

## LR 3 Click



PID: MIKROE-4616

**LR 3 Click** is a compact add-on board that contains a long-range transceiver. This board features the [32001345](#), RF technology-based SRD transceiver, which operates at a frequency of 868MHz from [Mipot](#). Thanks to the spread spectrum modulation feature, as well as the low power consumption, it is capable of achieving long-range communication, immune to interferences. It features a complete long-range stack onboard; it implements physical, network, and MAC layers, allowing for easy operation via the UART interface. The transceiver is also RED 2014/53/EU certified, allowing for easy integration into the final application. This Click board™ offers an easy and reliable solution for developing highly integrated long-range IoT networks, security systems, alarm networks, and similar applications that require simple and reliable networking solutions.

LR 3 Click is supported by a [mikroSDK](#) compliant library, which includes functions that simplify software development. This [Click board™](#) comes as a fully tested product, ready to be used on a system equipped with the [mikroBUS™](#) socket.

### How does it work?

LR 3 Click as its foundation uses the 32001345, a low-power long-range RF technology-based transceiver module from Mipot. It offers a long-range spread spectrum communication with high interference immunity. The network is implemented as a star topology, where endpoints work in duty cycle mode, significantly reducing the overall power consumption. Coupled with the AES128 message encryption and low current consumption, LR 3 Click offers an easy and reliable solution for developing low-power, highly integrated IoT networks, security systems, alarm networks, and similar applications that require simple and reliable networking solutions.

Mikroe produces entire development toolchains for all major microcontroller architectures.

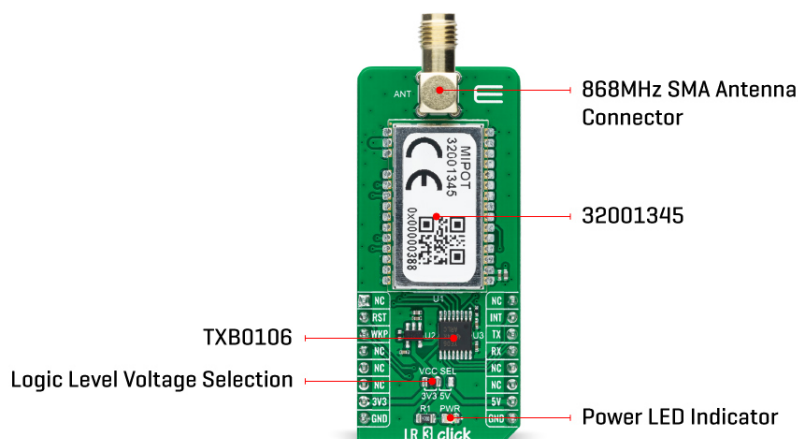
Committed to excellency, we are dedicated to helping engineers bring the project development up to speed and achieve outstanding results.



ISO 27001: 2013 certification of informational security management system.  
ISO 14001: 2015 certification of environmental management system.  
OHSAS 18001: 2008 certification of occupational health and safety management system.



ISO 9001: 2015 certification of quality management system (QMS).



This Click board™ can be configured to work as either END or MASTER NODE, by using simple [AT commands](#). While working as the MASTER NODE, the Click board™ can use a set of master-specific commands, such as the pairing command. This command will add the end node which requested pairing, to the master network table. While working as the END NODE, LR 3 Click can issue slave specific commands/requests, such as the pairing request command, which will allow that end node to be paired with the master.

LR 3 Click communicates with MCU using the UART interface with commonly used UART RX and TX pins at data rates up to 115200bps for the data transfer. In addition to these features, the 32001345 also uses several GPIO pins connected to the mikroBUS™ socket. The WK pin routed on the CS pin of the mikroBUS™ represents the Wake-up function used for waking up the device, while the RST pin on the mikroBUS™ socket can perform Hardware Reset function by putting this pin in a logic low state. This Click board™ also has an indicator routed on the INT pin of the mikroBUS™ socket, which will provide the user with feedback after a successfully received package and verified checksum.

LR 3 Click features the SMA antenna connector with an impedance of 50Ω, so it can be equipped with the appropriate 868MHz compliant antenna that [Mikroe](#) has in its [offer](#).

This Click board™ can operate with both 3.3V and 5V logic voltage levels selected via the VCC SEL jumper. A proper logic voltage level conversion is performed by the TXB0106 voltage level shifter, while the LDO ensures that recommended values power the module. This allows for both 3.3V and 5V capable MCUs to use the UART communication lines properly. However, the 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             | LoRa,Sub-1 GHz Transceivers                                                                                                                                                                                                   |
| Applications     | Lora 3 click offers an easy and reliable solutions for developing low power, highly integrated IoT networks, security systems, alarm networks, and similar applications that require simple and reliable networking solutions |
| On-board modules | MIPOT 32001345, Lora® RF technology-based                                                                                                                                                                                     |

Mikroe produces entire development toolchains for all major microcontroller architectures.

Committed to excellency, we are dedicated to helping engineers bring the project development up to speed and achieve outstanding results.



