



## C3000 Series – DOCSIS 3.0 CMTS & Provisioning Server

C9 Networks provides a DOCSIS 3.0 Cable Modem Termination System (CMTS) that is designed for Cable Operators or MDU operators to rollout high-speed broadband services quickly and cost-effectively at the lowest operational cost. All the necessary components are included in the single box solution with no hidden costs.

### C9's All-in-One CMTS solution

- DOCSIS 3.0 CMTS with advanced features
- DOCSIS Provisioning Server (no annual fee)
- IP Monitoring tools, RF plant Monitoring tools and packet processing features
- Intuitive User Interface to configure, monitor and operate both locally and remotely
- High speed internet access, Video on Demand (VoD), IPTV and VoIP
- Backward compatible with DOCSIS 2.0 cable modems
- DHCP Relay to support 3<sup>rd</sup> party provisioning server, without losing advanced features

Model	Configuration	DS bandwidth	US bandwidth	CMs supported
<b>C3400</b>	4DSx4US	160 Mbps	120 Mbps	450 CMs
<b>C3800</b>	8DSx4US	320 Mbps	120 Mbps	450 CMs
<b>C3900</b>	16DSx4US	640 Mbps	120 Mbps	450 CMs

**Note:** Can also operate in Euro-DOCSIS mode with the C3900 providing up to 800Mbps.

### Why C9 CMTS?

- **User Centric Design:** C3000 series is a result of over 15 years of first to the market, best in class products developed in Sunnyvale (Silicon Valley), California.
- **Lowest Cost of ownership.**
- **Optimized** for small/medium MSO's, MDU's and small communities.
- **Power of Integration:** SMS, DOCSIS management, IP monitoring and RF monitoring functions all implemented in one device, providing a consolidated view of all the relevant RF and IP data making it easy to debug the network.
- **Triple CPU System** - Three CPU systems to handle different critical groups of tasks:
  - CPU-1:Monitor the hardware, health of system and emergency shut off features.
  - CPU-2:Handle DOCSIS functions, DOCSIS QoS and other related functions.
  - CPU-3:Packet filtering and monitoring, IP QoS, Watchdog to monitor system stability and performance.
- Scalability:** With CPU-3, which is inline and dedicated for enhancements, this product offers enormous scalability to add new features making the C9 CMTS stand apart from the competition.

[www.C9Networks.com](http://www.C9Networks.com)

Email: [info@C9Networks.com](mailto:info@C9Networks.com)

Phone: 408-746-0400

**C9 NETWORKS Inc**

341 Cobalt Way, Suite #205  
Sunnyvale, California 94085

## Specifications:

## C3000 Series - DOCSIS 3.0 CMTS

### Physical

	Description
Physical	Form Factor 1U Chassis (Rack Mountable) Height 1.75 in / 4.5 cm (approx) Width 19 in / 48.3 cm Depth 18 in (approx) Weight -
Network Interfaces	<ul style="list-style-type: none"><li>• Layer2 Bridge</li><li>• Uplink: 1 Gigabit Ethernet port</li><li>• Serial Port (DB-9)</li><li>• Coaxial connectors for downstream and upstream ports (75 Ohm)</li></ul>

### CMTS Specifications

Models	<ul style="list-style-type: none"><li>• C3400: 4DSx4US; DS = 160Mbps; US = 120Mbps</li><li>• <b>C3800: 8DSx4US; DS = 320Mbps; US = 120Mbps</b> (most popular)</li><li>• C3900; 16DSx4US; DS = 640Mbps; US = 120Mbps (16DS = 800Mbps approx. in Euro-DOCSIS mode) (Supports 450 cable modems)</li></ul>
RF Spectrum Support	<u>Downstream Parameters</u> <ul style="list-style-type: none"><li>• 2, 4, 8 or 16 Downstream channels on single RF port</li><li>• Downstream modulation 256QAM, 64QAM</li><li>• US-DOCSIS (6MHz) &amp; Euro-DOCSIS (8MHz); (Annex A &amp; B)</li><li>• Frequency Range: 87MHz to 1000MHz</li></ul> <u>Upstream Parameters</u> <ul style="list-style-type: none"><li>• 4 Upstream channels; Frequency Range of 5MHz to 65MHz</li><li>• Max of 30Mbps per channel; Total upstream of 120Mbps</li><li>• Upstream modulation 64QAM, 16QAM and QPSK</li><li>• Upstream power at the CMTS -12 dbmV</li></ul>
DOCSIS Support	<ul style="list-style-type: none"><li>• Channel Bonding up to 16 Downstream channels</li><li>• Channel Bonding up to 4 Upstream channels</li></ul>
Cable Modem Interoperability & Upgrades	<ul style="list-style-type: none"><li>• Interoperates with all DOCSIS 3.0 and 2.0 modems</li><li>• Cable Modem firmware upgrade from CMTS / Provisioning Server</li><li>• Euro-DOCSIS and US-DOCSIS Cable Modems</li></ul>

