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
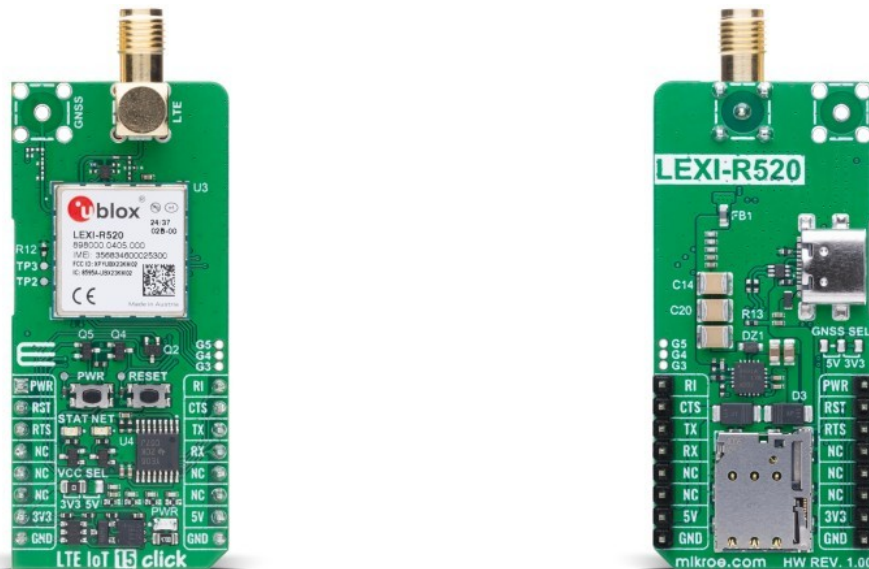www.mikroe.com

LTE IoT 15 Click

PID: MIKROE-6553

LTE IoT 15 Click is a compact add-on board designed for reliable LTE-M and NB-IoT connectivity in IoT applications. It is based on the LEXI-R520, a multi-band LTE-M/NB-IoT module from u-blox, built on the UBX-R52 chipset. Optimized for low power consumption, it supports deep-sleep modes (PSM and eDRX) and operates across multiple LTE bands, ensuring global compatibility. The board features UART and USB Type C interfaces, hardware flow control, power and reset buttons, status LEDs, and an SMA connector for an LTE antenna. Ideal for asset tracking, wearables, smart metering, remote monitoring, and connected healthcare, the LTE IoT 15 Click provides a reliable, low-power wireless communication solution for diverse IoT applications.

For more information about **LTE IoT 15 Click** visit the official product page.

How does it work?

LTE IoT 15 Click is based on the LEXI-R520, a multi-band LTE-M/NB-IoT module from u-blox. Built on the UBX-R52 chipset, this module combines cellular connectivity with assisted GPS, offering data transmission and location tracking. Optimized for ultra-low power consumption, the LEXI-R520 supports deep-sleep modes like PSM and eDRX, making it ideal for battery-powered IoT applications. Its software-based multi-band configurability ensures global network compatibility, while 3GPP Release 14 features enable extended coverage, even in basements and underground areas when using NB2.

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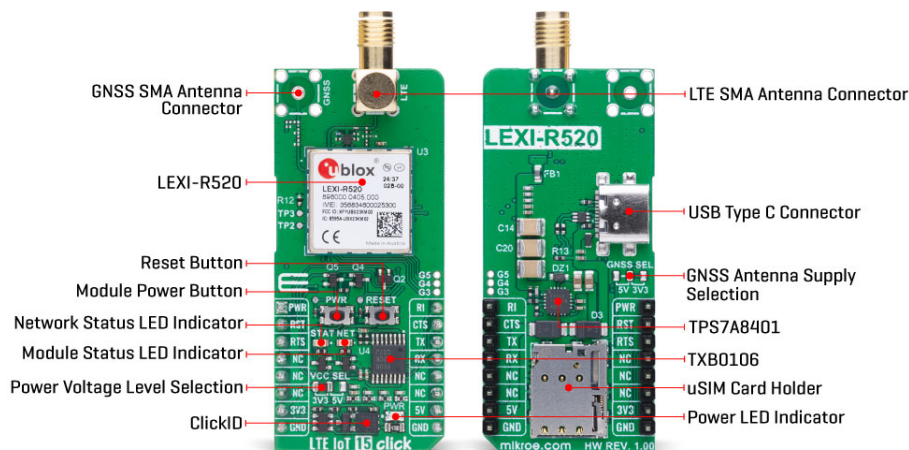
A key advantage is its support for over-the-air firmware updates via u-blox's uFOTA system, using the LwM2M protocol for efficient and lightweight updates. The module operates on multiple LTE bands (1/2/3/4/5/8/12/13/18/19/20/25/26/28/66/71/85), with a transmission power of +23dBm and data rates of up to 1200 kbit/s (uplink) and 588 kbit/s (downlink). Designed for compact IoT devices, this board is perfect for asset tracking, wearables, smart metering, remote monitoring, and connected healthcare. With an integrated IP stack and multiple interface options, it supports low-to-medium data throughput while ensuring long battery life.

