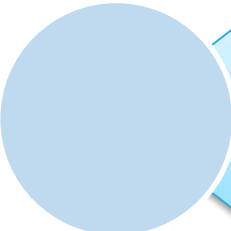


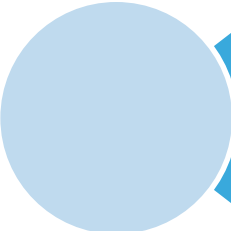
Quick Start Guide

DC-DC LED driver expansion board based on LED6001 for STM32 Nucleo (X-NUCLEO-LED61A1)





X-NUCLEO-LED61A1: DC-DC LED driver expansion board
Hardware and Software overview



Setup & Demo Examples
Documents & Related Resources



STM32 Open Development Environment: Overview

DC-DC LED driver expansion board

Hardware overview

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X-NUCLEO-LED61A1 Hardware description

- The X-NUCLEO-LED61A1 is a DC-DC LED driver expansion board based on LED6001 for STM32 Nucleo. The expansion board is equipped with a single-channel, constant-current LED driver for boost or SEPIC topologies

Main Features

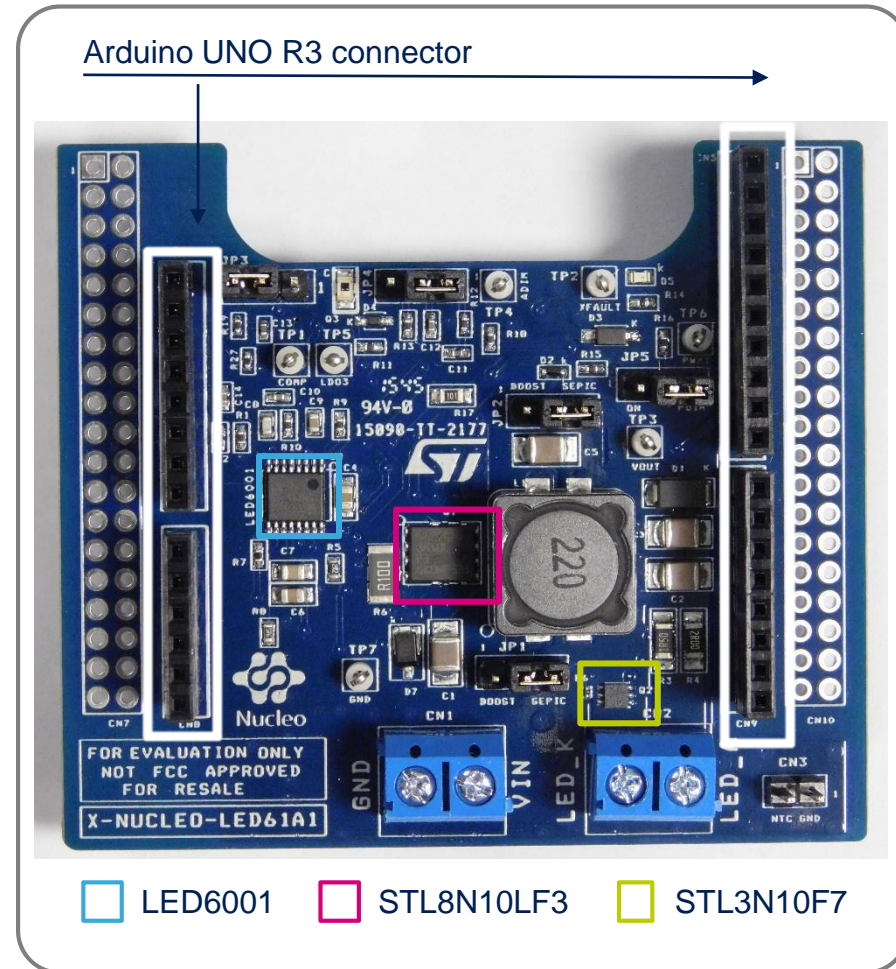
- Wide DC input voltage range: 8 V – 24 V
- Single channel LED Driver, 350 mA constant current
- PWM and analog brightness control with the STM32 Nucleo board
- Selectable boost or SEPIC converter topology
- Up to 92% efficiency (boost converter)
- Compatible with Arduino™ UNO R3 connectors
- Compatible with STM32 Nucleo boards

