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P&G Selfie Device

User Manual

Contents

1. Hardware Device

P&G Selfie Attachment Device is a device that is attached to an iPhone 15. The features of this device are:

- It helps to add Flash Capabilities to the front camera of iPhone.
- Range Sensing of the subject from the camera lens.
- LED indicator to detect whether the subject is within/out of the range.
- Color sensing to detect skin tone of the subject.
- ALS sensing the environment light.
- Taking Cross polarized images by affixing polarizing film to front flash and front camera.
- Additional image parameter controls (Exposure, ISO, Shutter Speed, White Balance, Auto Focus, Integration Time, Gain Time, DG, Threshold Frequency, Threshold Value).
- Bluetooth connectivity between the device and the iPhone.

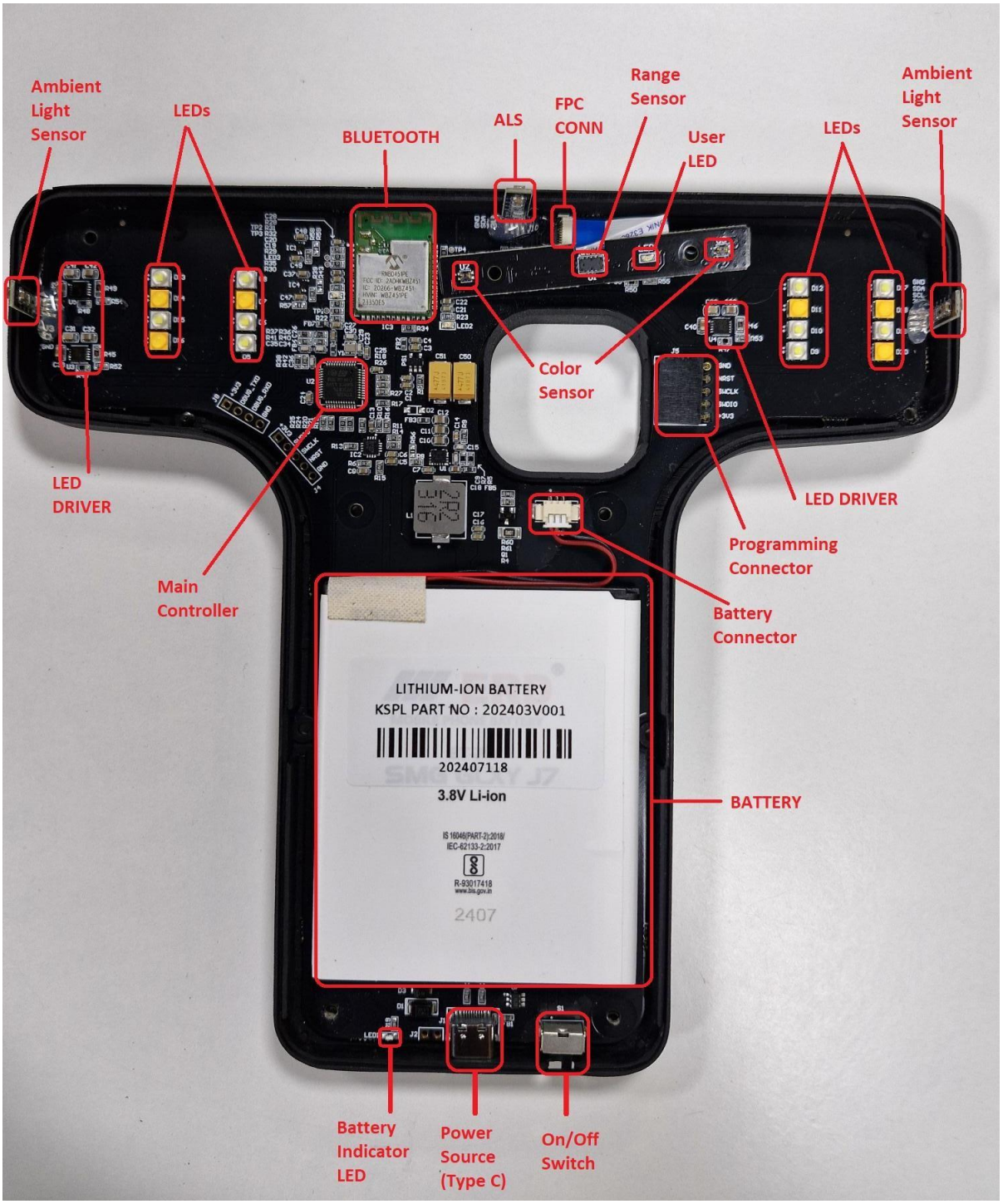

Fig 1: Selfie Attachment Device Description

Fig 2: Selfie Attachment Device with iPhone 15

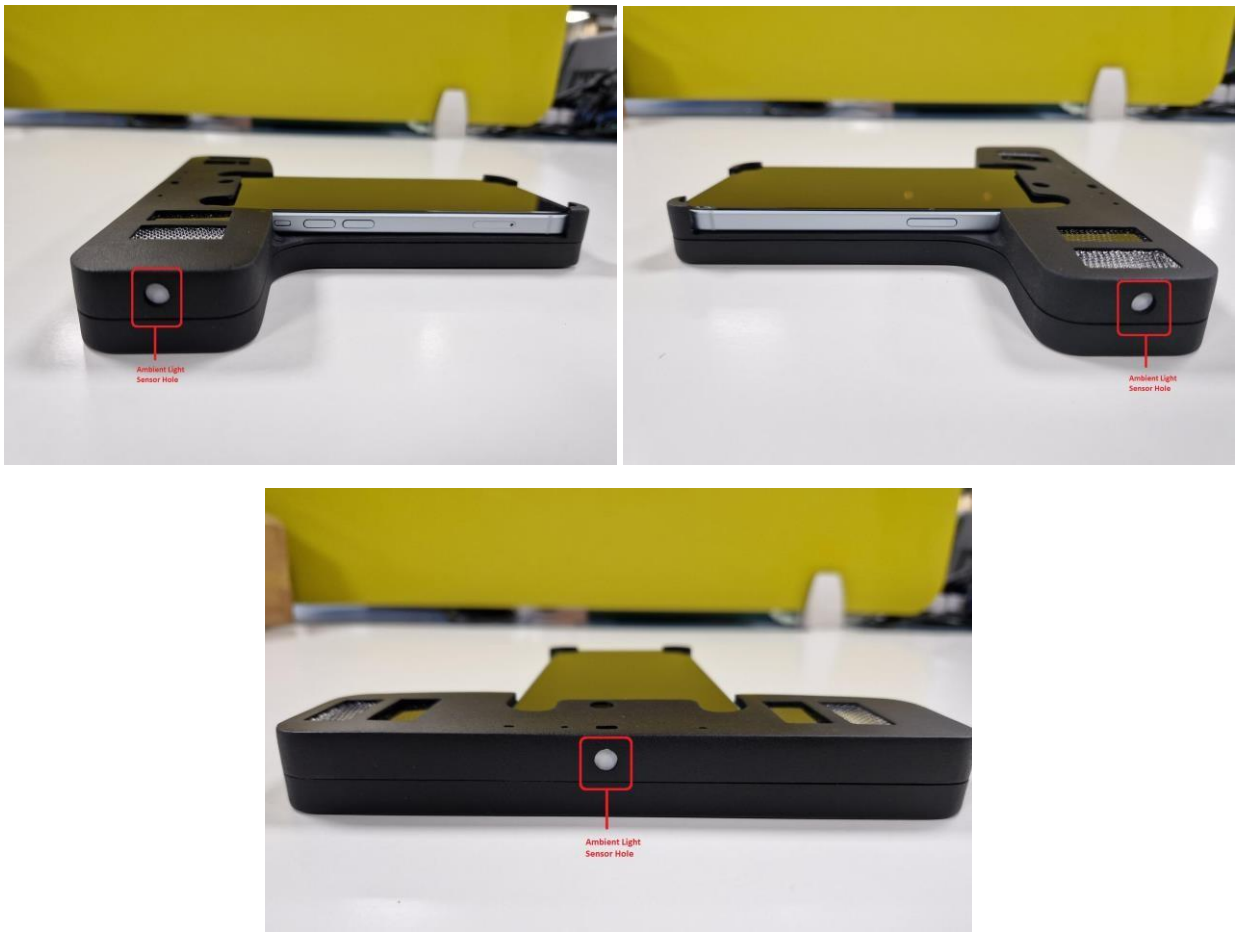

Fig 3: Ambient Light Sensor Hole in the enclosure

2. Device Power

Use the switch located on the bottom right of the device to power ON the device.

