PicoScope® 5000D Series
FlexRes® Oscilloscopes and MSOs

User's Guide

Contents

1   Welcome

Thank you for buying a **PicoScope 5000D Series FlexRes Oscilloscope.**

These flexible resolution oscilloscopes are high-specification real-time measuring instruments that connect to the USB port of your computer and use the PicoScope software to work as oscilloscopes and spectrum analyzers. Portability, resolution, deep memory, fast sampling rates and high bandwidth come as standard. These highly versatile oscilloscopes suit a wide range of applications.

The PicoScope 5000D deep-memory oscilloscopes all feature a maximum sampling rate of 1 GS/s, USB 3.0 connectivity, and an arbitrary waveform generator (AWG), as well as the specifications below:

	Analog channels	Digital channels	External trigger	Bandwidth	Capture memory*	
					8-bit mode	12-bit mode and higher
5242D	2	-	✓	60 MHz	128 MS	64 MS
5242D MSO		16	-			
5243D	2	-	✓	100 MHz	256 MS	128 MS
5243D MSO		16	-			
5244D	2	-	✓	200 MHz	512 MS	256 MS
5244D MSO		16	-			
5442D	4	-	✓	60 MHz	128 MS	64 MS
5442D MSO		16	-			
5443D	4	-	✓	100 MHz	256 MS	128 MS
5443D MSO		16	-			
5444D	4	-	✓	200 MHz	512 MS	256 MS
5444D MSO		16	-			

* Shared between active channels

Here are some of the benefits provided by the PicoScope 5000D Series oscilloscopes:

- **Programmability:** PicoSDK® lets you write your own programs, in your chosen programming language, to control all the features of the scope. Using the API functions, you can develop your own programs to collect and analyze data from the oscilloscope. Refer to the *PicoScope 5000 Series (A API) Programmer's Guide* for more information.

- **Long-term support:** Software upgrades and beta versions are available to download from our website. You can also call or email our technical specialists for support, or visit our support forum. All of these services are available free of charge for the lifetime of the product.

- **Five-year warranty:** Your oscilloscope is covered for five years from the date of purchase against manufacturing faults.

For further information on the PicoScope 5000D Series oscilloscopes, see the model comparison tables in this manual and the specification tables in the PicoScope 5000D Series Data Sheet, available on our website.

2   Introduction

2.1   Safety information

To prevent possible electrical shock, fire, personal injury, or damage to the product, carefully read this safety information before attempting to install or use the product. In addition, follow all generally accepted safety practices and procedures for working with and near electricity.

The product has been designed and tested in accordance with the harmonized standard publication EN 61010-1: 2010+A1:2019 (safety requirements for electrical equipment for measurement, control and laboratory use) and EN 61010-2-030: 2010 (requirements for testing and measuring circuits). The product left the factory in a safe condition.

A **WARNING** identifies conditions or practices that could result in injury or death.

A **CAUTION** identifies conditions or practices that could result in damage to the product or equipment to which it is connected.

Each of these safety instructions applies to all of the PicoScope 5000D Series oscilloscopes covered by this User's Guide, unless otherwise specified.

2.1.1   Symbols

These safety and electrical symbols may appear on the product and throughout this guide.

Symbol	Description	
⎓	Direct current	
∿	Alternating current	
⏚	Earth (ground) terminal	The terminal can be used to make a measurement ground connection. The terminal is NOT a safety or protective earth.
⏦	Chassis ground terminal	The ground terminals of connectors marked with this symbol are all connected together, and connected to the host PC via the screen of the USB cable.
⚡	Possibility of electric shock	
⚠	Caution	Appearance on the product indicates a need to read this Safety and operation instruction.
⚠	Static awareness. Static discharge can damage part(s).	
CAT	IEC 61010 overvoltage category	
♺	Do not dispose of this product as unsorted municipal waste	

2.1.2   Product usage

WARNING

To prevent injury or death, use the product only as instructed and use only accessories supplied or recommended. Protection provided by the product may be impaired if used in a manner not specified by the manufacturer.

2.1.3   Maximum input ranges

Observe all terminal ratings and warnings marked on the product.

The table below indicates the full scale measurement range and overvoltage protection range for each oscilloscope model. The full scale measurement ranges are the maximum voltages that can be accurately measured by the instrument. The overvoltage protection ranges are the maximum voltages that will not damage the instrument.

