

Rubidium Time & Frequency Reference

- Low phase noise
 - Ageing $<4 \times 10^{-10}$ /year
 - High Precision Atomic Clock
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The A1000 exhibits extraordinarily low ageing/drift and very high stability per hour and per day. These characteristics along with our three year warranty make the A1000 suitable for mission critical applications. The A1000 can be highly customised with multiple outputs and frequencies.

Features

- Multiple Output options
- 3 year warranty
- Custom Frequency outputs
- -120dBc/Hz @ 10Hz phase noise

Benefits

- Stability to 5×10^{-13} /s
- 10MHz Standard Output
- 1–40MHz optional
- 100MHz option (-180dBc/Hz NF)
- 5MHz option (-123dBc/Hz @ 1Hz)

Applications

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

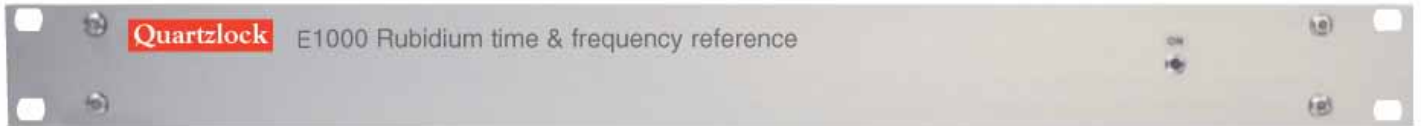
Outputs See options	10MHz, +7dBm into 50Ω, 0.5VRMS	
Adjustment		
Mechanical Range	2x10 ⁻⁹ min	
Electrical Range	2x10 ⁻⁹ min	
Control Voltage	0 ~ 5V	
Factory Setting	±5x10 ⁻¹¹ 1x10 ⁻¹¹	
Frequency Stability		
	1s	3x10 ⁻¹¹
	10s	1x10 ⁻¹¹
	100s	3x10 ⁻¹²
	1day	8x10 ⁻¹²
Ageing		
	1 day	3x10 ⁻¹²
	1 month	4x10 ⁻¹¹
	1 year	5x10 ⁻¹⁰
Phase Noise	dBc/Hz in 1Hz BW	Standard
	1Hz	-70
	10Hz	-100
	100Hz	-120
	1kHz	-140
	10kHz	-145
Harmonics	<40dBc	
Spurious	<80dBc	
Warm Time to 1 x 10 ⁻⁹	5 minutes	
Retrace after 24h off & 1h on, same temp	<3x10 ⁻¹³	
Power Supply	90 245V ac	
Power at steady state at 25C	Battery Back Up option 13W @ 24V (22–30Vdc) @ 25C, Max 2A	
Frequency Offset over output voltage range	<2x10 ⁻¹¹	
Temperature		
Operating	-20C ~ +50C	
Storage	-40C ~ +70C	
Freq offset over operating temperature range	<3x10 ⁻¹⁰	

Magnetic Field

Sensitivity	<2x10 ⁻¹¹ /Gauss
Atmospheric Pressure	-60m ~ 4000m <1x10 ⁻¹³ /mbar
Approx MTBF, Stationary	Approx MTBF, Stationary
Mechanical	88mm (3.5") 2U x 19" rack mounted
Options	0 Seamless Battery Back-up Switch 1 High Performance Distribution Card 1 Input 4 Outputs 2 E1 Output 3 T1 Output 4 13MHz Output 5 TTL Output 7 10.24MHz Output 8 10.23MHz Output 9 Add 6 Output Distribution Card (not available with option 48 – ULN) 18 Add Additional 1–5 Years Warranty (18.1 = 1 Year ... 18.5 = 5 Years) 40 Reduced Harmonic (<-50dBc) and Spurii 48 ULN Ultra Low Noise Outputs 5MHz -123dBc/Hz @ 1Hz offset 10MHz -115dBc/Hz @ 1Hz 100MHz -135dBc/Hz @ 100Hz -162dBc/Hz @ 1kHz -180dBc/Hz @ 100kHz

