

# Meridian CDMA Frequency Reference

*Convenient and Flexible Time and Frequency Standard*

**The Meridian CDMA Frequency Reference is a time and frequency standard designed for easy installation.** The Meridian includes a proprietary dual-band CDMA Cellular/PCS receiver for synchronization to Universal Coordinated Time (UTC). This permits the convenient installation of a small antenna anywhere a cell phone signal is available, even deep inside buildings, and it eliminates the risk of lightning strike damage to your equipment rack. The Meridian includes a 1 PPS and IRIG-B as outputs and a standard network port supports many protocols including the Network Time Protocol (NTP), Telnet, FTP and DHCP. It can be remotely managed via SNMP, SSH, Telnet, or via a local console on the RS-232 serial port and a Web Interface (HTTPS) is provided for status monitoring using your Internet browser.



## CDMA Timing and Frequency Control

The Meridian receives its timing information from the Global Positioning System (GPS) via the CDMA mobile telecommunications network used by many cellular telephones. For time and frequency applications, the CDMA base stations act as GPS repeaters, boosting the signal level and making indoor reception possible. Incorporating a dual-frequency receiver with digital cellular (800 MHz) and PCS (1.9 GHz) capability, the Tycho uses the CDMA wireless infrastructure to precisely synchronize itself to UTC to the 10-microseconds level of accuracy. The frequency of the internal oscillator is disciplined to match the frequency of the UTC timescale to parts in  $10^{12}$  level-of-accuracy over 24-hour observation intervals.

## FEATURES

- Modular, plug-and-play design, accepts a variety of field-installable options.
- Frequency accuracy:  $< 1 \times 10^{-11}$ .
- 1 PPS output.
- IRIG-B timecode output.
- Network Time Protocol (NTP).
- Vibrant display with user-friendly keypad and display-embedded help messages.
- Network port with NTP, SNMP, SSH, Telnet, FTP, Enterprise MIB.
- Web Interface lets you monitor status via your Internet browser.
- High-reliability, solid-state, fanless design.
- Flash memory for free field upgrades.
- Up to 24 output signals.

## Highly-Reliable, Modular Design

A complete suite of time and frequency capabilities with an exceptionally high number and variety of outputs are provided in a 1U chassis. To achieve this level of output density in a fanless, sealed chassis, EndRun Technologies has set a new standard in power efficiency and thermal packaging. The solid-state design yields a conservative MTBF of 25 years, and a wide range of option cards make it easy to tailor the unit to support your application. The modular design allows for easy, field-installable upgrades and permits the installation of up to five option boards in a single 1U chassis.

## Secure Network Interface

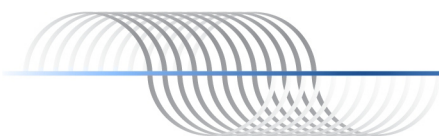
An ethernet port is provided as a standard feature of the Meridian with a wide variety of network protocols including NTP, SNMP with Enterprise MIB, SSH, HTTPS, Telnet, FTP, and SNT. The incorporation of SNMP v3 and SSH provides the ultimate in network security and allows you to safely perform monitoring and maintenance activities. Security-conscious users can also disable any or all of the risky protocols such as HTTPS, Telnet, Time and Daytime. In addition, HTTPS, SSH, SNMP and Telnet access can be restricted to specific hosts.

## Two-Year Warranty

The Meridian TimeBase is backed by a full two-year warranty against defects in material and workmanship.

## Money-Back Guarantee

If your standard Meridian TimeBase does not meet your precision time and frequency needs for any reason, simply return it within 60 days for a full refund minus shipping fees. See [www.endruntechnologies.com/guarantee.htm](http://www.endruntechnologies.com/guarantee.htm) for details.



# Meridian CDMA Frequency Reference Specifications



## CDMA RECEIVER:

- Cellular Mobile Receive Band - 869-894 MHz.
- PCS Mobile Receive Band - 1930-1990 MHz.
- TIA/EIA IS-95 CDMA Pilot and Sync Channels.

## ANTENNA:

- TNC jack on rear panel,  $Z_{in} = 50\Omega$ .
- Dual Band, 824-896 MHz/1850-1990 MHz, magnetic-base with integral 12 ft. RG-58/U cable and TNC plug. Extension cables and preamplifiers are available as options.

## LOCAL OSCILLATOR:

See the [Meridian CDMA Options](#) datasheet for more information on these oscillators.

- TCXO:  $2.5 \times 10^{-6}$  over  $-20^{\circ}$  to  $70^{\circ}$  C.
- MS-OCXO (option):  $4 \times 10^{-9}$  over  $0^{\circ}$  to  $70^{\circ}$  C.
- HS-OCXO (option):  $1 \times 10^{-9}$  over  $0^{\circ}$  to  $70^{\circ}$  C.
- US-OCXO (option):  $5 \times 10^{-10}$  over  $0^{\circ}$  to  $70^{\circ}$  C.
- Rubidium (option):  $1 \times 10^{-9}$  over  $-20^{\circ}$  to  $70^{\circ}$  C.
- HS-Rubidium (option):  $1 \times 10^{-10}$  over  $-20^{\circ}$  to  $70^{\circ}$  C.