### Internal Provisioning Server

Provisioning Servers	<ul style="list-style-type: none"><li>• DHCP, TOD, TFTP and Web Server; SSH and SFTP</li><li>• Integrated with the CMTS in the same chassis</li></ul>
DHCP Features & Tools	<ul style="list-style-type: none"><li>• Support for Non-routable IP addresses for Cable Modems.</li><li>• CM Private subnet</li><li>• Routable IP addresses for CPEs</li></ul>
Subscriber Provisioning	<ul style="list-style-type: none"><li>• Subscriber Provisioning Manager: Service activation/de-activation</li><li>• IP address assignment/management</li><li>• Multiple levels of QoS creation and assignment to subscribers</li></ul>

### DHCP Relay & External Provisioning Server

DHCP Relay	<ul style="list-style-type: none"><li>• DHCP relay with option 82 support</li><li>• CMTS can sniff DHCP relay packets to build a CM vs CPE tables</li><li>• Full capability to monitor RF and IP packets in relay mode also</li></ul>
Third Party Server Support	<ul style="list-style-type: none"><li>• Supports 3<sup>rd</sup> party provisioning server &amp; Management Systems</li><li>• Easy switch between Internal Provisioning Server &amp; 3<sup>rd</sup> party server</li></ul>

## User Interface

User Interface	<ul style="list-style-type: none"><li>• Intuitive, user-friendly user interface</li><li>• Web interface, GUI</li><li>• Command Line (CLI ) over serial and TFTP</li><li>• SNMP based monitoring</li><li>• Remote monitoring and configuration</li></ul>
Servers in System	<ul style="list-style-type: none"><li>• DHCP, TOD, TFTP and Web Server; SSH and SFTP</li></ul>

## Tools for Network Monitoring and Operation

Scope of Tools	<ul style="list-style-type: none"><li>• RF monitoring; IP monitoring of CMTS, CMs and CPE's</li></ul>
Consolidated View	<ul style="list-style-type: none"><li>• Combined view of SMS data, RF and IP data for monitoring CMs and the Cable Network, enabling quick separation of IP and RF problems</li><li>• Enables quick identification of RF issues</li></ul>

## Network Management

Network Management & Provisioning	<ul style="list-style-type: none"><li>• SNMPv1 and v3 (upgradable)</li><li>• IETF MIBS, DOCSIS MIBs</li><li>• Tools to monitor RF levels of CM and CMTS</li><li>• Tools to display the MAC and IP address of CMs and CPEs</li></ul>
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## Security Features

Password	<ul style="list-style-type: none"><li>• Password protection to access CMTS</li></ul>
Configurable HTTP Port	<ul style="list-style-type: none"><li>• Configure HTTP to any port number desired</li><li>• Extra protection against routine hacking on well-known port 80</li></ul>
ACL based Security	<ul style="list-style-type: none"><li>• Access Lists Control (ACL): Enable only authorized users from accessing the CMTS system. ACL for HTTP, SSH and SNMP access</li></ul>

## System Health Monitor

Hardware System Health Monitor	<ul style="list-style-type: none"><li>• On board voltage, power and Temperature monitors</li><li>• Auto-system shut down in case of most failures to protect system</li></ul>
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