Key Products on board

LED6001: PWM dimmable single channel LED driver with integrated boost controller

STL8N10LF3: N-channel 100 V, 25mΩ typ., 7.8 A, STripFET™ III Power MOSFET in a PowerFLAT™ 5x6 package

STL3N10F7: N-channel 100 V, 0.062 Ohm typ., 4 A STripFET F7 Power MOSFET in a PowerFLAT 2x2 package



Latest info available at www.st.com
X-NUCLEO-LED61A1

DC-DC LED driver expansion board

Software overview

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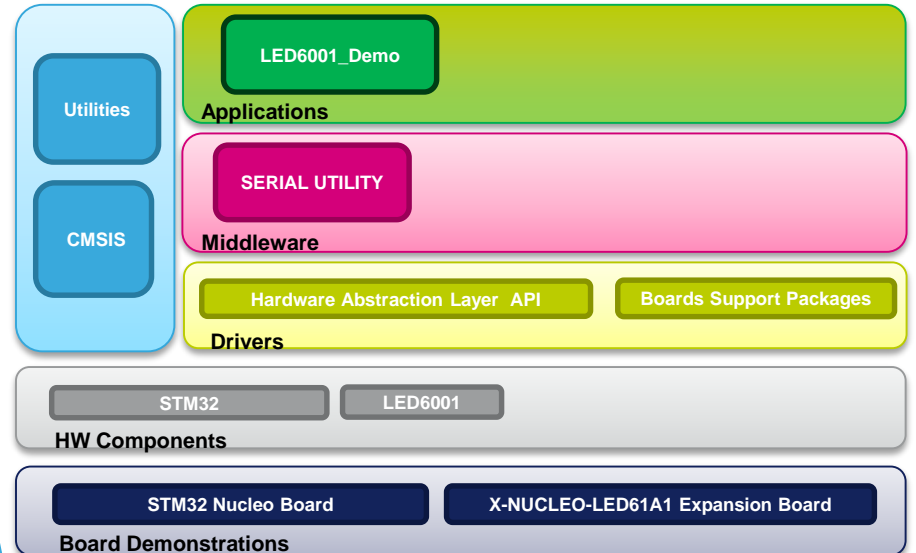
X-CUBE-LED1 Software description

- The software runs on the STM32 microcontroller and includes drivers for controlling a string of high-brightness LEDs. The expansion is built on STM32Cube software technology to ease portability across different STM32 microcontrollers.
- The software comes with sample implementations of drivers running on the X-NUCLEO-LED61A1 plugged on a NUCLEO-F401RE or NUCLEO-L053R8.

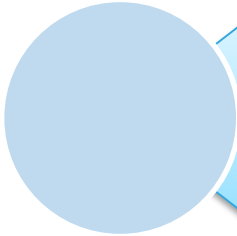
Main features

- Complete middleware to build applications using the LED6001 LED Driver
- Easy portability across different MCU families thanks to the STM32Cube
- Sample applications that the developer can use to start experimenting with the code
- Free user-friendly license terms

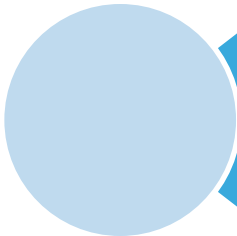
Overall Software Architecture



Latest info available at www.st.com
X-CUBE-LED1



X-NUCLEO-LED61A1: DC-DC LED driver expansion board
Hardware and Software overview



Setup & Demo Examples
Documents & Related Resources



STM32 Open Development Environment: Overview

Setup & Demo Examples

Hardware prerequisites

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- 1x STM32 Nucleo development board
(**NUCLEO-F401RE** or **NUCLEO-L053R8**)
- 1x DC-DC LED driver expansion board based on LED6001
(**X-NUCLEO-LED61A1**)
- 1x Laptop/PC with Microsoft Windows 7 or 8 installed
- 1x USB type A to Mini-B USB cable
- 1x external DC power supply (*)



