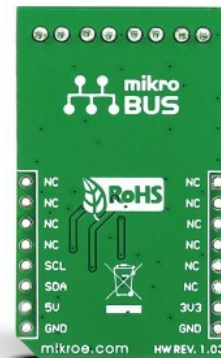
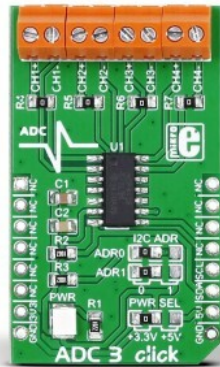


## ADC 3 Click



PID: MIKROE-1894

**ADC 3 Click** is a compact add-on board with a high-performance data converter. This board features the [MCP3428](#), a 16-bit  $\Delta\Sigma$  analog-to-digital converter with differential inputs and I2C compatible interface from [Microchip](#). The MCP3428 performs conversions at rates of 15, 60, or 240 samples per second, depending on user-controllable configuration bit settings, and has a programmable gain amplifier which makes it an ideal choice for monitoring extremely low-voltage sensors. All four channels have differential inputs monitoring a full-scale range of 4.096VDC or  $\pm 2.048V$  differentially. This Click board™ is suitable for various high-accuracy analog-to-digital data conversion applications where ease of use and low power consumption are significant considerations.

### How does it work?

ADC 3 Click is based on the MCP3428, a differential multi-channel low-power, 16-bit  $\Delta\Sigma$  A/D converter from Microchip. The MCP3428 contains an input channel selection multiplexer (CH1, CH2, CH3, or CH4), an onboard voltage reference, and an internal oscillator. It performs conversions at rates of 15, 60, or 240 samples per second (12, 14, or 16 bits), depending on user-controllable configuration bit settings, and has a programmable gain amplifier (x1, x2, x4, or x8) which makes it an ideal choice for monitoring extremely low-voltage sensors. All four channels have differential inputs monitoring a full-scale range of 4.096VDC or  $\pm 2.048V$  differentially.

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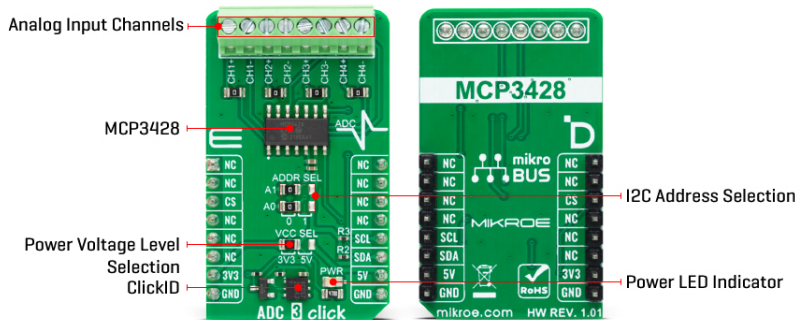
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 OHSAS 18001: 2008 certification of occupational health and safety management system.



ISO 9001: 2015 certification of quality management system (QMS).



The MCP3428 has two conversion modes: Continuous and One-Shot mode. In the Continuous Conversion mode, the ADC converts the inputs continuously, while in the One-Shot Conversion mode, the MCP3428 converts the input one time and stays in the low-power Standby mode until it receives another command for a new conversion. The standby mode reduces current consumption significantly during idle periods. This ADC can be used for various high-accuracy analog-to-digital data conversion applications where ease of use and low power consumption are significant considerations.

ADC 3 Click communicates with an MCU using the standard I2C 2-Wire interface to read data and configure settings, supporting High-Speed Mode up to 3.4MHz. It also has a 7-bit slave address with the first four MSBs fixed to 1101. The address pins, ADR0 and ADR1, are programmed by the user and determine the value of the last three LSBs of the slave address, allowing up to 8 devices to operate on the same bus segment. The value of these address pins can be set by positioning onboard SMD jumpers labeled as I2C ADR to an appropriate position marked as 0 or 1.

This Click board™ can operate with both 3.3V and 5V logic voltage levels selected via the VCC SEL jumper. This way, it is allowed for both 3.3V and 5V capable MCUs to use the communication lines properly. However, the 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	ADC
Applications	Can be used for various high-accuracy analog-to-digital data conversion applications
On-board modules	MCP3428 - analog-to-digital converter from Microchip
Key Features	ADC with differential inputs, high resolution, self-calibration of internal offset and gain per each conversion, high accuracy, programmable gain amplifier and data rate, two conversion modes, low power consumption, I2C interface with selectable slave address, and more

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Interface	I2C
Feature	ClickID, No ClickID
Compatibility	mikroBUS™
Click board size	M (42.9 x 25.4 mm)
Input Voltage	3.3V or 5V

## Pinout diagram

This table shows how the pinout on ADC 3 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

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

## Onboard settings and indicators

Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator
JP1	VCC SEL	Left	Power Voltage Level Selection 3V3/5V: Left position 3V3, Right position 5V
JP2-JP3	I2C ADR	Left	I2C Address Selection 0/1: Left position 0, Right position 1

## ADC 3 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
Resolution	12	-	16	bit
Data Rate	15	-	240	SPS

## Software Support

We provide a library for the ADC 3 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](#).

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## Library Description

This library contains API for ADC 3 Click driver.

Key functions

- This function is used to initiate general call reset.
- This function is used to read ADC value and calculate voltage.

## Example Description

ADC 3 example code shows usage of analog-to-digital converter.

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.Adc3

## 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™](#)

## Downloads

[ADC 3 click user manual](#)

[ADC 3 click example on Libstock](#)

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[ADC 3 click schematic v101](#)

[MCP3428 datasheet](#)

[ADC 3 click 2D and 3D files v101](#)

[ADC 3 click 2D and 3D files v101ID](#)

[ADC 3 click schematic v101ID](#)

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