

EZO Carrier Click - pH



PID: MIKROE-6009

EZO Carrier Click - pH is a compact add-on board that allows you to measure the potential of hydrogen (the power of hydrogen) in your application. This board features the [EZO™ pH](#), a pH measurement interface circuit board from [Atlas Scientific](#). The EZO™ pH is a small additional board that comes with the carrier board and allows you to read the pH values of the solvent in a range of 0.001 up to 14.000, in a resolution of 0.001 and accuracy +/-0.002. The EZO™ pH allows readings in a maximum of one reading per second. This Click board™ makes the perfect solution for the development of food-grade analyzers, chemical products analyzers, water quality measuring devices, and more. It is compatible with various galvanic measurement probes, such as the [pH Electrode](#) with BNC connector.

EZO Carrier Click - pH is fully compatible with the mikroBUS™ socket and can be used on any host system supporting the [mikroBUS™](#) standard. It comes with the [mikroSDK](#) open-source libraries, offering unparalleled flexibility for evaluation and customization. What sets this [Click board™](#) apart is the groundbreaking [ClickID](#) feature, enabling your host system to seamlessly and automatically detect and identify this add-on board.

How does it work?

EZO Carrier Click - pH is based on the EZO™ pH, a pH measurement interface circuit board from Atlas Scientific. It allows you to interface a pH measurement probe, which measures the potential of hydrogen, by sinking the probe into the solvent you want to measure the pH. The EZO Carrier Click - pH comes with the BNC connector for interfacing the appropriate probe, which MIKROE also offers. The EZO™ pH needs to be isolated from the host MCU; therefore, this Click™ board comes with the [Si8400AB](#), a bidirectional isolator from Skyworks. The isolator provides a standard bidirectional and I2C communication with a clock frequency of up to

Mikroe produces entire development toolchains for all major microcontroller architectures.

Committed to excellency, we are dedicated to helping engineers bring the project development up to speed and achieve outstanding results.

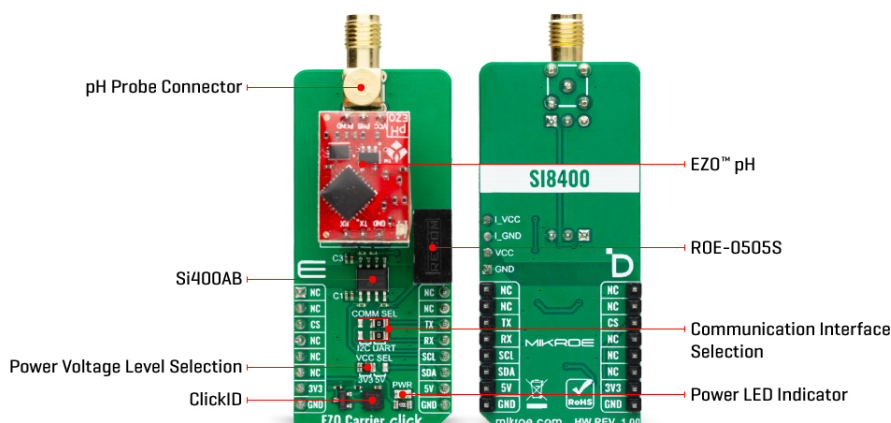


ISO 27001: 2013 certification of informational security management system.
ISO 14001: 2015 certification of environmental management system.
OHSAS 18001: 2008 certification of occupational health and safety management system.



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

1.7MHz.



The EZO™ pH circuit is a very sensitive device, and the sensitivity is what gives the pH circuit its accuracy. It is capable of reading micro-voltages that are bleeding into the solvent. So, to eliminate the electrical noise, besides the Si8400AB isolator, the power supply voltage is also isolated. For this purpose, this Click™ board is equipped with the ROE-0505S, a DC/DC converter from Recom. The EZO™ pH has a flexible calibration protocol allowing for single-point, two-point, or three-point calibration. The temperature compensation should be taken into account. The EZO™ pH features sleep mode, continuous operation, find function, export/import calibration, on-module status LED, and more.

EZO Carrier Click - pH can use a standard 2-wire UART interface to communicate with the host MCU with the default baud rate of 9600bps. While using the UART interface, you can use the library we provide or a simple ASCII set of commands. You can also choose a standard 2-wire I2C interface over the COMM SEL jumpers.