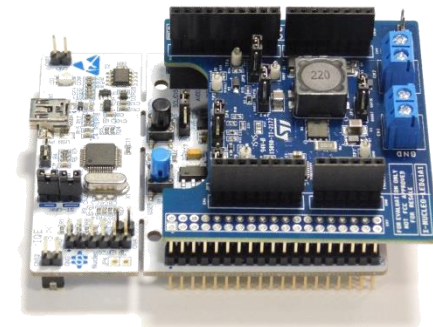
NUCLEO-F401RE
NUCLEO-L053R8



Mini USB Cable



X-NUCLEO-LED61A1



X-NUCLEO-LED61A1
plugged on a compatible
STM32 Nucleo board

Setup & Demo Examples

Software prerequisites

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- **STSW-LINK008:** ST-LINK/V2-1 USB driver
- **STSW-LINK007:** ST-LINK/V2-1 firmware upgrade
- **X-CUBE-LED1**
 - copy the .zip file content into: “c:\Program Files (x86)\STMicroelectronics\” folder on your PC. The package will contain source code example (Keil, IAR, True Studio) based on **NUCLEO-F401RE** or **NUCLEO-L053R8**

Start coding in just a few minutes with X-CUBE-LED1

1 Go to www.st.com/x-nucleo



2 Select
X-NUCLEO-LED61A1



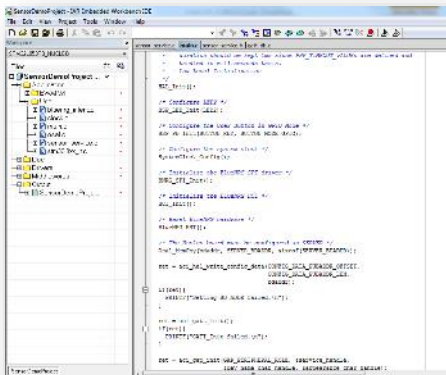
3
Download & unpack
X-CUBE-LED1

X-CUBE-LED1 package

_htmresc	
Documentation	Generic Nucleo docs & Driver porting
Drivers	Drivers
Middlewares	Serial Utility
Projects	Application examples
package.xml	
Release_Notes.html	

6

Modify, build application

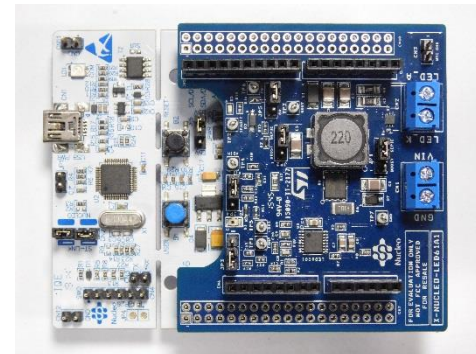


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Open project example
LED6001 Demo

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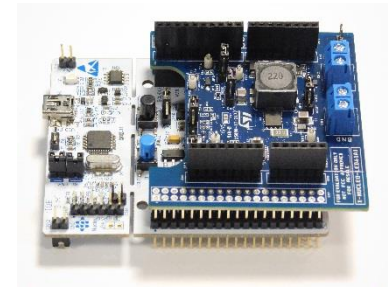
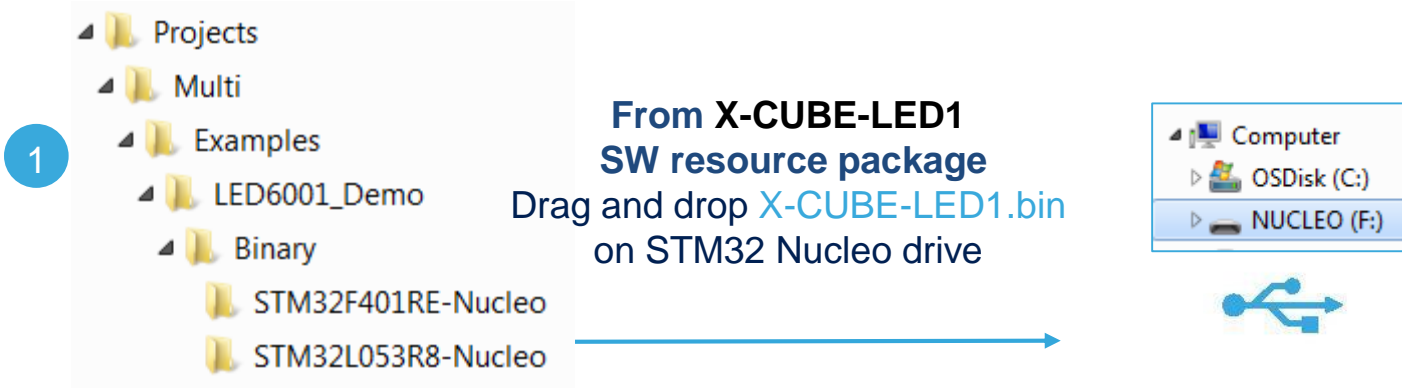
Download & install STM32
Nucleo ST-LINK/V2-1 USB driver



