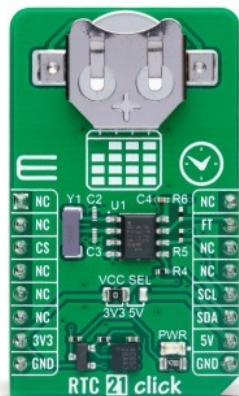


## RTC 21 click



PID: MIKROE-5541

**RTC 21 Click** is a compact add-on board that accurately keeps the time of the day. This board features the [PT7C4311](#), an I2C-configurable real-time clock module with programmable square-wave output from [Diodes Incorporated](#). The PT7C4311 includes time and calendar functions providing various information such as hour, minute, second, day, date, month, year, and century. It operates in a 24-hour format indicator, has automatic leap year compensation, and low power consumption, allowing it to be used with a single button cell battery for an extended period. This Click board™ is suitable for various time-keeping applications, including daily alarms, metering applications, and others requiring an accurate RTC for their operation.

RTC 21 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 21 Click is based on the PT7C4311, an ultra-low power, real-time clock (RTC) time-keeping device from Diodes Incorporated. The PT7C4311 is configured to transmit calendar and time data to the MCU (24-hour format) based on a 32.768kHz quartz crystal and comes with 56 bytes of general-purpose RAM. It reads and writes clock/calendar data from and to the MCU in units ranging from seconds to the last two digits of the calendar year, providing seconds, minutes, hours, dates, days, months, year, and century information. The end-of-the-month date is automatically adjusted for months with fewer than 31 days, including corrections for the leap year until 2100.

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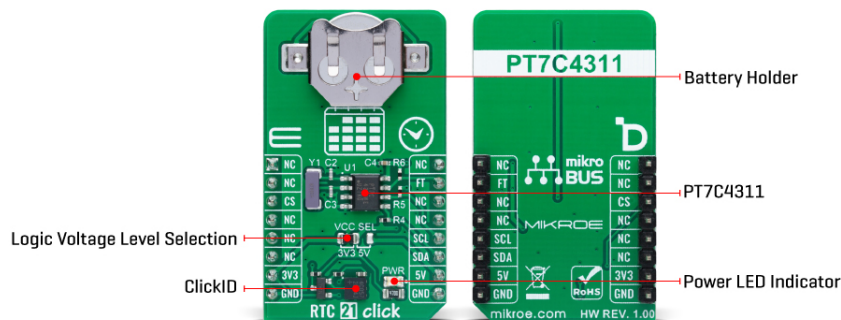
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ISO 27001: 2013 certification of informational security management system.  
 ISO 14001: 2015 certification of environmental management system.  
 OHSAS 18001: 2008 certification of occupational health and safety management system.



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



This Click board™ communicates with MCU using the standard I2C 2-Wire interface to read data and configure settings, supporting a Fast Mode operation up to 400kHz. It also incorporates one open-drain output labeled as FT, which can be used as a frequency test signal (512Hz square-wave password for frequency test purposes) or as a register-configurable output DC level when square-wave is disabled. The PT7C4311 also includes an automatic backup switchover circuit allowing it to be used with a single-button cell battery for an extended period.

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. 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	RTC
Applications	Can be used for various time-keeping applications, including daily alarms, metering applications, and others requiring an accurate RTC for their operation
On-board modules	PT7C4311 - real-time clock (RTC) from Diodes Incorporated
Key Features	Low power consumption, programmable square-wave output, high-speed I2C interface, clock/calendar counter, 24-hour format, 56 bytes RAM, automatic leap year compensation, automatic backup switchover, and more
Interface	I2C
Feature	ClickID
Compatibility	mikroBUS™
Click board size	M (42.9 x 25.4 mm)
Input Voltage	3.3V or 5V

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## Pinout diagram

This table shows how the pinout on RTC 21 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	<b>FT</b>	Frequency Test/DC Level
ID COMM	<b>CS</b>	3	CS	RX	14	NC	
	NC	4	SCK	TX	13	NC	
	NC	5	MISO	SCL	12	<b>SCL</b>	I2C Clock
	NC	6	MOSI	SDA	11	<b>SDA</b>	I2C Data
Power Supply	<b>3.3V</b>	7	3.3V	5V	10	<b>5V</b>	Power Supply
Ground	<b>GND</b>	8	GND	GND	9	<b>GND</b>	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

## RTC 21 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
Memory Size	-	-	56	bytes
Date Format	YY-MM-DD			
Time Format	HH:MM:SS (24 hr)			

## Software Support

We provide a library for the RTC 21 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

This library contains API for RTC 21 Click driver.

### Key functions

- `rtc21_set_time` This function sets the starting time values - second, minute and hour.
- `rtc21_set_date` This function sets the starting date values - day of week, day, month and year.

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- `rtc21_read_time` This function reads the current time values - second, minute and hour.

## Example Description

This example demonstrates the use of RTC 21 Click board™ by reading and displaying the time and date values.

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.RTC21

## 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. A 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 [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™](#)

[ClickID](#)

## Downloads

[RTC 21 click example on Libstock](#)

[RTC 21 click 2D and 3D files v100](#)

[PT7C4311 datasheet](#)

[RTC 21 click schematic v100](#)

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