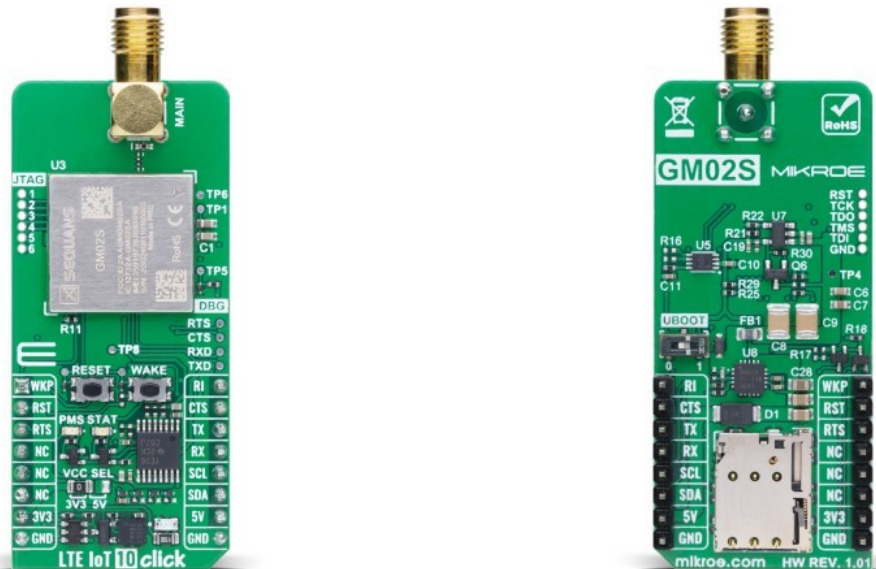


LTE IoT 10 Click



PID: MIKROE-6563

LTE IoT 10 Click is a compact add-on board that provides reliable LTE-M and NB-IoT connectivity for industrial and commercial IoT applications. This board features the Monarch 2 [GM02S](#), a dual-mode LTE-M/NB-IoT module from [Sequans](#) (based on Sequans SQN3430 Chipset), offering global band support from 617MHz to 2.2GHz (covering bands 1,2,3,4,5,8,12,13,14,17,18,19,20,25,26,28,66,85). The GM02S module is 3GPP LTE Release 14 (upgradable to Release 17), embedded IP stack with multiple protocol support including PPP. It enables quick switching between LTE-M and NB-IoT modes for attaching to LTE live network or test equipment (CMW500 or similar). It includes UART interface for debugging and firmware upgrades. Additional features include a wake button, reset functionality, visual status indicators, an SMA connector for LTE antennas, and a micro SIM card slot. LTE IoT 10 Click is ideal for smart meters, industrial sensors, asset tracking, smart home and city applications, wearables, and healthcare monitoring solutions requiring power-efficient cellular IoT connectivity.

For more information about **LTE IoT 10 Click** visit the official [product page](#).

How does it work?

LTE IoT 10 Click is based on the Monarch 2 GM02S module from Sequans, designed to provide reliable LTE-M and NB-IoT connectivity. The GM02S is a highly optimized dual-mode LTE-M and NB-IoT solution featuring global band support from 617MHz to 2.2GHz (bands 1,2,3,4,5,8,12,13,14,17,18,19,20,25,26,28,66,85), making it compatible with both public and private LTE networks worldwide. The board can be used for attaching to LTE live network or test equipment (CMW500 or similar). Engineered with Sequans' second-generation Monarch 2 chip platform (Sequans SQN3430 Chipset), this module ensures superior performance,

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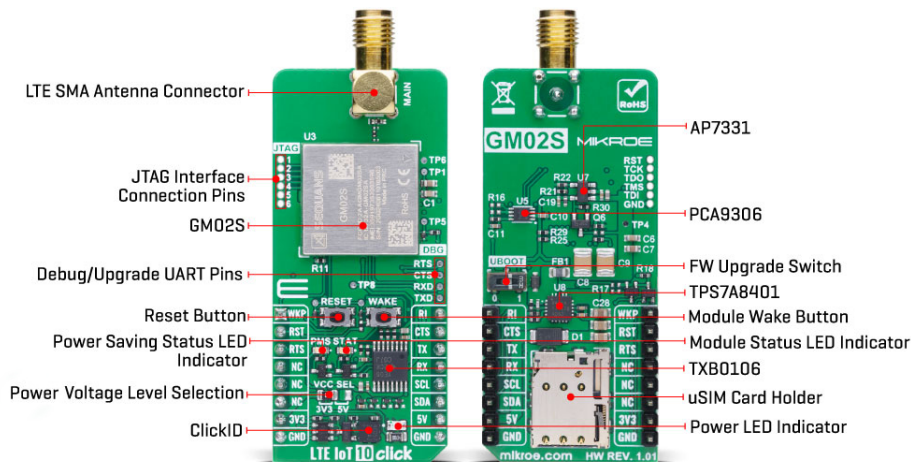


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significantly reduced power consumption (industry lowest deep sleep mode at 1µA and best-in-class eDRX and PSM), and robust security, making it an ideal solution for industrial and commercial IoT solutions requiring low power and high reliability, including smart meters, industrial sensors, asset tracking systems, smart home and city applications, wearable devices, and healthcare monitoring solutions.



