Digital Bird

Software Installation Guide

These instructions will take you through the software installation for the complete Digital Bird Motion Control system.

Currently the system consists of 5 parts.

- The Slider
- Pan Tilt Head
- Cinematic Turntable
- Focus motor and
- WIFI remote display

All parts of the system know use the ESP32 processor

DOWNLOADING THE DIGITAL BIRD SOFTWARE

1. If you haven't done so already your first step is to download the contents of the Digital Bird code repository from Github this is the link.https://github.com/digitalbird01/DigitalBird-Camera-Slider.git
2. Click on the Green "CODE" button top right and select **<Download Zip>**
3. Unpack the ZIP file to somewhere you will remember on your system but do not unzip the zip files contained in that top level folder.

   This folder contains all the Digital Bird specific software you need to install the system but be aware the project is still under development and you should check back for future updates and bug fixes.

SETTING UP THE ARDUINO IDE

All parts of the system are installed through the Arduino IDE. If you are not familiar with this don't worry you will only be using it to update firmware you will not have to write any code yourself. For those of you already familiar with this you can probably skip down to installing the ESP32 board and libraries.

The Arduino IDE is simply a software authoring tool which allows us to write code for a large number of different development boards and upload the code to many different processor development boards including the ESP32 we are using..

Installing and setting up the Arduino IDE

1. Download the Arduino IDE from here: https://www.arduino.cc/en/software and install on your computer.
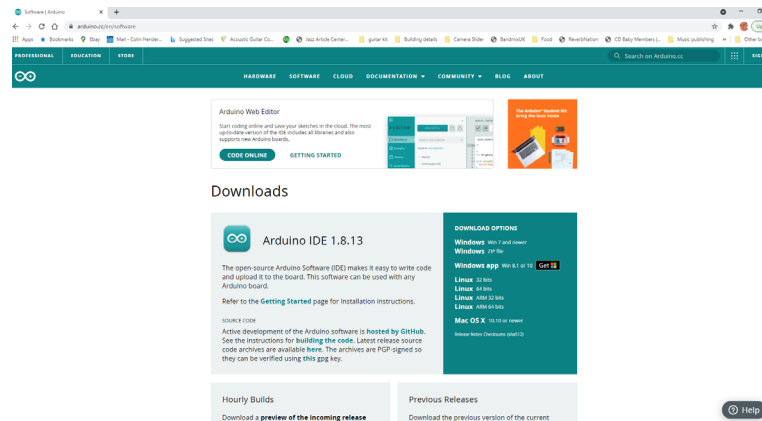

