

# Ultra Low Noise Rubidium Frequency Standard



## APPLICATIONS

- Frequency Calibration
- Telecom Network Synchronisation
- Broadcast – Radio & TV
- HDTV
- Production Test Reference
- Microwave Test Bench or Solution

## BENEFITS

- High Performance Reference
- Multiple Outputs
- Custom Frequency Outputs
- Low Failure Risk – 3 year warranty

## FEATURES

- Low Phase Noise -165dBc/Hz (-173dBc/Hz option)
- Aging:  $4 \times 10^{-10}$ /year
- Stability to  $5 \times 10^{-13}$ /s
- 10MHz Standard Output
- 1–40MHz optional
- 100MHz option (-180dBc/Hz)



## STANDARD SPECIFICATIONS This product replaces the HSRO

<b>Output</b> (100MHz ULN option)	10MHz, +7dBm into 50Ω, 0.5VRMS - see options		
<b>Adjustment</b> Mechanical Range Electrical Range Control Voltage Factory Setting	2x10 <sup>-9</sup> min 2x10 <sup>-9</sup> min 0 ~ 5V ±5x10 <sup>-11</sup>		
<b>Frequency Stability</b> typical	<b>A10-M</b>	<b>A10-MX</b>	
	<b>STD</b>	<b>LN</b>	<b>ULN</b>
1s	3x10 <sup>-12</sup>	1x10 <sup>-12</sup>	5x10 <sup>-13</sup>
10s	2x10 <sup>-12</sup>	5x10 <sup>-12</sup>	2x10 <sup>-13</sup>
100s	8x10 <sup>-13</sup>	4x10 <sup>-13</sup>	4x10 <sup>-13</sup>
1day	x10 <sup>-12</sup>	1x10 <sup>-12</sup>	x10 <sup>-12</sup>
<b>Aging</b>			
1 day	3x10 <sup>-12</sup>	1x10 <sup>-12</sup>	5x10 <sup>-13</sup>
1 month	4x10 <sup>-11</sup>	4x10 <sup>-11</sup>	4x10 <sup>-11</sup>
1 year	5x10 <sup>-10</sup>	4x10 <sup>-10</sup>	4x10 <sup>-10</sup>
<b>Phase Noise</b> dBc/Hz in 1Hz BW	<b>Std</b>	<b>LN</b>	<b>ULN</b>
1Hz	-90	-110	-115
10Hz	-120	-139	-148
100Hz	-135	-152	-158
1kHz	-145	-162	-165
10kHz	-150	-160	-170
100kHz	-150	-170	-173
<b>Harmonics</b>	<40dBc		
<b>Spurious</b>	<80dBc		
<b>Warm time to 1x10<sup>-9</sup></b>	5min		
<b>Retrace</b> after 24h off & 1h on, same temp	<3x10 <sup>-11</sup>		
<b>Power Supply</b> Power at steady state at 25°C	90 .... 245V ac Battery Back Up option 13W @ 24V (22~30Vdc) @ 25°C, Max 2A		
<b>Freq offset</b> over output voltage range	<2x10 <sup>-11</sup>		
<b>Temperature</b> Operating Storage Freq offset over operating temperature range	-20°C ~ +50°C -40°C ~ +70°C  <3x10 <sup>-10</sup>		
<b>Magnetic Field</b> Sensitivity Atmospheric Pressure Approx MTBF, Stationary	<2x10 <sup>-11</sup> /Gauss -60m ~ 4000m <1x10 <sup>-13</sup> /mbar Approx MTBF, Stationary		
<b>Mechanical</b>	88mm (3.5") 2U x 19" rack mounted		

### OPTIONS

- Multiple Outputs
- 1 ... 40MHz Output Frequency
- Ultra Low Noise. 50 ... 100MHz Outputs (-180dBc Noise Floor)
- 24V dc Battery Back-up Input

A10-MX Uses Quartzlock DPPL-DDS Clean Up Loop Technology

Please contact Quartzlock about your application. We can help you choose the most cost effective low noise solution.

The Quartzlock A10-M or A10-MX find applications in standards laboratories, as low noise frequency references and as calibrators.

### EXTERNAL CALIBRATOR OPTION 4A

Separate outputs are provided.

**Calibrator outputs specification**  
Sinewave +13dBm 50 Ohm 1Vrms

Output frequencies:

1MHz  
5MHz  
10MHz  
100MHz  
1GHz

**Ultra low frequency option for calibration use:**

Specification  
Square wave TTL output  
Output frequencies:  
From 0.01Hz to 500kHz in 1, 2 & 5 steps (24 separate switched frequencies)  
This ULF option is a separate module.  
This option includes a 1MHz square wave output from A10-M or A10-MX.

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