SITEF

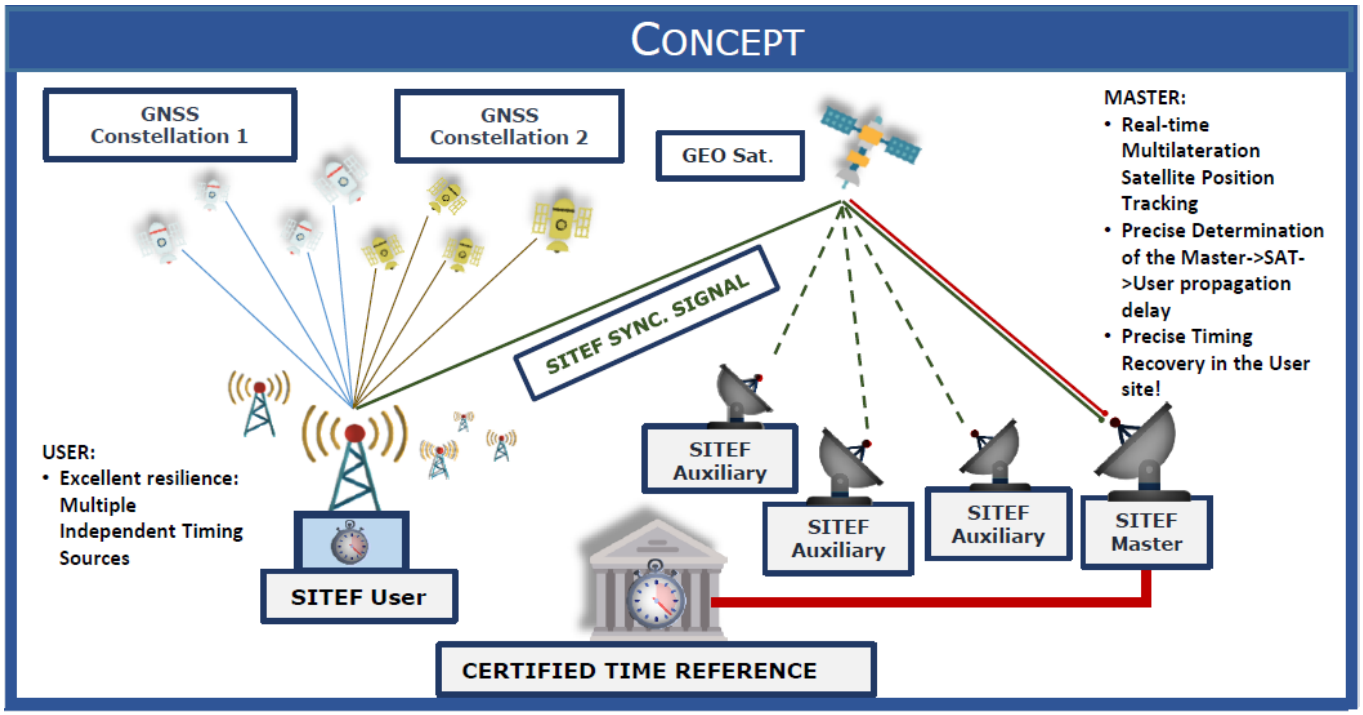
THE INNOVATIVE SYNCRONIZATION SYSTEM

Synchronisation is a major problem affecting the Time and Frequency Synchronisation sector, in particular the critical infrastructures like Broadcast, Telecoms, and Electrical Utilities. The Global Navigation Satellite System (GNSS) system currently utilised is vulnerable to threats like jamming, spoofing and are mostly controlled by the military. To address the identified problems, BLU Electronic have developed an innovative system for time and frequency synchronisation (SITEF).

