TELEDYNE TEST TOOLS
Everywhereyoulook™

Quick Start Guide

T3PS13206, T3PS23203, T3PS33203 and T3PS43203 DC Power Supply Quick Start Guide

The information in this manual was correct at the time of printing. However, Teledyne LeCroy continues to improve products and reserves the rights to change specification, equipment, and maintenance procedures at any time without notice.

Table of Contents

SAFETY INSTRUCTIONS

This chapter contains important safety instructions that you must follow when operating the T3PSX3200 series and when keeping it in storage. Read the following before any operation to insure your safety and to keep the best condition for the T3PSX3200 series.

Safety Symbols

These safety symbols may appear in this manual or on the T3PSX3200 series.

 WARNING	Warning: Identifies conditions or practices that could result in injury or loss of life.
 CAUTION	Caution: Identifies conditions or practices that could result in damage to the T3PSX3200 series or to other properties.
	DANGER High Voltage
	Attention Refer to the Manual
	Protective Conductor Terminal
	Earth (ground) Terminal
	Do not dispose electronic equipment as unsorted municipal waste. Please use a separate collection facility or contact the supplier from which this instrument was purchased.

Safety Guidelines

General Guidelines

⚠ CAUTION

- Do not place any heavy object on the device.
- Avoid severe impacts or rough handling that leads to damaging the device.
- Do not discharge static electricity to the device.
- Do not block or obstruct the cooling fan vent opening.
- Do not perform measurement at circuits directly connected to Mains (see note below).
- Do not disassemble the device unless you are qualified as service personnel.

(Measurement categories) EN 61010-1:2010 specifies the measurement categories and their requirements as follows. The T3PSX3200 series falls under category I.

- Measurement category IV is for measurement performed at the source of low-voltage installation.
- Measurement category III is for measurement performed in the building installation.
- Measurement category II is for measurement performed on the circuits directly connected to the low voltage installation.

Power Supply

⚠ WARNING

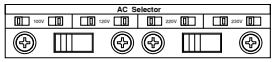
- AC Input voltage:
  100V/120V/220V±10%, 230VAC +10%/-6%, 50/60Hz
- Connect the protective grounding conductor of the AC power cord to an earth ground, to avoid electrical shock.

Fuse

⚠ WARNING

- Fuse type:
  100V/120V: T6.3A/250V
  220V/230V: T3.15A/250V
- Make sure the correct type of fuse is installed before power up.

	• To ensure fire protection, replace the fuse only with the specified type and rating. • Disconnect the power cord before fuse replacement. • Make sure the cause of fuse blowout is fixed before fuse replacement.
Cleaning the device	• Disconnect the power cord before cleaning. • Use a soft cloth dampened in a solution of mild detergent and water. Do not spray any liquid. • Do not use chemicals or cleaners containing harsh products such as benzene, toluene, xylene, and acetone.
Operation Environment	• Location: Indoor, no direct sunlight, dust free, almost non-conductive pollution (note below) • Relative Humidity: < 80% • Altitude: < 2000m • Temperature: 0°C to 40°C
	(Pollution Degree) EN 61010-1:2010 specifies the pollution degrees and their requirements as follows. The T3PSX3200 series falls under degree 2. Pollution refers to "addition of foreign matter, solid, liquid, or gaseous (ionized gases), that may produce a reduction of dielectric strength or surface resistivity". • Pollution degree 1: No pollution or only dry, non-conductive pollution occurs. The pollution has no influence. • Pollution degree 2: Normally only non-conductive pollution occurs. Occasionally, however, a temporary conductivity caused by condensation must be expected. • Pollution degree 3: Conductive pollution occurs, or dry, non-conductive pollution occurs which becomes conductive due to condensation which is expected. In such conditions, equipment is normally protected against exposure to direct sunlight, precipitation, and full wind pressure, but neither temperature nor humidity is controlled.

Storage environment	• Location: Indoor • Relative Humidity: < 70% • Temperature: −10°C to 70°C
Disposal 	Do not dispose this instrument as unsorted municipal waste. Please use a separate collection facility or contact the supplier from which this instrument was purchased. Please make sure discarded electrical waste is properly recycled to reduce environmental impact.
Select AC voltage CAUTION	Before powering up the power supply, select the AC input voltage from the rear panel. 

Power cord for the United Kingdom

When using the T3PSX3200 series in the United Kingdom, make sure the power cord meets the following safety instructions.

