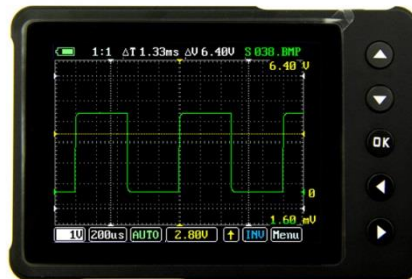


# The uScope – Getting started

## Introduction (fw 6.01)

The uScope! A single channel, pocket-sized, digital storage oscilloscope that is small, quick, and powerful. Automotive presets get you going quickly. Ideal for the Flat Rater that wants the ultimate run and gun lab scope for pin point testing. Ideal for the student that is ready to start scope'n.

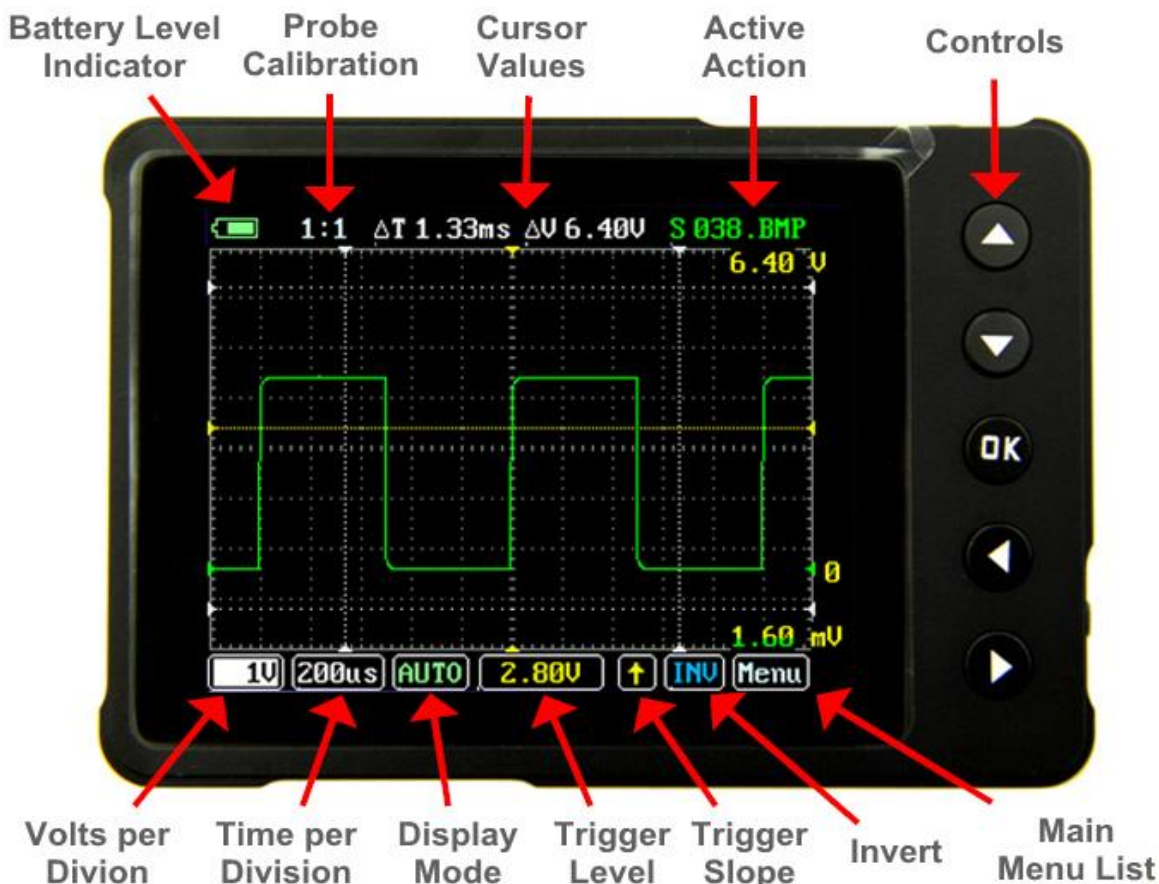


The uScope is powered by an easy to use interface enhanced with automotive presets and reference waveforms.

