Thermocouple Mod

Hardware Components You'll Need:

1. **Arduino Nano**
2. **HW-550 Thermocouple (MAX6675) Module**
3. **Jumper Wires**
4. **USB Cable** for Arduino Nano connection
5. TCSkycommand.ino

   Quick Video Overview

Step 1: Installing the Arduino IDE

If you haven't already installed the **Arduino IDE**, follow these steps:

1. **Download the Arduino IDE** from the official Arduino website.
2. **Install the software** on your computer, following the on-screen instructions for your operating system (Windows/macOS/Linux).
3. Once installed, **open the Arduino IDE**.

Step 2: Installing the MAX6675 Library

To interface with the **HW-550 (MAX6675) thermocouple**, you will need the **MAX6675 library**.

1. Open the **Arduino IDE**.
2. Click on **Sketch** > **Include Library** > **Manage Libraries**.
3. In the **Library Manager** window, type **MAX6675** in the search box.

4. Look for the library titled **MAX6675 by Adafruit** and click **Install**.
5. Wait until the installation is complete.

Step 3: Wiring the HW-550 (MAX6675) to Arduino Nano

Hardware Setup

1. **Thermocouple (MAX6675) Connections:** The code sets these pins:
   - `pinSCK = 7`
   - `pinCS = 6`
   - `pinSO = 5`

   Wire your MAX6675 module as follows:
   - Arduino `5V` to MAX6675 `VCC`
   - Arduino `GND` to MAX6675 `GND`
   - Arduino `7 (SCK)` to MAX6675 `SCK`
   - Arduino `6 (CS)` to MAX6675 `CS`
   - Arduino `5 (SO)` to MAX6675 `SO`

   Note: If your MAX6675 module specifies different power requirements or has a regulator onboard, ensure you follow its recommended wiring.
2. **Roaster Control Lines:**
   - `txPin = 3` (Arduino output)
   - `rxPin = 2` (Arduino input)

   Connect these pins to your roaster's control interface as required. These pins are used for sending and receiving signals from the roaster.
3. **Power and Grounding:** Ensure all grounds (Arduino, MAX6675, roaster interface) share a common ground. Double-check all connections to avoid damage to the board or sensors.

Preparing the Code

1. **Open Arduino IDE:** Launch the Arduino IDE on your computer.
2. **Create or Open the Sketch:**
   - Create a new sketch (File > New).
   - Copy and paste the provided code into the new sketch window.
3. **Select Your Board and Port:**
   - Go to **Tools > Board** and choose your Arduino board model (e.g., Arduino Uno).

- Go to **Tools > Port** and select the port that your Arduino is connected to.

4. **Verify Libraries:**
   - Ensure the `MAX6675` library is installed via the Library Manager as noted above.
   - `SPI` is included by default, no additional steps needed

Compiling and Uploading

1. **Verify (Compile) the Code:**
   - Click the **Checkmark (Verify)** button in the Arduino IDE toolbar to compile the code.
   - If there are errors, make sure you've selected the correct board, port, and have the MAX6675 library properly installed.
2. **Upload the Code:**
   - Once verification is successful, click the **Right Arrow (Upload)** button to upload the code to your Arduino.
   - After upload completes, the Arduino will reset and begin running the program automatically.

Running and Interacting

1. **Serial Monitor:**
   - Open the Serial Monitor by going to **Tools > Serial Monitor**.
   - Set the baud rate to `115200` to match the code's setting.
2. **Commands:** You can send commands via the Serial Monitor. Examples:
   - `READ` — returns the temperature readings and current duty cycles.
   - `OT1;XX` — sets heater duty cycle to XX (0-100).
   - `OT2;XX` — sets fan duty cycle to XX (0-100).
   - `DRUM;1` — turns the drum on (100%), `DRUM;0` turns it off.
   - `FILTER;XX`, `COOL;XX` — sets filter fan or cooling levels.
   - `CHAN` — responds with channel setup.
   - `UNITS;C` or `UNITS;F` — changes temperature units between Celsius and Fahrenheit.
   - `OFF` — shuts down all outputs.
3. **Data Output:**
   - The Serial Monitor will display temperature data from the thermocouple and any status messages.
   - If no commands are received for an extended period, the code will shut everything down for safety

Troubleshooting

- **No Temperature Reading:**
  Double-check thermocouple wiring and confirm the MAX6675 module is functioning.
- **No Response to Commands:**
  Ensure you've set the correct baud rate and are typing commands properly in the Serial Monitor.
- **No Upload / Compilation Errors:**
  Confirm you have the correct board selected and libraries installed.

Please remember that any modifications you undertake are entirely at your own discretion. While we aim to offer helpful guidance, we cannot assume responsibility for any resulting damage, injury, or loss. Proceed only if you feel confident in understanding the process and accept the associated risks

Thank you TOU! for providing code which can be seen on kaffee-netz.de forum.

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