PI-SIGHT Device User Manual

Please observe the following precautions:

- Observe all regulations regarding camera use.
- The camera generates a low-level magnetic field. Keep it away from medical equipment to avoid interference.
- The low-level magnetic field generated by the camera can cause interference with other electronic devices.
- Careless use can be dangerous and can result in serious injury. Be sure to follow the safety precautions in the document.
- Turn off the product in areas where wireless communication is prohibited.
- Check again that the product is properly secured before use. If the product is detached during use, it may be damaged and cause an accident.
- If you notice any unusual smell, heat, or other abnormal symptoms while using or charging the product, immediately stop charging or using it.
- If the product is attached to a helmet, the helmet warranty may be voided or the helmet may be interfered with. Therefore, you should fully understand the risks of accidents caused by this before using the product.
- Before using the product, make sure you understand the laws in your area and comply with the relevant regulations.
- Do not hit the product with sharp tools or pull the cable excessively. This may damage the product.
- Keep out of reach of pets and infants.
- Check in advance that the camera is operating normally.
- Do not use under direct sunlight for long periods of time. The product may be damaged and may cause burns due to overheating.
- Do not use or store the product with the battery installed inside a car in hot weather. The battery may overheat or catch fire.
- Do not install a physically damaged battery. This may cause an explosion or accident.
- Battery life may vary depending on the situation, environment, and function.
- Store the product at room temperature. The device may be damaged if placed in extremely low or high temperatures.
- Be careful to protect the display, and if foreign substances adhere to the prism, wipe the surface with a soft cloth.
- Do not use the product in rainy or snowy environments as the product is not waterproof.
- This device is a business (Class A) electromagnetic compatibility device, so sellers or users should be aware of this, and it is intended for use in areas other than the home.

1. Introduction / Product Composition

Thank you for purchasing PI-SIGHT.

PI-SIGHT is a head-up display (HUD) device that displays necessary information in front of the helmet wearer's eyes.
You can check the necessary information without moving your head through the translucent display in front of your eyes, and you can operate the device with a wireless remote control.

It operates based on the Raspberry Pi Zero 2W board and Raspberry Pi OS, and you can download and install the desired software on the memory card or develop it yourself.
You can also connect external modules such as a Bluetooth headset or GPS, so you can use it for various purposes such as navigation, racing instrumentation, and aviation instrumentation boards as needed.

This manual covers the rearview software that is provided by default. You need a separate Windows PC to check the video recorded on the device.

For more information about modules and software that can be used with PI-SIGHT, please refer to vudev.net.

The box contains the following items:

- PI-SIGHT display unit
- PI-SIGHT main body-camera unit
- PI-SIGHT PI microphone unit
- PI-SIGHT remote control
- Micro SD memory (for rearview software installation)
- Helmet mount
- Velcro for microphone attachment
- Phillips screwdriver
- User manual

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*The product does not include a battery or charger. You must purchase them separately to operate and charge the product. For more information, please refer to the technical specifications.
*The product does not include an adapter to connect the Micro SD memory to a PC. You must purchase them separately to check recorded videos and reinstall the software.

2. Technical specifications

PI-SIGHT Body Set

- Length: Main body 105.5mm / Camera 21mm / Display 71mm
- Height: Main body 35mm / Camera 23.5mm / Display 47.5mm
- Width: Main body 34.4mm / Camera 35mm / Display 38mm
- Weight: 145g (including battery)
- Screen size: 0.23 inches / 3 meters 50 inches
- Screen resolution: 640*400
- Camera: 5 million pixels 120 degree wide angle
- Video resolution: 1296*860p (user changeable / up to 1920*1080p)
- Motherboard: Raspberry Pi Zero 2W
- Processor: 1GHz quad-core 64-bit Arm Cortex-A53 CPU
- RAM capacity: 512MB
- Wireless communication: 2.4GHz 802.11 b/g/n Wi Fi, Bluetooth 4.2, BLE
- Connector: USB-C for charging, 3.5mm for display, 3.5mm for Pi microphone
- Memory card: 32GB Micro SD (Class 10 or higher recommended for additional purchase)
- *Battery: 18650 Li-ion replaceable

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*Batteries must be purchased separately

PI-SIGHT remote control

- Length: 87mm
- Height: 87.5mm
- Width: 23mm
- Weight: 85g (including battery)
- Connector: USB-C for charging
- Wireless communication: Bluetooth 4.2
- *Battery: 18650 Li-ion replaceable

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*Batteries must be purchased separately

