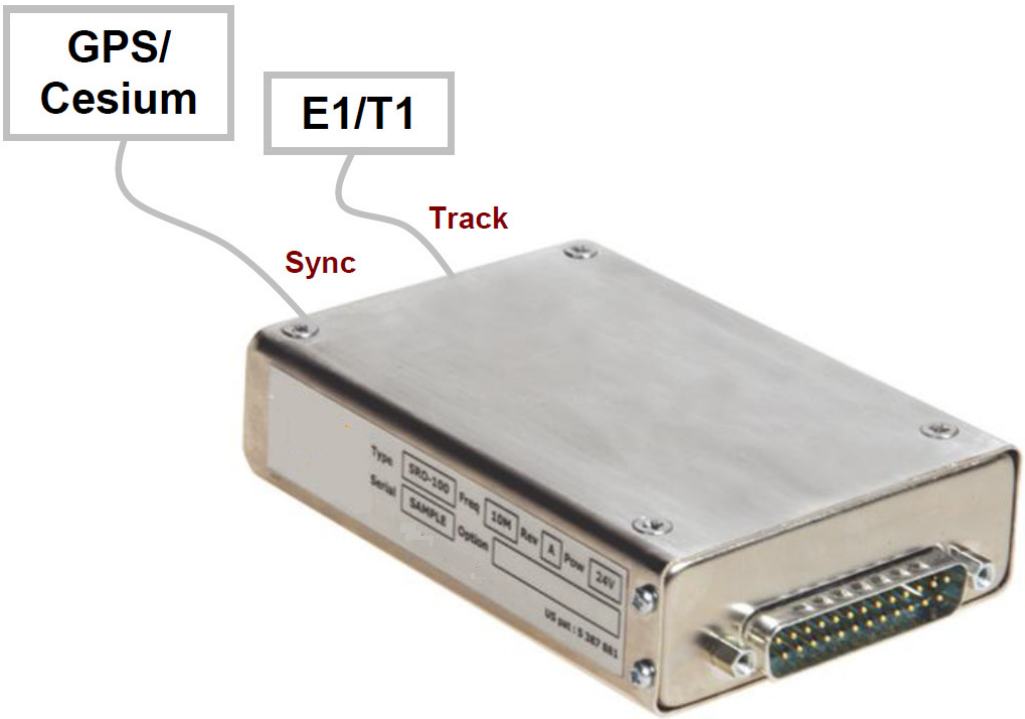
# RFS4: 10 MHz Rubidium Oscillator




## Key Features

- Rubidium Oscillator for OEM and industrial applications
- Low phase noise
- Low Allan Deviation
- Low monthly and yearly ageing
- External 1 pps conditioning option
- 10 MHz Sinewave Output in phase with 1 pps input / output
- Integrated GPS receiver option
- RS232 interface (control and monitor)
- 12 or 24 VDC Power Supply
- Custom built options available upon request

## Description

The RFS4 is a high quality rubidium oscillator module. Intended for OEM applications, the RFS4 provides a very accurate 10 MHz output signal. The RFS4's base plate will need to be placed on a suitable heat sink

A special feature of the RFS4 is the ability to lock to an external 1 pps signal, such as from a GPS receiver. The 10 MHz signal output's phase and 1 pps outputs will be aligned to the external 1 pps rising edge.

Many options are available for the RFS4 including built in GPS receiver, 12 or 24 V power supply, external 1pps disciplining and lower monthly ageing with higher stability.

# Specifications

| Description | Specification | Remarks |
|---|---|---|
| **Rubidium Oscillator** | | |
| Output Frequency | 10 MHz sinewave (option squarewave) | Optional change to 5 MHz |
| Output Level | Sine Wave +7 dBm into 50 Ω | |
| Aging (after 30 days) | < 5 x $10^{-11}$ /month or < 5 x $10^{-10}$ /year | Typically 3 x $10^{-11}$ /month |
| Aging (option after 30 days) | < 3 x $10^{-11}$ /month or < 2 x $10^{-10}$ /year | Typically 1 x $10^{-11}$ /month. Opt 02 |
| Accuracy at shipment | < ± 5 x $10^{-11}$ @ 25 °C | |
| Allan Deviation (standard) | < 3 x $10^{-11}$ (1s), < 3 0 x $10^{-12}$ (100s) | |
| Allan Deviation (option)) | < 1 x $10^{-11}$ (1s), < 1 0 x $10^{-12}$ (100s) | Option 04 |
| Phase Noise (Standard Unit) | -75,-95,-125,-145,-145dBc/Hz | @ 1/10/100/1k/10k/ Offsets |
| Phase Noise (Option) | -80,-100,-125,-145,-145 dBc/Hz | @ 1/10/100/1k/10k/ Offsets |
| Spurious / Harmonics | <-80 dBc (100 kHz BW) / -25 dBc | |
| Frequency Retrace | ± 5 x $10^{-11}$ (24 hours off, 1 hour on) | Typical |
| Digital Frequency Adjustment | ± 1.6 x $10^{-8}$ Resolution < 5.12 x $10^{-13}$ | |
| Analog Trim Range | ±5 x $10^{-9}$ | |
| Warm-Up Time | < 12 minutes to within 5 x $10^{-10}$ | |
| Temperature Coefficient | ±1 x $10^{-10}$ (-10 °C to +55 °C) | Optional < 5 minutes |
| Magnetic Field | < 2 x $10^{-10}$ for 1 Gauss field reversal | Option -32 °C to +65 °C |
| Design Life | 10 to 20 years | |
| **Options** | | |
| Option 07 | Integrated GPS Receiver | RFS4 disciplined by GPS system |
| Option 08 | 10 MHz ACMOS Output | |
| **Miscellaneous** | | |
| Operating / Storage Temp. | -30 °C to +55 °C / -55 °C to +85°C | Base Plate |
| Altitude | 21200 m or 70000 feet | |
| Power Supply | +12 VDC (11.2-16V) standard, | Option 20 to 32V |
| Current | 2.4A warm-up, 1 A steady state | Typical |
| Protection | ± 30 VDC on any power pin | |
| Interface | RS232, 9600 baud 0 to 5V levels | |
| Lock Indicator | Open Collector | |
| Operation Vibration | GR-63-Core, Section 5.4.2 | Random MIL-PRF-28800F, Class 3,4 |
| Shock | Survival 40g 11 ms | |
| Helium Concentration Sensitivity | < 1E-10 per ppm of Helium concentration | |
| EMC | MIL-STD-461F/CE-102 | |
| Physical / Weight | 102 x 71 x 25.4 mm / 0.24 kg. | |
| RoHS | Lead – Free Compliance | |
| Consult Precision Test Systems for further details of available options. | | |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Specifications subject to change without notice (130715)