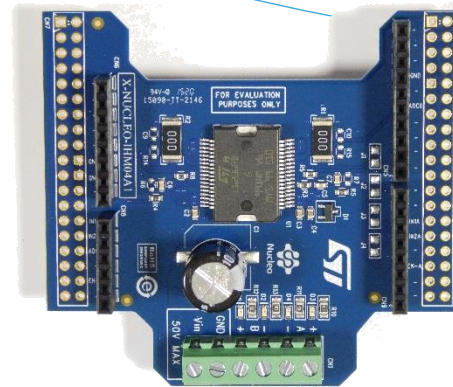


Quick start guide

Dual-brush DC motor driver expansion board based on
L6206 for STM32 Nucleo
(X-NUCLEO-IHM04A1)



Version 1.0 (August 14, 2015)

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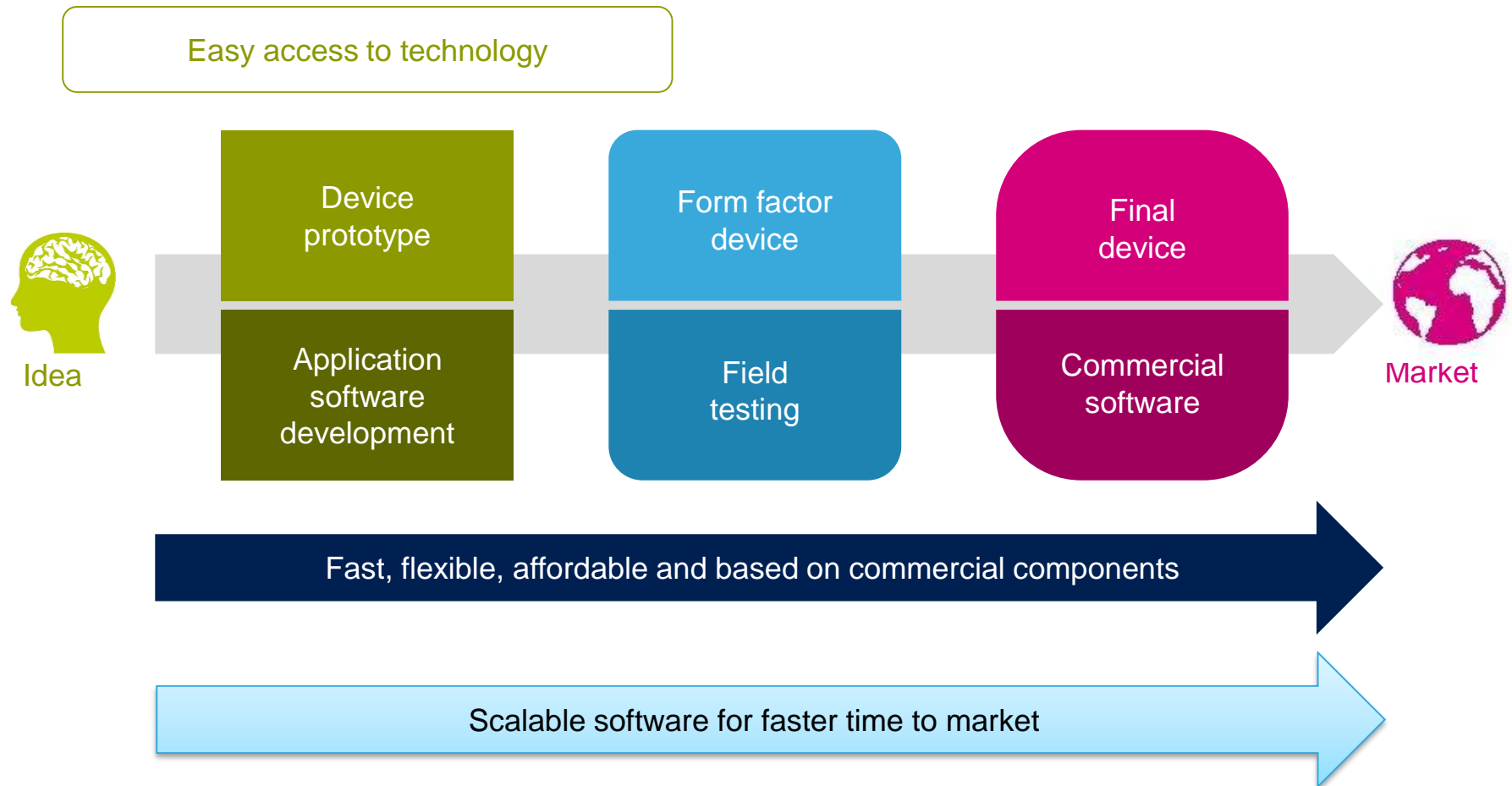
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STM32 Open Development Environment