X-CUBE-LED1

Evaluate using X-CUBE-LED1

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2 Connect power supply and LED load using input/output connectors

All documents are available in the DESIGN tab of the related products webpage

X-NUCLEO-LED61A1:

- **Gerber files, BOM, Schematic**
- **DB2780:** DC-DC LED driver expansion board based on LED6001 for STM32 Nucleo – **data brief**
- **UM1999:** Getting started with X-NUCLEO-LED01A1, DC-DC LED driver expansion board for STM32 Nucleo – **user manual**

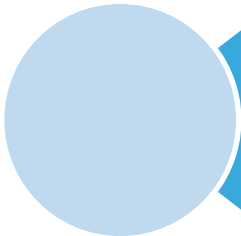
X-CUBE-LED1:

- **DB2779:** DC-DC LED driver software expansion for STM32Cube – **data brief**
- **UM1998:** Getting started with X-CUBE-LED1, DC-DC LED driver software expansion for STM32Cube – **user manual**
- **Software setup file**

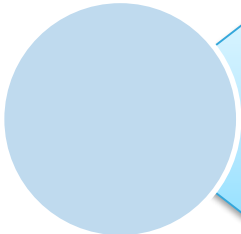
Consult www.st.com for the complete list



X-NUCLEO-LED61A1: DC-DC LED driver expansion board
Hardware and Software overview



Setup & Demo Examples
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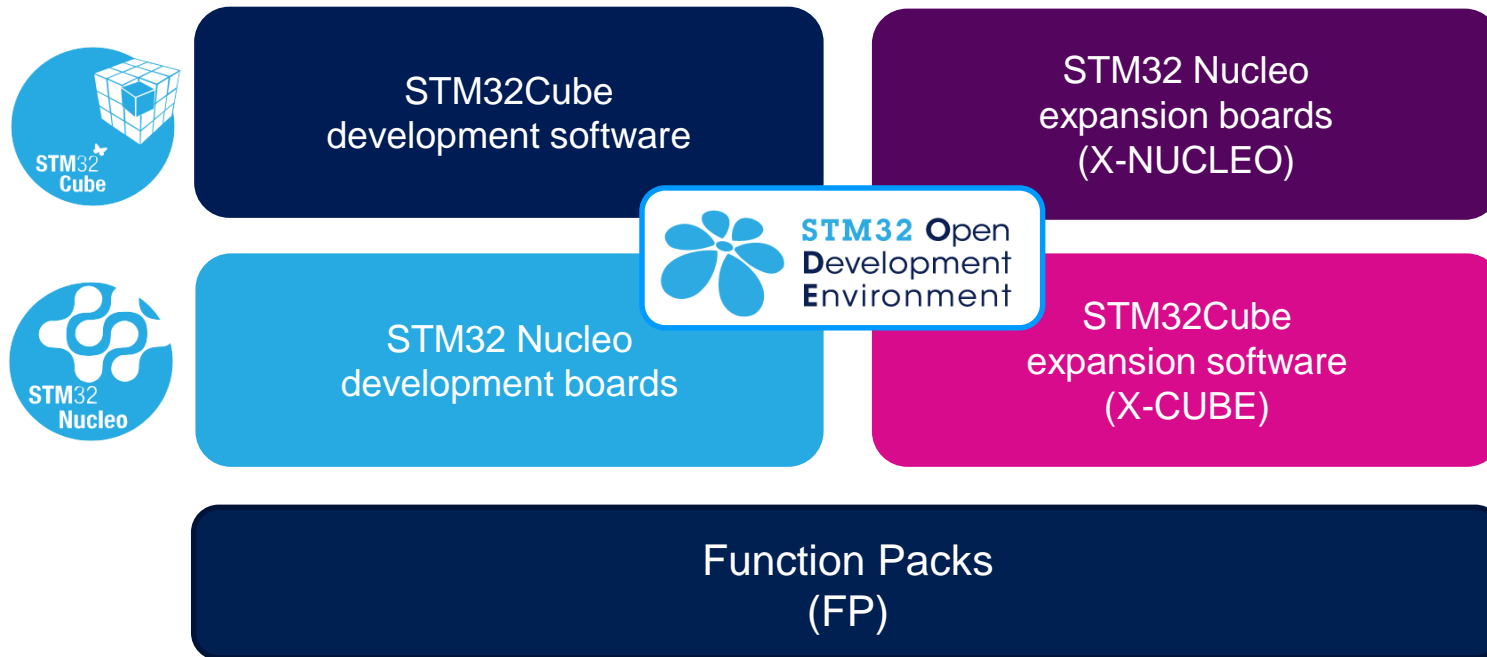
STM32 Open Development Environment: Overview

