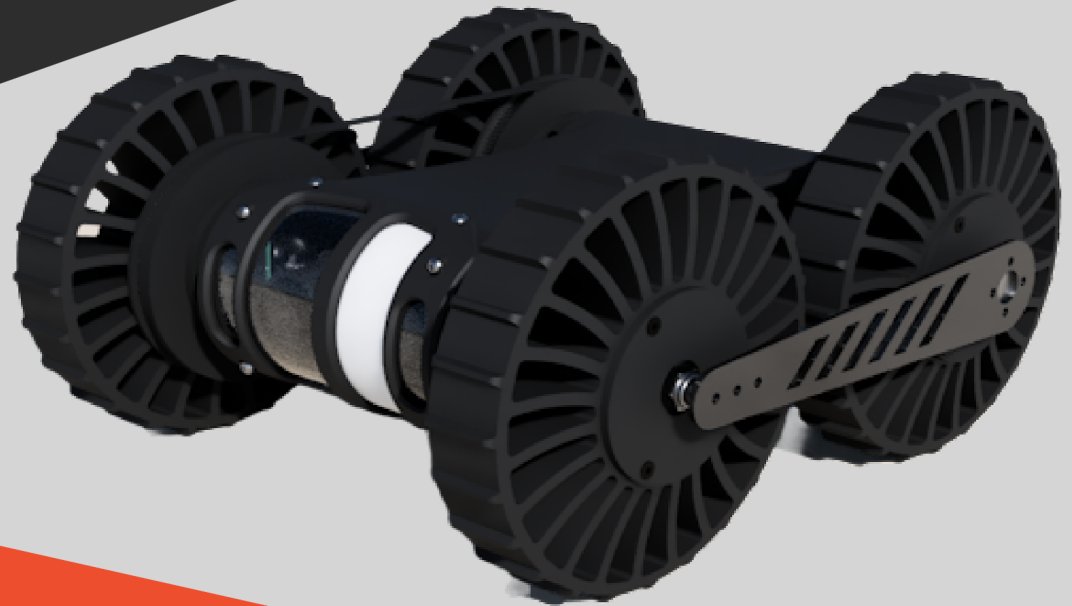




# CERBERUS-3

## Inspection & Surveillance Robot User Guide

June 26, 2023



The Cerberus-3 robot is designed to travel and send a live view of inspections to the controller with the ability to take snapshots and video recordings. This document outlines instructions on how to operate and look after your robot.

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# SAFETY AND CARE

## Warnings

- Some environments may cause a malfunction of the Cerberus robot
  - Do not immerse it in water
  - Do not expose it to open flame or keep it under direct sunlight for prolonged periods
- Do not open Cerberus – this should only be done by Techmatics or under their instruction
- When turning on Cerberus
  - Do not touch the joysticks on the controller until Cerberus has finished booting up
  - Do not store Cerberus with the batteries flat (as it will damage the cells in the battery)
- All charging of Cerberus should be done in a clean and dry area away from any liquids

## In Case of Malfunction

- If there is smoke or fire coming from Cerberus, power it off immediately.
- If the video feed is not showing check that the antennas are connected correctly
- If the video does not automatically flip, restart Cerberus.

## Recommendations

- Always keep Cerberus in the case provided while traveling
- Check the battery percentage after every use
- Charge Cerberus after every use (Cerberus can be plugged in to charge and left on for a few months at a time)

# HERELINK CONTROLLER

- 1 Left Joystick**  
Left/right: Manual focus  
Up/Down: Vertical camera tilt
- 2 Right Joystick**  
Forward/backward movement and turning
- 3 Home Button**  
Tap to exit apps and go to the home screen
- 4 Power Button**  
Hold down to power-on the controller (or show the power menu when it is on)
- 5 Top Right Button**  
Short press: Infrared light  
Long press 1: White light on  
Long press 2: Flashing mode
- 6 A Button**  
Change zoom mode (min, medium, max)
- 7 B Button**  
Switches on/off the infrared filter
- 8 C Button**  
Change camera view (normal, split screen, thermal)
- 9 D Button (Optional)**  
Return flippers to home



- 10 Wheel (Optional)**  
Turn and hold:  
Rotates the flippers
- 11 Micro USB Port**  
For charging and transferring files
- 12 Micro SD Card Slot**  
For transferring files or extra storage
- 13 Device Mount**  
For attaching a lanyard

# CERBERUS ROBOT

## 1 Rugged Design

With a tough body and custom tyres for travelling on different surfaces

## 2 HD Camera With Optical Zoom

Provides a clear view from the front of the robot

## 3 Thermal Camera

Allows heat signatures to be identified

## 4 Tilting Camera Bracket

Both cameras are able to be tilted (and the views/controls flipped in software when the robot is)

## 5 Infrared and White Lights

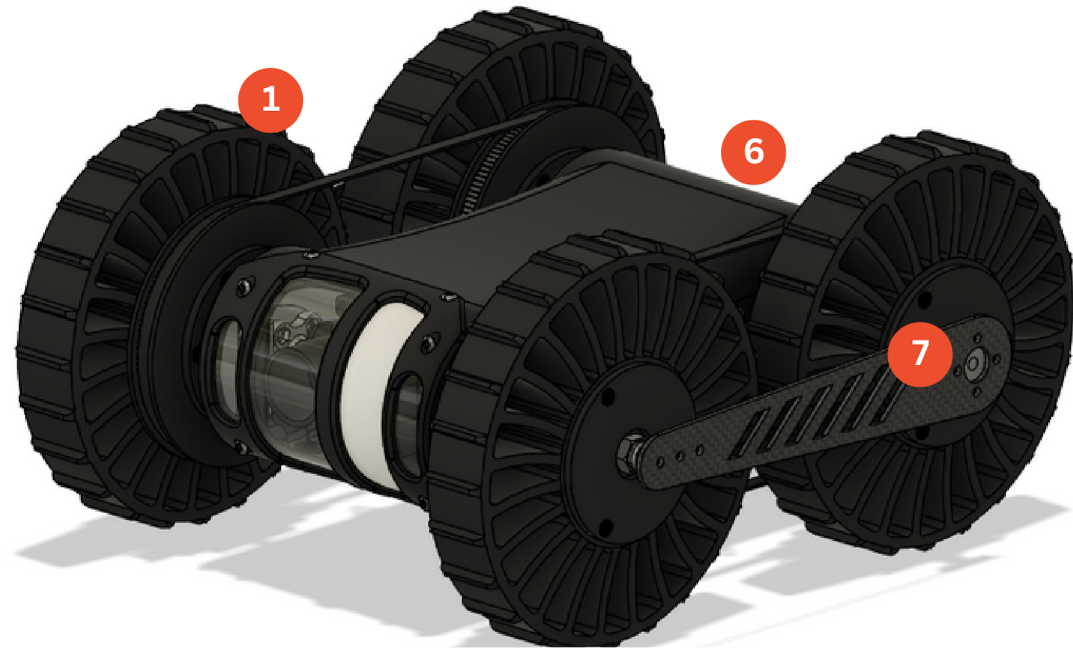
Allows the robot to be used both day and night

## 6 Charging Port and Binder Plug

Binder inserted: Power off  
Binder removed: Power on

## 7 Optional: Carbon Fiber Flippers

For flipping the robot (with automatic repositioning)



# POWERING/CHARGING CERBERUS

- The battery capacity of Cerberus will be displayed at the top of the screen on the Herelink controller (Figure 1)
- To turn on Cerberus, undo the binder plug in the charging port at the back of the unit (Figure 2) by pushing it in and rotating. To turn off Cerberus, reconnect the binder plug. Note that the sleeve on the plug may need to be rotated before it fits in the socket.
- To charge Cerberus, connect the power supply provided to the charging port (Figure 2). The blue light on the charger box indicates Cerberus is charging (Figure 3). When the light turns green it means the battery is fully charged.



Figure 1

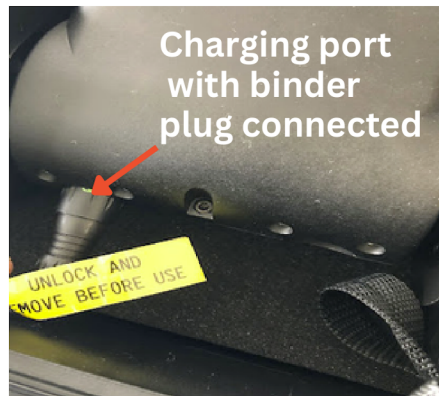


Figure 2

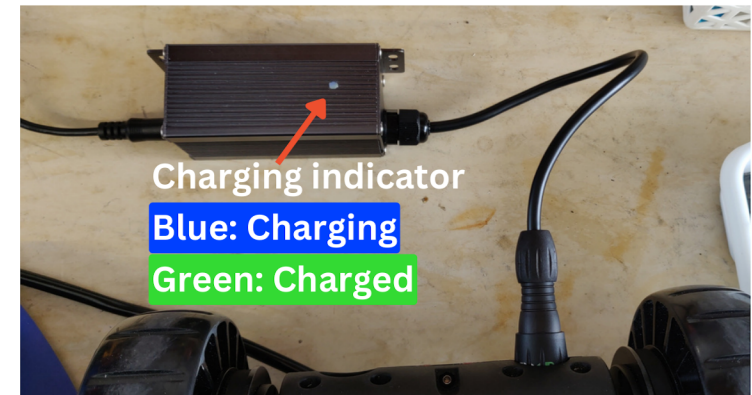


Figure 3

# DISPLAYING CAMERA VIEWS

1. Power on the Herelink controller and Cerberus
2. On the controller open the **HereLinkVideo** app (Figure 1)
3. A video feed will display
  - a. Note that the screen won't show everything until Cerberus has booted up
  - b. During boot, if Cerberus is upright, the video will initially appear upside down.
  - c. Once loaded, the video orientation will automatically correct itself (even with subsequent flips).
  - d. Press A to cycle through the zoom modes (Figure 2)
    - i. Min
    - ii. Medium
    - iii. Max
  - e. Press B to enable/disable the infrared filter (Figure 2)
  - f. Press C to cycle through the video modes
    - i. Normal camera (Figure 3)
    - ii. Thermal camera (Figure 4)
    - iii. Split screen (Figure 5)



