**How to Deploy Camera Application and Required Software**

*This guide provides step-by-step instructions on how to deploy the Video Keystone Streaming Application on the provided Android tablet, using the provided* ***ESP-32 camera hardware, Lexar USB-C flash drive*** *and the* ***.ino code file***

**Online Repository Link**: <https://github.com/ColinSmitty/HTMLKeystoneVideoStreamer>

**Pre-requisites:**

* Software deployed onto Camera with Correct IP configured in the .ino code file (via Arduino IDE)
  + E.g. If setting up Lane 1, set camera to 192.168.4.1
    - Gateway Adress set to 192.168.4.250
    - Subnet Mask set to 255.255.255.0
      * Setup allows 254 lanes from 192.168.4.1 to 192.168.4.254 (Network address is 192.168.4.0, broadcast is 192.168.4.255)
* Latest software from online repository installed onto a USB-C flash drive
  + Navigate to <https://github.com/ColinSmitty/HTMLKeystoneVideoStreamer>
  + Click on the green **<> Code** Dropdown and choose Download ZIP
    - **If downloading and extracting via the tablet:**
      * Ensure USB-C flash drive is plugged into charger port of Tablet
      * Once downloaded from the Online Repository, open the My Files application on the android tablet
      * Tap and hold the HTMLKeystoneVideoStreamer-main.zip file, click on More in the bottom right corner (3 vertical dots) and click on Extract.
      * Open the extracted folder, and repeat the process to extract the CaliberFinal.zip file
      * Open the extracted Caliber final folder
      * Tap and hold to select all files. Click on Copy at the bottom of screen. In the Select folder popup, click on USB storage 1 and choose Copy here
      * Navigate to USB Storage 1 and run the TrebEdit v3.5.20 (PREMIUM).apk)
        + If prompted for security, open Settings->and allow Install unknown apps, Install TrebEdit
      * Open TrebEdit and tap on Next until you see the home screen
      * Click on Text editor
      * Tap on the 3 dots in the top right corner, and click on Open File
      * Tap on Device File Picker
        + If security prompt appears, tap on Okay, I understand
      * Click on the 3 horizontal lines in the top left corner, and choose Lexar
      * Tap on CaliberV7.html
      * Locate the Camera Application IP Adress section in the code and change the IP to correspond with the static IP to be set of the Tablet (refer to IP address map Excel document provided)
        + E.g. if setting up Lane 1:

A screen shot of a computer

AI-generated content may be incorrect.

* + - * Click on the 3 dots in the top right corner on Trebedit, and choose Save
    - **If downloading and extracting via Windows computer:**
      * Ensure USB-C flash drive is plugged into computer
      * Once downloaded from the Online Repository, open Windows File Explorer, and open Downloads
      * Right click on HTMLKeystoneVideoStreamer-main.zip, click on Extract All
      * Open the extracted folder, and repeat the process to extract the CaliberFinal.zip file
      * Open the extracted Caliber final folder
      * Copy all the files from this folder, into the Lexar drive (found in file explorer under This PC
      * Right click on CaliberV7.html, and select Open with -> Notepad
      * Locate the Camera Application IP Adress section in the code and change the IP to correspond with the static IP to be set of the Tablet (refer to IP address map Excel document provided)
        + E.g. if setting up Lane 1:

**A screen shot of a computer

AI-generated content may be incorrect.**

* + Click on File->Save

**Installation and Setup**

*Once the required pre-requisites are satisfied, we can begin Installation and Setup of the Keystone Streaming Software.*

**Step 1: Install and copy required files onto the Tablet from the USB-C flash drive**

* Plug the USB-C Flash drive into the Tablet (Charger port)
* Open My Files Application on the Tablet
* Tap on USB storage 1
  + These are where all our files are
* Click on, download and install XAPK Installer v4.6.4.1 (Premium).apk
  + If prompted for security, open Settings->and allow Install unknown apps
* Once installed, close My Files app, and open XAPK Installer.
* Click on INSTALL .XAPK FILES and click on OK for granting file access permissions.
  + In the All-files access permissions menu, scroll down and make sure that XAPK Installer is switched on.
* Return to the previous screen, or re-open app and Click on INSTALL .XAPK FILES again. In the list, find Simple HTTP Server\_1.11.1\_APKPure.xapk. Click on the green download icon.

