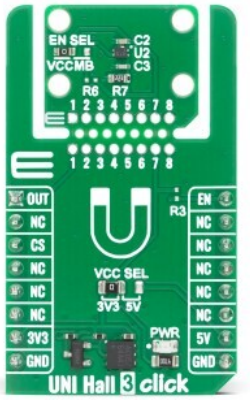
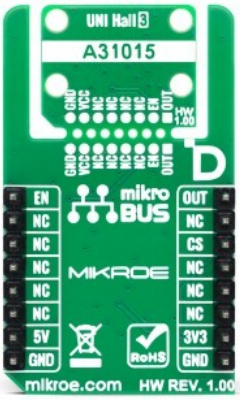
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UNI Hall 3 Click





PID: MIKROE-7094

UNI Hall 3 Click is a compact add-on board designed for contactless magnetic sensing. It features the A31015KEWALT-47SN from Allegro MicroSystems, a nanopower, ratiometric linear Hall-effect sensor configured for south-pole sensing. The board provides an analog output proportional to magnetic field strength, a typical 15kHz bandwidth, and GPIO-controlled enable and sleep modes. It supports selectable 3.3V or 5V operation, ClickID identification, and Click Snap technology for flexible sensor placement. Its analog interface allows the host MCU to evaluate magnetic position and movement. It is ideal for position sensing, proximity detection, contactless switching, human-machine interfaces, industrial automation, and smart home applications.

For more information about **UNI Hall 3 Click** visit the official product page.

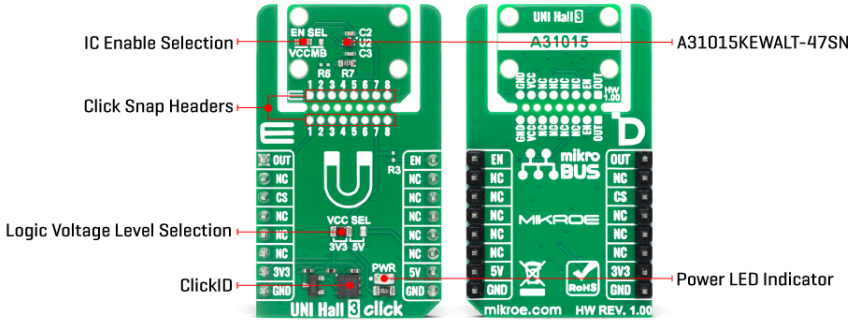
How does it work?

UNI Hall 3 Click is based on the A31015KEWALT-47SN, a nanopower, ratiometric 1D linear Hall-effect sensor from Allegro MicroSystems. The sensor integrates a Hall sensing element, dynamic offset cancellation, signal amplification and filtering, and an analog output stage in a compact four-pin DFN package. It measures the magnetic field component perpendicular to the package and is configured for unipolar south-pole sensing, providing an output voltage that increases with the applied south-pole magnetic field. At a 3.3V supply and 25°C, its typical sensitivity is 4.7mV/G, equivalent to 47mV/mT, with a typical operating magnetic field range of approximately -2.8mT to 58.9mT. A typical output bandwidth of 15kHz allows the sensor to track changes in magnetic field strength associated with position and movement. These features make UNI Hall 3 Click suitable for position sensing, proximity detection, magnetic field monitoring, contactless switching, human-machine interfaces, industrial automation, and smart

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home devices.



The A31015KEWALT-47SN provides a ratiometric analog output, meaning that both its zero-field output voltage and magnetic sensitivity scale with the supply voltage. At 25°C, the zero-field output is typically 10% of the supply voltage, corresponding to 0.33V at 3.3V and 0.5V at 5V, while the typical sensitivity at 5V is 7.1mV/G. Its dedicated active-high enable input allows the host MCU to alternate between active measurements and sleep mode, reducing average sensor power consumption in applications that take periodic readings. The enable time is typically 10µs, with a maximum of 13µs, and the output becomes high impedance in sleep mode. At 3.3V and 25°C, the IC draws a typical supply current of 1.9mA in active mode and 65pA in sleep mode. The sensor supports an operating temperature range from -40°C to +125°C, while magnet polarity and orientation determine the magnetic field applied along its sensitive axis.

