Six15 HUD

Android Applications User Guide

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Table of Contents

Android Applications User Guide **1**

List of Tables **3**

1. Six15 HUD Applications 4
   1.1 Overview 4
2. Provided Content 5
   2.1 Provided Functionality (HUD Service) 5
   2.2 Provided Functionality (Native Driver) 5
3. System Requirements and Setup 6
   3.1 Six15 HMD Service and Demo Installation 6
   3.2 Two Builds of HMD Service 6
      3.2.1 camSDK 6
      3.2.2 uvc 6
   3.3 Notifications 6
4. HUD Service User Interface 7
   4.1 HUD Service Version 7
   4.2 Microphone Enable 7
   4.3 Device Information 7
   4.4 Notifications 8
5. HUD Demo Demo Application 10
   5.1 Audio Capture 10
   5.2 HUD Camera Capture 12
      5.2.1 Camera Stat/Stop 13
      5.2.2 Send Image to HUD 13
      5.2.3 Resolution 13
   5.3 IMU Capture 13
   5.4 Display Image 14
      5.4.1 Play/Pause 15
      5.4.2 Skip Buttons 15
      5.4.3 Slideshow Speed 15
   5.5 Display Android Camera 15
   5.6 Information 15
   5.7 Brightness 16
      5.7.1 Minus Button 16
      5.7.2 Brightness Level 17
      5.7.3 Plus Button 17
   5.8 Close 17
6. Updater App 18
   6.1 Six15 Updater Installation 18
   6.2 Using the Updater 18
7. Screen Mirroring 24
   7.1 Screen Mirroring Installation 24
   7.2 Mirroring Functionality 24
8. Troubleshooting 25

8.1 Application Uninstall 25
8.2 Device Boots into Safemode 25
8.2.1 Powercycle 25
8.2.2 Reflash the Firmware 25
8.2.3 Contact Six15 25
9. Document Revision History 27

List of Tables

Table 2 – Document Revision History 27

1. Six15 HUD Applications

This document is intended to teach users how to use the Six15 HUD Applications.

1.1 Overview

Six15 HUD Service is a standalone application that is installed on Android devices to provide basic functionality and the abstracted interface for programmers to develop custom applications.

The Six15 Demo Application is a functionality and source code example demonstrating use and implementation of the HUD features and capabilities.

2. Provided Content

2.1 Provided Functionality (HUD Service)

The HUD Service provides basic functionality such as display to and from HUD, as well as capturing audio and data from the HUD.

2.2 Provided Functionality (Native Driver)

The driver for the camera and microphone is included in Android and does not require additional drivers. This functionality is not part of the Six15 HUD Service, it uses the interfaces provided by Android.

3. System Requirements and Setup

The Six15 HUD Service and Six15 applications require Android 5 or newer operating system with USB HS.

3.1 Six15 HMD Service and Demo Installation

The HUD service installation is provided via a zip file downloaded from the Six15 Developer website. Unzip the files and plug in the target device to the computer. On the target device, open the notification menu and select the “USB charging this device. Tap for more options” option. A list of options for the USB functionality will appear, select the “Transfer files” option.

Next, open a file explorer and navigate to the downloads folder of the target device. Copy two files that folder: “Six15Hud_Android_Service_AIDL_v5.43.apk” and “Six15_Demo_App_v9_08.apk”.

From here on we will be operating only on the target device. Find the device’s file storage application and navigate to the downloads folder. Select “Six15Hud_Android_Service_AIDL_v5.43.apk” and run it. Install the application by following the onscreen prompts, then do the same with “Six15_Demo_App_v9_08.apk”.

3.2 Two Builds of HMD Service

3.2.1 camSDK

The camSDK version of the service includes the Six15 proprietary camera interface. This is needed to use the camera in the demo app.

3.2.2 uvc

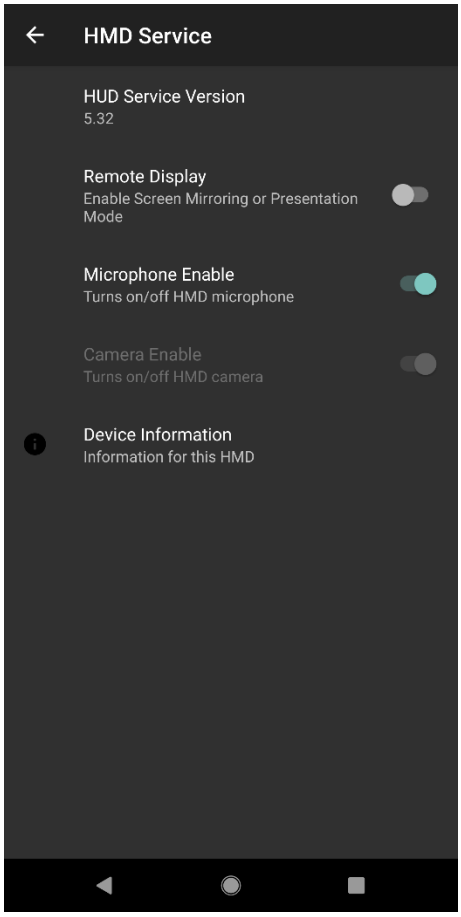
The uvc version of the service does not talk to the camera and makes it available or other apps to interface with the camera (UVC interface). This is used if the customer already has an app that connects to the camera.

3.3 Notifications

The HUD Service provides a notification icon when a HUD device is connected or disconnected via USB at the top of the app.

4. HUD Service User Interface

The HUD Service User interface allows for basic functionality of the connected HUD with no programming or additional applications required.



4.1 HUD Service Version

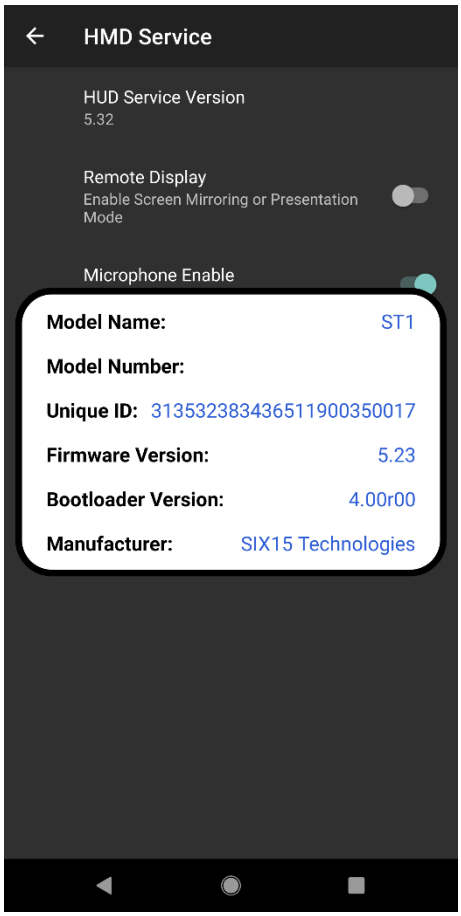
Displays the firmware version in the HUD.