Figure 1

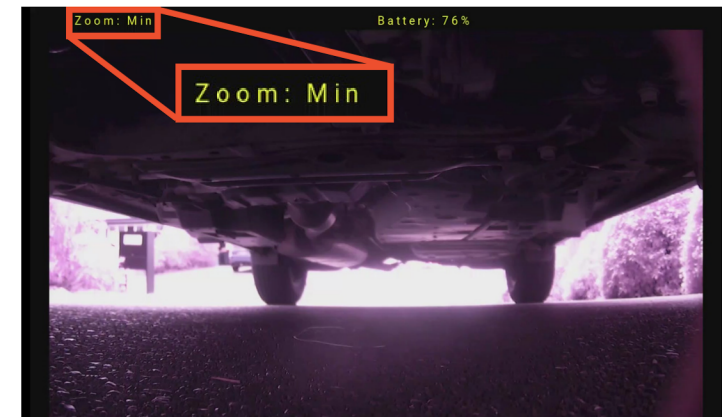


Figure 2



# DISPLAYING CAMERA VIEWS

## Thermal Camera

- Only the hottest object in the frame will be highlighted as white-hot (Figure 4)
- For example, if you point the camera at a person standing in front of a cold wall, they will be strongly highlighted as white-hot. However, suppose you position the camera to include a hotter object in the frame, such as a hot radiator. In that case, the radiator will be strongly highlighted white-hot and the person will be faintly highlighted as they are no longer the hottest object in the frame.
- For optimal results endeavor to only capture the object of interest in the frame

## Infrared Cut Filter

- This filters out infrared (IR) light (Figure 2). For example, if you are out in the sun (which emits a lot of IR light) the filter will remove these frequencies to show a more accurate image.



Figure 3



Figure 4



Figure 5

# DISPLAYING CAMERA VIEWS

## Restarting the HereLinkVideo App

If the camera views do not load or update after opening the app a restart may be required.

1. Tap the multitasking button (Figure 6)
2. Locate the **HereLinkVideo** app. This may require swiping up or down to locate it.
3. Swipe the app window to the left or right and release (the app should disappear from the list)
4. Press the Home button to return to the apps screen
5. Reopen the **HereLinkVideo** app

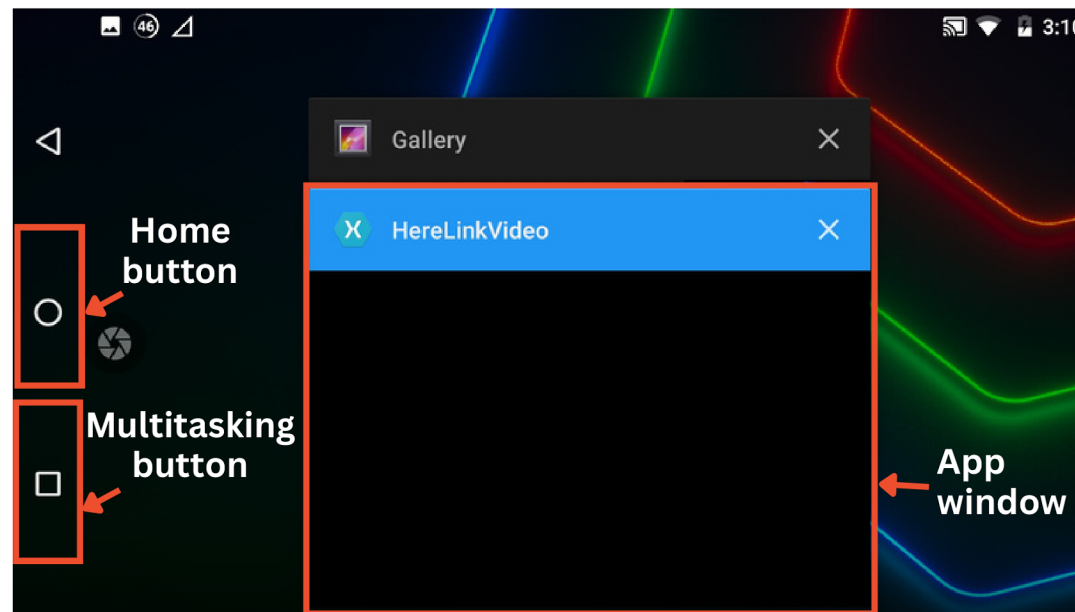


Figure 6

## Automatically Opening the HereLinkVideo App When the Herelink is Powered on (Optional)

1. On the home screen tap and hold the **HereLinkVideo** app icon (Figure 1) until a menu shows (Figure 7)
2. Tap the **Enable Launch on Boot** option. This causes the app to open when the device is powered on from a completely off state (which is different from when the device is on but the screen is off).

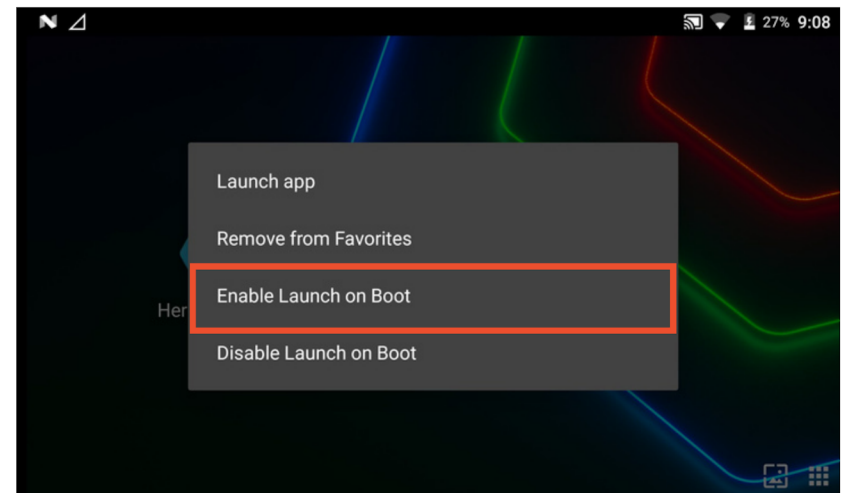


Figure 7

# CONTROLLING CERBERUS

## Left Joystick (Camera Tilting)

- Push the joystick forward to move the camera head up
- Pull the joystick back to move the camera head down

## Right Joystick (Movement and Turning)

- Use the right joystick to move Cerberus forwards, backward, or turn on the spot.
- Push the joystick forward to move Cerberus forward (away from you)
- Pull the joystick back to move Cerberus back (towards you)
- Push the joystick to the left to turn Cerberus anticlockwise
- Push the joystick to the right to turn Cerberus clockwise

## Lights

- Press the button on the top right of the controller to turn on the infrared light. This is useful for illuminating dark environments so that they are visible to the camera but not to the human eye.
- Press and hold this button to turn on the white lights
- Press and hold this button a second time to activate a strobe (flashing) mode

## Flippers (Optional)

- Rotate and hold the wheel on the top left of the controller clockwise to angle Cerberus up on its rear wheels
- Rotate and hold the wheel anticlockwise to lower Cerberus
- Note that Cerberus can be flipped completely if necessary
- Press the D button to return the flippers to the home position (horizontal and pointing forward)

# TAKING PICTURES

1. Double-tap the screenshot button to capture what is on the screen (Figure 1)
2. Or single-tap the screenshot button to immediately crop a screenshot
  - a. Drag the rectangle surrounding the image to change its size
  - b. When ready, tap the **Save** button at the bottom of the screen.
3. Note that this button can be repositioned on the screen by dragging it
4. To maximize captured detail, take screenshots with a video feed mode that fills the entire screen.
5. Once captured, the screenshot will be available in the gallery app on the controller

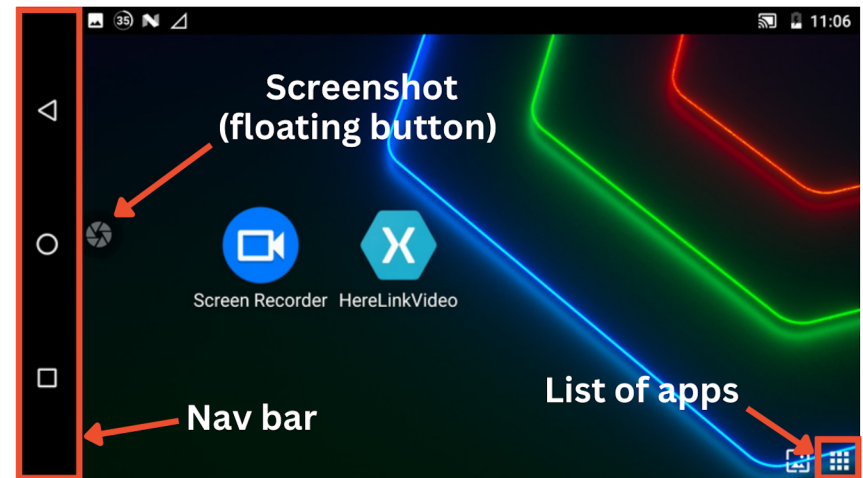


Figure 1

# TAKING PICTURES

## Taking Screenshots That Exclude the Nav Bar (Optional)

1. Open the list of apps (Figure 1)
2. Open the **Screen Master** app (Figure 2)
3. Scroll down (by swiping up) to the **Exclude status bar** menu item and open it (Figure 3)
4. Select the **Exclude nav bar** option (Figure 4)
5. This setting will be saved for all future screenshots

