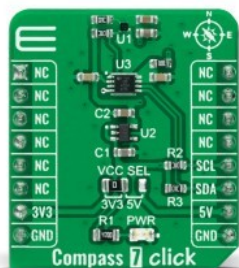


Compass 7 Click



PID: MIKROE-5190

Compass 7 Click is a compact add-on board perfect for applications like an electronic compass. This board features the [MMC5633NJL](#), a monolithic complete 3-axis AMR magnetic sensor with on-chip signal processing and an integrated digital bus from [MEMSIC](#). It can measure magnetic fields within the full-scale range of ± 30 Gauss (G) with up to 0.0625mG per LSB resolution at 20bits operation mode and 2mG total RMS noise level, enabling heading accuracy of $\pm 1^\circ$ in electronic compass applications. Also, an integrated SET/RESET function eliminates thermal variation-induced offset error (Null field output) and clears the residual magnetization resulting from powerful external fields. This Click board™ is suitable, as mentioned before, as an electronic compass but also can be used in various position sensing applications.

Compass 7 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?

Compass 7 Click as its foundation uses the MMC5633NJL, a monolithic high-performance 3-axis AMR magnetic sensor from MEMSIC. It comes with an integrated drive circuit, signal processing circuit, and serial interface block, allowing low noise and high resolution. It can measure magnetic fields within the full-scale range of ± 30 Gauss (G) with up to 0.0625mG per LSB resolution at 20bits operation mode and 2mG total RMS noise level, enabling heading accuracy of $\pm 1^\circ$ in electronic compass applications.

Mikroe produces entire development toolchains for all major microcontroller architectures.

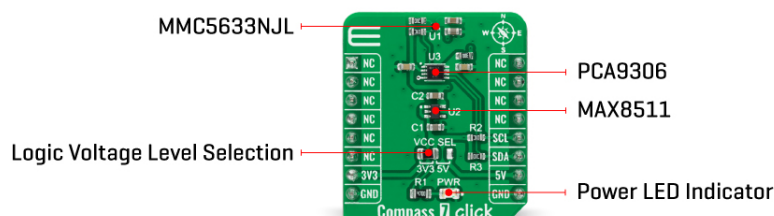
Committed to excellency, we are dedicated to helping engineers bring the project development up to speed and achieve outstanding results.



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).



An integrated SET/RESET function eliminates errors due to Null Field output change with temperature. In addition, it clears the sensors of any residual magnetic polarization resulting from exposure to strong external magnets. The SET/RESET function can be performed periodically for each measurement as the specific application requires.

Compass 7 Click communicates with MCU using the standard I2C 2-Wire interface with a maximum clock frequency of 400kHz, fully adjustable through software registers. The MMC5633NJL does not require a specific Power-Up sequence but requires a voltage of 1.8V for its interface and logic part to work correctly. Therefore, a small regulating LDO is used, the [MAX8511](#), providing a 1.8V out of mikroBUS™ power rails. Since the sensor for operation requires a power supply of 1.8V, this Click board™ also features the [PCA9306](#) voltage-level translator allowing the MMC5633NJL to work with 3.3V and 5V MCU properly.

This Click board™ can operate with both 3.3V and 5V logic voltage levels selected via the VCC SEL jumper. This way, it is allowed for both 3.3V and 5V capable MCUs to use the communication lines properly. However, the 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	Compass,Magnetic
Applications	Can be used as an electronic compass but also can be used in various position sensing applications
On-board modules	MMC5633NJL - monolithic high-performance 3-axis AMR magnetic sensor from MEMSIC
Key Features	Low power consumption, superior dynamic range and accuracy, on-chip automatic degaussing with built-in SET/RESET function, sensitivity compensation and on-chip temperature sensor, and more
Interface	I2C
Feature	No ClickID
Compatibility	mikroBUS™

Mikroe produces entire development toolchains for all major microcontroller architectures.

Committed to excellency, we are dedicated to helping engineers bring the project development up to speed and achieve outstanding results.



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).

Click board size	S (28.6 x 25.4 mm)
Input Voltage	3.3V or 5V

Pinout diagram

This table shows how the pinout on Compass 7 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	NC	
	NC	2	RST	INT	15	NC	
	NC	3	CS	RX	14	NC	
	NC	4	SCK	TX	13	NC	
	NC	5	MISO	SCL	12	SCL	I2C Clock
	NC	6	MOSI	SDA	11	SDA	I2C Data
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	Logic Level Voltage Selection 3V3/5V: Left position 3V3, Right position 5V

Compass 7 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
Field Range (Each Axis)	-	±30	-	G
Accuracy	-	±1	-	Deg
Resolution	-	20	-	bits
Operating Temperature Range	-40	+25	+85	°C

Software Support

We provide a library for the Compass 7 Click as well as a demo application (example), developed using MikroElektronika [compilers](#). The demo can run on all the main MikroElektronika [development boards](#).

Package can be downloaded/installed directly from NECTO Studio Package Manager(recommended way), downloaded from our [LibStock™](#) or found on [Mikroe github account](#).

Library Description

This library contains API for Compass 7 Click driver.

Mikroe produces entire development toolchains for all major microcontroller architectures.

Committed to excellency, we are dedicated to helping engineers bring the project development up to speed and achieve outstanding results.



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).

Key functions

- `compass7_set_measurement_mode` This function sets the control and ODR registers for the selected measurement mode.
- `compass7_get_magnetic_flux` This function reads the raw values of X, Y, and Z axis and converts them to magnetic flux data in Gauss.
- `compass7_get_temperature` This function reads the temperature measurements in Celsius.

Example Description

This example demonstrates the use of Compass 7 Click board™ by reading and displaying the magnetic field strength of 3-axis as well as the temperature measurements in Celsius.

The full application code, and ready to use projects can be installed directly from NECTO Studio Package Manager(recommended way), downloaded from our [LibStock™](#) or found on [Mikroe github account](#).

Other Mikroe Libraries used in the example:

- MikroSDK.Board
- MikroSDK.Log
- Click.Compass7

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 MikroElektronika [compilers](#).

mikroSDK

This Click board™ is supported with [mikroSDK](#) - MikroElektronika 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™](#)

Downloads

[PCA9306 datasheet](#)

Mikroe produces entire development toolchains for all major microcontroller architectures.

Committed to excellency, we are dedicated to helping engineers bring the project development up to speed and achieve outstanding results.



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).

[MMC5633NJL datasheet](#)

[MAX8511 datasheet](#)

[Compass 7 click 2D and 3D files](#)

[Compass 7 click schematic](#)

[Compass 7 click example on Libstock](#)

Mikroe produces entire development toolchains for all major microcontroller architectures.

Committed to excellency, we are dedicated to helping engineers bring the project development up to speed and achieve outstanding results.



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).