NOTE: This lead/appliance must only be wired by competent persons

⚠WARNING: THIS APPLIANCE MUST BE EARTHED

IMPORTANT: The wires in this lead are coloured in accordance with the following code:

Green/ Yellow:	Earth
Blue:	Neutral
Brown:	Live (Phase)

As the colours of the wires in main leads may not correspond with the colours marking identified in your plug/appliance, proceed as follows:

The wire which is coloured Green & Yellow must be connected to the Earth terminal marked with the letter E or by the earth symbol ⏚ or coloured Green or Green & Yellow.

The wire which is coloured Blue must be connected to the terminal which is marked with the letter N or coloured Blue or Black.

The wire which is coloured Brown must be connected to the terminal marked with the letter L or P or coloured Brown or Red.

If in doubt, consult the instructions provided with the equipment or contact the supplier.

This cable/appliance should be protected by a suitably rated and approved HBC mains fuse: refer to the rating information on the equipment and/or user instructions for details. As a guide, cable of 0.75mm^2 should be protected by a 3A or 5A fuse. Larger conductors would normally require 13A types, depending on the connection method used.

Any moulded mains connector that requires removal /replacement must be destroyed by removal of any fuse & fuse carrier and disposed of immediately, as a plug with bared wires is hazardous if a engaged in live socket. Any re-wiring must be carried out in accordance with the information detailed on this label.

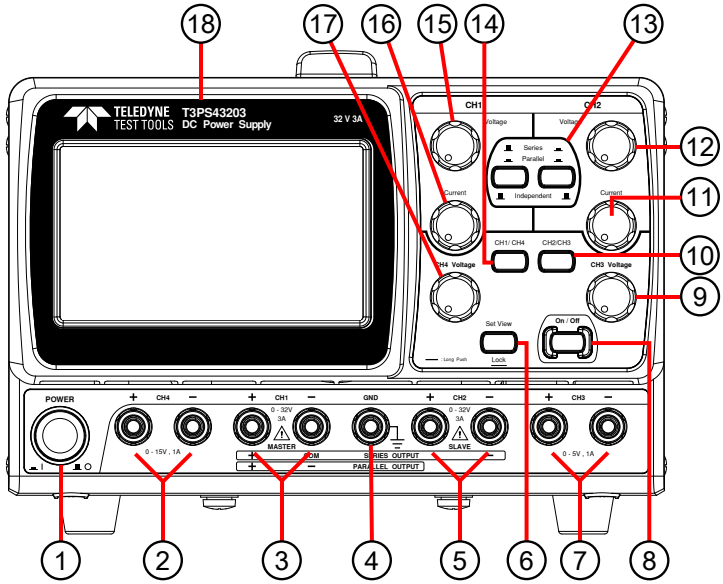
Overview

This chapter describes the T3PSX3200 series in a nutshell, including its main features and front/ rear panel introduction. After going through the overview, follow the Setup chapter (page 19) to properly power up and set operation environment.

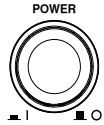
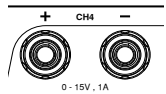
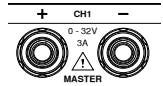
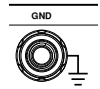
Series Lineup / Main Features

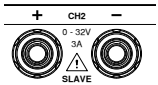
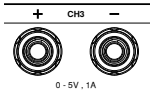
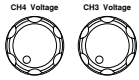
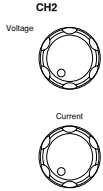
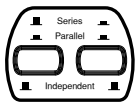
Performance	• Low noise: Temperature controlled cooling fan • Compact size, light weight
Operation	• Constant Voltage / Constant Current operation • Series Tracking / Parallel Tracking operation • Output On/Off control • Multi-output: T3PS13206: 32V/6A x1; T3PS23203: 32V/3A x2; T3PS33203: 32V/3A x2, 5V/5A x 1 T3PS43203: 32V/3A x2, 5V/1A x1, 15V/1A x1 • Coarse and fine Voltage/Current control(T3PS13206) • Output voltage compensation control (T3PS13206) • Function for locking the setting voltage (CH1/CH2) • Output voltage/ current setting view • Set the displayed digit resolution for the voltage & current output.
Protection	• Overload protection • Reverse polarity protection • Inadvertent voltage setting protection
Interface	• Remote control (Output ON/OFF)

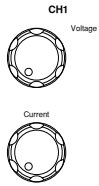
Front Panel Overview



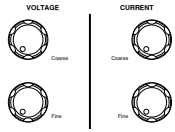
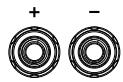
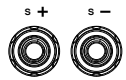
The figure above is the front view of the T3PS43203. For views of other models, please refer to physical device.

