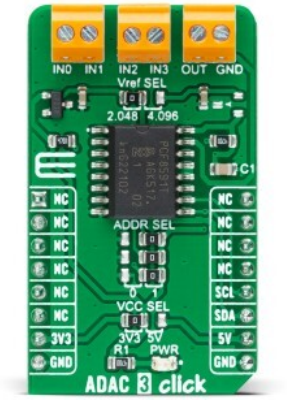
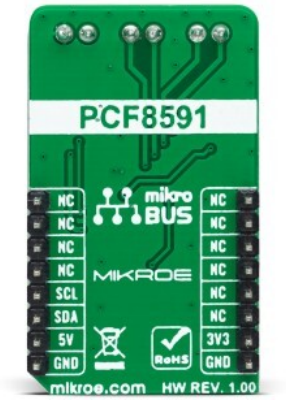
MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
VAT: SR105917343 Registration No. 20490918
Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com
www.mikroe.com

ADAC 3 Click





PID: MIKROE-5198

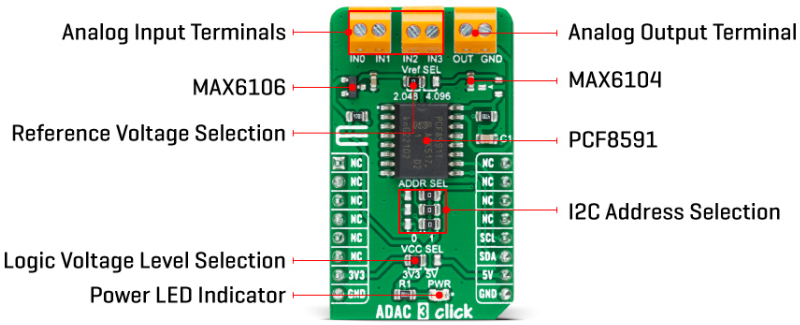
ADAC 3 Click is a compact add-on board representing the ADC/DAC combo solution. This board features the PCF8591, a low-power 8-bit CMOS data acquisition device with four analog inputs, one analog output, and a serial I2C interface from NXP Semiconductors. The PCF8591 includes analog input multiplexing, an on-chip track and hold function and 8-bit analog-to-digital conversion alongside an 8-bit digital-to-analog conversion. In addition, the user is given the option to select the PCF8591 reference voltage value, choosing between 2,048 and 4,096V. This Click board™ is suitable for various control, monitoring, or measurement applications such as supply monitoring, reference setting, analog control loops, and more.

ADAC 3 Click is supported by a mikroSDK compliant library, which includes functions that simplify software development. This Click board™ comes as a fully tested product, ready to be used on a system equipped with the mikroBUS™ socket.

How does it work?

ADAC 3 Click as its foundation uses the PCF8591, a low-power CMOS data acquisition device from NXP Semiconductors. The PCF8591 comes with four analog inputs configurable as single-ended or differential inputs used to measure voltages, alongside one analog output representing an 8-bit digital-to-analog converter. In addition to measuring voltage, the user can create them as desired and even use DAC and ADC together to generate an input to a circuit and measure the results with the ADC, making it suitable for various control, monitoring, or measurement applications. By its internal structure, the PCF8591 also consists of an analog input multiplexing circuit, an on-chip track and hold function, alongside a serial interface block.

MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
VAT: SR105917343 Registration No. 20490918
Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com
www.mikroe.com



This Click board™ communicates with MCU using the standard I2C 2-Wire interface with a maximum clock frequency of 100kHz. The PCF8591 has a 7-bit slave address with the first four MSBs fixed to 1001. The address pins A0, A1, and A2, are programmed by the user and determine the value of the last three LSBs of the slave address, which can be selected by positioning onboard SMD jumpers labeled as ADDR SEL to an appropriate position marked as 0 or 1.

Besides, the user can choose the PCF8591 reference voltage value by positioning the SMD jumper labeled VREF SEL to a proper position, choosing between 2,048 and 4,096V provided by MAX6104 and MAX6106.

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-DAC
Applications	Can be used for various control, monitoring, or measurement applications
On-board modules	PCF8591 - low-power CMOS data acquisition device from NXP Semiconductors
Key Features	Low power consumption, combo solution with four analog inputs and one analog output, 8-bit successive approximation A/D conversion, I2C serial interface, analog inputs configurable as single ended or differential inputs, on-chip track and hold circuit, and more
Interface	I2C
Feature	No ClickID
Compatibility	mikroBUS™
Click board size	M (42.9 x 25.4 mm)

MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
VAT: SR105917343 Registration No. 20490918
Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com
www.mikroe.com

Input Voltage	3.3V or 5V

Pinout diagram

This table shows how the pinout on ADAC 3 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	
	NC	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	Logic Level Voltage Selection 3V3/5V: Left position 3V3, Right position 5V
JP2-JP4	ADDR SEL	Right	I2C Address Selection 0/1: Left position 0, Right position 1
JP5	VREF SEL	Left	Reference Voltage Selection 2.048/4.096: Left position 2.048, Right position 4.096

ADAC 3 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
Analog Input Voltage	0	-	5	V
Analog Output Voltage	0	-	5	V
Resolution	-	8	-	bit
Operating Temperature Range	-40	+25	+85	°C

Software Support

We provide a library for the ADAC 3 Click as well as a demo application (example), developed using MikroElektronika compilers. The demo can run on all the main MikroElektronika development boards.

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

MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
VAT: SR105917343 Registration No. 20490918
Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com
www.mikroe.com

account.

Library Description

This library contains API for ADAC 3 Click driver.

Key functions

- adac3_write_control This function writes a control byte by using I2C serial interface.
- adac3_write_dac This function writes a DAC byte by using I2C serial interface.
- adac3_read_adc This function reads the AD conversion byte by using I2C serial interface.

Example Description

This example demonstrates the use of ADAC 3 click board by setting the DAC output and reading the ADC results from 2 single-ended channels (AIN0, AIN1) and from a differential channel (AIN2+, AIN3-).

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

Other Mikroe Libraries used in the example:

- MikroSDK.Board
- MikroSDK.Log
- Click.ADAC3

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 MikroElektronika compilers.

mikroSDK

This Click board™ is supported with mikroSDK - MikroElektronika 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

MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
VAT: SR105917343 Registration No. 20490918
Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com
www.mikroe.com

Click Boards™

Downloads

ADAC 3 click example on Libstock

MAX6106 datasheet

PCF8591 datasheet

MAX6104 datasheet

ADAC 3 click schematic