VL53L5CX Experience
SparkFun Qwiic Mini ToF Imager
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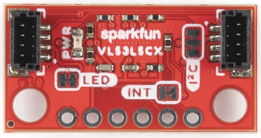
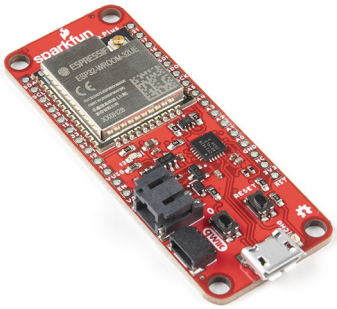
2023.06.08 -

Homebrew Robotics Club thread on ultrasonic sensors https://groups.google.com/g/hbrobotics/c/cuIcserPXr0 suggested the alternative of the **SparkFun Qwiic Mini ToF Imager VL53L5CX**, an up to 8x8 ToF distance sensor: https://www.sparkfun.com/products/19013



I am looking to use this on the NASA/JPL Open Source Rover with a raspberry Pi 4 (or perhaps a Jetson NANO).

However, the Sparkfun documentation pairs it with an Arduino clone as an Arduino Uno doesn't have enough memory for the firmware: **SparkFun Thing Plus - ESP32 WROOM (U.FL)** https://www.sparkfun.com/products/17381 So bought one. And the Qwiic jumper package. https://www.amazon.com/gp/product/B08HQ1VSVL/ref=ppx_od_dt_b_asin_title_s00?ie=UTF8&psc=1



However, another VL53L5CX breakout, Pimoroni, appears to interface with the Pi and has a github python library:

https://shop.pimoroni.com/products/vl53l5cx-time-of-flight-tof-sensor-breakout?variant=39972903059539

https://github.com/pimoroni/vl53l5cx-python/tree/dev

2023.06.10-11
SparkFun Thing Plus & Qwiic bundle arrived today.
Installed updated Arduino IDE
Installed SparkFun ESP32 Thing Plus C via Board Manager per SparkFun directions
Installed CP2140 USB Driver “

Selected Board “SparkFun ESP32 Thing Plus C”
cc Blink sample sketch
Uploaded and got error message:

```
WARNING: library Servo claims to run on avr, megaavr, sam, samd, nrf52, stm32f4, mbed, mbed_nano, mbed_portenta, mbed_rp2040 architecture(s) and may be incompatible with your current board which runs on esp32 architecture(s).
In file included from C:\Users\jhphe\OneDrive\Documents\Arduino\HomebrewArduinoBumperStop\HomebrewArduinoBumperStop.ino:1:
C:\Users\jhphe\AppData\Local\Arduino15\libraries\Servo\src/Servo.h:77:2: error: #error "This library only supports boards with an AVR, SAM, SAMD, NRF52 or STM32F4 processor."
 #error "This library only supports boards with an AVR, SAM, SAMD, NRF52 or STM32F4 processor."
  ^~~~~

exit status 1

Compilation error: exit status 1
```

Despite having exact board in Board Manager, SparkFun directions instruct to select “Adafruit ESP32 Feather”.
Get SAME error message.

Try to run anyway...
File not found "executable":
"C:/Users\jhphe\AppData\Local\Temp\arduino\sketches\CBAB99269183E4B2FBAEB0DB46541BDF\Blink.ino.elf"

Uninstalled ESP32 Board.
Arduino IDE recognized that board needed installing & asked if I wanted it installed, or manual. Chose install.
It reinstalled the esp32.

I now realize it was trying to load the HomeBrewed Robot “bump” sketch for the Arduino Uno! Make sure is loading the SparkFun.ino for Blink!

If I try to delete the HBRC sketch, it closes the whole IDE.
Reopening, it’s still there. Renaming doesn’t change .ino tab.

It KEEPS trying to load the HBRC sketch for the wrong board and I can’t get rid of it!!

