

T3AFG5 / T3AFG10

Function / Arbitrary Waveform Generators

Quick Start Guide



Version 1.1
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General Safety Summary

Read the following precautions carefully to avoid any personal injuries, or damage to the instrument or products connected to it. Use the instrument only as specified.

Use only the power cord supplied for the instrument.

Ground the instrument. The instrument is grounded through the ground conductor of the power cord. To avoid electric shock, always connect to grounded outlets. Make sure the instrument is grounded correctly before connecting its input or output terminals.

Do not connect external signals. The BNC connector is used to output the generated waveforms only. No external signals should be connected to the BNC, or the instrument may be damaged.

Observe all terminal ratings and signs on the instrument to avoid fire or electric shock. Before connecting to the instrument, read the manual to understand the input/output ratings.

Do not operate with suspected failures. If you suspect that the instrument is damaged, contact the Teledyne LeCroy service department immediately.

Do not operate in wet/damp conditions.

Do not operate in an explosive atmosphere.

Keep the surface of the instrument clean and dry.

Avoid touching exposed circuits or wires. Do not touch exposed contacts or components when the power is on.

Do not operate without covers. Do not operate the instrument with covers or panels removed.

Use only the fuse specified for the instrument.

Use proper over voltage protection.

Observe ventilation requirements. Ensure good ventilation. Check the vent and fan regularly to prevent overheating.

Safety Terms and Symbols

The following terms may appear on the instrument:

DANGER: Direct injury or hazard may occur.

WARNING: Potential injury or hazard may occur.

CAUTION: Potential damage to instrument/property may occur.

The following symbols may appear on the instrument:



CAUTION
Risk of injury or damage. Refer to manual.



WARNING
Risk of electric shock or burn



Earth
Ground
Terminal



Protective
Conductor
Terminal



Frame or
Chassis
Terminal



ON/
Standby
Power



Alternating
Current

Operating Environment

Temperature: 0 °C to 40 °C

Relative Humidity: 90% RH at ≤ 35 °C, 60% RH at 35 - 40 °C

Altitude: ≤ 3000 m

Use indoors only.

Pollution Degree 2. Use in an operating environment where normally only dry, non-conductive pollution occurs. Temporary conductivity caused by condensation should be expected.

AC Power

Input Voltage & Frequency: 100-120 V at 400 Hz or
100-240 V at 50/60 Hz

Automatic AC selection.

Power Consumption: 50 W maximum

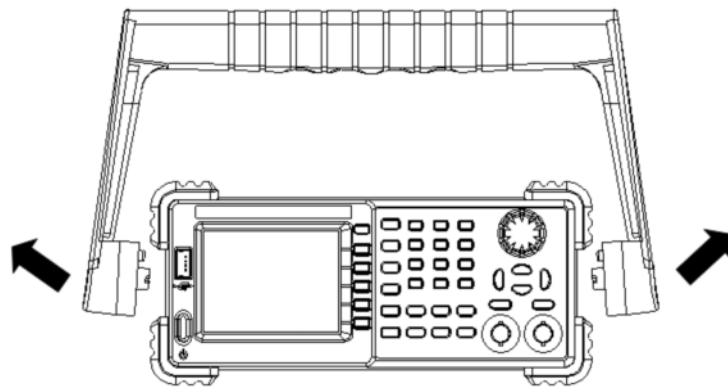
Mains Supply Connector: CAT II per IEC/EN 61010-1:2010,
instrument intended to be supplied from the building wiring at
utilization points (socket outlets and similar).

