CLOUDBERRY**AERO**

CM-1600 SERIES

CM-1600-AERO Series - Cloudberry Aerospace Managed Gigabit PTP/NTP Ethernet Switch

The Cloudberry CM-1600 AERO series is a rugged layer 3 Gigabit Ethernet switch family combined with an accurate network time server for aerospace applications. The platform is optimized for aircraft and military network systems and is available several configurations; Network time server and switch with PTP/NTP, Transparent clock/slave clock switch or Standard Ethernet switch. CM-1600 is available in high and low profile form factors.

Features:

- 8 x 10/100/1000BASE-TX ports
- 28VDC power input
- Standard compliance: RTCA D0160
- Ingress protection: Category S (RTCA DO160G)
- NTP Time server
- PTP v1 or v2 Grand Master Clock
- PTP v1 or v2 Transparent Clock
- PTP v1 or v2 Slave Clock
- Built-in GNSS receiver with accuracy to absolute time < 50ns (with GPS lock)
- PTP accuracy < 30 ns
- PTP version translation to/from PTP v1 and v2
- High accuracy (<1us) NTP server
- NMEA/PPS and IRIGB-DC input
- Time synchronization output interfaces such as GNSS emulation, PPS or IRIG-B (AM or DC)

- GPS position available as a IP/UDP Multicast stream
- Network redundancy: MSTP/RSTP/STP protocol
- Network management: Web, telnet, CLI and SNMP v1/v2/v3 with RMON
- Multicast filtering: IGMP snooping, static multicast filters or filtering based on UDP destination port number of UDP/IP packets
- End Point Tap combined with index filtering based on a configurable field
- Event notification: Syslog, Email, and SNMP trap
- IEEE802.1Q VLAN
- Quality of Service
- Wide operating temperature
- Ventilation screw for aligning pressure when used in high altitude applications
- Export Jurisdiction: ITAR-Free

Overview:

OnTime networks
RUGGED ETHERNET AND TIMING SOLUTIONS

Phone: +1 214.800.2054
Fax: +1 214.800.2805
contact@ontimenet.com

AMERICAS/USA
6060 North Central Expy.
Suite 500
Dallas, Texas 75206, U.S.A.

EMEA
Phone: +47 22 09 03 03
Frysjaveien 33C
0884 Oslo, Norway

ontimenet.com »

Today's modern military platforms contain dozens of network devices that must be interconnected, including communications and navigation systems and IP-based sensors, weapon systems and video cameras. Ethernet technology is an ideal solution for mobile military platforms such as aerial, ground and underwater vehicles. These communication networks are faster, more flexible and offer greater functionality than the legacy, serial and low-speed communications systems currently in place.

The CM-1600-AERO Series is an accurate NTP server, PTP Grand Master Clock or Transparent Clock fulfilling IEEE 1588 Std 2002 (v1) and IEEE 1588 Std 2008 (v2). Both PTPv1 and PTPv2 Slave clocks can co-exist in the same network by using the PTP version translator feature of the CM-1600 platform. Multicast filters can be set on the switch either based on IGMP snooping or by manual configuration of static filters. Filtering of broadcast packets can be done based on UDP destination port number of UDP/IP broadcast packets. The switches in the CM-1600 AERO Series offer full management based on HTTP, telnet, CLI or SNMP. The switch is designed for aircraft and military environments. The switch is available with several operating temperature range alternatives.

INTEROPERABILITY — Supports relevant IEEE Ethernet standards. Management based on web (HTTP/HTTPS), CLI and telnet.

IRIG-B — IRIGB-AM/DC, GPS emulation.

TIMING — Network time server with IEEE1588-2002/2008 and hardware time stamped NTP

MANAGEMENT — Management based on web (HTTP/HTTPS), CLI and telnet.

RUGGED — Designed for the harsh environmental requirements of the Aerospace and Defense industry and offers a wide operating temperature range (-40 to +71C). RTCA D0160 and MIL-STD 461D, -704E and -810G standards.

CONNECTORS — Military style connectors for Ethernet ports and Power connections.