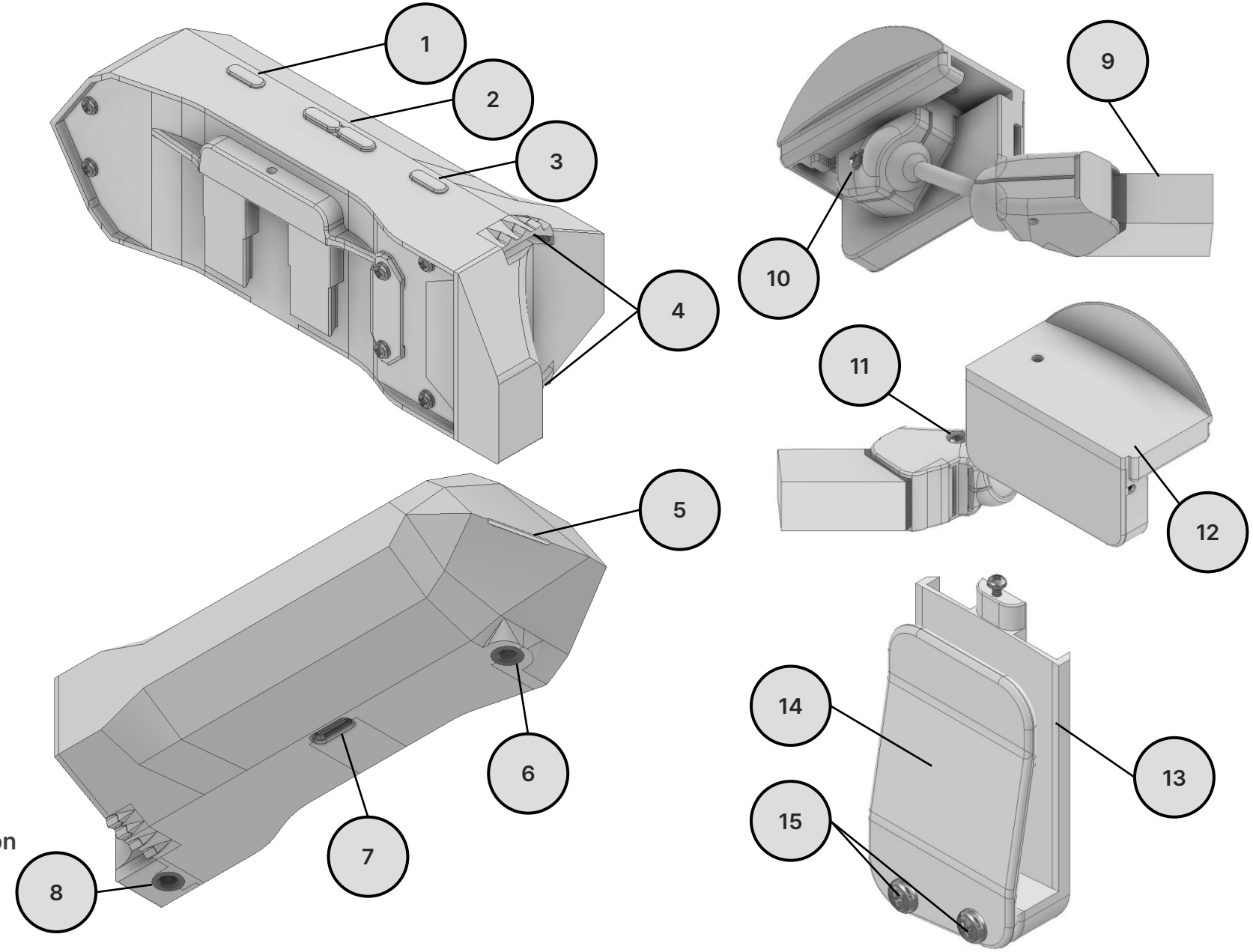
- Operating time: Main body about 5 hours, remote control about 16 hours
  (3500mAh, based on medium screen brightness, may vary depending on software used)

3. Getting Started – PI-SIGHT Part Names

PI-SIGHT Body Set

1. Power Button
2. Screen Brightness Button
3. Fn Button
4. Battery Cover Clip
5. Battery Gauge
6. Display Terminal
7. Charging Terminal
8. Pi-Mic Terminal
9. Display Prism
10. Display Mount Tension Bolt
11. Display Prism Tension Bolt
12. Display Helmet Mount
13. Body Mount
14. Body Mount Clip
15. Body Mount Clip Bolt

