

# Rubidium Frequency Reference Low Noise Multiple Outputs

- ❑ Eight outputs
- ❑ -110dBc/Hz @ 1Hz phase noise
- ❑ Compact light weight portable for a wide range of applications
- ❑ Low drift  $5 \times 10^{-12}$ /day



Compact simple to install low noise multi-output atomic frequency reference for use as a general purpose 10MHz rubidium frequency standard. This very low noise rubidium frequency reference will enable up to eight separate instruments to be referenced. This frequency standard benefits from having Quartzlock's SMAC (Sub Miniature Atomic Clock), and very low noise distribution amplifier technology built in.

## Features

- 10MHz Output
- Ageing  $< 5 \times 10^{-10}$ /Year
- $5 \times 10^{-11}$  accuracy
- $8 \times 10^{-12}$ /s @ 100s

## Benefits

- Atomic accuracy
- Quick and simple to use and install
- Higher sensitivity
- Enables narrower bandwidth filtering
- Improve instrument frequency accuracy & phase noise

## Applications

- Frequency referencing of interception and monitoring receivers
- **Time and frequency standard for calibration and external referencing of all quartz-based instrumentation in RF and microwave laboratories to significantly reduce noise level and improve accuracy**
- Frequency reference for counters, signal generators, spectrum, DSO, VNA, SA and network analysers
- Secure communications, C4 defence and R&D

## Specification

Outputs – 4 or 8	4 (E10-Y4) or 8 (E10-Y8) 10MHz, +10dBm $\pm$ 1dB into 50 Ohms +10dBm $\pm$ 1dB into 75 Ohms available			
Output Connectors	SMA			
Adjustment				
Mechanical Range	2x10 <sup>-9</sup> min			
Electrical Range	2x10 <sup>-9</sup> min			
Control Voltage	0 ~5V			
Factory Setting	$\pm$ 5x10 <sup>-11</sup> 1x10 <sup>-11</sup>			
Frequency Stability		Option 1	Option 2	
	1s	$\leq$ 2.00E-12	$\leq$ 5.00E-13	
	10s	$\leq$ 5.00E-12	$\leq$ 6.00E-13	
	100s	$\leq$ 2.00E-12	$\leq$ 8.00E-13	
	1 hour	$\leq$ 6.00E-12	$\leq$ 4.00E-12	
	1 day	$\leq$ 4.00E-12	$\leq$ 4.00E-12	
Ageing				
	1 day	1x10 <sup>-12</sup>		
	1 month	4x10 <sup>-11</sup>		
	1 year	4x10 <sup>-10</sup>		
Phase Noise		Option 1	Option 2	Option 3
	1/Hz	-110dBc/Hz	-113dBc/Hz	-115dBc/Hz
	10Hz	-134dBc/Hz	-138dBc/Hz	-140dBc/Hz
	100Hz	-150dBc/Hz	-152dBc/Hz	-154dBc/Hz
	1kHz	-155dBc/Hz	-155dBc/Hz	-155dBc/Hz
	10kHz	-158dBc/Hz	-158dBc/Hz	-158dBc/Hz
Harmonics	<30dBc	-46dB	-36dB	
Spurious	<80dBc			
Warm Time to 1 x 10 <sup>-9</sup>	5 minutes			
Retrace after 24h off & 1h on, same temp	<3x10 <sup>-13</sup>			
Power Supply Power at steady state at 25C	90 .... 240V ac Battery Back Up option 15Vdc @ 500mA 7.5W (1.5A warm-up 22.5W) @ 25C, Max 2A			
Frequency Offset over output voltage range	<2x10 <sup>-11</sup>			
Temperature Operating Storage Freq offset over operating temperature range	-22C ~ +30C max -40C ~ +70C <3x10 <sup>-10</sup>			

Magnetic Field	
Sensitivity	<2x10 <sup>-11</sup> /Gauss
Atmospheric Pressure	-60m ~ 4000m <1x10 <sup>-13</sup> /mbar
Approx MTBF, Stationary	Approx MTBF, Stationary
Size	103 x 55 x 122 mm
Weight	500gm approx
Warranty	24 months

## Options

The E10-Y series is a new product range introduced in 2012. A few options will be available to meet customer requirements – please discuss with Quartzlock.

Cable set: 8 x SMA to BNC cables 1.5m long can be supplied.