

GNSS 19 Click - SE868K5-D



PID: MIKROE-6816

GNSS 19 Click - SE868K5-D is a compact add-on board designed for multiconstellation GNSS positioning, navigation, and tracking in demanding outdoor environments. This board is based on the [SE868K5-D](#), a standard dual-frequency multiconstellation GNSS module from [Telit Cinterion](#). It combines GPS/QZSS and Galileo in the L1/E1 and L5/E5 bands, GLONASS in the L1 band, BeiDou in the B1 and B2 bands, and SBAS support to improve positioning accuracy and reduce multipath effects in dense urban areas. The board features NMEA data output, raw measurement support, AGNSS ephemeris injection, local short-term ephemeris prediction for faster TTFF, selectable UART or I2C communication, USB-to-UART boot support, and more. It is suitable for fleet management, e-mobility, road tolling, automotive telematics, cellular base stations, wearable sports monitors, drones, and other GNSS-based positioning systems.

For more information about **GNSS 19 Click - SE868K5-D** visit the official [product page](#).

How does it work?

GNSS 19 Click - SE868K5-D is based on the SE868K5-D, a standard dual-frequency multiconstellation GNSS module from Telit Cinterion. The SE868K5-D improves position reporting and navigation solution performance by combining GPS/QZSS and Galileo signals in the L1/E1 and L5/E5 bands, GLONASS signals in the L1 band, BeiDou signals in the B1 and B2 bands, and satellite-based augmentation systems (SBAS). By supporting dual-frequency GNSS operation through L1/E1 and L5/E5 bands, GNSS 19 Click - SE868K5-D enhances positioning accuracy and helps reduce multipath effects, especially in dense urban areas where reflected satellite signals can affect location reliability. The module can navigate down to -165dBm, making it suitable for harsh environments and demanding outdoor scenarios where signal conditions may be limited. It is well suited for fleet management systems, e-mobility

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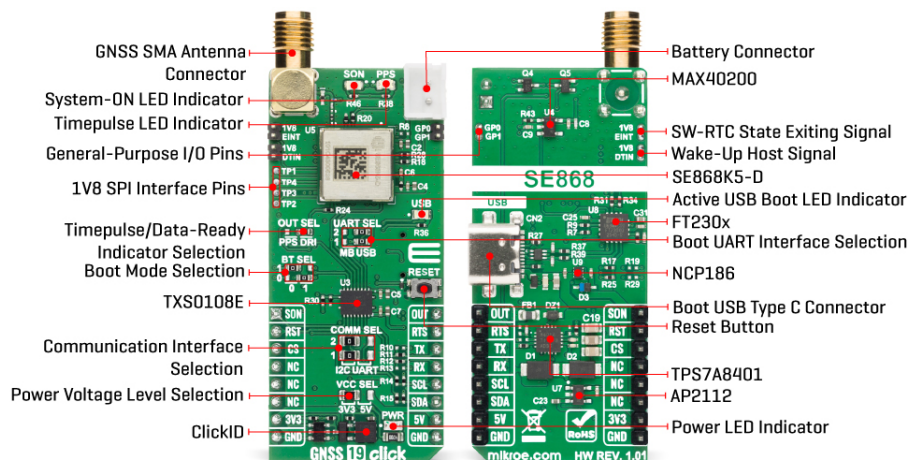


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applications, road tolling systems, cellular base stations, automotive telematics systems, wearable sports training monitors, drones, and other applications that require GNSS-based positioning.



The SE868K5-D integrates a powerful baseband processor, flash memory, an integrated LNA for optimal receiver performance, a SAW filter for improved coexistence, and a switching regulator for optimized power consumption. GNSS 19 Click - SE868K5-D delivers navigation data according to the NMEA protocol standard and supports serial communication through a UART interface with TX, RX, RTS, and CTS signals, or through an I2C interface, selectable via onboard COMM SEL jumpers. The module also supports the output of raw measurements for high-precision applications, ephemeris file injection through assisted GNSS (AGNSS), and local prediction of short-term ephemerides to reduce time to first fix (TTFF). In addition, support for SBAS and QZSS L1S signals further contributes to improved positioning accuracy and navigation reliability.

GNSS 19 Click - SE868K5-D also includes a set of additional hardware features that extend control, status monitoring, boot configuration, and development flexibility around the SE868K5-D module. Alongside the selected host communication interface, the Click board™ uses several mikroBUS™ pins for module control and indication. The SON pin is used as a system-ON indicator and is accompanied by a blue SON LED, allowing the active system state to be monitored visually. The RST pin shares the same reset function as the onboard RESET button, providing a convenient way to reset the main SE868K5-D module either from the host MCU or manually. The OUT pin provides an output signal selected through the onboard OUT SEL jumper, allowing the user to choose between the PPS time pulse signal and the data-ready indicator.

