NOVATECH
INSTRUMENTS, INC.
4 Channel 30MHz DDS Signal Generator
Model 2910B/RACK

The Model 2910B/RACK is a four channel 30MHz DDS Signal Generator in a rackmount (1U) instrument case. The 2910B/RACK generates up to four different output frequencies simultaneously from 100Hz to 30MHz in 1μHz steps. The 2910B/RACK can be locked to an external frequency standard or used with its internal temperature compensated crystal oscillator (TCXO). Sinewave at 1Vrms, TTL or squarewave differential outputs are available. The 2910B can be configured with 2 or 4 (standard) frequencies. Simple front panel control or RS232 allows setting of all parameters, which can be saved into non-volatile EEPROM memory upon power down. The 2910B/RACK is an ideal higher density upgrade for the 2910A.

Specifications:

OUTPUT
TYPES: Sinewave, TTL or Squarewave Differential.
IMPEDANCE: 50Ω, Sine, TTL. 100Ω, Differential.
RANGE: 100Hz to 30MHz in 1μHz steps.
FLATNESS: ±3dB from 100Hz to 30MHz referenced to amplitude at 15MHz. Sine only.

AMPLITUDE
Sine: approx. +13dBm (1.0V$_{rms}$) into 50Ω. TTL: V$_{ol}$<0.5V, V$_{oh}$>2.4V into a 15pF series terminated load. Differential: ±1.6Vpp minimum into 100Ω. (DC-offset RS422 levels).

CONTROL
Three front panel buttons and a rotary encoder per section 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 for each section. Other than AC line power, each section is independent.

ACCURACY AND STABILITY (internal clock)
On-board VCTCXO gives <±1.5ppm at 18-28 °C. Stable to an additional ±3ppm per year, 18-28 °C.

LOCK TO EXTERNAL STANDARD
LEVEL: 0.5-3Vrms Sine or Square Wave can be applied to the EXT STD Input BNC. 50Ω.
EXT. STD. FREQUENCY: 1, 2, 5, 10, 1.544, or 2.048MHz, selectable from front panel or serial commands. The accuracy and stability of a locked 2910B/RACK are equal to the standard.
LOCK RANGE: The 2910B/RACK will lock and track an EXT. STD. Frequency as long as the input frequency is equal to the selected frequency ±5ppm (typically ±10ppm).

SPECTRAL PURITY (sine outputs, 50Ω load)
Phase Noise: <-130dBc, 10kHz offset, 5MHz out.

Spurious:	<-60dBc below 10MHz (typ. 60MHz span)
	<-50dBc below 20MHz
	<-40dBc below 30MHz
Harmonic:	<-70dBc below 1MHz
	<-60dBc below 10MHz
	<-50dBc below 20MHz
	<-35dBc below 30MHz

JITTER
<0.2% of Period or 200pS, whichever is greater, TTL and Differential Ouputs only.

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

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

STANDARD CONFIGURATIONS
2910B/RACK/S-04: 8 Sine Outputs, BNC connectors, 4 frequencies, 2 displays.

2910B/RACK/T-04: 8 TTL/CMOS Outputs, BNC connectors, 4 frequencies, 2 displays.

2910B/RACK/D-04: 8 Differential Outputs, Triax connectors, 4 frequencies, 2 displays.

Consult factory for other configurations.

28-Aug-2003

Table 1: 2910A Legacy Serial Commands

RS232 Command	Function
`F XX.XXXXXXXXXXX`	Set Frequency in MHz to nearest 1μHz. Decimal point required. Both outputs set to same frequency.
`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 2910B/RACK. EEPROM data is preserved and, if valid, is used upon restart. This is the same as cycling power.
`Reset All`	This command clears the EEPROM valid flag and restores all factory default values.
`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. Values 3, 4, 5 and 6 have been added to the 2910B/RACK. 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.

Table 2: 2910B/RACK New Serial Commands

RS232 Command	Function
`Fx XX.XXXXXXXXXXX`	Set Frequency in MHz to nearest 1μHz. Decimal point required. x=a or b, depending upon frequency being set. In a 4-frequency system, there are two serial ports, each requiring Fa and Fb.
`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 2910B/RACK and will only equal the values from "Qe" if no changes have been made in the settings. See manual for details of returned information.
`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 legacy "P" command.