Lowering the barriers for “developers”

4



STM32 Open Development Environment

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The STM32 Open Development Environment consists of a set of **modular developer boards** and a **software environment** designed around the **STM32 microcontroller** family

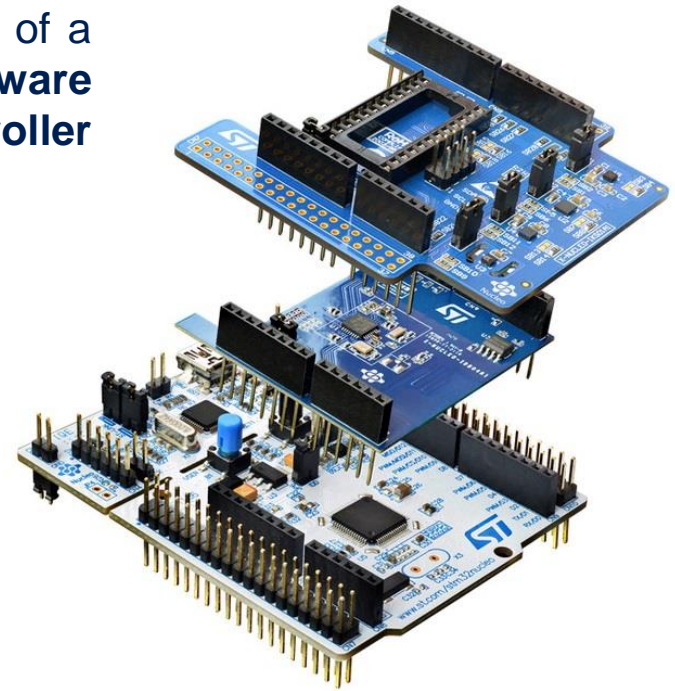
STM32 Nucleo
development boards

STM32Cube
development software

STM32 Nucleo
