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BATTERY-OPERATED TEMPERATURE LOGGER

RT-11

BATTERY OPERATED LOGGER OF TEMPERATURE AND HUMIDITY

RTW-12

USER MANUAL

Table of contents

1. Logger characteristics

The RT-11 and RTW-12 recorders are manufactured in a hermetic housing with a protection degree of Ip65.

RT-11 is a device for recording of ambient temperature. Optional version with a remote sensor can be used for recording the temperatures of solids, liquids and gases, depending on the type of connected sensor

.The RTW-12 allows recording the temperature and relative humidity of a gas at the site of the installation or at the remote sensor site. RTW-12 sensor's special shielding filter is made of porous sintered acid-resistant steel.

The battery loggers type RT-11 and RTW-12 are microprocessor-based devices enabling recording of temperature (RT-11 type) or temperature and air humidity (type RTW-12). Small dimensions and battery power supply enable their use wherever registration and documentation of changes is required. Particularly in situations where providing poweris difficult or impossible.

The loggers are fully autonomous devices. They are equipped with sensors,its own non-volatile memory along with a control system and its own power source in the form of a lithium battery. The capacity of the recorder's memory allows recording 204,800 measurement results, which with registration conducted e.g. every quarter of an hour, can last continuously for almost 6 years.

The measured data is protected against attempts of modification or falsification. The temperature and humidity is registered along with the current date and time. Cooperation with a PC is via a USB. An integral part of the recorder is software that works in®Windows environment. It allows full configuration of the logger and visualization of saved data, by a deskop or printer.

The computer file with records it can be easily imported by popular programms such as excel. Each record is marked with the date and exact time of registration.

Perfect example of the use of battery temperature loggers is in the transport and storage of food and drugs, vaccines, blood preparations and other deep-frozen products, where there is an obligation to document the conditions of production, storage and transportation.

2.Installation

Installation of the recorder consists of three consecutive steps: connecting the recorder to the computer, installing the drivers and installing the software.

2.1 Connecting to the computer

The battery logger is connected to the computer via USB. It is included in the package, a standard USB type A<->B cable.

The USB socket is accessible by unscrewing 4 screws and opening the lid of the logger

Due to the high transmission speeds, it is recommended to use the cables included in the kit. You can also use another short (up to 3 meters) USB cable between the computer and the logger.

Two light-emitting diodes located on the housing indicate the transmission progress. The green one lights up when the DVR is sending, and the yellow one when the DVR is receiving data.

2.2 Installation of drivers

In order for the logger to be "seen" by the computer, its drivers must be installed. The current version of the drivers can be downloaded from www.czaki.pl from the "Support" tab or from the product page.

The direct link is: https://www.czaki.pl/content-dir/uploads/FTDI.zip

This installation will make an additional virtual serial port available on the computer when the interface is connected.

2.3 Software installation

The software for configuring and reading recorded data does not require installation. It is a single file batlogger.exe downloadable from the product page on www.czaki.pl.

The direct link is: https://www.czaki.pl/content-dir/uploads/rt_rtw_v127.zip

This file needs to be copied to your hard drive to a directory of your choice.

3. Software description

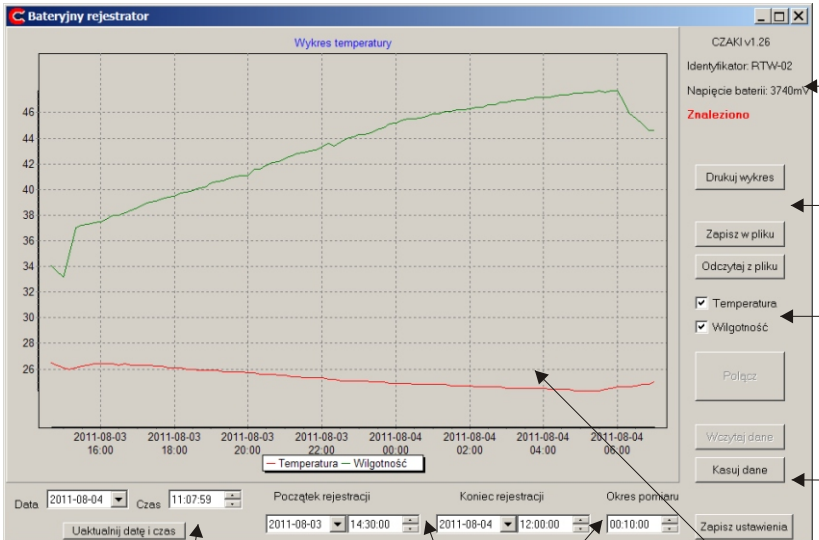
The software that operates the logger consists of only one main window, shown on the next page, which greatly simplifies operation. The main window contains both elements for configuring the recorder and visualizing the recorded results.

