



*Augmented Instruments*

## **IkaScope WS200 datasheet and user manual**

Ultra portable, one channel, 30 MHz, wireless oscilloscope.

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## IkaScope WS200 overview

IkaScope WS200 is an ultra portable oscilloscope probe. It weighs less than 60g and is designed to fit perfectly in your hand. With a Wifi connection to a smartphone, a tablet or a computer, signals can be displayed and measurements can be easily made. Patented ProbeClick® technology transforms the probe tip into an intelligent part of the oscilloscope: The probe detects when pressure is applied or released, allowing measurement to be automatically started and stopped without the need of traditional RUN/STOP button.

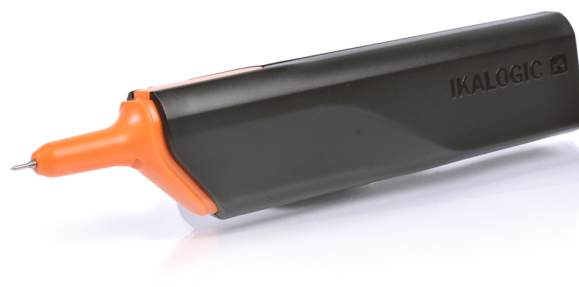


Figure 1: IkaScope WS200 ultra-portable oscilloscope

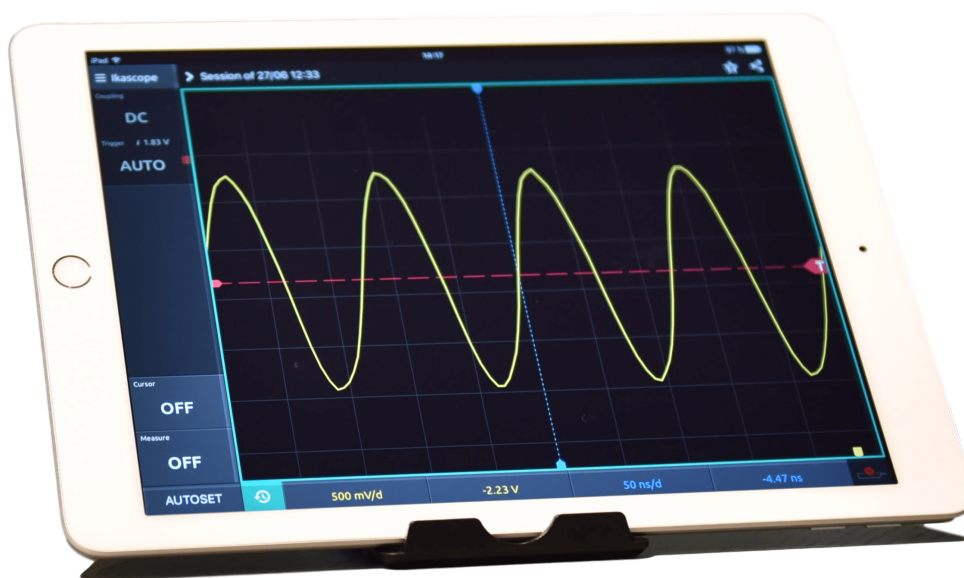


Figure 2: IkaScpoe software running on a tablet

## Typical applications

IkaScope is designed to be mobile, hence applications that require quick, on-the-field measurements are a perfect match for this technology.

- Onsite maintenance and inspection
- Isolated measurements
- Design troubleshooting
- Education and research
- Manufacturing industry
- Aerospace industry
- Automotive industry

## Product highlights

- 200 MSPS for a 30 MHz bandwidth and 4 Kpts memory.
- Works on Windows, Linux, MacOS, Android and iOS.
- 1 week battery life (20 measurements per day).
- Patented ProbeClick® technology

## Warning



Read **safety information** section carefully before using this instrument.