2. Once installed navigate to Open Arduino IDE and go to <File> <Preferences> and in the box labeled "Additional Boards Manager URL's" add the following link: https://dl.espressif.com/dl/package_esp32_index.json
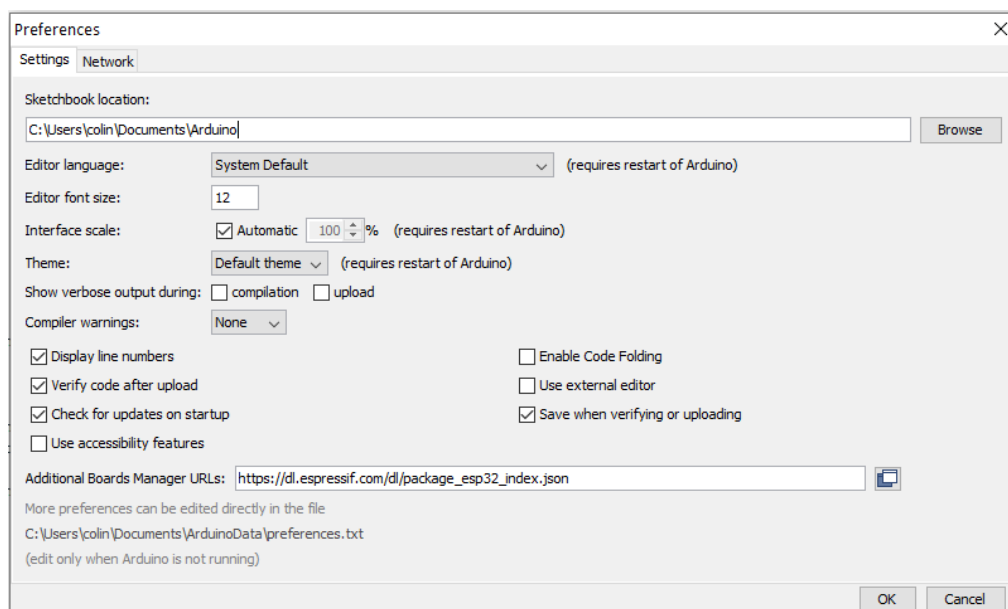
3. Next select <tools><Boards><Boards Manager> and you should see a window appear with the board manager. In the dialog box type ESP32 and return. Below the dialogue box you should know see the listing for the ESP32 drivers. Select install and all the ESP32 drivers will be added to your system.
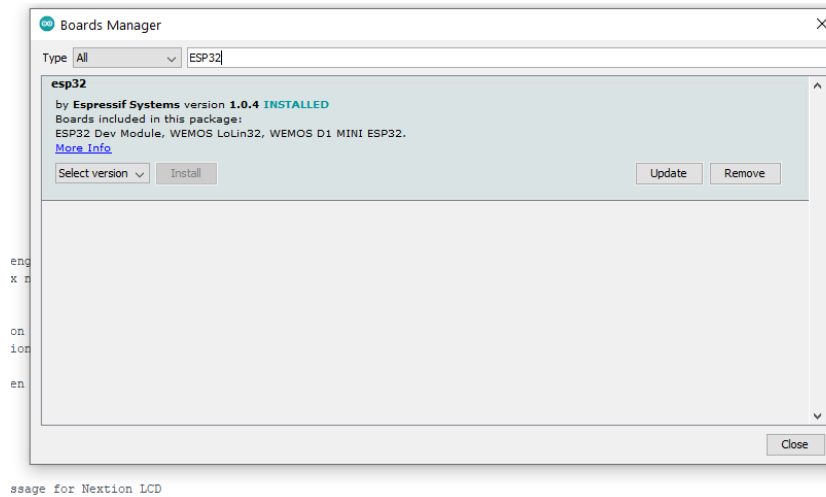

4. Depending on which board we are installing to you can now select this from the board list under the ESP32 title. The two boards we are interested in are the **ESP32 Dev** and the **Adafruit ESP32 feather**. The Adafruit board should be selected when installing to the WIFI remote; all other boards are the ESP32 Dev Module.
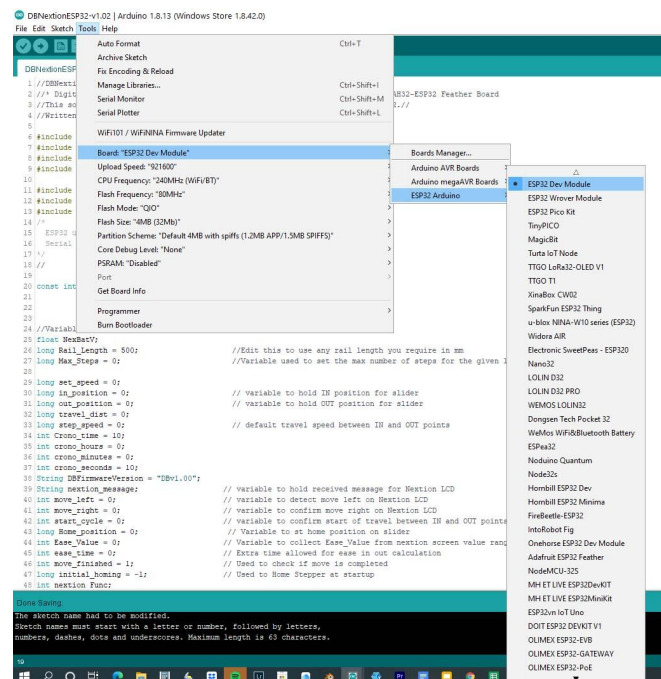
5. The software makes use of the following libraries which must be installed into the Arduino IDE before uploading the software to the boards. These libraries are included in your Digital Bird software folder as Zip files. You do not need to unpack these; the system will pull them directly from the zip files.
   ● FastAccelStepper.h   (To control the stepper Drivers)
   ● AS5600.h   (For the AS5600 magnetic encoder)
   ● EasyNextionLibrary.h   (For control of the Nextion display)

From the Arduino IDE Menu Bar at the top of the screen select:

