RSL10 Smart Shot Color Camera Getting Started Guide

Overview

The RSL10 Smart Shot Color Camera (SECO-RSL10-CAM-COLOR-GEVK) is a complete ultra-low-power, event-triggered, node-to-cloud platform that enables smart image capture for portable, low duty cycle IoT applications including asset monitoring and event-triggered camera. Based on the RSL10 SIP and the ARX3A0 CMOS image sensor (color and mono), the platform features multiple trigger modes including periodic intervals, motion detection, and environmental sensor triggers (e.g. changes in temperature and humidity). The RSL10 SIP serves as the processing hub of the camera, and Bluetooth® Low Energy (Bluetooth LE) connectivity enabling remote control and transfer of captured image and sensor data to the provided mobile app (available on GooglePlay™ , iOS®).

This guide provides instructions for using the RSL10 Smart Shot Color Camera and accompanying mobile application. For further information about the platform, refer to the User Manual.

To get started with the platform, you will need:

- RSL10 Smart Shot Camera (SECO-RSL10-CAM-COLOR-GEVK)
- RSL10 Smart Shot mobile app
- RSL10 FOTA mobile app
- Amazon Web Services™ (AWS™) account credentials to use Amazon Rekognition™

Hardware Setup

The RSL10 Smart Shot Color Camera kit includes the baseboard PCB, two ARX3A0 IAS camera modules and a USB cable. By default, the color ARX3A0 IAS module is mounted onto the PCB and the mono IAS module is bundled with the kit. To use the mono IAS module, swap the module onto the baseboard PCB. The firmware supports both module, and is capable of automatically identifying the modules. In this guide, we will be using the color IAS module.

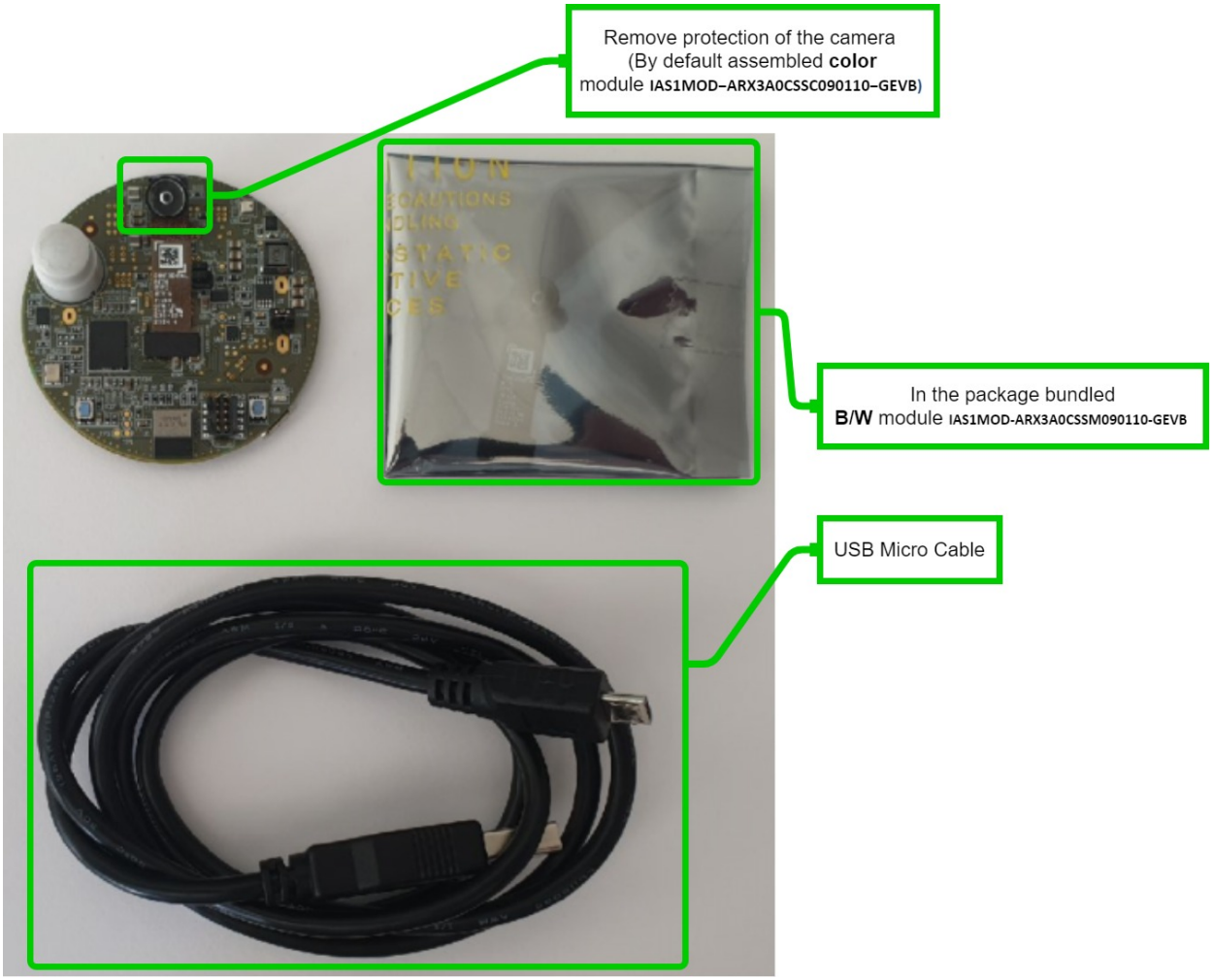


Figure 1. Unboxing the RSL10 Smart Shot Camera

To get started with the kit, remove the protective layer from the camera module and connect the provided USB cable to your PC's USB port (Fig.2).

A green LED, shown in figure 2 below, will begin blinking to confirm that the device is ready and in BLE Advertising Mode.