ISO 27001: 2013 certification of informational security management system.  
ISO 14001: 2015 certification of environmental management system.  
OHSAS 18001: 2008 certification of occupational health and safety management system.



ISO 9001: 2015 certification of quality management system (QMS).

|                  |                                                                                                                                                                                       |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                  | long range transceiver                                                                                                                                                                |
| Key Features     | The click board™ features robust Lora® RF technology based wireless networking, full network stack, message encrypting (AES128), easy to use UART interface and low power consumption |
| Interface        | UART                                                                                                                                                                                  |
| Feature          | No 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 **LR 3 click** corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

| Notes        | Pin          |  |      |     |    | Pin        | Notes              |
|--------------|--------------|-----------------------------------------------------------------------------------|------|-----|----|------------|--------------------|
|              | NC           | 1                                                                                 | AN   | PWM | 16 | NC         |                    |
| Reset        | <b>RST</b>   | 2                                                                                 | RST  | INT | 15 | <b>INT</b> | Data TX indication |
| Wake up      | <b>WKP</b>   | 3                                                                                 | CS   | RX  | 14 | <b>TX</b>  | UART TX            |
|              | NC           | 4                                                                                 | SCK  | TX  | 13 | <b>RX</b>  | UART RX            |
|              | NC           | 5                                                                                 | MISO | SCL | 12 | NC         |                    |
|              | NC           | 6                                                                                 | MOSI | SDA | 11 | NC         |                    |
| Power supply | <b>+3.3V</b> | 7                                                                                 | 3.3V | 5V  | 10 | <b>+5V</b> | Power supply       |
| Ground       | <b>GND</b>   | 8                                                                                 | GND  | GND | 9  | <b>GND</b> | Ground             |

## Onboard settings and indicators

| Label | Name    | Default | Description                                                                |
|-------|---------|---------|----------------------------------------------------------------------------|
| LD1   | PWR     | -       | Power LED indicator                                                        |
| JP1   | VCC SEL | Left    | Logic Level Voltage Selection 3V3/5V: Left position 3V3, Right position 5V |

## LR 3 click electrical specifications

| Description                 | Min | Typ | Max | Unit |
|-----------------------------|-----|-----|-----|------|
| Supply Voltage              | 3.3 | -   | 5   | V    |
| Operating Frequency Range   | 863 | 868 | 870 | MHz  |
| Operating Temperature Range | -40 | +25 | +85 | °C   |

## Software Support

Mikroe produces entire development toolchains for all major microcontroller architectures.

Committed to excellency, we are dedicated to helping engineers bring the project development up to speed and achieve outstanding results.



ISO 27001: 2013 certification of informational security management system.  
ISO 14001: 2015 certification of environmental management system.  
OHSAS 18001: 2008 certification of occupational health and safety management system.



ISO 9001: 2015 certification of quality management system (QMS).

We provide a library for the LR 3 Click as well as a demo application (example), developed using MikroElektronika [compilers](#). The demo can run on all the main MikroElektronika [development boards](#).

Package can be downloaded/installed directly from compilers IDE (recommended way), or downloaded from our [LibStock](#), or found on [mikroE github account](#).

## Library Description

This library contains API for LR 3 Click driver.

Key functions:

- void lr3\_cfg\_setup ( lr3\_cfg\_t \*cfg ); - Config Object Initialization function.
- LR3\_RETVAL lr3\_init ( lr3\_t \*ctx, lr3\_cfg\_t \*cfg ); - Initialization function.

## Examples description

This example reads and processes data from LR 3 clicks.

The demo application is composed of two sections :

The full application code, and ready to use projects can be installed directly from compilers IDE (recommended) or found on [LibStock](#) page or [mikroE GitHub account](#).

Other mikroE Libraries used in the example:

- MikroSDK.Board
- MikroSDK.Log
- Click.LR3

## 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. The terminal available in all MikroElektronika [compilers](#), or any other terminal application of your choice, can be used to read the message.

## mikroSDK

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

Mikroe produces entire development toolchains for all major microcontroller architectures.

Committed to excellency, we are dedicated to helping engineers bring the project development up to speed and achieve outstanding results.



ISO 27001: 2013 certification of informational security management system.  
ISO 14001: 2015 certification of environmental management system.  
OHSAS 18001: 2008 certification of occupational health and safety management system.



ISO 9001: 2015 certification of quality management system (QMS).

[Click Boards™](#)

## Downloads

[LR 3 click schematic](#)

[LR 3 click 2D and 3D files](#)

[32001345 datasheet](#)

[LR 3 click example on Libstock](#)

Mikroe produces entire development toolchains for all major microcontroller architectures.

Committed to excellency, we are dedicated to helping engineers bring the project development up to speed and achieve outstanding results.



ISO 27001: 2013 certification of informational security management system.  
ISO 14001: 2015 certification of environmental management system.  
OHSAS 18001: 2008 certification of occupational health and safety management system.



ISO 9001: 2015 certification of quality management system (QMS).