

# Data sheet 119-0221 T550 Multi-GNSS Dual-LAN NTP Server with TCXO

TimeTools T550 time server is a very accurate, Stratum-1 Multi-GNSS referenced Network Time Protocol Server in a 1U rack-mountable enclosure. The built-in 32 channel timing receiver provides concurrent multi-constellation reception of GPS, GLONASS, BeiDou, Galileo<sup>†1</sup> for improved reliability and redundancy.

The T550 also features Dual Ethernet ports and a high-stability TCXO oscillator, which provides extended Stratum-1 holdover during loss of GNSS signal lock.

The T550 provides an accurate time reference to computer networks of any size and can accurately synchronize any NTP or SNTP compatible system.



## Highlights

NTPv4 Stratum-1 GPS\Multi-GNSS Network Time Server.

Multi-GNSS concurrent reception of GPS, GLONASS, BeiDou and Galileo<sup>†1</sup> for improved reliability and redundancy.

High-stability TCXO oscillator provides extended Stratum-1 holdover during loss of GNSS signal lock.

GNSS accurate to 15 nanoseconds (GPS Locked).

NTP accurate to 3 microseconds (GPS Locked).

Synchronize in excess of 100,000 clients at default NTP polling frequency.

Dual 10/100 Mbit auto-sensing, auto-MDIX Ethernet ports.

IPv4 and IPv6 Internet Protocols.

Integrated universal AC mains input PSU.

Made in UK, with 6-year warranty and free lifetime support.



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## Applications

- Network timing, measurement and synchronization.
- Synchronize Microsoft Windows, Linux, servers, workstations and network infrastructure.
- Automation Systems, SCADA, Network Monitoring and Control Systems.
- CCTV, DVR and Video Management Systems (VMS).
- Access Control Systems (ACS).
- Master clock for NTP synchronized clock systems.
- Accurately synchronize time critical processes to a traceable source of time inside your firewall.

## Key Features and Benefits

- Linux based true stratum-1 NTP time server.
- Extremely easy to install and configure.
- Simple web based configuration and status information.
- High-quality, 1U high, 19" rack-mountable aluminium enclosure.
- Large back-lit LCD display shows detailed status information.
- USB port for convenient firmware updates.

## GPS\Multi-GNSS Timing Features

- 32 channel multi-GNSS timing receiver providing concurrent multi-constellation reception of GPS, GLONASS, BeiDou, Galileo<sup>\*1</sup> for improved reliability and redundancy.
- Operation with outdoor, indoor or window located antenna with limited sky view, saving on cabling costs.
- Timing receiver synchronizes to 15 nanoseconds ( $15 \times 10^{-9}$  sec, 1 sigma, GPS locked).
- Time-Receiver Autonomous Integrity Monitoring (T-RAIM) assures very high timing integrity.
- Fully automatic impending leap second warning and insertion, no user intervention required.
- High sensitivity receiver with single-satellite in view operation.
- Jam-resistant signal reception.

## NTP Timing Features

- NTP synchronization to <3 microsecond ( $3 \times 10^{-6}$  sec) UTC (GPS Locked).
- High-stability TCXO oscillator for extended holdover to maintain stratum-1 operation during GNSS signal loss.
- Ability to synchronize in excess of 100,000 clients at default NTP polling frequency.
- Peer to multiple external and internet based NTP servers.
- MD5 authentication for enhanced security.

## Reliable and Environmentally Friendly

- Based on extremely reliable industrial computing module.
- Very low-power consumption, less than 7W.
- RoHS compliant - Restriction on use of hazardous substances.

## Networking Features

- Dual 10/100 Mbit Auto-Sensing, Auto-MDIX Ethernet ports.
- NTPv4, SNTPv4, HTTP, HTTPS, SSH, SCP, SFTP, FTP, SNMPv1 and SNMPv2c alarms, DHCP, DHCPv6.
- IPv4 and IPv6 Internet Protocol.

## Warranty and Support

- Made in UK, with industry leading 6-year warranty.
- Free unlimited support and firmware updates for the lifetime of the product.

# Product Specification

## Interfaces

Dual 10/100 Mbit Base-T, RJ45, Auto-Sensing Network Interfaces.  
TNC RF Connector For Active GPS/GNSS Antenna.  
USB port for firmware updates.  
RS232 Console Port for Configuration and Status.  
Second RS232 (shared) Port for serial time code output.

## Operating System

Flash-Based Linux Operating System with PPS Extensions.

## Internet Protocol (IP)

IPv4, IPv6.