BUILT-IN TESTING — Built-in-Test (BIT) support. The BIT provides a level of confidence in the correct operation at both power-up and during normal operation.

GPS — Built in GPS, GPS emulation and external GPS input.

Specifications:

Ethernet LAN ports	
10/100/1000 BASE-TX Amphenol Terrapin ports with Auto MDI/MDIX	8, Amphenol SCE-B-76A07-14SN-001-CPD (N-keying)
Console port (service port)	
Amphenol Terrapin console port	Amphenol SCE-B-76A07-14SA-001-CPD (A-keying) PTP CPU console port: Baud rate setting: 9600, 8, N, 1 Switch CPU console port: Baud rate setting: 115200, 8, N, 1 Reset pin RS422 Rx serial interface to external GNSS receiver (9600,8,N,1) RS422 multi-purpose port: PPS/IRIGB output, Console, GNSS emulation: NMEA RMC GPS Telegram IRIGB-AM output TTL Output: PPS or IRIGB-DC
GPS	
GPS antenna interface	1, HUBER-SUHNER TYPE: 24_QN-50-2-3 (female)
Technology	
Standards	IEEE 802.3 for 10Base-T IEEE 802.3u for 100Base-TX and 100Base-FX IEEE 802.3z for 1000Base-X IEEE 802.3x for Flow control IEEE 802.3ad for LACP (Link Aggregation Control Protocol) IEEE 802.1D for STP (Spanning Tree Protocol) IEEE 802.1p for COS (Class of Service) IEEE 802.1Q for VLAN Tagging IEEE 802.1w for RSTP (Rapid Spanning Tree Protocol) IEEE 802.1s for MSTP (Multiple Spanning Tree Protocol) IEEE 802.1X for Authentication IEEE 802.1AB for LLDP (Link Layer Discovery Protocol) RFC1305/2030/5905 for NTP/SNTP IEEE 1588-2002 IEEE 1588-2008 RFC 4330 SNTP
MAC table	8192 MAC addresses
Priority queues	4
Switch properties	Store-and-forward and full wire speed on all ports
Security Features	Enable/disable ports, MAC based port security Port based network access control (802.1x) VLAN (802.1Q) to segregate and secure network traffic Radius centralized password management SNMPv3 encrypted authentication and access security

Network redundancy	STP RSTP MSTP
Management	HTTP, telnet, CLI and SNMP v1/v2/v3 and OnTime IPSetWeb
Other protocols	IGMP snooping v1, v2 or v3 (Up to 1024 active filters) Static multicast filtering Port rate limiting TOS/Diffserv Quality of Service (802.1p) VLAN (802.1Q) with VLAN tagging and GVRP Port configuration, status, statistics, monitoring, security NTP/SNTP with hardware time stamp support, accuracy better than 1us.
NTP	
NTP clock modes **NTP server**	Client or server; client can be used in combination with PTP MC operation (kind of PTP BC operation), where NTP client is the time base of the switch.
Accuracy	H (High Accuracy NTP server, accuracy < 1us) M (Mid Accuracy NTP server, accuracy < 100us) S (Standard NTP server, accuracy ~ms)
IEEE1588	
Delay mechanism	End to End(E2E) or Peer to Peer (P2P)
Clock support	v1(1 step or 2 step) or v2 (1 step or 2 step)
Synchronization	OnTime Networks slave clock implementation or GPS
Translation	PTP v1 to PTP v2 PTP v2 to PTP v1
Accuracy	+- 30ns
iNET	iNet Ready
Power	
Input Power	28VDC DC inputs. 22-32VDC on 3-pin connector (M83723/72R1203N connector)
Power Consumption (Typ.)	Typical : 21 Watt. Link on all ports(Gb) or during boot, temperature : 77°F /25°C Worst case: 33 Watt. Link on all ports (Gb) or during boot, temperature: 194°F/90°C
Overload Current Protection	Yes
Reverse Polarity Protection	Yes

OnTime networks   RUGGED ETHERNET AND TIMING SOLUTIONS

Phone: +1 214.800.2054
Fax: +1 214.800.2805
contact@ontimenet.com

AMERICAS/USA
6060 North Central Expy.
Suite 500
Dallas, Texas 75206, U.S.A.