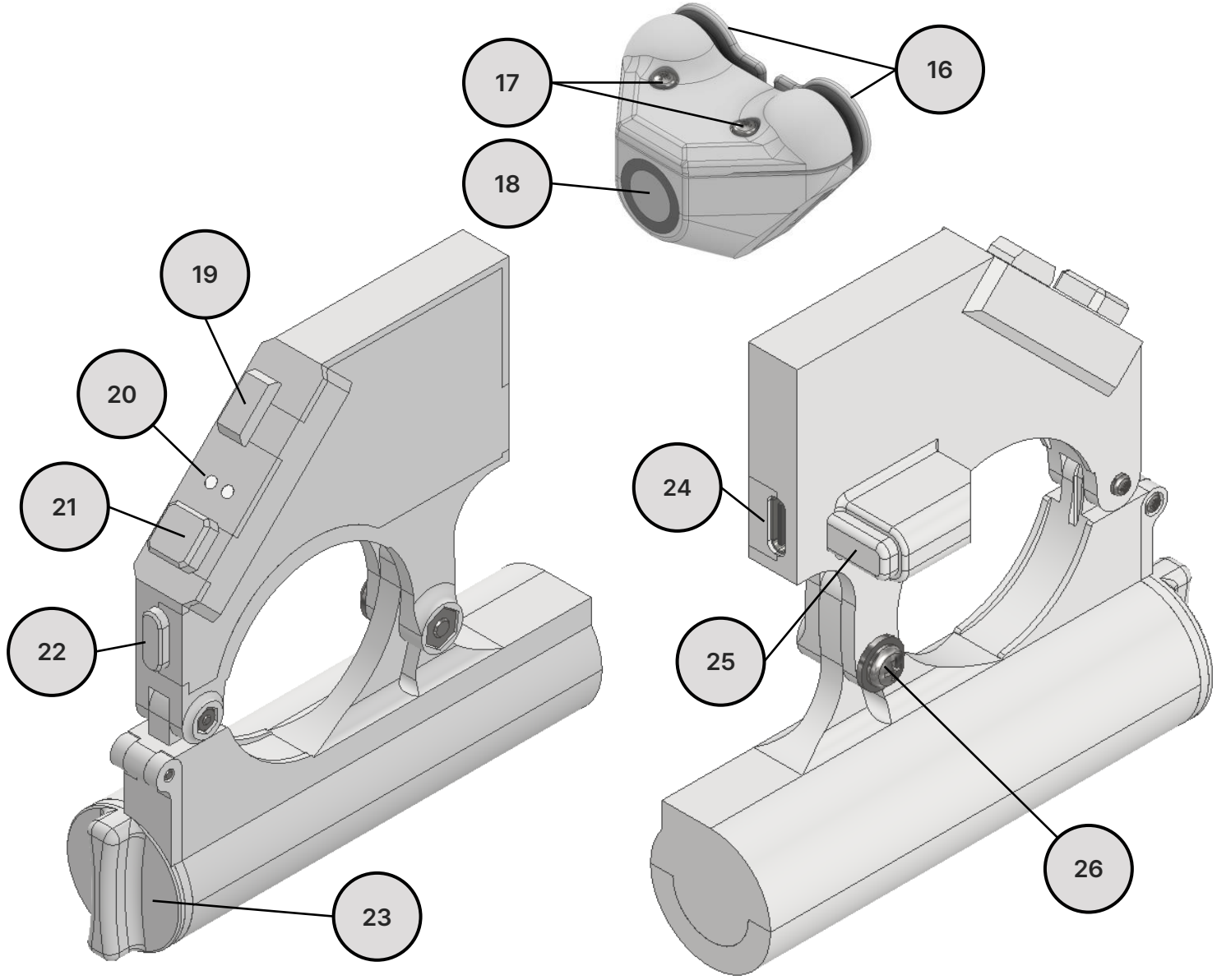
Buttons may have different roles depending on the software.



3. Getting Started – PI-SIGHT Part Names

PI-SIGHT remote control

16. Camera helmet mount
17. Camera tension bolt
18. Camera lens
19. Power switch
20. Charging LED
21. 5-way joystick button (up, down, left, right, press)
22. Thumb button
23. Battery cover
24. Charging terminal
25. Index button
26. Fixing bolt



Buttons may have different roles depending on the software.

3. Getting Started – Installing the Body Set

1. Remove all bolts and body mount clips of the body mount, and attach it to the main body.

2. Slightly loosen the camera tension bolts to allow the camera helmet mount to move, and attach the camera so that it is positioned in the center of the left and right sides of the helmet according to the curve of the helmet.

3. Attach the body mount to the helmet according to the length of the camera cable.

4. Attach the pi microphone to the front of the mouth inside the helmet.

Caution!

Before bonding the parts, clean the helmet surface of any foreign matter and dry it completely. Attach the body so that the camera cable is not pulled excessively.

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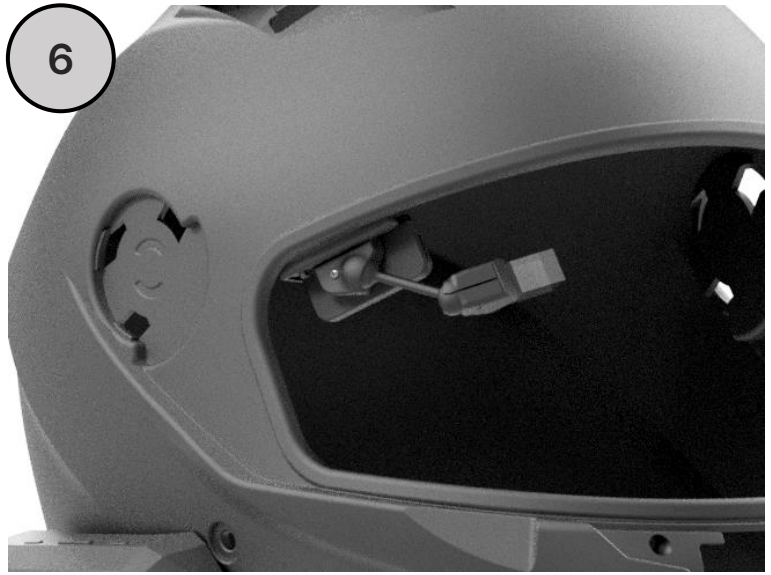
3. Getting Started – Installing the Body Set

