

# Quick Start Guide

Dynamic NFC/RFID tag IC expansion board based on ST25DV04K for  
STM32 Nucleo  
(X-NUCLEO-NFC04A1)

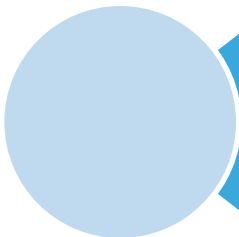


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X-NUCLEO-NFC04A1: Dynamic NFC/RFID tag IC expansion board  
Hardware and Software overview



Setup & Demo Examples  
Documents & Related Resources



STM32 Open Development Environment: Overview

# Dynamic NFC/RFID tag IC expansion board

## Hardware overview

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### X-NUCLEO-NFC04A1 Hardware Description

- The X-NUCLEO-NFC04A1 dynamic NFC/RFID tag IC expansion board is based on the ST25DV04K NFC Type V/RFID tag IC with a dual interface 4 Kbits EEPROM that also features an I<sup>2</sup>C interface. It can be powered by the pin of Arduino connector or directly by the received carrier electromagnetic field.
- The X-NUCLEO-NFC04A1 expansion board is compatible with the Arduino™ UNO R3 connector pin assignment and can easily be plugged onto any STM32 Nucleo board. Various expansion boards can also be stacked to evaluate different devices operating together with the dynamic NFC tag. The board also features an antenna with a 54 mm ISO 24.2 diameter, single layer, copper etched on PCB.

### Key products on board

#### ST25DV04KV

Dynamic NFC/RFID tag IC with 4-Kbit, 16-Kbit or 64-Kbit EEPROM, and Fast Transfer Mode capability

Arduino UNO R3 connector



□ ST25DV04K    □ Printed Antenna

Latest info available at [www.st.com](http://www.st.com)  
**X-NUCLEO-NFC04A1**

# Dynamic NFC/RFID tag IC expansion board

## Software overview

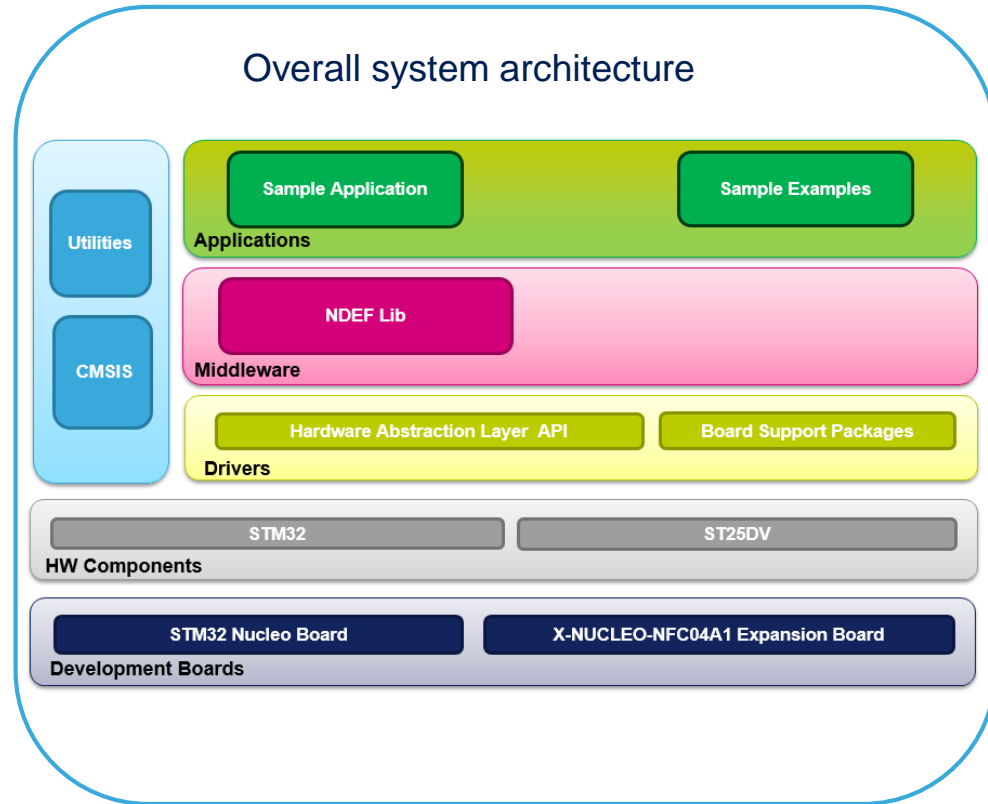
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### X-CUBE-NFC4 software description