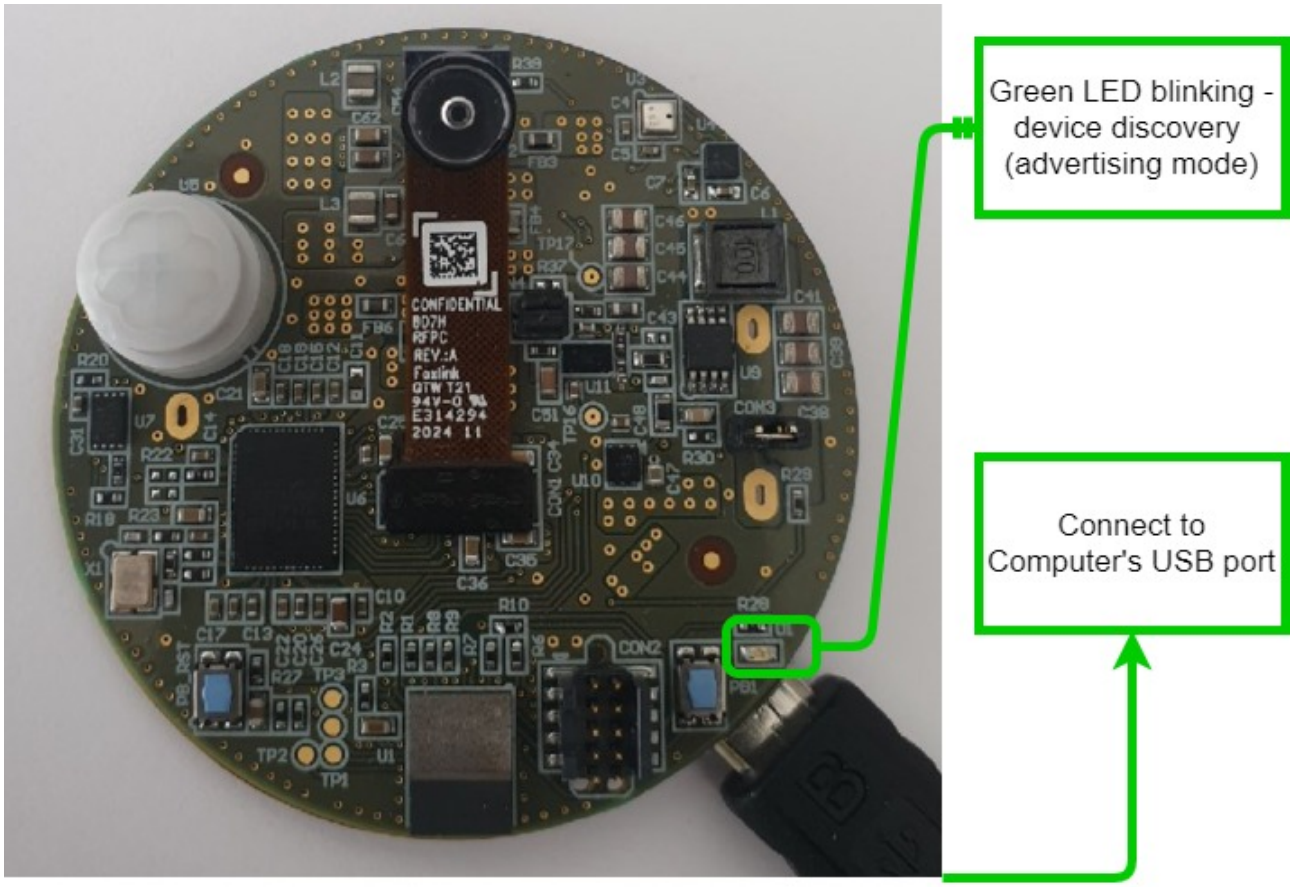


Figure 2. Operation after Micro USB is Connected

Install the RSL10 Smart Shot Mobile App

In order to operate the board, download *RSL10 Smart Shot* mobile app from GooglePlay™ or iOS®. After installing the app, ensure that Bluetooth and GPS are enabled on your phone. The following sections detail steps to capture images from the camera over Bluetooth Low Energy, set trigger events, perform image analytics using AWS Rekognition and perform wireless firmware updates (FOTA).

Figure 3. RSL10 Smart Shot Mobile App

Connect to the Camera

The home screen of the mobile app displays the RSL10 Smart Shot Camera as a discovered device. Select the device to connect the camera to the mobile app (fig. 4).

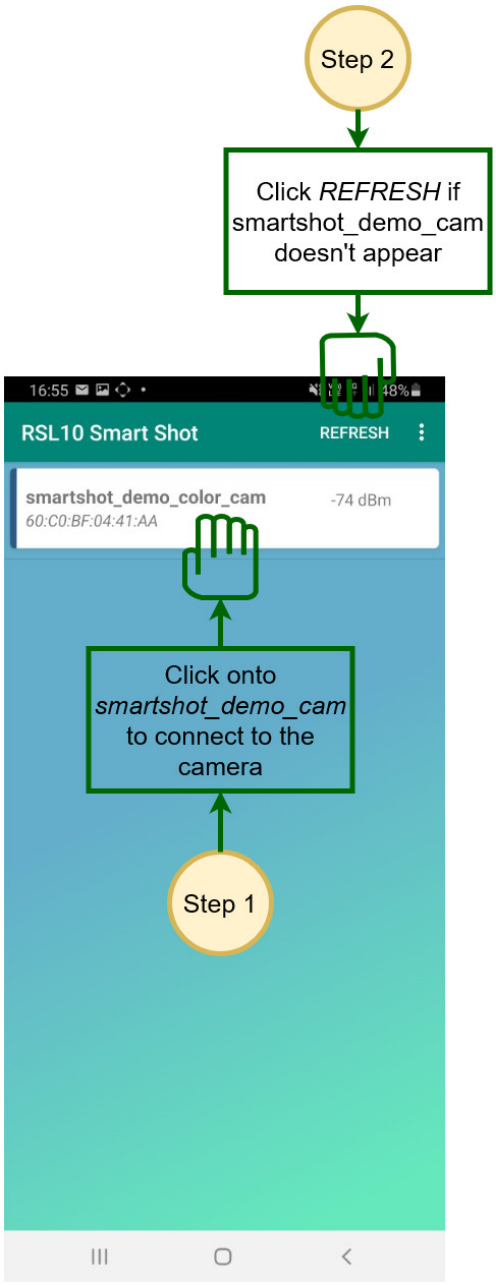


Figure 4. Connecting the RSL10 Smart Shot Camera to the Mobile App

Capture Image

After the camera is connected, the app will switch to the image capture page in Figure 5. Click the *Camera* icon to instruct the camera to take a picture. The image captured by the camera is transferred over Bluetooth Low Energy and is displayed on the screen. To save the image on your mobile phone, click the *Save i*con. On an Android phone, the image is stored in the *RSL10Smartshot* directory. On iPhone, the image is stored in your *Photos* directory.

