E6000® CER

Upstream Cable Access Module 2

PRODUCT OVERVIEW

The E6000® Converged Edge Router (CER) is a next-generation CCAP™ platform that provides cable operators unprecedented advances in channel density, power efficiency, and cost savings in a redundant, integrated architecture designed from the ground up for high availability. This powerful design enables operators to converge all services (video, HSD, and voice) on a single physical connector thus creating additional savings in capital and operational expenditures along with increased operational efficiency. Operators that converge services with the E6000 CER economize rack space, powering, and cooling in their facilities. In the E6000 CER system, upstream PHY and Media Access Control (MAC) functionality are provided by the Upstream Cable Access Modules (UCAMs). The second generation UCAM (UCAM-2) provides hardware support for both DOCSIS® 3.0 single carrier QAMs (SC-QAMs) and DOCSIS 3.1 operation (OFDMA). The UCAM-2 hardware allows Operators to deploy both SC-QAMs and OFDMA on each physical port (i.e., each upstream service group); this will enable higher throughput with greater spectral efficiency while providing backward compatibility for all currently-deployed modems. The current E6000 software, Release 4.0, supports 12 SC-QAMs per upstream physical port.

The Upstream Cable Access Module 2 (UCAM-2) is the second generation line card for the E6000 CER that provides upstream RF functionality. The UCAM-2 is designed to deliver hardware support for both SC-QAMs (i.e. DOCSIS 3.0) and OFDMA (i.e. DOCSIS 3.1) on a per-connector basis. From a hardware perspective, the UCAM-2 is capable of supporting an average of 12 SC-QAMs plus two blocks of 96 MHz OFDMA on each physical port. Migration to UCAM-2 for the existing E6000 deployed base is very simple. UCAM-2 utilizes the same Upstream Physical Interface Card (UPIC) as the Gen 1 UCAM, so no disconnecting of RF cables is required during the upgrade activity.

Operators should note that beginning with Rel. 4.0, the E6000 CER no longer supports Payload Header Suppression (PHS).

SUMMARY OF UCAM-2 FEATURES AND HARDWARE CAPABILITIES (PARTIAL LIST)
12 SC-QAMs per Physical Port
288 Total SC-QAMs per Module
Two (2) OFDMA Blocks per Physical Port, each up to 96 MHz (no OFDMA supported in Release 4.0)
48 OFDMA Blocks per Module (no OFDMA supported in Release 4.0)
5 – 204 MHz Upstream Passband (5 – 85 MHz in Release 4.0)
Compatible with RSM Gen 1 and RSM-2
Compatible with DCAM Gen 1 and DCAM-2
Deploys with same UPIC as Gen 1 UCAM

UCAM-2 OPERATIONAL DIFFERENCES COMPARED TO UCAM GEN 1
UCAM-2 does not support receiver sharing across Connector Groups
UCAM-2 does not support channel bonding across Connector Groups
UCAM-2 organizes the 24 physical ports into 12 Connector Groups, each of two ports

Managing the E6000 CER is typically done via SNMP and/or CLI. The E6000 CER has multiple options available for IPDR, a useful tool for measuring bandwidth usage. Physical maintenance of the E6000 CER is very simple. Air filters—one in the front and another in the rear of the chassis—should be inspected and/or replaced per recommendations in the E6000 CER User Documentation.

GENERAL SPECIFICATIONS

RF Upstream

Frequency Range (MHz)	5 to 204 (5 to 85 supported in Rel. 4.0)
Channel Type	TDMA, ATDMA, TDMA/ATDMA, OFDMA (no OFDMA supported in Release 4.0)
Max OFDMA Channel Width (MHz)	96 (Two channels supported per port) (no OFDMA supported in Release 4.0)
SC-QAM Data Rate (Mbps) (Max.)	30.72 per channel
SC-QAM RF Input Level (dBmV)	-16 to +29
SC-QAM Frequency Resolution (KHz)	< 1
SC-QAM Symbol Rate (Ksym/sec)	160, 320, 640, 1280, 2560, 5120
SC-QAM Bandwidth per Channel (MHz)	0.2, 0.4, 0.8, 1.6, 3.2, 6.4