3. Software

This device works with an iOS application. The operation of the Selfie device is initiated and controlled by an iOS application named “GS Pro”.

4. IOS Application Features

The iOS Application provides control over the following parameters of the image to be taken:

- **Timer:** Measures the time difference between three consecutive photos.
- **ISO:** Manual adjustment of the camera's sensitivity to light.
- **Shutter Speed:** Manual control over the camera's exposure time.
- **Exposure:** Manual adjustment of the exposure bias value.
- **White-Balance:** Automatic White Balance mode activated at the start of each camera session. We can manually adjust the WB also.
- **A/F (Auto-Focus):** Auto-focus set to automatic mode when the camera session begins. We can manually adjust the A/F also.
- **Flash Brightness:** Intensity of LEDs we are using in this project
- **Min. Distance:** Min. Distance is the distance between the camera and the object from which it starts taking the picture or it focuses on the object.
- **Max. Distance:** Max. Distance is the distance between the camera and the object after which the app will not take the picture.
- The image is being saved in either **DNG or JPG** format with the max available resolution as per user choice.

We have the option of advance settings:
In advance setting:

- **RGB Sensor**:
  - **Integration Time:** The duration over which a sensor collects and accumulates incoming light or signal.
  - **Gain Time:** It is the digital camera setting that controls the amplification of the signal from the camera sensor.
  - **Spectrum:** The spectrum is the range of different colors which is produced when light passes through a glass prism or through a drop of water.
  - **Threshold Value:** A value that sets a limit or boundary above or below which a different state or condition is observed.
  - **Threshold Deviation:** Sets the maximum acceptable value for the calculated deviation value. If the calculated deviation is above this threshold value, the text for that feature is displayed in red in the alignment feature area.

- **Ambient Light Sensor:**
  - **Gain Time:** Gain time refers to the period during which the ALS adjusts its gain setting in response to detected changes **in ambient light. This adjustment ensures that the sensor can accurately measure light levels across a wide range of con**ditions, from bright sunlight to dimly lit rooms.
  - **Time:** The "time" in an ambient light sensor refers to the duration or interval during which the sensor measures and evaluates the ambient light intensity in its environment.
  - **Threshold Value:** The threshold value is a predetermined light level set within the sensor's operating range. It acts as a reference point to determine when the ambient light has reached a certain intensity, prompting the sensor to perform a specific function.
  - **Threshold Deviation:** Threshold deviation sets the range or margin around a predefined threshold value within which the sensor considers the ambient light level acceptable and does not initiate any action. It defines how much the ambient light intensity can vary from the threshold before the sensor responds.

5. Recommended Range for Parameters

- **Timer:** Recommended range from 0 to 1000.
- **ISO:** Recommended range from 25 to 1000.
- **Exposure:** Recommended range from -4 to +4.
- **Shutter Speed:** Recommended range from 10 to 255 (internally converted to 1/VALUE format).
- **Brightness:** Recommended range from 0 to 100.
- **White-Balance:** Recommended range from 2300 – 7000.
- **Auto-Focus:** Recommended range from 0-1.
- **Flash Brightness:** Recommended range from 10-100.
- **Min. Distance:** Recommended range from 250-300 mm.
- **Max. Distance:** Recommended range from 300-350 mm.
- **RGB:**
  - **Integration Time:** Recommended values are: 50 ms, 100ms, 200 ms, 400 ms.
  - **Gain Time:** Recommended values are: 0.1, 1.0, 2.0, 4.0.
  - **DG:** Recommended values are: 1, 2, 4.
  - **Spectrum:** Recommended colors are: Red, Green, Blue, Clear, Infrared.
  - **Threshold Value:** Recommended range from 0-255.
  - **Threshold Deviation:** Recommended range from 0-100%.
- **ALS:**
  - **Gain Time:** Recommended values are: 1, 2, 64, 128.
  - **Time:** Recommended range from 1-255 ms.
  - **Threshold Value:** Recommended range from 100, 1000, 100000.
  - **Threshold Deviation:** Recommended range from 0-100%.

6. Device Operation

Following steps constitute the procedure to use the application:

- Open the “GS Pro” application on the iPhone.
- If Bluetooth is not on, then a pop-up will appear on the screen prompting you to turn Bluetooth On. Go to settings and Click on the **“Allow new Connections”** and go back to the app.
- Check if the dot on the top left corner of the screen is Green, if yes proceed to the next steps, if it is Red then follow the following steps:
  - After turning ON Bluetooth, click the **Scan** Button which will display the available Bluetooth Devices.
  - Select the device id of your device (can be found at the back of your device).
  - A pop-up will appear if you want to connect with the device or not. Click on **Pair.**
  - After successful pairing you will see that the **Red** dot on the top left corner of the screen changes to **Green**. Along with this, the flash LEDs (with polarizer and without polarizer) glow once which indicates the successful pairing of Bluetooth for diagnostic parameters.
- Next, click on the **Settings** button which appears on the bottom left of the screen.
- Adjust the desired settings (timer, exposure, ISO, shutter, white balance, focus, flash brightness, minimum distance, maximum distance) and press the **Apply** button.
- Additionally, an Advanced Settings button is also available. Tap this button to access advanced settings for RGB and ALS sensors:

  RGB Sensor Settings:
  - Set the desired values for both left and right sensor separately.
  - Apply these sensor values.
  - Real-time data for RGB sensor values is checked within the threshold range.
  - If within range, the status shows "OK". If not, a warning appears.

  ALS Sensor Settings:
  - Set the desired values for four ALS sensors separately.
  - Apply these sensor values.
  - Real-time data for ALS sensor values is checked within the threshold range.
  - If within range, the status shows "OK". If not, a warning appears.

- Then click on the apply button to save these advanced settings. If the RGB and ALS advanced settings are not applied, then the warning comes “No deviation logs found”.
- After applying RGB and ALS sensor settings, an additional confirmation screen appears to validate real-time sensor data:

  a. The screen displays real-time readings for RGB and ALS sensors.
  b. Threshold ranges are visibly marked for each sensor parameter.
  c. If sensor values fall within the specified thresholds, a confirmation message ("OK") is displayed.
  d. If sensor values exceed the thresholds, a warning notification alerts the user.

- Keep the face/object between the min. and max. distance range to take the picture.

