STEVAL-IOD04KT1

Data brief

Industrial smart sensor kit based on L6364W dual IO-Link device transceiver

Product summary	
Industrial smart sensor kit based on L6364W dual IO-Link device transceiver	STEVAL-IOD04KT1
Software pack for STEVAL-IOD04KT1 with IO-Link stack v1.1, IODD, and control software for industrial sensors	STSW-IOD04K
Dual channel IO-Link device transceiver in CSP package	L6364W
Applications	Factory automation Industrial sensors

Features

- Kit content:
  - STEVAL-IOD004V1 (45.8 x 8.3 mm) main board with shape easy to be integrated in industrial sensors housing (not available for separate sale)
  - STLINK-V3MINI programmer and debugger tool
  - M8-M12 industrial connector adapter including a 20 cm cable
  - 14-pin flat cable
- Main board features:
  - Industrial sensor node based on STM32G071EB (mainstream Arm® Cortex®-M0+ RISC core MCU operating at up to 64 MHz frequency), L6364W (dual channel transceiver IC for SIO and IO-Link sensor applications), IIS2MDC (high accuracy, ultra-low-power, 3-axis digital output magnetometer) and ISM330DHCX (iNEMO inertial module with machine learning core, and finite state machine with digital output for industrial applications)
  - Runs an IO-Link v.1.1 demo-stack and MEMS control software, included in the companion package STSW-IOD04K together with the IODD file
  - Operating voltage range 7 to 32 V
  - Four-pole M8 industrial standard connector
  - L6364W embedded DC-DC converter provides 3.3 V supply for all on-board ICs
  - General-purpose LEDs for transmission, programming/debugging, warning, and status
  - Jumpers for CQ and DIO selection in independent or joint mode
  - Switch for transmission mode selection (transparent, single, or multioctet)
  - Reset button
  - 10-pin connector for sensor expansion options
  - SWD connector for debugging and programming capability
  - Protections against surge pulse (up to ± 3APK with 500 Ω coupling) and reverse polarity
  - EMC and EMI tested according to standard requirements
  - RoHS compliant

Description

The STEVAL-IOD04KT1 is a reference design kit that exploits the features of the L6364W IO-Link dual-channel device transceiver.

The kit consists of the STEVAL-IOD004V1 main board (not available for sale), the STLINK-V3MINI programmer and debugger tool, a 14-pin flat cable, and an M8 to M12 standard industrial connector adapter.

The kit acts as a modern smart industrial sensor to be connected to a master IO-Link hub (or a suitable PLC interface).

The power supply for the MCU, sensors, and other logic devices derives from the DC-DC converter controller embedded in the L6364W.

The on-board STM32G071EB microcontroller runs an IO-Link demo stack v.1.1, which controls the IO-Link communication, and the software code that manages the L6364W transceiver and the MEMS industrial sensors.

The tiny dimensions of the main board have been achieved thanks to the small sizes of the CSP package options of L6364W and STM32G071EB.

