metrix GX-1030 Function-Arbitrary Waveform Generator User Guide

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metrix GX-1030 Function-Arbitrary Waveform Generator

PRESENTATION

The GX 1030 is a dual-channel function/arbitrary waveform generator with specifications of up to 30 MHz maximum bandwidth, 150 MSa/s sampling rate and 14-bit vertical resolution.
The proprietary EasyPulse technology helps to solve the weaknesses inherent in traditional DDS generators when generating pulse waveforms, and the special square wave generator is capable of generating square waveforms with up to 30 MHz frequency and low jitter.
With these advantages, GX 1030 can provide users with a variety of high-fidelity and low-jitter signals and can meet the growing requirements of complex and extensive applications.

KEY FEATURES

- Dual-channel, with bandwidth up to 30 MHz and amplitude up to 20 Vpp
- 150 MSa/s sampling rate, 14-bit vertical resolution, and 16 kpts waveform length
- Innovative Easy Pulse technology, capable of generating lower jitter
- Pulse waveforms bring a wide range and extremely high precision in pulse width and rise/fall times adjustment
- Special circuit for a Square wave, which can generate Square wave with frequencies up to 60 MHz and jitter less than 300 ps + 0.05 ppm of period
- A variety of analog and digital modulation types: AM, DSB-AM, FM, PM, FSK, ASK, PSK and PWM
- Sweep and Burst functions
- Harmonic waveforms generating function
- Waveforms combining function
- High precision Frequency Counter
- 196 kinds of built-in arbitrary waveforms
- Standard interfaces: USB Host, USB Device(USBTMC), LAN (VXI-11)
- LCD 4.3” display 480X272 points

PRECAUTIONS FOR USE

POWER INPUT VOLTAGE

The instrument has a universal power supply that accepts a mains voltage and a frequency between:

- 100 – 240 V (± 10 %), 50 – 60 Hz (± 5 %)
- 100 – 127 V, 45 – 440 Hz

Before connecting to a mains outlet or power source, ensure that the ON/OFF switch is set to OFF and verify that the power cord and extension cord are compatible with the voltage/current range and that the circuit capacity is sufficient. Once the checks are done, connect the cable firmly.
The mains power cord included in the package is certified for use with this instrument. To change or add an extension cable, make sure that it meets the power requirements of this instrument. Any use of unsuitable or dangerous cables will void the warranty.

DELIVERY CONDITION

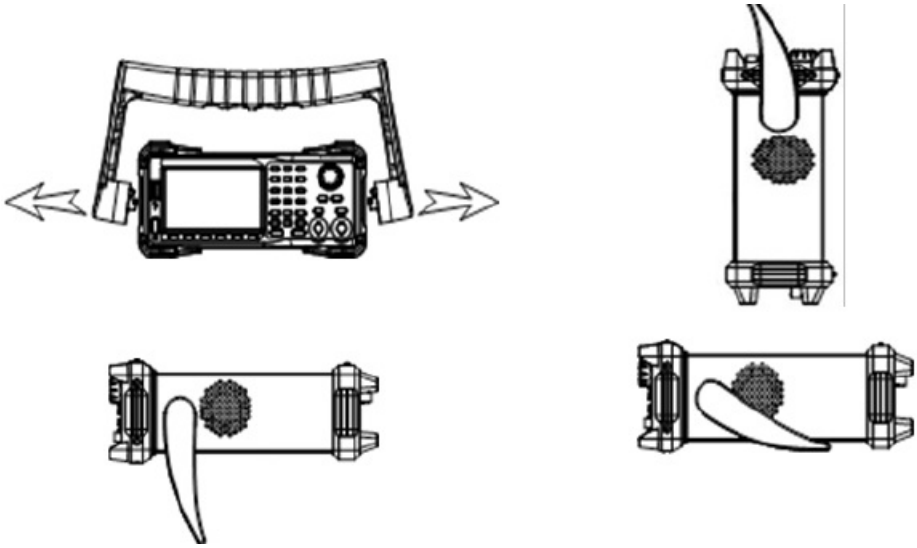
Check to make sure that all the items you ordered have been supplied. Delivered in a cardboard box with:

- 1 Quick start guide paper
- 1 user’s manual in pdf on website
- 1 PC software SX-GENE on website
- 1 multilingual safety sheet

- 1 compliance attestation
- A power cord that fits the standards 2p+T
- 1 USB cable.

