◈ MANTIS

OWNER'S MANUAL

MANTIS SUB ENCLOSURE
FOR INSTA360 PRO/PRO2

Please read these instructions carefully before using this product, and save this manual for future use. For questions, email info@mantis-sub.com or visit https://www.mantis-sub.com/

Please note that the actual controls and components, menu items, etc. of your camera and software may look somewhat different from those shown in the illustrations in this Owner's Manual.

Version 2.5, 2021-06-21

Table of Contents

ABOUT THE MANTIS SUB SUB ENCLOSURE

Mantis Sub underwater housings make it easy to achieve professional 360/VR productions with the Insta360 Pro and Pro2 cameras — 8K, 3D and live-streamed.

Vacuum leak detection for your peace of mind.

Anodized aluminium body is durable and neutrally buoyant.

Specially designed domes for clean zenith and nadir

7-color LED indicator shows camera status at a glance.

Underwater start/stop to conserve disk space.

Underwater on/off to conserve battery.

3x18650 batteries extend recording time.

4x external bulkhead ports for hydrophone, ethernet, power, vacuum valve, etc.

Easy setup with App.

- 8K, 6K, 4K video in 2D (monoscopic) and 3D (stereoscopic).
- Up to 7680x7680 still images (3D).
- 4K live-streaming, pre-stitched direct from the camera.
- 8K live-streaming, using optional Insta360 Live software.
- Ideal for photogrammetry / 3D reconstruction.

"There's nothing that delivers underwater 360 3D at the same calibre as the Mantis Sub housing."

— Richie Robinson, award-winning underwater photojournalist

CAUTIONS FOR USE

- A water-tight test in a bathtub or similar is highly recommended when using the system for the first time and after the changing of port and O-ring(s). Submerge the enclosure fully for several minutes, and watch for any bubbles.
- Before cleaning the enclosure, remove the batteries or the DC coupler, or disconnect the power plug from the outlet.
- Do not use solvents such as benzine, thinner, alcohol, kitchen detergents, etc, to clean the enclosure, since it may deteriorate the external case or the coating may peel off.
- Do not leave the enclosure with the lens facing the sun, as rays of light from the sun may cause it to malfunction.
- Do not leave any metal items (such as clips or hex keys) near the contact areas of the power plug or near the batteries.
- Store batteries in a cool and dry place with a relatively stable temperature:
  - Recommended temperature: 15ºC to 25ºC (59ºF to 77ºF)
  - Recommended humidity: 40%RH to 60%RH
- Do not store batteries for a long time while fully charged. When storing batteries for a long period of time, we recommend charging them once a year.
- Do not use lubricants from other brands with the nitrile rubber O-ring on this enclosure, only use the lubricant provided by Mantis.
- Discontinue use immediately should you notice any leakage.
- Store the enclosure in a robust, shock-proof container during transportation; avoid transporting while turned on.
- When travelling by air, do not close the enclosure latches, as this may lead to a pressure difference between the atmosphere and inside the enclosure.
- Care must be taken when opening the enclosure, as pressure may build up inside the enclosure which increases the opening force.
- Do not open the product in a wet or sandy environment. Protect the interior from moisture and debris in order to prevent malfunction or leakage.
- Do not store the product in an environment of high humidity.
- Do not leave the enclosure in direct sunlight for prolonged periods.
- Keep out of reach of children, failure to do so could result in injury.
- Defective products should be shipped to our factory or distributors for service. Unauthorised disassembling and/or modifications could result in malfunction or leakage.

WARRANTY AND LIMITATIONS OF LIABILITY

For warranty, limitations of liability and terms of sale see our standard terms at
https://www.mantis-sub.com/

PACKAGE LIST

- 1x Waterproof transport case
- 1x Mantis Sub underwater enclosure with
  - 6x domes, mounted.
  - 1x Nauticam M14 Vacuum Valve II (push-button release), installed.
  - 1x M14 port plug, installed.
  - 2x M16 port plug, installed.
  - 2x Sacrificial anodes, installed.
  - 1x Camera tray with Mantis Sub electronics, installed.
- 1x 2mm hex key for domes.
- 1x O-ring kit.
- 1x O-ring grease.
- 2x 2dBi SMA stub antennas (replace Insta360 standard to fit inside housing).
- 1x Ethernet cable coupler.
- 1x Mantis Sub housing stand.
- 1x Neoprene bag for underwater enclosure.
- 1x Vacuum pump.

