

Net.Time is a Grandmaster and Boundary clock that supports PTP and NTP over PRP and multiple input/output options such as IRIG-B, 1PPS, ToD and SyncE to satisfy all timing needs of power utility, enterprise and telecom applications.

Datasheet

Updated on 26/5/20

Net.Time a seamless time integration

Net.Time is a latest generation clock designed to simplify the integration of PTP protocols with NTP or IRIG-B architectures. Net.Time offers seamless translation while offering a high variety of clock reference inputs and outputs that may be used as primary or backup references, monitoring and synchronization of both new generation and legacy appliances.

1. Interfaces

1.1 Ethernet

- Port A: 10-100-1000Mb/s by RJ45 and 100-1000Mb/s by SFP
- Port B: 10-100-1000Mb/s by RJ45 and 100-1000Mb/s by SFP

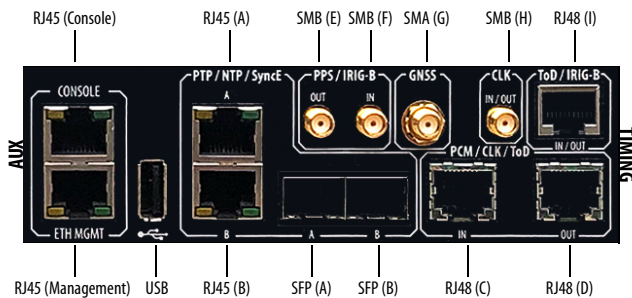


Figure 1. Physical interfaces

1.2 Timing

- 2 x SFP optical
- 2 x RJ45 electrical
- 3 x RJ48: balanced (RS-422) 100 Ω
- 1 x SMA: unbalanced 50 Ω
- 3 x SMB: unbalanced 50 Ω

	GNSS	PTP	NTP	ToD	IRIGB	PPS	PP2S	SyncE	T1/E1	Hz
RJ45 (A)		out	out						in/out	
RJ45 (B)		in	in						in/out	
SPF (A)		out	out						in/out	
SPF (B)		in	in						in/out	
SMB (E)					out	out	out			
SMB (F)					in	in	in			
SMB (H)										in/out
SMA (G)	in									
RJ48 (I)				in/out	in/out					
RJ48 (C)				in					in	in
RJ48 (D)				out					out	out

Table 1. Signals and interfaces

1.3 Management

- RJ45 (Console): RS-232
- RJ45 (Management): 10/100 BASE-T

2. GNSS

- Built-in GNSS receiver
- Single and Multiple constellation
- Fixed position mode for GNSS references
- 72 channels in the L1 band
- Automatic setting of UTC-to-TAI offset (leap sec. count)
- 4 ~ 5 VDC output
- Cable delay compensation
- Automatic antenna detection

3. Synchronization Inputs

Custom delay compensation for phase and time

3.1 Frequency

- Hz: 1544 kHz, 2048 kHz, 5 MHz, 10 MHz
- b/s: 1544 kb/s (T1), 2048 kb/s (E1)
- SyncE

3.2 Phase

- PPS: 1PPS, 1PP2S

3.3 Time

- ToD: ITU-T G.8271, China Mobile and NMEA
- IRIG-B: B00X, B12X, B13X, B14X, B15X, B22X
- IRIG-B: .5 ~ 10 Vpp, AC/DC coupling, termination 50 / 600 Ω / High Z
- GNSS: GPS, GLONASS, Beidou, Galileo
- PTP: Default, Telecom, Power, Utility profiles
- NTP: NTPv3, NTPv4, SNTPv3

4. Synchronization Outputs

Custom delay compensation for phase and time

4.1 Frequency

- Hz: 1544 kHz, 2048 kHz, 5 MHz, 10 MHz
- b/s: 1544 kb/s (T1), 2048 (E1)
- SyncE

4.2 Phase

- PPS: 1PPS, 1PP2S

4.3 Time

- ToD: ITU-T G.8271, China Mobile and NMEA
- IRIG-B: B00X, B12X, B13X, B14X, B15X, B22X
- IRIG-B: 4 Vpp over 50 / 600 Ω
- PTP: Default, Telecom, Power, Utility profiles
- NTP: NTPv3, NTPv4, SNTPv3

5. Oscillators

5.1 Internal Oscillator

- Default OCXO better than ±0.1 ppm
- Optional Rubidium better than ±5.0 e-11

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5.2 Locking time

	OCXO	Rubidium
Time	< 5 min	< 4 hours

Table 2. Locking time.

