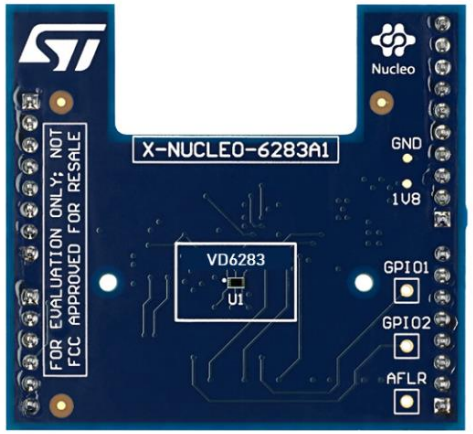

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Quick Start Guide

Hybrid filter multispectral sensor with light flicker engine multi target sensor expansion board based on VD6283 for STM32 Nucleo

Version 1.0 (Apr 22, 2021)

Agenda

1. Hardware and Software overview
2. Documents & Related Resources
3. STM32 Open Development Environment: Overview

1- Hardware and Software overview

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Ambient Light Sensor expansion board
Hardware Overview (1/2)

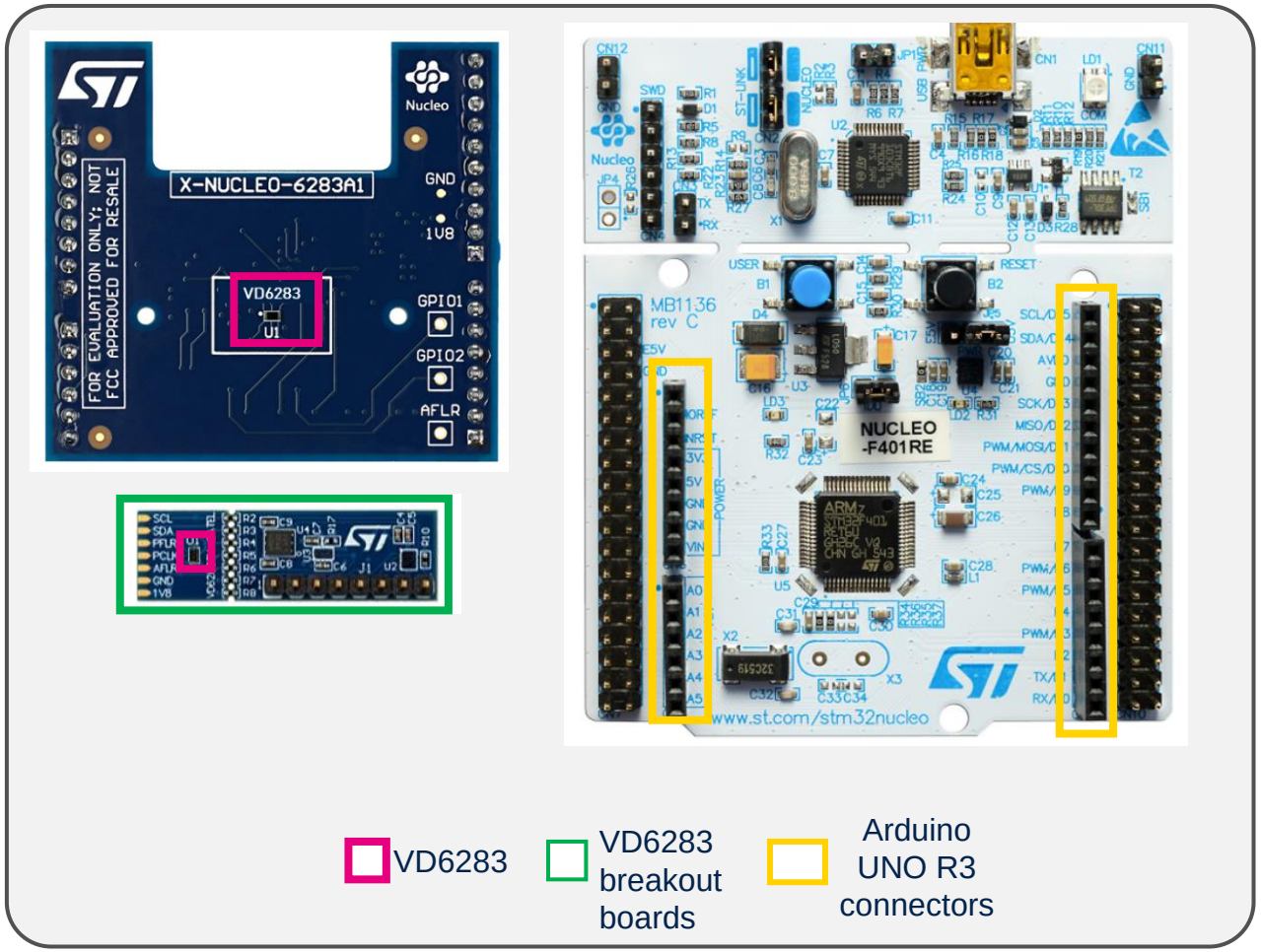
X-NUCLEO-6283A1 Hardware Description

- The X-NUCLEO-6283A1 is a hybrid filter multispectral sensor with light flicker engine multi target sensor and development board designed around the VD6283 sensor based on ST Ambient Light Sensor technology
- The VD6283 communicates with the STM32 Nucleo developer board host microcontroller through an I^2C link available on the Arduino UNO R3 connector.

