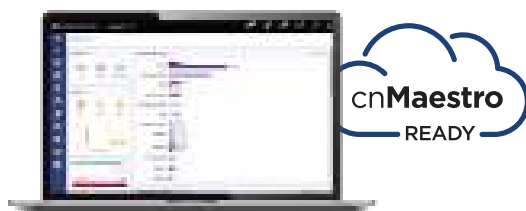# cnMatrix™ EX3000 Series Switches

QUICK LOOK:

- **Zero-touch deployments**

- **Policy Based Automation**

- **Auto device profiling and segmentation**

- **Non-blocking, line-rate architecture with fully featured L2/L3 switching**

cnMaestro READY

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™

- 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

The cnMatrix series of fully managed switches delivers full Layer 2 and Layer 3 capabilities with enhanced access security. The EX3000 series offers SFP+ (10 Gbps) fiber uplink ports. The EX3000 series also offers dual remove-able power supplies and features up to 60W of PoE per port. These switches come with a 5-Year Limited Lifetime Warranty

cnMatrix™ EX3000 Series Switches

Specifications	EX3028R-P	EX3052R-P
Throughput	128 Gbps	176 Gbps
Forwarding Rate in Mpps (64 Byte Packets)	120	120
10/100/1000 Ports	24	48
2.5 G Ports	n/a	n/a
Uplink Ports	4 SFP+	4 SFP+
PoE+ Enabled Ports 802.3af/at/bt (30W)	12	24
PoE++ Enabled Ports 802.3af/at/bt (60W)	12	24
Serial Console	✓	✓
USB	✓	✓
Out-of-Band Management Port	✓	✓
Rack Mount Kit	✓	✓
Internal Fans	2	2
Reset Button	✓	✓
MAC Address Table Size	16K	16K
Flash Storage	256 MB	256 MB
DRAM	1 GB	1 GB
VLANs	4K	4K
QinQ	Yes	Yes
LACP/Trunking	8 LAGs/8 links per LAG	8 LAGs/8 links per LAG
QoS Priority Queues	8	8
PVRST	32	32
Ingress/Egress ACL	128	128
Static ARP Entries	512	512
ARP Entries	512	512
Static Routes	64	64
Dynamic Routing	512	512
IGMP Multicast Groups	256	256
Policy Based Automation	✓	✓

Feature to be included in a future release.

cnMatrix™ EX3000 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
	QinQ
	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

* Feature to be included in a future release.

Layer 3 Feature Set	Inter-VLAN Routing	Dynamic Routing – RIPv1/v2
	Static ARPs	Dynamic Routing – OSPFv2
	Static Routes	Route Redistribution
	DHCP Relay	

cnMatrix™ EX3000 Series Switches

Specifications - All Models cont'd

Management	cnMaestro or XMS (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
	Out-of-Band Ethernet Management	IPv6 management
	SSH / SSH v2	Password management
	SNMP v1/v2/v3	Autoinstall support for firmware images and config files
	DHCP relay	

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

	EX3028R-P	EX3052R-P
Power Supply	CRPS dependant	CRPS dependant
Max Switch Power (WITH TRAFFIC)	61W	82.5W
MTBF (Hours)	547,054	471,517
Weight	3.679 Kg (8.11 lbs)	4.904 Kg (10.81 lbs)
Dimensions	4.4 x 28 x 44.15 cm (1.73 x 11.02 x 17.38 in)	4.4 x 39.4 x 44.15 cm (1.73 x 15.51 x 17.38 in)
CPU Speed	800 MHz	800 MHz
LEDs Per Port	Link/Activity, PoE	Link/Activity, PoE
PoE+ Power Budget	CRPS dependant	CRPS dependant
PoE + Voltage	54V	54V

cnMatrix™ EX3000 Series Switches

Hardware Specifications cont'd

	EX3028R-P	EX3052R-P
PoE Max Power Per Port	30W/60W	30W/60W
Rack Mountable	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)
Operating Humidity	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)

