**VISA SensorTile Tutorial**

Author: Stephen Sheldon

**Introduction:**

This tutorial guides you on setting up the VISA SensorTile project.

**Parts:**

* Sparkfun Haptic Motor Driver – DRV2605L (<https://www.sparkfun.com/products/14538>)
* Vibration Motor – B1034.FL45-00-015 (<https://www.sparkfun.com/products/8449>)
* STM SensorTile with SensorTile Cradle Expansion Board - STEVAL\_STLKT01V1 (<https://www.st.com/en/evaluation-tools/steval-stlkt01v1.html>)
* US-100 Ultrasonic Distance Sensor (<https://www.adafruit.com/product/4019>)
* Adafruit PowerBoost 500 + Charger (<https://www.adafruit.com/product/1944>)

**Setting up the circuit:**

Utilize the following diagram and schematic to help setup the circuit.

**Diagram, schematic

Description automatically generated**

**Importing the VISA SensorTile project:**

1. Download the VISA SensorTile Source code
2. Inside STM32CubeIDE Go to File → Import → import ac6 System Workbench for STM32 Project then click “next.”

Graphical user interface, text, application

Description automatically generated

1. In the next screen you will select the visa\_sensortile project folder from your download.

Graphical user interface, text, application, chat or text message

Description automatically generated

1. Click the “Finish” button. Your visa\_sensortile project is now imported and ready to be build and run.

**Running the VISA SensorTile project:**

For this portion I am using a Raspberry Pi 4 to interact with the VISA SensorTile over BLE.

1. Run the VISA SensorTile code.
2. On your BLE client device connect to the SensorTile’s mac address which is **aa:aa:aa:dd:ee:ff**.

Graphical user interface, text

Description automatically generated

1. To read data from the distance sensor you can issue the following command: **char-read-hnd 000e**. The last two bytes returned will be the distance in little endian order. So, for example, in the below screenshot you have a distance of 0x0102 which is 258 millimeters when converted to decimal.

Text

Description automatically generated

1. To stream distance sensor data over BLE you will need to modify the characteristic value of handle 0x000f as seen below. You can write 0100 to turn the stream on and 000 to turn it off.

Text

Description automatically generated

1. The haptic feedback can be controlled by modifying the characteristic value of handle 0x0012. This can take one of the following values. When you change the characteristic value, the haptic motor will give a vibration pattern unique to each hand movement.

|  |  |
| --- | --- |
| Characteristic Value | Hand Movement |
| 0000 | Turn off haptic feedback |
| 0100 | Move hand right |
| 0200 | Move hand left |
| 0300 | Move hand up |
| 0400 | Move hand down |
| 0500 | Move hand forward |
| 0600 | Move hand backward |

Text

Description automatically generated

1. If you want to see what the current characteristic value is for the haptic feedback handle you can issue the following command: **char-read-hnd 0012**. You will receive the current characteristic value returned in little endian format.

Text

Description automatically generated