Key Products on board

VD6283 ambient light with multi target detection detection sensor module

VD6283 breakout boards



Order Code: **X-NUCLEO-6283A1**

Latest info available at www.st.com
X-NUCLEO-6283A1

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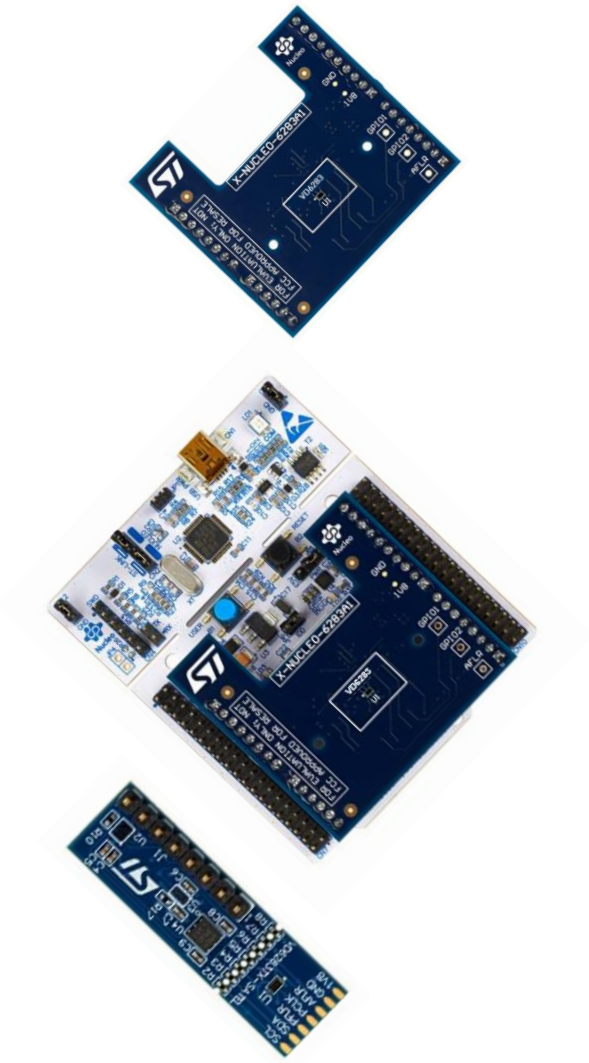
Ambient Light Sensor expansion board
Hardware Overview (2/2)

- X-NUCLEO-6283A1 expansion board
  - VD6283 devices in custom applications can be integrated with expansion board, or external VD6283 breakout.
  - The breakout boards are delivered separately.
- X-NUCLEO-6283A1 is also available as a NUCLEO Pack (P-NUCLEO-6283A1)
  - The X-NUCLEO-6283A1 expansion board can also be ordered on www.st.com as part of a NUCLEO Pack with expansion board and STM32 NUCLEO board.
  - Order code: **P-NUCLEO-6283A1**:
    X-NUCLEO-6283A1 expansion board and NUCLEO-F401RE full features board.
- VD6283 breakout boards can be ordered separately
  - Order code: **VD6283-SATEL**



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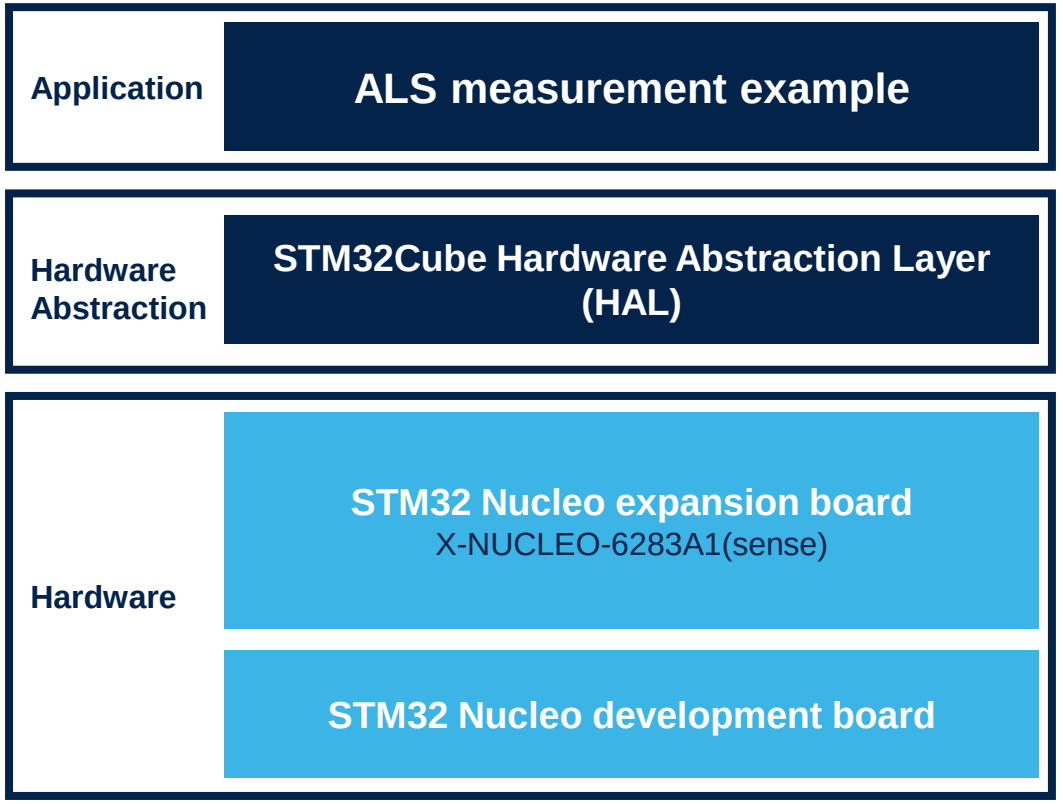
Ambient Light Sensor expansion board STM32Cube Software Overview

X-CUBE-ALS software description

- The X-CUBE-ALS software package is an STM32Cube expansion for the X-NUCLEO-6283A1 expansion board for STM32. The source code is based on STM32Cube to ease portability and code sharing across different STM32 MCU families. An sample implementation is available for the STM32 Nucleo ambient light sensor expansion board (X-NUCLEO-6283A1) plugged on top of an STM32 Nucleo development board (NUCLEO-F401RE or NUCLEO-L476RG).

Key features

- Driver layer (VD6283A1 API) for complete management of the VD6283A1 ambient light sensor integrated in the X-NUCLEO- VD6283A1 expansion board.
- Easy portability across different MCU families, thanks to STM32Cube.
- Free, user-friendly license terms.
- Sample code for ambient light measurement.