Acoustic Noise dBA Per Switch (AMBIENT TEMPERATURE)		
EX3028R-P	1200W CRPS	73.3dB -<33C, 73.4dB 30C-40C, 73.6dB >43C
	930W CRPS	71dB -<33C, 71.2dB 30C-40C, 71.5dB >43C
	600W CRPS	69.9dB -<33C, 70dB 30C-40C, 70.4dB >43C
EX3052R-P	1200W CRPS	76.4dB -<33C, 76.5dB 30C-40C, 76.96dB >43C
	930W CRPS	72.8dB -<33C, 73dB 30C-40C, 73.3dB >43C
	600W CRPS	72dB -<33C, 72.2dB 30C-40C, 72.5dB >43C

cnMatrix™ EX3000 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)
	IEEE 802.1ad (QinQ)*
	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 Features	Inter-VLAN Routing
	Static ARP
	Static Routes
	RFC 2131 – DHCP Relay
	RFC 2328 – OSPF Version 2
	RFC 2453 – RIP Version 2

* Feature to be included in a future release.

cnMatrix™ EX3000 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™ EX3000 Series Switches

SNMP MIBs

Enterprise MIBs for Full Configuration Support of Switching Features		
	RFC 1213—MIB II	RFC 2819—RMON groups 1, 2, 3, and 9
	RFC 1493—Bridge MIB	RFC 2863—IF-MIB
	RFC 1612—DNS resolver MIB extensions	RFC 2925—Definitions of Managed Objects for Remote Ping, Traceroute, and Lookup Operations
	RFC 1643—Definitions of managed objects for Ethernet-like interface types	RFC 3273—RMON Groups 1, 2, and 3
	RFC 2233—Interfaces group MIB using SMI v2	RFC 3291—Textual conventions for Internet network addresses
	RFC 2613—SMON MIB	RFC 3434—RMON Groups 1, 2, and 3
	RFC 2618—RADIUS authentication client MIB	RFC 4022—TCP-MIB
	RFC 2674—VLAN MIB	RFC 4113—UDP-MIB
	RFC 2737—Entity MIB version 2*	

* 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	RFC 2475—An architecture for differentiated services
	Police the flow to a specific rate with two-color aware support	RFC 2597—Assured forwarding Per-Hop Behavior
	RFC 2474—Definition of the differentiated services field (DS field) in the IPv4 and IPv6 headers	

