Star 4

OEM GPS Clock for Base Station integration

MANUFACTURING

Highlights

- Inexpensive and easy-to-integrate GPS Clock
- High frequency stability and long term accuracy
- Various oscillators and hold-over capabilities
- Ultra compact + reliable
- 1PPS, 10MHz and Time-of-day
- Phase alignment of all outputs within ±5ns with "0 crossing" 1PPS / 10MHz
- UTC-derived 1PPS and MEA0183 timing information
- 1 Power supply input connection only
- ROHS compliant
- Firmware upgradeable

Applications

Rack integration for Wireless Base stations

- WiMAX, WiBRO, 3G, 4G, LTE, CDMA, TD-SCDMA
- DAB, DVB-T/H/SH, T-DMB, MediaFLO, DRM
- E911 Location Systems
- Timing and Synchronization

The Oscilloquartz Star 4 series offers superior time and frequency synchronization in a minimal space and at a ultra low cost.

Based on a state-of-the art GPS receiver, the Clock delivers 1PPS, 10 MHz and time-of-day outputs with the highest levels of accuracy and stability.

In addition to GPS, the Star 4 board has a 1PPS input to cascade time and frequency from a single GPS-antenna to several Star 4 boards, saving the cost of multiple GPS antenna installations.

Various levels of configurations are available to easily adapt to the requirements of your Base Stations, Broadcast Station systems, and sub-systems for a discrete and cost optimized synchronization solution.

When no valid input is available, the OSA OEM GPS Clock enters into holdover mode and is specially designed to hold its output frequencies to supply long hours of frequency and phase accuracies.

When enhanced with Oscilloquartz' advanced Aging and Temperature Drift Compensation (ATDC) system, the Star 4 is the most stable GPS quartz clock available in holdover mode. It has a very thin form factor and allows for large temperature variations and harsh environmental conditions.

Thanks to an exhaustive list of commands, Star 4 is easy to integrate into any base station management platform.

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GPS System

- 50-channels, L1 frequency, C/A Code
- High immunity to jamming
- First acquisition and tracking after 1 minute
- -160dBm in fixed position and -144dBm in cold start
- Short circuit and TVS protection at 5kV

Single input power supply

- 12 VDC ± 5%

Management

- LVTTL 3.3V or RS-232 (on choice)
- 4 alarm outputs and firmware upgrade by download

Alternative input to GPS receiver

- 1 PPS: 3.3 V LVCMOS @ 1 kΩ (optional)

OEM GPS CLOCK variants	STAR 4 - S01	STAR 4 - S02	STAR 4+ - DO	STAR 4+ - ATDC
Oscillator	Single-oven OCXO 1	Single-oven OCXO 2	Double-oven OCXO	Special Version Double-oven OCXO
OUTPUTS				
1PPS	**TTL**	**TTL**	**TTL**	**TTL**
Holdover PPS 10 µs Duration (Temp range)	8 hours (constant) 45 min (5°C)	16 hours (constant) 2 hours (5°C)	32 hours (constant) 24 hours (8°C)	40 hours (10°C) 24 hours (25°C)
Phase stability when locked to GPS	± 30 ns typical	± 30 ns typical	± 30 ns typical	± 30 ns typical
Level / Impedance	3.3 Vpp / 1 kΩ 1.5 Vpp / 50 Ω	3.3 Vpp / 1 kΩ 1.5 Vpp / 50 Ω	3.3 Vpp / 1 kΩ 1.5 Vpp / 50 Ω	3.3 Vpp / 1 kΩ 1.5 Vpp / 50 Ω
Rising time / PPS Duration	≤10 ns / 20 µs	≤10 ns / 20 µs	≤10 ns / 20 µs	≤10 ns / 20 µs
10MHz	Square & sine wave	Square & sine wave	Square & sine wave	Square & sine wave
Phase alignment at ambient temp.	± 5 ns	± 5ns	± 5 ns	± 5 ns
Phase Noise (10 MHz Sine)		-110 dBc @ 10 Hz -135 dBc @ 100Hz -140 dBc @ 1kHz	-125 dBc @ 10 Hz -140 dBc @ 100Hz -140 dBc @ 1kHz	-125 dBc @ 10 Hz -140 dBc @ 100Hz -140 dBc @ 1kHz
Level of 10MHz Sine	1 Vrms / 50 Ω	1 Vrms / 50 Ω	1 Vrms / 50 Ω	1 Vrms / 50 Ω
Level of 10MHz Square	3.3 Vpp / 1 kΩ 1.5 Vpp / 50 Ω	3.3 Vpp / 1 kΩ 1.5 Vpp / 50 Ω	3.3 Vpp / 1 kΩ 1.5 Vpp / 50 Ω	3.3 Vpp / 1 kΩ 1.5 Vpp / 50 Ω
Time-of-Day NMEA0183	✓	✓	✓	✓
TRACKING, FILTERING & HOLDOVER				
OCXO performance ageing per day	2E-9	5E-10	1E-10	5E-11
OCXO performance thermal (full temp range)	5E-8 peak to peak	2E-8 peak to peak	6E-10 peak to peak	2E-10 peak to peak
Aging & Temp. Drift Compensation	⊘	on request	on request	✓
GENERAL				
Footprint (LxWxH)	**17.9** x 135 x 60 mm	**20.4** x 135 x 60 mm	**23.8** x 135 x 60 mm	**23.8** x 135 x 60 mm
Operating temperature	-20 to 65°C	-20 to 65°C* *(-30 to 85°C on request)	-20 to 65°C*	-20 to 65°C*

See also TSAR board for GLONASS/GPS and OSA 4560 for boxed unit.

Subject to change without prior notice.

Ed.10/ORIS

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