STM32 Open Development Environment

Fast, affordable Prototyping and Development

12

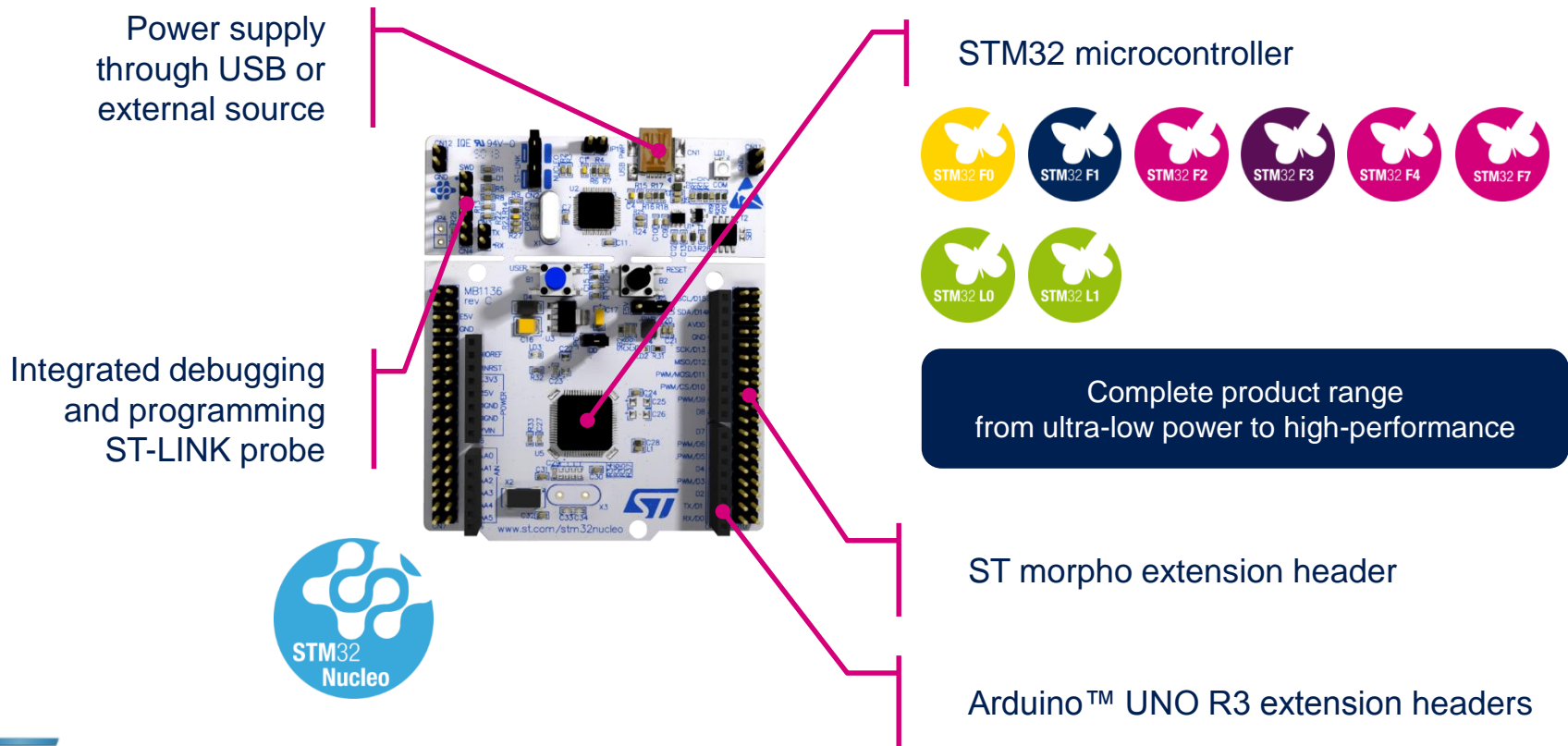
- The STM32 Open Development Environment (ODE) consists of a set of stackable boards and a modular open SW environment designed around the STM32 microcontroller family.



