



## CM-4000-MIL Series CloudberryMIL 8 to 14 Ports Managed Military Ethernet Switch for Airborne and Ground Applications

### Key Features

- 8 to 12 ports of 10/100/1000BASE-TX ports in three Mighty Mouse connectors
- 0 to 2 ports of 1000BASE-S/LX/LHXX ports in one D38999 connector
- Small form factor and low weight <2 lbs
- 28VDC power input
- Wide operating temperature
- Corrosion-Resistant, Aluminum Chassis Sealed against Water, Dust (IP67)
- Designed to meet military environmental (Temp, Shock, Vibration, Humidity, Altitude, Dust/Water Ingress) MIL-STD-810G
- EMC requirements (Conducted & Radiated Emissions & Susceptibility), MIL-STD-461F/1275E
- Network redundancy: MSTP/RSTP/STP protocol
- Robust Layer 2 Switching and network management: Web, telnet, CLI and SNMP v1/v2/v3 with RMON
- Supports layer 3 IPv4 / IPv6 static routing for attached WAN / radios.
- High-Performance MIL-Circular Connectors
- IEEE 1588v2 Precision Time Protocol (PTP) Transparent Clock (TC) and Slave Clock (SC)
- Per port 1588 version control
- Version translation between PTPv1 and PTPv2
- Provides GPS (PPS and NMEA) emulation
- Excellent clock hold-over capability, < 0.1ppm
- Packet filtering: IGMP snooping
- IEEE802.1Q VLAN
- Event notification: through Syslog and SNMP trap
- Data Zeroization Support
- Enhanced Watch dog features
- LEDs for link/activity per port, power and ON (Option)
- Export Jurisdiction: ITAR-Free



CM-4012-MIL





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## Overview

The CM4000-MIL is a ruggedized managed Ethernet switch with up to 14 Gigabit ports specifically designed to operate reliably in the harsh climatically and noisy electrical demanding environments (e.g. high altitude, extreme shock, & vibration, extended temperatures, humidity, dust & water exposure, noisy EMI, dirty power) of military applications.

The CM4000-MIL is a reliable and accurate PTP Transparent Clock/Slave Clock (TC/SC) 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 CM4000 -MIL platform. The switch can also provide GPS emulation output. GPS emulation means Pulse Per Second (PPS) output signals via GPO pins in the power connector (TTL) and NMEA telegrams via RS232 in the same connector.

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 CM4000-MIL is an advanced and highly engineered Commercial off the Shelf (COTS) Gigabit Ethernet (GbE) switch that addresses complexity, enable modularity and provides growth, while delivering optimal performance for Space, Weight, Power and Cost (SWaP-C) constrained military applications onboard vehicles and aircraft platforms. The unit designed to meet the environmental requirements of MIL-STD 810G and the EMI/EMC requirements (Conducted & Radiated Emissions & Susceptibility) of MIL-STD 461F and 1275E.

This fully managed, Layer 2 Gigabit switch provides a powerful set of networking features, including support for IPv4 multicast traffic filtering according to static filters or IGMP snooping, Virtual Local Area Networks (VLANs), port control (speed / mode / statistics, flow control), Quality of Service (QoS) traffic prioritization, Link Aggregation (802.3ad), SNMPv1/v2/v3 management, secure authentication (802.1X, ACLs, Web/CLI), redundancy (RSTP/MSTP) and port mirroring. The switch also supports Transparent Clock operation according to IEEE 1588 Std 2008 (PTPv2).

28VDC power input and Ethernet signals are available through the Mighty Mouse military connectors of shell size 7 (power) and 13 (Ethernet copper ports), where each of the three Ethernet Mighty Mouse connector contains 4 x 10/100/1000BASE-T(x) ports. The CM4000-Mil fiber variant, CM4014F2-MIL, offers two fiber transceivers of 1000BASE-SX, 1000BASE-LX or 1000BASE-LHX type in one D38999 connector.





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## Key Features/Benefits



### INTEROPERABILITY

The CM-4000-MIL-series supports relevant IEEE Ethernet standards.



### MANAGEMENT

The switches in the CM-4000-MIL-series offer management based on web (HTTP/HTTPS), CLI and telnet.



### BUILT-IN TESTING

The Cloudberry CM-4000-MIL-series has Built-in-Test (BIT) support. The BIT provides a level of confidence in the correct operation of the CM-4000-MIL-series at both power-up and during normal operation.



### FILTERING

The CM-4000-MIL-series offers VLAN filtering capabilities, in order to selectively pass data to the monitoring ports for analysis, processing and recording purposes.