- The X-CUBE-NFC4 software expansion for STM32Cube provides a complete middleware for STM32 to build applications using dynamic NFC/RFID tag IC (ST25DV device).
- The software is based on STM32Cube technology and expands STM32Cube based packages. It is built on top of STM32Cube software technology to ease portability across different STM32 microcontrollers.
- The software comes with sample implementations of the drivers running on the X-NUCLEO-NFC04A1 expansion board plugged on top of NUCLEO-F401RE or NUCLEO-L053R8.

### Key features

- Complete middleware to build applications using dynamic NFC/RFID tag IC (ST25DV04K)
- Easy portability across different MCU families, thanks to STM32Cube
- Sample application to communicate with PC software
- Samples to use the ST25DV/basic features
- Free user-friendly license terms
- Sample implementation available on the X-NUCLEO-NFC04A1 expansion board plugged on top of a NUCLEO-F401RE or a NUCLEO-L053R8 board



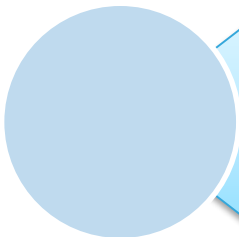
Latest software available at [www.st.com](http://www.st.com)  
**X-CUBE-NFC4**

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# Setup & demo examples

## HW prerequisites

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- 1x Dynamic NFC/RFID tag IC expansion board (**X-NUCLEO-NFC04A1**)
- 1x STM32 Nucleo development board (**NUCLEO-L053R8** or **NUCLEO-F401RE**)
- 1x NFC-enabled Android™ smartphone and ST25 NFC App
- 1x USB type A to Mini-B USB cable



NUCLEO-F401RE  
NUCLEO-L053R8

### Smartphone requirement



Android OS phone

### Application for Demo

<https://play.google.com/store/apps/details?id=com.st.demo&hl=fr>

Or

[http://www.st.com/content/st\\_com/en/products/embedded-software/st25-nfc-rfid-software/stsw-st25001.html](http://www.st.com/content/st_com/en/products/embedded-software/st25-nfc-rfid-software/stsw-st25001.html)



X-NUCLEO-NFC04A1

# Setup & demo examples

## SW prerequisites

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- **STSW-LINK009:** ST-LINK/V2-1 USB driver
- **X-CUBE-NFC4:** expansion software for STM32Cube
  - Copy the .zip file content into: “c:\Program Files (x86)\STMicroelectronics\” folder on your PC
  - The package contains source code example projects (Keil, IAR, AC6) based on **NUCLEO-L053R8** or **NUCLEO-F401RE** and ST25DV drivers.



# Dynamic NFC/RFID tag IC expansion board

## Start coding in just a few minutes with X-CUBE-NFC4 (1/2)

1 Go to [www.st.com/x-nucleo](http://www.st.com/x-nucleo)



2 Select  
X-NUCLEO-NFC04A1



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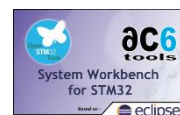
Download & unpack  
X-CUBE-NFC4

### X-CUBE-NFC4 package

_htmresc	
Documentation	Generic Nucleo docs porting
Drivers	BSP, HAL and ST25DV driver
Middlewares	NDEF lib
Projects	Application examples
package.xml	
Release_Notes.html	

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Download & install STM32  
Nucleo **ST-LINK/V2-1** USB driver  
**STSW-LINK009**