- If the distance is less than the min. distance, then the dot on the top right of the screen turns yellow and the **Click Image Button** appears Red.
- If the distance is greater than the max. distance, then the dot on the top right of the screen turns **Red** and the **Click Image Button** appears **Red**.
- If the distance is within the range, then the **Click Image Button** changes to **white** and **dot turns green.**

- Click on the **Click Image Button,** when it turns **white**. After Clicking this button, the device will capture three consecutive pictures.
- A pictures preview of 3 images will appear on the screen which will be the following in order:
  1. Non-Polarized without Flash.
  2. Polarized with Flash.
  3. Non-Polarized with Flash.
- Close the camera preview/session by clicking **Close** button.
- There is a Diagnostic button on the bottom right of the screen. In this Diagnostic button, we can check the status of everything whether it is working or not. If it is working properly, it shows the status as **PASS** otherwise **FAIL**. Also, it contains last top 10 logs for better verification.
- Go to **Photos** folder to view these images. These images will be saved either in **DNG or JPG or ALL (both JPG AND DNG** format along with **EXIF** data**.**
  - The **EXIF** data is in the format -
    [App Bundle ID], [Battery %], [Distance in MM], [Image Type], [(R, G, B, C, IR)1], [(R, G, B, C, IR) 2], [ALS Left], [ALS Right], [ALS Top], [ALS Front], [White Balance], [Focus], [Flash Brightness], [App Version], [Firmware Version]
- The **EXIF** data of the image will indicate the value added in the camera setting page when the white balance and auto focus are in manual mode.
- The **EXIF** data of the image will indicate **Auto** when the auto focus is in auto mode and for the white balance the **EXIF** data of the image will be displayed in the format **Auto(Red Gain, Green Gain, Blue Gain, Temperature, Tint).**
- There is an option to reset the camera settings and the advanced settings applied to their default values. After tapping on the reset button, an alert comes which asks for the confirmation to either apply or cancel the default values.
- One can export the applied settings to the files and name the settings according to their use. For ex. “HOME” or “OUTDOOR” etc.
- After export, one can import the settings file in .json format from the files to the app. After importing, an alert comes which asks for the confirmation to either apply or cancel.
- After importing or exporting one should click on the apply button.
- If the battery level of the BLE device is less than **20%** than an indication will be given to charge the device and **Shutter Button** will be disabled.

FCC Compliance 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.
OPERATING REQUIREMENTS AND CONDITIONS: The design of product complies with U.S. Federal Communications Commission (FCC) guidelines respecting safety levels of radio frequency (RF) exposure for Mobile devices. 2.2 RF Radiation Exposure Statement this equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.
2.3 FCC PART 15 STATEMENT § 15.105 (Class B digital device) 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.

FCC CAUTION STATEMENT FOR MODIFICATIONS CAUTION: Any changes or modifications not expressly approved by Procter & Gamble International Operations SA could void the user's authority to operate the equipment.

Fig 4: Open the App

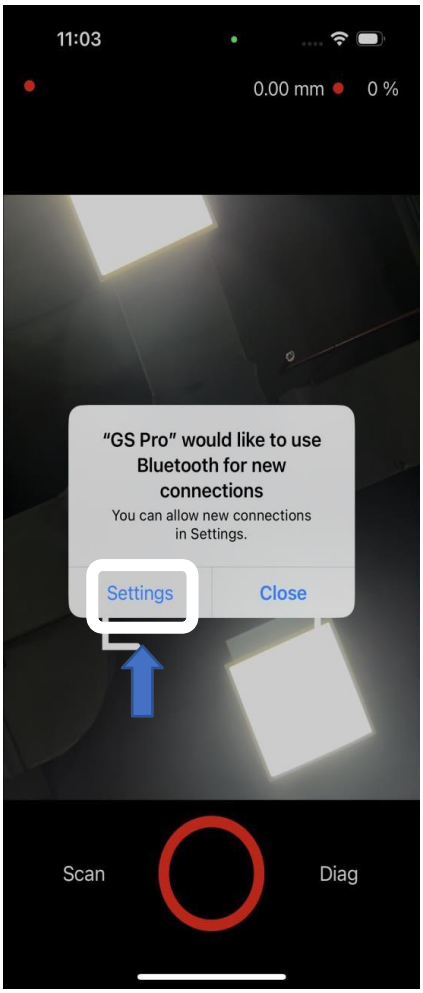

Fig 5: Pop-up for Bluetooth, go to settings

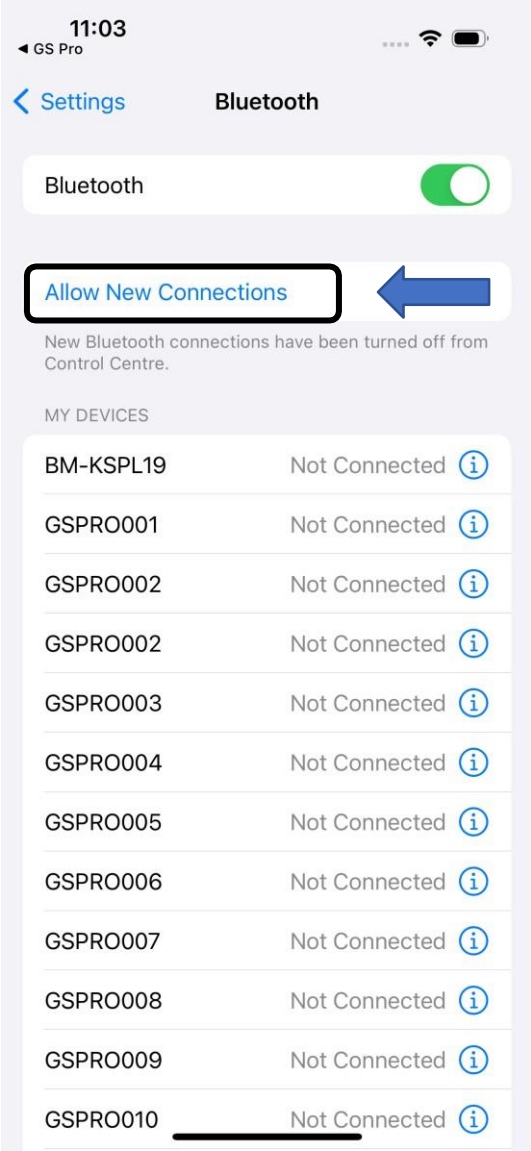

Fig 6: Turn ON the Bluetooth and click "Allow new connections"