No.	Item	Diagram	Description
①	Power Switch		Turns On▬ or Off■ the main power.
②	CH4 Output		Outputs CH4 voltage and current.
③	CH1 Output		Outputs CH1 voltage and current.
④	GND Terminal		Accepts a grounding wire.

⑤	CH2 Output	 Outputs CH2 voltage and current.
⑥	View setting value/ Key lock	 When the output is ON, you can view the voltage/current settings of each channel by pressing this key. The corresponding channel will be displayed on the LCD display. Press and hold the key to lock and unlock the panel keys (except OUTPUT).
⑦	CH3 Output	 Outputs CH3 voltage and current.
⑧	Output Key	 Turns the output on or off.
⑨ ⑰	CH3/ CH4	 Sets the voltage for the T3PS43203.
⑩ ⑭	CH1/3 and CH2/4	 Views the channel settings or readback values for T3PS43203 voltage/current. Press the CH1/3 or CH2/4 key to toggle the view for the corresponding channels in the display.
⑪ ⑫	CH2	 Sets the voltage/current for the T3PS23203/33203/43203.
⑬	Parallel/ Series Keys	 Activates parallel/series tracking operation. The corresponding channel will be displayed on the LCD display. The T3PS13206 doesn't have this function.

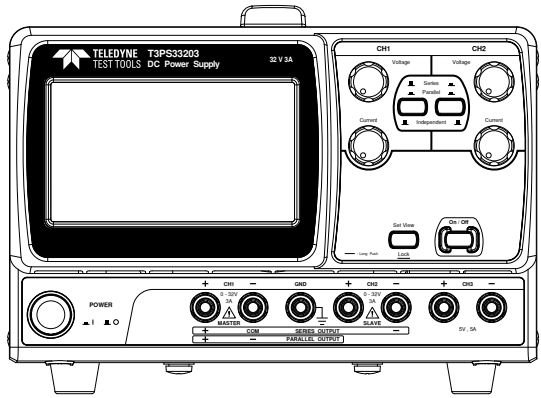
⑮ CH1 ⑯		Sets the voltage/current for the T3PS23203/33203/43203.

(For T3PS13206 only)

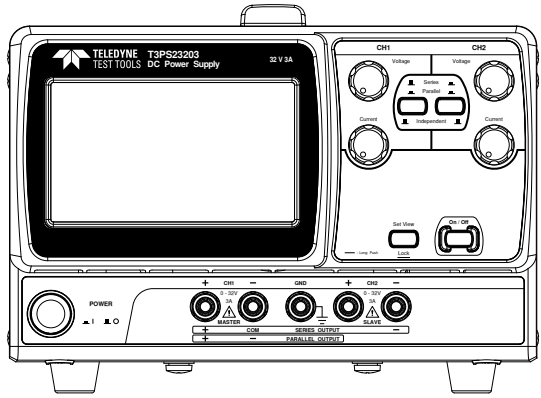
Single Channel		Sets the voltage and current. It has coarse and fine adjustment features. The fine-tune range is about 1/10th of the present setting value.
The Output terminal		Output voltage and current
The Sense terminal		Remote sense terminals

Front views of the other three models:

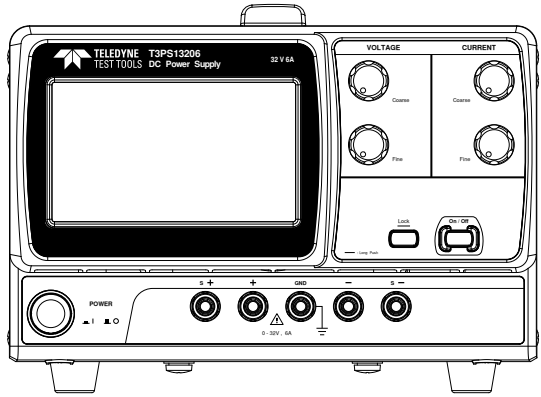
T3PS33203



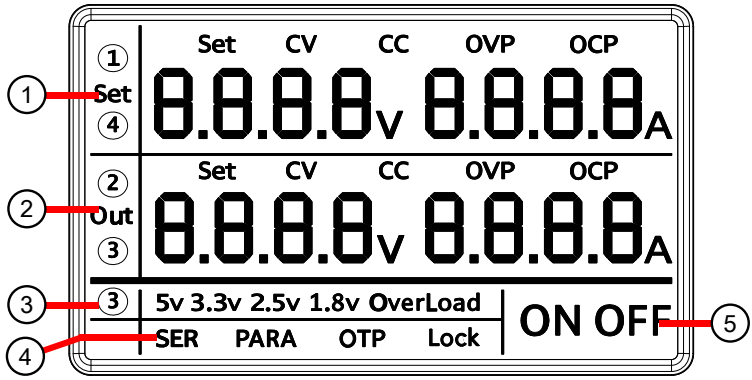
T3PS23203



T3PS13206



Display



No.	Item	Description
①	CH1/CH4 parameter display area	
	*(Parameter settings for the T3PS13206)	
②	CH2/CH3 parameter display area	
	*(Parameter settings for the T3PS13206)	
③	CH3 parameter display area for the T3PS33203	
④	Status display area	
⑤	Output status display	ON OFF

Voltmeter Displays output voltage of each channel.
T3PS43203: CH1/CH4 and CH2/CH3
T3PS23203/33203: CH1 and CH2
T3PS13206: Voltage setting/readback

3 digits: 

4 digits: 

CH3 display: 5V .
(T3PS33203)

Ammeter — Displays output current of each channel.
T3PS43203: CH1/CH4 and CH2/CH3
T3PS23203/T3PS33203: CH1 and CH2
T3PS13206: Current setting/readback

3 digits: 

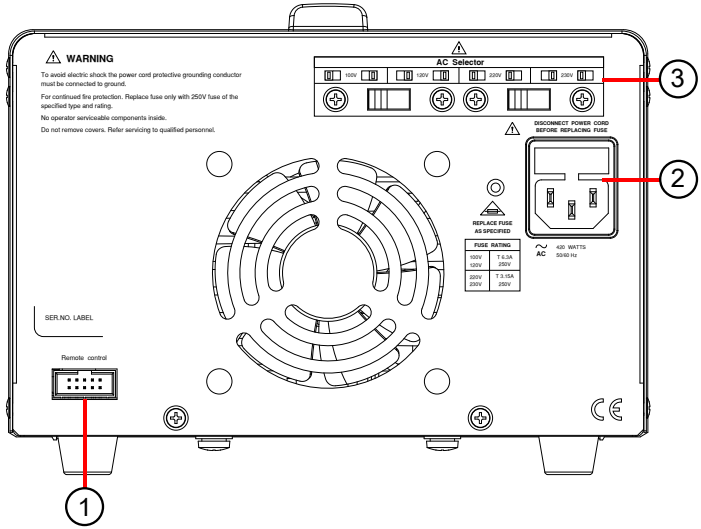
4 digits: 

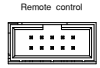
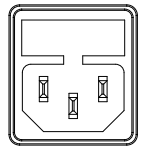
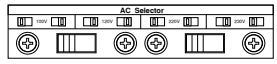
CV/CC/OVP indicators for CH1/4 — CV CC — You can view the constant current, constant voltage or OVP status for CH1 or CH4, depending on which CH1 (① icon appears on the leaf-hand side of the LCD display.) or CH4 (④) is selected. Each state is valid only when the output is ON. When output is OFF, the display is turns off.

CV/CC/OVP indicators for CH2/3 — CV CC — You can view the constant current, constant voltage or OVP status for CH2 or CH3, depending on which CH2 (② icon appears on the leaf-hand side of the LCD display.) or CH3 (③) is selected. Each state is valid only when the output is ON. When output is OFF, the display is turns off.

View setting value	Set	When output is ON, you can view the voltage/ current setting value depending on the channel be selected. The T3PS13206 display both reading and setting values simultaneously without pressing this function key. When the output is on, you can view the voltage/current setting depending on which channel is selected. The T3PS13206 displays both the reading and the setting values simultaneously without pressing this function key.
Channel indicator	①②③④	Indicates the currently selected channel. The T3PS13206 doesn't have such display.
Output status of CH3 in the T3PS33203	OverLoad	When the output current is over range, the overloaded indicator Overload will be lit on the LCD display.