4.2 Microphone Enable

Turns on or off the HUD's onboard microphone.

4.3 Device Information

Displays the current device configuration information for the HUD unit.

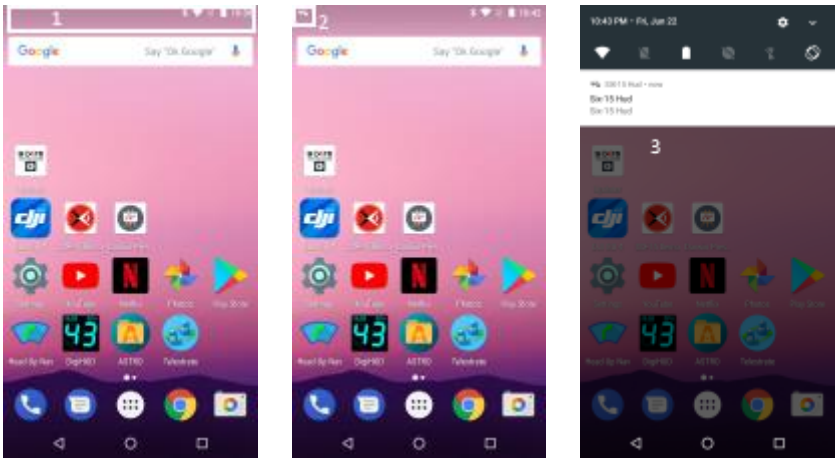


4.4 Notifications

The HUD Service provides a notification icon when a HUD device is connected via USB.

At the top of the Android screen in the notification bar is where the HUD service will notify the user when a Six15 HUD is connected to the Android Device. When the HUD is connected, an Augmented Reality Icon will appear in the top left notification bar. With the notification icon

present, the notification drawer will have a HUD button to access the User interface control panel for the HUD service.

