

MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia VAT: SR105917343 Registration No. 20490918 Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com www.mikroe.com

# LTE IoT 9 Click





PID: MIKROE-4465

**LTE IoT 9 Click** is a compact add-on board containing a cellular IoT Module that supports 3GPP Release 14 and all LTE bands. This board features the EXS62-W, LTE-IoT Wireless Module from Telit Cinterion that offers a rich set of Internet protocols and industry-standard interfaces such as UART, USB, etc. Global IoT connectivity, integrated GNSS support, SMS support, extended coverage range, and reduced power consumption make this single IoT module an excellent choice for device makers while ensuring worldwide reliability. This Click board<sup>™</sup> is suitable for applications such as logistics and asset tracking, predictive maintenance, industrial, smart agriculture, and many more.

LTE IoT 9 Click is supported by a <u>mikroSDK</u> compliant library, which includes functions that simplify software development. This <u>Click board</u> comes as a fully tested product, ready to be used on a system equipped with the <u>mikroBUS</u> socket.

#### How does it work?

LTE IoT 9 Click as its foundation uses the EXS62-W, a cellular IoT Module from Telit Cinterion that supports 3GPP Release 14, global machine type communication (MTC) technologies, NB-IoT, LTE M, and 5G-enabled LPWA connectivity for industrial applications. It provides integrated GNSS support and delivers up to 20dBm of power, providing a downlink data speed of up to 300Kbps and an uplink data speed of up to 1.1Mbps. State-of-the-art security features protect the device and data and provide secure enrollment in cloud platforms enabling trust in the IoT ecosystem. The module's simplified power supply design and advanced management system extend battery lifetime.

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This Click board<sup>m</sup> is equipped with a USB type C connector. It allows the module to be powered and configured by a personal computer (PC) using <u>FT230X</u>, a compact USB to a serial UART interface device designed to operate efficiently with USB host controllers. It uses as little bandwidth as possible when compared to the total USB bandwidth available.

Also, it possesses two SMA antenna connectors with an impedance of  $50\Omega$ , labeled as GNSS and LTE, used for connecting the appropriate antenna that <u>Mikroe</u> has in its <u>offer</u>. The integrated GNSS receiver supports the NMEA protocol, representing combined electrical and data specifications for communication between various electronic devices, including GNSS receivers. By default, the GNSS receiver is OFF, and if the user wants to activate it, switching to the ON state can be done via AT commands. GNSS antenna also offers supply selection of 3V or 5V selected by appropriate jumper J2 or J3. Besides those SMA connectors, this Click board<sup>TM</sup> also has a nano-SIM card slot that provides multiple connections and interface options.

LTE IoT 9 Click communicates with MCU using the UART interface as its default communication protocol for exchanging <u>AT commands</u> with the host, data transfer, and firmware update. It also possesses the RX/TX LED indicator that indicates whether the bridge is in RX or TX function. The users can also use other interfaces such as SPI or I2C to configure the module and write the library by themselves by populating the appropriate jumpers on the Click board's bottom (J4 – J9).

This Click board<sup>™</sup> can be battery-powered and used as a stand-alone device. It also contains the MC34671, a fully-integrated Li-Ion or Li-Polymer battery charger allowing a battery charge when Click board<sup>™</sup> is inserted in mikroBUS<sup>™</sup> socket or plugged into a USB port with the CHG LED indicator used as an indicator of the charging progress. CHG LED will turn off once the battery charging is finished.

Another indicator that this Click board<sup>™</sup> has, in addition to the yellow LED labeled as STAT that indicates different operating modes of the module, is the blue LED labeled as PWI that reports the module's power state and shows whether it is active or in Power-Down mode. The onboard pushbutton labeled as ON is routed to the RST pin on the mikroBUS<sup>™</sup> representing the Ignition button.

An additional feature of this Click board<sup>™</sup> is a PWR Header used for power consumption monitoring:

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This Click board<sup>™</sup> can operate with both 3.3V and 5V MCUs. A proper logic voltage level conversion is performed by appropriate voltage level shifters, while the on-board LDOs ensure that the recommended voltage levels power module. However, the Click board<sup>™</sup> 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**

Туре	GPS/GNSS,LTE IoT
Applications	Can be used for applications such as logistics and asset tracking, predictive maintenance, industrial, smart agriculture, and many more.
On-board modules	EXS62-W - a cellular IoT Module from Telit Cinterion that supports 3GPP Release 14 and all LTE bands
Key Features	Power saving modes, LTE bands that allows multiple regions coverage, dual SMA antenna connectors, USB connectivity, visual network and status indication, and more.
Interface	I2C,SPI,UART,USB
Feature	No ClickID
Compatibility	mikroBUS™
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 LTE IoT 9 Click corresponds to the pinout on the mikroBUS<sup>m</sup> socket (the latter shown in the two middle columns).

Notes	Pin	● ● mikro™ ● ● ● BUS	Pin	Notes

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SUSPEND Mode	SMI	1	AN	PWM	16	CS	SPI Chip Select
Ignition	ON	2	RST	INT	15	RTS	UART Ready to Send
UART Clear to Send	CTS	3	CS	RX	14	RX	UART RX
SPI Clock	SCK	4	SCK	TX	13	ТХ	UART TX
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	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	CHG	-	Charging LED		
			Indicator		
LD3	PWI	-	PWI LED Indicator		
LD4	STAT	-	Status LED Indicator		
LD5	RX/TX	-	RX/TX LED Indicator		
SW1	ON	-	Power button: Power		
			ON - hold pressed for		
			150ms, Power OFF -		
			hold pressed for 1.5s		
J1	-	Populated 1.2.3	Power Consumption		
		(Default)	Monitoring Header		
J2-J3	-	J2 Populated	GNSS Antenna Voltage		
			Selection		
J4-J7	-	Unpopulated	SPI Interface Selection		
J8-J9	-	Unpopulated	I2C Interface Selection		

#### LTE IoT 9 Click electrical specifications

Description	Min	Тур	Max	Unit
Supply Voltage	3.3	-	5	V
Operating Frequency Range	850	-	1800	MHz
Operating Temperature Range	-40	+25	+90	°C

#### Software Support

We provide a library for the LTE IoT 9 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 way), downloaded from our LibStock<sup>™</sup> or found on <u>mikroE github</u> <u>account</u>.

#### **Library Description**

This library contains API for LTE IoT 9 Click driver.

Key functions:

• Iteiot9\_cfg\_setup - Config Object Initialization function.

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- Iteiot9 init Initialization function.
- Iteiot9 default cfg Click Default Configuration function.

#### **Examples description**

This application shows capability of LTE IoT 9 Click board<sup>™</sup>. It connects to network with standard "AT" commands, then sends SMS whit SIM card, and then logs GNNS data.

The demo application is composed of two sections :

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

Other mikroE Libraries used in the example:

- MikroSDK.Board
- MikroSDK.Log
- Click.LTEIoT9

#### Additional notes and informations

Depending on the development board you are using, you may need USB UART click, USB UART 2 click or RS232 click to connect to your PC, for development systems with no UART to USB interface available on the board. The terminal available in all MikroElektronika compilers, or any other terminal application of your choice, can be used to read the message.

#### mikroSDK

This Click board<sup>™</sup> is supported with <u>mikroSDK</u> - MikroElektronika Software Development Kit. To ensure proper operation of mikroSDK compliant Click board<sup>™</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<sup>™</sup>

#### **Downloads**

LTE IoT 9 click 2D and 3D files

FT230X datasheet

MC34671 datasheet

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EXS62-W datasheet

LTE IoT 9 click example on Libstock

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