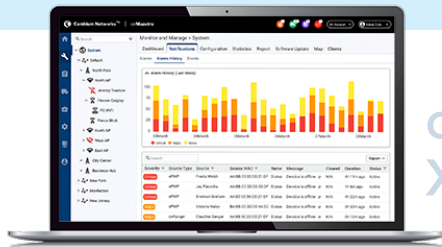


cnMatrix™ EX1000 Series Switches

QUICK LOOK:

- **Zero-touch deployments**
- **Policy Based Automation**
- **Auto device profiling and segmentation**
- **Non-blocking, line-rate architecture with fully featured L2 switching**



cnMaestro™
XMS

Cambium Networks' next generation switching platform offers a cloud managed, high performance, feature rich enterprise grade ethernet switching solution.

The cnMatrix platform of switches provides:

- **Easy and simple, free cloud (or on premise) management with cnMaestro™ or XMS***
- **Zero-touch deployment of switches makes installation easy**
- **Policy Based Automation eliminates manual and time consuming configuration**
- **Enhanced Security with automated device profiling and segmentation**
- **Policy Based Automation eliminates manual configuration during adds, moves and changes of network devices**
- **Unified Wired-Wireless access solution**



EX1028

The cnMatrix series of fully managed switches delivers full Layer 2 capabilities with enhanced access security. These switches come with a 5-Year Limited Lifetime Warranty

* Feature to be included in a future release.

cnMatrix™ EX1000 Series Switches

Specifications

	EX1028-P	EX1028	EX1010-P	EX1010
Throughput	56 Gbps	56 Gbps	20 Gbps	20 Gbps
Non-Blocking Throughput	✓	✓	✓	✓
Forwarding Rate in Mpps (64 Byte Packets)	120	120	120	120
10/100/1000 Ports	24	24	8	8
2.5 G Ports	n/a	n/a	n/a	n/a
Uplink Ports	4 SFP	4 SFP	4 SFP	4 SFP
PoE+ Enabled Ports (802.3af/at)	24	n/a	8	n/a
Serial Console	✓	✓	✓	✓
USB	✓	✓	✓	✓
Out-of-Band Management Port	n/a	n/a	n/a	n/a
Rack Mount Kit	✓	✓	Optional	Optional
Internal Fans	2	Fanless	Fanless	Fanless
Reset Button	✓	✓	✓	✓
MAC Address Table Size	16K	16K	16K	16K
Flash Storage	128 MB	128 MB	128 MB	128 MB
DRAM	512 MB	512 MB	512 MB	512 MB
VLANs	4K	4K	4K	4K
Port Based VLANs	4K	4K	4K	4K
LACP/Trunking	8 LAGs/8 links per LAG	8 LAGs/8 links per LAG	8 LAGs/8 links per LAG	8 LAGs/8 links per LAG
QoS Priority Queues	8	8	8	8
PVRST	32	32	32	32
Ingress/Egress ACL	128	128	128	128
Static ARP Entries	512	512	512	512
ARP Entries	512	512	512	512
Static Routes	64	64	64	64
Dynamic Routing	n/a	n/a	n/a	n/a
IGMP Multicast Groups	256	256	256	256
Policy Based Automation	✓	✓	✓	✓

cnMatrix™ EX1000 Series Switches

Specifications - All Models

Quality of Service

ACL mapping and marking of ToS/DSCP (COS)

ACL mapping marking of 802.1p

ACL mapping to priority queue

DiffServ support

Honoring DSCP and 802.1p (CoS)

Traffic shaping/metering

Priority queue management using Weighted Round Robin (WRR), Strict Priority (SP) and a combination of WRR and SP

Traffic Management

ACL-based inbound rate limiting policies

Broadcast, multicast and unknown unicast rate limiting

Inbound rate limiting per port

Outbound rate limiting per port/queue

Security

802.1x authentication

MAC authentication*

DHCP snooping

RADIUS authentication/authorization

Radius/Tacacs/Tacacs+

Authentication, Authorization, and Accounting (AAA)