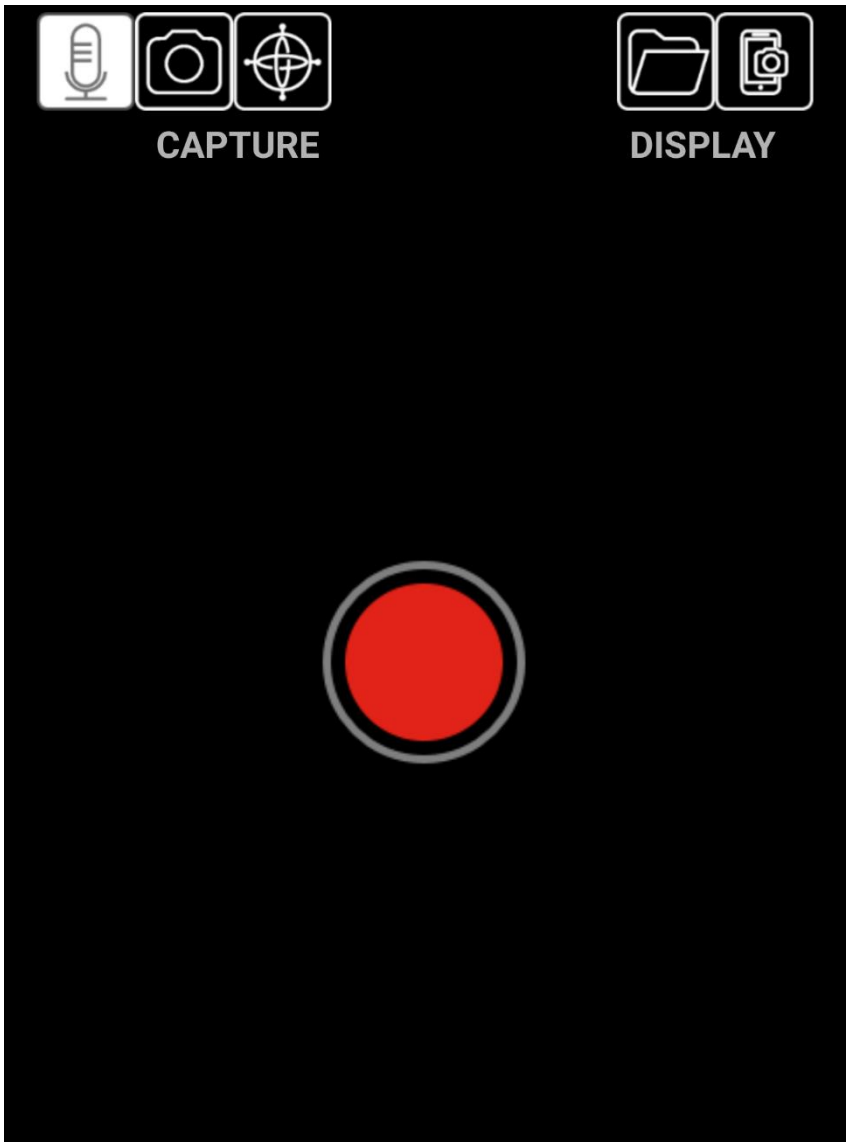


5. HUD Demo Demo Application

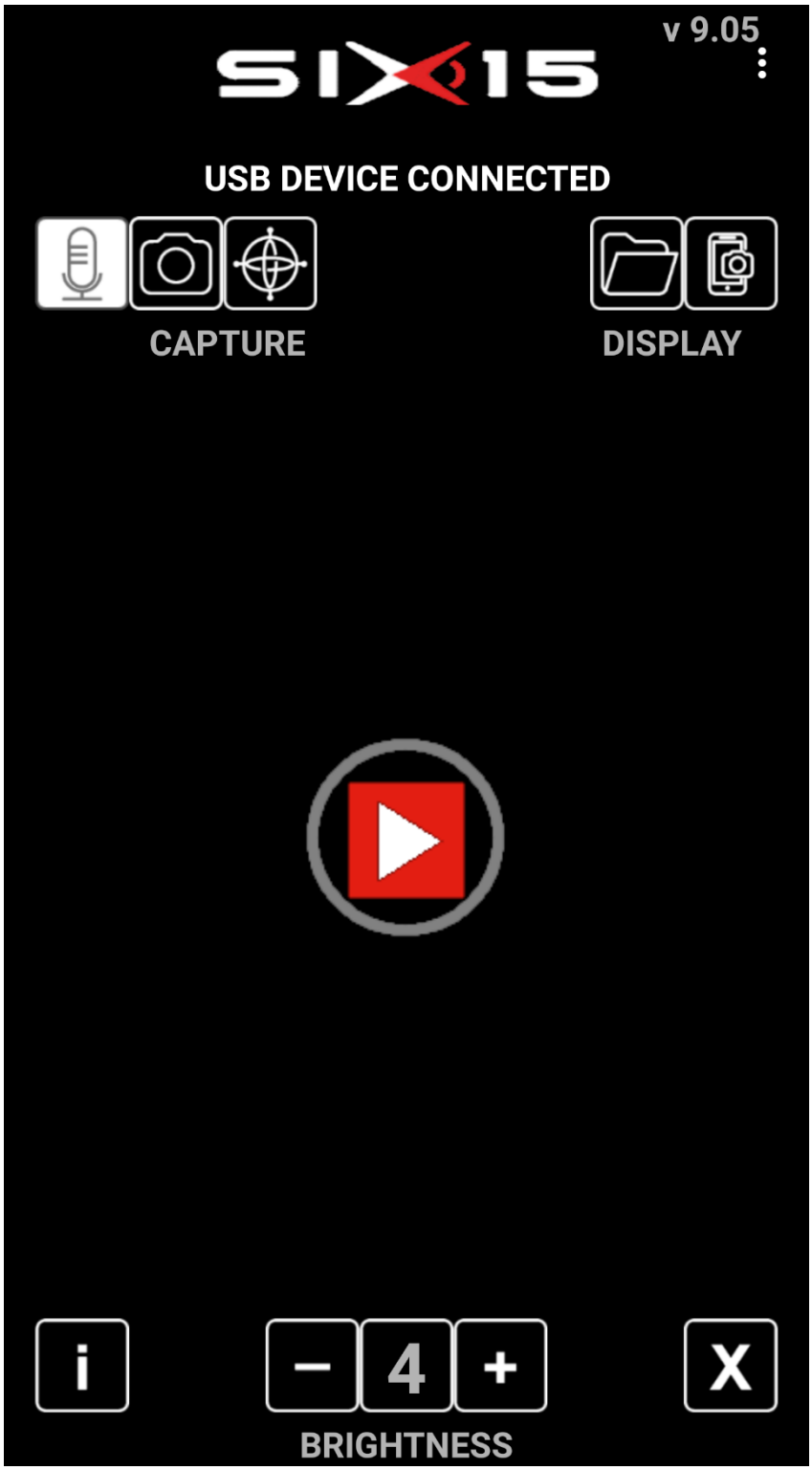
The HUD Demo Application demonstrates the full functionality of the HUD to a user. The source code for this application is provided to developers as part of the SDK.

5.1 Audio Capture

The HUD audio capture option will allow input to the on-board HUD microphone to be temporarily recorded and replayed.