Put the power of the uScope in your hand (and shirt pocket).

Secondary ignition, injectors, mass air flow, crank, cam, TPS, O2, CTS you name it it'll scope it. The uScope is also perfect for your low amp probe, secondary ignition pickup and pressure transducers.

When you just need to run a quick test to verify the "signal" is working as the engineer intended, why spend time pulling out and setting up your "big boy Scope" when you can do it faster with the uScope?



## First Time Use:

### Protective Film:

When you first receive your uScope, the front face of the unit will have a plastic film that protects the uScope during shipping. Please feel free to remove the plastic film.

### Charge the battery:

Charge your new uScope for at least 5 hours before first use.

- Grab your uScope and USB cable included with your kit.
- Connect your uScope to any active USB port on a PC or charging station.

Note: to verify the uScope is charging, turn on the uScope and look at the bottom left of the screen, you should see the word "USB." If you see a battery icon, then the uScope is connected to an inactive USB port or not properly connected.

Note: a USB receptacle or USB wall charger can also be used to charge the uScope.

Note: Do not use the uScope on AC line signals while charging.

## **CAUTIONS AND WHAT YOU NEED TO KNOW ABOUT THE USCOPE**

- Do not connect to circuits or perform tests while charging the uScope.
- The uScope is intended for testing automotive DC circuits **AND NOT** AC line voltage circuits
- The maximum voltage the uScope can display is 80v. To view higher voltages you will need a 10x probe. Contact AESwave for more information. (Primary Ignition 10x probe AES# 01-18-u)

## Key Specs

Display	Full Color 2.8" TFT LCD 65K 320×240
Analog bandwidth	0 - 200KHz
Max sample rate	1Msps 12Bits
Sample memory depth	4096 Point
Horizontal sensitivity	1uS/Div~10S/Div
Horizontal position	adjustable with indicator
Vertical sensitivity	10mV/Div~10V/Div (with ×1 probe) 0.5V/Div~100V/Div (with ×10 probe)
Vertical position	adjustable with indicator
Input impedance	>500KΩ
Max input voltage	80Vpp (by ×1 probe)
Coupling	DCs Auto, Normal, Single, None, Scan and Fit
Trig modes	Rising/Falling edge/level trigger Trig level adjustable with indicator Trig sensitivity adjustable with indicator Auto measurement: frequency, cycle time, duty cycle, peak voltage, RMS voltage, Average voltage and DC voltage
Waveform Functions	Precise vertical measurement with markers Precise horizontal measurement with markers Hold/Run
Signal Generator	10Hz~1MHz square wave
Waveform storage	Micro SD card
PC connection via USB	as SD card reader
Upgrade	USB
Power supply	500mAh 3.7V Lithium battery / USB
Dimension (w/o probe)	91mm*62mm*13mm

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## Ports, Connection and On/Off Button

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### On/Off

The on off switch is located at the bottom right of the unit. It is a slide switch.



### Test Lead Port

The test lead connection is a MCX plug located at the top left side of the unit. When connecting, ensure that the plug is inserted to the base.

Note: The 3.5 stereo audio jack port located at the bottom left of the unit is a signal generator. **DO NOT USE THIS PORT WHEN TESTING AN AUTOMOTIVE CIRCUIT.**



### USB to PC Connection and Charging Port

The USB connector is a standard mini USB and is located in the middle left side of unit. This port is used for PC and uScope communication and for charging the uScope.



### Memory Card – microSD Card

The uScope incorporates a microSD memory card. The card port is located in the center of the bottom side of the unit. Note that the electrical connection tabs face toward you for installation. Press the card in until fully seated. When properly installed the card will be just below flush.

