

Disciplined Oscillator *Options*

For GPS-Synchronized Time & Frequency Standards

EndRun's Meridian II and Tycho II can be easily upgraded with various disciplined oscillators. A temperature-compensated crystal oscillator (TCXO) is the basic oscillator. An upgrade is indicated when your application requires either improved holdover accuracy, or improved short-term stability and phase noise. Choices include three grades of oven-controlled crystal oscillators (OCXOs) and two grades of compact Rubidium vapor atomic frequency standards. The HS-OCXO, US-OCXO and HS-Rubidium are individually characterized and hand-selected for state-of-the-art performance. We also guarantee that our OCXOs are free of sudden frequency steps - an industry exclusive. *You will not find equal close-in phase noise and short term stability specifications in our competitors' offerings.*

KEY BENEFITS

- Industry-leading Phase Noise
- Industry-leading Short-Term Stability
- No Frequency Steps (OCXOs)
- Improved Holdover Accuracy
- Available in 1U Chassis



OCXO Options

We offer three grades of OCXO: medium-stability (MS), high-stability (HS), and ultra-stable (US). All three feature SC-cut crystals for fast warmup, low ageing and phase noise. By using premium, high-Q 5 MHz crystals and a frequency doubler, these units provide both 5 and 10 MHz outputs with exceptional close-in phase noise performance while delivering state-of-the-art long term ageing performance.

The MS-OCXO provides more than two orders-of-magnitude improvement in temperature stability relative to the standard TCXO and a reduction in ageing. Since it has very good phase noise characteristics, it can support sinewave outputs with high spectral purity. The HS-OCXO provides improved stability and phase noise performance. It provides high performance and good value when the MS-OCXO is not sufficient. Choose the

US-OCXO for the ultimate, calibration laboratory grade OCXO performance. This unit improves the temperature stability eight times relative to the MS-OCXO option and provides 1 second Allan Deviation at 5.1 parts in 10¹³. With excellent close-in phase noise performance, it can also support sinewave outputs with very high spectral purity.

Compact Rubidium Options

Phase noise and short-term stability of Rubidium vapor atomic frequency standards are inferior to that of quality OCXOs, so in many situations the HS-OCXO or US-OCXO is a better choice, offering comparable holdover performance for periods of several hours, superior short-term stability, low-phase noise, reliability and much lower cost. But if you need the ultimate in long-term holdover performance and medium-term stability, a Rubidium option is the right choice. For the ultimate in temperature stability and long-term ageing performance we offer the high-stability HS-Rubidium option.