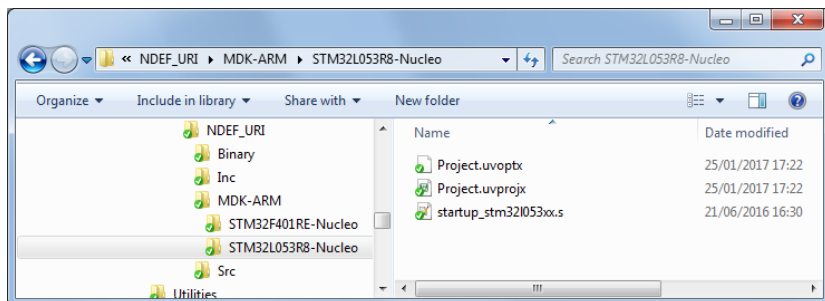
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Modify, build application



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Open project example  
NDEF URI





# Dynamic NFC/RFID tag IC expansion board

## Evaluate using X-CUBE-NFC4 (2/2)

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- 7 Program STM32 on Nucleo with STM32xxxx.hex binary file
- 8 Enable NFC on your phone and make sure it is also connected to the internet
- 9 Bring the phone close to the X-NUCLEO-NFC04A1 Antenna.  
You are directly redirected to **www.st.com**



# Documents & Related Resources

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

## X-NUCLEO-NFC04A1:

- Gerber files, BOM, Schematic
- **DB3301**: Dynamic NFC/RFID tag IC expansion board based on ST25DV04K for STM32 Nucleo – **Data Brief**
- **UM2235**: Getting started with X-NUCLEO-NFC04A1 dynamic NFC/RFID tag IC expansion board based on ST25DV04K for STM32 Nucleo – **User manual**

## X-CUBE-NFC4:

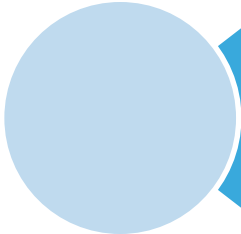
- **DB3316**: Dynamic NFC/RFID tag IC software expansion for STM32Cube – **Data Brief**
- **UM2239**: Getting started with the X-CUBE-NFC4 dynamic NFC/RFID tag IC software expansion for STM32Cube – **User manual**
- Software setup file

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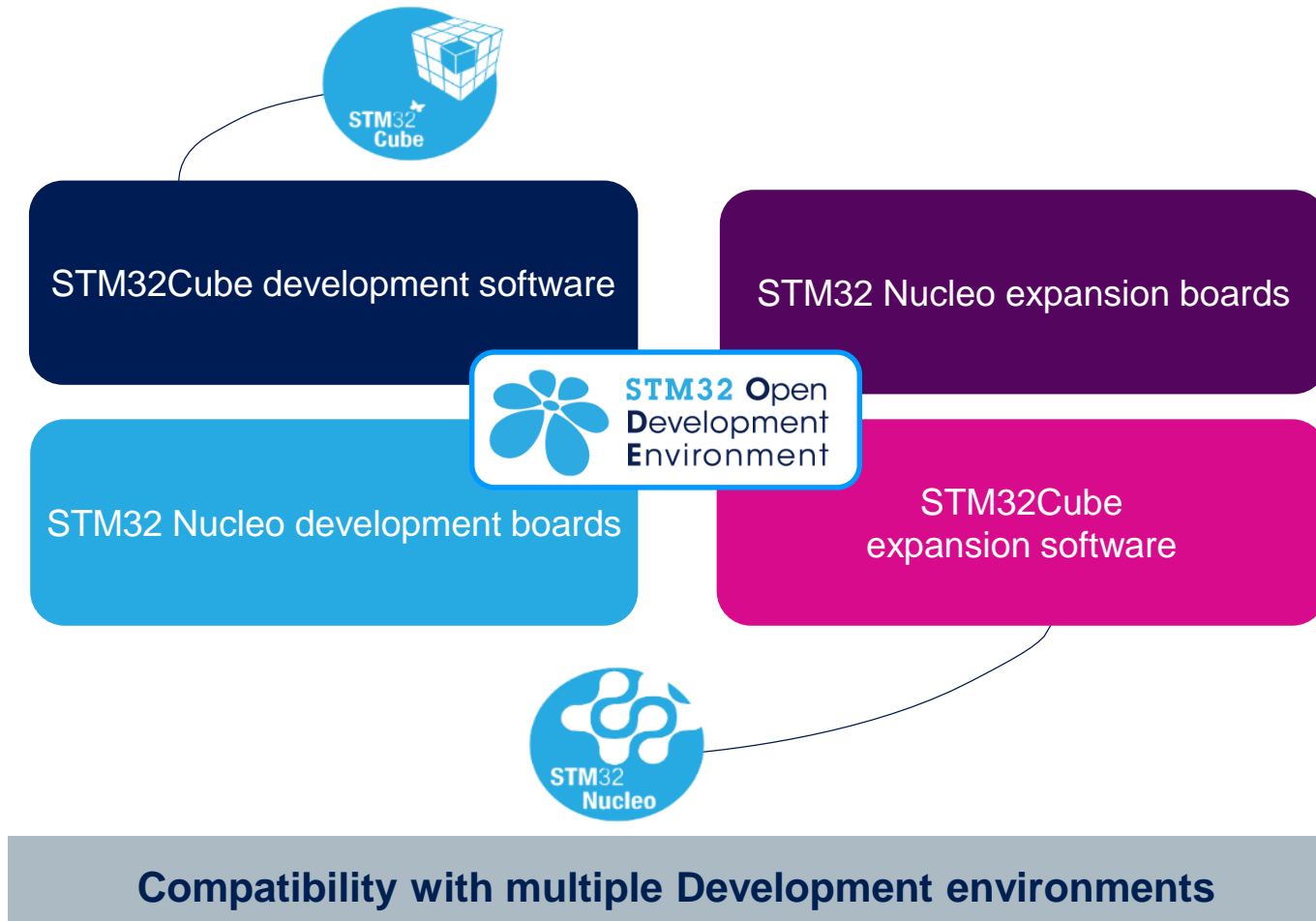
STM32 Open Development Environment: Overview

