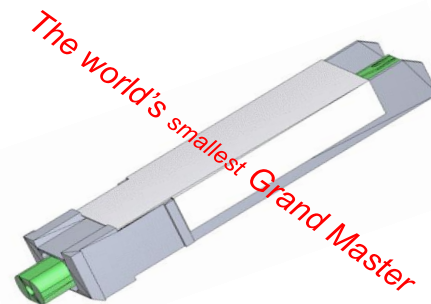


Time4 Systems T410 GM SFP

Flexible synchronization solution for both time and frequency



Time4 Systems T410 provides a zero footprint synchronization solution for mobile networks.

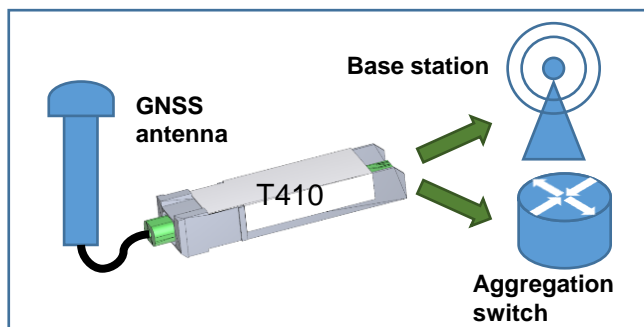
Summary

T410 provides a cost-effective migration path for deploying robust synchronization near the network edge. It offers flexible deployment and integration into existing network management. The timing optimized, dual frequency GNSS receiver achieves good performance even in urban canyons. Design, and network redundancy techniques, provide resiliency against local GNSS jamming.

- ❖ Small cell, LTE, LTE-TDD, LTE-A, 4G...
- ❖ Grand Master / PRTC
- ❖ IEEE1588 (PTP) and Synchronous Ethernet
- ❖ Zero footprint - host equipment SFP slot
- ❖ Switches, Routers, base stations MWR...

Versatile deployment options

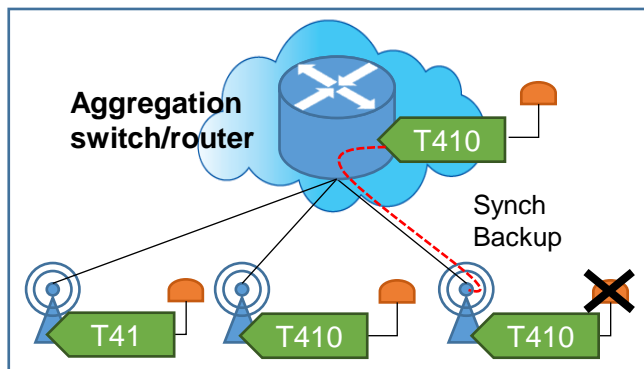
Specific deployment scenarios include small cell, LTE, LTE-TDD, LTE-A, 4G networks. T410 also provides a cost effective upgrade solution for legacy 2G and 3G networks - supporting SDH replacement scenarios. T410 provides the function of a Grand Master Clock and conforms to IEEE1588v2 standards and the relevant industry profile specifications. While the T410 supports the ITU-T telecoms profiles, it can also support profiles from other industries.



T410 plugs into host equipment

Choosing T410 locations

One network deployment scenario is to deploy T410 units at the lowest level aggregation switches and distribute synchronization to connected base stations. This model may be extended with T410's provisioned at cell-site locations to provide additional resiliency and GNSS jamming protection. The optimal deployment solution, for a given network, depends on the network capabilities and the balance of system level costs and the required level of resiliency.

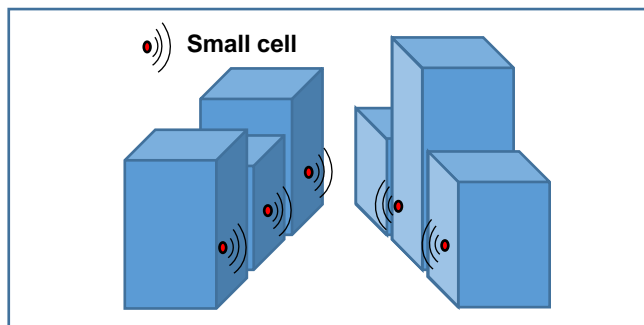


Backup in case of GNSS failure/Jamming

Small size - High performance

The design choices made in T410 take into account the product's role as a critical source of time. The T410 has an exceptionally good multi-GNSS engine that enables high performance operation even in urban canyons where many small-cell deployments have to be made.

Jamming resiliency is increased by concurrent reception of GNSS systems (dual-frequency) and support for narrow beam antennas.



T410 supports small cells in urban canyons



“Time4 your network”!

Profiles, and defaults

The T410 is able to support both Layer-2 and Layer-3 transports and both unicast and multicast. By default the T410 operates as a Layer-2 GM with SyncE enabled (Telecoms profile).

When additionally configured as a Layer-3 GM the T410 responds to service requests from slave devices.

With a Layer-3 slave function configured the T410 is able to request service from remote (or co-located masters) providing the backup service.

GNSS Receiver

- 72-channel multi-GNSS engine
- Supports Fixed location / Survey mode
- Concurrent GNSS (dual frequency)
- GPS/QZSS L1 C/A, GLONASS L10F, BeiDou B1
- SBAS L1 C/A: WAAS, EGNOS, MSAS
- Galileo-ready (software update required)

interfaces

- Antenna connector: MCX 50Ohm;
- Antenna supply voltage 3.3V
- SFP or SFP+ 1000BaseX
- Dedicated indicators:
 - Red LED – Antenna / GNSS Fault
 - Green LED - Active Clients

IEEE 1588 PTP Profiles

- ITU-T: G.8275.1; G.8265.1
 - Master capacity 50 unicast clients
- IEEE1588 Default profiles
- Power profile
- Enterprise profile

Time accuracy

- UTC+/-100ns (Primary Reference Time Clock)

Time4 Systems, founded in 2013, focuses in providing carrier grade synchronization solutions for telecommunications operators globally. In addition to synchronization innovation the Time4 team has a solid 100+ years telecommunications experience covering software, hardware, SOPC and RF design.



T410 as a monitoring probe

The T410 is also able to act as a measurement probe accurately monitoring network timing quality.

Monitoring can be:

- IEEE1588 probe function
- SyncE timing measurement function
- Delay measurement protocols (Y.1731, etc...)

Holdover performance

- OCXO Stratum 3E (20-55°C)

Synchronous Ethernet (SyncE)

- SyncE output coherent with PTP
- SyncE input

Management

- IEEE1588 (with TLV extensions)

Power consumption

- < 1W (excluding start-up and <20°C)

Operating conditions

- Temperature -40°C thru +65°C

Contact information:

Time4 Systems Ltd,
Finnoonniiyynkuja 4
02270 Espoo, FINLAND
Tel. +358-40-5085944
Email: contact@time4systems.com
URL: <http://www.time4systems.com>

