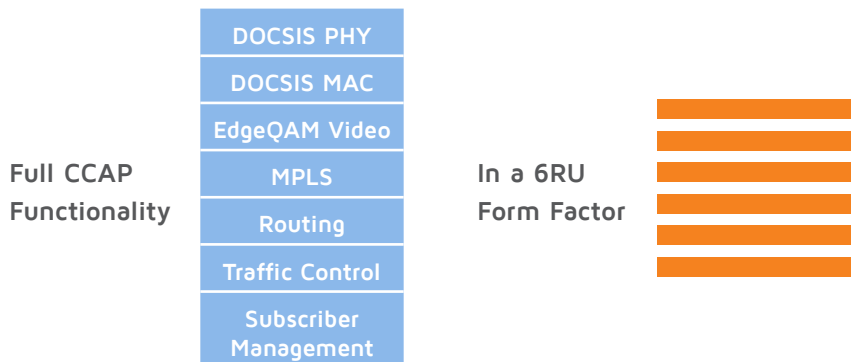# Casa Systems C40G Converged Cable Access Platform (CCAP)

Winning and keeping residential and enterprise video and Internet services customers has never been tougher. Service providers face a range of competition in a business that requires rapid response but is still capital intensive. They need partners who are fast enough to get them ahead of their competition and committed to keeping them there, which is why more and more, leading providers depend on Casa Systems.

Casa has consistently designed today's products with tomorrow in mind, and has proven to be the most reliable partner in the industry in delivering high performance solutions at each technology shift in cable access networks. Designed from the beginning to deliver gigabit+ services from a true CCAP platform, the C40G enables a smooth transition from DOCSIS® 3.0 to DOCSIS 3.1 and to Distributed Access Architectures (DAA). The C40G can also support EPON using DOCSIS provisioning of EPON v2 (DPoEv2).

Based on the same architecture as Casa's award winning C100G, the C40G delivers full CCAP functionality in the industry's smallest form factor, making it ideal for smaller headend offices or hub sites.

Full CCAP Functionality

- DOCSIS PHY
- DOCSIS MAC
- EdgeQAM Video
- MPLS
- Routing
- Traffic Control
- Subscriber Management

In a 6RU Form Factor

The C40G is the product of visionary design and development choices made for Casa's C100G award winning chassis. Those choices are enabled by our Axyom Software Architecture, which provides the ability to adapt to changing industry standards more quickly than competitors.

Service providers who choose the C40G obtain competitive advantages today, including the ability to deliver faster high-speed data rates, lower OPEX, and improve subscriber Quality of Experience. More importantly, the C40G delivers strategic benefits for the long term — including the ability to meet demands without new hardware, lower lifetime TCO, and investment protection as networks evolve.

Deployed by some of the world's leading service providers, Casa's CCAP solutions are the gold standard for current and future CCAP capabilities.

Highlights

Full CCAP in a 6RU Form Factor
DOCSIS PHY and MAC, EdgeQAM video, Routing and MPLS, subscriber and traffic management control in one chassis. Only CCAP solution in the industry delivering video and data over a single port in commercial deployments.

Full Spectrum DOCSIS 3.1 Support
Full 192 MHz OFDM / 96 MHz OFDMA spectrum block support with existing hardware

Backward Compatibility
Full support for DOCSIS 1.0 — DOCSIS 3.0 concurrent with DOCSIS 3.1

Capacity
Up to 3,072 downstream channels and 384 upstream channels/chassis

Scalability
Full 1.2 GHz spectrum support per service group.

Reliability
99.999% availability, full redundancy

Density
6 RU, 6 slot chassis (4 subscriber, 2 management modules)

Power Consumption
1.8kW per fully loaded chassis

Forward Engineered
Smooth transition to DOCSIS 3.1, 10G PON, and / or DAA

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Feature	Benefit
Density and Scalability	
6 RU, 6 slot chassis (4 subscriber slots, 2 management module slots)	Industry leading density in a small footprint, proven to reduce OPEX significantly over legacy solutions.
Up to 255 Service Groups (SGs) and 64 DAA Nodes	Casa's Remote-PHY solution, enabled by the CSC card in the C40G, offers various Distributed Access node form factors to meet service provider needs.
Downstream (DS) Capacity	Available today with DOCSIS 3.1 - full 1.2 GHz spectrum support. Per port support for up to two (2) 192 MHz downstream OFDM block along with multiple SC-QAM channels.
Upstream (US) Capacity	Available today with DOCSIS 3.1. One 96 MHz upstream OFDMA block along with multiple SC-QAMs per port can supported.
2x280 Gbps Switching Capacity	End user speeds can be constrained at various points. Adequate bandwidth between the switch card and line card assures higher throughput.
Affordability	
Power Consumption	Reduce costs and energy consumption with a fully loaded 6RU chassis that consumes < 1.8kW.
OPEX Reduction	The C40G's small form factor helps operators deliver more channels in less space.
Reliability	
Product Reliability	99.999% availability and hitless failover assure services are consistently delivered to subscribers
Vendor Reliability	Casa Systems' track record proves a reliable history of bringing new technologies to market first, at each generational shift. Casa's winning design, vision of the future, freedom from reliance on third party silicon providers, and passion to be first with the best solution all create value for our customers. Service providers who want faster time to revenue, lower lifetime TCO, and gigabit+ speeds today choose Casa Systems.
Service and Support	Casa's support engineers own our customers' problems from the first contact to resolution (we have no external call centers) with a sense of urgency and ownership — even if the problem turns out to be with another vendor's equipment. This means less network downtime for our customers.
Road to the Future	
Investment Protection	Future engineered design enables transition to DOCSIS 3.1 with no new hardware required and transition to DAA with the addition of a single new card (the CSC or CCAP Services Card), as well as support for DPoEv2. Service providers' investments in the C40G are protected as networks evolve toward a more distributed future.
Clear Roadmap	Casa's roadmap from today's C40G capabilities through distributed access architectures toward virtualization of key network functions is clearly defined and takes advantage of a winning design that keeps our customers ahead of their competitors.