For accessories and spares, visit our web site: **www.chauvin-arnoux.com**

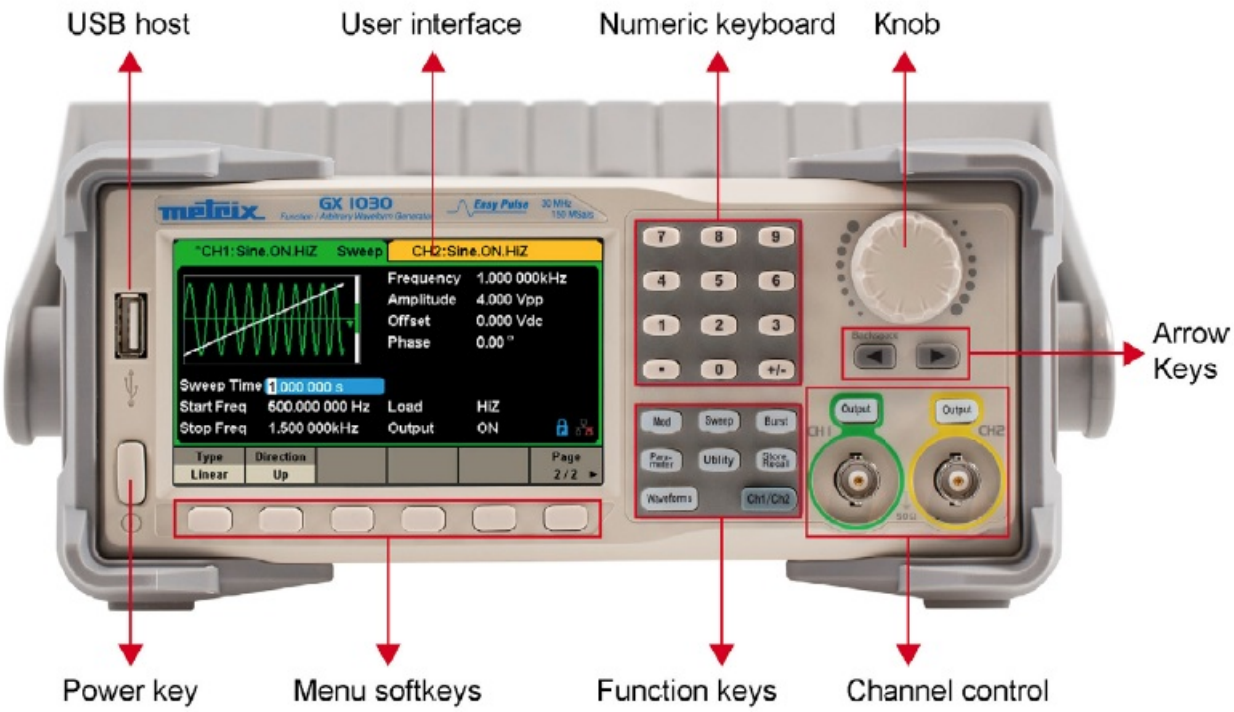
HANDLE ADJUSTMENT
To adjust the handle position of the GX 1030, please grip the handle by the sides and pull it outward. Then, rotate the handle to the desired position.



DESCRIPTION OF THE INSTRUMENT

THE FRONT PANEL

The front panel GX 1030 has a clear and simple front panel which includes a 4.3 inch screen, menu softkeys, numeric keyboard, knob, functions keys, arrow keys and channel control area.



GETTING STARTED

1. **Check Power Supply**
   Make sure that the supply voltage is correct before turning on the instrument. The supply voltage range shall comply with the specifications.
2. **Power Supply Connection**
   Connect the power cord to the receptacle on the rear panel and press the ON switch to turn on the instrument. A start screen will appear on the screen during initialization followed by the main screen display.
3. **Auto Check**
   Press Utility, and select the Test/Cal option.

   Then select the SelfTest option. The device has 4 automatic test options : check the screen, keys, LEDS and internal circuits.

4. **Output Check**
   Follow the steps below to perform a quick check of settings and output signals.
   Turn the device on and set it to the default settings. To do this, press Utility, then System, then Set To Default.
   - Connect the BNC output of CH1 (green) to an oscilloscope.
   - Press the Output key on the BNC output of CH1 to start the output and observe a wave according to the above parameters.
   - Press the Parameter key.

- Press Freq or Period in the menu and change the frequency using the numeric keypad or rotary button. Observe the change on the scope display.
- Press Amplitude and use the rotary button or numeric keyboard to change the amplitude. Observe the change on the scope display.
- Press DC Offset and use the rotary button or numeric keyboard to change the Offset DC. Observe the changes on the display when the scope is set for DC coupling.
- Now connect the CH2 (yellow) BNC output to an oscilloscope and follow steps 3 and 6 to control its output. Use CH1/CH2 to switch from one channel to another.

