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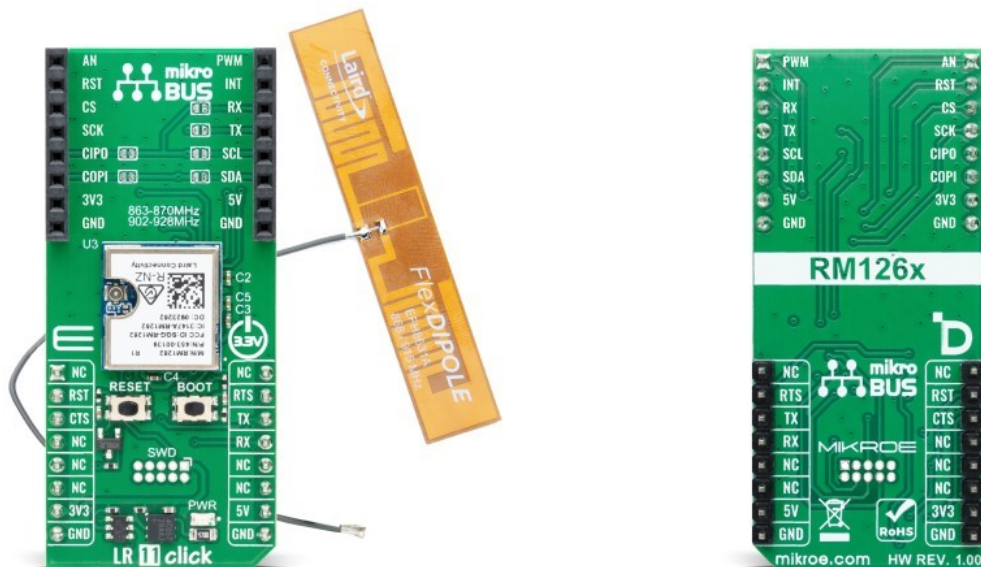www.mikroe.com

[LR 11 Click - 915MHz](#)

PID: MIKROE-6333

LR 11 Click - 915MHz is a compact add-on board for long-range, low-power wireless communication in IoT applications. This board features the 453-00139R, an ultra-low power LoraWAN module Ezurio (part of the RM126x series), integrating the Silicon Labs EFR32 SoC and the Semtech SX1262 radio. It supports LoRaWAN classes A, B, and C, offering secure, scalable, and bi-directional communication. It operates in the 902-928MHz frequency range with a typical transmit power of up to 22dBm and a communication range of up to 15km. The board also features an additional mikroBUS™ socket for peripheral expansion with UART, SPI, and I2C interface support. With its extensive regulatory support and certifications, the LR 11 Click is ideal for IoT devices, asset tracking, smart home systems, industrial automation, and any application requiring long-range, battery-powered sensor solutions.

NOTE: The 453-00139R module includes an on-module antenna connector designed to work with the **868/915MHz FlexDIPOLE antenna** ([EFH8631A3S-10MH4L](#)) included in the Click board™ package. This offers enhanced connectivity and functionality, ensuring optimal performance for long-range communication applications.

How does it work?

LR 11 Click is based on the 453-00139R, an ultra-low power LoRaWAN module from Ezurio. This module is part of the Ezurio RM126x series, specifically the RM1262, which integrates the Silicon Labs EFR32 series System on Chip (SoC) and the Semtech SX1262 radio. This combination provides an efficient, low-power, long-range solution for developing a wide range of LoRaWAN™ applications certified by the LoRa Alliance. The module has a built-in MHF4 connector, a Temperature Compensated Crystal Oscillator (TCXO), and a DC-DC converter, ensuring reliable performance in various environments. Supporting LoRaWAN classes A, B, and

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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).

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C, the 453-00139R offers secure, scalable, and bi-directional communication. It has broad regulatory region support, including USA, Canada, Australia, and New Zealand, and holds certifications such as EU, UKCA, NCC, MIC, and IN, making it a reliable and efficient solution for diverse use cases requiring robust long-range communication.
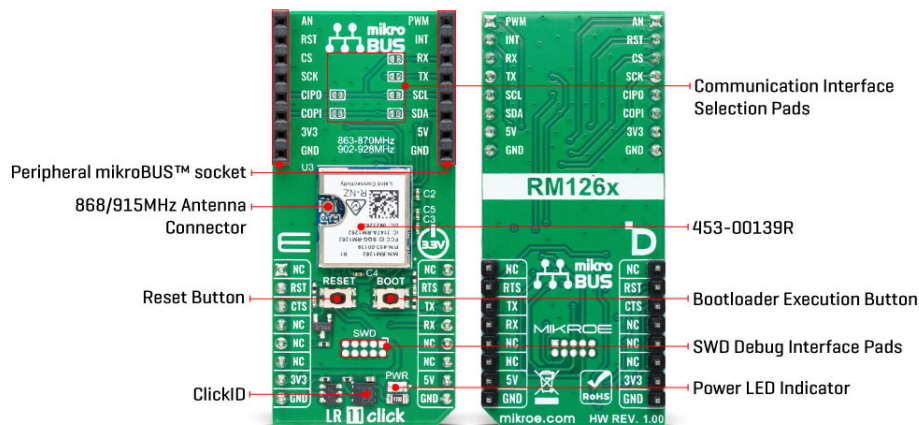
In addition to LoRaWAN capabilities, the 453-00139R features a LoRa Point-to-Point (LoRa P2P) capability, enabling the creation of private, ultra-long-range radio networks between two RM126x modules. This capability supports both unicast and broadcast modes, accommodating up to 64 devices per network. This module is designed to operate in both hosted and hostless modes. In hosted mode, it is programmed with an AT command set, while in hostless mode, it uses its in-module Cortex-M33 core, which includes 512kB of flash memory and 32kB of RAM. The module's key characteristics also include a frequency range of 902-928MHz, with 915MHz being typical, a maximum transmit power of up to 22dBm, and a communication range of up to 15km in open spaces. This Click board™ is ideal for IoT devices, asset tracking and control, smart home systems, public or private networks, irrigation and agriculture applications, industrial automation, and any long-range, battery-powered sensor application.

