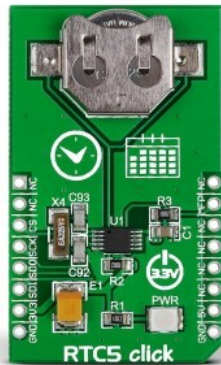


RTC5 Click



PID: MIKROE-1990

RTC 5 Click is a compact add-on board that measures the passage of real-time. This board features the MCP79510, a register-configurable real-time clock/calendar from Microchip. The MCP79510 provides information like seconds, minutes, hours, days, months, years, and dates based on a 32.768kHz quartz crystal through an SPI serial interface to transmit time and calendar data to the MCU. It also has an alarm function that outputs an interrupt signal to the MCU when the day of the week, hour, or minute matches the pre-set time, a programmable square-wave output, and a backup supply. This Click board™ is suitable for general-consumer applications, including daily alarms, metering applications, and others requiring an accurate RTC for their operation.

RTC 5 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.

How does it work?

RTC 5 Click is based on the MCP79510, a low-power time-keeping device from Microchip, using internal counters for hours, minutes, seconds, hundredths of seconds, days, months, years, and days of the week. The MCP79510 is configured to transmit calendar and time data to the MCU (24-hour/12-hour format) based on a 32.768kHz quartz crystal and comes with an integrated interrupt generation function. It reads and writes time data from and to the MCU in units ranging from seconds to the last two digits of the calendar year. The calendar year will automatically be identified as a leap year when its last two digits are a multiple of 4. Consequently, leap years up to the year 2399 can automatically be recognized.

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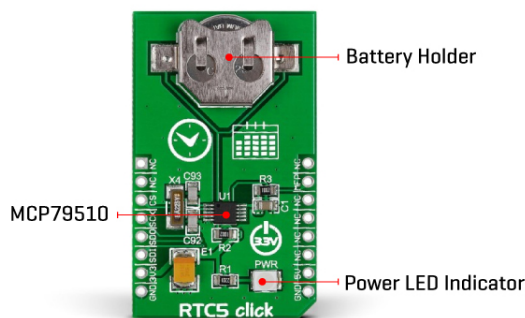
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 OHSAS 18001: 2008 certification of occupational health and safety management system.



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



The MCP79510 is highly integrated with memory and advanced features usually found in much more expensive versions of RTC. It consists of digital trimming added for higher accuracy, a battery switchover for backup power, a timestamp to log power failures, and three types of memory, including 64 bytes of general-purpose SRAM, 1Kbit EEPROM, and a unique blank ID in a locked section of EEPROM.

SRAM and timekeeping circuitry are powered from the backup supply (button cell battery holder compatible with the 3000TR battery holder suitable for 12mm Coin Cell batteries) when main power is lost, allowing the device to maintain accurate time and the SRAM contents. Times during power transfer from primary to auxiliary and vice versa are both logged by the power-fail timestamp.

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 5MHz. Besides, it also has a shared pin for outputting a selectable frequency square wave from 1 up to 32.768kHz, or alarm signals routed to the INT pin of the mikroBUS™ socket marked as MFP. Alarm signals can either generate an interrupt at a specific time in the future or generate a periodic interrupt every second, minute, hour, day, day of the week, or month.

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	RTC
Applications	Can be used for general-consumer applications, including daily alarms, metering applications, and others requiring an accurate RTC for their operation
On-board modules	MCP79510 - real-time clock/calendar device from Microchip
Key Features	Low power consumption, backup supply, power-fail timestamp, high accuracy, clock/calendar feature, programmable

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	interrupt and clock output, automatic leap year recognition, and more
Interface	GPIO,SPI
Feature	No ClickID
Compatibility	mikroBUS™
Click board size	M (42.9 x 25.4 mm)
Input Voltage	3.3V,5V

Pinout diagram

This table shows how the pinout on RTC 5 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	MFP	Alarm Interrupt/Programmable Clock
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	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	PWR	-	Power LED Indicator

RTC 5 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Memory Size (SRAM)	-	-	64	bytes
Memory Size (EEPROM)	-	-	1	Kbits
Clock Output	-	-	32	kHz

Software Support

We provide a library for the RTC5 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](#).

Library Description

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This library contains API for RTC5 Click driver.

Key functions

- Set time hours, minutes and seconds function.
- Set date hours, minutes and seconds function.
- Get time and date function.

Example Description

This is a example which demonstrates the use of RTC 5 Click board.

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.Rtc5

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

[RTC5 click example on Libstock](#)

[RTC5 click user manual](#)

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[RTC5 click 2D and 3D files](#)

[MCP79510 datasheet](#)

[RTC5 click schematic](#)

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