# GPS-2000

## 10 MHz OCXO-based GPS Disciplined Oscillator


### Key Features

- High-performance GPS Receiver
- Small footprint and low profile: only 1.5" x 3" x 0.65"
- Built-in 10 MHz Distribution Amplifier with 3 outputs (>80 dB isolation)
- Low phase noise
- 1 PPS output accuracy of ±50 ns to UTC RMS (1-sigma), GPS-locked

### Applications

- Unmanned Aerial Vehicles (UAV's)
- IED jammers–fixed, mounted, dismounted
- Radar systems
- Aircraft guidance systems
- Tactical radios
- Underwater systems using GPS for initialization
- DAB/DVB-T

The Symmetricom® GPS-2000 is a 10 MHz Single-Oven OCXO-based GPS Disciplined Oscillator (GPSDO), covering a temperature range of 0°C to +75°C. The unit features a high-performance GPS receiver that can track up to 50 GPS signals, down to levels as low as -160 dBm. The receiver is compatible with GPS, WAAS, EGNOS, and MSAS signals.

Special software functionality supports airborne applications by providing avionics systems with a 3D velocity vector, Attitude/Tilt information, Speed, Heading, Height (both MSL and GPS height), Position, Time, Date, Frequency, Time-stamping, and Health information. For mission-critical applications, the GPS-2000 also provides a direct redundancy feature, allowing multiple units to be daisy-chained to each other for increased reliability.

The GPS-2000 provides three high-isolation 10 MHz sine-wave outputs (>90 dB at 10 MHz, >80 dB at 3 GHz), each at +13 dBm, as well as one LVDS 10 MHz differential pair. It also provides a single 1 PPS LVDS differential output with ±50 ns accuracy to UTC RMS (1-sigma), once GPS lock has been achieved.

Holdover stability is ±60 µs over a 24-hour period at +25°C. Phase noise is <-92 dBc/Hz at a 1 Hz offset, and the unit consumes <3.2W of power at +25°C.

The unit can be monitored and controlled through an RS-232 port via standard SCPI commands, and it can also generate NMEA-0183 output sentences for easy integration into existing system architectures.

The GPS-2000 offers all of this performance in a package that is less than one-half the size of the smallest competitive products.

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## Specifications

**ELECTRICAL SPECIFICATIONS**

**MODULE**

| | |
|---|---|
| 1 PPS Accuracy | ±50ns to UTC RMS (1-sigma) GPS locked |
| Frequency Accuracy | Better than ±3E-10 after 3 hours operation with GPS locked at 25°C |
| Holdover Stability | <±60µs over 24 hour period at 25°C (no motion or airflow, after 5 days with GPS) |
| ADEV | 0.1s to 1000s: <6E-11 with GPS lock |
| 1 PPS Output (OCXO Flywheel Generated) | One LVDS pair output |
| 10MHz Output | One LVDS pair and three isolated sine wave at +13dBm ±3dB |
| Distribution Amplifier Port Isolation | 2MHz: >98dB, 10MHz: >92dB, 1GHz: >92dB |
| Avionics Support | 3D velocity vector (velocity output for the X, Y, and Z planes), 3D MEMS accelerometer with ± 3G range |
| RS-232 Control | Full control via SCPI-99 control commands, NMEA-0183 |
| GPS Frequency | L1, C/A 1574MHz |
| GPS Antenna | Passive or active, 5V |
| GPS Receiver | 50 channels, mobile, GPS, WAAS, EGNOS, MSAS supported |
| Sensitivity | Acquisition – 144 dBm<br>Tracking – 160 dBm |
| TTFF | Cold start – <45 sec<br>Warm start – 1 sec<br>Hot start – 1 sec |
| TTL Alarm Output | GPS unlock and event indicator |
| Warm Up Time / Stabilization Time | <45 min to 1.0E-9 accuracy at +25°C (typical) |
| Supply Voltage (Vdd) | 12 VDC nominal ±5% |
| Power Consumption | <3.2W at +25°C |
| Operating Temperature | 0°C to +75°C |
| Storage Temperature | -45°C to +85°C |

**OSCILLATOR**

| | |
|---|---|
| 10MHz Retrace | ±2E-08 after 24 hrs. on, 24 hrs. off, 1 hr. on at +25°C (no GPS) |
| Frequency Stability Over Temperature | ±1.5E-08 |
| Oscillator Heater Warm Up Time | <8 min |
| Phase Noise | 1Hz -92dBc/Hz<br>10Hz -120dBc/Hz<br>100Hz -140dBc/Hz<br>1kHz -145dBc/Hz<br>10kHz -150dBc/Hz |
| Designed Lifetime | >10 years |

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