Latest SW available at www.st.com
X-CUBE-6283A1

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2- Setup & Demo Example

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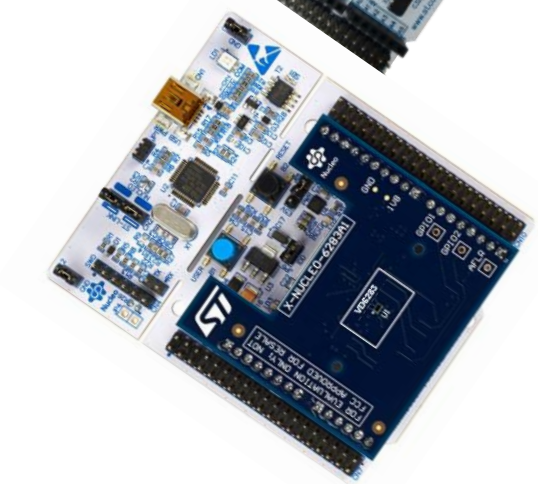
Setup & Demo Examples
HW prerequisites

- 1x Ranging sensor expansion board based on VD6283 (**X-NUCLEO-6283A1**).
- 1x STM32 Nucleo development board (**NUCLEO-F401RE**)
- 1x Laptop/PC with MS Windows
- 1x USB type A to Mini-B USB cable
- If you don’t have an STM32 Nucleo development board, you can order a Nucleo pack (**P-NUCLEO-6283A1)**:
  - X-NUCLEO-6283A1 expansion board and NUCLEO-F401RE full features board delivered together.

X-NUCLEO-6283A1

NUCLEO-F401RE



P-NUCLEO-6283A1

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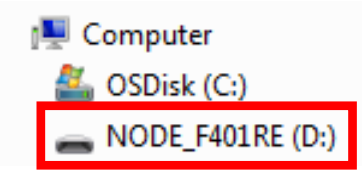
Setup & Demo Examples
SW prerequisites

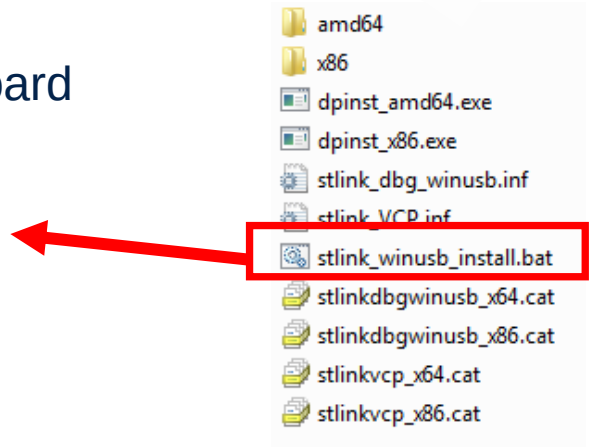
- **STSW-IMG016**: P-NUCLEO-6283A1 Graphical User Interface (GUI) on Windows 7 and 10
- **X-CUBE-6283A1**: P-NUCLEO-6283A1 software expansion. Copy the .zip file content into a folder on your PC; the package will contain the API software driver, a simple ranging source code example (Keil, IAR, STM32CubeIDE) based on NUCLEO-F401RE for STM32Cube, and all the necessary documentation.

Setup & Demo Examples
NUCLEO Kit driver installation

1. Connect the Nucleo pack to the PC through USB
   - Wait for the board to be recognized; the drivers are installed automatically)
   - If Windows cannot install automatically the STLINK driver, please follow step 2



2. Install the PC USB port driver to detect the Nucleo board
   - Called **STSW-LINK009**, downloaded from www.st.com
   - Unzip, extract the docs, and install "stlink_winusb_install.bat"



=> VD6283 NUCLEO Kit is ready for GUI installation

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VD6283 GUI software installation

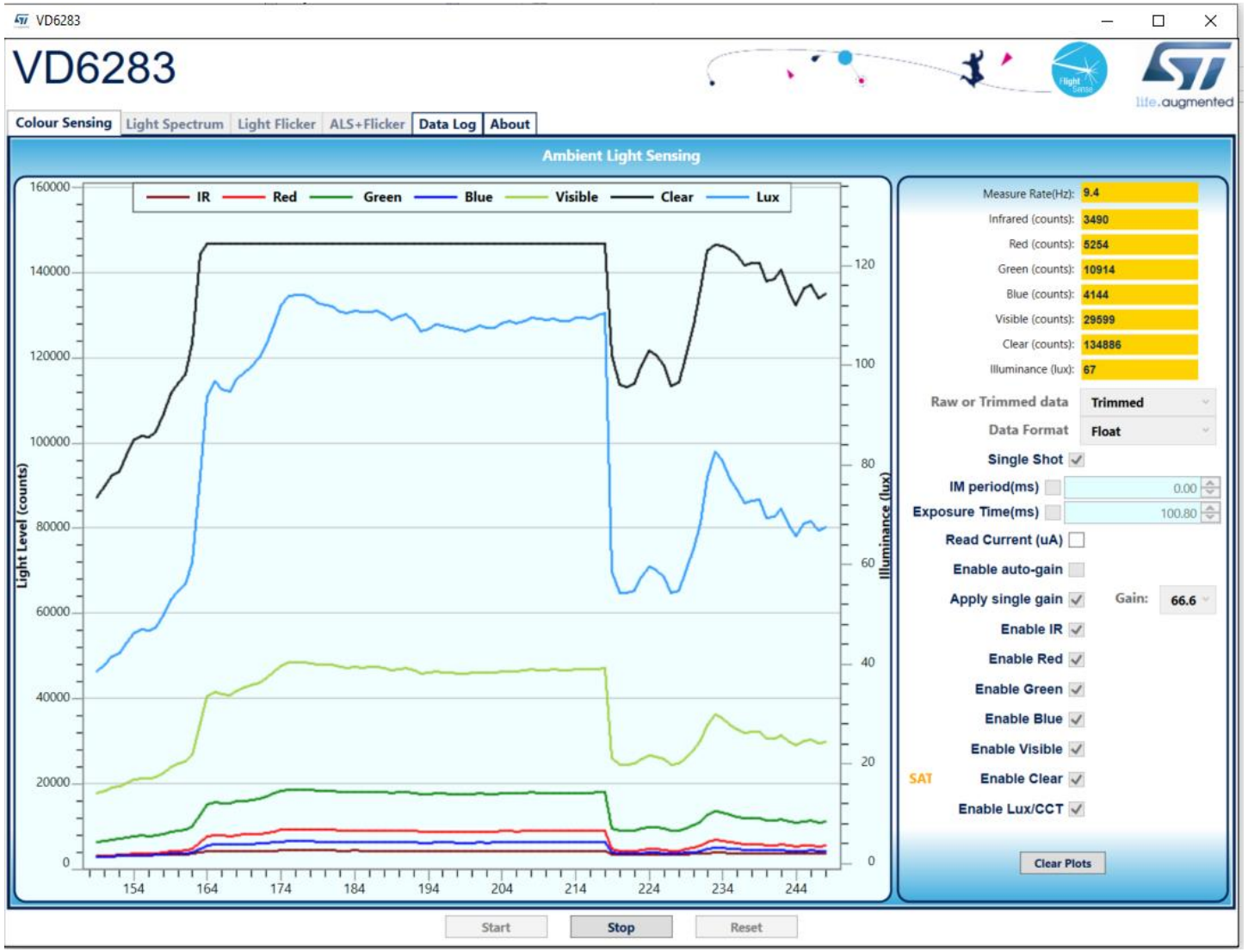
GUI is generally the first step to evaluate the device