<Sketch> <Include Library> <Add .ZIP library> and point this at each of the three zipped libraries in your Digital Bird Software folder one at a time until all three are installed.
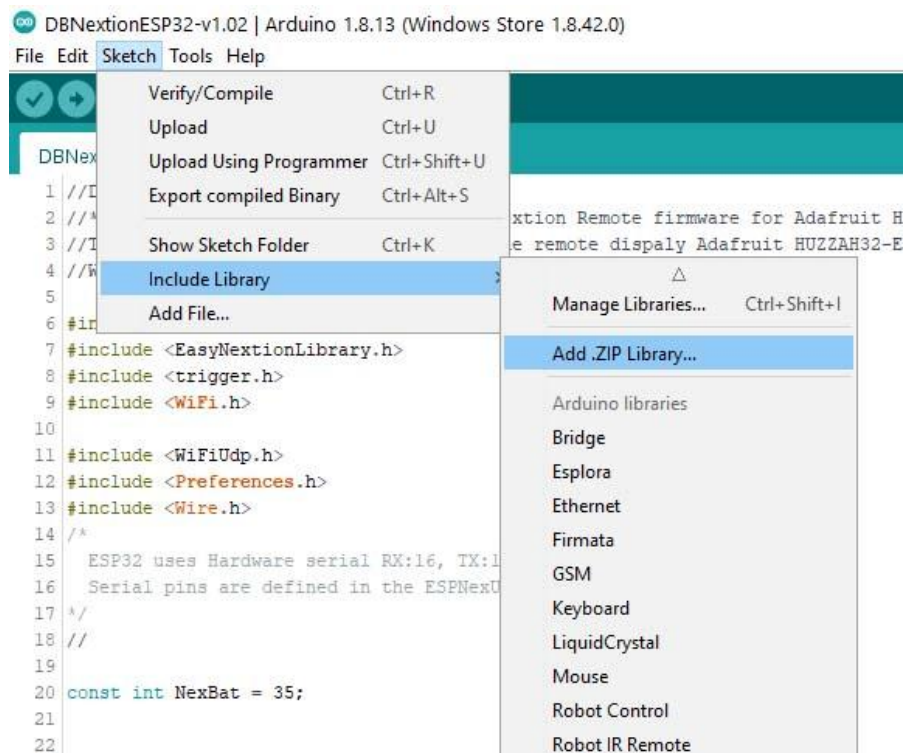
WIFI REMOTE DISPLAY

If you purchased a slider kit after 15th April 2021 you can skip all of this as the board will have come supplied with all the correct pins attached and the software installed.
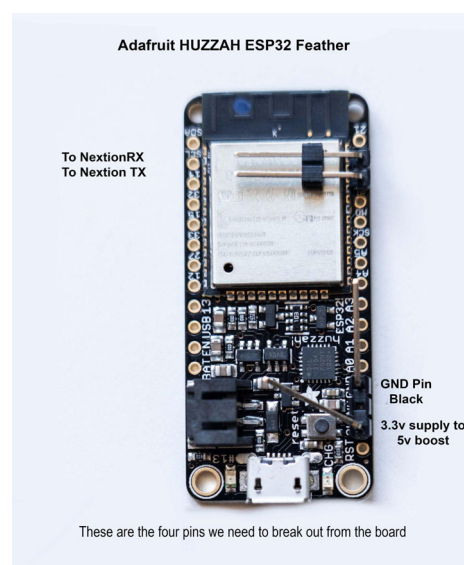
If you are supplying your own board or are updating the software on a supplied board read on.

You will need:

- **Adafruit HUZZAH 32 Feather** (no pins attached. This board is used alongside the Nextion display inside the remote)
- **2.8" Nextion display part No. NX3224T028** (Not the enhanced version we don't need the extras)
- **Adafruit 5V mini boost** (To bring the boards 3.3v up to 5v for the Nextion,Switch harness and cables all supplied in the slider kit.)
- **A 1200 mAh lipo battery** with JST-PH 2.0mm plug, (not supplied in kit due to handling issues.)
- **Your own 3D printed case** files downloadable from **Thiniverse** these are included with the slider parts. Make sure you have the most up to date files before you begin.

Installing to the Adafruit HUZZAH 32 Feather

1. Prepare the Adafruit HUZZAH 32 Feather by soldering the pins as per below image. Note regardless of if you had to supply your own board the pins are supplied in the kit together with all the other cables required.

