SPECIFICATIONS

WAVEFORM OUTPUTS

Channels: 2 (1 for 9101)

DC Accuracy: 1.0% or 20 mV (whichever is greater).

Resolution: 8 bits (256 levels).

Dynamic Range: Single or dual channel - 8 bits; Channels summed - 9 or more bits, depending on wave shape, filtering, offset requirements.

Total Harmonic Distortion: < -50 dBc for output frequency of 1 MHz or less. < -35 dBc @ 10 MHz, Typically < -38 dBc @ 10 MHz for output levels <5Vpp.

Spurious and non-harmonic distortion:
    < -65 dBc, f < 1 MHz
    < -60 dBc, f > 1 MHz
    excluding the band within 1 kHz of carrier.

Signal to Noise Ratio:

Full Scale Amplitude	S/N
75 mV or greater	> 45 dB
30 mV	40 dB
5 mV	25 dB

S/N specified at 0 V offset, sum mode off.

Maximum Output Voltage: 10 V p-p (+5 V) into 50 Ω, 20 V p-p into high impedance.

Minimum Output Voltage: 5 mV p-p into 50 Ω.

Risetime: < 5 nsec, 10% to 90% (no filter).

Overshoot and Ringing: 5% of p-p amplitude, maximum; 3% of p-p amplitude, typical.

Settling Time: < 20 nsec to 3% for 5 V transition, including risetime (filters off).

Offset: Individually programmable for each channel.

Offset Resolution: < 6 mV steps.

Offset Accuracy: Same as D.C. accuracy.

Maximum Offset Voltage:

External Load:	Max. Offset V:
50 Ω	+5 V
Open Circuit	+10 V

Output Smoothing: Built-in filters with programmable cutoff frequencies:
bypassed, 1, 3, 10, 30, 100 MHz; 18 dB/octave (Bessel)

Crosstalk Between Channels: < 1%

Ch 1 to Ch 2 Phase Accuracy:
Internal Summing +.5 nsec
Dual Outputs +1 nsec

STANDARD FUNCTIONS (WAVEFORMS)

Sinewave
Frequency Range: 0.01 Hz to 25 MHz
Frequency Resolution: 0.035%

Squarewave
Frequency Range: 0.01 Hz to 25 MHz
(50 MHz dual channel)
Frequency Resolution: 0.035%

Triangle
Frequency Range: 0.01 Hz to 25 MHz
Frequency Resolution: 0.035%
Linearity: +1%

Pulse - (single channel only) Period: 40 nsec to 10 sec; Width: variable, 5 nsec to 10 sec (not to exceed period); Orientation: selectable, positive or negative going.

Ramp - Period: 40 nsec to 100 sec; Resolution: 0.035%; Linearity: +1%; Orientation: selectable, positive or negative going.

DC - Generates a D.C. level, the value of which is the offset level. Accuracy: the greater of 1% or 20 mV.

TIME BASE (Clock Rate)

(Clock Rate):Range: 5 nsec to 20 sec per point

(Clock Rate):Resolution: 0.035%

(Clock Rate):Accuracy: 5 ppm, at achievable set points, 235 C, 115 VAC/60 Hz, after 30 minute warmup

(Clock Rate):Stability: < 0.5 ppm/5 C

TRIGGER Modes

Continuous: The generator runs continuously at the selected frequency.

Recurrent: The waveform is cycled with a programmable delay of up to 1 million points (1/2 million in dual channel) between cycles. Number of waveforms per cycle is programmable up to 65,535.

Single: Upon receipt of a trigger, the selected waveform is generated only once. The start of the waveform can be delayed from the trigger point by up to 1 million points (1/2 million in dual channel).

Burst: Upon receipt of a trigger, the selected waveform is generated the number of times set into the burst counter, up to 65,535. The start of the burst can be delayed up to 1 million points (1/2 million in dual channel).

Gated (uses the trigger threshold): Uses a triggered start and stops at the completion of the current waveform cycle after the gate closes.

