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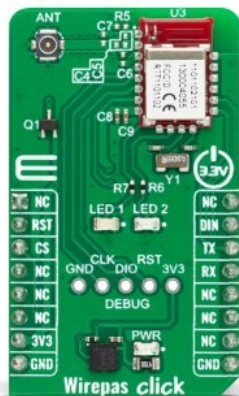www.mikroe.com

Wirepas Click

PID: MIKROE-5874

Wirepas Click is a compact add-on board that allows you to implement the Wirepas Mesh wireless connectivity stack to your application. This board features the WIRL-PRO2 Thetis-I (2611011021010), a radio module with Wirepas Mesh Protocol from Würth Elektronik. It supports creating a Wirepas routing mesh protocol and is optimized for ultra-low energy consumption. The large scalability is ideal for extensive IoT networks and can work as a host-controlled device. This Click board™ makes the perfect solution for developing long-life battery drive IoT networks, supply chains, asset tracking, smart lighting, smart metering, and more.

How does it work?

Wirepas Click is based on the WIRL-PRO2 Thetis-I, a radio module with Wirepas Mesh Protocol from Würth Elektronik. The module is meant to be integrated into Wirepas-based routing networks for wireless communication between devices or nodes. The module transmits data securely and reliably in the license-free 2.4 GHz band, which is globally available and features both authentication and encryption mechanisms. The WIRL-PRO2 Thetis-I module features small dimensions comparable to a nano-SIM card (8 mm x 12 mm), including an onboard PCB antenna, making the modules ideal for small-form-factor design.

Mikroe produces entire development toolchains for all major microcontroller architectures.
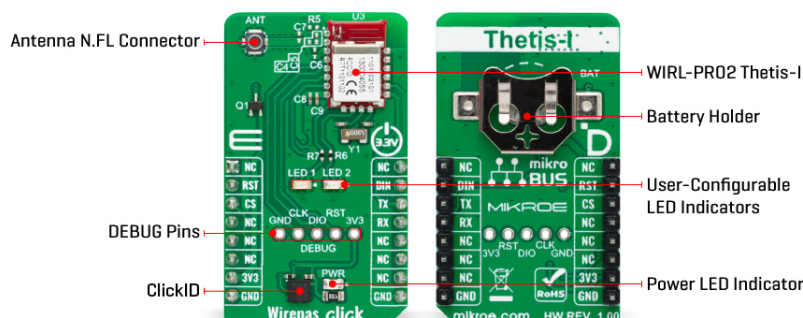Committed to excellency, we are dedicated to helping engineers bring the project development up to speed and achieve outstanding results.

ISO 27001: 2013 certification of informational security management system.
ISO 14001: 2015 certification of environmental management system.
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ISO 9001: 2015 certification of quality management system (QMS).

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The module works in a frequency range of 2402 up to 2480MHz with a data rate of up to 1Mbps. It is based on nRF52840, a 32-bit ARM Cortex-M4 microcontroller from Nordic Semiconductor. It is accompanied by 1MB of Flash and 256KB of RAM. It has a printed antenna with a smart antenna configuration (2-in-1 module), which allows up to +6dBm of transmit power and -92dBm sensitivity. The connectivity can be even better with an external one attached to the onboard N.FL connector from a vast MIKROE offer.

Wirepas Click can work as a beacon because of its very small power consumption. For this purpose, it is equipped with a backup battery. In addition, there are two user-configurable indication LEDs, LED1 and LED2 (blue and green). In addition, the Wirepas Click is also equipped with an unpopulated header for debugging purposes, which allows you direct communication to the Wirepas microcontroller.

Wirepas Click uses a standard 2-wire UART interface to communicate with the host MCU, supporting 115200bps of bitrate. You can reset the device over the RST pin. There is the DIN pin to observe the data flow, which is a data indication to the host MCU with an active Low logic state.

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	2.4 GHz Transceivers
Applications	Can be used for developing long-life battery drive IoT networks, supply chains, asset tracking, smart lighting, smart metering, and more
On-board modules	WIRL-PRO2 Thetis-I - radio module with Wirepas Mesh Protocol from Würth Elektronik
Key Features	Wirepas module, Wirepas routing mesh protocol optimized for ultra-low energy consumption, high scalability is ideal for large IoT networks, low-energy and low-latency

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	modus, remote nodes' configuration, printed or external antenna, and more
Interface	UART
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 Wirepas 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	**RST**	2	RST	INT	15	**DIN**	Data Indication
ID COMM	**CS**	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	NC	
Ground	**GND**	8	GND	GND	9	**GND**	Ground

Onboard settings and indicators

Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator
LD2-LD3	LED 1 - LED 2	-	User-Configurable LED Indicators

Wirepas Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Operating Frequency Range	2402	-	2480	MHz
Data Rate	-	-	1	Mbps
Sensitivity	-	-92	-	dBm
Line of Site Range	-	400	-	m

Software Support

We provide a library for the Wirepas 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

Mikroe produces entire development toolchains for all major microcontroller architectures.
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This library contains API for Wirepas Click driver.

Key functions

- wirepas_send_command Wirepas send command function.

- wirepas_write_csap_attribute Wirepas write CSAP attribute function.

- wirepas_send_data Wirepas send data function.

Example Description

This example demonstrates the use of Wirepas click board by processing the incoming data and displaying them on the USB UART in sink mode, and sending data to the sinks in router 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.

Other Mikroe Libraries used in the example:

- MikroSDK.Board
- MikroSDK.Log
- Click.Wirepas

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

[Wirepas click example on Libstock](#)

[WIRL-PRO2 datasheet](#)

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

[Wirepas click schematic](#)

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