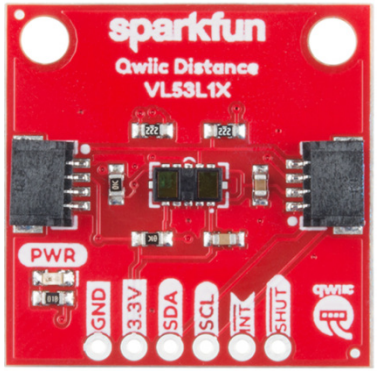
VL53L1X.

Capteur de distance ToF.



Caractéristiques :

Plage de mesure : de 4 cm à 4 m
Résolution : ± 1mm
Angle de mesure : de 15 à 27°
Alimentation : 3.3V 20 mW à 10 Hz
Interface : I²C sur bus Qwiic
Datasheet : VL53L1X

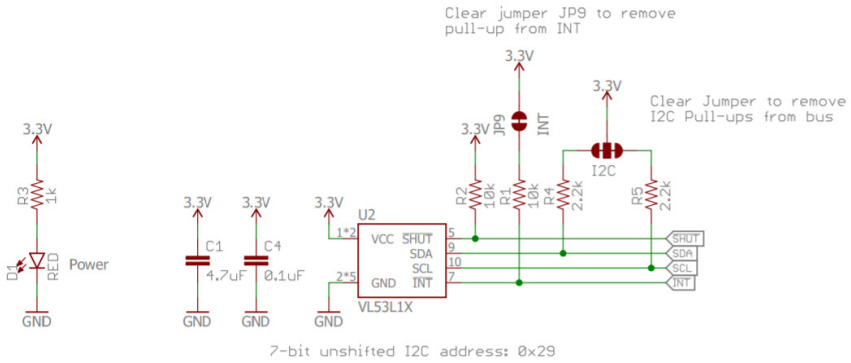
Applications :

- Mesure de distance et détection d'obstacles.
- Cartographie d'un environnement.

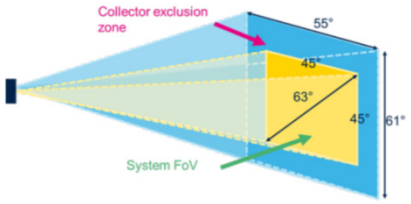
Principe physique.

Mesure de distance par temps de vol (ToF) utilisant un laser à 1940 nm.

Architecture du circuit.

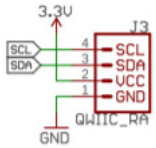


- Vitesse maximale de mesure : 50 mesures par seconde.
- Une version multizone existe : le VL53L5CX, elle permet de lire une matrice de distance de 8 x 8 éléments de 63° de diagonale

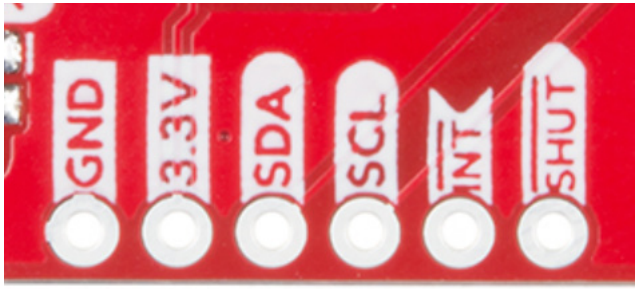


Interfaçage et brochages.

Connecteur Qwicc :



Bornes pour header.



- Masse (GND)
- Alimentation (3.3 V)
- SDA, SCL (I²C)
- Interruption, un flanc descendant indique une donnée prête (/INT).
- Mode faible consommation (/SHUT).

https://github.com/sparkfun/Qwiic_Distance_VL53L1X

Programmation pour un Arduino.

Librairie Sparkfun :
https://github.com/sparkfun/SparkFun_VL53L1X_Arduino_Library

```
//Be sure the vacuum tape has been removed from the sensor.
*/

#include <Wire.h>
#include "SparkFun_VL53L1X.h"

SFEVL53L1X distanceSensor;

void setup(void)
{
Wire.begin();// return 0  if init is OK
}

void loop(void)
{
//Write configuration bytes to initiate measurement
distanceSensor.startRanging();
while (!distanceSensor.checkForDataReady())
  {
    delay(1);
  }
// Read distance
int distance = distanceSensor.getDistance();
distanceSensor.clearInterrupt();
distanceSensor.stopRanging();
}
```

Programmation pour un Raspberry Pi.

Modules : https://github.com/sparkfun/Qwiic_VL53L1X_Py

```
import qwiic
import time

ToF = qwiic.QwiicVL53L1X()

while True:
    ToF.start_ranging()  # Write default configuration bytes
    time.sleep(.005)
    distance = ToF.get_distance()  # Read distance
    time.sleep(.005)
    ToF.stop_ranging()
```

Programmation pour un Raspberry Pi Pico.

Librairies et explications : https://core-electronics.com.au/tutorials/raspberry-pi-pico/piicodev-distance-sensor-vl53l1x-raspberry-pi-pico-guide.html

```
from PiicoDev_VL53L1X import PiicoDev_VL53L1X
from time import sleep

distSensor = PiicoDev_VL53L1X()
while True:
    dist = distSensor.read() # read the distance in mm
    print(str(dist) + " mm")
    sleep(0.1)
```

Fournisseurs :

Antratek VL53L1X : 26.56 TVAC
https://www.antratek.com/distance-sensor-breakout-4-meter-vl53l1x-qwiic

Elektor VL53L1X : 20.12 € TVAC
https://www.elektor.fr/sparkfun-distance-sensor-breakout-4-m-vl53l1x-qwiic

Antratek VL53L5CX : 30.19 TVAC
https://www.antratek.com/tof-imager-vl53l5cx-qwiic

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