TO TURN ON/OFF OUTPUT

There are two keys on the right side of the operation panel which are used to enable / disable the output of the two channels. Choose a channel and press the corresponding Output key, the key backlight will be lighted and the output will be enabled. Press the Output key again, the key backlight will be extinguished and the output will be disabled. Keep pressing the corresponding output key for two seconds to switch between High Impedance and 50 Ω load.

USE NUMERIC INPUT

There are three sets of keys on the front panel, which are arrow keys, knob and numeric keyboard.

1. The numeric keyboard is used to enter the parameter's value.
2. The knob is used to increase (clockwise) or decrease (counterclockwise) the current digit when setting parameters.
3. When using knob to set parameters, the arrow keys are used to select the digit to be modified. When using numeric keyboard to set parameters, the left arrow key is used as a Backspace function

Mod – Modulation function

The GX 1030 can generate AM, FM, ASK, FSK, PSK, PM, PWM and DSB-AM modulated waveforms. Modulating parameters vary with the types of the modulation. In AM, users can set the source (internal/external), depth, modulating frequency, modulating waveform and carrier. In DSB-AM, users can set the source (internal/external), modulating frequency, modulating waveform and carrier.

Sweep – Sweep function

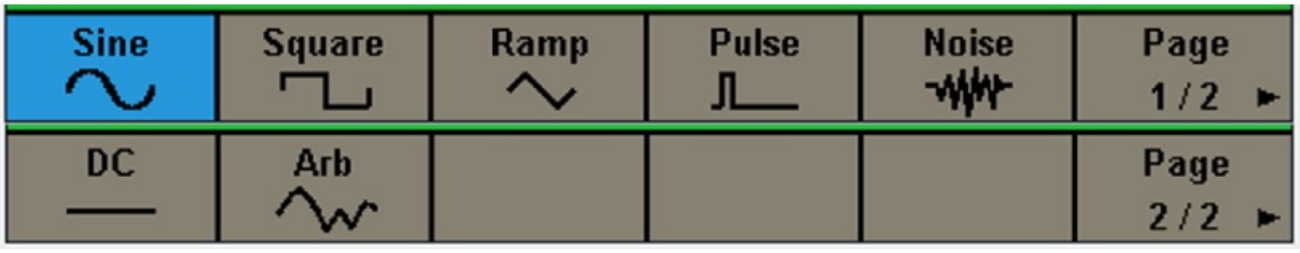
In the sweep mode, the generator steps from the start frequency to the stop frequency in the sweep time specified by the user.
The waveforms that support sweep include sine, square, ramp and arbitrary.

Burst – Burst function
The Burst function can generate versatile waveforms in this mode. Burst times can last a specific number of waveform cycles (N-Cycle mode), or when an external gated signals (Gated mode) is applied. Any waveform (except DC) may be used as the carrier, but noise can only be used in Gated mode.

TO USE COMMON FUNCTION KEYS

- **Parameter**
  The Parameter key makes it convenient for the operator to set the parameters of basic waveforms directly.
- **Utility**
  Select the System Info option of the utility menu to view the generator‘s system information, including startup times, software version, hardware version, model and serial number.
  The GX 1030 provides a built-in help system, by which users can view the help information at any time when operating the instrument. Press [Utility] → [System] → [Page 1/2] → [Help] to enter the following interface.
- **Store/Recall**
  The Store/Recall key is used to store and recall waveform data and configuration information.
  The GX 1030 can store the current instrument state and user-defined arbitrary waveform data in internal or external memory and recall them when needed.
  The GX 1030 provides an internal non-volatile memory (C Disk) and a USB Host interface for external memory.
- **Ch1/Ch2**
  The Ch1/Ch2 key is used to switch the currently selected channel between CH1 and CH2. After start-up, CH1 is selected as default. At this point, press the key to select CH2.

TO SELECT THE WAVEFORM
Press [Waveforms] to enter the menu. The example below will help familiarize with the waveform selection settings.



The Waveforms key is used to select basic waveforms.

