

ESP8684 Click



PID: MIKROE-5803

ESP8684 Click is a compact add-on board that contains a wireless combo module. It features the [ESP8684-MINI-1](#), a highly integrated WiFi, and a Bluetooth 5 module from [Espressif Systems](#). It simultaneously supports BSS in Station mode, SoftAP mode, Station + SoftAP mode, and promiscuous mode. As for the Bluetooth 5, the module supports central role and peripheral role. In addition, ESP8684 Click allows you to upgrade or upload your custom software on the ESP8684 module over the USB C connector. This Click board™ makes the perfect solution for the development of smart home applications, industrial automation, consumer electronics, health care, smart agriculture, and more.

ESP8684 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?

ESP8684 Click is based on the ESP8684-MINI-1, a highly integrated WiFi, and a Bluetooth 5 module from Espressif Systems. It is based on the ESP8684H2 embedded 32-bit RISC-V single-core processor operating at up to 120MHz frequency. The processor also has an on-chip 576KB of ROM and 272KB of SRAM memory, supporting flash in-circuit programming (ICP). It also features an internal co-existence mechanism between WiFi and Bluetooth to share the same printed PCB antenna. The downside is that you can't use both WiFi and Bluetooth at the same time.

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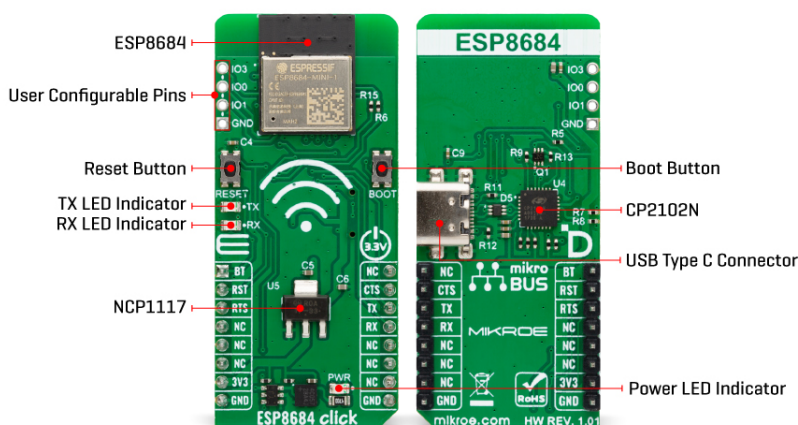
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ESP8684 Click is an IEEE802.11b/g/n-compliant and supports 20MHz bandwidth in the 2.4GHz band. In 1T1R mode, it can achieve data rates of up to 72.2Mbps. In addition, the module supports WiFi Multimedia (WMM), fragmentation and defragmentation, transmit opportunity (TXOP), automatic beacon monitoring hardware (hardware TSF), and more. As for Bluetooth, the module can achieve speeds of 125kbps, 500kbps, 1Mbps, and 2Mbps. The security features secure boot, flash encryption, 1024-bit OTP up to 256 bits for use, cryptographic hardware acceleration, and more.

This Click board™ is equipped with a USB type C connector and circuits that allow you to establish direct communication between the ESP8684 module and a PC. This communication can be used for testing purposes or for upgrading the software. For uploading software to the ESP8684 module, there is an auto-reset circuit and the [CP2102N](#), a USB-to-UART bridge from Silicon Labs. Two LEDs, RX and TX, are there to confirm the data exchange over this bridge visually. In addition, two buttons, RESET, and BOOT, allow you to enter the ESP8684's boot mode. Finally, a header contains 3 GPIOs and a GND for user configuration and can be used for an analog interface.

ESP8684 Click uses a standard 2-Wire UART interface to communicate with the host MCU with commonly used UART RTS and CTS control flow pins. Besides the available software and libraries we provide, you can use a set of AT commands to program the ESP8684 module. In addition to the UART bridge and two onboard buttons, you can enter the ESP8684's boot mode via RST and BT pins of the mikroBUS™ socket. Thanks to the onboard [NCP1117](#) LDO, which converts USB voltage into the 3.3V necessary for operation, this board can be standalone independent of the mikroBUS™ socket.

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	BT/BLE,WiFi
Applications	Can be used for the development of smart home applications, industrial automation, consumer electronics, health care, smart agriculture, and more

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On-board modules	ESP8684-MINI-1 - highly integrated WiFi, and a Bluetooth 5 module from Espressif Systems
Key Features	Highly integrated module, printed PCB antenna, ESP8684 32-bit RISC-V single core processor at 120MHz (272KB SRAM, 576KB ROM), WiFi 802.11b/g/n modes (Station, SoftAP, Station+SoftAP, promiscuous), WiFi Multimedia, Bluetooth 5, high power mode 20dBm, multiple advertisement sets, and more
Interface	UART,USB
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 ESP8684 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin					Pin	Notes
Boot Signal	BT	1	AN	PWM	16	NC	
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	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
LD2	PWR	-	Power LED Indicator
LD3	TX	-	UART TX LED Indicator
LD4	RX	-	UART RX LED Indicator
T1	BOOT SIGNAL	-	Boot Button
T2	RESET	-	Reset Button

ESP8684 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
WiFi Operating Frequency	2412	-	2484	MHz
WiFi Data Rate	-	-	72.2	kbps
Bluetooth Operating Frequency	2402	-	2480	MHz

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Bluetooth Data Rate	125	-	2000	kbps
UART Data Rate	-	-	2.5	Mbps

Software Support

We provide a library for the ESP8684 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 ESP8684 Click driver.

Key functions

- esp8684_send_cmd ESP8684 send command with arguments function.
- esp8684_send_query_cmd ESP8684 send query command function.
- esp8684_connect_to_network ESP8684 connect to network function.

Example Description

This example connects to the desired WiFi network and then connects to the TCP/UDP server, writes then reads data to and from it.

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.ESP8684

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](#).

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Resources

[mikroBUS™](#)

[mikroSDK](#)

[Click board™ Catalog](#)

[Click boards™](#)

[ClickID](#)

Downloads

[NCP1117 datasheet](#)

[CP2102N datasheet](#)

[ESP8684 click 2D and 3D files](#)

[ESP8684 click schematic](#)

[ESP8684 click example on Libstock](#)

[ESP8684-MINI-1 datasheet](#)

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