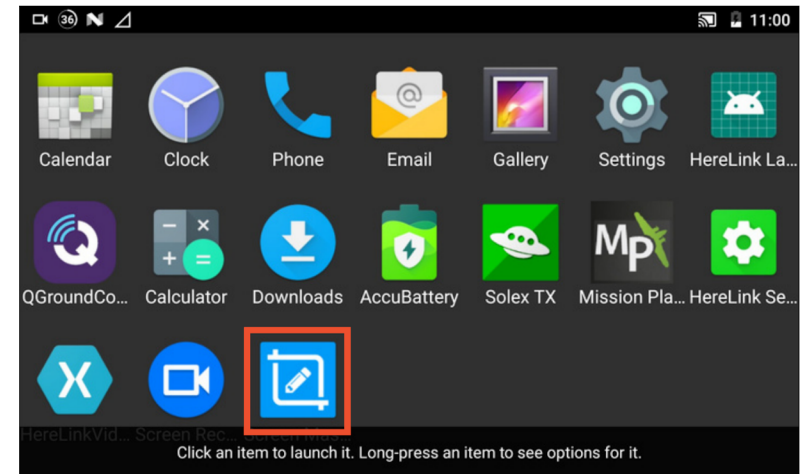


Figure 2

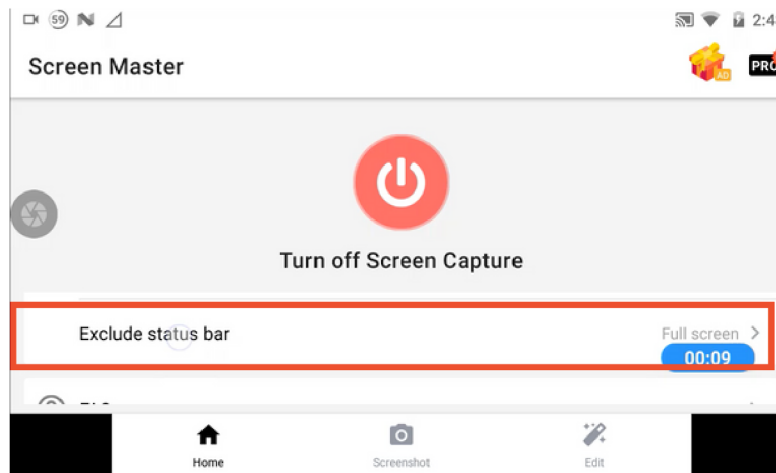


Figure 3

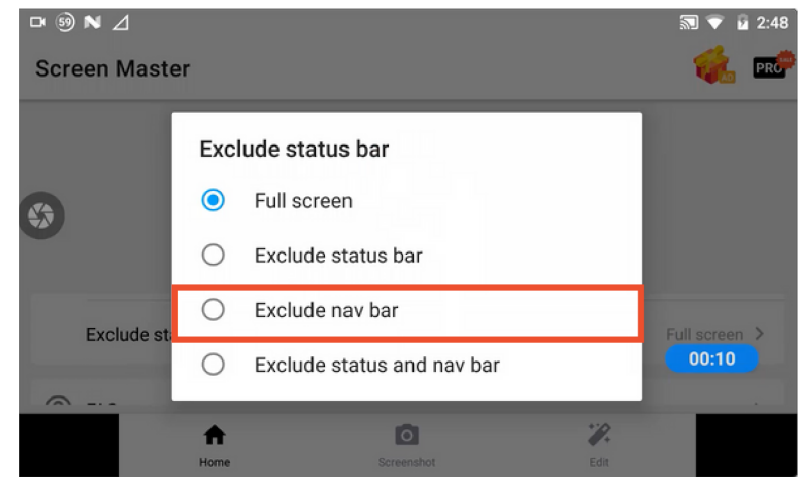


Figure 4

# TAKING PICTURES

## Increasing the Quality of Screenshots (Optional)

1. Open the list of apps (Figure 1)
2. Open the **Screen Master** app (Figure 2)
3. Scroll down the list (by swiping up) until you can see the **Image file quality** menu item and open it (Figure 5)
4. Select the **100** option (Figure 6)
5. This setting will be saved for all future screenshots

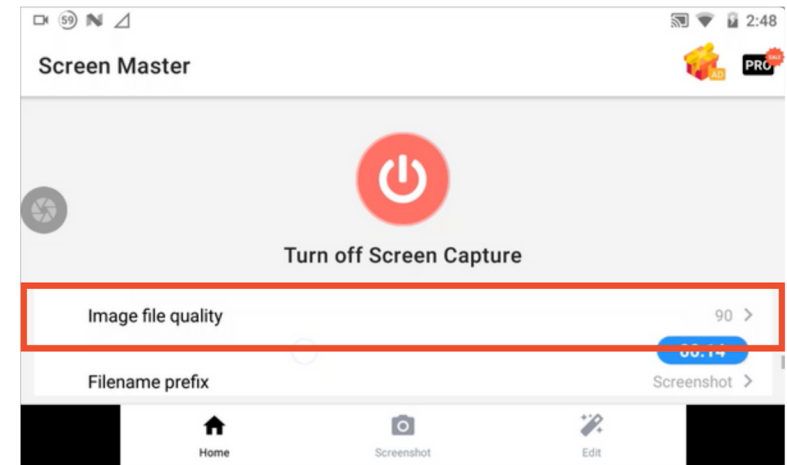


Figure 5

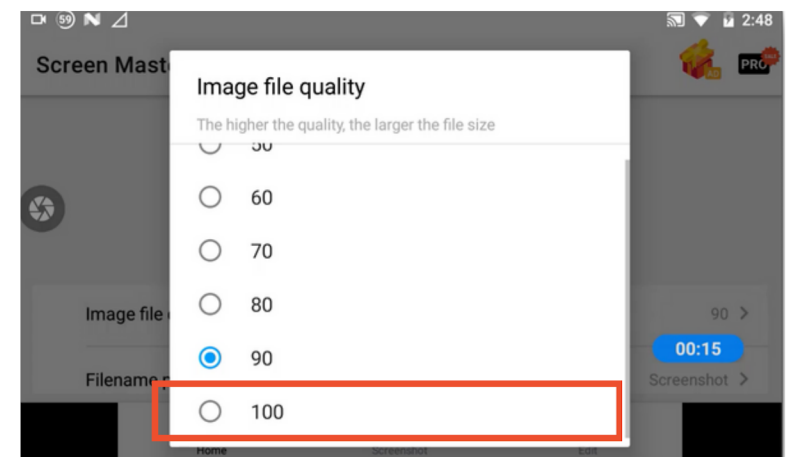


Figure 6



# RECORDING VIDEO

1. Open the **Screen Recorder** app (Figure 1)
2. Once the app has loaded, tap the activate video toolbar button (Figure 2).
3. Drag the toolbar to the top of the screen (tap and hold on the white area around the buttons to do this)
4. Optional: To enable/configure the magic button, open settings from the toolbar (Figure 1), tap **Magic Button** in the settings menu (Figure 3), and activate the blue toggle shown in Figure 4. A menu will then show with the magic button configuration. Once set tap **OK**.
5. Open the HereLinkVideo app and wait until what you would like to record is showing
6. Tap the record video button on the video toolbar. Note that there is a 3-second countdown before the recording starts.
7. To pause, stop or draw on the screen use the magic button. Alternatively, these are available as buttons in the notifications panel accessed by swiping down from the top of the screen (Figure 5).