A screen shot of a computer

AI-generated content may be incorrect.

* Click on Ok to allow files installed from unknown sources.
  + In the Install unknown apps permission screen, make sure XAPK Installer is turned on.
* Go back to XAPK Installer application, go back to the simple http server from the list, and click on the same green download icon. Click on Install.

**Step 2: Setup Server Path**

*Now that the files are installed, it is time to set up the server to host the HTML application*

* Open Simple HTTP Server application
* Tap on Root Folder
* Tap on Storage Access Framework
* Tap on Create New Folder
* Name the folder **CAM**
* Choose USE THIS FOLDER and choose Allow
* Go back to the home screen on Simple HTTP Server, and enable AutoStart on boot at the bottom, under “Misc”
  + Note: Tablet needs to be using a version of Android less than 15 for this feature
* Enable “Render folder content pages” under Files
* Close out of Simple HTTP Server, and Open up My Files application
* Navigate back to the extracted “Caliber” folder.
* Locate the “CaliberV7.html” camera app. Select the file (this can be done by tap and holding down onto it) and than choose “Copy”, or “Move Here” and search for the **CAM** folder. Place the .HTML file inside the **CAM** folder.

**Step 3: Setup Static IP on Tablet and IP in Camera Streaming Application**

*To access the live video stream, we will setup a static IP for the server running the app on the tablet.*

* First, make sure the camera is plugged in, reset, and is on, and providing a signal for the ESP32-CAM-AP SSID.
* Open settings on the tablet, and connect to the camera’s network:

SSID: ESP32-CAM-AP (Will change according to Lane way name)

Password: 12345678 (Or whatever chosen)

(refer to .ino code file via Arduino for network credentials)

* Go to Wi-Fi Settings and to the connected network (ESP32-CAM-AP).
* Tap on Settings icon beside network, and view more at bottom
* Change IP Settings to Static (DHCP option means it will automatically receive an IP)
* **Set the Values on the tablet, the same that was set in the Camera video application code in Trebedit, or in Notepad**

Example (Lane 1):

IP Address: 192.168.4.51 - This will be the IP to enter in browser to connect

Gateway: 192.168.4.1

Subnet Mask: 255.255.255.0

**Step 4: Run the server and connect to the app**

*Once our Static IP is set, we can now run the server and view the stream*

* Open “HTTP Server”
* Check and ensure the IP address matches that of the static you set.
  + If it does not, restart the server app. Check settings and ensure you are connected to camera’s network and static is set
* Take note of the Port number and click on “START” to start the server. Click on “Allow” to send notifications.
* Open a browser on the tablet, and enter the IP address, : , and the port number.

Example:

192.168.4.51:8080

- Tap on the “Caliberv7.html” file to view the stream.

**Step 5: Tablet Cleanup**

*Add application to home screen, enable App Pinning and locking, Delete apps from home screen*

* While on the stream in the browser, click on the 3 lines in the corner of your browser, choose “Add to” and choose “Homepage”
  + Name the app to a name of your choice, E.g. “Caliber”
* Open settings on the Tablet, go to “Security and privacy”.
* Scroll down and choose Other security settings
* Scroll down and enable Pin app
  + To pin app, tap on the very left bottom of the Tablet, on the icon with the 3 vertical lines, to view all open/running apps.
  + Find your browser running the stream
  + Click on the App’s icon
  + Click on Pin this app
* Optionally, repeat steps for the server, but choose Lock this app to keep it always on

