

10-Volt Solid-State DC Voltage Reference Module

Owning a precision DC Voltage Reference Standard needn't be expensive or inconvenient. Wavetek's Model 7001 is a complete self-contained Solid-State 10-Volt DC Voltage Reference in portable unit measuring only xx x xx x xx mm and weighing a mere xx kg (including batteries). Yet it's capable of delivering 1-year stabilities of better than 1 ppm, at a cost around half that of its nearest competitor.

Utilizing a low-temperature oven that minimizes the ageing rate of its zener reference diodes, plus thin-film resistor arrays that dramatically reduce the drift and temperature coefficient of its gain defining networks, the Model 7001 gives you a drift predictability after 2 years of better than 0.3 ppm/year and a temperature coefficient better than 0.05 ppm/°C. And because it utilizes a unique new DC/DC isolation technique, you won't find that the output voltage shifts when you switch between back-up battery and AC

line supply power.

Unlike other solid-state DC voltage references on the market, the Model 7001 isn't solely reliant on its batteries during transportation. Although it's an advantage to keep the zener diode oven up to temperature during transportation, Wavetek's patented zener reference conditioning guarantees that both the 10 V and 1.018 V outputs return to within ± 0.5 ppm of their previous values if deep discharge of the battery caused oven control to be lost. As a result, unpredicted delays during shipment won't mean that your 10-Volt reference needs complete recalibration.

The optional ruggedized transit case not only protects the unit, it also includes a temperature monitor that tracks environmental conditions during shipment.

- ◆ *Compatible with Wavetek Nanoscan and Transref Systems*
- ◆ *Self-Contained DC Voltage Reference*
- ◆ *Better Than 1 ppm/Year Stability*
- ◆ *10-Volt and 1.018-Volt Outputs*
- ◆ *Low-Cost Entry Point into 10-Volt Metrology*
- ◆ *Suitable for Unpowered Shipment*



solid-state

Specifications**(Total Uncertainties for 1 year, $\pm 1^\circ\text{C}$)****10V Output**Stability: -0.8 ± 0.7 ppm

Drift Predictability:

After 1 year: ± 0.5 ppm/yearAfter 2 years: ± 0.3 ppm/year

Temperature Coefficient:

 $+15^\circ\text{C}$ to $+35^\circ\text{C}$: < 0.05 ppm/ $^\circ\text{C}$

Noise:

White Noise ($< 1\text{MHz}$): < 100 ppm rms0.01Hz to 10Hz: < 0.040 ppm rmsDC to 0.02Hz (24hr): < 0.025 ppm rms

Hysteresis:

After conditioning: < 0.5 ppm

Output Current: 12 mA max.

Output Resistance: $< 10\text{ m}\Omega$

Load Regulation:

Zero to 2 mA: < 1.2 ppm2 mA to 12 mA: < 12 ppm

Line Regulation:

Ext. DC Supply

11.8 V to 14.5 V: < 0.05 ppm

Int. Battery Supply

25% to 100% Charge: < 0.05 ppm

Protection:

Short Circuit: indefinite

220 V DC: < 50 mA continuous1100 V DC: < 25 mA continuous**1.018V Output (Switchable to 1V)**

Stability:

After 1 year: < 2 ppmAfter 2 years: < 1 ppmDrift Predictability: ± 0.6 ppm/year

Temperature Coefficient:

 $+15^\circ\text{C}$ to $+35^\circ\text{C}$: < 0.2 ppm/ $^\circ\text{C}$

Noise:

White Noise ($< 1\text{MHz}$): < 100 ppm rms0.01Hz to 10Hz: < 0.040 ppm rmsDC to 0.02Hz (24hr): < 0.025 ppm rms

Hysteresis:

After conditioning: < 0.5 ppm**Battery**

Type: NiMH

Backup Period: > 16 hrs from fully charged condition

Recharge Times:

Zero to 25% charge: < 4 hours25% to full charge: < 48 hoursHalf Life: > 5 years**Environment**

Temperature:

Operating: $+15^\circ\text{C}$ to $+35^\circ\text{C}$ Storage: 0°C to $+45^\circ\text{C}$ Transit: -18°C to $+45^\circ\text{C}$

Humidity:

Warm-Up Period: 10 minutes to ± 0.1 ppm of final output value**Power** $< 1\text{W}$ **Mechanical**

Dimensions (HxWxD) XX x XX x XX mm

Weight: X.XX kg (X.X lb)

EMC/ESD

Emissions: EN55011:1991

Immunity: EN50082-1:1992

Safety

UL3111, EN61010-1-1:

1993/A2:1995

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Ordering Information

Model 7001 Solid-State 10-Volt DC Voltage Reference complete with External Power Supply

Option XXX Ruggedized Transit Case complete with Environmental Monitor