# **NEXTION GUI DOCUMENTATION:**

To integrate a Nextion display into your electric car project using a Teensy microcontroller, you'll need to follow these basic steps:

**1. Hardware Setup:**

* **Wiring:**
  + **Power the Display:** Connect the **5V** and **GND** pins of the Nextion display to the corresponding power and ground pins of your car's electrical system.
  + **Connect to Teensy:**
    - **TX (Nextion) to RX (Teensy):** Connect the **TX** pin of the Nextion display to a **RX** pin on the Teensy.
    - **RX (Nextion) to TX (Teensy):** Connect the **RX** pin of the Nextion display to a **TX** pin on the Teensy.
    - If you're using a Teensy model with multiple hardware serial ports (e.g., Teensy 3.2 or Teensy 4.0), you can directly connect to one of the available serial ports (e.g., Serial1, Serial2).

**2. Install Necessary Software:**

* **Teensyduino:** Install Teensyduino, which is an add-on for the Arduino IDE, to support Teensy boards.
* **Nextion Library:** Install the Nextion library in the Arduino IDE if you haven't done so.

**3. Nextion Editor Setup:**

* **Design the UI:** Use the Nextion Editor to create the user interface (UI) for your car. This can include elements like speed, battery level, warnings, etc.
* **Export the .tft File:** After designing, generate the .tft file and upload it to the Nextion display using a microSD card.

**4. Teensy Programming:**

* **Setup the Serial Communication:**
  + Decide which hardware serial port on the Teensy will communicate with the Nextion display.
  + For example, if using Serial1:

**5. Car Integration:**

* **Display Mounting:**
  + Ensure the Nextion display is securely mounted in the car where it can be easily viewed by the driver.
  + The display should be protected from vibration, dust, and moisture, depending on the environment of the car.
* **Power Supply:**
  + Make sure the display and Teensy microcontroller are properly powered using the car's power system. Use voltage regulators if needed to provide stable power.
* **Sensor Integration:**
  + Connect any sensors (like speed sensors, battery monitors) to the Teensy. The Teensy will process this data and send updates to the Nextion display.

**6. Debugging and Testing:**

* **Test the Display:**
  + Run initial tests to ensure the Nextion display is receiving data correctly from the Teensy.
  + Verify that all UI elements update as expected based on sensor inputs or user interaction.
* **Troubleshoot Communication:**
  + Use the serial monitor to debug communication between the Teensy and the Nextion display.

**7. Final Integration:**

* **Optimize the Code:**
  + Ensure your code runs efficiently, with minimal delays, as it will be running in real-time in the car.
* **Safety Considerations:**
  + Make sure the display doesn’t distract the driver and is used to present only necessary information.

This approach should help you successfully integrate a Nextion display into your electric car project using a Teensy microcontroller.

Model planned to be used for the Display is **NX4024T032.**

The data sheet for this Display:[NX4024T032 - ITEAD Wiki (iteadstudio.com)](https://wiki.iteadstudio.com/NX4024T032)

Problems/Parameters to consider for this display:

1. The resolution of this display and brightness is very low so under Sun conditions we won’t be able to see anything on the display. Laptops nowadays have 400-500 nits’ peak brightness and they are also not visible under light. We need around 1000-1500 nits’ brightness for the display.
2. The power supply to this display is expected to be given from LM7805 board which is 5V but we need the current conditions for proper working of the display. As it is very probable that the display can get damaged very easily. We need 5v/500mA DC supply for this display.
3. To pass the rain test we need display to work in serious humidity conditions like we need around IP 68 kind of rating to pass the rain test or we need to remove the display in time of rain test.

The link to older Documentation [Nextion- Arduino.pdf](file:///D:\Downloads\Nextion-%20Arduino.pdf).This contains the resources and errors which occurred while Earlier Testing.