

Installing Node-RED and Essential Nodes

1. Preparing the Raspberry Pi

Before installing Node-RED, update your system. Open a terminal and run:

```
sudo apt update && sudo apt upgrade -y
```

2. Installing Node-RED

Option 1: Official Node-RED Install Script (Recommended)

Run the following command to install Node-RED and its dependencies:

```
bash <(curl -sL https://raw.githubusercontent.com/node-red/linux-installers/master/deb/update-nodejs-and-nodered)
```

Option 2: Manual Installation (If Needed)

If you prefer a manual setup:

```
sudo apt install -y nodejs npm (installing nodejs)
sudo npm install -g --unsafe-perm node-red (installing Node-RED)
```

3. Enabling and Starting Node-RED

Enable and start the Node-RED service:

```
sudo systemctl enable nodered (Enabling Node-RED to start on boot)
sudo systemctl start nodered
```

To check if Node-RED is running:

```
systemctl status nodered
```

4. Accessing Node-RED UI

Open a web browser and go to:

```
http://<raspberrypi-ip>:1880
```

5. Installing Additional Node-RED Nodes

There are two ways to install nodes: command line (manual) or using Node-RED's Manage Palette.

Option 1: Installing Nodes via Command Line

1. Open a terminal and navigate to the Node-RED user directory:

```
cd ~/.node-red
```

2. Install the required nodes:

```
npm install node-red-dashboard
npm install node-red-node-sqlite
npm install node-red-node-pi-gpio
```

3. Restart Node-RED:

```
node-red-restart
```

Option 2: Installing Nodes via Manage Palette

1. Open Node-RED in your web browser: `http://<raspberrypi-ip>:1880`

2. Click on the menu (≡) and select Manage palette.

3. In the Install tab, search for the required nodes and click Install:

- node-red-dashboard
- node-red-node-sqlite
- node-red-node-pi-gpio

6. Accessing Node-RED Dashboard (UI)

Once the node-red-dashboard nodes are installed, you can access the UI at:

`http://<raspberrypi-ip>:1880/ui`

7. Troubleshooting

To check logs for errors:

```
journalctl -u nodered -f
```

To manually start Node-RED (if needed):

```
node-red (run this on terminal)
```

Importing the Flow

1. In Node-RED, click on the **menu (≡) in the top-right corner**.

2. Select **Import → Clipboard**.

3. Paste the copied JSON flow code into the text box or select a file to import

4. Choose where to import the flow:

- **New Flow** (creates a new tab for the flow).
- **Current Flow** (adds nodes to the existing flow).

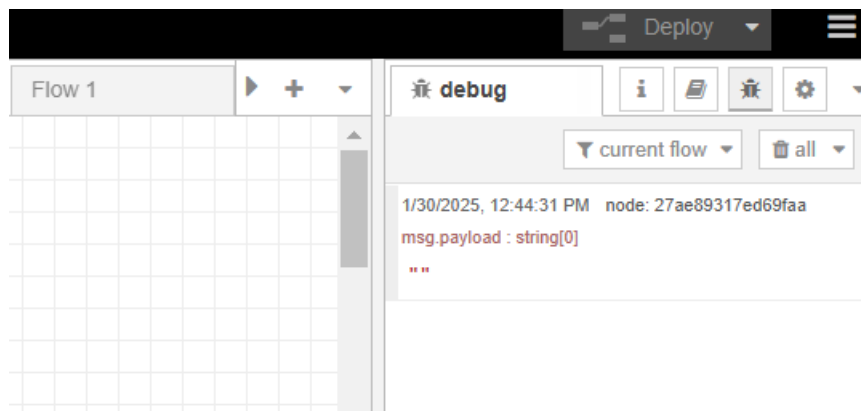
5. Click **import**

6 The flow will appear in the workspace, adjust the node positions if needed.

7. Click **Deploy**, check the debug panel for any errors or required configurations

- If any nodes require setup (e.g., credentials, paths, or settings), double-click the node and configure it. (configurations will be discussed further here)

- Click **Deploy** again after making changes.

