XPRO

High-Performance Rubidium Oscillator

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Standard Features

- 10MHz output
- 1PPS output
- <5.0E-11 per month aging
- Digital monitor & control
- RoHs 5/6 compliant
- Lower EMI emission and susceptibility

Optional Features

- <1.0E-11 per month aging

Benefits

- Low profile with standard connector interface for easy integration
- Lower maintenance
- Longer lifecycle (>10 years) without re-calibration

The Microsemi® XPRO is a high performance rubidium oscillator designed for a wide range of telecommunications and test and measurement applications. The XPRO is a drop in replacement for the venerable LPRO, which has been widely installed in wireless base station applications, RF test equipment and other applications where an embedded high performance oscillator is required.

The XPRO leverages over 35 years of proven rubidium atomic physics with advanced digital electronics architecture to provide an exceptionally stable oscillator that meets the most demanding performance requirements.

The XPRO with its low profile and standard connector interface is designed for ease of integration into time and frequency systems. Great care has been taken in the design to minimize EMI emissions and susceptibility, including the use of a filtered 9 pin D-connector, SMA for the RF output and a shielded outer cover.

The XPRO is designed for long operating periods without maintenance (long life Rb lamp, extended crystal control range). The XPRO, with a 5.0E-11 per month aging, will maintain 1.0E-9 frequency accuracy for 10 years or longer without recalibration.

A low aging rate option is available for XPRO that will provide 1E-11 per month aging providing an even more robust reference source.

Standard outputs are 10MHz, 1PPS and a rubidium lock status bit. All monitoring and control is done via the TTL level RS-232 style serial interface allowing the user access to comprehensive status and control parameters.

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Specifications

ELECTRICAL SPECIFICATIONS

RF Output

• Frequency:	10MHz
• Format:	Sinewave
• Amplitude:	+7.8 ± 0.8dBm
• Load impedance:	50Ω @ 10MHz
• Connector:	SMA
• Qty:	1

1PPS Output

• Rise time:	<5 nS
• Pulse width:	<20 µS
• Level:	>4.5V (15pF Load)
• Jitter:	<1ns RMS
• Connector:	DB-9
• Qty:	1

PERFORMANCE PARAMETERS

• Phase noise (SSB), £(f), dBc/Hz

• SB Freq

1 Hz	<-80
10 Hz	<-90
100 Hz	<-128
1 kHz	<-145
10 kHz	<-155

• Spectral purity

- Harmonics:	<-60dBc
- Non-harmonics:	<-80dBc

• Aging

- Monthly (after 1 month):	<±5.0E-11/Month <1.0E-11/Month (option)
- 10 years:	<±1.0E-9

• Frequency accuracy at shipment:	<±5.0E-11 (@ +25ºC)
• Frequency retrace	<±2.5E-11 (on-off-on: 24h, 48H, 24H at 25ºC)

• Short term stability $\sigma_y(\tau)$ (Allan deviation)

τ (sec)	
1	<1.0E-11
10	<3.2E-12
100	<1.0E-12

• Frequency control

Analog freq. adj. range:	±1.5E-9 (0 - 5V) Digital freq. adj. res: ±1.0E-6 with 2.0E-12 resolution

• Warm-up	-20ºC	+25ºC
- Time to lock:	<8.7 min	<6 min
- Time to <1E-9:	<10.2 min	<8 min
- Time to <4E-10	<12.7 min	<10.6 min
• Max input (Amps) @24V:	<1.45A	<1.43A

• Input voltage range:	+19 to 32 Vdc
• Voltage sensitivity:	0.72E-11/V (over input voltage range)

• Input power, quiescent

+24 Vdc @ -25ºC:	<13W
+19 Vdc @ +65ºC:	<8.5W

• Lock status (BITE) 5VCMOS

- low = Lock
- high = Unlock

• RS-232* control/monitor interface

Provides ID, status/monitor information, and frequency/operating parameter adjustments. Protocol: 57,600, 8, 1, None, No flow control.

*Note: The RS-232 Control/Monitor signals operate at TTL levels and not true RS-232 levels.

ENVIRONMENTAL & PHYSICAL SPECIFICATIONS

• Temperature

- Operating:	-25ºC to +70ºC baseplate
- Storage:	-55ºC to +85ºC
• Sensitivity:	<6.0E-10 over operating temp. range -<3.0E-10 (0ºC to 50ºC)

• Altitude

- Operating:	-200 to 40,000'
- Non-operating:	-200 to 70,000'
• Magnetic sensitivity:	dc(≤2Gauss) ≤ ±1.0E-11/Gauss
• RH (operating):	≤85% non-condensing Meet or exceed Telcordia GR-63-CORE Issue .2, April 2002, section 4.1.2

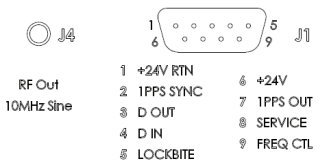
• Vibration:

- Operating:	Meets or exceeds Telcordia GR-63-CORE Issue .2, April 2002 section 4.4.3 and 5.4.2 (no unlock, 1.0g peak sine @ 5 - 100Hz)
- Non-operating:	Telcordia GR-63-CORE, Issue .2, April 2002, section 4.4.4 and 5.4.3, curve 1 or Figure 4-3 (1.5g peak max sine @ 5-500Hz)
• EMI:	Compliant to FCC Part 15 Class B (conducted and radiated emissions) and complies with EN55022B emissions (radiated and conducted) and EN50082-1 (immunity).
• Input connector:	(1) DB-9 (All input power, monitoring, 1PPS)
• RF Connector:	(1) SMA

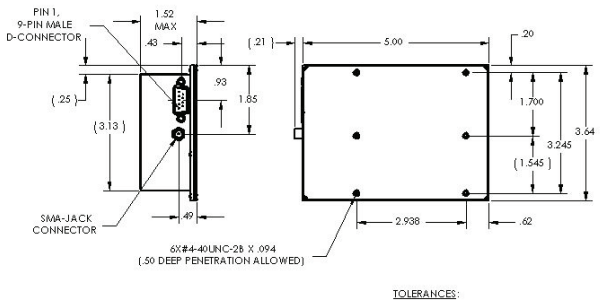
• Dimensions

- Height:	1.5" (3.81cm)
- Width:	3.7" (12.7cm)
- Depth:	5.0" (9.4cm)
- Weight:	<1.1lbs (<500g)

XPRO Connection Diagram



XPRO Outline Drawing



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