

NOVATECH INSTRUMENTS, INC.

12MHz DDS Signal Generator Module Model 101A



The Model 101A is a modular signal generator using Direct Digital Synthesis (DDS) to produce a sine or square wave up to 12.99999 MHz. The output is programmable using four front-panel cursor push buttons and an eight character liquid crystal display (LCD). The output frequency can be set with 10 Hz resolution over the full frequency range. The output amplitude of 1V_{pp} into 50Ω is suitable for many applications. An LVCMOS output at the same frequency as the sine wave is also available by moving a jumper. The Model 101A can be powered continuously by two LR6 (AA) cells for 10 hours, or +2.8 V_{dc} for embedded applications. The frequency range of the Model 101A facilitates low cost audio and baseband RF testing, as well as acting as a digital clock source.

Specifications:

OUTPUT

TYPES: Sine or LVCMOS.

IMPEDANCE: 50 Ω.

RANGE: 10 Hz to 12.99999 MHz, 10 Hz resolution.

AMPLITUDE: Sine: approximately 1.0 V_{pp} into 50 Ω, typ. ±2 dB from 1 MHz level. Audio level: typ ±0.1 dB from 20 Hz to 100 kHz. LVCMOS: 2.4 V_{oh}, 0.4 V_{ol} O.C., series terminated, 50Ω output. t_r, t_f <2 ns.

CONTROL

Five front panel push buttons and display allow setting of output. Eight character LCD shows frequency in MHz, with 10 Hz resolution. RS232 (approximately ±3 V levels) serial port at 9600 Baud can also be used without the display or the push buttons. The Save button, or Save command, stores instrument settings in EEPROM. This allows the 101A to be programmed for embedded applications.

SPECTRAL PURITY (50 Ω load, 25 MHz span, Sine Output)

Phase Noise: <-100 dBc, 10 kHz offset, 1 MHz out.

Spurious: <-50 dBc below 1 MHz
<-40 dBc below 5 MHz
<-30 dBc below 12 MHz

Harmonic: <-55 dBc below 1 MHz
<-45 dBc below 5 MHz
<-35 dBc below 12 MHz

ACCURACY AND STABILITY

Accuracy of ±0.005% at 20° C and a stability of ±0.0025% from +5 to +40° C.

POWER REQUIREMENTS

DC Input: nominal +2.8 V_{dc} (2.1-3.0 V_{dc}) at <100 mA. Two LR6 (AA) alkaline cells will power the Model 101A for at least 10 hours of operation. Two-cell LR6 battery holder with attached connector provided. Blinking digit indicates low battery (<2 V).

SIZE

80mm L, 61mm W, 12mm H. excluding connectors. An additional 10 mm is added to the height when the display is attached. Mounting holes and rubber feet provided.

ENVIRONMENTAL

Temperature: +5 °C to +50 °C operating. Humidity: 80% to 31° C, decreasing linearly to 50% at 40° C.

CONNECTORS

BNC female for output. Jumper shunt to select Sine or LVCMOS. 2-pin header for DC input. 3-pin pads for RS232. A through-hole component (pushbuttons, connectors, and switches) free version is available for OEM applications (consult factory).

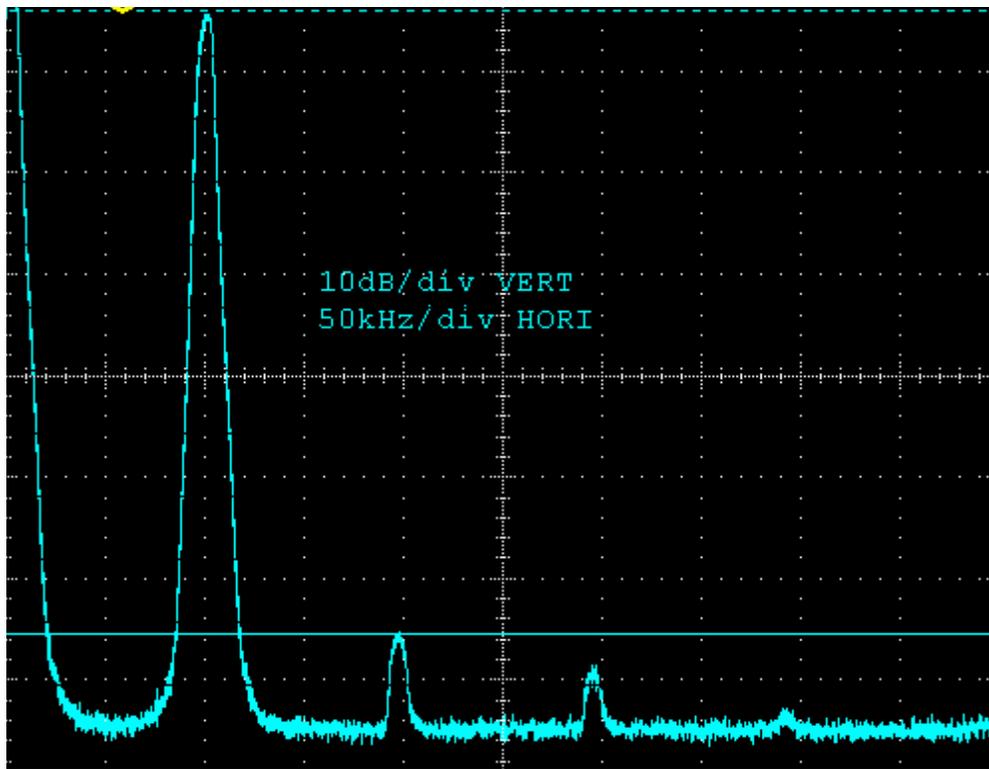
DOCUMENTATION

See www.novatech-instr.com/PDF_files/101a_man.pdf for manual.

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Table 1: Serial Commands

Serial Command	Function
F0 xx.xxxxx	Set Frequency of output in MHz to nearest 10 Hz. Decimal point required. Maximum setting: 12.99999 MHz.
E x	Serial Echo control. x=D for Echo D isable, x=E for Echo E nable
R	Reset. This command resets the 101A. EEPROM data is preserved and, if valid, is used upon restart. This is the same as cycling power.
CLR	Clear. This command clears the EEPROM valid flag and restores all factory default values. This is the same as holding the SAVE button down during power-up.
S	Saves current state into EEPROM and sets valid flag. State used as default upon next power up or reset. Use the "CLR" command to return to default values.
QUE	Return present frequency, status registers, and software revision.
M x	Mode command. x=S for S ine wave output (default). x=T for T riangle wave output.
V	The V command returns a single byte representing the raw input voltage. Nominal 2 V cutoff is 0x9A. Scale factor is approximately 13mV/count.



100 kHz Output