External Trigger Threshold:

Slope + or -
Range ±2.5 V
Resolution 20 mV (8 bits)

Source

Manual	Front-panel button
External	External trigger applied via a front panel BNC

Bus	Trigger from GPIB, RS-232 or Control Panel

Control Panel Trigger Key

Arm Source:

Auto - Automatically rearms itself.

Bus - Rearmed from the GPIB, RS-232 or the Control Panel.

Trigger sources and arm sources may be individually enabled or disabled. Internal triggering is automatically selected in continuous or recurrent trigger modes

Delay: Variable, from four to one million points (2 to 1/2 million in dual channel).

WAVEFORM MEMORY

Fast Memory Length: Single Channel - 512 kpoints; Dual Channel - 266 kpoints each channel expandable to 2 megapoints or 1 Channel. 1 megapoint or 2 Channels..

Storage Memory Length (RAM Disk): >350 setup and sequence files.

RAM Disk to Fast Memory Load Rate: 250 msec +0.7 msec/byte.

Battery back-up: >3 years (non-rechargable Lithium cells).

Minimum Waveform Length: Nonlinked waveform segment, no looping - 8 points (4 points for each channel in dual mode); linked waveforms - Single channel operation - 72 points, Dual channel operation - 36 points for each channel.

Waveform Length Resolution: Single channel operation - 8 point blocks, Dual channel operation - 4 point blocks.

Waveform Loop Counter: One counter per linked waveform maximum repetitions - 4095.

OUTPUTS:

Protection: Waveform outputs are protected against applied voltages to +40 V. If an externally applied overvoltage condition is detected, the output relay is opened, the LED for that channel is flashed and, if enabled, an SRQ is generated on the GPIB. The condition can be cleared by reconnecting the channel's output.

Front Panel

Waveform Outputs - Output impedance, 50 Ω; All Timing Outputs - Output impedance, 50 Ω, source 1.5 V peak into 50 Ω, approximately 75 nsec duration.

Time Marker Output - Settable from two up to one million clock cycles, referenced to the trigger point.

Sync Output - Occurs at the next Sample Clock edge after receiving a trigger.

Waveform Start Output - Occurs at the start of the waveform.

Rear Panel

Clock Outputs - 0 to -0.8 V into 50 Ω. Present in all modes including External Clock.

INPUTS

Protection: The maximum input voltage level for all inputs should not exceed 5 V.

Front Panel

External Gate/Trigger Input - Impedance: 50 Ω

Sum Input - Impedance: 50 Ω. Overload is indicated by flashing Sum 1 + 2 LED. Gain: X 1, +5% for >350 mV full scale output ranges. Bandwidth: >80 MHz at 3 dB

Hand-Held Keypad (Control Panel) Input - A DIN connector is provided for attaching the hand-held control panel and display.

Rear Panel

External Clock Input - When this input is selected, the internal clock is deselected and the waveform is generated using the external clock. Impedance: 50 Ω Threshold: Variable +2.5 V, 8 bits resolution.

FRONT-PANEL INDICATORS AND CONTROLS

Controls

Power ON/OFF

Manual Trigger Button

Manual Self Test Button

Hand-held Control Panel (optional)

Indicators

Power on LED - ON when power is applied to the instrument.

Trigger Armed LED - ON when awaiting a trigger signal.

Waveform Output LEDs: Chan 1: ON when Channel 1 is turned on; Chan 1 & 2: ON when Channel 1 is being summed with channel 2. Chan 2: ON when Channel 2 is turned on.

Waveform Active LED: ON when a waveform is being clocked out of the fast memory to one or both waveform outputs or if the unit is armed and waiting for a trigger.

GPIB

Talk LED - ON when the instrument is in the talk mode.

Listen LED - ON when the instrument is in the listen mode.

SRQ LED - ON when the SRQ line is asserted and the instrument is awaiting action from a GPIB controller.

Remote - This word is spelled out in the hand-held control panel display whenever the instrument is put into remote by a GPIB controller.