When the PPS option is selected, the time pulse activity can also be visually monitored through the orange PPS LED indicator. In addition to UART and I2C communication available through the mikroBUS™ socket, the SE868K5-D module also supports an SPI interface, with the corresponding SPI pins routed to test points on the front side of the board for evaluation and development purposes. In the case of other compatible module variants, these pins are reserved for future use. The board also includes BT SEL jumpers for boot mode selection, allowing the user to choose between UART and I2C download interfaces. A USB connector is available on the back side of the board, enabling UART communication through the [FT230X](#) interface and allowing boot operation over USB, while the active USB state can be monitored through the blue USB LED indicator.

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Since UART boot operation can also be performed through the mikroBUS™ socket, UART SEL jumpers are provided to select whether the UART connection is routed through USB or through the mikroBUS™ interface. Additional unpopulated headers provide access to several useful module signals, including GP0 and GP1 general-purpose I/O pins, the EINT signal used as an SW-RTC state exiting signal, and the DTIN signal used as a wake-up host signal. The board also includes a battery connector intended to provide a 1.8V power supply for the RTC section, supporting RTC-related operation when required by the application.

This Click board™ can operate with both 3.3V and 5V logic voltage levels, selected via the VCC SEL jumper. Since the SE868K5-D module operates and communicates at 1.8V logic levels, a logic-level translator, the [TXS0108E](#), is used to ensure proper operation and accurate signal-level translation. In this way, both 3.3V and 5V MCUs can use the communication lines correctly. This Click board™ also comes equipped with a library containing easy-to-use functions and example code that can be used as a reference for further development.

Specifications

Type	GPS/GNSS
Applications	Ideal for fleet management, e-mobility, road tolling, automotive telematics, cellular base stations, wearable sports monitors, drones, and other GNSS-based positioning systems
On-board modules	SE868K5-D - standard dual-frequency multiconstellation GNSS module from Telit Cinterion
Key Features	Multiconstellation GNSS positioning, GPS/QZSS and Galileo L1/E1 and L5/E5 support, GLONASS L1 support, BeiDou B1 and B2 support, SBAS support, QZSS L1S support, dual-frequency GNSS operation, reduced multipath effects, enhanced positioning accuracy, NMEA protocol data output, raw measurement output support, AGNSS ephemeris file injection, local short-term ephemeris prediction, faster TTFF performance, and more
Interface	I2C,SPI,UART
Feature	ClickID,Skylark® Service
Compatibility	mikroBUS™,Skylark®
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 GNSS 19 Click - SE868K5-D corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin		Pin	Notes
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System-ON Indicator	SON	1	AN	PWM	16	OUT	Timepulse / Data-Ready Indicator
Reset / ID SEL	RTS	2	RST	INT	15	RST	UART RTS
UART CTS / 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	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	PPS	-	Timepulse LED Indicator
LD3	SON	-	System-ON LED Indicator
LD4	USB	-	Active USB Boot LED Indicator
JP1	VCC SEL	Left	Power Voltage Level Selection 3V3/5V: Left position 3V3, Right position 5V
JP2-JP3	BT SEL	-	Boot Mode Selection 0/1: Left position 0, Right position 1
JP4,JP6	COMM SEL	Left	Communication Interface Selection I2C/UART: Left position I2C, Right position UART
JP5	OUT SEL	Right	Timepulse / Data-Ready Indicator Selection PPS/DRI: Left position PPS, Right position DRI
JP7-JP8	UART SEL	Right	Boot UART Interface Selection MB/USB: Left position MB, Right position USB
T1	RESET	-	Reset Button

GNSS 19 Click - SE868K5-D electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
GNSS Frequency Range	1176.45	-	1605.375	MHz
Navigation Sensitivity	-	-165	-	dBm

Software Support

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[GNSS 19 Click - SE868K5-D](#) 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 19 Click - SE868K5-D by reading and displaying the GNSS coordinates.

Key Functions

- `gnss19_cfg_setup` This function initializes Click configuration structure to initial values.
- `gnss19_init` This function initializes all necessary pins and peripherals used for this Click board.
- `gnss19_reset_device` This function resets the device by toggling the RST pin.
- `gnss19_generic_read` This function reads a desired number of data bytes by using UART serial interface.
- `gnss19_parse_gga` This function parses the GGA data from the read response buffer.

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™](#)

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[ClickID](#)

Downloads

[Skylark® Precise Positioning Service Quick Start Guide](#)

[GNSS 19 Click - SE868K5-D example package](#)

[GNSS 19 Click - SE868K5-D 2D and 3D files v101](#)

[GNSS 19 Click - SE868K5-D schematic v101](#)

[SE868K5-D datasheet](#)

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