

Hall Current 4 Click



PID: MIKROE-3308

Hall Current 4 Click is a compact add-on board for precise low-current measurement. This board features the ACS70331, a high-sensitivity current sensor IC from Allegro Microsystems, and the MCP3221 12-bit ADC from Microchip. The ACS70331 uses Giant Magnetoresistance (GMR) elements to detect the magnetic field generated by the current flowing through the primary conductor, offering 200mV/A sensitivity with a measurement range from -5A to +5A. The low 1.1 mΩ primary conductor resistance ensures minimal power dissipation and temperature rise, while the board supports both 3.3V and 5V logic voltage levels. This Click board™ is ideal for applications requiring precise current sensing in industrial, automotive, and consumer electronics, especially in low-current environments.

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?

Hall Current 4 Click is based on the ACS70331, a high-sensitivity current sensor IC from Allegro Microsystems, and the MCP3221 12-bit ADC from Microchip. The ACS70331 uses Giant Magnetoresistance (GMR) elements to indirectly measure the current flowing through its primary conductor by detecting the magnetic field generated by the current. This field

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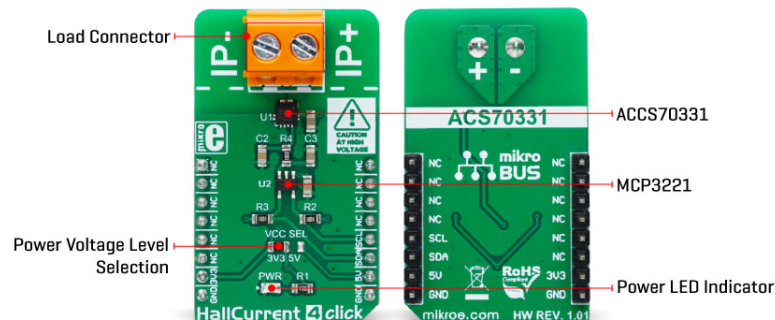


ISO 27001: 2013 certification of informational security management system.
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ISO 9001: 2015 certification of quality management system (QMS).

influences the voltage across the GMR sensor, which is highly sensitive even to low field strengths, making the ACS70331 ideal for precise low-current measurements. However, it reaches saturation quickly, limiting its suitability for higher currents.



The ACS70331 offers a sensitivity of 200mV/A, capable of measuring currents from -5A to +5A. With an operating range of approximately 1MHz, the sensor provides fast output voltage variations in response to changes in the load current, without noticeable latency. The output voltage is then processed by the MCP3221 ADC, allowing digital data to be accessed via the I2C interface.

The ACS70331 features a low primary conductor resistance of just 1.1 mΩ, minimizing power dissipation and temperature rise. Since it operates by detecting the magnetic field generated by the current flowing through its input pins, the sensor maintains electrical isolation between the load voltage and the rest of the chip. However, for safety reasons, it should not be used with voltages exceeding 100V.

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,Measurements
Applications	Ideal for applications requiring precise current sensing in industrial, automotive, and consumer electronics, especially in low-current environments
On-board modules	ACS70331 - high sensitivity GMR-based current sensor IC from Allegro Microsystems
Key Features	Very low serial resistance, measurement of relatively high voltage values - up to 5A independent from the polarization, great accuracy thanks to the GSR current sensor, big range of power supply voltages to which the load can be amounted, and more

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Interface	I2C
Feature	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 the Hall Current 4 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	
	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	3V3	7	3.3V	5V	10	5V	Power Supply
Ground	GND	8	GND	GND	9	GND	Ground

Onboard settings and indicators

Label	Name	Default	Description
PWR	PWR	-	Power LED indicator
VCC SEL	VCC SEL	Left	Power Voltage Level Selection: Left position 3V3, Right position 5V

Hall Current 4 click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
Current Range	-5	-	+5	A
Operating Voltage	0	-	100	V

Software Support

We provide a library for the Hall Current 4 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 Hall Current 4 Click driver.

Key functions

- Reads current in mA
- Reads raw (ADC) current data

Example Description

Demo application shows is reading current data in mA using Hall Current 4 Click.

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.HallCurrent4

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](#).

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Resources

[mikroBUS™](#)

[mikroSDK](#)

[Click board™ Catalog](#)

[Click Boards™](#)

Downloads

[Hall Current 4 click 2D and 3D files v100](#)

[ACS70331 datasheet](#)

[Hall Current 4 click schematic v100](#)

[Hall Current 4 click example on Libstock](#)

[Hall Current 4 click schematic v101](#)

[Hall Current 4 click 2D and 3D files v101](#)

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