FEATURES

- Clean nadir and zenith - full 3D/360 view, no black discs/occlusions.
- 10mm port for observing Insta360 display.
- WiFi for control, setup (surface), web interface to controller for remote control and log files.
- RGB Status LED
- Integrated vacuum sensor.
- Support for hydrophone in top bulkheads.
- Support for power, Ethernet and HDMI connection through bottom bulkhead.
- Battery pack to extend runtime.
- Vacuum valve installed as standard.

SPECIFICATIONS

- Housing body: Aluminium alloy.
- Surface treatment: Hard anodised.
- Dome Material: Acrylic.
- Depth rating: 90m/300ft.
- Buoyancy: freshwater 200g/7oz positive, seawater 300g/10oz positive
- Dimensions:
  - Dome: 90x70x40mm / 3.5*2.8*1.6 inch

- o Enclosure w/o dome: 138*163*250mm / 5.5*6.4*9.85 inch
- o Enclosure with domes: 190*209*250mm / 7.5*8.2*1.6 inch
- Weight without camera and batteries: 2.2 kg/4.8 lbs.
- Weight with camera and batteries: 3.7 kg/8.2 lbs.
- Battery life, controller: up to 12 hours

PREPARATION BEFORE CLOSING THE ENCLOSURE

- Ensure the DHCP setting of the Insta360 Pro/Pro2 is set to "Direct" and fan is set to "On".
- Insert the camera into enclosure and ensure the lens is centered.
- Connect the Ethernet cable to the camera.
- Connect battery pack to the tray. You will see the lights on the Ethernet port turn on.
- The Mantis Sub controller boots (~30 seconds). During booting the LED changes from red to blue to white.
- A white LED signals that the Mantis Sub controller is ready and waiting for connection to the Insta360 Pro/Pro2.

INFORMATION ON THE BATTERY PACK

- The battery shuttle inside the takes 3x 18650 batteries.
- A battery pack with 3x 3000mAh 18650 batteries can power the Mantis Sub controller for up to 20 hours.
- The battery pack can also power the Insta360 Pro/Pro2 via the extension cable and provide up to 30 minutes of additional runtime, depending on battery and health. This reduces the overall runtime of the controller.

PRE-DIVE CHECKLIST

1. Confirm the Insta360 Pro/Pro2 is charged and properly seated
2. Confirm the Ethernet cable is connected.
3. Confirm the Mantis Sub controller is powered on.
4. Confirm the O-ring is in place, undamaged, and free of debris.
5. Confirm the O-ring was not pinched while the housing was closed.
6. Confirm all four latches have locked securely.
7. Hold the power button for two seconds to power on Insta360 Pro/Pro2.
8. Observe display to confirm Insta360 Pro/Pro2 is ready.
9. Confirm the status LED has turned yellow to signal the controller is connected to the Insta360 Pro/Pro2.
10. Unscrew the vacuum port cover and pump 5-6 times to create vacuum.
11. Confirm the status LED has turned green to signal vacuum is achieved.
12. Replace the vacuum port cover.
13. Press the record button and wait for the recording to start. Confirm the status LED has turned magenta while the Insta360 Pro/Pro2 is preparing to record.
14. Confirm the status LED has turned off to not interfere with the recording.

6

15. Press the stop button and wait for the recording to stop.
16. Confirm the status LED has turned magenta while the Insta360 Pro/Pro2 is saving.
17. Hold the power button for three seconds to power off the Insta360 Pro/Pro2.
18. Confirm the status LED has turned Cyan after the Insta360 Pro/Pro2 has turned off to signal the vacuum is present and the camera disconnected.
19. Confirm the status LED remains cyan for several minutes to signal vacuum is stable.
20. Place the camera inside the neoprene bag to protect the domes while getting into the water.

POST-DIVE CHECKLIST

- Place the enclosure inside the neoprene bag to protect the domes while getting out of the water.
- Remove the housing from water.
- Rinse the enclosure with fresh water after use; wipe the housing with a towel before opening.
- If you're done for the day:
  - Open the enclosure.
  - Turn off power to the controller.
  - Remove the battery tray.
  - Remove the batteries from the tray and recharge them.
  - Remove the camera and charge it.