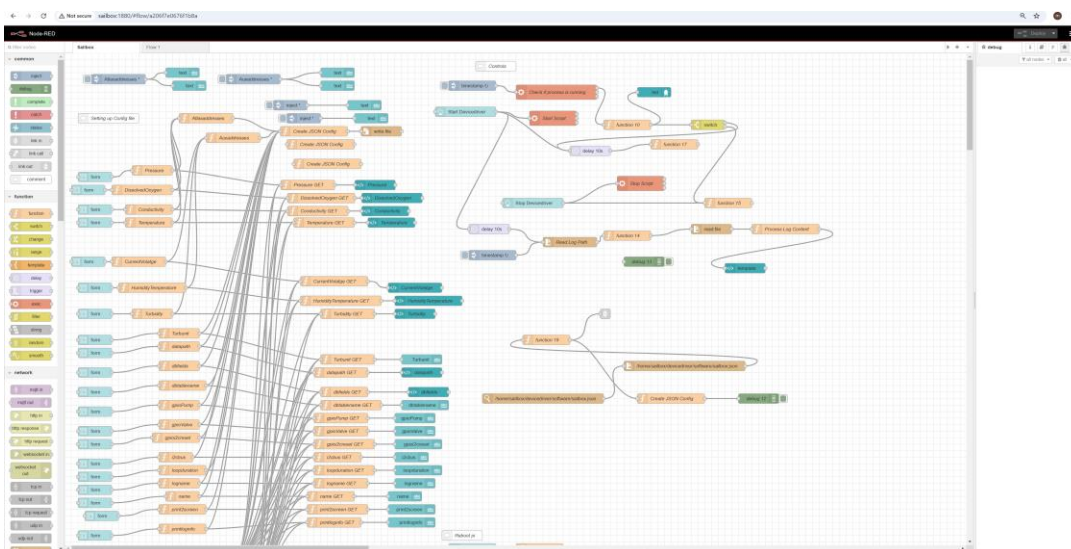


The third icon (spider) on the top-right is the debug panel

Flow Description

Flow area:

This is where you write the code using nodes and function blocks.



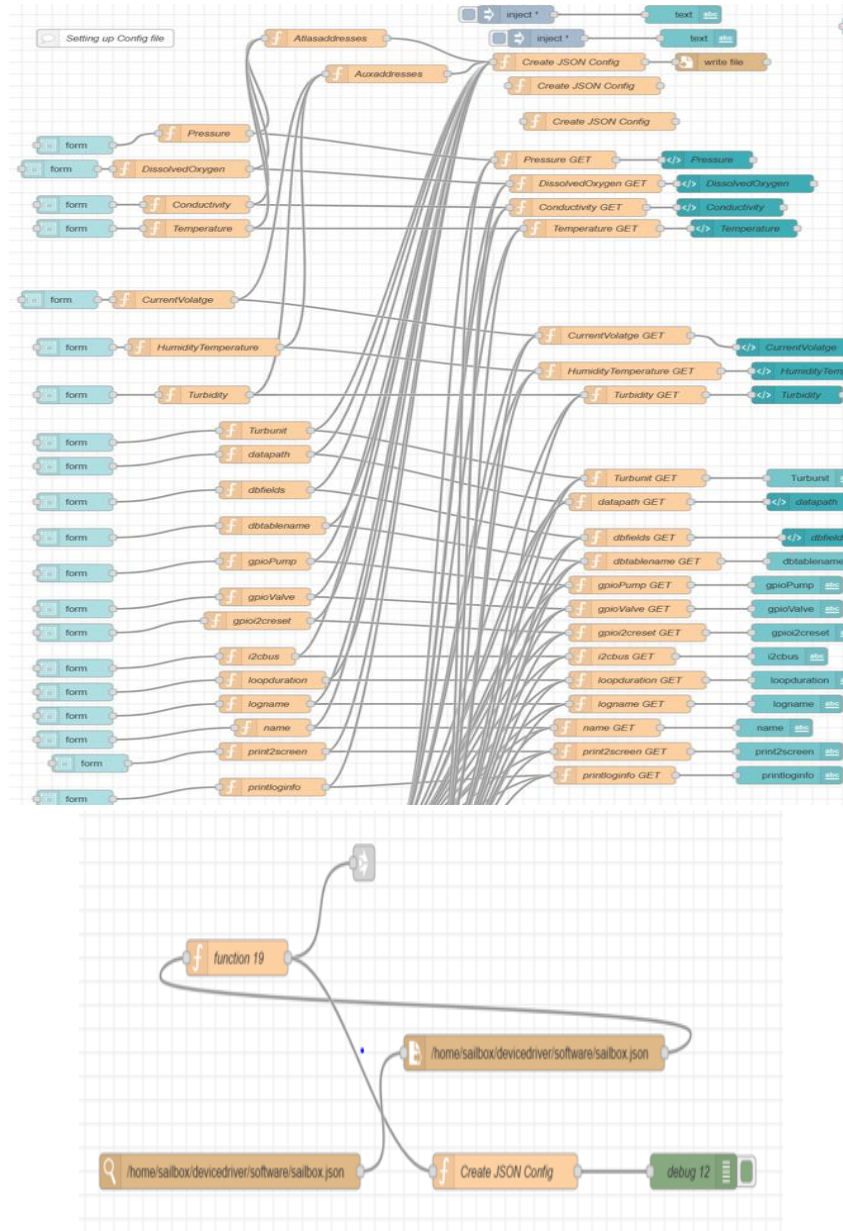
For documentation, visit: <https://nodered.org/docs/>