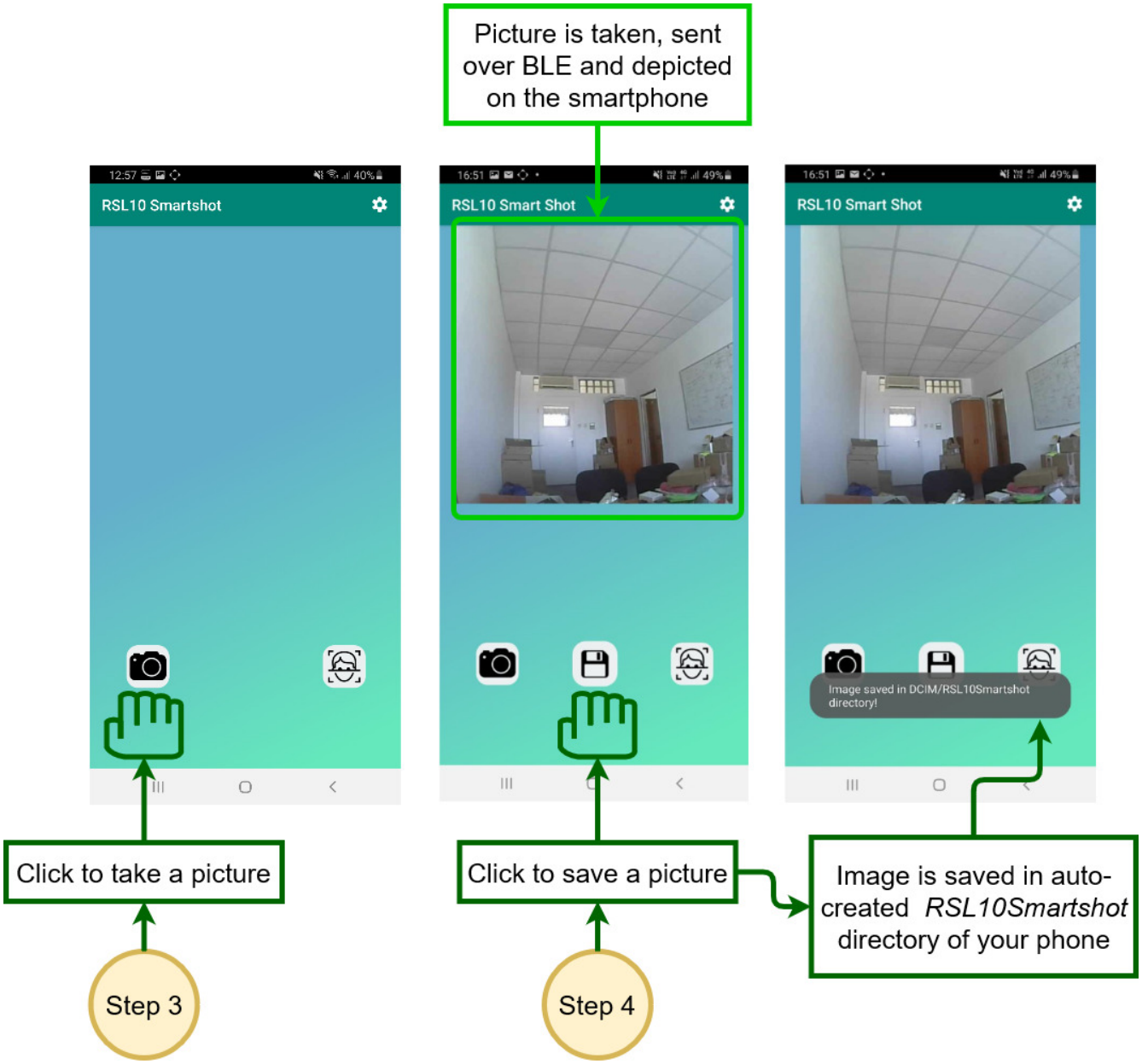
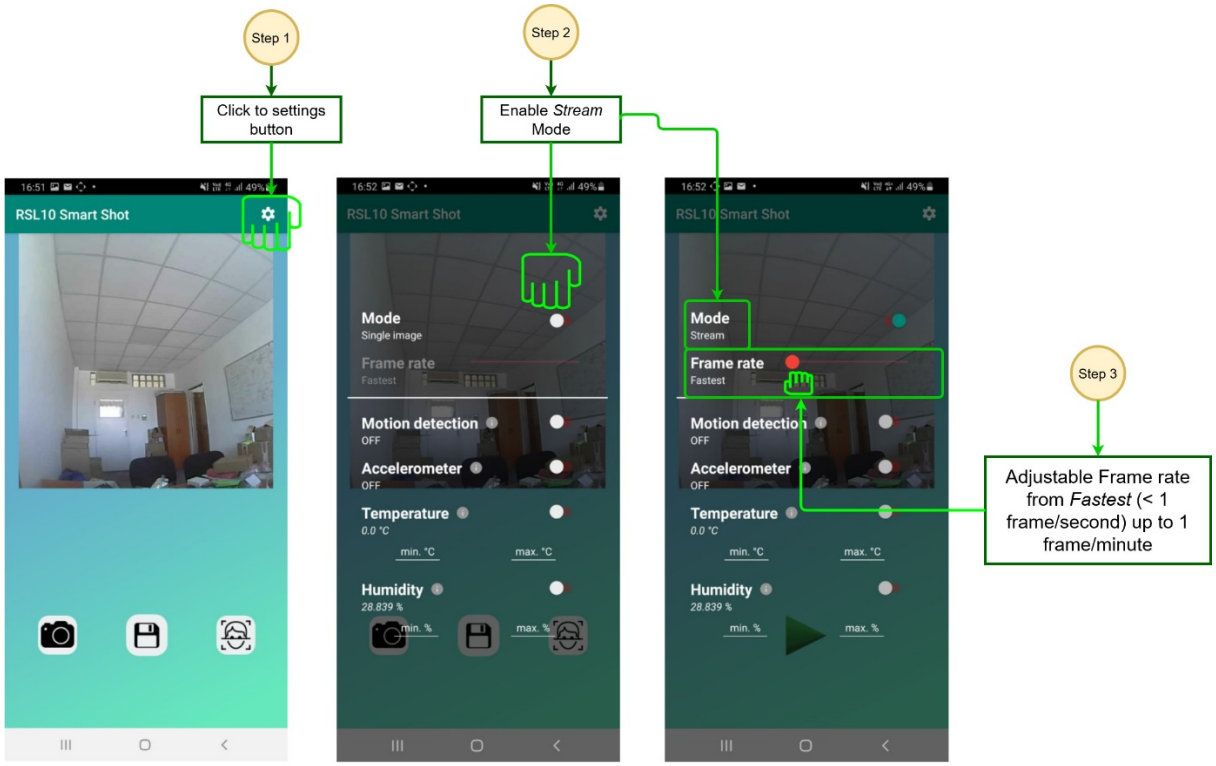


Figure 5. Using the RSL10 Smart Shot App to Capture and Save a Picture

Capture Stream of Images

The camera also can capture continuous stream of images with different frame rates. Click the *Settings icon* on the top right corner and toggle the *Mode* option from *Single Image* to *Stream*. You can also adjust the frame rate from <1 frame/second to 1 frame/minute.

Exit the *Settings menu* by tapping the bottom of the screen. Click the *Play button* to start streaming images, and click the *Stop button* to stop.