WARNING

To prevent electric shock, do not attempt to measure voltages outside the specified full scale measurement range below.

Model	Full scale measurement range	Overvoltage protection (voltages that will not damage)		
		Input channels / External trigger	**Signal generator**	**Digital inputs**
All PicoScope 5000D Series oscilloscopes	±20 V	±100 V pk max.	±20 V pk max.	±50 V pk max.

WARNING

Signals exceeding the voltage limits in the table below are defined as "hazardous live" by EN 61010. To prevent electric shock, take all necessary safety precautions when working on equipment where hazardous live voltages may be present.

Signal voltage limits of EN 61010		
±60 V DC	30 V AC RMS	±42.4 V pk max.

WARNING

The PicoScope 5000D Series oscilloscopes are not designed to measure hazardous live signals as defined by EN 61010. To prevent electric shock, do not attempt to measure voltages outside of the limits shown in the table above or the specified full scale measurement range, whichever is lower.

WARNING

To prevent injury or death, the oscilloscope must not be directly connected to the mains (line power). To measure mains voltages, use a differential isolating probe specifically rated for mains use, such as the TA041 listed on the Pico website.

CAUTION

Exceeding the overvoltage protection range on any connector can cause permanent damage to the oscilloscope and other connected equipment.

2.1.4   Grounding

WARNING
The oscilloscope's ground connection through the USB cable is for measurement purposes only. The oscilloscope does not have a protective safety ground.

WARNING
Never connect the ground input (chassis) to any electrical power source. To prevent personal injury or death, use a voltmeter to check that there is no significant AC or DC voltage between the oscilloscope ground and the point to which you intend to connect it.

CAUTION
Applying a voltage to the ground input is likely to cause permanent damage to the oscilloscope, the attached computer, and other equipment.

CAUTION
To prevent measurement errors caused by poor grounding, always use the high-quality USB cable supplied with the oscilloscope.

2.1.5   External connections

WARNING
To prevent injury or death, when supplied use only the power cord and Pico approved adaptor supplied with the product. These are approved for the voltage and plug configuration in your country.

Power supply options and ratings

Model	USB* connection		External DC power supply		
	USB 2.0	USB 3.0	Voltage (V)	Current (A)	Power (W)
PicoScope 5242D PicoScope 5243D PicoScope 5244D	✓	✓	N/A	N/A	N/A
PicoScope 5242D MSO PicoScope 5243D MSO PicoScope 5244D MSO	✓	✓	N/A	N/A	N/A
PicoScope 5442D PicoScope 5443D PicoScope 5444D	✓	✓	5 V	1.6 A pk	8 W (@5 V)
PicoScope 5442D MSO PicoScope 5443D MSO PicoScope 5444D MSO	✓	✓	5 V	1.6 A pk	8 W (@5 V)

*Can be powered from either a single USB 2.0 or USB 3.0 port, provided the port supplies the required power. The PicoScope software will notify you if the port is not suitable.

For instructions on connecting your oscilloscope, see [Installation](#).

CAUTION
Take care to avoid mechanical stress or tight bend radii for all connected leads, including all coaxial leads and connectors. Mishandling will cause deformation of sidewalls, and will degrade performance and measurement accuracy.

2.1.6   Environment

This product is for indoor or outdoor use, in dry locations only. The products external mains power supply (if required) is for indoor use only.

Please contact Pico technical support if you would like any advice on integrating a PicoScope into your own product or application.

WARNING
To prevent injury or death, do not use in wet or damp conditions, or around explosive gas or vapor.

CAUTION
To prevent damage, always use and store your oscilloscope in appropriate environments.

	Storage	Operating
Temperature	−20 °C to +60 °C	0 °C to +40 °C (+15 °C to +30 °C for quoted accuracy*)
Humidity	5% to 95% RH (non-condensing)	5% to 80% RH (non-condensing)
Altitude	2000 m (maximum)	
Pollution degree	2 (maximum)	

*One hour warm-up for quoted accuracy

2.1.7   Care of the instrument

The product contains no user-serviceable parts. Repair, servicing and calibration require specialized test equipment and must only be performed by Pico Technology or an approved service provider. There may be a charge for these services unless covered by the Pico five year warranty.

WARNING
To prevent injury or death, do not use the product if it appears to be damaged in any way, and stop use immediately if you are concerned by any abnormal operations.