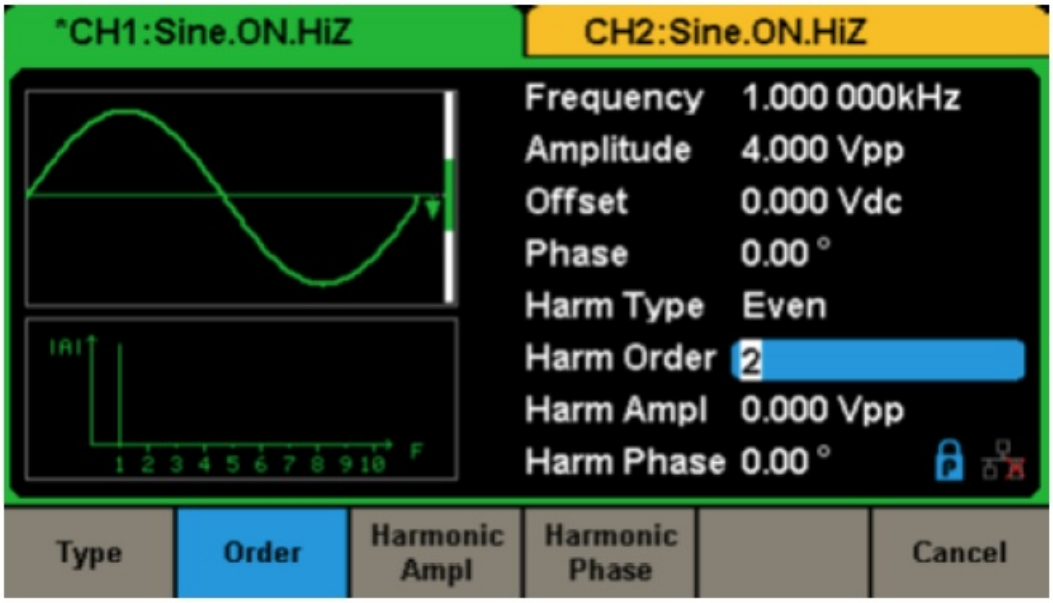
- **Waveforms → [Sine]**
  Press [Waveforms] key and then press [Sine] softkey. The GX 1030 can generate sine waveforms with frequencies from 1 μHz to 30 MHz. By setting Frequency/Period, Amplitude/High level, Offset/Low level and Phase, a sine waveform with different parameters can be generated.
- **Waveforms → [Square]**
  Press [Waveforms] key and then press [Square] softkey. The generator can generate square waveforms with

frequencies from 1 μHz to 30 MHz and variable duty cycle. By setting Frequency/Period, Amplitude/High level, Offset/Low level, Phase and DutyCycle, a square waveform with different parameters can be generated.

- **Waveforms → [Ramp]**
  Press [Waveforms] key and then press [Ramp] softkey. The generator can generate ramp waveforms with frequencies 1μHz to 500 kHz and variable symmetry. By setting Frequency/Period, Amplitude/High level, Phase and Symmetry, a ramp waveform with different parameters can be generated.
- **Waveforms → [Pulse]**
  Press [Waveforms] key and then press [Pulse] softkey. The generator can generate pulse waveforms with frequencies from 1 μHz to 12.5 MHz and variable pulse width and rise/fall times. By setting Frequency/Period, Amplitude/High level, Offset/Low level, PulWidth/Duty, Rise/Fall and Delay, a pulse waveform with different parameters can be generated.
- **Waveforms → [Noise]**
  Press [Waveforms] key and then press [Noise Stdev] softkey. The generator can generate noise with a 60 MHz bandwidth. By setting Stdev and Mean, noise with different parameters can be generated.
- **Waveforms → [DC]**
  Press [Waveforms] key and then press [Page 1/2], last press the DC softkey. The generator can generate a DC signal with a level up to ± 10 V into a HighZ load or ± 5 V into a 50 Ω load.
- **Waveforms → [Arb]**
  Press [Waveforms] key and then press [Page 1/2], lastly press the [Arb] softkey.
  The generator can generate repeatable arbitrary waveforms with 16 K points and frequencies up to 6 MHz. By setting Frequency/Period, Amplitude/High level, Offset/Low level and Phase, an arbitrary waveform with different parameters can be generated.

