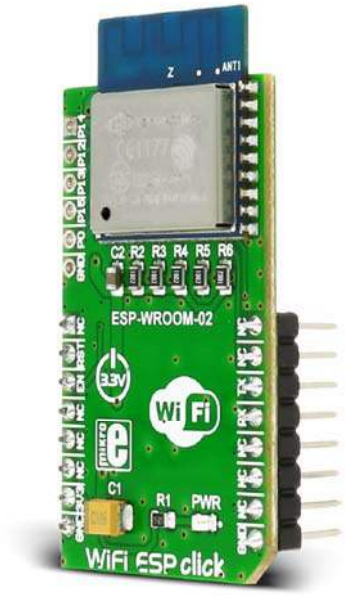
WiFi ESP click

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

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 }
```