

Cordelia-I Click



PID: MIKROE-6909

Cordelia-I Click is a compact add-on board for secure WLAN connectivity and cloud access for IoT applications. It is based on the Cordelia-I ([2610011025010](https://www.wuerth-elektronik.com/en/2610011025010)) WLAN radio module from [Würth Elektronik](https://www.wuerth-elektronik.com/). This module supports IEEE 802.11 b/g/n operation in the 2.4GHz band, communicates with the host through a UART interface with RTS/CTS hardware flow control, and can be configured using an AT-style command set, while independently managing secure cloud connectivity after setup. It also supports MQTT over TLS, encrypted and non-encrypted MQTT channels, a tamper-proof root-of-trust, QuarkLink™ zero-touch provisioning, multiple boot and operation modes, selectable antenna configuration. It is well suited for smart home devices, industrial monitoring, asset tracking, and other embedded IoT applications requiring secure and compliant wireless cloud connectivity.

For more information about **Cordelia-I Click** visit the official [product page](#).

How does it work?

Cordelia-I Click is based on the Cordelia-I (2610011025010) WLAN radio module from Würth Elektronik. Based on the IEEE 802.11 b/g/n standard, this module operates in the 2.4GHz frequency range from 2412MHz to 2472MHz, delivering a maximum output power of 18dBm with a typical value of 16dBm, making it suitable for low-power and low-to-medium throughput IoT applications. The Cordelia-I module is made to act as a communication bridge between a host MCU and cloud platforms, enabling easy data exchange and remote monitoring capabilities. Fully compliant with RED directives, including the delegated cybersecurity regulation 2022/30 according to the EN18031-1 standard, the Cordelia-I module ensures a high level of security and regulatory readiness, making it a dependable wireless solution for IoT devices that require secure cloud connectivity, such as smart home systems, industrial

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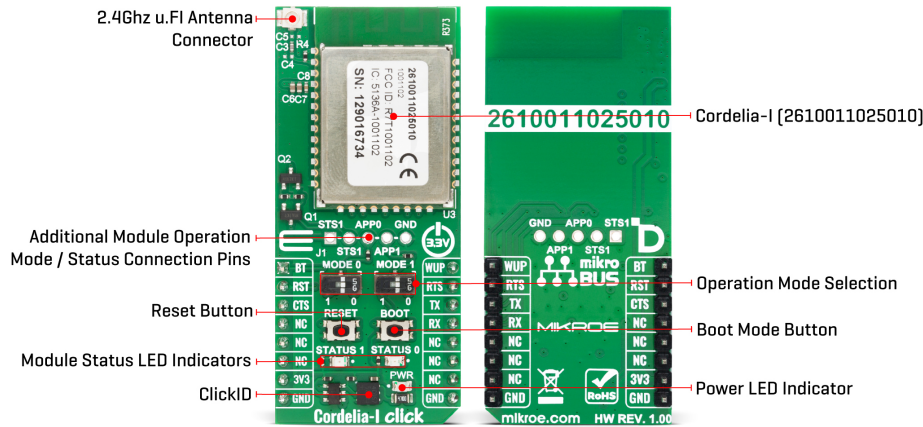


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monitoring, asset tracking, and other connected embedded applications.



This board communicates with the host MCU through a UART interface using TX and RX signal lines, with additional RTS and CTS pins available for hardware flow control and data handling. UART serves as the main control and communication interface between the Cordelia-I module and the host system, allowing the module to be fully configured and managed through an AT-style command set. After configuration, the module can independently maintain secure cloud connectivity, which reduces the processing burden on the host MCU and allows it to focus on the main application tasks.

For cloud communication, the module primarily relies on MQTT over TLS, enabling secure data exchange with cloud services (MQTT data transfer over both encrypted and non-encrypted channels). The module also incorporates a unique and tamper-proof root-of-trust, which provides a strong security foundation for establishing trusted communication channels that remain independent of the actual payload or application data. In addition, the Cordelia-I module supports out-of-the-box connectivity to the QuarkLink™ platform from Crypto Quantique, for secure and scalable zero-touch provisioning as well as simplified cloud onboarding of deployed end devices in the field.

