Physics 524

Survey of Instrumentation and Laboratory Techniques 2025, 2026

University of Illinois at Urbana-Champaign

Unit 4b: Proximity

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Goal for this unit

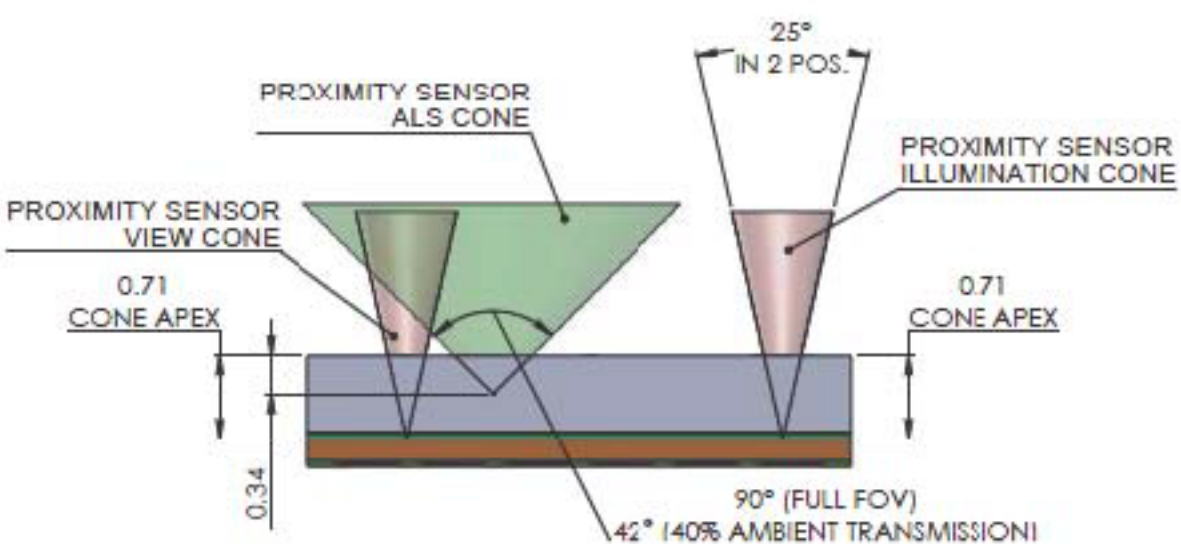
- Learn to use a VL6180X "Time of Flight Distance Ranging Sensor," a LIDAR-based I2C device that measures distances from roughly 5 mm to 200 mm.

First things first

Install an Adafruit VL6180X sensor on your breakout board. Be sure to peel off the protective cover on top of the LIDAR sensor in the center of the breakout board. Get the demo code in the Examples menu running.

The device

Here's a schematic representation of the sensor. According to STMicroelectronics[1], it uses an 850 nm (infrared) laser to figure out the distance from the sensor to the object it is laser-illuminating.



The Adafruit breakout board we're using is shown in the next picture.

[1] https://www.st.com/en/imaging-and-photonics-solutions/vl6180x.html

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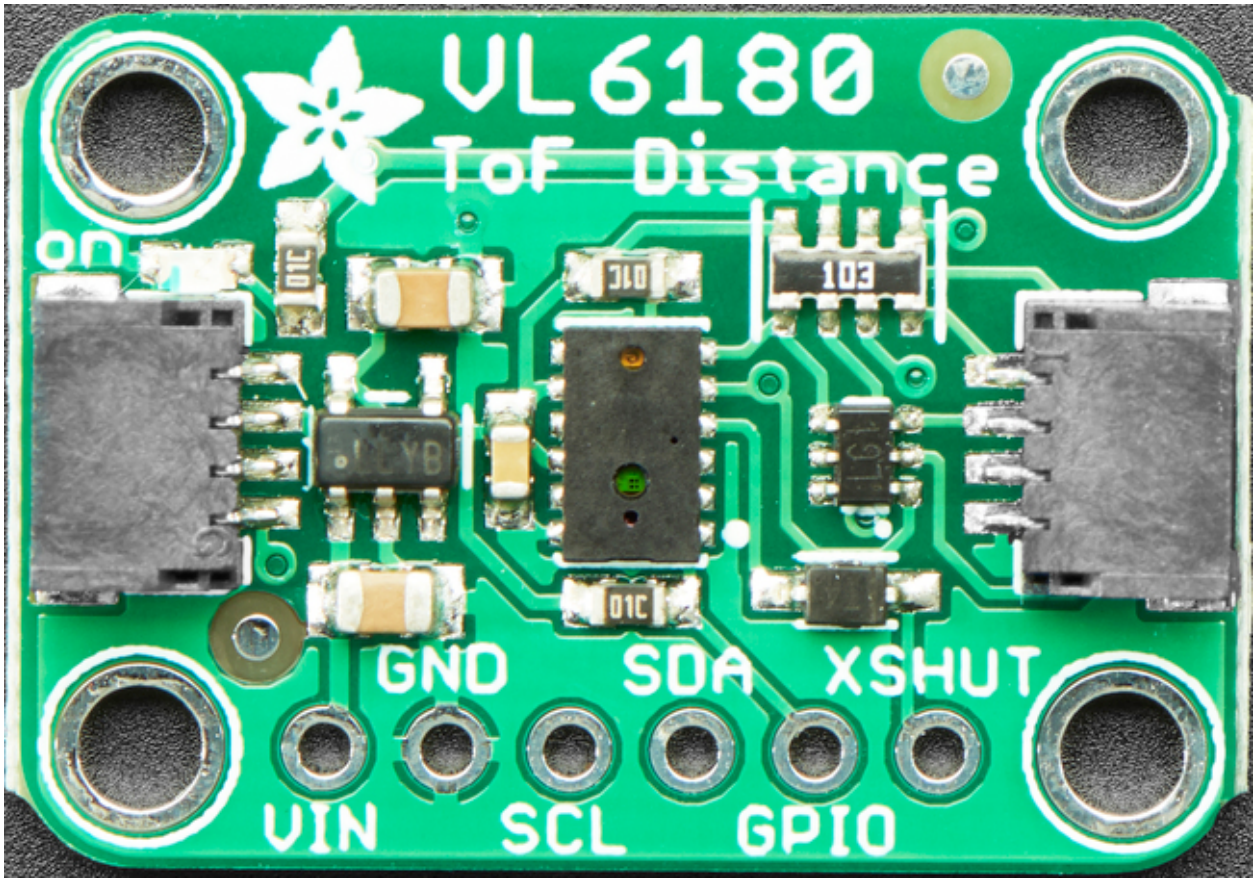

Add to the example code to allow the user to specify a distance threshold in the code, and to light the Arduino's on-board red LED whenever the distance is found by the VL6180X to be less than the specified value.

Homework assignment for this unit

On-the-fly parameters

Modify your program to accept an integer input from the serial monitor's input field and use this on the fly to decide when to illuminate the Arduino's red LED.

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