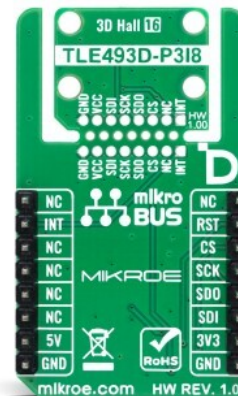
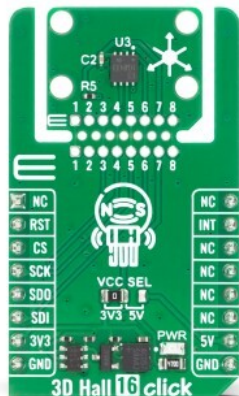


3D Hall 16 Click



PID: MIKROE-6949

3D Hall 16 Click is a compact add-on board designed for three-dimensional magnetic field sensing, position detection, and motion tracking. This board is based on the [TLE493D-P318](#), a XENSIV™ 3D Hall sensor with SPI interface and wake-up function from [Infineon](#). It measures magnetic field components in three orthogonal dimensions over a $\pm 160\text{mT}$ range, includes integrated temperature measurement, supports 2MHz SPI communication, and provides built-in diagnostic functions developed according to ISO 26262 SEooC for functional safety applications up to ASIL-B. The wake-up function allows low-power event-driven operation, while the Click Snap feature enables the sensor section to be separated and mounted remotely using direct pin access and a fixed screw hole. This Click board™ is suitable for long-stroke linear position measurement, angular position sensing, turn indicators, gear sticks, joysticks, thumbwheels, pedals, valve position sensing, and HMI control applications.

For more information about **3D Hall 16 Click** visit the official [product page](#).

How does it work?

3D Hall 16 Click is based on the TLE493D-P318, a XENSIV™ 3D Hall sensor with SPI interface and wake-up function from Infineon. The TLE493D-P318 measures magnetic field components in three orthogonal dimensions, allowing detection of linear movement, angular position, and control element displacement in compact embedded systems. It operates as an SPI bus slave, while the host MCU configure the sensor, control measurements, and read the acquired magnetic field data. 3D Hall 16 Click is well suited for long-stroke linear position measurement, angular position sensing, turn indicators, gear sticks, joysticks, thumbwheels, pedals, valve position sensing, and other applications that require reliable 3D magnetic field detection in embedded, automotive, industrial, or human-machine interface systems.

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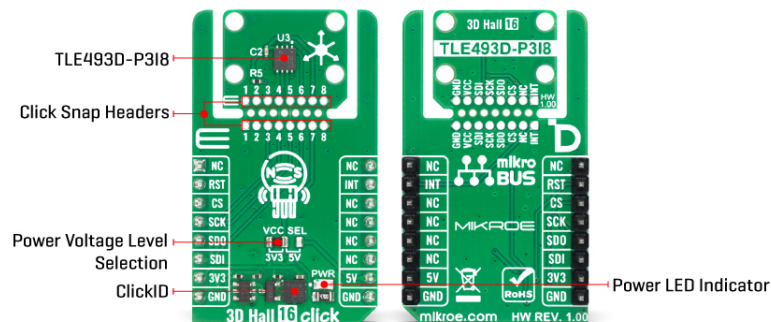
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ISO 27001: 2013 certification of informational security management system.
ISO 14001: 2015 certification of environmental management system.
OHSAS 18001: 2008 certification of occupational health and safety management system.



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



The TLE493D-P3I8 supports magnetic field sensing over a $\pm 160\text{mT}$ range and includes integrated temperature measurement, enabling additional compensation or monitoring functions in demanding applications. Developed according to ISO 26262 as a Safety Element out of Context (SEooC), the TLE493D-P3I8 provides built-in diagnostic functions to support functional safety applications up to ASIL-B requirements. Its wake-up function allows a sleeping system to be activated through the INT pin when a defined magnetic event is detected, making the board suitable for low-power and event-driven designs.

This Click board™ is designed in a unique format supporting the newly introduced MIKROE feature called "Click Snap." Unlike the standardized version of Click boards, this feature allows the main sensor/IC/module area to become movable by breaking the PCB, opening many new possibilities for implementation. Thanks to the Snap feature, the TLE493D-P3I8 can operate autonomously by accessing its signals directly on the pins marked 1-8. Additionally, the Snap part includes a specified and fixed screw hole position, enabling users to secure the Snap board in their desired location.

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.

Click Snap

Click Snap is an innovative feature of our standardized Click add-on boards, designed to bring greater flexibility and optimize your prototypes. By simply snapping the PCB along predefined lines, you can easily detach the main sensor/IC/module area, reducing the overall size, weight, and power consumption - ideal for the final phase of prototyping. For more details about Click Snap, visit the [official page](#) dedicated to this feature.

Specifications

Type	Magnetic
Applications	Ideal for long-stroke linear position measurement, angular position sensing, turn indicators, gear sticks, joysticks, thumbwheels, pedals, valve position sensing, and HMI control

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On-board modules	TLE493D-P3I8 - XENSIV™ 3D Hall sensor with SPI interface and wake-up function from Infineon
Key Features	Three-axis magnetic field measurement, 2MHz SPI communication, wake-up function, low-power event-driven operation, integrated temperature measurement, built-in diagnostic functions, ISO 26262 SEooC development, functional safety support up to ASIL-B, linear and angular position detection, and more
Interface	SPI
Feature	Click Snap, 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 3D Hall 16 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	
ID SEL	RST	2	RST	INT	15	INT	Interrupt
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	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

3D Hall 16 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
Magnetic Field Sensing Range	-160	-	+160	mT

Software Support

[3D Hall 16 Click](#) demo application is developed using the [NECTO Studio](#), ensuring compatibility

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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 3D Hall 16 Click board by reading the magnetic field strength from 3 axes and the sensor internal temperature.

Key Functions

- `c3dhall16_cfg_setup` This function initializes Click configuration structure to initial values.
- `c3dhall16_init` This function initializes all necessary pins and peripherals used for this Click board.
- `c3dhall16_default_cfg` This function executes a default configuration of 3D Hall 16 Click board.
- `c3dhall16_set_operating_mode` This function sets the sensor operating mode by writing the MOD1 register.
- `c3dhall16_set_range` This function sets the magnetic measurement range.
- `c3dhall16_get_data` This function reads the X, Y, Z magnetic flux density and internal junction temperature from the sensor.

Application Init

Initializes the driver and performs the Click default configuration.

Application Task

Reads data from the sensor and displays them on the USB UART every 200ms.

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](#)

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[Click boards™](#)

[ClickID](#)

Downloads

[3D Hall 16 click example package](#)

[3D Hall 16 click 2D and 3D files v100](#)

[3D Hall 16 click schematic v100](#)

[TLE493D-P3I8 datasheet](#)

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