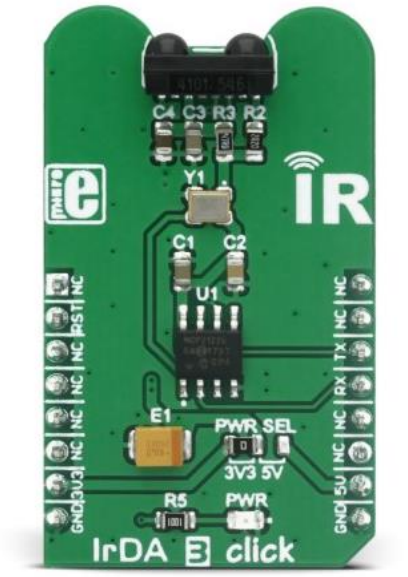
IrDA 3 click

PID: MIKROE-2871

IrDA 3 click is an intelligent IR transceiver device that can both send and receive UART commands via the IR interface. IrDA 3 click features both the IR transceiver and the encoder/decoder IC, used to convert the UART data and send or receive it in IrDA® compatible format. IrDA 3 click also has an onboard clock generator for the fastest possible UART performance of 115,200 bps, so it does not need an additional clock signal to be generated by the MCU.

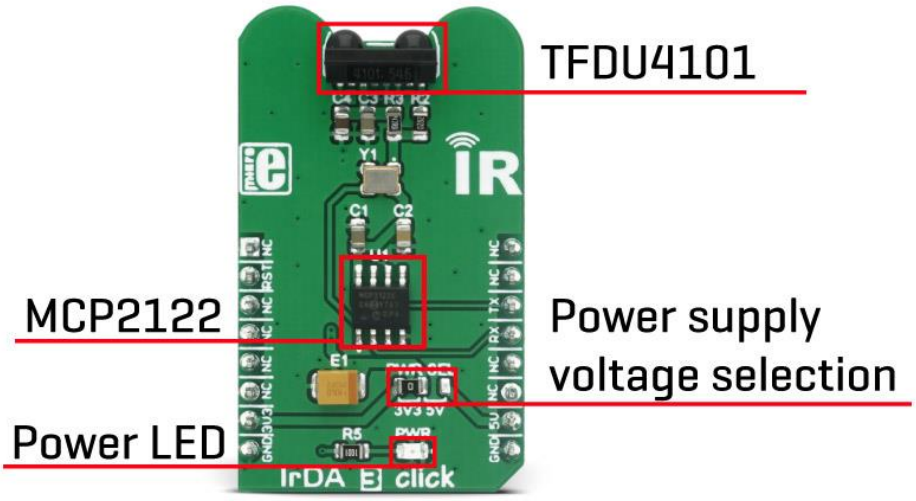
IrDA 3 click provides a direct and easy to use UART to IrDA interface. The device can be used for various applications that use the short-range remote communication, such as fax machines, photocopiers, screen projectors, TV boxes, Data loggers, GPS, various system controllers and many other IRDA standard compatible applications.



How does it work?

IrDA 3 click is composed of two integrated devices. The first one is the TFDU4101 transceiver from Vishay, an infrared transceiver module compliant to the latest IrDA® physical layer standard. It supports IrDA speeds up to 115.2 Kbps. The transceiver module is composed of the IRED (infrared emitter) and the photodiode IR receiver, which is used to both emit and receive the IR light commands. The range of this device is more than 1m and it depends on several factors. To ensure maximum possible range, the power supply is decoupled with proper capacitors, also the used oscillator is very stable and accurate, resulting with the range of about 4m. The second IC device is the MCP2122, an infrared half duplex encoder/decoder from Microchip that takes care of the proper conversion of the UART signals to TFDU4101 acceptable IrDA standard compliant data format. The MCP2122 has its UART interface pins routed to the mikroBUS™, and IrDA interface pins routed to the TFDU4101 IrDA module. The maximum communication speed for the UART interface is determined by the onboard oscillator that works at 1.8432MHz. The MCP2122 has the 16XCLK input that

acts as a bit clock. The state of the bit is determined within 16 clock cycles of the 16XCLK input. This means that for every bit of the UART information, 16-bit clock cycles are needed - so the UART frequency is the bit clock frequency divided by 16, as shown by this formula: 1,843,200 / 16 = 115,200. At the same time, 115,200 is the maximum baud rate that can be used for the TFDU4101 IrDA transceiver.



The click also has a voltage selection jumper for selecting the voltage between 3.3V and 5V. Besides the UART RX and UART TX signals routed to the mikroBUS™, it also has the RESET signal routed to the RST pin of the mikroBUS™. The RESET pin is used to reset the MCP2122 device. The LOW logic state on this pin will reset the device, while the HIGH state is used for a normal operation. The device can be put in a low power state if the RST pin is held LOW. Working with this click board is easy and the demo application that comes with the click board™ can be used as a reference for future designs. Besides the demo application example, the library provides functions for simplified workflow with the IrDA 3 click.

Specifications

Type	Optical
Applications	IrDA 3 click can be used for various applications that use the short-range remote communication, such as fax machines, photocopiers, screen projectors, TV boxes, Data loggers, GPS, various system controllers and many more.
On-board modules	MCP2122 - Infrared Encoder/Decoder, TFDU4101 transceiver
Key Features	Simple and easy to use UART to IRDA communication, the onbard encoder/decoder IC takes care of all the communication between the IR transceiver and the MCU.
Interface	GPIO,UART
Input Voltage	3.3V or 5V
Click board size	M (42.9 x 25.4 mm)

Pinout diagram

This table shows how the pinout on **IrDA 3 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	
Reset	**RST**	2	RST	INT	15	NC	
	NC	3	CS	RX	14	**TX**	UART Transmit
	NC	4	SCK	TX	13	**RX**	UART Receive
	NC	5	MISO	SCL	12	NC	
	NC	6	MOSI	SDA	11	NC	
Power Supply	**+3.3V**	7	3.3V	5V	10	**+5V**	Power Supply
Ground	**GND**	8	GND	GND	9	**GND**	Ground

IrDA 3 click electrical specifications

Description	Min	Typ	Max	Unit
Input logic LOW level voltage	GND		0.2 x VCC	V
Input logic HIGH level voltage	0.8 x VCC		VCC	V
UART baud rate		115,200		bps

Onboard settings and indicators

Label	Name	Default	Description
LD1	PWR	-	Power LED indicator
JP1	PWR SEL	Left	Power supply voltage selection: left position 3V3, right position 5V