STM32 Nucleo Development Boards (NUCLEO)

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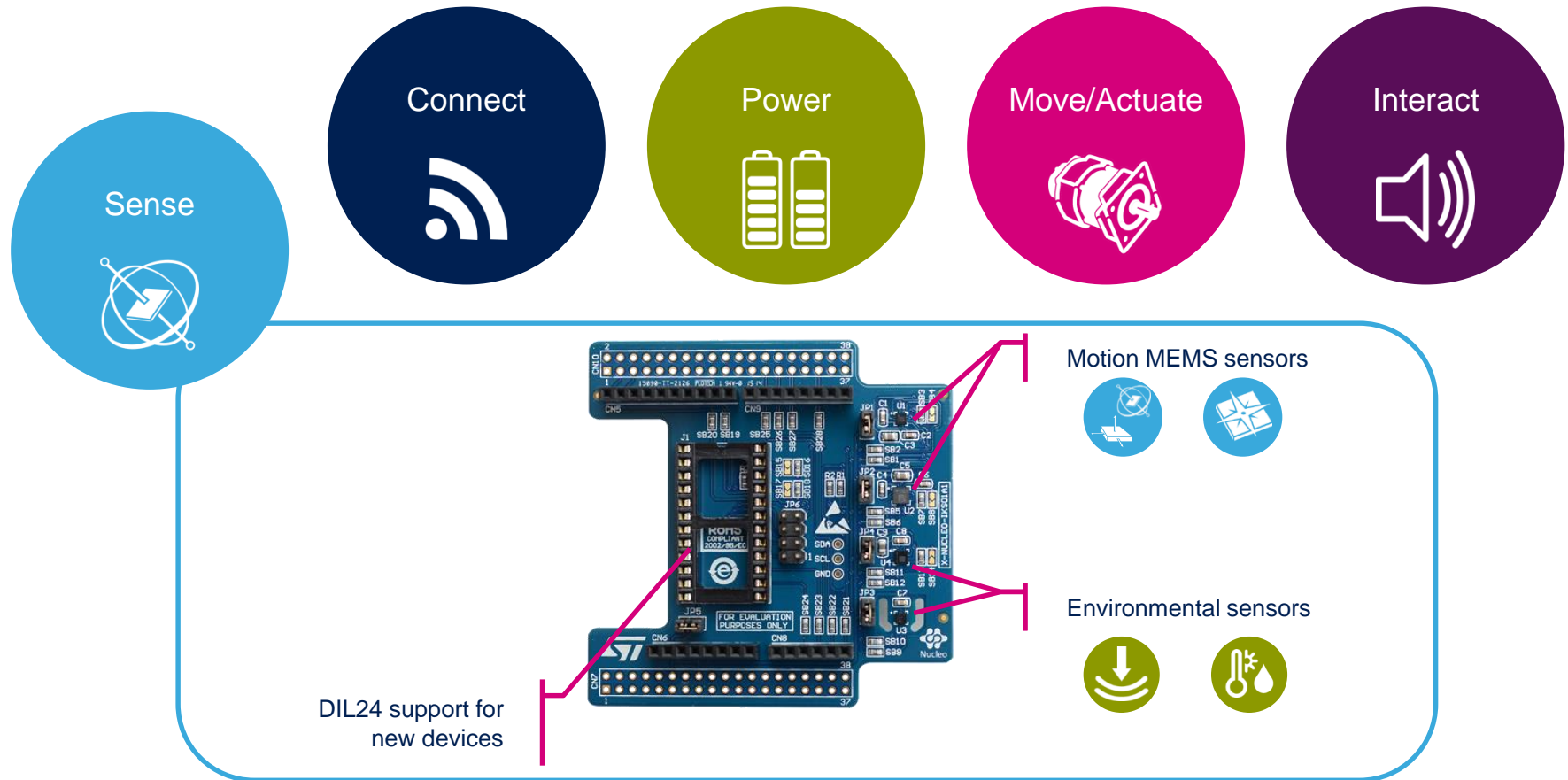
- A comprehensive range of affordable development boards for all the STM32 microcontroller series, with unlimited unified expansion capabilities and integrated debugger/programmer functionality.