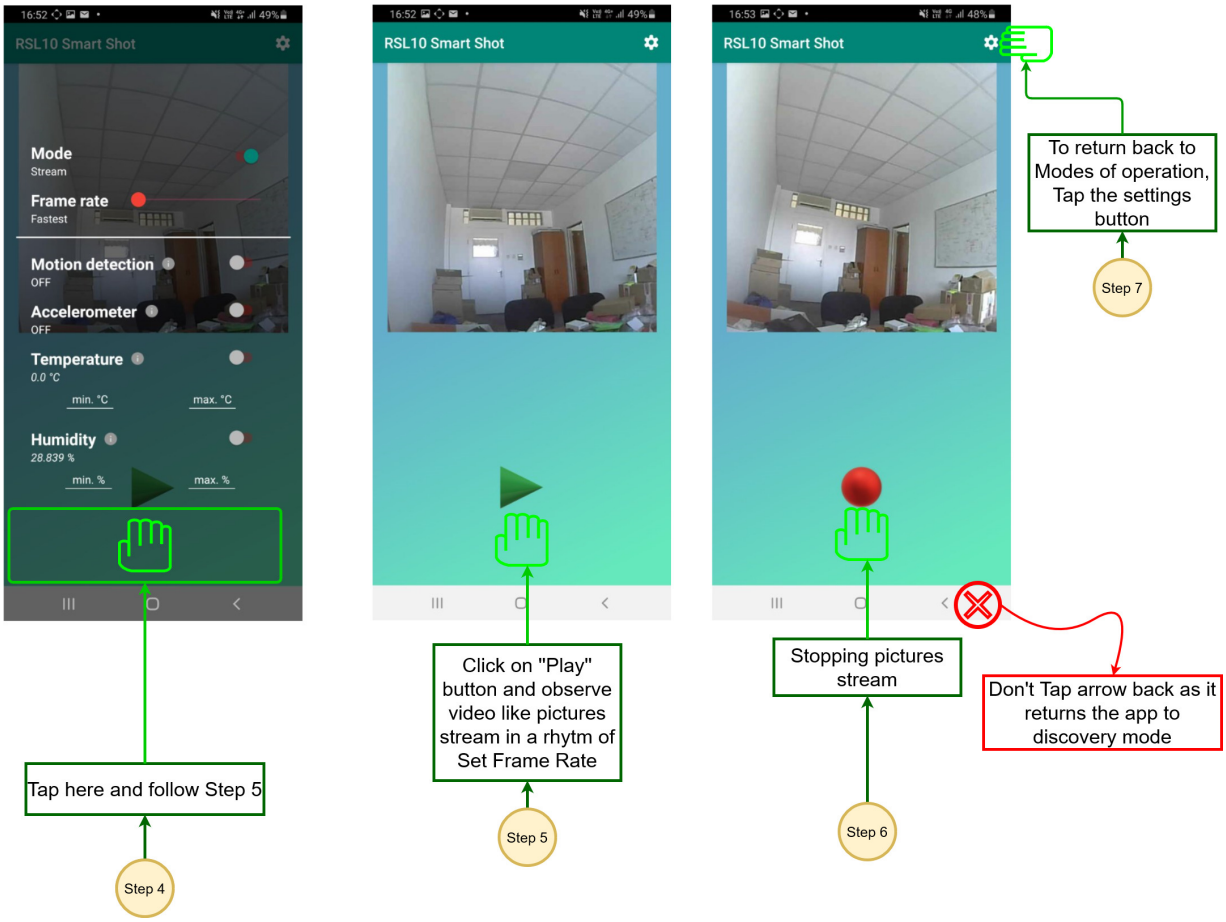


Figure 6. Stream Mode

Setting Event Triggers

The RSL10 Smart Shot Camera supports four environmental sensors, which can be used to trigger image capture whenever a change in value is detected.

To set or change the triggers, select the *Settings icon*. You can turn the triggers ON or OFF by toggling the switch for each sensor. For temperature and humidity sensors, you can also set the minimum and maximum thresholds values, and trigger an event when the sensors detect values outside the range. You can enable either an individual sensor or a combination of sensors to set your trigger condition for image capture.

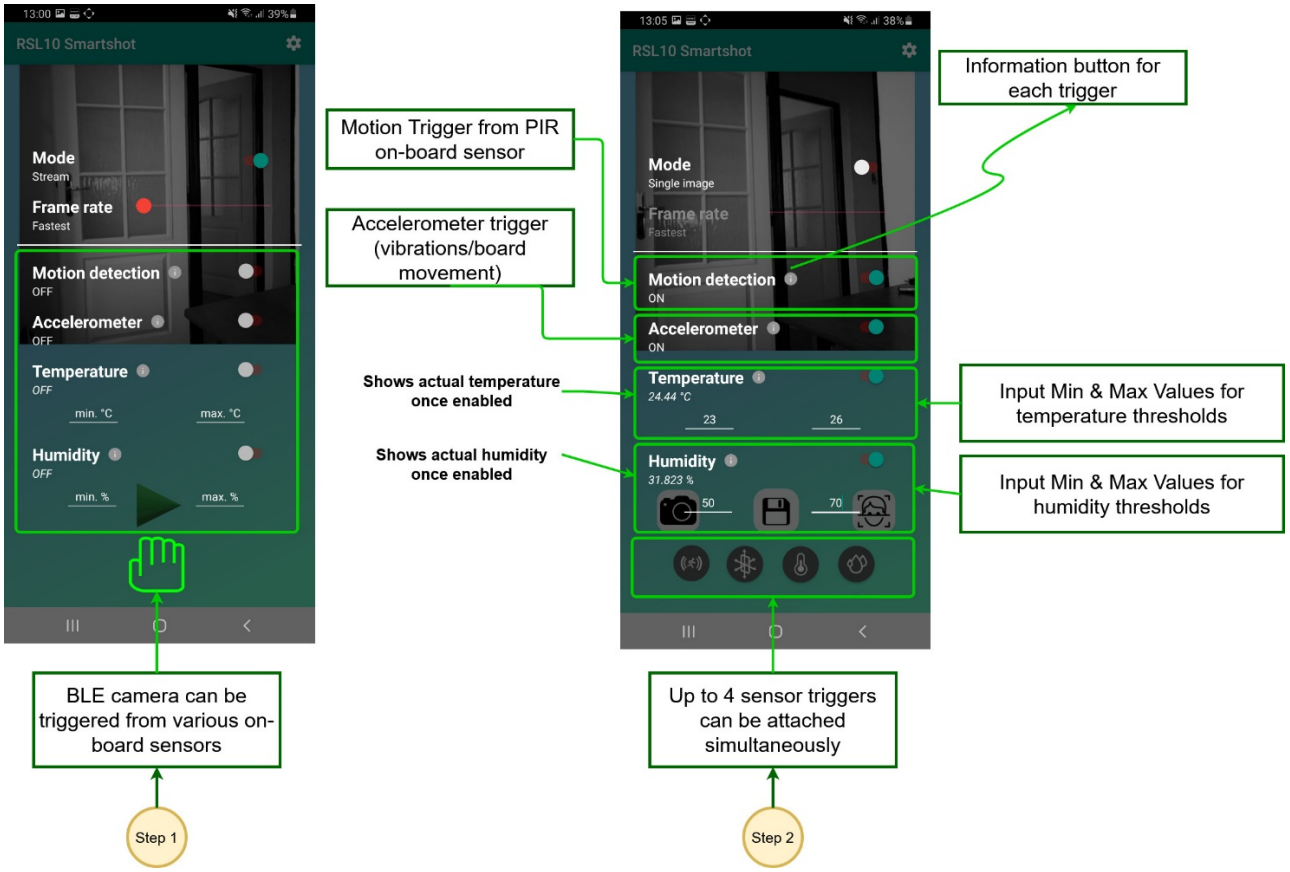


Figure 7. Environmental Trigger Settings

Exit the *Settings menu* by tapping the bottom of the screen. The RSL10 Smart Shot Camera will be armed and capture an image each time event conditions are triggered. The captured image along with the triggered event condition will be displayed on the screen.