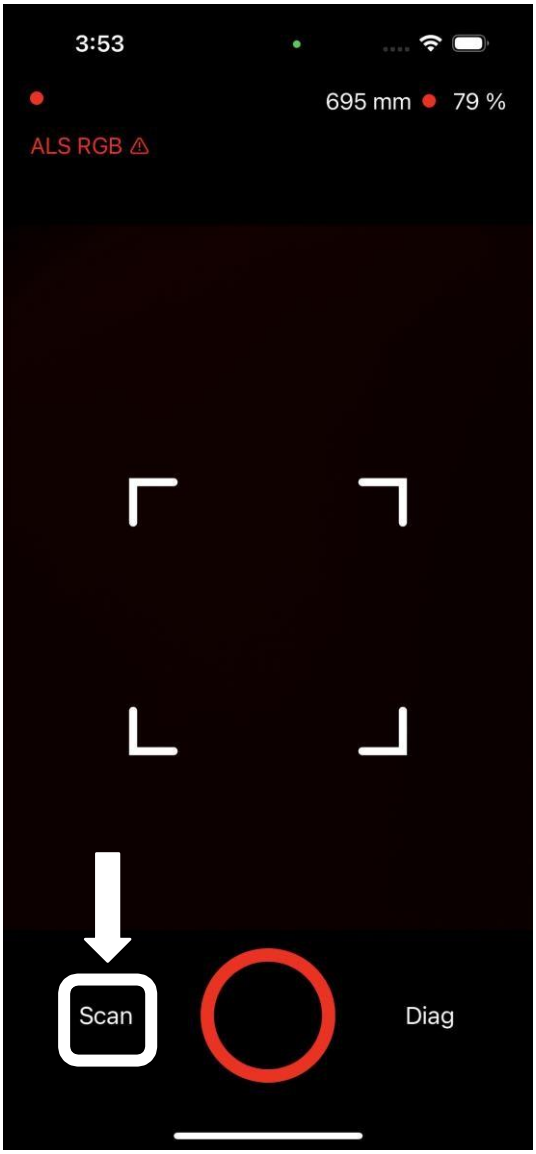

Fig 7: Scan the device

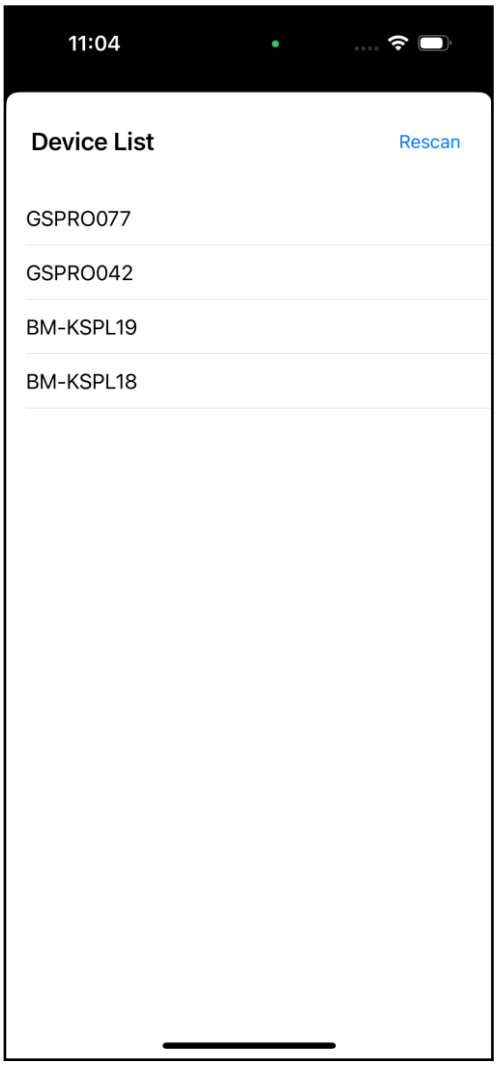

Fig 8: Select the Device ID

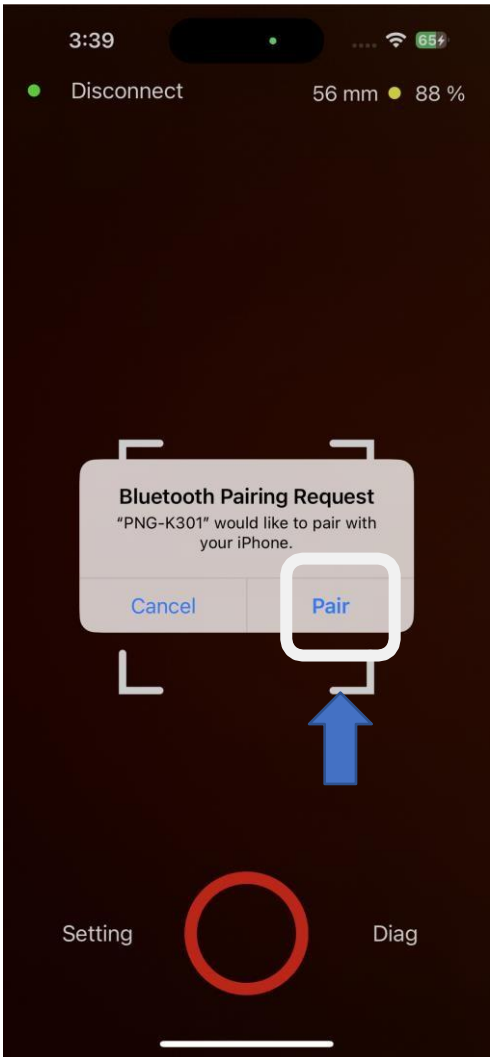

Fig 9: Click on PAIR to connect the Device

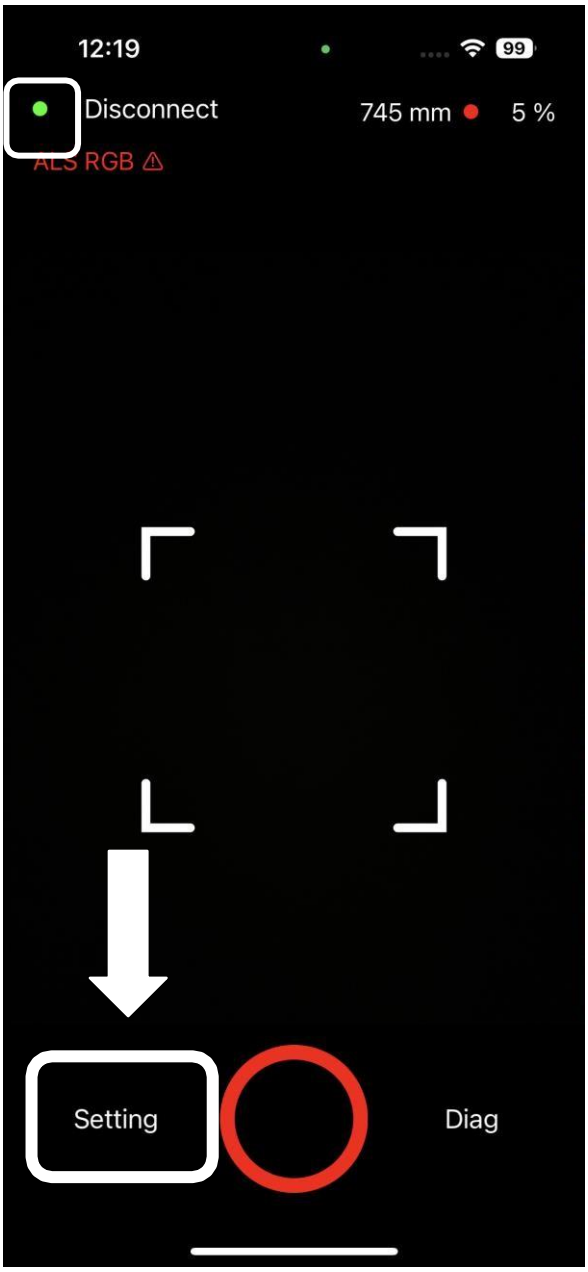

Fig 10: Green Dot appears on Top left of the screen, Click on the Setting button

