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GNSS 23 Click

PID: MIKROE-6526

GNSS 23 Click is a compact add-on board designed for precise global navigation and tracking across multiple satellite systems. This board features the LC26G (AB), a GNSS receiver module from Quectel, known for its high-performance multi-constellation tracking capability. Supporting GPS, GLONASS, Galileo, BDS, and QZSS, it achieves exceptional sensitivity levels of -166dBm for tracking and -147dBm for acquisition, ensuring fast signal lock and accurate positioning even in dense urban environments. Equipped with EASY (Embedded Assist System) and ALP (Adaptive Low Power) technologies, it delivers quick time-to-first-fix (TTFF) and optimized power consumption, making it ideal for power-sensitive designs. GNSS 23 Click is ideal for a wide range of applications, including industrial PDAs, consumer electronics, and portable devices requiring reliable, low-power positioning solutions.

For more information about **GNSS 23 Click** visit the official product page.

How does it work?

GNSS 23 Click is based on the LC26G (AB), a high-performance multi-constellation GNSS receiver from Quectel, designed to deliver precise positioning across various global navigation systems including GPS, GLONASS, Galileo, BDS, and QZSS. This advanced receiver integrates a low-noise amplifier (LNA) to ensure exceptional sensitivity, achieving industry-leading levels of -166dBm during tracking and -147dBm during acquisition. Such capabilities enable fast signal acquisition and accurate positioning, even in environments where satellite visibility is limited, like dense urban areas. By leveraging signals from multiple constellations, the LC26G (AB) significantly reduces Time To First Fix (TTFF) and enhances overall accuracy compared to single-constellation GPS receivers.

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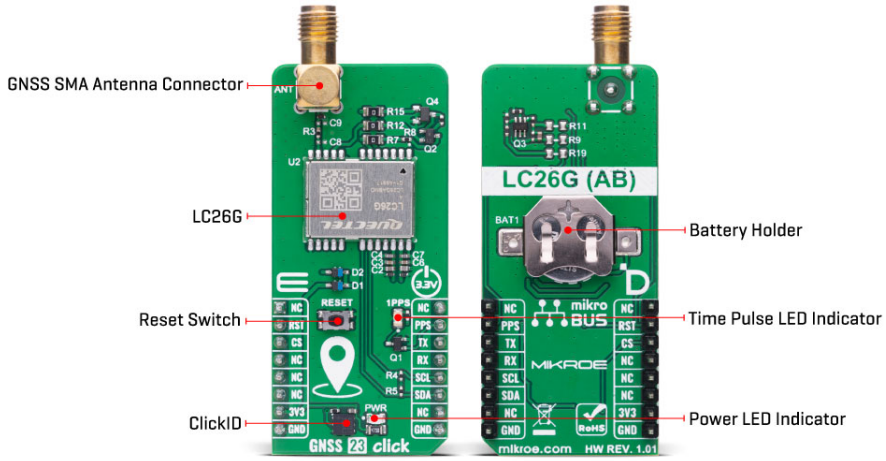

Incorporating Quectel's EASY (Embedded Assist System) and ALP (Adaptive Low Power) technologies, the module offers an optimal blend of high performance and low power consumption, fully meeting industrial-grade requirements. EASY technology allows the receiver to predict satellite orbits using stored ephemeris data for up to three days, enabling quicker position fixes while conserving power, even under weak signal conditions. ALP technology further optimizes power efficiency by dynamically adjusting operating cycles based on motion data and environmental factors, balancing accuracy with energy savings. These advanced features makes GNSS 23 Click an ideal solution for a wide range of applications, including industrial PDAs, consumer electronics, various industry-focused devices, while its ultra-low power profile also makes it particularly well-suited for portable and power-sensitive systems.

The GNSS 23 Click communicates with the host MCU through a UART interface using the standard UART RX and TX pins. The default communication speed is set at 115200bps, ensuring efficient data exchange. It also provides an I2C interface for communication with a host MCU in the I2C Fast speed mode (400kHz). Still, it must be noted that the I2C interface can only be operated in the peripheral mode.