## Timing Protocols

NTP v2 (RFC 1119), NTP v3 (RFC 1305), NTP v4 (RFC 5905).  
SNTP v3 (RFC 1769), SNTP v4 (RFC 2030).  
NTP Peering, NTP Broadcast.  
NTP MD5 Authentication.  
Max. Clients at Default NTP Polling Freq.<sup>2</sup>: 100,000

## Configuration and Monitoring Protocols

HTTP, HTTPS, SSH, SCP, SFTP, FTP.  
SNMPv1, SNMPv2 Trap Alarms.  
Dynamic Host Configuration Protocol - DHCP (RFC 2131).  
Dynamic Host Configuration Protocol - DHCPv6 (RFC 3315).

## Monitoring and Reporting

SNMP v1/v2c Trap Alarms (Can be disabled).  
GPS Satellites in View & Signal to Noise Ratio (SNR).

40 character x 2 line LCD display.  
Red/Green Alarm LED.

## Timing (typical)

GNSS Accuracy: 15 nsec ( $15 \times 10^{-9}$  sec, GPS Lock)  
NTP Accuracy (GPS Lock): <3 usec ( $3 \times 10^{-6}$  sec)  
TCXO Holdover 24 Hours (after 24 hrs continuous GPS lock):  
    < $\pm 4.3$  msec (25°C)  
    < $\pm 164$  msec (0°C-40°C)



## GPS/GNSS Timing Receiver

32 Channel Multi-GNSS receiver. GPS, GLONASS, Beidou, Galileo<sup>1</sup>.

Time-Receiver Autonomous Integrity Monitoring.  
High Sensitivity Outdoor/Indoor Antenna Operation  
Over-Determined Clock, Single Satellite Operation.

Positioning System: SPS, Timing

Update Rate: 1 Hz

Typical Min Acquisition Sensitivity: -148dBm cold start

Typical Min Tracking Sensitivity: -160dBm

Time to First Fix: <46s (50%), <50s (90%) cold start

Typical Time to Re-acquisition: <2s (90%)

## Mechanical \ Environmental

Dimensions: 483 x 145 x 44 mm (19.0" x 5.71" x 1.73")

Construction: 1U High 19" Rack-mount, Aluminium

Weight: approx 1.2Kg (2.6lbs)

Power: 100-240VAC 50-60Hz 0.1A

Fuses: Two: T0.315A LBC 250V

Power Consumption: <7W

Double Fused IEC Inlet

Operating Temperature 0°C ~ +50°C

Storage Temperature -20°C ~ +85°C

Working Humidity 90% RH non-condensing

## Antenna General Specifications

T-3740 GNSS Multi-Constellation Antenna

Size: 66.5mm diameter x 21mm High

Weight: 150g

Enclosure: Radome: EXL9330, Base: Zamak White Metal

Attachment Method: Through hole (M18 x 1 thread)

Environmental: IP67

Operating Temperature: -20°C ~ +85°C

LNA Gain: 40 dB typical.

Supply Current: 19mA typical.

Supply Voltage: 2.5 to 12 VDC nominal

## Approvals

CE: 1999/5/EC

2011/65/EU

93/68/EEC

Safety: EN 60950-1: 2006+A2: 2013

EMC: ETSI EN 301 489-1: V1.9.2 (2011-09)

ETSI EN 301 489-3: V1.6.1 (2013-08)

ETSI EN 300 440-2 V1.4.1:2010-08

EN 61000-3-2: 2014

EN 61000-3-3: 2013

RoHS: EN 50581:2012

# Ordering Information

## Product Codes

119-0221 T550-00 Multi-GNSS Dual-LAN TCXO NTP Server appliance.

## Scope of Supply – What is Included

T550 NTP Server Appliance  
T-3740 Pole Mounting Multi-GNSS Antenna.  
MT4-GPS Antenna Mount.  
TCX-030 30m (100 ft) RG58 Cable.

IEC Power Lead.  
RS232 Serial Console Cable.  
Quick Start Guide.  
CD containing user-guide, installation guide and white-papers.

## Optional Accessories

TCX-010 10m RG58 Cable.  
TCX-030 119-0222 30m RG58 Cable.  
TCX-050 119-0224 50m LMR195 Equivalent Cable.  
TCX-100 100m LMR400 Equivalent Cable.  
Custom cable lengths available on request.

119-0210 SPP-GPS Multi-strike maintenance-free surge suppressor  
T-AD200-8 GPS Amplifier – 20db

GPS over optical fibre systems.  
GPS Splitters – 2 to 32 way, compact or rack-mount.  
Digital NTP Wall clocks.  
Analog NTP Wall clocks.

\*1 Hardware ready: a firmware update is required to enable the Galileo constellation.

\*2. Assuming default 64 sec client NTP polling frequency. Even more clients can be synchronized by decreasing the polling frequency.

TimeTools Limited has relied on representations made by its suppliers in certifying this product as RoHS compliant.

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