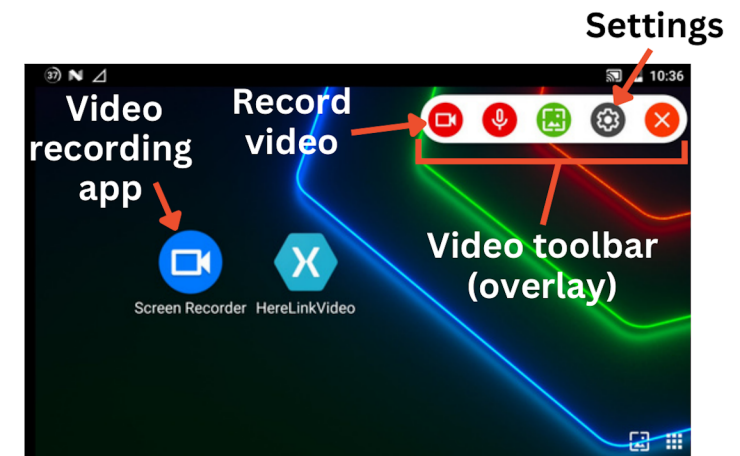


Figure 1

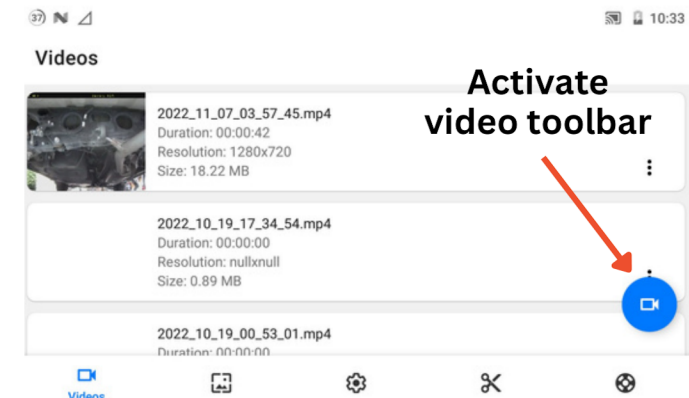


Figure 2

# RECORDING VIDEO

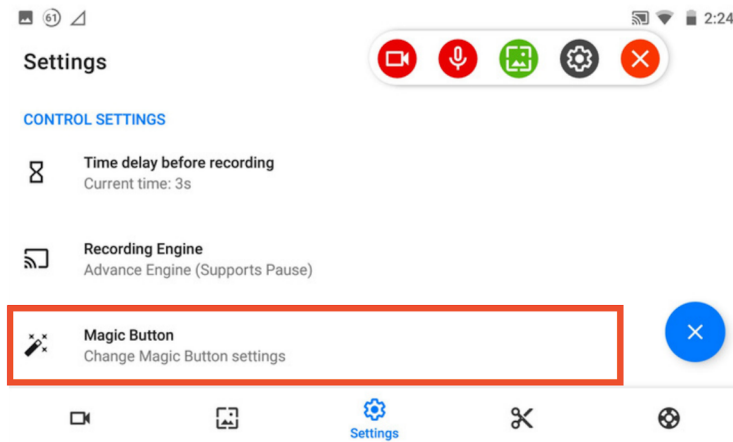


Figure 3

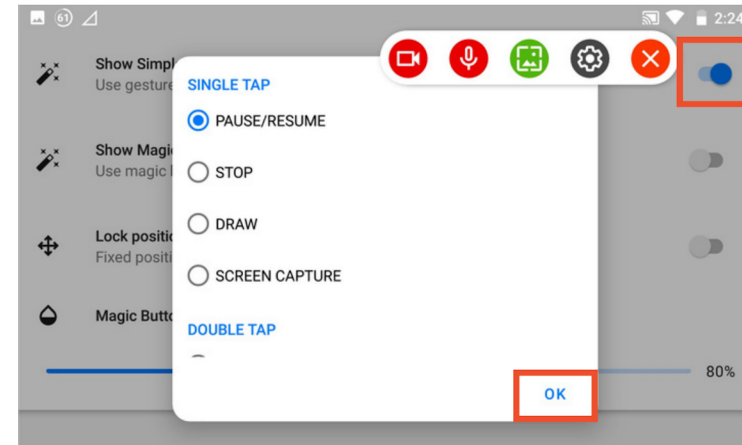


Figure 4

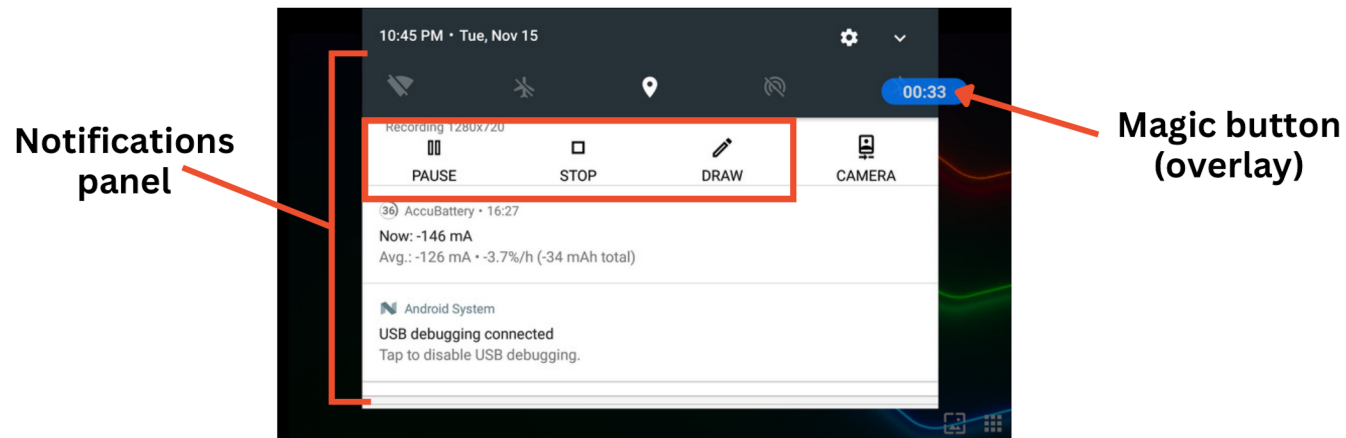


Figure 5

# VIEWING FILES

- 1.If the **Gallery** app is not on the main screen (Figure 1), open the list of apps by tapping the icon in the bottom right corner (Figure 1)
- 2.Open the **Gallery** app (Figure 2)
- 3.You are on the **Albums** screen. Select Screen Recorder for videos or Screen Master for pictures (Figure 3).
- 4.Here you will be able to navigate and view saved videos or pictures

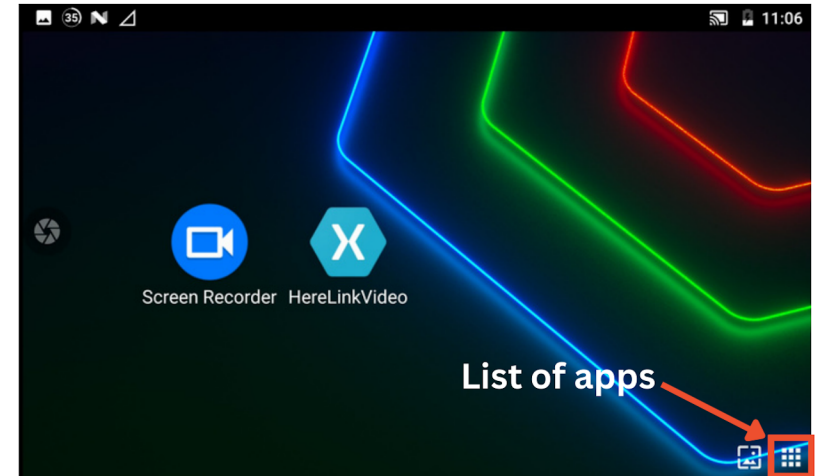


Figure 1

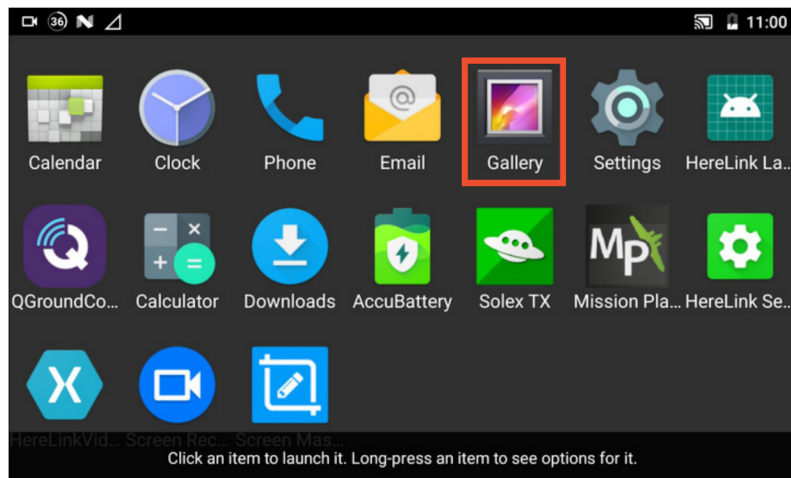


Figure 2

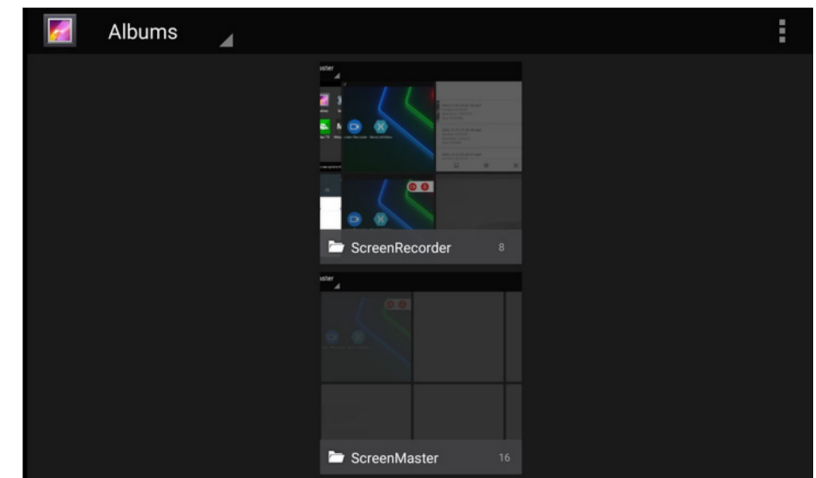


Figure 3

## Adding the Gallery app to the Home Screen (Optional)

1. Open the list of apps by tapping the icon in the bottom right corner (Figure 1)
2. Tap and hold the **Gallery** app (Figure 2) until a menu shows (Figure 4)
3. Tap **Add to Favourites**. This makes the Gallery app visible on the home screen (Figure 5).

