Cisco 1-Gbps Wideband Shared Port Adapter for the Cisco uBR10012 Universal Broadband Router

The Cisco® 1-Gbps wideband shared port adapter (SPA) (Figure 1) for the Cisco uBR10012 Universal Broadband Router enables cable operators to offer high-speed broadband connectivity at scale and to enable new IP services. This product supports both the traditional DOCSIS® 1.x and 2.x cable modems and the emerging wideband solutions. The new Cisco 1-Gbps wideband SPA works in conjunction with the Cisco 5x20U Broadband Processing Engine to meet the ever-increasing needs of cable operators that are delivering IP-based data, voice, and video services to an ever-increasing number of subscribers.

Figure 1. Cisco 1-Gbps Wideband SPA

Product Overview

The distributed and scalable architecture of the Cisco uBR10012 Universal Broadband Router can be expanded using the Cisco 1-Gbps wideband SPA to meet the most challenging large-scale IP service needs of cable operators. More specifically, the Cisco 1-Gbps wideband SPA delivers critical cable modem termination system (CMTS) functions, such as:

- Capacity for 24 DOCSIS Annex B and 18 Annex A downstream channels
- Integrated DOCSIS Media Access Control (MAC) processing
- Connectivity to third-party edge quadrature amplitude modulations (QAMs) using dedicated dual Gigabit Ethernet interfaces
- On-board packet-bonding engine that stripes IP packets across multiple DOCSIS downstream channels

The Cisco 1-Gbps wideband SPA performs all traditional and wideband DOCSIS processing of egress packets, including BPI+ encryption. The wideband MPEG packets are aggregated and encapsulated using the DOCSIS 3.0 packet-bonding technique (that is, User Datagram Protocol [UDP], IP, and Ethernet protocols [that is, packets are DOCSIS over wideband MPEG over UDP over IP over Ethernet]).

Each Cisco uBR10012 chassis can support up to two Cisco 1-Gbps wideband SPAs by utilizing a carrier card that occupies slots 1 and 2 in the I/O portion of the chassis. Equally important, these

SPAs work in conjunction with the existing Cisco 5x20U Broadband Processing Engines to more than double the available downstream bandwidth of the Cisco uBR10012 system.

Primary Features and Benefits

Table 1 describes product features and benefits.

Table 1. Product Features and Benefits

Feature	Benefit
Channel bonding	• Expands the current 30-Mbps service portfolio options up to 240 Mbps. • Enables efficient video delivery over IP. • Flexibility to offer a number of unique service tiers concurrently. • Opportunity to scale services to meet new subscriber growth. • Path to gigabit services.
Industry-leading port density	• Provides a flexible and easy option to more than the downstream capacity to the Cisco uBR10012. • Dramatic reduction in per-port cost. • Works in conjunction with the existing 5X20 RF line cards.
Utilizes the modular CMTS architecture	• Cost-effective option to scale DOCSIS deployments. • Easy first step in moving to DOCSIS 3.0.
Supports third-party edge QAMs	• Uses existing investments.
Integrated MAC processing	• Delivers superior DOCSIS 3.0 performance.
Uses existing hybrid fiber-coaxial (HFC) infrastructure and DOCSIS provisioning	• Addresses ongoing challenge to reduce operating expenses.
Overlapping service groups	• Enables multiple fiber nodes to support custom bandwidth offerings.
SPA design	• Modular port adapters have the ability to be supported across Cisco Systems® routing platforms.

