

# TimeSource 3550

## Primary Reference Source

### 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
- Rubidium holdover
- 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

TimeSource® 3550 consist of single unit modules that plug into a rack-mounted shelf. The TimeSource 3550 modules may be used in previously supplied shelves of TimeSource 3000, 3100, 3500, and 3600 products.

The Microchip TimeSource 3550 is a standalone Primary Reference Source (PRS) product that operates with an external high precision GPS timing



ANSI Shelf

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 3550 incorporates a rubidium Miniature Atomic Clock (MAC) for extended holdover performance.

Low power consumption and full RoHS compliance make TimeSource 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 3550 is its 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 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. 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 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.

### Management

The TimeSource 3550 can be managed using TL1 commands or via the TimeCraft graphical user interface utility for easier and more efficient management. The TimeSource 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:  $1 \times 10^{-12}$  when locked to GPS
- Time/phase accuracy: 100 nsec when locked to GPS
- Internal oscillator:
  - 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 3550:  $1 \times 10^{-11}$  frequency and  $<3 \mu\text{s}$  phase for 72 hours ( $0^\circ\text{C}$  to  $50^\circ\text{C}$ ,  $\pm 5^\circ\text{C}$ ) and  $1 \times 10^{-11}$  for 21 days ( $25^\circ\text{C}$ )
- 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: 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) 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:  $-30^\circ\text{C}$  to  $+80^\circ\text{C}$

### 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)
- Power input: -48 VDC (-40 VDC TO -72 VDC) dual, redundant
- Power consumption: TimeSource 3550: 16 W (steady state)
- Operating temperature:  $0^\circ\text{C}$  to  $+50^\circ\text{C}$
- Humidity: 5% to 95% non-condensing
- Convection cooling, no fans

### Performance Standards

- Telcordia GR-2830-CORE
- ANSI T1.101
- ITU-T G.811, G.812
- 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)

### Standards, Environmental and Safety Compliance

- Telcordia NEBS Level 3 certified
- ATT TP-76200/76450
- VZ.TPR.9305
- EMC: FCC Part 15, Class A, ICES-003
- RoHS: 6 of 6
- UL 62368-1, CSA C22.2 no. 62368-1
- CE Mark