

# WaveStation 3000

## Function/Arbitrary Waveform Generator

### Getting Started Guide





**TELEDYNE LECROY**  
Everywhereyoulook™

700 Chestnut Ridge Road  
Chestnut Ridge, NY 10977

1.800.5.LECROY • [teledynelecroy.com](http://teledynelecroy.com)

## **WaveStation 3000**

### **Getting Started Guide**

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## Welcome

Thank you for buying a Teledyne LeCroy product. We're certain you'll be pleased with the detailed features so unique to our instruments. This Getting Started Guide is designed to cover important safety and installation information for your waveform generator, along with some basic operating procedures so you're quickly working with the instrument.

### WaveStation™

With 5 basic signal types, and over 30 built-in arbitrary waveforms the WaveStation is a versatile waveform generator. A variety of modulation schemes, intuitive waveform editing software and remote control capabilities, enable versatile waveform generation of waveforms up to 160 MHz. The large color display and simple user interface make it easy to generate a wide range of waveforms.

### Specifications

Detailed specifications are maintained on the product page at [teledynelecroy.com](http://teledynelecroy.com).

Key Specifications	
<b>Bandwidth</b>	80 MHz – 160 MHz
<b>Channels</b>	2
<b>Memory</b>	512 kpts
<b>Sample Rate</b>	500 MS/s
<b>Vertical Resolution</b>	14-bit

### High Performance and Signal Fidelity

High performance hardware enables WaveStation to create accurate stable waveforms. High sample rate and resolution combined with low jitter and harmonic distortion means waveforms seen on the display are accurately created and outputted by the hardware.

### Graphical Waveform Creation

Easily create and edit waveforms on the PC with mathematical operations, filters, and point-by-point editing or draw a waveform with a mouse. Transfer waveforms to WaveStation over USB and view it on the large display. Additionally, connecting a WaveAce oscilloscope to the same PC enables seamless transfer of real world signals from oscilloscope to the WaveStation.

### Materials List

Check that you have all the parts listed here. Contact Teledyne LeCroy immediately if any part is missing.

- One (1) Function/Arbitrary Waveform Generator
- One (1) AC Line (Power) Cord rated for the region
- One (1) USB2.0 Cable Type A to B
- One (1) USB to GPIB Converter
- One (1) Getting Started Guide
- One (1) Waveform Generator Registration Card
- One (1) Performance Certificate
- One (1) Declaration of Conformity

## Front Panel



**A** USB port for Memory Stick or USB-GPIB connection

**B** Power button

**C** Color display

**D** Softkey selection buttons

**E** Numeric keypad

**F** Function buttons

**G** CH1/CH2 selection button

**H** Adjust knob

**I** Left/Right buttons

**J** CH1 and CH2 Output buttons

**K** CH1 and CH2 Output connectors

## Back Panel



**L** BNC terminals for Modulation In, 10 MHz In, 10 MHz Out, Sync Out and Ext Trig/Gate/Fsk/Burst

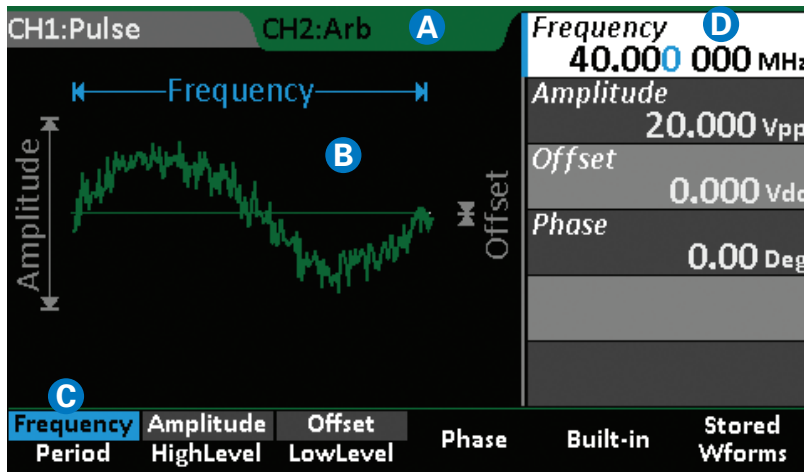
**M** USB 2.0 port for USBTMC connections

**N** Ground terminal

**O** AC Power port

## Display

The large color display and simple user interface make it easy to generate a wide range of waveforms. The display shows all relevant waveform parameters and the waveform shape. View the modulated waveform on the display and see how it changes when varying output frequency, carrier waveform or modulation type.