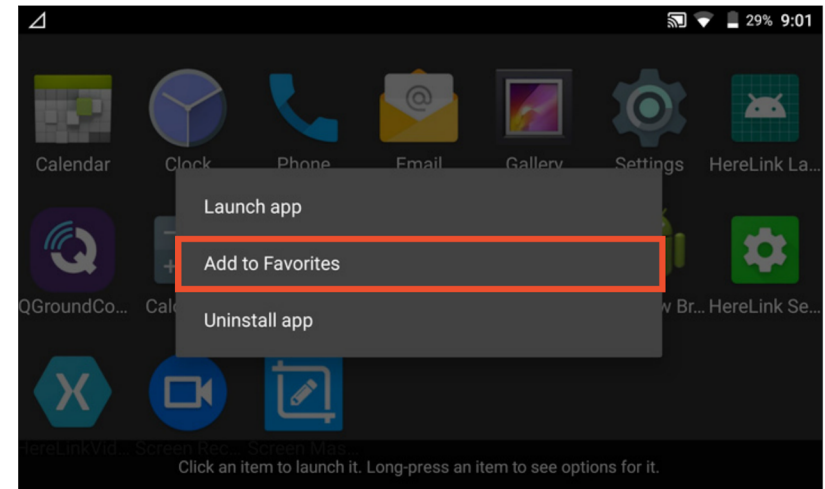


Figure 4

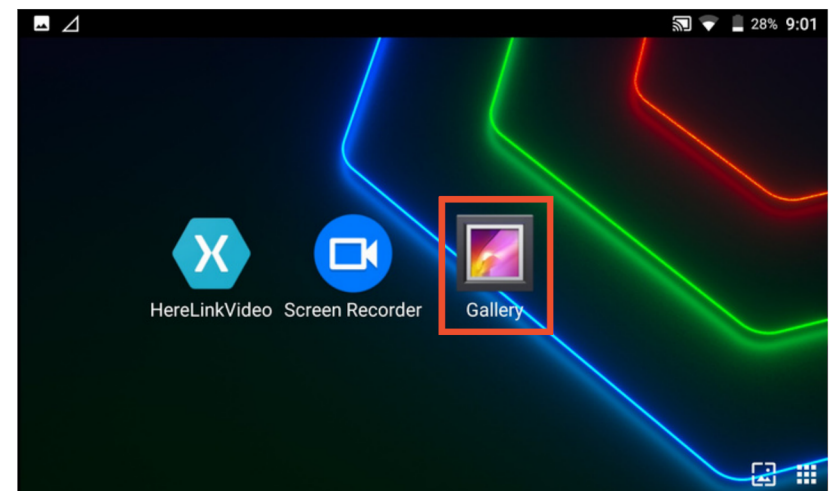


Figure 5

# TRANSFERRING FILES TO A COMPUTER

## Via USB

1. Connect the USB cable from the Herelink controller to a computer
2. On the Herelink controller, swipe down from the top of the screen to open notifications and find the line with **USB charging this device** (Figure 1).
3. Select this notification
4. Change from **Charge this device** to **Transfer files** (Figure 2). If this doesn't work try the **Transfer photos** option which works in a similar way.
5. To access the files on your computer, you find the instructions for Windows and Mac, respectively, on the following pages.

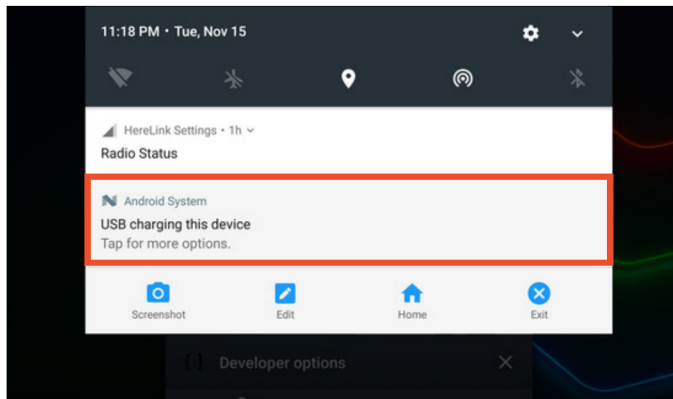


Figure 1

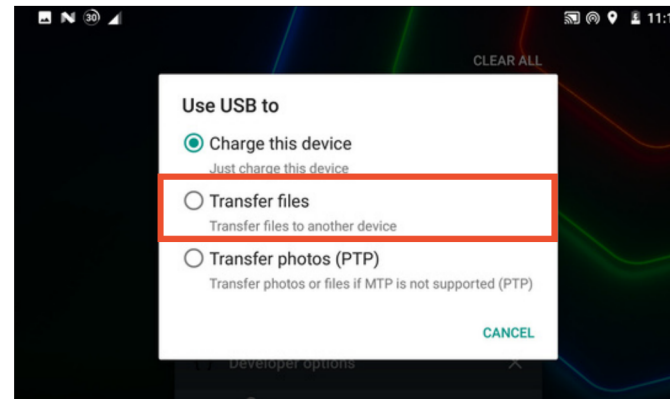


Figure 2

# TRANSFERRING FILES TO A COMPUTER

## Via USB - Windows

1. Open File Explorer
2. Find the devices connected to your computer by navigating to **This PC** (Figure 3)
3. Note that the Herelink device appears as Optimus (Figure 3)
4. Open Optimus. Then open the folder **Internal Shared Storage**. From here you can either open **Screen Recorder** for videos or **Screen Master** for pictures.
5. You can now copy these files to your computer

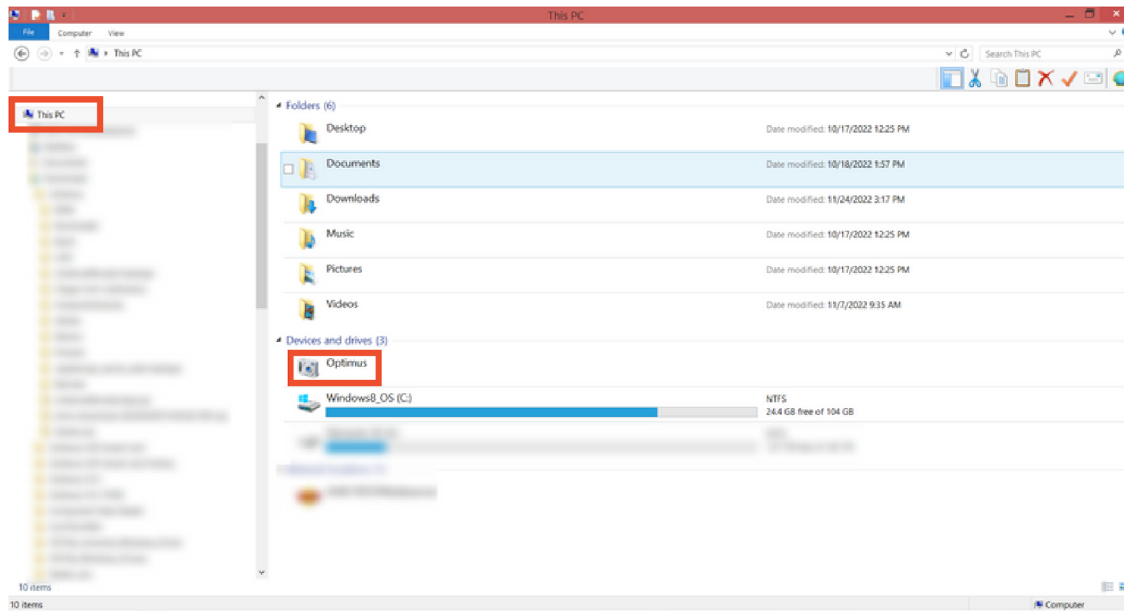


Figure 3

# TRANSFERRING FILES TO A COMPUTER

## Via USB - Mac

1. Download and install a free piece of software called [Android File Transfer](#).
2. Open Android File Transfer. This may automatically open when you connect your device.
3. Once opened, you will be able to access the filesystem on the Herelink controller (Figure 4)
4. In the **Screen Recorder** folder are videos and in the **Screen Master** folder are pictures.
5. To copy files to your computer, select the files of interest and drag them to a folder or the desktop on your computer.

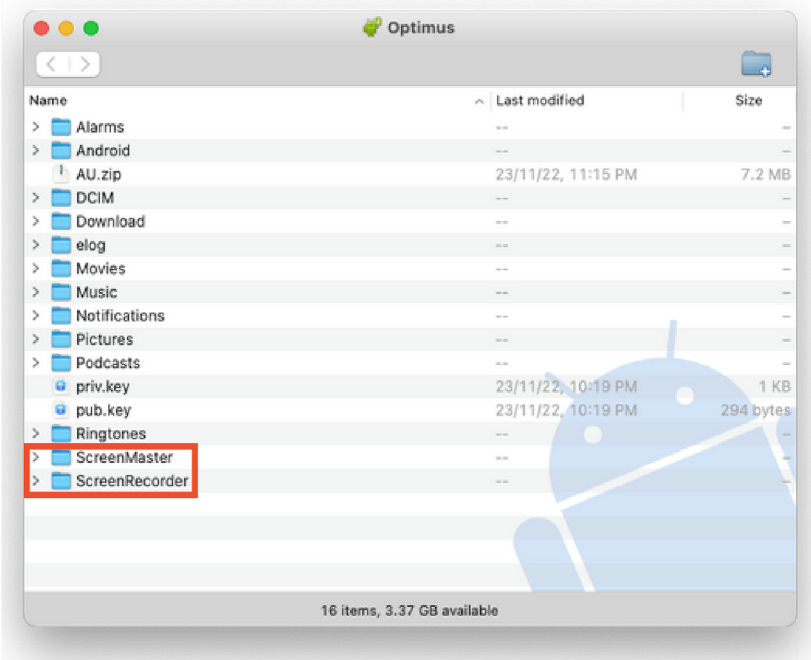


Figure 4

# TRANSFERRING FILES TO A COMPUTER

## Via SD Card - Formatting Instructions

To use an SD card with the Herelink controller, the SD Card must be formatted to be used for images and videos. You also need to set up Screen Master and Screen Recorder to save images and videos onto the SD card rather than internal storage. The following are instructions explain on how to do this:

1. Put a micro SD card in the SD card slot on Herelink controller (with the metal contacts facing upwards).
2. Swipe down from the top to open the notification screen
3. Navigate to the notification with an SD Card icon. Click on the icon (Figure 5). This will now open the SD card File browser.
4. Click on the highlighted icon in Figure 6. Click **Storage Settings** (Figure 7).
5. Select **Format** on the new screen (Figure 8).
6. A screen (Figure 9) will show a warning that formatting the SD Card will erase any data on the card. **Select Erase & Format.**
7. Navigate back to the SD card File browser. This time click on the highlighted icon in Figure 6 and click **New Folder** (Figure 7). Give the folder a name. You now have a place to put videos and images.