TURNING ON

- Turn on camera by pressing the mechanical button (right-hand side) all the way in and hold for 2 seconds.
- The camera boots (~20 seconds). During this time, the display will turn on, off, and on again. If you press your ear against the enclosure you can hear the fan.
  - If the camera doesn't boot, try holding the button for 10 seconds for a soft reset. Then press the button again to start the camera.
- After the camera has booted, the Mantis Sub controllers automatically connects to the camera.

TURNING OFF

- Turn off camera by pressing the mechanical button (right-hand side) all the way in and hold for 3 seconds.

RECORDING VIDEO

- Ensure the camera is turned on.

Version 2.5, 2021-06-21

- If the camera was turned off, the controller will automatically reconnect. This can take up to 10 seconds after turning on the camera due to network timeouts.
- Press the top button firmly to start recording.
- The status LED turns magenta while the Insta360 Pro/Pro2 is preparing to record.
- The status LED turns off when the Insta360 Pro/Pro2 is recording to not interfere with the recording.
- Note: The Insta360 Pro2 takes approximately 10 seconds before it starts recording.

Troubleshooting
- If the camera does not start recording, try pressing the record button again.
- If the camera still does not start recording and the display remains unchanged, reboot the camera and try again.

STOP RECORDING VIDEO

- Press lower button firmly to stop recording.
- The status LED turns magenta while the Insta360 Pro/Pro2 is saving.
- The status LED turns green when the Insta360 Pro/Pro2 has saved and is ready.
- Note: The Insta360 Pro2 takes approximately 7 seconds to stop recording.

CAPTURING TIME-LAPSE PHOTOS

You can capture time-lapse photos by setting the recording mode in the Mantis WebApp to "Timelapse".

Note: The Insta360 Pro/Pro2 needs to be configured with the Insta360 Pro App for time-lapse photo mode before entering the water.

- Ensure the camera is turned on
- Press the on/off button to enter photo mode.
- Press the on/off button again to start taking photos.

Alternatively, you can use the main on/off button to start/stop time-lapse recording without using the Mantis Sub controller buttons. This will record time-lapse photos even when the recording mode is set to a video format.

STOP CAPTURING TIME-LAPSE PHOTOS

- Press the mechanical button to stop taking photos.
- The camera remains in photo mode. You can still start video recording by pressing the top Mantis Sub controller button.

LIVE STREAMING

You can start a livestream by setting the recording mode in the Mantis WebApp to "Live".

- Ensure the camera is turned on.
- If the camera was turned off, the controller will automatically reconnect. This can take up to 10 seconds after turning on the camera due to network timeouts.
- Press the top button firmly to start streaming.
- The status LED turns magenta while the Insta360 Pro/Pro2 is preparing to stream.
- The status LED turns off when the Insta360 Pro/Pro2 is streaming to not interfere with the video.
- Note: The Insta360 Pro2 takes approximately 10 seconds before it starts streaming.
- To stop a live-stream, press the lower button.

   Troubleshooting
   - If the camera does not start streaming, try pressing the top button again.
   - If the camera still does not start streaming and the display remains unchanged, reboot the camera and try again.

Alternatively, you can use the Insta360 Pro App to control the camera and start/stop a livestream.

SWITCH BETWEEN INSTA360 APP AND MANTIS CONTROLLER

The Mantis Sub controller will automatically connect to the Insta360 Pro/Po2. The Insta360 Pro/Pro2 only allows one active connection at a time. When the Insta App is connected, the Mantis Sub controller can't connect. Please use the Mantis Sub controller WebApp to disconnect or reconnect the Mantis Sub controller from the camera.

- Connect to the Insta360-Pro WiFi with password 88888888
- Navigate to http://192.168.43.2/
- Follow on-screen instructions.

ADJUSTING RECORDING SETTINGS

- The Mantis Sub controller includes a WebApp that allows you to view status, logs, and change settings.
- Connect to the Insta360-Pro WiFi with password 88888888 (8 times 8).
- Your device may warn you that you do not have an internet connection, ignore the warning.