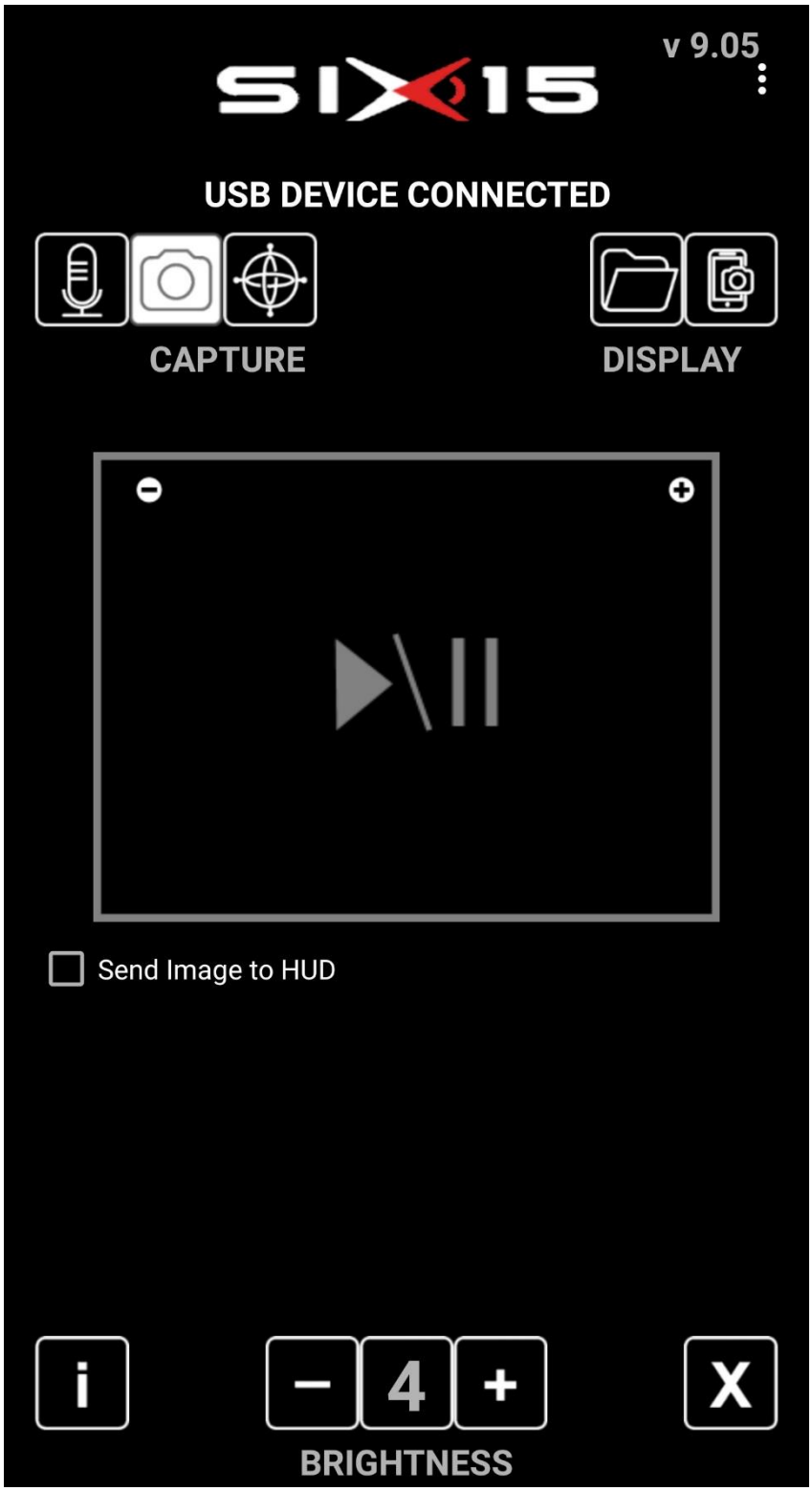


Clicking on the red button in the center of the interface will start the recording feature of the device. Once the recording is complete, tap on the play/stop icon. At which time, the app will play back the recorded audio immediately.


v 9.05
USB DEVICE CONNECTED
CAPTURE
DISPLAY
i
4
BRIGHTNESS
X

5.2 HUD Camera Capture

While this setting is active, the HUD's camera will capture video that can be sent back and displayed on the Android device. This mode also provides several unique options.



5.2.1 Camera Stat/Stop

To start capturing, simple click on the play/pause icon located in the middle of the screen.

5.2.2 Send Image to HUD

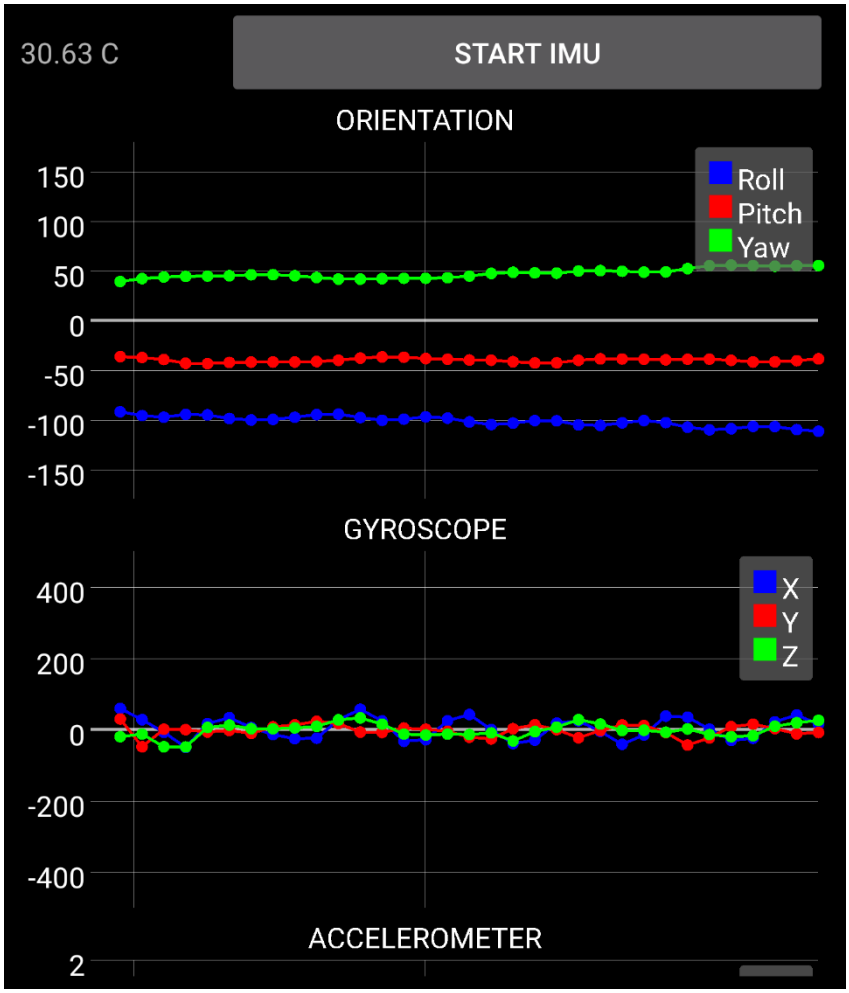
Checking of this box will put the image being captured by the HUD camera into the HUD's display.

5.2.3 Resolution

Tapping on this drop-down arrow to the bottom right of the preview window while HUD Capture mode is active will open a menu where the aspect ratio of the image in the HUD's camera can be adjusted.

