

# Cisco CRS Series 8-Port 10GE LAN/WAN-PHY Interface Module

The Cisco<sup>®</sup> 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<sup>®</sup> 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 8-Port 10 Gigabit Ethernet LAN/WAN-PHY Interface Module (Figure 1) provides eight 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 8-Port 10GE LAN/WAN-PHY Interface Module (8-10GBE-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 8-Port 10GE LAN/WAN-PHY Interface Module



## Features and Benefits

- Eight 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 8-Port 10GE LAN/WAN-PHY Interface Module.

**Table 1.** Product Specifications

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

**Table 2.** Compliance and Agency Approvals

Feature	Description
<b>Safety standards</b>	<ul style="list-style-type: none"> <li>• UL/CSA/IEC/EN 60950-1</li> <li>• AS/NZS 60950.1</li> <li>• IEC/EN 60825 Laser Safety</li> <li>• FDA - Code of Federal Regulations Laser Safety</li> </ul>
<b>EMI</b>	<ul style="list-style-type: none"> <li>• FCC Class A</li> <li>• ICES 003 Class A</li> <li>• AS/NZS CISPR 22 Class A</li> <li>• CISPR 22 (EN55022) Class A</li> <li>• VCCI Class A</li> <li>• IEC/EN 61000-3-2: Power Line Harmonics</li> <li>• IEC/EN 61000-3-3: Voltage Fluctuations and Flicker</li> </ul>
<b>Immunity (basic standards)</b>	<ul style="list-style-type: none"> <li>• IEC/EN-61000-4-2: Electrostatic Discharge Immunity (8-kV contact, 15-kV air)</li> <li>• IEC/EN-61000-4-3: Radiated Immunity (10V/m)</li> <li>• IEC/EN-61000-4-4: Electrical Fast Transient Immunity (2-kV power, 1-kV signal)</li> <li>• IEC/EN-61000-4-5: Surge AC Port (4-kV CM, 2-kV DM)</li> <li>• IEC/EN-61000-4-5: Signal Ports (1 kV)</li> <li>• IEC/EN-61000-4-5: Surge DC Port (1 kV)</li> <li>• IEC/EN-61000-4-6: Immunity to Conducted Disturbances (10 Vrms)</li> <li>• IEC/EN-61000-4-8: Power Frequency Magnetic Field Immunity (30A/m)</li> <li>• IEC/EN-61000-4-11: Voltage Dips, Short Interruptions, and Voltage Variations</li> </ul>
<b>ETSI and EN</b>	<ul style="list-style-type: none"> <li>• EN300 386: Telecommunications Network Equipment (EMC)</li> <li>• EN55022: Information Technology Equipment (Emissions)</li> <li>• EN55024: Information Technology Equipment (Immunity)</li> <li>• EN50082-1/EN-61000-6-1: Generic Immunity Standard</li> </ul>
<b>Network Equipment Building Standards (NEBS)</b>	<p>This product is designed to meet the following requirements (qualification in progress):</p> <ul style="list-style-type: none"> <li>• SR-3580: NEBS Criteria Levels (Level 3)</li> <li>• GR-1089-CORE: NEBS EMC and Safety</li> <li>• GR-63-CORE: NEBS Physical Protection</li> </ul>

## Additional Specifications

Table 3 gives additional specifications for the Cisco CRS-1 Series 8-Port 10GE LAN/WAN-PHY Interface Module.

**Table 3.** Additional Specifications

Parameter	Long Reach 1310 nm (LR/LR+)	Extended Reach 1550 nm (ER+)	Long-haul 1550 nm (ZR)
Connector type	LC	LC	LC
Target distance	10 km	40 km	80 km
<b>Transmitter</b>			
Power out (maximum)	0.5 dBm	4 dBm	4.0 dBm
Power out (minimum)	-8.2 dBm	-4.7 dBm	0 dBm
<b>Receiver</b>			
P (RMax) (overload)	0.5 dBm	-1.0 dBm	-7.0 dBm
P (RMin) (sensitivity)	-14.4 dBm	-15.8 dBm	-24 dBm

Parameter	Long Reach 1310 nm (LR/LR+)	Extended Reach 1550 nm (ER+)	Long-haul 1550 nm (ZR)
<b>Optical link</b>			
Fiber type	G.652 (single-mode fiber [SMF])	G.652 (SMF)	G.652 (SMF)
Compliance	IEEE 802.3ae 10GBASE-LR	IEEE 802.3ae 10GBASE-ER	IEEE 802.3ae 10GBASE-ZR
<b>Gigabit Ethernet XFP Optics</b>		<b>Maximum Distance</b>	
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
8-10GBE-WL-XFP(=)	Cisco CRS-1 8-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 8-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

C78-608169-01 07/11