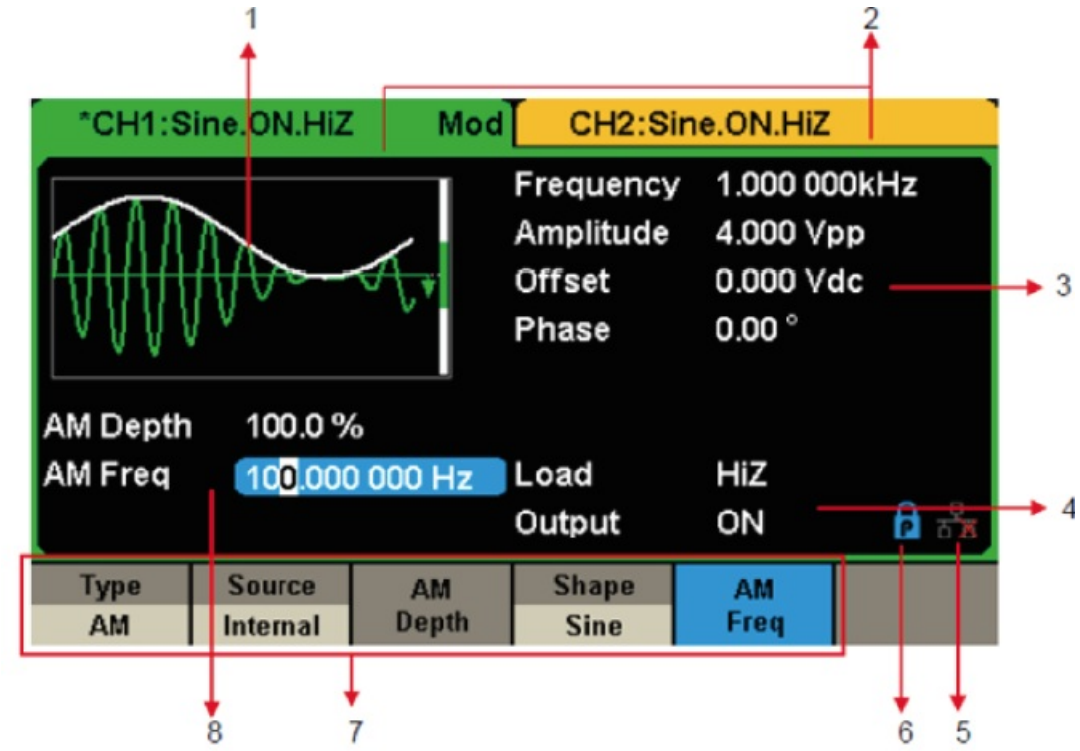
HARMONIC FUNCTION

The GX 1030 can be used as a harmonic generator to output harmonics with specified order, amplitude and phase. According to the Fourier transform, a periodic time domain waveform is the superposition of a series of sine waveforms.



USER INTERFACE

The GX 1030 can only display parameters and waveform information for one channel at a time.
The picture below shows the interface when CH1 chooses AM modulation of a sine waveform. The information displayed may vary depending on the function selected.



1. **Waveform Display Area**

   Displays the currently selected waveform of each channel.

2. **Channel status Bar**

   Indicates the selected status and output configuration of the channels.

3. **Basic Waveform Parameters Area**

   Shows the current waveform's parameters of each channel. Press Parameter and select the corresponding softkey to highlight the parameter to configure. then use number keys or knob to change the parameter value.

4. **Channel Parameters Area**

   Displays the load and output load, as selected by the user.

   Load —- Value of the output load, as selected by the user.

   Press Utility → Output → Load, then use the softkeys, number keys or knob to change the parameter value; or continue pressing the corresponding output key for two second to switch between High Impedance and 50 Ω.

   High Impedance: display HiZ

   Load: display impedance value (the default is 50 Ω and the range is 50 Ω to 100 kΩ).

   Output: Channel output state.

   After pressing corresponding channel output control port, the current channel can be turned on/off.

5. **LAN Status icon**

   The GX 1030 will show different prompt messages based on the current network status.

   -  This mark indicates LAN connection is successful.
   -  This mark indicates there is no LAN connection or LAN connection is unsuccessful.

6. **Mode Icon**

   -  This mark indicates current mode is Phase-locked.
   -  This mark indicates current mode is Independent.