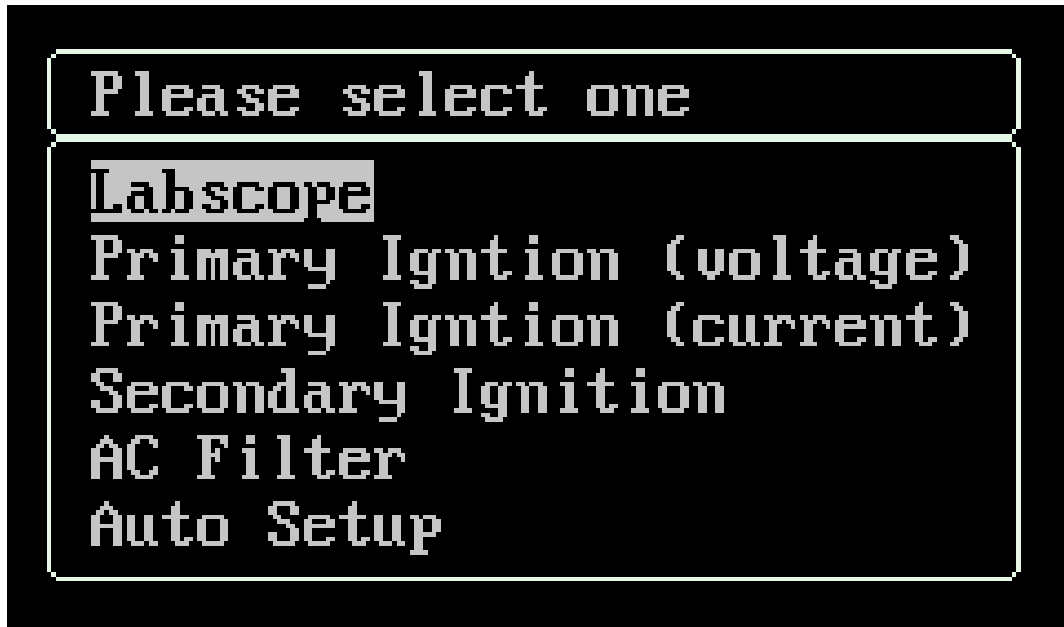
The uScope can be connected to your PC via the USB cable. Once connected to the PC, the memory card will show up as a removable storage card. To view the contents of the card, open the removable drive.

***\*\*Do not remove the memory card. Doing so may disable the ability to save and recall setups.***



## Splash Menu Startup Screen

Once the uScope is turned on, a pre-set menu screen will appear. This menu will adjust your uScope settings according to the selected preset. If the preset items on the menu do not apply to your test, select “**Labscope**” for general scope setup. Use the “**UP / DOWN**” arrow keys to make a selection. Press “**OK**” to apply the selected item.



## Disabling the Splash Menu Startup Screen

While on the main uScope Screen

1. Use the **LEFT | RIGHT** arrow keys and highlight the “Menu” icon. Press “**OK**” to open the menu window.
2. Use the **UP | DOWN** arrow keys and highlight the “Options” menu item.
3. Press “**OK**” and the menu will open.
4. Use the **UP | DOWN** arrow keys and highlight “Use Startup Menu”
5. While highlighted Press the **LEFT | RIGHT** arrow keys toggle between “Enable / Disable”. The “Enable / Disable” will appear on the upper right hand corner of the screen.
6. For this change to take effect, we will need to save the current settings. Open the “Menu” icon using the **LEFT | RIGHT** arrow keys.
7. Use the **UP | DOWN** arrow keys to select the “Options” menu item.
8. Use the **UP | DOWN** arrow keys to select “Save Current Settings”
9. Press and hold the “**OK**” button. The upper right hand corner will quickly display a message “**S Flash OK**”.
10. To verify the uScope has saved the changes, turn your uScope off and bank on.

