

## GNSS 28 Click



PID: MIKROE-6775

**GNSS 28 Click** is a compact add-on board that provides precise multi-constellation satellite positioning and reliable navigation performance for embedded applications requiring high accuracy and low power consumption. It is based on the SL871L ([SL871LG3240R003000](#)), a multi-constellation GNSS module from [Telit Cinterion](#) built around the low-power Mediatek MT3333 engine. This module supports GPS (L1), GLONASS (L1, FDMA), Galileo (E1), and BeiDou (B1) frequency bands, offering 99 search and 33 tracking channels, SBAS capability, AGPS for faster time-to-first-fix (TTFF), and advanced jammer rejection. GNSS 28 Click communicates with the host MCU via UART or I2C interfaces, includes active and passive antenna support, and integrates a backup power circuit with a coin-cell battery for RTC and data retention. This Click board™ is ideal for asset tracking, navigation systems, environmental monitoring, and location-based services.

For more information about **GNSS 28 Click** visit the official [product page](#).

### How does it work?

GNSS 28 Click is based on the SL871L (SL871LG3240R003000), a multi-constellation GNSS module from Telit Cinterion built around the low-power Mediatek MT3333 engine. Designed to deliver exceptional positioning accuracy, short time-to-first-fix (TTFF), and low energy consumption, this module makes GNSS 28 Click suitable for both battery-powered systems and continuous tracking applications. The SL871L supports GPS (L1), GLONASS (L1, FDMA), Galileo (E1), and BeiDou (B1) frequency bands, providing robust global coverage and high positional reliability even in challenging urban or environmental conditions. It provides precise multi-constellation satellite positioning and reliable navigation performance for embedded

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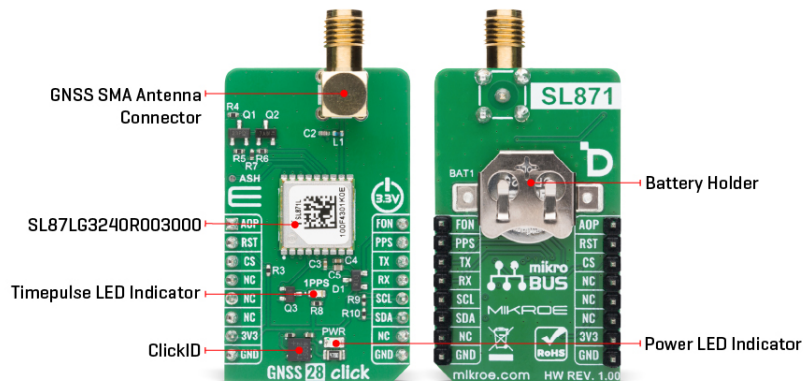


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applications such as asset tracking, navigation systems, environmental monitoring, and location-based services.



With 99 search and 33 tracking channels, along with SBAS support for WAAS, EGNOS, MSAS, and GAGAN, it ensures improved accuracy and integrity of positioning data. Integrated AGPS functionality, capable of using both locally generated and server-based ephemeris prediction, significantly reduces TTFF for faster start-up times. The module's additional low-noise amplifier (LNA) enhances RF sensitivity, while its DC block and jammer rejection circuitry improve signal stability and minimize interference. It supports both active and passive antennas, configurable fix reporting rates up to 10Hz, it is compliant with the standard NMEA protocol and fully compatible with Telit Cinterion NMEA commands, and includes low-power periodic and GNSS low-power (GLP) operating modes to optimize energy efficiency.

The GNSS 28 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. Still, it must be noted that I2C interface can only be operated in the peripheral mode. In addition to its standard power supply configuration, GNSS 27 Click incorporates a dedicated backup power circuit that enables standalone operation and data retention. A coin-cell battery mounted on the back side of the board provides continuous power to the module's internal real-time clock (RTC) and memory, allowing it to preserve essential timing, configuration, and satellite ephemeris data even when the main supply is disconnected.