cnMatrix™ EX3000 Series Switches

EX3052R-P / CRPS
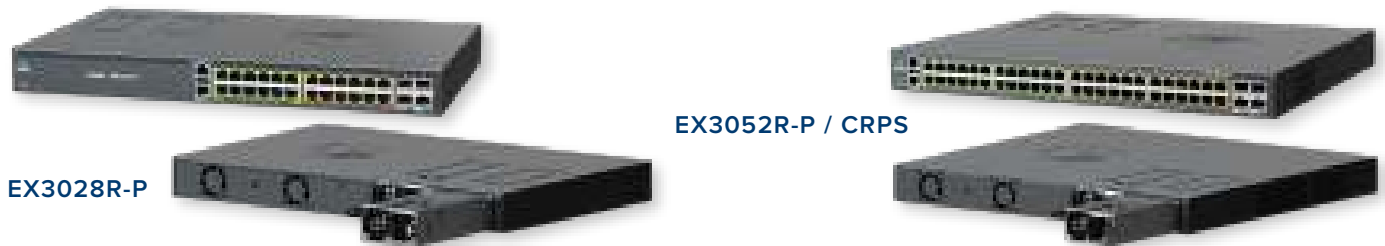
EX3028R-P

cnMatrix Ordering Information

Type	Part #	Description
EX3028R-P	MXEX3028GxPA10	**Intelligent Ethernet Switch,** 24 1G (12 PoE+ ports and 12 4PPoE ports (60W)) and 4 SFP+ ports, Dual/Removeable power supplies (not included) No power cord, non-USA
EX3052R-P	MXEX3052GxPA10	**Intelligent Ethernet Switch,** 48 1G (24 PoE+ ports and 24 4PPoE ports(60W)) and 4 SFP+ ports, Dual/Removeable power supplies (not included) No power cord, non-USA
EX3028R-P	MXEX3028GxPA11	**Intelligent Ethernet Switch,** 24 1G (12 PoE+ ports and 12 4PPoE ports (60W)) and 4 SFP+ ports, Dual/Removeable power supplies (not included) No power cord, USA only
EX3052R-P	MXEX3052GxPA11	**Intelligent Ethernet Switch,** 48 1G (24 PoE+ ports and 24 4PPoE ports (60W)) and 4 SFP+ ports, Dual/Removeable power supplies (not included) No power cord, USA only
CRPS	MXCRPSAC600A0	600W total Power, no power cord
CRPS	MXCRPSAC930A0	930W total Power, no power cord
CRPS	MXCRPSAC1200A0	1200W total Power, no power cord
CRPS	MXCRPSDC600A0	600W total Power, 36v–72v, includes 3m cable connector
CRPS	MXCRPSDC930A0	930W total Power, 36v–72v, includes 3m cable connector
CRPS	MXCRPSDC1200A0	1200W total Power, 36v–72v, includes 3m cable connector
Power Cord	N000900L092A	AC line cord, US Type B, 15A, 1.2 m C13 connector
Rack Ears	MX-EXTXFULLA-1	cnMatrix rack mount kit: Full-width switch
Transceiver	SFP-10G-SR	10G SFP+ MMF SR Transceiver, 850 nm. -40ºC to 85ºC (-40ºF to 185ºF)
Transceiver	SFP-1G-SX	1G SFP MMF SX Transceiver, 850 nm. -40ºC to 85ºC (-40ºF to 185ºF)
Transceiver	SFP-10G-LR	10G SFP+ SMF LR Transceiver, 1310 nm. -40ºC to 85ºC (-40ºF to 185ºF)
Transceiver	SFP-1G-LX	1G SFP SMF LX Transceiver, 1310 nm. -40ºC to 85ºC (-40ºF to 185ºF)
Transceiver	SFP-1G-Copper	1000Base-T (RJ45) SFP Transceiver. -40ºC to 85ºC (-40ºF to 185ºF)
Transceiver	SFP-10G-Copper	10G Base-T (RJ45) SFP Transceiver. 0ºC to 70ºC (-40ºF to 185ºF)

cnMatrix™ EX3000 Series Switches

cnMaestro X Ordering Information

cnMaestro X for EX3028R-P	MSX-3028R-P-1	cnMaestro X for one EX3028R-P. Creates one Device Tier20 slot. Includes Cambium Care Pro support. 1-year subscription
cnMaestro X for EX3028R-P	MSX-3028R-P-3	cnMaestro X for one EX3028R-P. Creates one Device Tier20 slot. Includes Cambium Care Pro support. 3-year subscription
cnMaestro X for EX3028R-P	MSX-3028R-P-5	cnMaestro X for one EX3028R-P. Creates one Device Tier20 slot. Includes Cambium Care Pro support. 5-year subscription
cnMaestro X for EX3052R-P	MSX-3052R-P-1	cnMaestro X for one EX3052R-P. Creates one Device Tier20 slot. Includes Cambium Care Pro support. 1-year subscription
cnMaestro X for EX3052R-P	MSX-3052R-P-3	cnMaestro X for one EX3052R-P. Creates one Device Tier20 slot. Includes Cambium Care Pro support. 3-year subscription
cnMaestro X for EX3052R-P	MSX-3052R-P-5	cnMaestro X for one EX3052R-P. Creates one Device Tier20 slot. Includes Cambium Care Pro support. 5-year subscription

EX3028R-P Cambium Care Advanced Ordering Information

CCADV-SUP-EX3028R-P-1	Cambium Care Advanced, 1-year support for one EX3028R-P. 24x7 TAC support, SW updates, and NBDS advance replacement for HW
CCADV-SUP-EX3028R-P-3	Cambium Care Advanced, 3-year support for one EX3028R-P. 24x7 TAC support, SW updates, and NBDS advance replacement for HW
CCADV-SUP-EX3028R-P-5	Cambium Care Advanced, 5-year support for one EX3028R-P. 24x7 TAC support, SW updates, and NBDS advance replacement for HW
CCADV-UPG-EX3028R-P-1	Cambium Care Advanced Add-on to cnMaestro X, 1-year support for one EX3028R-P. 24x7 TAC support, SW updates, and NBDS advance replacement for HW
CCADV-UPG-EX3028R-P-3	Cambium Care Advanced Add-on to cnMaestro X, 3-year support for one EX3028R-P. 24x7 TAC support, SW updates, and NBDS advance replacement for HW
CCADV-UPG-EX3028R-P-5	Cambium Care Advanced Add-on to cnMaestro X, 5-year support for one EX3028R-P. 24x7 TAC support, SW updates, and NBDS advance replacement for HW
CCADV-UPG-RNW-EX3028R-P-1	Cambium Care Advanced Add-on to cnMaestro X, 1-year support renewal for one EX3028R-P. 24x7 TAC support, SW updates, and NBDS advance replacement for HW
CCADV-UPG-RNW-EX3028R-P-3	Cambium Care Advanced Add-on to cnMaestro X, 3-year support renewal for one EX3028R-P. 24x7 TAC support, SW updates, and NBDS advance replacement for HW
CCADV-UPG-RNW-EX3028R-P-5	Cambium Care Advanced Add-on to cnMaestro X, 5-year support renewal for one EX3028R-P. 24x7 TAC support, SW updates, and NBDS advance replacement for HW

