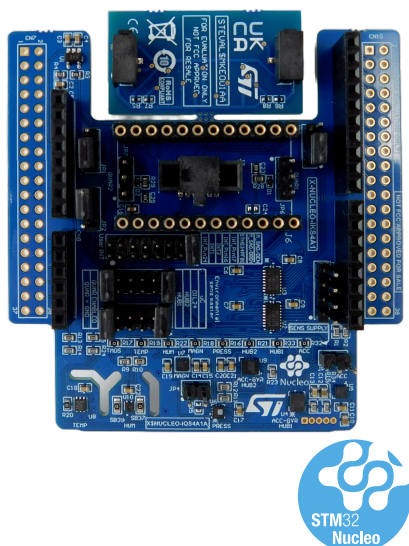


Motion MEMS and environmental sensor expansion board for STM32 Nucleo



Features

- LSM6DSO16IS: MEMS 3D accelerometer ($\pm 2/\pm 4/\pm 8/\pm 16$ g) + 3D gyroscope ($\pm 125/\pm 250/\pm 500/\pm 1000/\pm 2000$ dps) with ISPU (Intelligent Processing Unit)
- LIS2MDL: MEMS 3D magnetometer (± 50 gauss)
- LIS2DUXS12: Ultra low-power MEMS 3D accelerometer ($\pm 2/\pm 4/\pm 8/\pm 16$ g) with Qvar, AI, & anti-aliasing
- LPS22DF: Low-power and high-precision MEMS pressure sensor, 260-1260 hPa absolute digital output barometer
- SHT40AD1B
- STTS22H: Low-voltage, ultralow-power, 0.5 °C accuracy temperature sensor (-40 °C to $+125$ °C)
- LSM6DSV16X: MEMS 3D accelerometer ($\pm 2/\pm 4/\pm 8/\pm 16$ g) + 3D gyroscope ($\pm 125/\pm 250/\pm 500/\pm 1000/\pm 2000/\pm 4000$ dps) with embedded sensor fusion, AI, Qvar
- DIL 24-pin socket available for additional MEMS adapters and other sensors
- Free comprehensive development firmware library and example for all sensors compatible with STM32Cube firmware
- Equipped with Qvar touch/swipe electrode
- I²C sensor hub features on LSM6DSO and LSM6DSV16X available
- MIPI I3C® compatibility for communication with LIS2DUXS12, LSM6DSV16X and LPS22DF
- Compatible with STM32 Nucleo boards
- Equipped with Arduino UNO R3 connector
- Equipped with industrial connector for IR sensor (STHS34PF80) application development. It can be connected at the same time of external MEMS through DIL24 adapter
- Available interface for external camera module applications coupled with LIS2DUXS12 through aux SPI (3/4 w)
- RoHS compliant
- WEEE compliant
- UKCA compliant

Product summary

iNEMO inertial module: always-on 3-axis accelerometer and 3-axis gyroscope with ISPU - intelligent sensor processing unit	LSM6DSO16IS
Digital 3-axis magnetometer	LIS2MDL
6-axis IMU with embedded sensor fusion, AI, Qvar for high-end applications	LIS2DUXS12
digital nano pressure sensor	LPS22DF
digital sensor for relative humidity and temperature	SHT40AD1B
6-axis IMU with embedded sensor fusion, AI, Qvar	LSM6DSV16X