WARNING
To prevent electric shock, do not tamper with or disassemble the oscilloscope, case parts, connectors or accessories.

WARNING
When cleaning the product, use a soft cloth and a solution of mild soap or detergent in water. To prevent electric shock, do not allow liquids to enter the oscilloscope casing, as this will compromise the electronics or insulation inside.

2.2   Conformance

2.2.1   FCC notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to **Part 15 Subpart B of the FCC Rules**. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference which the user will be required to correct at their own expense.

2.2.2   CE and UKCA notices

This PicoScope oscilloscope meets the intent of the CE EMC directive 2014/30/EU and UKCA SI 2016/1091 EMC Regulations.

This oscilloscope also meets the intent of the CE Low Voltage Directive 2014/35/EU and UKCA SI 2016/1101 Electrical Equipment (Safety) Regulations.

For more information, please refer to your product's *EU Declaration of conformity* and *UKCA Declaration of Conformity* available for download from picotech.com.

2.3   Software license conditions

Grant of license. The material contained in this release is licensed, not sold. Pico Technology Limited ('Pico') grants a license to the person who installs this software, subject to the conditions listed below.

Access. The licensee agrees to allow access to this software only to persons who have been informed of and agree to abide by these conditions.

Usage. The software in this release is for use only with Pico products or with data collected using Pico products.

Copyright. Pico claims the copyright of and reserves the rights to all material (software, documents etc) contained in this release.

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Fitness for purpose. No two applications are the same, so Pico cannot guarantee that its equipment or software is suitable for a given application. It is therefore the user's responsibility to ensure that the product is suitable for the user's application.

Mission-critical applications. Because the software runs on a computer that may be running other software products, and may be subject to interference from these other products, this license specifically excludes usage in 'mission-critical' applications, for example life-support systems.

Viruses. This software was continuously monitored for viruses during production. However, the user is responsible for virus checking the software once it is installed.

Support. No software is ever error-free, but if you are dissatisfied with the performance of this software, please contact our technical support staff.

Upgrades. We provide upgrades, free of charge, from picotech.com/downloads. We reserve the right to charge for updates or replacements sent out on physical media.

2.4   Trademarks

Pico Technology Limited, PicoScope and *FlexRes* are trademarks of Pico Technology Limited, registered in the United Kingdom and other countries.

PicoScope and *Pico Technology* are registered in the U.S. Patent and Trademark Office.

Linux is the registered trademark of Linus Torvalds, registered in the U.S. and other countries.

macOS is a trademark of Apple Inc., registered in the U.S. and other countries.

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Windows is a registered trademark or trademark of Microsoft Corporation, registered in the U.S. and other countries.

2.5   Warranty and returns

Your PicoScope USB oscilloscope device is supplied with a five-year return-to-manufacturer warranty. All accessories are guaranteed for at least one year from the date of purchase. You may also return your oscilloscope for any reason within 14 days of purchase for a refund. For terms and conditions, visit picotech.com/about.

3   Product information

3.1   Maximum sampling rate

For full specifications and further information, refer to the [PicoScope 5000 Series page](#) on our website or to the *PicoScope 5000D Series Data Sheet*, available on our website.

How maximum sampling rate varies by resolution and the number of channels in use

Resolution	Maximum sampling rate with number of channels* in use			
	Any 1 channel	**Any 2 channels**	**3 or 4 channels**	**More than 4 channels**
8-bit	1 GS/s	500 MS/s	250 MS/s	125 MS/s
12-bit	500 MS/s	250 MS/s	125 MS/s	62.5 MS/s
14-bit	125 MS/s	125 MS/s	125 MS/s	62.5 MS/s
15-bit	**125 MS/s	**125 MS/s	**125 MS/s	-
16-bit	***62.5 MS/s	***62.5 MS/s	***62.5 MS/s	-

Channels refers to the number of analog channels and digital ports. There are two digital ports on the MSO models: the first port includes any number of connections to the D0-D7 inputs, the second includes any number of connections to the D8-D15 inputs.

**Maximum of two analog channels in use.

***Maximum of one analog channel in use.

3.2   Connector diagrams

Standard oscilloscope connectors
The PicoScope 5000D Series FlexRes oscilloscopes have input channels with standard BNC connectors and standard input impedance. They are therefore compatible with most oscilloscope probes including 10:1 and switched 1:1/10:1 types.