# STM32 Open Development Environment

## Fast, affordable Prototyping and Development

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- 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.

Power supply  
through USB or  
external source

STM32 microcontroller



Integrated debugging  
and programming  
ST-LINK probe



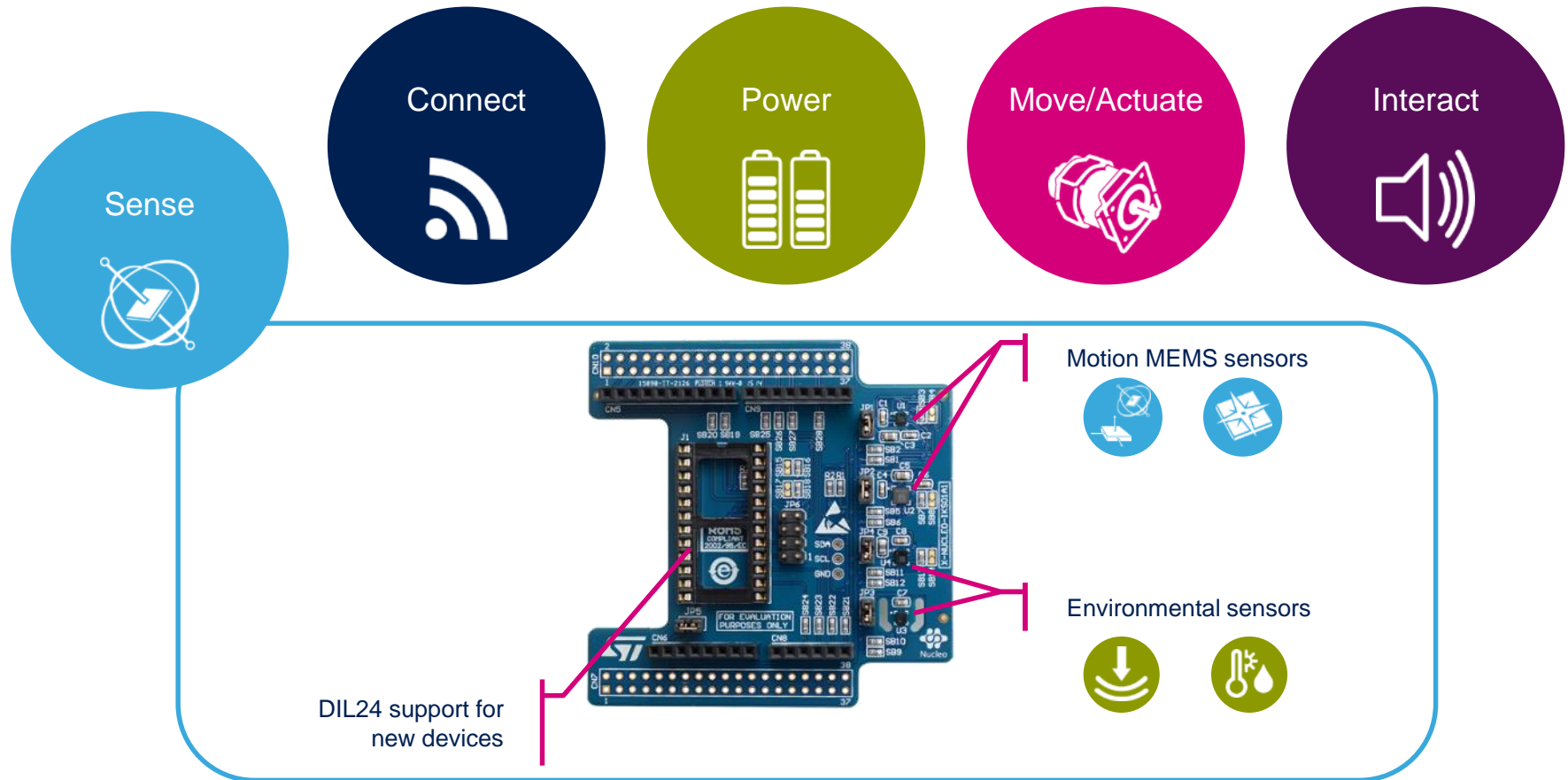
ST morpho extension header

Arduino™ UNO R3 extension headers

# 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.



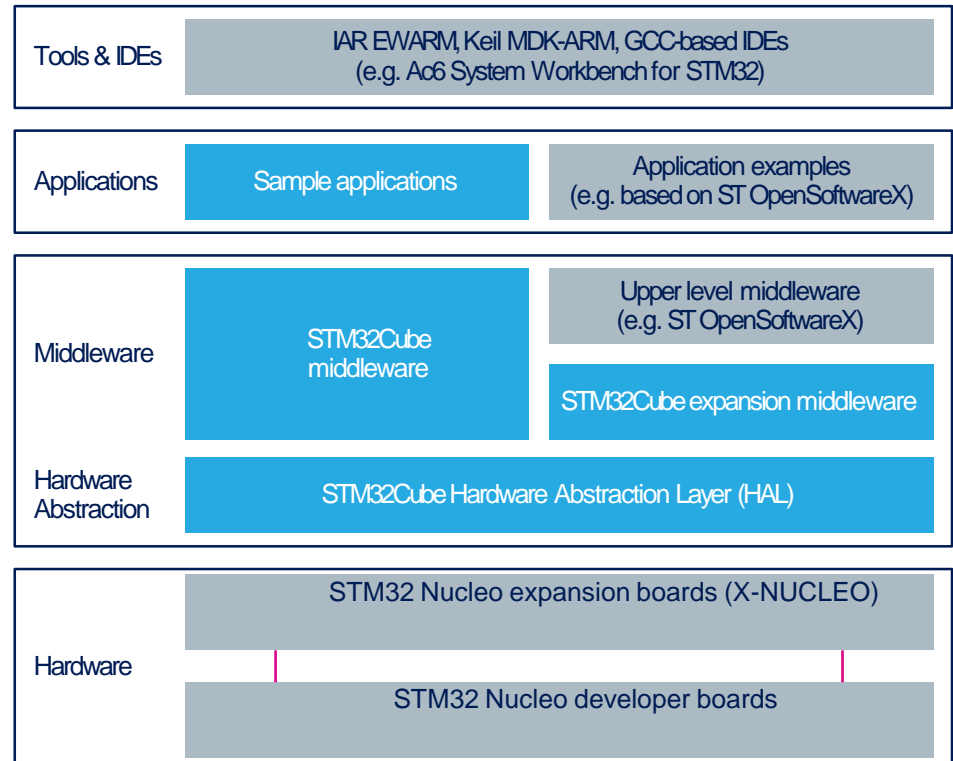
Example of STM32 expansion board (X-NUCLEO-IKS01A1)

