



ZC Analytics

Educators quick start guide for the iMSO-204x

This document is your quick start to implementing your iMSO-204x in your classroom.

INTRODUCTION

Oscilloscopes are used for a wide array of applications across a number of industries. Examples of professions who use oscilloscopes include electrical engineers, automotive mechanics, medical researchers, electronic repair technicians, as well as neurobiology and physical sciences. Oscilloscopes are an integral tool for those designing, testing, or repairing electronic equipment.

The iMSO-204x digital storage oscilloscope is the most versatile, student (and instructor) friendly scope available. The basic hardware is an iMSO-204x, a digital recording instrument that measures electrical signals, through the analog or digital inputs. It is capable of recording two analog signals and four digital sources simultaneously. The connections to the iMSO-204x is shown in Figure 1.

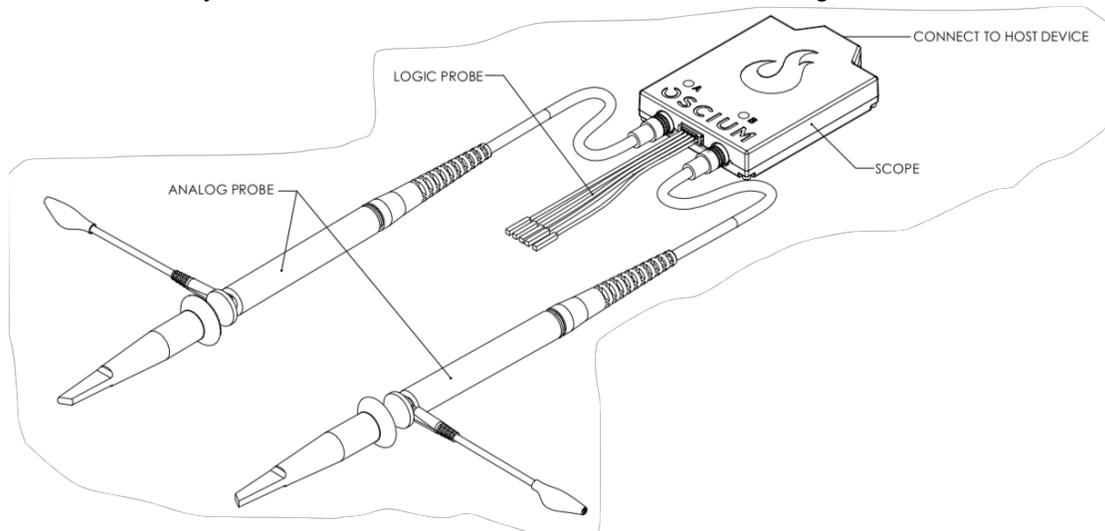


Figure 1. Principle components of the iMSO-204x digital storage oscilloscope.

GETTING STARTED WITH THE IMSO SOFTWARE

The iMSO software is free for you to download to your PC or mobile device'

System Requirements:

Apple mobile device	iOS version 7.0 & higher
Android devices	Android version 4.0.3 & higher
Windows PC	Windows 7 & higher
Macintosh	Mac OS 10.10 (Yosemite) & higher

Download PC version from this link: https://www.oscium.com/sites/default/files/iMSO_Installer_3.3.exe

Download Mac version from this link: <https://www.oscium.com/sites/default/files/iMSO-3.3.dmg>

Mobile devices please retrieve the app from the App Store or Google play:



Be sure to disable your virus protection software (if necessary) before installing on your computer.

SETTING UP THE IMSO-204X HARDWARE

The iMSO-204x should be connected to your computer or mobile device using the appropriate cable. This will be a Mini-B to: Lightning, Micro-B, USB A, or USB C cable depending upon your device.

The iMSO-204x hardware is controlled through the iMSO software, so there are no knobs or dials on the scope.

SAFETY

The analog probe which has a sliding red lever  that allows the user to move between 1x and 10x modes.