Product Specifications

Physical

- Occupies one single half-height SPA slot (half slot)
- Dual Gigabit Ethernet interface with Small Form-Factor Pluggable (SFP) connectors
- Hot-swappable; either right-side Subslot (0 or 1) can be used
- Weight: 0.5 lb (0.23 kg)
- Dimensions (H x W x D): 6.75 x 0.8 x 7.28 in. (17.5 x 2.03 x 18.49 cm)

Power

- Unit power: 20W

Reliability and Availability

- Mean time between failure (MTBF): >500,000 hr

Environmental

- Operating altitude: –197 to 13,123 ft (–60 to 4000m)
- Conforms to IEC/EN/UL/CSA 60950 requirements up to 2000m
- Storage temperature: –4 to 149℉ (–20 to 65℃)
- Operating temperature, nominal: 41 to 104℉ (5 to 4 0℃)
- Storage relative humidity: 5 to 95%
- Operating relative humidity: 10 to 90%

Regulatory compliance

Safety

- UL60950 and CAN/CSA-C22.2 No. 60950
- IEC/EN 60950
- 73/23/EECIEC/EN 60950
- AS/NZS 60950

Electromagnetic Emissions

- EN55022: 1998 Class B
- CISPR 22: 1997 Class B
- CFR 47 Part 15 Class B
- ICES -003, Issue 2, Class B, April 1995
- VCCIV-3/2000.04
- AS/NZS 3548: 1995 Class B
- CNS-13438 Class B—BSMI (BCIQ) in Taiwan

Electromagnetic Immunity

- EN50082-1: 1992
- EN50082-1: 1997
- EN55024: 1998
- EN61000-3-2: 1995
- EN61000-3-3: 1995
- EN61000-4-2: 1995 [including AMD1 + AMD2] ESD immunity
- EN61000-4-3: 1997 Radiated RF field immunity
- EN61000-4-4: 1995 Immunity to electrical fast transients
- EN61000-4-5: 1995 Surge immunity
- EN61000-4-6: 1996 [including AMD1] RF conducted immunity

Network Equipment Building Systems

Designed to meet the requirements of:

- Level 3 compliant
- GR-63 Core
- GR-1089 Core

Mechanical

- IEC 68-2-1, IEC 68-2-2, IEC 68-2-56: Operational temperature and humidity
- IEC 68-2-27: Operating shock
- IEC 68-2-64, IEC 68-2-6, IEC 68-2-47: Operating and nonoperating vibration
- IEC 68-2-32: Nonoperating freefall drop
- IEC 68-2-40: Nonoperating altitude
- IEC 68-2-27, IEC 68-2-32: Nonoperating mechanical shock
- IEC 68-2-3: Nonoperating humidity

- IEC 68-2-14, IEC 68-2-33: Nonoperating temperature shock
- LEDs
  - One SPA status LED (amber/green): off indicates that power is off; solid amber details that the wideband SPA power is on and good, and the SPA is being configured; solid green indicates the wideband SPA is ready and operational.
  - One status LED for each Gigabit Ethernet interface(amber/green): off indicates that the Gigabit Ethernet port has not been enabled by software; solid amber indicates that the Gigabit Ethernet port is enabled by software but there is no valid Ethernet link; solid green indicates the port is enabled by software and there is a valid Ethernet link.

Gigabit Ethernet Optical Connectivity Options

- Short-wavelength (SX) optics: support a maximum distance of 1804 ft (550m).
- Long-wavelength (LX) optics: support a maximum distance of 6.2 mi (10 km).
- Extended distance (ZX) optics: support a maximum distance of 43.5mi (70 km).

Network management

MIBs

Standard MIBs

- IF-MIB (RFC-2233)
- ENTITY-MIB (RFC-2737)
- MIBII (RFC1213)
- EtherLike-MIB (RFC-2665)
- IGMP-MIB (RFC-2993)
- RMON-MIB (RFC-1757)

Expression MIBs

- SNMPv2-SMI
- SNMPv2-TC
- SNMPv2-MIB
- IANAifType-MIB

SNMPv3 MIBs

- SNMP-FRAMEWORK-MIB (RFC-2571)
- SNMP-MPD-MIB (RFC-2572)
- SNMP-NOTIFICATION-MIB (RFC-2573)
- SNMP-TARGET-MIB (RFC-2573)
- SNMP-USM-MIB (RFC-2574)
- SNMP-VACM-MIB (RFC-2575)

