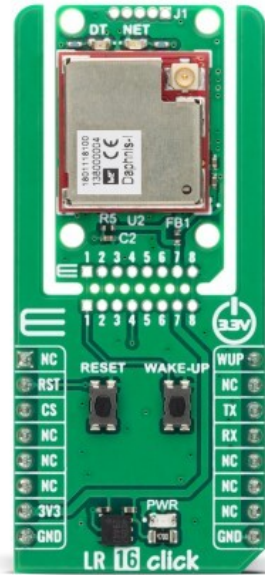


LR 16 Click



PID: MIKROE-6598

LR 16 Click is a compact add-on board that provides low-power, long-range wireless connectivity for IoT and industrial applications. It is based on the WIRL-LORA Daphnis-I (2618011181000) module from Würth Elektronik, which integrates the STM32WLE5CCU6 chip and supports both LoRaWAN® and proprietary communication modes. The board operates in the EU868 frequency band with an output power of 13.4dBm, fully compliant with LoRaWAN® 1.0.4 specification and supporting device classes A, B, and C. Proprietary protocols allow peer-to-peer, star, and mesh networking with broadcast, multicast, and unicast communication options. Additional features include UART communication with [AT command](#) support, firmware upgrades and boot control, SWD for debugging, Click Snap, and LED indicators for data activity and network status. This Click board™ is ideal for smart city, agriculture, logistics, healthcare, and Industry 4.0 applications.

For more information about **LR 16 Click** visit the official [product page](#).

How does it work?

LR 16 Click is based on the WIRL-LORA Daphnis-I (2618011181000) LoRaWAN® module from Würth Elektronik, that provides low-power, long-range wireless connectivity designed around the STM32WLE5CCU6 chip. This module supports both LoRaWAN® and proprietary communication modes, including peer-to-peer, star, and mesh topologies, offering developers a highly flexible platform for diverse applications. Operating in the EU868 frequency band, the board delivers 13.4dBm of output power while maintaining ultra-low power consumption, making it ideal for battery-powered and energy-efficient embedded designs.

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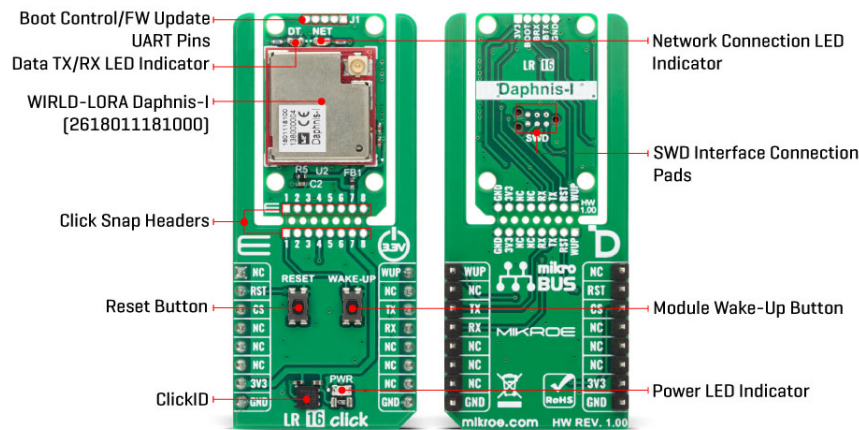
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The LoRaWAN® mode is fully compliant with specification 1.0.4 and supports device classes A, B, and C, while the proprietary mode enables broadcast, multicast, and unicast communication through a 4-byte addressing scheme, providing reliable and adaptable networking options. The LR 16 Click enables a wide range of IoT and industrial applications, from smart city and home solutions like parking, metering, and environmental monitoring, to agriculture and healthcare systems for crop, livestock, and equipment tracking. It also supports logistics, fleet management, and space utilization in transportation, as well as predictive maintenance and supply chain optimization in smart factories.

This Click board™ is designed in a unique format supporting the newly introduced MIKROE feature called "Click Snap." Unlike the standardized version of Click boards, this feature allows the main sensor/IC/module area to become movable by breaking the PCB, opening up many new possibilities for implementation. Thanks to the Snap feature, the 2618011181000 can operate autonomously by accessing its signals directly on the pins marked 1-8. Additionally, the Snap part includes a specified and fixed screw hole position, enabling users to secure the Snap board in their desired location.

