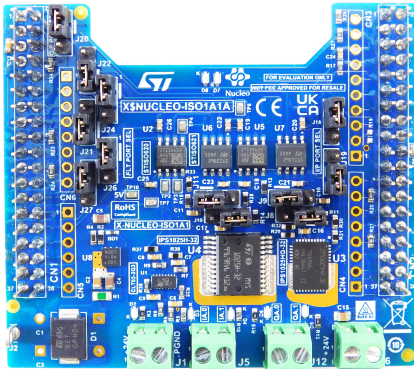




Industrial isolated input/output expansion board based on STISO620/621, CLT03-2Q3 and IPS1025HQ for STM32 Nucleo



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.

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

1 Schematic diagrams

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

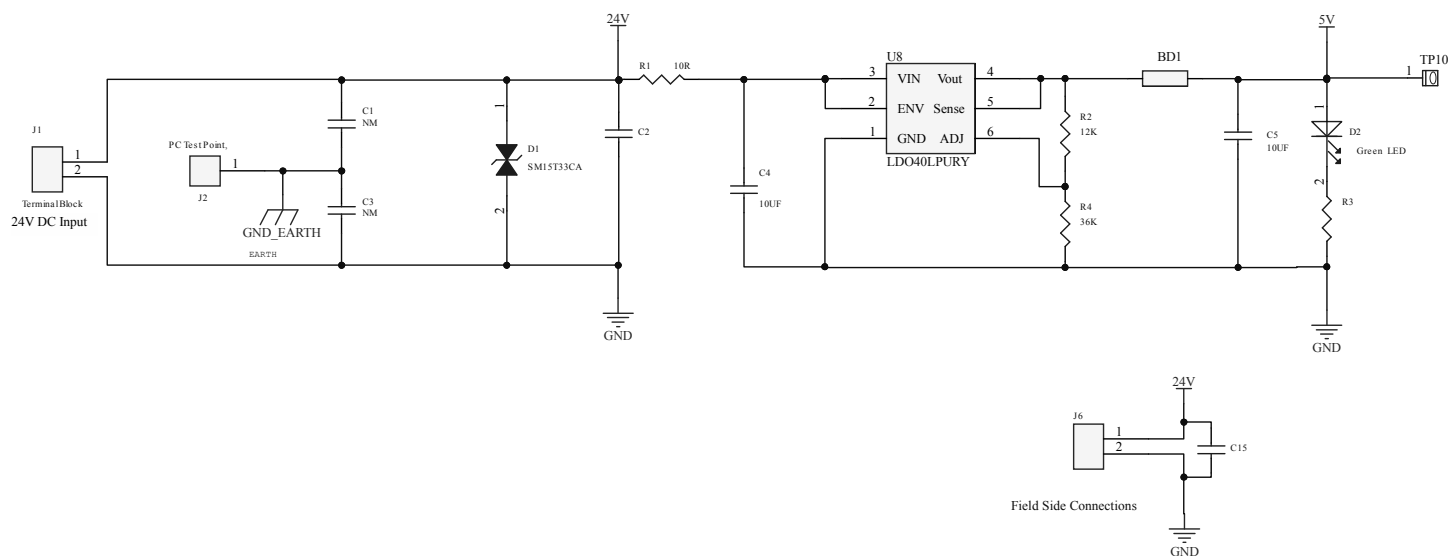
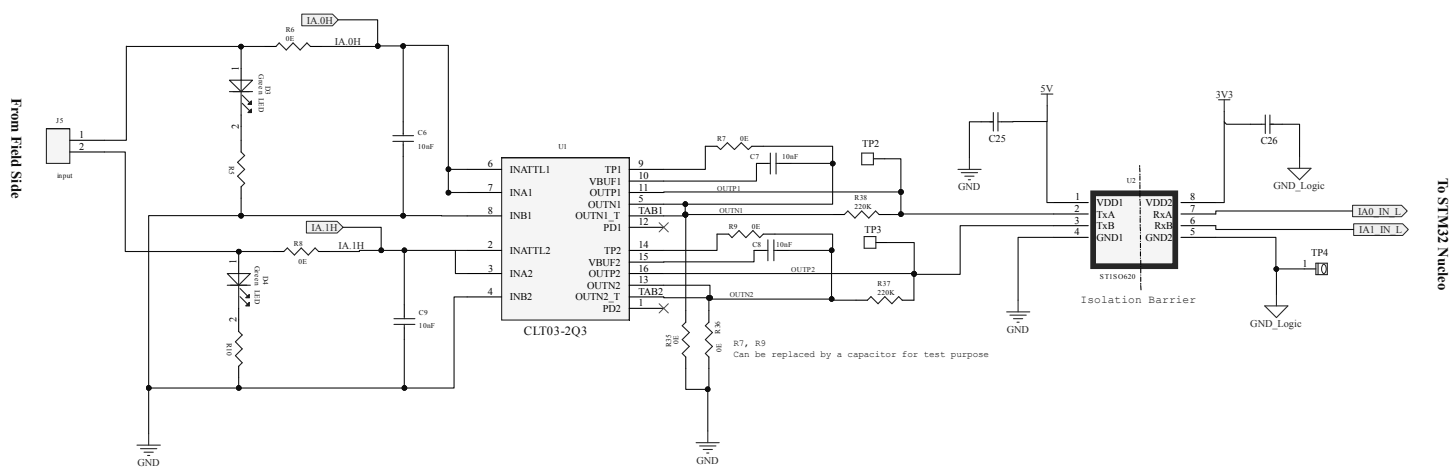