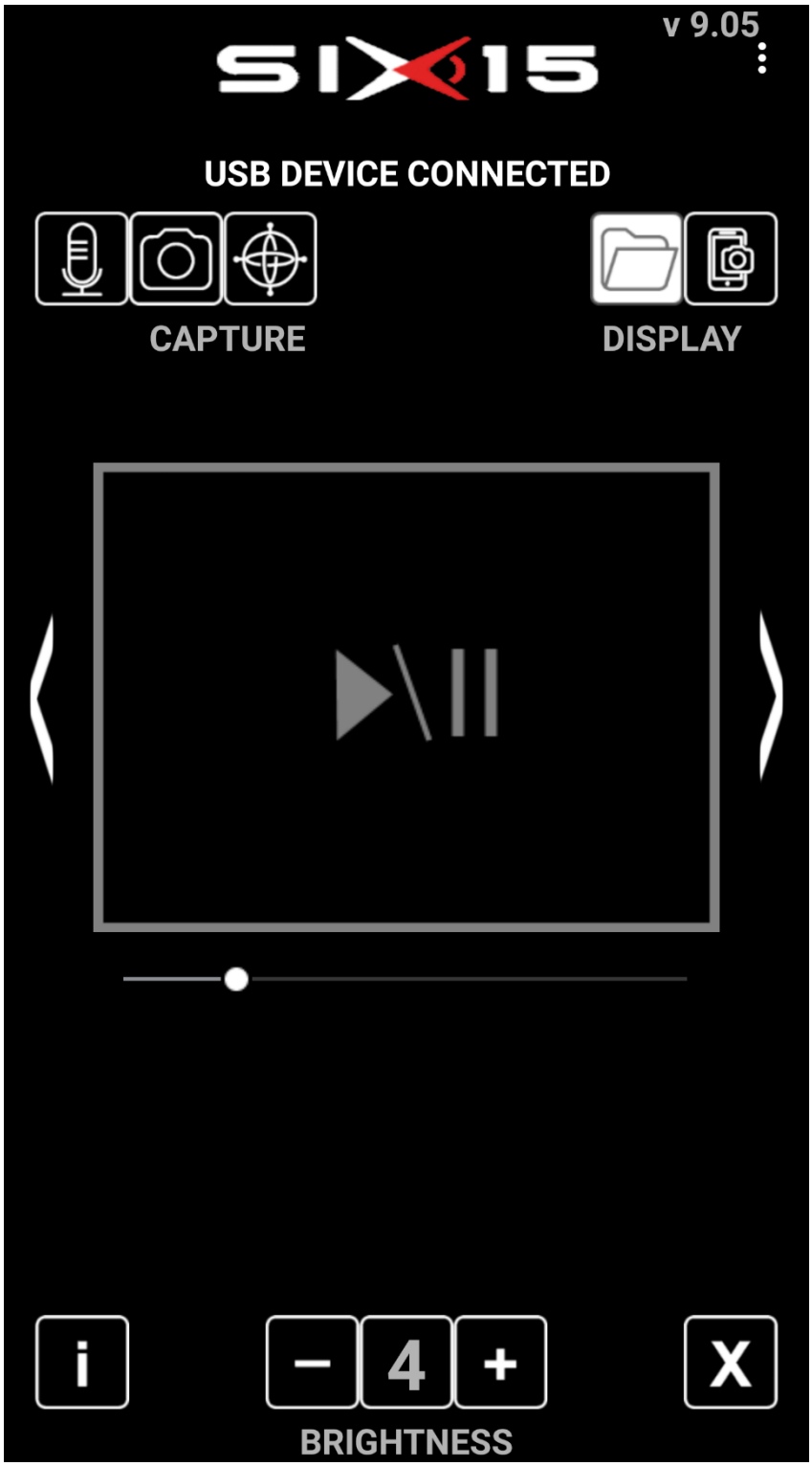
5.3 IMU Capture

This mode will provide several types of movement related information from the HUD. Tapping on the "START IMU" button located near the top will start displaying the given information from the unit. This will begin collection of raw sensor data from the HUDs multi-axis gyroscope, accelerometer, and magnetometer. It will also provide HUD orientation calculated from that data.



5.4 Display Image

This mode allows you to display a saved image from the Android device in the HUD's display view.



5.4.1 Play/Pause

Pressing the play/pause button will bring up a list of image folders on the Android device that can be sent to the HUD to begin the slideshow capabilities. Selecting one of these folders will start the slideshow.

5.4.2 Skip Buttons

Located on each side of the preview panel is a white arrow that allows you to skip around the folder of images. On the left the arrow goes back to the previous picture in the folder and the arrow on the right skips to the next image in the folder. These controls only available when the slideshow has been paused.

5.4.3 Slideshow Speed

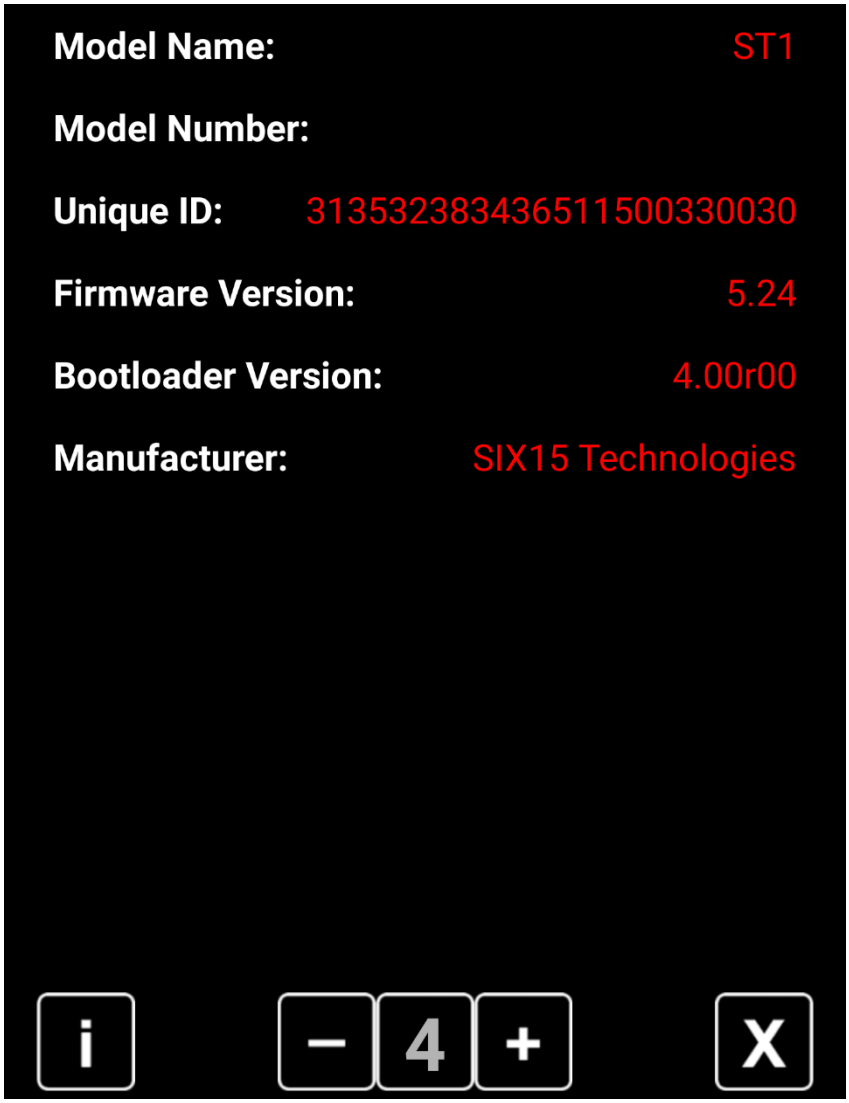
Underneath the preview panel is a slider that allows the user to control the speed at which the slideshow auto-scrolls; left for slower and right for faster.

