

# NTS-antenna

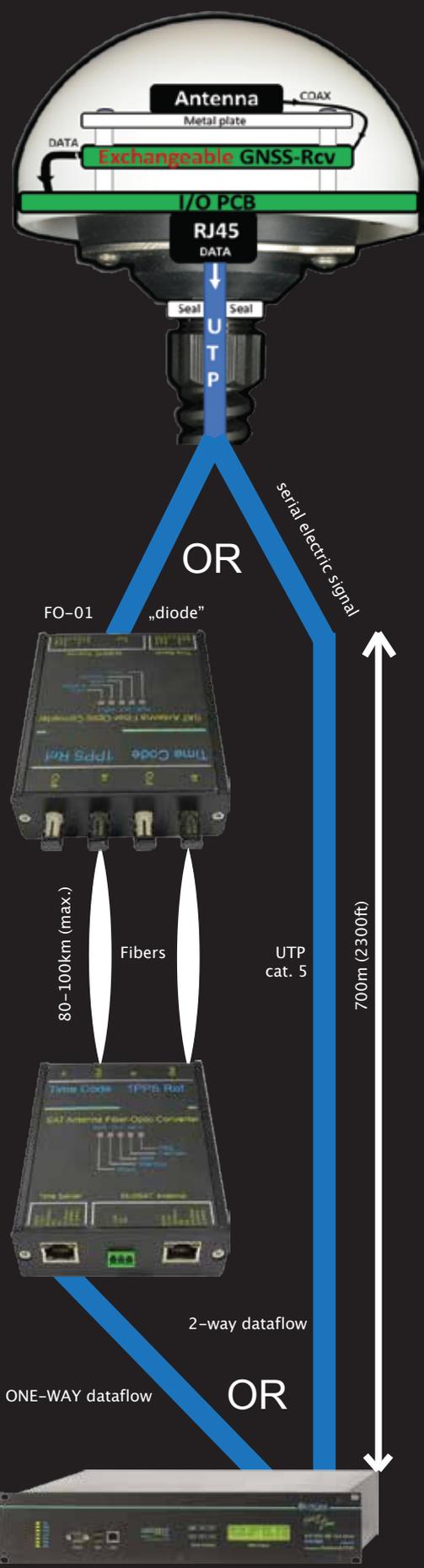
## From Robust GNSS Synchronization To Advanced Cybersecurity & GPS Firewalls

- **GPRD 2016/679** EU Directive (General Data Protection Reg.)
- **SELECTABLE** set of GNSS:
  - GPS
  - GLONASS
  - BEIDOU\*
  - GALILEO\*
  - IRNSS<sup>3</sup> on request\*
  - IRIDIUM<sup>3</sup> on request\*
- **ONE-WAY** „Diode Firewall”\* protection ensuring dataflow GNSS-TO-SERVER
- **2x RECEIVERS** /TIME-SERVER
- **OVERVOLTAGE** built-in
- **I/O RJ45** serial w/ NMEA 1PPS
- **EASY TO MOUNT** cable UTP
- **MAX DISTANCE** 700m/2300ft
- **FIBER OPTIC\*** option available
- **ROBUST UTC** from all GNSS
- **VANDAL RESISTANT** dome
- **BULD-IN** data signal amplifier
- **RF GAIN** 38dB for all GNSS L1
- **READY TO USE** mast included
- **GPS L1\*** anti-jaming<sup>3</sup>/spoofing<sup>3</sup>
- **PRODUCT** Made in EU (Poland)

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 **ELPROMA**

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**Single NTS-antenna** is included to each NTS-3000, NTS-5000, NTS-5000LITE time server. This is enough for basic synchronization supported by most of solutions today. But where our competitors stop, Elproma keeps it's solution growing to appoint robust synchronization.

**Using double NTS-antenna** improves robustness of UTC synchronization and cybersecurity. Two active antennas seriously reduce risk and effectivity of GPS-jamming/ spoofing attacks. Extremely long cable connection distance from server, modular arhitecture, innovative high-tech RF technology - all keep Elproma product state of the art and GNSS market leading.

In case of ensuring General Data Protection Regulation (GDPR EU directive #2016/679) for personal data protection and privacy, the NTS-antenna can be equipped with special FO-01 fiber-optic „diode“ box. It ensures the GNSS data transfer to be a one-way only from antenna.

### Easy To Mount – Ready To Use

**Extra long cable connection.** Single NTS-antenna can be located on max. distance of 700m (2300ft) from/to NTS-x000 family time servers using std. UTP/STP cat. 5 cables - all with no special signal amplifiers. The internal RF antenna gain is 38dB for all GNSS L1 frequency. This is an advantage when the cabling installation is carried out in skyscrapers or the installation takes place in a large area of industrial plants, power distribution, telecom and airports. Using fiber-optic (FO-01) converters connection distance can be extended up to 100km.

**Simple, easy and fast installation.** In comparison to a rigid coaxial cable the UTP/STP cable can be curved and easily passed through hole in the wall. In the event of a break, cables can be reconnected and soldered together too. Such solution is not allowed for coax met at other products. Cables can be purchased locally to reduce shipment weight and freight costs.

**Built-in overvoltage protection.** NTS-antenna is electrically protected by varistors on all data output lines. It also can be equipped with external **NTS-protect\*** - a set of surge arrestors\*. Elproma is unique worldwide offering built-in basic overvoltage protection for all it's products.

**New Concept of GNSS receiver inside NTS-antenna** always ensures state of the art technology. **Moving commercial GNSS-receiver out of time server case** makes Elproma solution flexible and independent on server architecture. Each time there is requirement to update GNSS for new constellations the receiver PCB can be replaced by a new one - more advanced.

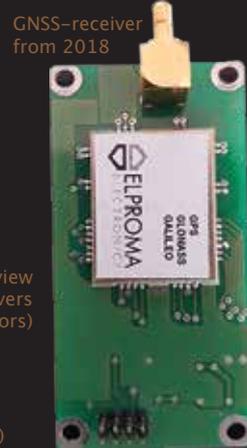
**The GNSS modularity of NTS-antenna improves cybersecurity** too. Elproma has carefully selected several suppliers of GNSS-receiver board. All have been well laboratory tested to ensure a final UTC output is always available whatever synchronization is to GLONASS, GPS, BEIDOU, GALILEO or any combination of above. This is not a trivial understanding how big offsets are between GNSS subsystems (e.g. GLONASS and BEIDOU to GALILEO offset is 37 seconds; 19 seconds to GPS; the GPS-GALILEO offset is now 18 seconds). Compensating internal GNSS time offsets to UTC is always a weak part of synchronization. Together with weak Leap second it leaves cybersecurity „door open: for time manipulation. Generating „artificial“ Leap second is a hacker tool for destabilizing network synchronization. Therefore Elproma tightly focus on testing all above cases to provide robust synchronization.

### GNSS Receiver

- GPS L1 (1575,42MHz)
- GLONASS L1 (1598,06–1605,38MHz)
- GALILEO L1 (1575,42MHz)
- BEIDOU L1 (1561,09–1575,42MHz)
- SBAS L1 support (EGNOS/WAAS)

GNSS-receiver BCB view  
Elproma NTS-antenna basis on several GNSS-receivers (for security reasons they are all from different vendors)

NTS-antenna (internal core-module view)  
The GNSS-receiver module is located between PCB's)



### Time Accuracy

- better than 15 nanoseconds
- RAIM Support (timing modules are in use)

### Mechanical/environmental

- Dome size: 109mm x 61 mm
- Power: 24VDC (max 0.5A)
- Operating temperature: -40°C + 85°C
- Humidity: up to 95%



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