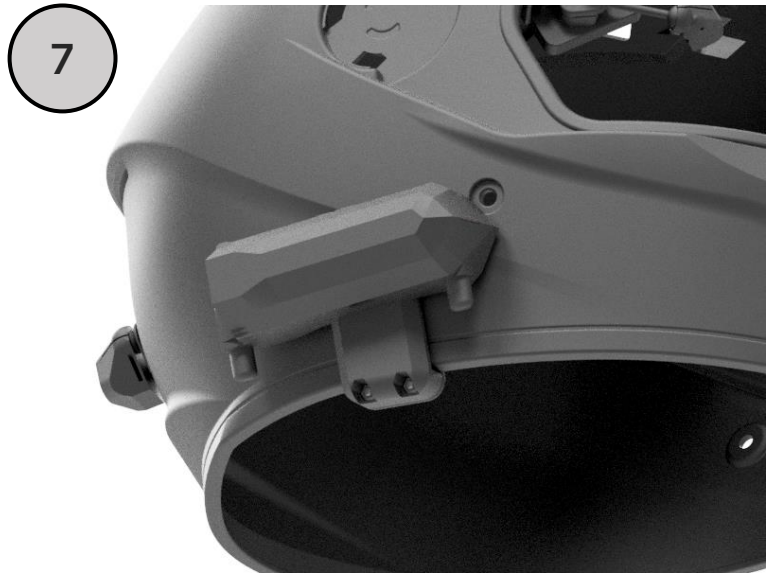
5. Route the Pi mic cable inside the outer shell of the helmet and attach the body mount clip and bolt.

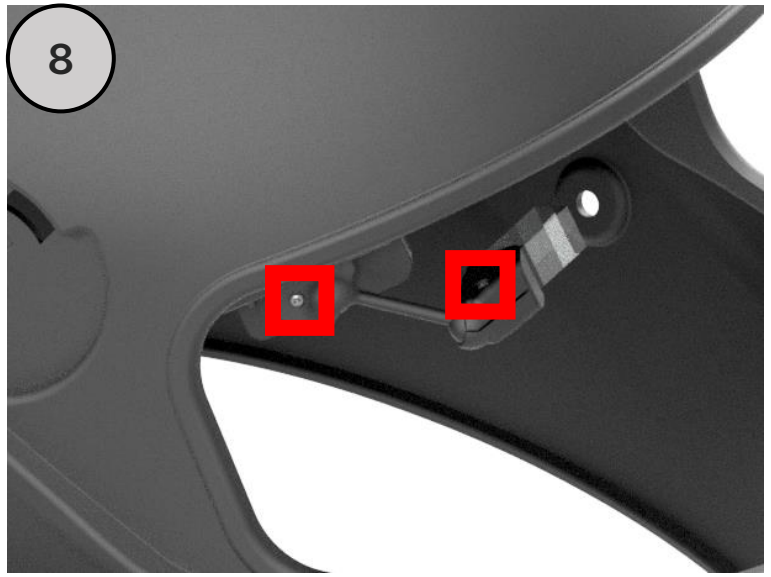
6. Attach the display helmet mount to the helmet.

7. Route the display cable inside the outer shell of the helmet and attach it to the main body.

8. Adjust the display mount and prism tension bolts so that they can be moved by hand but do not move while riding. Then, attach the helmet and check that it is properly in your field of vision.







Caution!

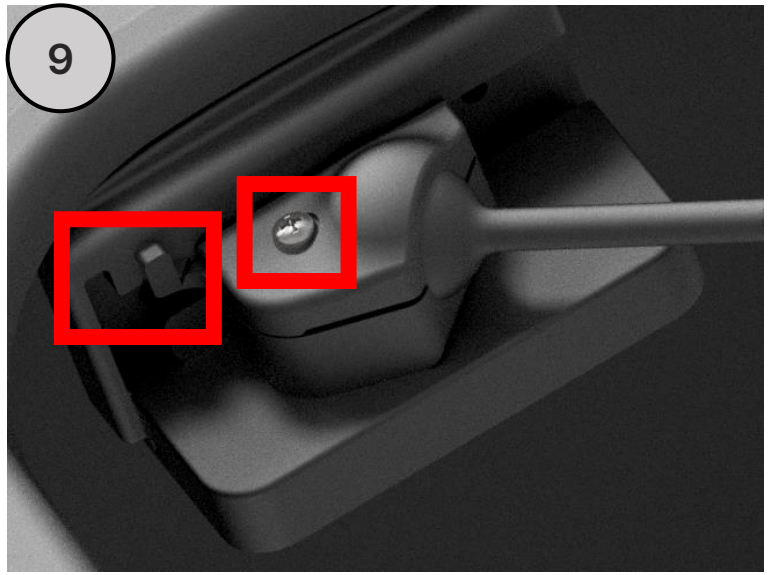
Be careful not to pull too hard when organizing cables.

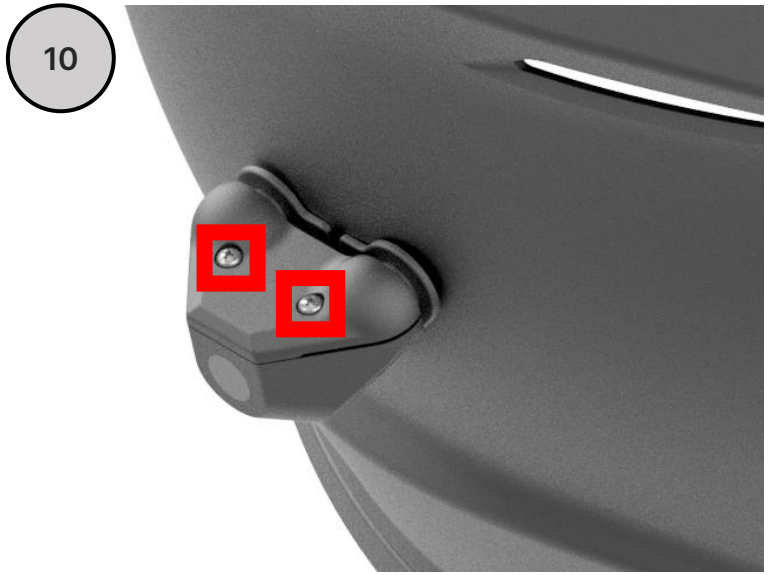
After connecting cables, organize excess wires behind the inner padding to avoid damaging the wiring.