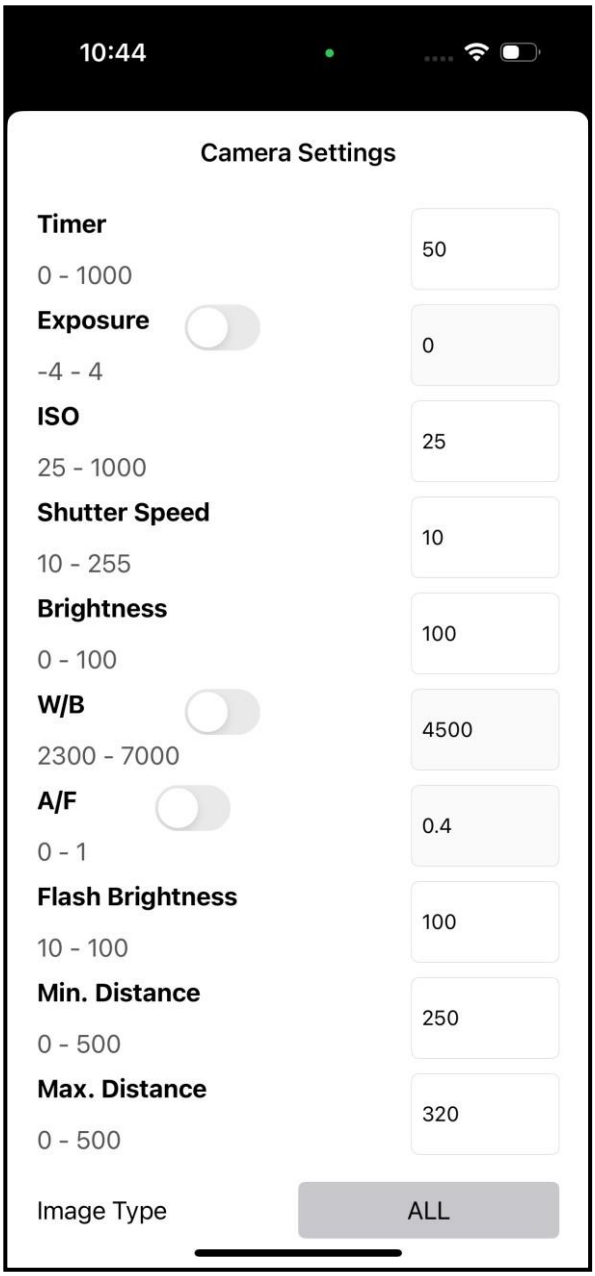

Fig 11: Adjust the desired camera setting

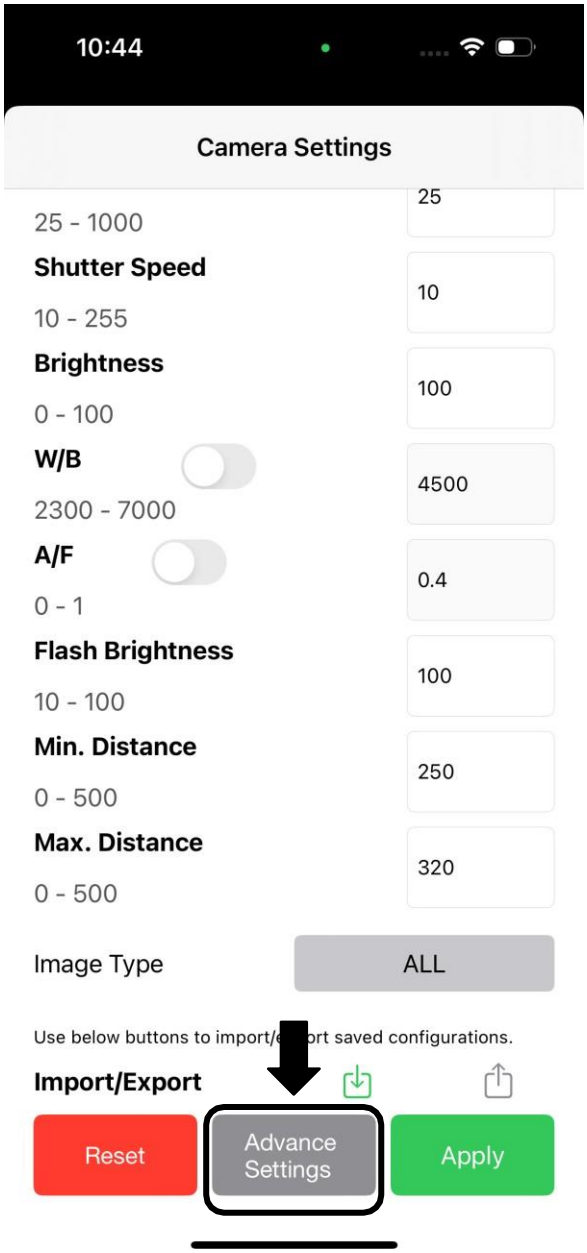

Fig 12: For ALS and RGB, click on the advance settings

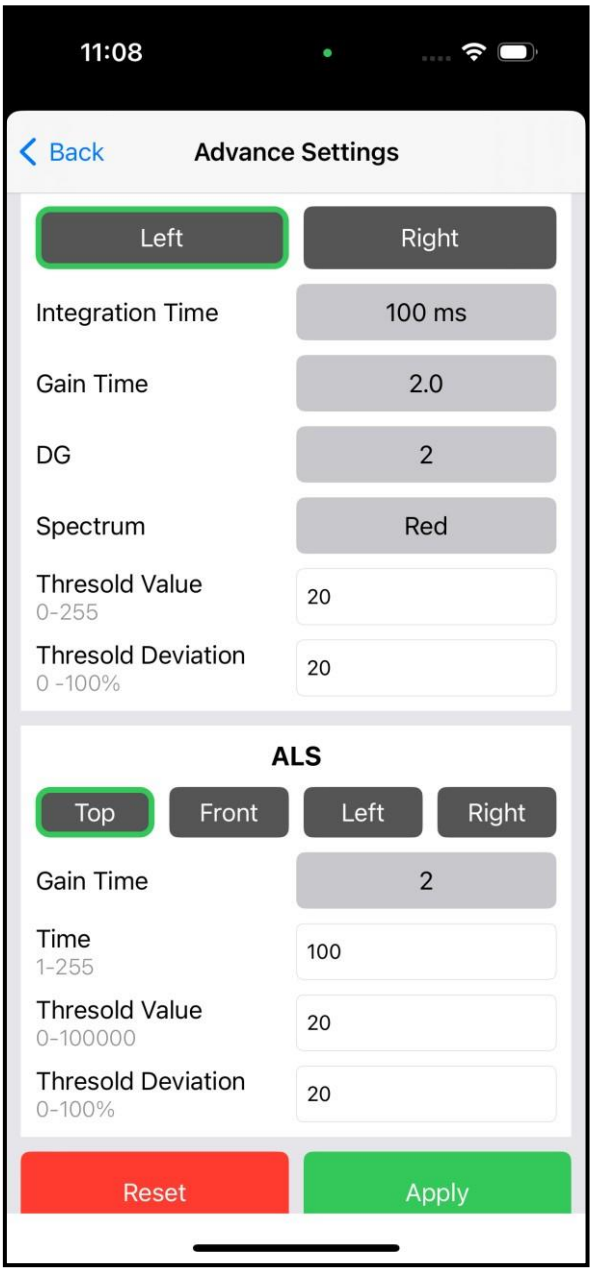

Fig 13: Set the ALS and RGB settings

Fig 14: Yellow Dot appears on Top right of the screen, if it is greater than range

