

Features

Long Caesium Beam Tube Life Span
No Calibration Necessary - No Aging
Programmable TTL Output
Transportable



CAESIUM PRODUCTS
Modules, Instruments, Militarized Instruments and Replacement Tubes

4040B Caesium Frequency Standard



Overview

The Datum 4040B is a high performance rack mounted caesium frequency standard with multiple output configurations. The long term stability and accuracy of the 4040B make it ideally suited for precision timing and frequency control in a variety of stringent applications that include communication, navigation, test and measurement.

APPLICATIONS

- Stratum 1 master clock reference for communications systems & telephone networks
- Synchronization of satellite ground terminals and remote stations
- Calibration of secondary quartz and rubidium oscillators

The accurate, stable, and spectrally pure sinusoidal signals available from the Datum 4040B are derived from a micro-processor controlled cesium beam tube

used to stabilize the output of an integral oven-controlled quartz crystal oscillator. This oscillator drives output signals at 1, 5, and 10 MHz, and optionally at telecom rates and formats, 1544 or 2048 kbps.

Internal Microprocessor Functions

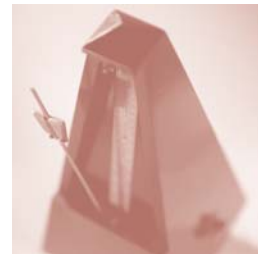
- Digital demodulation and integration of the servo loop signals.
- Monitoring of system parameters
- OCXO frequency locked to a cesium resonance pedestal (search phase) and peak (normal operation)
- Automatic compensation for cesium tube signal level changes
- C-Field lock to Zeeman resonance peak
- Microwave power levels continuously optimized



datum

Timing, Test & Measurement

Specifications



ELECTRICAL SPECIFICATIONS

RF Outputs

Frequency	1, 5, 10 MHz
Amplitude	> 1V
Harmonic Signals	<-40dB
Non-harmonics	<-80dB
Load Impedance	50 Ohms
Connector Type	BNC
Programmable	0.1, 1, 5, 10 MHz
Amplitude/Format	> 2.4V peak / Square
Load Impedance	50 Ohms
Connector Type	BNC

One Pulse/Second

Amplitude	> 2.4V peak
Load Impedance	50 Ω
Width	20 μ s
Rise Time	< 5 ns
Jitter	< 1 ns rms
Connector Type	BNC

Timing Outputs

Time Code	IRIG B ⁺ (Modulated)
Connector Type	BNC

* Other configurations available upon request

ACCURACY AND STABILITY PERFORMANCE

GPS Tracking Mode**

RF Outputs	
Accuracy	$\pm 2.8E-13$

SSB Phase Noise

Offset (Hz)	(10 MHz)
1	-106 (dBc)
10	-135 (dBc)
100	-145 (dBc)
1,000	-155 (dBc)
10,000	-160 (dBc)

** After minimum of five days of stable GPS tracking.

1 PPS Output

Accuracy	20 ns (TYP) to UTC***
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*** Requires input of coordinates from geodetic survey of installation site and pre-calibration at Datum

Stability

Averaging Times (seconds)	Allan Deviation
10	<1.0 E-11
100	<5.0 E-12
1,000	<1.6 E-12
10,000	<5.0 E-13
100,000	<2.0 E-13
>100,000	<2.0 E-14

ENVIRONMENTAL & PHYSICAL SPECIFICATIONS

Power Requirements

Operating Voltage	90 to 265 VAC
Frequency Range	47 to 63 Hz
Power	< 60 W (Operating)

Dimensions

Height	3U; 5.25" (~13.4 cm)
Width	19" Rack Mount (~48.3 cm)
Depth	21" (~53.4 cm)

Weight 45 lbs. (20.4 kg.)

Options

- Standard Performance, 2 yr electronic, 12 year tube warranty
- Certified shipping container, cardboard

CONNECTOR CHART		
CONN	CONN TYPE	SIGNAL DESCRIPTION
J104	BNC	1PPS
J105	BNC	10 MHz
J106	BNC	5 MHz
J107	BNC	1 MHz
J108	BNC	IRIG
J110	BULKHEAD JACK	ANTENNA
J100 AC INPUT	PIN 1	AC POWER
	PIN 2	NEUTRAL
	PIN 3	SAFETY GND
J102 RS232	PIN 1	DCD
	PIN 2	RXD
	PIN 3	TXD
	PIN 4	DTR
	PIN 5	GROUND
	PIN 6	DCR
	PIN 7	RTS
	PIN 8	CTS
	PIN 9	NC
J103 ALARM	PIN 1	(F=CL) MAJ
	PIN 2	(COM) MAJ
	PIN 3	(COM) MIN
	PIN 4	(F=CL) MIN
	PIN 5	GROUND
	PIN 6	NC
	PIN 7	(F=OP) MIN
	PIN 8	(F=OP) MAJ
	PIN 9	NC



Specifications subject to change without notice.