## Main characteristics

### Timing <sup>1 2</sup>

Sampling rate (MAX.)	200 MSPS (8 bits)
Rise time (Calculated)	12 ns
Input channels	1
Sampling memory	4 Kpts
Waveform update rate	250 fps
Time base accuracy	± 100ppm

### Vertical

Input impedance	1MΩ   14 pF
Vertical resolution	8 bits
Maximum input voltage	80 Vpp ( ± 40V) CAT I
Offset range	≤ 1V/Div: ± 20 V > 1V/Div: ± 40 V
DC vertical gain accuracy (All ranges)	± 3% full scale
DC vertical offset accuracy	± 3% of offset setting
Coupling	DC / AC (True)

### Bandwidth vs vertical range

100mV/div	50 MHz
200mV/div	37 MHz
500mV/div	40 MHz
1V/div	38 MHz
2V/div	38 MHz

<sup>1</sup>Sampling memory is divided into 4x1Kpts burst buffers allowing minimum dead time between 4 consecutive triggers

<sup>2</sup>Actual FPS (Frames Per Second) depend on Wifi network performance as well as display device performance.

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5V/div	38 MHz
10V/div	30 MHz

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**General<sup>3 4</sup>**

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Input protection	253 VAC during 1 minute (production sample test) never exceed $\pm 40V$
Input to USB galvanic isolation	1100 VAC 1 minute (production sample test) never exceed $\pm 40V$
Built-in lithium battery	420 mAH
Communication interface	Wifi 802.11 b/g/n/e/i 2.4 GHz. Access point or Station
Operating, recharging and storage conditions	10°C to 40°C < 80% HR non-condensing Altitude < 2000m
Charging method	Micro USB port

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<sup>3</sup>Input isolation is defined according to measurements made on sample units taken from production batches. Do not exceed  $\pm 40V$  between any measurement terminal and USB port.

<sup>4</sup>The IKASCOPE should not be used during the battery charge in order to speed up the battery charge time.



## IkaScope WS200 Interfaces

IkaScope WS200 ports and interfaces are shown in the image below:



Figure 3: IkaScope WS200 interfaces

1. Probe tip
2. Ground lead connection
3. Status LEDs and charging port
4. Battery status LED
5. Wifi status LED
6. USB (micro-B) charging port

## Principle of operation

### How does it work?

IkaScope can be seen as a wireless oscilloscope probe, that displays measured signals and is configured via remote screen (Tablet, smartphone or computer). Technically speaking, IkaScope WS200 integrates a full featured analog front end, a digital processing stage and a wifi module. First, measured signals are conditioned, then converted to digital values via a high speed 8-bits ADC. Finally, a digital processing stage streams the captured signal frames over a high speed wifi link.

## ProbeClick® technology

IkaScope incorporates an intelligent probe tip (called ProbeClick®) that detects when pressure is applied. This allows important power saving since all power consuming circuitry is in stand-by when a measurement is not in progress. That same intelligent probe tip is used to turn ON IkaScope, which then turns OFF after 10 minutes of non activity. During that period IkaScope keeps wifi connexion active for optimal responsiveness when quick measurements need to be made.

## Connectivity options

Since IkaScope is designed to be used in the office on the field, both Station and AP wifi modes are supported. In other words, IkaScope may as well connect to your office or home Wifi network (when configured to do so) or may create its own Wifi Access Point to which another display device may connect.

## Unpacking and first usage

IkaScope relies on a free application for display, analysis and configuration. You should first start by downloading and installing it on your favorite platform. Check [ikalogic.com](http://ikalogic.com) website for latest download link or search “ikascope” in the application store of your mobile device.

## Turning ON IkaScope

After unpacking a new IkaScope, turn it ON by pressing the probe tip on any rigid surface for more than 1 second. At the very first usage, IkaScope will not have any configured Wifi networks in its memory, so it will automatically switch to AP (access point) mode. When IkaScope is correctly turned ON and operating in AP mode, Wifi status LED should be blinking in white color.



In some situations, IkaScope battery may be fully discharged. If that's the case, please connect your IkaScope to a USB port with the provided cable to recharge it. Refer to the LEDs Behavior section to ensure the battery is being correctly charged. Read the safety section first.

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## **First connection**

At this stage, you should configure your display device (Smartphone, tablet or computer) to connect to the Wifi network created by IkaScope. This network's SSID will start with "IKASCOPE" and will end with the serial number of your IkaScope device.

When your display device is connected to IkaScope's wifi network, you may launch IkaScope application and follow further instructions to display measured signals.

## **AP vs Station connection**

Although IkaScope can be used in AP mode with its full performance, we recommend configuring IkaScope to connect to existing wifi networks. This way, it won't be necessary to change wifi settings of the display device for each and every usage.

