MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
VAT: SR105917343 Registration No. 20490918
Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com
www.mikroe.com

ETH Click

PID: MIKROE-971

ETH Click is a compact add-on board that manages the communications between the system's digital processing and an Ethernet interface. This board features the ENC28J60, a stand-alone Ethernet controller with an industry-standard Serial Peripheral Interface (SPI) from Microchip, designed to serve as an Ethernet network interface for any host MCU. The ENC28J60 meets all the IEEE 802.3 specifications and incorporates several packet filtering schemes to limit incoming packets. It also provides an internal DMA module for fast data throughput and hardware-assisted checksum calculation used in various network protocols alongside two LEDs for link and network activity indication. This Click board™ is suitable for industrial automation, home control, security and instrumentation applications, and many more.

How does it work?

ETH Click is based on the ENC28J60, a stand-alone Ethernet controller with an industry-standard Serial Peripheral Interface (SPI) from Microchip, designed in Half-Duplex Mode to serve as an Ethernet network interface for any host MCU. The ENC28J60 consists of seven major functional parts such as a serial interface and control register block, a dual port RAM buffer for received and transmitted data packets, the MAC (Medium Access Control) module that implements IEEE 802.3 compliant MAC logic, and the PHY (Physical Layer) module that encodes and decodes the analog data that is present on the twisted-pair interface through an onboard RJ-45 connector.
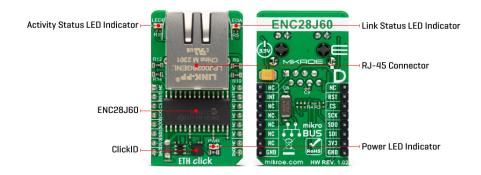
MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
VAT: SR105917343 Registration No. 20490918
Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com
www.mikroe.com

This Click board™ communicates with MCU through a standard SPI interface supporting the most common SPI mode, SPI Mode 0, with a maximum frequency of 20MHz. The operation of the ENC28J60 depends entirely on commands given by the host MCU over the SPI interface in the form of instructions of one or more bytes used to access the control memory and Ethernet buffer spaces. The entire buffer is 8 Kbytes, divided into separate receive and transmit buffer spaces used by the Ethernet controller.

Before the ENC28J60 can be used to transmit and receive packets, specific settings must be initialized. Depending on the application, some configurational options must change. These tasks may be accomplished once after Reset, activated through the RST pin of the mikroBUS™ socket. The ENC28J60 also uses an interrupt pin, the INT pin of the mikroBUS™ socket, to signal the occurrence of events to the host MCU alongside two LED indicators, green for a link and yellow for network activity indication.

Apart from these indications, these LEDs also support automatic polarity detection during a Reset case. Upon system Reset, the ENC28J60 will detect how the LED is connected and begin driving the LED to the default state configured by the PHLCON register. If the LED polarity changes while the ENC28J60 operates, there will be no new polarity detection until the next system Reset occurs. The LEDs can also be configured separately to control their operating polarity (ON or OFF when active), blink rate, and blink stretch interval.

This Click board™ can be operated only with a 3.3V logic voltage level. The board must perform appropriate logic voltage level conversion before using MCUs with different logic levels. However, the Click board™ comes equipped with a library containing functions and an example code that can be used as a reference for further development.

Specifications

Type	Ethernet
Applications	Can be used for industrial automation, home control, security and instrumentation applications, and many more
On-board modules	ENC28J60 - stand-alone Ethernet controller from Microchip
Key Features	IEEE 802.3™ Compatible Ethernet Controller, fully compatible with 10/100/1000Base-T

MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
VAT: SR105917343 Registration No. 20490918
Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com
www.mikroe.com

	networks, integrated MAC and 10Base-T PHY, Half-Duplex Mode, SPI interface, configurable 8Kb TX/RX buffer, multifunctional interrupt, link and network status indicators, and more
Interface	GPIO,SPI
Feature	ClickID Manifest,No ClickID
Compatibility	mikroBUS™
Click board size	M (42.9 x 25.4 mm)
Input Voltage	3.3V

Pinout diagram

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

Notes	Pin	mikro™ BUS			Pin	Notes
	NC	1	AN	PWM	16	NC	
Reset / ID SEL	**RST**	2	RST	INT	15	**INT**	Interrupt
SPI Select / ID COMM	**CS**	3	CS	RX	14	NC	
SPI Clock	**SCK**	4	SCK	TX	13	NC	
SPI Data OUT	**SDO**	5	MISO	SCL	12	NC	
SPI Data IN	**SDI**	6	MOSI	SDA	11	NC	
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	LEDB	-	Network Activity Status LED Indicator
LD2	LEDA	-	Link Status LED Indicator
LD3	PWR	-	Power LED Indicator

ETH Click electrical specifications

Description	Min	Typ	Max	Unit
Receiver inputs voltage range	-	3.3	-	V
Receiver inputs voltage range	-	-	10	Mbps

Resources

mikroBUS™

mikroSDK

Click board™ Catalog

MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
VAT: SR105917343 Registration No. 20490918
Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com
www.mikroe.com

Click Boards™

Downloads

ETH Click User Manual

ETH click example on Libstock

ETH click 2D and 3D files v101

ENC28J60 datasheet

ETH click schematic v101

ETH click 2D and 3D files v102

ETH click schematic v102