



BLUEBERRY  
INDUSTRIAL  
ETHERNET



CM-1608FC4-NTS SERIES

## Cloudberry CM-1600-NTS series, Network Time Server, PTP or NTP with 8 Port Managed Gigabit Ethernet Capability

### Features

- NTP/SNTP time server
  - PTP v1 or v2 Grand Master Clock
  - PTP v1 or v2 Transparent Clock
  - PTP v1 or v2 Slave Clock
  - Combined NTP client and PTP Boundary Clock
  - PTP protocol supports:
    - Unicast or multicast
    - Layer 2 or IP
    - 1-step or 2-step clock
    - Peer-to-Peer (P2P) or End-to-End (E2E) delay mechanism
    - PTP version translation
  - Built-in GPS receiver (GMC variant) with time accuracy to absolute time < 50ns (with GPS lock)
  - PTP accuracy < 20 nanosecond (\*)
  - 4 x 10/100/1000BASE-T(x) ports
  - 4 x 10/100/1000BASE-X combo ports
  - Wide operating temperature: [-40°F to 158°F] / [-40°C to 70°C]
  - 100-240AC power input
  - Network redundancy: OnTime-Ring- or MSTP/RSTP/STP protocol
  - Network management: Web, telnet, CLI and SNMP v1/v2/v3 with RMON
  - Multicast filtering: IGMP snooping or static multicast filters
  - IEEE802.1Q VLAN
  - Event notification: through Syslog, Email, and SNMP trap
- (\*) Accuracy per network hop.



The Cloudberry CM-1600 NTS is a GPS Network Time Server (NTS) for NTP or PTP IEEE 1588 that provides secure, accurate and reliable time synchronization for networks and offers integrated fully managed switch capabilities for 8 (10/100/1000BASE) Gigabit Ethernet ports. The CM-1600 NTS can be used for data centers, test facilities, military installations, federal or municipal agencies, financial services and technology firms, and many other enterprises which need precision timing to support their network operations.





The CM-1600 NTS provide exact time over Ethernet either based on the well-established NTP/SNTP protocol or PTP according to IEEE 1588 Std 2008. It not only provides NTP and PTP timing capabilities, but also a variety of other time codes and signals, such as GPS emulation and IRIG-B. The unit also provides backwards compatibility for older timing systems. Such interfaces are normally provided on the network boundaries integrated on relevant SNTP clients or PTP Slave Clocks platforms.

The CM-1600 NTS is used for applications that require reliable timing to accurately synchronize networks, systems, and devices and to log events with legally traceable time. The CM-1600 NTS Series offers a broad portfolio of features, including network master clocks (NTP or PTP), monitoring and management capabilities, and a complete software package to deliver high performance timing for network applications and devices. The CM-1600 NTS is easy-to-install and is full configurable to customize its features, interfaces, ports and protocols to your needs. These features include remote login and file transfer capabilities, which provide the utmost security using industry standard interfaces. A full-suite of network protocols includes SNMP capability, support for enterprise directory servers to authenticate users, internal and external logging and monitoring of error messages through Syslog, DHCP for installation convenience, and IPv4.

The CM-1600 NTS is a reliable and accurate NTP and PTP Grand Master Clock fulfilling the IEEE 1588 Std 2002 (v1) and IEEE 1588 Std 2008 (v2). The CM-1600 NTS contains a built-in state-of-the-art GPS receiver that is used as the time base for the GMC clock. The CM-1600 2-step clock modes and either E2E or P2P as the delay mechanism. The platform maximizes PTP performance since all critical PTP functions are implemented in hardware. The switch functionality in the CM-1600 NTS series offer full management based on HTTP, telnet, CLI or SNMP. Network Redundancy is achieved based on the OnTime-Ring- or MSTP/RSTP/STP (IEEE 802.1s/w/D) protocol. The unit offers a wide operating temperature range: [-40°F to 158°F] / [-40°C to 70°C].





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## Specifications

Ethernet LAN ports	
<b>10/100/1000 BASE-TX ports in RJ45</b>	4-8
<b>Auto MDI/MDIX</b>	
<b>1000BASE-X SFP slots</b>	4
BNC	
<b>GPS antenna interface</b>	Male BNC connector
<b>OUT1</b>	PPS output signal
<b>10MHz</b>	10MHz reference
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 Std 2002 (PTPv1) IEEE 1588 Std 2008 (PTPv2) RFC 4330 NTP
<b>MAC table</b>	8192 MAC addresses
<b>Priority queues</b>	4
<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>	OnTime-Ring STP/RSTP/MSTP
<b>Management</b>	HTTP, telnet, CLI and SNMP v1/v2/v3 or IPSetWeb tool. iNET ready; iNET MIB v0.8.5 supported.





