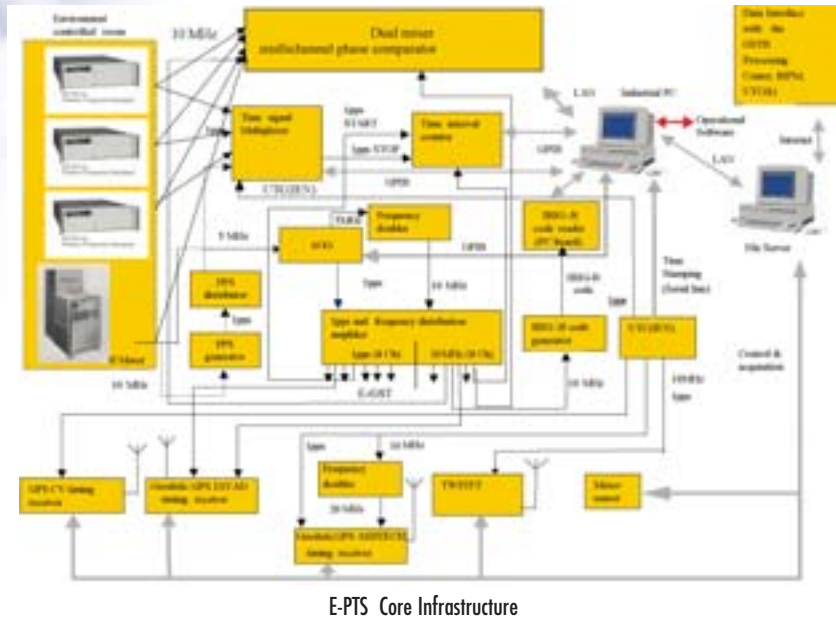


Galileo System Test Bed V1 Experimental Timing Station (E-PTS)

The Experimental Precise Timing Station (E-PTS) provides the accurate and stable reference time for the GSTB-V1: the Experimental Galileo System Time (E-GST).

E-PTS infrastructure is based on dedicated HW and SW including a clock ensemble, measurement chains, and synchronisation links to external time laboratories. A time scale algorithm elaborates the measures and drives the real-time timescale generation. The E-PTS is hosted in the Italian Metrological Lab IEN with a link to the German and British Time Laboratories PTB and NPL



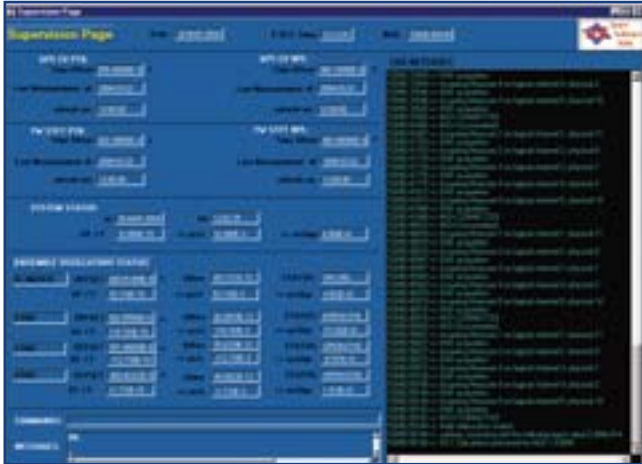
E-PTS set-up at IEN facilities:

- 1 H-maser and 3 Cs Clocks in an environmental controlled room
- A primary measurement chain based on an electronic counter for clock comparison
- A secondary measurement chain based on a Multi Channel Phase Comparator for a real time clock monitoring.
- A completely automated real time processing workstation
- 2 geodetic GPS receivers and one timing GPS receiver
- A Two Way Satellite Time and Frequency Transfer system
- A dedicated server for data transfer with the GSTB-V1 Processing Centre and the PTB and NPL Timing laboratories



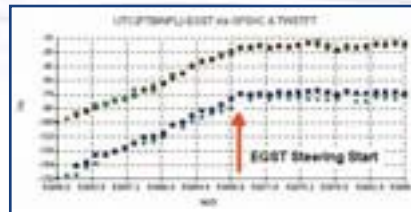
E-PTS set-up at Italian Timing Laboratory (IEN Turin)

E-PTS application SW and E-GST Experimentation



The E-PTS SW has been designed to work in real time for the generation of E-GST and also in off-line configuration for testing different algorithms and different clock configurations.

In this environment it will be possible to evaluate the validity and the limits of the proposed algorithms providing also an assessment of the performance of the time scale in terms of stability, accuracy, and robustness



The E-GST is based on an ensemble of 3 Cesium clocks and one Hydrogen maser with the aim of ensuring a good short and long term stability. In addition, E-GST is steered versus the International Atomic Time (TAI), the international time reference, to ensure accuracy and to provide the additional service of time dissemination.

The steering to TAI relies on the monthly estimates received from the Bureau International des Poids et Mesures (BIPM) and it is day by day verified by satellite time transfer comparison with PTB and NPL time scales.

E-GST timescale drives a dedicated GPS geodetic receiver whose pseudorange measurements are then transferred to the GSTB-V1 Processing Centre for Orbit Determination & Time Synchronisation processing.

A wide set of Core Products are automatically generated during the on-line and off-line processing allowing the immediate evaluation and reporting of the status and performance of the timescale experiments.



Coming soon:

The E-PTS is currently operational at IEN Laboratory in Turin: the steered EGST is running in real time and experimentation is ready to start.

As of April 2004, EGST data will be made available on GSTB V1 server. (www.gstb-v1.esa.int)

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