GPS 5 Click

PID: MIKROE-5298

GPS 5 Click is a compact add-on board that provides users with positioning, navigation, and timing services. This board features the M20050-1, a compact GPS module receiver using the MediaTek MT3333 flash chip, providing a complete GNSS receiver for optimum performance from Antenova. The receiver tracks 3 GNSS constellations concurrently (GPS+Galileo+GLONASS or GPS+Beidou) to considerably enhance location and TTFF (Time-to-first-fix) and has configurable low power modes operating from a 3.3V power supply. In addition to the possibility of using an external antenna, backup power, and various visual indicators, the M20050-1 also has an accurate 0.5ppm TXCO ensuring short TTFF alongside multi-path algorithms, which improves position accuracy in inner-city environments. This Click board™ is suitable for a broad spectrum of GPS applications where performance, cost, and time to market are prime considerations.

GPS 5 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?

GPS 5 Click as its foundation uses the M20050-1, an integrated GNSS receiver module with an integrated antenna incorporating the MediaTek MT3333 flash chip from Antenova. The M20050-1 tracks 3 GNSS constellations concurrently (GPS+Galileo+GLONASS or GPS+Beidou) to considerably enhance the location and has configurable low power modes alongside acquisition and tracking sensitivity of -163dBm and -165dBm. This module offers indoor and outdoor multi-path detection and compensation and has an accurate 0.5ppm TXCO that ensures short TTFF besides an active interference cancellation (AIC) feature. This Click board is
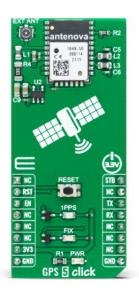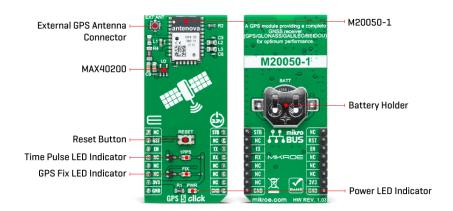
MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
VAT: SR105917343 Registration No. 20490918
Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com
www.mikroe.com

ideal for asset tracking/ personal safety, navigation devices, and sports equipment applications based on good attributes.

The M20050-1 has three power-saving modes: Standby, Backup, and Periodic. Standby mode is a power-saving mode initiated either with a hardware signal labeled as STB and routed on the PWM pin of the mikroBUS™ socket or by a software command. It shuts down the RF section of the module, putting the processor into Standby mode. The RTC is kept alive, and the RAM power is maintained to keep the module configuration. Periodic mode is a user-configurable mode that reduces current consumption by only waking the module for short periods to maintain FIX data.

Backup mode is accessed due to the absence of the main board power supply VCC. For this reason, there is an additional backup power supply in the form of a battery that powers the RAM and RTC sections of the receiver and needs to be applied at all times for Backup mode to run correctly. Once initiated, the RTC and all configurations are saved along with any ephemeris data to allow quick TTFF once the VCC is re-applied.

GPS 5 Click communicates with MCU using the UART interface with commonly used UART RX and TX pins operating at 115200bps by default configuration to transmit and exchange data with the host MCU. It also possesses an active-low reset signal routed on the RST pin of the mikroBUS™ socket that activates a hardware reset of the M20050-1. The reset function can also be used using an onboard RESET button.

In addition to precise positioning, the GPS 5 Click also has an accurate timing signal indicated via a red LED indicator marked as 1PPS, a blue LED indicator marked with FIX, which shows once a GPS fix has been obtained, as well as the possibility of using an external active antenna which can also be found in our offer, activated through EN pin of the mikroBUS™ socket.

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. 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	GPS/GNSS
Applications	Can be used for asset tracking/ personal

MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
VAT: SR105917343 Registration No. 20490918
Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com
www.mikroe.com

	safety, navigation devices, and sports equipment applications
On-board modules	M20050-1 - compact GPS module receiver from Antenova
Key Features	Drop in GNSS receiver module (GPS/GLONASS/Galileo/Beidou), MediaTek MT3333 flash chip, low power consumption, interference cancellation, internally generated orbit prediction for short time to first fix, external antenna, and more
Interface	UART
Feature	No ClickID
Compatibility	mikroBUS™
Click board size	L (57.15 x 25.4 mm)
Input Voltage	3.3V

Pinout diagram

This table shows how the pinout on GPS 5 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin		mikro™ BUS			Pin	Notes
	NC	1	AN	PWM	16	**STB**	Standby Mode
Reset	**RST**	2	RST	INT	15	NC	
External Antenna Activation	**EN**	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	1PPS	-	Time Pulse LED Indicator
LD3	FIX	-	GPS Fix LED Indicator
T1	RESET	-	Reset Button

GPS 5 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Operating Frequency	1.559	1.575	1.609	GHz
Acquisition Sensitivity	-	-163	-	dBm

MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
VAT: SR105917343 Registration No. 20490918
Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com
www.mikroe.com

Tracking Sensitivity	-	-165	-	dBm
Operating Temperature Range	-40	+25	+85	°C

Software Support

We provide a library for the GPS 5 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 GPS 5 Click driver.

Key functions

- gps5_set_rst_pin This function sets the RST pin logic state.

- gps5_generic_read This function reads a desired number of data bytes by using UART serial interface.

- gps5_parse_gngga This function parses the GNGGA data from the read response buffer.

Example Description

This example demonstrates the use of GPS 5 Click board™ by reading and displaying the GPS coordinates.

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.
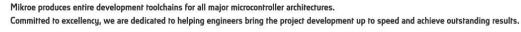
Other Mikroe Libraries used in the example:

- MikroSDK.Board
- MikroSDK.Log
- Click.GPS5

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

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).

MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
VAT: SR105917343 Registration No. 20490918
Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com
www.mikroe.com

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

[GPS 5 click example on Libstock](#)

[M20050-1 datasheet](#)

[GPS 5 click 2D and 3D files](#)

[GPS 5 click schematic](#)

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[Mikroe](#):

[MIKROE-5298](#)