

Time-saving embedded tools

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# **GNSS 6 Click**





PID: MIKROE-5638

**GNSS 6 Click** is a compact add-on board that provides fast positioning capabilities. This board features the <u>Teseo-LIV3FL</u>, a tiny low-power GNSS module from <u>STMicroelectronics</u>. It is an easy-to-use global navigation satellite system that embeds the Teseo III single-die standalone positioning receiver, which can work simultaneously on multiple constellations (GPS, Galileo, Glonass, BeiDou, and QZSS). It provides proven accuracy and robustness of the Teseo ICs and comes with embedded firmware that saves development time. This Click board<sup>™</sup> makes the perfect solution for the development of both acquisition and tracking devices and represents an ideal product for automotive, consumer, and industrial tracking applications.

#### How does it work?

GNSS 6 Click is based on the Teseo-LIV3FL, a tiny low-power GNSS module from STMicroelectronics. It supports all the GNSS constellations, and the user can select the active constellations in the firmware configuration. By default, active GNSS constellations are GPS and Glonass. The module supports SBAS as a system that provides differential GPS correction data. It also supports differential GPS that improves position accuracy. The other features are Assisted GNSS, ST-assisted GPS, predictive AGNSS, real-time AGPS, and more. In addition, the module comes equipped with an embedded flash that can be used for data logging and FW upgrades.

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GNSS 6 Click is equipped with the SMA antenna connector, which can connect the appropriate active antenna, such as the GNSS Active External Antenna that MIKROE offers for improved range and received signal strength. For improved reception, there are filters but also the BGA824N6, a silicon germanium low-noise amplifier for GNSS from Infineon. The RF output of this amplifier is internally matched to 500hm. The antenna can be switched off over the TPS22943, a low-input-voltage current-limited load switch from Texas Instruments. The Teseo-LIV3FL module has a backup supply option on this Click board<sup>™</sup> available as an onboard VCC input or over the coin battery.

GNSS 6 Click uses a standard 2-Wire UART interface to communicate with the host MCU, supporting much of the functionality of the industry-standard 16C650 UART. In addition, the module includes an I2C interface, supporting normal and fast speed with up to 400kHz of clock frequency. Both interfaces support the NMEA protocol. The time output pulse is available as a PPS LED indication and over the PPS pin. You can wake the module from the software standby over the WUP pin, while the RST pin is a standard reset pin for the GNSS module.

This Click board<sup>™</sup> 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. Also, it comes equipped with a library containing functions and an example code that can be used as a reference for further development.

# Specifications

Туре	GPS/GNSS
Applications	Can be used for the development of both acquisition and tracking devices and represents an ideal product for automotive, consumer, and industrial tracking applications
On-board modules	Teseo-LIV3FL - tiny low-power GNSS module from STMicroelectronics.
Key Features	Simultaneous multi-constellation supports GPS, Galileo, Glonass, BeiDou, QZSS, high CEP position accuracy excellent tracking sensitivity, embedded flash for data logging and FW upgrade, free FW configuration, and more

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Interface	I2C,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 6 Click corresponds to the pinout on the mikroBUS<sup>m</sup> socket (the latter shown in the two middle columns).

Notes	Pin	● ● mikro* ● ● ● BUS			TV.	Pin	Notes
	NC	1	AN	PWM	16	WUP	Module Wake-Up
Reset	RST	2	RST	INT	15	PPS	Timepulse Output
ID COMM	CS	3	CS	RX	14	ТХ	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	-	Timepulse LED	
			Indicator	

# **GNSS 6 Click electrical specifications**

Description	Min	Тур	Max	Unit
Supply Voltage	-	3.3	-	V
Operating Frequency	-	1575.42	-	MHz
Tracking Sensitivity	-	-163	-	dBm
CEP Position Accuracy	-	-	1.5	m
TTF - Cold Start	-	36	-	sec

# Software Support

We provide a library for the GNSS 6 Click as well as a demo application (example), developed using MikroElektronika <u>compilers</u>. The demo can run on all the main MikroElektronika <u>development boards</u>.

Package can be downloaded/installed directly from NECTO Studio Package Manager (recommended), downloaded from our <u>LibStock™</u> or found on <u>Mikroe github account</u>.

#### **Library Description**

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This library contains API for GNSS 6 Click driver.

Key functions

- gnss6\_generic\_read This function reads a desired number of data bytes from the module.
- gnss6\_reset\_device This function resets the device by toggling the RST pin.
- gnss6\_parse\_gpgga This function parses the GPGGA data from the read response buffer.

#### **Example Description**

This example demonstrates the use of GNSS 6 Click boards  $^{\rm \tiny M}$  by reading and displaying the GNSS coordinates.

The full application code, and ready to use projects can be installed directly from NECTO Studio Package Manager (recommended), downloaded from our <u>LibStock<sup>m</sup></u> or found on <u>Mikroe github</u> <u>account</u>.

Other Mikroe Libraries used in the example:

- MikroSDK.Board
- MikroSDK.Log
- Click.GNSS6

#### Additional notes and informations

Depending on the development board you are using, you may need <u>USB UART click</u>, <u>USB UART</u> <u>2 Click</u> or <u>RS232 Click</u> to connect to your PC, for development systems with no UART to USB interface available on the board. UART terminal is available in all MikroElektronika <u>compilers</u>.

# mikroSDK

This Click board<sup>m</sup> is supported with <u>mikroSDK</u> - MikroElektronika Software Development Kit. To ensure proper operation of mikroSDK compliant Click board<sup>m</sup> demo applications, mikroSDK should be downloaded from the <u>LibStock</u> and installed for the compiler you are using.

For more information about mikroSDK, visit the official page.

#### Resources

mikroBUS™

mikroSDK

Click board<sup>™</sup> Catalog

Click boards™

#### <u>ClickID</u>



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### **Downloads**

MAX40200 datasheet

GNSS 6 click example on Libstock

Teseo LIV3FL datasheet

TPS22943 datasheet

BGA824N6 datasheet

GNSS 6 click 2D and 3D files

**GNSS 6 click schematic** 

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