- The maximum voltage limit for the analog probe in 1X mode and when using the SMB-BNC adaptor is -8v / +13v.
- The maximum voltage limit for the analog probe in 10x mode is -40V / +40V.
- To enable 10x mode, slide the red lever located on the probe itself.
 - The 10x option located in software only changes the voltage scales in software; it does not actually divide the input voltage. Please remember to slide the red lever on the physical probe for all 10x measurements.

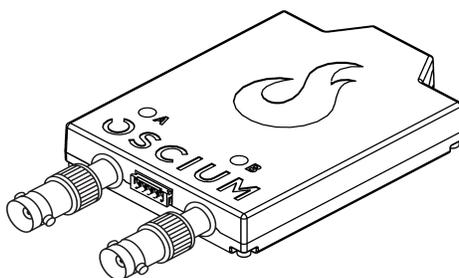


Figure 2. Use the BNC adaptor on analog channels allows for connection to other equipment with an analog output via a BNC cable.

- To use the 4 Digital logic inputs the voltage should be between -0.4 and 7.0V.
- Grabbers have a small pin that fits in the socket at the end of the logic harness.

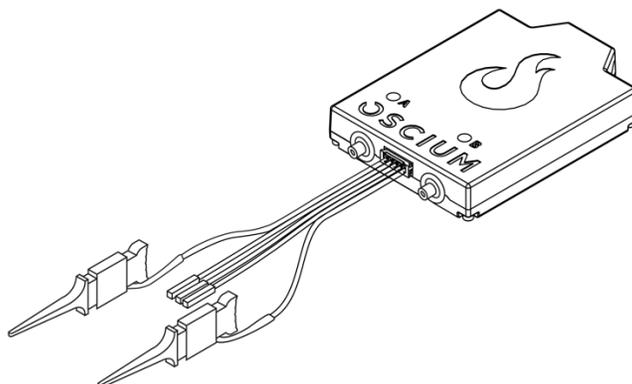


Figure 3. Attach the grabbers to the logic harness as necessary to use the digital inputs. In this illustration grabbers are attached to D1 and Ground input wires.

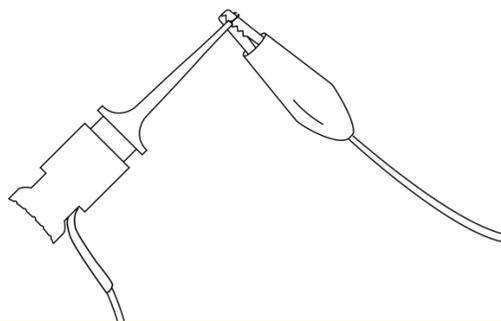


Figure 4. Grabbers can be attached to test cables, bare wires, etc.

STARTING IMSO SOFTWARE

1. Find the Oscium icon  on the desktop and launch iMSO software as you would any other computer program.
 - a. If using a mobile device, launch the app.
2. iMSO software will appear on the screen as in Figure 4.