Fuse Type

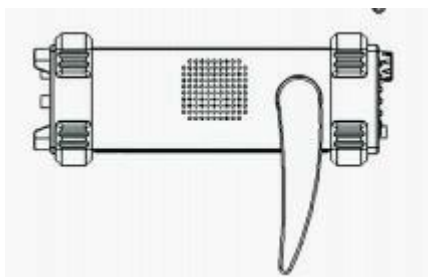
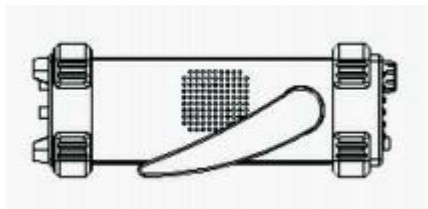
1.25 A, 250 V

Handle Adjustment

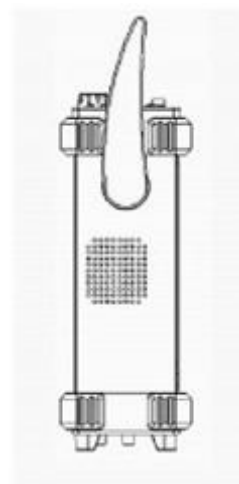
Users can adjust the handle to the required position by pulling the mounting points outward and adjusting the handle position.



Handle Adjustment



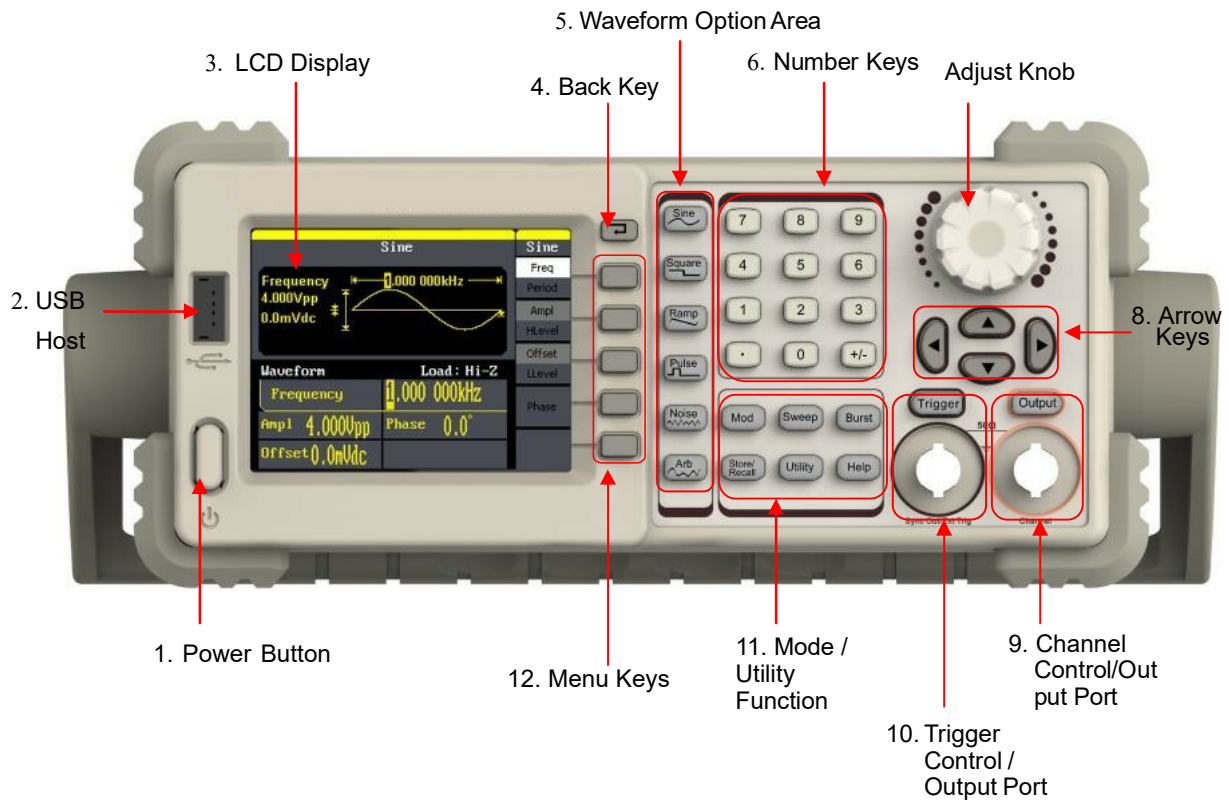
Horizontal Position



Carrying Position

Front Panel

The picture below shows the front panel composition:



1. Power Button

Used to turn on/off the waveform generator. When the power button is off, the generator is under power off state.