The probes supplied with the PicoScope 5000D Series oscilloscopes have been trimmed specifically for use with the scopes they are supplied with (refer to label on base of scope for associated probe part number). For optimum performance, please use the probes supplied. Although other oscilloscope probes can be used, the specified performance cannot be guaranteed. You can order replacement probes matched to your PicoScope device from Pico Technology.

Signal generator (Gen) output
The **Gen** connector is the output of the oscilloscope's built-in [signal generator](#), which can generate waveforms with a number of built-in functions. The signal generator also produces user-defined arbitrary waveforms. Connect a BNC cable between this output and one of the channel inputs to send a signal to that channel.

- If you are using the PicoScope 6 software, refer to the *PicoScope 6 User's Guide* for information on how to configure the signal generator.

- If you are writing your own software, refer to the *PicoScope 5000 Series (A API) Programmer's Guide*.

- You can download the most recent software and documentation free of charge from [picotech.com/downloads,](#)

Digital inputs for mixed-signal oscilloscopes (D MSO models only)

Alongside the analog channels, the mixed-signal 5000D MSO Series oscilloscopes also feature 16 digital inputs. The PicoScope software allows you to view both digital and analog signals simultaneously. Digital inputs are easily manageable, and can be reordered, grouped, and renamed.

The digital channels can also be used with our most popular features, such as triggering and serial decoding.

See Digital inputs for PicoScope 5000D Series MSO models for more information.

External trigger (Ext) input (non-MSO models only)

The Ext input can be used as a trigger source. Select it from the **Trigger** menu in the PicoScope software, or by using a function call if you are writing your own software.

The Ext input uses dedicated circuitry, in combination with a software-configurable threshold, to detect a trigger signal. This leaves the analog channels free for viewing signals. The input characteristics of the Ext input are matched to a scope channel so that the supplied, compensated probes can be used with the Ext input to give high vertical accuracy.

Where trigger timing accuracy is critical, we recommend using one of the main input channels as the trigger source. These channels use accurate digital triggering (to one sample period) and have a vertical resolution of 1 LSB.

USB port

All models have a SuperSpeed USB 3.0 port for connection to a PC. See Connectivity, power and installation for more information.

Earth terminal

External noise may sometimes interfere with your measurements if the PicoScope is used with a computer which does not have a ground connection. If this is the case, connect the earth terminal to an external ground point (for example, on the system you are testing) to provide a ground reference for the oscilloscope.

3.2.1   2-channel model connector diagram

PicoScope 5242D, 5243D, and 5244D.
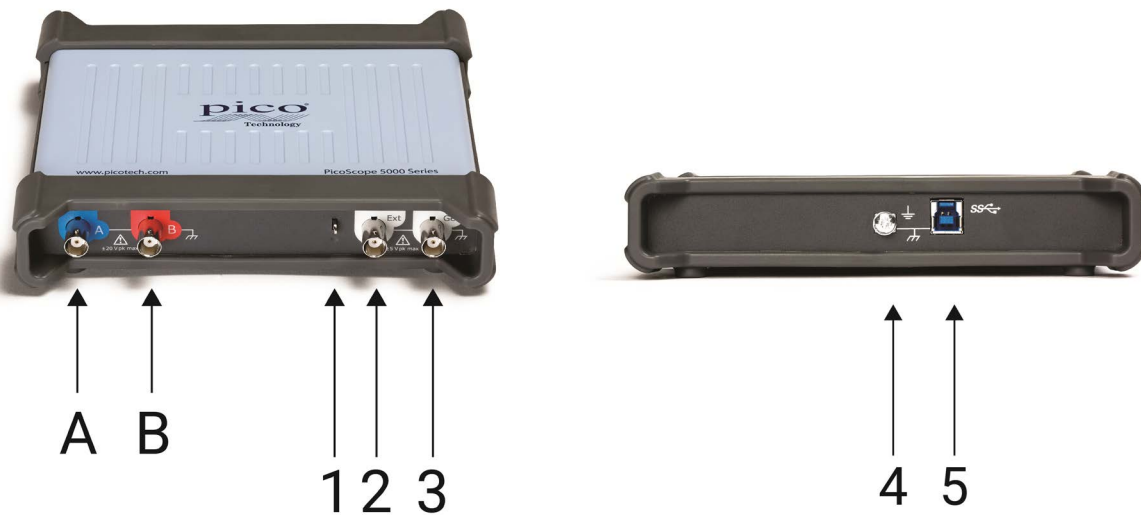
A. Input channel A

B. Input channel B

1. Probe compensation output

    LED: red when scope is connected but not operating. Flashes green when the oscilloscope is capturing data.