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Technology	
<b>Other protocols</b>	Multicast filtering based on: <ul style="list-style-type: none"> <li>- IGMP snooping v1, v2 or v3</li> <li>- Static multicast filter setting</li> <li>- Up to 1024 multicast filters can be active</li> </ul> Port rate limiting TOS/Diffserv supported Quality of Service (802.1p) for real-time traffic VLAN (802.1Q) with VLAN tagging and GVRP Port configuration, status, statistics, monitoring, security
<b>Console ports</b>	2 x RS-232 in RJ45 connector – service port for PTP- and switch CPUs. Baud rate setting: 9600bps, 8, N, 1
NTP	
<b>(S)NTP clock modes</b> <b>(S)NTP server</b>	Client or server; client can be used in combination with PTP (option) MC operation (kind of PTP BC operation), where NTP client is the time base of the switch.
<b>Accuracy</b>	100us
IEEE1588	
<b>PTP clock modes</b>	GMC, TC or SC
<b>PTP versions</b>	Both PTPv1 and PTPv2 (only PTPv2 for TC-STND)
<b>Delay mechanism</b>	End-to-End(E2E) or Peer-to-Peer (P2P) (only E2E for TC-STND)
<b>PTP version translation</b>	PTPv1 to/from PTPv2 (not supported on TC-STND)
<b>Accuracy</b>	20ns
Power	
<b>Input Power</b>	100-240AC
<b>Power Consumption (Typ.)</b>	20 Watts (typical)
<b>Dual Power Supply</b>	Option available
Physical Characteristic	
<b>Enclosure</b>	IP30, Aluminum case
<b>Dimension (W x D x H)</b>	443.7(W) x 260(D) x 44(H) mm (17.47 x 10.24 x 1.73 inch.)
<b>Weight (g)</b>	2500g
<b>Installation</b>	19" mounting.
Environmental	
<b>Storage Temperature</b>	[-40°F to 185°F] / [-40°C to 85°C]
<b>Operating Temperature</b>	[-40°F to 158°F] / [-40°C to 70°C]





## CM-1608FC4-NTS variants

Variants	Description
<b>(S)NTP</b>	Managed Ethernet switch with (S)NTP Network Time Server support; 4 x 10/100/1000BASE-TX and 4 x 10/100/1000BASE-X combo ports
<b>NTP</b>	Managed Ethernet switch with NTP Network Time Server support; 4 x 10/100/1000BASE-TX and 4 x 10/100/1000BASE-X combo ports
<b>PTP</b>	Managed Ethernet switch with NTP or PTP Network Time Server support; 4 x 10/100/1000BASE-TX and 4 x 10/100/1000BASE-X combo ports

## Ordering information

Product	
<b>CM-1608FC4-NTS-(S)NTP-SERV</b>	NTS with (S)NTP Server support. Providing mid-level accuracy of 0.5ms
<b>CM-1608FC4-NTS-NTP-SERV</b>	NTS with NTP Server support. Providing high-level accuracy of sub-us
<b>CM-1608FC4-NTS-PTP-GMC</b>	NTS with NTP Server or PTP GMC or TC/SC support.
<b>CM-1608FC4-NTS-PTP-TC</b>	NTS with TC/SC support.
<b>CM-1608FC4-NTS-NTPcli-PTP</b>	NTS with NTP client and PTP BC support.
<b>Options:</b>	
<b>DP</b>	Dual 100-240AC power supply option
<b>SFP-1000BASE-SX</b>	1000 Mbps fiber transceiver, LC–connector, 850nm, multi mode, 550m
<b>SFP-1000BASE-LX</b>	1000 Mbps fiber transceiver, LC–connector 1310nm, single mode, 10km
<b>SFP-1000BASE-LHX</b>	1000 Mbps fiber transceiver, LC–connector 1310nm, single mode, 30km
<b>ACC-CAB-N_BNC_2/10</b>	GPS cable 2/10 meters with female N- and male BNC connectors





Product	
<b>ACC-CAB-N_BNC_10</b>	GPS cable 10 meters with female N connectors (relevant in case surge arrester is used)
<b>ACC-ANT-N</b>	GPS antenna with male N connector
<b>ACC-SUR_ARRESTOR</b>	Huber +Suhner surge arrester with female N connector.

