



Net.Time-B is a boundary clock designed to provide PTP and SyncE synchronization to a number of clients in applications such as 4G / LTE backhaul. One input becomes slave and this time reference is permanently monitored to verify quality in terms of drifts, offset and wander to assure timing quality.

# Net.Time-B boundary clock

Net.Time-B is a boundary clock suitable to deploy timing services at large scale across 4G/ LTE, 3G, WiMax, GPON and Backhaul networks by means of PTP and SyncE signals. The unit distributes highly accurate signals to its clients including frequency, phase and time-of-the-day information. The most outstanding feature of Net.Time is the capacity to monitor in test the quality of the input signal that is being used as time reference in order to satisfy the highest demands of synchronization and sintonization.

## 1. TIMING SOURCE

### 1.1. RECEIVERS

#### 1.1.1 Slave / Reference

- 2 x SyncE (optical, electrical)
- 2 x PTP (optical, electrical)

#### 1.1.2 Backup

- GPS: SMA connector (50 Ω)
- 10 MHz
- E1 (2048 kHz, 2048 Mb/s)
- T1 (1544 kHz, 1544 Mb/s)
- PPS
- TOD (Time-of-day)

### 1.2. CLOCK MODULES

- OCXO
- Rubidium

### 1.3. TIME ACCURACY

- In Holdover mode

Metric	OCXO	Rubidium
Phase < ±1.5 μs	1 hour	24 hour
Phase < ±5.0 μs	4 hour	72 hour
Phase < ±10.0 μs	12 hour	120 hour
Frequency < 16 ppb	1 month	5 year

## 2. PTP AND SYNC E SYNCHRONIZATION

### 2.1. SYNCHRONIZATION OUTPUTS

#### 2.1.1 Frequency

- 1 x E1 (2048 kHz, 2048 Mb/s)
- 1 x T1 (1544 kHz, 1544 Mb/s)

#### 2.1.2 Phase

- 1 x PPS

#### 2.1.3 Time of the Day (TOD)

- 1 x TOD

### 2.2. PTP MASTER FUNCTION

- Capacity: 8, 16, 32, 64 clients
- Up to 128 msg/client per second
- Protocol: Port state, Best clock, Master identity
- Method: 2-step clock
- Communication: Unicast, Multicast

#### 2.2.1 Profiles

- ITU-T G.8265.1 (telecom)
- IEEE 1588 (default)

### 2.3. SYNCHRONOUS ETHERNET

- 2 x SyncE (optical and electrical)
- Full ESMC / SSM support

## 3. PROTOCOLS

- IEEE 1588-2008
- IP
- Ethernet
- IEEE 802.1Q
- DSCP / CoS
- ARP
- DNS
- DHCP

## 4. TESTING AND STATISTICS

### 4.1. ETHERNET AND IP COUNTS

Separate reports per each Port

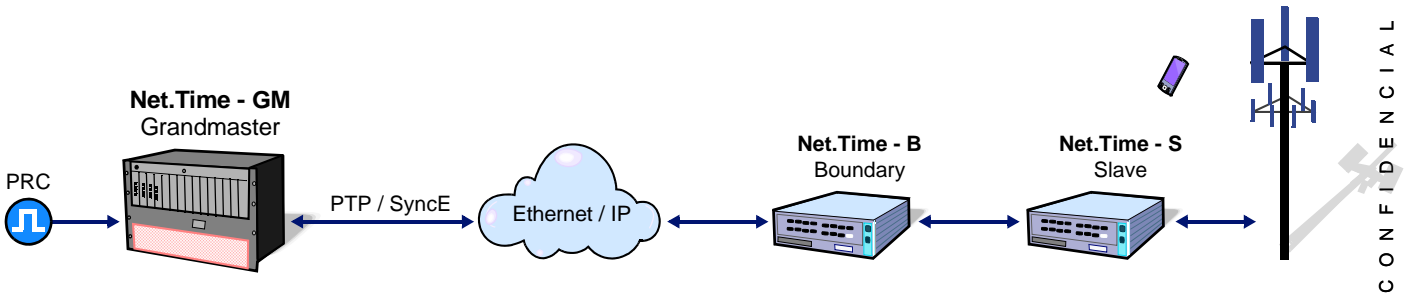
- Type: BPDUs, SSMs, VLAN, Q-in-Q, Control, Pause
- Size: Classification, Under/Oversized, Fragments, Jabbers
- Cast: Uni/Multi/Broadcast (%)
- Errors: Frames, Packets
- Bit rates: IP, UDP, ICMP, Current, Max, Min, Avg

