

Nano GPS 2 Click



PID: MIKROE-4150

Nano GPS 2 Click features the smallest GPS module with an integrated patch antenna, the [ORG1510-MK05](#) a module from [OriginGPS](#). It's the world's smallest multi-constellation antenna module enabling high-performance in a variety of applications. Multi Micro Hornet ORG1510-MK05 module is introducing the industry's lowest energy per fix ratio, unparalleled accuracy, and extremely fast fixes even under challenging signal conditions, such as in built-up urban areas, dense foliage or even indoor.

Despite its size, Nano GPS 2 Click offers superior sensitivity and outstanding performance, with time to first fix (TTFF) of less than 1 second, high accuracy of less than 2.5m, and tracking sensitivity down to -165dBm.

Nano GPS 2 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?

Nano GPS 2 Click uses the Multi Micro Hornet module from OriginGPS, the smallest GPS module with incorporated on-board antenna element that is perfectly matched to receiver front-end, frequency trimmed to GPS band, and Right-Hand Circularly Polarized (RHCP). Module possesses dual-stage LNA (Low Noise Amplifier), SAW (Surface Acoustic Wave) filter, RTC crystal, GNSS SoC, and RF shield. GNSS SoC on a module is a hybrid positioning processor that combines many constellation configurations to provide a high-performance navigation solution such as GPS, GLONASS, GALILEO, BEIDOU, SBAS, QZSS, DGPS, and AGPS, allowing integration in embedded solutions with low computing resources.

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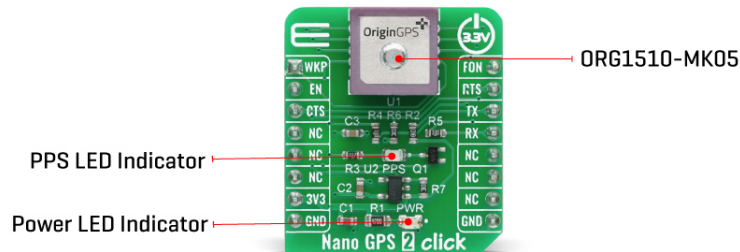
Committed to excellency, we are dedicated to helping engineers bring the project development up to speed and achieve outstanding results.



ISO 27001: 2013 certification of informational security management system.
ISO 14001: 2015 certification of environmental management system.
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ISO 9001: 2015 certification of quality management system (QMS).



The ORG1510-MK05 module supports operational modes that allow them to provide positioning information at reduced overall current consumption. The availability of GNSS signals in the operating environment will also be a factor in the choice of power management modes. The user can choose a mode that provides the best trade-off of performance versus power consumption. Several power management modes can be enabled via a command such as:

- Full Power-Continuous Mode (for best GNSS performance)
- Power Save Mode (to optimize power consumption)
- Backup Mode (low quiescent power state where receiver operation is stopped)

Nano GPS 2 Click operates with received signal levels down to -167dBm and can be affected by high absolute levels of RF signals out of GNSS band, moderate levels of RF interference near the GNSS band, and by low-levels of RF noise in GNSS band. Uses a standard UART port and besides the commonly used UART RX, TX, RTS, and CTS Nano GPS 2 Click have also FON, and WKP pins, which are routed to the PWM and AN pins of the mikroBUS™ socket, respectively.

Integrated GPS SoC incorporating a high-performance microprocessor and sophisticated firmware keeps positioning payload off the host, allowing integration in embedded solutions with low computing resources. Innovative architecture can detect changes in context, temperature, and satellite signals to achieve a state of near-continuous availability by maintaining and opportunistically updating its internal fine time, frequency, and satellite ephemeris data while consuming mere microwatts of battery power.

This Click Board™ is designed to be operated only with a 3.3V logic level. A proper logic voltage level conversion should be performed before the Click board™ is used with MCUs with logic levels of 5V. More information about the ORG1510-MK05 module can be found in the attached datasheet. However, this Click board™ comes equipped with a library that contains easy to use functions and a usage example that may be used as a reference for the development.

Specifications

Type	GPS/GNSS
Applications	Can be used for a rapid development and testing of various applications based on asset tracking, road navigation devices, public transport, wearable devices, etc.

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On-board modules	Nano GPS 2 Click uses the Multi Micro Hornet ORG1510-MK05 module
Key Features	Superior sensitivity and outstanding performance, with time to first fix (TTFF) of less than 1 second, high accuracy of less than 2.5m, and tracking sensitivity down to -165dBm
Interface	GPIO,UART
ClickID	No
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 Nano GPS 2 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikro™ BUS				Pin	Notes
Wake Up	WKP	1	AN	PWM	16	FON	Force Enable
Enable Module	EN	2	RST	INT	15	RTS	UART RTS
UART CTS	CS	3	CS	RX	14	TX	UART TX
	NC	4	SCK	TX	13	RX	UART RX
	NC	5	MISO	SCL	12	NC	
	NC	6	MOSI	SDA	11	NC	
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
LD2	PPS	-	Pulse Per Second, when the GNSS receiver has established a connection with the satellite constellation the LED starts blinking

Software Support

We provide a library for the Nano GPS 2 Click on our [LibStock](#) page, as well as a demo application (example), developed using MikroElektronika [compilers](#). The demo can run on all the main MikroElektronika [development boards](#).

Library Description

Library provides function for controlling GPIO, sending commands over UART module. There is

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generic parser that can parse response of specific command that device is sending, buffer for parser is getting data from process function that sends one byte of data to buffer, and there is function for clearing that buffer.

Key functions:

- `uint8_t nanogps2_generic_parser ( char *command, uint8_t element, char *parser_buf )` - Generic parser function
- `void nanogps2_process ( char temp )` - Process function that adds byte data to buffer for parsing
- `void nanogps2_clear_rsp_buf ( void )` - Function for clearing buffer for parsing

Examples description

The application is composed of three sections :

- System Initialization - Initialization of UART module and additional pins
- Application Initialization - UART interrupt initialization
- Application Task - Parsing RX data and logs GPS data if there is some every 2sec and then clears buffer.

The full application code, and ready to use projects can be found on our [LibStock](#) page.

Other mikroE Libraries used in the example:

- CString
- UART

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. The terminal available in all MikroElektronika [compilers](#), or any other terminal application of your choice, can be used to read the message.

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™](#)

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Downloads

[Nano GPS 2 click 2D and 3D files](#)

[ORG1510-MK05 datasheet](#)

[Nano GPS 2 click example on Libstock](#)

[Nano GPS 2 click schematic](#)

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