The 453-00139R and the host MCU are communicated through a UART interface, using standard UART RX and TX pins and hardware flow control pins (CTS/RTS- Clear to Send/Ready to Send) for efficient data transfer. The module defaults to a communication speed of 115200bps, allowing for data exchange over AT commands. At the lower part of the LR 11 Click, an additional unpopulated header offers full support for debugging and programming capabilities. With this header, users can use a Serial Wire Debug interface for programming and debugging, available through the SWD interface pins (SWDIO, SWCLK, and SWO).

Besides interface pins, this Click board™ also has a reset pin/button (RESET) for direct module resetting and a BOOT button used to determine when the bootloader must be executed. Upon reset, the bootloader begins execution. When the BOOT button is pressed, the bootloader executes firmware updates via the UART. When released, the bootloader stops execution and passes control to the main application firmware.

A special feature of the LR 11 Click is the additional mikroBUS™ socket, which expands the board's functionality with peripherals such as sensors and LCDs. Added Click boards™ can communicate with the onboard 453-00139R module through UART, SPI, or I2C interfaces. Given that the 453-00139R GPIOs PD02 and PD03 are shared across multiple signals (can be used for all three interfaces), they must be configured appropriately when selecting the communication mode. This is achieved via six pads located on the peripheral mikroBUS™ socket section,

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enabling the PD02 and PD03 pins of the module to be set for the desired interface. By default, SPI communication is selected with the CIPO and COPI pins connected. If another interface is needed, it is necessary to cut these traces (disconnect them) and then solder the pads of the desired interface pins (UART or I2C).

This Click board™ has both mikroBUS™ power rails needed for the peripheral mikroBUS™ socket but only uses a 3.3V voltage level as a main power supply for the 453-00139R module. The board must perform appropriate logic voltage level conversion before using MCUs with different logic levels. It also comes equipped with a library containing functions and example code that can be used as a reference for further development.

Specifications

Type	LoRa
Applications	Ideal for IoT devices, asset tracking, smart home systems, industrial automation, and any application requiring long-range, battery-powered sensor solutions
On-board modules	453-00139R - ultra-low power LoraWAN module Ezurio
Key Features	915MHz frequency range, based on the EFR32 series SoC, powerful Cortex-M33 core, both hosted/hostless modes of operation, up to 15km in open space, additional mikroBUS™ socket for peripheral expansion, ultra-low power consumption, wide regulatory region support and certifications, LoRa P2P, and more
Interface	UART
Feature	ClickID
Compatibility	mikroBUS™
Click board size	L (57.15 x 25.4 mm)
Input Voltage	3.3V,5V

Pinout diagram

This table shows how the pinout on LR 11 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikro™ BUS			Pin	Notes
	NC	1	AN	PWM	16	NC	
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

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Ground	**GND**	8	GND	GND	9	**GND**	Ground

Onboard settings and indicators

Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator
J1	SWD	Unpopulated	SWD Debug Interface Pads
T1	RESET	-	Reset Button
T2	BOOT	-	Bootloader Execution Button

LR 11 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
Frequency Range	902	915	928	MHz
Transmit Power	-	-	22	dBm
Range	-	-	15	km

Software Support

We provide a library for the LR 11 915MHz 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 11 915MHz Click driver.

Key functions

- lr11915mhz_reset_device This function resets the device by toggling the reset pin logic state.

- lr11915mhz_cmd_run This function sends a specified command with or without parameters to the click module.

- lr11915mhz_cmd_set This function sets a value to a specified command parameter of the click module.

Example Description

This example demonstrates the use of LR 11 915MHz Click board™ by showing the communication between two click boards configured in P2P network mode.

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.

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Other MIKROE Libraries used in the example:

- MikroSDK.Board
- MikroSDK.Log
- Click.LR11915MHz

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

Downloads

LR 11 click 2D and 3D files v100

RM126x datasheet

RM126x AT commands

LR 11 click - 915MHz schematic v100

LR 11 Click - 915MHz example on Libstock

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