expansion boards

STM32Cube
expansion software

Compatibility with multiple development
environments



STM32 Open Development Environment

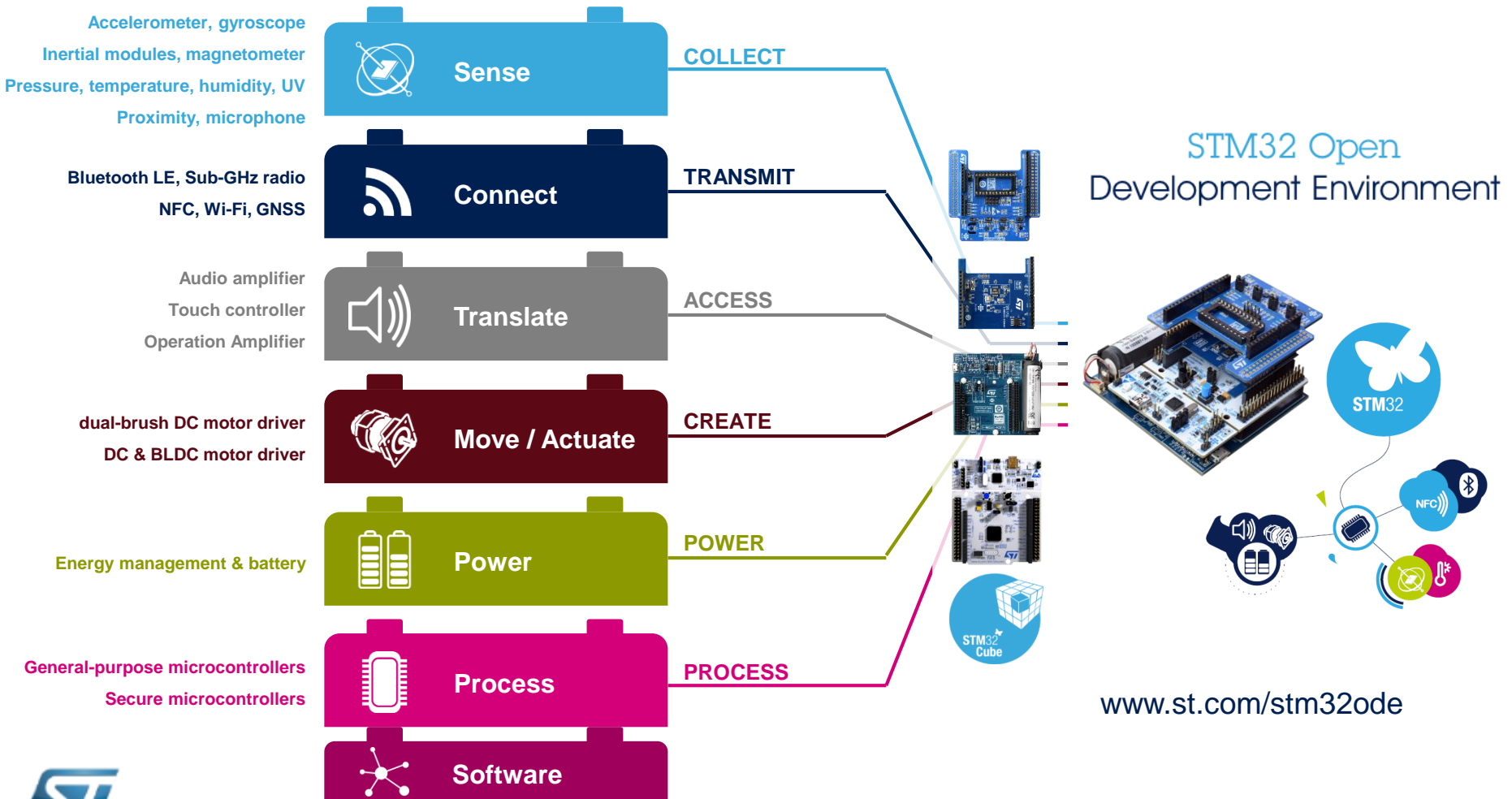
Building block approach

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The building blocks

Your need

Our answer



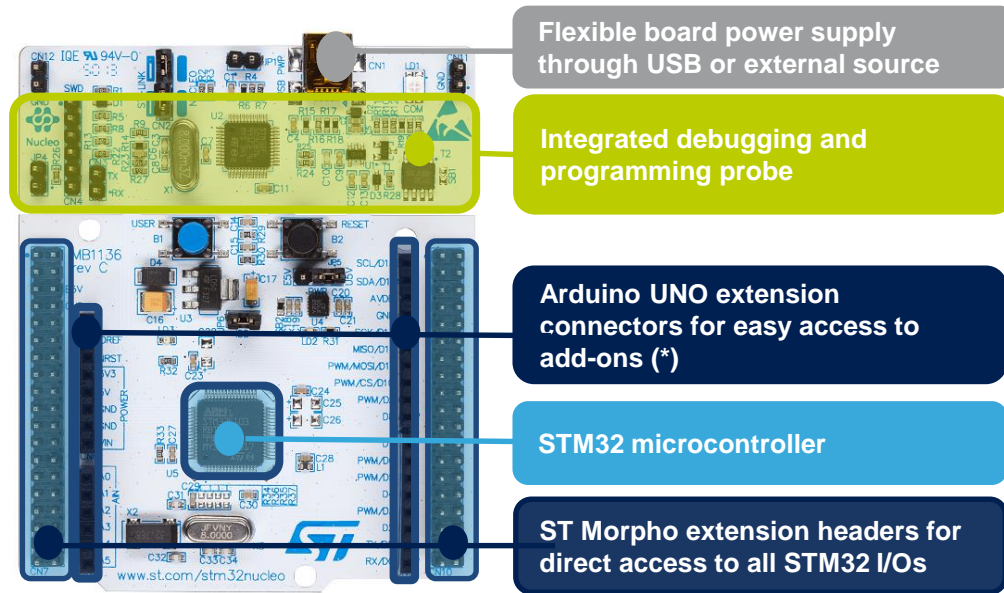
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STM32 Nucleo development board