3. Getting Started – Installing the Body Set

9. Fully loosen the display mount tension bolt and remove the cover, and you can adjust the mount forward and backward by moving the clip.

10. Turn on the power and check the rear camera to adjust the camera's up and down angle, and tighten the camera tension bolt to prevent it from moving.





3. Getting Started – Installing the Remote Control

1. Loosen the remote control fixing bolts so that the top and bottom of the remote control can move.

2. Mount the remote control on the left handlebar.

3. Make sure that the thin connection part of the remote control faces the lever so that it does not interfere with the movement of the lever.
   After that, hold the top and bottom of the remote control so that it does not move, and tighten the fixing bolts so that it does not come loose.

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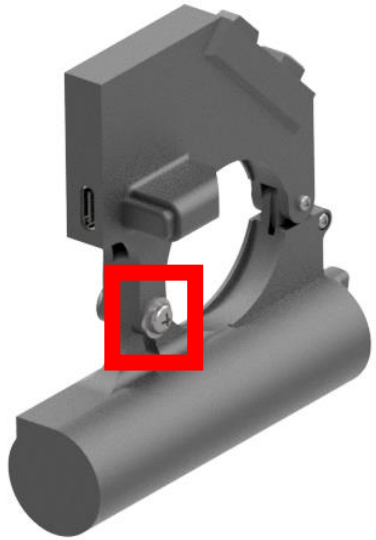

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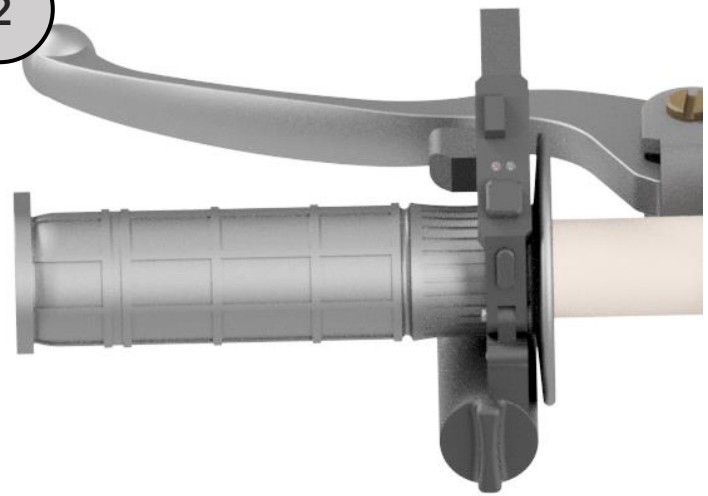

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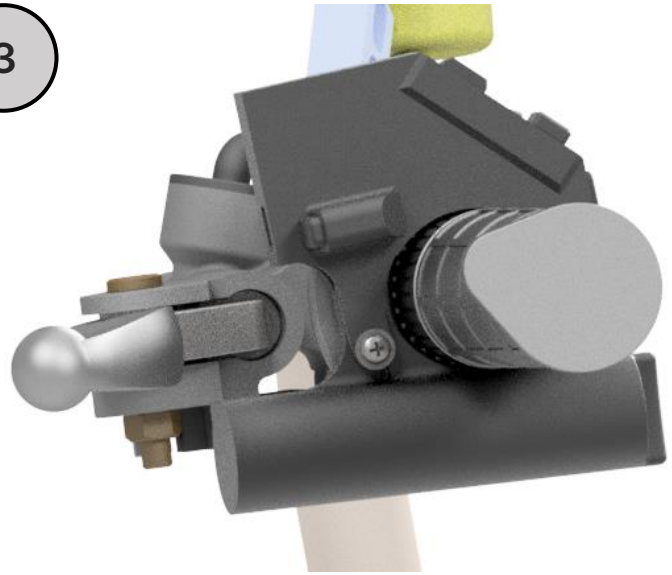


Caution!

Tightening the remote control/top/bottom part too much to the handlebar may damage the hinge. Depending on the bike, this may interfere with the movement of the lever.

3. Getting started – Inserting the battery and memory card

1. Pinch the upper/lower clips of the main body battery cover and pull to separate the cover.
   Insert the battery with the + side facing inward, insert the memory card into the slot with the top side facing inward, and close the battery cover.