Oscillator Options - Summary Performance Data

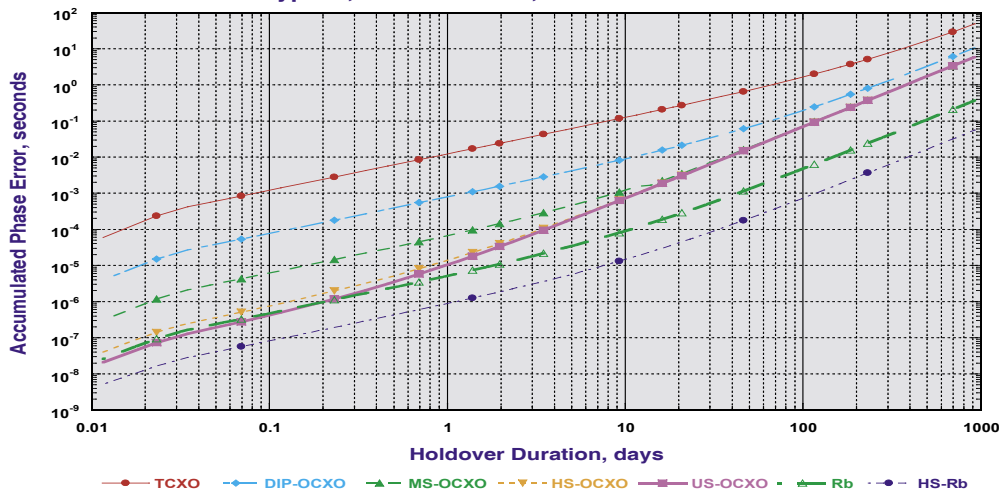
	TCXO	MS-OCXO	HS-OCXO	US-OCXO	Rubidium	HS-Rubidium
Temp Stability	2.5 x 10 ⁻⁶	4 x 10 ⁻⁹	1 x 10 ⁻⁹	5 x 10 ⁻¹⁰	1 x 10 ⁻⁹	1 x 10 ⁻¹⁰
Temp. Range °C	-20 to +70	0 to +70	0 to +70	0 to +70	-20 to +70	-20 to +70
Ageing Rate/Year	1 x 10 ⁻⁶	3 x 10 ⁻⁸	3 x 10 ⁻⁸	3 x 10 ⁻⁸	1 x 10 ⁻⁹	5 x 10 ⁻¹⁰
Allan Deviation @ 1 sec	6 x 10 ⁻¹⁰	3 x 10 ⁻¹²	1 x 10 ⁻¹²	4.0 x 10 ⁻¹³	2 x 10 ⁻¹¹	1.2 x 10 ⁻¹¹
Phase Noise dBc/Hz:	10MHz	10 / 5MHz	10 / 5MHz	10 / 5MHz	10MHz	10MHz
1 Hz	-70	-95 / -100	-105 / -110	-113 / -118	-80	-80
10 Hz	-100	-120 / -130	-130 / -135	-138 / -143	-100	-100
100 Hz	-125	-135 / -140	-140 / -145	-148 / -152	-135	-135
1 kHz	-135	-145 / -150	-150 / -155	-152 / -155	-145	-145
10 kHz	-140	-145 / -150	-150 / -155	-153 / -155	-145	-145
100 kHz	-145	-145 / -150	-150 / -155	-153 / -155	-145	-145

NOTE: OCXO and Rubidium phase noise specifications are guaranteed on Low-Phase-Noise Module. TCXO phase noise specifications are typical.

Disciplined Oscillator Options

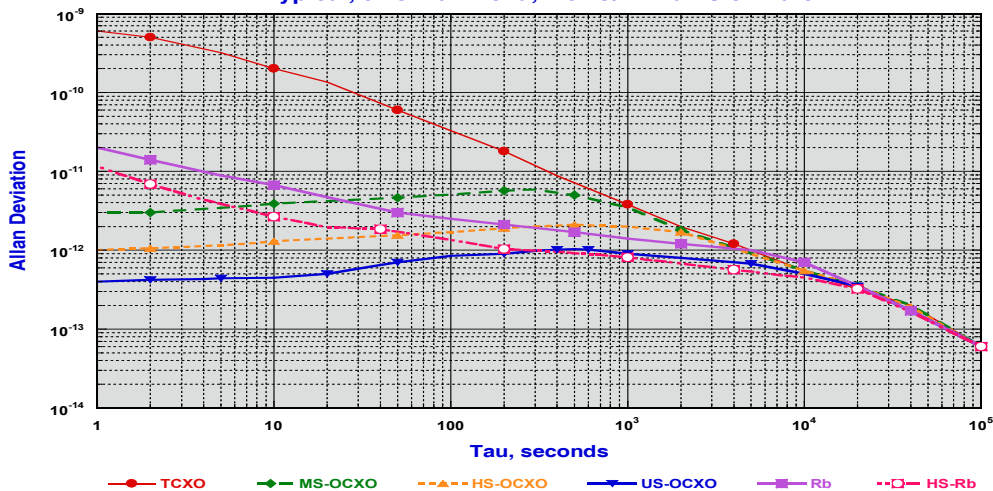
Holdover Performance - Oscillator Options

Typical, 5° C Max Delta, 7.5° C/Hr Max SlewRate



Time Domain Stability -- Oscillator Options

Typical, 5° C Max Delta, 7.5° C/hr Max SlewRate



Phase Noise Performance - Oscillator Options

Low Phase Noise Output Option @ 10 MHz