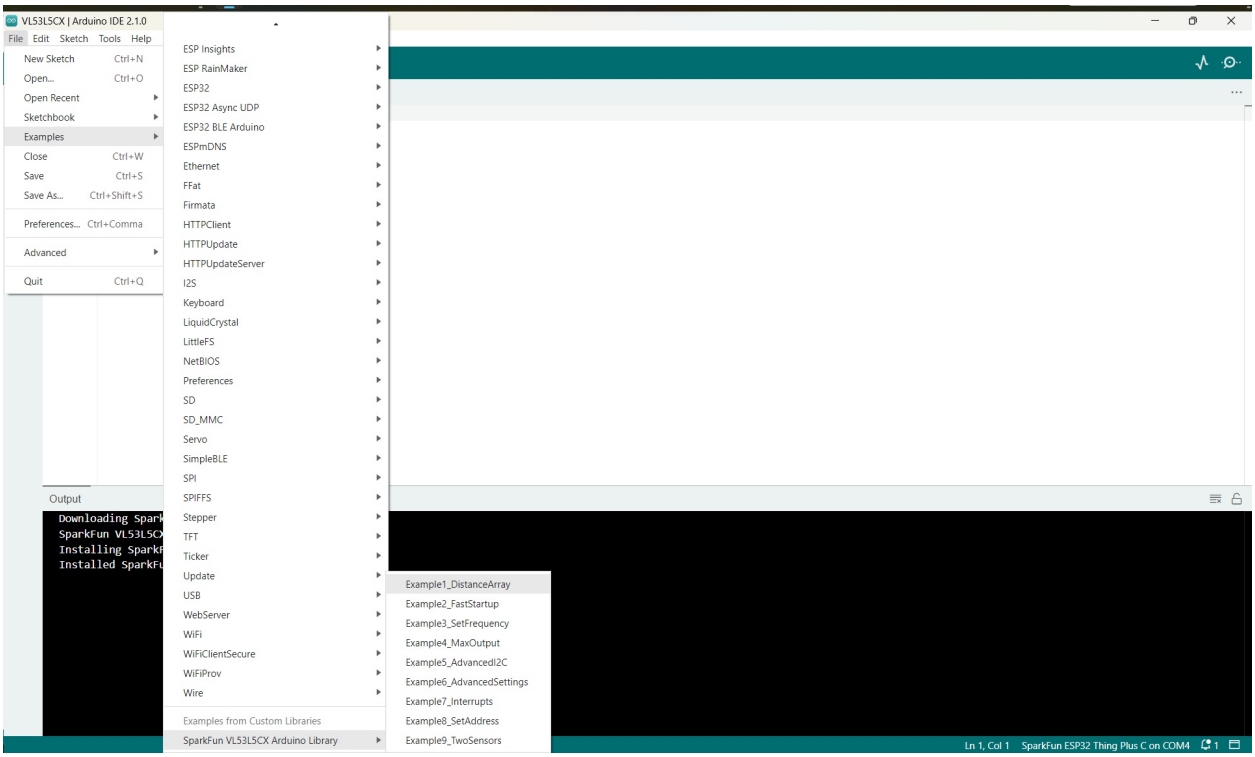
Try creating a HBRC subfolder and putting all HBRC files into it.
Created SparkFun folder with just its files. So far nothing in it. How do I save JUST the SparkFun sketch to it??

DELETED ALL ARDUINO SKETCH FILES
C:\Users\jhphe\OneDrive\Documents
This time opens with just template .ino
cc Blink sketch from web
Rename sketch to blink(.ino)
Select board: “SparkFun ESP32 Thing Plus C”
unplug ToF sensor to avoid confusion
upload
Connects & loads w/o error!
Open Serial Monitor (Arduino IDE icon upper right)
Baud rate dropdown menu on right of Serial Monitor 9600 > 115200
“Hello, world!” ...   !!

Now to try the VL53L5CX ToF Imager!

From SparkFun Hookup Guide:
https://learn.sparkfun.com/tutorials/qwiic-tof-imager---vl53l5cx-hookup-guide
Install the library through the Arduino Library Manager tool by searching for "SparkFun VL53L5CX"
done

*Hook up your ToF imager to your Artemis Thing Plus via the Qwiic cables, and click "File > Examples > SparkFun VL53L5CX Arduino Library > **Example1_DistanceArray**".*



Opens new IDE window w/ example sketch.

