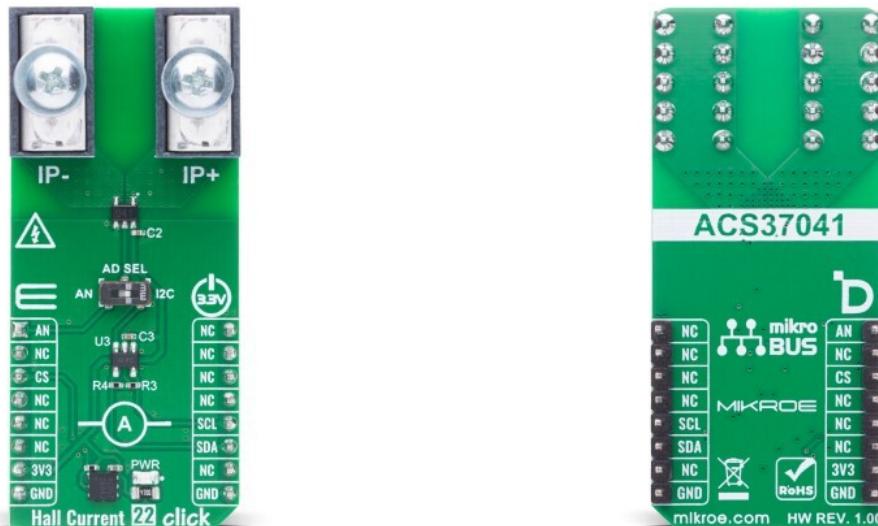


Hall Current 22 Click



PID: MIKROE-6632

Hall Current 22 Click is a compact add-on board designed for precise and isolated measurement of bidirectional current flow. This board features the [ACS37041KLHBLT-010B3](#), an integrated Hall effect current sensor from [Allegro Microsystems](#). It offers a shuntless, galvanically isolated analog voltage output with $\pm 10\text{A}$ current sensing range, 132mV/A sensitivity, and a low $1.6\text{m}\Omega$ internal conductor resistance for minimal power loss. It supports 100VRMS functional isolation and is AEC-Q100 Grade 1 qualified, ensuring robust performance in demanding environments. Ideal for use in industrial motor control, renewable energy systems like string and micro inverters, and personal mobility applications.

For more information about **Hall Current 22 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?

Hall Current 22 Click is based on the ACS37041 (ACS37041KLHBLT-010B3), an integrated Hall effect current sensor from Allegro Microsystems, to provide current sensing in a wide range of industrial and energy-related applications. This sensor delivers a shuntless, self-contained

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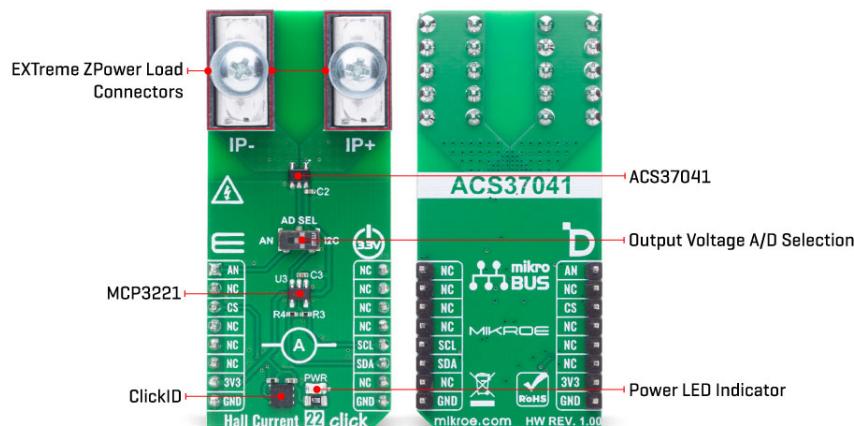


- ISO 27001: 2013 certification of informational security management system.
- ISO 14001: 2015 certification of environmental management system.
- OHSAS 18001: 2008 certification of occupational health and safety management system.



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current measurement solution, eliminating the need for an external sense resistor. It outputs an analog voltage signal that is galvanically isolated from the current being measured, enhancing safety and system flexibility. Hall Current 22 Click is well-suited for use in industrial motor drives, clean energy string and micro inverters, as well as personal mobility systems.



The internal current conductor of the ACS37041 features a low resistance of just $1.6\text{m}\Omega$, making it suitable for applications with stringent power dissipation requirements. With support for bidirectional current measurement up to $\pm 10\text{A}$, a high sensitivity of 132mV/A , and a functional working voltage of 100VRMS , this sensor offers reliable and accurate performance. Additionally, the ACS37041 is AEC-Q100 Grade 1 automotive qualified, ensuring robust operation in demanding environments.

The ACS37041's output signal can be converted to a digital value using [MCP3221](#), a successive approximation A/D converter with a 12-bit resolution from Microchip, using a 2-wire I₂C compatible interface, or sent directly to an analog pin of the mikroBUS™ socket labeled as AN. Selection can be performed via an onboard SMD switch labeled AD SEL, placing it in an appropriate position marked as AN or I₂C.

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. It also comes equipped with a library containing functions and example code that can be used as a reference for further development.

Specifications

Type	Current sensor,Measurements
Applications	Ideal for use in industrial motor control, renewable energy systems like string and micro inverters, and personal mobility applications
On-board modules	ACS37041 (ACS37041KLHBLT-010B3) - integrated Hall effect current sensor from Allegro Microsystems
Key Features	Integrated Hall-effect current sensor, shuntless current measurement, galvanic isolation, analog voltage output, $\pm 10\text{A}$

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	bidirectional current sensing, high sensitivity, low resistance current conductor, low power dissipation, automotive grade qualification, I2C or analog output selection, and more
Interface	Analog, I2C
Feature	ClickID
Compatibility	mikroBUS™
Click board size	L (57.15 x 25.4 mm)
Input Voltage	3.3V

Pinout diagram

This table shows how the pinout on Hall Current 22 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikro™ BUS				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	NC	
Ground	GND	8	GND	GND	9	GND	Ground

Onboard settings and indicators

Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator
SW1	AD SEL	Right	Output Voltage A/D Selection AN/I2C: Left position AN, Right position I2C

Hall Current 22 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Current Range	-10	-	+10	A
Sensitivity	-	132	-	mV/A

Software Support

[Hall Current 22 Click](#) demo application is developed using the [NECTO Studio](#), ensuring 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

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This example demonstrates the use of Hall Current 22 Click board by reading and displaying the input current measurements.

Key Functions

- `hallcurrent22_cfg_setup` This function initializes Click configuration structure to initial values.
- `hallcurrent22_init` This function initializes all necessary pins and peripherals used for this Click board.
- `hallcurrent22_calib_offset` This function calibrates the zero current offset value.
- `hallcurrent22_calib_resolution` This function calibrates the data resolution at the known load current.
- `hallcurrent22_read_current` This function reads the input current level [A].

Application Init

Initializes the driver and calibrates the zero current offset and data resolution at 1A load current.

Application Task

Reads the input current measurements and displays the results on the USB UART approximately once per second.

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](#)

Downloads

[Hall Current 22 click example package](#)

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[Hall Current 22 click 2D and 3D files v100](#)[Hall Current 22 click schematic v100](#)[AC3704x datasheet](#)

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