TA-Series NTP Network Time Server

Hardware Installation Guide

Models Covered: TA210, TA310, TA610

Document Number: T1210-01
18 February 2025

The latest version of this user guide can be obtained from TimeToolsLtd.com

Revision History

Date	Doc. Rev.	Changes
18-Feb-25	T1210-01	Initial release.

Important Safety Information:

Important Safety Information - Read the safety instructions before using this product.

1. Please read the manuals and retain for future reference. Please follow all instructions and heed all warnings.

2. Do not use this apparatus near water.

3. Clean only with dry cloth.

4. Install in accordance with the manufacturer's instructions.

5. Do not install near any heat sources such as radiators, heat registers, or other apparatus (including amplifiers) that produce heat.

6. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.

7. Only use attachments as specified by the manufacturer.

8. The unit has no user serviceable parts inside. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

9. Use the mains plug to disconnect the apparatus from the AC mains. The mains plug shall remain easily accessible.

10. To completely disconnect unit power from the AC mains, disconnect the unit's power cord from the mains socket. To reconnect power, plug the unit's power cord into the mains socket following all safety instructions and guidelines.

11. Never push objects of any kind into this product through cabinet apertures as they may touch dangerous voltage points or short out parts that could result in fire or electric shock.

For PERMANENTLY CONNECTED EQUIPMENT, a readily accessible disconnect device shall be incorporated external to the equipment.

For PLUGGABLE EQUIPMENT, the socket-outlet shall be installed near the equipment and shall be easily accessible.

Verification of the protective earthing connection of the socket-outlet by a skilled person is required for the safe use of the product.

CAUTION:
Before installing and configuring any TimeTools NTP server appliance, please read the manuals and retain for future reference. Please follow all instructions and heed all warnings.

Full product documentation can be found at TimeToolsLtd.com.

While reasonable efforts have been taken in the preparation of this document to ensure its accuracy, TimeTools Limited assumes no liability resulting from any errors or omissions in this manual, or from the use of the information contained herein.

All claims based on information publicly available at time of printing.

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1. Introduction

Network Time Protocol (NTP) can be used to synchronize the time on network clients, across an IP network, to the correct time of an NTP time server. TimeTools NTP Servers provide a stratum 1 time reference for ensuring the time is correct across an entire network.

The Network Time Server acquires time from satellite constellations and distributes time across a network using the TCP/IP Network Time Protocol (NTP).

2. Key Features

Designed and Manufactured In The UK.

Enterprise-Class, Stratum-1, NTP v4 Network Time Server with full support for NTP and SNTP.

Ultra-Fast, >45,000 NTP Polls Per Second For Precise Client Synchronization.

Gigabit Ethernet (GbE).

Includes Multi-GNSS antenna for reception of GPS (TA210, TA310), or concurrent reception of GPS and Galileo constellations (TA610).

Integrated high-stability TCXO oscillator provides continued operation (holdover) during loss of signal lock.

Powerful, yet easy to use, Web interface.

Command line interface, for advanced users, with full control of functionality.

Comprehensive networking support, including full HTTPS encryption with TLS certificate management, HTTP, SSH, SCP, SFTP, FTP, SNMP v1/2c/3, DHCP, DHCPv6.

Timing receiver synchronises to less than 30 nanoseconds (RMS, GNSS Locked).

NTP accurate to less than 2 microseconds ($2x10^{-6}$ seconds) UTC (GNSS Locked).

Synchronise in excess of 45 million clients at default NTP polling rate.

IPv4 and IPv6 Internet Protocol.

Integrated universal AC mains input PSU for world-wide operation.

3. Scope of Supply

TimeTools TA-Series shipment typically includes the following components:

TA-Series	NTP Time Server Appliance. (TA210, TA310, TA610) GNSS Antenna. Antenna Mount. Antenna Coax Cable. IEC Power Lead. Quick Start Guide.

3.1. Options

GNSS Surge Suppressor (Product code: CN-UB-280DC-SB).

Customised GNSS Antenna Cables to accommodate specific installation requirements.

Digital NTP Wall Clocks.

4. Front Panel

The TA-Series models have the following front panel indicators: LCD Display (TA310, TA610 models), Green Power LED, Red Alarm LED, Select Menu Button.