UNI Hall 3 Click interfaces with the host MCU through analog and GPIO signals on the mikroBUS™ socket. The sensor's OUT signal is routed to the AN pin, allowing the host MCU's ADC to read the analog voltage and use it for magnetic field monitoring or position and proximity detection. When the EN SEL jumper is set to the MB position, the mikroBUS™ PWM pin serves as a GPIO control line for the sensor's EN input. A HIGH logic level enables measurements, while a LOW logic level places the sensor in sleep mode. The host should allow the specified enable time to elapse before sampling the analog output after wake-up. The mikroBUS™ CS pin is used for ClickID communication through the onboard identification circuitry, allowing automatic board identification in supported systems.

The board includes a green PWR LED that indicates the presence of the selected board supply and an EN SEL jumper for choosing the sensor's enable source. In its default VCC position, this jumper connects the enable input to the selected supply for continuous operation; the MB position enables control from the host MCU. UNI Hall 3 Click also features Click Snap technology, allowing the sensor section to be detached from the mikroBUS™ base for installation closer to the magnet or within a compact assembly. Paired eight-pin connection footprints expose the OUT, EN, VCC, and GND signals for reconnecting the separated sections with suitable headers or wiring. Mounting holes on the sensor section support mechanical installation, and all active components are located on the top side of the board for straightforward access and integration.

UNI Hall 3 Click uses the power rails provided by the mikroBUS™ socket, with the VCC SEL jumper selecting either the 3.3V rail, its default setting, or the 5V rail for the sensor supply. The

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ClickID circuitry is powered from the 3.3V rail. The selected sensor supply determines the analog output scaling, so the host ADC input range and reference should be configured accordingly. This Click board™ comes with a ready-to-use code example, available for download, that provides a starting point for evaluating the sensor and developing application software.

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 applications such as position sensing, proximity detection, contactless switching, human-machine interfaces, industrial automation, and smart home devices
On-board modules	A31015KEWALT-47SN - Nanopower ratiometric 1D linear Hall-effect sensor with south-pole sensing and 15kHz typical bandwidth from Allegro MicroSystems
Key Features	Unipolar south-pole sensing, ratiometric linear analog output, 4.7mV/G typical sensitivity at 3.3V and 25°C, 15kHz typical bandwidth, GPIO-controlled enable and sleep modes, selectable 3.3V/5V sensor supply, ClickID support, Click Snap technology, and more
Interface	Analog,GPIO
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 UNI Hall 3 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikroBUS				Pin	Notes
IC Output	**OUT**	1	AN	PWM	16	**EN**	Enable
	NC	2	RST	INT	15	NC	
ID COMM	**CS**	3	CS	RX	14	NC	
	NC	4	SCK	TX	13	NC	

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	NC	5	MISO	SCL	12	NC	
	NC	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/sensor supply voltage selection 3.3V/5V: Left position 3.3V, Right position 5V
JP2	EN SEL	Left	IC enable source selection VCC/MB: Left position VCC, Right position mikroBUS™

UNI Hall 3 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
Operating Temperature	-40	-	125	°C
Polarity	-	Unipolar South	-	-
Sensing Range	-2.8	-	58.9	mT
Bandwidth	-	15	-	kHz

Software Support

UNI Hall 3 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 the UNI Hall 3 Click board by reading and displaying the magnetic flux density measured by the on-board A31015 linear Hall-effect sensor.

Key Functions

- unihall3_cfg_setup This function initializes Click configuration structure to initial values.
- unihall3_init This function initializes all necessary pins and peripherals used for this Click board.
- unihall3_enable_device This function enables the device by setting the EN pin to high logic state.
- unihall3_disable_device This function disables the device by setting the EN pin to low logic state.
- unihall3_read_field This function reads the magnetic flux density measured by the sensor, in Gauss.
- unihall3_read_voltage_avg This function reads a desired number of ADC samples and calculates the average voltage level.

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Application Init

Initializes the driver and logger.

Application Task

Reads the magnetic flux density in Gauss once per second and logs the result on the USB UART.

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

UNI Hall 3 Click example package

UNI Hall 3 Click 2D and 3D files v100

UNI Hall 3 Click schematic v100

A31015 datasheet

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