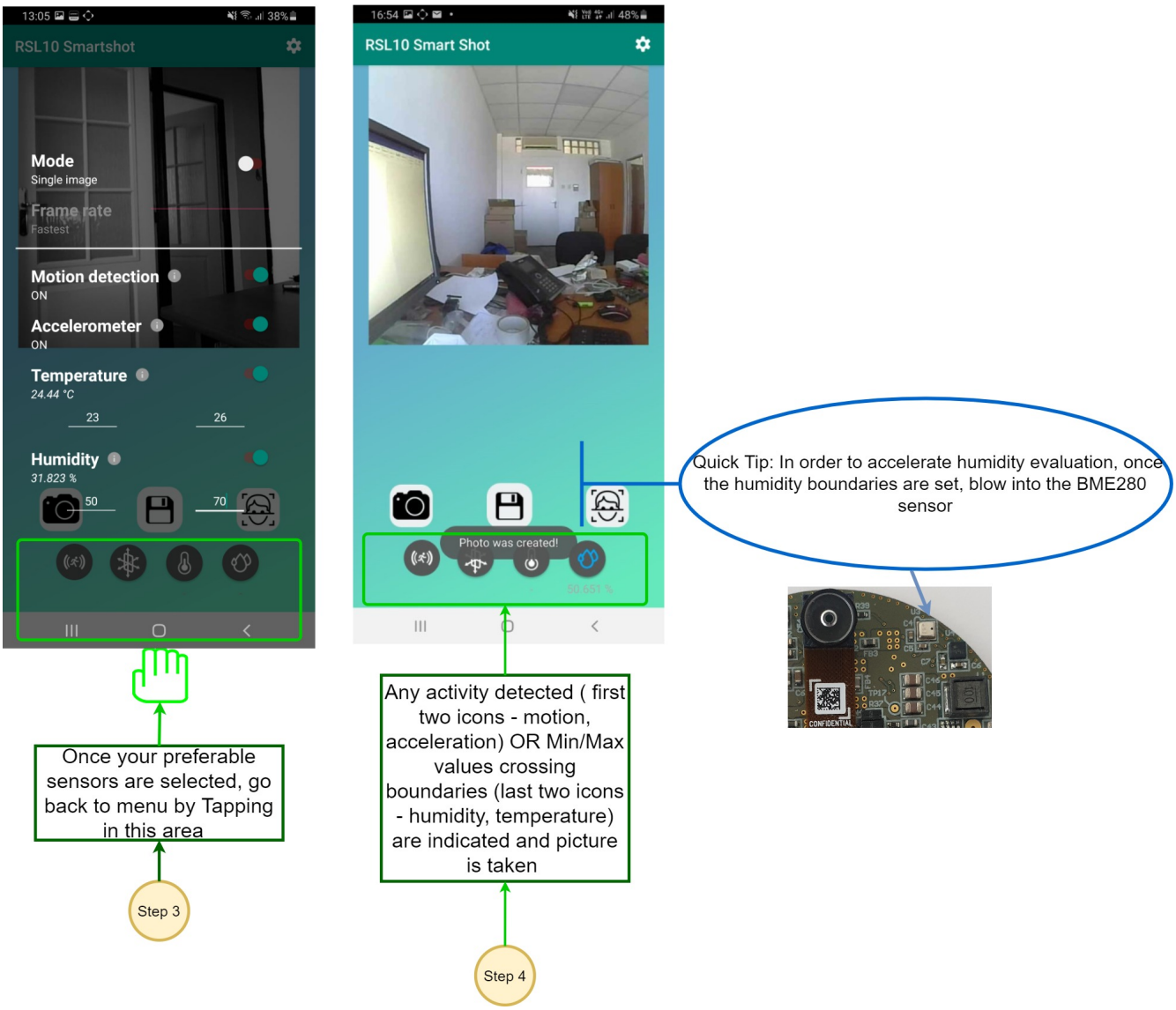


Figure 8. Sensor Triggered Image Capture

Object Recognition using Amazon Rekognition

The mobile app uses Amazon Rekognition cloud engine to analyze the image and identify objects within it. The captured image is uploaded to the cloud engine for analysis, and results are displayed on the app. More information about the Amazon Rekognition setup is available in the platform User Manual.

You should specify your AWS account credentials to use this feature. Select the *Settings icon -> AWS Account* on the Home Screen.

