

LTE IoT 13 Click



PID: MIKROE-6802

LTE IoT 13 Click is a compact add-on board designed for low-power cellular connectivity and GNSS positioning for IoT devices operating over LTE-M and NB-IoT networks. It is based on the WIRL-CLTI Adrastea-I ([2615011136000](https://www.wuerth-elektronik.com/en/2615011136000)) module from [Würth Elektronik](https://www.wuerth-elektronik.com), built around the Sony Altair ALT1250 chipset with integrated GPS/GLONASS support and an onboard ARM Cortex-M4 user MCU. The board features wide global band coverage, 3GPP Release 13 compliance upgradeable to Release 14, multiple communication protocols, hardware flow-controlled UART, USB Type-C for firmware upgrading, tamper-detection, micro SIM support, and many other features. This Click board is ideal for smart industry, smart city, asset tracking, agriculture, healthcare, and remote monitoring applications that require secure and wide-area cellular connectivity.

For more information about **LTE IoT 13 Click** visit the official [product page](#).

How does it work?

LTE IoT 13 Click is based on the WIRL-CLTI Adrastea-I (2615011136000), an LTE-M/NB-IoT module from Würth Elektronik using the Sony Altair ALT1250 chipset, compliant with 3GPP Release 13 and upgradeable to Release 14. It integrates GNSS with GPS and GLONASS support for built-in positioning and includes an onboard ARM Cortex-M4 MCU with 1MB Flash and 256KB RAM for running custom user applications, reducing overall system complexity. The board ensures reliable IoT connectivity over LTE Cat M and NB-IoT networks, ideal for low-power, wide-area applications in both urban and remote deployments.

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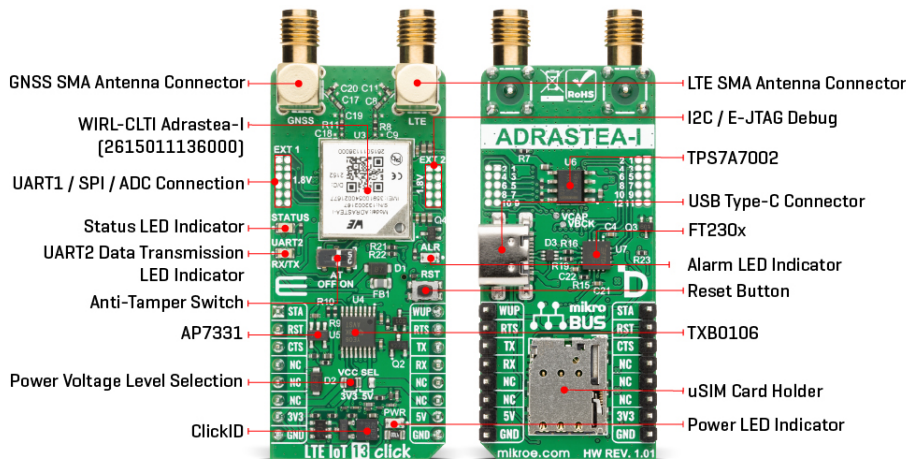
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The module offers flexible LTE Cat M and NB-IoT operation with wide global band support, covering LTE-M bands B2/B3/B4/B5/B8/B12/B20/B25/B26/B28 and NB-IoT bands B3/B5/B8/B20/B28. It delivers data rates up to 300Kbps downlink and 375Kbps uplink in LTE-M mode, and 27.2/62.5Kbps downlink/uplink in NB-IoT mode, with 23dBm output power. Communication protocols include IPv4/IPv6, TCP/UDP, HTTP/HTTPS, TLS/DTLS, MQTT, and LWM2M, supported by 3GPP TS27.005, TS27.007, and Würth Elektronik [AT commands](#) for simplified network management and cloud integration.

This Click board is suitable for a broad range of IoT applications, including predictive maintenance, supply chain management, mobile machinery, vending systems, and industrial condition monitoring. It also fits Smart City and Smart Home solutions such as waste and water management, surveillance, smart metering, traffic and lighting control, and facilities management. Additional uses include fleet management, asset tracking, usage-based insurance, and agricultural and healthcare systems such as livestock monitoring, irrigation control, and health monitoring devices.

Communication between the Adrastea-I module and the host MCU is performed over a UART interface using standard RX/TX pins and hardware flow control (CTS/RTS) for reliable data transfer. The module operates at a default baud rate of 115200bps and communicates through AT commands. The board also includes a USB Type-C connector for easy local firmware upgrades, enabling quick maintenance without additional hardware. A blue UART2 LED indicator provides visual feedback of USB RX/TX activity, making data transmission monitoring straightforward during development.