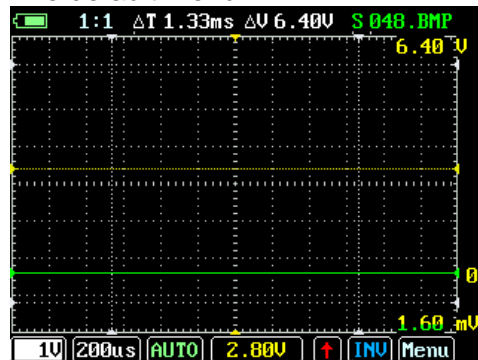
## Main Buttons

**[On/Off]** Turn uScope on or off  
Slide switch located on bottom right side of uScope



**[Arrows]** Navigation (located on right side of the front Panel)

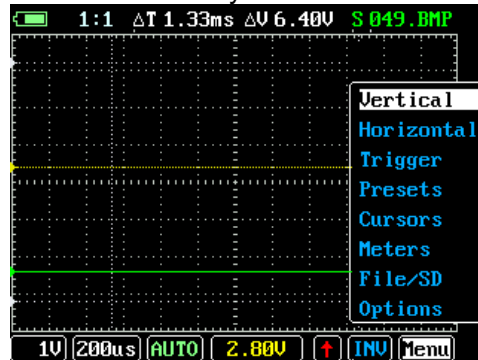
**Toolbar menu:**  
The default menu.



When navigating the “Toolbar” menu  
-LEFT/RIGHT arrows: Navigate between different toolbar menu items.  
-UP/DOWN arrows: Make adjustments for the currently highlighted menu item.

### Main Menu a.k.a. Pop UP Menu

Press “OK” at any time or select MENU from toolbar menu items.



When navigating the “Pop UP” menu:

- UP/DOWN arrows: Move between vertical lists of menu items.
- LEFT/RIGHT arrows: Make adjustments/selections for the currently highlighted menu item.

## [OK] **Select menu Items (“OK” = menu)**

When the Main Menu is visible, “OK” will open or close the currently selected menu item. For example, when “Tr” is highlighted, press “OK” to open the “Tr” menu item. Press “OK” to close it.

### **Long Press “OK”**

When a menu item calls for a selection, a long press of “OK” will close the window and select the action.

## [A] **Run/Stop Button**

1. **Pressing the “A” button will switch between “Stop” or “Run” of the current waveform.**



## [B] **Save Button**

Press and hold “B”, while in grid value mode to save a BMP image or a “User Defined File”.

By default, the uScope will save a “User Defined File”. You can change the default of the “B” button by navigating to:  
Menu > File/SD > B button save (user your left and right arrow keys to choose between BMP or User Defined File).

## Quick Start - How To:

### Waveform Capture using a PreSet:

All presets are stored and loaded onto the SD card.

Turn on the uScope by sliding the switch located on the bottom right of unit.

11. Use the **LEFT | RIGHT** arrow keys and highlight the “Menu” icon. Press “OK” to open the menu windows.
12. Use the **UP | DOWN** arrow keys and highlight the “Presets” menu item.
13. Press “OK” and the menu will open.
14. Use the **UP | DOWN** arrow keys to highlight the desired preset “Group.”
  - a. Sensors, Actuators, Amp, Ignition, Charging, User Set Ups
15. Press the **LEFT | RIGHT** arrow keys to select the desired preset in the “Group” (File name will appear on the top right corner of the screen).
16. Press and Hold the “OK” button to activate the preset.
17. Connect your test leads and fine tune Time/Voltage/Trigger adjustments if desired.
18. Note: To select Auto Setup, highlight Auto Setup, and press & hold “OK” to activate it.