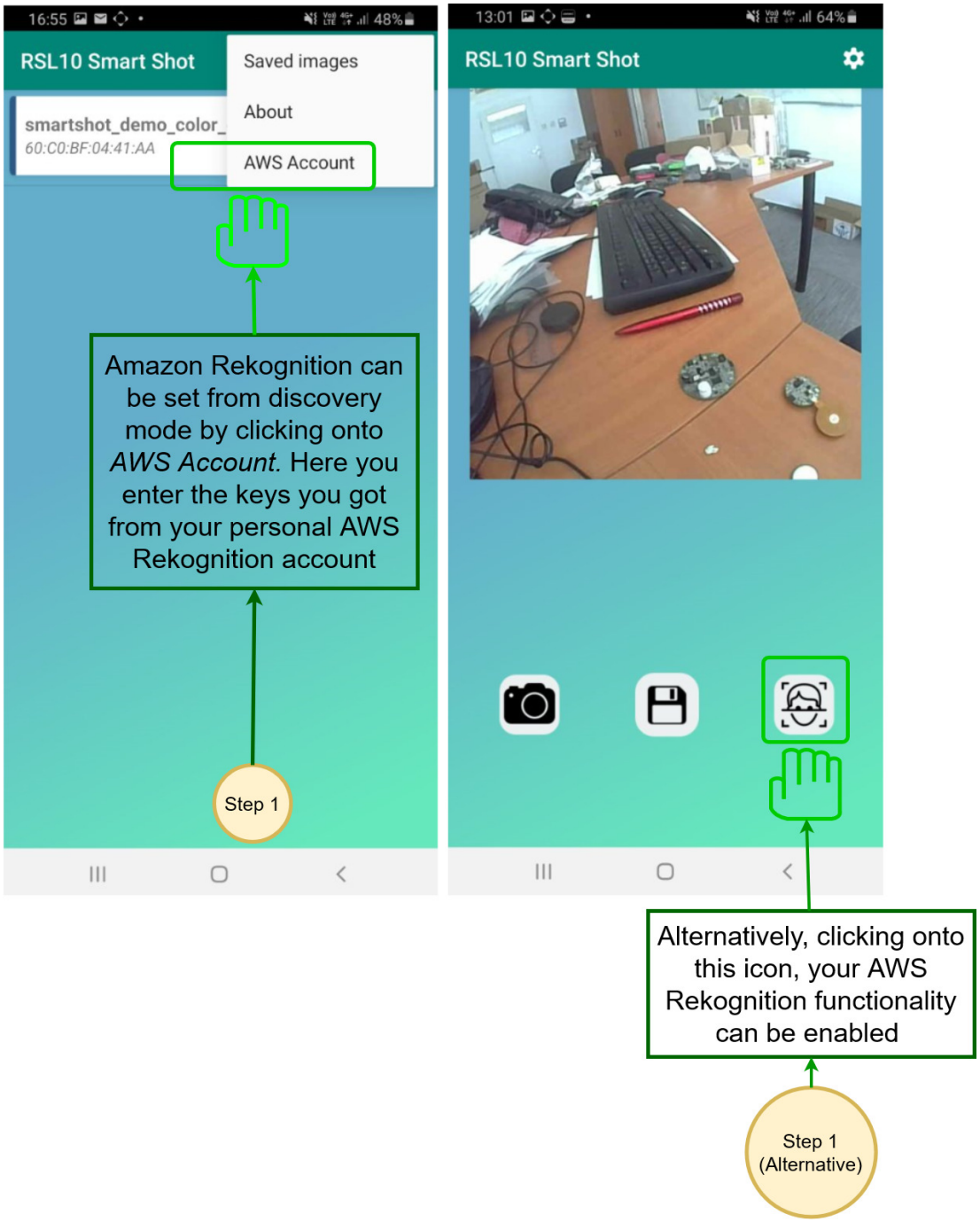
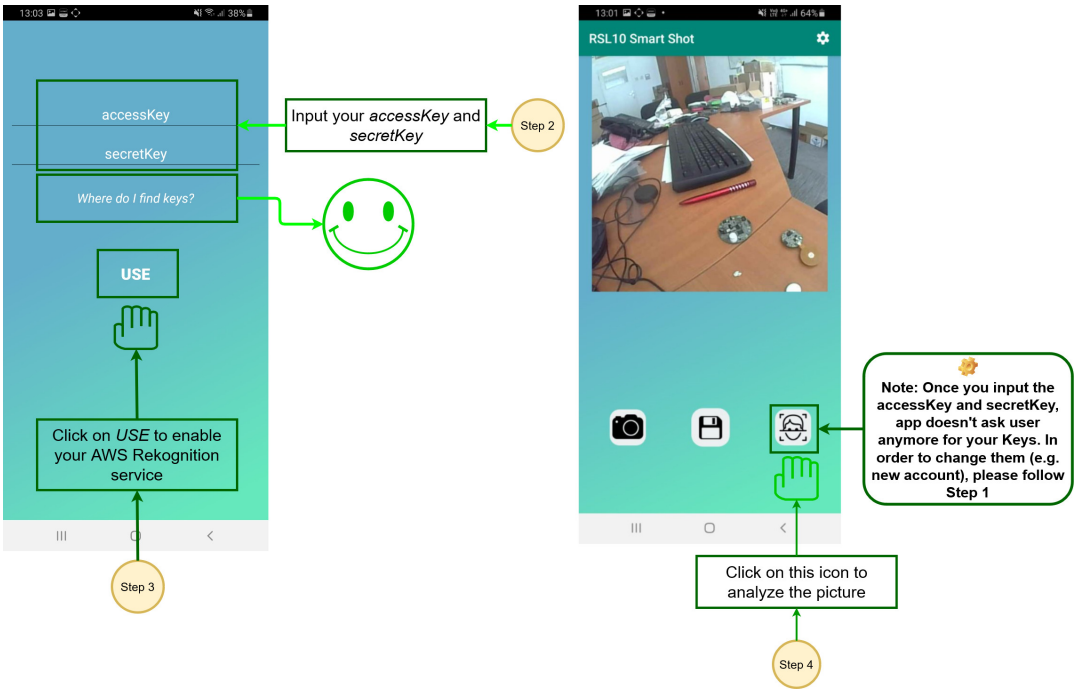


Figure 9. Accessing Amazon Rekognition

Enter the *accessKey* and *secretKey* associated with your AWS account and click *Use*. After logging in, you can use the *Face icon* shown below to analyze pictures captured with the RSL10 Smart Shot Camera.



