# User Manual

**Parts of the user manual:**

1- VR user manual
2- Controller user manual
3- VRPhysicsLab application user manual

## 1- VR user manual

### Needed Softwares

- **Steam**
- **SteamVR**
- **IVRy from Steam**
- **IVRy from App Store / Play Store for Mobile Phone**

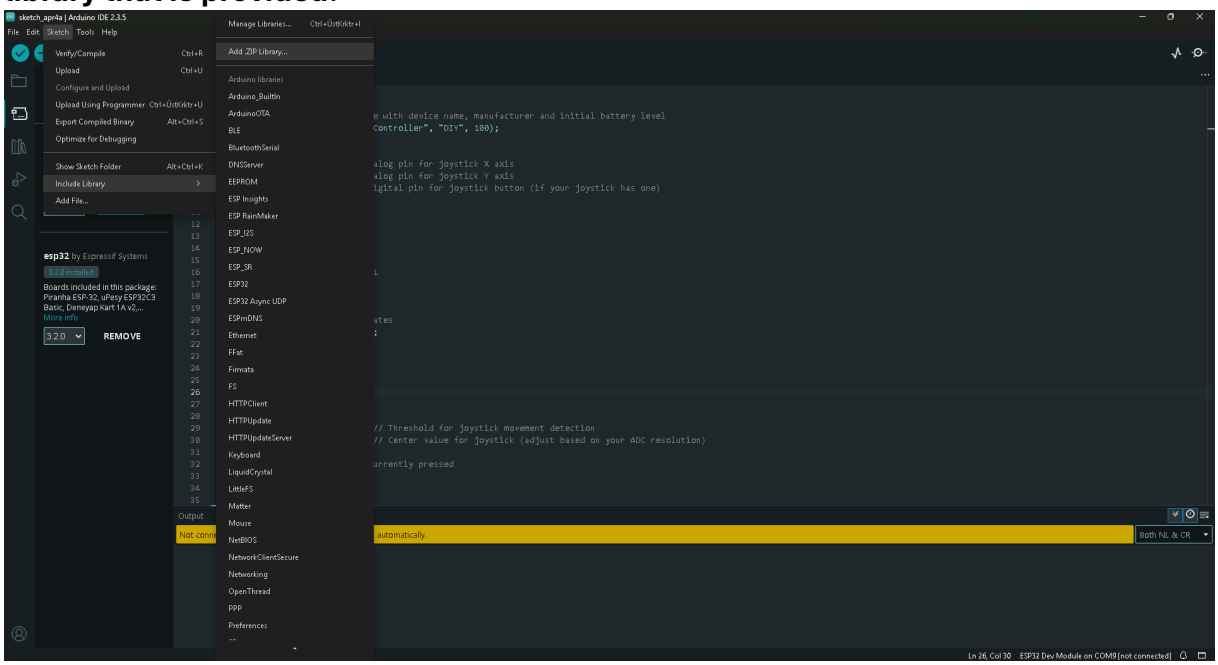
**After above mentioned programs has been downloaded. Mobile Phone and the computer must be on the same network. After they are connected, Firstly IVRy on mobile phone will be opened. After that IVRy program on pc must be run. It should detect mobile phone as the VR headset. If the icon is seen, then the game can be run.**

