

LTE IoT 14 Click



PID: MIKROE-6389

LTE IoT 14 Click is a compact add-on board designed for low-latency and low-throughput wireless data communication in IoT applications. This board features the SIM7090G, a multi-band LTE module from SIMCom, supporting Cat-M and Cat-NB communication modes and multi-constellation GNSS (GPS/GLONASS/Galileo/BeiDou) for global connectivity. This board features a UART interface for communication with the host MCU, a USB Type-C port for data transfer and firmware upgrades, as well as visual indicators for real-time network and power status. It also includes test points for easier debugging, dual SMA connectors for LTE and GNSS antennas, and a micro SIM card holder for flexible service provider selection. LTE IoT 14 Click is ideal for applications such as metering, asset tracking, remote monitoring, e-health, and other M2M solutions requiring reliable connectivity under various radio propagation conditions.

How does it work?

LTE IoT 14 Click is based on the SIM7090G, a multi-band LTE module from SIMCom suitable for global connectivity. The SIM7090G supports Cat-M/Cat-NB wireless communication modes, has multiple built-in network protocols, and has a maximum 0.589Mbps downlink rate and 1.119Mbps uplink rate. Besides, it also supports multiple Cat-M bands (B1/B2/B3/B4/B5/B8/B12/B13/B14/B18/B19/B20/B25/B26/ B27/B28/B66/B85), and Cat-NB (B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B26/B28/ B66/B71/B85), as well as multi-constellation GNSS support (GPS/GLONASS/Galileo/BeiDou). Based on its broad features, this Click board™ is ideal for M2M applications that need low latency, low throughput data communication in various radio propagation conditions, such as metering, asset tracking, remote monitoring, E-health, and more.

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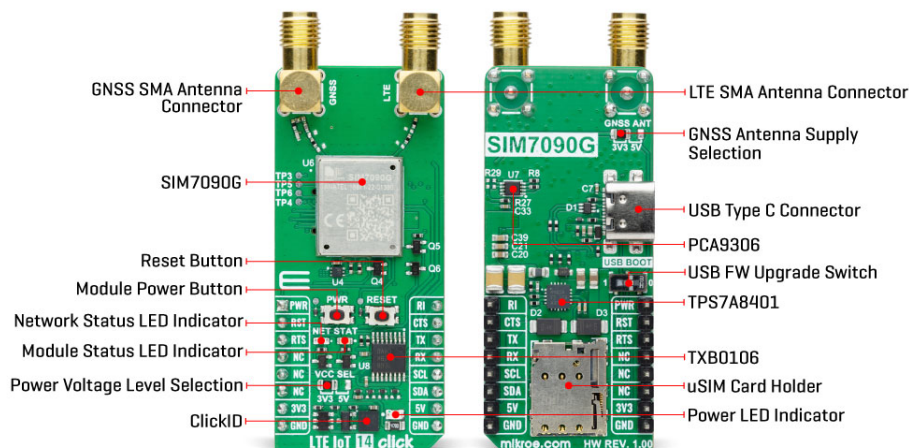
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Communication between the SIM7090G and the host MCU is made through a UART interface, using standard UART RX and TX pins and hardware flow control pins (CTS/RTS/RI - Clear to Send/Ready to Send/Ring Indicator) for efficient data transfer. The module defaults to a communication speed of 115200bps, allowing for seamless data exchange over [AT commands](#). Users can change it to the I2C interface supporting up to 400kbps in Fast Mode for the same purpose.

This Click board™ also includes a USB Type C connector for both power and data transfer, which is compliant with the USB 2.0 specification (peripheral only). In addition to this interface, the board also features a USB FW upgrade switch on the back of the board labeled USB BOOT to manage firmware upgrades. This switch has positions 0 for normal operation and 1 for firmware upgrades over USB, ensuring a straightforward upgrade process.

The LTE IoT 14 Click includes several additional functionalities that enhance its usability and control. The PWR button allows users to easily power the module ON or OFF, while the RESET button provides a quick way to reset the module. These functions can also be controlled digitally via the mikroBUS™ pins PWR and RST, offering greater flexibility. Moreover, this board also has dedicated test points (TP3/TP4 for DBG_UART, TP5/TP6 for NMEA data output for GNSS) for easier debugging and testing and two visual indicators to provide real-time status updates.