5.3 Performance locked 24h

Locked mode	OCXO	Rubidium
GNSS	± 45 ns	± 40 ns
1PPS / ToD	± 10 ns	± 10 ns

Table 3. Performance when locked.

5.4 Performance in hold-over

Metric	OCXO	Rubidium
Frequency	±100 ns	±100 ns
Phase within ±100 ns	-	2 hours
Phase within ±1.0 μs	1 hours	24 hours
Phase within ±10.0 μs	12 hours	120 hours

Table 4. Hold-over.

6. Precision Time Protocol (PTP)

6.1 General

- Port A: PTP master / Port B: PTP slave
- 256 unicast clients @ 128 packets per second

6.2 Profiles

- Default profiles (IEEE 1588-2008 Annex J)
- Telecom frequency profile (ITU-T G.8265.1)
- Telecom phase and time profile (ITU-T G.8275.1)
- PTS / APTS profile (ITU-T G.8275.2)
- Utility Profile (IEC 61850-9-3)
- Power Profile (IEC C37.238)

Operation

- 1-step clock
- 2-step clock

Messages

Setting of message rates

- Sync
- Delay Request
- Peer Delay Request
- Announce messages: rate and time-out
- End-to-end and peer-to-peer path delay mechanisms
- Encapsulations: PTP over UDP / IPv4, PTP over Ethernet

6.3 Translator

- PTP profile translation from Port A to Port B
- Telecom to Power profile and vice versa
- PTP messages are forwarded / terminated as specified in IEEE 1588

7. Network Time Protocol (NTP)

General

- Port A: NTP server / Port B: NTP clients
- 1000 transactions per second

NTP versions

- NTPv3 (RFC 1305) / NTPv4 (RFC 5905) server and client
- SNTPv3 (RFC 1769) server

Configuration

- Maximum polling interval
- Minimum polling interval

8. Synchronous Ethernet (SyncE)

8.1 General

- Interfaces: RJ45 and SFP
- Full ESMC / SSM support as per ITU-T G.8264 and G.781

9. Ethernet

9.1 Interfaces

- RJ45-SFP ports work in combo mode
- 2 x RJ45: 10BASE-T, 100BASE-TX, 1000BASE-T
- 2 x SFP: 100BASE-FX, 1000BASE-LX, 1000BASE-T, 1000BASE-ZX, 1000BASE-BX

9.2 Auto-Negotiation

- Bit rate: 10 Mb/s, 100 Mb/s, 1 Gb/s
- Disable auto-negotiation, force line settings

9.3 Ethernet MAC

- Formats: DIX, IEEE 802.1Q
- Enable / Disable VLAN
- VLAN VID / User Priority setting

10. Parallel Redundancy Protocol (PRP)

- PRP extension for IEEE 1588 / IEC 61588
- Link Redundancy Entity (LRE) / IEC 62439-3

11. Internet Protocol (IP)

- Configuration of DSCP CoS labels
- IPv4 destination address resolution through DNS
- DHCP (client side) (IETF RFC 2131)

12. Platform and System

12.1 Management

- CLI management interface through Console interface (RJ45)
- Remote management SSH through ETH MGMT interface
- USB and TFTP soft and firmware updates
- RFC 3164 Syslog event reporting (device role)

12.2 Statistics

- Frame counts and bandwidth statistics
- PRP frames and PRP nodes statistics
- System resource statistic

12.3 Ergonomics

- Fanless operation
- 19" / ETSI/1U/201 mm rack mount
- Weight: 2.8 kg / 6.2 lb



Figure 2. Power Supply and LEDs

12.4 Power Supply

- Redundant power supply (Single or Double)
- AC: 85 ~ 264 Vac, 47 ~ 63 Hz (IEC 60320 C13/C14)
- DC: 18 ~ 75 Vdc (2-pin 5.1 mm)
- Universal: 85 ~ 264 Vac or 100 ~ 370 Vdc (2-pin 5.1 mm)

12.5 LEDs

- Platform: PSU1, PSU2, System
- Application: Alarm, GNSS, Locked

12.6 USB

- Software and firmware upgrade
- Configuration, results, user files

12.7 General

- Storage: -20 ~ +85°C
- Operating: -10 ~ +65°C temp. / 10 ~ 90% humidity
- Environmental operation conditions follow IEEE 1613 and IEC 61850-3