Precise Time & Frequency Equipment (PTFE)

Both the Caesium and Rubidium-based PTFE maintain precise time in the temporary absence of GPS satellite received time by using the US Naval Observatory-maintained coordinated Universal Time (UTC), obtained using the NAVSTAR GPS. Both are highly reliable due to self-arbitration and redundancy.

Caesium-based PTFE Key Features



- Will maintain precise time to an accuracy of less than 50µsec after 90 days without GPS
- Equipped with an integral 4th generation GPS receiver module to discipline a secondary Rubidium
- Caesium tube primary oscillator; Rubidium tube secondary oscillator
- Highly stable phase-lock-loop control circuit for the secondary rubidium source
- Automatic and instantaneous switching to internal source in the case of GPS signal loss or degradation
- Supports the NATO PTTI interface in accordance with STANAG 4430

Rubidium-based PTFE Key Features



- Will maintain precise time to an accuracy of less than 250µsec after 45 days without GPS
- Dual-redundant internal Rubidium frequency source
- Highly stable phase-lock-loop control circuit for each RB oscillator
- GPS interface in accordance with ICD-GPS-060
- Supports the NATO PTTI interface in accordance with STANAG 4430
- Currently in service with the Royal Navy as Outfit FSF, fitted to some twenty-five operational ships including Type 45 destroyers
- Currently being fitted to Type 26 and Type 31

Technical Specifications

Caesium-based PTFE

Frequency Accuracy

3 x 10⁻¹²

Short-term Frequency Stability better than 5 x 10⁻¹² per day

Long-term Frequency Stability better than 8 x 10⁻¹⁴

Ageing

Time Accuracy (GPS

accessible)

Time Accuracy (GPS lost)

Electrical Power Source

Electrical Consumption

Back-up Batteries

PTFE Physical Characteristics

External Caesium Unit Physical Characteristics

within 100ns

less than 50µs after 90 days

115V AC 60Hz / 240V AC 50Hz

250W

optional

Weight: 23kg

Height: (5U) 222mm

Width: (19") 482mm

Depth: 460mm

Weight: 13.5 kg

Height: (2U) 99mm

Width: (19") 482mm

Depth: 380 mm

Rubidium-based PTFE

Frequency Accuracy

5 x 10⁻¹¹

Short-term Frequency Stability better than 2.5 x 10⁻¹² per day

Long-term Frequency Stability -

Ageing

5 x 10⁻¹¹/month

Time Accuracy (GPS

accessible)

within 100ns

Time Accuracy (GPS lost)

less than 250µs after 45 days

Electrical Power Source

115V AC 60Hz / 240V AC 50Hz / 24VDC supply

Electrical Consumption

Physical Characteristics

optional

250W

Back-up Batteries

Weight: 23kg

Height: (5U) 222mm

Width: (19") 482mm

Depth: 460mm

Options

Custom interface and output signal requirements implemented (frequency outputs, time messages, fibre optic interfaces) via Interface Modules, as required, including customised distribution

Alternative levels of redundancy available with marginal decrease in reliability

Back-up battery available in separate shelf unit providing more than one hour at full load