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Technical Specifications

System

2x280 Gbps switching capacity

MPEG switching from any port to any port

4 CCAP module slots per system

1~3 Downstream modules per system

1~3 Upstream modules per system

Management

RS232 serial port (RJ45)

10/100BASE-T management port

Command line interface (CLI)

Telnet

SSH

SNMPv1, v2 & v3

Standard DOCSIS & IETF MIBs

IPDR

Casa Systems Enterprise MIBs

Event logging through Syslog

Electronic mail notification

Resource usage reporting

TACACS+ and RADIUS

DOCSIS Features

Full DOCSIS 3.1 compliance

Full DOCSIS 3.0 compliance

Full EuroDOCSIS 3.0 compliance

DOCSIS 3.0 and DOCSIS 3.1 channel bonding

DOCSIS 3.1 OFDM channel bonding
with SC-QAM

DOCSIS 3.0 downstream channel bonding up to 32 channels

DOCSIS 3.0 upstream channel bonding up to 8 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)

PacketCable 2.0 compliant

PacketCable MultiMedia (PCMM) I06

DSG

BSoD L2VPN

TaFDM

IP Features

OSPF v2 and OSPF v3

IS-IS (IPv4 & IPv6)

RIPv2 and RIPng

BGP (IPv4 & IPv6)

PIM-SM

IGMP snooping

IGMP v2 and v3

Static IP routing

DHCP Relay and option 82

DHCPv6

DHCP prefix delegation

Multiple DHCP servers

Proxy ARP

IP subnet bundling

Multiple default routes

Access Control Lists

L2 MPLS

L3 MPLS

L2VPN VLAN Tagging

IPFIX

Video Features

Table based VOD

SDV session based VOD

LInear Broadcast

VOD encryption:
· 	PME, PKE, DVB Simulcrypt

Broadcast encryption:
· 	DVB Simulcrypt

DOCSIS Downstream Modules

The C40G can be flexibly equipped with any of the following downstream modules.

DS8x96	The DS8x96 provides a lower capacity option
DS8x192	Delivers DOCSIS 3.1 modem capabilities of up to 2 OFDM (192 MHz) channels per port along with multiple SC-QAM channels
	Flexible support for multiple SCQAM channels and OFDM channels

Please refer to the respective datasheets for each of the above modules for details regarding QAM modulations, QAM constellations, Data Rates, Frequency Ranges, Channel Widths, and other technical specifications.

DOCSIS Upstream Modules

The C40G can be flexibly equipped with any of the following upstream modules.

US 16x8 (16 port I/O option)	8 ATDMA per port (DOCSIS 3.0)
	1 OFDMA (96MHz) + 4 ATDMA per port (DOCSIS 3.1)
US 16x8 (32 port I/O option)	4 ATDMA per port

Please refer to the respective datasheets for each of the above modules for details regarding QAM modulations, QAM constellations, Data Rates, Frequency Ranges, Channel Widths, and other technical specifications.

Switch and Management Modules (SMM)

SMM 2x10G	Two 10 GigE interfaces
	Eight GigE interfaces
	GigE copper or fiber SFP+
	Full line-rate support
SMM8x10G	Eight 10 GigE interfaces
	Two GigE interfaces
	GigE copper or fiber SFP+
	Full line-rate support

RF I/O Downstream Module (RFD)

Number of ports	8 per module
Connector	F-type, 75 Ω

RF I/O Upstream Module (RFU)

Number of ports	16 or 32 ports per module
Connector	16 port: F-type, 75 Ω
	32 port: MCX

Additional Features

Dynamic upstream & downstream load balancing

Spectrum Management

Software-defined MAC domains

Software channel licensing

Ingress cancellation filtering

Please refer to the following for information regarding additional technologies supported by the C100G:
- DAA - DAA Product Overview and Distributed Access (DA500, DA1000 and DA2000) & CSC8x10G Card data sheets
- PON using DPoEv2 -PON Product Overview and 16x10G PON Card & SMM300G data sheets

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Mechanical

Form factor	6RU
Height	10.5 in. / 266 mm
Width	19 in. / 482 mm
Depth	18.3 in. / 466 mm
Weight	60 lbs (fully loaded)
Mounting	19 inch, 6 rack unit high
Front panel LED	Power & alarm

Environmental

Operating temperature	0° to 50° C
Storage temperature	-40° to 70° C
Operating humidity	5% to 95%, non-cond.
Power requirements (DC)	-40.5 to –60 V (dual)
Power requirements (AC)	90 to 264 V (dual)
Power consumption	< 1800 W (nominal)

Regulatory Compliance

Designed to NEBS level 3 requirements

Safety: EN/UL/IEC/CAN/CSA/C22.2 60950-1

EMC: FCC Part 15 Class A & CISPR Class A

Immunity: EN61000-4

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