2. Turn the handle of the remote control battery cover 45 degrees counterclockwise.

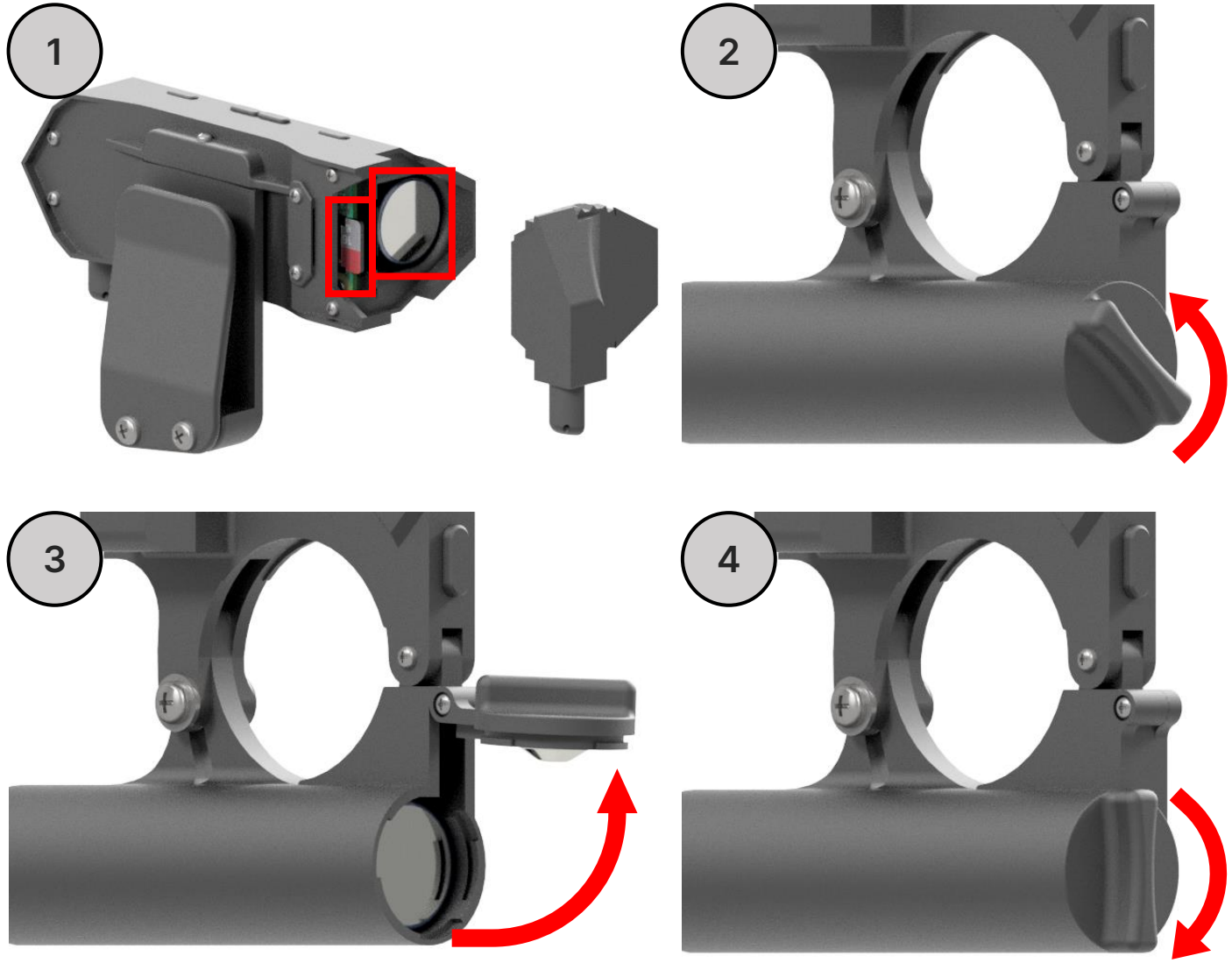
3. Open the remote control battery cover and insert the battery with the + side facing inward.

4. Close the battery cover and turn the handle clockwise so that it is aligned up and down until you feel a click.

Caution!

Always insert the battery with the + side facing inward.

Make sure the internal module pins are engaged when attaching the main body battery cover.



3. Getting started – Powering on and off, charging

1. Press the power button on the main body once to turn it on, and press it twice in a row to turn it off. The remaining battery level is indicated by four red lights on the battery gauge. (100%/75%/50%/25%, low power blinking)

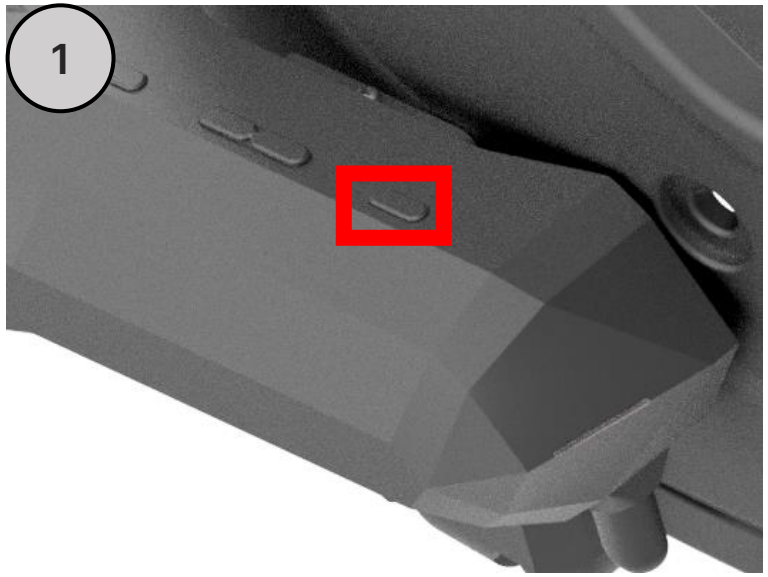
2. You can charge the battery installed in the main body through the USB-C terminal at the bottom of the main body. The power remains on while charging and cannot be turned off.