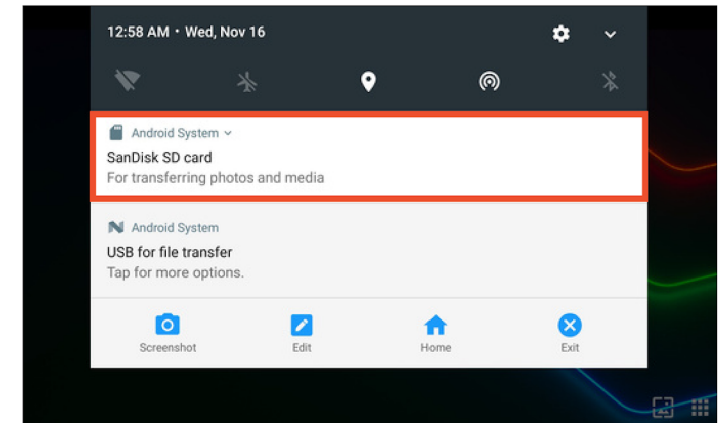


Figure 5

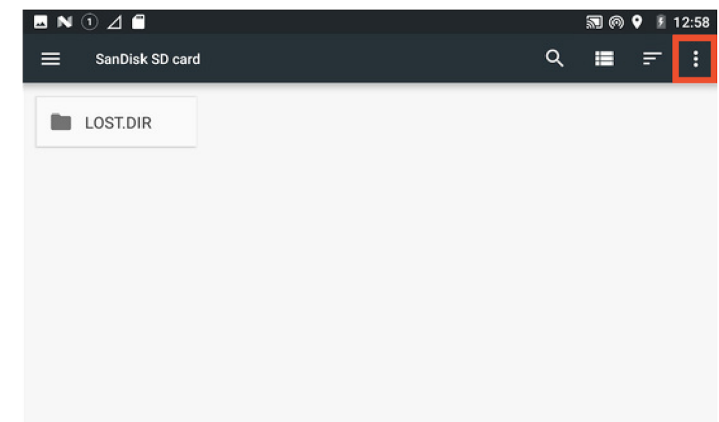


Figure 6



# TRANSFERRING FILES TO A COMPUTER

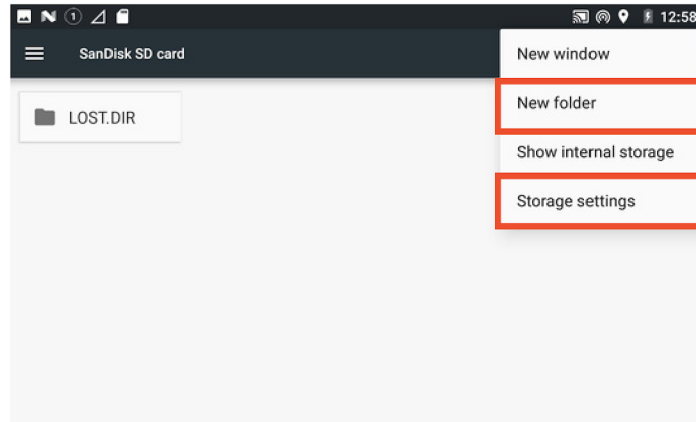


Figure 7

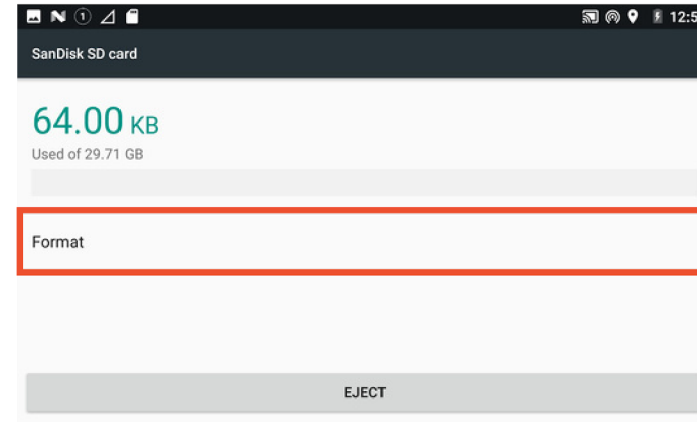


Figure 8

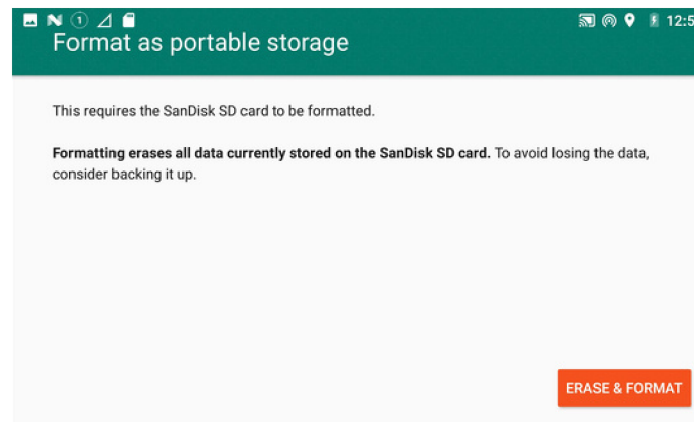


Figure 9

# TRANSFERRING FILES TO A COMPUTER

## Transferring via SD Card - Setting up SD Card

The next steps involve changing settings on Screen Master and Screen Recorder.

1. Open the list of apps
2. Open Screen Master and navigate to **More Settings** at the bottom of the list (Figure 10).
3. Open **Save Path** (Figure 11)
4. Select the SD card icon (Figure 12) with text underneath. It should become highlighted in blue.
5. Find the folder you created in the previous section on the SD card and open it
6. Tap **OK** and exit the app (Figure 13)

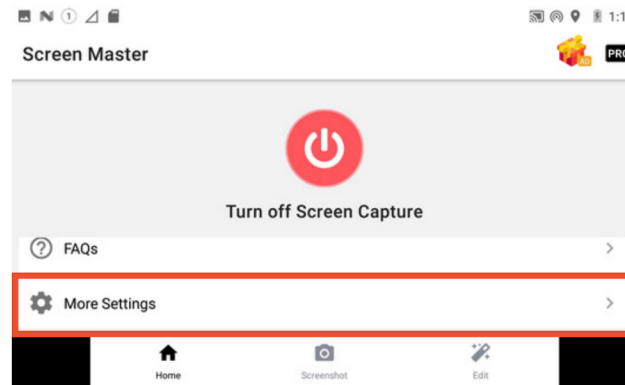


Figure 10

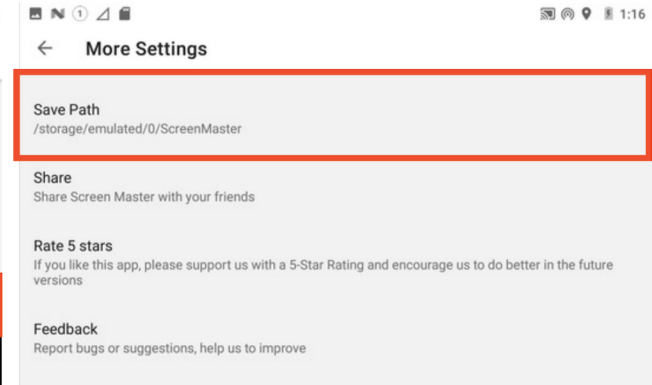


Figure 11

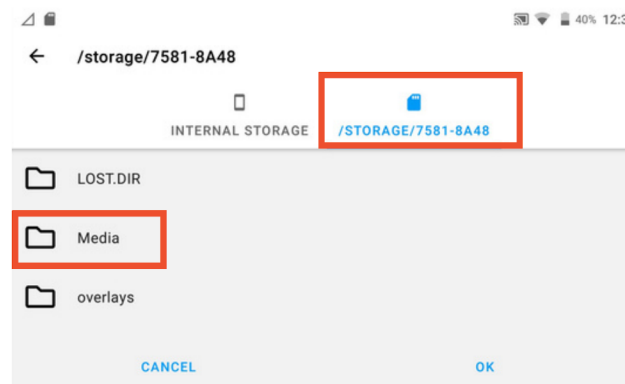


Figure 12

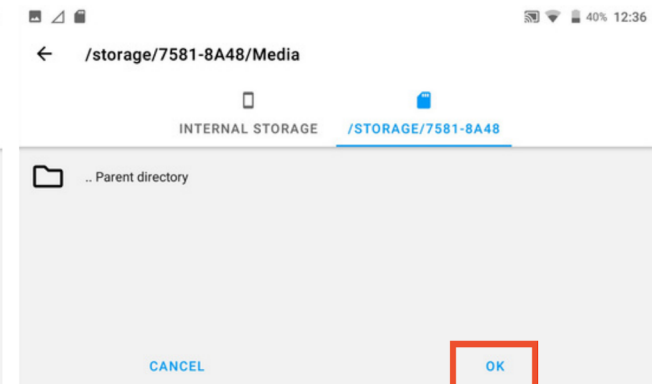


Figure 13

# TRANSFERRING FILES TO A COMPUTER

## Transferring via SD Card - Setting up SD Card

1. Open the **Screen Recorder** app from the main screen and click on the settings icon (Figure 14)
2. Scroll down the list to the **Select recording folder location** (Figure 15) item and open it
3. Select **SD Card storage** (Figure 16) and then **OK**
4. Navigate into the folder you created on the SD Card. Tap **Select** (Figure 17) and exit the app.