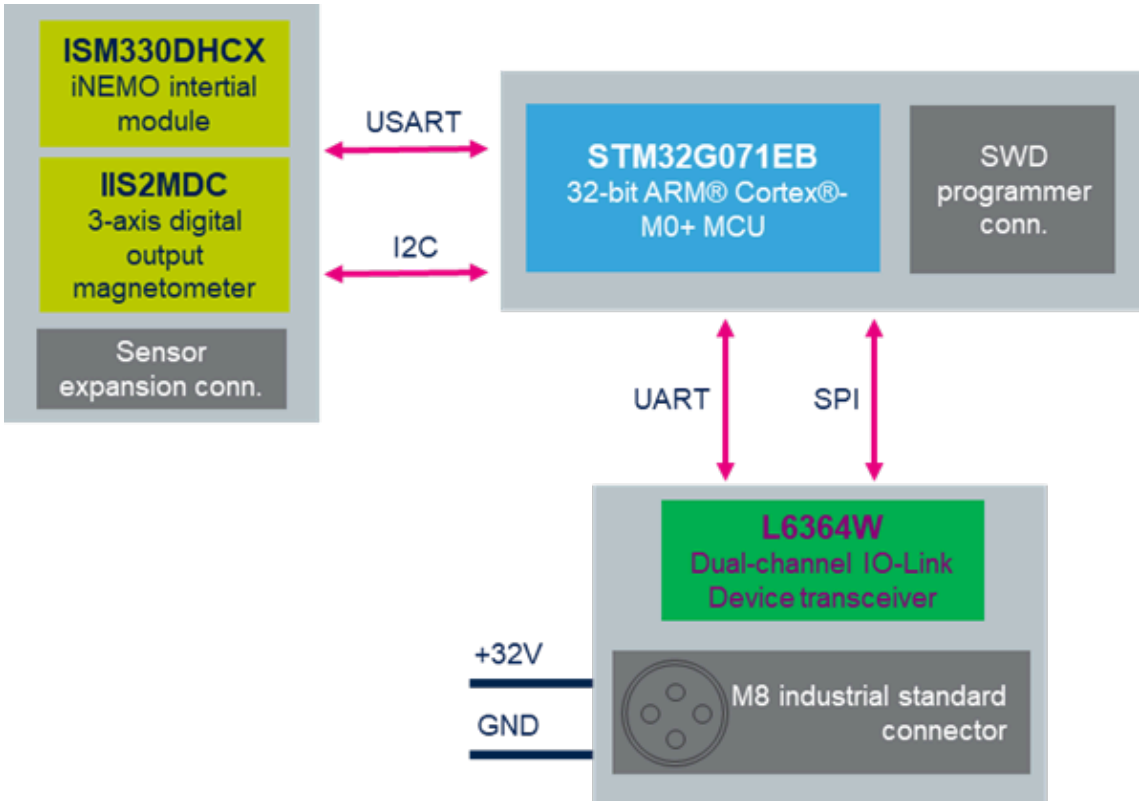
Connect the main board to an IO-Link master via the adapter and the M8 connector included in the kit for normal operation. Connect the same board to the STLINK-V3MINI through the flat cable only if you want to program the STM32G071EB with a new firmware.

1 Solution overview

This reference design targets IO-Link based applications, that is, smart industrial sensors that feature easy configuration, remote monitoring, reduced wiring, advanced diagnostics, and easy device replacement.

The main board (STEVAL-IOD004V1) has been designed with few ICs. Taking this into consideration, smart-sensing applications can benefit from the L6364W dual-channel transceiver. For example, the ISM330DHCX inertial module can monitor a robotic arm (for vibration and compensation) while the IIS2MDC can detect the magnetic field, providing a warning along the supplementary channel.