Rubidium Frequency Reference

☐ Stability	(AVAR) $8 \times 10^{-13}/s$ typically
☐ Low phase noise	110dBc/Hz offset as standard
☐ Stability	(AVAR) $8 \times 10^{-13}/s$ typically
☐ Drift	$5 \times 10^{-10}/year$



Features

- Ultra High Performance Reference
- Multiple Output Options
- Custom Frequency Outputs
- Noise Floor – 167dBc/Hz
- Ageing – $4 \times 10^{-10}/year$

Benefits

- Stability to $5 \times 10^{-13}/s$
- 10 MHz Standard Output
- 1–40 MHz optional
- 100 MHz option (-180dBc/Hz NF)
- 5 MHz option (-123 dBc/Hz @ 1 Hz)
- E1000 uses Quartzlock Active Noise Filter Clean Technology

Applications

- Frequency Calibration
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 - Broadcast – Radio & TV HDTV
 - Satellite communications
 - Production Test Reference for instrumentation
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Outputs See options	10MHz, +7dBm into 50Ω, 0.5VRMS	
Adjustment		
Mechanical Range	2x10 ⁻⁹ min	
Electrical Range	2x10 ⁻⁹ min	
Control Voltage	0 ~ 5V	
Factory Setting	±5x10 ⁻¹¹	
	1x10 ⁻¹¹	
Frequency Stability	Standard spec	ULN option
1s	2x10 ⁻¹²	5x10 ⁻¹³
10s	5x10 ⁻¹²	2x10 ⁻¹³
100s	4x10 ⁻¹³	4x10 ⁻¹³
1 hour		
1day	1x10 ⁻¹²	1x10 ⁻¹²
Ageing		
1 day	3x10 ⁻¹²	3x10 ⁻¹²
1 month	4x10 ⁻¹¹	4x10 ⁻¹¹
1 year	5x10 ⁻¹⁰	5x10 ⁻¹⁰
Phase Noise	Standard	ULN option
dBc/Hz in 1Hz BW		
1Hz	-110	-115
10Hz	-140	-146
100Hz	-145	-156
1kHz	-155	-163
10kHz	-157	-164
100kHz		-167
Harmonics	<30dBc	<30dBc
Spurious	<80dBc	
Warm Time to 1 x 10 ⁻⁹	5 minutes	
Retrace after 24h off & 1h on, same temp	<3x10 ⁻¹³	
Power Supply	90 245V ac	
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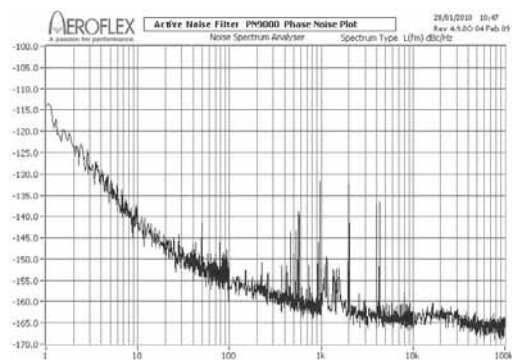
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Approx MTBF, Stationary	Approx MTBF, Stationary

Mechanical

88mm (3.5") 2U x 19" rack mounted

Options

- 0** Seamless Battery Back-up Switch
- 1** High Performance Distribution
Card 1 Input 4 Outputs
- 2** E1 Output
- 3** T1 Output
- 4** 13MHz Output
- 5** TTL Output
- 7** 10.24MHz Output
- 8** 10.23MHz Output
- 9** Add 6 Output Distribution Card
(with option 48 a ULN card is fitted)
- 18** Add additional 1–5 Years
Warranty (18.1 = 1 Year ...
18.5 = 5 Years)
- 40** Reduced Harmonic (<-50dBc)
and Spuri
- 48** ULN Ultra Low Noise Outputs
5MHz -123dBc/Hz @ 1Hz offset
10MHz -115dBc/Hz @ 1Hz
100MHz -135dBc/Hz @ 100Hz
-162dBc/Hz @ 1kHz
-180dBc/Hz @ 100kHz



E1000 with 10MHz ULN Option. Typical Phase Noise