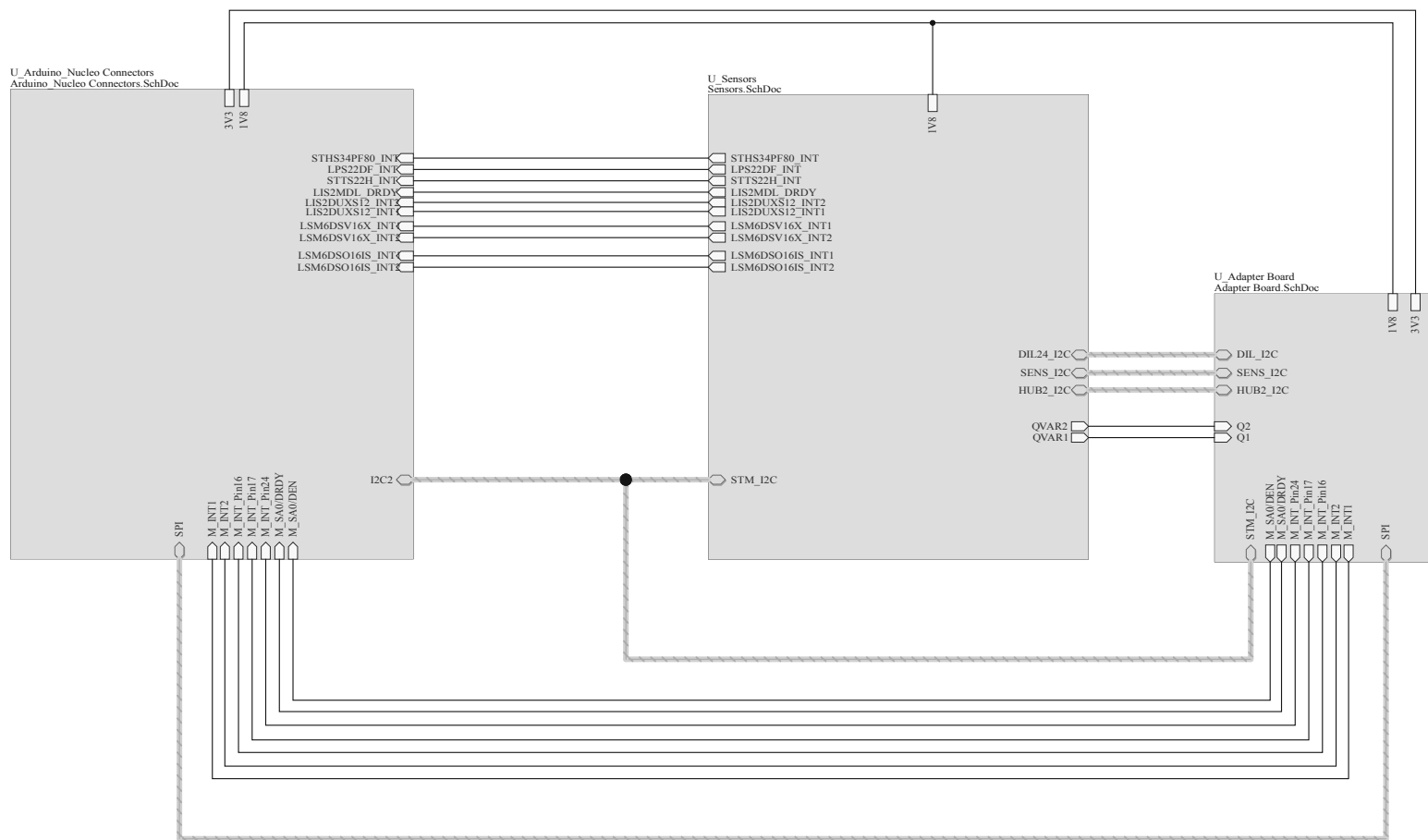
Description

The X-NUCLEO-IKS4A1 is a motion MEMS and environmental sensor evaluation board kit consisting of the main board X-NUCLEO-IKS4A1, which hosts the motion MEMS and environmental sensors, and the detachable add-on board STEVAL-MKE001A, which hosts the Qvar swipe electrodes.

This expansion board allows application development with features like sensor HUB (LSM6DSO16IS and LSM6DSV16X), camera module integration and Qvar touch/swipe gestures (thanks to the equipped electrode).

There is also the possibility to integrate presence and motion detection with an IR sensor.

Figure 1. X-NUCLEO-IKS4A1 circuit schematic (1 of 4)