Figure 1. STEVAL-IOD004V1 functional block diagram



2 Schematic diagrams

Figure 2. **STEVAL-IOD004V1 (main board) circuit schematic (1 of 4)**

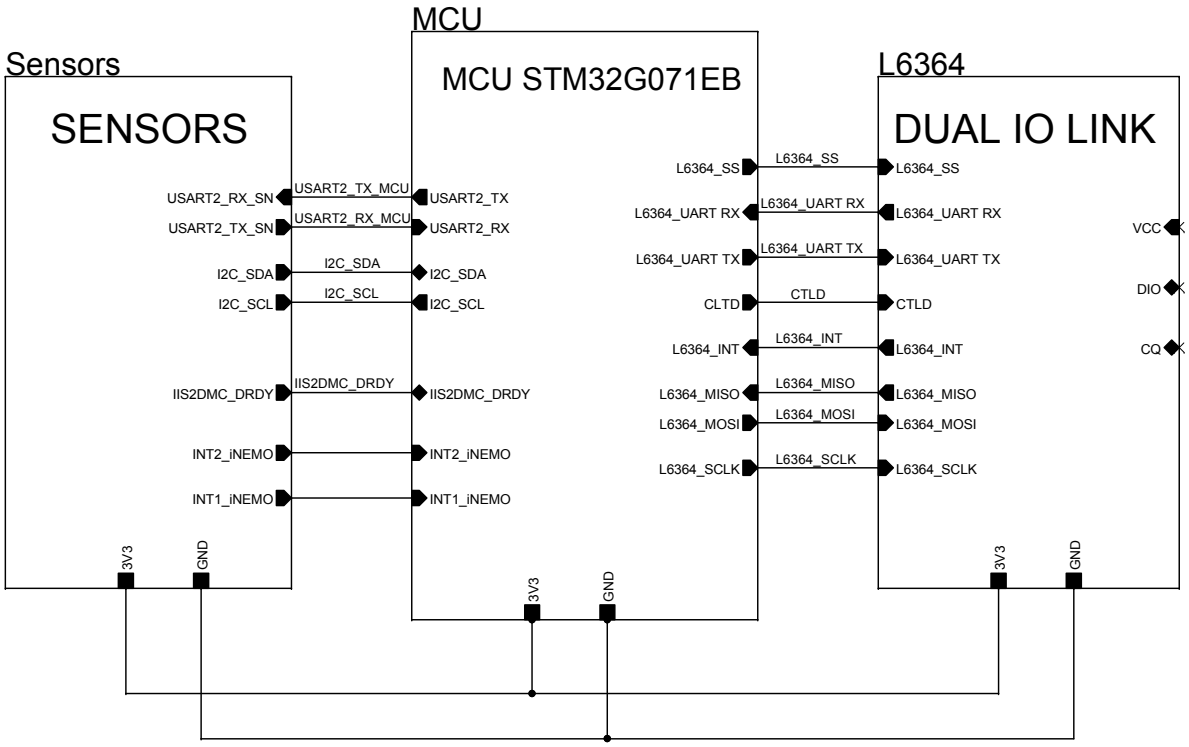


Figure 3. **STEVAL-IOD004V1 (main board) circuit schematic (2 of 4)**

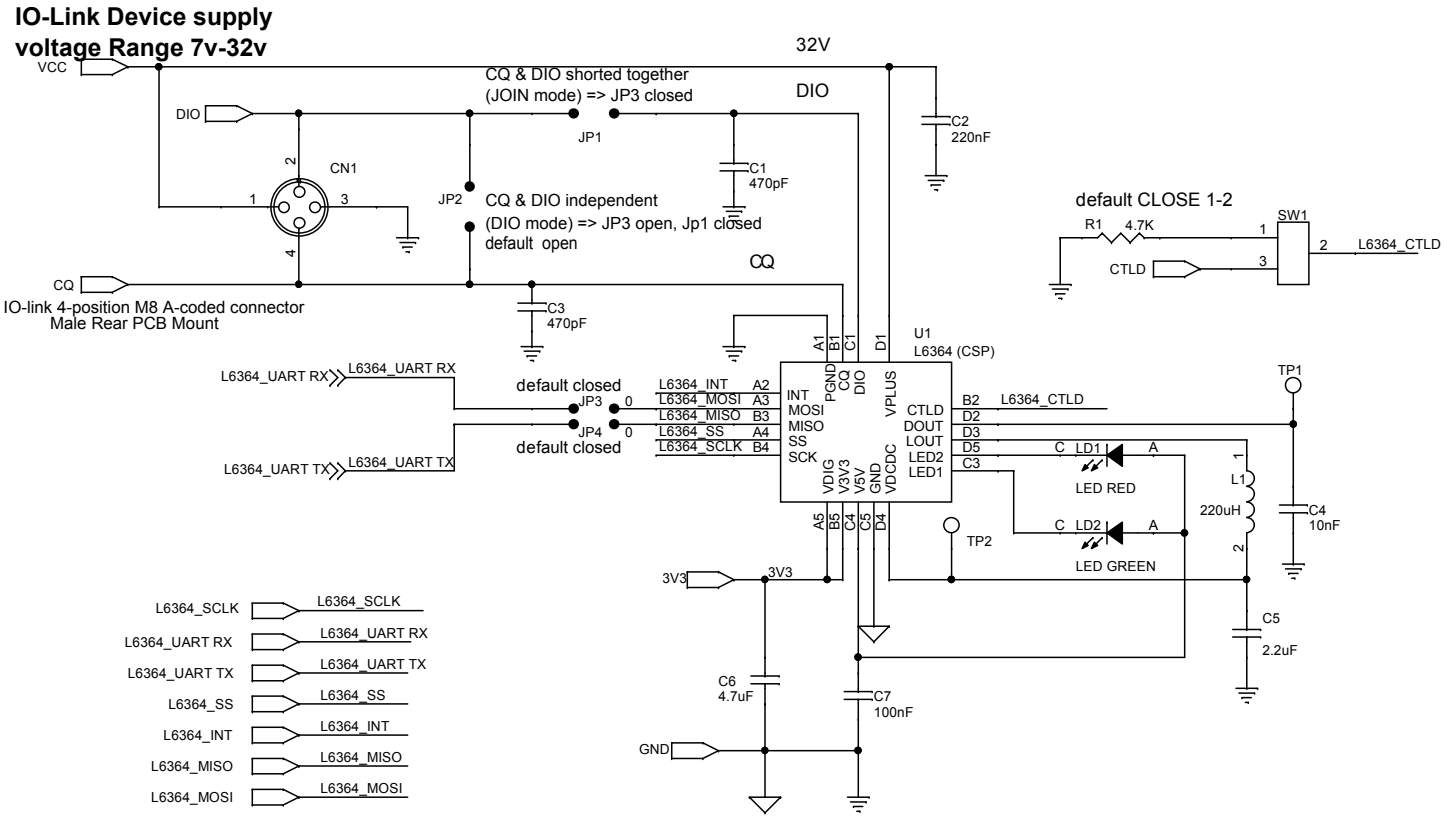


Figure 4. STEVAL-IOD004V1 (main board) circuit schematic (3 of 4)

