

MIOPS Smart USER MANUAL

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1. Introduction

Thank you for choosing MIOPS Smart Camera and Flash Trigger for High-speed Photography. Miops Smart is revolutionary photography equipment, which combines power of electronics with the flexibility of smartphone platform. It will deliver high performance with reliable and easy operation. MIOPS is always open to new features with the upgradeable firmware. On top of that, the dedicated smartphone application is open to unlimited options. With every version of the app, you will get new features. In other words, Miops Smart is a platform for high-speed photography rather than a gadget with firm capabilities.

This document will be your reference for the overall operation of Miops Smart including the app. Please note that the document can be out of date with the release of new app and firmware version. You can get the latest version of this manual from our website www.miops.com. You can see the version of the firmware and app this document refers to, in the cover page of the document.

This manual includes the information you need to use Miops Smart with all features, so please read it carefully before using Miops Smart. You can check the FAQ section to find answers of some common questions. If your question is not listed, please contact us.

Miops Smart combines different functions in a single unit. You can use it either as a standalone device or as a smartphone controllable device. If you use Miops Smart as a standalone device, it will offer six different modes: Lightning, Sound, Laser, Time Lapse, HDR and DIY. You can fully configure these modes, using the buttons on the device. If you configure Miops Smart using your smartphone, you can use advanced functions on top of basic modes as well. The advanced features are but not limited to: Scenario mode, Cable Release, Press and Hold, Press and Lock, Timed Release. With the new versions of the app, other functions may be available.

Thank you very much again for choosing Miops Smart. We hope that Miops Smart will help you to bring your photography skills to the next level.

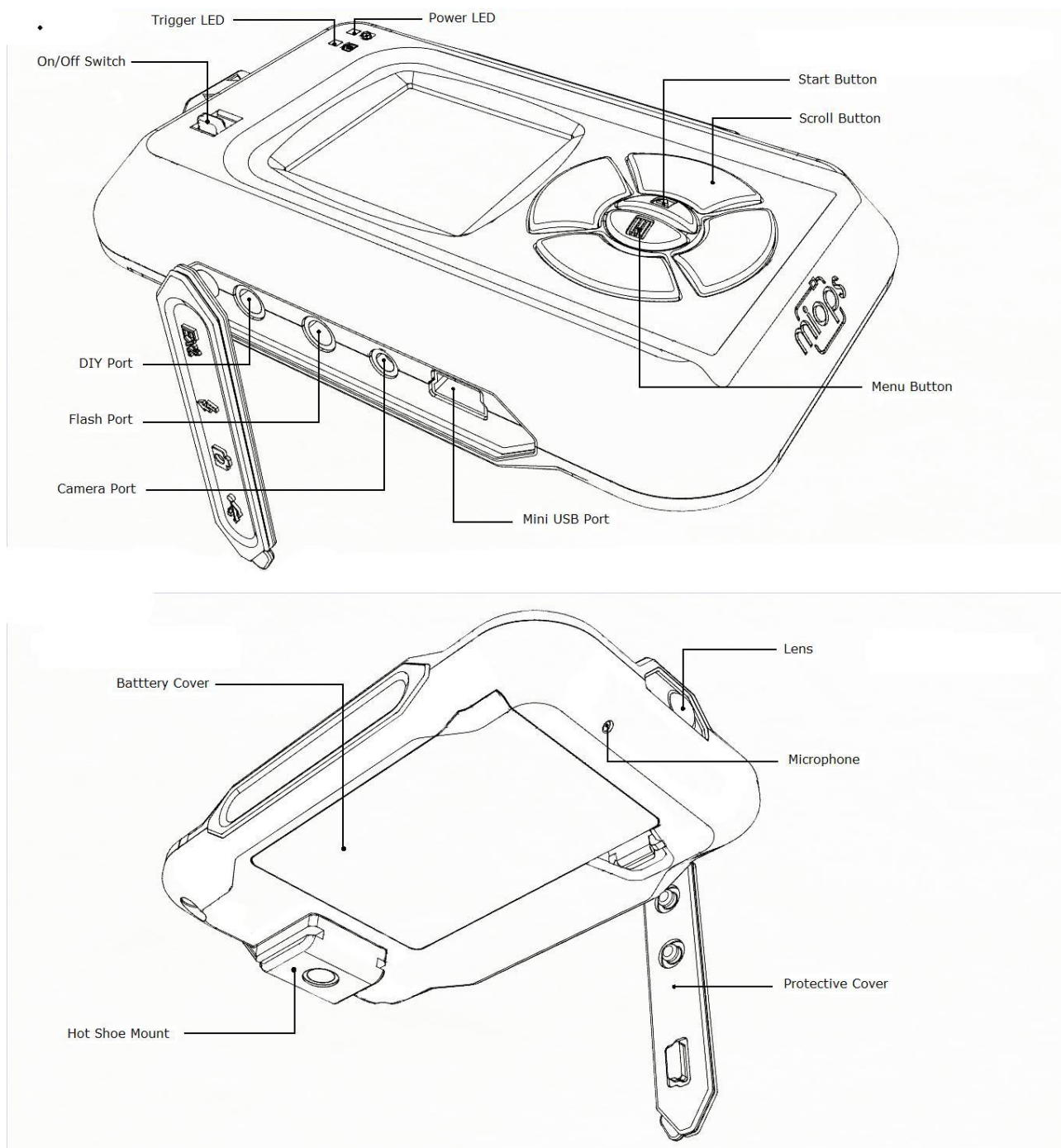


Figure 1 Buttons, Ports and LEDs

2. Specifications

In this section you can find the technical specifications of Miops Smart.

LCD Screen: 128 x 128 pixels

Battery: 3.7 Vdc, 1020 mAh, 3.8 Wh

Bluetooth: Bluetooth 4.0 (Low Power)

USB Interface: 5 Vdc

Weight: 176 gr (Batteries included)

3. Charging and Operation

Miops Smart can only be used with the provided rechargeable battery and USB connection. The battery will be charged when you connect Miops Smart to a USB power source. You can use your computer USB port for this purpose. You can power Miops Smart directly from the USB port if the battery is not in the device. Using Miops Smart with other type of battery and power source may harm your device.

When you connect your Miops Smart to a USB power source, it will start to charge the battery automatically. The power led will light up when the battery is charging. When the battery is full, the Power LED will dim. You can see the remaining battery percentage on the screen of Miops Smart in any mode.

4. Content of the Package

When you purchase a MIOPS Smart, it will be delivered with the following items:

- 1x MIOPS Smart Unit
- 1x Rechargeable Battery
- 1x USB Connection Cable
- 1x Flash Connection Cable (PC Sync)
- 1x Camera Connection Cable (of your choice)

If the delivery is missing one of these items, please contact your supplier immediately. You may receive extra items if you have purchased them additionally (extra cable, spare battery, etc.).



5. First Use

Your MIOPS Smart will be delivered with the latest firmware at the date of your purchase. If a new firmware has been released, before you have used it for the first time, you can update the firmware using the firmware upgrade tool. To get detailed information about the firmware upgrade, see the Firmware Upgrade Section.

The rechargeable battery comes partially charged. You can use it right out of the box but you may need to charge to get it fully loaded. You can charge the battery using any USB charger (500 mA min.) or the USB port of your computer. It will take about two hours to charge the battery from 0% to 100%. MIOPS Smart will be delivered with a Mini-USB

cable. You can use this cable to charge it. The mini end of the USB cable will be plugged into the USB port. It is located on the left side of the device under the protective cover. Please see Figure 1 to see the location of the USB port.

To use the MIOPS Smart for the first time, take the rechargeable battery and remove the protective plastics. Open the battery cover of the device and align the battery with the power terminals of the device. Put the battery in with the correct alignment and put the battery cover back. Turn the device on using the On/Off switch.



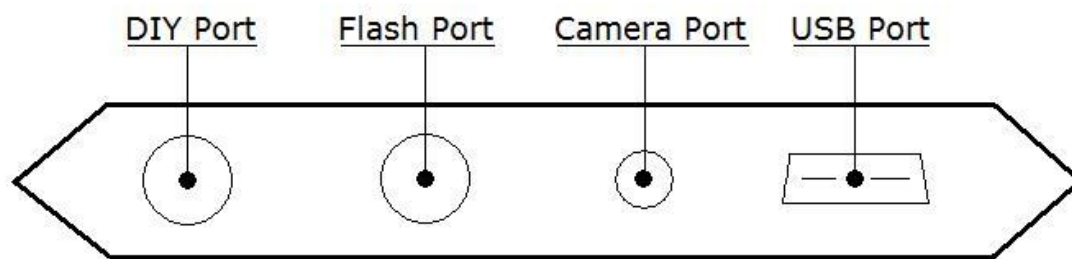
Initial screen of Miops Smart will appear on the device showing the Miops logo and the device firmware information at the bottom of the screen. It will switch to Lightning Mode automatically in three seconds.

Warning: Never use any other type of battery to power Miops Smart. This can damage the unit and may cause fire and electrical shock!

6. Camera and Flash Cable Connections

The Miops Smart uses connection cables to trigger your camera or flash unit. Your unit will be shipped with the proper camera and flash connection cables. The Miops Smart is a versatile device, which is compatible with many makes and models. You can use the same device with many different cameras by just changing the connection cable. If you consider buying a new camera, you can check the compatibility list to see whether you need to buy a new connection cable. You can visit the following list to see the compatibility list: <http://miops.com/cablelist/>

The Miops Smart has separate outputs for the camera and flash cables. Both of the output ports are located on the left side of the device under the protective cover.



The camera cable port is a 2.5 mm stereo female jack. The camera cables have the male 2.5 mm stereo jack on one end. This end is plugged into the camera connection port. The other end changes depending on the camera make and model. This end is plugged in the shutter release port of your camera.

The flash cable port is a 3.5 mm mono female jack. There is only one type of the flash connection cable. It has a 3.5 mm male jack on one end. This end is plugged into the flash connection port. The other end of the cable is a standard PC Sync port. This end is connected to the PC Sync port of the flash unit. If your flash does not have a PC Sync port, you can use a hot shoe adapter with a PC Sync port.

You can use both of the outputs at the same time. They are electrically isolated from each other. They trigger the connected device synchronously. Some older flash units require high voltages (~ 50 V) to be triggered. These flash units are not compatible with the Miops Smart. Using such a high voltage flash unit can damage the Miops Smart.

The camera and flash cables are designed to trigger the cameras and flash units only. Do not use them for any other purpose. Doing so can damage the cable. If you lose or break the connection cable, please contact us. We will help you to get a new cable.

