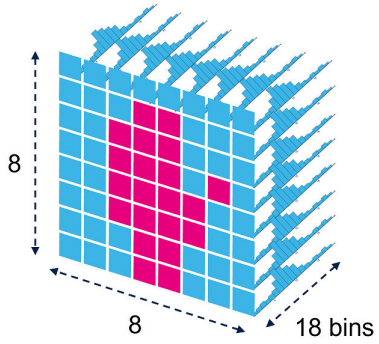
STSW-IMG043

Data brief

Software package for the VL53L7CH and VL53L8CH artificial intelligence enabler multizone Time-of-Flight sensors



Product status link
STSW-IMG043

Features

- The same unique software package supports the:
  - VL53L7CH, artificial intelligence (AI) enabler, Time-of-Flight (ToF), 8x8, multizone sensor with 90° field of view (FoV).
  - VL53L8CH, AI enabler, high performance, 8x8, multizone, ToF sensor.
- A compact and normalized histogram (CNH) data output for artificial intelligence (AI) with:
  - Multizone data output in up to 64 separate zones.
  - Histogram output and signal counts for each bin.
  - Ability to program the histogram size of up to 128 bins.
  - Minimum bin width down to 37 mm.
  - Ambient infra red (IR) light level reported for each zone.
  - Availability of the CNH and all ToF processed data (such as distance, signal amplitude, and reflectance).
- Ready to use solution allowing easy integration into the:
  - Ultra lite driver (ULD) source code.
  - Linux driver based on the ULD.
  - STM32 project source code, running on the STM32F401.
  - Python script examples.
- Intuitive graphical user interface (GUI) to discover the CNH including:
  - A solution, which is 100% compatible for both products.
  - Multiple graphical widgets (CNH plots, curve plots, and more).
  - A data logging function to replay and debug.

Application

- AI applications requiring multizone raw data.
- Cup rim detection for coffee machines and beverage dispensers.
- Floor sensing for robotics and vacuum cleaners.
- Gesture motion and hand posture recognition.
- People counting for smart building and smart homes.

Description

The STSW-IMG043 is the software package of the VL53L7CH and the VL53L8CH. The CNH innovative data output is specially designed for AI applications requiring multizone, raw data from a high performance, multizone, ToF sensor.

The same, unique software package supports both sensors. The software includes a complete development ecosystem with drivers, intuitive GUI, and basic Python scripts that give reduced design times. An STM32 project source code running on the STM32F401 completes the software package. A Linux driver can be used in the user space or kernel thanks to compilation keys.

The IR signal measured in each zone is sent as raw data to the host through each bin of the histogram. Highly configurable, the user can program the resolution of the sensors in up to 64 zones (8x8 zones). It is also possible to define the bin width, and modify the histogram resolution in up to 128 bins. All CNH data and standard ToF sensor data (ranging distance, signal level, and reflectance) are transmitted to the host at speeds of up to 30 Hz. Transmission is through I²C in the VL53L7CH, and through SPI in the VL53L8CH.

The CNH data transform the STMicroelectronics' ToF ranging sensor into a versatile optical sensor. This development enables endless AI-based applications. The ability to send both CNH raw data and standard ranging data to the host, opens the door to many new applications beyond simple distance measurements. From solid material (including carpet, wood, glass, and mirror) to gas or liquid (water, oil, and chemicals), it becomes possible to sense the floor material for robotics, to detect the location and size of a cup in a coffee machine, and to develop advanced shape, motion, or hand posture recognition.

Revision history

Table 1. **Document revision history**

Date	Version	Changes
21-Jun-2023	1	Initial release

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