Cadant®
C3™ Cable Modem Termination System

Application
A CableLabs® DOCSIS® 2.0 Qualified Cable Modem Termination System (CMTS) delivering superior performance for up to 3000 registered cable modems while occupying only one rack unit (1RU) of space (1.75 in) in a cable operator's head-end facility. This small size allows operators to successfully deploy next generation IP services in both new and existing cable networks in any size market worldwide.

Architectural Overview
The system utilizes a dual RISC processor architecture for supporting high traffic volume with excellent latency control and ample reserve processing resources. Transmit and receive capacity is scalable with a single system supporting one downstream RF channel and up to six upstream RF channels. The two network interfaces support 10/100/1000 BaseT Ethernet.

Flexible Upstream Channel Configurations
With two, four or six physical upstream channels available for the Cadant C3 CMTS, an operator can tailor the number of upstreams in the system to match the anticipated traffic conditions and node sizes in the network. The optimal number of upstreams can be chosen to balance both cost and service growth potential in a given deployment area.

Advanced RF Performance
The Cadant C3 CMTS includes a fully digital receiver supporting TDMA, ATDMA and SCDMA. This allows operators to utilize parts of the upstream below 20 MHz that were previously unusable due to noise conditions. The added benefit is that existing legacy DOCSIS or Euro-DOCSIS 1.x cable modems can operate in 16 QAM mode or use wider channels on existing HFC cable plant.

Operator Selectable Layer 2 or Layer 3 Forwarding
Networks implementing Layer 2 bridging technology can take advantage of the Cadant C3 CMTS's Layer 2 mode of operation. Additionally the Cadant C3 CMTS offers static routing and an optional choice of RIPv2 or OSPFv2 Layer 3 routing protocols. With the option of up to 64 sub-interfaces per physical interface, operators have the flexibility to provision individual Layer 3 routing protocols or Layer 2 bridging on a per sub-interface basis.

Virtual LAN (VLAN) Service
The Cadant C3 CMTS enables end-to-end VLANs for advanced data applications such as business class services or multiple ISP support. The 802.1Q VLAN protocol stack ensures seamless integration into existing 802.1Q VLAN-based networks. VLANs can be provisioned between the Cadant C3 CMTS and the modems without running client-based software. Optional downstream broadcast privacy allows each VLAN to operate as a secure and private network for VPN-like service.

DS1 Commercial Service
The Cadant C3 CMTS when used with third party devices provides a DOCSIS-based DS1 solution. Subscriber access is via coaxial cable with no fiber drop to the customer site. This is an economical and scalable solution to effectively compete against Local Exchange Carrier T1 service.

Scalable and Reliable VoIP
Up to 1,000 voice lines may be provisioned on one Cadant C3 CMTS. For EMTA's, NCS and SIP are supported using DOCSIS Dynamic Service QoS. For stand-alone MTA's, SIP is supported using Dynamic Polling. Voice and data packets can be copied and forwarded to a lawful intercept mediation device.

Attributes:

- **Versatile Design to Deliver Next Generation IP Services Worldwide**
- **Superior RF Performance Overcomes Challenging HFC Plant Applications**
- **Advanced Technology Maximizes Subscriber Service Penetration**

Release 4.3 Features:

- **TACACS+ Authentication**
- **OSPF Point-to-Multipoint**
- **Route Redistribution Filtering**
- **Transparent 802.1Q VLAN Bridging**
- **Additional MIB Support**
- **Dynamic Service Flow Timeout / Teardown**
- **128 IP Addresses per Subinterface**
- **Show IP Interface Brief CLI Command**