7. Standalone, Smartphone App and Mobile Dongle

There are three different methods of using Miops Smart. These are: Standalone, Smartphone app and with Mobile Dongle.



Some functions are enabled with the smartphone app and mobile dongle only. The table below shows the availability of each mode during standalone, smart app, and mobile done method of operation.

MODE	Standalone	Smart Phone	Mobile Dongle
Lightning	✓	✓	✓
Sound	✓	✓	✓
Laser	✓	✓	✓
Time Lapse	✓	✓	✓
HDR	✓	✓	✓
DIY	✓	✓	✓
Scenario	Execution Only	✓	✓
Cable Release	✗	✓	✓
Press & Hold	✗	✓	✓
Press & Lock	✗	✓	✓
Timed Release	✗	✓	✓

The standalone mode offers you to control the Miops Smart with the buttons on the device only. You use the six basic modes of Miops Smart as a standalone device. They are: Lightning, Sound, Time Lapse, Laser, HDR and DIY. You can also use predefined scenarios, but you cannot modify or delete them. This mode of operation also does not require any Bluetooth connection. The cable connections to the camera and flash unit will be done over the unit itself.

The smartphone app offers all of the standalone modes, plus three advanced shutter release modes. They are: Press & Hold, Press & Lock, and Timed Release. The three shutter release modes require continuous Bluetooth connection between the Miops Smart

and the smartphone. If the connection is lost, they will not work. The basic modes require Bluetooth connection during the setup phase only. Once the parameters are set and the operations starts, you can end the Bluetooth connection. Miops Smart will continue working without interruption.

The mobile dongle is enabled for all modes of the smartphone app. You can use the mobile dongle for all modes after you have connected your smartphone to your camera using the mobile dongle. In this case, there will be no cable connection to the camera or flash unit from the Miops Smart.

8. Standalone Mode

You can use your Miops Smart as a standalone device without the involvement of your smartphone. If you use Miops Smart as a standalone device, you can set it to six basic modes: Lightning, Sound, Time Lapse, Laser, HDR and DIY modes. The advanced modes are available with the smartphone application only. The scenario mode will be enabled for the previously saved scenarios only. If you have previously used Miops Smart in scenario mode, the latest versions of them will be available in Miops Smart as a standalone device. You can reuse them, but you cannot make any changes on them.

a. User Interface of MIOPS Smart

Miops Smart features a device menu system which enables you to use the device very easily. The menu has two levels: Main Menu and Sub-menus. The Main Menu lets you to switch between different modes of operation. You can navigate on modes by using the right and left scroll buttons. To operate in a certain mode you need to enter the Sub-menu of that mode by pressing the Start button. Each mode of operation has its own Sub-Menu where you can adjust the settings of that mode as mentioned in the following sections. You can always switch back to the Main Menu from Sub-menus by pressing the Menu button.

The modes of Miops Smart are as follows: Lightning, Sound, Time Lapse, Laser, HDR, DIY, Scenario. Each of these modes has their parameters in the submenus. You can use the up and down scroll buttons to select the parameters. In order to change the value of a parameter, you can use the right and left scroll buttons.

Example: We want to work in Sound Mode with a sensitivity of 80, delay of 5 ms and LOCK OFF.

- 1) Turn the Miops Smart on. The device will start in Lightning mode.
- 2) Press the right scroll button once and the device will get into Sound Mode.
- 3) Press the Start button. You will see the parameters of the Sound mode.
- 4) The first parameter is the sensitivity. Bring the sensitivity to 80 using the right and left scroll buttons.
- 5) Press the down scroll button and then bring the delay to 10 ms.
- 6) Press the down scroll button one more time and then bring the lock parameter to LOCK OFF.
- 7) You have just adjusted the parameters of the SOUND mode.
- 8) Press the Start button to start capturing sound events.

Notice: Miops Smart will store the settings whenever you change them. You will not lose

your settings, when you turn the device off.

Miops Smart will get into the sleep mode if you don't press any key in 30 seconds. You can press any key to get it out of sleep mode and it will have no other affect. After that, the buttons will start working normally. If the Miops Smart gets into sleep mode while actively working in a mode, the operation will not be interrupted. Only the screen will be turned off to save the battery. In such a case, you can just press a key to get the device out of the sleep mode.

b. Lightning Mode

The lightning mode is used to capture light events like lightning, fireworks, sparks etc. The MIOPS Smart has a high-quality optical sensor and it is located in the front face of the device. If you are working in the lightning mode, please make sure that the window of the optical sensor is not covered by anything. Align the device toward the light event.

The lightning mode has a single parameter and it is the sensitivity. You can set the sensitivity anywhere between 1 and 99. If you want to capture even the smallest lightning, you can set the sensitivity to a higher value. A high sensitivity will also increase the chance of false triggering. If you want to capture the big bolts only, you can set the sensitivity to a lower value. There is no recommended setting for the sensitivity; it all depends on the environment. If you are shooting during daytime, a higher sensitivity will be useful. Please note that artificial lights (light bulbs, projectors, etc.) can cause false triggering. If there is too much artificial light in the environment, either turn them off or move the MIOPS Smart to another spot.

Camera settings: The camera must be in manual focus mode. Otherwise, MIOPS Smart will not be able to trigger your camera. You can set the focus to infinity. You can set the aperture and exposure per the environment. Please note that the lightning will be visible for about 200~300 ms. depending on the power of the bolt.

The optical sensor of MIOPS Smart is also sensitive against Infrared (IR) light. You can notice that Miops Smart triggers your camera even if there is no lightning. This can be due to lightning bolts, which are not visible to the human eye. MIOPS Smart can also detect lightning which are behind the clouds.

WARNING: Lightning is very dangerous. Please make sure that you keep a safe distance between yourself and the lightning. For more information please visit: <http://www.lightningsafety.noaa.gov/>

c. Sound Mode

The sound mode is commonly used for high speed photography. In this mode Miops Smart will detect sound events like popping balloons, breaking glasses or exploding items. The microphone of Miops Smart is inside the unit. You don't need any extra microphone to detect the sound events.

The common scenario for the sound mode is triggering the flash unit in a completely dark room. This is a simple trick to take high speed pictures with your regular DSLR camera. Prepare your setup in a room where you can make it completely dark. The event must make a sound which is loud enough to trigger the Miops Smart. Run a few dry-runs to find the correct sensitivity. In this manner you have two options. You can either adjust the distance between the setup and the Miops Smart or you can adjust the sensitivity of the sound mode. The closer to the setup the better will be performance. You can use an extension cable if you want to put the flash away from the Miops Smart. In this scenario, the camera is completely independent from the flash unit and Miops Smart.

After you have placed everything into place, bring your camera to bulb mode and turn off the lights. While it is completely dark, press the shutter button of your camera, start the event and let Miops Smart trigger the flash unit per the event (like a popping balloon). Then close the shutter of your camera and turn on the lights. Check the picture to examine the final picture.

If there is blurring on the image, this means that the flash duration is longer than required. You can lower the output power of your flash; this will give you a shorter flash duration. If you have photographing a moving object, check the location of the object in the picture as well. If the object has still way to go before it is where you want it to be, you can give some delay in milliseconds using the sound menu "delay" parameter. If the object is further away, then you can either lower the delay or if there is no delay, you can place the Miops Smart further away from the setup. Moving it 3 meters (~10 feet) from the event, will delay the triggering for about 9 milliseconds. Every single meter away from the setup, will add about 3 milliseconds of delay to the trigger event. Please note that you might have to increase the sensitivity as you are putting distance between the setup and Miops Smart.

The sound mode has the lock parameter to avoid continuous triggering. If the lock parameter is off, it is possible that the flash unit will be triggered more than once and this

will ruin the high-speed picture. You can switch the lock parameter to "ON" to enable single triggering only. You will need to press the start key again, after the sound mode has triggered once with the lock "ON". You don't need to do that, if you are working as lock is "OFF".

There might be scenarios where you don't want to trigger the flash at the first sound event, but maybe at the second or later ones. In such a case, you can use the Miops Smart App Scenario mode. Please refer to the Scenario Mode section of the user manual to get detailed information.

You can also trigger the camera in the sound mode. If you want to do so, just connect your camera to the Miops Smart with the camera connection cable. Both of the outputs, the camera and flash connection ports are triggered synchronously. The DSLR cameras have a certain shutter lag which is quite high compared to the propagation delay of the sound. The average shutter lag of a DSLR camera is about 300 milliseconds. You may consider this if you trigger your camera per a sound event.

d. Time Lapse Mode

The time lapse mode enables you to take pictures with a certain interval between each other until you reach a certain number of pictures. You can also define the exposure of the pictures in seconds, if your camera is in bulb mode. If your camera is not in bulb mode, Miops Smart cannot override the exposure settings of your camera.

The time lapse mode has three parameters. The first one is the interval. This is the duration between each triggering. You can set it anywhere between 1 sec and 1 hour with 1 second increments. Miops Smart will wait so long, before it initiates another triggering. You can see the counter counting down for each cycle, so you can see how much time is left before the next cycle.

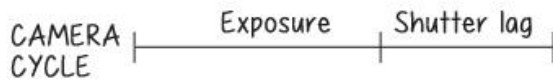
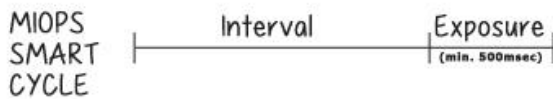
The second parameter is the exposure. Again, you can set the exposure anywhere between 1 sec and 1 hour with 1 second increments. The specified exposure will only be applied if the camera is in bulb mode, otherwise the camera will take the pictures per its settings. If the exposure is set to 0, the Miops Smart will trigger your camera for about 500 milliseconds. After this it will start the next cycle. In this configuration, every cycle will last for the duration of the interval plus 500 milliseconds. This will be the total duration for every cycle. If the exposure value of your camera is higher than this, the next triggering will be missed and you will get a lower number of pictures in total. In order to avoid this you need to adjust the interval value so that it will cover the exposure duration of your camera.

Example: **The exposure of the camera is set to 3 seconds and you want to take a picture in every 30 seconds.** In this case the interval must be at least 33 seconds, because otherwise the second triggering will be missed and you will not get as much pictures as you wish.

Example: **The camera is aperture mode and the expected exposure is less than 500 milliseconds and you want to take a picture in every 10 seconds.** In this case, you can set the interval to 10 seconds as the cycle of the camera for each picture will be shorter than the cycle of Miops Smart for every picture.

The diagram on the right shows an explanation of the cycles for Miops Smart and the camera. You need to make sure

that the cycle of the MIOPS Smart is always equal or greater than the cycle of the camera.



