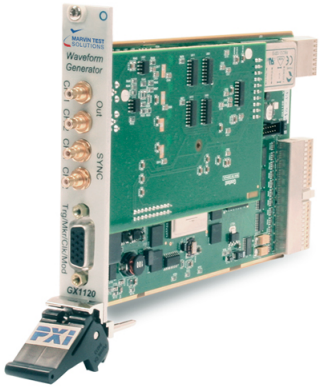
GX1120

250 MS/S, TWO CHANNEL, ARBITRARY WAVEFORM FUNCTION GENERATOR PXI CARD

- Arbitrary Waveform Generator and Direct Digital Synthesis modes
- 250 MS/s sample rate per channel, 400 MS/s sample rate combined channel mode
- 16-bit vertical resolution
- 32 M sample memory
- PLL clock generator for AWG mode
- PXI hybrid slot compatible



DESCRIPTION

The GX1120 is a high performance, two-channel PXI arbitrary waveform generator that offers function generator and arbitrary waveform generator functionality within one instrument. Built-in waveforms are available for use with both the DDS or AWG modes of operation and include Sine, Triangle, Ramp, Noise, and pulse waveform generation.

FEATURES

With a sample rate of 250 MS/s for each channel and with the ability for the two channels to operate synchronously and phase coherently, the GX1120 is an ideal I/Q modulation source for communication applications, troubleshooting encoding schemes, and verifying modulator performance. Additionally, the GX1120's two channels can be combined to produce 400 MS/s arbitrary waveforms with 16 bits of vertical resolution – offering an extremely high performance, high resolution waveform generator in a compact, 3U form factor. Each channel is fully independent and offers programming of the channel's sample clock, output level, waveform and offset settings. The GX1120 comes standard with 32 M samples of waveform memory.

Triggering

The GX1120 can be triggered via a software command, a PXI trigger event, or an external trigger input, offering users the ability to control waveform generation via external trigger events. The waveform trigger modes include continuous, triggered, gated hold, and burst functionality.

Sample Clock

An internal 50 MHz clock reference is used to create the 250 MHz clock for DDS mode. For Arb mode, two independent PLLs are used to drive each arbitrary waveform generator with a maximum sample rate of 250 MHz. The PLLs can use the internal 50 MHz reference or they can be locked to the PXI 10 MHz clock. The sample clock can generate sample frequencies with 4 digits of resolution or 10 ps of resolution.

SOFTWARE

The board is supplied with GtWave, a software package that includes a virtual instrument panel, a Windows 32/64-bit DLL driver library and documentation. A trial license for WaveEasy, a software package for creating, modifying and analyzing waveforms is also included. The virtual panel can be used to interactively program and control the instrument from a window that displays the instrument's current settings and status. In addition, interface files are provided to support access to programming tools and languages such as ATEasy, LabView, C/C++, Microsoft Visual Basic®, Delphi, and Pascal. An On-Line help file and PDF User's Guide provides documentation that includes instructions for installing, using and programming the board.

APPLICATIONS

- Video
- Navigation
- Radar
- Sonar
- Communications
- Converter Testing
- Filter Design & Test

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SPECIFICATIONS

STANDARD WAVEFORMS		
Sine, triangle, square, pulse, ramp up, ramp down, noise		
Waveform Maximum Frequency (FS = 250 MHz)	DDS Mode	AWG Mode
Sine	100 MHz	
Triangle	20 MHz	
Ramp	20 MHz	
Pulse		100 MHz
Square	20 MHz	
Noise		10 MHz

ARBITRARY WAVEFORM GENERATOR MODE	
Sample Rate	0.1 Hz to 250 MHz
Multiplexed Channel Sample Rate	400 MHz (max)
Sample Rate Resolution and Accuracy	4 digits, limited by 10 ps 1 ppm, 15 to 35 C
Vertical Resolution	16 bits
Waveform Memory	32 M samples

