

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

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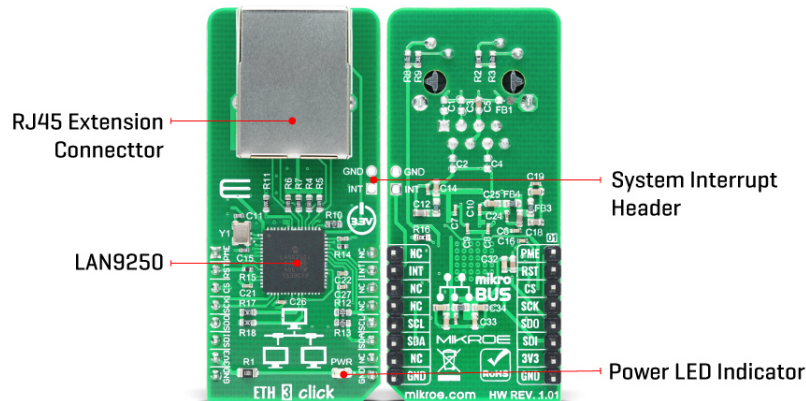


ISO 27001: 2013 certification of informational security management system.
ISO 14001: 2015 certification of environmental management system.
OHSAS 18001: 2008 certification of occupational health and safety management system.



ISO 9001: 2015 certification of quality management system (QMS).

PHY with a high-performance SRAM-like slave interface. The integrated checksum offload 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 |
| Feature | No ClickID |
| 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 |  | | | | 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

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This Click board currently comes without dedicated MIKROE mikroSDK support in the form of libraries, functions, or example code. The software support is provided in 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](#).

Resources

[mikroBUS™](#)

[mikroSDK](#)

[Click board™ Catalog](#)

[Click boards™](#)

Downloads

[ETH 3 click 2D and 3D files](#)

[LAN9250 datasheet](#)

[ETH 3 click schematic](#)

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