You can also set the number of total pictures to be taken in the time lapse mode. Miops Smart will stop triggering your camera after the number has been achieved. The total number of the pictures will only be equal to the set frame number, if the cycle duration of Miops Smart is longer than the cycle of the camera as explained above. If you get a lower number of pictures in total, check your camera and Miops Smart settings and change them per the requirements.

If you want to start a new round of the time lapse with the same settings, you can just the start key again and Miops Smart will start taking pictures again. The scenario mode of the Miops Smart app enables you to combine different rounds of time lapse with different parameters. Please refer to the Scenario Mode section of the user manual to get detailed information.

e. Laser Mode

The laser mode requires an external laser source (sold separately). This mode is based on the existence of a laser beam fed to the optical receiver of the Miops Smart. It will trigger your camera or flash unit whenever the beam is broken. You can use a regular laser pen or pointer as the laser source. The color of the laser does not make any difference.

WARNING: Please take every possible safety caution while you are working with a laser. Wear a safety goggle all the time. Never point the laser to your eyes, other people and animals.

The laser mode requires a consistent laser beam to be fed to the optical receiver of the MIOPS Smart. It is located on the front face of the device. The receiver is behind a transparent window and there is an optical lens on the window. The lens will help to focus the laser beam to the receiver. The laser beam must hit the lens on the window. A slight movement of the laser source can move the beam away from the receiver, so make sure that both the laser source and the Miops Smart are firmly mounted on a steady stand.

After you have firmly mounted the laser source and the Miops Smart, turn the device on and switch to the laser mode. If the laser beam is correctly aligned to the receiver, you should see the "LM" sign at the top right corner of the screen. LM stands for Laser Matched. Seeing a constant LM sign on the screen is the first condition of the laser mode. If you see the LM sign blinking, this may have two reasons:

- The power of the laser beam might be just about the threshold value. You can try to lower the "**threshold**" value from the parameters of the laser mode. You can also try to shorten the distance between the laser source and the Miops Smart. The density of the laser beam will decrease due to scattering, as the beam reaches further away from the source. Moving the laser source closer to the Miops Smart can solve the problem. Please note that, decreasing the threshold value may cause false triggering because of environment light. If you are working outdoors and during day time, a certain threshold value would be mandatory due to IR light. In such a situation, you can try a laser source with more output power.
- The second reason of the blinking LM sign can be the shaking of the laser source and the Miops Smart. A small misalignment can cause the laser beam to miss the receiver. If you are working outdoors, wind can be the reason for this. In such a case, you can try adding some balance weight to your tripod

or decreasing the distance between the laser source and Miops Smart. A laser source which can stay on all the time with a switch will be easier to work with. You can look for such a laser from your local suppliers.

After you see the LM sign on the screen, you can press the start key to get the laser mode running. You can go ahead and make some dry runs by cutting the beam. The Miops Smart will trigger whenever you cut the beam with your hand or something else. Again, you can use both of the output simultaneously.

You can add some delay to the triggering with the delay parameter. You can specify any value in milliseconds between 0 and 999. Different from the sound mode, the distance between the laser source and the Miops Smart does not make any difference in terms of delay. You just need to provide a consistent alignment between the laser and the Miops Smart.

The third parameter for the laser mode is the frame number. You can specify how many pictures to be taken after the laser beam has been cut. The Miops Smart will trigger your camera so many times equal to the frame number. You can set the number anywhere between 1 and 999. Miops Smart can trigger your camera at a maximum rate of 2 times per second. This means your camera has about 500ms for every picture. Your camera may need longer than this due to the camera settings. In such a situation, you will get a lower number of triggering. If your camera is in burst mode, it is also possible that you get a higher number of pictures than specified. You will get the exact number of frames, if your camera needs less than 500ms for every picture and it must be in single shot mode.

The laser mode does not have a LOCK parameter. It will keep triggering if the laser beam is fed and then cut again. If you want the laser mode to stop working for good after a certain number of frames, you can create a custom scenario using the Miops Smart app on your smartphone. Please refer to the Scenario Mode section of the user manual to get detailed information.

f. HDR (High Dynamic Range) Mode

HDR mode enables you to take the same picture with different exposures, so you can combine them later with image processing software to get a final image. The final image will be closer to what human eye can see. The theory behind the HDR photography is very simple. The human eye can see the light in 20 different stops. This is approximately about 1000000:1 contrast ratio. A high quality DSLR camera can capture about 14 stops at maximum. If you sweep through all possible exposure values by taking multiple images, you will get as close as possible to what human eye can see.

The HDR photos are usually taken in odd numbers as there will be an image at the center exposure and equal number of images with the higher and lower exposures. The exposure values will be calculated depending on the center value. This parameter is shown as "Center" in the HDR menu. You will also need to specify how much you want to increase or decrease the exposure at each step. The higher the ratio, the wider will be the dynamic range. This parameter is shown as "EV(+/-)". The final parameter is how many pictures you want in total. This is shown as "Frame". If you want three pictures for example, there will be one at the center exposure, one at the high exposure and one at the low exposure. If you want five pictures starting from the same center value, the exposure will get high and down one step more. If you set EV(+/-) to 2, the highest possible value for the frame value is limited to 5. This is due to the technical limitations of the DSLR cameras. It is technically not possible that a DSLR camera would be that fast in bulb mode.

The calculation of the exposure steps is pure mathematics. The formula is very simple.

$$(n - 1)th Exposure = \frac{Center}{2^{(EV)}}$$

$$Center Exposure = Center$$

$$(n + 1)th Exposure = Center * 2^{(EV)}$$

If you set the EV(+/-) to 1, the exposure will be multiplied or divided by 2. If you set it to 1/2, the factor will be 1.41. If you set the EV(+/-) to 1/3 the factor will be 1.25. The exposure values will be calculated by multiplying or dividing the center value with or by the factor.

Example: I want the center exposure to be 2 seconds. I want to take 3 pictures with EV(+/-) equal to 1/2. What will be the exposure values?

As the EV(+/-) is set $\frac{1}{2}$, the factor is 1.41. The center exposure will be 2 seconds. The high exposure will be $(2 * 1.41)$ which will be rounded to 3 seconds. The lower exposure will be $(2/1.41)$ which will be rounded to 1.5 seconds.

Example: **I want to take seven pictures in total but the lowest exposure is faster than my camera can go in bulb mode. What will happen?**

In such a case the speed of your camera will be the lower limit for the exposure. It is possible that you get two pictures with the same exposures for the lower values.

IMPORTANT: Your camera must be in BULB mode to take HDR pictures. Otherwise, all of the pictures will have the same exposure.

After you have all the three parameters set, you can press the start key. After this, a time line will appear on the screen with the calculated exposure values and stops. You will also see the current index of the picture to be taken along with the total number of the pictures to be taken.

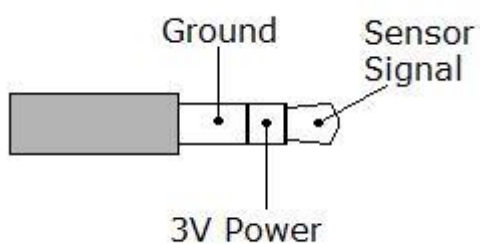
g. DIY (Do It Yourself) Mode

The DIY mode is used to connect external sensors to your MIOPS Smart. The external sensor can be of any type if it meets some technical specifications. The DIY mode enables you to trigger your camera or flash unit based on a signal coming from an external sensor.

WARNING: The DIY mode is designed for expert only. If you are not sure whether your sensor would work or not, do not connect it to the MIOPS. You can damage the device and your sensor. Please make sure that your sensor meets the criteria.

The DIY port is located on the left hand side of the device. It is under the protective cover. It is a 3.5 mm stereo jack. The external sensor should be connected to the DIY port only. You can damage your sensor and Miops Smart if you connect it to the flash connection port.

The DIY port has three terminals. The first terminal is the ground terminal. The ground of the sensor must be connected to this terminal. The second terminal is the power input terminal. If your sensor requires an external power source to work, MIOPS Smart can provide 3Volts to it through this port. You can feed your sensor from this port by observing the polarity. If the sensor is already powered from another source, you don't need to make any connection through this terminal. The third terminal is the signal output terminal. The output signal from your sensor must be connected to this one. Please refer to the diagram below to see the signal, power and ground pins of the sensor connection jack.



Please note that, Miops Smart provides 3Volts to the sensor from this jack. The terminal in the middle is where Miops Smart will feed the voltage. The output signal of the sensor must be connected to the first terminal of the jack.

Figure 2: 3.5 mm Sensor Output Jack

The output signal can have a maximum value of 3.3 Volts. Using a sensor with higher voltage can damage the Miops Smart. Please make sure that the output jack of your sensor is compatible with the diagram shown above.

After you have made sure, that your sensor has the correct terminal connections, you can connect the jack to the DIY port of the MIOPS Smart. The DIY mode has three different parameters. The first one is the threshold value. It is given in percentage and it reflects the required change in the signal level to initiate a triggering. As the input signal can be anywhere between 0 and 3.3 Volts, one percent change is equal to 0.033 Volts. You can set the threshold value per this calculation. The second parameter is the delay. As in the other modes, you can add some delay to the triggering event. The delay can be set to any value between 0 and 999 milliseconds.

The third parameter is called the "mode". This parameter specifies how the output signal of the sensor should change to qualify as a trigger event. There are three options: Change, Rising, Falling. If you set the mode to change, it will not matter whether the voltage is going up or down. Any value above the threshold will qualify as a triggering event. If you want to detect increasing voltage only, the mode should be set to rising. And finally, if you set the mode to falling, you will only detect decreasing voltage changes.

h. Scenario Mode (Execution Only)

The scenario mode works in combination with the smartphone app. You can store up to three different scenarios to the Miops Smart to be executed later any time. Please refer to the Scenario Mode section of the user manual to see how to create new scenarios using the app.

When you create a new scenario and run it, it will be also stored to the Miops Smart. You can run them later, but you cannot modify them without the smartphone app. The scenario mode screen lets you choose one of three previously stored scenarios. You can select the scenario you want to run using the up and down scroll buttons. When you are ready, press the start button and the scenario will be executed. Each scenario can have up to five different steps. The screen will display which step is currently running and when the scenario ends, the Miops Smart will return to the selection screen. If you have defined less than three scenarios, empty setup rows will be disabled.

If you modify a scenario from the smartphone app while it is running, it will be stopped on the Miops Smart and you will get back to the setup selection menu. You can quit from a running scenario by pressing any key. If the scenario ends with a single frame final step, like sound mode with lock on, you will be taken back to the setup selection menu after the triggering. The last step can also be a multiple frames step like lightning mode. In such a case, Miops Smart will continue running the scenario until it is ended by the user.