Arduino & Morpho Connectors

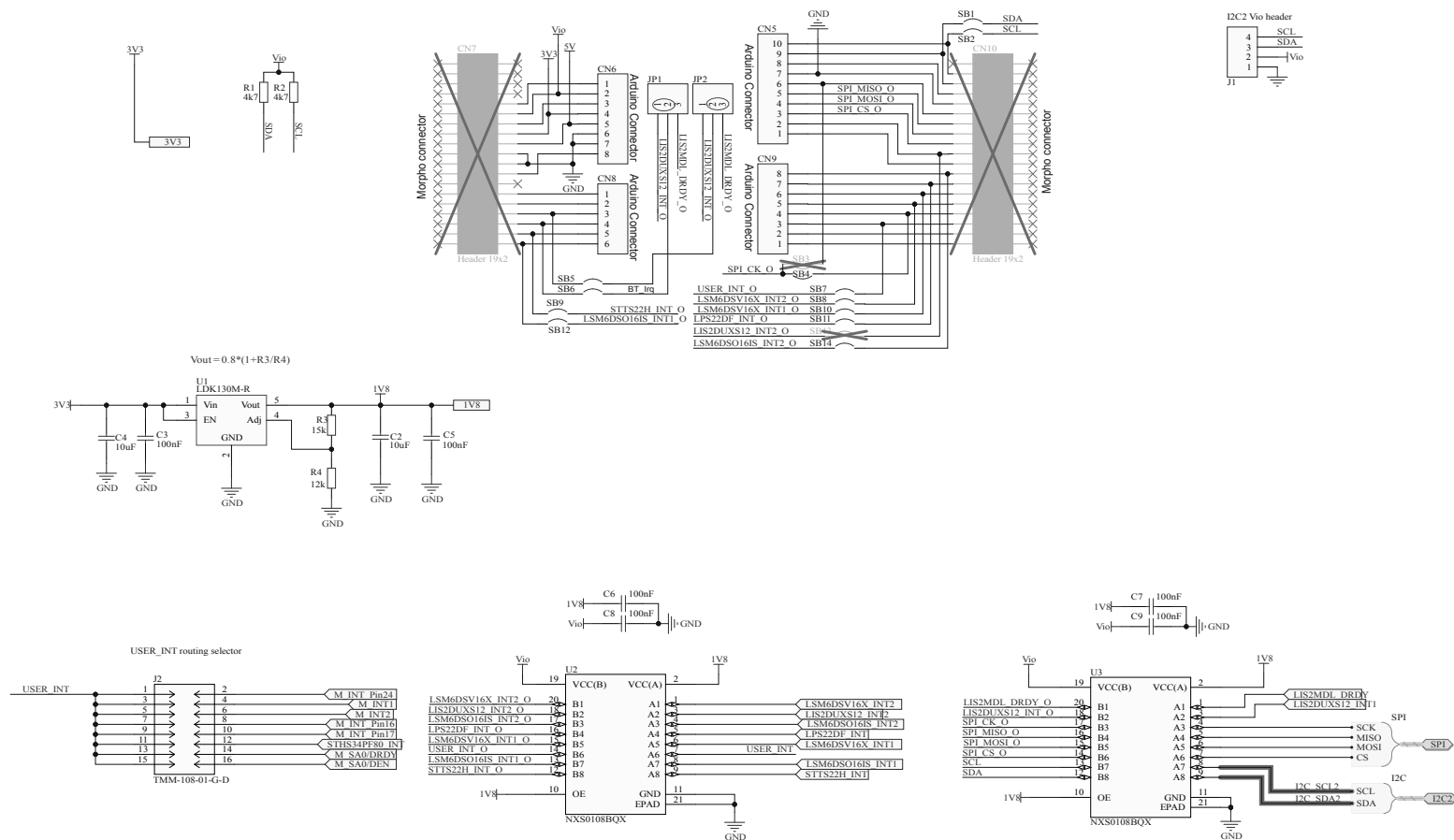
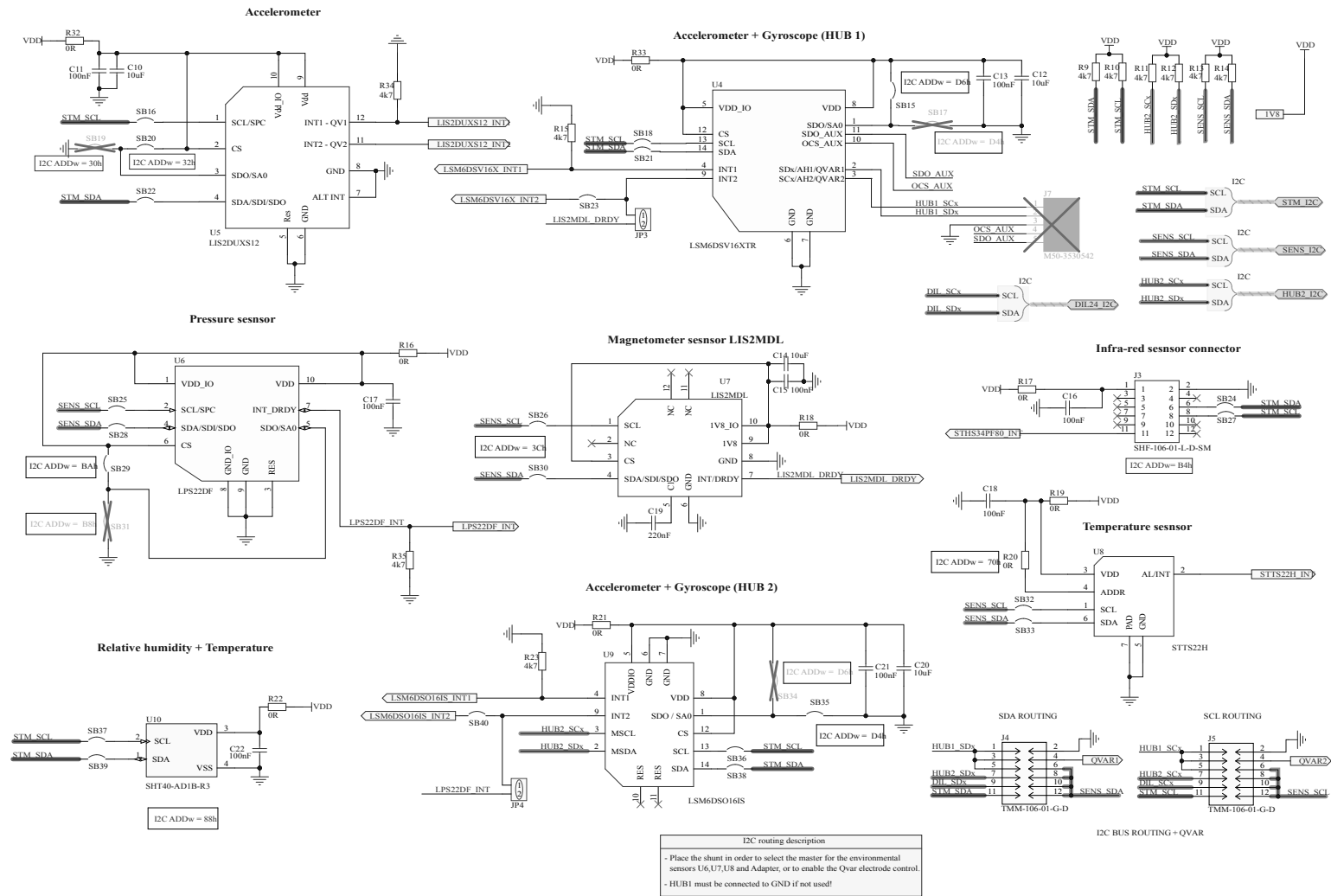