### Waveform Capture not using a PreSet:

1. Turn on the uScope by sliding the switch located on the bottom right of unit to the right.
2. Use the **LEFT | RIGHT** arrow keys and highlight the “AUTO” menu.
3. Use the **UP | DOWN** arrow keys to select between **AUTO, NORM, & SING**. Note the trigger mode will display in the icon.
  - a. AUTO trigger type will allow the uScope to update the screen regardless of other trigger settings. This is a great first step to get the signal on the display. Reference chart on page 13 for more detail on trigger modes.
4. Press “OK” to exit the menu
5. Connect test leads to the signal.
6. If the signal is too short or too tall:
  - a. Use the **LEFT | RIGHT** arrow keys and highlight the Voltage icon with the V value “1V”.
  - b. Use the **UP | DOWN** arrow keys while the Voltage icon is highlighted to make the waveform taller or shorter.
7. To see more of the signal or less of the signal:
  - a. Use the **LEFT | RIGHT** arrow keys to highlight the Time icon. The scope will default to 200us.
  - b. Use the **UP | DOWN** arrow keys
  - c. Use the **UP** arrow key to go to a faster time setting showing less time of the signal but in greater detail – like a magnifying glass. For example, see one injector pulse instead of three.
  - d. Use the **DOWN** arrow key to go to a slower time setting showing more time of the signal but in less detail. For example, display three injector pulses instead of one.
8. To stabilize the signal:



## AES uScope Manual

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- a. Some signals can not be stabilized. For example, a square wave that has a unique ID such as a crank sensor. Other signals are easy to stabilize. In either case follow these procedures:
- b. Use the **LEFT | RIGHT** arrow keys and highlight the **Trigger Level Icon**.
- c. Use the **UP | DOWN** arrow keys to set the trigger level. The **DOWN** arrow key moves the trigger level down and the **UP** key moves the trigger level up. Note: the Yellow dotted horizontal line in the display indicating the selected level.
- d. The numerical value of the Trigger will be displayed in the Trigger Level Icon.
- e. A good technique for beginners is to move the **Yellow Dotted line** level indicator above the signal. Then move it down and note the changes in the display of the waveform.
  - i. **Rules of thumb:**
    1. For repetitive signals that do not have a unique spike that reaches above or below the repetitive portion of the signal, such as a square wave, just place the trigger level within the center 1/3 of the signal. Leave the **TRIGGER MODE** on **AUTO** or **NORM**.
    2. For signals that do have a unique characteristic such as an injector or ignition place the TRIGGER LEVEL along a unique portion of the signal such as the rising edge of the spike or a falling edge use **TRIGGER MODE** on **NORM** to stabilize. One more helpful adjustment is to set the **TRIGGER SLOPE** to positive or negative. (In the "TR" menu highlight "TR." **SLOPE** and use the **LEFT | RIGHT** arrow key to set the **SLOPE**.

## Main Menu

### “Vertical” Voltage & Vertical setting Menu

Highlight the “Vertical” menu item and press “OK” to open the menu.

**V/Div** (Voltage per division setting)

- Highlight V/Div
- Use LEFT/RIGHT to select desired Volts per division
- Press “OK” when complete to close menu

**Invert** (Inverts waveform on display, ideal for secondary ignition.)

- Highlight Invert
- Press LEFT/RIGHT arrow key
- Note: the Top Right of the screen will indicate if invert is on or off
  - The following will be displayed at the button right of the screen if invert is on:
    - **INV (ON = RED)**
    - **INV (OFF = BLUE)**
- Press “OK” when complete to close menu

**Gnd Pos**(Ground position)

- Highlight “Gnd”
- Use the LEFT/RIGHT to move the vertical position of the waveform. Note: that left arrow moves waveform down and right arrow moves it up.
- Note: The horizontal grid line will always reference 0 volts.
- Press “OK” when complete to close menu

**Ref Vert Pos** (Reference Waveform Vertical Position)

- Highlight Ref Vert Pos
- Use the LEFT/RIGHT to pick the desired position of the reference waveform.
- Press “OK” to exit the menu

**Probe Cal** (Probe Calibration)

- Highlight Probe Cal
- At the top left of the screen, the uScope will specify what attenuation setting you are currently on (Note: 10x does not change anything within the scope other than the voltage settings will be 10x larger – 1volt per division will read 10 volt per division.
- Use the LEFT/RIGHT to pick the desired attenuation.
- Press “OK” to exit the menu

### “Horizontal” Time and Horizontal Setting Menu

Highlight the Horizontal Menu and press “OK” to activate the menu.