Once you have defined or modified a scenario using the smartphone app, you have to start it at least once from the app, so it will be sent and stored to the Miops Smart. If you just save the scenario but don't start it, it will not be saved. Once the scenario starts running on the Miops Smart, you don't need to keep the app running. You can also disconnect the smartphone and the operation of Miops Smart will continue.

The operation of defining and storing new scenarios has been explained in the Smart Phone App section of the user manual. Please refer to that section to get detailed information about the smartphone app scenario mode.

9. Smartphone App Mode

The smartphone app has been designed as an interface to configure and control your MIOPS Smart. It is available on iOS and Android platforms. You will receive software updates over Apple AppStore and Google Play. The iOS version must be 7.0 or higher. The Android version must be 4.3 or higher. The communication between the smartphone and MIOPS Smart is done over Bluetooth connection. Your smartphone has to be compatible with Bluetooth 4.0. The interface of the application is very similar for most of the functions. They have only a few minor differences in some of the modes. The difference will not change the user experience.

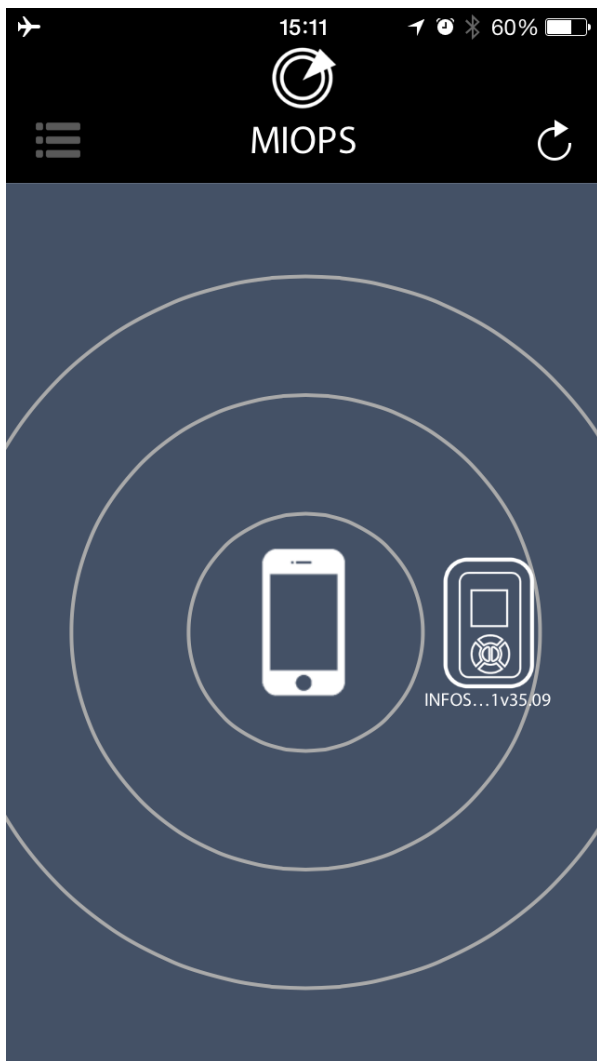
a. Installing the Application

The app name is “MIOPS” on AppStore and Android Market. You can download and install it from the repositories just like any free app. There is no registration needed to use the application. If your smartphone version is compatible, you can install it to your phone by following the regular app install procedure.

b. App Requirements

You will see the MIOPS logo on the screen of your phone. You can start the application by touching the MIOPS icon. Make sure that your phone is not in Airplane mode. Otherwise, MIOPS Smart cannot communicate with your phone. Bluetooth must set to “ON” in your smartphone as well.

Please note that, your smartphone must have Bluetooth 4.0 capability. Otherwise MIOPS Smart will not be able to connect to it. Miops Smart features a Bluetooth 4.0 module which offers lower energy consumption and better range compared to the previous versions.



The initial screen of the app will show your smartphone and the nearby discovered MIOPS Smart units. You can pair your MIOPS Smart with the smartphone by touching the MIOPS icon. The logo will move onto the smartphone logo and the mode selection menu will show up on the left hand side of the screen. If you want pair the smartphone with another MIOPS Smart, you can touch the refresh icon on left-top section of the screen. The app will discover all available MIOPS Smart units in the Bluetooth cover range. You can choose which one to connect just by touching the MIOPS icon.

c. Using the Application

The app has a menu style interface to switch between different modes. The initial menu will appear on the left hand side of the screen. Different modes will be listed from top to the bottom. You can select the mode you want to use by touching the icon. The menu will scroll down to show additional modes that do not fit into the screen. The menu will disappear once you select any mode and the app will enter in to the configuration page of that particular mode. You can switch between different modes anytime. In order to do that, you just need to touch the menu icon on the top-right hand side of the screen. When you switch back and forth between different modes, the settings will not change.



The first button on the menu is Search Devices button. This button is used if you haven't connected to your MIOPS Smart as you have started the app. You can use the same button if your MIOPS Smart has disconnected for some reason. The range, in which a MIOPS unit can be discovered, depends on different factors. If your device is not discovered by the app, get closer to the MIOPS Smart. If there is too much interference in the environment, it may take longer to connect. If you have multiple MIOPS Smart units in the area, you will see all of them on the screen. You can connect to a single MIOPS Smart at a time.

The Bluetooth connection is only needed until you have configured your MIOPS Smart. Once you have successfully configured your MIOPS Smart, you don't need keep the app running. If you want to switch to another mode or change settings, you will need to start the application again. In that case, you can use the Search Devices button to

discover and connect to your MIOPS Smart again. A continuous connection is needed when you are going to use the four release modes: Cable Release, Press & Hold, Press & lock, Timed Release. These modes will only function properly if there is an active Bluetooth connection between MIOPS Smart and your smartphone.

In each mode you will have different parameters. The parameters are consistent among both the standalone operation and smartphone app. You can set the parameters per your need. In order to send your configuration, to MIOPS Smart, you need to touch the start button on the bottom of the screen. **MIOPS Smart will not start to function until you touch the “start” key.**

You can verify if the configuration has been successfully sent, by reading the notification “Data is sent successfully!” at the bottom of the screen.

When the configuration is successfully sent, you will see that the screen of MIOPS Smart changes to that mode if it is another mode. If MIOPS Smart was in the same mode, the screen will refresh with the new adjusted parameters.

d. Scenario Mode

The scenario mode is most powerful mode of the smartphone app. It is a revolutionary function, which enables you to combine different sensor and factors to create a custom scenario to be executed by Miops Smart.

You can define up to three different scenarios and you can save them to use later. Each scenario can have up to five different steps. Each step can be either one of six basic modes of Miops Smart (Lightning, Sound, Time Lapse, Laser, HDR, and DIY) or a certain amount of delay. Each step is fully configurable per the parameters of that particular mode. The last step of a scenario cannot be a delay; otherwise there are no restrictions about the order of the steps. The delay can be up to 59 minutes 59 seconds with one second increments.

You can start adding scenario steps by touching the “plus” sign on the first row. You will see a horizontal list of available options. You can scroll left or right to find the desired mode for that step. When you find the desired mode, you can touch the check mark on the right side of the bar. This will take you to the parameter settings of that mode. You can adjust the parameters as you would do in the stand alone mode of operation. Once you are finish you can touch the “save’ button and this will add this step to the scenario. If you press the “cancel” button at that time, this step will not be added to the scenario. At

each row you can see the mode of that step and the parameters as well.

You can change the order of the steps by touching the particular row. The row will be highlighted and you can swipe it up or down to change the order. The delay cannot be the last step of a scenario. Other than that, there are no restrictions on the scenario steps. If you want to delete a step you can swipe the row to the right. A pop up window will appear to ask if you really want to delete that step. You can touch "No" to keep the step, or just touch "Yes" to delete it.

In order to start the execution of a scenario, you need to touch the "start" button at the bottom of the screen. This will also transfer the scenario to the Miops Smart and save it to the device. You can use the saved scenarios later without the smartphone app. The Bluetooth connection must exist between the Miops Smart and the smartphone to transfer the scenario. Otherwise, it will not be saved to the device. To get detailed information about using the saved scenarios in the stand alone mode, please refer to the Chapter 8.h of the user manual.

When the execution of the scenario starts you can follow it both on the device and smartphone. When a step is complete, a check mark will appear on that row and the next step will be executed. You can also follow the progress on the screen of the Miops Smart. Once the scenario is over, Miops Smart will return the scenario mode screen again. You can stop the execution of the scenario by touching the "stop" button at the bottom of the screen. Miops Smart must be connected to the smartphone, to be able to stop the execution remotely. Otherwise, you can stop it only by pressing any key on the device.

You can define three different scenarios. You can switch between the scenarios by touching the scenario name. A notch will move to that scenario and you will see the steps of that scenario on the screen.

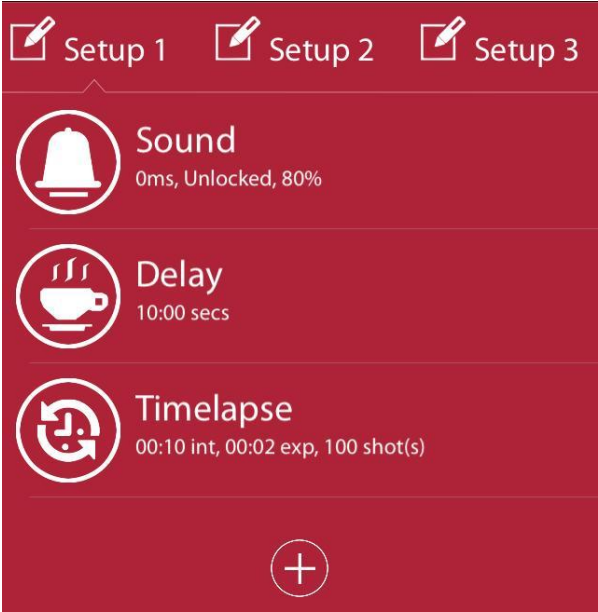
You can also use the mobile dongle with the scenario mode. To know how to use the mobile dongle in the lightning mode, please refer to the Mobile Dongle section of the user manual.

Example: I want to start a time lapse 10 minutes after a sound event. How many steps do I need?

You will need three steps in a scenario. The first step will be the sound mode.