STM32 Nucleo Expansion Boards (X-NUCLEO)

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



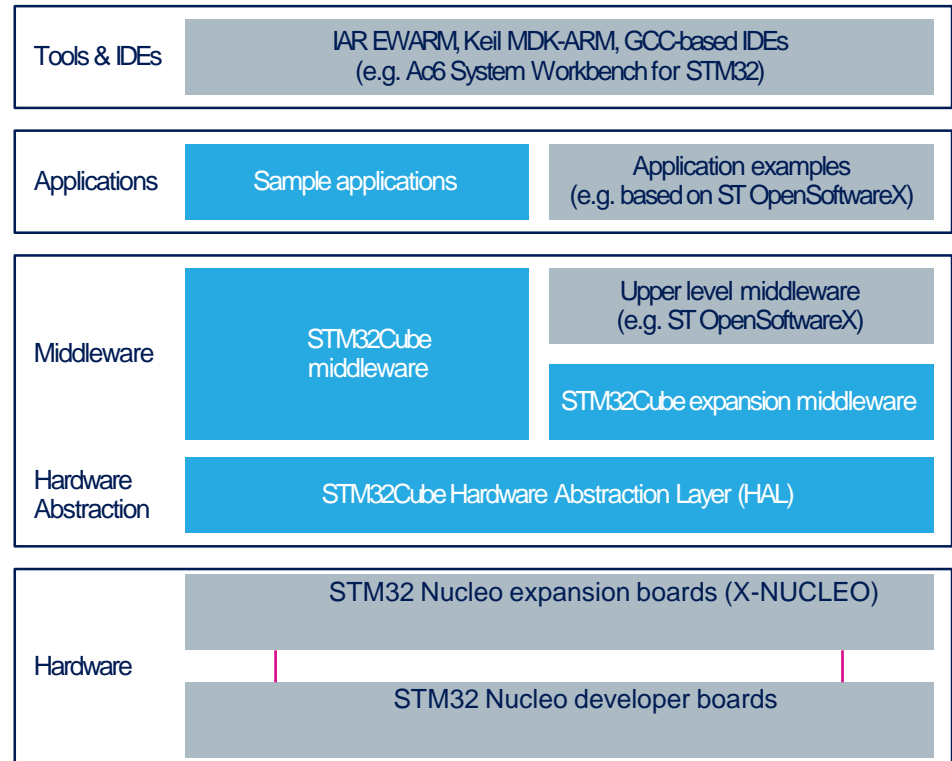
Example of STM32 expansion board (X-NUCLEO-1KS01A1)

STM32 Open Development Environment

Software components

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- **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, which 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.

