Industry4.0 Telecom-5G IEC-61850 SmartGrids MiFID II

NTS-4000

HQ High Quality Oscillator

OCXO

NTP/PTP IEEE1588 Network Time Server

PTP IEEE1588 Grandmaster

NTP Time Server STRATUM1

Status Display:
```
10-01-2021 GPS 12/32
12:00:00    GLN 10/32
```

ELPROMA
Time Server NTP IEEE1588
NTS-4000   Holdover OCXO
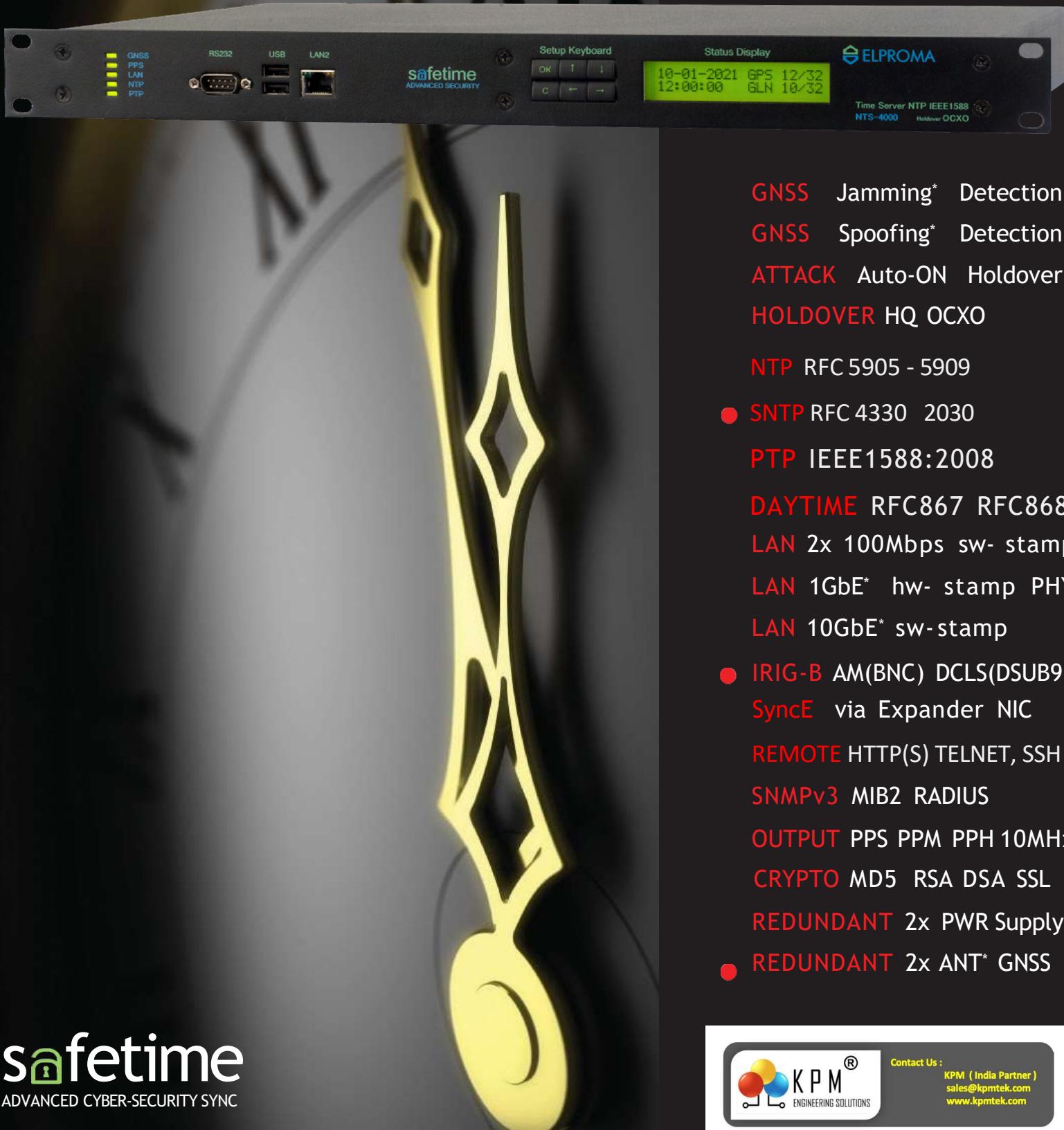
GNSS Jamming* Detection
GNSS Spoofing* Detection
ATTACK Auto-ON Holdover
HOLDOVER HQ OCXO