Output of serial monitor
(click double chevron R upper to toggle autoscroll)

```
19      1305    1321    1724    2251    2380    2321    2076
646     1570    1892    2289    2325    2336    2345    2282
26      2139    2327    2365    2348    2341    2338    2332
2257    2339    2344    2357    2369    2566    2368    2306
2335    2362    2398    2426    2634    2576    2531    2342
2376    2354    2502    2628    2608    2579    2600    2521
2365    2556    2595    2600    2619    2598    2584    2599
2641    2630    2565    2600    2558    2585    2601    2597
```

Looking at ceiling

```
8       8       8       10      13      14      13      2068
13      9       10      8       11      13      16      11
10      7       8       8       9       12      15      14
13      8       12      6       9       12      11      13
10      12      8       11      13      8       9       14
2393    12      15      13      12      9       12      15
2391    2659    9       13      13      17      12      12
2636    2623    2596    13      16      13      15      12
```

With finger held over sensor

Example2_FastStartup
Boosts settings to load faster

Example3_SetFrequency
Increases freq from 1hz to 15hx for 8x8

Example4_MaxOutput
Vizualize the output
Initially didn't work as the Processing download link downloaded the V-_3D_Depth_Map.pde (and old version of .ino)
Followed the link to Processing link to:
https://processing.org/download
Unzipping takes quite a while. Don't be in a hurry to launch.
Run processing.exe
open SparkFun_VL53L5CX_3D_Depth_Map.pde from Processing or by right-clicking in the file location and "open with" Processing.

Processing opens the 3D_Depth_Map. Code is modified as directed to my COM4. Example3_MaxOutput.ino is running in the Arduino IDE with Serial Monitor TURNED OFF else Processing can't access the port. Running 3D_Depth_Map in Processing displays the "red square" which can be manipulated by the mouse. HOWEVER, no data display with hand waving.

Reinstalled both Processor and 3D_Depth_Map. Didn't fix it.
Tried Processor Debug. Watched Debug tutorial. Wouldn't work.
Reinstalled. Working.
Changed port to COM4
3D_Depth_Map line 109 "variable p not used":
void serialEvent(Serial p){
Changed to (Serial port) and error vanished.