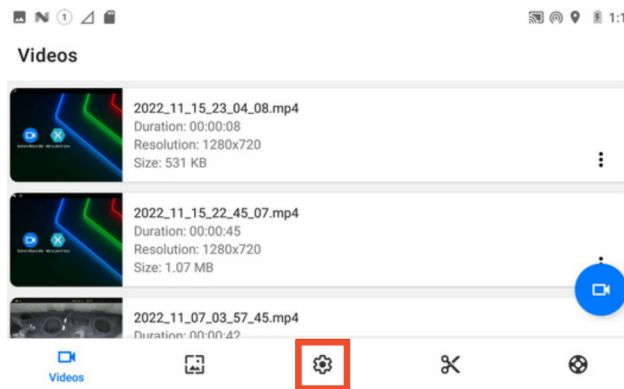


Figure 14

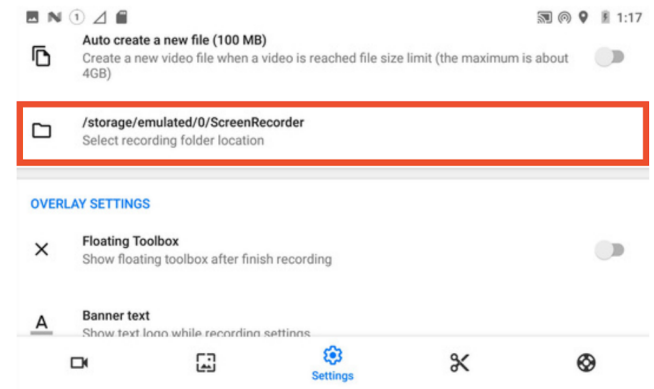


Figure 15

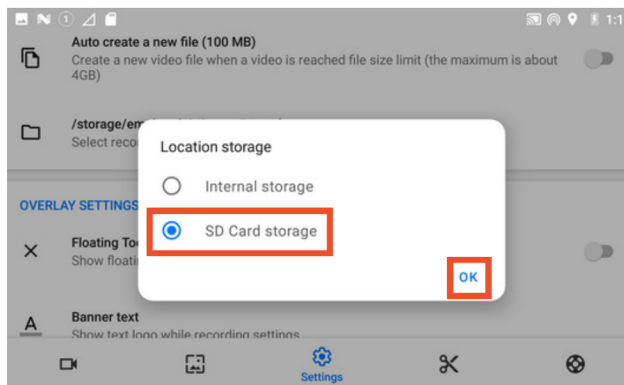


Figure 16

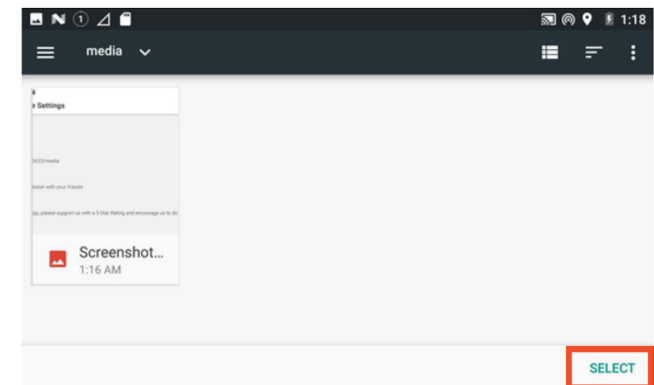


Figure 17

# TRANSFERRING FILES TO A COMPUTER

## Transferring via SD Card

1. Remove the micro SD card (Figure 18) from the Herelink controller
2. Put the SD card into your computer's SD Card reader using a micro-to-SD adaptor (Figure 19) if necessary
3. On Windows open File Explorer (Figure 20) or on Mac open Finder (Figure 21)
4. You will have a new device that you can open
5. Open the new device. Inside the folder that you created for videos and images will be your files.
6. Copy the files into a folder on your computer



Figure 18



Figure 19

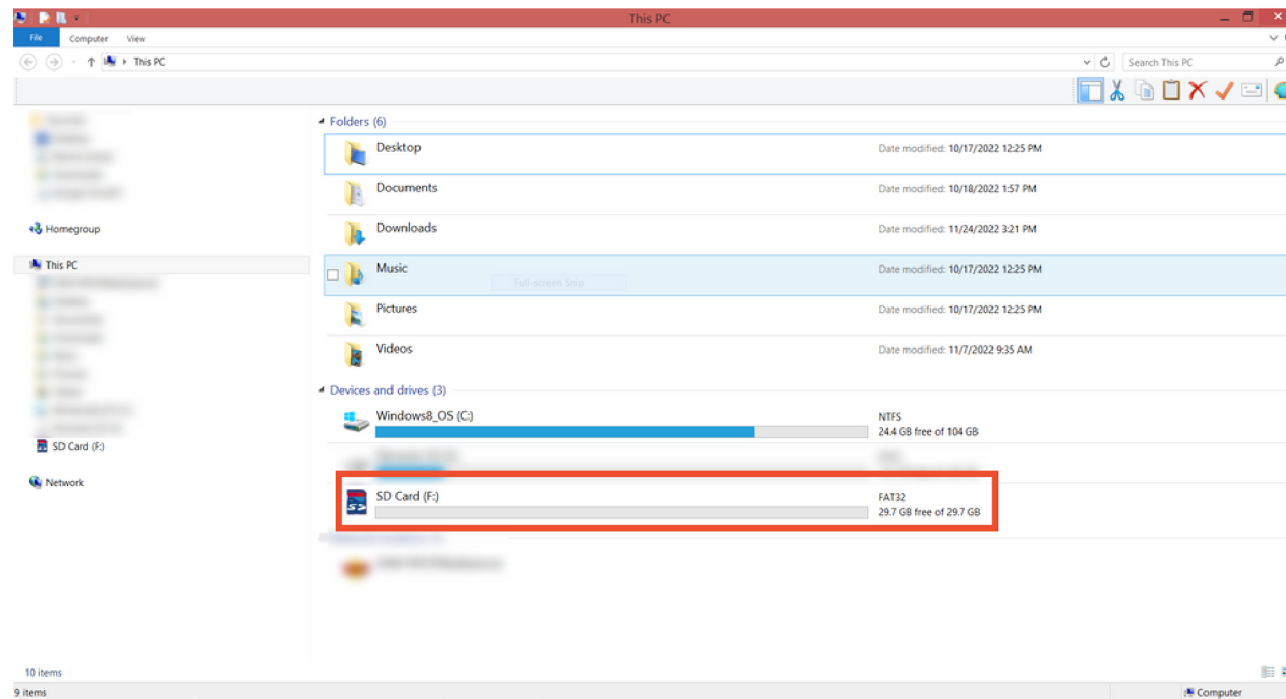


Figure 20

# TRANSFERRING FILES TO A COMPUTER

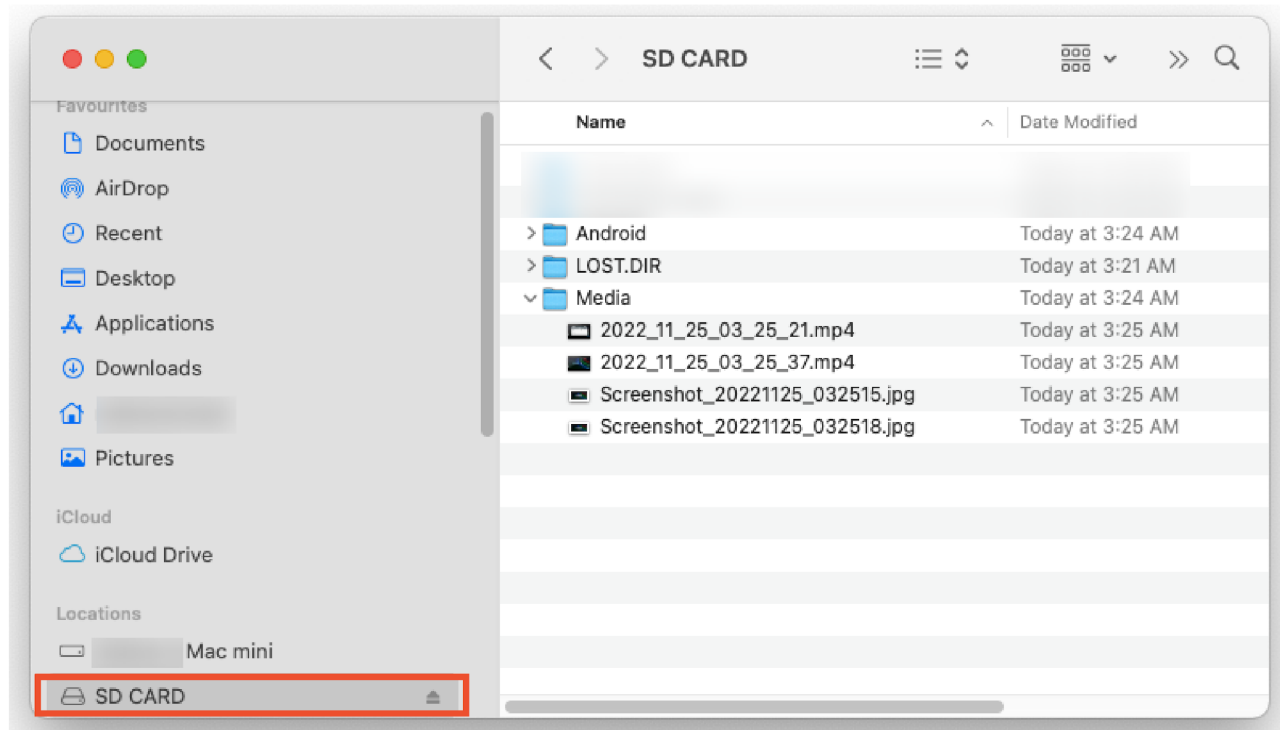


Figure 21

# REMOTE VIEWING

## Initial Setup

1. Enable the Hotspot on the Herelink controller (Figure 1)
2. Tap and hold the **Hotspot** icon. This opens the Wireless & Networks screen. Select **Tethering & portable hotspot** (Figure 2).
3. Click on **Set up Wi-Fi Hotspot** (Figure 3)
4. From here you can find out the Wi-Fi settings, including the password (Figure 4).
5. Power up the tablet
6. Using the credentials found in Step 4, connect to the hotspot.