You will add the first step in the sound mode with your desired parameters. The second step will be a delay of 10 minutes. And finally, you will need to add a step in time lapse mode with the interval,

exposure and frame parameters.



e. Lightning Mode

The lightning mode in the smartphone app has the same parameter with the standalone mode. The only available parameter is the sensitivity. To get detailed information about the parameters and the usage of the lightning mode, please refer to the Lightning Mode section in Standalone Mode Operation of Miops Smart (Chapter 8.b).



The sensitivity of the lightning mode can be adjusted, using the touch dial on the screen. Turning the dial clockwise will increase the sensitivity and vice versa. The faster you turn the dial, the faster will change the sensitivity. The current level can be read in the middle of the dial. If you want to fine tune the sensitivity level, you need to turn dial really slow. You can change the level by +/- 1 percent if you do so.

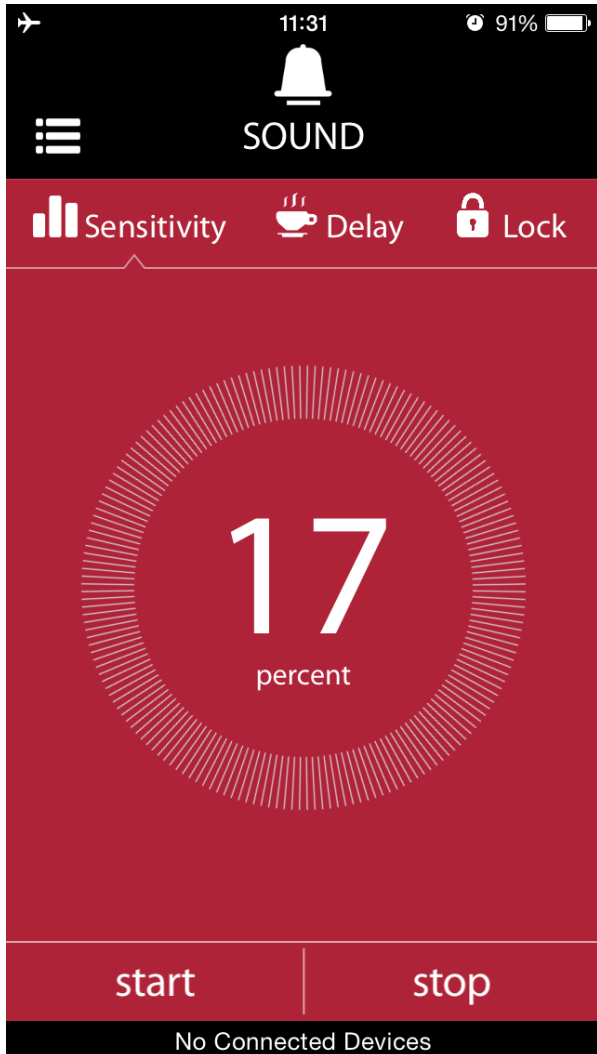
You can change the sensitivity anytime, by using the buttons on MIOPS Smart as well. But the settings on the smartphone app will override the settings on MIOPS Smart, whenever data is sent from the app to MIOPS Smart

As it is the case in all modes, do not forget to touch the "start" button. Verify that data has been successfully sent to MIOPS Smart to ensure a proper operation. To know how to use the mobile dongle in the lightning mode, please refer to the Mobile Dongle section of the user manual.

f. Sound Mode

The sound mode in the smartphone app has the same parameters with the standalone operation. They are the sensitivity, delay and lock. You can set all of them using the

sound mode screen of the app. To switch from one parameter to the next one, just touch the icon at the top of the screen. You will see a notch moving to that parameter and the screen will show the available parameter setting menu. To get detailed information about the parameters and the usage of the sound mode, please refer to the Sound Mode section in Standalone Mode Operation of Miops Smart (Chapter 8.c).

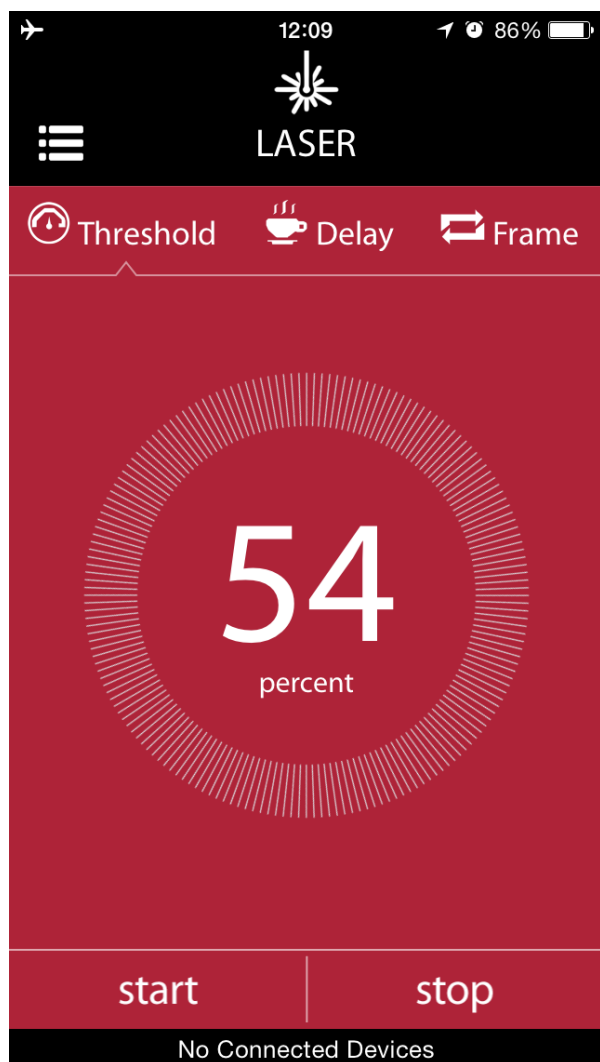


The parameters work the same way as they do in the standalone mode. The smartphone app just provides an interface to them. It also enables to use the mobile dongle. To know how to use the mobile dongle in the sound mode, please refer to the Mobile Dongle section of the user manual.

g. Laser Mode

The laser mode works consistently with the standalone operation as well. It has the same parameters in the smartphone app. To get detailed information about the parameters and the usage of the laser mode, please refer to the Laser Mode section in Standalone Mode Operation of Miops Smart (Chapter 8.e).

Attention: Laser beam can be dangerous. Avoid eye contact. Use the laser source at your own risk. We strongly recommend that you use a protective goggle.

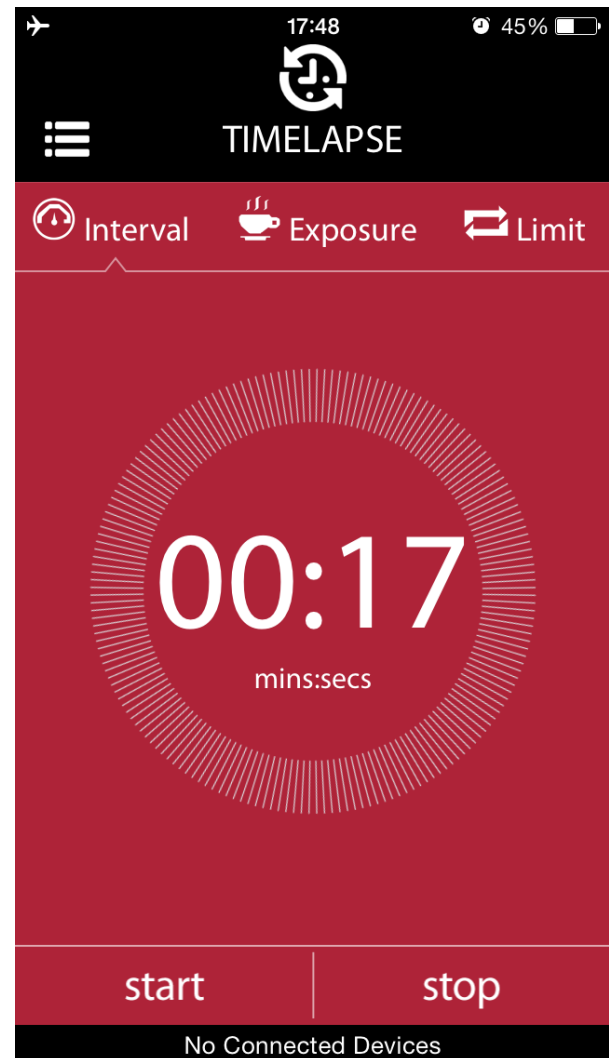


You can set the parameters of the laser mode by using the dials on the screen. To switch between different modes, just touch the icon of that parameter. A notch will move to the parameter and you can change the parameter value by using the dial. You can also enable the mobile dongle from this screen. To know how to use the mobile dongle in the laser mode, please refer to the Mobile Dongle section of the user manual.

h. Time Lapse Mode

The Time Lapse mode has also the same parameters with the standalone mode. They are the interval, exposure and the limit. To get detailed information about the parameters and the usage of the time lapse mode, please refer to the Time Lapse Mode section in Standalone Mode Operation of Miops Smart (Chapter 8.d). You can set all of the parameters using the Time Lapse mode screen of the app. To switch from one parameter to the next one, just touch the icon at the top of the screen. You will see a notch moving to that parameter and the screen will show the available parameter setting menu.

To know how to use the mobile dongle in the laser mode, please refer to the Mobile Dongle section of the user manual.



i. DIY (Do It Yourself) Mode

The DIY mode has also the same parameters with the standalone mode. They are the threshold, delay and the mode. To get detailed information about the parameters and the usage of the DIY mode, please refer to the DIY Mode section in Standalone Mode Operation of Miops Smart (Chapter 8.g). You can set all of the parameters using the DIY mode screen of the app. To switch from one parameter to the next one, just touch the icon at the top of the screen. You will see a notch moving to that parameter and the screen will show the available parameter setting menu. To know how to use the mobile dongle in the laser mode, please refer to the Mobile Dongle section of the user

manual.

j. HDR (High Dynamic Range)

The HDR mode has also the same parameters with the standalone mode. They are the threshold, delay and the mode. To get detailed information about the parameters and the usage of the DIY mode, please refer to the DIY Mode section in Standalone Mode Operation of Miops Smart (Chapter 8.g). You can set all of the parameters using the DIY mode screen of the app. To switch from one parameter to the next one, just touch the icon at the top of the screen. You will see a notch moving to that parameter and the screen will show the available parameter setting menu. To know how to use the mobile dongle in the laser mode, please refer to the Mobile Dongle section of the user manual.

k. Press & Hold

Using Press & hold mode you can keep the shutter open as long as you want. The shutter will open when you press the circle and it will close whenever you release it.

l. Press & Lock

Press & Lock mode will open the shutter with a tap on the screen. The shutter will remain open until you tap the screen again.

m. Timed Release

In this mode you can keep the shutter open for a certain period of time. You can specify the time period in seconds. You can go up to 1 hour.

