This document gives an overview of the various steps required to set up your hardware device for using it in SensorStudio.

1. Contents

2. ICM30670

Several hardware components are required in the ICM-30670 reference kit:

- The **Arduino Zero Board** - Application board with a standalone microcontroller. For more information about the Arduino Zero board, please refer to Arduino website[1].
- The **ICM-30670 eMD Shield**- Includes the ICM-30670 chip. All connectors at the back of the shield will be connected to Arduino Zero pins.
  The board can support two additional daughter boards to be connected to the front connectors.
  Be careful of the jumper's configuration: they must be set as below:
  - *JP1*: connect VDD to VDDIO
  - *JP2*: connect VDD to 3V3
  - *JP3*: closed if you want to be able to debug, open otherwise

Figure 1 – ICM-30670 eMD Shield

- The **Sensor Daughter Board** is optional but adds available external sensors -- magnetometer, proximity sensor and pressure sensor. Please plug the board as described on the picture below – you can plug it in either of the two slots available.

Jumpers' configuration:

- J100 : [1<->2] closed, [3<->4] closed, [5<->6] open, [7<->8] open

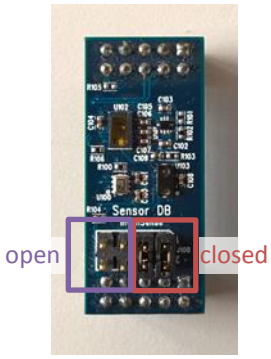

Figure 2 – Sensor Daughter Board

Final setup looks like Figure 3.
You can then connect the Arduino Zero board to your computer through Micro USB (**PROGRAMMING port**). All the required drivers were installed during SensorStudio installation wizard.

[1] Arduino Zero website: https://www.arduino.cc/en/Main/ArduinoBoardZero

You can now use your device in SensorStudio. You can check out the interactive tutorial or the samples from the welcome screen of SensorStudio.

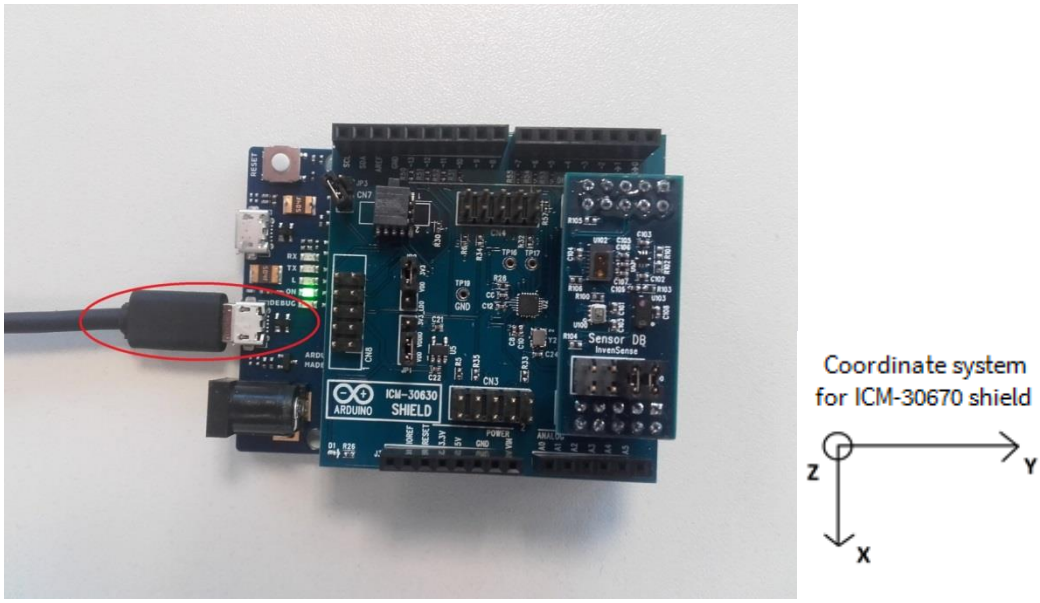

Figure 3 – Connect to PC using USB Programming Port

For more details about the ICM30670 solution, please refer to the ICM30670 eMD Software Guide (available from the Help menu in SensorStudio).

3. GENERIC SENSOR HUB

Warning	Before connecting the device to your computer, you must install the ST-Link drivers available at http://www2.st.com/content/st_com/en/products/embedded-software/development-tool-software/stsw-link009.html.