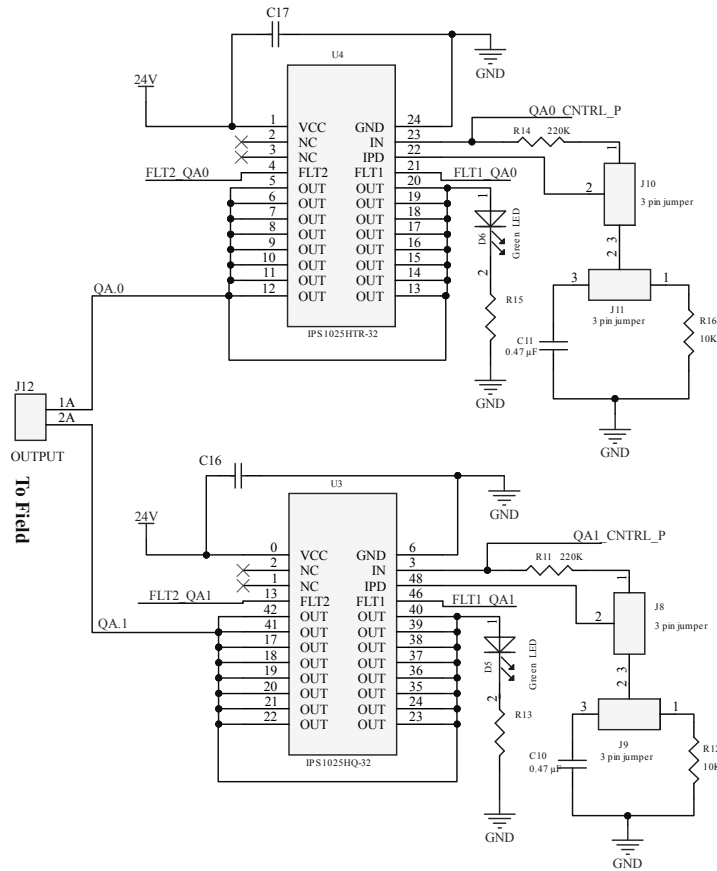
Figure 2. X-NUCLEO-ISO1A1 circuit schematic (2 of 4)



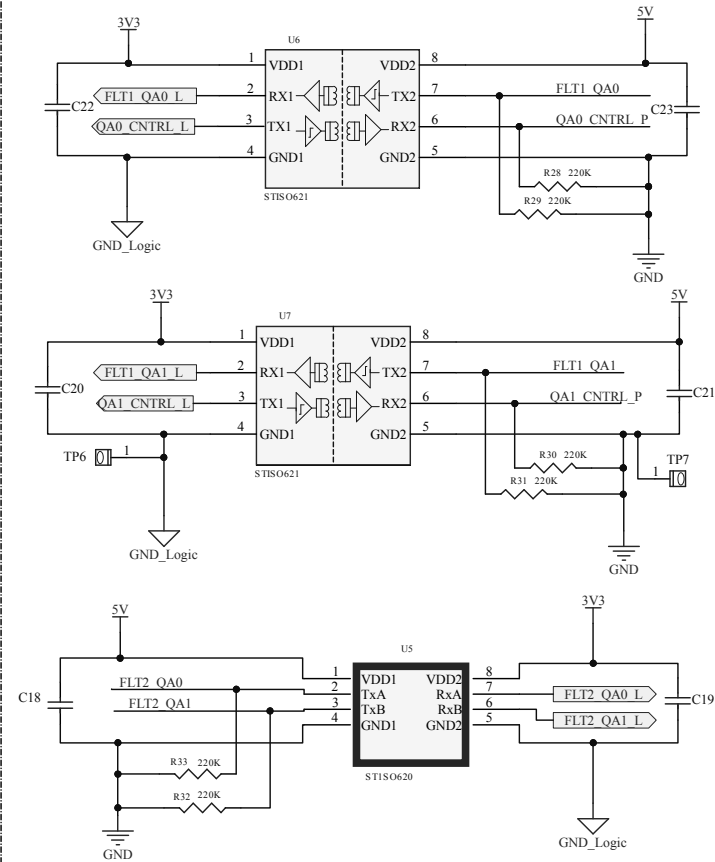
Input Current Limiter with Digital Isolation

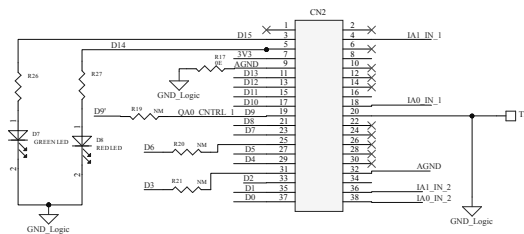
Figure 3. X-NUCLEO-ISO1A1 circuit schematic (3 of 4)

High side Switch Section



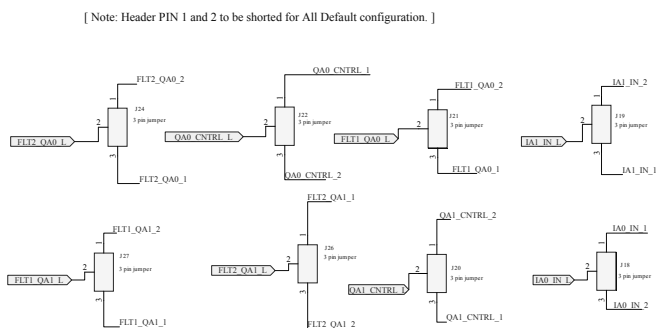
Isolation Section





X-NUCLEO-ISO1A1

Schematic diagrams



Arduino Connectors

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.

Revision history

Table 2. Document revision history

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

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