Net.Time GM52

Network synchronization

Net.Time -GM is a Grandmaster Clock designed to be deployed in the back-haul of Ethernet / IP networks to deliver accurate timing services including frequency, phase and time-of-day to Telecom, Power grid, Transport and Industry clients. Net.Time GM52 is a double port (opt/elec) PTP Grandmaster clock. Once locked to the selected reference, it delivers highly accurate time signals that maintained in hold-over mode.

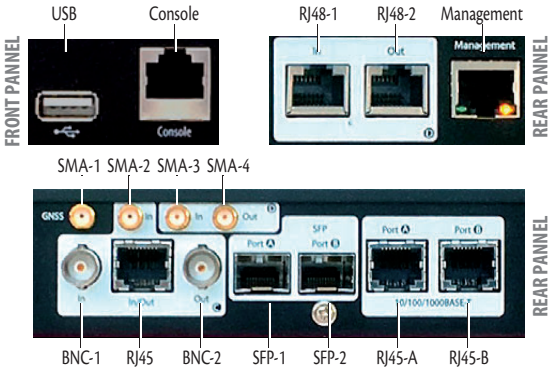
General

1.1 Double Port

Port A: 10Mb/s to 1G/s by optical and electrical interfaces (SFP + RJ45)

Port B: 10Mb/s to 1G/s by optical and electrical interfaces (SFP + RJ45)

1.2 Interfaces, signals and timing



- RJ45: balanced 120 Ω
- BNC: unbalanced 75 Ω
- SMA: unbalanced 50 Ω
- RJ-48: balanced (V11) 100 Ω

	PTP	SyncE	1pps	ToD	GNSS	T1	E1	MHz
BNC-1						In	In	In
RJ45			Out	In/Out		In/Out	In/Out	In/Out
BNC-2						Out	Out	Out
SPF-1	Out	In/Out						
SPF-2	Out	In/Out						
RJ45-A	Out	In/Out						
RJ45-B	Out	In/Out						
SMA-1					In			
SMA-2	future use							
SMA-3			In					
SMA-4			Out					
RJ48-1			In	In				
RJ48-2			Out	Out				

2 - Clocks and Timing

2.1 Internal Clock

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

2.2 Rubidium Clock

Freerun (No GPS)

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

GPS Locked

- Time/Phase Accuracy to UTC (after 24h locked): ±20 ns at 1σ
- Frequency Accuracy: < ±1e-11 (averaged over one week)

Hold-over

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

OCXO clock

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

Built-in GNSS receiver

- Built-in receiver GPS/GLONASS/Galileo
- Onmidirectional magnetic L1 band antenna (SMA)
- 4 ~ 5 V DC output.

3 - Synchronization I/O signals

Inputs

- Frequency: T1, E1, 1544 kHz, 2048 kHz, 10 MHz (RJ45 or BNC)
- Frequency: 2 x SyncE (SFP or RJ45)
- Phase: 1 pps (RJ-48 or SMA)
- Frequency and Phase: GNSS (SMA)

Outputs

- Frequency: 2048 kHz or 10 MHz (BNC)
- Phase: 1 pps (RJ-48 or SMA)
- Frequency and Phase: 2 x PTP (SFP or RJ45)

4 - Ethernet PHY

Interfaces

- SFP ports: 1000BASE-T, 1000BASE-SX, 1000BASE-LX, 1000BASE-ZX, 1000BASE-BX, 100BASE-FX, 100BASE-TX, 10BASE-T
- RJ-45 ports: 10BASE-T, 100BASE-TX, 1000BASE-T

Auto-Negotiation

- Bit rate: 10 Mbit/s, 100 Mbit/s, 1 Gbit/s
- Master and Slave roles in the 1000BASE-T
- Disable auto-negotiation, force line settings

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5 - Synchronous Ethernet

General

- ITU-T G.8261 and G.8262 compliant.
- Full ESMC / SSM support as per ITU-T G.8264 and G.781 Interfaces.
- SFP ports:1000BASE-T, 1000BASE-SX, 1000BASE-LX, 1000BASE-ZX, 1000BASE-BX, 100BASE-TX.
- RJ-45 ports: 100BASE-TX, 1000BASE-T.

6 - Precision Time Protocol (PTP)

General

- Relevant standards: ITU-T G.811, ITU-T G.8272
- 2 Gigabit Ethernet electrical / optical combo ports.

Interfaces

- SFP interfaces: 1000BASE-SX, 1000BASE-LX, 1000BASE-ZX
- RJ-45 interfaces: 1000BASE-T, 100BASE-TX, 10BASE-T.

6.1 PTP Grandmaster Function

- PTP 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.
- Encapsulations: PTP over UDP / IPv4, PTP over Ethernet.
- Up to 2048 unicast clients at128 PTP packet/sec.
- Support of ITU-T G.8265.1 and G.8275.1 profiles.

Protocol state

- Port state, best master clock, master identity, grandmaster: identity, BMC priorities, clock class, accuracy, clock variance, time source.

7 - Platform

7.1 Management

- CLI management interface.
- Local management through serial console (RS-232 in RJ45 port).
- Remote management through SSH protocol.

7.2 Ergonomics

- Fanless operation
- 19" / ETSI/1U/240 mm rack mount.
- Weight: 3.4 kg / 8.7 lb.

7.3 Front Panel

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

7.4 Back Panel

- Network and Time interfaces.
- Remote management interface (10/100BASE-T in RJ-45 port).
- Redundant Power Supply.
- Earth connector.

7.5 Power and Batteries

- Redundant Power Supply: (AC+AC or AC+DC or DC+DC).
- VDC: -40 ~ -60 V / VAC: 110 ~240 V.
- Li Ion Polymer Batteries.
- Up to 3 hours of operation on batteries with Rubidium.

7.6 General

- Storage range: -20°C to +70°C.
- Operating temp.: -10°C to +50°C.
- Operating Humidity: 10% to 90%.

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