

DATA SHEET

CISCO CRS-1 16-PORT OC-48C/STM-16C POS/DPT 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 designed for always-on operation while scaling system capacity up to 92 Tbps. The innovative system architecture combines the Cisco Silicon Packet Processor, the first programmable 40-Gbps application-specific integrated circuit (ASIC), with the Cisco Service Separation Architecture for unprecedented service flexibility and speed to service. The Cisco CRS-1 marks a new era in carrier IP Communications by powering the foundation for network and service convergence today while protecting investments for decades to come.

This data sheet provides detailed product specifications for the Cisco CRS-1 16-Port OC-48c/STM-16c POS/DPT Interface Module. For more information about the Cisco CRS-1 or about other interfaces available for the Cisco CRS-1, visit:

<http://www.cisco.com/go/crs>



PRODUCT SPECIFICATIONS

Table 1. Product Specifications

Feature	Description
Chassis Compatibility	<ul style="list-style-type: none"> • Compatible with all current Cisco CRS-1 line-card chassis • Requires modular services card for operation
Software Compatibility	<ul style="list-style-type: none"> • Cisco IOS® XR Software Release 2.0 & 3.0 or higher
Protocols	<ul style="list-style-type: none"> • Packet over Synchronous Optical Network/Synchronous Digital Hierarchy (SONET/SDH) • RFC 1619/2615, Point-to-Point Protocol (PPP) over SONET/SDH • RFC 1662, PPP in High-Level Data Link Control (HDLC)-like framing • RFC 2615, PPP over SONET/SDH • HDLC
Port Density	<ul style="list-style-type: none"> • One 16-port OC-48/STM-16 POS interface per physical layer interface module (PLIM) • All 16 ports can be configured with either short-reach (SR) or long-reach (LR) Small Form-Factor Pluggable (SFP) optics
Optical Options	<ul style="list-style-type: none"> • Each port is configurable: <ul style="list-style-type: none"> – SR SFP—LC connector – LR SFP—LC connector • Optical specifications are detailed in Table 3 below.

Feature	Description
Layer1/Layer 2	<ul style="list-style-type: none"> • Supports a maximum transmission unit (MTU) of up to 9188 bytes • POS channel is supported (up to 8 interfaces in hardware) • Layer 2 encapsulations: HDLC, PPP; no subinterface support • Error counts for B1, B2, B3 • Threshold-crossing alerts (TCAs), far end block error path (FEBE) for B1, B2, and B3 with threshold that can be set • Loss of signal (LOS), loss of frame (LOF), line alarm indicator signal (LAIS), path alarm indicator signal (PAIS), loss of pointer (LOP), line remote defect indicator (LRDI), path remote defect indicator (PRDI), signal failure (SF), signal degrade (SD), line remote error indicator (line FEBE), and path remote error indicator (path FEBE) • Performance monitoring—Error counts for B1, B2, B3, TCAs, and FEBE for B1, B2, or B3 with threshold that can be set • Synchronization • Local (internal) or loop-timed (recovered from network) • Stratum 3 clock accuracy over full operating temperature • Pointer activity monitoring • Local (diagnostic) and line (network) loopback • Payload mapping • 1 + X⁴³ self-synchronous scrambler • Power and input current monitoring
Reliability and Availability	Online insertion and removal (OIR) without affecting system traffic
Network Management	<ul style="list-style-type: none"> • Simple Network Management Protocol (SNMP) • Extensible Markup Language (XML) interface • CraftWorks Interface (CWI)
Physical Dimensions	<ul style="list-style-type: none"> • Occupies one PLIM slot • Weight: 7.8 lb (3.5 kg) • Height: 20.6 in. (52.2 cm) • Depth: 11.2 in. (28.4 cm) • Width: 1.8 in. (4.49 cm)
Power	150W
Environmental Conditions	<ul style="list-style-type: none"> • Storage Temperature: -40°C to 70°C (-40°F to 158°F) • Operating Temperature: <ul style="list-style-type: none"> – Normal: 5°C to 40°C (41°F to 104°F) – Short term: -5°C to 50°C (23°F to 122°F) short term • 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. Compliance and Agency Approvals

Feature	Description
Safety Standards	<ul style="list-style-type: none"> • UL/CSA/IEC/EN 60950-1 • IEC/EN 60825 Laser Safety • ACA TS001 • AS/NZS 60950 • FDA-Code of Federal Regulations Laser Safety
EMI	<ul style="list-style-type: none"> • 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)	<ul style="list-style-type: none"> • IEC/EN-61000-4-2: Electrostatic Discharge Immunity (8kV Contact, 15kV Air) • IEC/EN-61000-4-3: Radiated Immunity (10V/m) • IEC/EN-61000-4-4: Electrical Fast Transient Immunity (2kV Power, 1kV Signal) • IEC/EN-61000-4-5: Surge AC Port (4kV CM, 2kV DM) • IEC/EN-61000-4-5: Signal Ports (1kV) • IEC/EN-61000-4-5: Surge DC Port (1kV) • IEC/EN-61000-4-6: Immunity to Conducted Disturbances (10Vrms) • 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 Systems (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. Additional Specifications—Optics

Parameter	Short Reach 1310-nm (SR-1)	Long Reach 1550-nm (LR-2)
Connector Type	SFP—LC connector	SFP—LC connector
Target Distance	2 km	80 km

