

## WiFi 11 Click



PID: MIKROE-4245

WiFi 11 Click is a compact add-on board that contains a WiFi and Bluetooth module that has dual bands for WiFi communication. This board features the BW16, a low-power dual bands Wireless LAN (WLAN) and Bluetooth Low Energy SoC module from Shenzhen B&T Technologies Co., Ltd. This module supports the WiFi 5G and Bluetooth Low Energy 5.0, it consists of a high-performance MCU on a module named KM4, a low power MCU named KM0, WLAN (802.11 a/b/g/n) MAC, a 1T1R capable WLAN baseband, RF, Bluetooth, and peripherals. An inner antenna and many interfaces are available in this WiFi and Bluetooth module. This Click board™ is suitable for industrial wireless control, Bluetooth gateway, security ID tags, smart home applications, and many more.

WiFi 11 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?

WiFi 11 Click is based on the BW16, a low-power dual bands Wireless LAN (WLAN) module from [Ai-Thinker](#). The BW16 module represents a highly integrated WiFi SoC based on the RTL8720DN, a highly integrated Single-Chip with low-power dual bands (2.4GHz and 5GHz), and a Wireless LAN (WLAN). It consists of a high-performance MCU (ARM V8M, Cortex-M4F instruction compatible) named KM4, a low-power MCU (ARM V8M, Cortex-M0 instruction compatible) named KM0, WLAN (802.11 a/b/g/n) MAC, a 1T1R capable WLAN baseband, RF, and other peripherals. The BW16 integrates internal memory for complete WiFi protocol functions. The embedded memory configuration also provides simple application developments.

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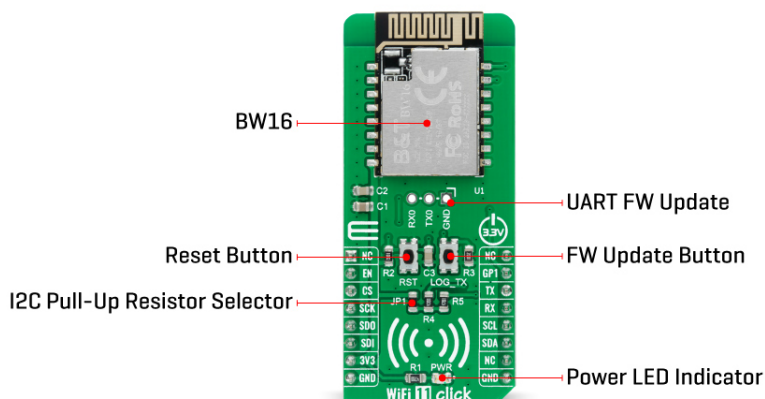
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WiFi 11 Click communicates with the MCU using the UART interface at 57600 bps as its default communication protocol, but the user can also use other interfaces, such as SPI and I2C if he wants to configure the module and write the library himself. A jumper JP1 on this Click board™ also enables the necessary pull-up resistors on the SCL and SDA lines of I2C communication.

**NOTE:** After the primary module initialization and before uploading any program, the user should write network and TCP server parameters.

Additional functionality, such as the Chip Enable button labeled as RST, used to Enable or put the module in Shut-Down mode, is provided and routed at the EN pin of the mikroBUS™ socket. Alongside this pin, this Click board™ has one general purpose pin GP1 routed at the INT pin of the mikroBUS™ socket, which can be used in various cases like interrupt or some other purposes. WiFi 11 Click also has an additional header with UART RX0 and TX0 module pins and a button labeled LOG\_TX, which can be used for Firmware Update or as a low-power mode Wake-Up function.

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             | WiFi                                                                                                                                                  |
| Applications     | Can be used for industrial wireless control, security ID tags, smart home applications, and many more                                                 |
| On-board modules | BW16 - low-power dual bands Wireless LAN (WLAN) SoC module from Ai-Thinker                                                                            |
| Key Features     | Ultra-low power consumption, support low-power Tx/Rx for short-range applications, supported TrustZone-M and Secure boot, eFuse protection, and more. |
| Interface        | I2C,SPI,UART                                                                                                                                          |
| ClickID          | No                                                                                                                                                    |

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|                  |                     |
|------------------|---------------------|
| 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 WiFi 11 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 | NC         |                     |
| Chip Enable     | <b>EN</b>   | 2         | RST  | INT | 15 | <b>GP1</b> | General Purpose Pin |
| SPI Chip Select | <b>CS</b>   | 3         | CS   | RX  | 14 | <b>TX</b>  | UART TX             |
| SPI Clock       | <b>SCK</b>  | 4         | SCK  | TX  | 13 | <b>RX</b>  | UART RX             |
| SPI Data OUT    | <b>SDO</b>  | 5         | MISO | SCL | 12 | <b>SCL</b> | I2C Clock           |
| SPI Data IN     | <b>SDI</b>  | 6         | MOSI | SDA | 11 | <b>SDA</b> | I2C Data            |
| Power Supply    | <b>3.3V</b> | 7         | 3.3V | 5V  | 10 | NC         |                     |
| Ground          | <b>GND</b>  | 8         | GND  | GND | 9  | <b>GND</b> | Ground              |

## Onboard settings and indicators

| Label | Name   | Default | Description                   |
|-------|--------|---------|-------------------------------|
| LD1   | PWR    | -       | Power LED Indicator           |
| JP1   | -      | -       | I2C Pull-Up Resistor Selector |
| J1    | M1X3   | -       | UART FW Update Header         |
| T1    | LOG_TX | -       | FW Update Button              |
| T2    | RST    | -       | Chip Enable Button            |

## WiFi 11 Click electrical specifications

| Description          | Min           | Typ | Max           | Unit |
|----------------------|---------------|-----|---------------|------|
| Supply Voltage       | -             | 3.3 | -             | V    |
| Frequency Range      | 2.412 / 5.180 | -   | 2.484 / 5.825 | GHz  |
| Receiver Sensitivity | -             | -92 | -             | dBm  |
| Transmit Power       | -             | 7±2 | -             | dBm  |

## Software Support

We provide a library for the WiFi 11 Click on our [LibStock](#) page, as well as a demo application (example), developed using MikroElektronika [compilers](#). The demo can run on all the main MikroElektronika [development boards](#).

## Library Description

The library contains a basic functions for using WiFi 11 click.

Key functions:

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- void wifi11\_set\_conect\_to\_ap( char \*username, char \*password ) - Connect to AP
- void wifi11\_send\_command ( uint8\_t \*cmd ) - Send command

## Examples description

The application is composed of three sections :

- System Initialization - Initializes UART module and all necessary GPIO pins
- Application Initialization - Initializes driver module and start sends AT comands.
- Example : TCP client - Please, before the uploaded program you should write network parameters and TCP server parameters.

The full application code, and ready to use projects can be found on our [LibStock](#) page.

Other mikroE Libraries used in the example:

- UART Library

## 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. The terminal available in all MikroElektronika [compilers](#), or any other terminal application of your choice, can be used to read the message.

## mikroSDK

This Click board™ is supported with [mikroSDK](#) - MikroElektronika 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™](#)

## Downloads

[WiFi 11 click example on Libstock](#)

[WiFi 11 click 2D and 3D files](#)

[WiFi 11 click schematic](#)

[BW16 datasheet](#)

[BW16 AT command guide](#)

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