

TimeTools T100 time server is a very cost-effective, accurate, Stratum-1 GPS referenced Network Time Protocol Server in a compact enclosure.

It provides an accurate time reference to computer networks and can accurately synchronize any NTP or SNTP compatible system.



## Highlights

NTPv4 Stratum-1 GPS Network Time Server.

GPS accurate to 15 nanoseconds (GPS Locked).

NTP accurate to 3 microseconds (GPS Locked).

Synchronize in excess of 2 million clients.

10/100 Mbit auto-sensing, auto-MDIX Ethernet port.

IPv4 and IPv6 Internet Protocols.

Simple Network Management Protocol Monitoring (SNMP v3).

Extremely cost-effective.

Universal AC mains power adapter.

Made in UK.

## 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, compact aluminium enclosure.
- USB port for convenient firmware updates.

## GPS Timing Features

- 16 channel, high-sensitivity, GPS timing receiver with single-satellite in view operation.
- 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.
- Jam-resistant signal reception.

## NTP Timing Features

- NTP synchronization to <3 microsecond ( $3 \times 10^{-6}$  sec) UTC (GPS Locked).
- Ability to synchronize in excess of 2 million clients at default NTP polling frequency.
- Peer to multiple external and internet based NTP servers.
- 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

- 10/100 Mbit Auto-Sensing, Auto-MDIX Ethernet port.
- NTPv4, SNTPv4, HTTP, HTTPS, SSH, SCP, SFTP, FTP, SNMPv3, DHCP, DHCPv6.
- IPv4 and IPv6 Internet Protocol.

## Warranty and Support

- 12-month warranty.
- Free unlimited support and firmware updates for the lifetime of the product.

# Product Specification

## Interfaces

10/100 Mbit Base-T, RJ45, Auto-Sensing Network Interface.  
TNC RF Connector For Active GPS 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 Authentication.  
Max. NTP Polling Freq.: 2000 polls per second.  
Max. Clients at Default NTP Polling Freq.<sup>\*1</sup>: 2,000,000

## Configuration and Monitoring Protocols

HTTP, HTTPS, SSH, SCP, SFTP, FTP.  
SNMP: v1, v2c, v3  
Dynamic Host Configuration Protocol - DHCP (RFC 2131).  
Dynamic Host Configuration Protocol - DHCPv6 (RFC 3315).

## Timing (typical)

GPS Accuracy: 15 nanoseconds ( $15 \times 10^{-9}$  sec, GPS Lock)  
NTP Accuracy (GPS Lock): <3 microsecond ( $3 \times 10^{-6}$  sec)

## GPS Timing Receiver

16 Channel GPS Receiver.  
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  
Freq. Band: GPS L1  
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: 144 x 103 x 30 mm (5.6" x 4.1" x 1.2")  
Construction: Aluminium  
Weight: approx 0.3Kg (0.7 lbs)

Power: 7.5V DC @ 1A  
Universal power adapter.  
Power Consumption: <7W

Operating Temperature 0°C ~ +50°C  
Storage Temperature -20°C ~ +85°C  
Working Humidity 90% RH non-condensing

## T-3040 GPS Antenna Specification

Freq. Band: 1575 MHz  $\pm$  10 MHz  
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: -40°C ~ +85°C

LNA Gain: 40 dB typical.  
Supply Current: 19mA typical.  
Supply Voltage: 2.5 to 12 VDC nominal

## Approvals

CE: 2014/53/EU  
2011/65/EU  
2015/863/EU  
Radio: EN 300 440 V2.1.1  
EMC: EN 55032: 2012 +AC: 2013  
EN 55024: 2010  
EN 61000-3-2: 2014  
EN 61000-3-3: 2013  
Safety: EN 60950-1: 2006+A2: 2013  
RoHS: EN 50581:2012

# Ordering Information

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## Product Codes

T100-00 GPS NTP Server appliance.

## Scope of Supply – What is Included

T100 GPS NTP Server Appliance  
T-3040 Pole Mounting GPS Antenna .  
MT4-GPS Antenna Mount.  
TCX-010 10m (30 ft) LMR195 Equivalent Cable.  
GE12107-P1J 7.5V DC Universal Power Supply.

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

## Optional Accessories

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

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

Digital NTP Wall clocks.  
Analog NTP Wall clocks.

\*1. Assuming default 1024 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.

TimeTools Limited is not responsible for the availability, operation or failure of operation of GPS/GNSS satellites.

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