Communication between the WIRLD-LORA Daphnis-I (2618011181000) module and the host MCU is made through a UART interface, using standard UART RX and TX pins for efficient data transfer. The module defaults to a communication speed of 115200bps, allowing for data exchange over AT commands. Also, the board features an unpopulated J1 header that exposes essential boot control pins along with dedicated firmware upgrade UART pins, giving developers direct access for advanced configuration, in-field updates, or recovery procedures. In addition to the interface pins, the board features a reset (RST) pin for hard-resetting the module when necessary and SWD pads designed for use with MIKROE's [6-pin Needle Cable](#), providing an optional flash and debug SWD (Serial Wire Debug) interface functionality.

The LR 16 Click includes several additional functionalities that enhance its usability and control. The WAKE-UP button allows users to wake the module 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™ pins WUP and RST, offering greater flexibility. This Click board™ is also equipped with two onboard LED indicators that provide clear and immediate visual feedback of the module's operation. A green DT LED is used to indicate data transmission and reception activity, while a blue NET LED serves as a network status indicator, illuminating to signal a successful LoRaWAN® or proprietary network connection. The module features one u.FI connector for the main antenna that MIKROE offers, like the [Rubber 868MHz Antenna](#) combined with an [IPEX-SMA cable](#) for flexible and efficient connectivity.

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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. It also comes equipped with a library containing functions and example code that can be used as a reference for further development.

Click Snap

Click Snap is an innovative feature of our standardized Click add-on boards, designed to bring greater flexibility and optimize your prototypes. By simply snapping the PCB along predefined lines, you can easily detach the main sensor/IC/module area, reducing the overall size, weight, and power consumption - ideal for the final phase of prototyping. For more details about Click Snap, visit the [official page](#) dedicated to this feature.

Specifications

Type	LoRa
Applications	Ideal for smart city, agriculture, logistics, healthcare, and Industry 4.0 applications
On-board modules	WIRL-LORA Daphnis-I (2618011181000) - Daphnis-I LoRaWAN® and proprietary (P2P, star, mesh) module from Würth Elektronik
Key Features	LoRaWAN® and proprietary communication modes with peer-to-peer, star, and mesh topologies, compliance with LoRaWAN® specification 1.0.4 supporting device classes A, B, and C, operation in the EU868 frequency band, ultra-low power consumption, module based on the STM32WLE5CCU6 chip, UART interface with AT commands, boot control and firmware upgrade, SWD pads for flashing and debugging, Click Snap support, and more
Interface	UART
Feature	Click Snap, 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 16 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikroBUS				Pin	Notes
	NC	1	AN	PWM	16	WUP	Module Wake-Up
Reset	RST	2	RST	INT	15	NC	
ID COMM	CS	3	CS	RX	14	TX	UART TX
	NC	4	SCK	TX	13	RX	UART RX

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	NC	5	MISO	SCL	12	NC	
	NC	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	DT	-	Data TX/RX LED Indicator
LD3	NET	-	Network Connection LED Indicator
T1	RESET	-	Reset Button
T2	WAKE-UP	-	Module Wake-Up Button
J1	J1	Unpopulated	Boot Control / FW Update UART Pins
J2	SWD	-	SWD Interface Connection Pads

LR 16 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Frequency Range	-	868	-	MHz
Output Power	-	13.4	-	dBm

Software Support

[LR 16 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

This example demonstrates the use of LR 16 Click board by showing the communication between two Click boards configured in P2P network mode.

Key Functions

- `lr16_cfg_setup` This function initializes Click configuration structure to initial values.
- `lr16_init` This function initializes all necessary pins and peripherals used for this Click board.
- `lr16_reset_device` This function resets the device by toggling the reset pin logic state.
- `lr16_cmd_run` This function sends a specified command to the Click module.
- `lr16_cmd_set` This function sets a value to a specified command of the Click module.

Application Init

Initializes the driver and logger.

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Application Task

Application task is split in few stages:

- LR16_POWER_UP:

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

- LR16_CONFIG_EXAMPLE:

Configures device for the LoRa P2P network mode.

- LR16_EXAMPLE:

Performs a LoRa P2P test example by exchanging messages with another LR 16 Click board.

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](#)

[Click boards™](#)

[ClickID](#)

Downloads

[LR 16 click example package](#)

[WIRL-LORA Daphnis-I \(2618011181000\) datasheet](#)

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[WIRL-LORA Daphnis-I \(2618011181000\) user manual](#)

[LR 16 click 2D and 3D files v100](#)

[LR 16 click schematic v100](#)

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