10. Mobile Dongle Mode

The mobile dongle enables you to trigger your camera with a cable connection from your smartphone. In this mode, you don't need to have a cable connection from Miops Smart to your camera. You have to plug the mobile dongle to the earphone jack of your smartphone. The camera connection cable will be connected to the mobile dongle and to your camera. Miops Smart will have a Bluetooth connection to your smartphone. If you are working in the lightning, sound and laser modes, Miops Smart will detect the events using the internal sensors and when a triggering event happens, it will command the smartphone to trigger your camera. In the remaining modes, the smartphone app does not need the Miops Smart.

The mobile dongle is available in every mode rather than being a standalone mode. In each mode, on the right top of the screen you will see the mobile dongle icon. It lets you to switch to the mobile dongle mode of operation. Before you switch to that mode, you have to plug in the mobile dongle to the earphone jack of the smartphone. If you touch the mobile dongle icon before you plug the earphone, a pop-up message will appear. You cannot switch to mobile dongle mode unless you plug the earphone. You will also need to set the volume to max level. You will get another warning about that, if the volume is not set to max.

The mobile dongle requires an active Bluetooth connection between the Miops Smart and your smartphone for the lightning, sound and laser modes. Please note that the mobile dongle adds a certain delay to the triggering. This might affect your setup. If you switch to mobile dongle mode from the cable connection, you might need to adjust the parameters of that mode.

The mobile dongle is designed to be used with Miops app and a camera only. Do not use it with other applications or devices. This may cause malfunction and damage your Miops Smart and device.



Figure 3 Mobile Dongle Cable Connection

11. Firmware Upgrade

When a new firmware is released, you can upgrade your MIOPS Smart with the firmware upgrade software on both Windows and Mac systems. The instructions on how to upgrade your device for both systems is given below.

a. Windows Systems

In order to complete the upgrade you will need to download the following items: Firmware Upgrade Software, Device Drivers and Firmware File. Create a folder called MIOPS Smart in your computer to store the required files. Note the folder location as you will save all of the required files to that folder.

The Firmware Upgrade Software is the dedicated program that you will use to put the new firmware to your MIOPS Smart. It transfers the firmware from your computer to MIOPS Smart using the USB connection. You will also need to introduce MIOPS Smart to your computer using the device drivers. You will need to do this once. Once this step is complete, your computer will recognize MIOPS Smart automatically.

For your convenience, we have bundled all of the required files into a single compressed file. You just need to download the file and extract it to the MIOPS Smart folder that you have created for the upgrade. You can download the upgrade kit from the following link: <http://www.miops.com/firmware/firmwareUpgrade.zip>

The content of the folder should be looking as shown in the picture below.

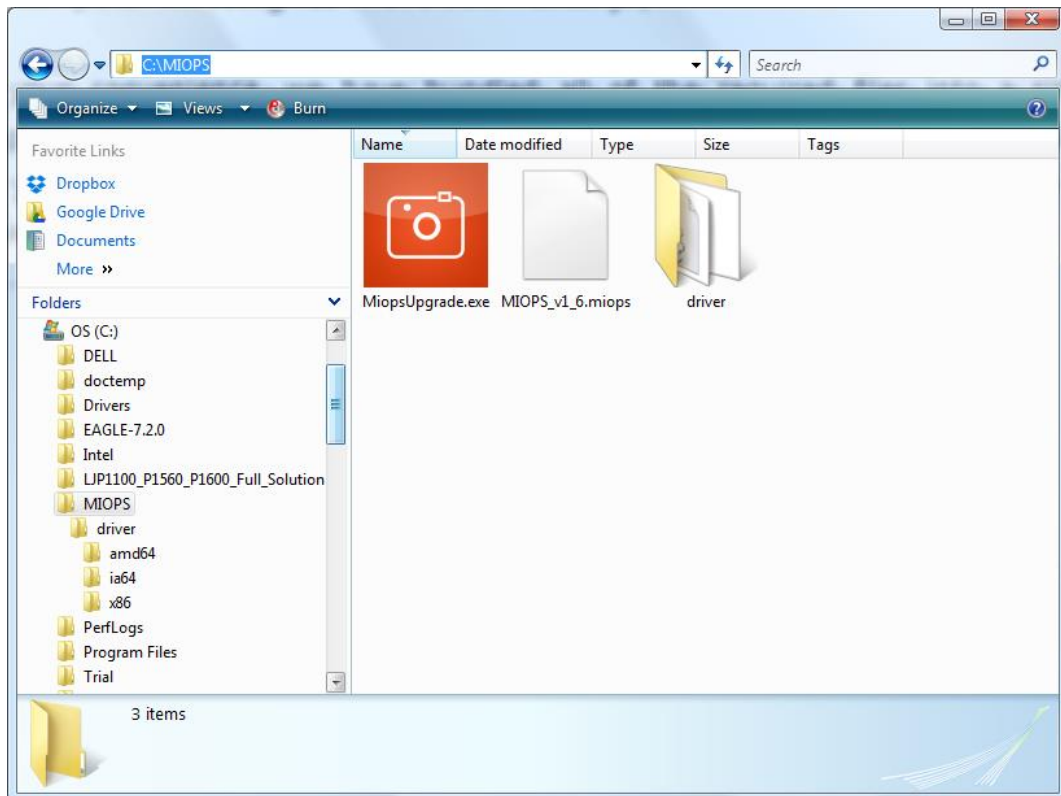


Figure 4 Firmware Upgrade Folder

In order to start the firmware upgrade, you need to connect MIOPS Smart to your computer with the provided USB connection cable. Connect MIOPS Smart to your computer as it is still turned off. Start the MiopsUpgrade.exe software. This software will start automatically. **In order to put MIOPS Smart to firmware upgrade state, you need to turn it on while pressing the UP scroll button.** This is important. If you cannot do this, MIOPS Smart will not be in the firmware upgrade state and you will not be able to upgrade it.

Press and hold the UP scroll button and turn MIOPS Smart on. Then connect it to one of the USB ports of your computer. As this is the first time that MIOPS Smart is connected to your computer, you will need to install the required drivers. After you have done this once, you don't need to do it again. Next time your computer will recognize MIOPS Smart which is put to "Firmware Upgrade" state. If you connect MIOPS Smart to your computer without putting it to "Firmware Upgrade" state, it will not communicate with your computer so nothing will happen.

After you have connected MIOPS Smart to your computer, open the "Control Panel" in Windows operating systems. Click "System" and choose "Device Manager". You will see an unknown device under other devices section with exclamation point on it. Right click on this device and select Update Driver Software.

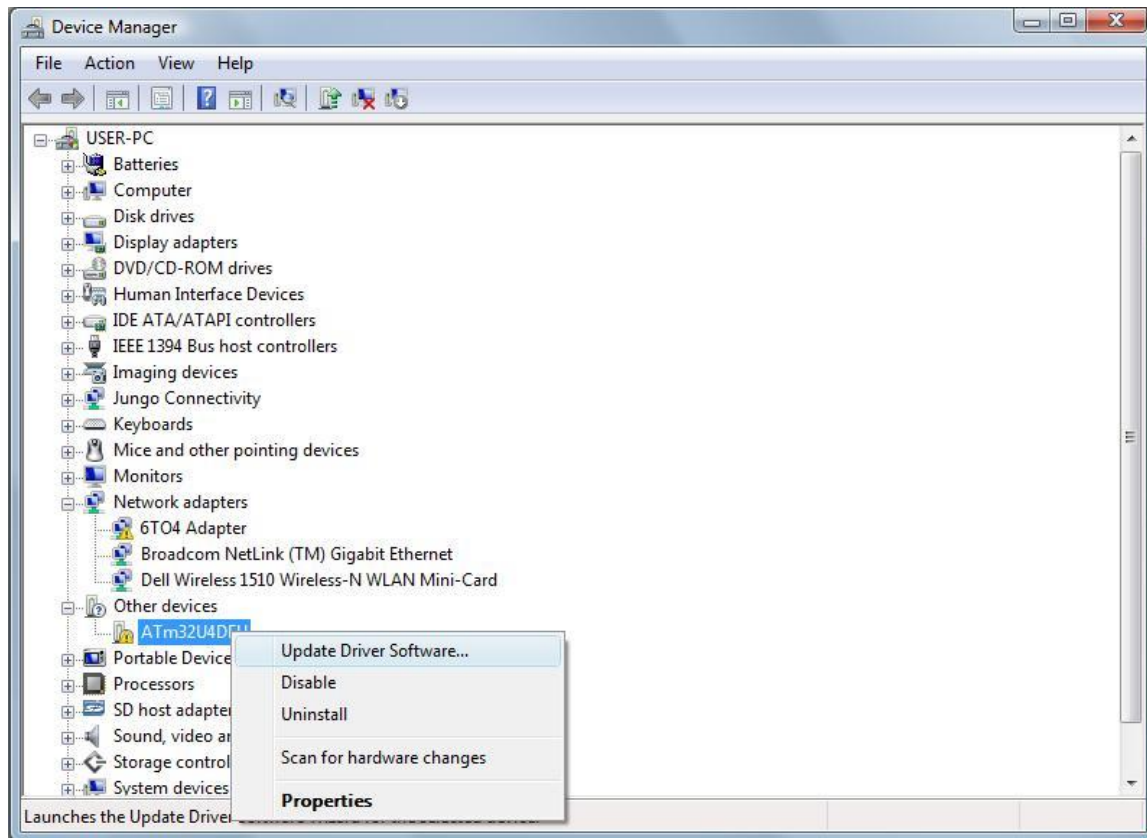


Figure 5 Device Manager

At this point you will be prompted if you want your computer search for the driver or you will be browsing for them. Choose "Browse my computer for driver software" and point the "driver" folder.

