**Smart IoT Ice Dispenser – User Manual**

**Overview**

The Smart IoT Dispenser is a bilingual, temperature-based automation system designed to open a micro servo-controlled gate when the internal temperature drops below a user-defined threshold. It also includes a segment display to show current temperature and a physical button for manual activation.

**🛠️ Components**

* Raspberry Pi with GPIO Extension Board
* DS18B20 Temperature Sensor
* SG90 Micro Servo Motor
* TM1638 Segment Display
* Physical Push Button
* Limit Switch
* GUI-based Controller (Tkinter)

**🔌 Wiring Guide**

| **Component** | **Signal Pin** | **GPIO Pin #** | **Physical Pin #** |
| --- | --- | --- | --- |
| Temperature Sensor | Data | GPIO4 | Pin 7 |
| Segment Display | DIO | GPIO27 | Pin 13 |
| Segment Display | CLK | GPIO22 | Pin 15 |
| Segment Display | STB | GPIO23 | Pin 16 |
| Segment Display | VCC / GND | 3.3V / GND | Pin 1 / 14 |
| Micro Servo | Signal | GPIO17 | Pin 11 |
| Limit Switch | Signal | GPIO18 | Pin 12 |
| Physical Button | Signal | GPIO25 | Pin 22 |

**🧑‍💻 GUI Instructions**

**1. Launch the App**

To start the application:

python3 multilingual.py

Make sure pigpiod is running:

sudo pigpiod

**2. View Temperature**

The main display shows the current temperature in Celsius and Fahrenheit.

**3. Set Threshold**

* Use + / – buttons to raise or lower the target temperature.
* Use the "Set Target Temp" field and click the apply button.

**4. Dispense Ice (Open Servo Door)**

* Click the “Dispense Ice” button in the GUI
* Or press the physical hardware button
* The ice ill automatically dispense if the temperature goes below the set value

**5. Language Selection**

* Use the "English" or "Français" buttons to switch the interface language.