The first red NET LED indicates the current network status of the module. When the LED blinks slowly, with 64ms ON and 3000ms OFF, the device has successfully registered on the network, specifically in the PS domain. If the LED blinks at a normal pace, with 64ms ON and 800ms OFF, the device has not yet registered to a network. A fast blinking pattern, with 64ms ON and 300ms OFF, signals data transmission occurs, such as during a PPP dial-up connection or when using data services like internal TCP, FTP, or HTTP. When the LED is completely OFF, it indicates that the device is either powered off or in Power Saving Mode (PSM). The second yellow STAT LED indicates the module's power status, which stays off when the module is OFF and turns ON when the module is powered on or firmware ready.

The board features two SMA connectors for LTE and GNSS antennas that MIKROE offers, like the [LTE Flat Rotation Antenna](#) and [Active GPS Antenna](#), for efficient connectivity options. In addition, the user can easily choose the power supply of the optional GNSS antenna by choosing between 3.3V and 5V on the GNSS ANT jumper at the back of the board. The board also has a micro SIM card holder that supports only 1.8V uSIM cards, allowing users to select the most appropriate service provider for their particular use case.

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This Click board™ can operate with both 3.3V and 5V logic voltage levels selected via the VCC SEL jumper. Since the SIM7090G module operates at 3.8V, a logic-level translators, the [TXB0106](#) and [PCA9306](#), are also used for proper operation and an accurate signal-level translation. This way, both 3.3V and 5V capable MCUs can use the communication lines properly. Also, this 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	LTE IoT
Applications	Ideal for M2M applications such as metering, asset tracking, remote monitoring, E-health, and more
On-board modules	SIM7090G - global multi-band LTE module from SIMCom
Key Features	Cat-M/Cat-NB/ communication modes, global multi-band LTE support, optional multi-constellation GNSS, USB-C for power and high-speed data transfer, micro SIM card slot, firmware upgrade support, and more
Interface	I2C,UART,USB
Feature	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 14 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin					Pin	Notes
Module Power-ON	PWR	1	AN	PWM	16	RI	Ring Indicator
Reset / ID SEL	RST	2	RST	INT	15	CTS	UART CTS
UART RTS / ID COMM	RTS	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	NET	-	Network Activity

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			Status LED Indicator
LD3	STAT	-	Module Operational Status LED Indicator
JP1	VCC SEL	Left	Power Voltage Level Selection 3V3/5V: Left position 3V3, Right position 5V
JP2	GNSS ANT	Left	GNSS Antenna Supply Selection 3V3/5V: Left position 3V3, Right position 5V
T1	PWR	-	Module Power-ON Button
T2	RESET	-	Module Reset Button
SW1	USB BOOT	Right	USB FW Upgrade Switch 1/0: Left position 1, Right position 0
TP3-TP4	TP3-TP4	-	UART Debug Test Point
TP5-TP6	TP5-TP6	-	GNSS NMEA Data Output Test Point

LTE IoT 14 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
LTE Frequency Range	700	-	2650	MHz
LTE Output Power	-	+20	-	dBm
LTE RX Sensitivity	-	-159	-	dBm

Software Support

We provide a library for the LTE IoT 14 Click as well as a demo application (example), developed using MIKROE [compilers](#). The demo can run on all the main MIKROE [development boards](#).

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

Library Description

This library contains API for LTE IoT 14 Click driver.

Key functions

- `Iteiot14_set_sim_apn` This function sets APN for sim card.
- `Iteiot14_send_sms_text` This function sends text message to a phone number.
- `Iteiot14_send_cmd` This function sends a specified command to the click module.

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Example Description

Application example shows device capability of connecting to the network and sending SMS or TCP/UDP messages, or retrieving data from GNSS using standard "AT" commands.

The full application code, and ready to use projects can be installed directly from NECTO Studio Package Manager (recommended), downloaded from our [LibStock™](#) or found on [MIKROE github account](#).

Other MIKROE Libraries used in the example:

- MikroSDK.Board
- MikroSDK.Log
- Click.LTEIoT14

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. UART terminal is available in all MIKROE [compilers](#).

mikroSDK

This Click board™ is supported with [mikroSDK](#) - MIKROE 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™](#)

[ClickID](#)

Downloads

[LTE IoT 14 click example on Libstock](#)

[LTE IoT 14 click 2D and 3D files v100](#)

[SIM7090G datasheet](#)

[LTE IoT 14 click schematic v100](#)

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