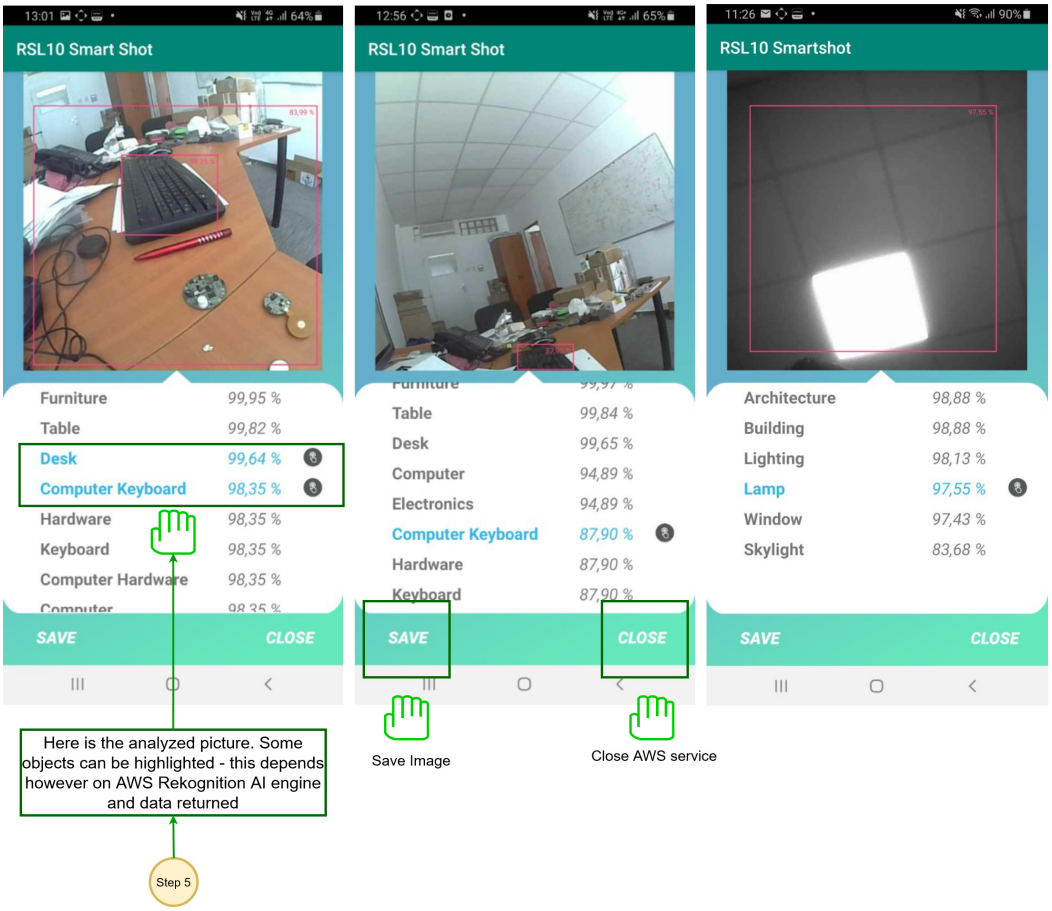


Figure 10. Using Amazon Rekognition to Analyze Captured Images

Firmware over the Air (FOTA) Updates

The RSL10 Smart Shot Camera supports wireless firmware updates using the RSL10 Bluetooth 5 radio.

You will need:

- RSL10_SMARTSHOT_FIRMWARE_UPDATE_PACKAGE.zip
- RSL10 FOTA mobile app (available on GooglePlay™ , iOS®).
-
- Unzip above package and download the *smartshot_demo_color_cam.fota* image file to your mobile

To get started, unzip the RSL10 Smart Shot Firmware update package and download the smartshot_demo_color_cam.fota image file to your mobile device.
Note: FOTA only updates the RSL10 SoC firmware. To update the Image Sensor Processor firmware (SPCV1100A) refer to the *SmartShot Firmware Update Guide.html* under *RSL10_SMARTSHOT_FIRMWARE_UPDATE_PACKAGE.zip*.

The boards can be switched into FOTA mode by pressing and holding the on-board push button PB1 during normal operation over RSL10 FOTA mobile application.
This section describes over the air updates via RSL10 FOTA Mobile Application. Switch to FOTA mode is indicated by 1 second long flash of LED. The platform will then be discoverable on the RSL10 FOTA app.

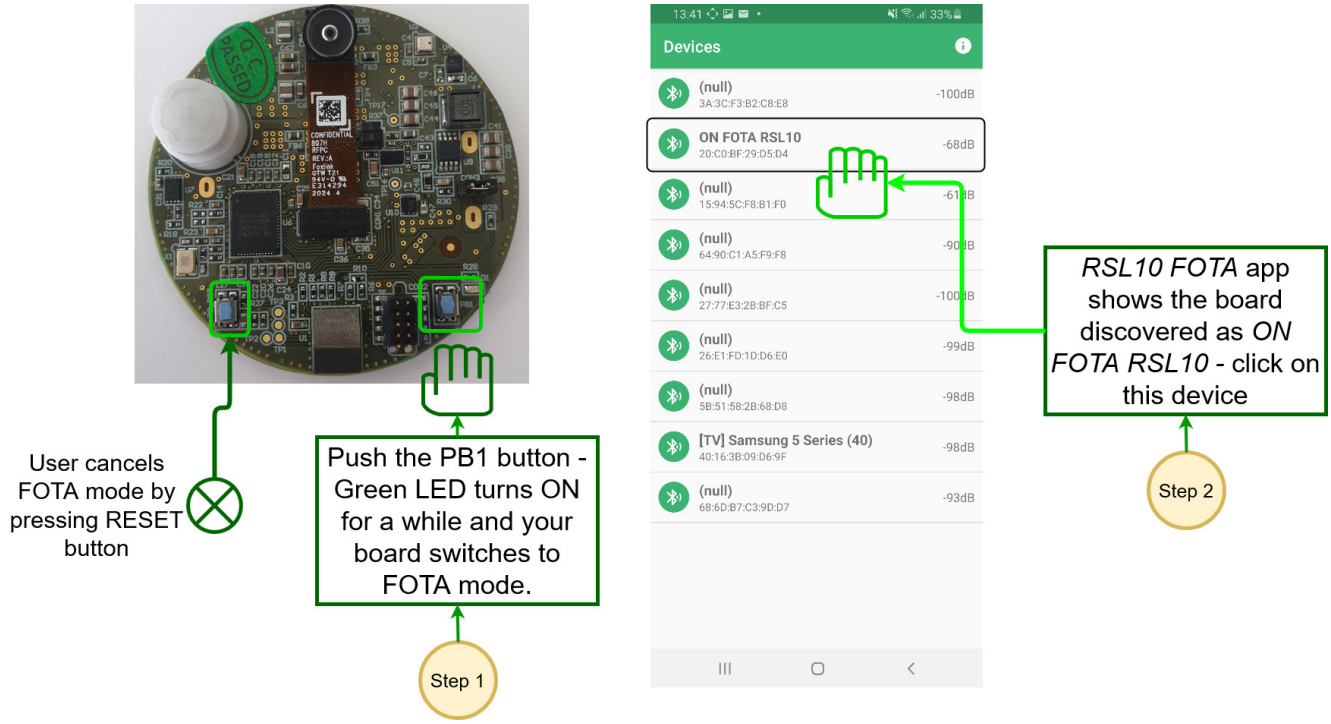


Figure 11. Switching to FOTA Mode

After selecting the device on the mobile app, you can update the firmware by clicking Select File to import the new firmware. Click Connect and Update to send the firmware to the device.