2. USB Host Port

Used to read waveforms or status files from a USB drive, or to save current instrument status to a USB drive. The waveform generator supports FAT format USB drives.

3. LCD Display

The waveform generator has a 320*240 TFT color LCD display, which can display current function menu, parameter settings, system state, and help.

4. Back Key

This key is used to return to the last menu.

5. Waveform Options

Sine ----Sine Wave

Provides a sine wave output.

The backlight lights when the key is being used.

The “Frequency/Period”, “Amplitude/High level”, “Offset/Low level”, “Phase” of the sine wave can be adjusted.

Square ----Square Wave

Provides a square wave output.

The backlight lights when the key is being used.

The “Frequency/Period”, “Amplitude/High level”, “Offset/Low level”, “Phase” and “Duty” of the square wave can be adjusted.

Ramp ----Ramp Waveform

Provides frequency ranges from 1 μ Hz to 300 KHz ramp waveform output.

The backlight lights when the key is being used.

The “Frequency/Period”, “Amplitude/High level”, “Offset/Low level”, “Phase” and “Symmetry” of the ramp waveform can be adjusted.

Pulse ----Pulse Waveform

Provides frequency ranges from 500 μ Hz to 5 MHz pulse waveform output.

The backlight lights when the key is being used.

The “Frequency/Period”, “Amplitude/High level”, “Offset/Low level”, “Pulse width/Duty” and “Rise/Fall” of the pulse waveform can be adjusted.

Noise ----Noise Signal

Provides Gaussian white noise output

The backlight lights when the key is being used.

The “Variance” and “Mean” of the noise signal can be adjusted.

Arb ----Arbitrary Waveform

Provides frequency ranges from 1 μ Hz to 5MHz arbitrary waveform output.

The Arb function can output 46 kinds of waveforms: Sinc, index rose, exponential decline, tangent, cotangent, inverse trigonometric, and Gaussian. It can also output the arbitrary waveforms that have been saved to a USB drive.

Users can edit 16 Kpts arbitrary waveforms and down load them to the instrument.

Arb ----Arbitrary Waveform - Continued

- The “Frequency/Period”, “Amplitude/High level”, “Offset/Low level”, “Phase” of the arbitrary waveform can be adjusted.

6. Number Keys

The key pad numbers from 0 to 9, radix points “.”, symbol keys “+/-”, are used to input parameters. If a negative number is required then input a “-” symbol before you input the numbers.

7. Adjust Knob

The Adjust knob is used to increase (clockwise) or decrease (anticlockwise) the current numerical value when setting parameters.

8. Arrow Keys

The arrow keys are used to change the adjusted digit in the numeric value when using the knob to set parameters.

When inputting a file name, it is used to move the position of cursor. When saving or reading files, it is used to choose a position to save a file or choose a file to be read.

9. Channel Control/Output Key

Output This key is used to turn on/off the Channel output.

The BNC connectors’ nominal output impedance is 50 Ω

When the **Output** is turned on (backlight is lit), the BNC connector outputs the waveform.

10. Trigger Control/Output Key

Trigger This key is used to generate a manual trigger signal used in burst mode.

The trigger input BNC connector is the external trigger input connector for the Sweep/Burst mode.

11. Mode/Utility Function Keys

Mod

This key is used to output modulated waveforms and provide several kinds of mode modulate and digital modulated waveforms. It generates AM, AM-DSB, FM, PM, ASK, FSK and PWM modulated signals.

It supports Internal modulation source.

The key backlight lights when the function key is being used.

Sweep

- Used to generate “sine wave”, “square wave”, “sawtooth waveform” and “arbitrary waveform” swept signals. It supports “Linear” and “Log” sweep types. It supports “Internal”, “Manual” and “External” trigger sources. The backlight of the key lights when the key is being used.

Burst

Used to generate “sine wave”, “square wave”, “sawtooth waveform” and “arbitrary waveform” burst output.

It supports “NCycle”, “Gated” and “Infinite” burst modes.

Noise can also be used to generate gated burst.

It supports “Internal”, “Manual” and “External” trigger sources.