Rear Panel Overview



No.	Item	Diagram	Description
①	Remote Control Terminal		For more information about the remote control terminal.
②	Power Cord / Fuse Socket		The power cord socket accepts the AC mains. The fuse holder contains the AC mains fuse.
③	AC Selector		Selects AC input voltage: 100V/ 120V/ 220V/ 230V; 50 ~ 60Hz.

SETUP

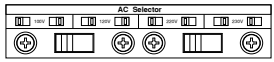
This chapter describes how to properly power up and configure the T3PSX3200 series before operation.

Power Up

Select AC voltage

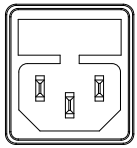
CAUTION

Before powering up the power supply, select the AC input voltage from the rear panel.



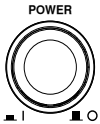
Connect AC power cord

Connect the AC power cord to the rear panel socket.



Power On

Press the power switch to turn on the power. The display will first display all the LCD segments before showing settings for each channel.



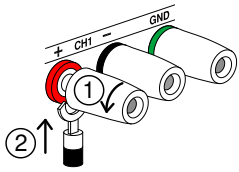
Power switch

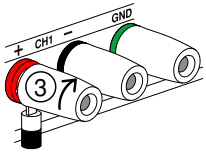
Press the power switch again to turn off the power.

Load Cable Connection

Standard accessories (GTL-104A, GTL-105A)

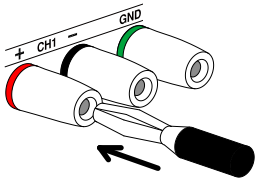
1. Turn the terminal counterclockwise and loosen the screw.
2. Insert the cable terminal.
3. Turn the terminal clockwise and tighten the screw.





Banana plug

Insert the plug into the socket.

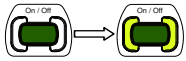
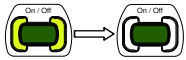


Wire type

When using load cables other than the attached, make sure they have enough current capacity for minimizing cable loss and load line impedance. Voltage drop across a wire should not excess 0.5V. The following list is the wire current rating at 450A/cm^2.

Wire size (AWG)	Maximum current (A)
20	2.5
18	4
16	6
14	10
12	16

Output On/Off

Panel operation	Press the Output key to turn on all outputs in each channel.	
	Push the Output key again to turn off all outputs. The OFF icon will become lit on the LCD display.	

Automatic output off

Any of the following actions during output on automatically turns it off.

- Change the operation mode between independent / series tracking / parallel tracking
- When OVP is activated on a channel (except CH3 on the T3PS33203)
- When the lock function is disabled.
- When toggling to remote control

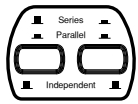
Select CH1/CH2 series or parallel mode

Background / Connection

When you need to output a higher voltage or current through the T3PSX3200 series can be connected in series or parallel to achieve it. When connecting in series, the output voltage is twice than that of a single channel. When connecting in parallel, the output current is twice than that of a single channel.

Panel operation

You can toggle the connection mode of CH1/ CH2 by using different combinations of the mode selection key.



- For the independent mode, the right key is not pressed

- Toggle to parallel mode when both keys are pressed.

- Right key is pressed and the left key is not pressed in series mode.

- When CH1 / CH2 is in the series or parallel mode, the corresponding series or parallel icon appears on the LCD display.

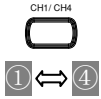
Switch between Channels

Background / Connection

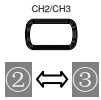
This feature is only available for the T3PS43203.The voltage and current settings and readback values for 2 channels can be displayed on the LCD display simultaneously. To check and view the relevant information for the other channels, you need to switch channels. Please follow the steps listed below to switch between channels.

Panel operation

Press the CH1/4 key to toggle between CH1 and CH4. The activated channel will be shown on the channel indicator.



Press the CH2/3 key to toggle between CH2 and CH3. The activated channel will be shown on the channel indicator.



APPENDIX

Specifications

The specifications apply when the T3PSX3200 series are powered on for at least 30 minutes under +20°C – +30°C.