7. **Menu**

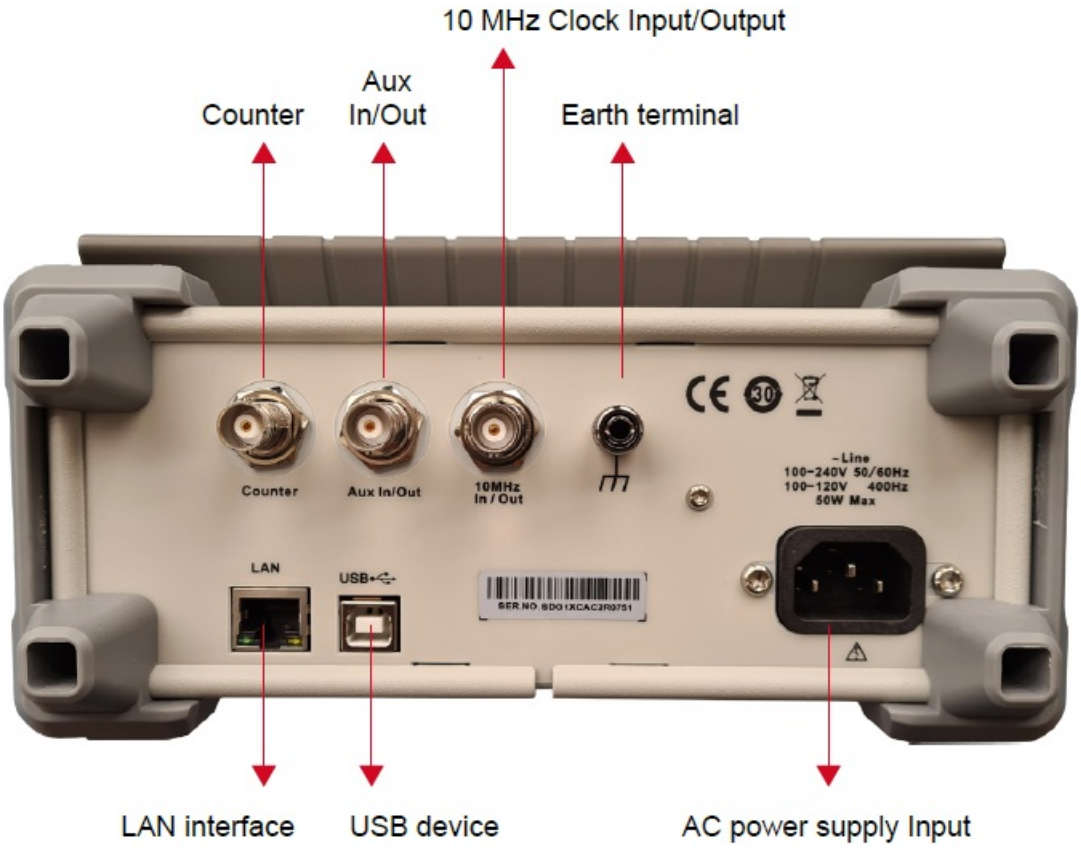
Shows the menu corresponding to the displayed function. For example, «User Interface» Figure, shows the parameters of AM modulation.

8. **Modulation Parameters Area**

   Shows the parameters of the current modulation function. After selecting the corresponding menu, use number keys or knob to change the parameter value.

REAR PANEL

The Rear Panel provides multiple interfaces, including Counter, 10 MHz In/Out, Aux In/Out, LAN, USB Device, Earth Terminal and AC Supply Input.



- **Counter**

  BNC connector. The input impedance is 1 MΩ. This connector is used to accept the signal measured by the frequency counter.

- **Aux In/Out**

  BNC connector. The function of this connector is determined by the current operating mode of the instrument.

  - Sweep/Burst trigger signal input port of external trigger.
  - Sweep/Burst trigger signal output port of internal/manual trigger.
  - Burst gating trigger input port.
  - Synchronization output port. When synchronization is enabled, the port can output a CMOS signal with the same frequency as basic waveforms (except Noise and DC), arbitrary waveforms, and modulated waveforms (except external modulation).
  - AM, DSB-AM, FM, PM, ASK, FSK, PSK and PWM external modulation signal input port.

- **10 MHz Clock Input/Output Port**

  BNC connector. The function of this connector is determined by the type of the clock source.

  - If the instrument is using its internal clock source, the connector outputs the 10 MHz clock signal

generated by the crystal oscillator inside the generator.

- If the instrument is using an external clock source, the connector accepts an external 10 MHz clock source.

- **Earth Terminal**

  The Earth Terminal is used to ground the instrument. AC Power Supply Input.

- **AC Power Supply**

  The GX 1030 can accept two different types of AC input power. AC power: 100-240 V, 50/60 Hz ou 100-120 V, 400 Hz Fuse: 1.25 A, 250 V.