Along with the communication and control pins, this Click board™ also includes a reset pin (RST) and a RESET button, enabling easy module resetting, a blue PPS LED indicator, which, in combination with the PPS pin, detects a synchronized pulse signal from the LC26GABMD once per second, and a battery holder for the backup power supply (RAM and RTC backup). The board also features one SMA connector for GNSS antenna that MIKROE offers, like the GNSS L1/L5 Active External Antenna for flexible and efficient connectivity options.

This Click board™ can operate with either 3.3V or 5V logic voltage levels selected via the VCC SEL jumper. This way, both 3.3V and 5V capable MCUs can use the communication lines properly. Also, this 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	GPS/GNSS
Applications	Ideal for a wide range of applications, including industrial PDAs, consumer electronics, and portable devices
On-board modules	LC26G (AB) - multi-constellation GNSS receiver

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	module from Quectel
Key Features	Multi-constellation GNSS receiver, high sensitivity, low-noise amplifier for enhanced signal reception, integrated EASY (Embedded Assist System) for fast positioning with orbit prediction up to 3 days, ALP (Adaptive Low Power) technology for optimized power consumption, UART and I2C communication interfaces, battery backup, and more
Interface	I2C,UART
Feature	ClickID
Compatibility	mikroBUS™
Click board size	L (57.15 x 25.4 mm)
Input Voltage	3.3V,External

Pinout diagram

This table shows how the pinout on GNSS 23 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikroBUS				Pin	Notes
	NC	1	AN	PWM	16	NC	
Reset	**RST**	2	RST	INT	15	**PPS**	Time Pulse Indicator
ID COMM	**CS**	3	CS	RX	14	**TX**	UART TX
	NC	4	SCK	TX	13	**RX**	UART RX
	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	NC	
Ground	**GND**	8	GND	GND	9	**GND**	Ground

Onboard settings and indicators

Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator
LD2	PPS	-	Time Pulse LED Indicator
T1	RESET	-	Reset Button

GNSS 23 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Frequency Range	1559	-	1606	MHz
Tracking Sensitivity	-	-166	-	dBm
Acquisition Sensitivity	-	-147	-	dBm

Software Support

GNSS 23 Click demo application is developed using the NECTO Studio, ensuring compatibility

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with mikroSDK's open-source libraries and tools. Designed for plug-and-play implementation and testing, the demo is fully compatible with all development, starter, and mikromedia boards featuring a mikroBUS™ socket.

Example Description

This example demonstrates the use of GNSS 23 Click by reading and displaying the GNSS coordinates.

Key Functions

- gnss23_cfg_setup This function initializes Click configuration structure to initial values.
- gnss23_init This function initializes all necessary pins and peripherals used for this Click board.
- gnss23_generic_read This function reads a desired number of data bytes by using UART or I2C serial interface.
- gnss23_parse_gga This function parses the GGA data from the read response buffer.
- gnss23_get_pps_pin This function returns the pulse per second (PPS) pin logic state.

Application Init

Initializes the driver and logger.

Application Task

Reads the received data, parses the NMEA GGA info from it, and once it receives the position fix it will start displaying the coordinates on the USB UART.

Application Output

This Click board can be interfaced and monitored in two ways:

- Application Output - Use the "Application Output" window in Debug mode for real-time data monitoring. Set it up properly by following this tutorial.
- UART Terminal - Monitor data via the UART Terminal using a USB to UART converter. For detailed instructions, check out this tutorial.

Additional Notes and Information

The complete application code and a ready-to-use project are available through the NECTO Studio Package Manager for direct installation in the NECTO Studio. The application code can also be found on the MIKROE GitHub account.

Resources

mikroBUS™

mikroSDK

Click board™ Catalog

Click boards™

ClickID

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Downloads

GNSS 23 click example package

GNSS 23 click schematic v100

GNSS 23 click 2D and 3D files v100

LC26GAB datasheet

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