Local LED - Located with the keypad input connector, it indicates when the instrument is in the LOCAL mode and the hand-held control panel is operative. When it is not ON, the instrument is in the GPIB remote state.

Self Test LED - ON when a self test or calibrate is in progress.

Test Fault LED - Flashes for 10 seconds when a self test or calibrate determines there is a fault or steady ON in the event of a microprocessor failure.

Battery Low LED - ON when the RAM Disk memory backup battery is too low.

Chan 1, Invert LED - ON when Ch 1 output is inverted.

Chan 2, Invert LED - ON when Ch 2 output is inverted.

REAR PANEL CONNECTORS AND SWITCHES

Connectors: GPIB: IEEE 488-1978 compatible; RS-232 Port: DB 25 S Connector.

Switches: GPIB Address Switch; RS-232 Port Configuration Switch, Line voltage selector and fuses.

WAVEFORM CREATION AND EDITING

LeCroy's EASYWAVE™ software package is available for PC-DOS compatible computers*. It provides for waveform creation and editing in a menu driven environment. Waveform creation can be accomplished by any of the following methods:

1. Equation Entry

2. Selecting and combining simple waveform elements.

3. Waveforms can be acquired over the GPIB from Oscilloscopes and edited.

Editing may be accomplished as follows:

1. Modifying individual points from the keyboard.

2. Modifying the equation describing the waveform.

3. Deleting, moving and rescaling blocks of data.

* Minimum hardware configuration of host computer 640K RAM, 10 Mbyte Hard Disk, Graphics (CGA,HGA, or VGA) Display.

Other GPIB Compatible Controllers: Waveforms can be created and edited on other controllers using user supplied software.

INSTRUMENT CONTROL

PC-DOS Compatibles: The same software package used for waveform editing also can be used for controlling the 9100.

Local Control Panel: Once the waveforms have been loaded an optional, detachable control panel with a four line LCD display may be used for controlling the 9100.

Other GPIB or RS-232 Compatible Controllers: Other computers or terminals may be used to control the instrument using the remote commands.

GENERAL

GPIB Interface Functions: IEEE 488-1978 compatible. SH1, AH1, T5, TE0, L3, LE0, SR1, RL1, PP0, DC1, DT1, C0.

GPIB DMA Rates: Typically 200 kbytes/sec.

RS-232C: Implemented as data communications Equipment (DCE).

Baud Rates: 300, 600, 1200, 2400, 4800, and 9600.

Data Bits: 7 or 8.

Stop Bits: 1 or 2.

Parity: None, Even, or Odd.

Protocol: Full Duplex, Xon/Xoff (DC1/DC3) handshake.

Data Formats: I Arbitrary length ASCII L ASCII HEX "00" to "FF" (double the length of internally stored binary data files).

Commands: Full Conversational same as GPIB plus: RS_SRQ, Define character equivalent to SRQ in GPIB. Default is "Bell", ESC commands ECHO on/off Trig remote/local.

Temperature Range: 15° C. to 35° C., full specification; 0° C. to 40° C., operating.

Humidity: 40° C., 10% to 95% relative, non-condensing.

Power: 115/220 +20% VAC, 47-63 Hz, approximately 147 watts.

Size: 5-1/4" H X 19" W X 15" D.

Weight: 26 lbs. (approximately).

STANDARD ACCESSORIES

9100/OM	Operator's Manual

ORDERING INFORMATION

9100	Dual Channel Arbitrary Function Generator
9100R	Dual Channel Arbitrary Function Generator with Rear Panel Connectors
9101	Single Channel Arbitrary Function Generator
9109	Dual Channel Arbitrary Function Generator with Digital Word Outputs

OPTIONAL ACCESSORIES

9100/CP	Detachable Hand-held Control Panel
9100/EC	6' Extender Cable (Control Panel)
9100/OM	Operator's Manual
9100/SM	Service Manual
9100/SW	EASYWAVE Software
9100 GPIB2	GPIB interface card and software (National Instruments PCII Card and GPIB-PC Software)
DC/GPIB-2	GPIB Cable, 2 meters

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