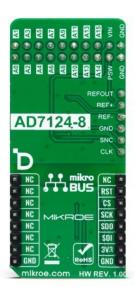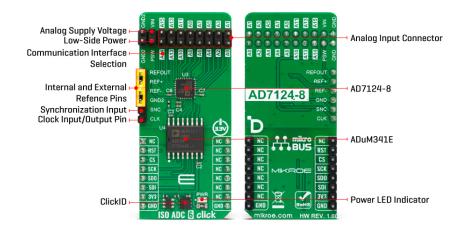MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
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ISO ADC 6 Click

PID: MIKROE-5901

ISO ADC 6 Click is a compact add-on board that contains an eight-channel isolated ADC. This board features the AD7124-8, an 8-channel, low noise, low power, 24-bit, sigma-delta ADC from Analog Devices. The ADC has a programmable gain array (PGA) that allows gains of 1, 2, 4, 8, 16, 32, 64, and 128. Additionally, the ADC contains a 2.5V reference, which can be used with reference buffers, along with the externally applied references. The host MCU is isolated from the ADC by the ADuM341E, a 5kVrms quad digital isolator from Analog Devices. This Click board™ makes the perfect solution for the development of a wide variety of industrial measurements, data acquisition systems, monitoring functions, and more.

ISO ADC 6 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?

ISO ADC 6 Click is based on the AD7124-8, an 8-channel, low noise, low power, 24-bit, sigma-delta ADC, and the ADuM341E, a 5kVrms quad digital isolator, both from Analog Devices. The ADC incorporates a sigma-delta modulator, buffer, reference, gain stage, and on-chip digital filtering. It is intended to measure wide dynamic ranges, weigh scales, temperature measurement applications, and low-frequency signals. The ADC allows up to 16 configurations or channels consisting of analog inputs, reference inputs, or power supplies. All ADC channels are available over the A0-15 header, with a common GND, power supply, and a bridge power switch (PSW).

You can add an external reference over the REF+ and REF- pins. The internal reference has its output available over the REFOUT pin. The synchronization input is also available over the SNC pin. It allows synchronization of the digital filters and analog modulators when using several AD7124-8 devices. For this purpose, the internal clock is available over the CLK pin. Alternatively, the internal clock can be turned off, and this pin can provide an external clock, allowing simultaneous conversions.

The isolator isolates the ADC communication lines to the host MCU. It features low propagation delay, low dynamic power consumption, 100Mbps maximum guaranteed data rate, and more. The isolator is based on CMOS, a monolithic air core transformer technology, and iCoupler technology.

ISO ADC 6 Click uses a standard 4-wire SPI serial interface of the ADC to communicate with the host MCU over the isolator barrier. The isolator uses a high-frequency carrier to transmit data across the isolation barrier using iCoupler chip scale transformer coils separated by layers of polyimide isolation. The ADC can work in three power modes, which allows sampling in a range of 1.17sps up to 19200sps.

This Click board™ can be operated only with a 3.3V logic voltage level. The board must perform appropriate logic voltage level conversion before using MCUs with different logic levels. Also, it comes equipped with a library containing functions and an example code that can be used as a reference for further development.

Specifications

Type	ADC
Applications	Can be used for the development of a wide variety of industrial measurements, data acquisition systems, monitoring functions, and more
On-board modules	AD7124-8 - 24-bit sigma-delta ADC from Analog Devices ADuM341E - 5kVrms quad digital isolator from Analog Devices
Key Features	Full SPI serial interface isolation, 8 ADC channels, wide output data rate, low RMS noise, three power modes, rail-to-rail analog

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	inputs, diagnostic functions, crosspoint multiplexed analog inputs, 8 differential/15 pseudo differential inputs, programmable gain, and more
Interface	SPI
Feature	ClickID
Compatibility	mikroBUS™
Click board size	L (57.15 x 25.4 mm)
Input Voltage	3.3V,External

Pinout diagram

This table shows how the pinout on ISO ADC 6 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikro™ BUS			Pin	Notes
	NC	1	AN	PWM	16	NC	
ID SEL	RST	2	RST	INT	15	NC	
SPI Select / ID COMM	CS	3	CS	RX	14	NC	
SPI Clock	SCK	4	SCK	TX	13	NC	
SPI Data OUT	SDO	5	MISO	SCL	12	NC	
SPI Data IN	SDI	6	MOSI	SDA	11	NC	
Power Supply	3.3V	7	3.3V	5V	10	NC	
Ground	GND	8	GND	GND	9	GND	Ground

Onboard settings and indicators

Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator

ISO ADC 6 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
External Supply Voltage	-	3.3	-	V
Output Data Rate	1.17	-	19200	sps
Programmable Gain	1	-	128	-
UL Recognition (for 1 min)	-	-	5	kVrms

Software Support

We provide a library for the ISO ADC 6 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 ISO ADC 6 Click driver.

Key functions

- isoadc6_get_voltage ISO ADC 6 get voltage level function.

- isoadc6_get_adc_data ISO ADC 6 get ADC data function.

- isoadc6_set_adc_control ISO ADC 6 set ADC control function.

Example Description

This example demonstrates the use of the ISO ADC 6 Click board™ by reading and writing data by using SPI serial interface and reading results of AD conversion.

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.ISOADC6

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

[ADC7124-8 datasheet](#)

[ADuM341E datasheet](#)

[ISO ADC 6 click example on Libstock](#)

[ISO ADC 6 click 2D and 3D files v100](#)

[ISO ADC 6 click schematic v100](#)