5.5 Display Android Camera

While in this mode, the Android device's camera will be used to capture video and send it to the HUD's display.

5.6 Information

Tapping the i button in the lower left-hand corner will provide information about the connected HUD.



5.7 Brightness

These buttons control the display brightness of the HUD device.

5.7.1 Minus Button

This button is used to dim the brightness in the HUD's display.

5.7.2 Brightness Level

Here the current brightness level of the HUD's display is shown. This goes on a scale of one (1) as the dimmest to four (4) as the brightest.

5.7.3 Plus Button

This button is used to brighten the HUD's display.

5.8 Close

Tapping on this button will stop whatever functionality the app is currently doing and clear the display in the HUD.

6. Updater App

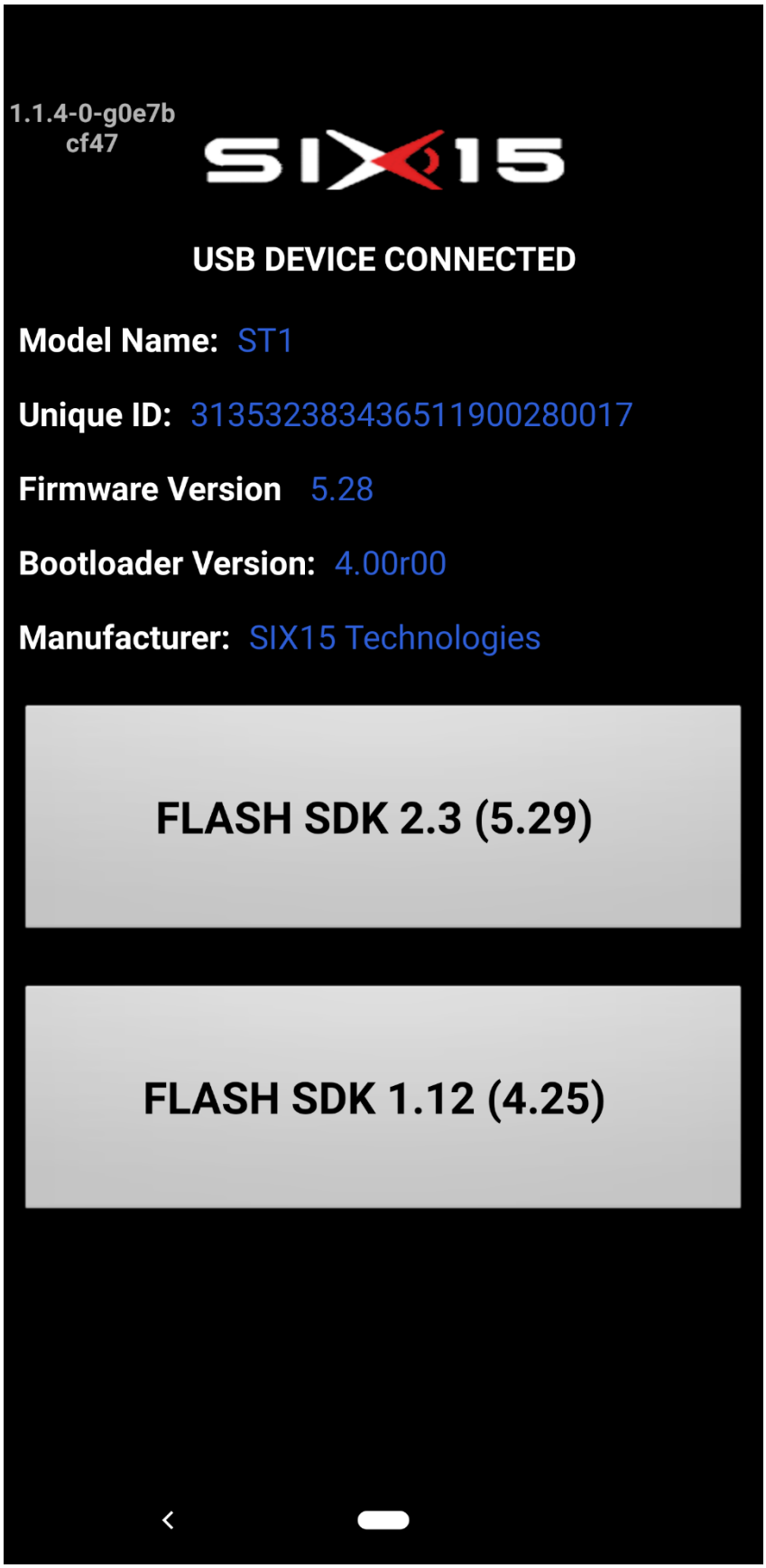
In order to update the firmware in the HUD, you must install the separate Six15 Updater.

