

Low Noise Rubidium Oscillator Module

Features

- Sine wave or CMOS/TTL output
- Short term stability 2×10^{-12} at 100sec
- Accuracy 5×10^{-11}
- Phase noise -115dBc at 1Hz
- 100 times less drift than OCXOs
- Low power consumption
- Compatible with 50Ω or 75Ω load



Description

The E10-LN Low Noise Rubidium Oscillator Module is a sub miniature atomic clock combined with 'active noise filter' technology. This rubidium oscillator has 100x less drift than OCXO's. With short term stability of $2 \times 10^{-12}/s$ @ 100s this rubidium oscillator provides significant improvement in performance over other rubidium components.

Applications

- Where sizes are restricted this 'breakthrough' low noise rubidium oscillator will enable new applications
- Extended holdover for CDMA, WiMAX and LTE base stations
- Higher stability and low phase noise communication and surveillance applications
- Compact designs and portable and mobile applications
- Production Test Reference for instrumentation
- Microwave Test Bench or Test solution

Related products

- **E10-Y** : Low Noise Desktop & Bench top Frequency reference 4 or 8 outputs
- **E10-P** : Desktop & Bench top Frequency reference 1 to 4 outputs
- **A1000**: 1U 19" rack mount up to 12 output, frequencies 1 to 100MHz
- **A10-M**: 2U 19" rack mount up to 24 output, frequencies 1 to 100MHz

A10-M Specification

Outputs *See options*

10MHz	+7dBm (± 2 dBm) into 50 Ohms, 0.5V _{rms} (Specify for 75Ω load)
Connector	SMA

Frequency Stability *Allan Deviation*

Frequency	Options A	Options B
	10MHz	10MHz
$\tau = 1s$	$\leq 2 \times 10^{-12}$	$\leq 7 \times 10^{-13}$
$\tau = 10s$	$\leq 5 \times 10^{-12}$	$\leq 1 \times 10^{-12}$
$\tau = 100s$	$\leq 7 \times 10^{-12}$	$\leq 2 \times 10^{-12}$

Phase Noise (SSB)

Frequency	Options 1	Options 2	Options 3
	10MHz	10MHz	10MHz
1Hz	-110 dBc	-113 dBc	-115 dBc
1Hz	-135 dBc	-138 dBc	-140 dBc
100Hz	-145 dBc	-152 dBc	-154 dBc
1 kHz	-155 dBc	-155 dBc	-155 dBc
10KHz	-158 dBc	-158 dBc	-160 dBc

Harmonics

	<-30dBc	Option C <-45dBc
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Spurious

100 KHz BW	<-100dBc	<-100dBc
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Aging (After 30 days)

Frequency	10MHz	Option D
<i>Per day</i>	5×10^{-12}	3×10^{-12}
<i>Per Month</i>	5×10^{-11}	3×10^{-11}
<i>Per Year</i>	5×10^{-10}	3×10^{-10}

Frequency accuracy

Accuracy at shipping 5×10^{-11}

Frequency retrace

After 1 hours of continues operation 3×10^{-11}

Frequency Adjustment

Mechanical	$\pm 2 \times 10^{-9}$	Option H
Electrical	$\pm 5 \times 10^{-9}$	Control voltage 0 to +5V

Warm up time

<5 minutes, time to lock
<6 minutes to 1×10^{-9} at room temperature 25°C

Environmental

<i>Temperature :</i>	Operating	-40°C +60°C
	Storage	-40°C +90°C
<i>Temp stability :</i>	Standard	-20°C +60°C < 0.3×10^{-9}
	Option E	-30°C +65°C 0.3×10^{-9}
	Option F	-50°C +65°C 0.5×10^{-9}

Relative humidity : 94% non-condensing

Magnetic Field sensitivity : 5×10^{-12} Gauss

Atmospheric pressure : 1×10^{-13} Per mbar

Approximate MTBF : 100,000 Hrs, Stationary

Dimensions without cover 101 x 60.5 x 34mm LWH

Dimensions with cover 101 x 60.5 x 37mm LWH

Power supply

DC power: +12 to +15V

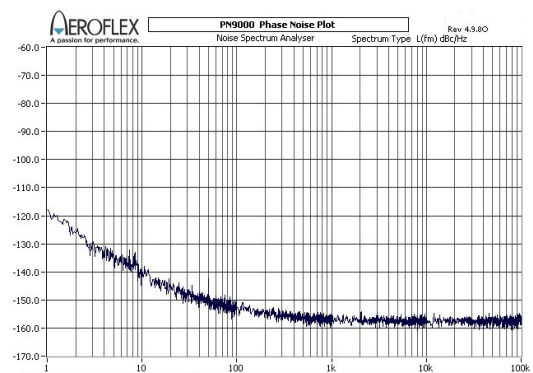
Power consumption: 22W Max at start (25°C)
6W at steady state

