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 11 Click

PID: MIKROE-6166

Current 11 Click is a compact add-on board for industrial and commercial current-sensing applications. This board features the ACS37600K (ACS37600KOKATN-006B5-C), a programmable linear Hall-effect sensor IC from Allegro Microsystems. This sensor features a chopper-stabilized Hall-effect front-end for precise magnetic flux detection, with a sensitivity of 6mV/G and a bidirectional operating range of ±333G. It also includes a user-programmable reference voltage pin for continuous zero-current monitoring and supports both 3.3V and 5V logic levels. This Click board™ excels in applications such as current sensing modules, motor control systems, Uninterruptible Power Supplies (UPS), overcurrent detection, and power supplies.

How does it work?

Current 11 Click is based on the ACS37600K (ACS37600KOKATN-006B5-C), a high-precision, programmable linear Hall-effect sensor IC from Allegro Microsystems. The ACS37600K includes a highly accurate, low-offset, chopper-stabilized Hall-effect front end, which detects magnetic flux perpendicular to the IC package surface and converts it into a proportional voltage. This Click board™ is designed to be paired with a ferromagnetic core, creating an exceptionally accurate current sensor ideal for various industrial, commercial, and communication applications. It excels in current sensing modules, motor control systems, Uninterruptible Power Supplies (UPS), overcurrent detection, power supplies, and more.

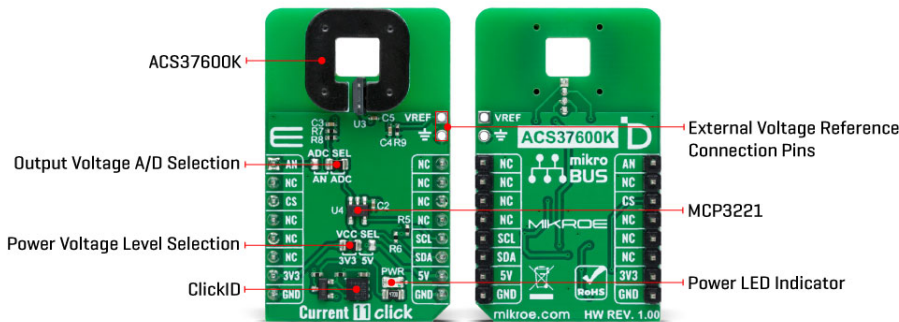Mikroe produces entire development toolchains for all major microcontroller architectures.
Committed to excellency, we are dedicated to helping engineers bring the project development up to speed and achieve outstanding results.

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.

ISO 9001: 2015 certification of quality management system (QMS).

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The ACS37600K allows for customer-specific programming of sensitivity and offset post-manufacturing, as well as temperature-dependent sensitivity adjustments to counteract ferromagnetic core drift. With a sensitivity of 6mV/G and a bidirectional operating range of ±333G, it ensures industry-leading accuracy in current sensing applications. Moreover, it offers a user-programmable bidirectional reference voltage pin on an unpopulated VREF header, in a range from 0.6V up to 2.65V, that continuously monitors the zero-current voltage, enhancing the sensor's reliability and precision.

The output signal of the ACS37600K 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 can be sent directly to an analog pin of the mikroBUS™ socket labeled as AN. Selection can be performed via an onboard SMD jumper labeled ADC SEL, placing it in an appropriate position marked as AN and ADC.

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 sensing modules, motor control systems, Uninterruptible Power Supplies (UPS), overcurrent detection, and power supplies
On-board modules	ACS37600KOKATN-006B5-C - programmable linear Hall-effect sensor IC from Allegro Microsystems
Key Features	High-precision current sensing, programmable sensitivity and offset, based on a chopper-stabilized Hall-effect front-end, user-programmable reference voltage pin, analog or digital output selection, and more
Interface	Analog,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 11 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin				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
JP2	ADC SEL	Right	Output Voltage A/D Selection AN/ADC: Left position AN, Right position ADC

Current 11 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
External Voltage Reference	0.6	-	2.65	V
Operating Range	-	±333	-	G
Sensitivity	-	6	-	mV/G

Software Support

We provide a library for the Current 11 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 Current 11 Click driver.

Key functions

- current11_set_vref This function sets the voltage reference for Current 11 click driver.

- current11_calibrate_offset This function calibrates the zero current offset value.

- current11_read_current This function reads the input current level [A] based on CURRENT11_NUM_CONVERSIONS of voltage measurements.

Example Description

This example demonstrates the use of Current 11 Click board™ 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.Current11

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

Downloads

[Current 11 click example on Libstock](#)

[Current 11 click 2D and 3D files v100](#)

[ACS37600K datasheet](#)

[Current 11 click schematic v100](#)