cnMatrix™ TX2000 Series Switches

QUICK LOOK:

- **Cloud Managed**
- **Non-Blocking, Fully Managed, Enterprise Grade, L2/L3 switch**
- **Cambium (GPS) Sync – Redundant dual sources**
- **Comprehensive/Intelligent PoE Solution**
- **Dual redundant AC/DC removable Power supplies**





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:

- Full Line Rate, non-blocking architecture
- 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

* Feature to be included in a future release.

The cnMatrix TX Series of Switches provides the following addition functionality:

Cambium Sync

- Redundant Input Sync sources
  - » Internal GPS module (with external antenna)
  - » cnPulse
- Full per-port control with stats available

Comprehensive/Intelligent PoE solution

- 802.3af/at/bt - up to 90W
- 24V Passive PoE - up to 15W
- 54V Passive PoE - up to 90W

Dual redundant removable power supplies AC supplies

- 600W, 930W, & 1200W options

DC supplies

- Fully Isolated – Supports positive/negative input voltages
- 36V–72V
- 600W, 930W, & 1200W options
- Grounding lug nut located on front panel

All interfaces located on front panel

The cnMatrix series of fully managed switches delivers full Layer 2 and Layer 3 capabilities with enhanced access security. The cnMatrix series offers flexibility with SFP+ (10 Gbps) or SFP (1 Gbps) uplink ports. These switches come with a 3/5-Year Limited Lifetime Warranty.

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cnMatrix™ TX2000 Series Switches

Specifications

	TX2012R-P	TX2020R-P
Throughput	104 Gbps	112 Gbps
Forwarding Rate in Mpps (64 Byte Packets)	120	120
10/100/1000 Mbps RJ45 Ports	8	16
1 Gbps Fiber Ports (SFP)	0	0
10 Gbps Fiber Ports (SFP+)	4	4
PoE+ Enabled Ports 802.3af/at/bt	8	16
Low Voltage Passive PoE (24 V)	4	8
High Power 4 PPoE (up to 90 W)	4	8
Serial Console	Yes	Yes
USB	Yes	Yes
Rack Mount Kit	No (optional accessory)	Yes
Internal Fans	2	2
Reset Button	Yes	Yes
MAC Address Table Size	16K	16K
Flash Storage	128 MB	128 MB
DRAM	512 MB	512 MB
VLANs	4K	4K
Port Based VLANs	4K	4K
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	Yes	Yes
Cambium Sync (via RJ45 ports)	8	16
Redunant Sync Sources	Yes	Yes
External Antenna Port	Yes	Yes
cnPulse Port	Yes	Yes
Removable Power Supply (CRPS)	1	2
Redundant Power Supplies	No	Yes

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cnMatrix™ TX2000 Series Switches

Hardware Specifications

	TX2012R-P	TX2020R-P
Power Supply	CRPS dependent	CRPS dependent
Max Switch Power (WITH TRAFFIC)	38.88W	39.24W
MTBF (hours)	393648	250744
Unit Weight	2.24 kg (4.98 lbs)	4.3 kg (9.46 lbs)
Unit Dimensions (H x L x W)	4.4 x 25 x 26 cm (1.73 x 9.84 x 10.24 in)	4.4 x 35 x 44 cm (17.3 x 1.75 x 117.32 in)
Boxed Weight	2.73 kg (6 lbs)	5.35 kg (11.77 lbs)
Boxed Dimensions (H x L x W)	9.2 x 37.5 x 31.5 cm (3.62 x 14.76 x 12.4 in)	12.8 x 55.1 x 48.5 cm (5.04 x 21.69 x 19.09 in)
CPU Speed	800 MHz	800 MHz
LEDs per port	Link/Activity, PoE	Link/Activity, PoE
PoE Power Budget	CRPS dependent (see table)	CRPS dependent (see table)
802.3af/at/bt PoE (54V)	Ports 1–8	Ports 1–16
24V Passive PoE - up to 15W	Ports 5–8	Ports 9–16
54V Passive PoE - up to 90W	Ports 1–4	Ports 1–8
54V Passive PoE - up to 30W	Ports 1–4	Ports 9–16
PoE Max Power Per Port	30W/90W	30W/90W
Rack Mountable	Not included	Yes 1U
Wall Mountable	Yes (Optional Accessory)	Yes
Temperature Ranges	-10°C up to 65°C	-10°C up to 65°C
Operating Humidity	55°C at 95% RH	55°C 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)

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cnMatrix™ TX2000 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	Dynamic Routing – RIPv1/v2
	Static ARPs	Dynamic Routing – OSPFv2
	Static Routes	Route Redistribution
	DHCP Relay	

* Feature to be included in a future release.