4.1. LCD Display

The TA310 and TA610 models are fitted with two line by 40 character ultra-bright backlit LCD displays for providing status and configuration information to the user. The display typically shows current time, system time offset compared to reference clock, NTP status, GNSS status and number of satellites currently in use and in view.

4.2. Power Indicator

A green LED power indicator illuminates when power is applied to the device.

4.3. Alarm Indicator

A red LED on the front panel indicates error conditions.

4.4. Select Menu Button

The select menu button (TA310, TA610 models) can be used to display the current firmware version and the devices Ethernet status.

5. Rear Panel

The rear panel of the TA-Series models have the following connectors: Power Inlet, Eth0, Antenna, USB Client and 'Def' button.

5.1. Power Inlet

Power to the appliance is applied via the double-fused IEC power entry inlet. The appliance accepts 100-240 VAC, 50-60Hz 0.1A. Fuse specification is two T 2A LBC 250V fuses.

CAUTION:

The TA-Series NTP server has Double Pole / Neutral Fusing.
No User Serviceable Parts Inside!

5.2. USB

TA-Series models have Micro USB 2.0 Type B receptacle that can be used to completely reprogram the devices flash memory.

5.3. Ethernet Ports

TA-Series models have a single RJ45 10/100/1000 MBit auto-sensing, auto-MDIX Ethernet port labelled 'LAN'.

Link:	10/100/1000 Mbit, auto-sensing, auto-MDIX
Connector:	RJ45
Cable Type:	Shielded CAT 5e or better.
Modes:	Half/Full Auto-negotiation.

5.4. Default Confinguration Button 'Def'

TA-Series models have a small push-button on the rear panel. If the button is held pressed for more than 10 seconds, the device will load its factory default settings and reboot. If required, the functionality can be disabled using the command line interface (CLI).

If the 'Def' button is pressed at power-up, the device enters a USB boot mode, which allows special firmware to be loaded so that it emulates USB Mass Storage Device (MSD) for reprogramming.

5.5. GNSS Antenna Connection

The GNSS antenna connector is a 50 ohm TNC jack connector. It accepts a coax cable to a 3.3V GNSS antenna.

Connector:	TNC jack, 50 ohm
Cable:	Coax, 50 ohm
Antenna Output Voltage:	3.3VDC

6. Installation

6.1. Locating the TA-Series NTP Server

Locate the appliance safely in a rack, on a shelf, or in a cupboard. The device should not be supported by the attached cables.

The appliance can be mounted into a 19” rack cabinet (TA310, TA610 models) using standard rack-mounting hardware.

CAUTION:
Do not install the TA-Series appliance where the operating ambient temperature may drop below -20°C or exceed 60°C.

6.2. Antenna Connection

The TA-Series antenna connection is a TNC jack RF connector. It is provided for connection of an active 3.3 volt GNSS antenna via a coax cable.

WARNING:
Any local installation regulations for outdoor or rooftop mounted antennas in the country where the antenna is installed must be observed.

Please refer to the GNSS Antenna Installation Guide (Document Number: T1202) for further information on antenna installation.

6.3. Connecting Ethernet

The TA-Series has a single 10/100/1000 Mbit BaseT RJ45 auto-sensing, auto-MDIX Ethernet port.

The auto MDI-X feature, automatically detects the required cable connection type and configures the connection appropriately, removing the need for crossover cables for peer to peer connection.

Connect one end of a CAT-5e (or better) patch cable to the RJ-45 network interface on the rear of the TA-Series. Connect the other end to a port on your network switch.

Alternatively, the TA-Series can be connected directly to a host PC Ethernet network port using a patch cable for configuration purposes.

6.4. Applying Power

Apply power by inserting the supplied mains cable into the IEC inlet at the rear of the NTP server and into an appropriate AC power source.

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For PERMANENTLY CONNECTED EQUIPMENT, a readily accessible disconnect device shall be incorporated external to the equipment.

For PLUGGABLE EQUIPMENT, the socket-outlet shall be installed near the equipment and shall be easily accessible.

Verification of the protective earthing connection of the socket-outlet by a skilled person is required for the safe use of the product.

7. Configuration

Before configuring the NTP server, you will need to acquire the following basic configuration information:

IP address,
Network mask,
Default Gateway,
Domain name servers

or confirm availability of a network DHCP server for dynamic networking configuration.

The TA-Series can be configured from a web browser or SSH session in one of two ways:

- Over a network on a PC connected to the same network segment.
- Using a peer-to-peer (direct cable) network connection to a PC.