**T/Div** (Time per division Settings)

- Highlight “T/Div”
- Use LEFT/RIGHT to select the time division setting
- Press “OK” to exit menu

**Horz Pos** (Horizontal Position)

- Highlight “Horz Pos”
- Use LEFT/RIGHT to select the desired Horizontal Position

- Press “OK” to exit menu

## “Trigger” Trigger and Display Mode Menu

Highlight the “Trigger” and press “OK” to activate the menu.

### Tr. Mode (Trigger Display Mode)

- Highlight “Tr. Mode”
- Use LEFT/RIGHT to select the desired trigger display mode
- Trigger mode is indicated at the Bottom Center of uScope screen
- Press “OK” to exit menu

### Tr. Level (Trigger Volt Level)

- Highlight “Tr Level.”
- Use LEFT/RIGHT to select desired position of the Trigger level
- Left moves the trigger level down and right moves it up.
- Note: horizontal yellow trigger level indicator trace.
- Note: Value is located on the bottom center of the uScope screen. Yellow Numerical Values.
- Press “OK” to exit menu

### Tr. Slope (Trigger Slope)

- Highlight “Tr Slope”
- Use LEFT/RIGHT to select Trigger Slope
- Trigger Slope will be indicated by a yellow or red arrow just to the right of the trigger value located on the bottom right of the uScope screen
- Note: When the trigger is red, this indicates the trigger is out of range.
- Press “OK” to exit menu

### Tr. Window (Trigger Window)

- Highlight “Tr. Window”
- Use LEFT/RIGHT arrow keys to select trigger window. LEFT makes the window smaller and RIGHT makes it larger (vertically).
- Trigger window is indicated by the yellow horizontal cursors
- Press “OK” to exit menu

### Tr HPos (Trigger Horizontal Position)

- Highlight HPos
- Use LEFT/RIGHT to select the trigger horizontal position.
- Press “OK” to exit menu

## “Presets” Automotive Presets Menu (memory card must be inserted)

Select the “Presets” menu item and press “OK” to activate the menu.

- Use UP/DOWN to select preset type
- Use LEFT/RIGHT to scroll through different preset setups within a preset group.
- Press and hold “OK” to load select preset.
- A loading message will appear on the upper right corner of the screen. Once the preset has loaded, a message will appear saying “Load OK”

### User Setups

- **Please reference the user’s manual for more information.**

### Show/Hide Ref

- Use UP/DOWN to highlight the menu item
- Use LEFT/RIGHT to toggle reference waveform ON/OFF
- Press “OK” to exit the menu

**(Please note: The “Auto Setup” preset does not have a reference waveform)**

## “Cursors” Cursor Values

- Highlight the “CR” menu using the UP/DOWN arrow keys and press “OK”
- Use UP/DOWN to Highlight the desired cursor (Cursor V1, V2, T1 T2)
- Use LEFT/RIGHT to adjust cursor location. (Note: The cursor values are located on the top center of the screen)
- To turn cursors off.
  - Highlight either V1-V2 (vertical cursors) or T1-T2 (time cursors).
  - Use LEFT/RIGHT to toggle between ON/OFF.
- Press “OK” to exit menu

## “Meters” Measurement values of Waveform

Highlight the “Meters” menu and press “OK” to activate the measurements value.

- To display a Measurement on the Graticule, highlight the desired measurement and press OK
- To turn off measurement values. Use UP/DOWN and select “Enable On/OFF”
- Use LEFT/RIGHT to toggle between ON/OFF
- Press “OK” to exit menu

## “File/SD” Save Waveforms, Setups, Configuration and Images on SD Card

Highlight the “File/SD” menu and press “OK” to activate the menu.

Note: SD card must be present in uScope.