The backlight of the key lights when the key is being used.

Store/Recall

Users can save/recall the instrument setup or arbitrary waveform data edited by users.

Users can do normal file operations since the function generator supports file management system.

The function generator has an internal nonvolatile memory (C disk) and can have an external USB drive (D disk) attached via the front panel USB connector.

The backlight lights when the key is being used.

Utility

The utility key is used to set some system parameters and check version information.

- The backlight lights when the key is being used.

Help

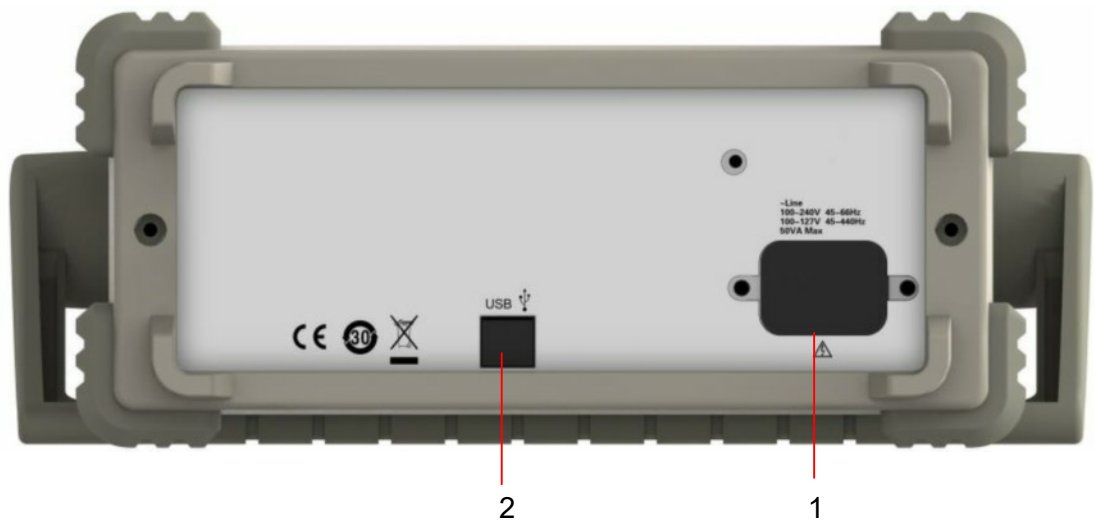
Press the help key to obtain built-in help information about the product.

- The backlight lights when the key is being used.

12. Menu Keys

Each menu key corresponds to the appropriate software menu selection.

Back Panel



1. AC Power Supply Input

The waveform generator can input two different kinds of AC power supply:
100 - 240 V at 50/60 Hz or 100 - 120 V at 400 Hz

The fuse type is: 1.25 A, 250 V

2. USB Device

Connect the instrument to a computer through the port, and use software to control the waveform generator.

User Interface

The example below shows the interface when selecting sine wave.

Current Function

Displays the current function name.

For example: “sine” in this example.

Waveform Display Area

Shows the channel's current waveform.

Frequency

Shows the channel's waveform frequency.

Adjust the frequency value by selecting the frequency menu then use the number keypad or knob.

Amplitude

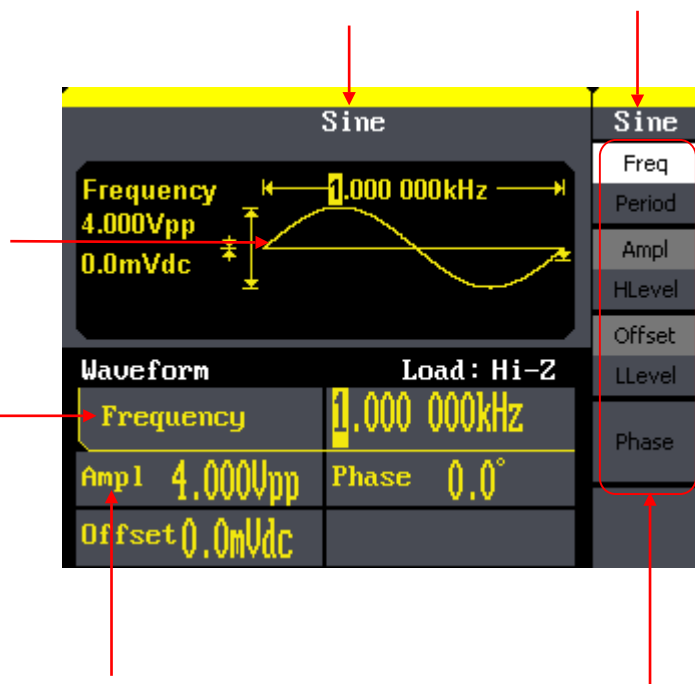
Shows the channel's waveform amplitude.