DDS MODE	
Frequency Range, Resolution, and Accuracy	1 µHz to 100 MHz 12 digits, resolution 1 ppm accuracy
Non-Harmonic Spurious Components	<60 dBc (DC to 1 MHz) <50 dBc to 200 MHz
Distortion (2nd Harmonic Relative to Carrier)	<-65 dBc @ < 20 kHz <-60 dBc, 20 kHz to 100 kHz <-50 dBc, 100 kHz to 5 MHz <-30 dBc, 5 MHz to 80 MHz
Phase Noise	<-100 dBc / Hz (typical) at 1 MHz 10 kHz offset from carrier
Modulation	AM: Int. / Ext. 0 - 100%, DC to 20 kHz FM: Int. / Ext. DC to 20 kHz Phase offset: 0 - 360 degrees, 0.1 degree resolution

MAIN OUTPUT	
Connector	Front panel SMB. one per channel
Output Mode	On / Off
Output Impedance	50 , ±1%
Protection	Protected against shorts to ground and over-voltage
Amplitude Range	10 mV_{PP} to 10 V_{PP} into 50 ; double into open circuit
Amplitude Resolution	4 digits (9.999V)
Amplitude Accuracy (@ 1 kHz)	±(1% of programmed value + 20 mV), 1 - 10 V_{PP} output ±(2% of programmed value + 5 mV), 10 mV to 1 V_{PP} output
Amplitude Flatness	±1% (0.1 dB) to 1 MHz ±1 dB to 50 MHz ±3 dB to 100 MHz
Offset Range	0 to ±5 V
Offset Resolution	1 mV or 4 digits, which ever is less
Offset Accuracy	±(1% of programmed value + 10 mV)
Rise / Fall Time	<6 ns into a 50 load (10% to 90% full scale step)
Abberations	<5% of p-p amplitude, ±20 mV
Asymmetry (Square Wave	<1% of period ± 5 ns
Filters	100 MHz, 9 pole elliptical LPF 500 MHz, 7 pole Bessel LPF
Channel Phase Locking	Channels may be phase locked (0 to 360 degrees Resolution: 0.1 degree
Channel to Channel Skew	<200 ps (phase locked mode)

SYNC OUTPUT (ONE PER CHANNEL)	
Connector	Front panel SMB output (one per channel), synchronous with output waveform
Impedance	50 , ±1%
Level	TTL compatible

MARKER OUTPUT (ONE PER CHANNEL)	
Positive pulse, user programmable and synchronous with the waveform output.	
Connector	Front panel DB-15 connector
Impedance	50 , ±1%

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Level	TTL compatible
MODULATION	
AM	0.01 Hz to 20 kHz (internal) Sine, square and triangle modulation 0% to 100% modulation DC to 50 kHz (external input)
FM	0.01 Hz to 20 kHz (internal) Deviation: 0 to 50% of the carrier frequency DC to 50 kHz (external)
FSK	0.01 Hz to 1 MHz (internal) DC to 10 MHz (external input) Deviation: 1 uHz to 100 MHz
Phase Modulation	0.01 Hz to 20 kHz Sine, square and triangle modulation Deviation: 0 to 360 degrees DC to 50 kHz (external input)
SWEEP CHARATERISTICS	
Sweep Modes	Linear or logarithmic, up or down
Sweep Time	1 ms to 500 s
Sweep Trigger	Continuous, triggered or burst, internal, external or PXI trigger
WAVEFORM SEQUENCING (ARB MODE)	
Loop	Loop in a defined segment of memory
Loop N Times	Loop in a defined segment of memory N times, N is programmable from 1 to 999999 or loop continuously
Sequencing Rate	0.01 Hz to 10 MHz
TRIGGER MODES	
Continuous	Output continuously generated
Triggered	Output waveform triggered by external or software triggered event. The external trigger signal edge may be a rising or falling edge. One waveform cycle generated. 50 MHz trigger rate for Arb mode 20 MHz trigger rate for DDS mode
Gated	Same as Triggered mode except that the waveform is generated for as long as the gate signal stays true (logic one). When the gate signal goes false (logic zero) the output goes quiescent.
Burst	Output waveform will become active on the occurrence of a trigger edge. The selected waveform is generated for a preset number of cycles between 1 and 999,999. Output will then disable.
Trigger Sources	Internal, external, or PXI trigger

