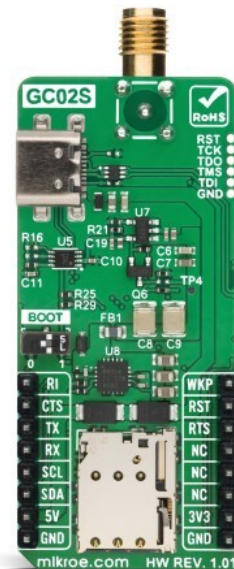
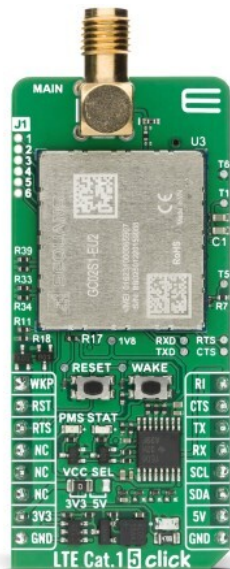


LTE Cat.1 5 Click (for Europe)



PID: MIKROE-6898

LTE Cat.1 5 Click is a compact add-on board designed for 4G LTE Cat 1 bis cellular connectivity in European IoT, M2M, and consumer applications. It is based on the [GC02S1-EU2](#), a 3GPP LTE Release 14 Cat 1 bis compliant module from [Sequans](#). This module features optimized Calliope 2 silicon with improved performance and power consumption, support for LTE bands B1, B3, B8, B20, and B28 across approximately 703MHz to 2170MHz, data rates up to 10Mbps downlink and 5Mbps uplink, UART communication interface, firmware upgrade support, hardware flow control, wake and reset functions, debug access through UART1 and JTAG, and 1.8V uSIM card support. It is well suited for utility meters, industrial sensors, security and alarm systems, payment terminals, asset trackers, smart home devices, smart metering infrastructure, and wearable consumer applications.

For more information about **LTE Cat.1 5 Click** visit the official [product page](#).

How does it work?

LTE Cat.1 5 Click is based on the GC02S1-EU2, a 3GPP LTE Release 14 Cat 1 bis compliant module from Sequans, built around the company's second-generation Calliope 2 silicon platform. This module is optimized to deliver efficient and dependable cellular connectivity while bringing notable improvements in both performance and power consumption compared to the previous Calliope generation. At the same time, it enables an easy migration path by leveraging Sequans's existing 4G LTE protocol stack, recognized as one of the most mature and proven solutions in the LTE ecosystem. The GC02S1-EU2 module integrates the essential elements of a complete LTE modem system in a compact form factor, including the Calliope 2 platform, an LTE-optimized transceiver, RF front-end circuitry, and key system interfaces required for straightforward cellular communication. Tailored for the European market, this

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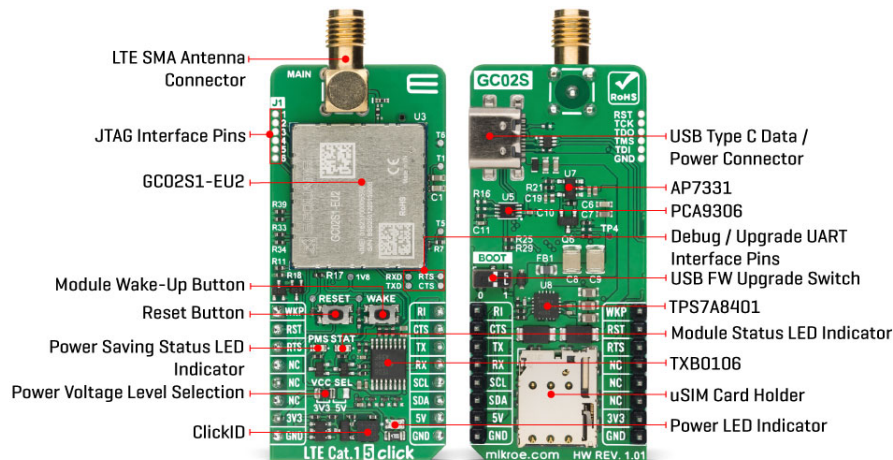


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module supports LTE bands B1, B3, B8, B20, and B28, covering approximately 703MHz to 2170MHz across its supported European LTE bands.



The module also offers data throughput of up to 10Mbps in downlink and 5Mbps in uplink, and it is hardware-ready for 3GPP LTE Release 15, providing an additional level of future readiness for next-generation requirements. With a maximum transmit power of +23dBm in each supported band, LTE Cat.1 5 Click delivers stable wireless performance suitable for applications such as utility meters, industrial sensors, security and alarm systems, payment terminals, asset tracking devices, smart home equipment, smart metering infrastructure, and wearable consumer applications.