Benefits
☑ <40ns Accuracy
☑ 1.5MHz Band
☑ Availability
☑ Encrypted signals
☑ Resilience

SITEF

The Innovation SITEF: Is a robust system, incorporating an innovative receiver completely independent from any actual GNSS systems. ***The service is distributed through 2 Master stations and 6 auxiliary stations.*** The number of stations is doubled in order to enhance product reliability – if one station fails the other automatically switches. SITEF will allow users to synchronise a network of User Stations (USs) to a common ground clock situated at the Master Control Station (MCS), by means of a geostationary satellite. We have achieved an accuracy level lower than 40nanoseconds, per regulation and our user's specifications. The system can operate at higher frequency bands, minimising intentional and unintentional interferences from receiver and RF signals. Integrated GNSS (Galileo, GPS, GLONASS) receivers will increase the availability of the system adding different technologies to SITEF system.



System definition:

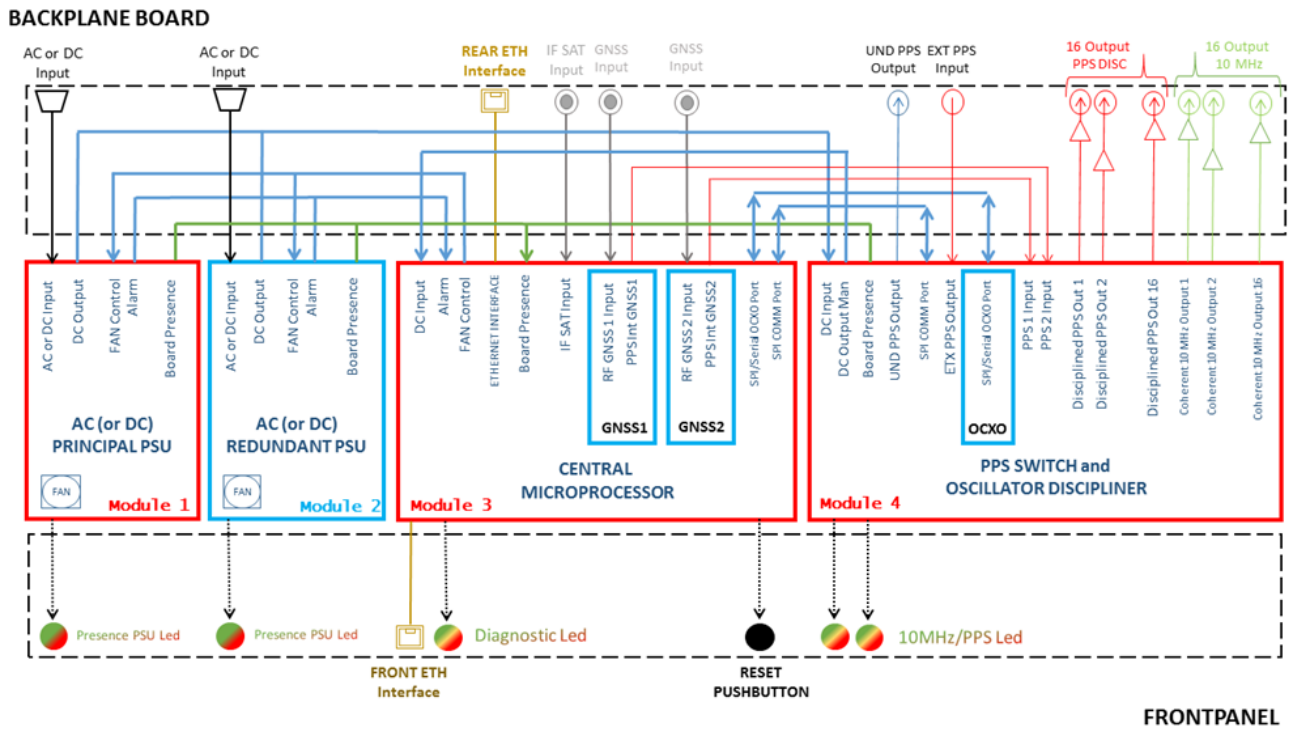
SITEF will allow users to synchronise a network of User Stations (USs) to a common ground clock situated at the Master Control Station (MCS), by means of a geostationary satellite.