- A** **Tabs** show which channel, waveform, or conditioning settings are active. Change from gray to channel color when active.
- B** **Diagram** displays active parameter in relation to waveform.
- C** **Menu** of waveform, parameter, or utilities options. Selected option is highlighted blue.
- D** **Parameter** values list. Active parameter is highlighted white; active digit is highlighted blue.

## Generate a Basic Waveform

1. Press **CH1/CH2** button **A** to select channel.
2. Press **Waveform** button **B**, then press **softkey** button **C** to choose waveform type from option menu.
3. Press **Parameter** button **D**.
4. Adjust waveform parameters:
  - Press **softkey** button **C** to select parameter.
  - Press **Left/Right** button **E** to select digit.
  - Turn **knob** **F** to change value.
5. Press **CH1** or **CH2 Output** button **G** to output the waveform.

## Generate a Modulated Waveform

Complete the steps to generate a basic waveform, then:

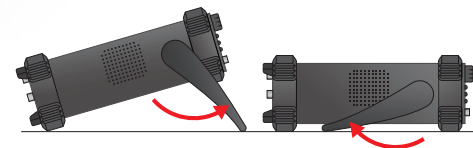
1. Press **Mod(ulate)** button **H**.
2. Press **softkey** button **C** to select modulation type - AM, FM, PM, FSK and others.
3. Press **softkey** button **C** to select shape of the modulating waveform.
4. Adjust other modulation parameters.
5. Press **CH1** or **CH2 Output** button **G** to output the waveform.





## Generate an Arbitrary Waveform

1. Press **Waveform** button **B**.
2. Press **More softkey** button **C**.
3. Press **Arb softkey** button **C**.
4. Press **Built-in softkey** button **C**.
5. Use softkeys to select arbitrary waveform type from 30+ built-in waveforms.
6. Press **CH1 or CH2 Output** button **G** to output the waveform.



Adjust viewing position by gently pulling handle away from sides and rotating.



## Safety

Observe generally accepted safety procedures in addition to the precautions listed here.

### Operating Environment

**Temperature:** 0° C to 40° C

**Humidity:** Maximum relative humidity 80% (non-condensing) for temperatures up to 30° C decreasing linearly to 50% relative humidity at 40° C.

**Altitude:** Up to 10,000 ft (3,048 m) at or below 30° C

### Symbols

These symbols appear on the body of the instrument or in documentation.



**CAUTION** of potential damage to equipment, or **WARNING** of potential bodily injury. Do not proceed until the accompanying information is fully understood and conditions are met.



Measurement ground connection.



Frame or chassis connection.



Safety (protective) ground connection.



Power on/off.

### Precautions

**Use proper power cord.** Use only the power cord shipped with this instrument and certified for the country of use.

**Maintain ground.** This product is grounded through the power cord grounding conductor. To avoid electric shock, connect only to a grounded mating outlet.

**Observe all terminal ratings.** Do not apply a voltage to any input that exceeds the maximum rating of that input. Refer to the markings next to the BNC terminals for maximum allowed values.

**Use only within operational environment listed.** Do not use in wet or explosive environment. Use indoors only.

**Keep product surfaces clean and dry.**

**Do not block the cooling vents.** Leave a minimum six-inch (15 cm) gap between the instrument and the nearest object. Keep the underside clear of papers and other objects.

**Do not remove the covers or inside parts.** Refer all maintenance to qualified service personnel.

**Do not operate with suspected failures.** Check body and cables regularly. If any part is damaged, cease operation immediately and sequester the instrument from inadvertent use.