The Generic Sensor Hub reference kit consists of of the following components:

- The **ST Nucleo F411-RE board** – Application board which includes a STM32F411 microcontroller. For more information about the ST Nucleo board, please refer to ST website[2].
  Required jumper configuration for NUCLEO is as follows:

JP1	Open
JP5 (PWR)	(U5V)
JP6 (IDD)	Closed
CN2	Closed - on (NUCLEO)

Table 1 – ST Nucleo jumper configuration

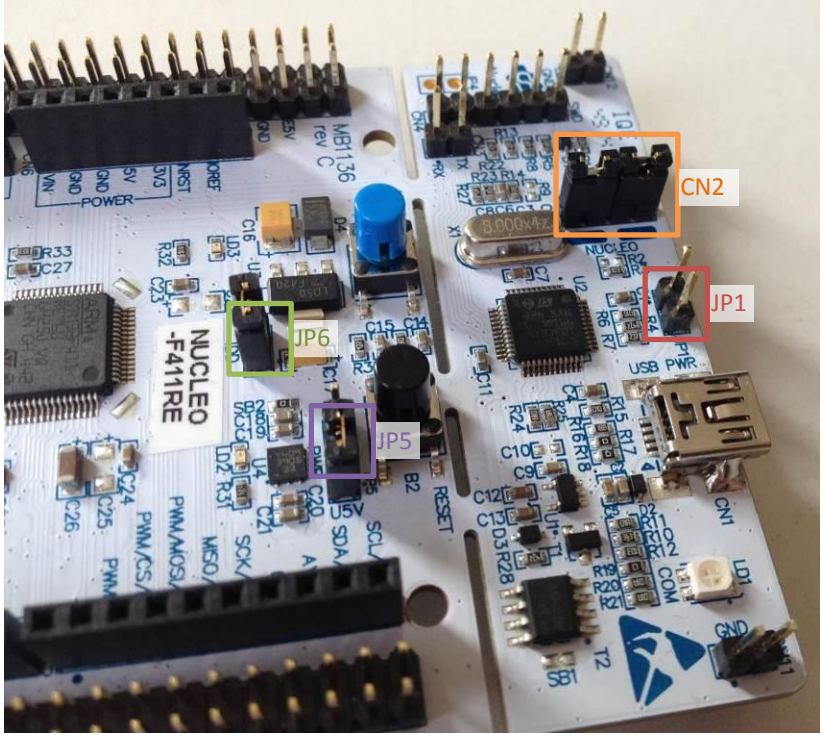

Figure 4 – ST Nucleo board jumper configuration

- The **InvenSense Nucleo Carrier Board** - offers a convenient way to connect ST Nucleo, ICM-20690 and additional sensor daughter boards together
  Please use the following jumper configurations:

JP1	(VDD=VDDIO)
JP2	(VDD=3V3)
JP8	(Nucleo)

Table 2 – Nucleo Carrier board jumper configuration

[2] ST Nucleo website: http://www.st.com/web/catalog/tools/FM116/SC959/SS1532/LN1847?sc=stm32nucleo

Warning	The ST Nucleo pin headers have to match the Nucleo Carrier board ones. Please verify that the two boards are correctly connected (pin1 aligned).

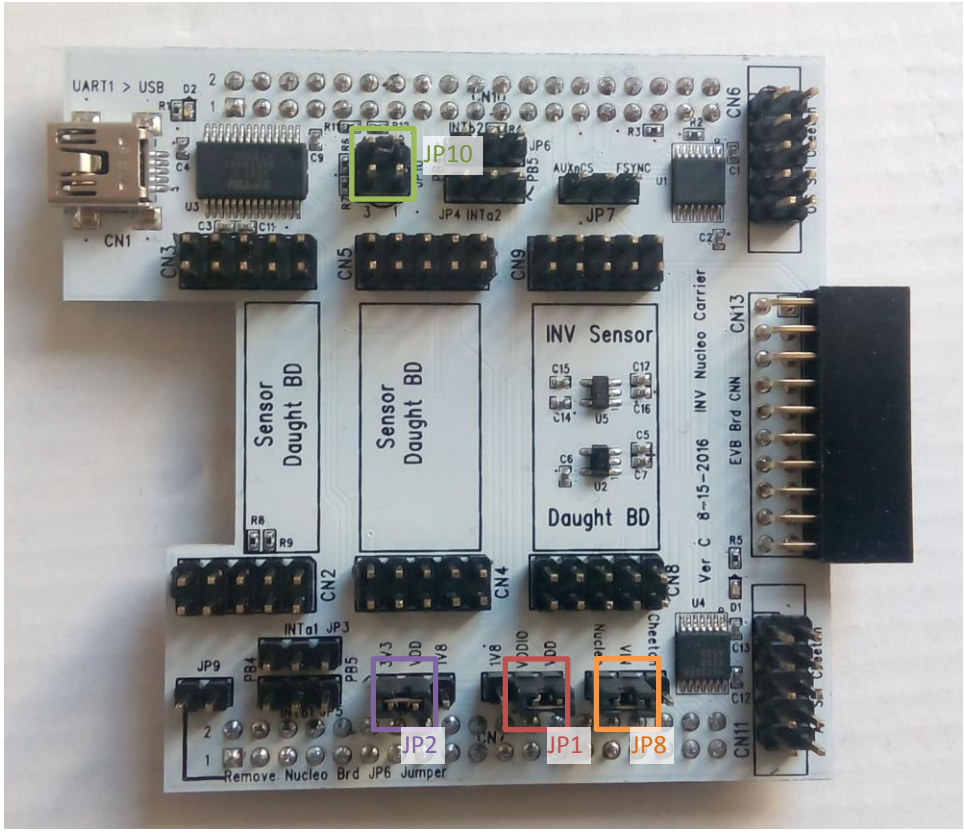

Figure 5 – Nucleo Carrier Board rev C Setup

The Nucleo Carrier Board has an additional jumper JP10 needed to multiplex the SPI and I2C output lines to communicate to ICM devices. This Quick Start Guide only covers the SPI configuration. Jumper on JP10 should remain open.

