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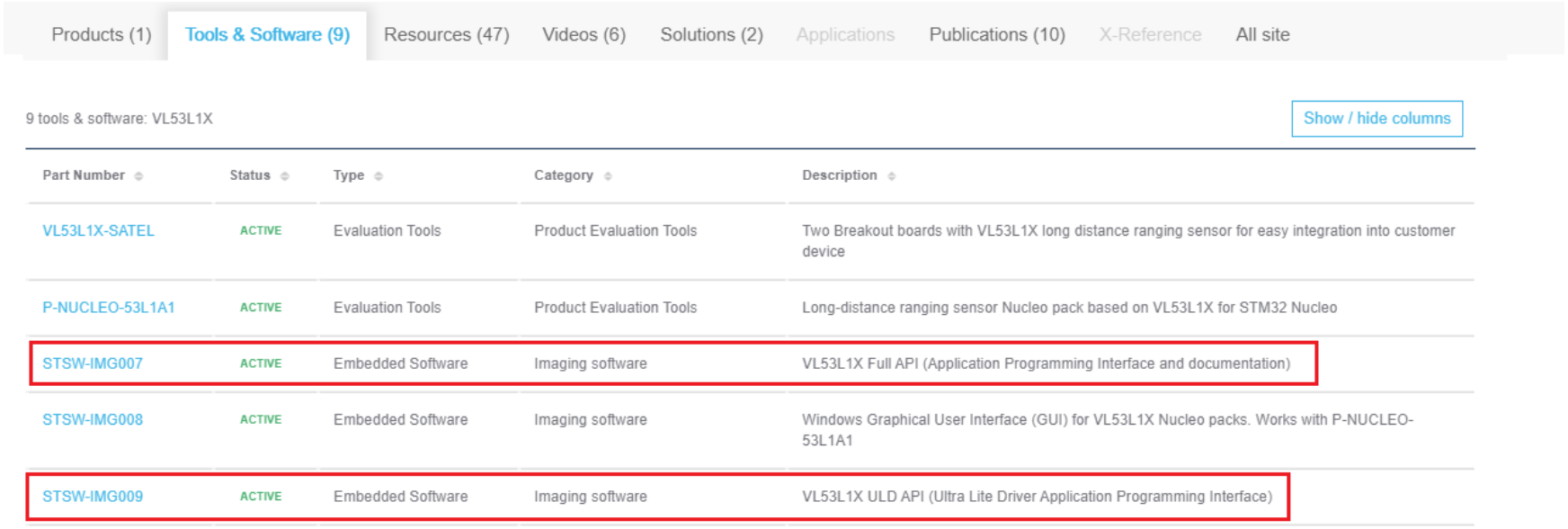
How to update the VL53L1X drivers in the existing X-CUBE-53L1A1 projects.

Where to download the latest VL53L1X drivers

- We recommend to update the drivers in the X-CUBE-53L1A1 to benefit the latest performances and bug corrections.
- The latest drivers can be download here
- To check the driver version please refer to slide #6



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9 tools & software: VL53L1X

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Part Number	Status	Type	Category	Description
VL53L1X-SATEL	ACTIVE	Evaluation Tools	Product Evaluation Tools	Two Breakout boards with VL53L1X long distance ranging sensor for easy integration into customer device
P-NUCLEO-53L1A1	ACTIVE	Evaluation Tools	Product Evaluation Tools	Long-distance ranging sensor Nucleo pack based on VL53L1X for STM32 Nucleo
STSW-IMG007	ACTIVE	Embedded Software	Imaging software	VL53L1X Full API (Application Programming Interface and documentation)
STSW-IMG008	ACTIVE	Embedded Software	Imaging software	Windows Graphical User Interface (GUI) for VL53L1X Nucleo packs. Works with P-NUCLEO-53L1A1
STSW-IMG009	ACTIVE	Embedded Software	Imaging software	VL53L1X ULD API (Ultra Lite Driver Application Programming Interface)

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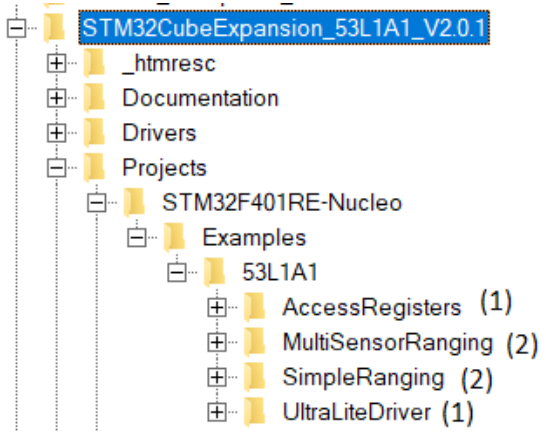
The two driver versions