Data output & monitoring

RS232, 9600 baud rate

Built-in options

- Option 05:** TTL Output
- Option 06:** 1PPS Output
- Option 18:** Extended warranty to 3 years
- Option 20:** Discipline to external GPS 1PPS or 10MHz input
- Option 42:** Low noise floor -170dBc at 10KHz
- Option 75:** Add internal battery, up to 4 hours of battery life.

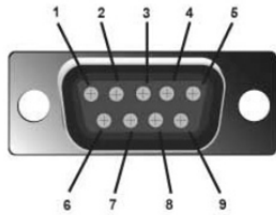


E10-LN Phase Noise (10MHz)

Included with shipment: Calibration certificate, Certificate of Conformance, product test sheet and 24 month warranty.

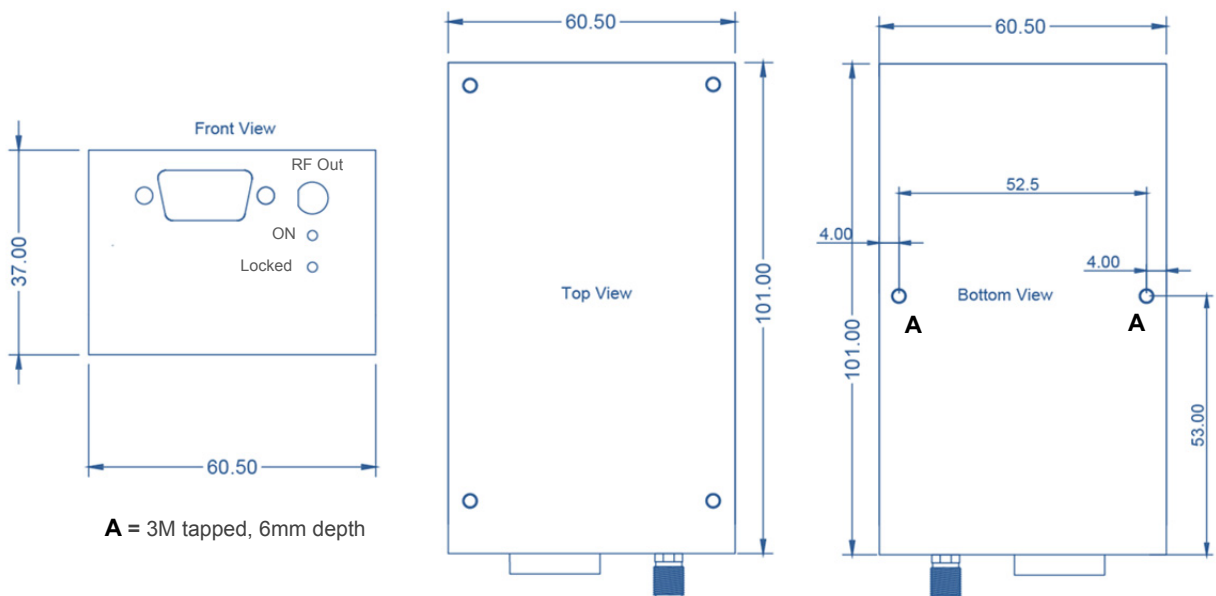
Contact us to configure this product to meet your requirement.
Designed and manufactured in the U.K.

Pin Connections



Pin No.	Function	Description
1	Lock Status	OFF: locked, ON: not locked
2	RXD	Serial data receive
3	TXD	Serial data transmit
4	Power Supply	Input power supply between +12 to 15V
5	GND	Ground
6	GND	Ground
7	Frequency adjustment	Apply 0-5 volt to adjust the frequency
8	Voltage reference	+5V supply voltage to be used for frequency adjustment
9	Not used	Not used

Outline Drawing / Enclosure



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