STM32 Open Development Environment

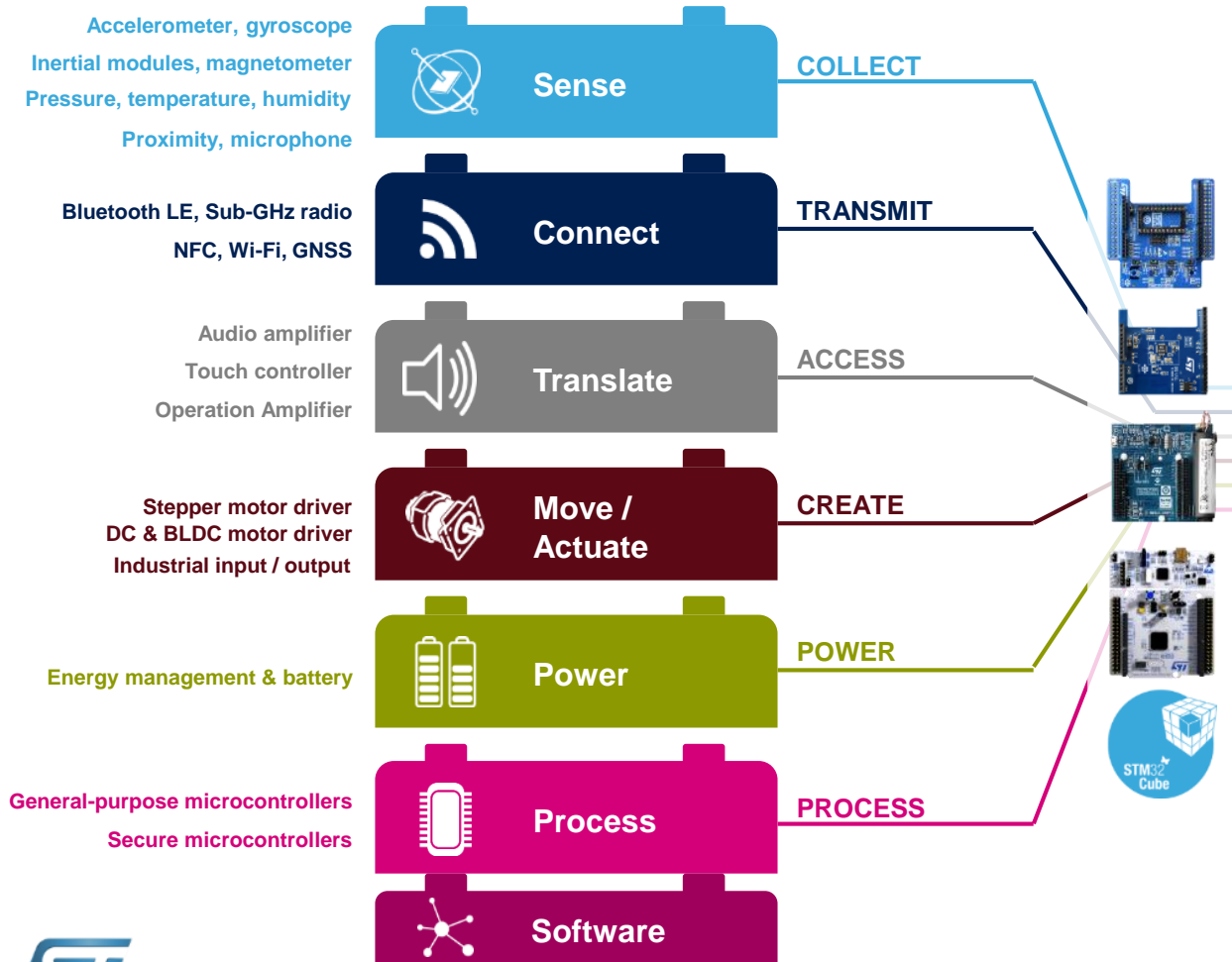
Building block approach

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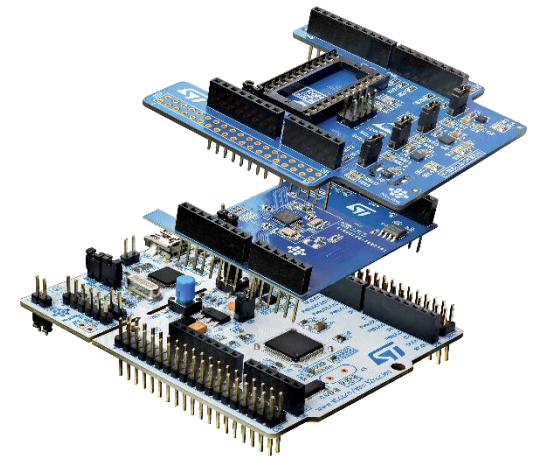
The building blocks

Your need

Our answer



 **STM32** Open
Development
Environment



www.st.com/stm32code