## **LEDs behavior**

There are 2 LEDs on the back of IkaScope probe. Refer to IkaScope WS200 interfaces section for more info about those LEDs.

### **Battery status LED**

Normally, battery status LED is turned off. If the battery is empty (less than 20% capacity) it will blink in orange color. When you plug in a USB charger, it will either glow in orange to indicate that charging is in progress, or glow in green that charging is complete (battery is recharged to 100%).

### **Wifi Status LED**

Wifi status led can show two colors: Blue or White, depending on the Wifi operating mode. White means AP mode (Access point, i.e., IkaScope created its own access point), while blue color means station mode.

If the LED is blinking it means no connection is made yet, when the LED is fixed, it means that a connexion was established. By connection here, we mean a "network connection".

## **Software Quick Start Guide**

Software follows a very similar user interface on all platforms composed of the following sections

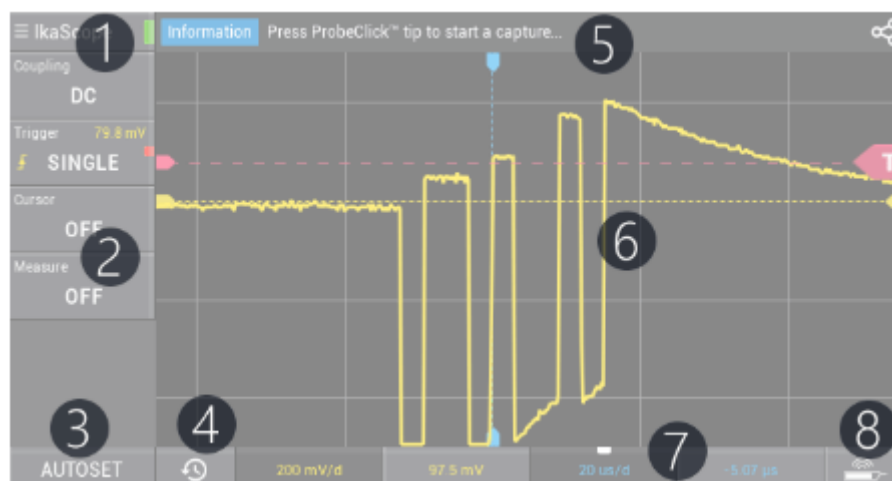


Figure 4: IkaScope application GUI

1. IkaScope general menu that gives you access to connection options (mainly to connect the application to a specific IkaScope WS200 device)
2. Menus for Measurements, cursors, trigger and annotations.
3. Autoset button
4. History feature, to restore previously measured signals.
5. Status and tips bar: Important information and hits are shown here.
6. Measured waveform.
7. Time/voltage gain and offset configuration.
8. Device status.

For detailed software manual, please check [www.ikalogic.com](http://www.ikalogic.com).

### Measuring your first signal

When IkaScope and the companion application are connected to the same network (either in AP or Station modes), you can start making measurements. When both IkaScope and the application are correctly connected, the connection icon should be green as in the following screenshot:

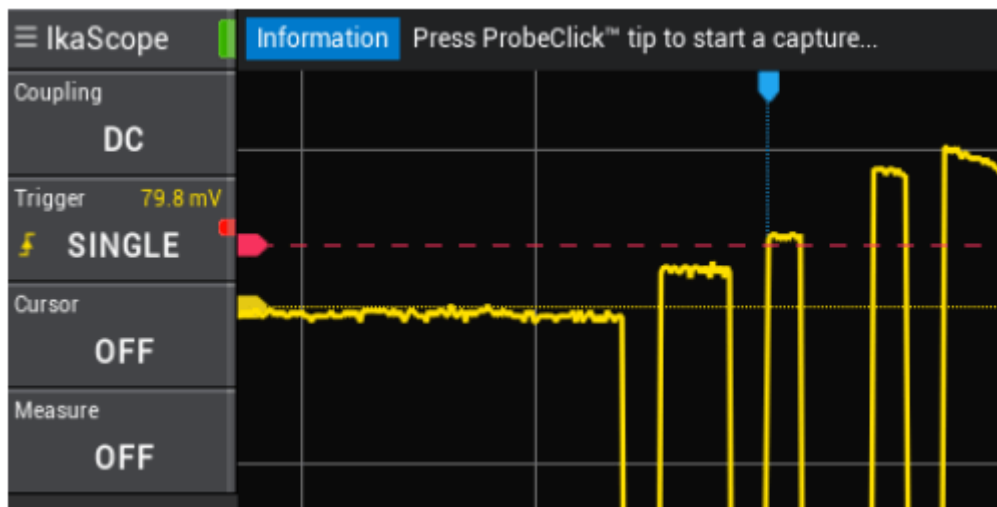


Figure 5: IkaScope application screenshot

**Note:** IkaScope device must be turned ON to be connected to a network. If all LEDs are switched OFF, please turn ON IkaScope by pressing on the probe tip for 1 second. Finally, press IkaScope probe tip on the pad where an electric signal needs to be measured. You should hear a “click” sound, and feel a vibration in the device: This means that data is being streamed to the application. Keep the pressure on the tip until you see signals appearing in the application (This can take between 100 and 800 milliseconds).

## Software technical requirements

Download the IkaScope app on [www.ikalogic.com](http://www.ikalogic.com) so you can use your device on your favorite platform.

IkaScope can run on any of those platforms:

- A Desktop computer connected to a network that has a Wifi spot (the computer may be connected by ethernet or Wifi).
  - Windows 7/8/10 with OpenGL 2.0 or later (OpenGL ES excluded)
  - Mac OS 10.9 with OpenGL 2.0 or later (OpenGL ES excluded)
  - Ubuntu 14.04 with OpenGL 2.0 or later (OpenGL ES excluded)
- Tablet/Smartphone
  - Android 5.0 or later
  - iOS 8 or later

## Mechanical data

Weight: 60 gm (2.12 ounces)

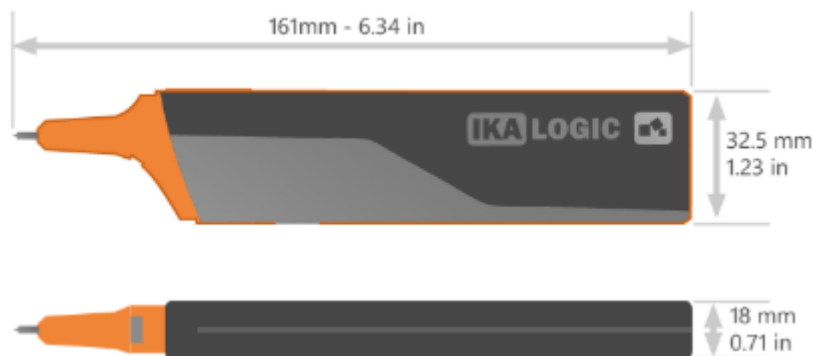


Figure 6: IkaScope WS200 dimensions

## Certifications and regulations



EMC : IEC NF/EN 61326-1 (In high perturbed RF environment, the displayed signal may be altered during perturbation with self recovering) and complies with Limit for class B digital device, pursuant to part 15 of the FCC rules.

IkaScope WS200 complies with the following regulations

- FCC (Part 15)
- CE
- ROHS
- REACH
- WEEE

IkaScope contains a lithium battery. Both the product and the battery were tested according to:

- PI965 AIR
- PI965 SEA
- PI967 AIR
- PI967 SEA

- UN38.3

IkaScope contains a Wifi module that complies with the following regulations

- CE1177
- FCC (USA)
- IC (Canada)
- GITEKI
- KCC

All test certificates can be provided upon request.



## Safety information

This product complies with safety standards IEC NF/EN 61010-1: 2010, IEC NF/EN 61010-2-030 and UL 61010-1: 2015. To prevent possible electrical shock, fire, personal injury, or damage to the product, read all safety information before you use the product. The following international symbols are used on the product and in this manual.

## Symbols definitions



Figure 7: Risk of Danger. Important information. See Manual.



Figure 8: WEEE logo. This product complies with the WEEE Directive (2002/96/EC) marking requirements. The affixed label indicates that you must not discard this electrical/electronic product in domestic household waste. Product Category: With reference to the equipment types in the WEEE Directive Annex I, this product is classed as category 9. Do not dispose of this product as unsorted municipal waste.



