

ISM 7 Click



PID: MIKROE-6611

ISM 7 Click is a compact add-on board designed for long-range, low-power wireless communication in the 868MHz SRD band. It is based on the Tarvos-III ([2609011081000](https://www.wuerth-elektronik.com/en/2609011081000)) radio module from [Würth Elektronik](https://www.wuerth-elektronik.com/), which integrates the TI CC1310 sub-GHz transceiver with an onboard antenna. The board supports communication ranges up to 300 meters line-of-sight, features low-power operation, and includes both command and transparent UART modes for flexible data handling. It also offers Flooding Mesh networking, support for up to 65,535 devices, and an integrated software stack for quick deployment. ISM 7 Click is ideal for smart metering, industrial monitoring, building automation, agriculture, and other sub-GHz IoT applications.

For more information about **ISM 7 Click** visit the official [product page](#).

How does it work?

ISM 7 Click is based on the Tarvos-III (2609011081000) radio module from Würth Elektronik, designed for operation within the 868MHz SRD frequency band. This module integrates a high-performance sub-GHz transceiver, the Texas Instruments CC1310, which incorporates a 32-bit ARM Cortex-M3 processor, 128kB of Flash memory, and 20kB of RAM, enabling both communication handling and custom application code execution. The frequency range supported by the module spans from 863MHz to 870MHz, offering reliable connectivity over distances of up to 300 meters in line-of-sight conditions. With a transmission output power of -8dBm and an impressive receiver sensitivity of -104dBm, ISM 7 Click ensures stable wireless communication even in challenging environments. This Click board™ is ideal for a wide range of wireless communication applications such as smart metering, industrial monitoring, building automation, agricultural sensing systems, logistics tracking, and other long-range, low-power

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.

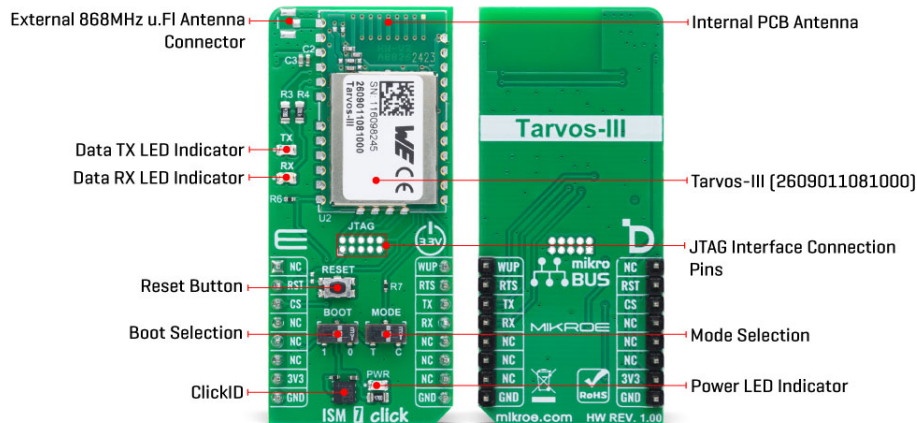


ISO 27001: 2013 certification of informational security management system.
 ISO 14001: 2015 certification of environmental management system.
 OHSAS 18001: 2008 certification of occupational health and safety management system.



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

IoT applications that operate within the sub-GHz spectrum.



The module's design emphasizes energy efficiency, making it suitable for battery-powered and low-power applications. It features an integrated software stack that supports advanced networking functionalities, including Flooding Mesh technology, which enables robust multi-hop communication across wide sensor networks. The addressing system is highly flexible, allowing up to 65,535 devices to be organized into 255 independent networks, ideal for scalable IoT deployments.

This Click board™ communicates with the host MCU through a UART interface using the standard UART RX and TX pins, and hardware flow control pin (RTS - Ready to Send) for data transfer. The default communication speed is set at 115200bps. It also features two onboard configuration switches - BOOT and MODE - that allow users to easily control the module's startup behavior. The BOOT switch is used to select the desired boot mode: when set to position 0, the module starts with the pre-loaded application firmware, while setting it to position 1 enables the UART bootloader mode, which is used for performing firmware updates. The MODE switch determines the module's operational mode during startup.

By setting the MODE switch to position 0 during boot, the module enters command mode, allowing the user to send AT-style commands for configuration and control. Alternatively, setting the MODE switch to position 1 during boot places the module into transparent mode, in which all incoming UART data is transmitted directly over the air. Along with the communication and control pins, this Click board™ also includes a reset pin (RST) and a RESET button, enabling easy module resetting, WUP pin used to wake up the module from shutdown mode, and a set of data LEDs, green TX and red RX, for successful data transmission and reception.

The Tarvos-III (2609011081000) module features an onboard antenna for standard operation. However, since the module footprint remains the same, this board can also accommodate alternative Tarvos-III version (2609011181000) that support external antenna. For such cases, the board includes an unsoldered external antenna connector, allowing integration of antennas such as the [ISM 868/915MHz Active PCB Antenna](#). In addition, the board also features pads for JTAG interface signals, an industry-standard solution for verifying designs and testing printed circuit boards.

NOTE: Although the Hyperion-I (AMB1981) or Hyperion-II (AMB1982) 868MHz antennas are officially recommended, the ISM 868/915MHz Active PCB Antenna can also be used, as it

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).

supports the same frequency range. With a slightly higher peak gain of +0.8 dB, it may even improve signal strength in certain scenarios, depending on the application and environment.


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.

Specifications

Type	Sub-1 GHz Transceivers
Applications	Ideal for smart metering, industrial monitoring, building automation, agriculture, and other sub-GHz IoT applications
On-board modules	Tarvos-III (2609011081000) - radio module from Würth Elektronik
Key Features	Sub-GHz radio communication, integrated antenna, optional external antenna support, UART interface with command and transparent modes, low-power operation, Flooding Mesh networking capability, integrated software stack, support for up to 65,535 nodes in 255 networks, onboard BOOT and MODE configuration switches, 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 ISM 7 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	WUP	Module Wake-Up
Reset	RST	2	RST	INT	15	RTS	UART RTS
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
-------	------	---------	-------------

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).

LD1	PWR	-	Power LED Indicator
LD2	TX	-	Data TX LED Indicator
LD3	RX	-	Data RX LED Indicator
T1	RESET	-	Reset Button
SW2	MODE	Right	Mode Selection T/C: Left position T, Right position C
SW3	BOOT	Right	Boot Selection 1/0: Left position 1, Right position 0

ISM 7 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Frequency Range	863	868	870	MHz
Output Power	-	-	-8	dBm
RX Sensitivity	-	-104	-	dBm
Line-of-Sight Range	-	-	300	m

Software Support

[ISM 7 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 ISM 7 Click board by showing the communication between two Click boards.

Key Functions

- `ism7_cfg_setup` This function initializes Click configuration structure to initial values.
- `ism7_init` This function initializes all necessary pins and peripherals used for this Click board.
- `ism7_send_cmd` This function sends a desired command packet from the Click context object.
- `ism7_read_event` This function reads an event packet from the ring buffer and stores it in the Click context object.
- `ism7_get_user_setting` This function reads data from the desired user settings index and stores it in the Click context event packet object.

Application Init

Initializes the driver, resets the Click board, reads the device info, and sends a message to initiate the communication with other Click board.

Application Task

Reads and parses all the received event packets and displays them the USB UART. All incoming data messages received from the connected device will be echoed back.

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).

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

[ISM 7 click example package](#)

[ISM 7 click 2D and 3D files v100](#)

[ISM 7 click schematic v100](#)

[Tavros-III \(2609011081000\) datasheet](#)

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).