single-mode fiber)		6.2 miles (10 km)
10 Gigabit Ethernet extended-reach (ER) optics (single-mode fiber)		25 miles (40 km)
10 Gigabit Ethernet long-haul (ZR) optics (single-mode fiber)		50 miles (80 km)
10 Gigabit DWDM fixed wavelength XFP (100-GHz ITU grid)		50 miles (80 km)
10 Gigabit DWDM Tunable XFP (50-GHz ITU grid)*		50 miles (80 km)

* Not yet qualified on this card; planned for future release

Ordering Information

To place an order, contact your local Cisco representative or visit the Cisco Ordering Home Page. Use the ordering information in Table 4.

Table 4. Ordering Information

Product Part Number	Product Name
4-10GBE-WL-XFP(=)	Cisco CRS-1 4-port 10GbE LAN/WAN-PHY Interface Module
XFP-10G-MM-SR(=)	Cisco 10 Gigabit Ethernet SR (300 m) Optics
XFP-10GLR-OC192SR-L(=)	Cisco 10 Gigabit Ethernet LR (10 km) Optics
XFP-10GER-OC192IR-L(=)	Cisco 10 Gigabit Ethernet ER (40 km) Optics
XFP-10GZR-OC192LR(=)	Cisco 10 Gigabit Ethernet ZR (80 km) Optics
DWDM-XFP-xx.xx(=)	Cisco 10 Gigabit DWDM (80 km) Optics

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For More Information

For more information about the Cisco CRS-1 Series 4-Port 10GE LAN/WAN-PHY Interface Module, contact your local Cisco representative or visit: <http://www.cisco.com/go/crs>.



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Printed in USA

C78-608171-01 05/11