



# Epsilon Clock

## Model EC2T



- **High performance reference clock**
- **ITU G.811 GPS PRC**
- **12 channel reception on L1 (1575 MHz) C/A code**
- **Continuous Time Integrity Monitoring (T-RAIM)**
- **Automatic self survey with robust OD fixed mode**
- **Antenna propagation delay compensation**
- **1 PPS TTL output**
- **4 x 2.048 MHz sine wave outputs**
- **Optional 2048 kbit/s output**
- **Time of Day output**
- **RoHS Compliant**

The Epsilon Clock™ 2T is a high performance GPS clock with OCXO oscillator. The extremely accurate and stable time and frequency signals in a compact stand alone chassis (1U high – 19" wide) suits a comprehensive range of applications where excellent accuracy and stability are required. Ideal as a Primary Reference Source (PRS) or Primary Reference Clock (PRC) for telecom network synchronization.

An ovenized oscillator (OCXO) slaved to the GPS input source offers outstanding accuracy and phase noise. An optional Double Oven OCXO is available for a very low aging. The oscillator in conjunction with the EpsilTime™ smart predictive slaving algorithm mitigates the effects of inherent GPS noise and complies to the most stringent holdover mode requirements if GPS is lost.

In addition to the 1 PPS, 4 x 2.048 MHz, and time of day outputs, the E1 option is available for 2 x 2048 Kbit/s. An option is available to synchronize to one external 1 PPS.

Time of day and status is available via the front panel display. Selection of all settings including squelch of frequency outputs, G.704 alarm bit, antenna cable delay, choice of time scale (UTC or GPS) are user programmable. Extended status is available via the serial line interface. Optional EpsilWin32 software achieves complete remote control and supervision.

## SPECIFICATIONS

### FREQUENCY OUTPUT (10 MHz):

		High Performance OCXO	Double Oven OCXO
Accuracy (Average over 24 hours when GPS locked)		$< \pm 2 \times 10^{-12}$	$< \pm 1 \times 10^{-12}$
Medium Term Stability (without GPS, constant temperature, after 2 weeks of continuous operation)		$2 \times 10^{-10}/\text{day}$	$1 \times 10^{-10}/\text{day}$
Short Term Stability (Allan Variance)	@ 1s	$1 \times 10^{-11}$	$5 \times 10^{-12}$
	@ 10s	$3 \times 10^{-11}$	n/a
	@ 100s	n/a	$1.5 \times 10^{-11}$
Temperature Stability (peak to peak)		$1 \times 10^{-9}$ (from 0° to 60°C)	$7 \times 10^{-10}$ (from 0° to 70°C)
Signal Waveform Typical Level		4 x 2.048 MHz, sine wave G.703 §13 / 75 Ω (BNC)	
MTIE / TDEV		Meet the ITU G.811 reccommendation when GPS locked	

### TIME OUTPUT (1 PPS):

Accuracy to UTC (GPS locked)	$\pm 120 \text{ ns } (1\sigma)$
Holdover Mode After 4 Hours	0.8 μs
Holdover Mode After 1 Day (at constant temperature, after 24 hours of GPS lock)	12 μs
Signal Waveform and Level	1 PPS TTL / 50 Ω (BNC)

### OTHER INPUTS/OUTPUTS:

Status and Remote Control Outputs	Remote control and time of day (RS-232C serial lines) Alarm: relay contact 1 line of 20 characters display (Date and Time)
GPS Input/Output for Antenna Am	L1 GPS C/A code (TNC) / 5 V @ 80 mA

### POWER:

Power Supply	AC Supply DC Supply	90 to 265 V / 48 to 63 Hz -36 to -72 V
Typical Power Consumption (without options)		< 25 W

### PHYSICAL

Size: 19" 1 U unit (483 x 340 x 44 mm)  
Weight: < 5 kg

### ENVIRONMENTAL

Operating Temperature: -5° to 60°C  
Storage Temperature: -40° to 85°C  
Relative Humidity: 95% RH @ 40°C, non condensing  
CE Compliance: EN 50082/EN 55022  
Safety: EN60950  
RoHS Compliant

### OPERATING MODE

Cold start-up time: < 20 minutes  
Synchronization and slaving on GPS reference  
Squelch of frequency outputs on set threshold  
Status displayed by LEDs (GPS, Power, PPS)  
Permanent self-test of main functions  
Full remote control by serial port RS-232C  
1 line of 20 characters display on front panel  
(Date and time)

### OPTIONS

E1 option: 2 x 2048 kbit/s (75Ω) outputs module  
(G.703 § 9 and G.704) 120 Ω is also available  
Configuration G.703 § 13/120 Ω for frequency output  
1 x 10 MHz output (instead of 1 x 2048 kHz)  
External 1 PPS reference

### ACCESSORIES

Active GPS antennas and cables  
Lightning protections/In-line amplifier/Splitters  
EpsilWin32 software for remote control/supervision

4493-E1

Specifications subject to change or improvement without notice.  
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