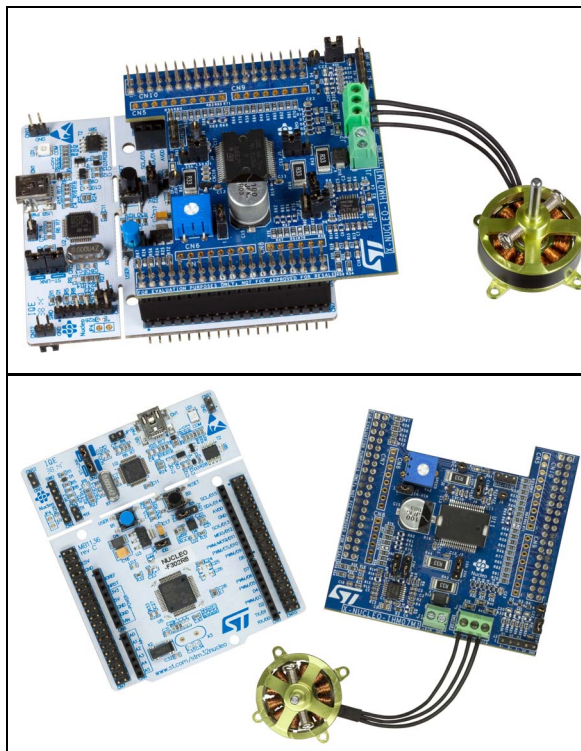


## STM32 Nucleo Pack FOC and 6-step motor control platform for three-phase low voltage motor

Data brief

### Features

- X-NUCLEO-IHM07M1:
  - Three-phase driver board for BLDC/PMSM motors based on L6230
  - Nominal operating voltage range from 8 V to 48 V dc
  - 2.8 A output peak current (1.4 A RMS)
  - Non dissipative overcurrent detection and protection
  - Full compatible with ST 6-step or ST FOC control algorithm
  - Full support for sensorless and sensor mode
  - 3-Shunt and 1-Shunt configurable jumpers for motor current sensing
  - Hall / encoder motor sensor connector and circuit
  - Potentiometer available for speed regulation
  - Compatible with STM32 Nucleo boards
  - Equipped with ST morpho connectors
- NUCLEO-F302R8:
  - STM32F302R8 32-bit Microcontroller based on Cortex®-M4 core (72 MHz max) with 64-Kbyte Flash memory and 16-Kbyte SRAM
  - Two types of extension resources: Arduino™ UNO Revision 3 connectivity and ST morpho extension pin headers for full access to all STM32 I/Os
  - Mbed-enabled (<http://mbed.org>)
  - On-board ST-LINK/V2-1 debugger/programmer with SWD connector: selection-mode switch to use the kit as a standalone ST-LINK/V2-1
  - two push buttons: USER and RESET
- Three-phase motor:
  - Bull-Running model BR2804-1700 kV
  - Nominal voltage 11.1 V dc (battery up to 3S)
  - Maximum DC current: 5 A
  - 7 pole pairs
  - Max speed 19000 RPM



1. Pictures not contractual



## 1 Description

The STM32 NUCLEO Pack (P-NUCLEO-IHM001) is a motor control kit based on X-NUCLEO-IHM07M1 and NUCLEO-F302R8 boards. This platform provides a motor control solution for low voltage three-phase DC brushless motor. It is based on L6230 driver (belonging to STSPIN family) and on STM32F302R8 MCU. The L6230 driver is a DMOS fully integrated device for three-phase brushless PMSM motor, with integrated overcurrent and thermal protection.

The STM32F302R8 is a 32-bit microcontroller based on a high-performance ARM® Cortex®-M4 32-bit RISC core, with floating point unit (FPU), operating at a frequency of up to 72 MHz and embedding an advanced analog peripheral set. The X-NUCLEO-IHM07M1 board is fully configurable and ready to support different closed loop control, FOC or 6-step, based on sensorless or sensor mode, and it is compatible with three shunts or single shunt for current sense measuring. The NUCLEO-F302R8 board provides an affordable and flexible way for users to try out new concepts and build prototypes with STM32 MCU.

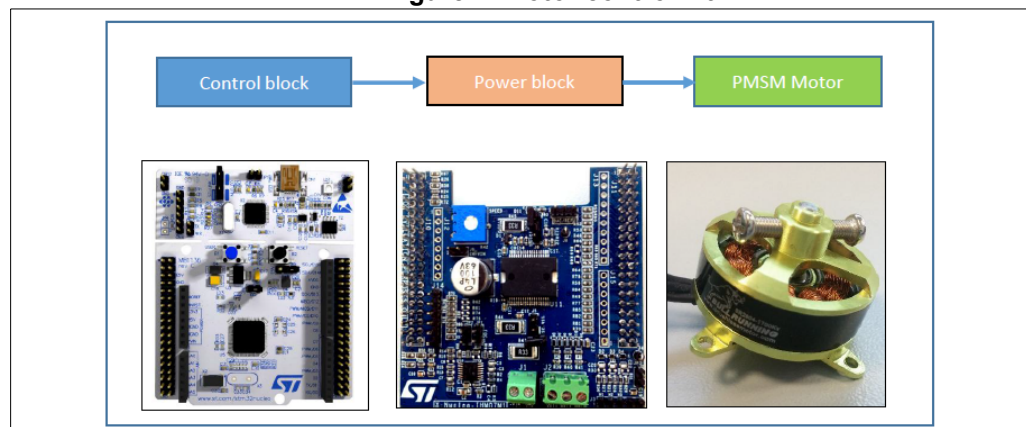
An external power supply (8 V min; 12 V max) is required to power the kit. It does not require any separate probe as it integrates the ST-LINK/V2-1 debugger and programmer.

## 2 P-NUCLEO-IHM001 - System architecture

This motor control kit is composed mainly of three main blocks (see [Figure 1](#)):

- Control block - NUCLEO-F302R8 MCU board
- Power block - X-NUCLEO-IHM07M1
- PMSM Motor - Bull-Running BR2804-1700kV

**Figure 1. Motor control kit**



An external power supply (8 V min; 12 V max) is required to power the kit.

### 3 Ordering information

To order the motor control kit based on X-NUCLEO-IHM07M1 and NUCLEO-F302R8 boards, use the order code: P-NUCLEO-IHM001.

### 4 Revision history

**Table 1. Document revision history**

Date	Revision	Changes
09-Sep-2015	1	Initial release.

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