NTP RFC 5905 - 5909
● SNTP RFC 4330 2030
PTP IEEE1588:2008
DAYTIME RFC867 RFC868
LAN 2x 100Mbps sw- stamp
LAN 1GbE* hw- stamp PHY
LAN 10GbE* sw-stamp
● IRIG-B AM(BNC) DCLS(DSUB9)
SyncE via Expander NIC
REMOTE HTTP(S) TELNET, SSH
SNMPv3 MIB2 RADIUS
OUTPUT PPS PPM PPH 10MHz
CRYPTO MD5 RSA DSA SSL
REDUNDANT 2x PWR Supply
● REDUNDANT 2x ANT* GNSS

safetime
ADVANCED CYBER-SECURITY SYNC

KPM®
ENGINEERING SOLUTIONS

Contact Us :
KPM (India Partner)
sales@kpmtek.com
www.kpmtek.com

*extra feature requiring additional hardware and firmware upgrade
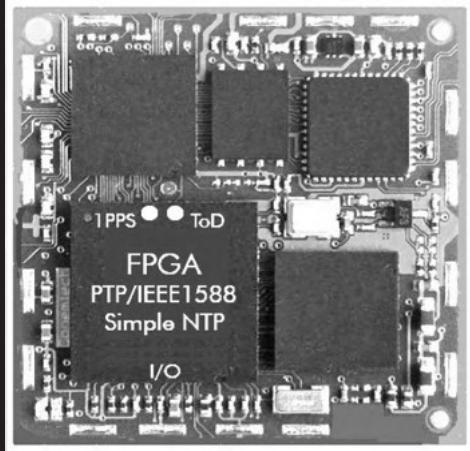
FPGA supports hardware timestamping

The miniature 2x2cm embedded PCB includes FPGA and it is a part of P-80 EXPANDER time-computer board
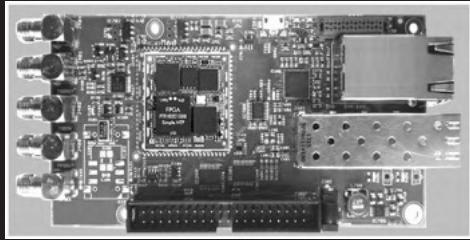
The EXPANDER P-80 computer option is autonomous PTP GRANDMASTER. It supports LAN3-LAN4 1GbE ETH

Network Time Protocol NTP v2, v3, v4 (LAN1-2):

- RFC1305
- RFC1119
- RFC5905
- RFC5906
- RFC5907
- RFC4330
- RFC2030
- RFC867
- RFC868

Precision Time Protocol PTP IEEE1588 (LAN3-4):

Profiles:
- Default IEEE1588
- Telecom (incl. SyncE)
    - ITU-I G.8265.1
    - ITU-I G.8275.1
    - ITU-I G.8275.2
- Broadcasting
    - SMPTE 2059.2
- Power & Power Utility
    - IEEE C37.238 (v2)
    - IEC 61850-9-3
- (S)NTP Server
    - RFC4330 RFC2030

Storage temperature: −55°C to +80°C
Humidity: up to 95%
MTBF 391000 hours

* extra feature requiring additional hardware

NTS-4000 OCXO delivers time directly to network using NTP, PTP/IEEE1588 protocols. The default configuration is equipped with 2x LAN (LAN1, LAN2) 100/10Mbps speed. The LAN2 can be upgraded to 10GbE* SFP software timestamping interface.

The hardware timestamping option* is available on LAN3 (RJ45) and LAN4 (SFP). I t is requiring additional EXPANDER* network card supporting 1GbE Ethernet. In case of using 1GbE HW-stamping, the LAN2 1x10GbE upgrade is not allowed. The maximum configuration of NTS-4000 supports 4x LAN: 2x 100/10Mbps & 2x 1GbE.