2. External trigger input

3. Signal generator output

4. Ground terminal

5. USB 3.0 port: connects to your PC using the Hi-Speed USB cable supplied. See Installation for powering options.

3.2.2   4-channel model connector diagram

PicoScope 5442D, 5443D, and 5444D.

A. Input channel A

B. Input channel B

C. Input channel C

D. Input channel D

1. Probe compensation output

    LED: red when scope is connected but not operating. Flashes green when the oscilloscope is capturing data.

2. External trigger input

3. Signal generator output

4. Ground terminal

5. USB 3.0 port: connects to your PC using the Hi-Speed USB cable supplied. See Installation for powering options.

6. DC power input

3.2.3   2-channel MSO model connector diagram

PicoScope 5242D MSO, 5243D MSO, and 5244D MSO.

A. Input channel A

B. Input channel B

1. Probe compensation output

    LED: red when scope is connected but not operating. Flashes green when the oscilloscope is capturing data.

2. Digital inputs D0 to D15

3. Signal generator output

4. Ground terminal

5. USB 3.0 port: connects to your PC using the Hi-Speed USB cable supplied. See Installation for powering options.

3.2.4   4-channel MSO model connector diagram

PicoScope 5442D MSO, 5443D MSO, and 5444D MSO.

A. Input channel A

B. Input channel B

C. Input channel C

D. Input channel D

1. [Probe compensation](#) output

LED: red when scope is connected but not operating. Flashes green when the oscilloscope is capturing data.

2. Digital inputs D0 to D15

3. [Signal generator](#) output

4. Ground terminal

5. [USB 3.0](#) port: connects to your PC using the Hi-Speed USB cable supplied. See [Installation](#) for powering options.

6. DC power input

3.2.5   Digital inputs on MSO models

The digital input pins of the 20-pin IDC header plug are shown below. The diagram is drawn as you look at the front panel of the oscilloscope.
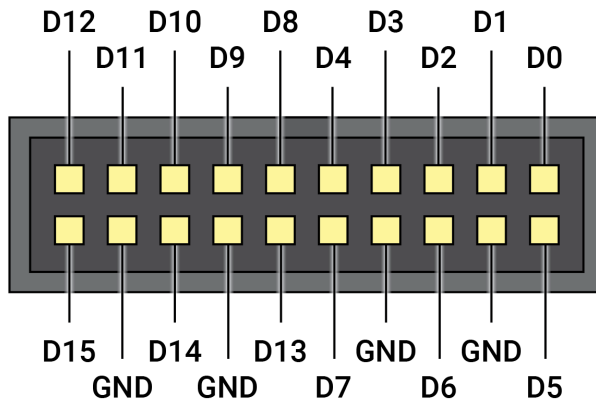
To avoid crosstalk on the digital inputs when probing signals with very fast edges, always take extra care to:

- Keep leads carrying fast signals separate from other input leads.
- Keep leads carrying fast signals as close as possible to the ground leads.
- Connect all four black ground leads to the ground of the circuit under test.

3.3   Connectivity, power and installation

1. PicoScope software installation

Before setting up your PicoScope 5000D Series oscilloscope, it is recommended that you first install the PicoScope 6 software by following the instructions in the supplied *Quick Start Guide*.

There are different connectivity and power supply options for each oscilloscope model depending on its specifications.

2. USB connectivity

> For best results, use only the high-quality USB cables supplied with your PicoScope

- If your computer has a USB 3.0 port, connect the oscilloscope to it using the USB 3.0 cable supplied (image below).