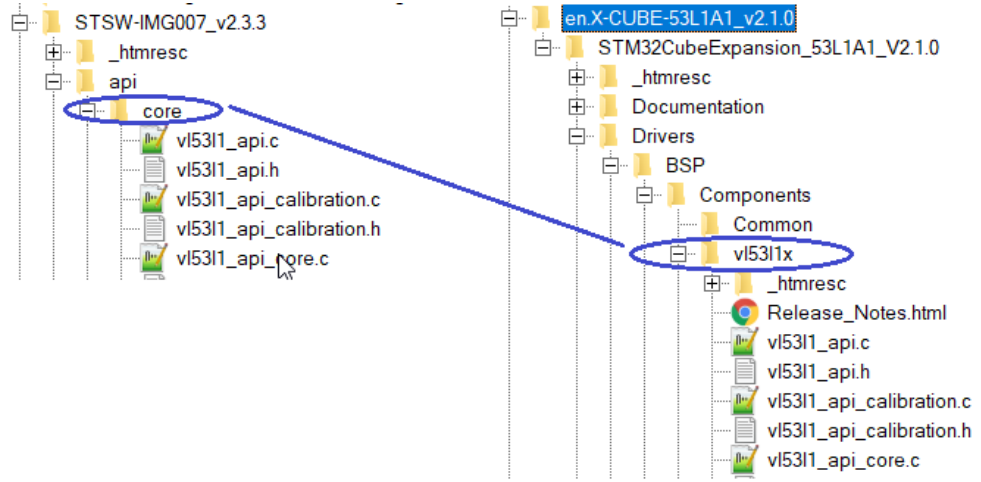
- STSW-IMG007 driver is used in MultiSensorRanging and SimpleRanging examples.
- STSW-IMG009 driver is used in the UltraLiteDriver and AccesRegisters examples
- The main differences between the two drivers are explained in the slide #5



(1) STSW-IMG007 (Full API)
(2) STSW-IMG009 (Ultra Lite Driver API)

Driver update the procedure

- The following procedure explains how to update the stsw-img007 driver, but the same procedure can be followed to update the stsw-img009
- Download and unzip stsw-img007
- Copy all *.c and *.h files in **api/core** into **Drivers/BSP/Components/vl53l1x** and replace the old *.c and *.h files.



- Rebuild the project and ensure that the compilation is successful.

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Ultra Lite Driver vs Full Driver

- There are two drivers for the VL53L1X used in the X-CUBE-53L1A1. Historically the VL53L1X_API (Full API) is the first driver and the VL53L1X_ULD_API (ULD) is the second.
- Functionally, both drivers have the same features. The ULD has much smaller code size and more direct access to the register write while the Full API code size is bigger and divided on several files. If the user doesn’t need to have the exact timing budget (TB) setting it is much more benefit to go with the ULD. For 99.9% of the cases, I don’t see the need to have continuous values of TB [20, 500 ms]. The discrete TB [15, 20, 30, 50,100, 200, 500] proposed in ULD covers largely the different use cases.
- Do not confuse Timing budget and Intermeasurement Period (IP). The TB is the ranging time during which on the device send the pulses of photons and the device computes the distance. The longer TB is, the more the accuracy is but also the more the device consumes the power.
- To set the measurement period use IP.
  - For example, to check if someone approaching a vending machine you just need to set the IP at 1s while for the vacuum cleaner to detect the stair we need faster response, set the IP to 30ms. In both cases the TB can be set to 20 ms to save the power.

Check the Driver version

- *The driver version can be read from the VL53L1_def.h file. Version 2.3.3*

```
/** VL53L1 IMPLEMENTATION major version */
#define VL53L1_IMPLEMENTATION_VER_MAJOR       2
/** VL53L1 IMPLEMENTATION minor version */
#define VL53L1_IMPLEMENTATION_VER_MINOR       3
/** VL53L1 IMPLEMENTATION sub version */
#define VL53L1_IMPLEMENTATION_VER_SUB         3
/** VL53L1 IMPLEMENTATION sub version */
#define VL53L1_IMPLEMENTATION_VER_REVISION  1885
```