

# Gyro 9 Click



PID: MIKROE-5881

**Gyro 9 Click** is a compact add-on board that contains a high-performance gyroscope. This board features the A3G4250D, a MEMS motion sensor from STMicroelectronics. It is a low-power 3-axes digital output gyroscope that provides unprecedented stability at zero rate level and sensitivity over temperature and time and is equipped with an embedded temperature sensor. The gyroscope has a 16-bit rate value data output with an 8-bit compensation temperature data output. This Click board™ makes the perfect solution for the development of in-dash car navigation, telematics, e-tolling, motion control with MMI (man-machine interface), and more.

Gyro 9 Click is fully compatible with the mikroBUS™ socket and can be used on any host system supporting the [mikroBUS™](#) standard. It comes with the [mikroSDK](#) open-source libraries, offering unparalleled flexibility for evaluation and customization. What sets Gyro 9 Click apart is the groundbreaking [ClickID](#) feature, enabling your host system to seamlessly and automatically detect and identify this add-on board.

## How does it work?

Gyro 9 Click is based on the A3G4250D, a MEMS motion sensor from STMicroelectronics. It includes a sensing element and an IC interface capable of providing the measured angular rate to the host MCU. The sensor has a full scale of  $\pm 245$ dps and can measure rates with a user-selectable bandwidth. The sensor also embeds a 32-slot, 16-bit data FIFO for each of the three output channels: yaw, pitch, and roll. This allows consistent power saving for the system, as the host MCU doesn't need to poll the data continuously. There is also a Bypass mode, which lets FIFO not operational and empty. The third mode is a Stream mode.

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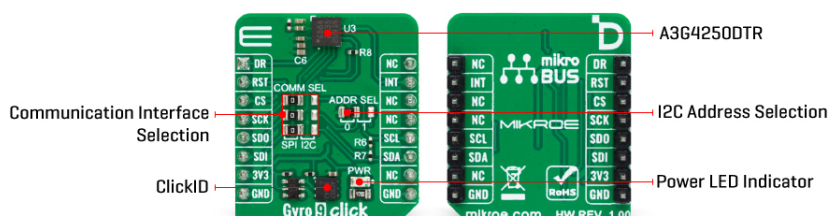
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Gyro 9 Click can use both the 4-wire SPI serial interface and the I2C interface to communicate with the host MCU. The selection can be made over the COMM SEL. The SPI is selected by default and supports clock frequency up to 10MHz. The I2C interface supports frequencies up to 400KHz. The I2C address can be selected over the ADDR SEL jumper (0 set by default). The gyroscope can be reset over the RST pin. The INT pin is a programmable interrupt and can be used in a combination of events. The DR is a data-ready output that generates dedicated interrupts depending on FIFO or Stream mode statuses.

This Click board™ can be operated only with a 3.3V logic voltage level. The board must perform appropriate logic voltage level conversion before using MCUs with different logic levels. 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	Motion
Applications	Can be used for the development of in-dash car navigation, telematics, e-tolling, motion control with MMI (man-machine interface), and more
On-board modules	A3G4250D - MEMS motion sensor from STMicroelectronics
Key Features	Integrates low and high-pass filters with user-selectable bandwidth, ultra-stable over temperature and time, embedded power-down and sleep mode, embedded temperature sensor, embedded FIFO, high shock survivability, and more
Interface	I2C, SPI
Feature	ClickID
Compatibility	mikroBUS™
Click board size	S (28.6 x 25.4 mm)
Input Voltage	3.3V

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## Pinout diagram

This table shows how the pinout on Gyro 9 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin					Pin	Notes
Data Ready Output	<b>DR</b>	1	AN	PWM	16	NC	
Reset / ID SEL	<b>RST</b>	2	RST	INT	15	<b>INT</b>	Interrupt
SPI Select / ID COMM	<b>CS</b>	3	CS	RX	14	NC	
SPI Clock	<b>SCK</b>	4	SCK	TX	13	NC	
SPI Data OUT	<b>SDO</b>	5	MISO	SCL	12	<b>SCL</b>	I2C Clock
SPI Data IN	<b>SDI</b>	6	MOSI	SDA	11	<b>SDA</b>	I2C Data
Power Supply	<b>3.3V</b>	7	3.3V	5V	10	NC	
Ground	<b>GND</b>	8	GND	GND	9	<b>GND</b>	Ground

## Onboard settings and indicators

Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator
JP1-JP2	COMM SEL	Left	Communication Interface Selection SPI/I2C: Left position SPI, Right position I2C
JP4	ADDR SEL	Left	I2C Address Selection 0/1: Left position 0, Right position 1

## Gyro 9 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Full-Scale Range	-	±245	-	dps
Sensitivity	7.4	8.75	10.1	mdps/digit

## Software Support

We provide a library for the Gyro 9 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 Gyro 9 Click driver.

Key functions

- gyro9\_get\_gyro\_axis Gyro 9 get gyro sensor axes function.

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- gyro9\_get\_axis\_data Gyro 9 get gyro data function.
- gyro9\_get\_data\_ready Gyro 9 get data ready function.

## Example Description

This library contains API for Gyro 9 Click driver. The library initializes and defines the I2C and SPI bus drivers to write and read data from registers, as well as the default configuration for reading gyroscope data.

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.Gyro9

## 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

[A3G4250D datasheet](#)

[Gyro 9 click example on Libstock](#)

[Gyro 9 click 2D and 3D files](#)

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[Gyro 9 click schematic](#)

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