### 4.2. PTP TEST & MONITORING

Input Wander Measurements: TIE, MTIE, TDEV

IEEE 1588 messages

- Sync Packet Delay: Current, Max, Min, Avg, Std Dev, Range
- Sync Packet Delay Variation: Current, Max, Min, Avg
- Sync Inter Packet Gap: Current, Max, Min, Avg
- Delay Request: Current, Max, Min, Avg, Std Dev, Range
- RTD with Path Delay Mechanism: Current, Mean
- Correction field: Current, Max, Min, Avg
- G.8260 Floor packet: count (FPC), rate (FPR), % (FPP)



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### 4.3. SYNCE TEST & MONITORING

- Measurements of input reference
- Frequency (O.174): Line (MHz), offset (ppm), drift (ppm/s)
- Wander (O.172): TIE, MTIE, TDEV
- QL trace in SSM (ITU-T G.781 Options I, II, III)

### 4.4. ETHERNET TESTS

- Loopback response to remote test (i.e. BER, RFC2544)
- Layer 1-4 loopback
- Loop frames matching filter conditions or loop all
- Loop controls for broadcast and ICMP frames

## 5. PLATFORM

### 5.1. MANAGEMENT

- Local: CLI
- Remote: SNMP, SSH, Web

### 5.2. INTERFACES

#### 5.2.1 Network

- Elect: 10/100/1000BASE-T
- SFP: 10BASE-T, 100BASE-TX, 100BASE-FX, 1000BASE-X
- Configurable in / out Port

#### 5.2.2 Time

- BNC: 10 MH, PPS, E1/T1
- RS232: TOD (time of the day)
- RJ45: T1 / E1

## 6. ERGONOMICS

### 6.1. FRONT PANEL

- Display: OLED 256 x 64 pixels
- Keypad: Up, Down, Left, Right, Page Up, Page Down, Esc
- LEDs: Power, System, Alarm, Clock
- Console: RJ45
- USB: upgrades, configuration, results, user files
- Power On/Off

### 6.2. BACK PANEL

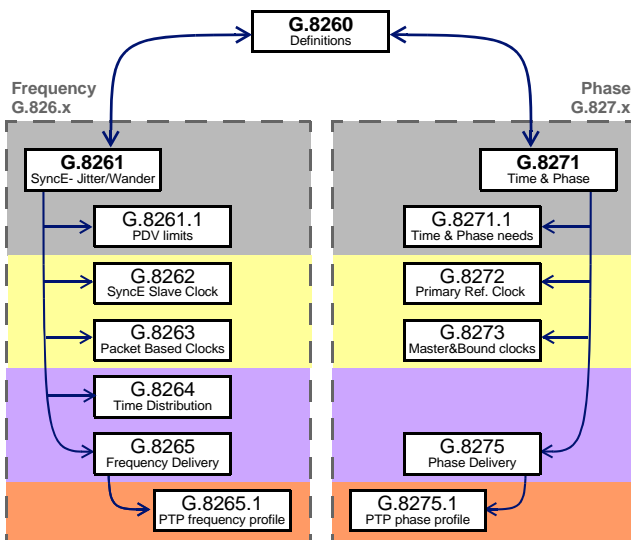
- Network and Time interfaces
- Redundant Power Supply: (AC+AC or AC+DC or DC+DC)
- VDC: -40 to -60V
- VAC: 110 to 240V

### 6.3. MECHANICAL

- Fanless
- 19" / ETSI/1U/240 mm rack mount
- Weight: 4.2 kg / 8.7 lb
- Operating temp.: -10°C to +50°C
- Operating Humidity: 10% to 90%



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Timing distribution through packet based networks