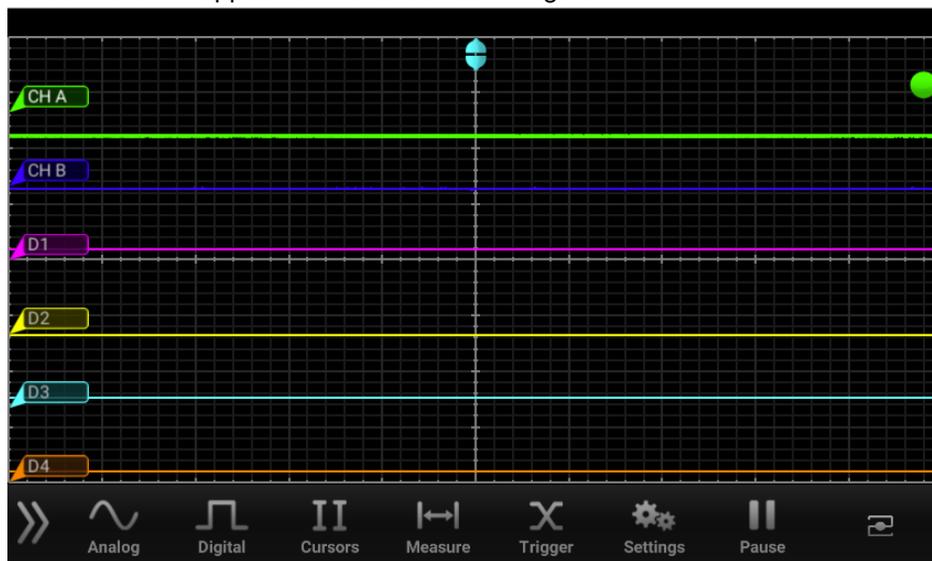


Figure 4. Default iMSO software display.

iMSO interface resembles a traditional digital oscilloscope, the toolbar at the bottom will have several sub menus with controls.

Locate the toolbar and select the Analog channel  button on the menu bar. These may be set up as necessary.

VISUALIZING AND RECORDING DATA

The next series of exercises teaches you how to properly display and collect data with the iMSO software, make adjustments to the display to visualize the data and save a screenshot.

You may adjust the time base and amplitude display by pinching on a touch screen device or using the arrow keys on your computer keyboard (figure 5). Adjust until the entire waveform is visible.



Figure 5. Adjust the screen by pinching a touchscreen (right) or by using the arrow keys (center) on a PC. The zoom dialog (left) will appear. Adjust until the entire waveform is visible.

MEASUREMENTS

Students may use the cursors and set up mathematical calculations on the incoming signals. Please see the Introductory labs included with the educator's materials.

Additional software and hardware documentation may be found here:

https://www.oscium.com/sites/default/files/iMSO-204x_UserManual_RevOrig_20170727.pdf

iMSO software has the ability to calculate various parameters as you record using the measurements functions.

1. Select Measure  from the menu bar. Fifteen different measurements exist:

Min	Pulse Width (-)
Max	Cycle Mean
Mean	Cycle RMS
Peak to Peak	Frequency
RMS	Period
Duty Cycle (+)	Rise Time
Duty Cycle (-)	Fall Time
Pulse Width (+)	

2. To select the measurement options, scroll through the pick wheel and select the desired measurements.

EXPORTING DATA

Students will export data as either a screen shot or a .csv data file. While flash drives may be used, if your PC has an internet connection, uploading to a cloud service (Google drive, iCloud, etc.) or using a web based email service will be the most efficient.

Screenshots:

1. Select the Settings menu  and then SCREENSHOT will fade to from black to gray and the display will briefly change to full screen mode.
 - a. If using an Apple mobile device simultaneously pressing the home and the power button. The screen will flash white while the picture is captured. When a picture is captured this way, everything visible on the LCD will be captured and available in photos.
2. You can now find your screen grab in the following file path:
 - a. Mac: Drive> Users>*user*>Documents>iMSO
 - b. PC: C:\Users*user*\AppData\Local\iMSO

Data logging:

The iMSO software has a built-in data logging feature that will allow you to export data as a .csv data file.

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3. Select Settings from the menu bar. Then click or touch **START** from the data log option, **DATA LOG** **START** **STOP** will then change to in order to indicate data is being logged. To stop data logging click or touch Stop
4. You can now find your data log in the following file path:
 - a. Mac: Drive> Users>*user*>Documents>iMSO
 - b. PC: C:\Users*user*\AppData\Local\iMSO

Each column of the .csv (excluding the first) is the data point in time that is shown on the screen. When the time scale is set to less than 100ms, each row is a single screen capture. When the time scale is greater than or equal to 100ms, each row is a data point in time.

TECHNICAL SUPPORT

Please send all support inquiries to product@zcanalytics.com and we will respond within one business day.