Communication between the GC02S1-EU2 and the host MCU is established through a UART interface, using standard UART RX and TX pins together with hardware flow control pins CTS, RTS, and RI (Clear to Send, Ready to Send, and Ring Indicator). The board also uses the module's USB interface for firmware upgrades. In addition, a USB firmware upgrade switch labeled BOOT is located on the back of the board to manage the upgrade process. This switch has position 0 for normal operation and position 1 for firmware upgrades over USB, ensuring a simple and straightforward upgrade procedure. The board also includes I2C pins, but this interface is not yet software supported and is reserved for future use.

LTE Cat.1 5 Click includes several additional features that improve usability and control. The WAKE button allows the module to be woken 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™ WKP and RST pins, offering greater flexibility. The board also includes several clearly marked test points, with dedicated points located next to the WAKE and RESET buttons for easier access to these control functions, as well as test points near the GC02S1-EU2 module that expose the UART1 interface. This interface can be used as a debug serial port, allowing insight into underlying log information for software debugging purposes. In addition, the board features unsoldered pins for the JTAG interface on the J1 header, an industry-standard solution used for design verification and printed circuit board testing.

The board is equipped with one SMA connector intended for the main antenna, such as the [LTE Flat Rotation Antenna](#) offered by MIKROE, and two LED indicators. The first, a red PMS LED, reflects the module's Sleep mode status and turns on when the module enters Sleep mode. The second, a yellow STAT LED, indicates when the module is attached to a network and blinks during data transmission. In addition, the board includes a micro SIM card holder that supports only 1.8V uSIM cards, matching the module's low-voltage design requirements.

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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 GC02S1-EU2 module operates at 3.8V and communicates at 1.8V logic levels, logic-level translators, the [TXB0106](#) and [PCA9306](#), are used to ensure proper operation and accurate signal-level translation. In this way, both 3.3V and 5V MCUs can use the communication lines correctly. This Click board™ also comes equipped with a library containing easy-to-use functions and example code that can be used as a reference for further development.

Specifications

Type	GSM/LTE
Applications	Ideal for utility meters, industrial sensors, security and alarm systems, payment terminals, asset trackers, smart home devices, smart metering infrastructure, and wearable consumer applications
On-board modules	GC02S1-EU2 - 3GPP LTE Release 14 Cat 1 bis compliant module from Sequans
Key Features	3GPP LTE Release 14 Cat 1 bis compliant module based on Sequans Calliope 2 silicon, support for European LTE bands B1, B3, B8, B20, and B28, hardware-ready for 3GPP LTE Release 15, UART interface with hardware flow control JTAG interface support, Sleep mode, network attachment and transmission activity indication, micro SIM card holder for 1.8V uSIM cards, 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,External

Pinout diagram

This table shows how the pinout on LTE Cat.1 5 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin					Pin	Notes
Sleep Mode 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
	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

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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
SW1	BOOT	Left	USB FW Upgrade Selection 0/1: Left position 0, Right position 1
PB1	WAKE	-	Module Wake-Up Button
T2	RESET	-	Reset Button

LTE Cat.1 5 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
Frequency Range	703	-	2170	MHz
Maximum TX Power	-	-	+23	dBm

Software Support

[LTE Cat.1 5 EU 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

- `ltecat15eu_cfg_setup` This function initializes Click configuration structure to initial values.
- `ltecat15eu_init` This function initializes all necessary pins and peripherals used for this Click board.
- `ltecat15eu_set_sim_apn` This function sets APN for sim card.
- `ltecat15eu_send_sms_text` This function sends text message to a phone number.
- `ltecat15eu_cmd_run` This function sends a specified command to the Click module.

Application Init

Initializes the driver and logger.

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Application Task

Application task is split in few stages:

- LTECAT15EU_POWER_UP:

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

- LTECAT15EU_CONFIG_CONNECTION:

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

- LTECAT15EU_CHECK_CONNECTION:

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

- LTECAT15EU_CONFIG_EXAMPLE:

Configures device for the selected example.

- LTECAT15EU_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](#)

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[Click boards™](#)

[ClickID](#)

Downloads

[LTE Cat.1 5 Click \(for Europe\) 2D and 3D files v101](#)

[LTE Cat.1 5 Click \(for Europe\) schematic v101](#)

[GC02S1 datasheet](#)

[LTE Cat.1 5 Click \(for Europe\) example package](#)

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