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- Based on ST's 32-bit ARM® Cortex®-M STM32 microprocessors
 - Development board with 1 MCU and hardware to program/debug
- Two connectors for companion chip boards
- For all STM32 families



Complete product range
from ultra-low power to high-performance

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Dual-brush DC motor driver expansion board

Hardware overview

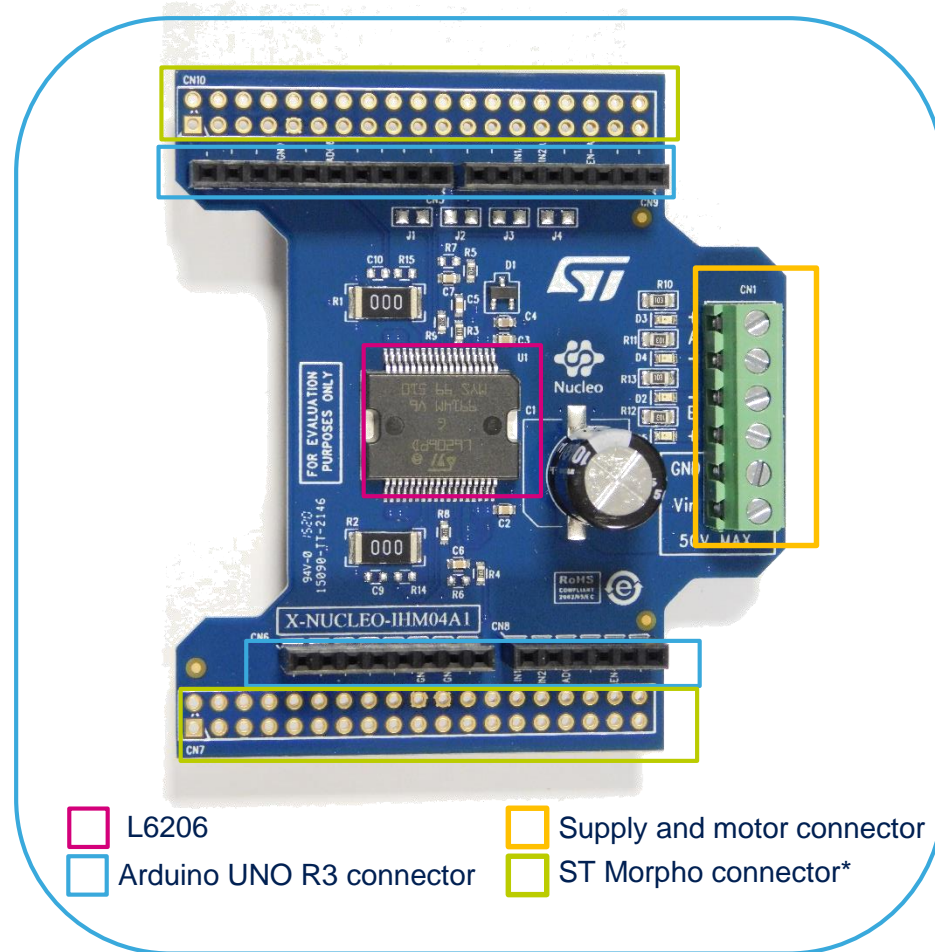
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X-NUCLEO-IHM04A1 hardware description

- The X-NUCLEO-IHM04A1 is a dual full-bridge for a dual-bipolar DC or quad-unipolar DC motor driver expansion board based on the L6206 for STM32 Nucleo.
- It provides an affordable and easy-to-use solution for driving brush DC motors in your STM32 Nucleo project.
- The X-NUCLEO-IHM04A1 is compatible with the Arduino UNO R3 connector, and supports the addition of other expansion boards with a single STM32 Nucleo board.

