

RN4678 Click



PID: MIKROE-2545

RN4678 Click is a compact add-on board that provides BT/BLE connectivity for any embedded application. This board features the RN4678, a Bluetooth 4.2 dual-mode module from Microchip. Data transfer is achieved through Bluetooth by sending or receiving data through SPP in Bluetooth (BT) Classic mode and Transparent UART in BLE mode. Over the onboard Bluetooth chip antenna, the module can achieve up to 32Kbps in a Bluetooth classic mode (BR/EDR). This Click board™ makes the perfect solution for the development of IoT applications, secure payment, home and security, health and fitness, industrial and data logger, and other similar applications that require Bluetooth connectivity.

RN4678 Click is supported by a [mikroSDK](#) compliant library, which includes functions that simplify software development. This [Click board™](#) comes as a fully tested product, ready to be used on a system equipped with the [mikroBUS™](#) socket.

How does it work?

RN4678 Click is based on the RN4678, a Bluetooth 4.2 dual-mode module from Microchip. It is built around Microchip's IS1678 Bluetooth dual-mode chip. The module includes an onboard Bluetooth stack, power management subsystem, 2.4 GHz transceiver, and RF power amplifier. It uses a transparent UART mode for seamless serial data over Bluetooth Classic using Serial Port Profile (SPP) and Bluetooth Low Energy (BLE) using Generic Attribute (GATT) Profile. In addition, the module supports also GAP, ATT, SMP, and L2CAP profiles (backward compatibility with Bluetooth 3.2). As for security, RN4678 supports AES128 encryption and Bluetooth 4.2 LE secure connection.

The firmware on RN4678 can be upgraded in the field over UART, and besides the library we

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provide, you can use an ASCII set of commands to program the module. Two status LEDs, STAT1 and STAT2, indicate one of four module statuses. For instance, STAT2 will light when the module is connected. The RN4678, as a power LED indicator, uses a dedicated LED driver integrated into the module to indicate one of five statuses over the configurable flashing sequence.

There are three jumpers labeled JP1, JP2, and JP3. By combining those jumpers, you can set the module's operational mode. You can choose between Write Flash mode, Write EEPROM and test mode, and a Normal operation/application mode. The module comes with Normal operation/application mode, which is set by default.

RN4678 uses a standard 2-Wire UART interface to communicate with the host MCU, supporting UART RTS and CTS control flow pins. Besides the UART interface, you can use a standard 2-Wire I2C interface to communicate with the host MCU, but without our support library. In addition, there is an RST pin for resetting the device, a WKUP pin to wake up from sleep mode, and a SW_BT PIN as a software button that acts as a power switch. After turning the module On over this pin, you must wait for a specific time before sending the first command.

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. However, the Click board™ comes equipped with a library containing functions and an example code that can be used as a reference for further development.

Specifications

Type	BT/BLE
Applications	Can be used for the development of IoT applications, secure payment, home and security, health and fitness, industrial and data logger, and other similar applications that require Bluetooth connectivity
On-board modules	RN4678 - Bluetooth 4.2 dual-mode module from Microchip
Key Features	Bluetooth 4.2, BLE, secure AES128 encryption, Bluetooth 4.2 LE secure connections, data packet length extension, transparent UART mode, dedicated LED driver, onboard Bluetooth stack, power management system, 2.4GHz transceiver, and RF power amplifier, onboard Bluetooth chip antenna, and more
Interface	I2C,UART
Feature	No ClickID
Compatibility	mikroBUS™
Click board size	M (42.9 x 25.4 mm)
Input Voltage	3.3V

Pinout diagram

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This table shows how the pinout on RN4678 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin					Pin	Notes
Software Button	SW_B T N	1	AN	PWM	16	WKUP	Sleep Wake-Up
Reset	RST	2	RST	INT	15	CTS	UART CTS
UART RTS	RTS	3	CS	RX	14	TX	UART TX
	NC	4	SCK	TX	13	RX	UART RX
	NC	5	MISO	SCL	12	SCL	I2C Clock
	NC	6	MOSI	SDA	11	SDA	I2C Data
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	STAT2	-	Status 2 LED Indicator
LD2	PWR	-	Power LED Indicator
LD3	STAT1	-	Status 1 LED Indicator
JP1	JP1	Left	System configuration - Along with JP2 and JP3 pins, used to set the module in any of the following three modes: Application mode (for normal operation), Test mode (to change EEPROM values), and Write Flash mode (to enter the new firmware into the module);
JP2	JP2	Left	System configuration - Along with JP1 and JP3 pins, used to set the module in any of the following three modes: Application mode (for normal operation), Test mode (to change EEPROM values), and Write Flash mode (to enter the new firmware into the module);
JP3	JP3	Left	System configuration - Along with JP1 and JP2 pins, used to set the module in any of the following three

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			modes: Application mode (for normal operation), Test mode (to change EEPROM values), and Write Flash mode (to enter the new firmware into the module);
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RN4678 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Operating Frequency	2402	-	2480	MHz
Data Throughput	-	-	32	Kbps

Software Support

We provide a library for the RN4678 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 RN4678 Click driver.

Key functions

- Enter the command mode function
- Exit the command mode function
- Set the device name function

Example Description

This example reads and processes data from RN4678 clicks.

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.Rn4678

Additional notes and informations

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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™](#)

[Click board™ Catalog](#)

[Click Boards™](#)

Downloads

[RN4678 click schematic v100](#)

[RN4678 datasheet](#)

[RN4678 click example on Libstock](#)

[RN4678 click 2D and 3D files](#)

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