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Current 14 Click

PID: MIKROE-6315

Current 14 Click is a compact add-on board designed for precise current measurement without direct contact. This board features the BM14270, a magnetic current sensor IC from ROHM Semiconductor. It uses a coreless, non-contact magnetic impedance (MI) sensor, ensuring low power loss and accurate current detection. It communicates through a 2-wire I2C interface, offering a 14-bit digital output with a measurable magnetic range of ±280µT and sensitivity of 0.045µT/LSB. The board includes an alert interrupt pin (ALR) that indicates data readiness, streamlining real-time data acquisition for the host MCU. Supporting both 3.3V and 5V logic voltage levels, Current 14 Click is ideal for industrial equipment monitoring, power measurement meters, uninterruptible power supplies (UPS), and power conditioning systems.

How does it work?

Current 14 Click is based on the BM14270 (BM14270AMUV-LB), a magnetic current sensor IC from ROHM Semiconductor. Engineered for long-term support in the industrial market, this coreless, non-contact current sensing solution uses a magnetic MI (Magnetic Impedance) sensor, enabling accurate current measurement with minimal power loss. Its non-invasive design allows it to measure current flowing through a conductor without direct contact, making it both efficient and adaptable for various applications. This Click board™ is an ideal solution for scenarios requiring accurate current monitoring without introducing additional load or loss into the circuit, providing robust support in demanding environments.

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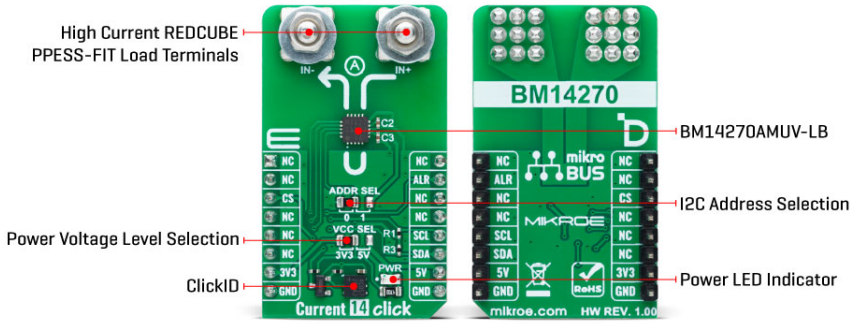

Current 14 Click uses a standard 2-wire I2C communication protocol to enable the host MCU to control the TSC1641. The I2C interface supports clock frequencies up to 400kHz, with the I2C address selectable via the ADDR SEL jumper. Data output is provided through a 14-bit digital format via the I2C interface, delivering high precision in current detection. The sensor's magnetic measurable range extends to ±280µT (typical), with a magnetic sensitivity of 0.045µT/LSB, allowing for fine-tuned and reliable measurements across various applications. This capability particularly benefits industrial equipment monitoring, power measurement meters, uninterruptible power supplies (UPS), and power conditioning systems.

This Click board™ also includes an alert interrupt pin, ALR, as a data-ready indicator. In addition to the standard interface pins, the ALR pin signals when new measurement data is available, streamlining the data acquisition process and ensuring timely updates for the host MCU. This feature enhances the board's responsiveness in real-time monitoring applications, making it particularly effective for dynamic systems where precise and immediate current data is essential.

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,Current sensor
Applications	Ideal for industrial equipment monitoring, power measurement meters, uninterruptible power supplies (UPS), and power conditioning systems
On-board modules	BM14270AMUV-LB - a current sensor IC from ROHM Semiconductor
Key Features	Coreless, non-contact magnetic impedance (MI) sensor for accurate low-loss current measurement, 14-bit digital output, I2C interface, alert interrupt as data-ready signal, high sensitivity, and more
Interface	I2C

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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 Current 14 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	**ALR**	Alarm Interrupt
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	ADDR SEL	Left	I2C Address Selection 0/1: Left position 0, Right position 1
JP2	VCC SEL	Left	Power Voltage Level Selection 3V3/5V: Left position 3V3, Right position 5V

Current 14 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
Magnetic Measurable Range	-	±280	-	µT
Sensitivity	-	0.045	-	µT/LSB

Software Support

We provide a library for the Current 14 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.

Library Description

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This library contains API for Current 14 Click driver.

Key functions

- current14_calib_offset This function calibrates the zero current offset value.
- current14_calib_resolution This function calibrates the data resolution at the known load current.
- current14_get_current This function reads the input current level [A].

Example Description

This example demonstrates the use of Current 11 Click by reading and displaying the input current measurements.

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.Current14

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™

ClickID

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Downloads

Current 14 click example on Libstock

Current 14 click 2D and 3D files v100

Current 14 click schematic v100

BM14270 datasheet