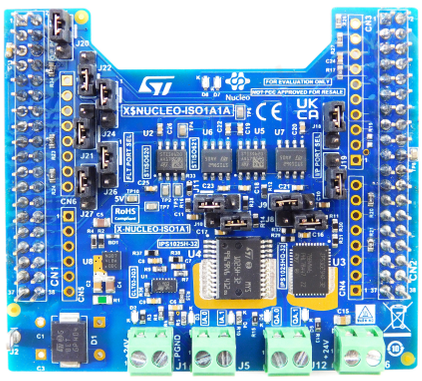
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X-NUCLEO-ISO1A1

Data brief

Industrial isolated input/output expansion board based on STISO620/621, CLT03-2Q3 and IPS1025HQ for STM32 Nucleo



Product summary	
Industrial isolated input/output expansion board based on STISO620/621, CLT03-2Q3 and IPS1025HQ for STM32 Nucleo	X-NUCLEO-ISO1A1
Software expansion for STM32Cube allowing micro-PLC functionality	X-CUBE-ISO1
High efficiency, high-side switch with extended diagnostic and smart driving for capacitive loads	IPS1025HQ-32/ IPS1025H-32
Self powered digital input current limiter	CLT03-2Q3
Dual channel digital isolator	STISO620/ STISO621
Applications	Programmable Logic Controllers

Features

- 2x input equipped with CLT03-2Q3 high-speed protected digital termination array
- 2x output features IPS1025H and IPS1025H-32 high-efficiency, high-side switches with extended diagnostics and smart driving for capacitive loads
- Dual-channel digital isolators include 2x STISO621 isolators with two channels in opposite directions providing up to 6 kV galvanic isolation
- Dual-channel digital isolators include 2x STISO620 isolators offering up to 4 kV galvanic isolation
- LDO40LPURY: low drop regulator with wide input voltage range up to 38 V, 0.4 A output current, and adjustable output voltage from 2.5 V
- LEDs for each input and output, as well as for the power port
- Interfaces with STM32 Nucleo board via 34-pin ST morpho
- Free comprehensive development firmware library and examples compatible with STM32Cube firmware, X-CUBE-ISO1
- Two programmable LEDs for custom indications
- RoHS compliant

Description

The X-NUCLEO-ISO1A1 is an evaluation board with isolated industrial input/output designed to expand the STM32 Nucleo board and provide micro-PLC functionality.

Two of the X-NUCLEO-ISO1A1 boards can be stacked together on top of an STM32 Nucleo board with appropriate selection of jumpers on the expansion board to avoid conflict in GPIO interfaces.

The UL1577 certified digital isolators STISO620 and STISO621 provide isolation between logic and process side components.

Two current limited high-side inputs from the process side are realized through CLT03-2Q3.

The CLT03-2Q3 provides protection, isolation, and energy-less status indication for industrial conditions, designed to meet standards such as IEC61000-4-2, IEC61000-4-4, and IEC61000-4-5.

Each of high-side switches, IPS1025H-32 provides protected output up to 5.6A with diagnostics and smart driving features. These can drive capacitive, resistive, or inductive loads.

The X-NUCLEO-ISO1A1 allows rapid evaluation of the onboard ICs using the X-CUBE-ISO1 software package.

The board has provision for Arduino connections.

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1 Schematic diagrams

Figure 1. X-NUCLEO-ISO1A1 circuit schematic (1 of 4)