The NTS-4000 server takes ref. time from 2x independent redundant GNSS receivers. Built-in OCXO high performance oscillator ensures UTC when missing GNSS signals. Server can be synchronized to external clocks using 1PPS, IRIG-B, RS232 (ToD) inputs. It also provides ref. time output using 1PPS, IRIG-B, RS232, 10MHz, RS232(ToD).

LAN1-LAN2 Time-stamping **Software**   *LAN3-LAN4* **Hardware** *time-stamping*

Redundant Synchronization Inputs

- 2x RJ45-ANT1/ANT2 for connecting max. smart NTS-antenna:
    - Supported GNSS systems: GPS, GLONASS, GALILEO, BEIDOU
    - Supported RF receivers: single band L1/E1, optionally dual band L1+L2 or L1 +L5
    - Supported UTC accuracy: <5ns* or <15ns or <25ns depends on receiver option
    - Note1: Please refer to NTS-antenna specification (1pcs of included to std. product)
    - Note2: The „accuracy" to UTC means PPS stability, the max. time error to UTC**.
- max. 10 remote NTP/PTP IEEE1588 time servers (number upgradable on requests)
- PPS BNC (50 Ohm)   - IRIG-B AM (50 Ohm)   - ToD (rs232 DSUB-9)

I/O

- All LAN interfaces are IEEE 802.3 compatible
- 2x LAN Ethernet 100Base-T (RJ45) LAN1-2
- 2x LAN Ethernet 1GbE* EXPANDER* LAN3-4
- 1x LAN Ethernet 10GbE* LAN2* update
- 2x Antenna INPUT or OUTPUT (RJ45)
- 3x RS232C (D-SUB9)
- 1x SMA* PPS-out (EXPANDER LAN3-4*)
- 5x BNC (50 Ohm): PPS, IRIG, 10MHz
- 2x USB 2.0 (for firmware upload)

Remote configuration

- SNMP (v1,2,3) - MIB 2 - RADIUS - HTTP - HTTPS - SSH - TELNET - NTPQ/NTPDC

Holdover

- OCXO HQ oscillator
- TCXO* Low-noise CHIP clocking
- DUAL* Both OCXO & TCXO clocking

Performance

- GNSS 1PPS-in @ 2-sigma/   < 5ns
- PTP master2slave sync (LAN3-4) < 25ns
- Network performance   9000 req/s
- Max. councurrent NTP clients   9.2 mln
- PTP max #SLAVE LAN3-4   32 (default)
- PTP max #SLAVE option: 128/256/450*

Time Accuracy & Time-Stamping

- GNSS receiver NTS-antenna pulse PPSinput: better than 5ns measured at 1-sigma
- GNSS receiver NTS-antenna pulse PPSinput: better than 15ns measured at 2-sigma
- Internal PPS pulse accuracy to UTC**: better than 5ns measured at 3-sigma
- LAN3-LAN4 harware time-stamping PTP/NTP better than 25ns
- LAN1-LAN2 software timestamping PTP/NTP better than 100us IEC61850 NTP/PTP
                    MiFID II NTP/PTP

Mechanical/environmental

- Size: 484x 300x 44,4 mm (rack'19 1U)
- Operating temp: −55°C to +80°C (receiver)
- Operating temp: 0°C to +60°C(server)
- Storage temp: −55°C to+80°C

Power supply

Power: 110-230 VAC (1A), 50-60Hz
        120-370 VDC (1A)
Telecom: 48VDC option* 20-70 VDC (2A)
Option: 2nd redundant* PWR-supply

HQ OCXO holdover

measurement error is a difference between an indication of the NTS-4000 device under test 1PPS-output true value in relation to reference UTC(PL) signal provided by the Polish Central Office of Measures (atomic clock 5071A) .

Days	1d	2d	3d	4d	5d	6d	7d	14d
ERROR μs	0,6	2,8	7,2	13,7	22,1	32,9	45,9	184