In addition to its primary interface pins, this Click board™ provides several auxiliary signals that improve control and monitoring of the Adrastea-I module. A RESET button enables quick manual resets, with the same function available digitally through the mikroBUS™ RST pin. The STA pin outputs the module's status and is paired with a blue STATUS LED for clear visual indication of operating events. For low-power applications, the WUP pin allows the module to be instantly awakened from Sleep Mode, ensuring fast response when communication or processing is needed. A green ALR LED serves as an alarm indicator to the external host, signaling different module states based on the Adrastea-I power mode configuration. The board also features an AT (Anti-Tamper) switch, adding security by detecting unauthorized physical interaction, making it suitable for sensitive or remote installations where tamper protection is required.

The board also includes two optional 2x6 headers, EXT 1 and EXT 2 (unsoldered by default),

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which provide connection to additional Adrastea-I signals. EXT 1 offers access to the UART1 interface for capturing modem logs, as well as a 1.8V SPI interface that is available only when using customized firmware, making it useful for high-speed peripheral communication in advanced applications. It also provides two 1.8V auxiliary ADC channels that can read external analog signals or be configured as programmable GPIOs. The EXT 2 header provides a 1.8V I2C interface with clock rates up to 400kHz, which is electrically available but requires custom firmware, as it is not supported by the default module configuration. This header also includes an E-JTAG debug interface for low-level MCU debugging, giving developers full access to the internal ARM Cortex-M4 when developing or analyzing custom application firmware.

The board features two SMA connectors for LTE antenna ([LTE Flat Rotation Antenna](#)) and one for GNSS such as the [GPS Passive Antenna](#) offered by MIKROE, ensuring efficient connectivity options. The board also has a micro SIM card holder that supports 1.8V uSIM cards, 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 Adrastea-I module operates at 3.6V and communicates at 1.8V, 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 smart industry, smart city, asset tracking, agriculture, healthcare, and remote monitoring applications that require secure, efficient, and wide-area cellular connectivity
On-board modules	WIRL-CLTI Adrastea-I (2615011136000) - LTE-M / NB-IoT cellular module from Würth Elektronik
Key Features	Support for LTE-M and NB-IoT connectivity, integrated GNSS with GPS and GLONASS positioning, wide global band coverage, 3GPP Release 13 compliance with upgradeability to Release 14, USB Type-C firmware upgrade capability, tamper-detection, micro SIM card support, 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 13 Click corresponds to the pinout on the

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mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikroBUS				Pin	Notes
Module Status	STA	1	AN	PWM	16	WUP	Module Wake-Up
Reset / ID SEL	RST	2	RST	INT	15	RTS	UART RTS
UART CTS / ID COMM	CTS	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
LD1	PWR	-	Power LED Indicator
LD2	STATUS	-	Module Status LED Indicator
LD3	RX/TX	-	UART2 Data Transmission LED Indicator
LD5	ALR	-	Alarm LED Indicator
JP1	VCC SEL	Left	Power Voltage Level Selection 3V3/5V: Left position 3V3, Right position 5V
T1	RST	-	Reset Button
SW1	AT	-	Anti-Tamper Switch

LTE IoT 13 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
LTE Operating Frequency	699	-	2155	MHz
GNSS Operating Frequency	1560	-	1610	MHz
LTE-M Sensitivity	-105	-	-107.2	dBm
NB-IoT Sensitivity	-	-110	-	dBm
LTE-M Output Power	21.4	-	23	dBm
NB-IoT Output Power	21.8	-	23.7	dBm
GNSS RX Sensitivity (Cold Start)	-	-145	-	dBm
GNSS TTFF (Cold Start)	-	-	36	sec

Software Support

[LTE IoT 13 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

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TCP/UDP messages or retrieving data from GNSS using standard "AT" commands.

Key Functions

- lteiot13_cfg_setup This function initializes Click configuration structure to initial values.
- lteiot13_init This function initializes all necessary pins and peripherals used for this Click board.
- lteiot13_set_sim_apn This function sets APN for sim card.
- lteiot13_send_sms_text This function sends text message to a phone number.
- lteiot13_cmd_run This function sends a specified command to the Click module.

Application Init

Initializes the driver and logger.

Application Task

Application task is split in few stages:

- LTEIOT13_POWER_UP:
Powers up the device, performs a factory reset and reads system information.
- LTEIOT13_CONFIG_CONNECTION:
Sets configuration to device to be able to connect to the network (used only for SMS or TCP/UDP demo examples).
- LTEIOT13_CHECK_CONNECTION:
Waits for the network registration indicated via CEREQ command and then checks the signal quality report (used only for SMS or TCP/UDP demo examples).
- LTEIOT13_CONFIG_EXAMPLE:
Configures device for the selected example.
- LTEIOT13_EXAMPLE:
Depending on the selected demo example, it sends an SMS message (in PDU or TXT mode) or TCP/UDP message, or waits for the GPS fix to retrieve location info from GNSS. By default, the TCP/UDP example is selected.

Application Output

This Click board can be interfaced and monitored in two ways:

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- 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 13 click example package](#)

[LTE IoT 13 click 2D and 3D files v101](#)

[Adrastea-I \(2615011136000\) datasheet](#)

[LTE IoT 13 click schematic v101](#)

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