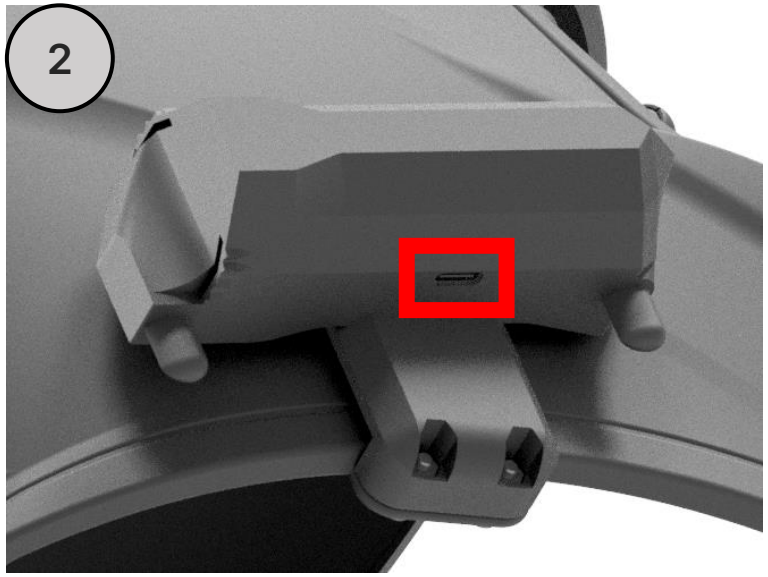
3. When you push the power switch on the remote control up, the power turns on, and when you push it down, the power turns off.

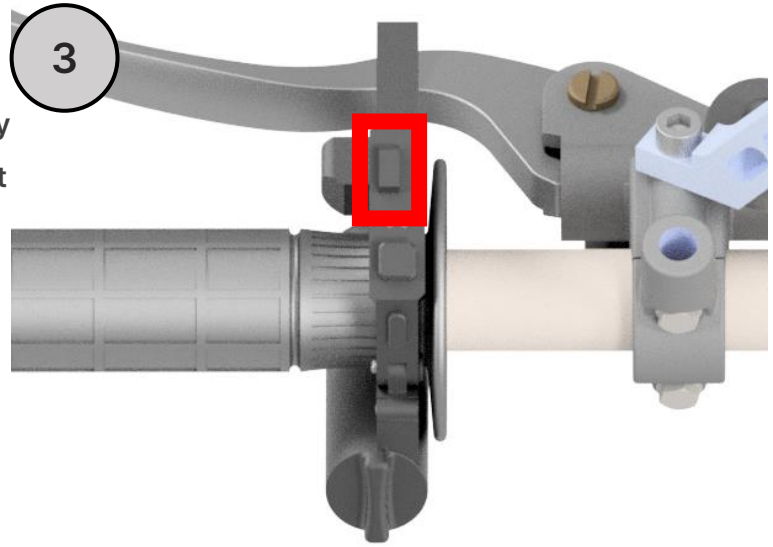
4. You can charge the battery installed in the remote control via the USB-C terminal on the back of the remote control. When the battery is charging, the red LED lights up, and when it is on standby without a battery or when charging is complete, the blue LED lights up.

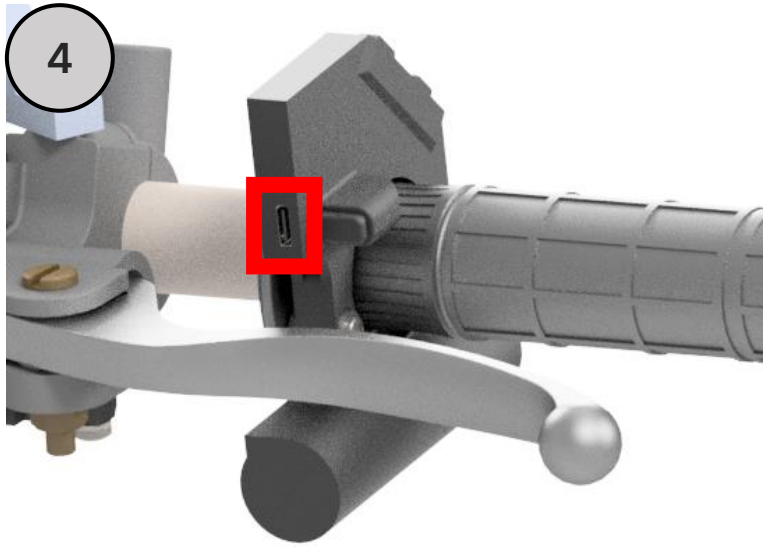
   If you connect the bike's USB charging terminal to the remote control, it can act as a charging station that swaps the main body and battery after charging, allowing you to use the device even during long rides.

   Since there is no indication that the remote control is powered on, make sure to turn the power off after use to prevent battery discharge.