EMEA
Phone: +47 22 09 03 03
Frysjaveien 33C
0884 Oslo, Norway

ontimenet.com »

Physical Characteristics	
Enclosure	Machined aluminum case, EN AW-7075-T6
Dimension (W x D x H)	250mm (W) x 143.5 (D) x 50.0(H) mm; 9,84 x 5.65 x 1,96 inch (LP) 205mm (W) x 143.5 (D) x 100.0(H)mm; 8,19 x 5.65 x 3,94 inch (HP)
Weight (g)	1700 g (LP) 2400 g (HP)
Environmental	
Storage Temperature	[-67°F to 221°F] / [-55°C to 105°C]
Operating Temperature	[-40°F to 194°F] / [-40°C to 80°C]
Altitude	50 000 feet / 15.2 km
Overpressure	24 656 psi / 170 kPa (**)
Humidity	95% Relative Humidity at 131°F / 55°C
Shock	6 g, 11ms
Crash safety	20 g, 11ms
Vibration	Random vibration, category: S, Zone 5, aircraft type 2, Test E (civil aircraft)
Waterproofness	Category S (RTCA DO160G)
Power input	DC input range: 22,0-30,3VDC
Momentary power interruptions	up to 0,25s
Voltage spike	600V, category A (civil aircraft)
Conducted RF susceptibility	0.15 to 7.5mA, 10KHz – 400MHz, category T (civil aircraft)
Radiated RF susceptibility	5 V/m, category: T (civil aircraft)
Conducted RF emission	category H (civil aircraft)
Radiated RF emission	category: H
Lightning - ground Injected	Single stroke: 750 V/2000A, level 4 Multiple strokes: 300 V/800A (first stroke) and 150V/400A (multiple strokes), level 4
Lightning - pin Injected	600V/24V, level 3
Lightning - cable Induction	600 V / 120 A, level 3, single stroke 300 V / 60 A, level 3, multiple strokes
ESD	+/- 15KV

Ordering information:

Article build up

The article number is structures into 4 main sections.

- Product family with port count: CM-16XXFX
- Environment: MIL
- Switch configuration: GHEDABBA1A
- Special options: 00

Detailed overview with the different options are listed below. Please note that the special options code can include several features. Please contact us if a required feature is missing; OnTime Networks provides customization to meet specific needs.

Product family with port count   Environment   Switch configuration   Special options

CM-29 XX FX -MIL-A G H E D A B B A 1 A -00

Product family

Total number of Ethernet ports   Number of fiber ports   Fiber transceiver   NTP   Copper connector   Form factor   Power connector   Router   Special option

Environment   PTP   Network Tap   Fiber connector   Power   Hold-Up
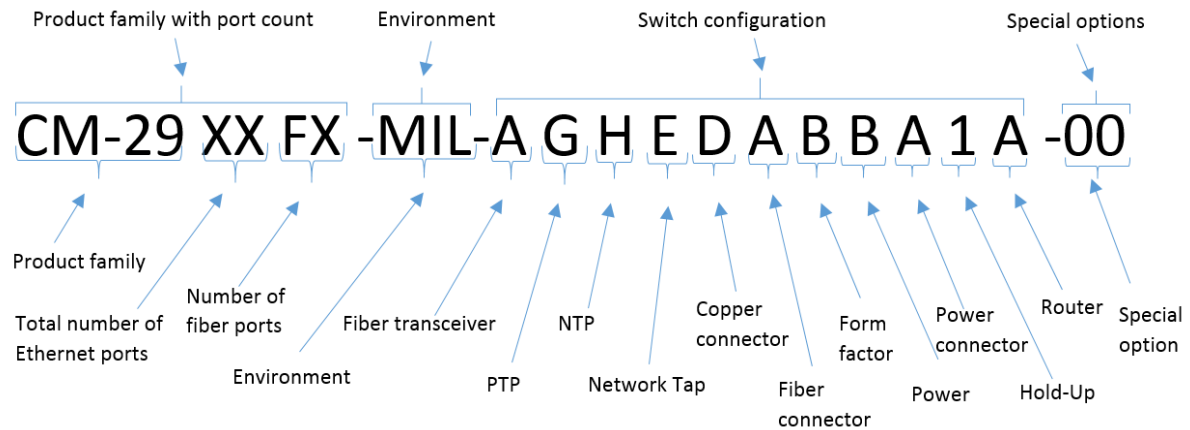
Product family
-    CM-16
Total number of Ethernet ports
-    08 (8 ports)
Number of fiber ports
-    F0 (No fiber ports)
Environment
-    AER (Rugged version)
Fiber transceiver
-    0 (no fiber transceivers)
PTP options
-    G (PTP 1588 Grand Master Clock, GMC)   -   S (PTP 1588 Transparency Clock/Slave Clock, SC/TC)   -   T (PTP Transparency Clock, TC)   -   0 (No PTP support)
NTP Options
-    H (High Accuracy NTP server, accuracy < 1us)   -   M (Mid Accuracy NTP server, accuracy < 100us)   -   S (Standard NTP server, , accuracy ~ms)   -   C (NTP Client)   -   0 (No NTP support)