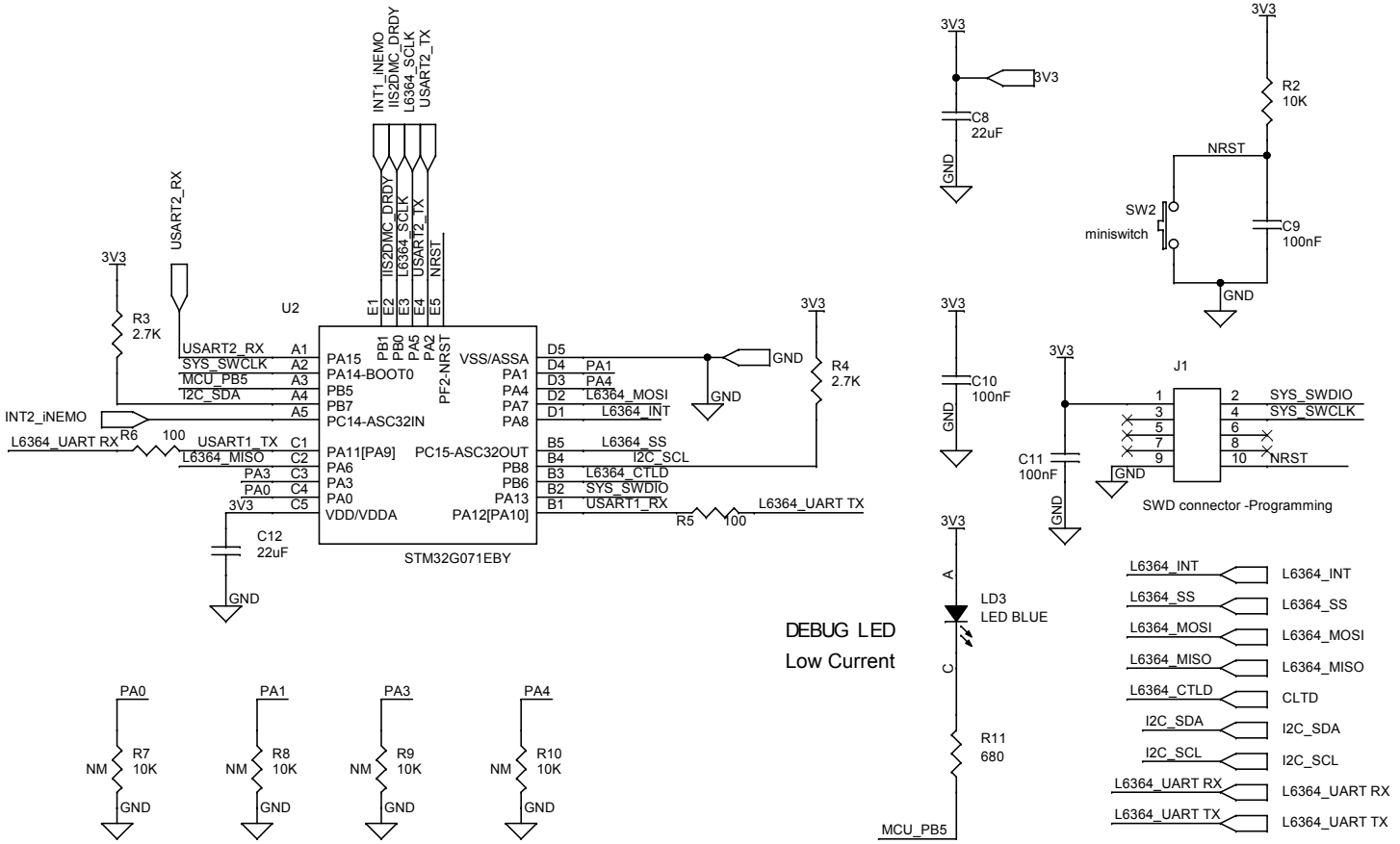
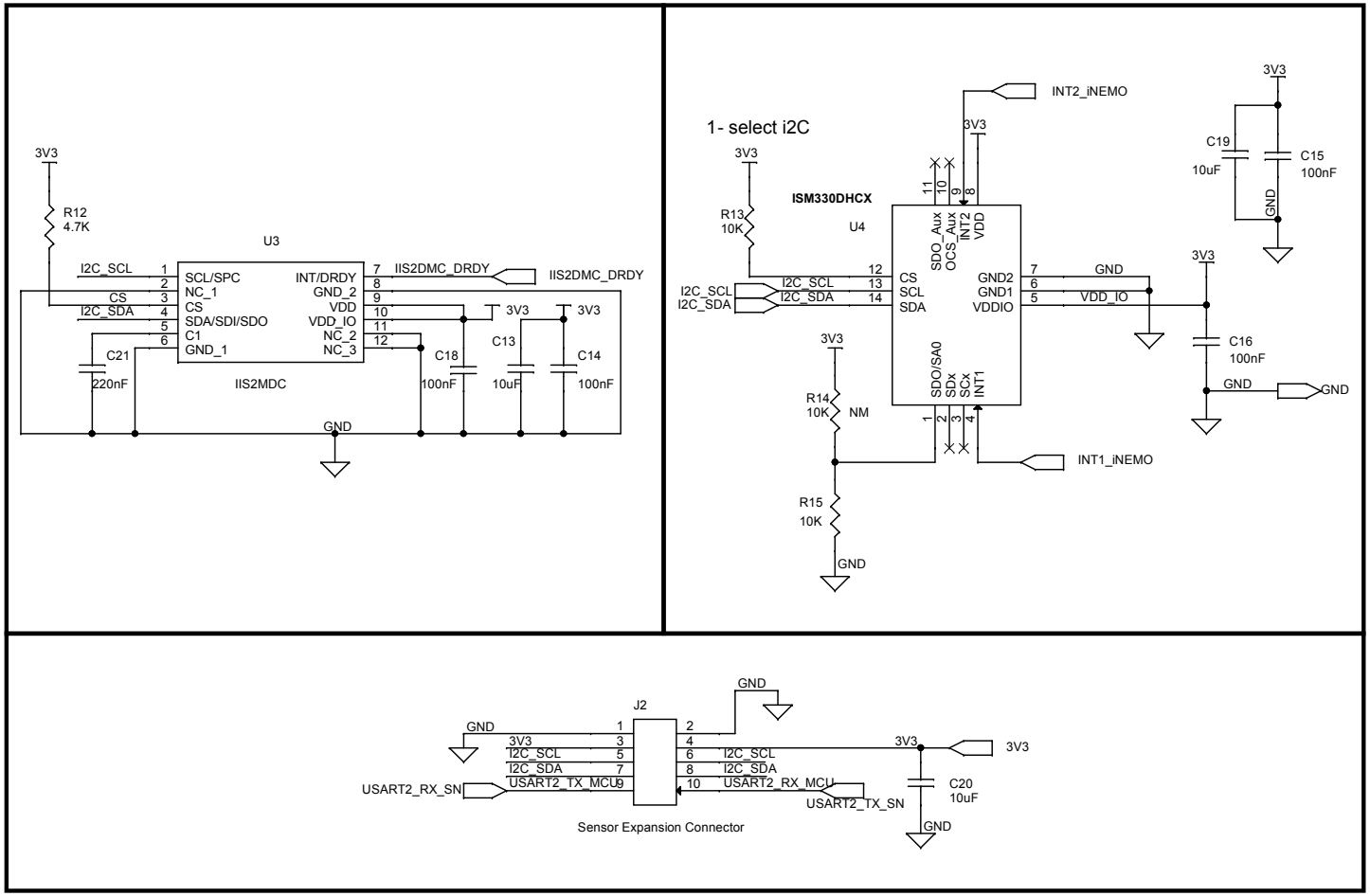


Figure 5. STEVAL-IOD004V1 (main board) circuit schematic (4 of 4)



3 Kit versions

Table 1. STEVAL-IOD04KT1 versions

Finished good	Schematic diagrams	Bill of materials
STEVAL$IOD04KT1A (1)	STEVAL$IOD04KT1A schematic diagrams	STEVAL$IOD04KT1A bill of materials

1. *This code identifies the STEVAL-IOD04KT1 evaluation kit first version.*

Revision history

Table 2. **Document revision history**

Date	Revision	Changes
27-Oct-2021	1	Initial release.
13-Dec-2021	2	Updated cover page image.