Key products on board

L6206: DMOS dual full-bridge driver



Latest info available at
[X-NUCLEO-IHM04A1](#)

Order code: X-NUCLEO-IHM04A1

(*) Not mounted

Dual-brush DC motor driver expansion board

Software overview

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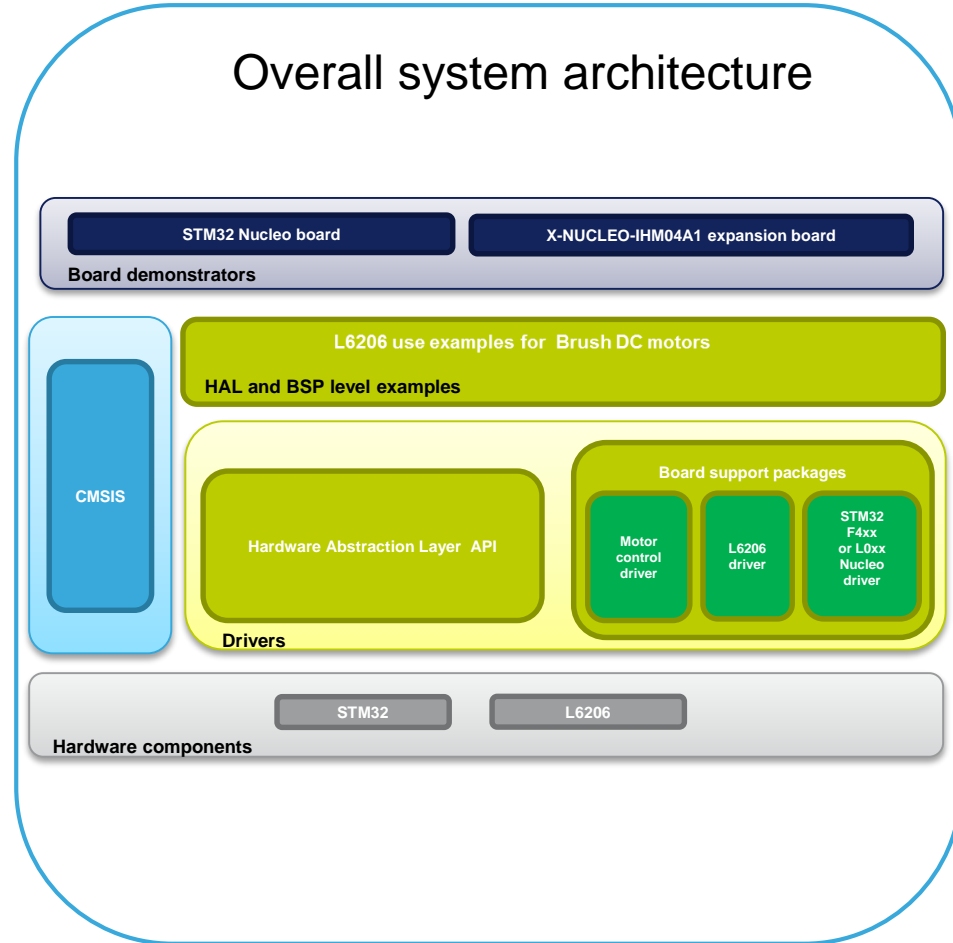
X-CUBE-SPN4 software description

- This software running on the STM32 completely manages the L6206 for the control of brush DC motors. It is built on top of the STM32Cube software technology that eases portability across different STM32 microcontrollers.

Key features

- Driver layer for complete management of the L6206 (Dual-DMOS full bridge driver) which is integrated on the X-NUCLEO-IHM04A1 expansion board
- Examples to control one bidirectional brush DC motor or 4 unidirectional brush DC motors
- Easy portability across different MCU families thanks to STM32Cube

Overall system architecture



Latest software available at
X-CUBE-SPN4

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Documents & related design resources

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All documents are available in the Design Resources tab of the dual-brush DC motor driver expansion board webpage

X-NUCLEO-IHM04A1: Product webpage ([Link](#))

- Gerber files, BOM, and schematics
- **DB2633**: Dual-brush DC motor driver expansion board based on L6206 for STM32 Nucleo – **Data brief**
- **UM1925**: Getting started with the X-NUCLEO-IHM04A1 dual-brush DC motor driver expansion board for STM32 Nucleo – **User manual**

X-CUBE-SPN4: Product webpage ([Link](#))


- **DB2636**: Dual-brush DC motor driver software expansion for STM32Cube – **Data brief**
- **UM1929**: Getting started with the X-CUBE-SPN4 dual-brush DC motor driver software expansion for STM32Cube – **User manual**
- Software setup file

Design Resources

Quick Links [Product Specifications](#)

Technical Documentation

Product Specifications

Description	Version	Size
 DB2633: Dual brush DC motor driver expansion board based on L6206 for STM32 Nucleo	1.0	257 KB