- **USB Device**

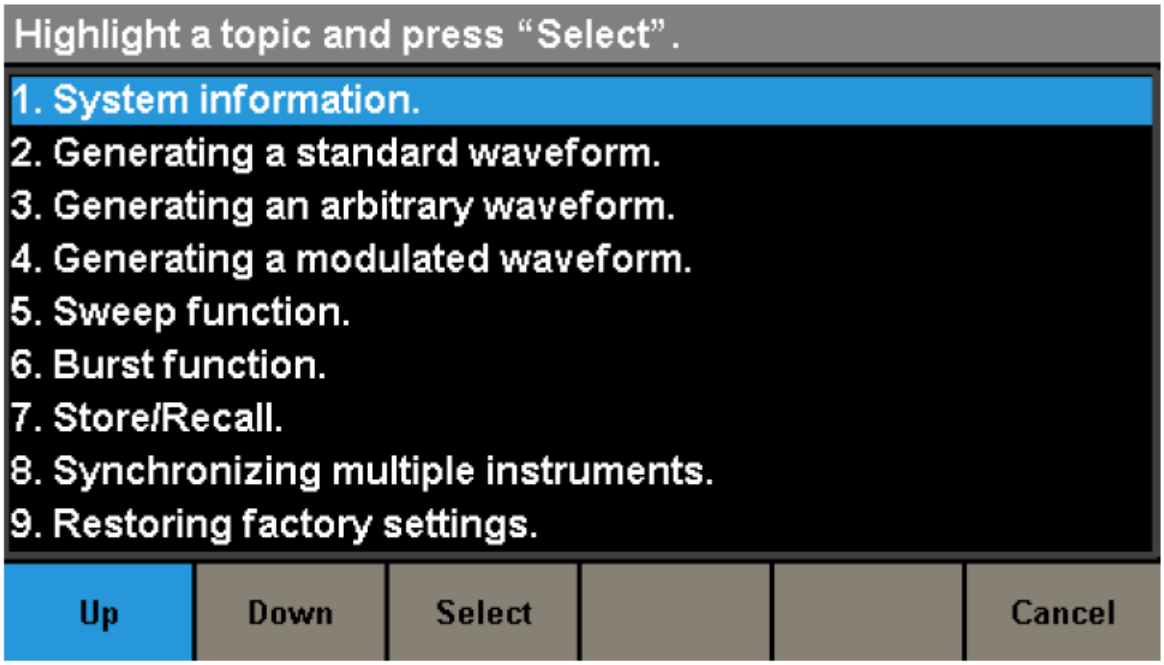
  Used when connecting the instrument to an external computer to allow waveform editing i.e., EasyWaveX) and remote control.

- **LAN Interface**

  Through this interface, the generator can be connected to a computer or network for remote control. An integrated testing system may be built, as the generator conforms to the VXI-11 class standard of LAN-based instrument control.

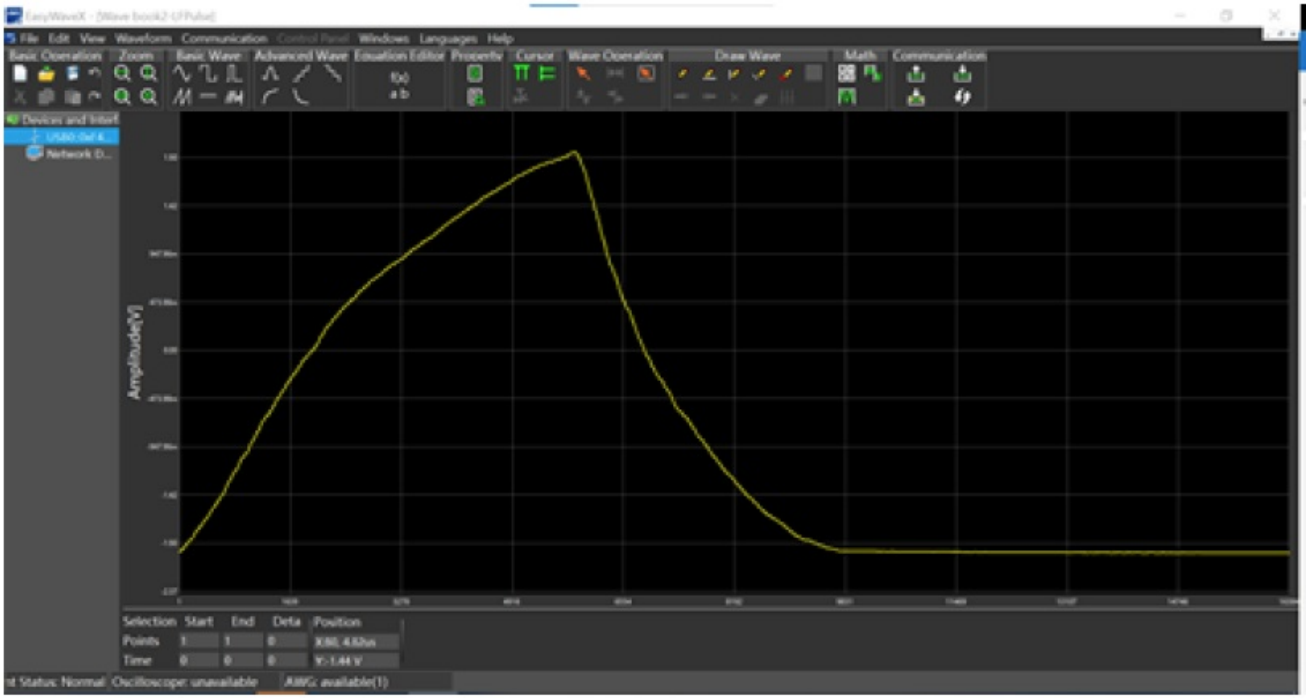
USING THE BUILT-IN HELP SYSTEM

The GX 1030 provides a built-in help system, by which users can view the help information at any time when operating the instrument. Press [Utility] → [System] → [Page 1/2] → [Help] to enter the following interface.