- Perform HW installation and connect the VD6283 NUCLEO pack(X-NUCLEO-6283A1 expansion board + STM32 Nucleo board) to the PC
- Install the GUI SW for VD6283 Demo and configuration settings
  - Called **STSW-IMG301**, downloaded from www.st.com
  - Unzip, extract the docs, and install “**VD6283_setup.exe**”
  - **Run the installer with Admin privileges**

The Graphical User Interface can:

- Evaluate ALS data
- Evaluate Flicker data
- Change key parameters of VD6283
- Display real time main data (ALS, Lux, CCT, Flicker),
- Get data logging (.csv file)

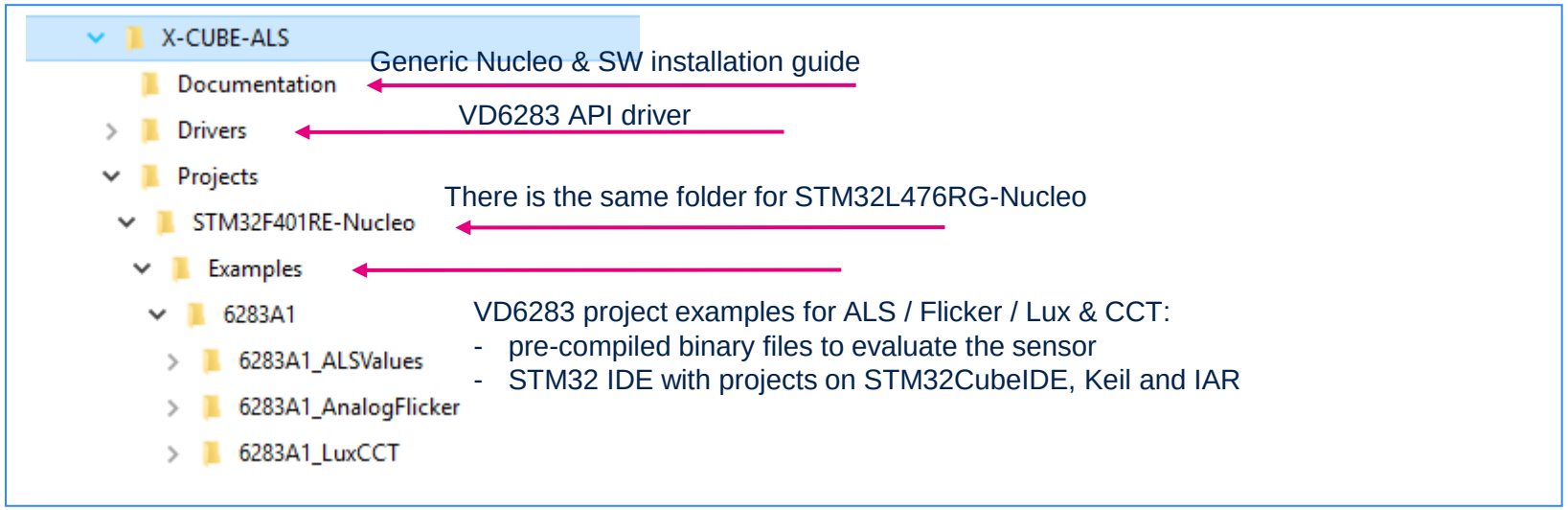
Setup & Demo Examples
VD6283 GUI software installation



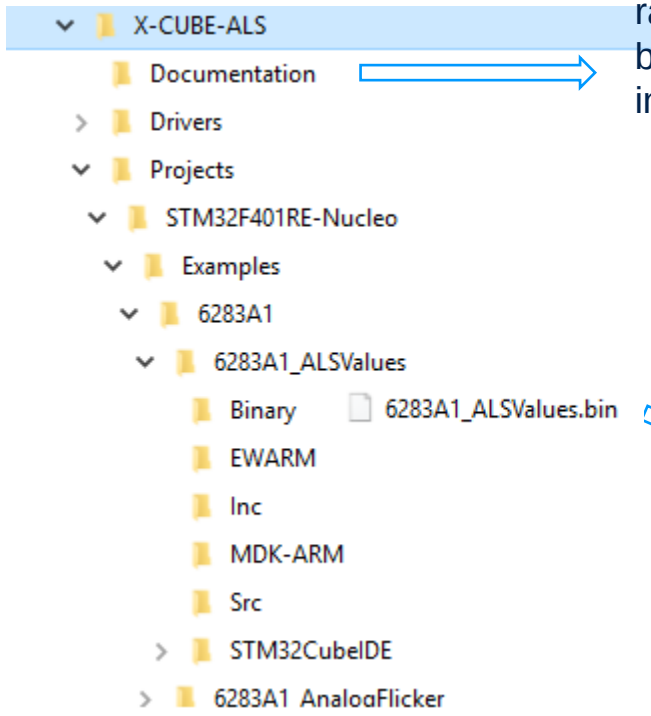
Setup & Demo Examples
X-CUBE-ALS software installation

- Perform HW installation and connect the NUCLEO kit (P-NUCLEO-6283A1) to the PC
- Install the X-CUBE-ALS SW package
  - Called **X-CUBE-ALS**, downloaded from www.st.com
  - Unzip, extract the docs, and the **X-CUBE-ALS** folder directory appears