Version 2.5, 2021-06-21

- Open the browser, then navigate to http://192.168.43.2/ to access the control interface.
- Follow on-screen instructions to change settings.
- After changing settings, press "Save".
- The settings will be applied immediately, there is no need to reboot the controller.
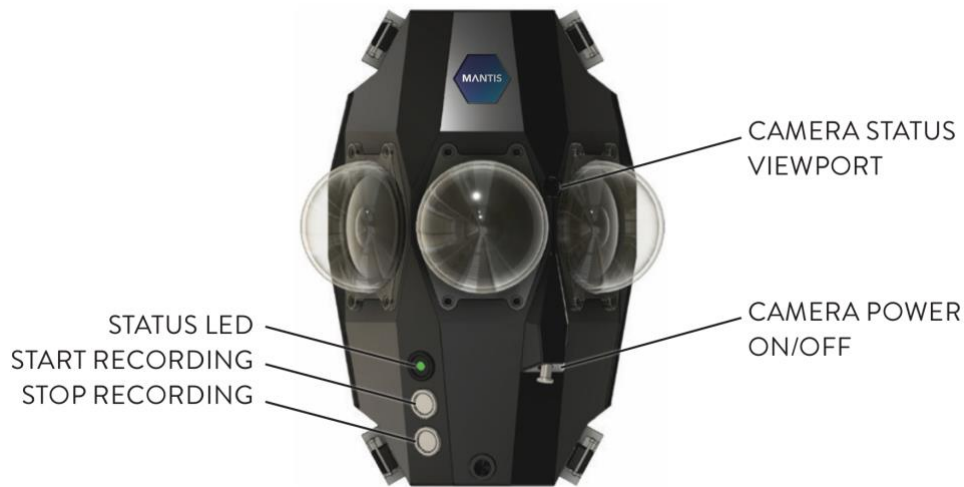- The settings will remain in effect after reboot until changed again.

CARE AND MAINTENANCE

1. Soak the enclosure in fresh water after each salt water use, during which all control buttons/knobs should be operated a few times to avoid the accumulation of salt residue; wipe the enclosure with a towel before opening.
2. After each day of diving, it is advisable to have the main O-ring in the front part of the enclosure removed from its groove and inspected for damage. Also check that the O-ring retains its original circular shape; never stretch the O-ring excessively or remove it with a sharp object.
3. The O-ring groove should be cleaned to ensure it is free from any salt deposit or foreign material; lightly coat the O-ring with the provided lubricant before reinstalling it in the groove.
4. A damaged O-ring should be discarded immediately and replaced only with one that is provided by Mantis.
5. Replace the tow main O-rings and three dome O-rings annually.
6. It is recommended that you ship the enclosure to the factory or our distributor for a complete overhaul every year or after every 200 dives.

RECOMMENDED CAMERA SETTINGS

While lighting conditions vary widely underwater, tests suggest that setting white balance manually to 6500, limiting ISO to 400 and shooting with iLog switched off is the best starting point for good results. We encourage users to experiment in their local environment, especially if using artificial light.

TROUBLESHOOTING

Version 2.5, 2021-06-21

CAMERA STATUS VIEWPORT

STATUS LED
START RECORDING
STOP RECORDING

CAMERA POWER ON/OFF

Situation: Camera doesn't turn on when power button is pressed
Reason: Camera battery is empty, or camera needs resetting
Resolution:
1) Force turn off camera (Hold Camera Power Button for 10s to force)
2) Restart camera (Hold Camera Power Button for 1s)
3) Wait for camera to start.

Situation: LED Blue (forever)
Reason: Mantis Controller failed to boot properly
Resolution:
1) Reinstall firmware
    i. Navigate to https://www.mantis-sub.com/downloads and download firmware,
    ii. Follow online instructions for installing the firmware.

Situation: LED White or Cyan
Reason: Camera powered off
Resolution:
1) Turn on camera (Hold Camera Power Button for 1s)

Situation: LED White
Reason: Camera on but not connected
Resolution, on surface:
1) Turn off camera (Hold Camera Power Button for 3s, or 10s to force)
2) Reset controller (Press Start Recording Button 5x)
3) Restart camera (Hold Camera Power Button for 1s)
4) Wait for connection.

Resolution:
5) Turn off camera (Hold Camera Power Button for 3s, or 10s to force)
6) Reset controller (Press Start Recording Button 5x)
7) Restart camera (Hold Camera Power Button for 1s)
8) Wait for connection.