### Power

**AC Power:** 100 - 240 VAC ( $\pm 10\%$ ) at 50/60 Hz ( $\pm 5\%$ ) or 100 - 240 VAC ( $\pm 10\%$ ) at 400 Hz ( $\pm 5\%$ )

**Maximum power consumption:** 50 VA



## Maintenance

- **Clean** the outside of the WaveStation using a soft cloth moistened with water or isopropyl alcohol solution. Dry thoroughly. Do not use harsh or abrasive cleansers. Do not submerge instrument or allow moisture to penetrate.
- Perform **SelfCal** and **SelfTest(s)** as needed. See the *WaveStation 3000 Operator's Manual* for instructions.
- Schedule **Factory calibration** once per year. Contact your local Teledyne LeCroy office for service.

## Warranty

**NOTE:** THE WARRANTY BELOW REPLACES ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS, OR ADEQUACY FOR ANY PARTICULAR PURPOSE OR USE. TELEDYNE LECROY SHALL NOT BE LIABLE FOR ANY SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, WHETHER IN CONTRACT OR OTHERWISE. THE CUSTOMER IS RESPONSIBLE FOR THE TRANSPORTATION AND INSURANCE CHARGES FOR THE RETURN OF PRODUCTS TO THE SERVICE FACILITY. TELEDYNE LECROY WILL RETURN ALL PRODUCTS UNDER WARRANTY WITH TRANSPORT PREPAID.

The WaveStation is warranted for normal use and operation, within specifications, for a period of three years from shipment. Teledyne LeCroy will either repair or, at our option, replace any product returned to one of our authorized service centers within this period. However, in order to do this we must first examine the product and find that it is defective due to workmanship or materials and not due to misuse, neglect, accident, or abnormal conditions or operation.

Teledyne LeCroy shall not be responsible for any defect, damage, or failure caused by any of the following: a) attempted repairs or installations by personnel other than Teledyne LeCroy representatives or b) improper connection to incompatible equipment, or c) for any damage or malfunction caused by the use of non-Teledyne LeCroy supplies. Furthermore, Teledyne LeCroy shall not be obligated to service a product that has been modified or integrated where the modification or integration increases the task duration or difficulty of servicing the instrument. Spare and replacement parts, and repairs, all have a 90-day warranty.

The instrument's firmware has been thoroughly tested and is presumed to be functional. Nevertheless, it is supplied without warranty of any kind covering detailed performance. Products not made by Teledyne LeCroy are covered solely by the warranty of the original equipment manufacturer.

## Certifications

This section certifies the instrument's Electromagnetic Compatibility (EMC), Safety, and Environmental compliance.

### EMC Compliance

#### EC DECLARATION OF CONFORMITY - EMC

The instrument meets intent of EC Directive 2004/108/EC for Electromagnetic Compatibility. Compliance was demonstrated to the following specifications as listed in the Official Journal of the European Communities:

EN 61326-1:2006, EN 61326-2-1:2006 EMC requirements for electrical equipment for measurement, control, and laboratory use.

### Safety Compliance

#### EC DECLARATION OF CONFORMITY – LOW VOLTAGE

The instrument meets intent of EC Directive 2006/95/EC for Product Safety. Compliance was demonstrated to the following specifications as listed in the Official Journal of the European Communities:

EN 61010-1:2010 Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 1: General requirements

EN 61010-2:030:2010 Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 2-030: Particular requirements for testing and measuring circuits

#### U.S. NATIONALLY RECOGNIZED AGENCY CERTIFICATION

The instrument has been certified by Underwriters Laboratories (UL) to conform to the following safety standard and bears UL Listing Mark:

UL 61010-1 Third Edition, Safety standard for electrical measuring and test equipment.

### CANADIAN CERTIFICATION

The instrument has been certified by Underwriters Laboratories (UL) to conform to the following safety standard and bears cUL Listing Mark:

CAN/CSA-C22.2 No. 61010-1-12 Safety requirements for electrical equipment for measurement, control and laboratory use.