Physical

Power	-48 VDC
Power Consumption	260 W typ. at 25 deg. C
Operating Temperature:	
Short Term °F (°C)	+23 to +131 (-5 to +55)
Long Term °F (°C)	+41 to +104 (+5 to +40)
Storage Temperature °F (°C)	-40 to +158 (-40 to +70)
Operating Humidity (Min.-Max.)	5 to 85% (Non condensing)
Dimensions (H x W x D) in. (cm)	13.8 x 1.2 x 17. 8 (35.0 x 3.0 x 45.3)
Weight lbs. (kg)	Approx. 6 (2.7)

Installation Environment (System Level)

Management Interfaces	100/1000 Mbps Ethernet (RJ-45) plus Console (serial port, RJ45)
RF Connector Access	DS RF (F connectors) via rear of chassis; US RF (MCX connectors) via rear of chassis
NSI Connector Access	RSM ports via front of chassis

Management Access (System Level)

In-band Management with Access Control Lists via any NSI port
Out-of-Band Management via dedicated Ethernet port on RPIC
Console (serial) port on RPIC

ORDERING CODES

Part Number	Description	Part Number	Description
801023	Duplex Chassis Kit - Two RSMs, No CAMs	1000445	UCAM-2 Hardware Only (Initial License Bundle purchase required)
801022	Simplex Chassis Kit - One RSM, No CAMs	1000443	48 Initial DOCSIS 3.0 Upstream Licenses for UCAM-2 (for Channels 1 – 48)
801025	128 DS DCAM Kit (Active) - 1 DCAM, Active DCAM PIC, and 128 DOCSIS DS Licenses	1000458	96 Initial DOCSIS 3.0 Upstream Licenses for UCAM-2 (for Channels 1 – 96)
801021	128 DS DCAM Kit (Spare) - 1 DCAM, Spare CAM PIC, and 128 DOCSIS DS Licenses	1000456	144 Initial DOCSIS 3.0 Upstream Licenses for UCAM-2 (for Channels 1 – 144)
782208	256 DS DCAM Kit (Active) - 1 DCAM, Active DCAM PIC, and 256 DOCSIS DS Licenses	1000457	192 Initial DOCSIS 3.0 Upstream Licenses for UCAM-2 (for Channels 1 – 192)
782209	256 DS DCAM Kit (Spare) - 1 DCAM, Spare CAM PIC, and 256 DOCSIS DS Licenses	799012	Router System Module Kit - 1 RSM and RSM PIC
782210	192 DS DCAM Kit (Active) - 1 DCAM, Active DCAM PIC, and 192 EuroDOCSIS DS Licenses	796836	Router System Module
782211	192 DS DCAM Kit (Spare) - 1 DCAM, Spare DCAM PIC, and 192 EuroDOCSIS DS Licenses	796847	RPIC - Physical Interface Card for RSM
782205	192 DS DCAM Kit (Active) - 1 DCAM, Active DCAM PIC, and 192 DOCSIS DS Licenses	801146	SFP+ Optical Interface, 10GBASE-LR/LW, 1310nm
782206	192 DS DCAM Kit (Spare) - 1 DCAM, Spare DCAM PIC, and 192 DOCSIS DS Licenses	801147	SFP+ Optical Interface, 10GBASE-SR, 850nm
1000226	DOCSIS 3.1 Downstream Licenses - 1 MHz DS License Bundle.	781346	SFP+ Optical Interface, 10GBASE-ER, 1550nm
781304	Annex B 32 DOCSIS DS License Bundle	781347	SFP+ Optical Interface, 10GBASE-ZR, 1550nm
781296	Annex A 32 EuroDOCSIS DS License Bundle	801169	E6000 Software Maintenance – Phone Plus Gold
1000010	Annex B Narrowcast Video License (Single VOD/SDV License)	1000012	Annex B Narrowcast Video Replication License
804061	Annex B Narrowcast Video 8-License Bundle		Full Price List available from ARRIS

CUSTOMER CARE

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