Adafruit HUZZAH ESP32 Feather

To NextionRX
To Nextion TX

GND Pin
Black

3.3v supply to
5v boost

These are the four pins we need to break out from the board

2. Cut the pins quite close to the underside of the board surface and cover the bottom of the board with electrical insulation tape. This board will rest on the nextion display and we don't want any shorts!

3. Open the Arduino IDE on your computer and set the board we are installing to.

   navigate to **<Tools> <Board> <ESP32> <Adafruit ESP32 feather>**
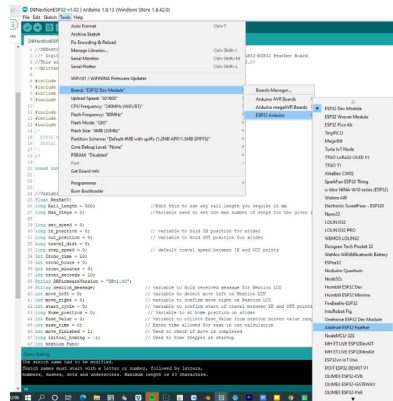
4. Now select **<File> <Open>** and find the file titled **"DBNextionESP32-v*.**.ino"** and you should see the code open in the main window. The Arduino IDE may ask to install a copy in its own file location under documents just accept this.

    Plug your board into the computer using a mini usb cable and check that the correct COM port is selected. Your System may use any number of COM select

     <TOOLS> <PORT><COM X>
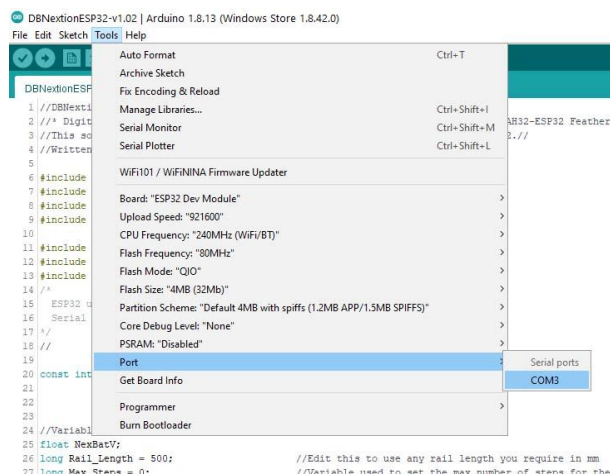
5. Finally Install the software to the board by selecting **<Sketch><Upload>** The system will compile the software, connect to your board and upload the code. If the compiler comes back with any errors make sure you have performed all the previous steps correctly. If the error is not obvious send me an email with the error and I will do my best to assist. digitalbirdfilm@gmail.com. That's it for the Feather.

Installing the Digital Bird Menu to the Nextion Display

1. Next we need to Install the Digital Bird Interface onto the Nextion display. To do this we do not need the Arduino IDE just an empty micro SD card. Copy the file titled **"DBNextionESP32.tft"** from your Digital Bird folder onto the SD card.

