

AC Current 2 Click



PID: MIKROE-6579

AC Current 2 Click is an add-on board designed for safe, non-invasive measurement of alternating current (AC) through a conductor. This board features the [MCP607](#) operational amplifier and the [MCP3221](#) 12-bit ADC, both from [Microchip](#). This Click board™ features a galvanically isolated current sensing probe that clamps around the conductor without electrical contact, an RC filter for EMI suppression, and flexible output options, providing both analog and digital signals via an I2C interface. It supports 3.3V and 5V logic levels, allowing easy integration with a wide range of MCUs, and comes equipped with a 3.5mm jack and connection terminal for probe attachment. AC Current 2 Click is ideal for current consumption monitoring, high-voltage system diagnostics, safety equipment, and general AC current measurements where circuit integrity and user protection are essential.

For more information about **AC Current 2 Click** visit the official [product page](#).

DO NOT TOUCH THE BOARD WHILE THE LOAD IS CONNECTED!

Note: This Click board™ needs to be used by trained personnel only while applying high voltages. Special care should be taken when working with hazardous voltage levels.

How does it work?

AC Current 2 Click is an add-on board made for the safe and accurate measurement of

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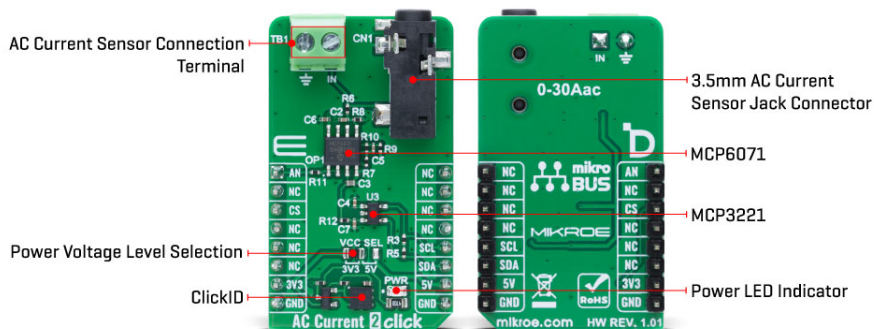


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alternating current (AC) running through a conductor. It is specifically designed to work with a non-invasive current sensor, like [AC Current Sensor - 30A](#) that MIKROE offers, allowing the current in high-voltage installations such as mains wiring to be monitored without direct electrical contact. Thanks to its galvanic isolation and non-intrusive design, this board is ideal for applications such as current consumption monitoring, safety systems, and general AC current measurement where user safety and circuit integrity are priorities. The board is equipped with a 3.5mm jack connector and a connection terminal, offering flexibility depending on how the sensing probe needs to be connected in the user's application.



The sensing probe operates on the principle of electromagnetic induction, much like a transformer, but without a primary winding. Instead, the AC current flowing through the conductor naturally generates the electromagnetic field necessary for sensing. The probe's core is split, allowing it to clamp around the cable easily and measure current without modifying or affecting the electrical system. To maintain signal quality, the incoming voltage from the sensor passes through an RC filter that suppresses electromagnetic interference (EMI) and radio-frequency noise. After filtering, the signal is amplified by the MCP607 operational amplifier from Microchip, a rail-to-rail OpAmp with extremely low offset voltage and low bias current, ensuring that the measurement remains accurate and stable across different conditions.

For digital signal processing, the amplified voltage is then converted into a digital form by the MCP3221, a 12-bit successive approximation analog-to-digital converter (ADC) that communicates with the host MCU via a standard I2C interface. In addition to the digital output, AC Current 2 Click also offers a direct analog signal path via AN pin, enabling users to access the amplified signal without conversion if needed.

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	Current sensor
Applications	Ideal for current consumption monitoring, high-voltage system diagnostics, safety equipment, and general AC current measurements

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On-board modules	MCP607 - rail-to-rail OpAmp from Microchip MCP3221 12-bit ADC from Microchip
Key Features	Non-invasive AC current measurement based on electromagnetic induction principle, galvanic isolation for safe high-voltage monitoring, integrated RC filter for EMI and RF noise suppression, flexible probe connection through 3.5mm jack connector or terminal block, output in analog and digital form, and more
Interface	Analog,I2C
Feature	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 AC Current 2 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikroBUS				Pin	Notes
Analog Output	AN	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 Voltage Level Selection 3V3/5V: Left position 3V3, Right position 5V

AC Current 2 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
Current Sensing Range	-	-	30	A

Software Support

[AC Current 2 Click](#) demo application is developed using the [NECTO Studio](#), ensuring

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compatibility with [mikroSDK](#)'s open-source libraries and tools. Designed for plug-and-play implementation and testing, the demo is fully compatible with all development, starter, and mikromedia boards featuring a [mikroBUS™](#) socket.

Example Description

This example demonstrates how to use the AC Current 2 Click board for reading the measurements from the AC Current sensor attached to the Click board input.

Key Functions

- `accurent2_cfg_setup` This function initializes Click configuration structure to initial values.
- `accurent2_init` This function initializes all necessary pins and peripherals used for this Click board.
- `accurent2_read_current` This function reads the current measurement from the AC Current sensor (30A/1V).

Application Init

Initializes the driver and logger.

Application Task

Continuously reads the AC current value and logs the measured data in amperes (A).

Application Output

This Click board can be interfaced and monitored in two ways:

- Application Output - Use the "Application Output" window in Debug mode for real-time data monitoring. Set it up properly by following [this tutorial](#).
- UART Terminal - Monitor data via the UART Terminal using a [USB to UART converter](#). For detailed instructions, check out [this tutorial](#).

Additional Notes and Information

The complete application code and a ready-to-use project are available through the NECTO Studio Package Manager for direct installation in the [NECTO Studio](#). The application code can also be found on the MIKROE [GitHub](#) account.

Resources

[mikroBUS™](#)

[mikroSDK](#)

[Click board™ Catalog](#)

[Click boards™](#)

[ClickID](#)

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Downloads

[MCP607 datasheet](#)

[MCP3221 datasheet](#)

[AC Current 2 click example package](#)

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

[AC Current 2 click schematic v101](#)

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