Sections:

The flow here consists of the following sections:

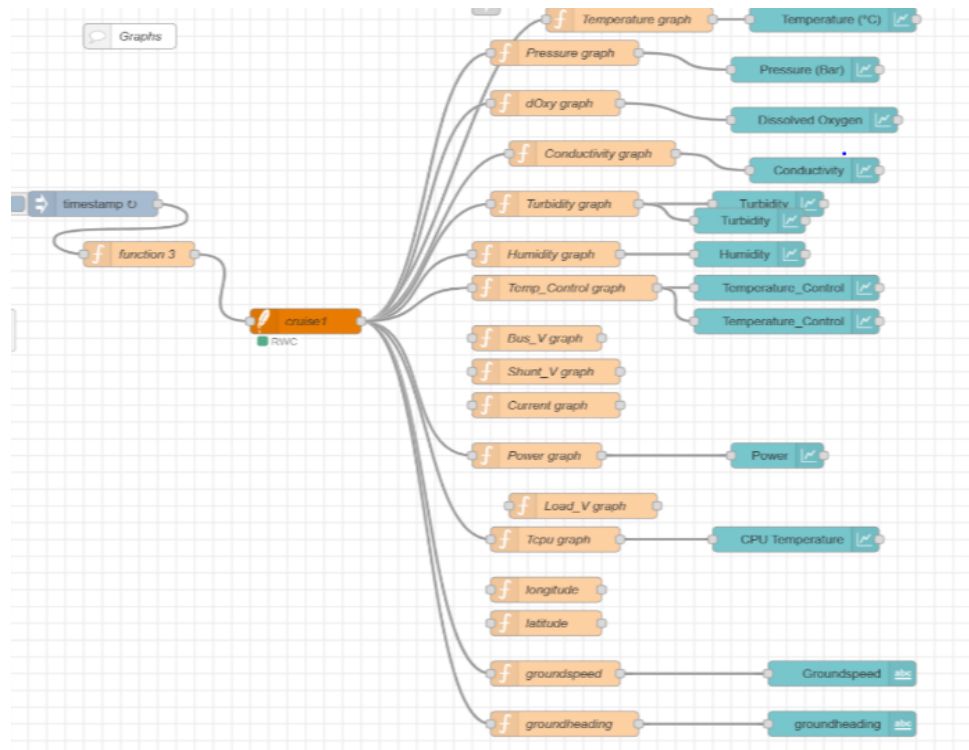
1. The form filler:

Data for the configuration file are provided through a form on the Node-RED dashboard. This is further processed and updated to the json configuration file stored on the device. Any changes on the configuration file will be also updated to the node red dashboard over a watch file node.



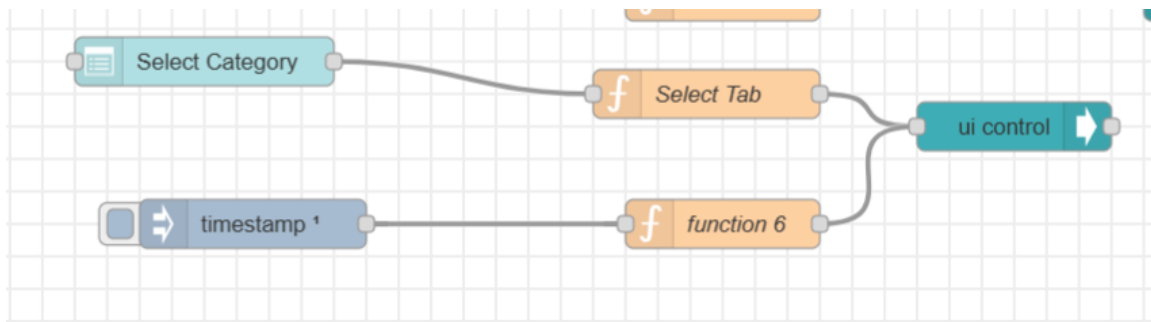
2. Querying the database to display graphs:

The sqlite database is queried and data is extracted separately to display the graphs of different parameters.



