

GNSS 27 Click



PID: MIKROE-6766

GNSS 27 Click is a compact add-on board that provides complete multi-constellation positioning and timing capabilities for precise location, navigation, and tracking applications. It is based on the [SE878K3A240R003000](#) module from [Telit Cinterion](#), built around the MediaTek MT3333 chipset, which integrates a high-performance GNSS receiver with LNA, TCXO, RTC, and onboard memory in a single compact package. This module supports concurrent reception of GPS, GLONASS, Galileo, BeiDou, and QZSS signals, along with SBAS and DGPS correction for improved accuracy, and offers AGPS functionality through EASY and EPO methods for faster satellite acquisition. The module features a built-in SMT patch antenna with an ANT SEL jumper for internal or external antenna selection, Active Interference Cancellation, a 1PPS output for precise timing, and backup battery support. GNSS 27 Click is ideal for navigation systems, portable trackers, asset monitoring devices, and other GNSS-based embedded applications.

For more information about **GNSS 27 Click** visit the official [product page](#).

How does it work?

GNSS 27 Click is based on the SE878K3A240R003000, a fully integrated GNSS receiver module from Telit Cinterion built around the MediaTek MT3333 chipset, that provides complete multi-constellation positioning and timing capabilities suitable for a wide range of embedded navigation applications like positioning, tracking, and timing applications. This advanced engine delivers high-performance, high-sensitivity, and low-power operation and supports concurrent reception of GPS, GLONASS, Galileo, BeiDou, and QZSS signals to ensure superior satellite coverage, improved accuracy, and robust availability even in challenging environments. The SE878K3A240R003000 module combines all critical elements, including

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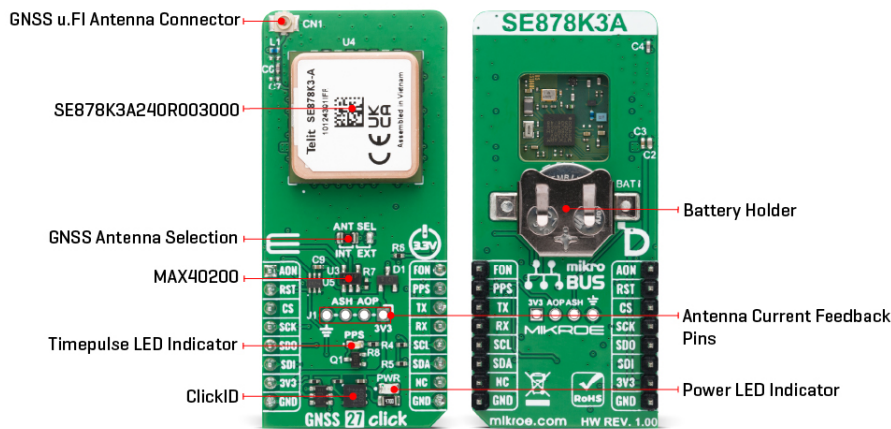


ISO 27001: 2013 certification of informational security management system.
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LNA, TCXO, RTC, and onboard memory, within a single compact package, simplifying integration and reducing design complexity.



This module features a built-in SMT patch antenna for easy system implementation, with an ANT SEL jumper on the board that allows selection between the internal and an external antenna (u.FI connector) for flexible RF input configuration. The module supports SBAS (WAAS, EGNOS, MSAS, GAGAN) for enhanced precision and is DGPS capable using the RTCM SC-104 protocol. Assisted-GPS (AGPS) operation is available through both local (EASY) and server-based (EPO) methods to accelerate time-to-first-fix and maintain reliable tracking in low-signal conditions.

Additional features include Active Interference Cancellation (AIC) for jamming rejection, a 1PPS output (PPS pin) with visual LED indication for synchronization applications, and configurable fix reporting from 1Hz up to 10Hz. The module communicates using standard NMEA input/output commands and consumes less than 80mW in full power mode, with integrated power management options that extend battery life for portable or energy-sensitive systems.

The GNSS 27 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 SPI and I2C interface for communication with a host MCU. Still, it must be noted that both interfaces 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 27 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, the AON pin (Active Antenna ON) enables external antenna power control, allowing users to activate or deactivate an active antenna as required by the application, 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 an unpopulated header that carries two diagnostic signals, ASH (Antenna Shorted) and AOP (Antenna Open), which serve as antenna status indicators. These signals allow the system to detect abnormal antenna conditions: ASH indicating excessive antenna current (short-circuit) and AOP signaling insufficient current (open-

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circuit).

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 navigation systems, portable trackers, asset monitoring devices, and other GNSS-based embedded applications |
| On-board modules | SE878K3A240R003000 - complete GNSS receiver module from Telit Cinterion |
| Key Features | Multi-constellation GNSS receiver supporting GPS, GLONASS, Galileo, BeiDou, and QZSS signals, high-performance MT3333 chipset with integrated LNA, TCXO, RTC, and memory, built-in SMT patch antenna with jumper for internal or external antenna selection, SBAS and DGPS support for improved accuracy, Assisted-GPS functionality via EASY and EPO methods, Active Interference Cancellation for jamming rejection, 1PPS output with LED indication for synchronization, and more |
| Interface | I2C,SPI,UART |
| Feature | 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 GNSS 27 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

| Notes | Pin | mikroBUS | | | | Pin | Notes |
|------------------------|-------------|----------|------|-----|----|------------|-----------------------|
| Active Antenna Control | AON | 1 | AN | PWM | 16 | FON | Force Full-Power Mode |
| Reset / ID SEL | RST | 2 | RST | INT | 15 | PPS | Timepulse Indicator |
| SPI Select / ID COMM | CS | 3 | CS | RX | 14 | TX | UART TX |
| SPI Clock | SCK | 4 | SCK | TX | 13 | RX | UART RX |
| SPI Data OUT | SDO | 5 | MISO | SCL | 12 | SCL | I2C Clock |
| SPI Data IN | SDI | 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

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| Label | Name | Default | Description |
|-------|---------|---------|---|
| LD1 | PWR | - | Power LED Indicator |
| LD2 | PPS | - | Timepulse LED Indicator |
| JP1 | ANT SEL | Left | GNSS Antenna Selection INT/EXT: Left position INT, Right position EXT |

GNSS 27 Click electrical specifications

| Description | Min | Typ | Max | Unit |
|--------------------------------|-----|---------|-----|------|
| Supply Voltage | - | 3.3 | - | V |
| Frequency Range | - | 1575.42 | - | MHz |
| Tracking Sensitivity | - | -165 | - | dBm |
| Navigation Sensitivity | - | -163 | - | dBm |
| Acquisition Sensitivity | - | -148 | - | dBm |
| Time to First Fix (Cold Start) | - | 35 | - | sec |

Software Support

[GNSS 27 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 27 Click by reading and displaying the GNSS coordinates.

Key Functions

- `gnss27_cfg_setup` This function initializes Click configuration structure to initial values.
- `gnss27_init` This function initializes all necessary pins and peripherals used for this Click board.
- `gnss27_generic_read` This function reads a desired number of data bytes by using the selected serial interface.
- `gnss27_parse_gga` This function parses the GGA data from the read response buffer.
- `gnss27_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:

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- 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](#)

Downloads

[GNSS 27 click example package](#)

[GNSS 27 click 2D and 3D files v100](#)

[SE878K3A240R003000 datasheet](#)

[GNSS 27 click schematic v100](#)

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