6.1 Six15 Updater Installation

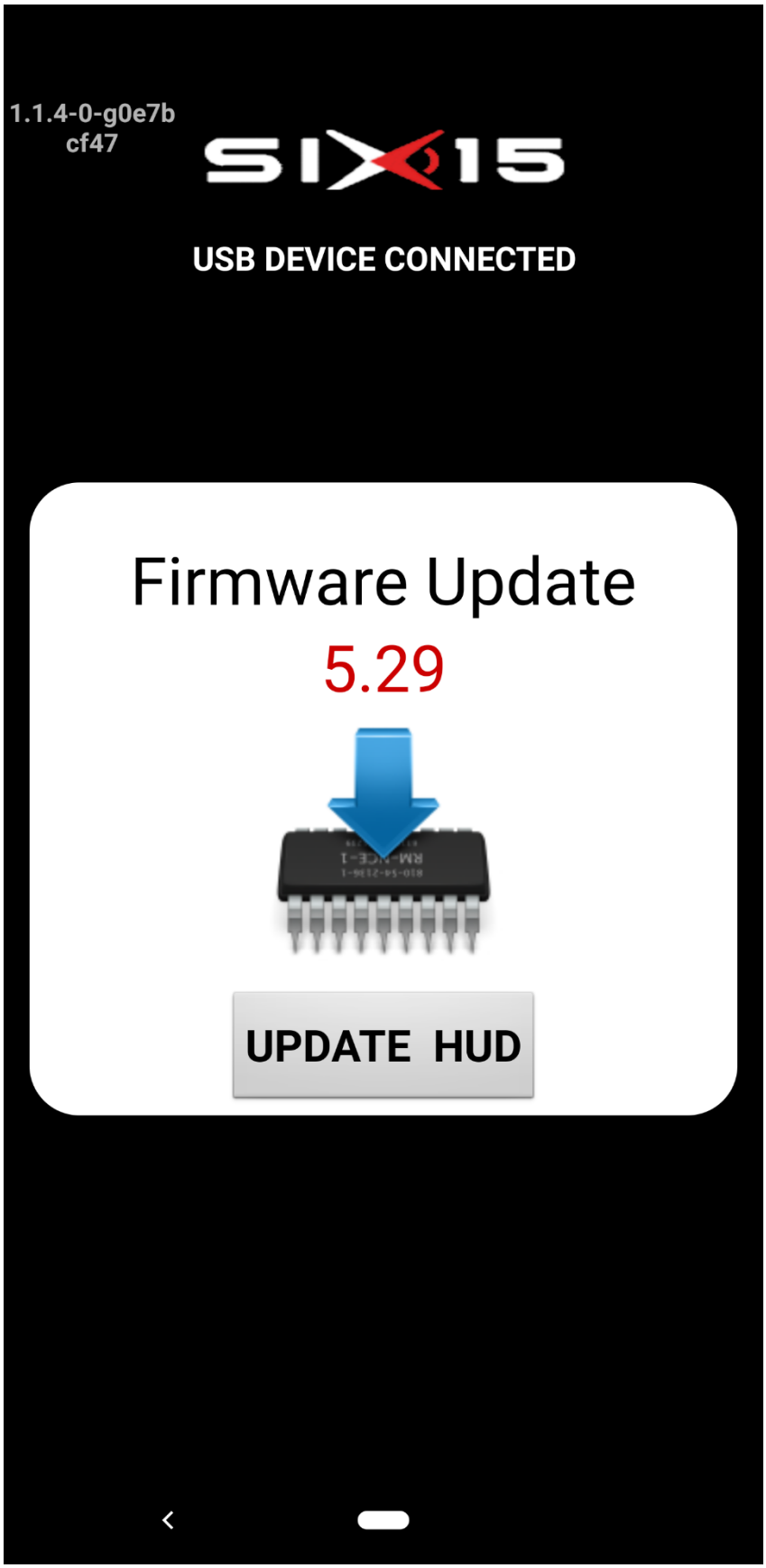
The HUD Updater installation file is provided via the same zip file download from the Six15 Developer website that the other Android application installations came in. Go through the same process of connecting your Android device to the computer, copying over the installation file “Six15_Updater-app_v1.1.0.apk” and running it on your Android device.

6.2 Using the Updater

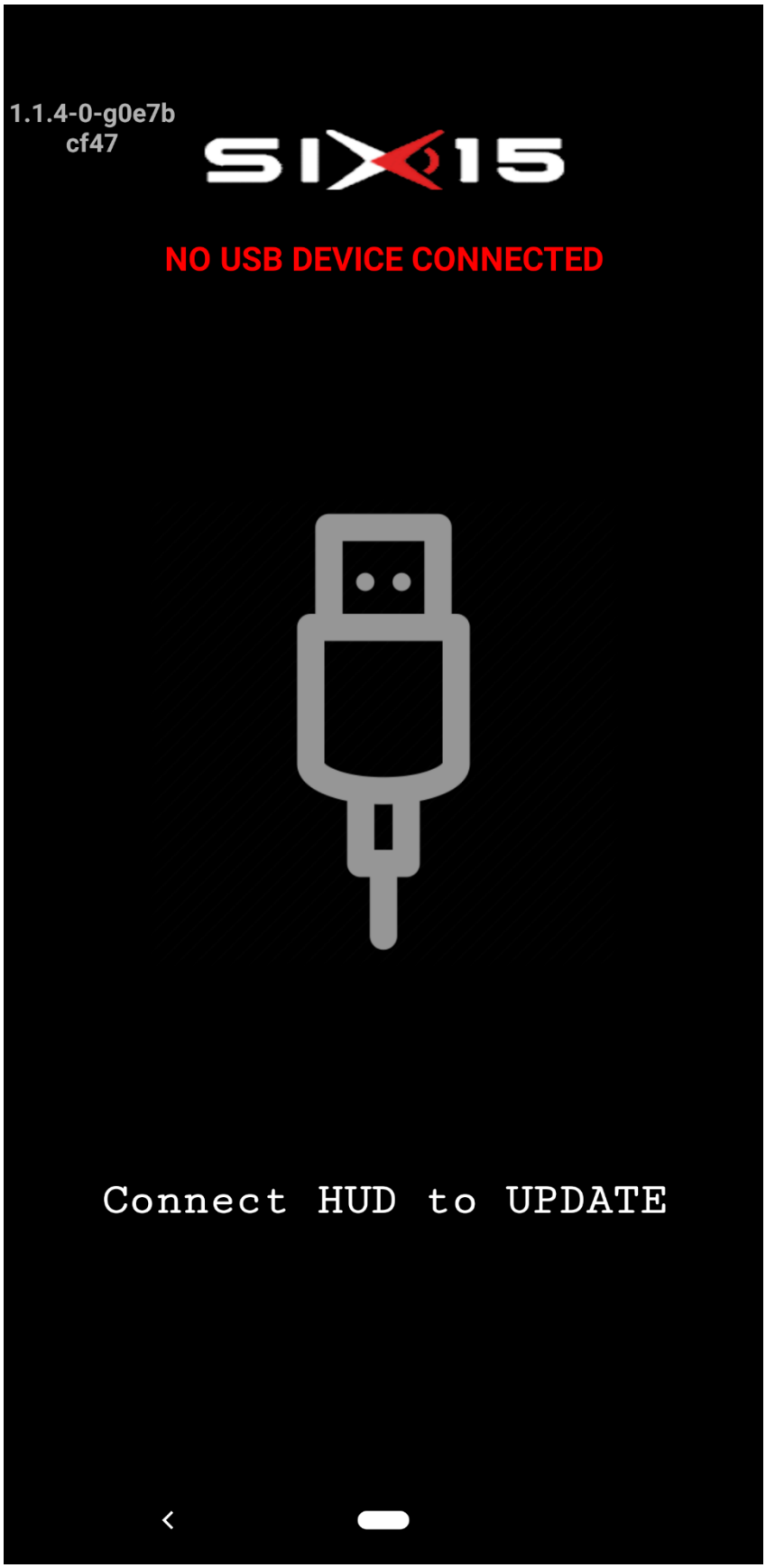
Once your HUD has been plugged in and the updater connects to it you will be shown information about your HUD as well as options of different firmware versions you may install.