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Specifications - All Models cont'd

Management

- cnMaestro (cloud management)
- Industry standard Command Line Interface (CLI)
- DHCP Client
- Embedded web management (HTTP/HTTPS)
- Embedded DHCP server
- USB file management and storage
- Out-of-Band Ethernet Management
- SSH / SSH v2
- SNMP v1/v2/v3
- DHCP relay
- Simple Network Time Protocol (SNTP)
- Local/remote system logging
- Policy Based Automation
- Display log messages multiple terminals*
- TFTP/SFTP
- Telnet client/server
- IPv6 management
- Password management
- 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
- TCP/UDP Source/Destination port
- IP Protocol Type
- Type of Service (ToS) or differentiated services (DSCP) field
- Source/Destination MAC address
- EtherType
- IEEE 802.1p user priority
- VLAN ID
- RFC 1858—Security Considerations for IP Fragment Filtering

* Feature to be included in a future release.

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cnMatrix™ TX2000 Series Switches

Acoustic Noise dBA Per Switch (AMBIENT TEMPERATURE)

TX2012R-P

AC CRPS

1 x 1200W AC: 52.7 dB < 33°C,52.8 dB 33°C-43°C, 53.5dB - >43°C,

1 x 930W AC: 51.3 dB < 33°C,51.6 dB 33°C-43°C, 52dB - >43°C,

1 x 600W AC: 60 dB < 33°C, 59.8dB 33°C-43°C, 59.6dB - >43°C,

DC CRPS

1 x 1200W DC: 69.2 dB < 33°C, 70.5dB 33°C-43°C, 70.6dB - >43°C,

1 x 930W DC: 64.3 dB < 33°C,68.5 dB 33°C-43°C, 68.5dB - >43°C,

1 x 600W DC: 59 dB < 33°C,65.5 dB 33°C-43°C, 65.5dB - >43°C,

TX2020R-P

AC CRPS

1 x 1200W AC : 71.4 dB < 33°C, 71.5dB 33°C-43°C, 71.5dB - >43°C,

2 x 1200W AC : 55.6 dB < 33°C, 55.7dB 33°C-43°C, 56.1dB ->43°C,

1 x 930W AC : 67.9 dB < 33°C, 68.0dB 33°C-43°C, 68.1dB - >43°C,

2 x 930W AC : 54.8 dB < 33°C, 55.1dB 33°C-43°C, 55.4dB - >43°C,

1 x 600W AC : 58.2 dB < 33°C, 58.4dB 33°C-43°C, 58.6dB - >43°C,

2 x 600W AC : 52.8 dB < 33°C, 53.3dB 33°C-43°C, 53.9dB - >43°C,

DC CRPS

1 x 1200W DC : 68.9 dB < 33°C, 71.2dB 33°C-43°C, 71.2dB - >43°C,

2 x 1200W DC : 72.9 dB < 33°C, 74.0dB 33°C-43°C, 74.0dB ->43°C,

1 x 930W DC : 64.3 dB < 33°C, 68.9dB 33°C-43°C, 68.9dB - >43°C,

2 x 930W DC : 61.3 dB < 33°C, 68.6dB 33°C-43°C, 68.7dB - >43°C,

1 x 600W DC : 60.7 dB < 33°C, 66.6dB 33°C-43°C, 66.7dB - >43°C,

2x600W DC : 55.8 dB < 33°C, 67.3dB 33°C-43°C, 67.3dB - >43°C,

Power Supply	Type (AC/DC)	Available PoE Load	PoE Load	Temperature
1200W	AC	~1000W	<700W	-10°C up to 65°C
1200W	AC	~1000W	>700W	-10°C up to 65°C
1200W	DC	~960W	<700W	-10°C up to 65°C
1200W	DC	~960W	>700W	-10°C up to 65°C
930W	AC	~800W	<600W	-10°C up to 65°C
930W	AC	~800W	>600W	-10°C up to 65°C
930W	DC	~840W	<600W	-10°C up to 65°C
930W	DC	~840W	>600W	-10°C up to 65°C
600W	AC	~500W	<450W	-10°C up to 65°C
600W	AC	~500W	>450W	-10°C up to 65°C
600W	DC	~500W	<450W	-10°C up to 65°C