11

Situation: LED blinking yellow
Reason: Vacuum too great
Resolution:
1) Remove vacuum valve screw cap
2) Press red vacuum valve button in short intervals until LED turns green.
3) Reseat vacuum valve screw cap

Situation: LED blinking Red
Reason: Vacuum lost
Resolution:
1) Resurface
2) Reseal housing using pre-flight checklist

Situation: LED blinking Green
Reason: Other controller is connected to camera (e.g. Insta App) and blocking connection by the Mantis controller.
Resolution:
1) Disconnect Insta360 App

Situation: LED blinking Blue
Reason: Other controller is connected to camera (e.g. Insta App)) and blocking connection by the Mantis controller.
Resolution:
1) Disconnect Insta360 App

Situation: Camera does not start recording
Reason: Camera connection error.
Resolution:
1) Repeat Camera Power Button press
2) Restart camera if problem persists

Situation: Camera does not stop recording
Reason: Camera malfunction.
Resolution:
1) Press Camera Power Button to stop recording
2) Observe viewport and wait for camera to enter ready state
3) Press Stop Recording Button (#3)
4) Restart camera if problem persists

Situation: Camera connection error persists.
Reason: Camera/Controller malfunction.
Resolution:
1) Turn off camera (Hold Camera Power Button for 3s, or 10s to force)
2) Reset controller (Press Start Recording Button 5x)
3) Restart camera (Hold Camera Power Button for 1s)
4) Wait for connection.

Version 2.5, 2021-06-21

DECLARATION OF CONFORMITY

MANTIS

Manufacturer: Global Dive Limited
Model: Mantis Sub

C E FC RoHS

FCC ID: OYR-CFWU710N
Made in New Zealand

For Customers in the U.S.A.

Trade Name: MANTIS SUB
Model No.: Mantis Sub
Responsible Party: Global Dive Limited, Auckland, New Zealand

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 into 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

This equipment has been verified to comply with the limits for a class B computing device, pursuant to FCC Rules. In order to maintain compliance with FCC regulations, shielded cables must be used with this equipment. Operation with non-approved equipment or unshielded cables is likely to result in interference to radio and TV reception. The user is cautioned that changes and modifications made to the equipment without the approval of manufacturer could void the user's authority to operate this equipment.

Caution

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

Caution: Exposure to Radio Frequency Radiation

This device must not be co-located or operating in conjunction with any other antenna or transmitter.
Contains TX FCC ID: OYR-CFWU710N

For Customers in Canada

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Caution: Exposure to Radio Frequency Radiation

The installer of this radio equipment must ensure that the antenna is located or pointed such that it does not emit RF field in excess of Health Canada limits for the general population; consult Safety Code 6, obtainable from Health Canada's website www.hc-sc.gc.ca/ewh-semt/ pubs/radiation/radio_guide-lignes_direct-eng.php#sc6

Contains TX FCC ID: OYR-CFWU710N

For Customers in Europe

Notice for the customers in the countries applying EU Directives.

Hereby, Global Dive Limited, declares that this equipment is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC. For details, please access the following URL: https://www.mantis-sub.com/

If static electricity or electromagnetism causes data transfer to discontinue midway (fail), restart the application or disconnect and connect the communication cable (USB, etc.) again.

This product has been tested and found compliant with the limits set out in the EMC regulation for using connection cables shorter than 3 meters (9.8 feet).

The electromagnetic fields at the specific frequencies may influence the picture and sound of this unit.

Caution: Exposure to Radio Frequency Radiation

This device must not be co-located or operating in conjunction with any other antenna or transmitter.
Contains TX FCC ID: OYR-CFWU710N

INTERFERENCE

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

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TRADEMARKS

- Insta360 and Pro/Pro2 are trademarks or registered trademarks of Shenzhen ARASHI VISION INC.in the United States and/or other countries.
- NAUTICAM is a trademark of NAUTICAM HOLDINGS LIMITED.
- All product names, logos, brands, trademarks and registered trademarks are property of their respective owners. All company, product and service names used in this manual are for identification purposes only. Use of these names, trademarks and brands does not imply endorsement.

CONTACT

Global Dive Limited
132 Beaumont Street
Auckland, 1010
New Zealand

Web: https://www.mantis-sub.com/
Email: info@mantis-sub.com
Tel: +64 (0) 9 920 5200