

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: 50Ω.

RANGE: 10 Hz to 12.99999 MHz.

AMPLITUDE: Sine: approximately 1.0 V_{pp} into 50Ω, typ. ±2dB from 1 MHz level. Audio level: typ ±0.1dB 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 serial Save command, stores instrument settings in EEPROM. This allows the 101A to be pre-programmed for embedded applications.

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

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

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

Harmonic: <-55dBc below 1 MHz
<-45dBc below 5 MHz
<-35dBc 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} (2.1-3.0V_{dc}) at <100mA. 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.

SIZE

80mm L, 61mm W, 12mm H. excluding connectors. An additional 10mm 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 for output. Jumper to select Sine or LVCMOS. 2-pin header for DC input. 3-pin header for RS232. A through-hole component (pushbuttons, connectors, and switches) free version is available for OEM applications (consult factory).

23-Oct-2010

Table 1: Serial Commands

Serial Command	Function
F0 xx.xxxxxx	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.