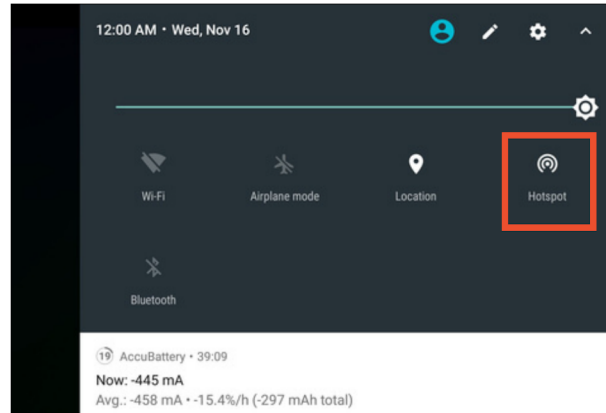


Figure 1

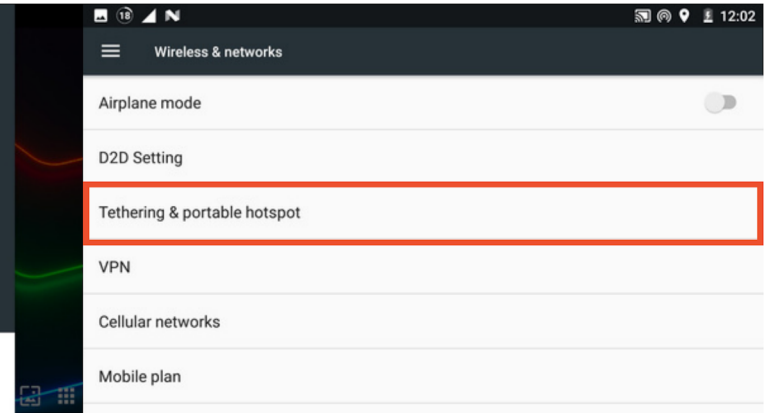


Figure 2

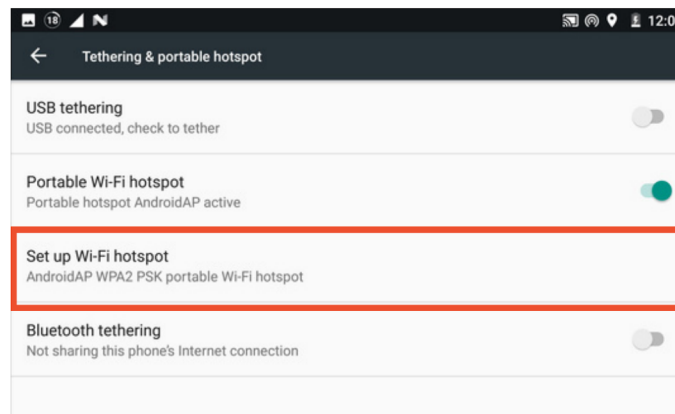


Figure 3

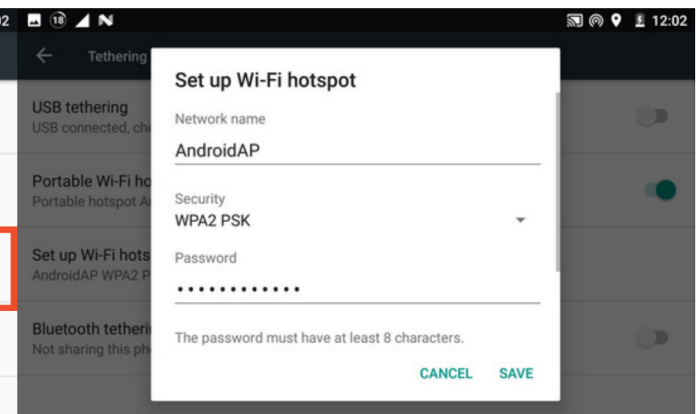


Figure 4

# REMOTE VIEWING

## Viewing the Stream

1. Turn on a tablet or phone (Android or iOS)
2. Install VLC player if it is not already on the device
3. Connect to the Wi-Fi hotspot **AndroidAP** (Figure 5)
4. Open **VLC** player (Figure 6)
5. Tap **New Stream** (Figure 7)
6. Type in the following address (Figure 8)  
**rtsp://192.168.43.1:8554/fpv\_stream**
- Optional: Save this address to a notetaking app for convenience
7. Tap the orange arrow on the right side to connect

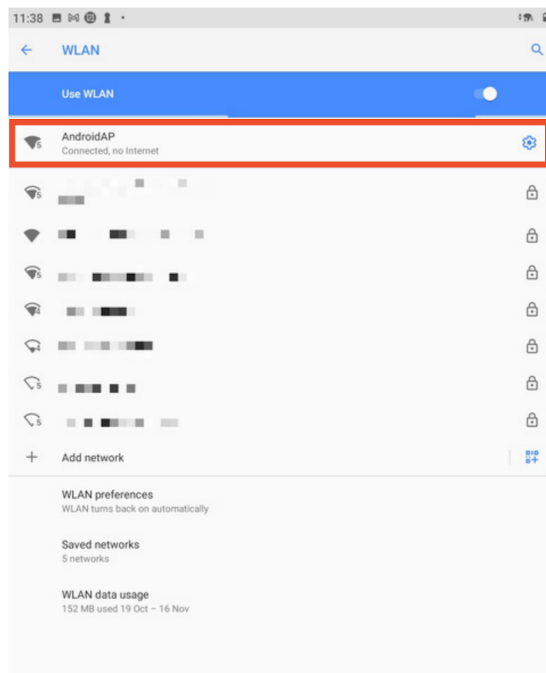


Figure 5

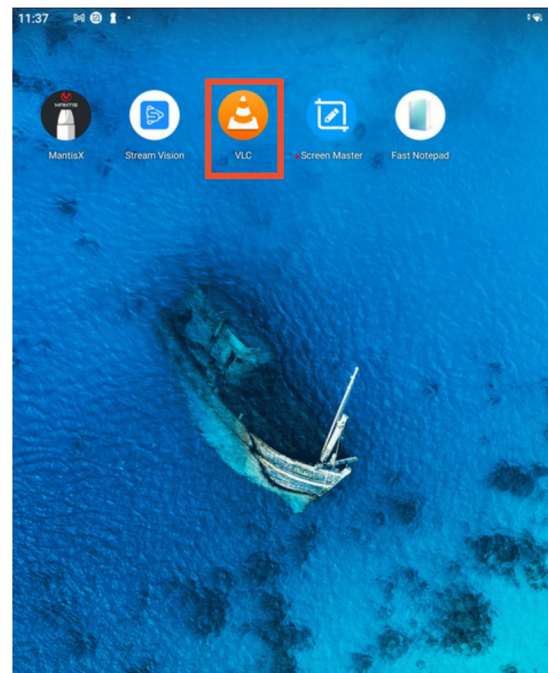


Figure 6

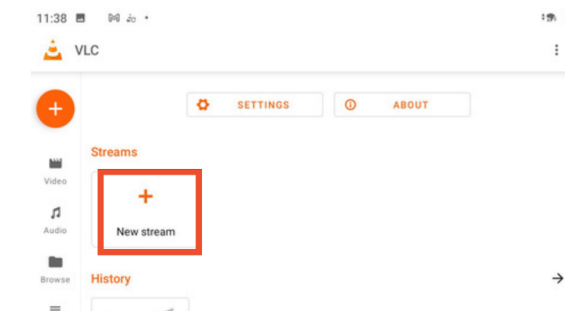


Figure 7



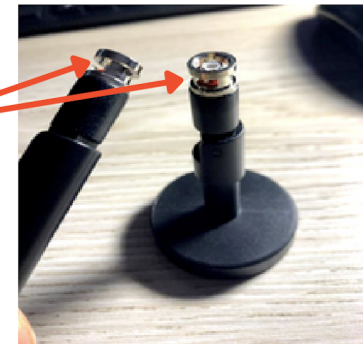
Figure 8

# CONNECTING ANTENNAS

- Before turning on the Herelink controller ensure that the two antennas are attached. Note that it does not matter which antenna you connect to which socket as long as you have both types.
- Line up the BNC connectors on the antennas, gently push down, and twist slightly clockwise to attach them to the Herelink.
- Ensure that the antennas are securely connected so they do not come out



Antenna connectors



Antenna connector in the Herelink





# BEFORE/AFTER OPERATION CHECKLISTS

## Before

- Ensure that both Cerberus and the Herelink controller with the cables are provided
- Ensure that both Cerberus and the controller are charged
- Ensure that the wheels and hubs are firmly attached
- Both antennas are connected to the controller before use
- If needed, an SD card is installed and set up on the Herelink controller

## After

- Remove debris off the wheels and dry them if they have become wet
- Use the USB cable provided or an SD card to transfer the photos and videos to a computer
- Charge the device and the controller so they are ready for the next time
- Keep Cerberus in the case provided while traveling