Please refer to the T-Series User Guide (Document Number T1300) for configuration information.

8. Certification and Compliance

8.1. RoHS Compliance Statement

This document certifies that the products manufactured by TimeTools do not contain the substances listed in the table below in the concentrations exceeding the Maximum Concentration Value (MCV).

Substance Maximum Concentration Value

Lead 0.1% by weight (1000 ppm)
Mercury 0.1% by weight (1000 ppm)
Cadmium 0.01% by weight (100 ppm)
Hexavalent Chromium 0.1% by weight (1000 ppm)
Polybrominated Biphenyls (PBB) 0.1% by weight (1000 ppm)
Polybrominated Diphenyl Ethers (PBDE) 0.1% by weight (1000 ppm)

Products containing the substances listed in the table above, in concentrations below the MCV, are understood to be in compliance with Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronics equipment (RoHS Directives). The stated components are deemed as compliant as accord to definitions given in the directives (refer to directives). This document also certifies that the materials declaration as provided by TimeTools is accurate to the best of our knowledge.

8.2. REACH Regulation (EC) No 1907/2006

TimeTools hereby certifies that to the best of its knowledge, and based on our suppliers' information, parts and products produced by TimeTools do not contain any of the substances referenced in the current list of Substances of High Concern (SVHCs are defined in Article 57 of Regulation (EC) No 1907/2006.) in concentrations greater than 0.1% weight by weight.

8.3. Environmental Policy

TimeTools is committed to minimising the risk of any environmental damage or pollution caused by the company . We ensure compliance with EU Directive 2002/96/EC Waste Electrical and Electronic Equipment, more commonly known as the “WEEE directive”.

The WEEE Directive aims to:

Reduce waste associated with electrical and electronic equipment.

Improve the environmental performance of companies involved in the life cycle of electrical and electronic equipment.

For further information on the WEEE Directive or if you would like to arrange the collection and disposal of an old, unserviceable or redundant piece of equipment that was originally supplied by TimeTools, please contact TimeTools via email at info@TimeToolsLtd.com.

8.4. Compliance

TimeTools TA-Series NTP servers a fully CE and UKCA compliant. A 'Declaration of Conformity' is available at: https://timetoolsltd.com/manuals/

9. Warranty

TimeTools Limited warrants TA-Series appliances to be free from defects in material and workmanship during a three-year period.

TimeTools Limited warrants GNSS antennas, antenna cables and any integral batteries to be free from defects in material and workmanship during a 12-month period.

The Warranty begins on the date the unit is shipped from TimeTools.

TimeTools' liability under this Warranty is limited to repairing or replacing, at TimeTools' option, the defective equipment and providing upgrade version changes for firmware. In case of repair, the product must be returned to an authorized TimeTools Solutions Service Centre.

This Warranty does not apply if repairs are required due to acts of nature beyond TimeTools' control such as, but not limited to, lightning strikes, power surges, misuse, damage, neglect, or if repairs/modifications have been made or attempted by anyone other than personnel authorized by TimeTools.

Disclaimer

IN NO EVENT WILL TIMETOOLS LIMITED BE LIABLE FOR ANY INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES FROM THE SALE OR USE OF THIS PRODUCT.

THIS DISCLAIMER APPLIES BOTH DURING AND AFTER THE TERM OF THE WARRANTY. TIMETOOLS LIMITED DISCLAIMS LIABILITY FOR ANY IMPLIED WARRANTIES, INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A SPECIFIC PURPOSE.

Repair and Returns

To obtain service under this Warranty, contact TimeTools at the address below during the Warranty period to receive a Return Material Authorization (RMA) number and shipping instructions. Then ship the product, transportation prepaid, for inspection.

Ship to:

TimeTools Limited
Attn: RMA XXXXXXX
3 Silverend Business Park,
Brettell Lane,
Brierley Hill. DY5 3LG.
UK.

One-way shipping is the Customer's responsibility. TimeTools will pay the charges to return ship the equipment. However, if the returned product is not found to be defective, then the buyer will be liable for all shipping charges. If the buyer is located outside of the UK, then they will be liable for any duties and taxes payable, if applicable.

TimeTools will not be responsible for dismounting and remounting of the NTP server, for unauthorized returns or for returns that do not list the RMA number and quantity returned on a packing list attached in plain view on the outside of the shipping container.

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