**IP Map**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Camera Lane # |  | Camera IP Address |  | Tablet IP Address |  | SSID | Gateway Address |
| 1 |  | 192.168.4.1 |  | 192.168.4.51 |  | ESP32-Lane01 | 192.168.4.250 |
| 2 |  | 192.168.4.2 |  | 192.168.4.52 |  | ESP32-Lane02 |  |
| 3 |  | 192.168.4.3 |  | 192.168.4.53 |  | ESP32-Lane03 | Sub Net |
| 4 |  | 192.168.4.4 |  | 192.168.4.54 |  | ESP32-Lane04 | 255.255.255.0 |
| 5 |  | 192.168.4.5 |  | 192.168.4.55 |  | ESP32-Lane05 |  |
| 6 |  | 192.168.4.6 |  | 192.168.4.56 |  | ESP32-Lane06 |  |
| 7 |  | 192.168.4.7 |  | 192.168.4.57 |  | ESP32-Lane07 |  |
| 8 |  | 192.168.4.8 |  | 192.168.4.58 |  | ESP32-Lane08 |  |
| 9 |  | 192.168.4.9 |  | 192.168.4.59 |  | ESP32-Lane09 |  |
| 10 |  | 192.168.4.10 |  | 192.168.4.60 |  | ESP32-Lane10 |  |
| 11 |  | 192.168.4.11 |  | 192.168.4.61 |  | ESP32-Lane11 |  |
| 12 |  | 192.168.4.12 |  | 192.168.4.62 |  | ESP32-Lane12 |  |
| 13 |  | 192.168.4.13 |  | 192.168.4.63 |  | ESP32-Lane13 |  |
| 14 |  | 192.168.4.14 |  | 192.168.4.64 |  | ESP32-Lane14 |  |
| 15 |  | 192.168.4.15 |  | 192.168.4.65 |  | ESP32-Lane15 |  |
| 16 |  | 192.168.4.16 |  | 192.168.4.66 |  | ESP32-Lane16 |  |
| 17 |  | 192.168.4.17 |  | 192.168.4.67 |  | ESP32-Lane17 |  |
| 18 |  | 192.168.4.18 |  | 192.168.4.68 |  | ESP32-Lane18 |  |
| 19 |  | 192.168.4.19 |  | 192.168.4.69 |  | ESP32-Lane19 |  |
| 20 |  | 192.168.4.20 |  | 192.168.4.70 |  | ESP32-Lane20 |  |
| 21 |  | 192.168.4.21 |  | 192.168.4.71 |  | ESP32-Lane21 |  |
| 22 |  | 192.168.4.22 |  | 192.168.4.72 |  | ESP32-Lane22 |  |
| 23 |  | 192.168.4.23 |  | 192.168.4.73 |  | ESP32-Lane23 |  |
| 24 |  | 192.168.4.24 |  | 192.168.4.74 |  | ESP32-Lane24 |  |
| 25 |  | 192.168.4.25 |  | 192.168.4.75 |  | ESP32-Lane25 |  |
| 26 |  | 192.168.4.26 |  | 192.168.4.76 |  | ESP32-Lane26 |  |
| 27 |  | 192.168.4.27 |  | 192.168.4.77 |  | ESP32-Lane27 |  |
| 28 |  | 192.168.4.28 |  | 192.168.4.78 |  | ESP32-Lane28 |  |
| 29 |  | 192.168.4.29 |  | 192.168.4.79 |  | ESP32-Lane29 |  |
| 30 |  | 192.168.4.30 |  | 192.168.4.80 |  | ESP32-Lane30 |  |
| 31 |  | 192.168.4.31 |  | 192.168.4.81 |  | ESP32-Lane31 |  |
| 32 |  | 192.168.4.32 |  | 192.168.4.82 |  | ESP32-Lane32 |  |
| 33 |  | 192.168.4.33 |  | 192.168.4.83 |  | ESP32-Lane33 |  |
| 34 |  | 192.168.4.34 |  | 192.168.4.84 |  | ESP32-Lane34 |  |
| 35 |  | 192.168.4.35 |  | 192.168.4.85 |  | ESP32-Lane35 |  |
| 36 |  | 192.168.4.36 |  | 192.168.4.86 |  | ESP32-Lane36 |  |
| 37 |  | 192.168.4.37 |  | 192.168.4.87 |  | ESP32-Lane37 |  |
| 38 |  | 192.168.4.38 |  | 192.168.4.88 |  | ESP32-Lane38 |  |
| 39 |  | 192.168.4.39 |  | 192.168.4.89 |  | ESP32-Lane39 |  |
| 40 |  | 192.168.4.40 |  | 192.168.4.90 |  | ESP32-Lane40 |  |