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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 Thales 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™ 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 mikroSDK compliant library, which includes functions that simplify software development. This Click board™ comes as a fully tested product, ready to be used on a system equipped with the mikroBUS™ socket.

How does it work?

LTE IoT 9 Click as its foundation uses the EXS62-W, a cellular IoT Module from Thales 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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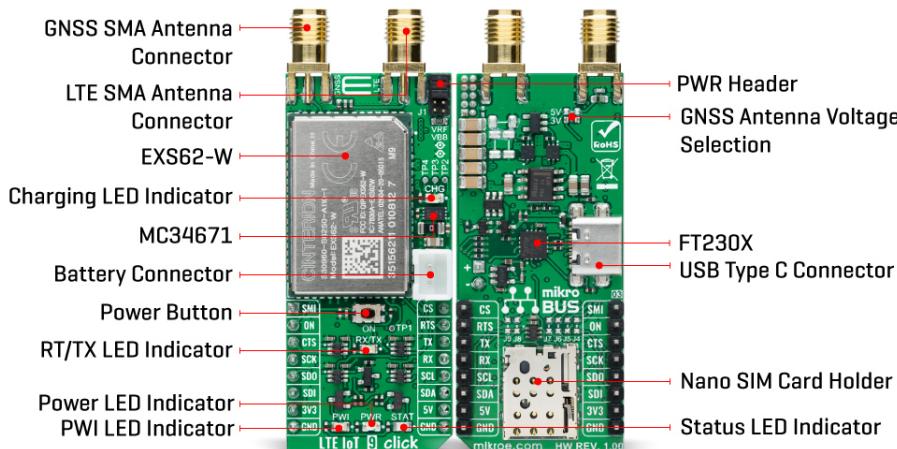
This Click board™ is equipped with a USB type C connector. It allows the module to be powered and configured by a personal computer (PC) using FT230X, a compact USB to a serial UART interface device designed to operate efficiently with USB host controllers. It uses as little bandwidth as possible when compared to the total USB bandwidth available.

Also, it possesses two SMA antenna connectors with an impedance of 50Ω, labeled as GNSS and LTE, used for connecting the appropriate antenna that Mikroe has in its offer. 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™ 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 AT commands 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™ 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™ is inserted in mikroBUS™ 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™ 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™ representing the Ignition button.

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

Default Configuration **Voltage measurment over 100Ω shunt** **Current measurment with current meter** **External Power Supply**
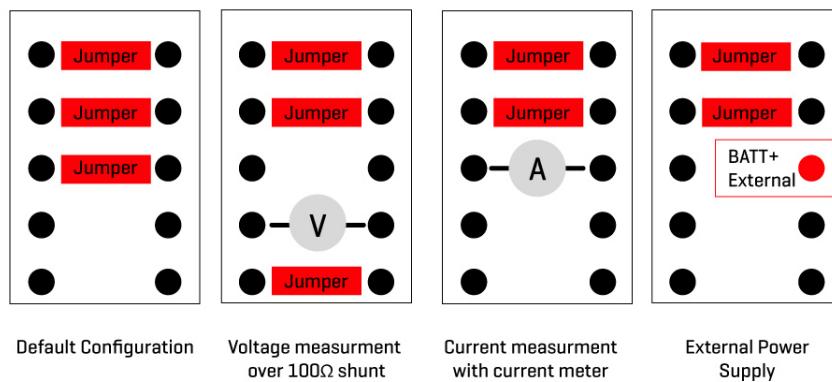
This Click board™ can operate with both 3.3V and 5V MCUs. A proper logic voltage level conversion is performed by appropriate voltage level shifters, while the on-board LDOs ensure that the recommended voltage levels power module. However, the Click board™ comes equipped with a library containing easy-to-use functions and an example code that can be used, as a reference, for further development.

Specifications

Type	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 Thales 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
ClickID	No
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™ socket (the latter shown in the two middle columns).

Notes	Pin	mikroBUS		Pin	Notes
SUSPEND Mode	SMI	1	AN	PWM	16	CS	SPI Chip Select

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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	**TX**	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 (Default)	Power Consumption 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	Typ	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 compilers. The demo can run on all the main MikroElektronika development boards.

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

Library Description

This library contains API for LTE IoT 9 Click driver.

Key functions:

- lteiot9_cfg_setup - Config Object Initialization function.
- lteiot9_init - Initialization function.

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- lteiot9_default_cfg - Click Default Configuration function.

Examples description

This application shows capability of LTE IoT 9 Click board™. 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™ 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™ is supported with mikroSDK - MikroElektronika Software Development Kit. To ensure proper operation of mikroSDK compliant Click board™ demo applications, mikroSDK should be downloaded from the LibStock and installed for the compiler you are using.

For more information about mikroSDK, visit the official page.

Resources

mikroBUS™

mikroSDK

Click board™ Catalog

Click boards™

Downloads

LTE IoT 9 click 2D and 3D files

FT230X datasheet

MC34671 datasheet

LTE IoT 9 click schematic

EXS62-W datasheet

LTE IoT 9 click example on Libstock