### Save as image (BMP)

- Highlight the “save as image” menu item.
  - Use LEFT/RIGHT to select file number to save. Note: filename at top right of screen.
  - Press and hold “OK” button until prompt changes to the next numerical file number - located in top right of screen.
  - Press “OK” to exit the menu

### Save to USER file

- Highlight “Save to user file”
  - Use LEFT/RIGHT to select file number to save. Note: filename at top right of screen.
  - Press and hold “OK” button until prompt at the top right of screen changes the file number.
  - Press “OK” to exit the menu

### B button save (Change the behavior when B button is pressed)

- Highlight “B button save”
  - Use LEFT/RIGHT to select between BMP or USER
  - Press and hold “OK” button to accept the changes.
  - Press “OK” to exit the menu

## “Options”

### Options

Highlight the “Options” menu and press “OK” to activate the menu.

#### Sample Speed

- Use LEFT/RIGHT to toggle between Normal screen update and *FAST* mode. (*FAST* mode is started by default.)
- Press “OK” to exit the menu

#### Grid Intensity

- Use LEFT/RIGHT to adjust the brightness of the graticule lines.
- Press “OK” to exit the menu

#### Set Custom Startup (Set current settings as default)

- Highlight “Set Custom Startup” using UP/DOWN
- Press and hold “OK”
- Message will appear on the upper right confirming the save “Save ok”
- Press “OK” to exit menu

#### Reset Factory Default

- To reset your uScope to factory default settings.
- Use UP/DOWN to select “Reset Factory Default”
- Press and hold “OK”
- You will see a “Load OK” message flash on the upper right hand corner

#### SigGen Freq (Connect leads to the frequency generator for this option)

- This refers to the built in Frequency generator
- Use Left/Right to select the Frequency
- Press “OK” to exit the menu

#### SigGen Duty (Connect leads to the frequency generator for this option)

- This refers to the built in Frequency generator duty
- Use Left/Right to select the Frequency percentage
- Press “OK” to exit the menu

#### Calibrate

- Ground level calibration is automatically handled by the firmware. However, you can change the gain calibration of the scope. Please reference to your user manual for more information.

## General:

The following items are helpful in understanding the operation of your scope so you can get the most out of it.

### How to Save a Waveform onto a PC:

- Turn the uScope On
- Plug the uScope into an available USB port on a computer
- Note: The waveforms and presets are saved onto the uScope memory card. Never remove the memory card; doing so will interrupt some of the uScopes functions.
- The uScope memory card will act as removable mass storage once plugged into your pc.
- The folder can be accessed through my computer under “Devices with Removable Storage”
- The folder containing the waveform images is labeled “IMAGE”
- Note: The images are organized by image number; you will need to remember the image number.
- **Note: IMAGE001- IMAGE016 are the reference waveforms. DO NOT delete the images.**

### Firmware updates

The uScope Firmware is updated on a regular basis with improved features and functions. To check for the latest version go to the uScope home: [www.uscope.aeswave.com/update](http://www.uscope.aeswave.com/update)

Note the firmware will only load and operate on the uScope designed by AESwave.


**[www.uscope.aeswave.com/update](http://www.uscope.aeswave.com/update)**

## TRIGGER MODES

<b>Mode</b>	<b>Trigger</b>	<b>Display Waveform</b>	<b>Synchronization</b>	<b>Example Applications</b>
AUTO	Yes	Always	Yes	General use
NORM	Yes	Triggered	Yes	Only watch periodic signals
SING	Yes	Triggered	Auto-hold	Capture 1 event

## ADDITIONAL RESOURCES

**Video:** Using the COP Paddle Probe with the uScope:

URL	QR Code (Scan Me)
<a href="https://goo.gl/XDoHPw">https://goo.gl/XDoHPw</a>	

**Video:** uScope Navigation (older software version 5.12)

URL	QR Code (Scan Me)
<a href="https://goo.gl/xYB46H">https://goo.gl/xYB46H</a>	