IkaScope WS200 user guide

Ultra portable, pen-shaped, wifi oscilloscope probe

Victor CANOZ & Ibrahim KAMAL

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Getting started with IkaScope WS200.

Is this the first time you are using IkaScope? You’re at the right place!


You do know that IkaScope is a pen shaped wireless oscilloscope that connects to almost any connected screen and streams captured signals through wifi. First download the app for the platform you want to use IkaScope with.

Figure 1: IkaScope wireless oscilloscope connected to smartphone via Wifi

Note: During the chapters in this manual, the words IkaScope, WS200, or “IkaScope WS200” may...
IkaScope App: Sharing measurements

be used. They all refer to the same product. Depending on the context, IkaScope may refer to the companion application that is required to run the physical IkaScope WS200 device.

Turning IkaScope ON

Just press the probe tip (ProbeClick™) to power up your IkaScope oscilloscope. IkaScope will automatically shut down after a while if you don’t use it. If it does not turn on, it may be totally discharged, in this case, please connect a USB cable to IkaScope’s charging port.

Status LEDs meaning

On the back of the product, you can see 2 LEDs that represent the status of IkaScope.

- The Battery led can be green or orange, depending on battery charge status
- The Wifi led can be blue (STA) or white (AP) depending on wifi mode

![Figure 2: IkaScope wifi oscilloscope status LEDs](image)

Connect to the IkaScope wifi network

IkaScope has to be connected to the same wifi network as your connected screen in order to work. You can find detailed documentation here. Anyway, for the very first usage, IkaScope will create its own wifi network. The SSID of that network will begin with “IKASCOPE” and end with the serial number of your IkaScope. Please connect to it.
**Launch the app**

Launch the IkaScope application, open the top menu and click on **Connect an IkaScope**

Just select your IkaScope from the list. You are now ready to measure!
Please note that if several devices are connected to the same network (and if they’re turned ON), they will appear in that list. Please select from the list the one that has the same serial number as yours.

**Let’s see some signals on the screen!**

Don’t forget to connect the ground clip. Press ProbeClick™ tip and keep it pressed for a while. You can now begin your first measurements. Note: If you’re in Auto trigger mode, you have to keep the ProbeClick™ tip pressed for the screen to continuously refresh and display signals.

Read the next chapters of this guide to become an IkaScope WS200 super user!
Getting started with IkaScope Application

IkaScope app is the free companion software that works together with IkaScope. It is used to control the device and visualize captured signals. Of course, this application is multiplatform, meaning you can use it on your phone as well as your computer.

You can download the latest version of the app here.

IkaScope interface overview

The IkaScope app is designed to be intuitive and easy to use. Almost everything on this software is only 2 clicks away from the main view. This view is composed of 9 different parts plus the signal itself onto the dynamic grid.

![IkaScope application interface](image)

1. **IkaScope's general menu** gives access to the connection wizard
2. **Oscilloscope general settings** like coupling and trigger options
3. **Analyze tools** allows the user to add cursors and/or use automatic measurements
4. **Autoset button** launches the automatic signal finder
5. **History** is where all the captures are saved after releasing ProbeClick™ tip
6. **Grid settings** shows the settings of the signal displayed

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7. **IkaScope device info** displays the current state of the device. It provides further information when clicked.
8. **The Share button** is used to share your measurements
9. **Notification center** displays useful context related information.
What is ProbeClick™ and what is it made for?

Ever had to ask a colleague to press the stop button on an oscilloscope while you’re holding a board and the probe (both hands busy)? This won’t happen anymore with IkaScope.

ProbeClick™ is one feature that traditional oscilloscopes lack! It is a simple yet innovative mechanism located in the probe tip that replaces that old run/stop button. Just press the probe to start capturing & streaming data to your screen. Release it, and you’ll freeze the signal and automatically store that capture in the history.

This technology also enables easier ways to trigger as explained in this article.

Figure 8: ProbeClick™ makes oscilloscope probe smarter!
Connecting to IkaScope WS200

In order to use IkaScope WS200 oscilloscope, you need a Wifi connected screen, to display the signal and configure the device (Setup the trigger, set time base, etc). That screen can be a smartphone, a tablet or computer.

You can connect to your IkaScope to the display device in two different ways covering all the situations: whether you’re at work, at home or in the field.