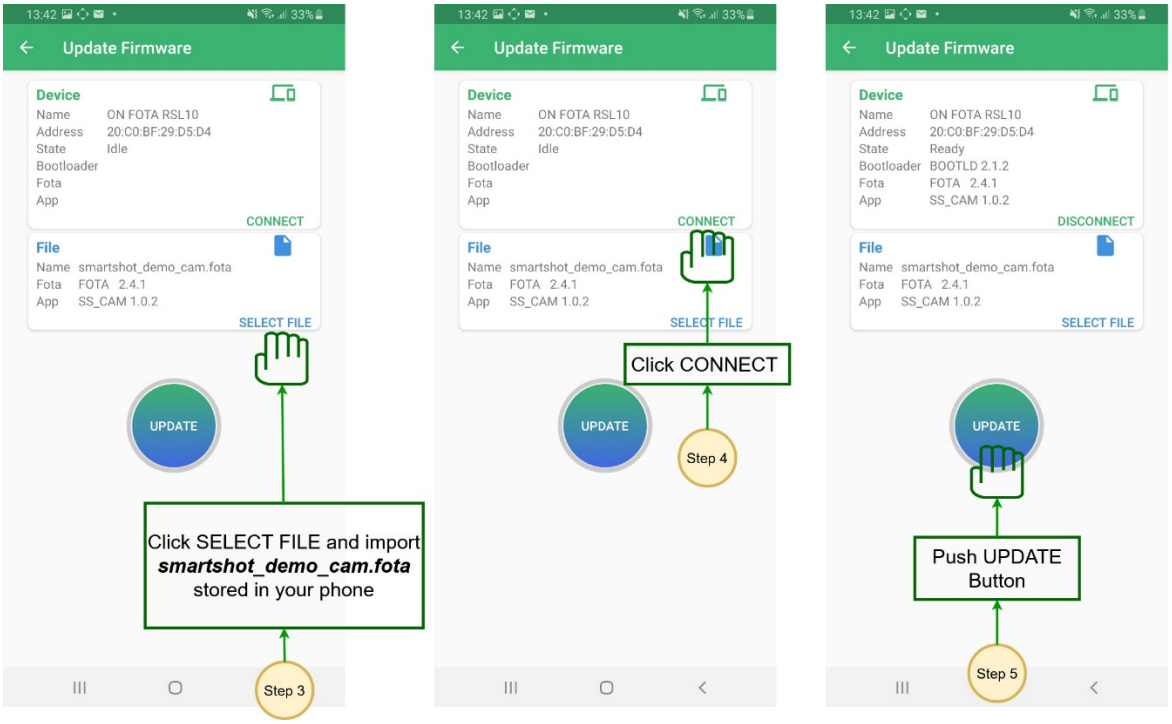


Figure 12. Sending Firmware Updates

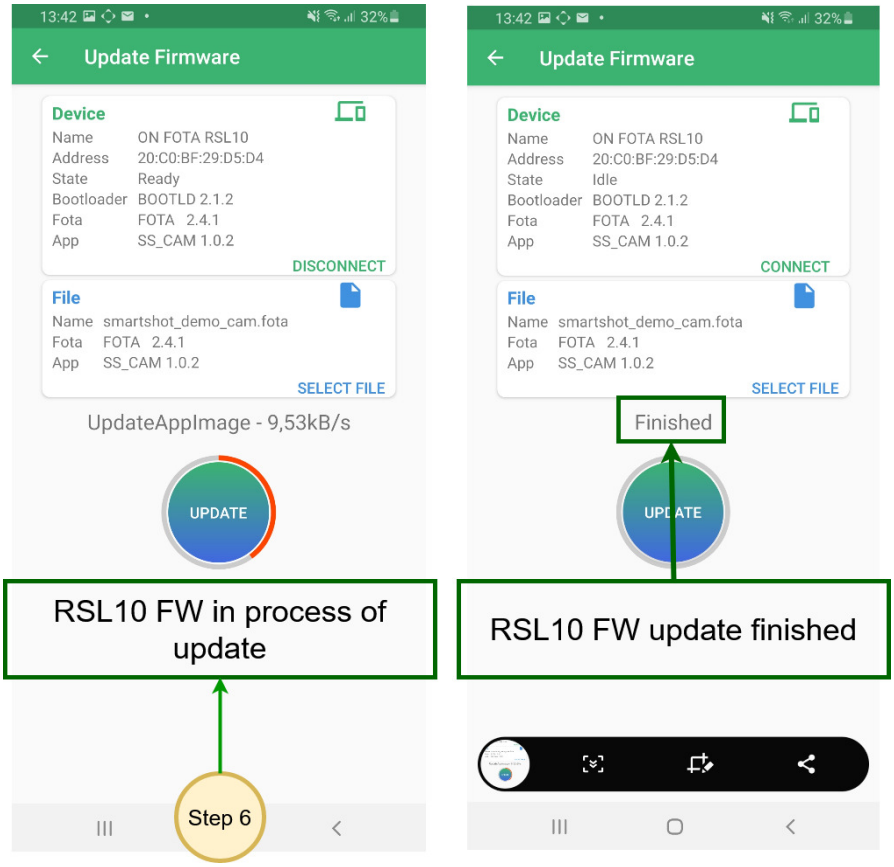


Figure 13. Firmware Update Process

Power Down Mode

In Power Down Mode, all systems are put into low power modes to consume the lowest possible amount of power. Low Power Mode can be entered by keeping the on-board button PB1 pressed after releasing the reset button. To return to normal operation, press the RESET button (PB_RST).

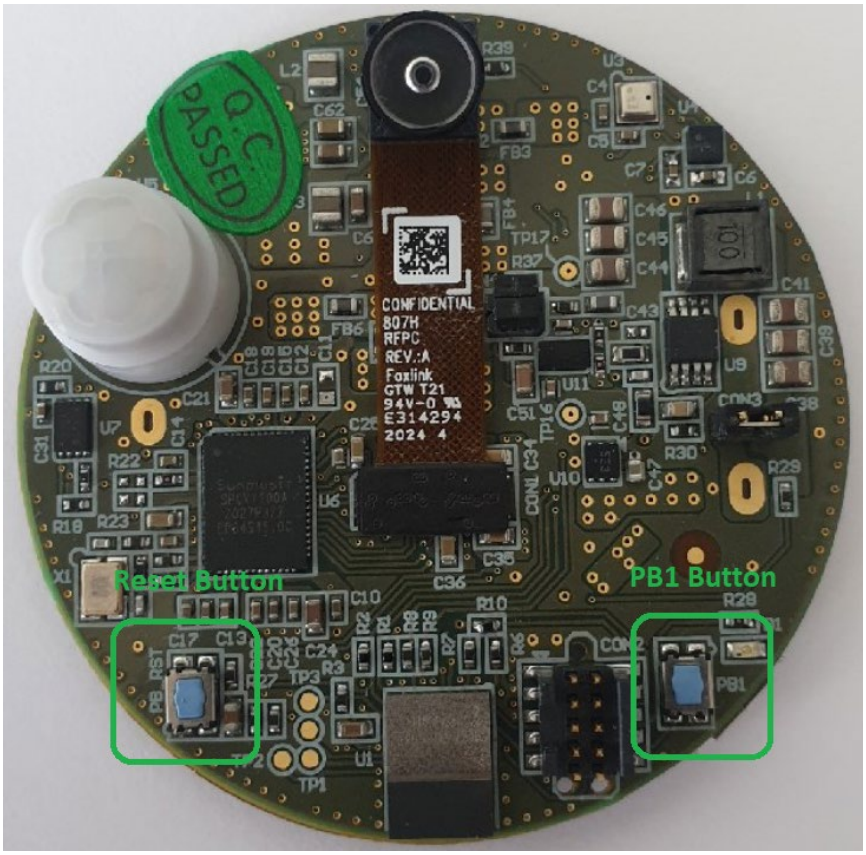


Figure 14. On-board Power and Reset Buttons

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