Features

- The same, unique solution supports the:
  - VL53L5CX, Time-of-Flight (ToF), 8x8 multizone ranging sensor, which has a 65° field of view (FoV)
  - VL53L7CX, ToF, 8x8 multizone ranging sensor, with 90 degrees FoV
  - VL53L8CX, low-power high-performance 8x8 multizone ToF sensor
- Gesture recognition, based on STMicroelectronics' ToF technology:
  - Hand-tracking: accurate real-time position of the user hand in the cartesian co-ordinate system (X, Y, and Z)
  - Tap: single and double
  - Swipe: left, right, up, and down
  - Level control
- Ready to use solution allowing easy integration:
  - Complete application example for the STM32F401 microcontroller, showing the library integration in an MCU project, sensor configuration, and crosstalk calibration example
  - Turnkey gesture library on several Arm® Cortex® microcontroller units
- Intuitive GUI to discover the gesture recognition:
  - This solution is 100% compatible with the three products
  - Multiple graphical widgets (gesture recognition, hand tracker, photo viewer, slide show control, and more)
  - Data logging function to replay and debug
- Benefits of gesture recognition, based on FlightSense technology:
  - Full privacy, no image, no camera
  - Independent of target reflectance. Gesture recognition performs well even when wearing gloves
  - "All-in-one sensor" easy to integrate, and can be hidden behind a dark cover glass
  - Low power consumption and ease of integration in any architecture

Application

- Home appliances and home automation:
  - Kitchen appliances (such as coffee machine, cooking plate, oven)
  - Smart home (thermostats, control panels, and so on)
  - Smart lighting
- Personal electronics:
  - Laptops
  - AR/VR headsets
  - Tablets and smartphones
  - Smart speakers
Multiple other applications:
  – Robotics (service and educational robots)
  – Sanitary devices
  – Vending machines
  – Elevator call buttons

Description

The STSW-IMG035 is a simple and robust gesture recognition solution. It runs on the VL53L5CX, the VL53L7CX, and now supports the VL53L8CX ToF sensors. The software includes a complete development ecosystem with ready-to-use example code and intuitive GUI for reduced design times.

The same, unique software supports the three sensors. The gesture recognition algorithms can detect multiple motions. They include: single and double tap, swiping in four directions (left, right, up, and down), and level control.

Thanks to the libraries available in the package, the application can run on microcontrollers that are based on Cortex® M0+, M3, M33, M4, and M7. The package includes: the GUI executable, example code for the NUCLEO-F401RE board, libraries for supported Cortex® cores, and an easy-to-read user manual.

To run the GUI, a Nucleo expansion board (X-NUCLEO-53L5A1, X-NUCLEO-53L7A1, or X-NUCLEO-53L8A1) is required, with a NUCLEO-F401RE Nucleo board. In addition, you can use the breakout boards (VL53L5CX-SATEL, SATEL-VL53L7CX, or SATEL-VL53L8) connected to the STM32 Nucleo board.

One major advantage of this gesture solution is that it provides full privacy. This is thanks to the multizone computing distance information of STMicroelectronics' ToF sensors (no image, no camera). The performances are independent of target reflectance. The solution works even with gloves or in low light conditions, unlike camera-based solutions.

The gesture recognition mode can be combined with the distance measurement mode of the ToF sensors. This allows user detection and system activation use-cases. The small size of the sensors makes them easy to integrate, and they can be hidden behind a dark cover glass.

The VL53L5CX and VL53L7CX are based on the same architecture, and are pin-to-pin compatible.

Gesture recognition can be used to enhance numerous applications and end-products. It perfectly fits to home appliances devices like coffee machines, cooking plates or ovens. In public places, it could control vending machines, elevator call buttons, and more. Personal electronics can also benefit from gesture recognition: especially in smart speakers, laptops, tablets, or AR/VR headsets.
### Revision history

**Table 1. Document revision history**

<table>
<thead>
<tr>
<th>Date</th>
<th>Version</th>
<th>Changes</th>
</tr>
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<tbody>
<tr>
<td>07-Apr-2022</td>
<td>1</td>
<td>Initial release</td>
</tr>
<tr>
<td>30-Jun-2022</td>
<td>2</td>
<td>Updated &quot;Features&quot; and &quot;Description&quot; with two more swiping possibilities.</td>
</tr>
<tr>
<td>24-Mar-2023</td>
<td>3</td>
<td>Included the VL53L7CX product in this document.</td>
</tr>
<tr>
<td>06-Jun-2023</td>
<td>4</td>
<td>Included support for the VL53L8CX</td>
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