X-CUBE software package contents: API SW + SW examples

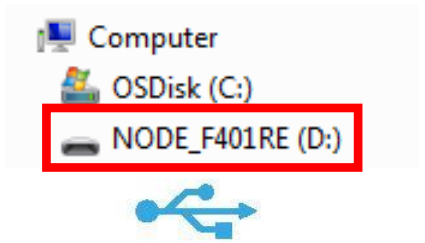


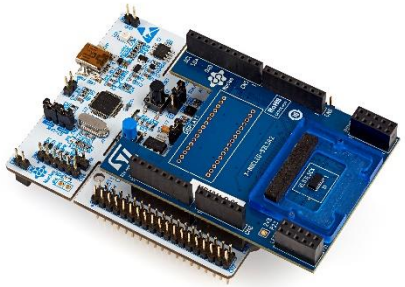
VD6283 Ambient Light Sensor expansion board
Evaluation code example (.bin) using X-CUBE-ALS and a NUCLEO Pack



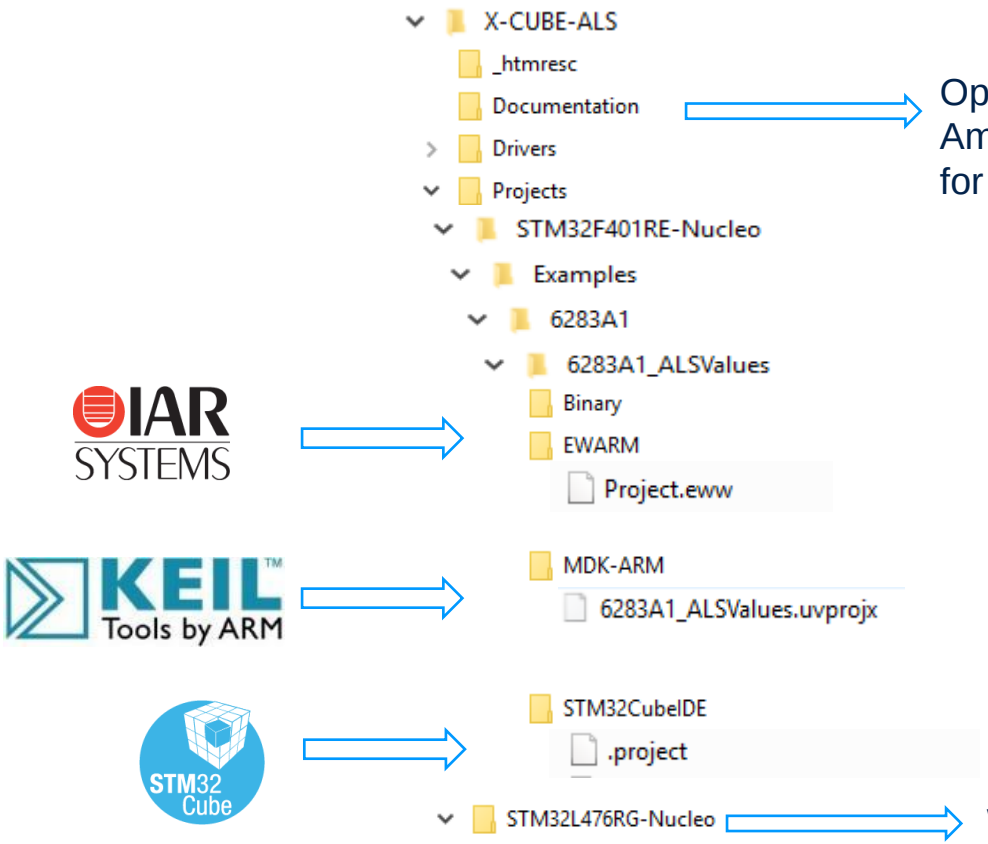
Open: **UM2867** (Getting started with X-NUCLEO-ALS ranging sensor with multi target detection expansion board based on for STM32 Nucleo) and follow the instructions

Drag and drop to





VD6283 Ambient Light Sensor expansion board
Start programming with code examples using X-CUBE-ALS and a NUCLEO Pack



Open: **UM2867** (Getting started with X-NUCLEO-ALS Ambient Light Sensor expansion board based on VD6283 for STM32 Nucleo) and follow the instructions

Open project example for
ALS Values measurement
And
Modify, build application SW

We find same folders and same files as above

3- Documents & Related Resources

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Documents & Related Resources

Go to https://www.st.com/en/imaging-and-photonics-solutions/ambient-light-sensors/vd6283tx.html
All documents are available in the DESIGN tab of the related products webpage

VD6283: Product Folder

- **DS13380**: Ambient Light Sensor - **data sheet**

X-NUCLEO-ALS: Product Folder

- **DB4481**: Ambient Light Sensor expansion board based on VD6283 for STM32 Nucleo – **data brief**
- **X-NUCLEO-ALS-6283A1 Quick start guide :** Long distance ambient light sensor expansion board **-** (this document)
- **UM2858:** Getting started with X-NUCLEO-ALS Ambient Light Sensor expansion board based on VD6283 for STM32 Nucleo - **user manual**

P-NUCLEO-6283A1: Product Folder

- **DB4484**: VD6283 nucleo pack with X-NUCLEO-6283A1 expansion board and STM32F401RE nucleo board – **data brief**

STSW-IMG301: Graphical User Interface (GUI) Folder

- **DB4496**: P-NUCLEO-6283A1 pack graphical user interface (GUI) – **data brief**
- **Software setup file**

STSW-IMG302: Application programming Interface (VD6283 software driver API) folder

- **DB4497**: VD6283 Ambient Light Sensor application programming interface (API) – **data brief**

X-CUBE-ALS: Software package for STM32Cube

- **DB4491:** Ambient Light Sensor expansion of STM32Cube – **data brief**
- **User Manual** integrated to the zip
- **Software setup file**