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Specifications

RF Downstream:	Frequency Range (MHz) ..... 88-860 Modulation ..... 64 or 256 QPSK, 16 QAM for wireless applications Data Rate (Mbps) (max.) ..... 30-53.6 RF Output Level (dBmV) ..... +45 to +61
RF Upstream:	Frequency Range (MHz) ..... 5-42 (DOCSIS) 5-55; 5-65 (Euro-DOCSIS) Modulation ..... QPSK, 8, 16, 32, 64 QAM 128 QAM with Trellis Code Modulation Data Rate (Mbps) (max.) ..... 5.12-30.72 RF Receive Level (dBmV) ..... -20 to +26
Installation Environment:	RF Interfaces ..... External 'F' type connector Network Interface ..... Dual RJ-45 Ethernet connections Network-side Interfaces ..... 10/100/1000 BaseT Ethernet Power ..... Dual power supply unit: -48 volt DC or universal AC AC Powering ..... 100-240 VAC, 2A, 47-63 Hz DC Powering ..... -40 to -60V, 4A Power Consumption ..... 87 Watts max.
Physical:	Operating Temperature °F (°C) ..... 32-104 (0-40) Storage Temperature °F (°C) ..... -40-167 (-40-75) Operating Humidity (min – max) ..... 10-80% (non-condensing) Thermal Dissipation ..... 90 Watts max, 80 Watts typical Dimensions (HxWxD) in. (cm) ..... 1.75 x 19 x 18.3 (4.4 x 48.3 x 46.5) 1 rack unit (RU) high Weight lbs (kg) 22 (10)
Software Support:	DOCSIS 2.0 Qualified and Euro-DOCSIS 2.0 Based 3,000 Registered Cable Modems Ingress Noise Cancellation DHCP Relay Agent (Option 82) Layer 2 Bridging PPPoE support in Routing Mode DOCSIS MIBs and ARRIS Enterprise MIBs Command Line Interface (CLI) SNMP v1, v2 and v3 CLI Configurable SNMP Telnet Secure Shell 1/2 TACACS+ Authentication In-band or Out-of-band Management 30 ACLs with 30 entries per ACL and Subscriber Management Filtering Cable Source Verify and Packet Throttling Numerical Load Balancing Bandwidth Aware Periodic Load Balancing Upstream Channel Change (UCC) 802.1Q VLANs (basic) 802.1Q VLANs (advanced) ..... Separate license required Static Routing RIPv2 (RFC 2453) ..... Separate license required OSPFv2 (RFC 2328) ..... Separate license required RIP-to-OSPF Route Redistribution ..... RIP and OSPF licenses required Route Redistribution Filtering IGMPv2 Proxy Payload Header Suppression (PHS) Scalable and Reliable VoIP (NCS or SIP) – up to 1000 provisioned lines Lawful Intercept DS1 Commercial Service Wireless DOCSIS ..... Separate license required
Regulatory:	EMC: FCC Part 15 Class A, CE UL

Cadant C3 CMTS, DOCSIS 2.0 Ordering Codes & Descriptions

2 Upstream Ports
#713920KA ..... Australian AC Cord
#713920KE..... European AC Cord
#713920KJ ..... Japanese AC Cord
#713920KN ..... North American AC Cord
#713920KU ..... United Kingdom AC Cord

4 Upstream Ports
#713921KA ..... Australian AC Cord
#713921KE ..... European AC Cord
#713921KJ ..... Japanese AC Cord
#713921KN ..... North American AC Cord
#713921KU ..... United Kingdom AC Cord
#714914 ..... DC Cord

6 Upstream Ports
#713922KA ..... Australian AC Cord
#713922KE ..... European AC Cord
#713922KJ ..... Japanese AC Cord
#713922KN ..... North American AC Cord
#713922KU ..... United Kingdom AC Cord
#714917 ..... DC Cord

Software for each CMTS:

#719336K* ..... Software Rel. 4.3 Kit (base license, SCDMA license, software & Documentation CD)
#713868 ..... RIPv2 Routing License (optional keyed feature)
#713869 ..... VLAN/Bridge Group License (optional keyed feature)
#713870 ..... RIPv2 & VLAN/Bridge Group License (optional keyed feature)
#714827 ..... OSPFv2 Routing License (optional keyed feature)
#714828 .. OSPFv2 Routing License & VLAN/Bridge Group License (optional keyed feature)

Upgrade Kits:

#719343K ..... 2 Upstream Ports
#719344K ..... 4 Upstream Ports
#719345K ..... 6 Upstream Ports

Maintenance Plan (required):

#710645 . Software Maintenance - Phone Plus Silver
#710646 ...Software Maintenance - Phone Plus Gold

Optional Items & Spares:

#710626 ..... Compact DC Power Module
#710625 ..... Compact AC Power Module
#713842 ..... Dual Upstream Receiver Module
#713843 ..... Wideband Digital Receiver Module (2 upstream Ports)
#713844 ..... Wideband Digital Receiver Module (4 upstream Ports)
#713845 ..... Wideband Digital Receiver Module (6 upstream Ports)

Note: Release 4.3 software is backward compatible with the previous generation C3 CMTS hardware that supports DOCSIS 1.1/Euro-DOCSIS 1.1 and ATDMA but not SCDMA.

19 January 2006