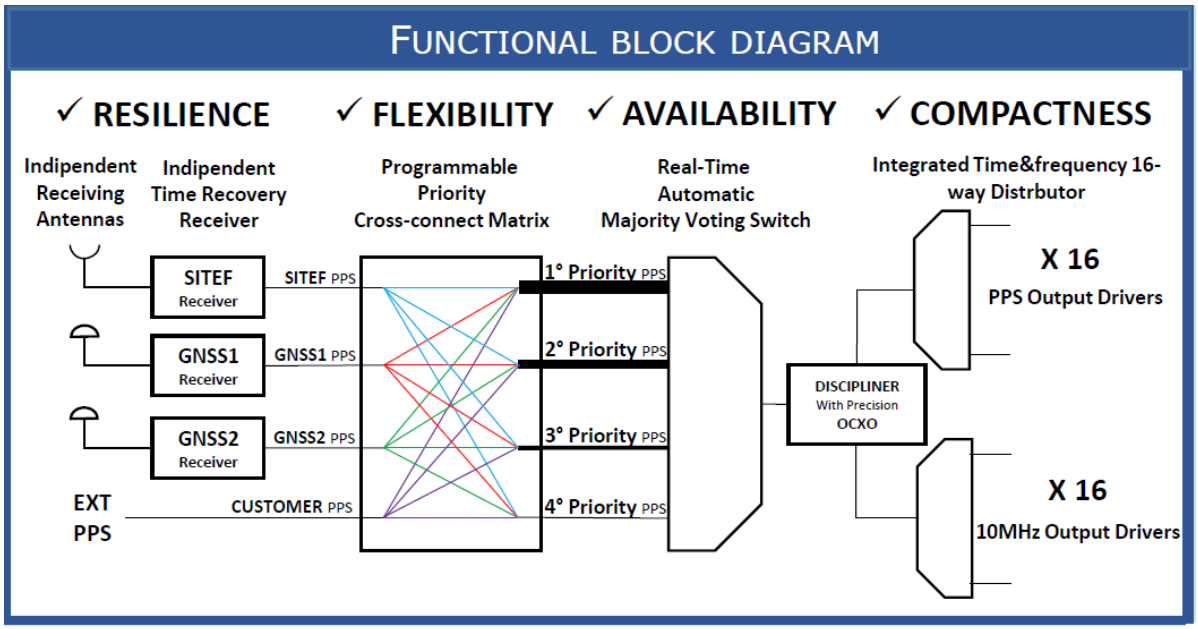
The main components of the system are the **Master Control Station (MCS),** the **Auxiliary Stations (AUX)** and a customer-defined number of **User Stations (US).**

- **The master control station (MCS)** takes its reference clock of PPS and 10MHz from a certified ground source and disseminates it via satellite to the user stations, together with information on the exact position of the satellite.
- **The MCS and a set of Auxiliary Stations (AUX)** are used to **track the satellite with high accuracy** to enable it to provide its position to the whole USs network.
- At local level, **the User Station (US)** receives the synchronisation signal and automatically corrects for delays through its exact distance to the satellite. The satellite simply acts as a mirror to the synchronisation signal. This eliminates constraints on the choice of satellite to be used, meaning any broadcasting satellite will be suitable.

System components:

1. **User Station:**
   - The User station will consist of 1 - 19 inch sub rack unit.
   - The sub rack is designed to be customisable depending on the type of end user and their needs.
   - The complete configuration will accommodate three or four modules where each module must be mechanically independent of each other, in order to be individually extracted.
   - The modules are interconnected via backplane integral with the sub rack.