Direct point-to-point connection

This is the easiest way to get your IkaScope oscilloscope up and running. It is called Access Point [AP] mode. In this case, IkaScope will be configured to create its own wifi network (like a hotspot, but without an internet connection).

![Connection to IkaScope wireless oscilloscope in AP mode](image)

How to connect to IkaScope in AP mode?

First, ensure that IkaScope is turned on and set in AP mode (white led blinking). If it’s not, you can force IkaScope into AP mode by pushing the reset button, as described at the bottom of this article.
Then, depending on your platform, connect to the wifi network created by IkaScope.

![Network Selection](image)

Figure 10: Selecting IkaScope WS200 network

Once connected in AP mode, you should be able to see your device in the IkaScope app, connect to it and start your measurements.
Connection through an existing access point

As you connect your smartphone to a standard wifi network, IkaScope may be paired to a router. This is called Station [STA] mode (and it’s recommended for best performance and battery life). After that, any computer or mobile device on the network can discover it, even if it does not have wifi. In this case the blue led will be lit.
**Why is it better to setup and use STA mode?**

Once your oscilloscope is registered to one or multiple networks, it will automatically connect to it at start up and be available straight away in the IkaScope app. On the other hand, if IkaScope is in AP mode, you’ll have to change your computer or mobile wifi network configuration to connect to IkaScope’s wifi at each start up.

**How to connect in STA mode?**

Well, that depends: If IkaScope is in AP mode (white led lit) follow the procedure described above to access your device’s wifi manager. If IkaScope is in STA mode (blue led lit) and your computer or mobile is already connected to the same network as your device, just launch the IkaScope app and go to the wifi manager.

You can now register your favorite network(s) to IkaScope’s memory. After applying, your oscilloscope will restart and try to connect to that network. Please ensure your computer or mobile is connected to the same network. Once connected, you should be able to see your device in the list.
IkaScope App: Sharing measurements

Figure 13: IkaScope application showing multiple devices found on the network
**IkaScope WiFi settings**

A wifi manager is provided on both desktop & mobile apps. It allows you to set IkaScope’s wifi preferences. The process is quite similar on all the platforms.

**What is the purpose of IkaScope’s Wifi Manager?**

IkaScope can store and “remember” up to 3 wifi networks. Let’s say you want IkaScope to connect automatically to your office’s wifi and your home’s wifi. Well, you’ll just have to add these network configurations to your IkaScope, just as Smartphones do.

![IkaScope WiFi Manager](image)

Figure 14: IkaScope Wifi manager

The network list order represents the priority of connection. At start-up IkaScope will try to connect to each one of the wifis stored until it is able to connect to one of them. In case of successful connection,
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This network would go top of the list. That means that this list is not static, it will evolve, ensuring you always get the fastest connection to networks you regularly use.

Changing the channel in AP mode can improve connection reliability in case of highly loaded networks. Be sure to meet local regulations when doing this.

**How can I access the Wifi Manager?**

First launch IkaScope app, then open the IkaScope menu. Start searching for devices by clicking "connect an ikaScope"

![Figure 15: Accessing wifi manager](image)

A list of available IkaScope devices will be displayed, as shown below. If you can’t find your device in the list, please read this article. A click on the highlighted button opens the wifi manager.
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Figure 16: accessing wifi manager for a specific device

**Alternative way to access to the Wifi manager**

If you are already connected to the scope, you can access it by clicking on the highlighted button.
Then click on the “wifi manager” button.
Figure 18: IkaScope device page
Compatible WiFi networks

IkaScope is only compatible with 2.4 GHz wifi networks (5 GHz is not supported). In terms of encryption, it can connect to open, WEP and WPA/WPA2 secured networks. IkaScope does not support WPA2 Enterprise.
Reset IkaScope to factory settings

If you want your IkaScope to “forget” all registered wifi networks or if you have some trouble configuring your wifi connection, you can always reset your device by pushing the reset button. This will reset IkaScope to factory settings.

1. First unplug your device from any electrical connection
2. Start your IkaScope by pressing ProbeClick™ tip
3. Use a non conductive pin to push the reset button as shown on the image below
4. The device will fully erase the wifi configuration (factory setting) and will restart in AP mode

![Reset button for IkaScope WS200 oscilloscope](image)

**Note:** Factory reset will not roll back any firmware updates made to the device.
IkaScope App: Dynamic grid

Current oscilloscopes usually have a fixed size grid, with a fixed number of divisions. There are commonly 8 divisions for voltage scale and 10 divisions for horizontal scale. This is a legacy from old Cathode-Ray Oscilloscopes which were invented back in the early 1900s and therefore had some hardware limitations. Nowadays this configuration remains, kind of a tradition!