4- STM32 Open Development Environment: Overview

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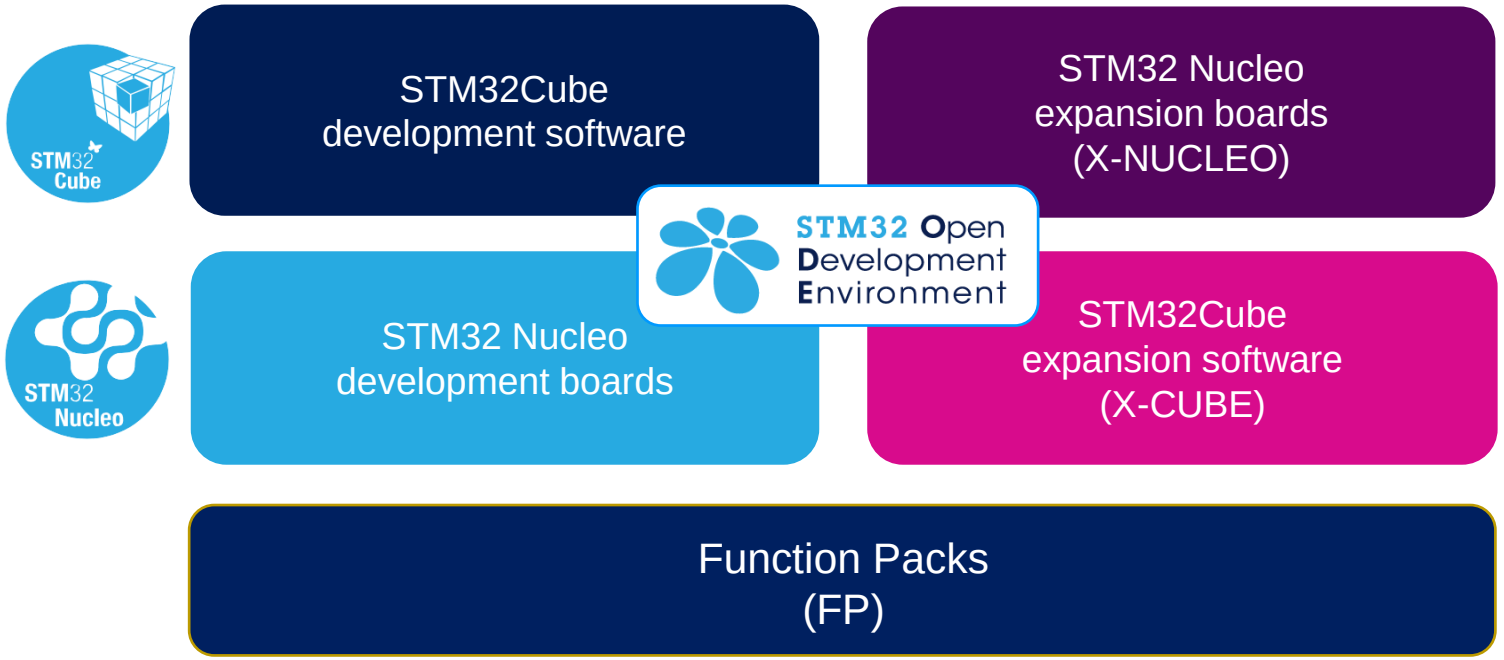
STM32 Open Development Environment
Fast, affordable Prototyping and Development

- The STM32 Open Development Environment (STM32 ODE) is an open, flexible, easy, and affordable way to develop innovative devices and applications based on the STM32 32-bit microcontroller family combined with other state-of-the-art ST components connected via expansion boards. It enables fast prototyping with leading-edge components that can quickly be transformed into final designs



