



## **C2200 (DOCSIS 3.0 Release) Cable Modem Termination System**

### **Overview**

The Casa Systems C2200 Cable Modem Termination System (C2200) is a new class of cable edge device that combines a third generation DOCSIS CMTS and an MPEG video Edge-QAM in a single compact 1RU platform.

The broadband access over cable market has experienced two generations of DOCSIS CMTS. Most of the products on the market today are either first generation CMTS or second generation CMTS that can be characterized by fixed downstream to upstream ratios, instantaneous bandwidth per subscriber limited to a single RF channel, very low downstream channel density per rack unit, and high cost per unit bandwidth.

The legacy CMTS does not have any MPEG video processing capability and thus makes it necessary to implement two parallel access networks for MPEG video and IP data. With those limitations, the legacy CMTS is not economically viable in the new market of high bandwidth applications such as IPTV or IP video delivery and is not competitive with other broadband access methods such as FTTH.



### **Features**

- **Full DOCSIS 3.0 qualified** – Multi-channel DRFI RF for Annex A, B, & C, downstream channel bonding up to 16 channels, upstream channel bonding up to 16 channels, IPv6, AES encryption/decryption, multicast QoS, bonded channel multicast, bonded S-CDMA with multiple logic channels, full DOCSIS 3.0 MIBs, and IPDR
- **Separate Downstream and Upstream Modules** – Unlike traditional CMTS with fixed downstream to upstream ratio, Casa CMTS has separate downstream modules and upstream modules that provide flexible downstream to upstream ratio
- **Integrated CMTS & Video QAM** – DOCSIS traffic & MPEG/DVB video traffic can share the same RF channel
- **Cost Effectiveness** –The lowest cost per DOCSIS channel in the industry. The only economical solution for high bandwidth multimedia IP applications
- **Software Licensing** –Ability to activate additional channels as needed up to the available physical capacity of the module
- **Superior Density** – Offers the highest channel density in the industry, ranging from 48DSx16US for IP video to 32DSx32US for typical broadband service deployment in a single chassis
- **Best Multi-channel RF performance** – Exceeds DOCSIS DRFI specification
- **Extended Frequency Range** – Downstream frequency range up to 1GHz (48~1002MHz)
- **DOCSIS 1.1 and 2.0 Features** – Complete DOCSIS/EuroDOCSIS 1.1 and 2.0 feature sets
- **Rich Operational Features** – Rich operational features such as show cable modem, flap list, spectral management and IP bundling ready for deployment

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## Specifications

### System

4x2 Gbps switching capacity  
MPEG switching from any port to any port  
Four DOCSIS interface slots per system  
1~3 Downstream modules per system  
1~3 Upstream modules per system

### DOCSIS Features

Full DOCSIS 3.0 Qualified (May, 2008)  
Full Euro-DOCSIS 3.0  
DOCSIS 3.0 downstream channel bonding up to 16 channels  
DOCSIS 3.0 upstream channel bonding up to 16 channels  
DOCSIS 3.0 AES encryption/decryption  
DOCSIS 3.0 IPv6  
DOCSIS 3.0 Multicast  
Complete DOCSIS/EuroDOCSIS 1.1 features  
DOCSIS/EuroDOCSIS 2.0 A-TDMA (standard)  
DOCSIS/EuroDOCSIS 2.0 S-CDMA (optional)  
PacketCable 1.5 qualified  
PacketCable MultiMedia (PCMM) 1.0  
DSG

### IP Features

DHCP Relay and option 82  
Multiple DHCP servers  
Proxy ARP  
IP subnet bundling  
Static IP routing  
Multiple default routes  
IGMP snooping  
IGMP v2 and v3  
Access Control List  
RIPv2  
BGP  
OSPFv2  
PIM-SM  
L2VPN VLAN tagging  
IS-IS

### Management

RS232 Serial port (DB9)  
10/100BaseT management port  
Command Line Interface (CLI)  
Telnet and SSH  
SNMPv1, v2, and v3  
Standard DOCSIS and IETF MIBs  
IPDR  
Casa Systems Enterprise MIBs  
Event logging through Syslog  
Electronic mail notification  
Resource usage reporting  
TACACS+ and RADIUS

### Additional Features

Dynamic upstream and downstream load balancing  
Spectrum Management  
Software-defined MAC domains  
Software channel licensing  
Ingress cancellation filtering

### MPEG Stream Processing

MPEG de-multiplexing and re-multiplexing  
Unicast to Multicast conversion  
PAT and PMT extraction and regeneration  
PID filtering and remapping  
PCR jitter removal and re-stamping  
SI table generation and insertion  
DVB Simulcrypt scrambling  
Session-based Encryption

### GbE Interfaces

10/100/1000 Mbps  
4-port copper or fiber SFP  
CWDM  
Full line-rate support

### DOCSIS QAM Module (DQM)

Number of ports	4 ports per module
DQM08	8 channels, 2 channels per port
DQM16	16 channels, 4 channels per port
QAM modulation	Annex A, B or C
QAM constellations	64, 128, & 256 QAM
Data rates (DOCSIS)	27 Mbps @ 64 QAM 38 Mbps @ 256 QAM
Data rates (EuroDOCSIS)	36 Mbps @ 64 QAM 51 Mbps @ 256 QAM
Connector	F-type, 75 Ω
Frequency range (center)	91 to 867 MHz (standard) 48 to 999 MHz (optional)
Frequency accuracy	+/- 5 ppm
Frequency step size	5 kHz
Channel width	6 to 8 MHz (tunable)
Maximum output power per channel	61 dBmV @ 1-ch/port 57 dBmV @ 2-ch/port 53 dBmV @ 4-ch/port
Output step size	0.1 dB
Return loss	50 ~ 870 MHz, 14 dB 870 ~ 1002 MHz 10 dB
Modulation error rate	43 dB (equalized)
Wideband noise	-73 dBc

### DOCSIS Control and Upstream Module (DCU)

DCU04	4 channels in 4 ports
DCU08	8 channels in 8 ports
DCU16	16 channels in 8 ports
Modulation	QPSK, 16, 32 & 64 QAM
Data rate per channel	0.32 – 30.72 Mbps
Input frequency range	5 – 42 MHz (DOCSIS) 5 – 65 MHz (EuroDOCSIS)
Connector	F-type, 75 Ω
Input range	-4 to 26 dBmV

### Mechanical

Form Factor	1RU
Height	1.75 in. / 44.45 mm
Width	19 in. / 482.6 mm
Depth	23.5 in. / 597 mm
Weight	30 lbs / 13.62 kg
Mounting	19 inch, 1 rack unit high
Front panel LED	Power, alarm, I/O status

### Environmental

Operating temperature	0° to 50° C
Storage temperature	-40° to 70° C
Operating humidity	5% to 95%, non-cond.
Power supply	AC operating range: 90 to 264 V (Option) DC: -36 to -60 V (redundant ) Power consumption < 400 W (nominal)

### Regulatory Compliance

Safety: UL/IEC/CSA 60950-1  
EMC: FCC Part 15 Class A and CISPR Class A  
Immunity: EN61000-4