The GM02S module leverages over 15 years of Sequans' expertise in 4G+ connectivity and comes with a mature, carrier-approved LTE protocol stack, ensuring seamless network integration. Its Single-SKU™ RF front end allows operation across all global LTE bands, eliminating the need for regional variations and simplifying deployment. With a transmission power of +23dBm across all bands, the GM02S delivers strong and stable connectivity, even in challenging environments. Additionally, the module complies with 3GPP LTE Release 14, with the potential for future upgrades up to Release 17, ensuring long-term compatibility with evolving network standards.

One of the key advantages of the GM02S module is its ability to switch between LTE-M and NB-IoT modes (Cat M1, NB1, NB2) with a single firmware image, providing unmatched flexibility in various IoT implementations. It also incorporates an embedded IP stack, supporting TCP with TLS 1.3, UDP with DTLS 1.2, CoAP/MQTT, HTTP/FTP, and more, making it well-suited for secure data communication.

Communication between the GM02S 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 data transfer with a default communication speed of 115200bps. The board also features a FW upgrade switch on the back of the board labeled UBOOT to manage firmware upgrades. This switch has positions 0 for normal operation and 1 for firmware upgrade, ensuring a straightforward upgrade process. A dedicated UART interface is available through test points labeled as DBG for debugging and module upgrades. In addition, the board also features JTAG interface pins, an industry-standard solution for verifying designs and testing printed circuit boards.

The LTE IoT 10 Click includes several additional functionalities that enhance its usability and control. The WAKE button allows users to wake the module from Sleep mode, while the RESET button provides a quick way to reset the module. These functions can also be controlled digitally via the mikroBUS™ pins WKP and RST, offering greater flexibility. Moreover, these controls have dedicated test points for easier debugging and testing. The board also features some visual indicators to provide real-time status updates. The first red PMS LED signals the

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power-saving status, giving insight into the module's low-power operation mode. The second yellow STAT LED indicates the module's power status, ensuring real-time monitoring of its operational state.

The board features one SMA connector for the main LTE antenna that MIKROE offers, like the [LTE Flat Rotation Antenna](#) or [LTE Rubber Antenna](#), for flexible and efficient connectivity options. The board has a micro SIM card holder that supports 1.8V uSIM cards, ensuring compatibility with a wide range of cellular networks and allowing users to select the most appropriate service provider for their particular use case.

This Click board™ can operate with both 3.3V and 5V logic voltage levels selected via the VCC SEL jumper. Since the GM02S module communicates at 1.8V, 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 smart meters, industrial sensors, asset tracking, smart home and city applications, wearables, and healthcare monitoring solutions
On-board modules	GM02S - dual-mode LTE-M/NB-IoT module from Sequans
Key Features	LTE Cat M1, NB1, NB2 with global band support, 3GPP LTE Release 14 compliance (upgradable to Release 17), +23dBm TX power across all bands, UART interface, JTAG, supports PPP, TCP/TLS 1.3, UDP/DTLS 1.2, CoAP/MQTT, HTTP/FTP, firmware upgrade, SIM card support, and more
Interface	I2C,UART
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 10 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikro™ BUS				Pin	Notes
Module Wake-Up	WKP	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

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	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	STAT	-	Module Status LED Indicator
LD3	PMS	-	Power Saving Status LED Indicator
JP1	VCC SEL	Left	Power Voltage Level Selection 3V3/5V: Left position 3V3, Right position 5V
T1	WAKE	-	Module Wake Button
T2	RESET	-	Module Reset Button

LTE IoT 10 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
Frequency Range	617	-	2200	MHz
Sensitivity	-105	-	-108	dBm
Output Power	-	+23	-	dBm

Software Support

[LTE IoT 10 Click](#) 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

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

Key Functions

- `lteiot10_cfg_setup` This function initializes Click configuration structure to initial values.
- `lteiot10_init` This function initializes all necessary pins and peripherals used for this Click board.
- `lteiot10_set_sim_apn` This function sets APN for sim card.
- `lteiot10_send_sms_text` This function sends text message to a phone number.
- `lteiot10_cmd_set` This function sets a value to a specified command of the Click module.

Application Init

Initializes the driver and logger.

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Application Task

Application task is split in few stages:

- **LTEIOT10_POWER_UP:**

Powers up the device, performs a device factory reset and reads system information.

- **LTEIOT10_CONFIG_CONNECTION:**

Sets configuration to device to be able to connect to the network.

- **LTEIOT10_CHECK_CONNECTION:**

Waits for the network registration indicated via CEREG command and then checks the signal quality report.

- **LTEIOT10_CONFIG_EXAMPLE:**

Configures device for the selected example.

- **LTEIOT10_EXAMPLE:**

Depending on the selected demo example, it sends an SMS message (in PDU or TXT mode) or TCP/UDP message. By default, the TCP/UDP example is selected.

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](#)

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[Click board™ Catalog](#)

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[ClickID](#)

Downloads

[LTE IoT 10 click example package](#)

[LTE IoT 10 click 2D and 3D files v101](#)

[GM02S datasheet](#)

[LTE IoT 10 click schematic v101](#)

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