INTERNAL TRIGGER	
Repitition Rate	1 µs to 100 s
Resolution	4 digits
Accuracy	±0.01%
EXTERNAL TRIGGER INPUT	
Connector	Front panel DB-15 connector
Impedance	10 k nominal
Threshold Level	Variable from -5 V to + 5 V, with 10 mV of resolution
Repetition Rate	DC to 50 MHz
Minimum Pulse Width	10 ns
Slope	Positive or negative going edge
Trigger Delay	0 - 15 s, with 4 ns of resolution
Trigger Hold	0 - 15 s, with 4 ns of resolution
EXTERNAL INPUT CLOCK	
Connector	Front panel DB-15
Input	External 10 MHz reference clock
Threshold Level	TTL
EXTERNAL OUTPUT CLOCK	
Connector	Front panel DB-15
Output	10 MHz reference clock Arb clock
Level	TTL
INTERNAL REFERENCE CLOCK	
Time Base	50 MHz, ±1 ppm PXI 10 MHz clock External 10 MHz clock
EXTERNAL MODULATION INPUT	
Connector	Front panel DB-15
Input Voltage Range	5 V_{PP} for 100% modulation
Input Impedance	10 k nominal
Bandwidth	DC to 50 kHz DC to 10 MHz (FSK modulation)

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GENERAL	
Power Requirements	15 W (max)
Current Consumption (Maximum)	+5 V @ 0.3 A +12 V @ 0.5 A -12 V @ 0.2 mA +3.3 V @ 3.3 A
Weight	Approx. 12 oz
Size	3U, single slot
Operating Temperature	0 °C to +50 °C
Storage Temperature	-20 °C to +70 °C
Humidity (Non-Condensing)	5% to 95%, < 70 °C
Safety	Designed to meet IEC 1010-1, UL 3111-1, and CSA 22.2#1010
Calibration Interval	1 year

Note: Specifications are subject to change without notice

ORDERING INFORMATION

GX1120	Two channel AWG, 250 MS/s, 16-bit, Arbitrary Waveform Function Generator
SOFTWARE	
WaveEasy	Analog Waveform Development and Analysis Software
ACCESSORY	
GX92012	Cable, BNC Male to BNC Male, 50 Ohm, 2'
GX92015	Cable, BNC Male to BNC Male, 50 Ohm, 5 Feet
GT-BNC50-2	Cable, BNC to BNC, 50 Ohm, 2 ft
GT-BNC50-5	Cable, BNC to BNC, 50 Ohm, 5 ft
GX93005	DIN Mating Connector for GTX22xx / GX2065
GX93006	3 ft Harness for GTX22xx/GX2065 DIN connector (DIN to Header)
CALIBRATION	
GX1120-CAL	GX1120 Calibration/Verification Service. Includes pre-verification data (post calibration data provided if applicable)
GX1120-CAL-3	GX1120 Calibration/Verification Service- 3 years. Includes pre-verification data (post calibration data provided if applicable)
GX1120-CAL-5	GX1120 Calibration/Verification Service- 5 years. Includes pre-verification data (post calibration data provided if applicable)

CalEasy-GX1120	CalEasy for the GX1120 (Single User License) with One Year Support and Subscription
CalEasy	CalEasy License for all Supported Marvin Test Solutions Products (Single User License) with One Year Support and Subscription
CalEasy-2Y	CalEasy License for all Supported Marvin Test Solutions Products (Single User License) with Two Year Support and Subscription
CalEasy-3Y	CalEasy License for all Supported Marvin Test Solutions Products (Single User License) with Three Year Support and Subscription

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