Figure 9: CE Logo. Conforms to European Union directives.

## Important safety notes



### Warning: To avoid electrical shock or fire:

- Carefully read all instructions.
- Use the product only as specified, otherwise the protection supplied by the product can be compromised.

- Do not use the product if it operates incorrectly.
- Before use, inspect device casing, probes, test leads and accessories for mechanical damage and replace if damaged.
- Never attempt to repair a defective device. Contact customer service.
- Do not use the product or its accessories in case of any damage.
- Disconnect all probes, test leads and accessories that are not in use.
- Never use the device for measuring mains circuits.
- Never use the device for measuring circuits which are not galvanically isolated from mains circuits.
- Do not touch electrical wires with bare hands.
- Keep away from children's sight or from animals.
- Do not expose to water, heat or moisture.
- Do not point probe tip toward body parts.
- Do not connect the ground lead to voltages higher than  $\pm 40\text{V}$  from earth ground.
- The electrical isolation between the USB port and the measurement ports is NOT designed to isolate from mains circuit.
- Do not apply more than the rated voltage ( $\pm 40\text{V}$ ), between the terminals or between each terminal and USB port ground.
- Do not apply input voltages above the rating of the instrument ( $\pm 40\text{V}$ ).
- Measure a known voltage first to make sure that the product operates correctly.
- Do not work alone.
- Comply with local and national safety codes. Use personal protective equipment (approved rubber gloves, face protection, and flame resistant clothes) to prevent shock.
- Do not operate the product with covers removed or the case open. Hazardous voltage exposure is possible.
- Only recharge from a USB port.
- Do not use the device in wet or damp conditions, or around explosive gas or vapor.
- Do not use in a system in which the failure of the product might result in personal injury.

### Lithium battery safety information

IkaScope WS200 contains a 420mAh lithium battery.



**Warning** To avoid electrical shock or fire:

- Never attempt to open an IkaScope WS200.

- Never attempt to replace the battery yourself. Contact customer service in case your battery needs replacement.
- Never recharge a device that shows signs of malfunctioning.
- Never recharge IkaScope WS200 for more than 3 hours (disconnect the USB cable from USB port)
- Only use the USB cable provided by Ikalogic to recharge the device.
- Only connect the USB cable to a USB compliant port.
- Never recharge the device with a defective USB cable or charger.
- Do not store the device uncharged for long periods of time.
- Do not expose the device to temperatures beyond the range of 10°C to 40°C.
- Keep the device away from heat sources and direct sunlight.
- Do not subject device to impacts such as mechanical shocks or perforation.
- In case of accidental opening of the device, do not recharge or use the device and contact customer support.
- Never short-circuit the battery.
- Never overcharge the battery.
- The battery contains dangerous chemical components, that can cause burns or explode. In case of exposure to those chemical products, clean with water and get medical assistance immediately.
- Do not dispose of the battery as unsorted municipal waste.
- A failed battery pack should be disposed of in accordance with local regulations.

## What's in the box

IkaScope WS200 is shipped with the following accessories:

- Ground connection probe.
- Protective cap.
- USB charging cable.
- Quick start guide.

## Ordering information and customer support

For ordering information, please check for nearest distributor on [www.ikalogic.com](http://www.ikalogic.com) or contact us for any inquiry at [contact@ikalogic.com](mailto:contact@ikalogic.com).



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## Accessories and maintenance

Accessories and maintenance services are available on our website: [www.ikalogic.com](http://www.ikalogic.com) or by contacting customer support ([support@ikalogic.com](mailto:support@ikalogic.com)).

## Limited warranty & limitation of liability

Each Ikalogic product is warranted to be free from defects in material and workmanship under normal use and service. The warranty period is three years for the test tool and two year for its accessories. This warranty extends only to the original buyer or end-user customer of an Ikalogic authorized reseller, and does not apply to fuses, disposable batteries or to any product which, in Ikalogic's opinion, has been misused, altered, neglected or damaged by accident or abnormal conditions of operation or handling.

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## Document Revisions

03-June-2019	Updated safety related information.
28-May-2019	Updated safety related information.
27-March-2018	Corrected time base accuracy.
26-February-2018	Added software technical requirements section.
04-December-2017	Initial release of this document.

The information in this document is subject to change without notice.