2. Layout and Plug in all the cables as shown below. Before you power up the system, insert your SD card into the Nextion SD card Slot.
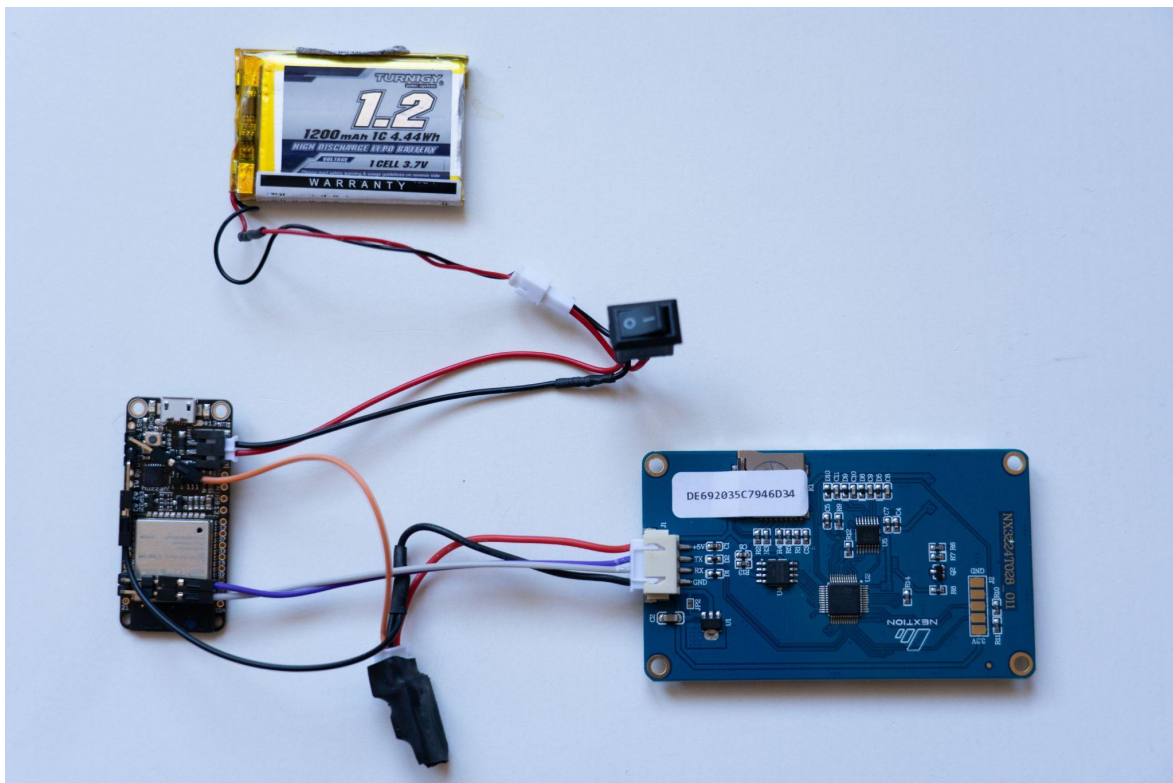
3. Power up the system and the display should automatically install the firmware from the card. When it has finished, switch off the system and remove the SD card. When you power up the system again you should see the Digital Bird menu on the display.


4. **That's it!** Unplug all the cables and install in your 3D printed case.

Digital Bird Camera Slider

You will need:

- A Digital Bird Slider main board
- ESP32 Dev board typically the Espressif ESP32-Dev.
- AS5600 encoder
- For other parts (see kit specifications)

Unlike the Arduino boards the ESP32 boards come with many different pinouts and pin spacings in a number of different form factors and it is important to find one which matches the pinouts used on the digital Bird motherboards. If your kit was supplied with the ESP32 installed you do not have to install any software unless there has been an update.
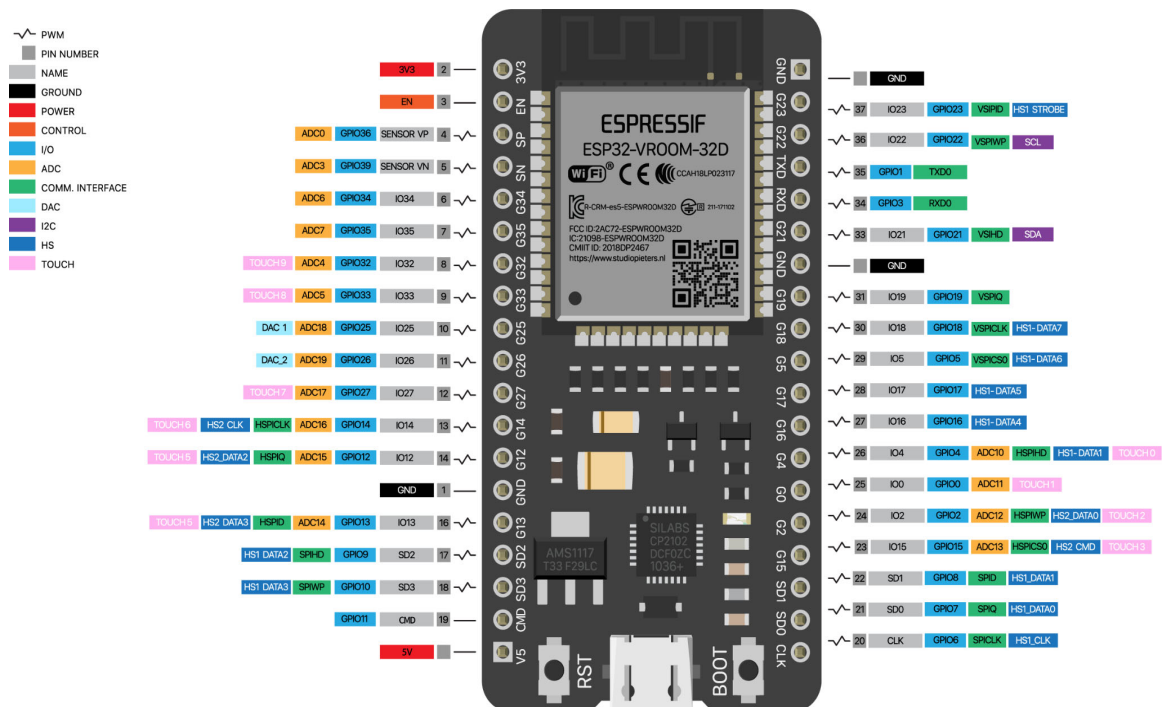
Note the position of the 5V and 3.2V pins on the board together with 38 pins)