# 2- Controller user manual

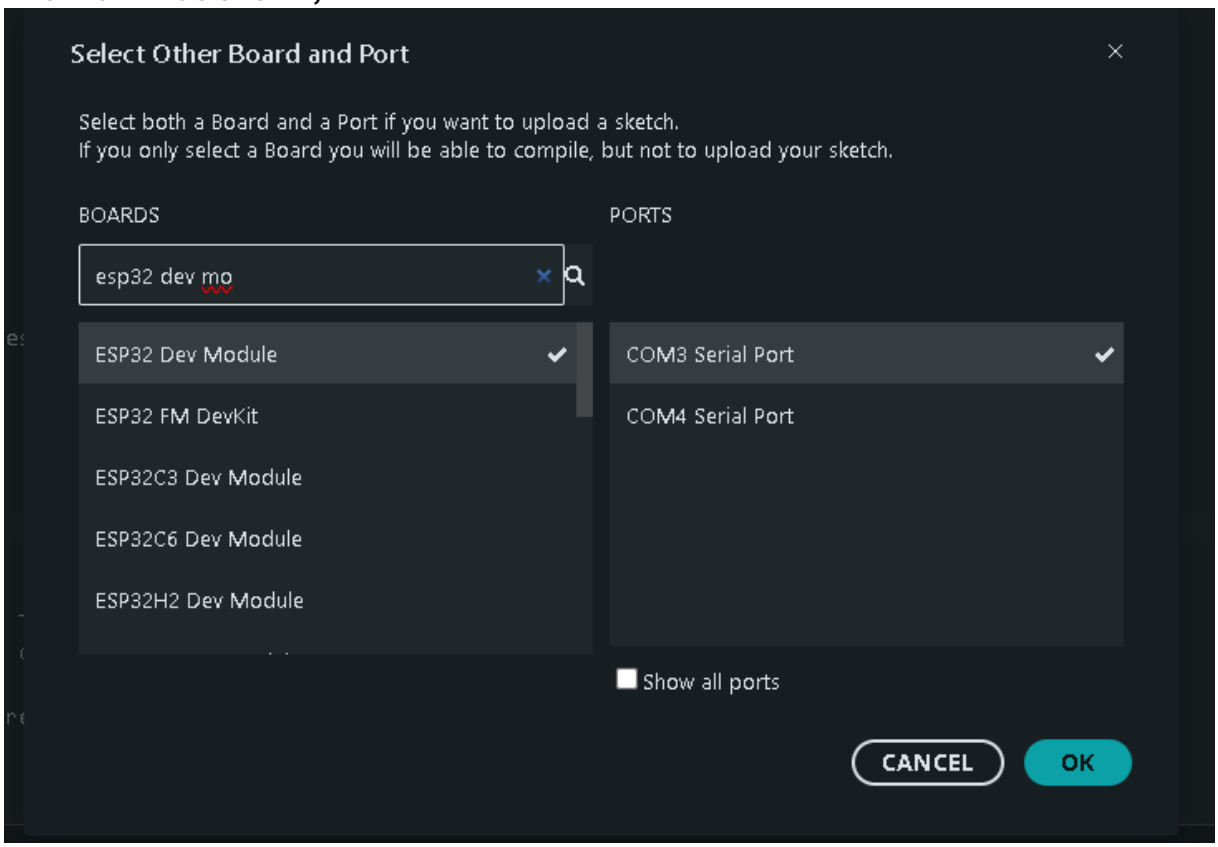
## Needed Softwares

- **Arduino IDE**
- **CP210x Driver**
- **After the arduino ide has been dowload it. First we must add esp32 components to ide.**

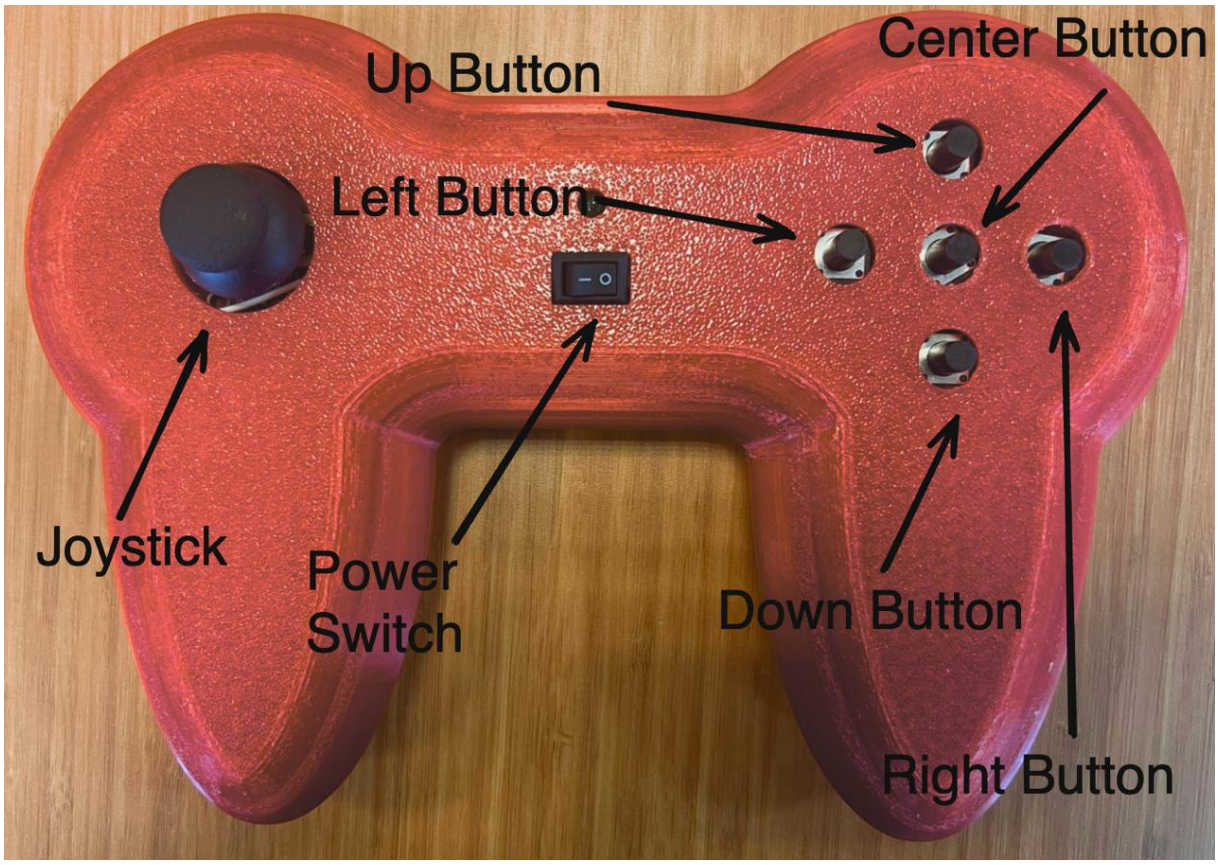
**On the menu search for esp32 and download esp32 from Espressiff. (If the menu does not show up press Ctrl+Shift+B). After that we must include the BLEKeyboard library that is provided.**