- The oscilloscope is also compatible with a single USB 2.0 port, and can be connected using the USB 3.0 cable (image below), provided the port supplies the required power. The PicoScope software will notify you if the port is not suitable.
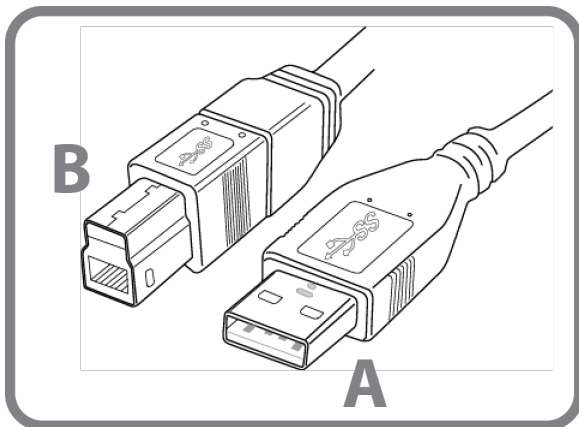
Connector A: Connect to the USB port on your PC

Connector B: Connect to the USB port on your PicoScope 5000D Series oscilloscope

3. Oscilloscope installation

Once you have connected your oscilloscope to a PC using the appropriate USB cable, Windows will install the device automatically. An ***Installing device driver software*** message will be displayed during the installation.

Note: If you move your oscilloscope to a different USB port at any point the installation process will be repeated.

4. External power supply (four-channel models only)

If only two of the four analog channels are required, the supplied USB cable is sufficient to power the device. To use all four analog channels, or if the USB port provides less than 1200 mA, then connect the supplied AC power adaptor and USB cable as shown below.

Note: if the AC adaptor is connected or disconnected while the oscilloscope is in operation, it will restart automatically and any unsaved data will be lost.
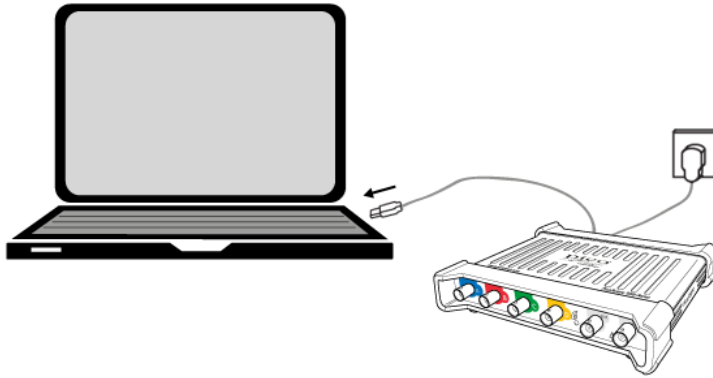
5. Running the PicoScope software

Once you have connected the oscilloscope, start the PicoScope software. Signals connected to the scope inputs should now be displayed. If you touch a connected probe's tip with your finger, you should see a small 50 or 60 Hz signal in the oscilloscope window.

3.4   Minimum system requirements

To ensure that your PicoScope 5000D Series oscilloscope operates correctly, you must have a computer with at least the minimum system requirements as shown in the following table. The performance of the oscilloscope will be better with a more powerful PC, and will benefit from a multi-core processor.

	Specification
Operating system	Windows 7, Windows 8, Windows 10. 32 bit and 64 bit versions. Beta software is also available for 64-bit Linux and macOS operating systems.
Processor	
Memory	As required by the operating system
Free disk space	
Ports	USB 3.0 or USB 2.0 port(s)*

*   See Connectivity, power and installation for more information.

3.5   Pack contents

A PicoScope 5000D Series oscilloscope is supplied with the following items:

- USB 3.0 cable

- Quick Start Guide

Each model is also supplied with probes and additional items as shown below:

Model	Probes supplied	Digital cable	Test clips	AC power adaptor
PicoScope 5242D	2 x 100 MHz	-	-	-
PicoScope 5242D MSO		✓	✓	
PicoScope 5243D	2 x 100 MHz	-	-	
PicoScope 5243D MSO		✓	✓	
PicoScope 5244D	2 x 200 MHz	-	-	
PicoScope 5244D MSO		✓	✓	
PicoScope 5442D	4 x 100 MHz	-	-	✓
PicoScope 5442D MSO		✓	✓	
PicoScope 5443D	4 x 100 MHz	-	-	
PicoScope 5443D MSO		✓	✓	
PicoScope 5444D	4 x 200 MHz	-	-	
PicoScope 5444D MSO		✓	✓	

3.6   Probe compensation

We recommend that you compensate each oscilloscope probe before using it with your PicoScope. Compensation instructions specific to the probe are included in the leaflet supplied with the probe.