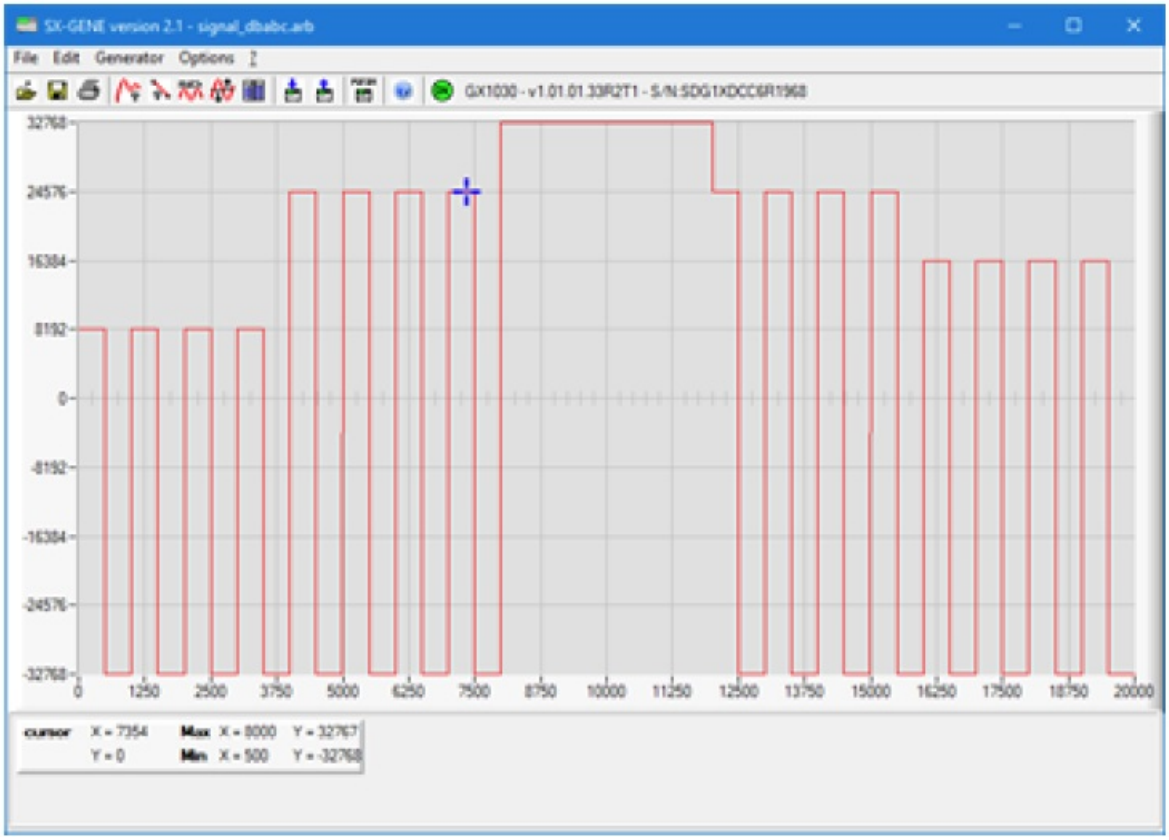


SOFTWARE

The GX 1030 includes arbitrary waveform editing software called EasyWave X or SX-GENE: Theses software are a platform for easily creating, editing and tranferring waveforms to the generator.



EASYWAVE on website:
https://www.chauvin-arnoux.com/sites/default/files/download/easywave_release.zip



SX GENE software on website:
https://www.chauvin-arnoux.com/sites/default/files/download/sxgene_v2.0.zip

Go to our web site to download the user manual for your instrument: www.chauvin-arnoux.com
Search on the name of your instrument. Once you have found it, go to its page. The user manual is on the right side. Download it.

FRANCE

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Documents / Resources

	metrix GX-1030 Function-Arbitrary Waveform Generator [pdf] User Guide GX-1030 Function-Arbitrary Waveform Generator, GX-1030, Function-Arbitrary Waveform Generator, Waveform Generator, Generator

References

- instrument de mesure - multimètre - appareil de mesure électrique | Chauvin Arnoux Metrix