



CT-WTFS9000 *Grandmaster Clock*

Datasheet

CT-WTFS9000 Grandmaster Clock receives GPS, BD satellite signal as well as various external time source. Built-in Rubidium clock and supporting multi-format outputs make it a super high precision, powerful and scalable grandmaster clock which meets the timing requirements of complex systems, and widely used in areas like energy, power, telecommunications, military and transportation etc. It is the primary clock of the CT-WTFS9000 Wide Area Time & Frequency Synchronization System.



CT-WTFS9000 Grandmaster front panel



CT-WTFS9000 Grandmaster rear panel

Functions

- ✓ Stratum 1 operation via GPS and/or BD satellite
- ✓ Support multi-format inputs: PTP, IRIG-B, BITS, 10MHz
- ✓ Support multi-format outputs: NTP, PTP, IRIG-B, Pulse, Serial, BITS, 10MHz
- ✓ 1x 10/100 Base-T Ethernet interface for management
- ✓ Internal precision time-keeping via Rubidium clock
- ✓ Support automatic selection of valid time source
- ✓ Support IEC61850, IEC60870-5-104 standard
- ✓ Fault alarm functions for time source, board cards, power supply and so on.
- ✓ Time delay compensation mechanism, compensation range: 20ns~500ms
- ✓ Time continuity judgment mechanism to avoid output time discontinuity
- ✓ Rigorous frequency calibration algorithm, to obtain high stable frequency holdover accuracy

Features

- ✓ Flexible module card design, easy for outputs configuration
- ✓ 2 x internal frequency source are configurable, to ensure the internal time reliability and security
- ✓ Support duplex, hot standby, cold standby configuration

- ✓ LCD display with man-machine interaction brings a simple operation
- ✓ Adapt to the strong electromagnetic interference environments
- ✓ Redundant dual power supplies
- ✓ 19" / 4U rack mount

Specifications

| | | |
|--|------------------------------|--|
| Time Reference | BD B1, GPS L1, BD & GPS | |
| Inputs | PTP, IRIG-B, BITS, 10MHz | |
| Outputs | IRIG-B | TTL、RS422/RS485、RS232、Fiber、idle contact |
| | Pulse (1PPS/1PPM/1PPH) | TTL、RS422/RS485、RS232、Fiber、idle contact |
| | Serial (TOD) | RS232 |
| | NTP/SNTP | RJ45 |
| | PTP over Ethernet | RJ45 |
| | PTP over E1 | BNC |
| | 10MHz | BNC |
| | BITS | BNC |
| Time Performance | Time Accuracy to UTC | $\leq 100\text{ns}$ (RMS) |
| | Holdover Accuracy | $\leq 500\text{ns}/24\text{hr}$ (After 24 hours locked) |
| | Frequency Accuracy | $\leq 1\text{E-}12/\text{day}$ (After 24 hours tamed) |
| | Frequency Stability | $< 1\text{E-}11/\text{s}$ |
| | | $< 5\text{E-}12/10\text{s}$ |
| | | $< 3\text{E-}12/100\text{s}$ |
| | Phase Noise | $\leq -95\text{dBc}/\text{Hz}/1\text{Hz}$ |
| $\leq -120\text{dBc}/\text{Hz}/10\text{Hz}$ | | |
| $\leq -135\text{dBc}/\text{Hz}/100\text{Hz}$ | | |
| $\leq -150\text{dBc}/\text{Hz}/1\text{KHz}$ | | |
| Harmonic suppression | $\leq -30\text{dBm}$ 2 times | |
| | $\leq -45\text{dBm}$ 2 times | |
| Stray | $\leq -80\text{dBm}$ 3 times | |
| Network Service | Network Interface | RJ45 10/100M Ethernet port, ST Optical Fiber |
| | NTP Time Sync Accuracy | 1ms~10ms (Rely on the network environment) |
| | NTP access ability | 2000 requests per second |
| | NTP\SNTP Protocols | RFC-1059 (NTP v1), RFC-1119 (NTP v2), RFC-1305 (NTP v3), RFC-5905(NTP v4), RFC-2030 (SNTP) |
| | PTP Protocols | IEEE1588-2008v2 |
| | | Support both P2P and E2E delay mechanism |
| | | Support BMC best master clock selection algorithm |
| | Other Protocols | IEC61850、IEC60870-5-104 |
| TELNET, HTTP (SSH,DHCP,FTP are customizable) | | |
| Installation | 19" / 4U standard chassis | |