EndRun TECHNOLOGIES
"Smarter Timing Solutions"

Disciplined Oscillator *Options*

For GPS-Synchronized Time & Frequency Standards

EndRun's Meridian II and Tycho II Precision TimeBase can be upgraded with OCXO and Rubidium oscillators to improve holdover accuracy, short-term stability, and phase noise. Three grades of oven-controlled crystal oscillators (OCXOs) and two grades of Rubidium vapor atomic frequency standards are available to upgrade the basic temperature-compensated crystal oscillator (TCXO). The RTM3205 Precision Timing Module can be configured with the any of the OCXOs. For state-of-the-art, industry-leading performance, the oscillators are individually characterized and hand-selected. We guarantee our OCXOs are free of sudden frequency steps - an industry exclusive.

KEY BENEFITS

- Industry-leading Phase Noise
- Industry-leading Short-Term Stability
- No Frequency Steps (OCXOs)
- Improved Holdover Accuracy

OCXO Options

The OCXO options are: medium-stability (MS), high-stability (HS), and ultra-stable (US). These proprietary OCXOs feature SC-cut crystals for fast warmup, low ageing and phase noise. By using premium, high-Q 5 MHz crystals and a frequency doubler, 5 and 10 MHz outputs are provided with exceptional close-in phase noise performance, stability, and deliver state-of-the-art long term ageing.

The cost-effective MS-OCXO provides two orders-of-magnitude improvement in temperature stability, ageing, short-term stability and phase noise performance relative to the standard TCXO. The HS-OCXO provides additional stability and phase noise performance. Choose the US-OCXO for the ultimate temperature stability, short-term stability and phase noise. With industry-leading close-in phase noise, it provides sinewave outputs with the highest spectral purity for demanding applications such as satellite communications, signal intelligence, radar, and calibration laboratories.

Rubidium Options

Rubidium atomic frequency standards excel in temperature stability, ageing, and medium-term stability. For the ultimate in long-term holdover performance and medium-term stability with very good phase noise, the ultra-stable Rubidium option is the right choice. The US-Rubidium is based on an industry-leading rubidium frequency standard that delivers true, uncompromised rubidium performance. An integrated SC-cut crystal output enables low phase noise as well. A standard, compact rubidium oscillator is also available for holdover applications that do not require US-Rubidium performance.

Oscillator Options - Summary Performance Data

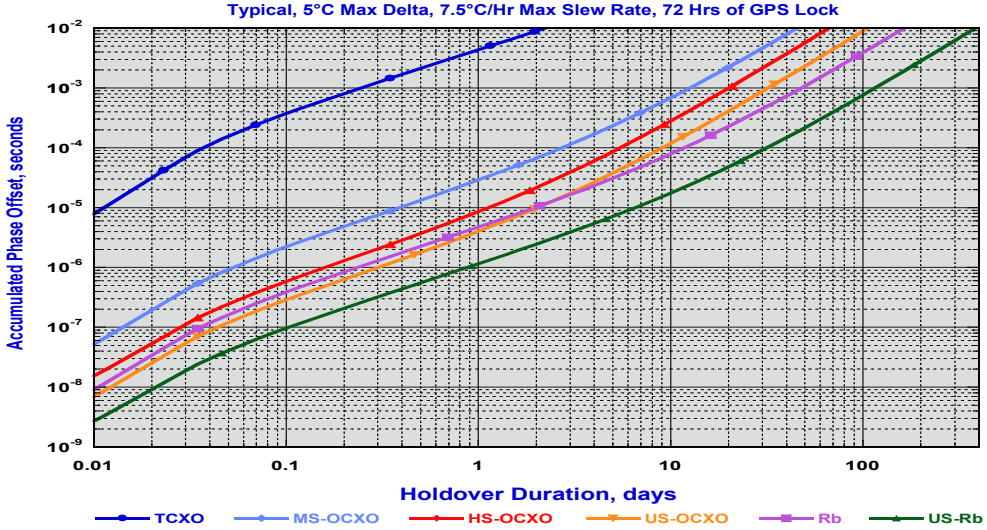
	TCXO*	MS-OCXO	HS-OCXO	US-OCXO	Rubidium*	US-Rubidium*
Temp Stability	2.5×10^{-6}	4×10^{-9}	1×10^{-9}	5×10^{-10}	1×10^{-9}	2×10^{-10}
Temp. Range °C	-20 to +70	0 to +70	0 to +70	0 to +70	-20 to +70	-20 to +65
Ageing Rate/Year	1×10^{-6}	3×10^{-8}	3×10^{-8}	3×10^{-8}	1×10^{-9}	5×10^{-10}
Allan Deviation @ 1 sec	2×10^{-10}	3×10^{-12}	1×10^{-12}	4.0×10^{-13}	2×10^{-11}	1.5×10^{-11}
10 sec	2×10^{-10}	3.9×10^{-12}	1.3×10^{-12}	5.0×10^{-13}	6.7×10^{-12}	5.0×10^{-12}
100 sec	8×10^{-11}	3.0×10^{-12}	1.7×10^{-12}	8.5×10^{-13}	2.5×10^{-12}	1.4×10^{-12}
1k sec	8×10^{-12}	2.0×10^{-12}	1.5×10^{-12}	8.0×10^{-13}	1.4×10^{-12}	7.0×10^{-13}
10k sec	8×10^{-13}	4.0×10^{-13}	4.0×10^{-13}	4.0×10^{-13}	4.0×10^{-13}	4.0×10^{-13}
100k sec	6×10^{-14}	6.0×10^{-14}	6.0×10^{-14}	6.0×10^{-14}	6.0×10^{-14}	6.0×10^{-14}
Phase Noise dBc/Hz:	**10MHz**	**10 / 5MHz**	**10 / 5MHz**	**10 / 5MHz**	**10 / 5MHz**	**10 / 5MHz**
1 Hz	-70	-95 / -100	-105 / -110	-113 / -118	-80 / -80	-92 / -92
10 Hz	-100	-120 / -130	-130 / -135	-138 / -143	-100 / -100	-135 / -135
100 Hz	-125	-135 / -140	-140 / -145	-148 / -152	-135 / -135	-148 / -148
1 kHz	-135	-145 / -150	-150 / -155	-152 / -155	-145 / -145	-154 / -154
10 kHz	-140	-145 / -150	-150 / -155	-153 / -155	-145 / -145	-155 / -155

