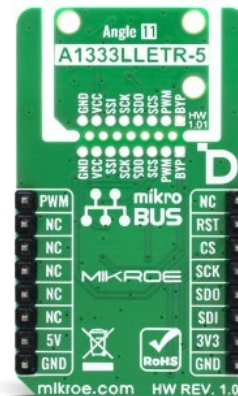
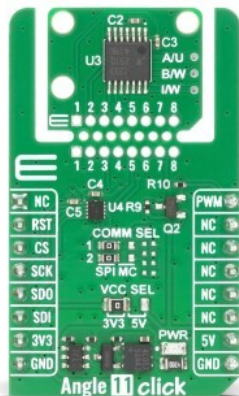


Angle 11 Click



PID: MIKROE-6888

Angle 11 Click is a compact add-on board for contactless angular position, rotational speed, and direction measurement in automotive, industrial, and motion-control applications. It is based on the [A1333](#) Hall-effect 360° angle sensor IC from [Allegro Microsystems](#). It uses magnetic circular vertical Hall (CVH) technology to provide full 0° to 360° angle sensing with up to 12-bit resolution, integrating a system-on-chip architecture with digital signal processing, configurable ABI or UVW outputs, PWM angle output, a full-duplex SPI interface for fast angle and diagnostic data transfer, and supports the MIKROE Click Snap feature for flexible integration. With integrated EEPROM supporting calibration programming and multiple output formats, this Click board is ideal for electronic power steering, throttle control, rotary selectors, motor commutation systems, and other rotary position sensing applications.

For more information about **Angle 11 Click** visit the official [product page](#).

How does it work?

Angle 11 Click is based on the A1333, a Hall-effect 360° angle sensor IC from Allegro Microsystems, using advanced magnetic circular vertical Hall (CVH) technology that provides contactless angular position, rotational speed, and direction measurement in automotive, industrial, and motion-control applications. The A1333 supports full 0° to 360° angle detection with up to 12-bit resolution when operating with a 900G magnetic field, making it suitable for high-precision rotary sensing applications such as electronic power steering systems, rotary PRNDL selectors, throttle control systems, and other position-feedback mechanisms requiring continuous angular measurement.

Mikroe produces entire development toolchains for all major microcontroller architectures.

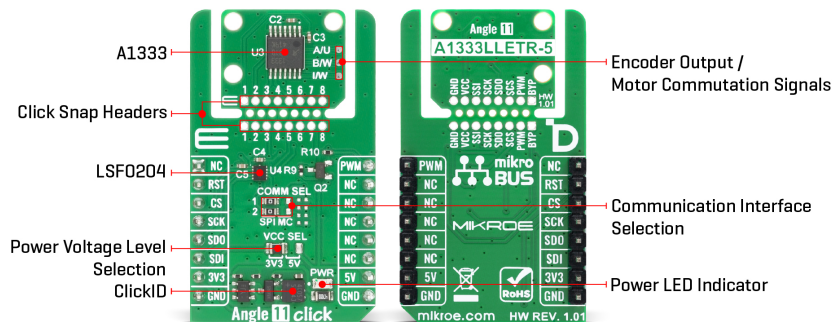
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ISO 27001: 2013 certification of informational security management system.
ISO 14001: 2015 certification of environmental management system.
OHSAS 18001: 2008 certification of occupational health and safety management system.



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



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 A1333 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.

The device integrates a complete system-on-chip architecture combining a CVH analog front end, digital signal processing, and configurable output stages capable of providing either motor commutation signals (UVW) or incremental encoder outputs (A, B, I). On-chip EEPROM memory supports up to 100 read/write cycles, allowing end-of-line calibration and parameter configuration without external memory components. Angle data and diagnostics are accessible through multiple output formats, including ABI/UVW signals exposed via test points in the Snap area for high-resolution, low-latency feedback, as well as a PWM output whose duty cycle is proportional to the measured angle and can be used for initial position detection.

A full-duplex 4-wire SPI interface operating in SPI mode 3 (CPHA = 1, CPOL = 1) provides low-latency communication for angle and diagnostic data while enabling multiple devices to share the same communication bus, and all device programming can be performed through either the SPI or Manchester interface, selectable via the COMM SEL jumper configuration. Since the A1333 operates exclusively from a 5V supply, Angle 11 Click integrates the [LSF0204](#) voltage level translator to ensure compatibility with both 3.3V and 5V microcontroller systems.

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.

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Specifications

Type	Magnetic
Applications	Ideal for electronic power steering, throttle control, rotary selectors, motor commutation systems, and other rotary position sensing applications
On-board modules	A1333 - Hall-effect 360° angle sensor from Allegro Microsystems
Key Features	Contactless 0° to 360° angular position sensing based on CVH Hall technology, up to 12-bit angle resolution with 900G magnetic field operation, simultaneous angular position, rotational speed, and direction measurement, integrated system-on-chip architecture with analog front end and digital signal processing, selectable ABI incremental encoder and UVW motor commutation outputs, PWM output proportional to measured angle for initial position detection, selectable interface, and more
Interface	PWM, 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 Angle 11 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	PWM	PWM Angle Output
ID SEL	RST	2	RST	INT	15	NC	
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-JP2	COMM SEL	Left	Communication Interface Selection

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			SPI/MC: Left position SPI, Right position MC
JP3	VCC SEL	Left	Power Voltage Level Selection 3V3/5V: Left position 3V3, Right position 5V

Angle 11 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
Magnetic Field Strength	-	900	-	G
Angle Measurement Range	0	-	360	deg
Angle Resolution	-	12	-	bit

Software Support

[Angle 11 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 Angle 11 Click board by reading and displaying the magnet's angular position in degrees, field strength in gauss, and the internal sensor temperature in degrees celsius.

Key Functions

- `angle11_cfg_setup` This function initializes Click configuration structure to initial values.
- `angle11_init` This function initializes all necessary pins and peripherals used for this Click board.
- `angle11_read_angle` This function reads the magnetic angular position in degrees.
- `angle11_read_temperature` This function reads the sensor internal temperature in degrees celsius.
- `angle11_read_field_strength` This function reads the magnetic field strength in gauss.

Application Init

Initializes the driver and logger.

Application Task

Reads the magnet's angular position in degrees, magnetic field strength in gauss, and the internal sensor temperature in degrees celsius and displays the results on the USB UART approximately every 100ms.

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

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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

[Angle 11 click example package](#)

[Angle 11 click 2D and 3D files v101](#)

[A1333 datasheet](#)

[Angle 11 click schematic v101](#)

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