For further information, please visit www.st.com/stm32ode

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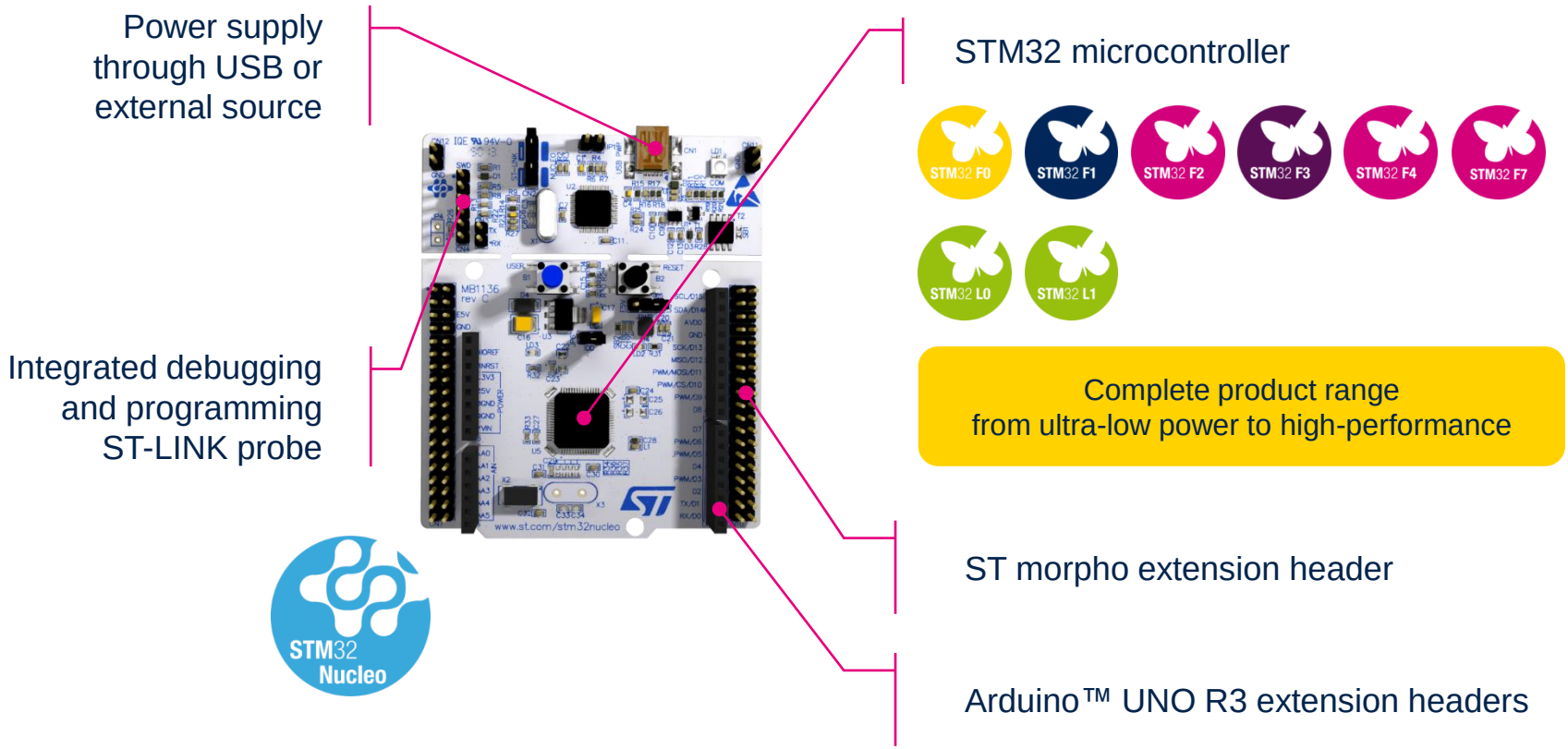
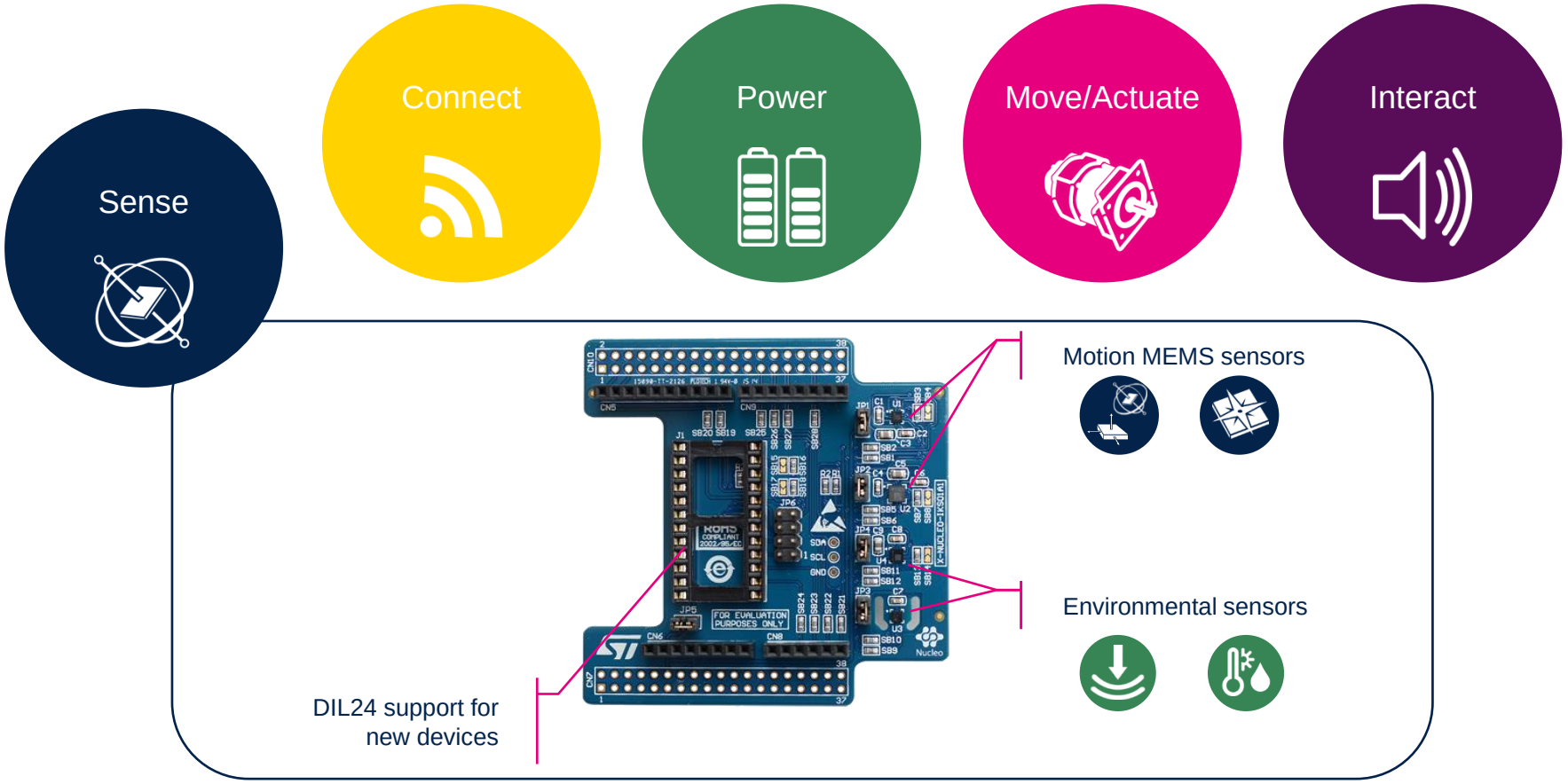
STM32 Nucleo
Development Boards (NUCLEO)

- A comprehensive range of affordable development boards for all the STM32 microcontroller series, with unlimited unified expansion capabilities and integrated debugger/programmer functionality.



STM32 Nucleo
Expansion Boards (X-NUCLEO)

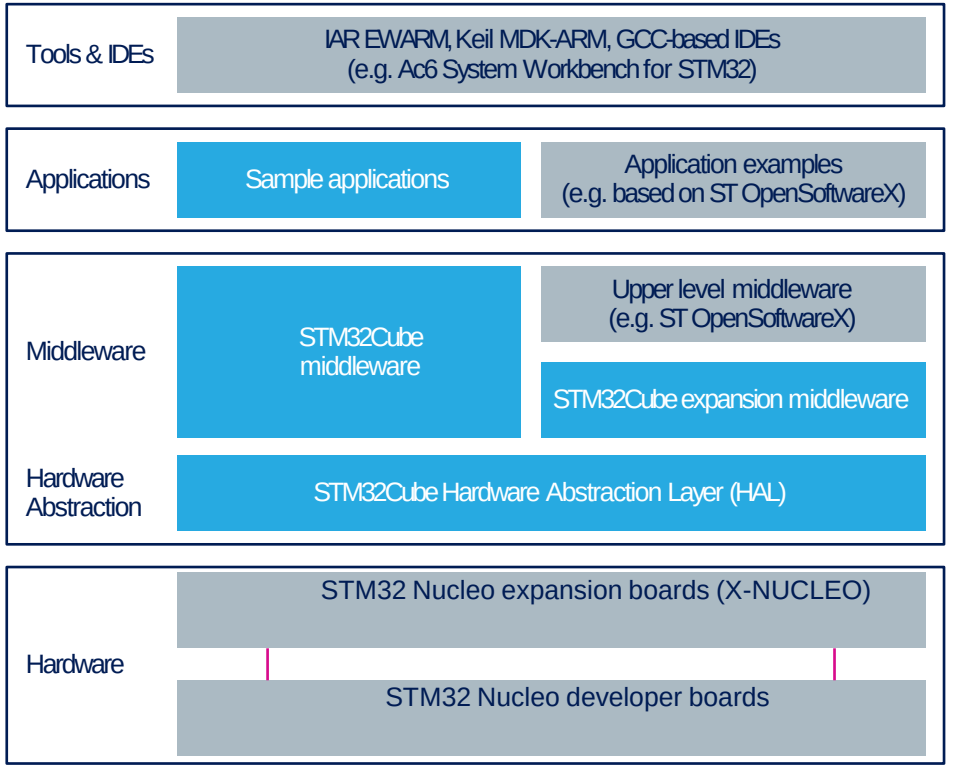
- Boards with additional functionality that can be plugged directly on top of the STM32 Nucleo development board directly or stacked on another expansion board.