OnTime networks — RUGGED ETHERNET AND TIMING SOLUTIONS

Phone: +1 214.800.2054
Fax: +1 214.800.2805
contact@ontimenet.com

AMERICAS/USA
6060 North Central Expy.
Suite 500
Dallas, Texas 75206, U.S.A.

EMEA
Phone: +47 22 09 03 03
Frysjaveien 33C
0884 Oslo, Norway

ontimenet.com »

Network Tap options
- 0 (No option)
- E (End point TAP with index filtering)
Copper connector options
- A (Terrapin, 14 pins connector for 1 x 10/100/1000Base-T(x)
Fiber connector options
- 0 (No option)
Form factor options
- D (250mm (W) x 143.5 (D) x 50 (H) mm)
- E (205mm (W) x 143.5 (D) x 100 (H) mm)
Power option:
- B (28VDC)
Power Connector
- H (3 Pin Deutsch M83723/72R1203N)
Hold-Up option
- 2 (250ms)
- 0 (No hold up)
Router option
- 0 (No router engine)

Special options:
- **00** (No options) / **01** (UDP filtering (UDPF)) / **02** (SNMP iNet (SNMPiNET)) / **03** (MDL)
- **04** EXT1 (-55°C to 85°C) / **50** (I/O signal level 3,3V) / **51** (I/O signal level 5V)
- **60** (GPS emulation, Enabled) /**61** (GPS emulation, No GPS functionality enabled)
Service and Support:
OnTime Networks can support customer on delivery of hardware with day-to-day service and support Contract (ordering code in brackets).
- One year service and support contract (1YS)
- Additional service and support, additional year (after year one) (1YAS)
Warranty:
OnTime Networks products delivered with standard 2-year warranty. Additional warranty purchased separately (ordering code in brackets):
- 3 year warranty (3YW) / 4 year warranty (4YW) / 5 year warranty (5YW)
- One year extended warranty (1YEW)
Accessories hardware:
Hardware options for the CM-1600 Series switch (ordering code in brackets):
- CAT 5e cable 2m length, SCE2-B-01K07-14PN each end: ACC-SCE2SCE
- CAT 5e cable 2m length, SCE2-B-01K07-14PN to RJ45: ACC-SCE2RJ45
- GPS cable 15 meters with male N connector and male 11_QN connector: ACC-CAB-N_QN_15
- GPS antenna with female N connector: ACC-ANT-N
- Power mating connector, Amphenol M83723/75R1203N, straight plug with sockets: ACC-POWM83723

Notes:

OnTime
networks

*RUGGED ETHERNET
AND TIMING
SOLUTIONS*

Phone: **+1 214.800.2054**
Fax: +1 214.800.2805
contact@ontimenet.com

AMERICAS/USA
6060 North Central Expy.
Suite 500
Dallas, Texas 75206, U.S.A.

EMEA
Phone: +47 22 09 03 03
Frysjaveien 33C
0884 Oslo, Norway

ontime**net**.com »