**Finally we connect the esp32 via cable to pc and choose the shown up com port. And mark it as shown,**




Now we can compile the provided code.




## 3- VRPhysicsLabApplication

Before running **VRPhysicsLab.exe**, please make sure the following steps are completed:

1. **Launch the iVRy Driver for SteamVR**
2. **Start SteamVR and ensure the headset is properly connected and tracked**
3. Confirm that your controller is paired and responsive
4. Make sure your smartphone or headset is properly mounted and ready for use

Once all systems are ready and SteamVR is running correctly,
**Double-click VRPhysicsLab.exe to start the application.**

All experiment setups can be found on the **green-colored table in the room**.

## Main Menu Controls

- **Joystick**: *(Not assigned)*
- **Joystick Press**: Exits the application
- **Head Movement**: Controls menu camera view

**Controller Buttons**:

- **Up**: Selects the Simple Pendulum Experiment
- **Down**: Selects the Torsion Axle Experiment
- **Right**: Selects the Magnetic Fields of a Solenoid Experiment
- **Left**: *(Not assigned)*
- **Center**: Opens the selected experiment

## Torsion Axle Experiment Controls

The experiment variables can be viewed on the blackboard positioned behind the setup area.

- **Joystick**: Controls player movement.
- **Joystick Press**: Returns to the main menu.
- **Head Movement**: Controls camera direction.

**Controller Buttons:**

- **Up Button**: Navigate to the previous variable in the variable table.
- **Down Button**: Navigate to the next variable in the variable table.
- **Right Button**: Increase the selected variable's value.
- **Left Button**: Decrease the selected variable's value.
- **Center Button**: Regenerates the experiment setup with updated values.

## Magnetic Fields of a Solenoid Experiment Controls

The experiment variables can be viewed on the blackboard positioned behind the setup area.

- **Joystick**: Controls player movement.
- **Joystick Press**: Returns to the main menu.
- **Head Movement**: Controls camera direction.

**Controller Buttons:**

- **Up Button**: Navigate to the previous variable in the variable table.
- **Down Button**: Navigate to the next variable in the variable table.
- **Right Button**: Increase the selected variable's value.
- **Left Button**: Decrease the selected variable's value.
- **Center Button**: Regenerates the experiment setup with updated values.

## Simple Pendulum Experiment Controls

The experiment variables can be viewed on the blackboard positioned behind the setup area.

- **Joystick**: Controls player movement
- **Joystick Press**: Returns to the main menu
- **Head Movement**: Controls camera direction

**Controller Buttons**:

- **Up**: Changes the length of the rope
- **Down**: Locks the pendulum weight
- **Right**: Applies a force to the weight
- **Left**: *(Not assigned)*
- **Center**: *(Not assigned)*