# 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

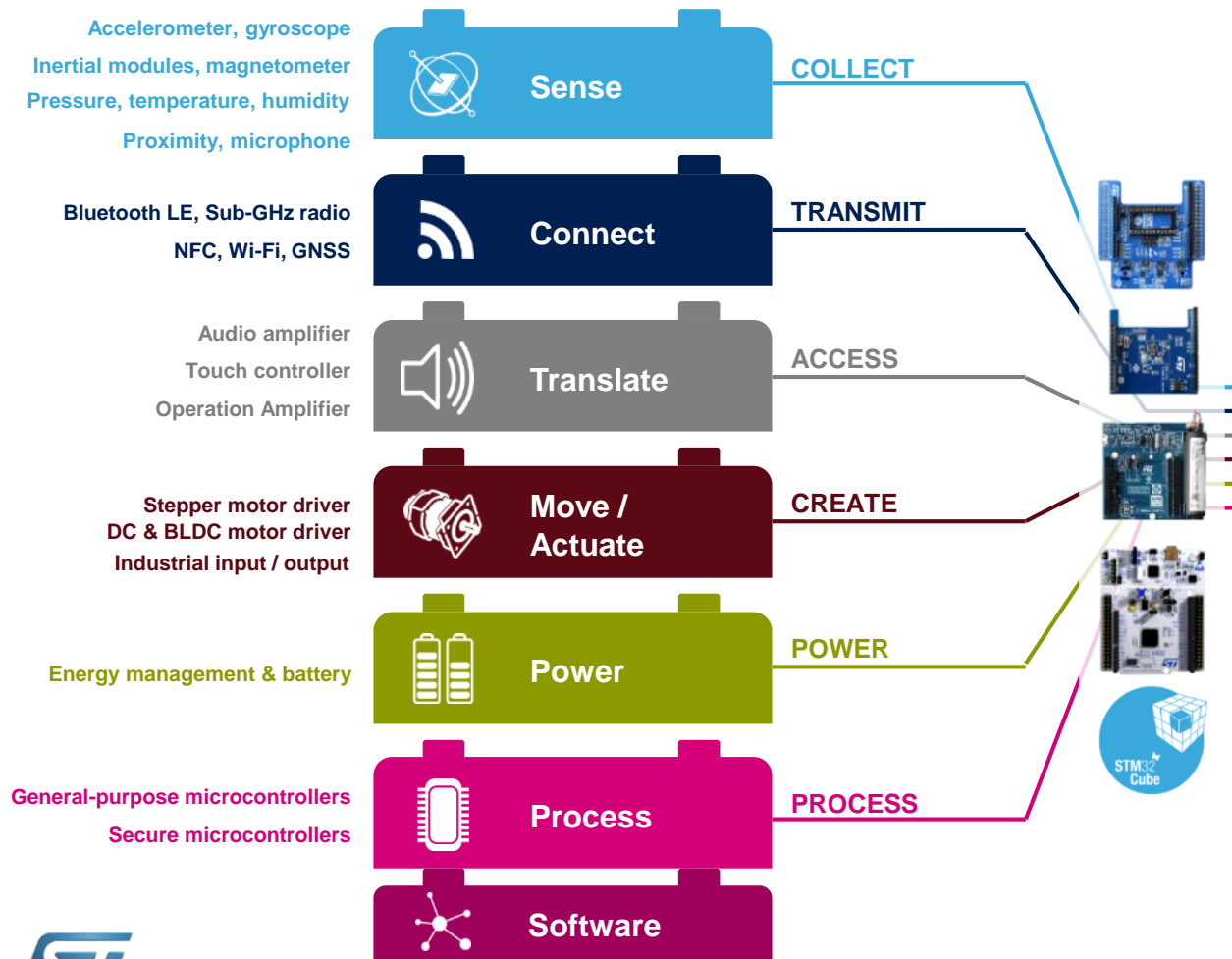
## Building block approach

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The building blocks

Your need

Our answer



 **STM32 Open Development Environment**

