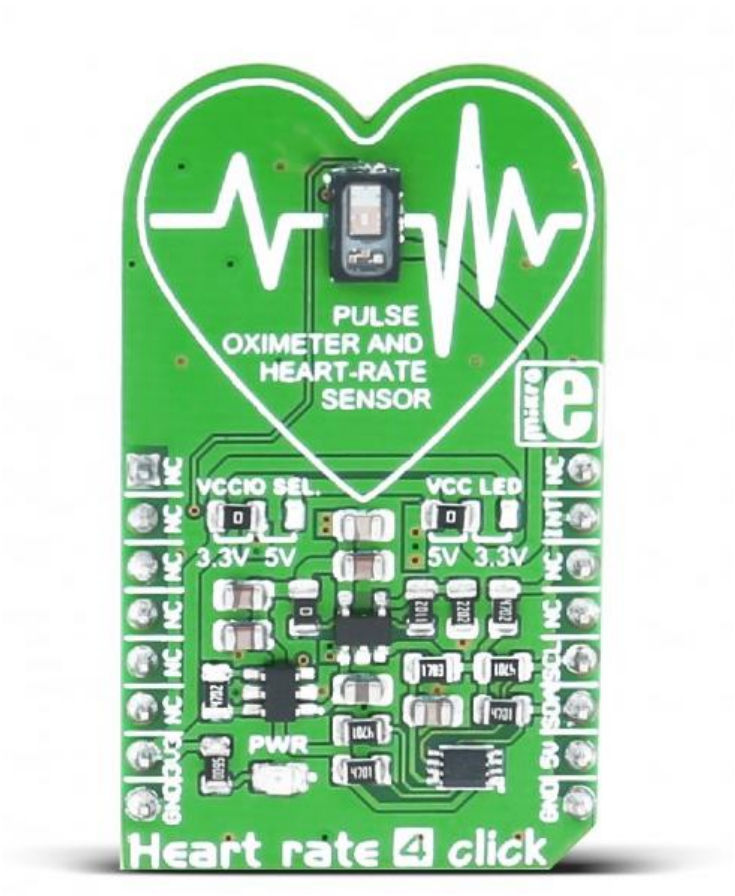
Heart rate 4 click

MIKROE-2510

Weight: 24 g



Heart rate 4 click carries the MAX30101 high-sensitivity pulse oximeter and heart-rate sensor from Maxim Integrated.

The click is designed to run on either 3.3V or 5V power supply. It communicates with the target MCU over I2C interface, with additional functionality provided by INT pin on the mikroBUS™ line.

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MAX30101 sensor features

The MAX30101 is an integrated pulse oximetry and heart-rate monitor module. It includes internal LEDs, photodetectors, optical elements, and low-noise electronics with ambient light rejection.

The MAX30101 integrates red, green, and IR (infrared) LED drivers to modulate LED pulses for SpO2 and HR measurements. The LED current can be programmed from 0 to 50mA with proper supply voltage.

The device includes a proximity function to save power and reduce visible light emission when the user's finger is not on the sensor.

The MAX30101 has an on-chip temperature sensor for calibrating the temperature dependence of the SpO2 subsystem. The temperature sensor has an inherent resolution 0.0625°C.

Pulse oximetry or Sp02

Oxygen-saturated blood absorbs light differently than unsaturated blood. Pulse oximeters measure the oxygen saturation in one's blood. Or to put it more precisely the percentage of hemoglobin molecules in blood that is saturated with oxygen.

In a healthy adult, this readings go from 94% to 100%.

How the sensor works

Since oxygen-saturated blood absorbs more infrared light than red light, and unsaturated blood absorbs more red light than infrared light, the SpO2 readings are calculated by the comparison of the amount of these two types of light.

It is best to use your finger for measurement.

The same sensor as Hexiwear

Did you know that this click carries the same sensor as Hexiwear?
When you place your wrist or fingertip over the slit on Hexiwear, the MAX30101 sensor measures the light absorbance of pulsing blood through a photodetector and derives heart-rate info. Current firmware version is able to show rough estimates.

MikroPlot

You can use the MikroPlot visualization tool (Windows) to generate a graph from the data sent from the MCU.

A UART-USB connection is required.

Specifications

Type	Biomedical
Applications	wearable devices, fitness assistant devices, biomedical devices, etc.
MCU	MAX30101 heart-rate sensor
Key Features	Pulse oximetry or SpO2, low power consumption, programmable sample rate
Interface	I2C,GPIO
Input Voltage	3.3V or 5V
Compatibility	mikroBUS
Click board size	M (42.9 x 25.4 mm)

Pinout diagram

This table shows how the pinout on **Heart rate 4 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	
	NC	2	RST	INT	15	**INT1**	Active-Low Interrupt (Open-Drain)
	NC	3	CS	TX	14	NC	
	NC	4	SCK	RX	13	NC	

	NC	5	MISO	SCL	12	**SCL1**	2C Clock Input
	NC	6	MOSI	SDA	11	**SDA1**	I2C Clock Data, Bidirectional (Open-Drain)
Power supply	**+3.3V**	7	3.3V	5V	10	**+5V**	Power supply
Ground	**GND**	8	GND	GND	9	**GND**	Ground

Jumpers and settings

Designator	Name	Default Position	Default Option	Description
J2A	VLED	LEFT	5V	With this jumper we determine the LED diodes supplied with 3.3V or 5V.