Helio-STELLA Heliophysics Spectrometer Kit Preparation Sheet

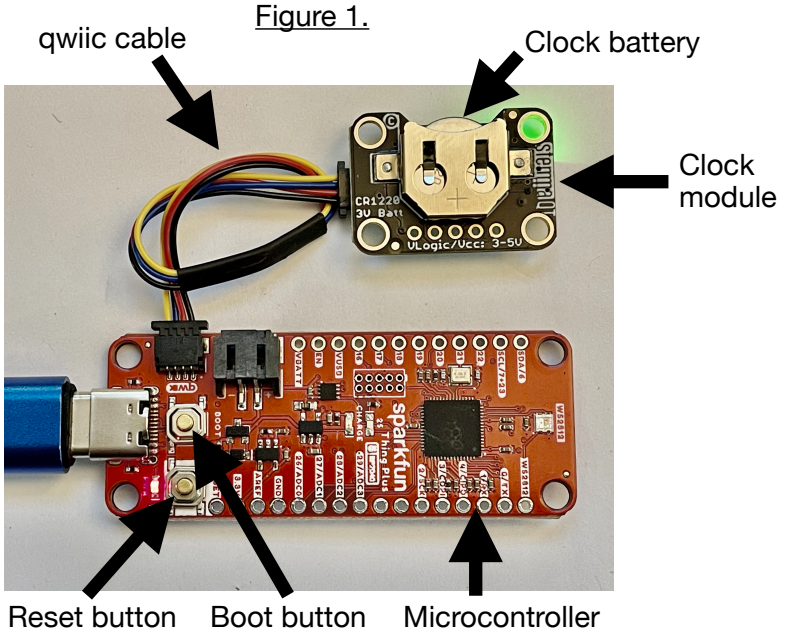
Kit parts

Line	Item	Quantity	Added
1	Thing Plus RP2040 microcontroller	1	☐
2	PCF8523 real time clock	1	☐
3	CR1220 clock battery	1	☐
4	AS7341 spectrometer	1	☐
5	LTR390 UV sensor	1	☐
6	128 x 32 pixel OLED display	1	☐
7	i2c button module	1	☐
8	power switch	1	☐
9	battery	1	☐
10	qwiic/ STEMMA-QT cables	6	☐
11	micro sd card	1	☐
12	micro sd card reader	1	☐
13	USB C cable	1	☐
14	ping pong ball, white	1	☐
15	double stick mounting tape, 4 piece squares	2	☐
16	Helio-STELLA layout sheet	1	☐
17	kit build sheet and operation guide	1	☐

Tools and supplies needed

Line	Item	Available
1	Glue stick	☐
2	Craft knife	☐
3	Scissors	☐
4	Clear tape	☐

Figure 1.



Get the software

Line	Item	Done
1	Download the Helio-STELLA software .ZIP file, and uncompress it. (Available at https://landsat.gsfc.nasa.gov/stella/helio-stella/)	☐
2	Download and install the Mu editor (available at http://codewith.mu)	☐

Preparation Instructions

Line	Item	Done
1	Select kit parts in the quantities listed, combine them into a package.	☐
2	Select the microcontroller and the USB C cable from the package. Use the cable to connect the microcontroller to a computer.	☐
3	While holding the **Boot button**, press and release the **Reset button**, then release the **Boot button**. A drive named **RP1-RP2** should appear in your computer's drive list. (See figure 1.)	☐
4	From the software package, copy the file in the **UF2_file** folder to the **RP1-RP2** drive. The drive will self-eject, and will reappear as **CIRCUITPY**	☐
5	In the software package, open the **code-and-libraries** folder. Copy the whole **lib** folder to the **CIRCUITPY** drive, replacing the existing **lib** folder	☐
6	Select the clock module and the coin cell battery from the the package. Insert the battery in the clock module, placing the flat side of the battery (+) away from the board.	☐
7	Select a qwiic cable from the kit. Connect the clock to the microcontroller (see figure 1.)	☐
8	Open the Mu editor. It will find the microcontroller and display this message "Detected new circuitpython device."	☐
9	In the Mu editor, click on the Serial button on the top menu bar. A serial dialogue box will open at the bottom of the window.	☐
10	In the software package, open the **test_codes** folder, then open the **00. clock_set** folder. From that folder, copy the **code.py** file to the **CIRCUITPY** drive.	☐
11	Follow the prompts in the serial window to set the hardware clock time. Use UTC to avoid confusion about time zones. (available at http://time.is/UTC)	☐
12	Now open the **code-and-libraries** folder again**,** and select the **code.py** file, and copy it to the **CIRCUITPY** drive. This file is the instrument operating code.	☐
13	In the Mu editor, press the Load button, and select the code.py file on the CIRCUITPY drive to open, to view the instrument code. The first two lines of code should read: SOFTWARE_VERSION_NUMBER = "<some number>" DEVICE_TYPE = "Helio-STELLA"	☐
14	Unplug the two cables from the microcontroller and clock module, and return all parts to the package. Do not remove the battery from the clock module as that will erase the time setting.	☐

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