Parameter	Short Reach 1310-nm (SR-1)	Long Reach 1550-nm (LR-2)
Transmitter		
Power out (maximum)	-3 dBm	3 dBm
Power out (minimum)	-10 dBm	-2 dBm
Extinction ratio (minimum)	8.2 dB	8.2 dB
Side-mode suppression (minimum)	N/A	30 dB
Modulation type	Direct	Direct
Receiver		
P (RMax) (minimum overload)	-3 dBm	-9 dBm
P (RMin) (minimum sensitivity)	-18 dBm	-28 dBm
Optical Link		
Fiber type	G.652 (single-mode fiber [SMF])	G.652 (SMF)
Maximum dispersion	12 ps/nm	1600 ps/nm
Attenuation range	0 to 7 dB	12 to 24 dB
Optical path penalty	1 dB	2 dB
Compliance	<ul style="list-style-type: none"> GR-253 SR-1 	<ul style="list-style-type: none"> GR-253 LR-2
Optical power monitoring	±3 dB accuracy	±3 dB accuracy

ORDERING INFORMATION

To place an order, visit:

[Cisco Ordering Home Page](#)

Table 4. Ordering Information

Product Part Number	Product Name
16OC48-POS/DPT (=)	Cisco CRS-1 16-port OC-48c/STM-16c POS/DPT interface module
POM-OC48-SR-LC-C (=)	Cisco CRS-1 1-port OC-48c/STM-16c pluggable optic module; 1310-nm SM-SR-LC
POM-OC48-LR2-LC-C (=)	Cisco CRS-1 1-port OC-48c/STM-16c pluggable optic module; 1550-nm SM-LR2-LC

SERVICE AND SUPPORT

Cisco offers numerous innovative services programs to accelerate customer success. These programs are delivered through a unique combination of people, processes, tools, and partners, resulting in high levels of customer satisfaction. Cisco services help you to protect your network investment, optimize network operations, and prepare the network for new applications to extend network intelligence and the power of your business. For more information about Cisco services, visit:

[Cisco Technical Support Services](#) or [Cisco Advanced Services](#)

FOR MORE INFORMATION

For more information about the Cisco CRS-1 16-Port OC48c/STM16c POS/DPT interface Module, contact your local account representative or visit:

<http://www.cisco.com/go/crs>



Corporate Headquarters

Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 526-4100

European Headquarters

Cisco Systems International BV
Haarlerbergpark
Haarlerbergweg 13-19
1101 CH Amsterdam
The Netherlands
www-europe.cisco.com
Tel: 31 0 20 357 1000
Fax: 31 0 20 357 1100

Americas Headquarters

Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-7660
Fax: 408 527-0883

Asia Pacific Headquarters

Cisco Systems, Inc.
168 Robinson Road
#28-01 Capital Tower
Singapore 068912
www.cisco.com
Tel: +65 6317 7777
Fax: +65 6317 7799

Cisco Systems has more than 200 offices in the following countries and regions. Addresses, phone numbers, and fax numbers are listed on **the Cisco Web site at www.cisco.com/go/offices.**

Argentina • Australia • Austria • Belgium • Brazil • Bulgaria • Canada • Chile • China PRC • Colombia • Costa Rica • Croatia • Cyprus • Czech Republic • Denmark • Dubai, UAE • Finland • France • Germany • Greece • Hong Kong SAR • Hungary • India • Indonesia • Ireland • Israel • Italy • Japan • Korea • Luxembourg • Malaysia • Mexico • The Netherlands • New Zealand • Norway • Peru • Philippines • Poland • Portugal • Puerto Rico • Romania • Russia • Saudi Arabia • Scotland • Singapore • Slovakia • Slovenia • South Africa • Spain • Sweden • Switzerland • Taiwan • Thailand • Turkey • Ukraine • United Kingdom • United States • Venezuela • Vietnam • Zimbabwe

Copyright © 2004 Cisco Systems, Inc. All rights reserved. CCIP, CCSP, the Cisco *Powered* Network mark, Cisco Unity, Follow Me Browsing, FormShare, and StackWise are trademarks of Cisco Systems, Inc.; Changing the Way We Work, Live, Play, and Learn, and iQuick Study are service marks of Cisco Systems, Inc.; and Aironet, ASIST, BPX, Catalyst, CCDA, CCDP, CCIE, CCNA, CCNP, Cisco, the Cisco Certified Internetwork Expert logo, Cisco IOS, the Cisco IOS logo, Cisco Press, Cisco Systems, Cisco Systems Capital, the Cisco Systems logo, Empowering the Internet Generation, Enterprise/Solver, EtherChannel, EtherSwitch, Fast Step, GigaStack, Internet Quotient, IOS, IP/TV, iQ Expertise, the iQ logo, iQ Net Readiness Scorecard, LightStream, Linksys, MGX, MICA, the Networkers logo, Networking Academy, Network Registrar, *Packet*, PIX, Post-Routing, Pre-Routing, RateMUX, Registrar, ScriptShare, SlideCast, SMARTnet, StrataView Plus, Stratum, SwitchProbe, TeleRouter, The Fastest Way to Increase Your Internet Quotient, TransPath, and VCO are registered trademarks of Cisco Systems, Inc. and/or its affiliates in the United States and certain other countries.

All other trademarks mentioned in this document or Web site are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (0402R) 204132.8_ETMG_AC_11.04