User Manual

Description	Version	Size
 UM1925: Getting started with the X-NUCLEO-IHM04A1 dual brush DC motor driver expansion board for STM32 Nucleo	1.0	1,263 KB

Hardware Resources

Board Manufacturing Specification

Description	Version	Size
 X-NUCLEO-IHM04A1 gerber files	1.0	437 KB

X-NUCLEO-IHM01A1
Product webpage
Design Resources tab

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Hardware prerequisites

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- STM32 Nucleo board
(NUCLEO-F401RE or NUCLEO-L053R8)
- One X-NUCLEO-IHM04A1 expansion board
- One or four brush DC motors according to the target setup
- An external DC power supply with two electric cables (*)
- A type A to mini-B USB cable

Setup & demo examples

Software prerequisites

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- A Windows PC with one of the supported development toolchains:
 - KEIL: MDK-ARM
 - IAR: EWARM
 - GCC-based IDEs (Atollic, TrueStudio...)
- X-CUBE-SPN4 firmware library ([Link](#))
- ST-LINK/V2-1 USB driver ([Link](#))
- ST-LINK/V2-1 firmware upgrade ([Link](#))

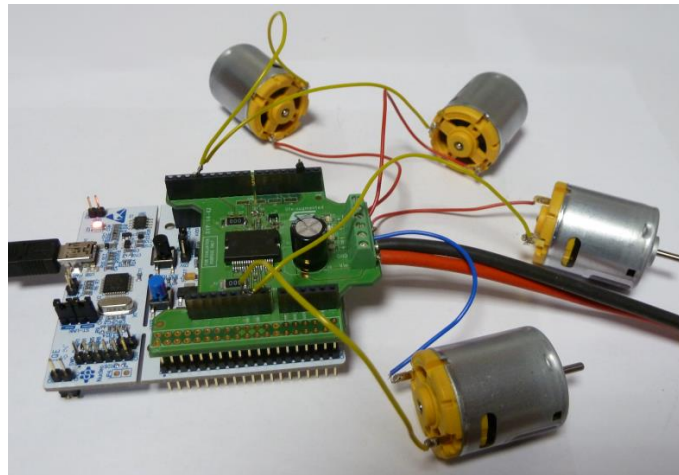
Dual-brush DC motor driver expansion board

Start coding in just a few minutes with X-CUBE-SPN4

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Driving a four-brush DC motor with X-NUCLEO-IHM04A1 and X-CUBE-SPN4

- 1 Set the X-NUCLEO-IHM04A1 configuration jumpers as follows:
 - J1, J2, J3 and J4 → Open
- 2 Plug the X-NUCLEO-IHM04A1 on the STM32 Nucleo board through the Arduino UNO R3 connector and connect the each brush DC motor between one of the power outputs (A+/- and B+/-) and ground. Connect the power supply (Vin\Gnd) to the CN1 connector.
- 3 Connect the STM32 Nucleo board to the PC through the USB cable.



Dual-brush DC motor driver expansion board

Start coding in just a few minutes with X-CUBE-SPN4

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- 4 Depending on the STM32 Nucleo board, from the examples folder (**\stm32_cube\Projects\Multi\Examples\MotionControl\NHM03A1_ExampleFor4UniDirMotors**) open the software project from:
 - **\YourToolChainName\STM32F401RE-Nucleo** for Nucleo based on **STM32F401RE**
 - **\YourToolChainName\STM32L053R8-Nucleo** for Nucleo based on **STM32L053R8**
- 5 Open the file: **stm32_cube\Drivers\BSP\Components\I6206\I6206_target_config.h**. and modify the parameters according your target configuration.
- 6 Build the project and download it into the STM32 memory.
- 7 Run the example. The motor automatically starts. (See main.c file for the detailed demo sequence.)