Example4_MaxOutput.ino

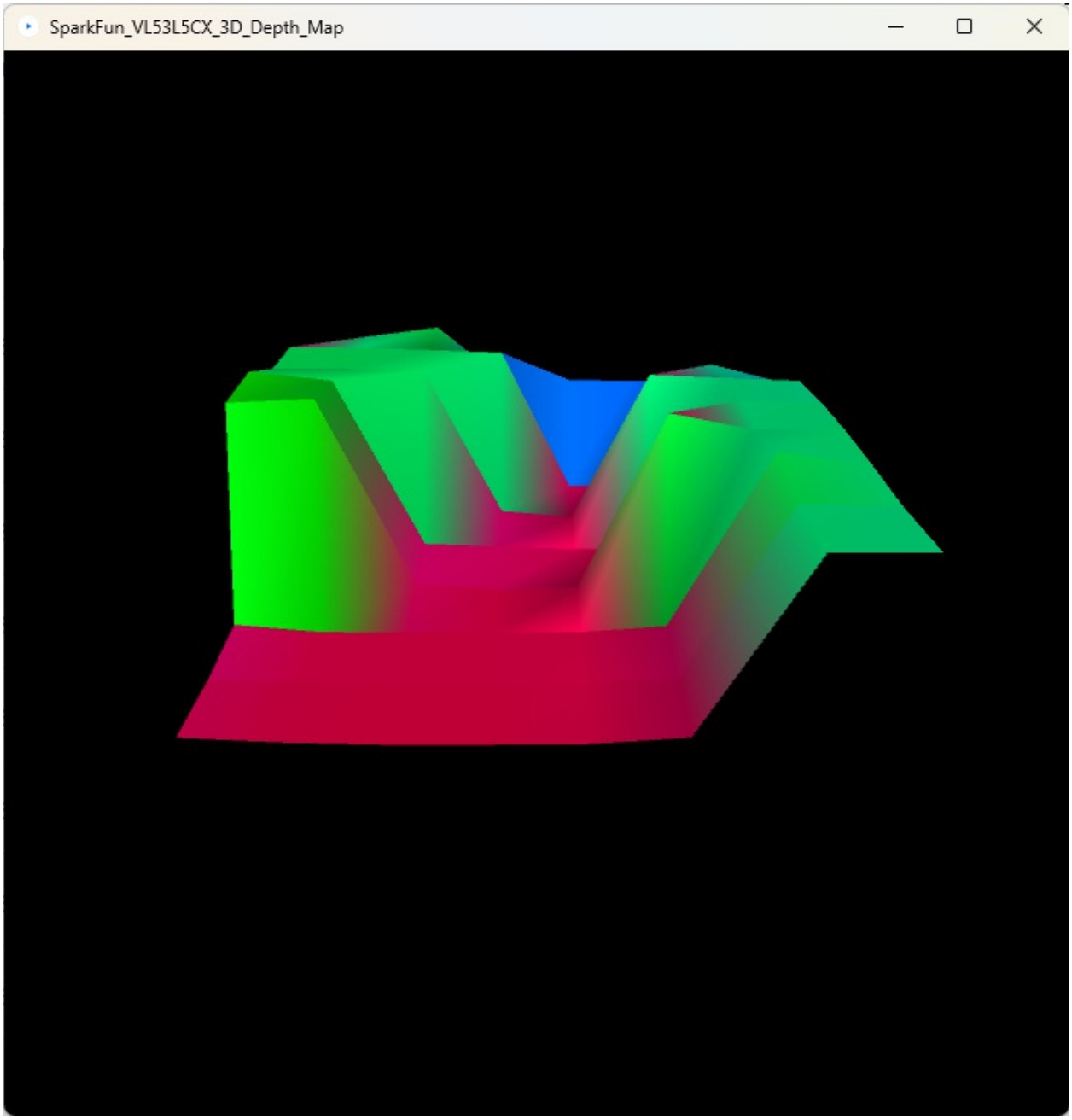
```
Rebooting...
ets Jul 29 2019 12:21:46

rst:0xc (SW_CPU_RESET),boot:0x13 (SPI_FAST_FLASH_BOOT)
configsip: 0, SPIWP:0xee
clk_drv:0x00,q_drv:0x00,d_drv:0x00,cs0_drv:0x00,hd_drv:0x00,wp_drv:0x00
mode:DIO, clock div:1
load:0x3fff0030,len:1184
load:0x40078000,len:13220
ho 0 tail 12 room 4
load:0x40080400,len:3028
entry 0x400805e4
SparkFun VL53L5CX Imager Example
Guru Meditation Error: Core  1 panic'ed (StoreProhibited). Exception was unhandled.

Core  1 register dump:
PC      : 0x400f3805  PS      : 0x00060a30  A0      : 0x800d1508  A1      : 0x3ffb2240
A2      : 0x3ffc2a18  A3      : 0x00000080  A4      : 0x00000000  A5      : 0x00000000
A6      : 0x00000001  A7      : 0x0000e100  A8      : 0x00000000  A9      : 0x3ffb2200
A10     : 0x00000001  A11     : 0x00000000  A12     : 0x00000000  A13     : 0x00000000
A14     : 0x3ffb8a74  A15     : 0x00000000  SAR     : 0x0000001c  EXCCAUSE: 0x0000001d
EXCVADDR: 0x00000005  LBEG    : 0x40086270  LEND    : 0x4008627b  LCOUNT  : 0xffffffff


Backtrace: 0x400f3802:0x3ffb2240 0x400d1505:0x3ffb2260 0x400d43ee:0x3ffb2290
```

Google search suggests this error is trying to write to a forbidden area. This script line 38:
myImager.setWireMaxPacketSize(128); // Increase default from 32 bytes to 128 - not supported on all platforms
Maybe this platform is not supported. Try >> 32. Nope!
But, if I allow (uncomment) this statement in Example2_FastStartup.ino, I get the same panic error. So this HAS to be the problem. Comment out line! NOW it works!!



Now to get it to work with a Raspberry Pi!