



DATUM FTS 4040A/RS CESIUM FREQUENCY STANDARD

KEY ADVANTAGES

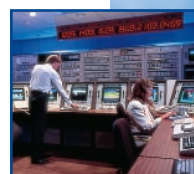
- **Long Cesium Beam Tube Life Span**
- **No Calibration Necessary - No Aging**
- **Programmable TTL Output**

The Datum FTS 4040A/RS meets the need for precision timing and frequency control in a variety of stringent applications. This Primary Timing & Frequency Reference Standard is especially suited for use in communications, navigation, test and measurement:

- Stratum 1 master clock reference communications systems & telephone networks
- Synchronization of satellite ground terminals and remote stations
- Calibration of secondary quartz and rubidium slave clocks
- Troubleshooting network synchronization problems
- Integrity monitoring of Global Positioning System (GPS)

All of these above applications take advantage of the accurate, stable, and spectrally pure sinusoidal signals available from Datum FTS 4040A/RS. The units use cesium beam tube technology 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. A microprocessor performs the following tasks:

- 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



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Global Timing Solutions

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Specifications (@ 25 degrees unless otherwise specified)

•Performance Parameters:		Datum FTS 4040A/RS	High Performance
Accuracy ¹		$<2 \times 10^{-12}$	$<1 \times 10^{-12}$
Warm-up Time(typical)		30 min	30 min
Reproducibility		$<1.2 \times 10^{-12}$	$<5 \times 10^{-13}$
Stability			
Averaging Time(s)		Allan Deviation	Allan Deviation
10 ⁰		$<2.0 \times 10^{-11}$	$<5.0 \times 10^{-12}$
10 ¹		$<2.1 \times 10^{-11}$	$<3.5 \times 10^{-12}$
10 ²		$<5.0 \times 10^{-12}$	$<8.5 \times 10^{-13}$
*10 ³		$<1.6 \times 10^{-12}$	$<2.7 \times 10^{-13}$
*10 ⁴		$<5.0 \times 10^{-13}$	$<8.5 \times 10^{-14}$
*10 ⁵		$<2.0 \times 10^{-13}$	$<3.0 \times 10^{-14}$
*floor		$<8.0 \times 10^{-14}$	$<2.0 \times 10^{-14}$
SSB Phase Noise Offset (Hz)		10 MHZ	10 MHZ
10 ⁰		-90 dBc	-90 dBc
10 ¹		-120 dBc	-120 dBc
10 ²		-140 dBc	-140 dBc
*10 ³		-145 dBc	-145 dBc
*10 ⁴		-145 dBc	-145 dBc
*10 ⁵		-150 dBc	-150 dBc
Stability			
Range		$\pm 1 \times 10^{-9}$	$\pm 1 \times 10^{-9}$
Resolution		1×10^{-15}	1×10^{-15}
Control		via RS232 port	via RS232 port

¹100% verified & calibrated against FTS in-house standard.

*excluding environmental effects

•Power Requirements:	AC	DC
Operating Voltage	90 to 132 V	± 22 to 56 V
Frequency Range	180 to 263 V	
	47 to 63 Hz	
	400 Hz	
Power		
(operating)	110 VA, 65W	60W
(warm-up)	140 VA, 90W	90W

•Dimensions:	
(EIA-310C)	
Height	5.22" (133mm)
Width (front Panel)	19.00" (483mm)
(instrument)	17.31" (440mm)
Depth	17.30" (439mm)

•Weight:	45 lbs (20.4 kg)
Additional shipping weight for reusable HAZMAT container	34 lbs (15.4 kg)

•Options	
1 PPS Output	
Telecom Synthesizer at 1544 kbps-Direct Digital Synthesizer	
Telecom Synthesizer at 2048 kbps-High Performance Cesium Tube	

•RF Output:	
Frequency	1 each at 1,5,10 MHz
Amplitude	>1 Vrms
Harmonic signals	$<_{-40}$ dBc
Non-harmonic distortion	<-80 dBc
Connector type*	BNC
Load impedance	50 ohms
Location	rear panel

* For telecom options three possible connector types are available: Twin BNC, Weco 310, and Bantam

•Programmable Output:	
Frequency	0.1, 1, 5, 10 MHz
Amplitude/wave shape	>2.4 V pk into 50 ohms, sq.
Connector type	BNC
Location	rear panel

•Telecom Output Connector Options:	
Option Suffix Letter*	Connector Type
T	Twin-BNC
W	Weco 310
B	Bantam

* When ordering with a telecom output option specify desired connector type with the suffix letter shown above along with the telecom output option designation - e.g. 264/T

DATUM markets its products and services through a global network of experienced electronic professionals. For assistance, additional information, or to place an order, please call us.

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Specifications subject to change without notice.
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