NTS-pico - NTP/PTP time server with cryptographic TSA stamping

N **TS-pico** is a miniature multi-tasking, time server intended for small LAN/WAN networks of several computers, servers or industrial controllers.

Inconspicuous, well-shaped, compact case hides ARM7 (CPU) and Linux (OS) - features making NTS-pico technically advanced.

Elproma has based its latest product on the very stable terminal-modem hardware architecture designed a few years earlier, namely RB-MTX, a flag export product of the company in the M2M segment under the trade mark (**www.teleorigin.com**) - the brand owned by Elproma for many years. NTS-pico, enriched by the results of works on the DEMETRA Horizon 2020 project

www.demetratime.eu

contains many innovative solutions and expansions and probably because of that Elproma decided that it will be available as a separate product in the CLEP-SYDRA time servers segment, a trade mark which also belongs to the Company.

GNSS and GSM modem as a standard reference of UTC time

For the attractive price of EUR 450,- customers receive a ready-to-use product in a version with standard firmware, containing a complete Network Time Protocol v4.2.8 distribution, guaranteeing compliant with all previous NTP versions and compatibility with Windows, Mac OSX, and Linux/Unix.

The set includes external, active GNSS (GPS & GLONASS) antenna with built-in L1 1575.42 MHz signal amplifier (gain 38dB) equipped with 30-meter long H-155 concentric cable as well as all necessary assembly accessories for quick, efficient installation of the antenna outside the building. The built-in GNSS signal amplifier allow to easily synchronise and start NTP-pico even by persons with no experience. The presence of signal amplifier deserves a closer attention because quite often when buying it separately we are forced to pay a lot for it. NTS-pico server contains

also as a standard wireless GSM modem with a separate antenna (in set), which at first glance may seem surprising - however it is not random.

Supporting UTC time from NTA (National Time Authority)

The presence of GSM modem in NTS-pico not only allows to remotely control the products, but it is mainly used to establish *dial-up* communication with NTA *(National Time Authority),* that is with The National Metrology Institute, which possesses the reference UTC time for a given country (NPL in UK, INRIM – Italy, GUM – Poland, ROB – Belgium, VLS – The Netherlands etc.)

NTS-pico, such as: GPIO, USB, RS232/485, allow to independently control, according to the COM time, the work of other industrial devices, while NTP protocol will ensure correctness of synchronisation of devices connected to NTS-pico via the LAN/WAN computer network.

New PTP and TSA functionalities in NTS-pico available as option

A true innovation is the possibility of optional use of two synchronisation protocols: PTPv2/IEEE1588-2008 and cryptographic event time-stamping - TSA by means of *TimeStamping RFC3161* protocol.

PTP/IEEE1588:2008 *(Precision Time Protocol)* may operate simultaneously with NTP as well as independently. Until recently its application in industry was rare, but today most manufacturers of network interface cards and Ethernet switches provide their products featuring the PTP service as a standard.

Unlike NTP, it allows for quicker synchronisation of devices connected via LAN network and may boast better precision and shorter time of initial synchronisation in the initialisation phase of the system. The PTP protocol does not support the IP routing, which is its drawback and which limits PTP application to internal networks (LAN). Currently, PTP is slowly becoming a time synchronisation standard in power industry, telecommunication and industrial automatics.

Cryptographic file and LOG event time-stamping RFC3161 gives the documents (files) properties such as: *integrity, non-repudiation, validity and authentication.*

In case of LOG registers it proves:

- irrefutability of occurrence of an event (e.g. failure) at a particular NTS-pico time;

- authenticity of event/failure (who/what reported), with 100% chronology;

- integrity, change of at least one bit of information automatically breaks the cryptographic "wax seal" preventing report manipulation;

- validity, for the covered by the rule of the so called event reaction time.

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Technical Specification

Model		NTS-pico	Miniature Network Time Server NTP/PTP
		LAN	1x 100/10Mbps (RJ45) max. 10-20 PC
		TCP/IP	IPv4, IPv6, TCP, UDP
		MANAGEMENT	HTTP, HTTPS, SSH, TELNET, SNMP
		SECURITY	PKI Authentication, NTP Autokey, DSA, SSL, MD5, RSA
		SYSLOG	yes
Sync. Accuracy	*GNSS*		better than 100us
		LAN	better than 100ms
Synchronization Protocols			NTP, SNTP, PTP*, TSA* (*option),
		NTP	RFC5905, RFC1305, RFC5906, RFC5907, RFC5908, RFC5909
		SNTP	RFC4330, RFC2030, RFC1769
		TSA	RFC3161
		TIME/DAYTIME	RFC(868), RFC(867) - extra feature*
GNSS			w/ 30m coax H-155 cable
		RECEIVERS	single w/ gain 38dB
		GNSS	GPS, GLONASS, GALILLEO* (test mode),
		SBAS support	yes /EGNOS (ESA), WAAS/
		FREQUENCY	L1: 1575.42MHz; GLONASS 1598.06MHz-1605.38MHz
		MAX. RCV/ANT DISTANCE	30m (cable incl)
		OVERVOLTAGE	no
Interfaces			All protected for overvoltage by built-in varistors
		GNSS	SMA
		LAN	RJ45
		1PPS	not supported
		RS232/RS485	RJ45
		USB	2.0
Other	SIZE		65mm x 55mm x 24mm
		TEMPERATURE	Operating 0C+50C Storage -40C+85C (humidity up to 95%)
		HUMIDITY	up to 95%
		POWER	12VDC