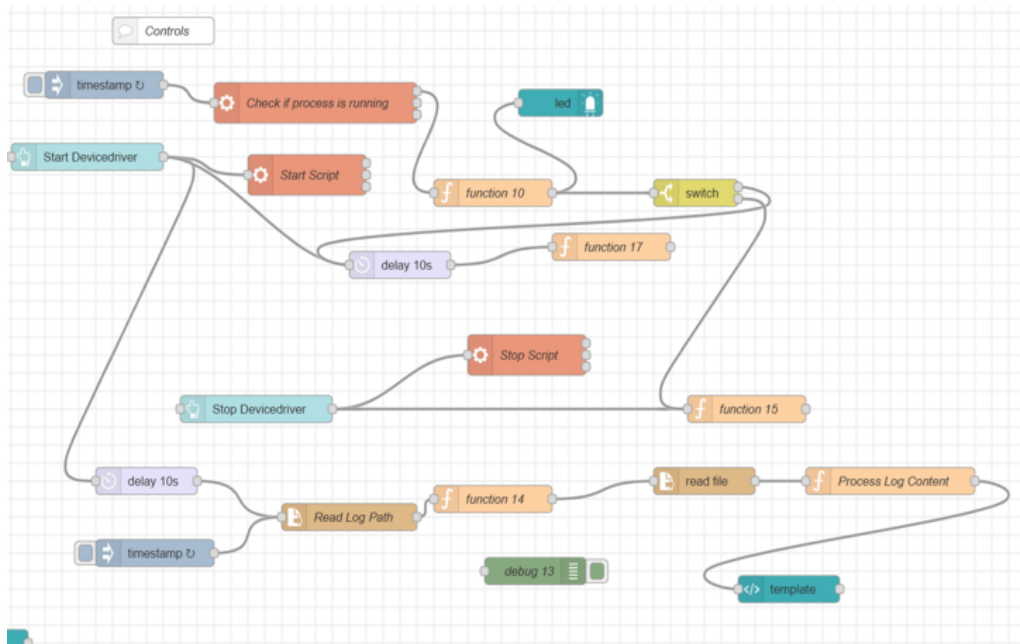
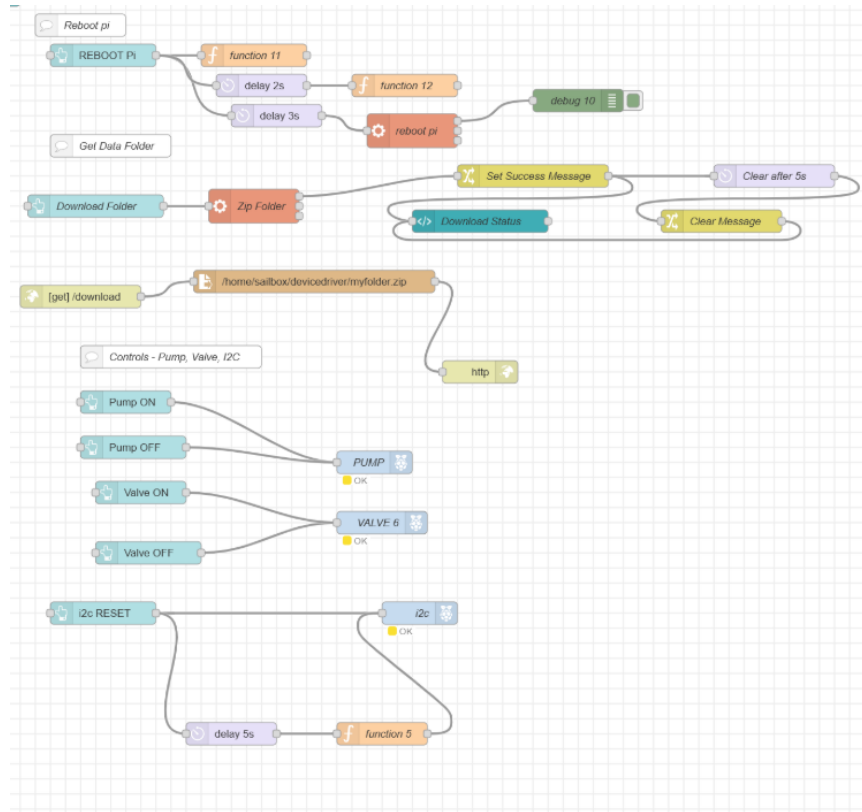
3. UI Control for tab changes:

For navigating the tabs for measurement and system data on the graphs section



4. Controls and Logs:

Controls for start/stop program, reboot pi, download the data folder, turn ON/OFF pump, valve and i2c bus. Logs are displayed in the dashboard when the program runs.



Dashboard Layout

1. On the top right, Click on the **menu (≡) → Dashboard**.

2. This opens the **Dashboard Layout Manager**, where you can organize tabs, groups, and widgets.