Secure shell

Secure copy (SCP)*

Local username/password

Layer 2 Feature Set

802.1s multiple spanning tree

VLAN, Port, Protocol, 802.1q

802.1d

802.1x authentication

Auto MDI/MDIX

BPDU Guard, Root Guard

IGMP Snooping v1/v2/v3*, Fast Leave

LLDP/LLDP MED

IGMP Proxy

Static MAC

Flow Control per port

Per VLAN STP (PVST/PVRST)

Port Mirroring: port based, ACL based, VLAN based

Port Isolation/Private VLAN Edge

Link Aggregation Groups (Static/LACP)

Rate Limiting/Storm Control

Jumbo frame (9k)

DHCP Snooping

BPDU filtering

Broadcast/Multicast/Unlearned Unicast (Storm Control)

DoS Protection

Ping/TraceRoute/ICMPv6

Layer 3 Feature Set

Inter-VLAN Routing

Static ARP

Static Routes

DHCP Relay

* Feature to be included in a future release.

cnMatrix™ EX1000 Series Switches

Specifications - All Models cont'd

Management	cnMaestro (cloud management)	Simple Network Time Protocol (SNTP)
	Industry standard Command Line Interface (CLI)	Local/remote system logging
	DHCP Client	Policy Based Automation
	Embedded web management (HTTP/HTTPS)	Display log messages multiple terminals*
	Embedded DHCP server	TFTP/SFTP
	USB file management and storage	Telnet client/server
	SSH / SSH v2	IPv6 management
	SNMP v1/v2/v3	Password management
	DHCP relay	Autoinstall support for firmware images and config files

Security PERMIT/DENY ACTIONS FOR INBOUND IP AND LAYER 2 TRAFFIC CLASSIFICATION BASED ON:	Source/Destination IP address	EtherType
	TCP/UDP Source/Destination port	IEEE 802.1p user priority
	IP Protocol Type	VLAN ID
	Type of Service (ToS) or differentiated services (DSCP) field	RFC 1858—Security Considerations for IP Fragment Filtering
	Source/Destination MAC address	* Feature to be included in a future release.

Hardware Specifications

	EX1028-P	EX1028	EX1010-P	EX1010
Power Supply	100-240 VAC	100-240 VAC	100-240 VAC	100-240 VAC
Max Switch Power (WITH TRAFFIC)	25.10 W	19.50 W	10.54 W	9.88 W
MTBF (Hours)	285,350	432,283	338,917	806,354
Weight	3.96 kg (8.75 lb)	2.77 kg (6.1 lb)	1.99 kg (4.375 lb)	1.6 kg (3.5375 lb)
Dimensions	44 x 4.4 x 25 cm (17.3 x 1.75 x 9.85 in)	44 x 4.4 x 20.9 cm (17.3 x 1.75 x 8.22 in)	21 x 4.4 x 25 cm (8.26 x 1.75 x 9.85 in)	21 x 4.4 x 25 cm (8.26 x 1.75 x 9.85 in)
CPU Speed	800 MHz	800 MHz	800 MHz	800 MHz
LEDs Per Port	Link/Activity, PoE	Link/Activity	Link/Activity, PoE	Link/Activity
PoE+ Power Budget	200 W	n/a	75 W	n/a
PoE+ Voltage	54 V	n/a	54 V	n/a

cnMatrix™ EX1000 Series Switches

Hardware Specifications cont'd

	EX1028-P	EX1028	EX1010-P	EX1010
PoE Max Power Per Port	30 W	n/a	30 W	n/a
Rack Mountable	Yes 1U	Yes 1U	Yes 1U	Yes 1U
Temperature Ranges	0°C to 50°C (32°F to 122°F)	0°C to 50°C (32°F to 122°F)	0°C to 50°C (32°F to 122°F)	0°C to 50°C (32°F to 122°F)
Operating Humidity	55° at 95% RH	55° at 95% RH	55° at 95% RH	55° at 95% RH
Storage Temperature	-40°C to 70°C (-40°F to 158°F)	-40°C to 70°C (-40°F to 158°F)	-40°C to 70°C (-40°F to 158°F)	-40°C to 70°C (-40°F to 158°F)