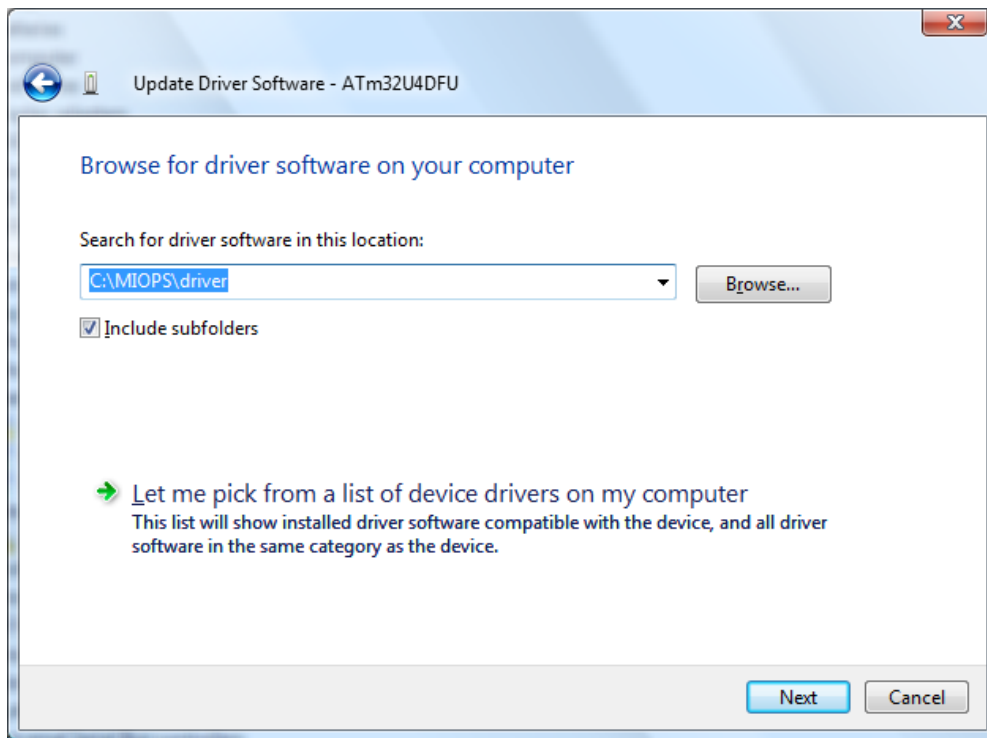


Figure 6 Locate Driver Folder

The driver files will be copied and you should see the following screen.

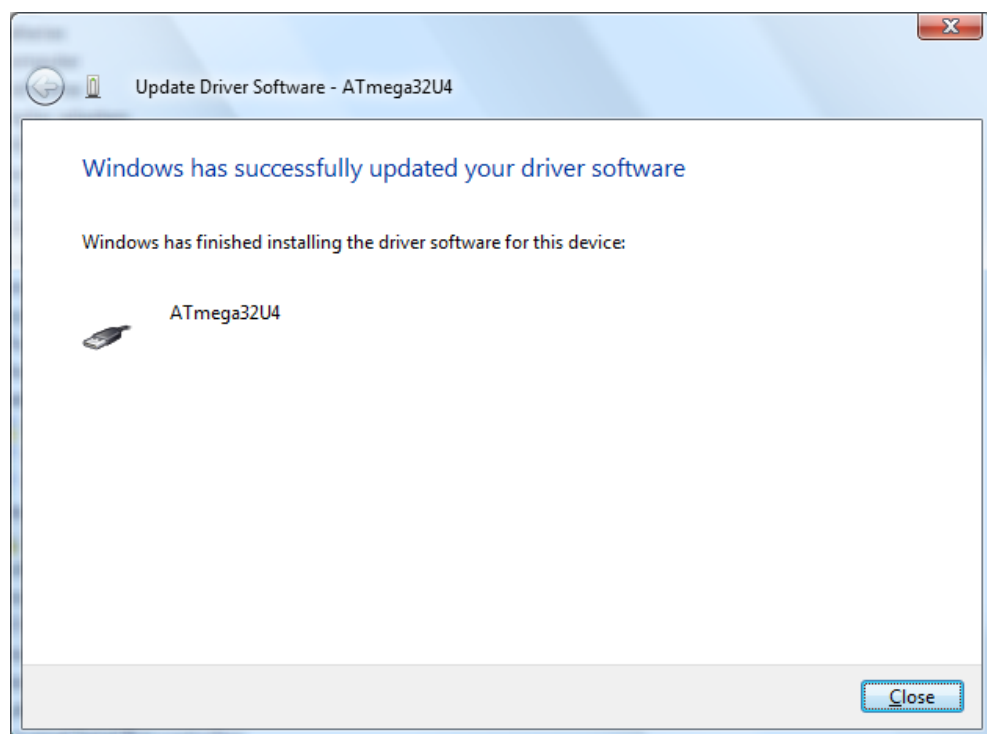


Figure 7 Driver Installed

After that step you are ready to install the firmware. **Switch off MIOPS Smart again and switch it back on as you press and hold down the Up Scroll button.** At this point, when you start MiopsUpgrade.exe, the program should recognize MIOPS Smart and it will show a green check sign on MIOPS Smart. This means the software is ready to put

the new firmware to MIOPS Smart. The only thing you need to do is to locate the firmware file. Click the browse button (see highlighted with red below) and locate the firmware file you stored in the MIOPS Smart folder.

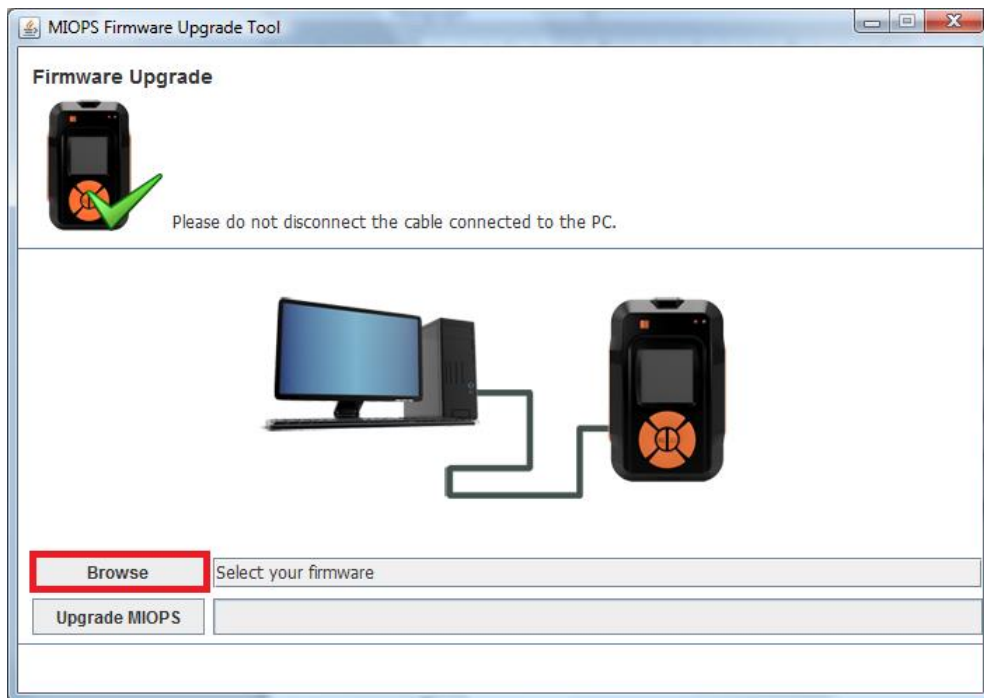


Figure 8 Browse for the Firmware File

The latest firmware file is MIOPS_v1_7.miops. You can download the latest file from the following link: <http://miops.com/download/> The file name can change for the future versions to reflect the version changes. After this click the Upgrade MIOPS button. It should take about 15 seconds to upgrade the firmware. Then MIOPS Smart will restart again and you will have your MIOPS Smart with the new firmware updated. If anything goes during the firmware upgrade you can start over. Repeat the same of putting MIOPS Smart to firmware upgrade mode locate the firmware file and then complete the upgrade.

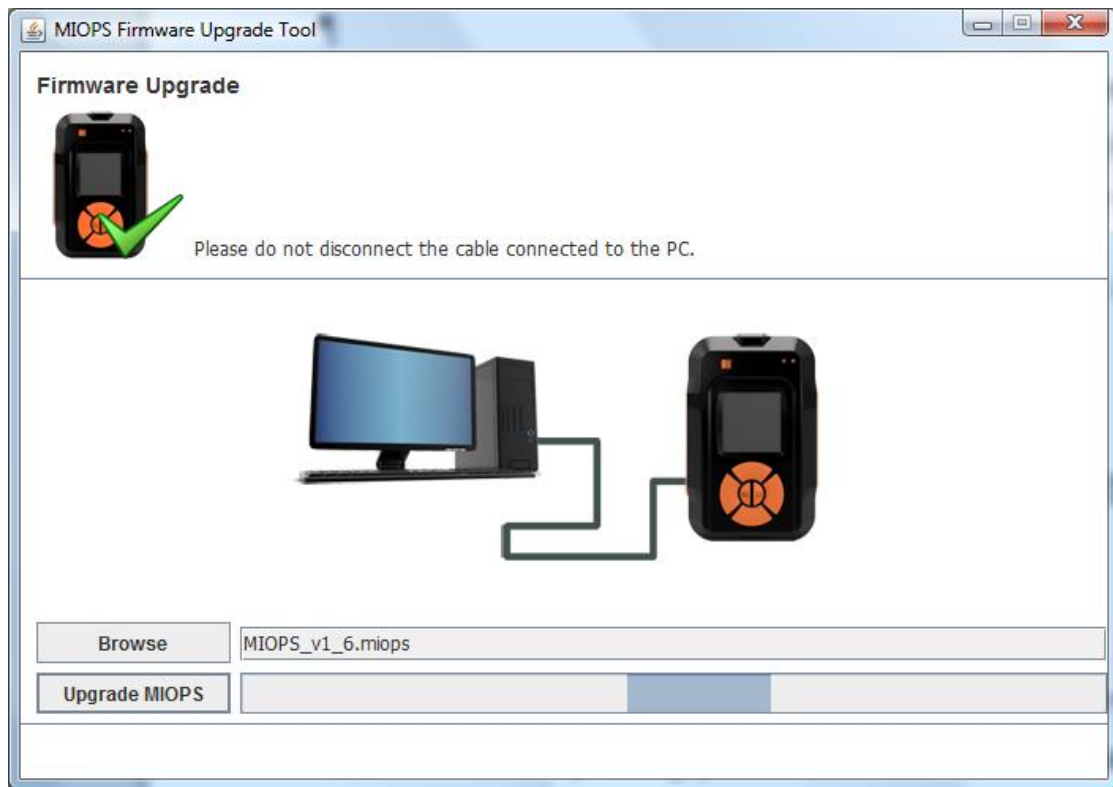


Figure 9 Firmware Upgrade Process

When the firmware upgrade is completed, you should see the following confirmation message.