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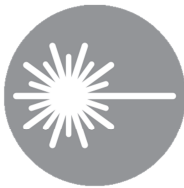
RUGGED

The CM-4000-MIL-series is designed for the harsh environmental requirements of the Aerospace and Defense industry and offers a wide operating temperature range (-40 to +71C). Ruggedized military approved connectors are used for both the Ethernet ports and the power connector. The unit is designed to meet RTCA DO 160G, as well as MIL-STD 461D, -704E and -810G standards



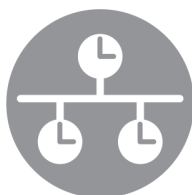
CONNECTORS

The CM-4000-MIL-series is configured with four connections. Power input (J4) and 3 x 10/100/1000BASE-TX Ethernet ports (J1-J3) with N-keying.



FIBER CONNECTION

The CM-4014F2-MIL is configured with two rugged fiber transceivers of either 1000BASE-SX, 1000BASE-LX or 1000BASE-LHX type. The two fiber ports are available in a D38999 connector (J5).



The CM-4014F2-MIL supports an accurate PTP Transparent Clock/Slave Clock (TC/SC) and also offers excellent clock hold-over capability (OCXO). GPS emulation (PPS and NMEA) is available via the power connector





## Specifications

Ethernet LAN ports	
<b>10/100/1000BASE-TX with Auto MDI/MDIX</b>	8 to 12 ports with four ports in each Mighty Mouse connector (37 pins)
<b>1000BASE-SX/LX/LHX</b>	0 - 2 ports in one D38999 connector.
Technology	
<b>Standards</b>	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) IEEE 1588 TC (optional)
<b>MAC table</b>	8192 MAC addresses
<b>Priority queues</b>	8
<b>Switch properties</b>	Store-and-forward and full wire speed on all ports
<b>Security Features</b>	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
<b>Network redundancy</b>	STP RSTP MSTP
<b>Management</b>	HTTP/HTTPS, telnet/SSH, CLI and SNMP v1/v2/v3
<b>Other protocols</b>	IGMP snooping (up to 1024 multicast filters) Static multicast filter setting Port rate limiting TOS/Diffserv supported Quality of Service (802.1p) for real-time traffic VLAN (802.1Q) with VLAN tagging and MVR Port configuration, status, statistics, monitoring, security





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Data Zeroization Support	
<b>Factory default</b>	Erase Non-Volatile Flash Memory and Restore Board to Factor Default Configuration, command available via CLI or HTTPS:
Power	
<b>Power Consumption (Typ.)</b>	<10 Watts
<b>Overload Current Protection</b>	Yes
<b>Reverse Polarity Protection</b>	Yes
<b>Power input</b>	28VDC, input range : 18-36VDC
Physical Characteristic	
<b>Enclosure</b>	Aluminum case
<b>Dimension (W x D x H)</b>	143/152 (W) x 96 (D) x 46(H)mm (*) 5.63"/5.98" (W) x 3.78" (D) x 1.81" (H) (*) (*) ex. connectors
<b>Weight (g)</b>	Approx. 930 g / 2.05 lbs
Environmental	
<b>Storage Temperature</b>	MIL-STD-810G, [-40°F to 185°F] / [-40°C to 85°C]
<b>Operating Temperature</b>	MIL-STD-810G, [-40°F to 160°F] / [-40°C to 71°C]
<b>Altitude</b>	50 000 feet / 15.2 km
<b>Overpressure</b>	24 656 psi / 170 kPa
<b>Humidity</b>	MIL-STD-810G, 5% to 99% condensing
<b>Shock</b>	MIL-STD-810G
<b>Vibration</b>	MIL-STD-810G
<b>Ingress protection</b>	IP68
<b>Conducted RF emission</b>	MIL-STD-461F
<b>Radiated RF emission</b>	MIL-STD-461F
<b>Power input</b>	MIL-STD-1275E





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## Ordering information

Product Family	
Reference	Description
<b>CM-4014F2-LX-MIL</b>	Managed Ethernet network switch, 12 x 10/100/1000BASE-TX in three Mighty Mouse connectors and 2 x 1000BASE-LX in one D38999 connector, op. temp range: [-40 .. 71]°C. 28V DC power supply
<b>CM-4014F2-SX-MIL</b>	Managed Ethernet network switch, 12 x 10/100/1000BASE-TX in three Mighty Mouse connectors and 2 x 1000BASE-SX in one D38999 connector, op. temp range: [-40 .. 71]°C. 28V DC power supply
<b>CM-4012F0-MMP-MIL</b>	Managed Ethernet network switch, 12 x 10/100/1000BASE-TX TX in three Mighty Mouse connectors, op. temp range: [-40 .. 71]°C. 28V DC power supply
<b>CM-4008F0-MMP-MIL</b>	Managed Ethernet network switch, 8 x 10/100/1000BASE-TX TX in two Mighty Mouse connectors, op. temp range: [-40 .. 71]°C. 28V DC power supply

