



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.

Datasheet
Updated on 19/4/17

Net.Time GM52 grandmaster clock

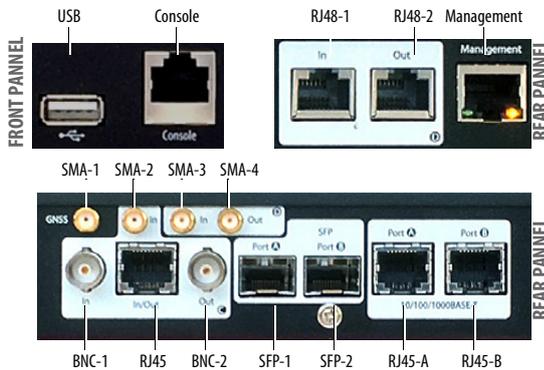
Net.Time GM52 is a double port (opt/elec) PTP Grandmaster clock. Once locked to the selected reference, it delivers highly accurate time signals that maintained in hold-over mode.

1. 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			In/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 $\pm 5.0e-11$

2.2 Rubidium Clock

Freerun (No GPS)

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

GPS Locked

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

Hold-over

- Output freq. accuracy (after 24h locked): $\pm 1e-11$ / 24h
- Output time accuracy (after 24h locked): ± 100 ns / 2h, $\pm 1.0\mu s$ / 24h

2.3 OCXO clock

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

2.4 Built-in GNSS receiver

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

3. Synchronization I/O signals

3.1 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)

3.2 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

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 at 128 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%