1. Open the Arduino IDE on your computer and set the board we are installing to.

   navigate to **<Tools> <Board> <ESP32> <ESP32 Dev Module>**
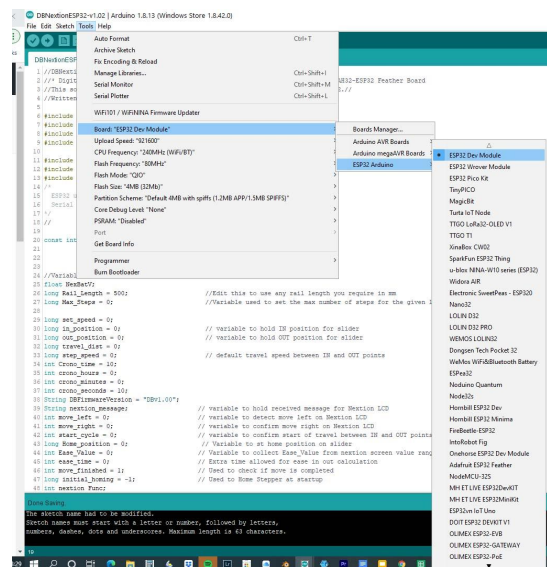
2. Now select **<File> <Open>** and find the file titled **"DBsliderESP32-v*.**.ino"** and you should see the code open in the main window. The Arduino IDE may ask to install a copy in its own file location under documents just accept this.

   Plug your board into the computer using a mini usb cable and check that the correct COM port is selected. Your System may use any number of COM select

   <TOOLS> <PORT><COM X>
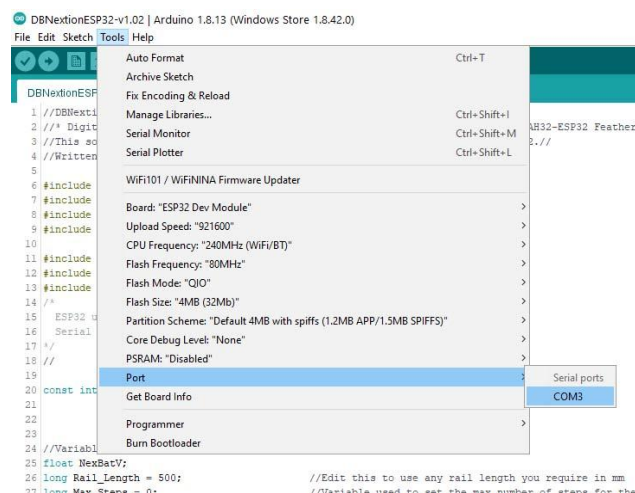
3. Finally Install the software to the board by selecting **<Sketch><Upload>** The system will compile the software, connect to your board and upload the code. If the compiler comes back with any errors make sure you have performed all the previous steps correctly. If the error is not obvious send me an email with the error and I will do my best to assist. digitalbirdfilm@gmail.com. That's it for the Slider.

INSTALLING FOR THE PAN TILT HEAD & VIDEO TURNTABLE

To Install our software on the Pan Tilt Head or Video Turntable simply follow all the steps as per the Slider above but upload the following files to the Arduino IDE in place of the slider code.

- Pan Tilt head **"DBpantiltESP32-v*.**.ino"**

- Video turntable **"DBturntableESP32-v*.**.ino"**