NOTE: OCXO and Rubidium phase noise specifications are guaranteed on Low-Phase-Noise Module. TCXO phase noise specifications are typical.
* Not available in the RTM3205.

Disciplined Oscillator Options

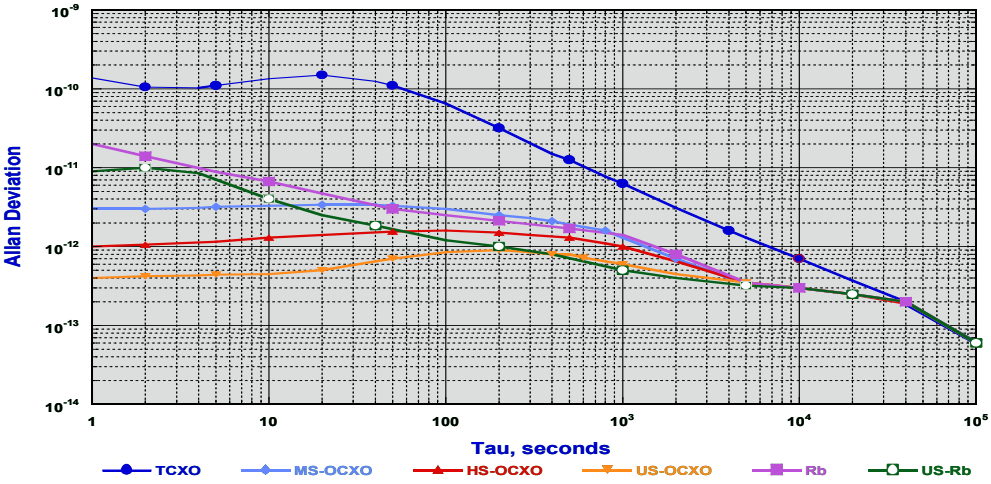
Holdover Performance

Typical, 5°C Max Delta, 7.5°C/Hr Max Slew Rate, 72 Hrs of GPS Lock

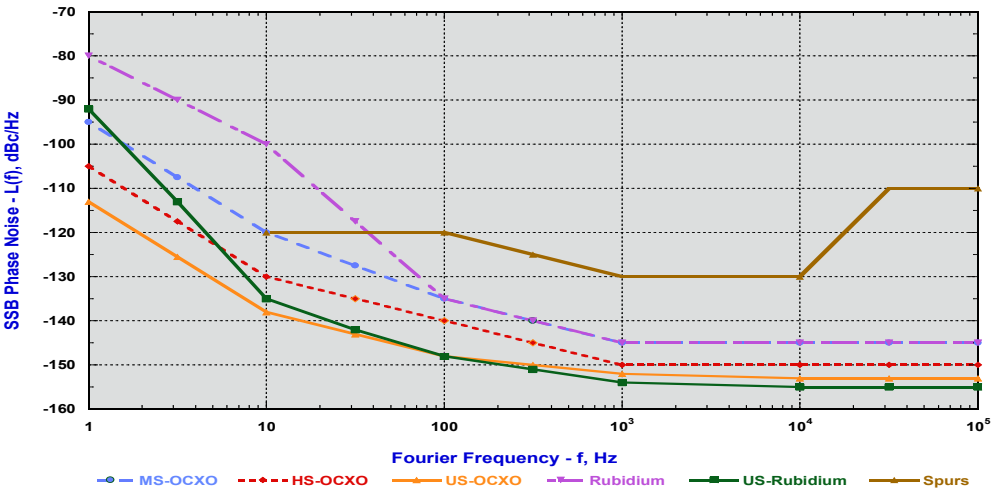


Time Domain Stability 10 MHz

Typical, 5° C Max Delta, 7.5° C/hr Max Slew Rate



Phase Noise Performance - 10 MHz



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