This Click board™ can operate with either 3.3V or 5V logic voltage levels selected via the VCC SEL jumper. This way, both 3.3V and 5V capable MCUs can use the communication lines properly. Also, this Click board™ comes equipped with a library containing easy-to-use functions and an example code that can be used as a reference for further development.

Specifications

Type	Environmental,Measurements
Applications	Can be used for the development of food-grade analyzers, chemical products analyzers, water quality measuring devices, and more
On-board modules	EZO™ pH - pH measurement interface circuit board from Atlas Scientific
Key Features	High stability and accuracy, easy-to-use data protocol, simple command structure, flexible calibration protocol, works with any off-the-shelf pH probe, noise immunity, completely isolated data and power supply lines, and more
Interface	I2C,UART

Mikroe produces entire development toolchains for all major microcontroller architectures.

Committed to excellency, we are dedicated to helping engineers bring the project development up to speed and achieve outstanding results.



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).

ClickID	Yes
Compatibility	mikroBUS™
Click board size	L (57.15 x 25.4 mm)
Input Voltage	3.3V or 5V

Pinout diagram

This table shows how the pinout on EZO Carrier Click - pH 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	
	NC	2	RST	INT	15	NC	
ID COMM	CS	3	CS	RX	14	TX	UART TX
	NC	4	SCK	TX	13	RX	UART RX
	NC	5	MISO	SCL	12	SCL	I2C Clock
	NC	6	MOSI	SDA	11	SDA	I2C Data
Power Supply	3.3V	7	3.3V	5V	10	5V	Power Supply
Ground	GND	8	GND	GND	9	GND	Ground

Onboard settings and indicators

Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator
JP1	VCC SEL	Left	Logic Level Voltage Selection 3V3/5V: Left position 3V3, Right position 5V
JP2-JP3	COMM SEL	Right	Communication Interface Selection I2C/UART: Left position I2C, Right position UART

EZO Carrier Click - pH electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
Potential of Hydrogen Range	0.001	-	14.000	pH
Resolution	-	0.001	-	pH
Accuracy	-0.002	-	+0.002	pH

Software Support

We provide a library for the EZO Carrier pH Click as well as a demo application (example), developed using MIKROE [compilers](#). The demo can run on all the main MIKROE [development boards](#).

Package can be downloaded/installed directly from NECTO Studio Package Manager(recommended), downloaded from our [LibStock™](#) or found on [Mikroe github account](#).

Mikroe produces entire development toolchains for all major microcontroller architectures.

Committed to excellency, we are dedicated to helping engineers bring the project development up to speed and achieve outstanding results.



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).

Library Description

This library contains API for EZO Carrier pH Click driver.

Key functions

- ezocarrierph_send_cmd Send command function.
- ezocarrierph_send_cmd_with_par Send command function with parameter.
- ezocarrierph_send_cmd_check Check the sent command.

Example Description

This example demonstrates the use of EZO Carrier pH Click board™ by processing the incoming data and displaying them on the USB UART.

The full application code, and ready to use projects can be installed directly from NECTO Studio Package Manager(recommended), downloaded from our [LibStock™](#) or found on [Mikroe github account](#).

Other Mikroe Libraries used in the example:

- MikroSDK.Board
- MikroSDK.Log
- Click.EZOCarrierpH

Additional notes and informations

Depending on the development board you are using, you may need [USB UART click](#), [USB UART 2 Click](#) or [RS232 Click](#) to connect to your PC, for development systems with no UART to USB interface available on the board. UART terminal is available in all MIKROE [compilers](#).

mikroSDK

This Click board™ is supported with [mikroSDK](#) - MIKROE Software Development Kit. To ensure proper operation of mikroSDK compliant Click board™ demo applications, mikroSDK should be downloaded from the [LibStock](#) and installed for the compiler you are using.

For more information about mikroSDK, visit the [official page](#).

Resources

[mikroBUS™](#)

[mikroSDK](#)

[Click board™ Catalog](#)

[Click boards™](#)

Downloads

Mikroe produces entire development toolchains for all major microcontroller architectures.

Committed to excellency, we are dedicated to helping engineers bring the project development up to speed and achieve outstanding results.



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).

[EZO Carrier Click - pH example on Libstock](#)

[EZO Carrier Click - pH 2D and 3D files](#)

[pH EZO datasheet](#)

[SI8400 datasheet](#)

[EZO Carrier Click - pH schematic](#)

Mikroe produces entire development toolchains for all major microcontroller architectures.

Committed to excellency, we are dedicated to helping engineers bring the project development up to speed and achieve outstanding results.



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).