JP10	Open (1!=3)
	Open (2!=4)

Table 3 – SPI/I2C Nucleo Carrier board jumper configuration

JP3, JP4, JP5 and JP6 jumpers are required to map auxiliary sensors interrupt but are not supported yet on the GSH.

- The **ICM-20690** 6-axis sensors
  In order to connect the ICM-20690 daughter board to the SPI bus, plug it on the Nucleo Carrier board into the slot labelled '*INV Sensor Daught DB*'.

- Optionally, sensor Daughter Boards for auxiliary sensors
  You can plug in an InvenSense sensor daugthter board (labelled "*InvenSense Sensor DB*") into the slot labelled "Sensor Daught DB" on the Nucleo Carrier board.

Warning	The jumper configuration of auxiliary sensor daugheter board is different when used with GenericSensorHub. See Figure 6.

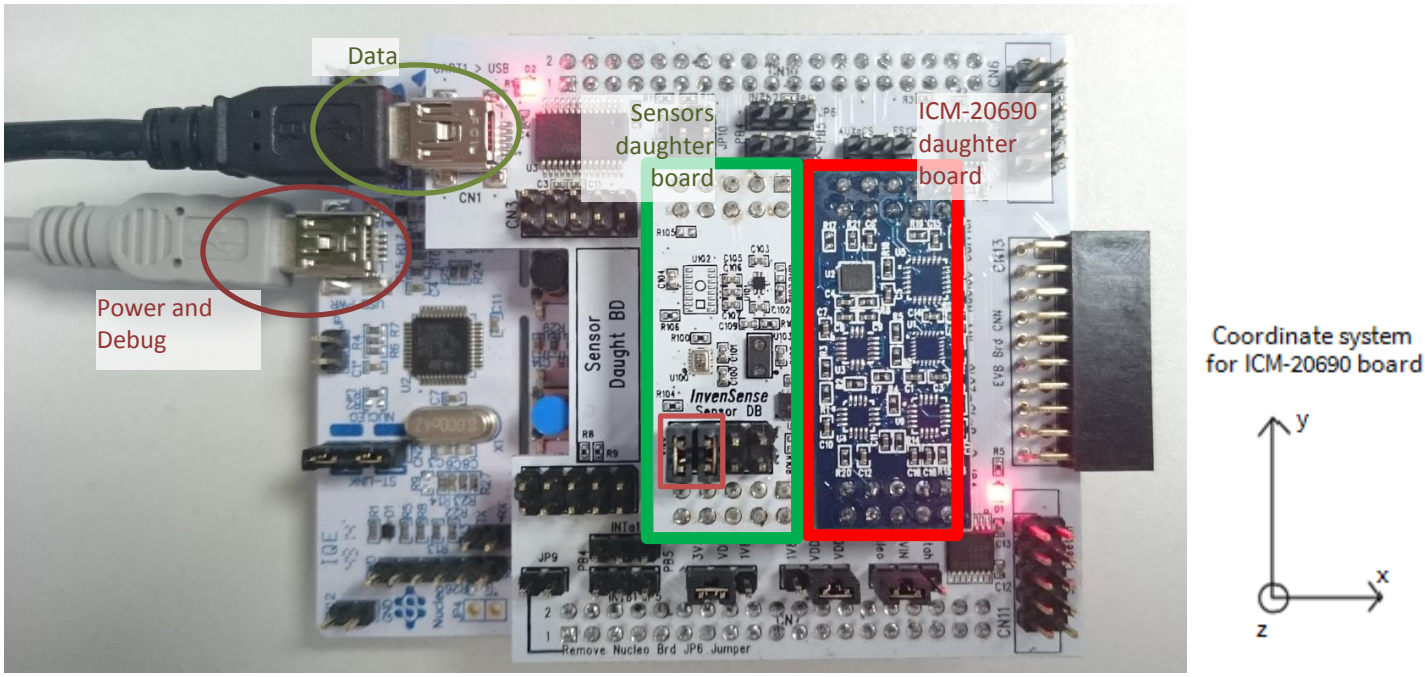

Figure 6 – Final GSH setup with Sensor Daughter Board

You can then connect your device to your computer, using both ports from the Nucleo (for power) and from the Nucleo Carrier board (for retrieiving data) at the same time. All the required drivers were installed during SensorStudio installation process.

You can now use your device in SensorStudio. You can check out the interactive tutorial or the samples from the welcome screen of SensorStudio.

For more details about the Generic Sensor Hub solution, please refer to the Generic Sensor Hub Quick Start Guide (available from the Help menu in SensorStudio).

4. REVISION HISTORY

REVISION DATE	REVISION	DESCRIPTION
10/7/2016	1.0	Initial Release