

# Features

- Power Conditioning
- Aging <math>5E-11</math> per month
- Output Flexibility
- Compact 1U Rack Mount or Bench Top
- Wide temperature range 0° C to 50° C
- GPS Disciplining Option



**RUBIDIUM PRODUCTS**  
Modules, Instruments and Militarized Components

## 8040 Rubidium Standard



# Overview

The Datum 8040 Rubidium Frequency Standard is a high performance 10MHz frequency standard in a 1U high, 19 inch rack mount plug and play package. Based on many years of refinement, the Datum 8040 rubidium physics package is a design that offers high reliability supported by tens of thousands of fielded units.

The standard instrument offers power supply selection to meet a variety of needs. A wide range of available individual options coupled to the highly stable

rubidium physics package's known performance level permit tailored configuration to address specific application needs.



**datum**

**Timing, Test & Measurement**

# 8040 Rubidium Standard

## Specifications



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### ELECTRICAL SPECIFICATIONS

Output/Frequency/Waveform 10 MHz sine wave  
Output Impedance 50Ω @10 MHz  
Output Amplitude 0.5v rms

Phase Noise (SSB) 1 Hz -75 dBc/Hz  
10 Hz -89 dBc/Hz  
100 Hz -128 dBc/Hz  
1000 Hz -140 dBc/Hz  
10 kHz -147 dBc/Hz

Spurs  
Harmonic 2nd <-51 dBc  
Other: <-65 dBc  
Non-Harmonic 1 Hz to 1 kHz <-89 dBc  
1 kHz to 10 kHz <-97 dBc  
10 kHz to 100 kHz <-100 dBc  
>100 kHz to 1 GHz <-68 dBc

Aging Monthly (after 1 month): <5E-11/month  
10 years <1E-9

Frequency Accuracy At Shipment ±5E-11(25° C)

Frequency Retrace (after 24 hrs power on @ 25° C & up to 48 hrs power off) ±2.5E-11

Short Term Stability τ =1 sec <2.5E-11  
τ =10 sec <8.0E-12  
τ =100 sec <2.5E-12

Frequency Control Internal trim range (trimpot) ≥±1.5E-9(0V 1.5E-9)  
External trim range (electronic) ≥±1.5E-9(0V to +5V)

Warm-up (at -20° C) (at 25° C)  
<8.7 min <5.6 min  
<10.2 min <7.3 min  
<12.7 min <10.6 min

### Status Monitor

Analog VCXO volts, lamp volts (20 kOhm impedance, filtered)  
Digital LOCK monitor: 5V CMOS load  
Lock >2.5V (TTL high)  
Unlock <0.2V (TTL low)  
Connector 9 Pin "D" on rear panel

### ENVIRONMENTAL SPECIFICATION

Operating Temperature 0° C to 50° C  
Temperature Coefficient |γ(50° C)-γ(0° C)| <3E-10

Storage Temperature -55° C to +85° C

Altitude  
Operating -200 ft to 40,000 ft.  
Non-operating -200 ft to 70,000 ft.

Magnetic Field Sensitivity, DC (2 Gauss Max) ±4E-11/GAUSS

Power Supply Requirements (85 to 264 VAC)  
Maximum Warm-up 60 W Quiescent (25° C) 25 W  
Typical 45 W 15 W

Dimensions  
Height 1.75"  
Width 19"  
Depth 12"

Weight <6 lbs

Options	Option P/N
• RF Buffer providing 1MHz, 5MHz, 10MHz, 1 Vrms sine	EU1
• 2 PPS Outputs (synchronizable)	R03
• Three 1 MHz Sine Wave Outputs, high isolation (>100dB)	R41
• Three 5 MHz Sine Wave Outputs, high isolation (>100dB)	R42
• Three 10 MHz Sine Wave Outputs, high isolation (>100dB)	R43
• Disciplining module	R46
• Three 10.23 MHz Sine Wave Outputs	R53



Specifications subject to change without notice.