At Ikalogic we care about ergonomics, this is why we designed a new way to move and zoom through a capture, enabling modern gestures such as pinch and zoom on touch screens, or zoom in/out with the mouse wheel.

Moving through the capture

Unlike most of the DSO (Digital Storage Oscilloscope), IkaScope grid is fixed with the signal. This means that a move on the grid results in a move on the signal too. You can drag the signal with a mouse or with your fingers (on a touch screen). The voltage origin is always 0V and the time origin is always the trigger instant.

Zooming through the capture

The following animation (only available on the online version of this manual) shows a zoom-in from 1V/div to 500mV/div with a mid-range DSO (not IkaScope).
IkaScope App: Sharing measurements

The following **IkaScope app capture** shows the same action on the same signal as above. Depending on your platform, you can also use the mouse wheel to zoom in and out as well as choosing a time base or voltage base by clicking on the buttons at the bottom of the screen.

The grid has only canonical divisions (1V/div, 2/div…) but the division size is not fixed. This enables smooth transitions from one zoom level to the other, and even allows you to set a custom zoom level.
# Out of boundaries

After a measurement was taken, the blind zone which was not recorded by the oscilloscope appears as hatched lines as you can see below.

Figure 23: out of bound zoom out
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**IkaScope trigger**

Triggering is one of the most important features on an oscilloscope. It allows you to select and stabilize the measurement on the useful part of a signal.

IkaScope’s triggers contain all necessary settings for edge trigger operations as shown below. You can easily define on which trigger event you want IkaScope to capture the signal.

![Trigger configuration in IkaScope oscilloscope app.](image)

**Figure 24: Trigger configuration in IkaScope oscilloscope app.**

**Trigger modes**

Three common trigger modes can be used (Auto, Normal and Single shot). In every case, you’ll have to set up the trigger level, by dragging the **T cursor** and set it to an appropriate level.

**Auto**  This mode always displays some signals on the screen. It is the best option when you don’t know exactly the signal you are probing. IkaScope will either:

- Stream the data directly without synchronization (without triggering)
- Synchronize the display to the signal if there is a trigger event, i.e. the signal is crossing the trigger level
Normal  In this setting data will be refreshed on the screen only if a trigger event occurs.

Single shot  As its name implies, this mode will allow only one trigger event to be captured. It is used when you want to isolate a “one-shot” event and analyze it. To get another shot, just release and press again ProbeClick??? tip.

Trigger edge polarity

Three different edge types can be selected:

1. Low to high edge
2. High to low edge
3. Either low to high or high to low

Trigger Hold off

Hold off option sets the period of time where the trigger is inhibited after a trig event. Set it to the minimum delay if you are not looking for a particular waveform. This setting is generally not known to beginners, yet it can be useful in certain circumstances:

1. When multiple trigger events can occur in a very short period of time
2. See complex waveforms with different frequencies like AM signals
3. Trigger at a fixed rate
Figure 26: IkaScope trigger hold off
**Automatic measurements history**

One of IkaScope’s most innovative functionalities is called Automatic History. It automatically saves a capture of the signal after releasing ProbeClick’s tip. This allows for example to quickly recall previously measured signals. The green frame that appears at releasing moment signifies that the capture was saved to the history.

![IkaScope oscilloscope app capture history](image)

You can access the history anytime by clicking on the history button.

![History icon in IkaScope app](image)

The history database is split in two parts:

1. The *Current Session* that, as the names implies, saves all the captures since the launch of the application
2. *Favorites* where captures are persistently saved, even after the application is closed.

Saving records into the permanent memory is quite easy, you just have to click on the *favorite icon* as shown below.
Browsing through the captures is a snap. You can also add measurements and cursors as you wish.
Sharing captured measurements

Unlike common bench-top oscilloscopes, it is super easy to share oscilloscope captures using IkaScope application.

Simply click the share button on the top right of the app:

![Image of IkaScope app showing share button and oscilloscope waveform]

Figure 30: sharing captured signal using IkaScope oscilloscope app

Then, you can share your measurements by email or paste them into a report, it’s up to you!