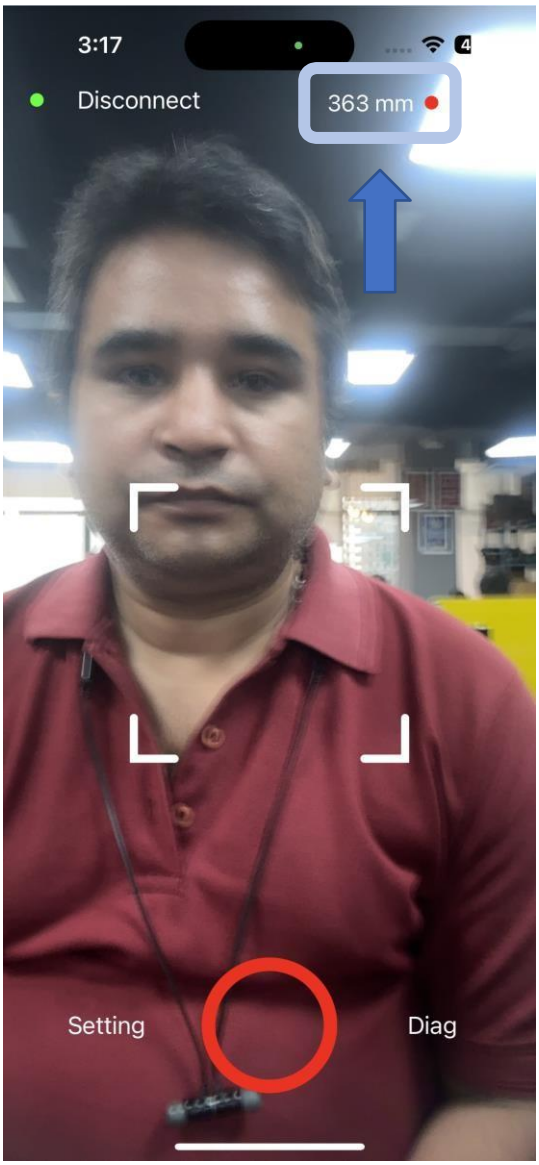

Fig 15: Red Dot appears on top right of the screen, if it is less than the range

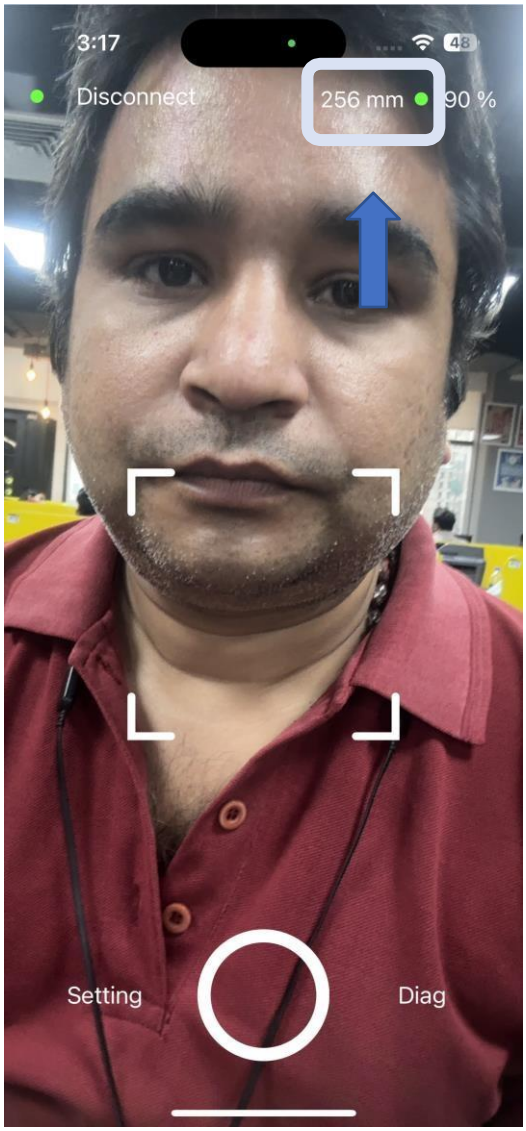

Fig 16: Green Dot appears on Top right of the screen, if it is within the range, Click in center to capture the images

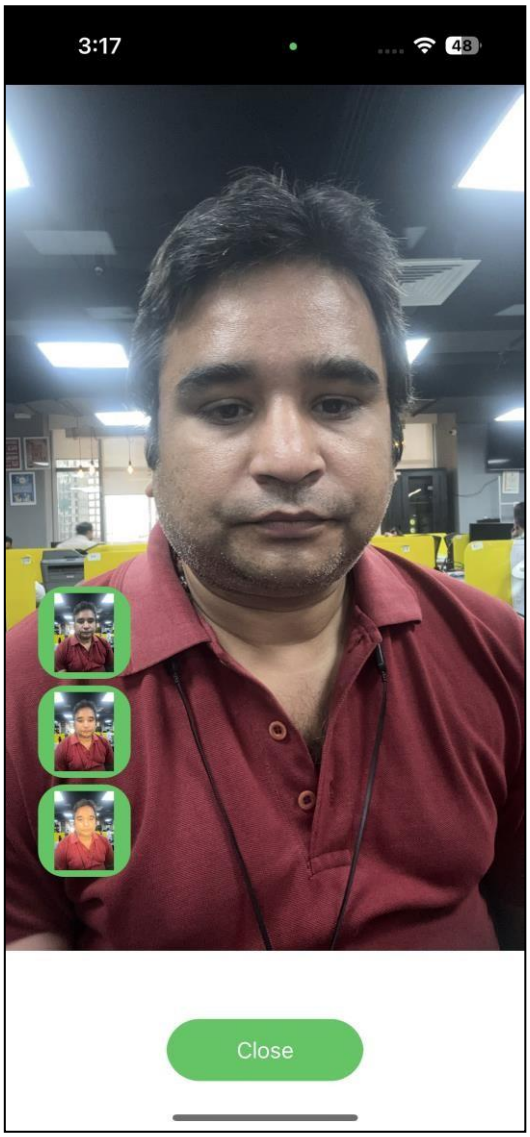

Fig 17: After capturing, picture preview is appear on the screen

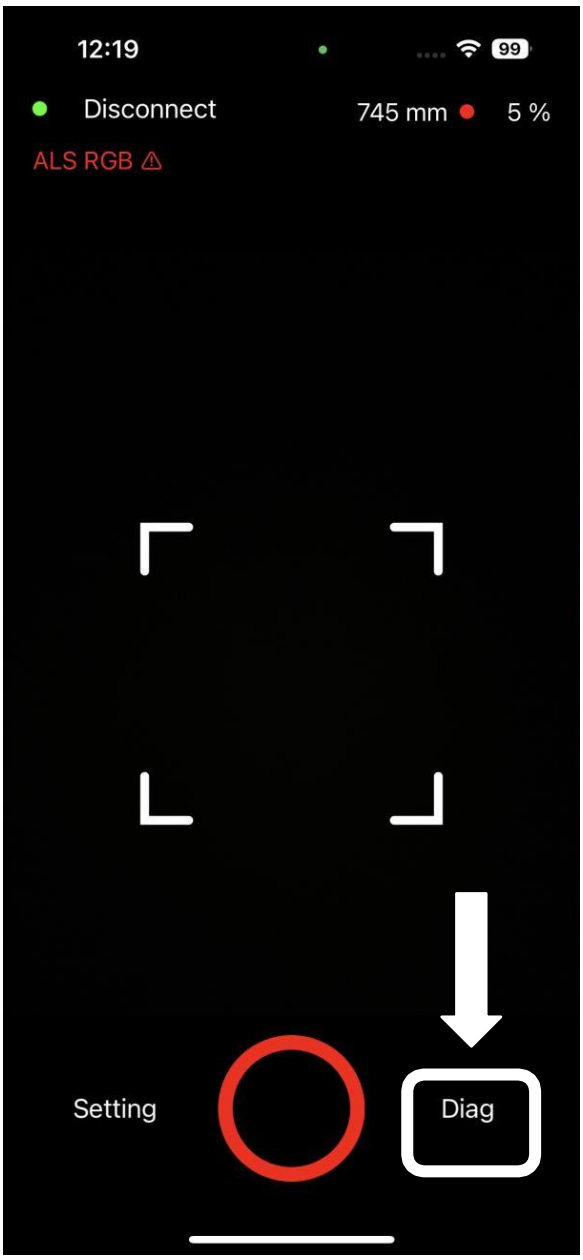

Fig 18: Click on the Diagnostic button to Check the status of everything.

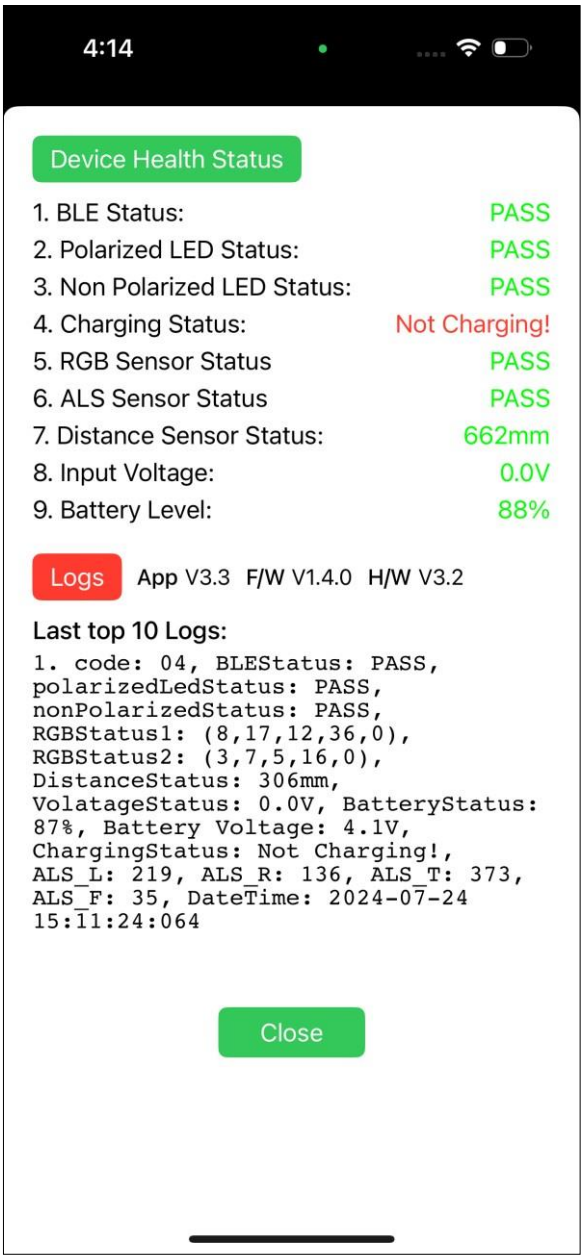

Fig 19: If it is working properly, it shows the status as PASS otherwise FAIL. Also, It contains recent logs for better verification.