Connecting a probe for frequency compensation

1. Plug the probe's BNC connector into the appropriate input channel on the scope.

2. Fit the spring hook (supplied with the probe) on the probe tip.

3. Attach the spring hook to the probe compensation output located on the front panel.

4. Attach the ground lead (supplied) to the probe and connect the crocodile clip to the ground shell of one of the scope's BNC inputs.

5. Run the PicoScope software. Set the input coupling to AC and then click **Auto Setup**, which ensures that the correct input range and collection time are selected.

6. Follow the frequency compensation instructions in the probe leaflet.

Note: if the probe is moved to a different scope channel, we recommend the frequency compensation procedure be repeated.

4   Glossary

API. Application Programming Interface. A library of function calls that give programmers access to the PicoScope device.

AWG. Arbitrary waveform generator. A circuit that can generate a waveform of almost any shape, as defined by the user.

Bandwidth. The range of input frequencies over which the measured signal amplitude is no more than 3 decibels below its true value.

Capture memory. The buffer memory is used by the oscilloscope to store data temporarily. This allows the oscilloscope to sample data independently of the speed at which it can transfer data to the computer. The size of the buffer memory is measured in samples.

Collection time. The time represented by the horizontal axis of the PicoScope display. On traditional oscilloscopes, this function is often known as the timebase.

Coupling control. To switch from AC coupling to DC coupling, or vice versa, select AC or DC from the control on the oscilloscope toolbar of the PicoScope software application. The AC setting filters out any DC component of the input signal, and is suitable for viewing small AC signals superimposed on a DC or slowly-changing offset. In this mode you can measure the peak-to-peak amplitude of an AC signal but not its absolute value. Use the DC setting for measuring the absolute value of a signal.

Driver. A program that controls a piece of hardware. The driver for the PicoScope 5000D Series oscilloscopes is supplied in the form of a 32-bit or 64-bit Windows DLL, `ps5000a.dll`. This is used by the PicoScope software, and by user-designed applications, to control the oscilloscopes.

External trigger. This is the BNC connector marked **Ext** on the PicoScope 5000D Series (non-MSO) oscilloscopes. It can be used as a trigger source but not as a waveform input. See also Connector information.

FlexRes®**.** The ability to reconfigure the hardware either to increase the sampling rate or the resolution. This allows you to capture and decode fast digital signals and to look for distortion in sensitive analog signals, all using the same oscilloscope.

Input range. The range of input voltages that the oscilloscope can measure. For example, a voltage range of ±20 V means that the oscilloscope can measure voltages between −20 V and +20 V. Input voltages outside this range will not be measured correctly, but will not damage the instrument as long as they remain within the protection limits stated in the specifications.

LSB. Least significant bit. This is the smallest voltage difference that the PicoScope can distinguish and is determined by the selected hardware resolution of the device.

Maximum sampling rate. A figure indicating the maximum number of samples the oscilloscope can acquire per second. Maximum sample rates are usually given in MS/s (megasamples per second) or GS/s (gigasamples per second.) The higher the sampling rate of the oscilloscope, the more accurate the representation of the high-frequency details in a fast signal.

MS/s. Megasamples per second. Used to quantify the sampling rate of an oscilloscope.

MSO. Mixed-signal oscilloscope. An oscilloscope that has both analog and digital inputs.

PicoScope software. This software product accompanies all our oscilloscopes. Along with your PicoScope device, it turns your PC into an oscilloscope and spectrum analyzer. You can download free updates and beta versions of the software from picotech.com/downloads.

Signal generator. A built-in circuit that generates signals suitable for driving an external device under test. Its output is the BNC connector marked **Gen** on the oscilloscope. See also Connector information.

USB 1.1. An early version of the USB standard, found on some older PCs. PicoScopes will operate slowly using a USB 1.1 port; performance will be greatly improved by using the recommended USB 3.0 port.

USB 2.0. A USB 2.0 port uses signaling speeds of up to 480 megabits per second and is backwards-compatible with USB 1.1.

USB 3.0. A USB 3.0 port uses signaling speeds of up to 5 gigabits per second and is backwards-compatible with USB 2.0 and USB 1.1.

Vertical resolution. A value, in bits, indicating the precision with which the oscilloscope converts input voltages to digital values. The resolution enhancement function in PicoScope can improve the effective vertical resolution.

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