

GSM/GNSS 2 Click



PID: MIKROE-2440

GSM/GNSS 2 Click is a compact add-on board that combines GPS/GLONASS location tracking with GSM module capability for mobile communication. This board features the SIM868, a high-performance GSM/GPRS module from SIMCom. It offers extensive internet protocols and integrates GNSS technology for satellite navigation. The module provides much flexibility and ease of integration for customers' applications. It communicates with the target MCU over the UART interface and offers a complete range of SMS and data transmission services to meet client-side demands. This Click board™ is suitable for many M2M applications, asset tracking, navigation devices based on GPS and GLONASS, automotive, and many more.

GSM/GNSS 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?

GSM/GNSS 2 Click as its foundation uses the SIM868, a multi-purpose module that integrates a high-performance GNSS engine and a GSM/GPRS engine from SIMCom. The quad-band GSM/GPRS engine can work at 850, 900, 1800, and 1900MHz. It also features GPRS multi-slot class 12 and supports the GPRS coding schemes CS-1, CS-2, CS-3, and CS-4. The GNSS solution offers best-in-class acquisition and tracking sensitivity, Time-To-First-Fix (TTFF), and accuracy. The GSM part of the SIM868 is integrated with Internet service protocols such as TCP, UDP, PPP, HTTP, and FTP. The excellent positioning performance, low power consumption, and dual µSIM card interfaces make SIM868 the superb choice for many M2M 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).

The SIM868 module has to be powered by a clean and stable power supply. The voltage needed for the module to work correctly is 4V, and it is derived from the 5V mikroBUS™ power rail through the MCP1826, a 1A low drop output (LDO) regulator. The main 4V power supply is also the power supply for the GSM/GNSS block of the SIM868. Also, activation of the module itself is possible via the RST pin on the mikroBUS™ socket connected to the PWRKEY pin of the module used for turning the module ON and OFF.

The SIM868 communicates with MCU using the UART interface with commonly used UART RX and TX pins with the hardware flow control pins UART CTS, RTS, RI (Clear to Send, Ready to Send, and Ring Indicator). The GSM/GNSS 2 Click also has an onboard MicroSD/MicroSIM card socket with card detection feature routed to the AN pin on the mikroBUS™ socket, A5839 Bluetooth 3.0 2.4GHz chip antenna, which the SIM868 module version supports, and an additional header labeled as HD1 for audio interface (channels for connecting speakers and a microphone). In addition to all these features, this Click board™ also has three yellow LED indicators labeled as NET, STAT, and 1PPS. The network status NET indicates if the module is attached or not to a network, Power-ON Status STAT indicates the operating status of the module, and successfully positioning 1PPS shows one pulse per second synchronized to GNSS satellites.

Furthermore, it possesses two SMA antenna connectors with an impedance of 50Ω, labeled as GNSS and GSM, used for connecting the appropriate antenna that Mikroe has in its offer. When connected to a GPS antenna, it can receive GPS coordinates, time, and other information from orbiting satellites. The Click board™ can be used for all GSM functions — calls, messages (SMS, MMS), mobile internet.

NOTE: To ensure the proper operation of the GNSS part, it is necessary to use only a GPS&GLONASS External Passive antenna that the user can also find in our offer.

This Click board™ can operate with both 3.3V and 5V logic voltage levels and comes with a proper logic voltage level conversion performed by the appropriate voltage level translator TXB0106. This way, it is allowed for both 3.3V and 5V capable MCUs to use the UART 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.

NOTE: To ensure the proper operation of the GNSS part, it is necessary to use only a [GPS&GLONASS External Passive antenna](#) that the user can also find in our offer.

This Click board™ can operate with both 3.3V and 5V logic voltage levels and comes with a proper logic voltage level conversion performed by the appropriate voltage level translator TXB0106. This way, it is allowed for both 3.3V and 5V capable MCUs to use the UART 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	2G GPRS,GSM+GPS
Applications	Can be used for a wide range of M2M applications, asset tracking, navigation devices based on GPS and GLONASS, automotive, and many more

Mikroe produces entire development rootchains 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).

On-board modules	SIM868 - multi-purpose module that integrates a high-performance GNSS engine and a GSM/GPRS engine from SIMCom
Key Features	GPS/GLONASS location tracking with GSM module capability, an extensive set of internet protocols, high accuracy, high performance, low power consumption, offers a complete range of SMS and data transmission, and more
Interface	GPIO,UART
Feature	No ClickID
Compatibility	mikroBUS™
Click board size	L (57.15 x 25.4 mm)
Input Voltage	3.3V or 5V

Pinout diagram

This table shows how the pinout on GSM/GNSS 2 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin					Pin	Notes
SD Card Detect	DET	1	AN	PWM	16	RING	UART RI
Reset	RST	2	RST	INT	15	CTS	UART CTS
UART RTS	RTS	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	5V	Power Supply
Ground	GND	8	GND	GND	9	GND	Ground

Onboard settings and indicators

Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator
LD2	STATUS	-	Power-ON Status LED Indicator
LD3	NET	-	Network Status LED Indicator
LD4	1PPS	-	Successfully Positioning LED Indicator
JP1	-	Left	Logic Level Voltage Selection 3V3/5V: Left position 3V3, Right position 5V
J1	HD1	Unpopulated	Audio Interface Header

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).

GSM/GNSS 2 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
Operating Frequency Range	850	-	1900	MHz
Operating Temperature Range	-40	+25	+85	°C

Software Support

We provide a library for the GSM/GNSS 2 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 GSM/GNSS 2 Click driver.

Key functions

- gsmgnss2_send_cmd Send command function.
- gsmgnss2_set_sim_apn Set sim card APN.
- gsmgnss2_send_sms_pdu GSM GNSS send SMS in PDU mode.

Example Description

This example reads and processes data from GSM/GNSS 2 clicks.

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.GSMGNSS2

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

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).

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™](#)

[Click board™ Catalog](#)

[Click Boards™](#)

Downloads

[GPS Learn Article](#)

[GSM/GNSS 2 click example on Libstock](#)

[SIM868 module datasheet](#)

[GSM/GNSS 2 click schematic](#)

[GSM/GNSS 2 click 2D and 3D files](#)

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).