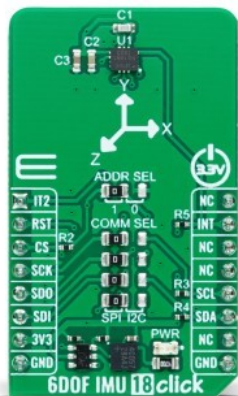


6DOF IMU 18 Click



PID: MIKROE-5591

6DOF IMU 18 Click is a compact add-on board with a 6-axis inertial measurement unit. This board features the [ICM-42605](#), a high-performance 6-axis MotionTracking™ IMU from [TDK InvenSense](#). It combines a 3-axis gyroscope and a 3-axis accelerometer featuring a 2Kb-byte FIFO that can lower the traffic on the serial bus interface (SPI or I2C). It reduces power consumption by allowing the system processor to burst read sensor data and then go into a low-power mode. Thanks to the industry-leading feature, APEX Motion Processing engine, this Click board™ represents an excellent choice for applications like tilt sensing, navigation, orientation measurement, platform stabilization, robotics, and many more.

6DOF IMU 18 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?

6DOF IMU 18 Click is based on the ICM-42605, a 6-axis motion tracking device that combines a 3-axis gyroscope and a 3-axis accelerometer from TDK InvenSense. It features a 2K-byte FIFO that can lower the traffic on the selected serial bus interface and reduce power consumption by allowing the system processor to burst read sensor data and then go into a low-power mode. With its 6-axis integration, the ICM-42605 guarantees optimal motion performance for customers. The ICM-42605 supports an extended operating temperature range, allowing customers to design it into various industrial IoT applications, including navigation and stabilizing industrial machinery and robots.

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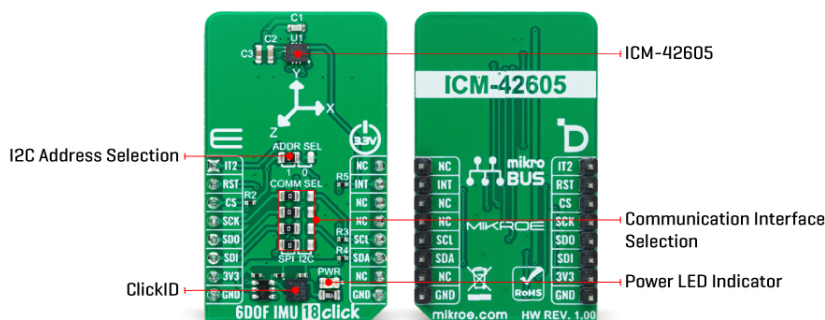
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The gyroscope supports eight programmable full-scale range settings from ± 15.625 dps to ± 2000 dps, and the accelerometer supports four programmable full-scale range settings from ± 2 g to ± 16 g. Other industry-leading features include on-chip 16-bit ADCs, programmable digital filters, an embedded temperature sensor, and programmable interrupts. The ICM-42605 also provides high robustness by supporting 20,000g shock reliability.

This Click board™ allows using both I2C and SPI interfaces at a maximum frequency of 1MHz for I2C and 24MHz for SPI communication. Selection is made by positioning SMD jumpers marked COMM SEL to the appropriate position. All jumpers must be on the same side, or the Click board™ may become unresponsive. When the I2C interface is selected, the ICM-42605 allows the choice of its I2C slave address, using the ADDR SEL SMD jumper set to an appropriate position marked 1 or 0. In addition to communication pins, this board also possesses additional interrupt pins, routed to the INT and IT2 pins on the mikroBUS™ socket, to signal MCU that an event, such as specific tap or sample acquisition conditions, has happened. Besides the standard interrupt function, the IT2 pin can also be used as a Frame Synchronization signal for synchronization with an external digital signal.

This Click board™ can only be operated with a 3.3V logic voltage level. The board must perform appropriate logic voltage level conversion before using MCUs with different logic levels. However, the Click board™ comes equipped with a library containing functions and an example code that can be used as a reference for further development.

Specifications

Type	Motion
Applications	Can be used for applications like tilt sensing, navigation, orientation measurement, platform stabilization, robotics, and many more
On-board modules	ICM-42605 - 6-axis MotionTracking™ IMU from TDK InvenSense
Key Features	Low power consumption, digital-output X-, Y-, and Z-axis angular rate sensors with programmable full-scale range, user-programmable interrupts, 20.000g shock tolerant, and more
Interface	I2C, SPI

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Feature	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 6DOF IMU 18 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin					Pin	Notes
Interrupt/Frame Sync	IT2	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	SCL	I2C Clock
SPI Data IN	SDI	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
JP1-JP4	COMM SEL	Left	Communication Interface Selection SPI/I2C: Left position SPI, Right position I2C
JP5	ADDR SEL	Left	I2C Address Selection 0/1: Left position 0, Right position 1

6DOF IMU 18 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Gyroscope Full-Scale Range	±15.625	-	±2000	dps
Accelerometer Full-Scale Range	±2	-	±16	g
Gyroscope Sensitivity	16	-	2097.2	LSB/dps
Accelerometer Sensitivity	2.048	-	16.384	LSB/g

Software Support

We provide a library for the 6DOF IMU 18 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](#).

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Library Description

This library contains API for 6DOF IMU 18 Click driver.

Key functions

- `c6dofimu18_set_reg_bank` 6DOF IMU 18 set register bank function.
- `c6dofimu18_get_int1_state` 6DOF IMU 18 read INT1 pin state function.
- `c6dofimu18_get_data_from_register` 6DOF IMU 18 read data function.

Example Description

This library contains API for 6DOF IMU 18 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 and accelerator data, and temperature.

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.6DOFIMU18

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, which needs to be downloaded from the [LibStock](#) and installed for the compiler you are using to ensure proper operation of mikroSDK compliant Click board™ demo applications.

For more information about mikroSDK, visit the [official page](#).

Resources

[mikroBUS™](#)

[mikroSDK](#)

[Click board™ Catalog](#)

[Click Boards™](#)

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[ClickID](#)

Downloads

[6DOF IMU 18 click example on Libstock](#)

[ICM-42605 datasheet](#)

[6DOF IMU 18 click 2D and 3D files v100](#)

[6DOF IMU 18 click schematic v100](#)

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