Output Ratings	CH1/CH2 Independent	0 ~ 32V / 0 ~ 3A 0 ~ 32V / 0 ~ 6A(T3PS13206)
	CH1/CH2 Series	0 ~ 64V / 0 ~ 3A
	CH1/CH2 Parallel	0 ~ 32V / 0 ~ 6A
	CH3	5V, 5A(T3PS33203) 0~5V, 1A(T3PS43203)
	CH4	0~15V,1A
Voltage Regulation	Line	≤ 0.01% + 3mV
	Load	≤ 0.01% + 3mV(rating current ≤ 3A) ≤ 0.02% + 5mV(rating current > 3A)
	Ripple & Noise	≤ 1mVrms (5Hz ~ 1MHz)
	Recovery Time	≤ 100μs(50% load change, minimum load 0.5A)
	Temperature Coefficient	≤ 300ppm/°C
Current Regulation	Line	≤ 0.2% + 3mA
	Load	≤ 0.2% + 3mA
	Ripple & Noise	≤ 3mArms

Tracking Operation	Tracking Error	≤ 0.1% + 10mV of Master (0~32V) (No Load, with load add load regulation ≤100mV))
	Parallel Regulation	Line: ≤ 0.01% + 3mV Load: ≤ 0.01% + 3mV(rating current ≤ 3A) Load: ≤ 0.02% + 5mV(rating current > 3A)
	Series Regulation	Line: ≤ 0.01% + 5mV Load: ≤ 100mV
	Ripple & Noise	≤ 2mVrms, 5Hz ~1MHz
Meter Resolution	Voltage	10mV or 100mV
	current	1mA or 10mA 2mA or 10mA (T3PS13206)
Display	LCD	4.3" single color LCD display
	Ammeter	3.200A full scale, 4 digits or 3 digits 6.200A full scale, 4 digits or 3digits (T3PS13206)
	Voltmeter	33.00V full scale, 4 digits or 3 digits
Accuracy	Setting/ Read back Accuracy	Voltage: ±0.1% of reading + 30mV(4digits) ±0.1% of reading + 200mV(3digits) Current: ±0.3% of reading + 6mA(4digits) ±0.3% of reading + 20mA(3digits) ±0.3% of reading + 10mA) (4digits, for T3PS13206) ±0.3% of reading + 20mA) (3digits, For T3PS13206)
CH3 on the T3PS33203	Output Voltage	5V, ±5%
	Output Current	5A
	Line	≤ 3mV
	Load	≤ 10mV
	Ripple & Noise	≤ 2mVrms (5Hz ~ 1MHz)
Insulation	Chassis and Terminal	20MΩ or above (DC 500V)
	Chassis and AC cord	30MΩ or above (DC 500V)

Operation Environment	Indoor use, Altitude: ≤ 2000m Ambient temperature: 0 ~ 40°C Relative humidity: ≤ 80% Installation category: II Pollution degree: 2
Storage Environment	Ambient temperature: -10 ~ 70°C Relative humidity: ≤ 70%
Power Source	AC 100V/120V/220V±10%, 230V+10%/-6%, 50/60Hz
Accessories	Quick Start Guide x 1 Power Cord x 3 Test lead: T3PS13206: GTL-104A x1, GTL-105A x1 T3PS23203: GTL-104A x2 T3PS33203: GTL-104A x3 T3PS43203: GTL-104A x2, GTL-105A x2
Dimensions	210 (W) x 155 (H) x 306 (D) mm
Weight	Approx. 8.7kg

Specifications listed above are specifications under the “Unlock” state.

ABOUT TELEDYNE TEST TOOLS

TELEDYNE TEST TOOLS
Everywhereyoulook™

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 extends the Teledyne LeCroy product portfolio with a comprehensive range of test equipment solutions. This new range of products delivers a broad range of quality test solutions that enable engineers to rapidly validate product and design and reduce time-to-market. Designers, engineers and educators rely on Teledyne Test Tools solutions to meet their most challenging needs for testing, education and electronics validation.

Location and Facilities

Headquartered in Chestnut Ridge, New York, Teledyne Test Tools and Teledyne LeCroy has 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.

Distributed by:

Teledyne LeCroy (US Headquarters)

700 Chestnut Ridge Road
Chestnut Ridge, NY. USA 10977-6499

Phone:	800-553-2769 or 845-425-2000
Fax Sales:	845-578-5985
Phone Support:	1-800-553-2769
Email Sales:	contact.corp@teledynelecroy.com
Email Support:	support@teledynelecroy.com
Web Site:	http://teledynelecroy.com/

World wide support contacts can be found at:
https://teledynelecroy.com/support/contact

World wide instrument service can be found at:
https://teledynelecroy.com/support/service.aspx

RoHS and WEEE information can be found at:
https://teledynelecroy.com/support/rohs.aspx