600W	DC	~500W	>450W	-10°C up to 65°C

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Part #	Power Supply	Type (AC/DC)	DC - in Voltage	Available PoE Load
MXCRPSAC1200A0	1200W (110V)	AC	NA	900W
MXCRPSAC1200A0	1200W (220V)	AC	NA	960W
MXCRPSDC1200A0	1200W	DC	48-72V	960W
MXCRPSDC1200A0	1200W	DC	36-47V	740W
MXCRPSAC930A0	930W	AC	NA	840W
MXCRPSDC930A0	930W	DC	48-72V	840W
MXCRPSDC930A0	930W	DC	36-47V	740W
MXCRPSAC600A0	600W	AC	NA	500W
MXCRPSDC600A0	600W	DC	48-72V	500W
MXCRPSDC600A0	600W	DC	36-47V	500W

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 Features	Inter-VLAN Routing
	Static ARP
	Static Routes
	RFC 2131 – DHCP Relay
	RFC 2328 – OSPF Version 2
	RFC 2453 – RIP Version 2

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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 1.2

RFC 2246—TLS protocol, version 1.2

RFC 2818—HTTP over TLS

RFC 3268—AES cipher suites for transport layer security

Telnet

Web GUI

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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

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cnMatrix™ TX2000 Series Switches

Ordering Information

Type	Model	Part Number	Description
Switch	TX2012R-P	MXTX2012GxPA10	Intelligent Ethernet PoE Switch, Cambium Sync, 8 x 1 Gbps, and 4 SFP+, Removable Power Supply (not included) - no pwr cord
Switch	TX2020R-P	MXTX2020GxPA10	Intelligent Ethernet PoE Switch, Cambium Sync, 16 x 1 Gbps and 4 SFP+, Removable & Redundant Power Supplies (not included) - no pwr cord
CRPS - AC		MXCRPSAC600A0	AC 600W total power, no power cord
CRPS - AC		MXCRPSAC930A0	AC 930W total power, no power cord
CRPS - AC		MXCRPSAC1200A0	AC 1200W total power, no power cord
CRPS - DC		MXCRPSDC600A0	DC 600W total power, 37V - 60V, includes 1.5 m cable connector
CRPS - DC		MXCRPSDC930A0	DC 930W total power, 37V - 60V, includes 1.5 m cable connector
CRPS - DC		MXCRPSDC1200A0	DC 1200W total power, 37V - 60V, includes 1.5 m cable connector
Power Cord		N000900L092A	AC line cord, US Type B, 15A, 1.2 m C13 connector
Power Cord		N000900L040A	AC line cord, US Type B, 1.2m C13 connector
Rack Ears		MX-EXTXFULLA-1	cnMatrix rack mount kit: Full-width switch

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Ordering Information

Type	Model	Part Number	Description
Transceiver	n/a	SFP-10G-SR	10G SFP+ MMF SR Transceiver, 850 nm. -40°C to 85°C (-40°F to 185°F)
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-10G-LR	10G SFP+ SMF LR Transceiver, 1310 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	1000 Base-T (RJ45) SFP Transceiver. -40°C to 85°C (-40°F to 185°F)
Transceiver	n/a	SFP-10G-Copper	10G Base-T (RJ45) SFP Transceiver. 0°C to 70°C (-40°F to 185°F)

TX2012R-P

TX2020R-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.

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