Communication between the LEXI-R520 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. This Click board™ also includes a USB Type C connector for both power and data transfer, compliant with the USB 2.0 specification, available for diagnostic purpose only.

The LTE IoT 15 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 (TP2/TP3) for easier debugging and testing, one unsoldered header with three configurable GPIO pins from LEXI-R520, and two visual indicators to provide real-time status updates.

The first red NET LED indicates the current network status of the module like when the device has successfully registered on the network, has not yet registered to a network, or signals when data transmission occurs. When the LED is completely OFF, it indicates that the device is either powered OFF or in Power Saving Mode. The second yellow STAT LED indicates the module's status; power-off or deep-sleep mode versus idle, active or connected mode.

The board features an SMA connector for an LTE antenna, such as the GSM/GPRS antenna offered by MIKROE, ensuring efficient connectivity options. However, please note that GNSS functionality is not currently supported on this Click board™, and as a result, GNSS-related components are not soldered. While the board includes a GNSS ANT jumper at the back, allowing the selection of either 3.3V or 5V for an optional GNSS antenna, this feature remains non-functional due to the absence of GNSS support. The board also has a micro SIM card holder that supports both 1.8V and 3.0V 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 LEXI-R520 module operates at 3.8V, a logic-level translator, the TXB0106 , is 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 asset tracking, wearables, smart metering, remote monitoring, and connected healthcare
On-board modules	LEXI-R520 - multi-band LTE-M/NB-IoT module from u-blox
Key Features	Multi-band LTE-M/NB-IoT connectivity, ultra-low power consumption, software-based multi-band configurability for global compatibility, UART interface with hardware flow control, USB Type C connector for power and diagnostics, status indicators for network and module activity, micro SIM card holder, integrated IP stack for low-to-medium data throughput, and more
Interface	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 15 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikro™ BUS				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	NC	
	NC	6	MOSI	SDA	11	NC	
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

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LD1	PWR	-	Power LED Indicator
LD2	NET	-	Network Activity 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 SEL	Unsoldered	GNSS Antenna Supply Selection 5V/3V3: Left position 5V, Right position 3V3
T1	PWR	-	Module Power-ON Button
T2	RESET	-	Module Reset Button

LTE IoT 15 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
LTE Frequency Range	600	-	2100	MHz
LTE Output Power	-	+23	-	dBm
LTE RX Sensitivity	-	-107	-	dBm

Software Support

LTE IoT 15 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

- lteiot15_cfg_setup This function initializes Click configuration structure to initial values.
- lteiot15_init This function initializes all necessary pins and peripherals used for this Click board.
- lteiot15_set_sim_apn This function sets APN for sim card.
- lteiot15_send_sms_text This function sends text message to a phone number.
- lteiot15_cmd_set This function sets a value to a specified command of the Click module.

Application Init

Initializes the driver and logger.

Application Task

Application task is split in few stages:

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- LTEIOT15_POWER_UP:

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

- LTEIOT15_CONFIG_CONNECTION:

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

- LTEIOT15_CHECK_CONNECTION:

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

- LTEIOT15_CONFIG_EXAMPLE:

    Configures device for the selected example.

- LTEIOT15_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

Click board™ Catalog

Click boards™

ClickID

Downloads

LTE IoT 15 click example package

LEXI-R520 datasheet

SARA-R5 / LEXI-R5 AT commands

LTE IoT 15 click 2D and 3D files v100

LTE IoT 15 click schematic v100

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