## TIME TO LOCK:

- < 5 minutes, typical (TCXO). < 10 minutes, typical (OCXO/Rb).

## 1 PPS TIMING CHARACTERISTICS:

- 1 PPS: Positive TTL pulse into  $50\Omega$  (standard) or RS-422 levels (option).
- User-Selectable Width: 20 us, 1 ms, 100 ms, 500 ms.
- User Calibration: +/- 500 us, 1 ns resolution.
- Stability: TDEV < 50 ns,  $\tau < 10^4$  secs.
- Accuracy: < 10 microseconds to UTC typical when locked.

## TIMECODE CHARACTERISTICS:

- Signal: Amplitude-modulated (AM), 3:1 ratio, 1 kHz carrier.
- Drive: 1 Vrms into  $50\Omega$ .
- User-Selectable Formats: IRIG-B1 20 (IEEE-1344), IRIG-B1 22, IRIG-B1 23, NASA-36, or 2137.

## ALPHANUMERIC DISPLAY/KEYPAD:

- Display: Brilliant 16x280 dot-matrix vacuum-fluorescent.
- Keypad: Enter, Back, Edit, Right, Left, Up, Down, Help.

## SYSTEM STATUS INDICATORS:

- Sync LED: Green LED pulses to indicate GPS lock status.
- Network LED: Amber LED indicates network activity.
- Alarm LED: Red LED indicates a serious fault condition.

## FIRMWARE UPGRADES:

- Software is field-upgradeable and provided free-of-charge

## SERIAL I/O PORT:

- RS-232 serial I/O on DB9M jack for secure, local terminal access.
- Parameters fixed at 19200 baud, 8 data bits, no parity, 1 stop bit.

## NETWORK I/O:

- Rear panel RJ-45 jack.
- AMD PC-Net Fast III 10/100Base-T ethernet.

## NTP CLIENT SYNCHRONIZATION:

- Timestamp accuracy: < 10 microseconds @ 200 NTP packets/second (200,000 clients).
- Network factors can limit LAN NTP client synchronization accuracy to  $\frac{1}{2}$  - 2 ms, typical.

## NTP CLIENT SOFTWARE:

- Please refer to [www.endruntechnologies.com/ntp-client.htm](http://www.endruntechnologies.com/ntp-client.htm).

## SUPPORTED NETWORK PROTOCOLS:

- SNTP, NTP v2, v3, v4, MD5 authentication, and broadcast/multicast mode and autokey.
- SSH server with "secure copy" utility, SCP.
- SNMP v1, v2c, v3 with Enterprise MIB.
- HTTPS (Web Interface).
- TIME and DAYTIME server.
- TELNET client/server.
- FTP and DHCP clients.
- SYSLOG.
- IPv4 and IPv4/IPv6 Hybrid.
- Optional PTP/IEEE-1588.

## POWER:

- 90-132 VAC/180-264 VAC, 47-63 Hz, 0.5A Max. @ 120 VAC, 0.25A Max. @ 240 VAC.
- 3-Pin IEC 320 on rear panel, 2 m. cord included.

## SIZE:

- Chassis: 1.75"H x 17"W x 10.75"D.
- Weight: < 10 pounds.
- Antenna: 2.5"H x 3.5" diameter.

## ENVIRONMENTAL:

- Temperature:  $0^{\circ}$  to  $+50^{\circ}$  C.
- Humidity: 0 to 95%, non-condensing.

## COMPLIANCE:

- CE, FCC.

## OPTIONS:

Refer to the [Meridian CDMA Options](#) datasheet for more information on all the following options.

- Medium-Stability OCXO, High-Stability OCXO, Ultra-Stable OCXO, Rubidium, High-Stability Rubidium.
- 5 & 10 MHz Low-Phase-Noise Frequency Outputs. See [LPN Option](#) datasheet.
- 1, 5 & 10 MHz Sine Wave Outputs.
- Alarm Output (Open Collector).
- Test-Range Timecodes (AM and DC Level Shift).
- User-Selectable Pulse Rate Outputs (1PPS, 10PPS, 100PPS, 1KPPS, 10KPPS, 100KPPS, 1MPPS, 5MPPS, 10MPPS).
- User-Selectable DDS Outputs (1 PPS - 10 MPPS @ 1 PPS resolution).
- Telecom Clock Outputs. See [Telecom Clock Option](#) datasheet.
- ASCII Once-Per-Second Output on Second Serial Port.
- Buffer Module to Provide Additional Outputs.
- 12, 24, 48, 125 VDC Inputs.
- Dual-Redundant Power Supplies.
- PTP/IEEE-1588 Grandmaster.
- Other options available. Call us with your requirements.

