

Casa Systems Distributed Access (DA1000 and DA2000)

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. Casa's award winning CCAP solutions were designed from the beginning to deliver gigabit+ services, enable a smooth transition from DOCSIS® 3.0 to DOCSIS 3.1 and evolve to distributed access architectures rapidly with low operational disruption.

Casa Systems' family of Distributed Access Architecture solutions are designed to help service providers push capacity to the edge to improve the services their subscribers enjoy, extract more value from existing investments, and maintain smooth operations in the transition from centralized to distributed access architectures.

Casa's Distributed Access Architecture (DAA) family includes:

- An iCCAP or Axyom vCCAP core. For the iCCAP core, CCAP Services Cards (CSC8x10G), are deployable in Casa's C100G or C40G. Alternatively, Casa's Axyom vCCAP core can be deployed to support DAA.
- A range of Distributed Access (DA) nodes which perform DOCSIS and EQAM PHY functions and can be optimally located based on service provider needs, including the DA1000 and the DA2000
- 10G Ethernet transport between the CCAP core and the DA nodes

Enabling service providers with optimum flexibility, Casa Systems offers a range of Distributed Access nodes. The DA2000 is ideal for single-family dwelling environments, the DA1000, well suited for MDU or enterprise settings.

The R-PHY module within the DA2000 and DA1000 supports 1.2GHz (full spectrum) downstream and 100MHz mid-split upstream and has its own 10Gbps Ethernet link with an optional standby port for 1+1 port protection.



DA2000



DA1000

Highlights

Gigabit+ Performance

10G Ethernet transport delivers 1Gbps+ to subscribers

Full CCAP

Full CCAP functionality (voice, video and data) in a distributed access architecture

Strong Security

IPSec secures communications between the CCAP core and the nodes and DOCSIS BPI+ between the core and the modems; DVB Simulcrypt, PKE or PME secure video transmissions

Operational Simplicity

Nodes appear as an extension of the CCAP core allowing existing tools to control nodes as a single CCAP

Forward Engineered

Smooth transition to virtualized end state by keeping MAC functions centralized

DOCSIS 3.0 and 3.1 Support

The DA1000 and the DA2000 provide full spectrum support for both DOCSIS 3.0 and / or DOCSIS 3.1.

Security

Casa's Distributed Access Architecture takes into account the fact that service providers may need to locate the Distributed Access node in locations that are not as secure as typical headend sites, neither from an environmental nor external threat perspective.

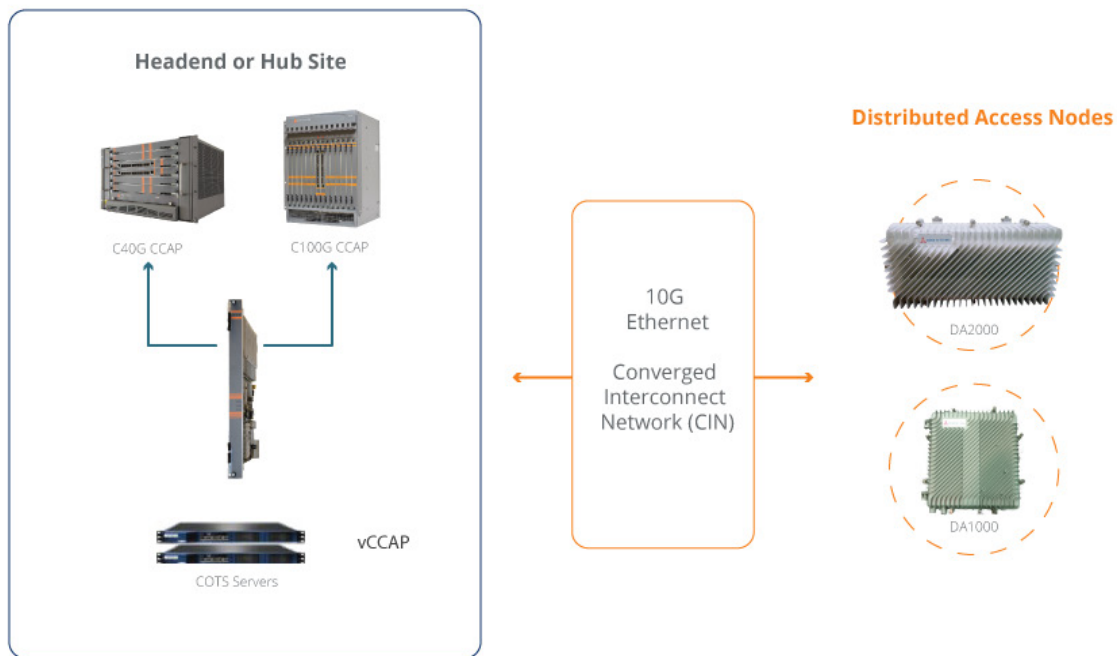
Casa's DA nodes are water-proof, weather hardened and can work in temperatures ranging from -40C to +60C. They are managed through the CCAP core at the headend rather than through a direct management interface, preventing changes in configuration or alteration of the behavior of the nodes through direct access.

The management and control of traffic between the CCAP core and the Distributed Access nodes are secured by IPSec to guard against man-in-the-middle attacks.

User data between the cable modem and the CCAP core is secured by DOCSIS BPI+ protocols. And, DVB Simulcrypt, PME or PKE secures video traffic, in the same way as an integrated CCAP.



