

# A10-M Rubidium Frequency Reference

- Low Phase Noise
- Aging  $<5 \times 10^{-10}$  per year
- High Precision Atomic Clock
- Two years warranty



## Description

The Quartzlock A10-M rubidium frequency reference is a 10 MHz, high-stability Rubidium frequency standard with flexible output options and very low cost of ownership primarily for production test of quartz oscillators and RF instrumentation frequency referencing. The A10-MX incorporates the latest high stability and low drift designs. It may also have both 5MHz and 10MHz outputs presented on the front panel to align with A7-MX Signal Stability Analyzer reference input.

## Applications

- Frequency Calibration
- Telecom Network Synchronization
- Broadcast – Radio & TV & Satellite Communications
- HDTV
- Production Test Reference for instrumentation
- Microwave Test Bench or Test Solution

## Features

**Output signals:** Sine wave & CMOS/TTL

**Multiple Output options:** 5 to 100MHz

**Custom Frequency Outputs:** 2 - 125MHz, 1PPS

**Low Noise Floor:** -170dBc at 10KHz offset

### Front panel outputs

Exceptionally low drift/aging and high stability per hour/day

<b>Stability</b>	$5 \times 10^{-13}$
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<b>Magnetic field sensitivity</b>	$2 \times 10^{-11}/\text{Gauss}$
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<b>Frequency trim range</b>	$2 \times 10^{-9}$
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### Optional disciplined to external 1PPS, or 10MHz

<b>Harmonic distortion</b>	$< 30\text{dB}$ (for 5 MHz output)
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<b>Non-harmonic distortion</b>	$< -100\text{dB}$ in the range from 10Hz to 10kHz
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## A10-M Specification

### Outputs *See options*

5 & 10MHz	+7dBm into 50 Ohms, 0.5V <sub>rms</sub>
Connector	BNC (Standard), SMA (specify)

### Frequency Stability *Allan Deviation*

Frequency	Options A		Options B	
	10MHz	5MHz	10MHz	5MHz
$\tau = 1s$	$\leq 2 \times 10^{-12}$	$\leq 1 \times 10^{-12}$	$\leq 5 \times 10^{-13}$	$\leq 5 \times 10^{-13}$
$\tau = 10s$	$\leq 3 \times 10^{-12}$	$\leq 2 \times 10^{-12}$	$\leq 7 \times 10^{-12}$	$\leq 7 \times 10^{-13}$
$\tau = 100s$	$\leq 5 \times 10^{-12}$	$\leq 4 \times 10^{-12}$	$\leq 8 \times 10^{-13}$	$\leq 8 \times 10^{-13}$

### Phase Noise (SSB)

Frequency	Options A		Options B	
	10MHz	5MHz	10MHz	5MHz
1Hz	-110 dBc	-115 dBc	-117 dBc	-123 dBc
10Hz	-135 dBc	-138 dBc	-140 dBc	-145 dBc
100Hz	-145 dBc	-152 dBc	-152 dBc	-153 dBc
1 kHz	-155 dBc	-154 dBc	-155 dBc	-155 dBc
10KHz	-158 dBc	-155 dBc	-158 dBc	-158 dBc

### Harmonics

		Options C	
	<-40dBc	<-40dBc	<-50dBc

### Spurious

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

Frequency	10MHz	5MHz
<i>Per day</i>	$5 \times 10^{-12}$	$1 \times 10^{-12}$
<i>Per Month</i>	$5 \times 10^{-11}$	$4 \times 10^{-11}$
<i>Per Year</i>	$5 \times 10^{-10}$	$4 \times 10^{-10}$

### Frequency accuracy

Accuracy at shipping  $5 \times 10^{-11}$

### Frequency retrace

After 1 hours of continues operation  $3 \times 10^{-11}$

### Frequency Adjustment

Mechanical	$\pm 2 \times 10^{-9}$	<b>Optional</b>
Electrical	$\pm 2 \times 10^{-9}$	Control voltage 0 to +5V

### Warm up time

<6 minutes, time to lock

<7 minutes to  $1 \times 10^{-9}$  at room temperature 25°C

### Environmental

<i>Temperature :</i>	Operating	-20°C +60°C
	Storage	-40°C +80°C
<i>Temp stability :</i>	-20°C +60°C	$1 \times 10^{-9}$
<i>Relative humidity :</i>	95% non-condensing	
<i>Magnetic Field sensitivity :</i>	$2 \times 10^{-11}$ Gauss	
<i>Atmospheric pressure :</i>	-60m -4000m $< 2 \times 10^{-11}$ Per mbar	
<i>Approximate MTBF :</i>	100,000 Hrs, Stationary	
<i>Dimensions :</i>	88mm (3.5") 2U 19" rack mount	

### Power supply

*AC power:* 90-245V AC, 50Hz

*Optional redundancy switch:* see option 00

Seamless battery back-up switch

### Data output & monitoring

	Options D	
RS232, 9600 baud rate	USB	Ethernet

### Built-in options

- Option 00:** Redundant switchover for external power back-up
- Option 02:** Output 2048kHz
- Option 03:** Output 1544kHz
- Option 04:** 13MHz Output
- Option 05:** TTL Output
- Option 06:** 1PPS Output
- Option 07:** 10.24MHz Output
- Option 08:** 10.23MHz Output
- Option 09:** Add 6 Output Distribution Card
- Option 10:** 26MHz Output
- Option 18:** Extended warranty to 3 years
- Option 20:** Discipline to external GPS 1PPS or 10MHz input
- Option 21:** 2 x 1PPS Output
- Option 42:** Low noise floor -170dBc at 10KHz
- Option 51:** Rack Mount 19" 1U
- Option 52:** Rack Mount 19" 2U
- Option 53:** Rack Mount 19" 3U
- Option 62:** AC Input 110V
- Option 64:** DC input: Specify +12V, +24V, +48V or +60V
- Option 75:** Add internal battery, up to 4 hours of battery life.

**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.**

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