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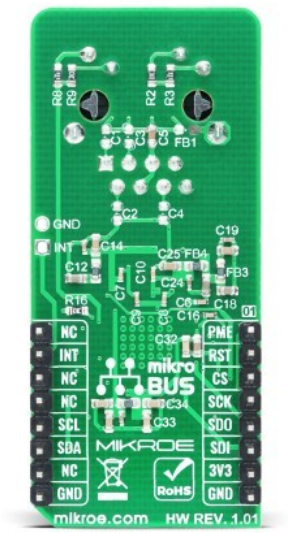
ETH 3 Click



PID: MIKROE-2850

ETH 3 Click is a compact add-on board that contains Ethernet Controller & PHY for embedded applications. This board features the LAN9250, a fully featured 10/100 Ethernet controller that provides performance, flexibility, ease of integration, and system cost control from Microchip Technology. It complies with the IEEE802.3 (Full/Half-Duplex 10BASE-T and 100BASE-TX) Ethernet protocol, IEEE 802.3az Energy Efficient Ethernet (EEE)(100Mbps only), and the IEEE 1588v2 precision time protocol. It also includes an integrated Ethernet MAC and PHY with a high-performance SRAM-like slave interface and large transmit and receive data FIFOs to accommodate high latency applications. This Click board™ is suitable for industrial automation systems, cable, satellite, and IP set-top boxes, VoIP/Video phone systems, home gateways, test and measurement equipment, and more.

ETH 3 Click is supported by a mikroSDK compliant library, which includes functions that simplify software development. This Click board™ comes as a fully tested product, ready to be used on a system equipped with the mikroBUS™ socket.

NOTE: The software support is provided in MPLABX by the Microchip company.

How does it work?

ETH 3 Click as its foundation uses the LAN9250, a fully-featured high-performance 10/100 Ethernet controller designed for embedded applications, where performance and flexibility are required, from Microchip Technology. It complies with the IEEE 802.3 (Full/Half-duplex 10BASE-T and 100BASE-TX) Ethernet protocol, IEEE 802.3az Energy Efficient Ethernet (100Mbps only), and the IEEE 1588v2 precision time protocol. It also includes an integrated Ethernet MAC and PHY with a high-performance SRAM-like slave interface. The integrated checksum offload

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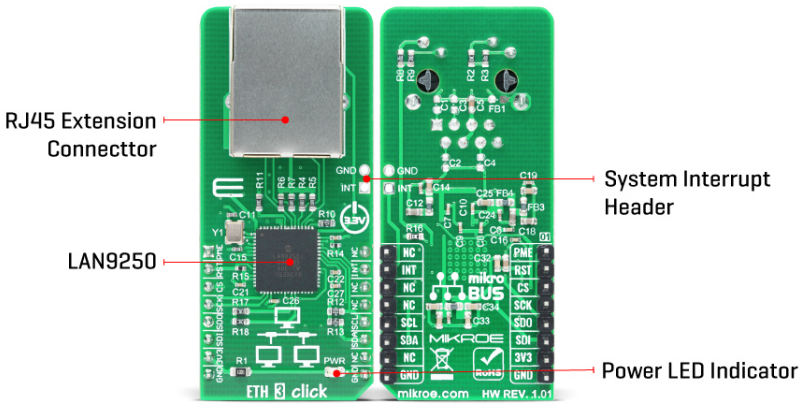
engines enable the automatic generation of the 16-bit checksum for received and transmitted Ethernet frames, offloading the CPU task.



The LAN9250 also includes large transmit and receive data FIFOs to accommodate high latency applications. If the FIFO gets too full, the LAN9250 can automatically generate flow control packets to the remote node or assert back-pressure on the remote node by causing network collisions. Also, the LAN9250 memory buffer architecture allows highly efficient use of memory resources by optimizing packet granularity and support features that reduce or eliminate packet loss. This Click board™ enables network connections and maintains signal integrity sent over an Ethernet cable through the onboard RJ-45 connector.

ETH 3 Click communicates with MCU using SPI/QuadSPI serial interface. An SPI/QuadSPI with a clock rate of up to 80 MHz allows access to the System CSRs, internal FIFOs, and memories. It supports single and multiple registers read and write commands with incrementing, decrementing, and static addressing. The LAN9250 also contains an I2C master EEPROM controller for connection to an optional EEPROM and allows for the storage and retrieval of static data using the I2C serial interface.

It also provides a programmable interrupt structure generated internally by the various device sub-modules or configured to create a single external host interrupt available on the onboard header. An additional Wake-up feature is available that places the LAN9250 in a reduced power mode and can be programmed to issue an external wake signal labeled as PME on the mikroBUS™ socket. This signal is ideal for triggering system Power-Up using remote Ethernet Wake-up events. Also, this Click board™ can reset through the Hardware Reset pin, labeled as RST on the mikroBUS™ socket.

This Click board™ operates only with a 3.3V logic voltage level. The board must perform appropriate logic voltage level conversion before use with MCUs with different logic levels.

Specifications

Type	Ethernet
Applications	Can be used for industrial automation systems, cable, satellite, and IP set-top boxes, VoIP/Video phone systems, home gateways, test and measurement equipment, and more.

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On-board modules	LAN9250 - fully-featured high-performance 10/100 Ethernet controller designed for embedded applications, where performance and flexibility are required, from Microchip Technology
Key Features	16-bit 10/100 industrial Ethernet controller & PHY, high performance, compliant with energy efficient Ethernet, Wake on LAN (WoL) support, SPI/SQI/I2C interface support, and more.
Interface	I2C,SPI
ClickID	No
Compatibility	mikroBUS™
Click board size	L (57.15 x 25.4 mm)
Input Voltage	3.3V

Pinout diagram

This table shows how the pinout on ETH 3 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikroBUS				Pin	Notes
Wake-up Detection	**PME**	1	AN	PWM	16	NC	
Reset	**RST**	2	RST	INT	15	**INT**	Interrupt
SPI Chip Select	**CS**	3	CS	RX	14	NC	
SPI Clock	**SCK**	4	SCK	TX	13	NC	
SPI Data OUT	**SDO**	5	MISO	SCL	12	**SCL**	I2C Clock
SPI Data IN	**SDI**	6	MOSI	SDA	11	**SDA**	I2C Data
Power Supply	**3.3V**	7	3.3V	5V	10	NC	
Ground	**GND**	8	GND	GND	9	**GND**	Ground

Onboard settings and indicators

Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator
J1	-	Unpopulated	System Interrupt Header

ETH 3 Click electrical specifications

Description	Min	Typ	Max	Unit
Receiver inputs voltage range	-	3.3	-	V
Ethernet Bandwidth	-	10/100	-	Mbps
Operating Temperature Range	-40	+25	+105	°C

Software Support

MikroElektronika does not provide software support for this Click board™ in the form of libraries, functions, or example code at this moment. The software support is provided in

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MPLABX by the Microchip company.

- The Quick Start Guide for the ETH 3 Click with the link to the software libraries is available on the Microchip product page.
- For Technical support questions, the customers can submit a support case to Microchip by following the procedure in this link.

Resources

mikroBUS™

mikroSDK

Click board™ Catalog

Click boards™

Downloads

ETH 3 click 2D and 3D files

LAN9250 datasheet

ETH 3 click schematic