Acoustic Noise dBA Per Switch (AMBIENT TEMPERATURE)

EX1028-P 40 dB - < 33°C, 44.3 dB - 30°C-40°C, 52 dB - > 43°C

EX1028 Fanless

EX1010-P Fanless

EX1010 Fanless

cnMatrix™ EX1000 Series Switches

IEEE Standards

Switching

Core Switching Features

IEEE 802.1ab—Link Layer Discovery Protocol (LLDP)
IEEE 802.1D—Spanning tree compatibility
IEEE 802.1p—Ethernet priority with user provisioning and mapping
IEEE 802.1s—Multiple spanning tree compatibility
IEEE 802.1Q—Virtual LANs with port-based VLANs
IEEE 802.1X—Port-based authentication

VLAN Support

IEEE 802.1W—Rapid spanning tree compatibility
IEEE 802.3—10BASE-T
IEEE 802.3u—100BASE-T
IEEE 802.3ab—1000BASE-T
IEEE 802.3ac—VLAN tagging
IEEE 802.3ad—Link aggregation
IEEE 802.3x —Flow control
Bridged Local Area Networks - Amendment 07: Multiple Registration Protocol

IEEE 802.1Q-2003

RFC 4541—Considerations for Internet Group Management Protocol (IGMP) Snooping Switches

ANSI/TIA-1057—LLDP-MEDia Endpoint Discovery (MED)

Advanced Layer 2 Features

Authentication, Authorization, and Accounting (AAA)
Broadcast/Multicast/Unknown unicast storm recovery
DHCP Snooping
IGMP Snooping Querier
Independent VLAN Learning (IVL) support
Jumbo Ethernet frame support
Port MAC locking
Port mirroring
Protected ports
Static MAC filtering

Layer 3 Feature Set

Inter-VLAN Routing
Static ARP
Static Routes
RFC 2131 – DHCP Relay

cnMatrix™ EX1000 Series Switches

System Facilities

Event and error logging facility

Run-time and configuration download capability

PING utility

FTP Transfers via IPv4/IPv6

RFC 768—UDP

RFC 783—TFTP

RFC 791—IP

RFC 792—ICMP

RFC 793—TCP

RFC 826—ARP

RFC 894—Transmission of IP datagrams over Ethernet networks

RFC 896—Congestion control in IP/TCP networks

RFC 951—BOOTP

RFC 1034—Domain names - concepts and facilities

RFC 1035—Domain names - implementation and specification

RFC 1321—Message digest algorithm

RFC 1534—Interoperability between BOOTP and DHCP

RFC 2021—Remote network monitoring management information base version 2

RFC 2030—Simple Network Time Protocol (SNTP)

RFC 2132—DHCP options and BOOTP vendor extensions

RFC 2819—Remote Network Monitoring Management Information Base

RFC 2865—RADIUS client

RFC 2869—RADIUS Extensions

RFC 3579—RADIUS support for EAP

RFC 3580—IEEE 802.1X RADIUS usage guidelines

RFC 3164—BSD syslog protocol

RFC 3580—802.1X RADIUS Usage Guidelines

* Feature to be included in a future release.

Management

SNMP v1, v2, and v3

SSH 1.5 and 2.0

RFC 4252—SSH authentication protocol

RFC 4253—SSH transport layer protocol

RFC 4254—SSH connection protocol

RFC 4251—SSH protocol architecture

RFC 4716—SECSH public key file format

RFC 4419—Diffie-Hellman group exchange for SSH transport layer protocol

SSL 3.0 and TLS 1.0

RFC 2246—TLS protocol, version 1.0

RFC 2818—HTTP over TLS

RFC 3268—AES cipher suites for transport layer security

Telnet

Web GUI

cnMatrix™ EX1000 Series Switches

SNMP MIBs

Enterprise MIBs for Full Configuration Support of Switching Features

RFC 1213—MIB II

RFC 1493—Bridge MIB

RFC 1612—DNS resolver MIB extensions

RFC 1643—Definitions of managed objects for Ethernet-like interface types

RFC 2233—Interfaces group MIB using SMI v2

RFC 2613—SMON MIB

RFC 2618—RADIUS authentication client MIB

RFC 2674—VLAN MIB

RFC 2737—Entity MIB version 2*

RFC 2819—RMON groups 1, 2, 3, and 9

RFC 2863—IF-MIB

RFC 2925—Definitions of Managed Objects for Remote Ping, Traceroute, and Lookup Operations