DA2000 Interior



Casa Systems' Distributed Access Architecture

Feature	Benefit
Plug and Play Deployment	<p>At the headend, with a C100G or C40G running software release 8.0 or beyond, plug in the CSC8x10G (CCAP Services Card) and make the necessary fiber connections.</p> <p>At the Distributed Access node site, simply connect the fiber and coax cable, then power on the node.</p> <p>Management and configuration of the Distributed Access Node is done from the CCAP core, either via SNMP or CLI (on the C100G / C40G).</p>
Full CCAP Services Support	<p>Casa's Distributed Access solutions support all CCAP DOCSIS and video functions including SDV, VoD and linear broadcast video. Narrowband Digital Forward (NDF) and Narrowband Digital Return (NDR) are supported for the seamless transport of (i) SCTE 55-1 or 55-2 OOB signaling between legacy set-top boxes and headend set-top management systems; (ii) telemetry to nodes, power supplies and amplifiers over the digital network; and, (iii) analog FM radio.</p>
Gigabit+ Throughput	<p>Designed for gigabit+ services, Casa's CSC8x10G can deliver 10 Gbps on each optical link to the Distributed Access nodes, and can support up to at least up to 16 DAA nodes per CSC card.</p>
Flexible Connectivity Options	<p>Casa's CSC is an 8x10G CCAP line card which supports either 10G Ethernet for maximum flexibility. Likewise, Casa's Distributed Access nodes connects to an Ethernet network.</p>
High Density Solution up to 255 Service Groups and up to 192 Distributed Access nodes per C100G	<p>Casa's CSC has 8x10G Ethernet interfaces. The C100G is 13 RU and can house 12 CSCs for a maximum of 96 ports. As a result, up to 192 Distributed Access nodes per C100G can be supported. Casa also offers a smaller full CCAP solution, the 6RU C40G. The C40G can house 4 CSCs for a maximum of 32 ports and up to 64 DAA nodes.</p>
Strong Security at Every Point	<p>An advantage of Casa's Distributed Access architecture is that the intelligence is centralized in the headend, making the system as a whole more secure than alternative approaches.</p> <p>Distributed Access nodes are managed through the headend CCAP core. The management/control traffic between the headend C100G and the node is secured by IPSec, which guards against man-in-the-middle attacks. User data between the CM and the CSC is secured by DOCSIS BPI+ protocol; DVB Simulcrypt, PME, or PKE secure video traffic, in the same way as in an integrated CCAP.</p>

Technical Specifications

	DA1000	DA2000
General		
Physical Dimensions (LxWxH)	432 x 409 x 142mm 17 x 16.1 x 5.59 inches	580 x 292 x 226mm 22.8 x 11.5 x 8.9 inches
Mounting	Aerial Strand and Pedestal	
Typical Weight (1x4 configuration)	31.6 lbs (14.3 kg)	48.5 lbs (22.0 kg)
Connectors	4	
Typical Total Power (1x4 configuration)	113W	Standard Power: 118W High Power: 152W
Supply Voltage	90 – 240 VAC (via AC input) or 40 - 90 VAC (via Hardline)	40 - 90 VAC (via Hardline)
Optical Connectors (per R-PHY module)	2 x 10GE SFP+	
Test Point Connectors	1x internal FWD per DS segment, 1x internal RVR per port 1x internal common (FWD+RVR) per port, 1x external per port	
Environmental		
Operating Temperature	-40C to 60C	
Operating Humidity	5% to 95%	
Waterproof	IP67	
DOCSIS		
Standard	DOCSIS 3.1, EuroDOCSIS3.0 (Annex A), DOCSIS 3.0 (Annex B)	
DS Frequency Range	54MHz - 1.218GHz	
DS Segments	1	1 or 2 (standard power) 1 (high power)
US Segments	2	2 or 4 (standard power) 2 (high power)
DOCSIS 3.0 Channels per Segment	Up to 128 DS channels 8 ATDMA US channels	
DOCSIS 3.1 Channels per Segment	Multiple OFDM DS channels 1 OFDMA US channel	

DA1000

DA2000

DOCSIS (continued)		
US QAM Modulations	QPSK, 8, 16, 32 and 64 QAM	
DOCSIS 3.1 US Modulations	BPSK, 8, 16, 32, 64, 128, 256, 512, 1024 QAM	
US Channel Width	1.6 MHz/3.2 MHz/6.4 MHz, OFDMA: Up to 96 MHz	
US Frequency Range	5-100 MHz	
US Input Power	Maximum input level (total power, all channels + noise, 5 to 100 Mhz): +38 dbmv Minimum input level (single channel): -4 dbmv	
DS QAM Modulations	64, 128, 256 QAM	
DOCSIS 3.1 DS Modulations	BPSK, QPSK, 8, 16, 64, 128, 256, 512, 1024, 2048, 4096 QAM	
DS Channel Width	SC-QAM: 6 MHz/8 MHz, OFDM: Up to 192 MHz	
DS Frequency Range (center)	57 MHz - 1.215 GHz	
Maximum Output Power (at the highest channel)	60 dBmV	Standard power: 57 dBmV High power: 64 dBmV
Output CTB	62 dBc	
Output CSO	62 dBc	
Output CNR	51 dBc	
Hum Modulation	55 (5-204 MHz), 60 (258-1218 MHz)	
Cross Modulation (Xmod)	58 dB	
Output Tilt (pluggable)	10 dB minimum, 22 dB max	
Output Return Loss	16 dB	
Modulation Error Rate	42 dB (equalized)	SP: 42 dB, HP: 39 dB (62 dBmV)

Analog Forward Receivers

Optical Input Level	-7 dBm to +2 dBm	
RF Frequency Range	54MHz to 1002 Mhz	
Optical Wavelength	1260 - 1620 nm	
CNR	51 dB	
Connector	SC/APC	