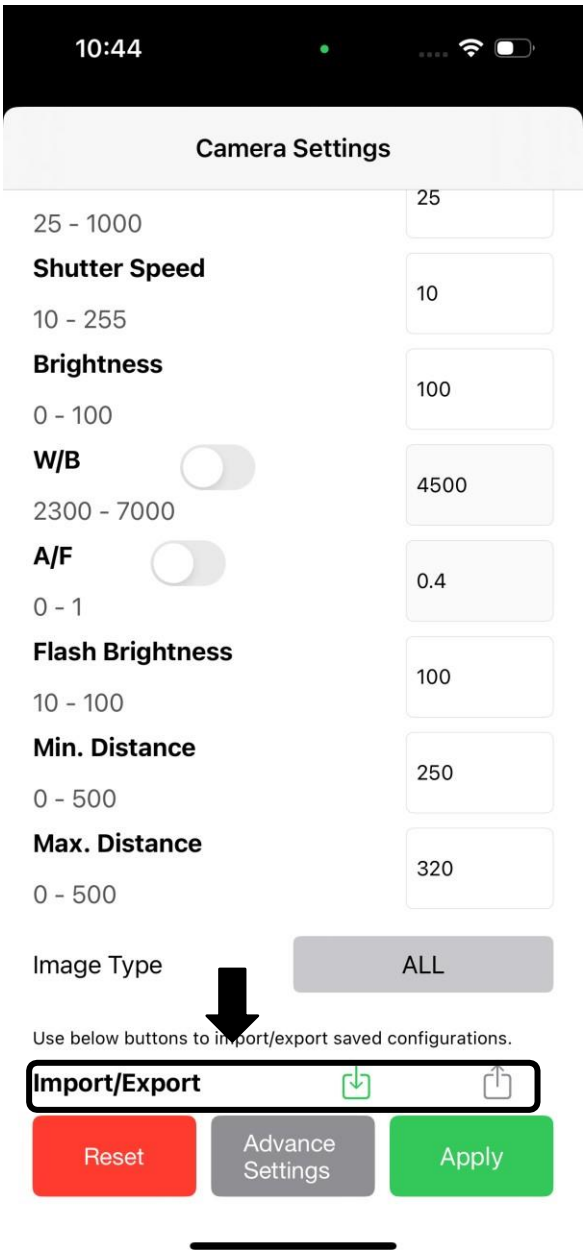

Fig 20: We can import/export the settings

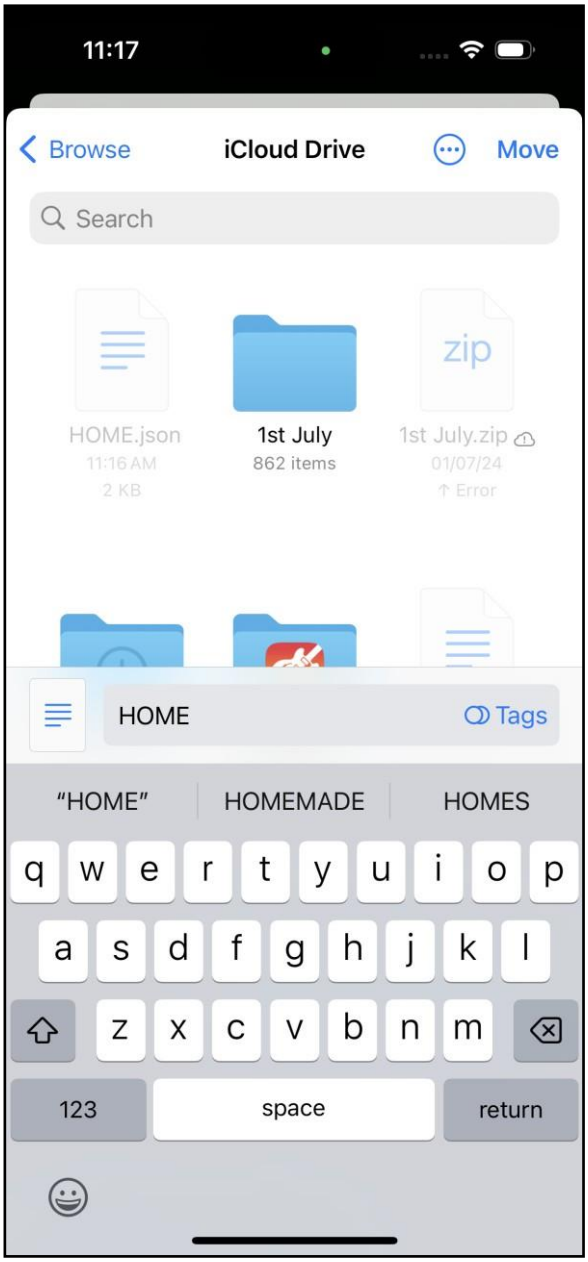

Fig 21: Set any name for exporting

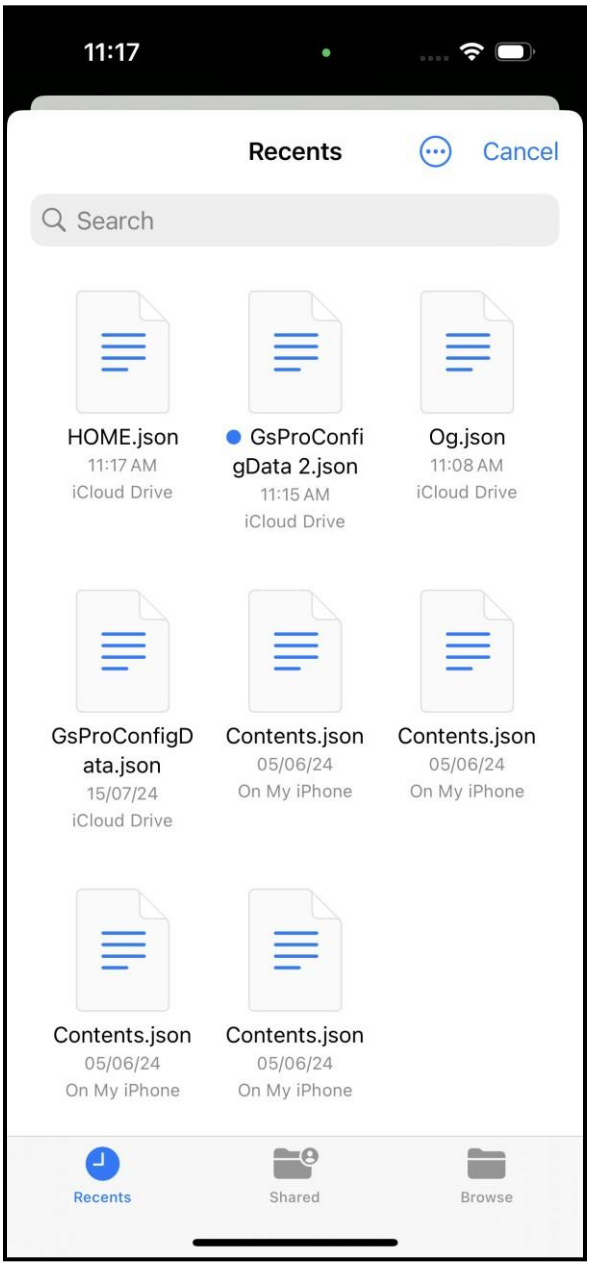

Fig 22: To import, select the saved .json file Apply

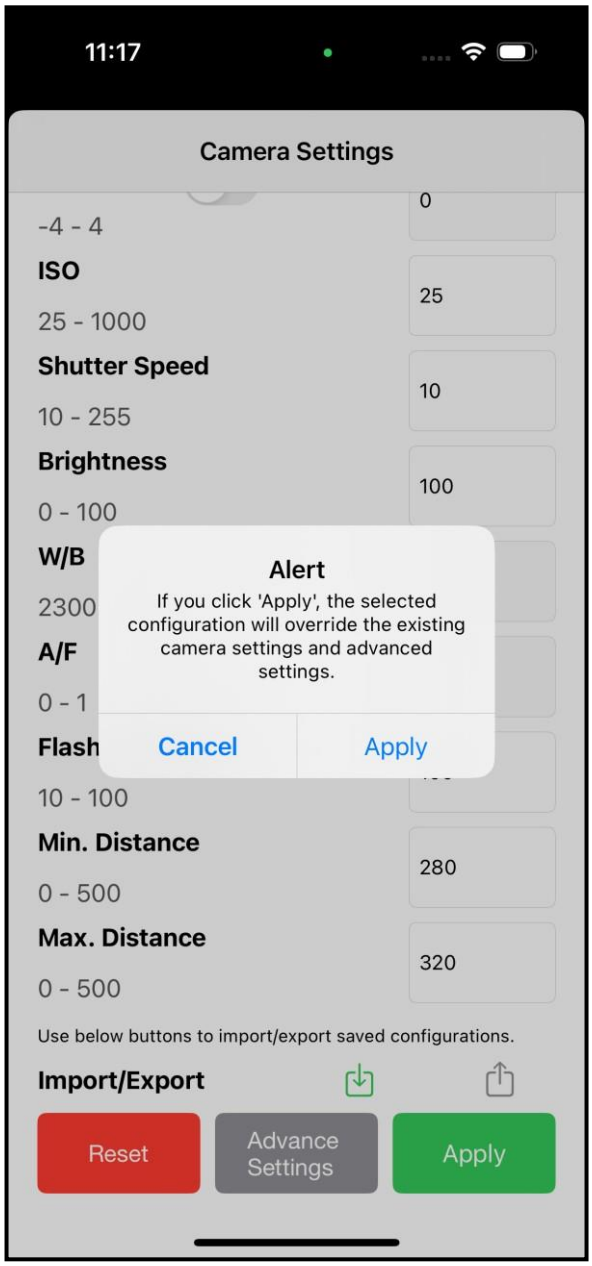

Fig 23: To reset, click on the rest button, and click

7. Exploring Image/Photos Parameters

Step 1: Open **Photos** App in iPhone.

