Sensor Motor

User Manual

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Getting Hooked Up

Complete these steps before connecting to power.

Plug the Pico Feather onto the Vandalino board.

Stepper Motor

Connect the Stepper Motor to the Stepper Motor Controller Board. Using the six male-to-female jumper wires, connect the following…

Stepper Motor Controller Board (female)	Pico Board (male)
+	USB
-	GND
IN1	12
IN2	13
IN3	6
IN4	0

HDC1080 Device

Using a grove connector, connect the HDC1080 device to an I2C port on the Vandalino board (any of the bottom three grove connectors).

Operating the Sensor Motor

Default Settings

At boot up, the Stepper Motor will continuously move clockwise.

Using Buttons to Control Sensor Motor

Pressing Button 1

1 Push: Moves the Stepper Motor on temperature. As the temperature increases, the motor will step clockwise. As the temperature decreases, the motor will step counterclockwise. If the temperature remains constant, the motor will not move.

2 Pushes: Moves the Stepper Motor on humidity. As the relative humidity increases, the motor will step clockwise. As the relative humidity decreases, the motor will step counterclockwise. If the relative humidity remains constant, the motor will not move.

4 Pushes: Triggers the emergency stop mechanism. The Stepper Motor will halt its movement. If the emergency stop is already active, then it is turned off and resumes previous functionality.

Pressing Button 2

1 Push: Continuously moves the Stepper Motor clockwise.

2 Pushes: Continuously moves the Stepper Motor counterclockwise.

3 Pushes: Alternates the Stepper Motor between clockwise and counterclockwise revolutions. The motor will always begin with a clockwise revolution.

Operating the 7 Segment Display

Default Settings

On bootup, the 7 Segment Display will display temperature in decimal.

Using Buttons to Control the 7 Segment Display

Pressing Button 1

3 Pushes: Toggles the 7 Segment Display between decimal and hexadecimal values. For three seconds, the displays shows

(hh) when switching to hexadecimal

(dd) when switching to decimal.

4 Pushes: Triggers the emergency stop mechanism. Error Message 3 will display. If the emergency stop is already active, then Error Message 3 is removed and displays previous settings.

Pressing Button 3

1 Push: Displays temperature on the 7 Segment Display.

2 Pushes: Displays relative humidity on the 7 Segment Display.

3 Pushes: Displays the Stepper Motor Status on the 7 Segment Display. The displays shows

(oo) when the motor is not moving

(cc) when the motor is moving clockwise

(ↄↄ) when the motor is moving counterclockwise

Operating the Neopixels

The Neopixels reflect the current state of the different peripherals of the system. Use the buttons as described above to manipulate the color of the Neopixels as you need.

What Each Pixel Represents

Neopixel 1 (top-most): reflects temperature

Bright red when temperature is increasing

Dim red when temperature is decreasing

Neopixel 2: reflects relative humidity (yellow)

Bright yellow when relative humidity is increasing

Dim yellow when relative humidity is decreasing

Neopixel 3: reflects the status of the 7 Segment Display

Red when displaying temperature

Yellow when displaying relative humidity

Purple when displaying motor status

Neopixel 4 (bottom-most): reflects the status of the Stepper Motor

Green when moving clockwise

Blue when moving counterclockwise

Orange when not moving

Emergency Stop

When the emergency stop mechanism is active, the four Neopixels will perform a rainbow effect. When the emergency stop mechanism is deactivated, it will continue its previous functionality.

Error Messages

Theses error messages are displayed on the 7 Segment Display

Error Message 1: (三三) Unknown Input. Each button has a set number of configured button pushes. If a button is pushed too many times, this error message will display.

Error Message 2: (OF) Overflow. *display_queue* is an internal structure. If more than 10 entries are added to this queue, then this error message will display.

Error Message 3: (EE) Emergency Stop. This is triggered if the user pushes Button 1 four times.