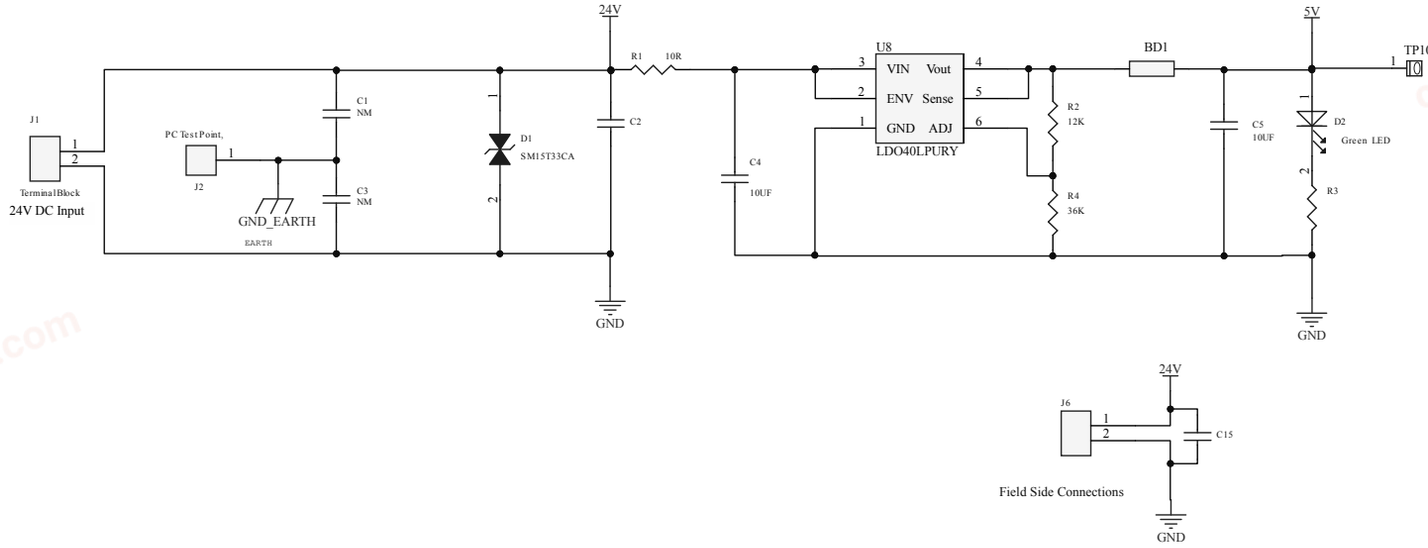
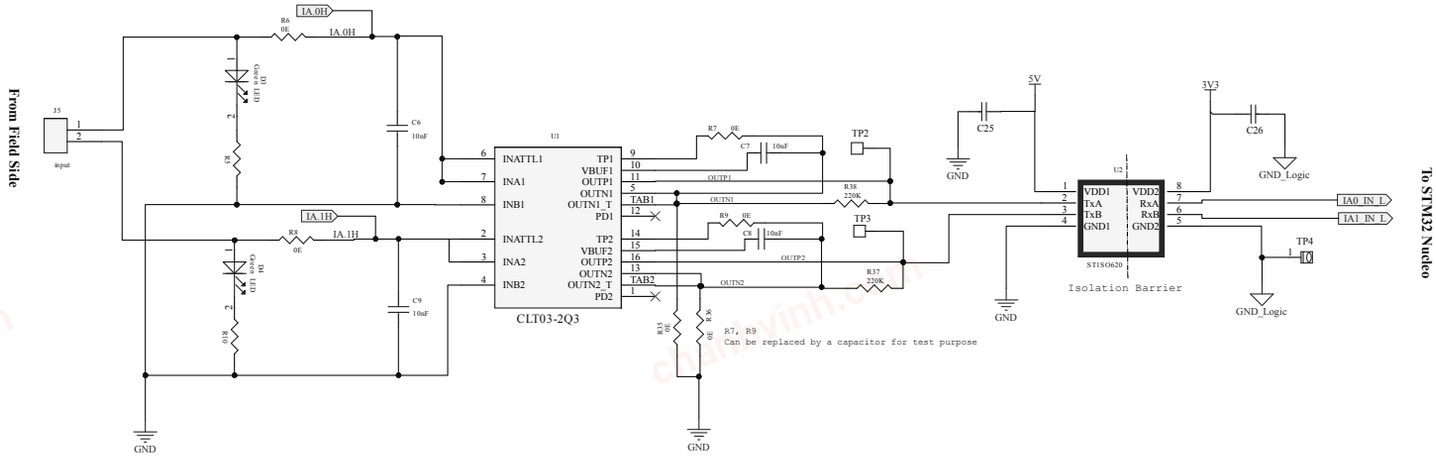


