

NOVATECH INSTRUMENTS, INC.

Dual 400MHz Synthesized Signal Source

Model 2940A



The Model 2940A is a two-channel 400MHz DDS Signal Generator in a table top instrument case. The 2940A generates two different output frequencies simultaneously from 200kHz to 400MHz in 1Hz steps. The 2940A can be locked to an external frequency standard or used with its internal temperature compensated crystal oscillator (TCXO). Optional internal amplifiers and 60dB step attenuators can be added. Simple front panel control or RS232 allows setting of all parameters, which can be saved into non-volatile EEPROM memory upon power down. The Model 1940A is a 1U rackmount version with up to four frequencies and programmable output levels.

Specifications:

OUTPUT

TYPES: Two independent Sinewaves. (consult factory for ECL or LVDS)
IMPEDANCE: 50 Ω , Sine.
RANGE: 200kHz to 399.999999MHz in 1Hz steps.

AMPLITUDE

Sine: approximately +0dBm (632mV_{pp} set at 25MHz) into 50 Ω . Flatness: \pm 3dB, 1MHz to 350MHz. (2940A/02: +4dBm, 0-60dB step attenuator, 10dB steps)

CONTROL

Three front panel buttons and a rotary encoder allow setting of frequency and menu selections. The same functions can be set using RS232 to 19.2kBaud. Output Frequency, status and menus are displayed on a 2-line LCD.

ACCURACY AND STABILITY (internal clock)

On-board VCTCXO gives $<\pm$ 1.5ppm at 18-28 $^{\circ}$ C. Stable to an additional \pm 2ppm per year, 18-28 $^{\circ}$ C.

LOCK TO EXTERNAL STANDARD

LEVEL: 0.1-2.0Vrms Sine or Square Wave on rear panel EXT. STD. Input BNC. 50 Ω .
EXT. STD. FREQUENCY: 1, 2, 5, 10, 1.544 (T1), or 2.048 MHz (E1), selectable. When locked, the accuracy and stability are equal to those of the standard.
LOCK RANGE: The 2940A will lock to and track an EXT. STD. Frequency \pm 5ppm (typically \pm 10ppm).

SPECTRAL PURITY (sine output, 50 Ω load)

Phase Noise: $<$ -120dBc, 10kHz offset, 10MHz out.
Spurious: $<$ -50dBc below 10MHz (typ. 500MHz span)
 $<$ -45dBc below 80MHz
 $<$ -40dBc below 160MHz
 $<$ -35dBc below 400MHz
Harmonic: $<$ -50dBc below 1MHz
 $<$ -45dBc below 20MHz
 $<$ -40dBc below 80MHz
 $<$ -35dBc below 160MHz
 $<$ -30dBc below 400MHz

Output-output isolation $>$ 40dBc.

POWER REQUIREMENTS

120/240VAC, 40VA Max. 50/60Hz.

SIZE

6.4cm H, 18.5cm W, 24.1cm L (excluding bail). 2.5kg.

ENVIRONMENTAL

Temperature: +5 $^{\circ}$ C to +40 $^{\circ}$ C operating.
Humidity: 80% to 31 $^{\circ}$ C, decreasing to 50% at 40 $^{\circ}$ C.

STANDARD CONFIGURATIONS

2940A: Two sine outputs, front panel BNC connectors.
2940A/01: One sine output.
2940A/02: Two +4dBm sine outputs, internal 0-60dB step attenuators.

7-Sep-2006

NOVATECH INSTRUMENTS, INC.

P.O. Box 55997
Seattle, WA 98155-0997
United States of America

<http://www.novatech-instr.com/>
sales@novatech-instr.com
206.363.4367 FAX/206.301.8986 Voice

Table 1: Serial Commands

RS232 Command	Function
F XXX.XXXXXX	Set Frequency in MHz to nearest 1Hz. Decimal point required. Both outputs set to same frequency. Maximum frequency 399.999999MHz.
Fx XXX.XXXXXX	Set Frequency in MHz to nearest 1Hz. Decimal point required. x=a or b, depending upon frequency being set. Maximum setting: 399.999999MHz
E x	x=D for Echo D isable, x=E for Echo E nable
P x	x=D, power up with default settings; x=S, power up with Saved Settings
Reset	This command resets the 2940A. EEPROM data is preserved and, if valid, is used upon restart. This is the same as cycling power.
C	Same as "Reset All" command. Restores factory defaults and clears EEPROM valid flag.
S	Saves current state into EEPROM and sets valid flag. State used as default upon next power up or reset. Use the "Reset All" or "C" command to return to factory default values. Automatically sets EEPROM valid flag and overrides the "P" command.
X n	n=D, 1, 2, 3, 4, 5, or 6. Use to select a preset reference value. Setting n=D selects the internal clock. If n=1, selects 5MHz external reference; n=2, selects 10MHz. Setting a 3 selects 1MHz, setting a 4 selects 2MHz, setting a 5 selects 1.544MHz and setting a 6 selects 2.048MHz. Both internal synthesizers are locked to the same external reference.
Qe	Query the non-volatile memory (EEPROM) storage. See manual for details of returned information.
Qr	Query the volatile (RAM) memory storage. These are the values currently output by the 2940A and will only equal the values from "Qe" if no changes have been made in the settings. See manual for details of returned information.