Dual-brush DC motor driver expansion board

Start coding in just a few minutes with X-CUBE-SPN4

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Driving a one-brush DC motor in Parallel mode with X-NUCLEO-IHM04A1 and X-CUBE-SPN4

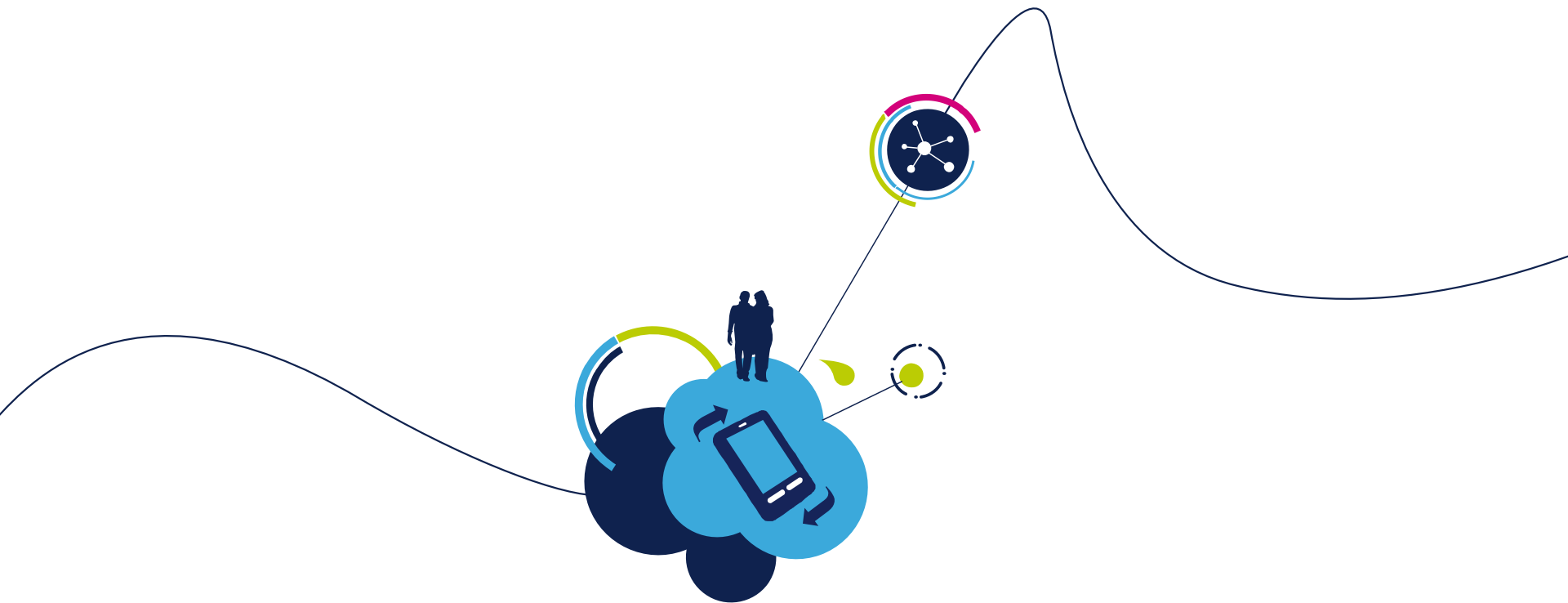
- 1 Set the X-NUCLEO-IHM04A1 configuration jumpers as following:
 - J1 → Closed (1A and 2A in parallel)
 - J2 → Closed (1B and 2B in parallel)
 - J3 and J4 → Open
- 2 Plug the X-NUCLEO-IHM04A1 on the STM32 Nucleo board through the Arduino UNO R3 connector and connect the the brush DC motor between one of the A+/- and B+/- power outputs. Connect the power supply (Vin\Gnd) to the CN1 connector.
- 3 Connect the STM32 Nucleo board to the PC through the USB cable.

Dual-brush DC motor driver expansion board

Start coding in just a few minutes with X-CUBE-SPN4

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- 4 Depending on the STM32 Nucleo board, from the examples folder (`\stm32_cube\Projects\Multi\Examples\MotionControl\NHM03A1_ExampleFor1BiDirMotor`) open the software project from:
 - `\YourToolChainName\STM32F401RE-Nucleo` for Nucleo based on **STM32F401RE**
 - `\YourToolChainName\STM32L053R8-Nucleo` for Nucleo based on **STM32L053R8**
- 5 Open the file: `stm32_cube\Drivers\BSP\Components\I6206\I6206_target_config.h`. and modify the parameters according your target configuration.
- 6 Build the project and download it into the STM32 memory.
- 7 Run the example. The motor automatically starts. (See main.c file for the detailed demo sequence.)



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