1.1.4-0-g0e7b
cf47
USB DEVICE CONNECTED
Model Name: ST1
Unique ID: 313532383436511900280017
Firmware Version 5.28
Bootloader Version: 4.00r00
Manufacturer: SIX15 Technologies
FLASH SDK 2.3 (5.29)
FLASH SDK 1.12 (4.25)

Select the firmware version to be installed on the HUD and confirm the next prompt.


1.1.4-0-g0e7b
cf47
USB DEVICE CONNECTED
Firmware Update
5.29
UPDATE HUD

Once the firmware is installed you will be presented with the following screen. Make sure to disconnect and reconnect your HUD.


1.1.4-0-g0e7b
cf47
SIX15
NO USB DEVICE CONNECTED
Connect HUD to UPDATE

7. Screen Mirroring

Screen Mirroring allows anything on the device to also be viewed in the HUD.

7.1 Screen Mirroring Installation

The Screen Mirroring installation is provided via an APK.

Installing can be done with the filesystem tool.

7.2 Mirroring Functionality

Screen Mirroring provides the code so that the connected device can be viewed through the HUD. After turning on the system, ensure the HUD is connected and then click on the toggle switch labeled “Screen Mirroring ON/OFF”. Your device’s screen should now be visible in the connected HUD.

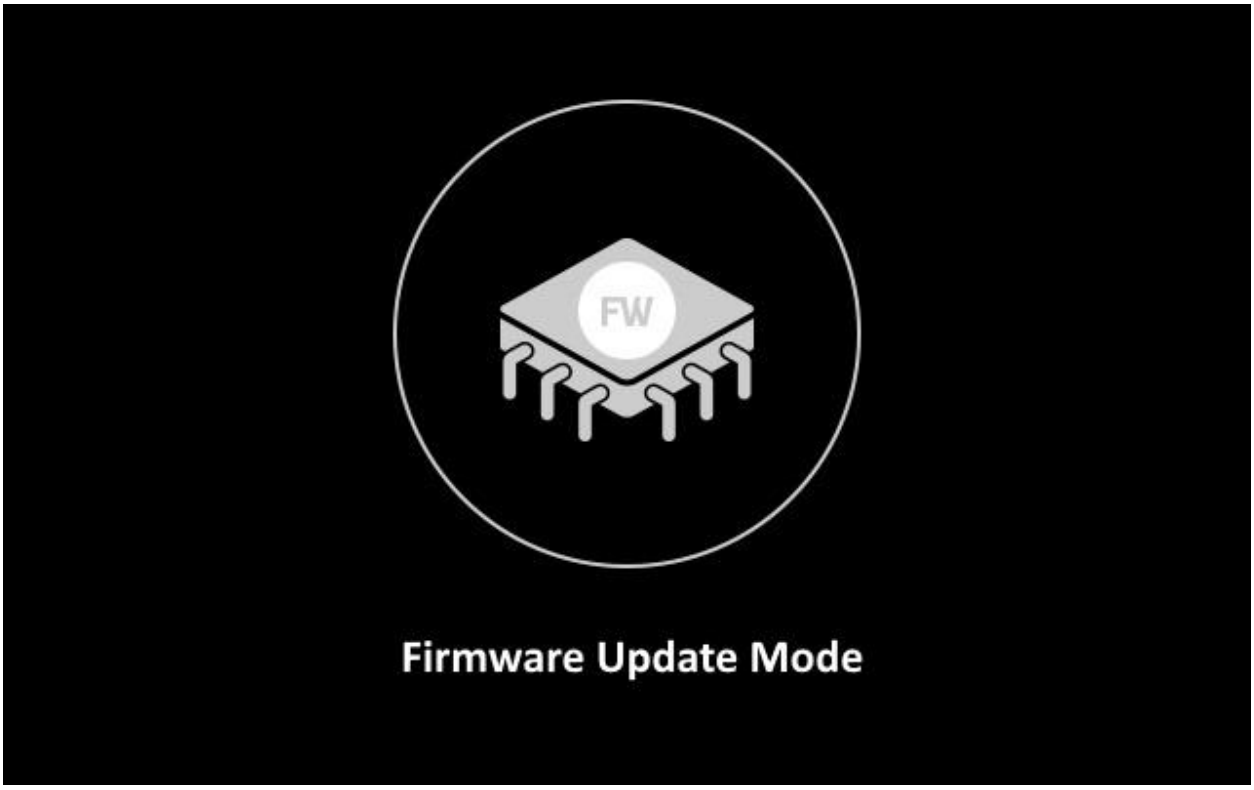
8. Troubleshooting

8.1 Application Uninstall

No special considerations are required for uninstalling the Six15 applications. Uninstall should be completed per instructions provided with your specific android device.

8.2 Device Boots into Safemode

Your HUD may occasionally display an image like the one below. This is because the device has entered bootloader mode.



8.2.1 Powercycle

When this happens, the first step you should take is to power cycle your HUD. Make sure to close the application connecting the Android device to your HUD before unplugging and reconnected the HUD.

8.2.2 Reflash the Firmware

If power cycling does not work, your next step is to try and reflash the firmware. To do this, refer to “section 6 “Updater App” for instructions on installing and using the updater app to update the HUD’s firmware.

8.2.3 Contact Six15

If all else fails and you are unsure why your device does not appear to be working, please contact Six15.

Email: Info@six-15.com

9. Document Revision History

Table 2 – Document Revision History

Version Number	Date	Author/Owner	Description of Change
2.2	03/18/2020	John Martel	Created document
2.3	07/06/2020	A Sojda	Update for SDK 2.3
2.4	12/07/2020	A Sojda	Update for SDK 2.4
2.5.0	3/31/2021	A Sojda	Update for SDK 2.5.0
2.6.3	8/13/2021	A Sojda	Update for SDK 2.6.3
2.6.4	8/24/2021	A Sojda	Update for SDK 2.6.4 (no changes)