4. Software Installation

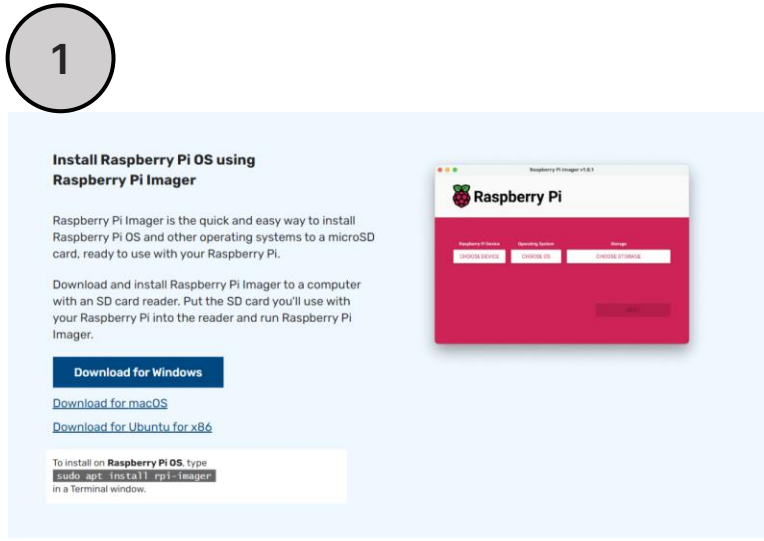
1. Download the Raspberry Pi Imager program appropriate for your PC operating system from www.raspberrypi.com, install it, and then run it.

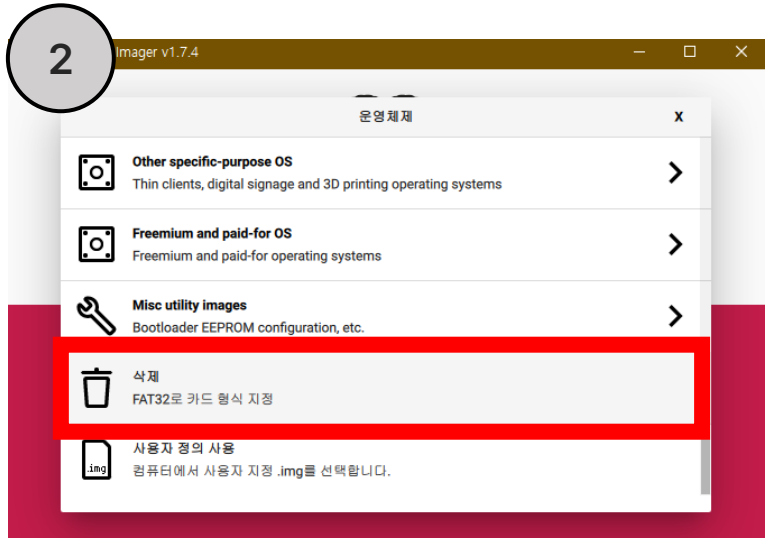
2. Connect the memory card, select Erase on the Operating System tab, click on the memory card on the Storage tab, and then click Write to format the memory card.

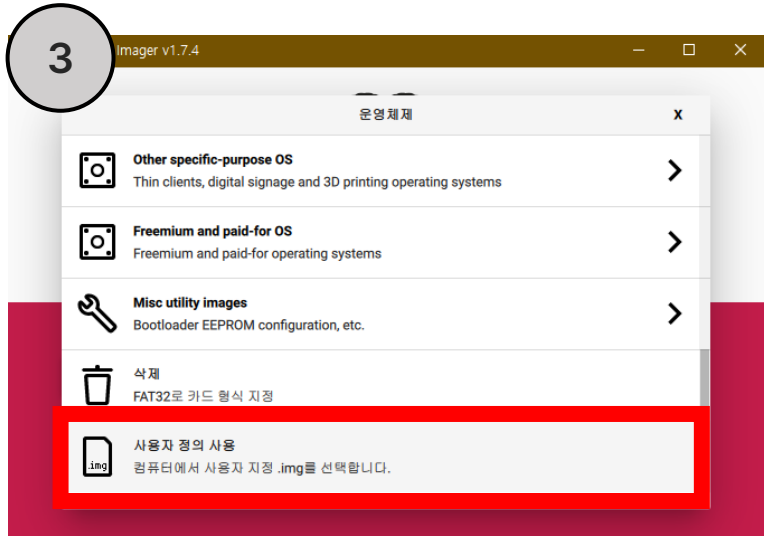
3. Download the img file of the desired software from vudev.net, click Use Custom in the Operating System tab of the Raspberry Pi Imager, and select the downloaded img file.

4. Select the memory card in the Storage tab, then click Write to begin installing the software on the memory card. Once the installation is complete, insert it into your device and use it.

Memory card format errors may occur when removing the memory card during a write operation or when exiting the program. This can be resolved using methods such as diskpart.







5.1 Main body operation problem

- If the battery gauge light comes on but the display does not work, check the connection between the main body and the display terminal.
- If the battery gauge light comes on but the boot screen does not appear, check if the memory card is inserted properly.
- If the battery gauge light does not come on, check if the battery is inserted properly.
- If the device continuously saves/deletes images and the memory card reaches its lifespan after a certain period of time, the device may not work properly. In this case, replace the memory card and reinstall the software.

5.2 Remote control charging light problem

- When the remote control is turned on and the battery is fully charged, the red and blue lights may turn on simultaneously or alternately, but this is normal operation.

5.3 Display Fixation Issues

- If the display is not firmly fixed and moves easily, adjust the tension bolts on the display mount and prism to adjust the fixation strength.