Alongside its primary communication interface pins, GNSS 28 Click uses several additional control and monitoring pins that enhance module management and operational reliability. The RST pin is used to perform a hardware reset of the module, and a blue PPS LED indicator, which, in combination with the PPS pin, detects a synchronized pulse signal from the SL871LG3240R003000 once per second. The AOP pin (Antenna Open) serve as output for a special NMEA message from receiver indicating the antenna line is open, and the FON pin provides control over the module's power state, enabling it to enter a backup or low-power mode to minimize energy consumption during idle periods.

In addition, the board features one test point ASH (Antenna Shorted) serve as antenna status indicator. This signal allow the system to detect abnormal antenna conditions: ASH indicating excessive antenna current (short-circuit). The board also features one SMA connector for GNSS antenna that MIKROE offers, like the [Active GPS Antenna](#) for flexible and efficient connectivity options.

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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. It also comes equipped with a library containing functions and example code that can be used as a reference for further development.

## Specifications

Type	GPS/GNSS
Applications	Ideal for asset tracking, navigation systems, environmental monitoring, and location-based services
On-board modules	SL871LG3240R003000 - multi-constellation positioning GNSS module from Telit Centurion
Key Features	Based on the low-power Mediatek MT3333 engine, support for GPS (L1), GLONASS (L1, FDMA), Galileo (E1), and BeiDou (B1) frequency bands, 99 search and 33 tracking channels, SBAS capability with WAAS, EGNOS, MSAS, and GAGAN support, AGPS with locally generated and server-based ephemeris prediction, additional low-noise amplifier (LNA) for enhanced RF sensitivity, DC block and jammer rejection circuitry for improved signal stability, and more
Interface	I2C,UART
Feature	ClickID
Compatibility	mikroBUS™
Click board size	M (42.9 x 25.4 mm)
Input Voltage	3.3V

## Pinout diagram

This table shows how the pinout on GNSS 28 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikroBUS				Pin	Notes
Antenna Open	<b>AOP</b>	1	AN	PWM	16	<b>FON</b>	Force Full-Power Mode
Reset	<b>RST</b>	2	RST	INT	15	<b>PPS</b>	Timepulse Indicator
ID COMM	<b>CS</b>	3	CS	RX	14	<b>TX</b>	UART TX
	NC	4	SCK	TX	13	<b>RX</b>	UART RX
	NC	5	MISO	SCL	12	<b>SCL</b>	I2C Clock
	NC	6	MOSI	SDA	11	<b>SDA</b>	I2C Data
Power Supply	<b>3.3V</b>	7	3.3V	5V	10	NC	
Ground	<b>GND</b>	8	GND	GND	9	<b>GND</b>	Ground

## Onboard settings and indicators

Label	Name	Default	Description
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LD1	PWR	-	Power LED Indicator
LD2	PPS	-	Timepulse LED Indicator

## GNSS 28 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Frequency Range	1561	-	1606	MHz
Acquisition Sensitivity	-	-148	-	dBm
Navigation Sensitivity	-	-163	-	dBm
Tracking Sensitivity	-	-165	-	dBm
Time-to-First-Fix (TTFF) - Cold	-	33	-	sec
Horizontal Position Accuracy	-	25	-	m

## Software Support

[GNSS 28 Click](#) demo application is developed using the [NECTO Studio](#), ensuring compatibility 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 28 Click by reading and displaying the GNSS coordinates.

### Key Functions

- `gnss28_cfg_setup` This function initializes Click configuration structure to initial values.
- `gnss28_init` This function initializes all necessary pins and peripherals used for this Click board.
- `gnss28_generic_read` This function reads a desired number of data bytes by using the selected serial interface.
- `gnss28_parse_gga` This function parses the GGA data from the read response buffer.
- `gnss28_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](#).

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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](#)

## Downloads

[GNSS 28 click example package](#)

[GNSS 28 click 2D and 3D files v100](#)

[GNSS 28 click schematic v100](#)

[SL871LG3240R003000 datasheet](#)

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