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# WiFi ESP click

PID: MIKROE-2542



**WiFi ESP click** carries the ESP-WROOM-02 module that integrates ESP8266EX. The click is designed to run on a 3.3V power supply. It communicates with the target microcontroller over UART interface and the following pins on the mikroBUS™ line: RST, CS.

## Access point and WiFi client mode

WiFi ESP click can function in both **AP (Access Point)** WiFi mode, as well as in **WiFi client mode**. The click brings easy implementation and usage.

The module supports the following network protocols: **IPv4/TCP/UDP/HTTP/FTP**. Thanks to this the click can operate as a *client device* requesting a file from a *file server device* (FTP - file transfer protocol) in local network systems, or request a web page via internet (IP/TCP/HTTP). It can also be used as a small *web server*, for example a wireless weather station prototype, etc.

Station mode is default when the click is in WiFi client mode.

## ESP-WROOM-02 module features

ESP-WROOM-02 carries ESP8266EX highly integrated Wi-Fi SoC solution to meet the continuous demands for efficient power usage, compact design and reliable performance in the industry.

Besides the Wi-Fi functionalities, ESP8266EX integrates an enhanced version of Tensilica's L106 Diamond series 32-bit processor and on-chip SRAM. As well as antenna switches, RF balun, power amplifier, low noise receiver amplifier, filters and power management modules.

With the complete and self-contained Wi-Fi networking capabilities, it can perform as either a standalone application (WROOM module itself) or the slave to an MCU host which is the primary intention of the click board as a whole. So, this click board is applied to any microcontroller design as a Wi-Fi adaptor through UART interface (RX,TX lines on mikroBUS pin socket).

For more information see the datasheet.

[http://www.espressif.com/sites/default/files/documentation/0c-esp-wroom-02\\_datasheet\\_en.pdf](http://www.espressif.com/sites/default/files/documentation/0c-esp-wroom-02_datasheet_en.pdf)

## Advanced usage

There are additional pad headers onboard (HSPI/GPIO interface of the module) for advanced usage.

For more information see the Documentation tab.

## Key features

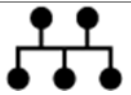
- ESP-WROOM-02 module
  - 802.11 b/g/n
  - Protocols: IPv4/TCP/UDP/HTTP/FTP
  - Frequency range: 2.4 GHz ~ 2.5 GHz
  - 32-bit processor
  - on chip SRAM
- PCB antenna
- UART interface
- 3.3V power supply

Product Type	Wi-Fi
Applications	Create smart appliances, home automation systems, wireless data loggers, etc
MCU	ESP-WROOM-02
Key Features	Protocols: IPv4, TCP/UDP/HTTP/FTP, 802.11 b/g/n standard, UART interface, 3.3V power supply

Key Benefits	The click can function in both AP mode and WiFi client mode
Interface	UART
Power Supply	3.3V
Compatibility	mikroBUS
Click board size	M (42.9 x 25.4 mm)

## Pinout diagram

This table shows how the pinout on **WiFi ESP click** corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	 mikroBUS™				Pin	Notes
Not connected	NC	1	AN	PWM	16	NC	Not connected
HW Reset	RST	2	RST	INT	15	NC	Not connected
Chip enable (active high)	EN	3	CS	TX	14	TX	UART0_TXD / Transmit end in UART download (program) mode
Not connected	NC	4	SCK	RX	13	RX	UART0_RXD / Receive end in UART download (program) mode
Not connected	NC	5	MISO	SCL	12	NC	Not connected
Not connected	NC	6	MOSI	SDA	11	NC	Not connected
Power supply	+3.3V	7	3.3V	5V	10	NC	Not connected
Ground	GND	8	GND	GND	9	GND	Ground

## Additional pins

Name	I/O	Description
CLK	IO	HSPI_CLK / GPIO14
SDO	IO	HSPI_MISO / GPIO12
SDI	IO	HSPI_MOSI / GPIO13
CS	IO	HSPI_CS / GPIO15
IO0	IO	GPIO0 (UART download mode - pull down, Flash boot - pull up)
GND		GND

## Buttons and LEDs

Designator	Name	Type (LED, BUTTON...)	Description
LD1	PWR	LED	Power Supply ON

## Programming

Code examples for WiFi ESP click, written for MikroElektronika hardware and compilers are available on [Libstock](#).

### *Code snippet*

This code snippet configures GPIO ports, initializes the display and prepares the WiFi module. In an endless loop, LED is enabled or disabled by a button, and that information is then sent to the server.

```
01 void main() {
02
03 // Initialize variables
04 length = 0;
05 state = 0;
06 response_rcvd = 0;
07 responseID = 0;
08 response = 0;
09 i = 0;
10
11 // GPIO Direction
```

```

12  GPIO_Digital_Input( &GPIOA_IDR, _GPIO_PINMASK_4 );
13  GPIO_Digital_Output( &GPIOD_BASE, _GPIO_PINMASK_13 );
14  GPIO_Digital_Output( &GPIOC_BASE, _GPIO_PINMASK_2 );
15  GPIO_Digital_Output( &GPIOA_ODR, _GPIO_PINMASK_0 );
16
17  // UART Initialization
18  UART3_Init_Advanced( 115200, _UART_8_BIT_DATA,
19                      _UART_NOPARITY,
20                      _UART_ONE_STOPBIT,
21                      &_GPIO_MODULE_USART3_PD89);
22
23  // Enable Interrupts
24  RXNEIE_USART3_CR1_bit = 1;
25  NVIC_IntEnable( IVT_INT_USART3 );
26  EnableInterrupts();
27
28  display_init();
29
30  // Initialize WiFi module
31  WiFi_Init();
32
33  // Setting WiFi Mode - SoftAP + station mode
34  WiFi_Configure();
35
36  state = 100;
37  i = 0;
38
39  TFT_Write_Text("Please connect to your STAIP...", 50, 100);
40  Delay_ms(20000);
41  WiFi3_Send();
42  TFT_Write_Text("Entering button toggling loop.", 50, 150);
43
44  LED_switching = 1;
45
46  while( 1 )
47  {
48      // detect logical one on PA4 pin
49      if (Button(&GPIOA_IDR, 4, 1, 1))
50      {
51          oldstate_A4 = 1;
52      }
53      // detect logical one-to-zero transition on PA4 pin
54      if (oldstate_A4 && Button(&GPIOA_IDR, 4, 1, 0))
55      {
56          if ( !strcmp(txt_state_A0, "OFF

```

```
" ))
57     {
58         strncpy( txt_state_A0, "ON
", 8 );
59         GPIOA_ODR.B0 = 1;
60     }
61     else
62     {
63         strncpy( txt_state_A0, "OFF
", 8 );
64         GPIOA_ODR.B0 = 0;
65     }
66     oldstate_A4 = 0;
67     A0_change = true;
68     WiFi3_Send();
69 }
70 }
71 }
```