



Epsilon Clock

Model EC20S



- **High-performance GPS clock**
- **Remote management by SNMP/HTTP, through Ethernet port**
- **Synchronize to a variety of sources**
 - 12 channel reception on L1 (1575 MHz) C/A code
 - 1PPS external
 - NMEA standard
- **Up to 10 x 1PPS TTL outputs**
- **Up to 10 x 10 MHz sine wave outputs**
- **NMEA output**
- **Additional outputs available**

The Epsilon Clock Model EC20S provides accurate and stable time and frequency signals for your high-performance synchronization application. The unit's optimized architecture is well-suited to transmitter synchronization of digital broadcast signals (DVB-T/T2, DVB-H, DVB-SH, T-DMB, FLO, DAB or DRM) in SFN modes, as well as wireless synchronization of BTS (WiMAX, CDMA, TD-SCDMA).

An ovenized oscillator (OCXO) slaved to the input source offers outstanding accuracy and reduces phase noise. The smart EpsilTime™ Kalman-based algorithm allows intelligent input signal filtering, providing adaptability to the quality of the active input reference (GPS, external PPS). If the input reference is disrupted, the oscillator maintains time (SFN) and frequency (MFN & SFN) accuracies in holdover mode.

The Epsilon Clock Model EC20S is also available with an optional Rubidium oscillator, which provides even greater holdover stability. Setup, status, and alarms are accessible through an Ethernet 10/100 Base-T interface, through embedded SNMP protocol, or through the Web User Interface. The antenna cable delay and the choice of time scale (UTC or GPS) are programmable.

Specifications

Frequency Output (10 MHz)

		OCXO	Rubidium
Accuracy (Average over 24 hours when GPS locked)		$< \pm 2 \times 10^{-12}$	$< \pm 1 \times 10^{-12}$
Medium Term Stability (without GPS, content temperature, after 2 weeks of continuous operation)		2×10^{-10} /day	5×10^{-11} /month
Short Term Stability (Allan Variance)	@1s	1×10^{-11}	3×10^{-11}
	@10s	3×10^{-11}	1×10^{-11}
	@100s	3×10^{-11}	3×10^{-12}
Temperature Stability (peak to peak)		1×10^{-9} (from 0° to 60°C)	1×10^{-10} (from 0° to 50°C)
Phase Noise (typical, static conditions)	@10 Hz	-120 dBc / Hz	-110 dBc / Hz
	@100 Hz	-135 dBc / Hz	-130 dBc / Hz
	@1 kHz	-145 dBc / Hz	-140 dBc / Hz
	@10 kHz	-150 dBc / Hz	-145 dBc / Hz
	@100 kHz	-150 dBc / Hz	-145 dBc / Hz
Signal Waveform (typical level)		7 X 10 MHz, Sine Wave, squelchable > 12 dBm \pm 2 dB / 50 Ω (BNC)	
Harmonic Distortion Spurious		-40 dBc -60 dBc	

Time Output (1PPS)

Accuracy to UTC (GPS locked)	± 2.5 ns (1 σ)	
Holdover Mode After 4 Hours (at constant temperature, after 24 hours of GPS lock)	0.8 μ s	0.3 μ s
Holdover Mode After 1 Day (at constant temperature, after 24 hours of GPS lock)	10 μ s	2 μ s
Signal Waveform and Level	7 X 1 pps / 50 Ω , squelchable (BNC)	

Other Inputs/Outputs

GPS Input/ Output For Antenna	L1 GPS C/A code / 5V @ 80 mA (N)
1PPS External Reference	TTL / 50 Ω (BNC)
Datation Input/Output	NMEA 0183, RS232, or SUB-D 9 points
NTP Output	Stratum 1 time stamp over Ethernet 10/100 Base-T (RJ45)

Power

Power Supply	AC Supply DC Supply	90 to 264 V / 48 to 63 Hz (CEE22) ± 20 to ± 72 VDC (XLR)
Typical Power Consumption (without options)		20W 30W
Max Power Consumption at Warm Up		25W 50W

Physical

Size: 19" 1U unit (483 x 340 x 44 mm)

Weight: < 5kg

Environmental

Operating Temperature:

-5° to 60°C (OCXO)

-5° to 50°C (Rubidium)

Storage Temperature: -40° to 85°C

Relative Humidity: 95% RH @ 40°C, non-condensing

CE Compliance: EN 61000, EN 55022

Safety: EN 60950

RoHS Compliant

Operating Mode

- Cold Start-Up Time < 20 minutes
- Hot Start-Up Time < 5 minutes
- Permanent self-test of main functions
- Monitoring of external references
- Squelch of frequency and time outputs
- Status displayed by LEDs

Options

- Additional 10 MHz outputs (x3)
- Additional 1PPS outputs (x3)

Accessories

- Active GPS antennas and cables
- Lightning protections/In-line amplifier/Splitters