Example of STM32 expansion board (X-NUCLEO-IKS01A1)

STM32 Open Development Environment
Software components

- **STM32Cube software (CUBE)** - A set of free tools and embedded software bricks to enable fast and easy development on the STM32, including a Hardware Abstraction Layer and middleware bricks.
- **STM32Cube expansion software (X-CUBE)** - Expansion software provided free for use with the STM32 Nucleo expansion board and fully compatible with the STM32Cube software framework. It provides abstracted access to expansion board functionality through high-level APIs and sample applications.



- **Compatibility with multiple Development Environments -** The STM32 Open Development Environment is compatible with a number of IDEs, including IAR EWARM, Keil MDK, and GCC-based environments. Users can choose from three IDEs from leading vendors; they are free of charge and deployed in close cooperation with ST. These include Eclipse-based IDEs such as Ac6 System Workbench for STM32 and the MDK-ARM environment.

OPEN LICENSE MODELS: STM32Cube software and sample applications are covered by a mix of fully open source BSD license and ST licenses with very permissive terms.

www.st.com/stm32cube

www.st.com/x-cube

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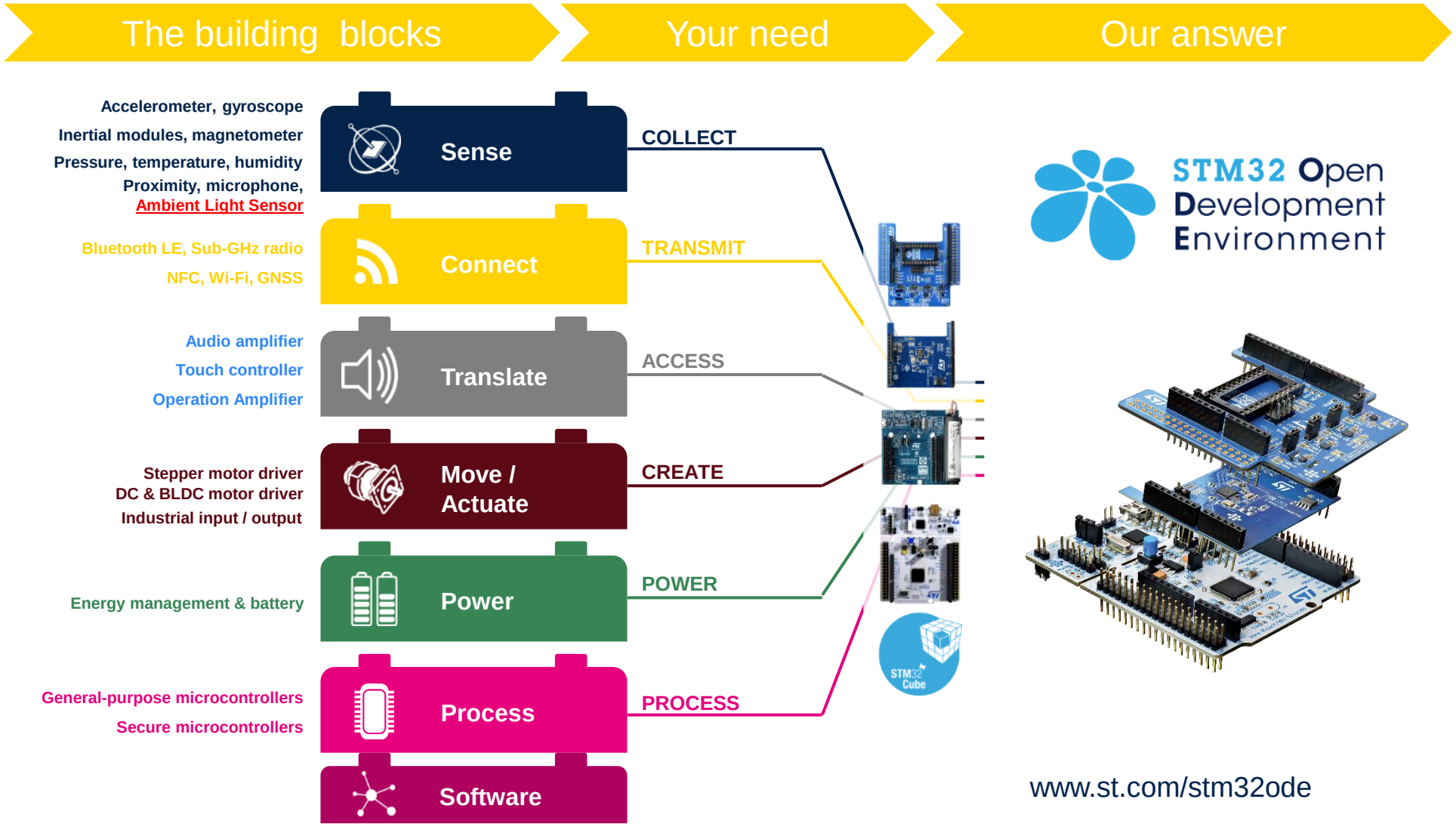
STM32 Open Development Environment
Building block approach



www.st.com/stm32ode

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Thank you

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