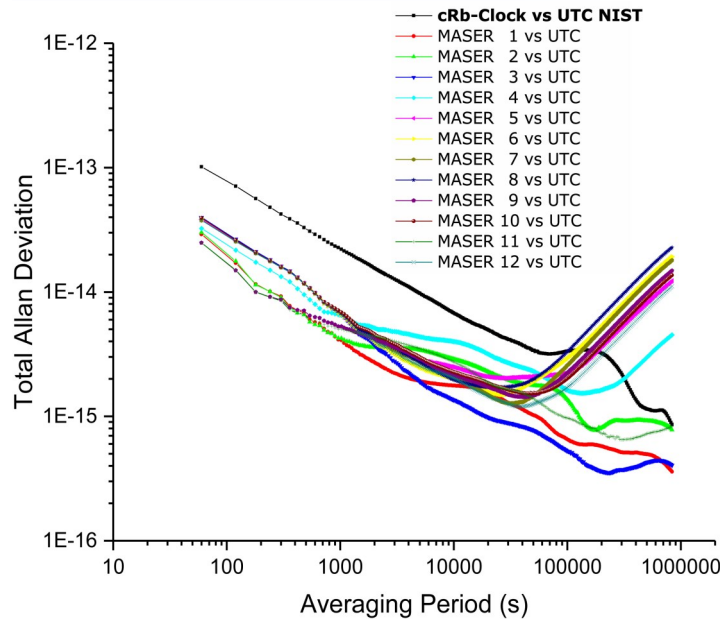


cRb-Clock Preliminary Datasheet



SpectraDynamics, Inc.



cRb-Clock vs Active Masers

The cRb-Clock is the world's first commercially available portable cold Rubidium microwave atomic clock. The clock is designed for high frequency stability in the short term of $8 \times 10^{-13} / \sqrt{T}$ and for excellent long term frequency stability of 3×10^{-15} at one day and less than 1×10^{-15} at 10 days. With this level of performance the cRb-Clock can be used as a substitute for Hydrogen masers. The cRb-Clock, does not require calibration since there is no long term frequency drift and has an accuracy of a few parts in 10^{-15} .

Maser-like performance is achieved in a small portable package. The entire clock is about the size of a desktop computer 18.75" X 14.75" X 8.77" (47.6 cm X 37.5 cm X 22.3 cm) and weighs 30.5 kg. The clock can run on both 100-240 VAC as well as +24 VDC. Steady state power consumption is 75 W. The clock outputs 100 MHz, 10 MHz, 5 MHz and 1 PPS with synchronization capability.

FEATURES

- Excellent short term stability $8 \times 10^{-13} / \sqrt{T}$
- Excellent long term stability 1×10^{-15}
- No long term frequency drift
- Clock output at 100 MHz, 10 MHz and 5 MHz
- 1 PPS output with synchronization
- Ethernet monitor port
- Small and portable

APPLICATIONS

- Atomic frequency standards
- Atomic time scales
- High performance testing facilities
- Laboratory frequency standard
- Trusted time in GPS denied environment
- Astronomy

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The views, opinions and/or findings expressed are those of the author and should not be interpreted as representing the official views or policies of the Department of Defense or the U.S. Government.

FRONT PANEL

- Touch Panel Display

cRb-Clock

BACK PANEL

- SMA Input connectors
- SMA Output connectors
- AC and DC power connectors
- Ethernet Monitor Port

SPECIFICATIONS

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Frequency stability	1 s		5×10^{-13}		
	10 s		3×10^{-13}		
	100 s		8×10^{-14}		
	1000 s		3×10^{-14}		
	10,000 s		8×10^{-15}		
	100,000 s		3×10^{-15}		
	10 days		1×10^{-15}		
Output level	1 PPS	3.7	3.8	5	V
	5 MHz	7	10	12	dBm
	10 MHz	7	10	12	
	100 MHz	7	10	12	
1 PPS	Risetime 10-90% Falltime 90-10%		1.2 1.2	1.5 1.5	
Phase noise @ 5 MHz	1 Hz	-	-120	-118	dBc/Hz
	10 Hz	-	-145	-142	
	1 kHz	-	-165	-163	
	10 kHz	-	-170	-168	
Phase noise @ 10 MHz	1 Hz	-	-114	-112	dBc/Hz
	10 Hz	-	-138	-137	
	1 kHz	-	-160	-157	
	10 kHz	-	-164	-162	
Phase noise @ 100 MHz	1 Hz	-	-94	-92	dBc/Hz
	10 Hz	-	-119	-117	
	1 kHz	-	-150	-147	
	10 kHz	-	-170	-168	

POWER REQUIREMENTS

- AC Operation: 100-240 VAC, 47-63Hz, 100 W max, 75 W steady state
- DC Operation: 24 VDC, 4 A, 100 W

ENVIRONMENT

- Storage Temperature 0 to +50 °C
- Operation Temperature +10 to +35 °C
- Humidity 5% to 95% Non-condensing

CHASSIS

- 18.75 " X 14.75 " X 8.77 " (47.6 cm X 37.5 cm X 22.3 cm)
- Weight 30.5 kg

Distribution Statement "A" (Approved for Public Release, Distribution Unlimited)