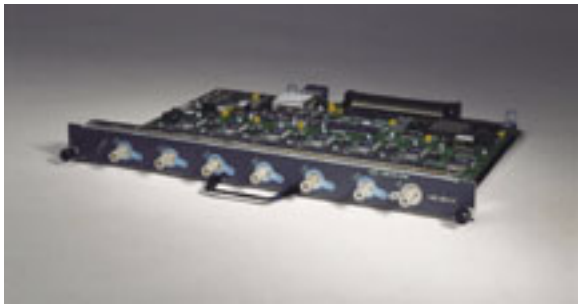
Data Sheet

Cisco MC16E Universal Broadband Router Line Card

The Cisco® MC16E 8-MHz Universal Broadband Router line card allows the Cisco uBR7246VXR to support European Data Over Cable Service Interface Specifications (EuroDOCSIS) (Figure 1). The card enables cable operators worldwide that use 8-MHz channel plans and want greater frequency options for the return-path spectrum to optimize their EuroDOCSIS networks. The Cisco MC16E supports the International Telecommunications Union (ITU) J.83 Annex A standard. The card is EuroDOCSIS 1.1-qualified.

Figure 1
Cisco MC16E Line Card



The Cisco MC16E is an example of the attention Cisco Systems® gives to worldwide cable markets and to customers outside the United States. With this card, Cisco offers another choice for data-over-cable standards, where cable operators can offer data and video services in EuroDOCSIS environments to standards-based, low-cost cable modems and set-top boxes. The Cisco MC16E 8-MHz line card builds on the DOCSIS standard, adding support at the physical layer (PHY) for Phase Alternating Line (PAL) and Systemme Electronique Couleur Avec Memoire (SECAM) channel plans. The Cisco MC16E offers a similar port configuration to the Cisco MC16C line card, with one downstream and six upstream ports. The card differs, however, from the Cisco MC16C card by offering a greater upstream spectrum range of 5 to 65 MHz and an increased downstream channel width of 8 MHz.

Other Cisco cable line cards that support EuroDOCSIS include the Cisco 5x20U and 5x20 Broadband Processing Engine for the Cisco uBR10012, and the Cisco uBR7200 Series MC28U, MC16U, MC28X, and MC16X Broadband Processing Engine for the Cisco uBR7246VXR. For more information on these products, refer to their respective data sheets.

Applications

- Provides EuroDOCSIS-based data services to set-top boxes and cable modems
- Flexible delivery of voice and data services from a single cable modem termination system (CMTS)

Table 1 Features and Benefits

Feature	Benefits
Provides 5- to 65-MHz frequency range on the upstream ports, offering an additional 23 MHz of spectrum for return-path service	• Reduces scarcity of upstream bandwidth • Provides a greater range of channel choices for finding a clean upstream channel
Translates the volume economies of DOCSIS customer premises equipment (CPE)—set-top boxes and cable modems—into cable markets with 8-MHz channel plans	• Translates the DOCSIS CPE economies of scale through interoperable multivendor CPE products
Gives cable plants running Annex A more efficient use of their available plant spectrum	• Offers better utilization of available channel bandwidth and increased downstream throughput capacity on an individual channel
Provides IF output compliant with European upconverters (36.125 MHz); interoperates with existing 8-MHz upconverters	• Responsive to non-U.S. customer requirements
Software is upgradable to DOCSIS 1.1	• Supports advanced functions and allows DOCSIS 1.0 and DOCSIS 1.1 modems and set-top boxes to coexist in the same upstream channel
Baseline privacy interface (BPI) and extensions to BPI (BPI+) provide secure link-layer communication over a shared hybrid fiber-coax (HFC) cable physical medium	• Offers security
Supports all DOCSIS and EuroDOCSIS-required Management Information Bases (MIBs)	• Offers advanced network management

Technical Specifications

Downstream PHY

- Downstream PHY-enhanced ITU J.83 Annex A, with convolutional and Reed-Solomon Forward Error Correction (FEC)
- Variable depth interleaving (I, J): (8, 16), (16, 8), (32, 4), (64, 2), (128, 1)
- Output impedance: 75 ohms nominal
- Connector: F-connector per [IPS-SP-406]

Table 2 Downstream PHY Values

Modulation	Channel Width	Line Bit Rate	Effective Bit Rate
64 quadrature amplitude modulation (QAM) (6 bits/sym)	8 MHz	40.44 MHz	-36 Mbps
256 QAM (8 bits/sym)	8 MHz	57.2 MHz	-57 Mbps

Upstream PHY

The following parameters are supported and transmitted to the cable modems by the CMTS:

- Symbol rates of 160, 320, 640, 1280, and 2560 ksym/sec
- Modulation: Quaternary phase shift keying (QPSK) and 16 QAM
- Upstream frequency range: 5 to 65 MHz, edge-to-edge
- FEC length (T = 0 to 10)
- Calibrated and widely adjustable upstream voltage level
- Total input power: less than 35 dBmV
- Operating power range: bursts within 6 dB of commanded level
- RF performance stable to 1.5 dB across -5 to 50˚C
- RF spurs less than 5 µV on all inputs and output

Table 3 Upstream PHY Values

Symbol Rate	Channel Bandwidth	Bit Rate (QPSK)	Bit Rate (16 QAM)	Input Power Ranges
160 ksym/sec	200 kHz	290 kbps	580 kbps	-16 to +14 dBmV
320 ksym/sec	400 kHz	580 kbps	1160 kbps	-13 to +17 dBmV
640 ksym/sec	800 kHz	1150 kbps	2300 kbps	-10 to +20 dBmV
1280 ksym/sec	1600 kHz	2300 kbps	4600 kbps	-7 to +23 dBmV
2560 ksym/sec	3200 kHz	4600 kbps	9200 kbps	-4 to +26 dBmV

Power requirements

- Heat dissipation: 30W
- 120 to 240 VAC

Physical configuration

- Dimensions (H x W x D): 1.35 x 13.50 x 10.56 in. (3.43 x 34.29 x 26.82 cm)

Universal chassis environmental specifications

- Operating temperature: 32 to 104˚F (0 to 40˚C)
- Nonoperating temperature: 4 to 149˚F (-20 to 65˚C)
- Relative humidity, noncondensing: 10 to 90 percent; 20 cfm

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.
Capital Tower
168 Robinson Road
#22-01 to #29-01
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 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

RDA4664-04/03