

LR 6 Click



PID: MIKROE-6112

LR 6 Click is a compact add-on board designed for ultra-long-distance spread-spectrum communication. This board features the Ra-01S, a LoRa™ wireless radio frequency module from Ai-Thinker Technology, featuring the SX1268 radio chip. This module provides exceptional sensitivity of over -148dBm, a power output of +22dBm, and supports multiple modulation methods, including LoRa™, within the 433MHz frequency band. The board offers robust anti-interference capabilities and low power consumption, making it ideal for applications requiring reliable long-range communication. This Click board™ is well-suited for various applications, including automatic meter reading, home and building automation, security systems, and remote irrigation systems.

How does it work?

LR 6 Click is based on the Ra-01S, a LoRa™ wireless radio frequency module from Ai-Thinker Technology, designed for ultra-long-distance spread-spectrum communication. The Ra-01S module uses the SX1268 radio chip, primarily employing LoRa™ modulation technology for extended communication ranges. This module is known for its robust anti-interference capabilities and low current consumption, making it ideal for applications requiring reliable long-range communication. With Semtech's patented LoRa™ technology, the SX1268 chip offers exceptional sensitivity exceeding -148dBm and a power output of +22dBm. It supports multiple modulation methods, including FSK, GFSK, MSK, GMSK, LoRa™, and OOK, within the 433MHz frequency band (ranging from 410MHz to 525MHz).

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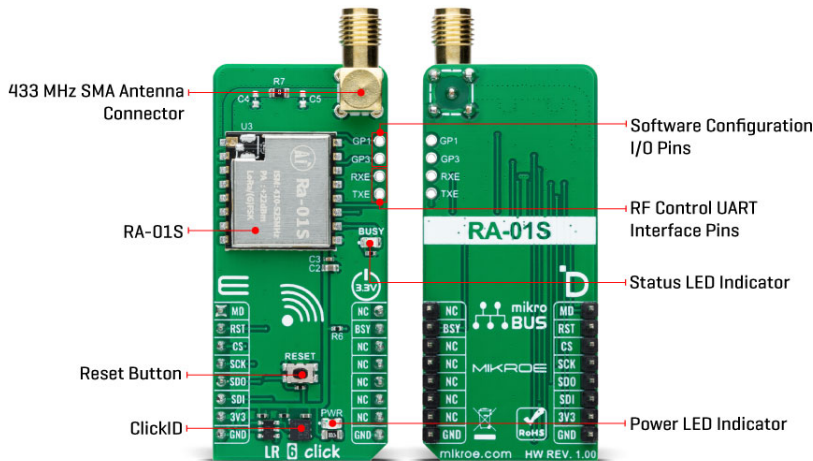
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Compared to traditional modulation technologies, LoRa™ offers significant advantages regarding anti-blocking and signal selection, addressing distance, interference, and power efficiency challenges. LR 6 Click is well-suited for various applications such as automatic meter reading, home and building automation, security systems, and remote irrigation systems, where long-distance communication and reliability are critical.

This Click board™ communicates with the host MCU through a standard 4-wire SPI interface with frequencies up to 10MHz. In addition to the interface pins, the Ra-01S module uses the MD pin from the mikroBUS™ socket to select the TX or RX operational mode. It features a reset pin (RST) along with a RESET button for module resetting. This board also includes two unpopulated two-pin headers - one for I/O digital signals for additional software configurations, another for an additional UART interface for RF port control, and a BSY pin alongside a red BUSY LED that indicates data transmission activity (module status).

LR 6 Click also features the SMA antenna connector with an impedance of 50Ω, compatible with various antennas available from MIKROE, like the [Rubber Antenna 433MHz](#), to enhance its connectivity.

This Click board™ can be operated only with a 3.3V logic voltage level. The board must perform appropriate logic voltage level conversion before using MCUs with different logic levels. Also, it comes equipped with a library containing functions and an example code that can be used as a reference for further development.

Specifications

Type	LoRa, Sub-1 GHz Transceivers
Applications	Ideal for automatic meter reading, home and building automation, security systems, and remote irrigation systems
On-board modules	Ra-01S - LoRa™ wireless radio frequency module from Ai-Thinker Technology
Key Features	Ultra-long-distance communication, based on SX1268 radio chip with high sensitivity, multiple modulation methods, 433MHz frequency band, anti-interference capabilities, low power consumption, SPI interface, and

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Interface	SPI
Feature	ClickID
Compatibility	mikroBUS™
Click board size	L (57.15 x 25.4 mm)
Input Voltage	3.3V

Pinout diagram

This table shows how the pinout on LR 6 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikroBUS				Pin	Notes
Mode Control	MD	1	AN	PWM	16	NC	
Reset / ID SEL	RST	2	RST	INT	15	BSY	Status Indicator
SPI Select / ID COMM	CS	3	CS	RX	14	NC	
SPI Clock	SCK	4	SCK	TX	13	NC	
SPI Data OUT	SDO	5	MISO	SCL	12	NC	
SPI Data IN	SDI	6	MOSI	SDA	11	NC	
Power Supply	3.3V	7	3.3V	5V	10	NC	
Ground	GND	8	GND	GND	9	GND	Ground

Onboard settings and indicators

Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator
LD2	BUSY	-	Status LED Indicator
T1	RESET	-	Reset Button

LR 6 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Frequency Range	410	433	525	MHz
Sensitivity	-	-148	-	dBm
Output Power	-	-	+22	dBm

Software Support

We provide a library for the LR 6 Click as well as a demo application (example), developed using MIKROE [compilers](#). The demo can run on all the main MIKROE [development boards](#).

Package can be downloaded/installed directly from NECTO Studio Package Manager (recommended), downloaded from our [LibStock™](#) or found on [MIKROE github account](#).

Library Description

This library contains API for LR 6 Click driver.

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Key functions

- `Ir6_send_data` This function sends a desired number of data bytes to the buffer by using the selected mode using the SPI serial interface.
- `Ir6_receive_data` This function receives a desired number of data bytes to the buffer by using the SPI serial interface.
- `Ir6_set_lr_config` This function performs the desired LoRa configuration by using the SPI serial interface.

Example Description

This example demonstrates the use of LR 6 Click by processing the incoming data and displaying them on the USB UART.

The full application code, and ready to use projects can be installed directly from NECTO Studio Package Manager (recommended), downloaded from our [LibStock™](#) or found on [MIKROE github account](#).

Other MIKROE Libraries used in the example:

- MikroSDK.Board
- MikroSDK.Log
- Click.LR6

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. UART terminal is available in all MIKROE [compilers](#).

mikroSDK

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

[Click boards™](#)

[ClickID](#)

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Downloads

[LR 6 click example on Libstock](#)

[RA-01S datasheet](#)

[LR 6 click 2D and 3D files v100](#)

[LR 6 click schematic v100](#)

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