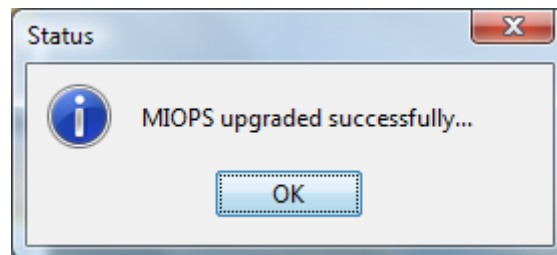


Figure 10 Firmware Upgrade Complete

b. MAC Systems

You can upgrade your MIOPS Smart on a MAC computer with the special software upgrade tool. You can download the firmware upgrade tool from the following link: <http://miops.com/download/> Download the zip file and extract it to a folder. Download the latest firmware file as well. Please note that Windows and MAC systems use the same firmware file, they just have different upgrade tools.

Connect your Miops Smart to the computer with the USB cable, but do not turn it on at this time. Open the firmware upgrade tool. You will see the initial screen of the upgrade tool.

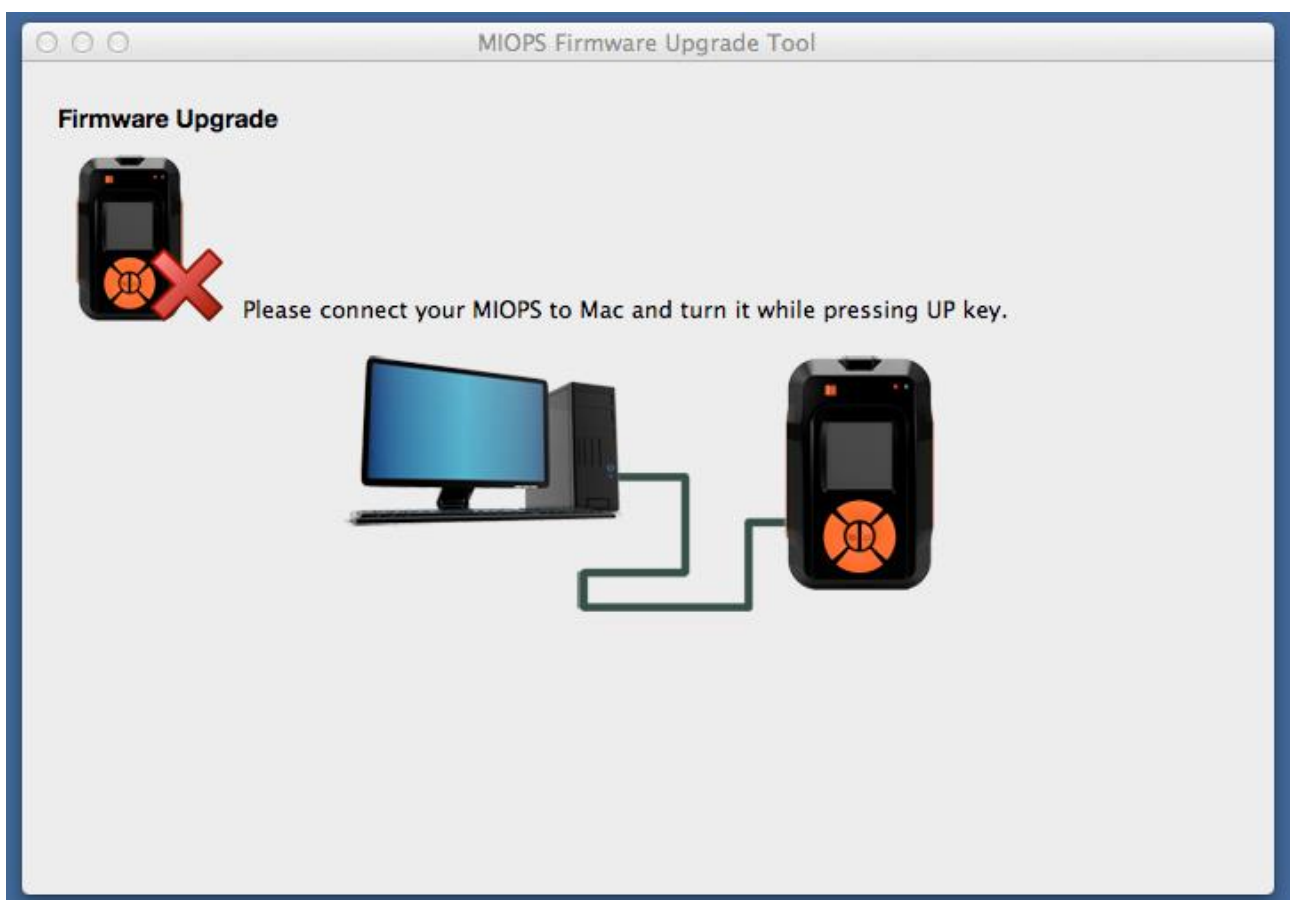


Figure 11: MAC Firmware Upgrade Tool

Before you start the firmware upgrade process, you need to put Miops Smart into the Firmware Upgrade state. Turn the Miops Smart on as you keep pressing the "Up" scroll button. This will put it into Firmware Upgrade status. You should see that there is a green check mark on the Miops icon. This means you have successfully put it into the Firmware Upgrade state. If you cannot do this at the first time, you can try again. You don't need to restart the app. Just turn it on as you keep pressing the Up scroll button. In this state, the

screen of the Miops Smart will be just black. The screen of the app should be as shown below.

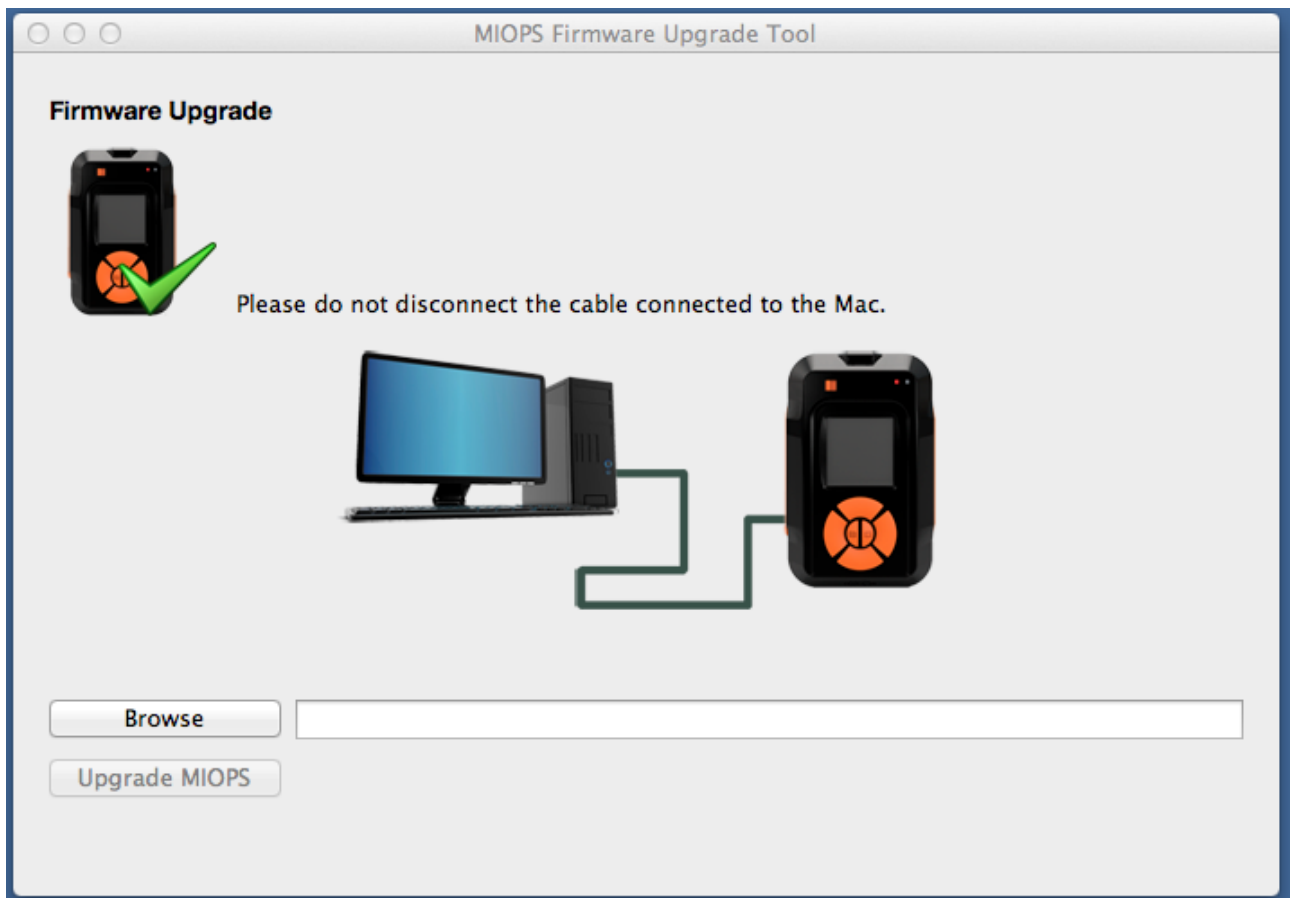


Figure 12: MIOPS in Firmware Upgrade Status

You can continue the upgrade process by pressing the Browse button. You will need to locate the firmware file. Select the firmware file you have downloaded from the download page. The path of the file will appear next to the Browse button. You can then press the "Upgrade MIOPS" button. You will see a progress bar on the screen and the upgrade should be complete in about 10 seconds. MIOPS Smart will start after this in regular mode with the new firmware. You can disconnect it from the computer.

12. Warranty

MIOPS Smart comes with a 2-Year warranty against manufacturing defects. If you think that your unit is not working as it should, please contact us at info@miops.com with your purchase details.

The device is not water proof, so water damages are not covered. If you are using MIOPS Smart outside, make sure that you protect it from water. Do not drop MIOPS Smart as this can damage the PCB and electronics components inside. There are no user serviceable parts inside, so please do not disassemble the device.

13. Disclaimer

Lightning Photography is a dangerous activity. We are not liable for any damage or personal injury associated with the use of MIOPS Smart. MIOPS Smart is intended for use as a camera shutter release device only and no other purpose. MIOPS Smart is not waterproof. It should be treated and handled with the care of a camera and should not be dropped and/or exposed to extreme heat or moisture.

14. FCC Approval

Federal Communications Commission (FCC) Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: To assure continued compliance, any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. (Example – use only shielded interface cables when connecting to computer or peripheral devices.)

FCC Radiation Statement

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.