Adjust the amplitude value by selecting the amplitude menu then use the number keypad or knob.

Menu

Shows the corresponding operation menu and adjustment options of the current function.

For example “Sine” wave in the above diagram.



The example below shows the interface when selecting sine wave.

Load

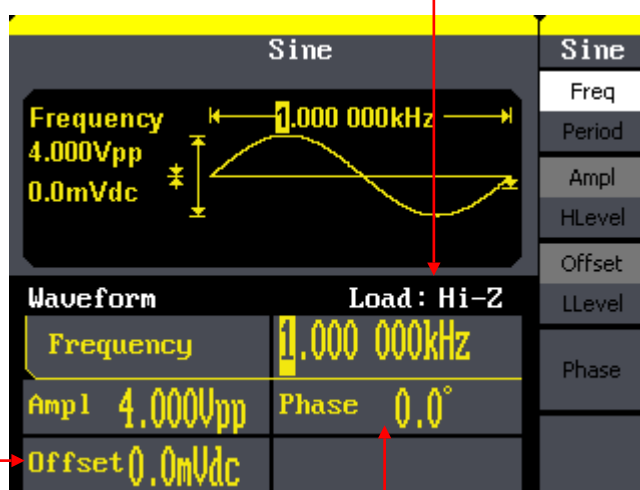
Shows each channel's load setting.

High Resistance: displays "Hi-Z"
Load display default is "50 Ω "

Offset

Shows the channel's DC offset value.

Adjust the offset value by selecting the Offset menu then use the number keypad or knob.



Phase

Shows the channel's current phase value.

Adjust the Phase value by selecting the Phase menu then use the number keypad or knob.

Using the Built-In Help System

To access the built-in help system, press the **Help** key, then use the arrow keys to choose the help item you want. Finally, press **Select** to obtain help.

The help listings are as follows:

1. View the instrument information
2. Basic waveform output
3. Arbitrary waveform output
4. Generate a modulated waveform
5. Sweep output
6. Burst output
7. Storage management.
8. Generate a DC-only signal
9. Synchronize multiple instruments
10. Reset the instrument to its default state



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ABOUT TELEDYNE TEST TOOLS

Company Profile

Teledyne LeCroy is a leading provider of oscilloscopes, protocol analyzers and related test and measurement solutions that enable companies across a wide range of industries to design and test electronic devices of all types. Since our founding in 1964, we have focused on creating products that improve productivity by helping engineers resolve design issues faster and more effectively. Oscilloscopes are tools used by designers and engineers to measure and analyze complex electronic signals in order to develop high-performance systems and to validate electronic designs in order to improve time to market.

The Teledyne Test Tools brand expands on the Teledyne LeCroy product portfolio by adding a comprehensive range of test equipment solutions for its customers. The new range of product solutions deliver engineers with a broad range of quality test solutions that enables speed to market product validation and design. More and more designers, engineers and lecturers are relying on Teledyne Test Tools to meet their testing, education and electronics validation needs with confidence and within budget.

Location and Facilities

Headquartered in Chestnut Ridge, New York, Teledyne Test Tools and Teledyne LeCroy have sales, service and development subsidiaries in the US and throughout Europe and Asia. Teledyne Test Tools and Teledyne LeCroy products are employed across a wide variety of industries, including semiconductor, computer, consumer electronics, education, military/aerospace, automotive/industrial, and telecommunications.

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