![Microsemi logo — Power Matters.™]

TimeSource 3050 and TimeSource 3550

Primary Reference Source

ETSI Shelf

ANSI Shelf

Key Features

- Advanced multi-input clock engine
- High precision timing antenna with integrated GPS receiver
- Up to 1000 foot antenna cabling with automatic delay compensation
- Timing accuracy of 100 ns when locked to GPS
- OCXO and rubidium holdover options
- T1, E1, 2.048 MHz, and 10 MHz inputs and outputs
- 1 PPS and TOD output ports
- Sync status messaging on E1/T1 ports
- Integrated sync monitoring of input ports
- Optional SNTP server
- NEBS Level 3 compliant
- Low power consumption
- Direct Digital Synthesis (DDS) technology

Key Benefits

- PRS compliant, traceable GPS time reference
- Advanced clock algorithms and holdover capabilities for high accuracy and reliable performance
- Versatile input options to complement and backup the GPS reference
- Deployable in existing TimeSource shelves

Configurations

The TimeSource® 3050 and TimeSource® 3550 consist of single unit modules that plug into a rack-mounted shelf. Two shelves are available: ANSI standard with rear connectors and ETSI standard with front facing connector access. The TimeSource 3050/3550 modules may be used in previously supplied shelves of TimeSource 3000, 3100, 3500, and 3600 products.

The Microsemi TimeSource 3050 and TimeSource 3550 are standalone Primary Reference Source (PRS) products that operate with an external high precision GPS timing antenna to meet GR-2830 and EN 300 462-6-1 requirements. Output ports are software configurable for T1, E1, 2.048 MHz or composite clock to support frequency timing applications. The TimeSource 3050 is equipped with a high quality Oven Controlled Crystal Oscillator (OCXO), while the TimeSource 3550 incorporates a rubidium Miniature Atomic Clock (MAC) for extended holdover performance.

Low power consumption and full RoHS compliance make TimeSource 3050/3550 deployments a positive step toward more environmentally friendly central offices and reduced overall operating costs.

Advanced Clock Engine

Key to the superior performance of the TimeSource 3050 and TimeSource 3550 is their patented, multiple input, frequency locked loop clock engine. The advanced clock engine, GPS input, local oscillator and optional additional inputs work together to produce precise Stratum 1 timing outputs.

TimeSource 3050 can ensemble the GPS reference with optional T1, E1, and/or 10 MHz inputs to increase system resiliency. With additional reference input, holdover performance can be extended to 72 hours when GPS signals are interrupted.

TimeSource 3550, the advanced clock engine with rubidium holdover oscillator, continues to predict GPS timing information during the loss of GPS signals, thereby providing Stratum 1 performance with as few as a single satellite in view for as little as 10 hours per day. PRS quality holdover is up to 72 hours without the use of additional input references.

GPS Antenna and Cables

The GPS antenna can be installed up to 1,000 feet from the office shelf, without amplifiers, using inexpensive thin coax cable. TimeSource 3050 operates with roof mount antennas, while both roof mount and wall mount antenna options are supported by the TimeSource 3550. Antenna connections employ a high precision interface to maintain accuracy to the TimeSource module. When TimeSource 3050/3550 modules are used to replace currently deployed TimeSource products, the existing cable can remain in place, though the antenna must be upgraded to the model with integrated receiver. A significant advantage of this approach is automatic cable delay compensation providing optimal performance without the need to measure the cable delay and manually enter the parameter. In addition, the antenna has improved narrowband interference rejection, protecting your GPS input against interference from adjacent spectrum.

TimeSource 3050 and TimeSource 3550

Management

The TimeSource 3050/3550 can be managed using TL1 commands or via the TimeCraft graphical user interface utility for easier and more efficient management. The TimeSource 3050/3550 is fully software upgradeable and can be provisioned while in service. Communication is via RS-232 or Ethernet port.