### Environmental Compliance

#### END-OF-LIFE HANDLING



The instrument is marked with this symbol to indicate that it complies with the applicable European Union requirements to Directives 2002/96/EC and 2006/66/EC on Waste Electrical and Electronic Equipment (WEEE) and Batteries.

The instrument is subject to disposal and recycling regulations that vary by country and region. Many countries prohibit the disposal of waste electronic equipment in standard waste receptacles. For more information about proper disposal and recycling of your Teledyne LeCroy product, please visit [teledynelecroy.com/recycle](http://teledynelecroy.com/recycle).

#### RESTRICTION OF HAZARDOUS SUBSTANCES (ROHS)

This instrument has been classified as Industrial Monitoring and Control Equipment, and is outside the scope of the 2011/65/EU RoHS Directive until 22 July 2017 (per Article IV, Paragraph 3).

## Teledyne LeCroy Service Centers

<p><b>United States and Canada World Wide Corporate Office</b></p> <p>Teledyne LeCroy 700 Chestnut Ridge Road Chestnut Ridge, NY, 10977-6499 Ph: 800-553-2769 / 845-425-2000 Fax: 845-578-5985 teledynelecroy.com</p> <p><b>Support:</b> contact.corp@teledynelecroy.com</p> <p><b>Sales:</b> customersupport@teledynelecroy.com</p>	<p><b>US Protocol Solutions Group</b></p> <p>Teledyne LeCroy 3385 Scott Boulevard Santa Clara, CA, 95054 teledynelecroy.com</p> <p><b>Sales and Service:</b> Ph: 800-909-7211 / 408-727-6600 Fax: 408-727-0800 contact.corp@teledynelecroy.com</p> <p><b>Support:</b> Ph: 800-909-7112 / 408-653-1260 psgsupport@teledynelecroy.com</p>	<p><b>Europe</b></p> <p>Teledyne LeCroy SA 4, Rue Moïse Marcinhes Case postale 341 1217 Meyrin 1 Geneva, Switzerland Ph: +41 22 719 2228 / 2323 / 2277 Fax: +41 22 719 2233 contact.sales@teledynelecroy.com applications.indirect@teledynelecroy.com teledynelecroy.com/europe</p> <p><b>Protocol Analyzers:</b> Ph: +44 12 765 0397 1</p>	<p><b>Singapore</b></p> <p><b>Oscilloscopes:</b> Teledyne LeCroy Singapore Pte Ltd. Blk 750C Chai Chee Road #02-08 Singapore 469003 Ph: ++ 65 64424880 Fax: ++ 65 64427811</p> <p><b>Protocol Analyzers:</b> Genetron Singapore Pte Ltd. 37 Kallang Pudding Road, #08-08 Tong Lee Building Block B Singapore 349315 Ph: ++ 65 9760-4682</p>
<p><b>Taiwan</b></p> <p>LeColn Technology Co Ltd. Far East Century Park, C3, 9F No. 2, Chien-8th Road Chung-Ho Dist., New Taipei City, Taiwan Ph: ++ 886 2 8226 1366 Fax: ++ 886 2 8226 1368 sales_twn@teledynelecroy.com</p>	<p><b>Korea</b></p> <p>Teledyne LeCroy Korea 10th fl. Ildong Bldg. 968-5 Daechi-dong, Gangnam-gu Seoul 135-280, Korea Ph: ++82 2 3452 0400 Fax: ++82 2 3452 0490</p>	<p><b>China</b></p> <p>Teledyne LeCroy Beijing Rm. 2001 Unit A, Horizon Plaza No. 6 Zhichun Rd., Haidian Dist. Beijing 100088, China Ph: ++86 10 8280 0318 / 0319 / 0320 Fax: ++86 10 8280 0316</p> <p><b>Service:</b> Rm. 2002 Ph: ++86 10 8280 0245</p>	<p><b>Japan</b></p> <p>Teledyne LeCroy Japan Hobunsha Funchu Bldg, 3F 3-11-5, Midori-cho, Fuchu-Shi Tokyo, 183-0006 Japan Ph: ++ 81 4 2402 9400 Fax: ++ 81 4 2402 9586 teledynelecroy.com/japan</p>

