Net.Time -GM is a Grandmaster clock designed to be deployed in the backhaul of Ethernet / IP networks to deliver SyncE and PTP timing services including frequency, phase and time-of-day of LTE, PON, Wimax and Circuit Emulation Networks.

Datasheet

Net.Time-GM grandmaster clock

Net.Time GM is a general purpose PTP Grandmaster conceived to supply synchronization to clients connected to Ethernet / IP networks such as 4G / LTE base stations. Once locked to the GNSS it delivers highly accurate PTP frequency and time. Synchronous Ethernet, 10 MHz, 1PPS and other interfaces can be used as backup for the GNSS input. The unit is a rack mount chassis, with redundant AC or DC power source and fanless operation.

1. GNSS Receiver
- Built-in GPS/GLONASS receiver
- SMA connector to antenna
- Antenna: L1 band
- 4 ~ 5 V DC output

2. Rubidium Oscillator

2.1 Freerun
- Output freq. accuracy (7.5 minutes warm up): ±1e-9
- Output freq. accuracy on shipment (24 h. warm up): ±5e-11
- Aging (1 day, 24 hours warm up): ±.4e-11
- Aging (1 year): ±1.5e-9

2.2 GPS Locked
- Time/Phase Accuracy to UTC: ±20 ns at 1σ after 24 hours lock
- Frequency Accuracy: < ±1e-11 (averaged over one week)

2.3 Hold-over
- Output freq. accuracy (after 24 h. locked): ±1e-11 / 24h
- Output time accuracy (after 24 h. locked): ±100 ns / 2h, ±1.0μs / 24 h

3. OCXO
- Free run output freq. accuracy: ±1e-7
- Locked time/phase accuracy to UTC: ±25 ns at 1σ after 24 hours lock
- Holdover output freq. accuracy (after 24 h. locked): ±3e-10 / 2h
- Holdover output time accuracy (after 24 h. locked): ±2.0μs / 2 h

4. PTP and Synchronous Ethernet

4.1 General
- Relevant standards: ITU-T G.811, ITU-T G.8272
- 2 Gigabit Ethernet electrical / optical combo ports
- SFP interfaces: 1000BASE-SX, 1000BASE-LX, 1000BASE-ZX
- RJ-45 interfaces: 1000BASE-T, 100BASE-TX, 10BASE-T

4.2 PTP Grandmaster Function
- IEEE 1588v2-2008 compliant
- 1-step and 2-step clock mechanisms
- Unicast and multicast addressing
- End-to-end and peer-to-peer path delay mechanisms

- PTP over UDP / IPv4, PTP over Ethernet
- Up to 512 unicast clients
- Support of ITU-T G.8265.1 and G.8275.1 profiles

4.3 Synchronous Ethernet
- ITU-T G.8261 and G.8262 compliant
- Provides backup Synchronous Ethernet synchronization to client devices
- Full ESMC / SSM support as per ITU-T G.8264 and G.781

5. Alternative Synchronization Inputs
- Frequency: 2048 kHz, 1544 kHz, E1, T1, 10 MHz over balanced RJ45 120 Ω or unbalanced BNC 75 Ω
- Frequency: 2 x SyncE over optical or electrical interface
- Phase: 1 PPS over balanced RJ-48 120 Ω or unbalanced SMA 50 Ω

6. Alternative Synchronization Outputs
- Frequency: 2048 kHz or 10 MHz over unbalanced BNC 75 Ω
- Phase: 1 PPS over balanced RJ-48 120 Ω 48 or unbalanced SMA 50 Ω

7. Platform

7.1 Management
- CLI management interface
- Local management through serial console connection
- Remote management through SSH protocol

7.2 Front Panel
- Display: OLED 256 x 64 pixels
- Keypad: Up, Down, Left, Right, Page Up, Page Down, Esc
- LEDs: Power, System, Alarm, Clock
- Console (RS-232 in RJ45 port)
- USB: upgrades, configuration, results, user files
- Power On/Off

7.3 Back Panel
- Network and Time interfaces
- Remote management interface (10/100BASE-T in RJ-45 port)
- Redundant Power Supply: (AC+AC or AC+DC or DC+DC)
- VDC: -40 ~ -60 V
- VAC: 110 ~240 V

7.4 Mechanical
- Fanless operation
- 19" / ETSI/1U/240 mm rack mount
- Weight: 3.4 kg / 8.7 lb
- Operating temp.: -10ºC to +50ºC
- Operating Humidity: 10% to 90%❏