RFC 3273—RMON Groups 1, 2, and 3

RFC 3291—Textual conventions for Internet network addresses

RFC 3434—RMON Groups 1, 2, and 3

RFC 4022—TCP-MIB

RFC 4113—UDP-MIB

* Feature to be included in a future release.

Quality of Service MIBs

MIBs for full configuration support of DiffServ, ACL, and CoS functionality

RFC 3289—Management information base for DiffServ architecture (read-only)

Quality of Service

Classify Traffic Based on Same Criteria as ACLs and Optionally:

Mark the IP DSCP or Precedence header fields

Police the flow to a specific rate with two-color aware support

RFC 2474—Definition of the differentiated services field (DS field) in the IPv4 and IPv6 headers

RFC 2475—An architecture for differentiated services

RFC 2597—Assured forwarding Per-Hop Behavior

cnMatrix™ EX1000 Series Switches

Ordering Information			
Type	Model	Part #	Description
Switch	cnMatrix EX1028-P	MX-EX1028PxA-E	Intelligent Ethernet PoE+ Switch, 24 x 1 Gbps and 4 x 1 Gbps SFP fiber ports - no power cord; EMEA
Switch	cnMatrix EX1028-P	MX-EX1028PxA-0	Intelligent Ethernet PoE+ Switch, 24 x 1 Gbps and 4 x 1 Gbps SFP fiber ports - no power cord
Switch	cnMatrix EX1028	MX-EX1028xxA-E	Intelligent Ethernet Switch, 24 x 1 Gbps and 4 1 Gbps SFP fiber ports - no power cord; EMEA
Switch	cnMatrix EX1028	MX-EX1028xxA-0	Intelligent Ethernet Switch, 24 x 1 Gbps and 4 1 Gbps SFP fiber ports - no power cord
Switch	cnMatrix EX1010-P	MX-EX1010PxA-E	Intelligent Ethernet PoE Switch, 8 x 1 Gbps and 2 SFP fiber ports - no power cord; EMEA
Switch	cnMatrix EX1010-P	MX-EX1010PxA-0	Intelligent Ethernet PoE Switch, 8 x 1 Gbps and 2 SFP fiber ports - no power cord
Switch	cnMatrix EX1010	MX-EX1010xxA-E	Intelligent Ethernet Switch, 8 x 1 Gbps and 2 SFP fiber ports - no power cord; EMEA
Switch	cnMatrix EX1010	MX-EX1010xxA-0	Intelligent Ethernet Switch, 8 x 1 Gbps and 2 SFP fiber ports - no power cord
Transceiver	n/a	SFP-1G-SX	1G SFP MMF SX Transceiver, 850 nm. -40°C to 85°C (-40°F to 185°F)
Transceiver	n/a	SFP-1G-LX	1G SFP SMF LX Transceiver, 1310 nm. -40°C to 85°C (-40°F to 185°F)
Transceiver	n/a	SFP-1G-Copper	1000Base-T (RJ45) SFP Transceiver. -40°C to 85°C (-40°F to 185°F)


EX1010

EX1028

EX1010-P

EX1028-P

ABOUT CAMBIUM NETWORKS

Cambium Networks empowers millions of people with wireless connectivity worldwide. Its wireless portfolio is used by commercial and government network operators as well as broadband service providers to connect people, places and things. With a single network architecture spanning fixed wireless and Wi-Fi, Cambium Networks enables operators to achieve maximum performance with minimal spectrum. End-to-end cloud management transforms networks into dynamic environments that evolve to meet changing needs with minimal physical human intervention. Cambium Networks empowers a growing ecosystem of partners who design and deliver gigabit wireless solutions that just work.