Step 2: Select clicked photo.

Step 3: Click on **i** button to check the image parameters.

Note: Please follow the above instructions to achieve the best results.

Fig 24: Click on "Photos" to check the Parameters

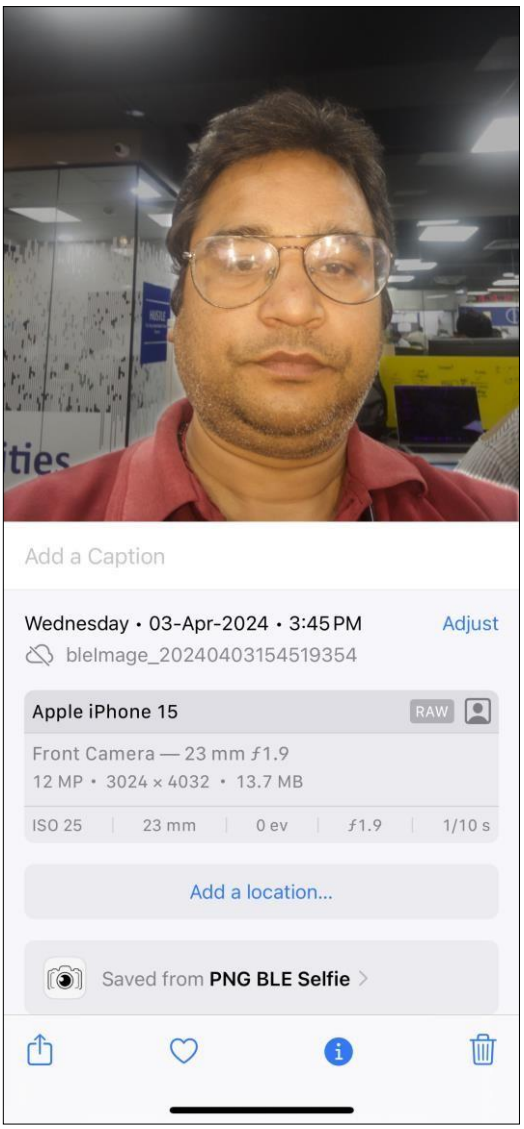

Fig 25: Click on the "i" button bottom of the image to check the information

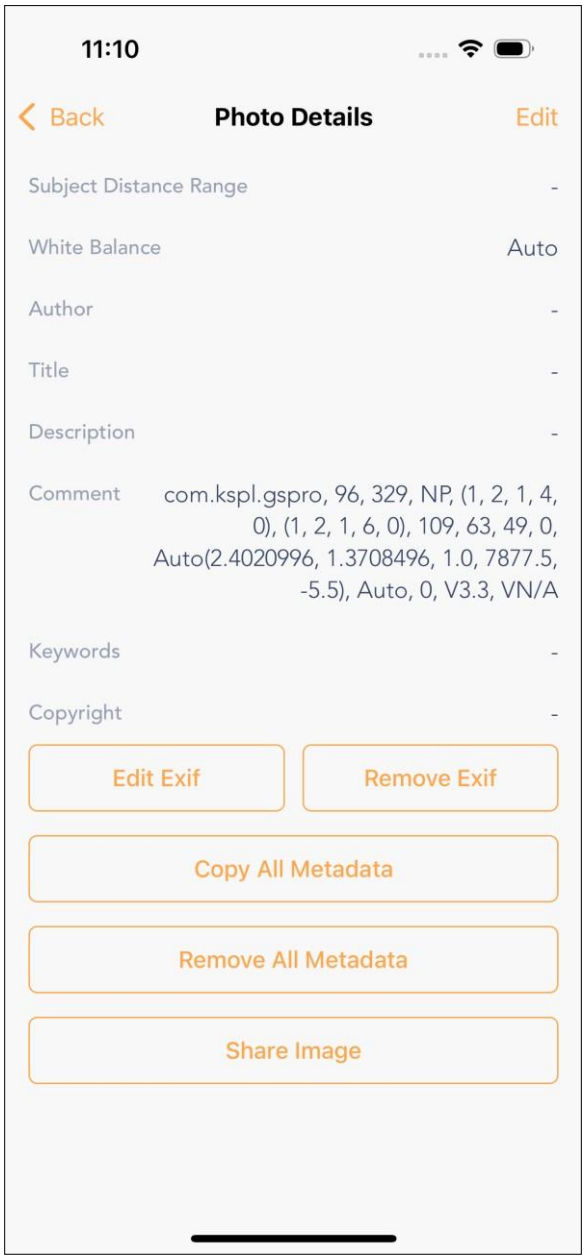

Fig 26: Open the image in the laptop or MacBook or EXIF App to check the EXIF data