

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 100,000 clients at default NTP polling frequency.

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

IPv4 and IPv6 Internet Protocols.

Extremely cost-effective.

Universal AC mains power adapter.

Made in UK, with 12-month warranty and free lifetime support.

## 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 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

- 10/100 Mbit Auto-Sensing, Auto-MDIX Ethernet port.
- 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 12-month warranty.
- Free unlimited support and firmware updates for the lifetime of the product.

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# 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 MD5 Authentication.  
Max. Clients at Default NTP Polling Freq.<sup>1</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).

Red/Green Alarm LED.

## 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

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

## Antenna General Specifications

T-3040 GPS 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

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# Ordering Information

## 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) RG58 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 RG58 Cable.  
TCX-030 30m RG58 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

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

\*1. 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.

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

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