cnMatrix™ EX3000 Series Switches

EX3052R-P Cambium Care Advanced Ordering Information

CCADV-SUP-EX3052R-P-1	Cambium Care Advanced, 1-year support for one EX3052R-P. 24x7 TAC support, SW updates, and NBDS advance replacement for HW
CCADV-SUP-EX3052R-P-3	Cambium Care Advanced, 3-year support for one EX3052R-P. 24x7 TAC support, SW updates, and NBDS advance replacement for HW
CCADV-SUP-EX3052R-P-5	Cambium Care Advanced, 5-year support for one EX3052R-P. 24x7 TAC support, SW updates, and NBDS advance replacement for HW
CCADV-UPG-EX3052R-P-1	Cambium Care Advanced Add-on to cnMaestro X, 1-year support for one EX3052R-P. 24x7 TAC support, SW updates, and NBDS advance replacement for HW
CCADV-UPG-EX3052R-P-3	Cambium Care Advanced Add-on to cnMaestro X, 3-year support for one EX3052R-P. 24x7 TAC support, SW updates, and NBDS advance replacement for HW
CCADV-UPG-EX3052R-P-5	Cambium Care Advanced Add-on to cnMaestro X, 5-year support for one EX3052R-P. 24x7 TAC support, SW updates, and NBDS advance replacement for HW
CCADV-UPG-RNW-EX3052R-P-1	Cambium Care Advanced Add-on to cnMaestro X, 1-year support renewal for one EX3052R-P. 24x7 TAC support, SW updates, and NBDS advance replacement for HW
CCADV-UPG-RNW-EX3052R-P-3	Cambium Care Advanced Add-on to cnMaestro X, 3-year support renewal for one EX3052R-P. 24x7 TAC support, SW updates, and NBDS advance replacement for HW
CCADV-UPG-RNW-EX3052R-P-5	Cambium Care Advanced Add-on to cnMaestro X, 5-year support renewal for one EX3052R-P. 24x7 TAC support, SW updates, and NBDS advance replacement for HW

Cambium Care Pro Ordering Information

CCPRO-SUP-**EX3028R-P**-1	Cambium Care Pro, 1-year support for one EX3028R-P. 24x7 TAC support, SW updates
CCPRO-SUP-**EX3028R-P**-3	Cambium Care Pro, 3-year support for one EX3028R-P. 24x7 TAC support, SW updates
CCPRO-SUP-**EX3028R-P**-5	Cambium Care Pro, 5-year support for one EX3028R-P. 24x7 TAC support, SW updates
CCPRO-SUP-**EX3052R-P**-1	Cambium Care Pro, 1-year support for one EX3052R-P. 24x7 TAC support, SW updates
CCPRO-SUP-**EX3052R-P**-3	Cambium Care Pro, 3-year support for one EX3052R-P. 24x7 TAC support, SW updates
CCPRO-SUP-**EX3052R-P**-5	Cambium Care Pro, 5-year support for one EX3052R-P. 24x7 TAC support, SW updates

ABOUT CAMBIUM NETWORKS

Cambium Networks enables service providers, enterprises, industrial organizations, and governments to deliver exceptional digital experiences, and device connectivity, with compelling economics. Our ONE Network platform simplifies management of Cambium Networks' wired and wireless broadband and network edge technologies. Our customers can focus more resources on managing their business rather than the network. We deliver connectivity that just works.

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