EnOcean 2 click

PID: MIKROE-2521

EnOcean 2 click carries the TCM 515Z transceiver, based on the **2.4 GHz** IEEE 802.15.4 radio standard. The click is designed to run on a 3.3V power supply. It communicates with the target microcontroller over UART interface.

This low-powered wireless module is intended for use together with EnOcean's range of energy harvesting modules. These are miniaturized converters that harness energy from motion, light or temperature differences, that come in the form of self-powered, battery-free wireless switches, sensors and actuators.

TCM 515Z

TCM 515Z enables the realization of line-powered actuators, controllers, and gateways communicating based on the 2.4 GHz **IEEE 802.15.4 radio standard**.

It provides a transparent radio link between EnOcean 2.4 GHz devices and an external host connected via the standardized ESP3 interface (EnOcean Serial Protocol V3).

TCM 515Z works on a 2.4 GHz frequency for ZigBee systems.

EnOcean Serial Protocol 3.0 (ESP3)

ESP3 is a Point-to-Point protocol with a packet data structure.

The maximum size of transferred data is 65535 bytes. Compared with ESP2.0, that has the maximum of 25 bytes, it's a considerable improvement.

Onboard antenna

TCM 515Z receives and transmits data based on a **50Ω whip antenna** connected to its ANTENNA input.
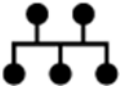
Key features

- TCM 515Z module
    - Frequency: 2.4 GHz ZigBee systems
    - Receiver sensitivity (typ, at 25°C): -95 dBm
    - Transmit power (typ, at 25°C): +2 dBm
    - Default radio channel: IEEE 802.15.4 radio channel 11
- UART interface
- 3.3V power supply

SPECIFICATION

Product Type	RF 2.4GHz
Applications	Incorporate battery-free wireless energy harvesting modules into your designs
On-board modules	TCM 515Z
Key Features	the 2.4 GHz IEEE 802.15.4 radio standard, EnOcean Serial Protocol 3.0, 3.3V power supply, UART interface
Key Benefits	Communicates with battery-free switches, sensors and actuators. Onboard chip antenna
Interface	UART
Power Supply	3.3V
Compatibility	mikroBUS
Click board size	L (57.15 x 25.4 mm)

Pinout diagram

This table shows how the pinout on **EnOcean 2 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
Not connected	NC	2	RST	INT	15	NC	Not connected
Not connected	NC	3	CS	TX	14	**UART_TX**	UART transmit
Not connected	NC	4	SCK	RX	13	**UART_RX**	UART receive
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

Jumpers and settings

Designator	Name	Default Position	Default Option	Description
JP1	TURBO MODE	Right	Disable	Change the default ESP3 interface speed at power up from 57600 Bit per second to 460800 Bit per second.

Programming

Code examples for EnOcean 2 click, written for MikroElektronika hardware and compilers are available on Libstock.

The library implements EnOcean Serial Protocol 3. It can be used for communication between a host and an EnOcean module. Recieved packets, if valid, are forwarded to a user via the callback function.

The demo demonstrates the library functionality using EnOcean 2 click and PTM215ZE Pushbutton Transmitter Module. When the user pushes the button, a corresponding LED is turned on or off.

Code snippet

The code snippet shows how to use library packet type and send command to an EnOcean module.

```
01  static void read_version()
02  {
03      esp3_packet_t cmd_packet;
04      uint8_t cmd_packet_buffer[1];
05
06      cmd_packet.data_length = 1;
07      cmd_packet.option_length = 0;
08      cmd_packet.type = ESP3_TYPE_COMMON;
09      cmd_packet.data_buffer = cmd_packet_buffer;
10      // Command code.
11      cmd_packet_buffer[0] = ESP3_CO_RD_VERSION;
12
13      esp3_send(&cmd_packet);
14  }
```