NOVATECH
INSTRUMENTS, INC.

Rubidium Frequency Standard
Model 1450A

The Model 1450A Rubidium Frequency Standard provides sinewave outputs of 10MHz, 1MHz and 100kHz along with a optional synthesized outputs. Containing an Atomic Resonance Rubidium Oscillator, the 1450A provides long term stability of better than $\pm 5 \times 10^{-11}$ per month and short term stability of $<1 \times 10^{-11}$ in 10 seconds. The 1450A is ideal for use as a master oscillator in laboratories and ground stations, as well as for test and calibration applications. Up to four optional synthesized outputs, which are internally locked to the Rubidium Oscillator, can be used to generate any frequency from 100Hz to 30MHz with a resolution of 1μHz.

Specifications:

FREQUENCY STABILITY (typ)

Short Term	t=1s: $\pm 3 \times 10^{-11}$
	t=10s: $\pm 1 \times 10^{-11}$
	t=100s: $\pm 3 \times 10^{-12}$
Aging	Monthly: $\pm 5 \times 10^{-11}$ after 1 month
	Yearly: $\pm 5 \times 10^{-10}$ after 3 month
Temperature	+5 to +40°C;$\pm 1 \times 10^{-10}$
Line Voltage(± 10%)	$\pm 5 \times 10^{-12}$
Holdover (24Hours, fixed temperature)	$\pm 1 \times 10^{-11}$/day

FREQUENCY ACCURACY (typ)

At shipment: $\pm 5 \times 10^{-11}$ at 25°C baseplate temperature.

Retrace: $\pm 5 \times 10^{-11}$ from previous frequency (constant temperature) after 72 hours ON and up to 24 hours OFF

SINEWAVE OUTPUTS

Standard: 10 MHz, 1 MHz and 100 kHz
Optional: Auxiliary outputs can be factory set to any one of the standard values or to optional synthesized values from 100Hz to 30MHz, 1μHz resolution.
Connectors: Rear mounted BNC Female, 50Ω ± 10%

OUTPUT AMPLITUDE

Approximately 1Vrms into 50 ohms all outputs. (TTL levels optional on auxilliary outputs).

SPECTRAL PURITY (Typical)

10 MHz, 1 MHz, 100 kHz: Harmonic <-40 dBc, Non-Harmonic <-70 dBc. Synthesized outputs: Harmonic <-35 dBc, Non-Harmonic <-60dBc, Phase Noise (synthesized outputs, typ.) -120dBc 10kHz offset, 5MHz output.

PHASE NOISE (10MHz output, typical dBc/Hz)

Freq. Offset	dBc/Hz
1Hz	-70
10Hz	-90
100Hz	-120
1kHz	-140
10kHz	-140

ENVIRONMENTAL

Temperature: 0°C to 50°C operating

Humidity: 80% to 31°C, decreasing linearly to 50% at 40°C

SIZE

8.8cm H, 42.5cm W, 30.5cm D excluding rack handles and connectors. (Standard 2U, 19 inch rack)

LINE POWER

120/240 VAC ±10%, 50/60Hz. 55 VA (75 VA during warm-up, 10 minutes).

STATUS INDICATORS

POWER OK: Front panel LED indicates power is on.
RUBIDIUM LOCK: Front panel LED and rear panel TTL level signal indicate output is locked to Rubidium Oscillator.

OPTIONS

Outputs can be configured to have up to 4 different synthesized frequencies, either at TTL levels or 1Vrms sinewaves, in addition to the standard outputs of 10MHz, 1MHz and 100kHz.

See “Ordering Information” for standard configurations.Consult factory for custom versions.

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