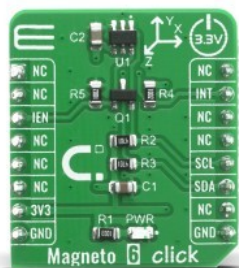


Magneto 6 Click



PID: MIKROE-4139

Magneto 6 Click features low power three dimensional Hall effect sensor, TLI493D-A2B6, designed for magnetic sensing applications. It measures the magnetic field in X, Y, and Z direction. Each X, Y and Z Hall probe is connected sequentially to a multiplexer, which is then connected to an Analog to Digital Converter (ADC). Optional, the temperature can be determined as well after the three Hall channels. The data measurement is provided in digital format to the microcontroller over the standard I2C interface. Some of the benefits of this Click board™ are wide application range addressable due to high flexibility and component reduction due to the 3D magnetic measurement principle. Magneto 6 Click is ideal for use in various applications, such as robotics, stick position sensing, control elements for navigation systems, anti-tampering in smart meters, and more.

Magneto 6 Click is supported by a mikroSDK compliant library, which includes functions that simplify software development. This Click board™ comes as a fully tested product, ready to be used on a system equipped with the mikroBUS™ socket.

How does it work?

Magneto 6 Click uses the [TLI493D-A2B6](#), low power three dimensional Hall effect sensor with I2C interface, from [Infineon](#). Within its small 6-pin package the sensor provides direct measurement of the X, Y, and Z components of a magnetic field. This sensor offers accurate three dimensional sensing with extremely low power consumption and consists of three main functional units:

- The power mode control system, containing a low-power oscillator, basic biasing, accurate restart, undervoltage detection, and a fast oscillator.

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.

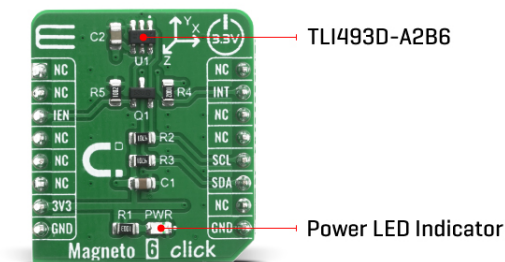


ISO 27001: 2013 certification of informational security management system.
ISO 14001: 2015 certification of environmental management system.
OHSAS 18001: 2008 certification of occupational health and safety management system.



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

- The sensing unit, which contains the HALL biasing, HALL probes with multiplexers, and successive tracking ADC, as well as a temperature sensor.
- The I2C interface, containing the register files.



Some of the main characteristics of this sensor IC are 3D magnetic flux density sensing of ± 160 mT, 12-bit data resolution for each measurement direction plus 10-bit temperature sensor, programmable flux resolution down to 65 μ T, and interrupt signal to indicate a valid measurement to the microcontroller. For a good adaptation, this sensor is equipped with different modes and a digital communication interface. I2C interface can be accessed in any power mode. The interrupt function is multiplexed with the I2C SCL pin, and can be used to indicate measurement completion. The use of an interrupt line is optional but highly recommended to ensure proper and efficient readout of the sensor data. Magneto 6 Click is ideally suited for the measurement of 3 dimensional movement within a magnetic field, linear slide movement, or 360° angle rotation. The magnetic measurement values are provided in the two's complement with 12-bit or 8-bit resolution in the registers with the symbols Bx, By, and Bz. By default, the temperature measurement is activated. The temperature measurement can be disabled if it is not needed and to increase the speed of the repetition of the magnetic values.

This Click Board™ uses I2C communication interface, and it's designed to be operated only with 3.3V logic level. A proper logic voltage level conversion should be performed before the Click board™ is used with MCUs with logic levels of 5V. More information about the TLI493D-A2B6 can be found in the attached datasheet. The Click board™ comes equipped with a library that contains easy to use functions and a usage example that may be used as a reference for the development.

Specifications

Type	Magnetic
Applications	The TLI493D-A2B6 is designed for all kinds of sensing applications, it can be used for multi function knobs, joystick and gimbals, robotics position sensing.
On-board modules	Magneto 6 Click uses the TLI493DA2B6 IC, a high accuracy magnetic sensor, from Infineon Technologies.

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).

Key Features	Low-power oscillator, basic biasing, accurate restart, undervoltage detection, fast oscillator, HALL biasing, HALL probes with multiplexers, successive tracking ADC, temperature sensor, I2C interface
Interface	GPIO,I2C
Feature	No ClickID
Compatibility	mikroBUS™
Click board size	S (28.6 x 25.4 mm)
Input Voltage	3.3V

Pinout diagram

This table shows how the pinout on Magneto 6 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	INT	Interrupt
Interrupt Enable	IEN	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

Software Support

We provide a library for the Magneto 6 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

This library contains API for Magneto 6 Click driver.

Key functions

- **magneto6_read_data** This function reads the measurements of the 3-axes magnetic field sensor in mT and the temperature sensor in degrees Celsius.

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).

- `magneto6_read_reg` This function reads a desired number of data bytes starting from the selected register by using I2C serial interface.
- `magneto6_write_reg` This function writes a data byte to the selected register by using I2C serial interface.

Example Description

This example demonstrates the use of Magneto 6 Click by reading the magnetic field strength from 3 axes as well as the ambient temperature 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.Magneto6

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™](#)

Downloads

[Magneto 6 click example on Libstock](#)

[TLI493D-A2B6 datasheet](#)

[Magneto 6 click 2D and 3D files](#)

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).



Time-saving embedded tools

MIKROELEKTRONIKA D.O.O, Barajnički 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

[Magneto 6 click schematic](#)

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).