

Turbidity Click



PID: MIKROE-4276

Turbidity Click is an adapter Click board™, used to interface a compatible turbidity sensor with the host MCU. This board features one 1x3 2.5mm connector suitable for connecting a TSD-10 Turbidity Sensor via an additional 3-wire cable for Turbidity Click specially made for this purpose. It allows users to upgrade their projects with a sensor that senses the cloudiness or haziness of a fluid caused by large numbers of individual particles invisible to the naked eye. This sensor also measures temperature as well as turbidity.

Turbidity 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 sensor and cable do not come in the same package with this Click board™; you can find a [Turbidity sensor \(TSD-10\)](#) and [3-wire Male to Male Cable - 15 cm](#) for Turbidity Click in our shop. And if you want the complete package, please visit the [Turbidity Click Bundle page](#).

How does it work?

Turbidity Click is an adapter Click board™ that simplifies the interface of the Turbidity Sensor with the host MCU. This Click board™ represents a small-size PCB that can be connected to the mikroBUS™ socket like any other Click board™, with a 1x3 2.5mm pitch vertical type board connector placed on itself used for the turbidity sensor connection. Each of the connector pins corresponds to a pin of the turbidity sensor. Each of the connector pins corresponds to the turbidity sensor pins connected to this same connector via an additional 3-wire cable for Turbidity Click, specially made for this purpose. This way allows easy pin access and manipulation while retaining a perfect connection quality at all times.

Mikroe produces entire development toolchains for all major microcontroller architectures.

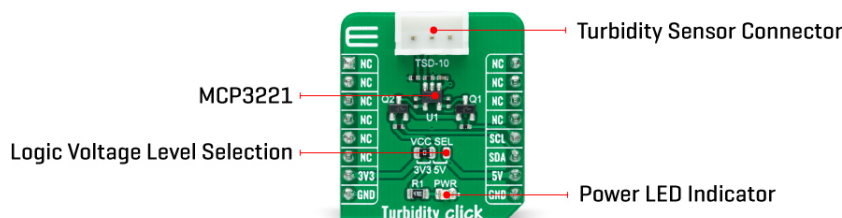
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ISO 27001: 2013 certification of informational security management system.
ISO 14001: 2015 certification of environmental management system.
OHSAS 18001: 2008 certification of occupational health and safety management system.



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



This Click board™ allows users to upgrade their projects with a sensor that senses the cloudiness or haziness of a liquid caused by large numbers of individual particles invisible to the naked eye. The turbidity level is determined based on a comparison between clean water measurements and later based on the used water at the end of usage; more precisely, the turbidity sensor measures the amount of transmitted light to determine the turbidity of the liquid. As well as turbidity, this sensor also measures liquid temperature.

The analog output voltage of the Turbidity Sensor can be converted to a digital value using MCP3221, a successive approximation A/D converter with a 12-bit resolution from Microchip, using a 2-wire I2C compatible interface. Using MCP3221 and I2C interface, data transfers at rates of up to 100kbit/s in the Standard and 400kbit/s in the Fast Mode.

This Click board™ can operate with both 3.3V and 5V logic voltage levels selected via the VCC SEL jumper. This way, it is allowed for both 3.3V and 5V capable MCUs to use the I2C communication lines properly. However, the 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	Adapter, Environmental
Applications	Can be used to senses the cloudiness or haziness of a fluid caused by large numbers of individual particles invisible to the naked eye
On-board modules	Turbidity Click is adapter with socket for the TSD-10 Turbidity Sensor
Key Features	Low power consumption, high performance, allowing sensing of the cloudiness or haziness of a fluid, I2C configurable analog-to-digital converter, suitable for both mikroBUS™ power rails, and more
Interface	I2C
ClickID	No
Compatibility	mikroBUS™
Click board size	S (28.6 x 25.4 mm)

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Input Voltage	3.3V or 5V
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Pinout diagram

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

Notes	Pin					Pin	Notes
	NC	1	AN	PWM	16	NC	
	NC	2	RST	INT	15	NC	
	NC	3	CS	RX	14	NC	
	NC	4	SCK	TX	13	NC	
	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

Turbidity Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
Nephelometric Turbidity Unit	0	-	4500	NTU
Operating Temperature Range	-10	+25	+90	°C

Software Support

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

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

Library Description

This library contains API for Turbidity Click driver.

Key functions

- turbidity_get_ntu Turbidity get NTU function.

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- turbidity_read_adc Turbidity read ADC function.
- turbidity_get_adc_voltage Turbidity get voltage function.

Example Description

This library contains API for the Turbidity Click driver. The demo application reads ADC value, ADC voltage and Nephelometric Turbidity Units (NTU).

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

Other Mikroe Libraries used in the example:

- MikroSDK.Board
- MikroSDK.Log
- Click.Turbidity

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 MikroElektronika [compilers](#).

mikroSDK

This Click board™ is supported with [mikroSDK](#) - MikroElektronika 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

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

[Turbidity click schematic](#)

[Turbidity click example on Libstock](#)

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