In addition to its primary communication interface, Cordelia-I Click provides several extra control and status features that simplify module management. The board includes an RST signal on the mikroBUS™ socket, complemented by a RESET button, both serving the same purpose of resetting the Cordelia-I module when needed. It also features a BT signal on the mikroBUS™ socket together with a BOOT button, which share the same function and are used during module boot-related control operations. A WUP pin is available for waking the module from Sleep mode, enabling support for low-power application scenarios where power efficiency is important. For flexible configuration, the board is equipped with MODE 0 and MODE 1 operation mode switches, which determine the startup behavior of the Cordelia-I module depending on their position.

Using these switches, the module can boot into one of several operating modes, including AT command normal mode, FOTA mode, provisioning mode, or transparent mode, giving developers access to different functional states REQUIRED for configuration, firmware updates, commissioning, or data transport. Status monitoring is supported through onboard LED indicators, where the yellow Status 1 LED signals a successful WLAN connection and the green Status 0 LED indicates that a FOTA update has started. The board also offers additional flexibility through an unsoldered header that provides extended access to the module's

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operation mode control pins and status indication pins, which can be useful for debugging, external monitoring, or custom hardware integration. Alongside this, it features a flexible antenna configuration with a u.FI connector that allows selection between the module's internal antenna and an external 2.4GHz antenna, with the internal antenna used by default.


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	WiFi
Applications	Ideal for smart home devices, industrial monitoring, asset tracking, and other embedded IoT applications
On-board modules	Cordelia-I (2610011025010) - WLAN radio module from Würth Elektronik
Key Features	IEEE 802.11 b/g/n WLAN connectivity, UART interface, AT-style command interface, MQTT over TLS support, encrypted and non-encrypted MQTT data transfer, unique tamper-proof root-of-trust, out-of-the-box QuarkLink™ support for zero-touch provisioning and cloud onboarding, multiple operating modes, selectable antenna configuration, 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 Cordelia-I Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin					Pin	Notes
Boot Mode Control	BT	1	AN	PWM	16	WUP	Module Wake Up
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	NC	
Ground	GND	8	GND	GND	9	GND	Ground

Onboard settings and indicators

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Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator
LD2	STATUS 1	-	WLAN Connection LED Indicator
LD3	STATUS 2	-	FOTA Update LED Indicator
SW1-SW2	MODE 0 - MODE 1	-	Module Operation Mode Selection 1/0: Left position 1, Right position 0
T1	RESET	-	Reset Button
T2	BOOT	-	Boot Mode Button

Cordelia-I Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Frequency Range	2412	-	2472	MHz
RF Output Power	-	16	18	dBm

Software Support

[Cordelia-I 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 the Cordelia-I Click board to connect to a WiFi access point and establish an MQTT connection to a public broker. After the initial device setup and network configuration, the application publishes a predefined message to the selected MQTT topic and waits for an echo/receive indication from the module, printing all responses on the UART terminal.

Key Functions

- `cordeliai_cfg_setup` This function initializes Click configuration structure to initial values.
- `cordeliai_init` This function initializes all necessary pins and peripherals used for this Click board.
- `cordeliai_reset_device` This function resets the device by toggling the RST pin state.
- `cordeliai_cmd_run` This function sends a specified command to the Click module.
- `cordeliai_generic_read` This function reads a desired number of data bytes by using UART serial interface.

Application Init

Initializes the logger and Cordelia-I Click driver, then prepares the example state machine. The application starts in the POWER UP state, where the device is reset, communication is verified, factory settings are restored, and system information is read. After successful initialization, the application proceeds to the connection configuration state.

Application Task

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Application task is split in few stages:

- CORDELIAI_POWER_UP:

Performs device reset, factory reset, and reads version info.

- CORDELIAI_CONFIG_CONNECTION:

Connects to the configured WiFi network and sets MQTT parameters (endpoint, port, client ID, flags, subscribe/publish topic names), then connects to the MQTT server.

- CORDELIAI_EXAMPLE:

Periodically publishes a message to the MQTT topic and waits for the module receive indication, logging all traffic to the UART terminal.

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

[Cordelia-I click example package](#)

[Cordelia-I click 2D and 3D files v100](#)

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[Cordelia-I click schematic v100](#)

[Cordelia-I \(2610011025010\) datasheet](#)

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