Figure 3. X-NUCLEO-IKS4A1 circuit schematic (3 of 4)





2 Kit versions

Table 1. X-NUCLEO-IKS4A1 versions

Finished good	Schematic diagrams	Bill of materials
X\$NUCLEO-IKS4A1A ⁽¹⁾	X\$NUCLEO-IKS4A1A schematic diagrams	X\$NUCLEO-IKS4A1A bill of materials

1. This code identifies the X-NUCLEO-IKS4A1 evaluation kit first version. The kit consists of the main board X-NUCLEO-IKS4A1 whose version is identified by the code X\$NUCLEO-IKS4A1A and the detachable board STEVAL-MKE001A whose version is identified by the code STEVAL-MKE001AA.

Revision history

Table 2. Document revision history

Date	Version	Changes
11-Oct-2023	1	Initial release.

IMPORTANT NOTICE – READ CAREFULLY

STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, enhancements, modifications, and improvements to ST products and/or to this document at any time without notice. Purchasers should obtain the latest relevant information on ST products before placing orders. ST products are sold pursuant to ST's terms and conditions of sale in place at the time of order acknowledgment.

Purchasers are solely responsible for the choice, selection, and use of ST products and ST assumes no liability for application assistance or the design of purchasers' products.

No license, express or implied, to any intellectual property right is granted by ST herein.

Resale of ST products with provisions different from the information set forth herein shall void any warranty granted by ST for such product.

ST and the ST logo are trademarks of ST. For additional information about ST trademarks, refer to www.st.com/trademarks. All other product or service names are the property of their respective owners.

Information in this document supersedes and replaces information previously supplied in any prior versions of this document.

© 2023 STMicroelectronics – All rights reserved