DOCSIS and EuroDOCSIS MIB

- DOCS-IF-MIB (v2 Rev04)
- DOCS-CABLE-DEVICE-MIB (RFC-2669)
- DOCS-BPI-PLUS-MIB (Rev 5)
- DOCS-QOS-MIB (Rev 4)

- DOCS-CABLE-DEVICE-TRAP-MIB
- DOCS-SUBMGT-MIB (Rev 2)

Cisco DOCSIS MIBs

- CISCO-CABLE-WIDEBAND-MIB
- CISCO-DOCS-EXT-MIB
- CISCO-DOCS-REMOTE-QUERY-MIB
- CISCO-DOCS-QOS-EXT-MIB
- CISCO-CABLE-SPECTRUM-MIB
- CISCO-CABLE-AVAILABILITY-MIB
- CISCO-DOCS-EXT-CAPABILITY-MIB

Cisco generic MIBs

- CISCO-SYSLOG-MIB
- CISCO-SMI-MIB
- CISCO-TC-MIB
- CISCO-PRODUCTS-MIB
- CISCO-FLASH-MIB
- CISCO-CONFIG-MAN-MIB
- CISCO-CONFIG-COPY-MIB
- CISCO-MEMORY-POOL-MIB
- CISCO-BULK-FILE-MIB
- CISCO-SONET-MIB
- CISCO-TCP-MIB
- CISCO-RTTMON-MIB
- CISCO-FTP-CLENT-MIB
- CISCO-IPMROUTE-MIB
- CISCO-QUEUE-MIB
- CISCO-IMAGE-MIB
- CISCO-ENVMON-MIB
- CISCO-ENTITY-VENDORTYPE-OID-MIB
- CISCO-PRODUCTS-MIB

Product System Requirements and Compatibility

Hardware Requirements

- Cisco uBR10012 chassis.
- Cisco uBR10012 Performance Routing Engine 2 is required.
- The wideband SPA is supported with all MC5X20x RF line cards.
- The Cisco uBR10012 1-Gbps wideband SPA requires a carrier (part number UBR10-2XDS-SIP) for compatibility with the Cisco uBR10012 chassis.

Ordering Information

Visit http://www.cisco.com/en/US/ordering/index.shtml to place an order.

Table 2 details the product part numbers for the Cisco wideband SPA.

Table 2. Part Numbers for Cisco 10012 1-Gbps Wideband SPAs and Associated Options

Product Part Number	Product Description
SPA-24XDS-SFP	1-Gbps wideband SPA for the CMTS
SPA-24XDS-SFP =	1-Gbps wideband SPA for the CMTS, spare
UBR10-2XDS-SIP	2 bays I/O slot SPA interface processor
UBR10-2XDS-SIP =	2 bays I/O slot SPA interface processor, spare
SPA-BLANK	Blank cover for regular SPA
SPA-BLANK=	Blank cover for regular SPA, spare
GLC-SX-MM	1000BASE-SX pluggable transceiver
GLC-SX-MM=	1000BASE-SX pluggable transceiver, spare
GLC-LH-SM	1000BASE-LX pluggable transceiver
GLC-LH-SM=	1000BASE-LX pluggable transceiver, spare
GLC-ZX-SM	1000BASE-ZX pluggable transceiver
GLC-ZX-SM =	1000BASE-ZX pluggable transceiver, spare

All Cisco uBR10012 1-Gbps wideband half-height SPAs require a carrier (product number UBR10-2XDS-SIP). Each carrier holds two half-height line cards; a blank (product number SPA-BLANK) is shipped with any carrier with open half-height SPA slots.

Cisco recommends that customers who order a spare carrier or half-height SPAs also order enough blanks so that the configured system has no empty slots.

Service and Support

Cisco offers a wide range of services programs to accelerate customer success. These innovative services 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, see Cisco Technical Support Services.

For More Information

For more information about the Cisco 1-Gbps wideband spared port adapter, visit http://www.cisco.com/en/US/products/hw/cable/ps2209/index.html or contact your local account representative.

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