

## Example code for Time-of-Flight migration from VL6180 to VL53L4CD, a high accuracy and low power proximity sensor



### Product status link

[STSW-IMG049](#)

## Features

- Complete technical package including:
  - STSW-IMG049\_STD an example code to demonstrate how to replicate the standard functions of the VL6180 using the VL53L4CD
  - STSW-IMG049\_ECE an example code to evaluate the VL53L4CD features used to minimize power consumption.
  - AN6147 technical application note.
  - Step-by-step user guide included in the technical packages to define how to use these example codes.
- Benefits of the migration from VL6180 to VL53L4CD, high accurate and low power proximity sensor:
  - Detects people up to 1.3 meters distance with high precision.
  - Integrates a completely invisible 940 nm VCSEL laser emitter.
  - Features a 18° field of view, providing focused sensing capabilities.
  - Offers improved accuracy and linearity down to 1 mm thanks to a new generation laser emitter.
  - Simplified software integration facilitates a user-friendly experience.
  - Pin-to-pin compatible with:
    - VL53L4CX for long-distance ranging (up to 600 cm) or performance under ambient light conditions (up to 180 cm)
    - VL53L4ED for industrial applications requiring an extended temperature range (-40°C to 105°C)
- For applications previously using the ambient light sensor integrated in the VL6180X, a separate ALS chip such as the VD6283 by STMicroelectronics is recommended, which is compact in size and integrates seamlessly.

## Application

Proximity ranging applications such as:

- Wall tracking and cliff detection for robotics
- System activation and presence detection
- Touchless switch
- Ultra-low power consumption for battery-powered devices including:
  - Access control
  - Sanitary (faucets, dispensers, etc.)
  - Home appliances (thermostats, lighting control)
- Fast ranging:
  - Bar code readers
  - Biometric distance applications
  - Virtual fences

- Liquid (water, milk, soda, oil, fuel) level measurement solution for:
  - Home appliance devices
  - Industrial applications
  - Smart farming including rice paddies, milk collectors, and food containers for pet feeding
  - Sanitary devices
  - Smart housing and smart buildings

## Description

The STSW-IMG049 is specially designed to help you migrate from your VL6180-based solution to an enhanced solution using the VL53L4CD, before the VL6180 end of production. The package includes two example codes designed to support migration. The first example code, STSW-IMG049\_STD, introduces the standard functions. It shows how to initialize the VL53L4CD and its functions compared to its predecessor. The second code example, STSW-IMG049\_ECE, compares an optimized version of the ultralow power (ULP) feature of the VL53L4CD sensor to the early convergence estimate (ECE) feature of the VL6180, used to minimize the power consumption.

As the VL6180, the VL53L4CD sensor is specifically designed for proximity and short-range measurements with low power consumption. Compared to its predecessor, the VL53L4CD provides more accurate distance measurements over a wider measurement distance range from only 1 mm up to 1300 mm.

The VL53L4CD replaces the VL6180 which was the world's first all-in-one Time-of-Flight sensor. The VL53L4CD features a ranging speed up to 100 Hz, easy-to-use evaluation and integration software, but also a new generation laser emitter, completely invisible 940 nm VCSEL, offering improved performance under ambient light.

The VL53L4CD sensor features also ultralow power mode for continuous FoV monitoring. It has a minimal power consumption, down to 55  $\mu$ A (see the AN5870), which is optimized for battery-powered devices. Such integrated on-chip processing reduces design complexity and the BOM (bill of material) cost. These features allow the use of more power-efficient, therefore cost-effective, microcontrollers.

## Revision history

**Table 1. Document revision history**

Date	Version	Changes
24-Jul-2024	1	Initial release

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