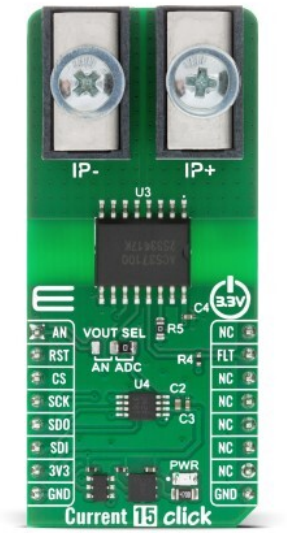
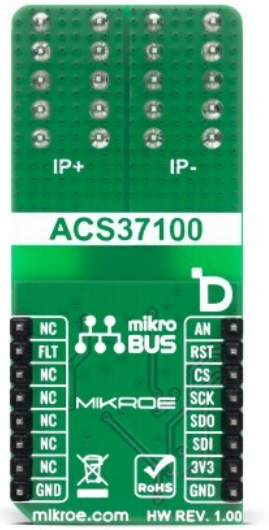
MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
VAT: SR105917343 Registration No. 20490918
Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com
www.mikroe.com

Current 15 Click





PID: MIKROE-6665

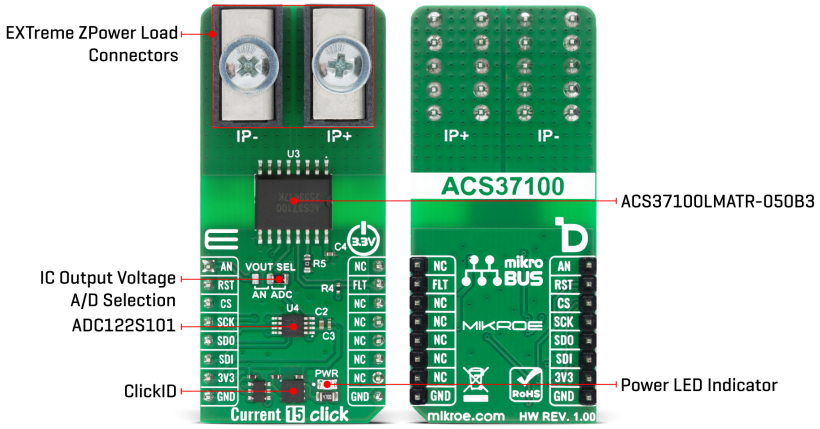
Current 15 Click is a compact add-on board for bidirectional current measurement in high-power embedded applications. It is based on the ACS37100LMATR-050B3, a TMR current sensor from Allegro Microsystems. This sensor features a factory-trimmed tunneling magnetoresistance sensing element for current monitoring over an input range of up to ±50A, with a typical sensitivity of 26.4mV/A, while its high-isolation construction and differential TMR bridge architecture help suppress common-mode magnetic interference in noisy environments. It also allows the analog output to be read directly or converted to a digital value through the onboard ADC122S101 12-bit A/D converter, along with a fast open-drain overcurrent detection. This board is ideal for on-board chargers, DC-DC converters, server power systems, C&I solar string inverters, and DC EV charging applications.

For more information about **Current 15 Click** visit the official product page.

How does it work?

Current 15 Click is based on the ACS37100LMATR-050B3, a bidirectional TMR current sensor from Allegro Microsystems that uses a tunneling magnetoresistance sensing element to deliver current monitoring across the entire operating range without requiring any customer programming. This sensor is factory-trimmed to ensure high accuracy and consistent performance, with input current range support of up to ±50A with a typical sensitivity of 26.4mV/A, making it well suited for on-board chargers, DC-DC converters, server power systems, commercial and industrial solar string inverters, and DC EV charging applications.

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



The sensors internal construction achieves high isolation by magnetically coupling the field generated by current flow in the conductor to the monolithic TMR IC, eliminating any physical connection between the sensing IC and the integrated current conductor. Current is measured differentially by two TMR bridges, which effectively suppress interfering common-mode magnetic fields and improve measurement robustness in electrically noisy environments.

The ACS37100LMATR-050B3's output signal can be converted to a digital value using ADC122S101, an A/D converter with a 12-bit resolution from Texas Instruments, using a 4-wire SPI 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 VOUT SEL, placing it in an appropriate position marked as AN or ADC. In addition, the board incorporates fast overcurrent fault output (FLT pin) for open-drain overcurrent detection.

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
Applications	Ideal for on-board chargers, DC-DC converters, server power systems, C&I solar string inverters, and DC EV charging applications
On-board modules	ACS37100LMATR-050B3 - TMR current sensor with overcurrent detection from Allegro Microsystems
Key Features	Bidirectional TMR current sensing, factory-trimmed high-accuracy performance, high-isolation magnetic current sensing, differential TMR bridge architecture for common-mode magnetic field suppression, direct analog or SPI-compatible digital output option, fast open-drain overcurrent detection, and more
Interface	Analog,SPI

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

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 Current 15 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	
ID SEL	**RST**	2	RST	INT	15	**FLT**	Overcurrent Detection
SPI Select / ID COMM	**CS**	3	CS	RX	14	NC	
SPI Clock	**SCK**	4	SCK	TX	13	NC	
SPI Data OUT	**SDO**	5	MISO	SCL	12	NC	
SPI Data IN	**SDI**	6	MOSI	SDA	11	NC	
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
JP1	VOUT SEL	Right	IC Output Voltage A/D Selection AN/ADC: Left position AN, Right position ADC

Current 15 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Input Current Range	-50	-	+50	A
Sensitivity	-	26.4	-	mV/A

Software Support

Current 15 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

This example demonstrates the use of Current 15 Click board by reading and displaying the input current measurements.

Key Functions

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

- current15_cfg_setup This function initializes Click configuration structure to initial values.
- current15_init This function initializes all necessary pins and peripherals used for this Click board.
- current15_calib_resolution This function reads the sensor voltage reference and calibrates the data resolution at a known load current.
- current15_read_current This function reads the input current level [A].

Application Init

Initializes the driver and calibrates the data resolution at 3A 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

Current 15 click example package

Current 15 click 2D and 3D files v100

Current 15 click schematic v100

ACS37100 datasheet