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I2C Isolator 7 Click

PID: MIKROE-5943

I2C Isolator 7 Click is a compact add-on board that offers completely isolated bidirectional communication. This board features the ADuM1252, an ultra-low power, bidirectional I2C isolator from Analog Devices. It can isolate I2C bidirectional data transfer of up to 2MHz SCL and bidirectional SCL for advanced bus topologies, and it supports clock stretching and multiple controllers across the isolation barrier. It also features the enhanced hot-swappable side 2 IO. This Click board™ makes the perfect solution for the development of applications based on transferring digital signals between circuits with different power domains at ambient temperatures.

I2C Isolator 7 Click is fully compatible with the mikroBUS™ socket and can be used on any host system supporting the mikroBUS™ standard. It comes with the mikroSDK open-source libraries, offering unparalleled flexibility for evaluation and customization. What sets this Click board™ apart is the groundbreaking ClickID feature, enabling your host system to seamlessly and automatically detect and identify this add-on board.

How does it work?

I2C Isolator 7 Click is based on the ADuM1252, an ultra-low power, bidirectional I2C isolator from Analog Devices. It features independent power supplies on both sides. Side 1 is reserved for 3.3V and 5V of mikroBUS™ socket rails, while side 2 can be supplied in a range of 1.71V up to 5.5V. To prevent latch-up action, its side 1 outputs comprise a special buffer that regulates the logic-low voltage, and the input logic-low threshold is lower than the output logic-low voltage. In addition, side 2 features conventional buffers that do not regulate logic-low output voltage.

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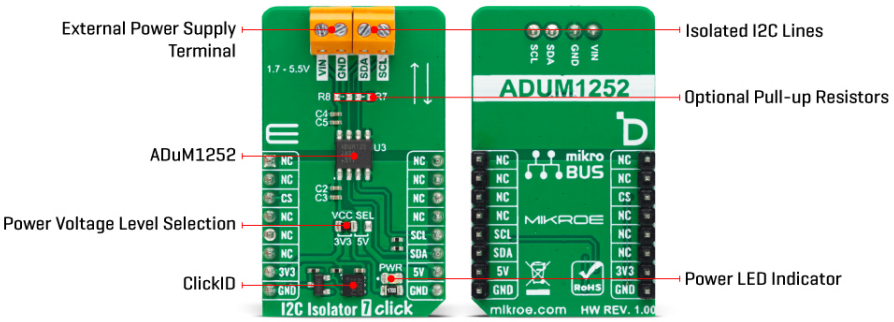

I2C Isolator 7 Click uses a standard 2-Wire I2C interface to allow the host MCU to have an isolated bidirectional data transfer with a connected I2C device to the I2C terminals. As we mentioned, besides the I2C bus, the power supply is isolated, too. Places for optional pull-ups on the I2C bus are left unpopulated. You can solder resistors according to your needs.

This Click board™ can operate with either 3.3V or 5V logic voltage levels selected via the VCC SEL jumper. This way, both 3.3V and 5V capable MCUs can use the communication lines properly. Also, this Click board™ comes equipped with a library containing easy-to-use functions and an example code that can be used as a reference for further development.

Specifications

Type	I2C,Isolators
Applications	Can be used for the development of applications based on transferring digital signals between circuits with different power domains at ambient temperatures
On-board modules	ADuM1252 - ultra-low power, bidirectional I2C isolator from Analog Devices
Key Features	Two bidirectional open-drain channels for applications such as I2C, wide independent supply range, especially for side 2, enhanced hot-swappable side 2 IO, strong current sinking, robust galvanic isolation of digital signals, ultra-low power consumption, and more
Interface	I2C
ClickID	Yes
Compatibility	mikroBUS™
Click board size	M (42.9 x 25.4 mm)
Input Voltage	3.3V or 5V,External

Pinout diagram

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This table shows how the pinout on I2C Isolator 7 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikroBUS				Pin	Notes
	NC	1	AN	PWM	16	NC	
	NC	2	RST	INT	15	NC	
ID COMM	**CS**	3	CS	RX	14	NC	
	NC	4	SCK	TX	13	NC	
	NC	5	MISO	SCL	12	**SCL**	I2C Clock
	NC	6	MOSI	SDA	11	**SDA**	I2C Data
Power Supply	**3.3V**	7	3.3V	5V	10	**5V**	Power Supply
Ground	**GND**	8	GND	GND	9	**GND**	Ground

Onboard settings and indicators

Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator
JP1	VCC SEL	Left	Power/Logic Voltage Level Selection 3V3/5V: Left position 3V3, Right position 5V

I2C Isolator 7 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
External Power Supply	1.71	-	5.5	V
Maximum Data Rate	-	-	2	MHz
Galvanic Isolation	-	-	445	V_{RMS}

Software Support

We provide a library for the I2C Isolator 7 Click as well as a demo application (example), developed using MIKROE compilers. The demo can run on all the main MIKROE development boards.

Package can be downloaded/installed directly from NECTO Studio Package Manager (recommended), downloaded from our LibStock™ or found on Mikroe github account.

Library Description

This library contains API for I2C Isolator 7 Click driver.

Key functions

- i2cisolator7_generic_write This function shall generate a START signal, followed by len number of writes from data_in.
- i2cisolator7_generic_read This function shall generate a START signal, followed by len number of reads from the bus placing the data in data_out.
- i2cisolator7_write_then_read This function performs a write operation followed by a

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read operation on the bus by using I2C serial interface.

Example Description

This demo application shows an example of an I2C Isolator 7 Click wired to the PRESS Click board™ for reading device ID (Who am I). The library also includes an I2C writing and reading functions.

The full application code, and ready to use projects can be installed directly from NECTO Studio Package Manager (recommended), downloaded from our LibStock™ or found on Mikroe github account.

Other Mikroe Libraries used in the example:

- MikroSDK.Board
- MikroSDK.Log
- Click.I2CIsolator7

Additional notes and informations

Depending on the development board you are using, you may need USB UART click, USB UART 2 Click or RS232 Click to connect to your PC, for development systems with no UART to USB interface available on the board. UART terminal is available in all MIKROE compilers.

mikroSDK

This Click board™ is supported with mikroSDK - MIKROE Software Development Kit. To ensure proper operation of mikroSDK compliant Click board™ demo applications, mikroSDK should be downloaded from the LibStock and installed for the compiler you are using.

For more information about mikroSDK, visit the official page.

Resources

mikroBUS™

mikroSDK

Click board™ Catalog

Click boards™

ClickID

Downloads

I2C Isolator 7 click 2D and 3D files

I2C Isolator 7 click schematic

I2C Isolator 7 click example on Libstock

ADuM1252 datasheet

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