Specifications

Overview

- Primary reference source standards compliant
- Frequency accuracy: 1×10^{-12} when locked to GPS
- Time/phase accuracy: 100 nsec when locked to GPS
- Internal oscillator:
  - TimeSource 3050: Oven Controlled Crystal Oscillator (OCXO)
  - TimeSource 3550: Rubidium Miniature Atomic Clock (MAC)
- Sync input types: GPS, T1, E1, 2.048 MHz, 10 MHz
- Sync output types: T1, E1, 2.048 MHz, Composite Clock, 10 MHz, 1PPS, TOD, Ethernet (optional NTP)

Holdover Performance

- TimeSource 3050: 1×10^{-10} frequency and <8.6 µs phase for 24 hours ($0°$ C to $50°$ C, $\pm 5°$ C)
  - 1×10^{-11} frequency and <3 µs phase for 72 hours with optional additional frequency input reference ($0°$ C to $50°$ C, $\pm 5°$ C)
- TimeSource 3550: 1×10^{-11} frequency and <3 µs phase for 72 hours ($0°$ C to $50°$ C, $\pm 5°$ C)
  - 1×10^{-11} for 21 days ($25°$ C)

Holdover specifications are typical performance after 7 days of steady-state operation

System Output Ports

- Ports: 2 (10 optional)
- Type: T1, E1, Composite Clock outputs (software configurable)
- T1 Format: D4, ESF with or without SSM (software configurable)
- E1 Format: 2.048 Mbps (CCS, CAS, CRC4, or non-CRC4) with or without SSM, analog 2.048 MHz (software configurable)
- Connector: BNC and wire wrap (ETSI shelf), wire wrap (ANSI shelf)

1 PPS Output

- Ports: 1
- Signal type: TTL
- Connector: BNC

10 MHZ Output

- Ports: 1
- Signal: TTL
- Connector: BNC

Input Ports

- Ports: 2
- Signal: T1, E1 (software configurable), with SSM
- Connector: BNC and wire wrap (ETSI shelf), wire wrap (ANSI shelf)

Remote Oscillator Input Ports

- Ports: 2
- Signal: 10 MHz
- Connector: BNC

NTP Time Server (Optional)

- Type: SNTP
- Interface: Ethernet

Time Of Day Output

- Ports: 1
- Type: Cisco ASCII or NTP type 4
- Signal: RS-422
- Connector: RJ45

Management

- Management interfaces: TL1, TimeCraft GUI
- Craft port: RS-232, female DB9
- Alarm output: Wire wrap (critical, major, minor)
- Alarm cut off: Push button on front panel

Antenna Specifications

- Type: Active antenna with integrated GPS receiver
- Cable type: RG-59 with TNC connector
- Cable delay compensation: Automatic compensation for up to 1000 feet without amplifier
- Operating temperature: $-30°$ C to $+80°$ C

Mechanical, Power and Environmental

- Dimensions, ANSI shelf: 3.50"(H) x 19"(W) x 12"(D) 8.89 cm (H) x 48.26 cm (W) x 30.48 cm (D)
- Dimensions, ETSI shelf: 8.66"(H) x 17.72"(W) x 9.84"(D) 22 cm (H) x 45 cm (W) x 25 cm (D)
- Power input: -48 VDC (-40 VDC TO -72 VDC) dual, redundant
- Power consumption:
  - TimeSource 3050: 18 W (steady state)
  - TimeSource 3550: 16 W (steady state)
- Operating temperature: $0°$ C to $+50°$ C
- Humidity: 5% to 95% non-condensing
- Convection cooling, no fans

Standards, Environmental and Safety Compliance

- Telcordia GR-2830-CORE
- ETSI EN 300 462-6-1
- ANSI T1.101
- ITU-T G.811, G.812
- ETSI 3017
- Telcordia NEBS: GR-1089-CORE (with STP cabling), GR-63-CORE, SR-3580 Level 3
- ITU-T G.704, Telcordia GR-253
- ITU-T G.703/9, G.703/13
- IEEE 802.3u, 802.3ab, and 802.3z (TimeSource 3550)
- EMC: FCC Part 15, Class A
- RoHS: 6 of 6
- ATIS PP-0600020.2010
- UL 60950-1
- ETSI EN 60950-1
- IEC 60950-1
- ETSI EN 300 386 Class B (with UTP or STP cabling)
- ETSI EN 300 019-2-1, EN 300 019-2-2, EN 300 019-2-3
- CE

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