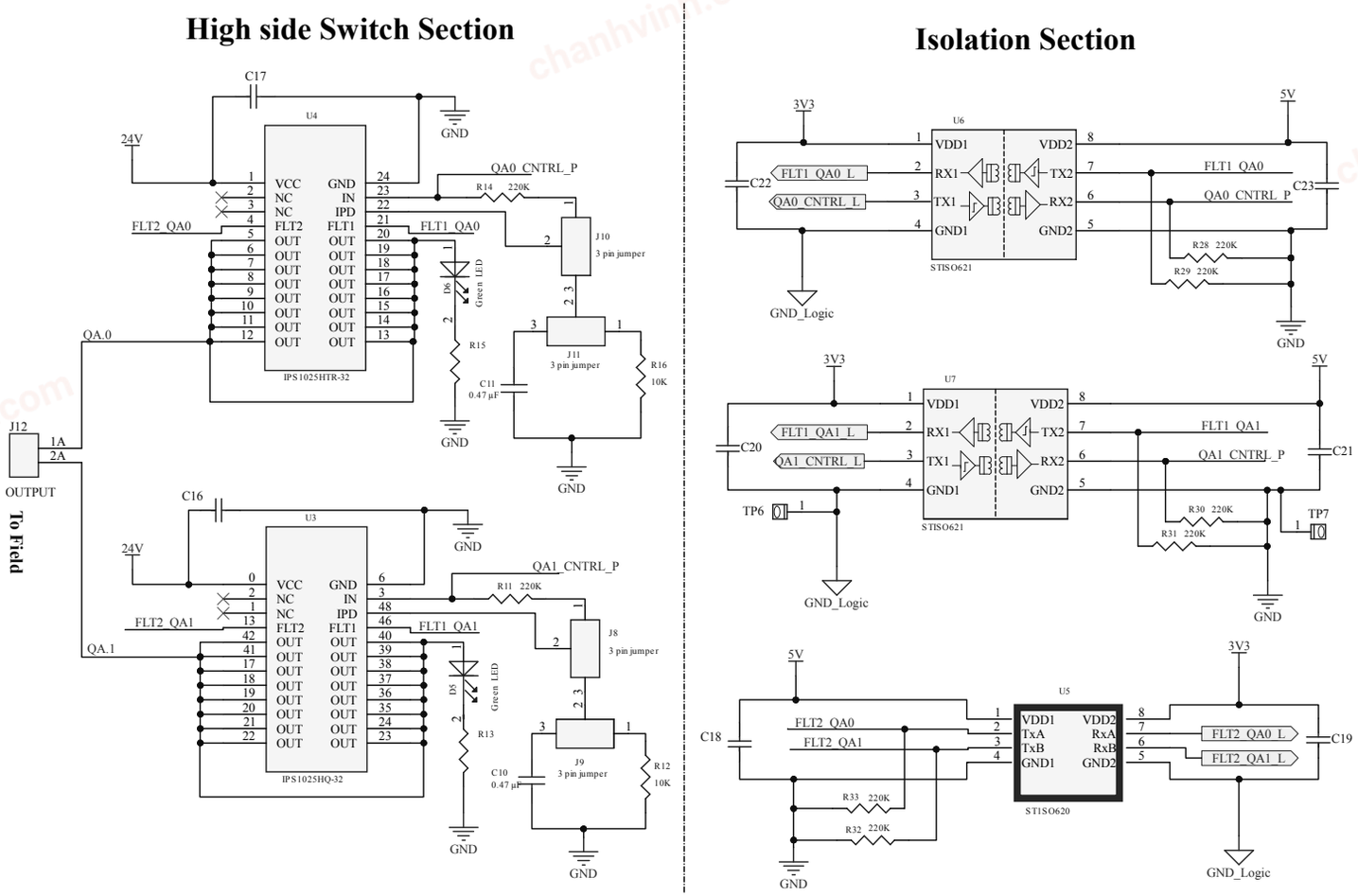
Figure 2. X-NUCLEO-ISO1A1 circuit schematic (2 of 4)



Input Current Limiter with Digital Isolation

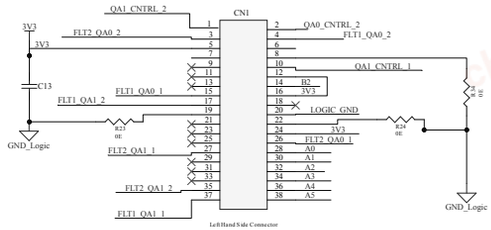
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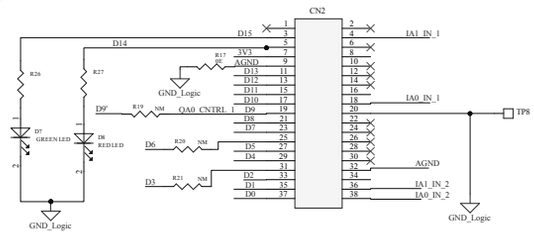
Figure 3. **X-NUCLEO-ISO1A1 circuit schematic (3 of 4)**



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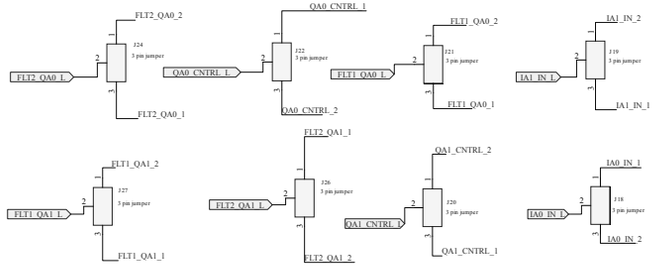
Figure 4. X-NUCLEO-ISO1A1 circuit schematic (4 of 4)



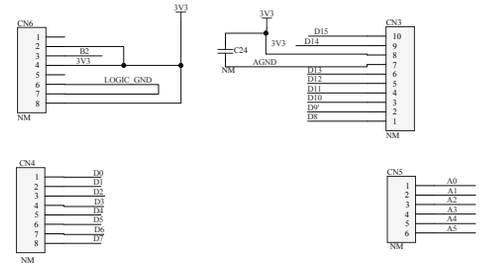


Morpho Connectors

[Note: Header PIN 1 and 2 to be shorted for All Default configuration.]



MCU Interface Routing Options



Arduino Connectors

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2 Board versions

Table 1. **X-NUCLEO-ISO1A1 versions**

Finished good	Schematic diagrams	Bill of materials
X$NUCLEO-ISO1A1A (1)	X$NUCLEO-ISO1A1A schematic diagrams	X$NUCLEO-ISOA1A bill of materials

1. *This code identifies the X-NUCLEO-ISO1A1 evaluation board first version.*

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Revision history

Table 2. **Document revision history**

Date	Revision	Changes
27-Feb-2025	1	Initial release.

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