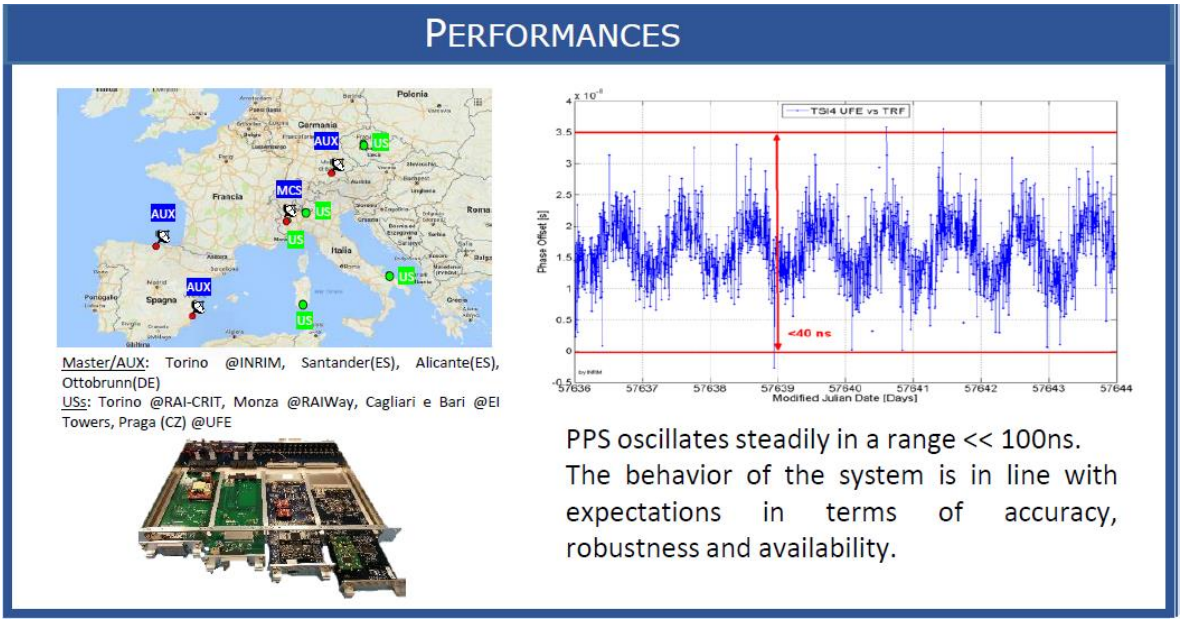
2. Master Control Station:

- Consists of at least 5 -19" sub racks, and we will upgrade it to 8 -19" sub racks.
- Like the user stations, the master stations must be mechanically independent of each other.
- The master control station has all connections on the rear panel.

3. Auxiliary Transceiver Station:

Installed remotely, their task is to measure the distance between themselves and the satellite. They then send this information to the Master Control Station with the associated geographical coordinates.

System Performance and specification



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Power Supply	
AC Supply	85÷264 Vac / 47÷63 Hz
DC Supply	18÷75 Vdc
Power Consumption	40 W (max)
SITEF Receiver	
Frequency	925 ÷ 2175 MHz (L-band)
Connectors	1 x F-type / 75 Ω
Req. Antenna	1.2 m (typ)
Req. LNB Freq. Stability	2 MHz
Double GNSS Receiver	
Frequency Band	GPS L1C/A, SBAS L1C/A, QZSS L1C/A, QZSS L1 SAIF, GLONASS L1OF, BeiDou B1I, Galileo E1B/C
Connectors	1 x N-type/50Ω, 1 x SMA-type/50Ω
GPS Antenna Power Out	5VDC / 80 mA
Receivers	72 ch. Concurrent GPS + GALILEO + GLONASS or BEIDOU
Datation IO	NMEA 0183
External 1PPS Input	
Connectors	1 x BNC / 50 Ω

Time Output (1PPS)	
Connectors	16 x BNC / 50 Ω
Accuracy to UTC	< 40 ns (1s)
Frequency Output (10 MHz)	
Connectors \ Signal	16 x BNC / 50 Ω, sine wave
Technology	OCXO
Accuracy (av. 24h)	$< 2 \cdot 10^{-12}$
Medium Term Stability	$2 \cdot 10^{-10}$ / day
Short Term Stability (1s)	
	$2 \cdot 10^{-11}$
Temperature Stability (pp)	$2 \cdot 10^{-9}$
Various	
Management Ports & Supported Protocols	2 x Eth. 10/100 Base-T (RJ45) for FTP, SSH, HTTPS and SNMP
Physical	19" 1U (483 x 407 x 44 mm) < 5 kg
Operating Temperature	-5°÷60°C
CE Mark	EN 60950-1, EN61000-6-2, EN61000-6-3