The application does not require a particularly modern computer, but it should be noted that the computing power of a computer can make a difference when there is a large amount of recorded data (more than 100,000 records) on the speed of refreshing and recalculating the graph, when zooming in.

The program is the only tool for operating the recorder, communication with the recorder itself is done only through it. The following parts can be specified in it:

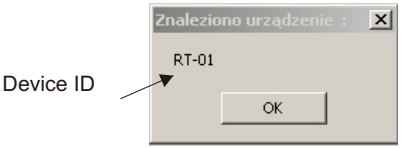
* **the chart**, na którym wyświetlany jest przebieg temperatury zarejestrowanej przez rejestrator, bądź odczytany z pliku, w przypadku BRTW do obszaru tego należą także dwa elementy pozwalające na wybór wielkości fizycznej jaka na wykresie ma być przedstawiona
* **current time,** used to correct the internal time of the recorder
* **registration settings,** where you specify the beginning and end of registration and sets the interval between individual measurements
* **recorder control buttons** for reading data from the recorder, modifying the settings and clearing the internal memory
* **buttons for operations on data,** which allow saving the recorded data data to a text file, to read them again, and to print both the graph and detailed report
* **informational,** which provides information about:
  -whether the connection has been established correctly
  -what the voltage of the internal battery is
  , -and provides the ID of the of the recorder.

More of these areas details will be described in the following section of this chapter


Bateryjny rejestrator
Wykres temperatury
CZAKI v1.26
Identyfikator: RTW-02
Napięcie baterii: 3740mV
Znaleziono
Drukuj wykres
Zapisz w pliku
Odczytaj z pliku
Temperatura
Wilgotność
Połącz
Wczytaj dane
Kasuj dane
— Temperatura — Wilgotność
Data
2011-08-04
Czas
11:07:59
Uaktualnij datę i czas
Początek rejestracji
2011-08-03
14:30:00
Koniec rejestracji
2011-08-04
12:00:00
Okres pomiaru
00:10:00
Zapisz ustawienia
information
Operations on data
Selection of unitplot tedon the chart(RTW only)
Logger control
Current date and time options
Registration settings
Chart

3.1 Setting up the connection

Before configuring the recorder or before reading data from its memory, it is necessary to set up a connection with it. The attempt to establish a connection is started when the "Connect" button is pressed. The application itself searches the various ports available on the computer. If the search operation is successful, the following message will appear. When the "OK" button is pressed, all of the recorder's settings will be loaded into the application. The device ID indicates which recorder has been found. Depending on the type of recorder found, some functions of the program may not be available.



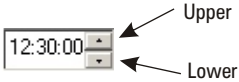
Otherwise, a similar message will appear, but with the content "Device is not responding"..

3.2 Date and time entry.

Before describing in detail the various time-related configuration functions, it is necessary to provide a general overview of how to enter time and dates in the edit fields of the current time and registration settings.

Time change

Changing the time is done similarly to changing the date. It can also be done in two ways. Select the hour minutes or seconds with the left mouse button and enter the new value, or once selected, increase or decrease using the arrows on the right side of the box.



Date change

There are two ways to change the date.

The first: use the left mouse button to highlight the year, month or day and enter the new value.

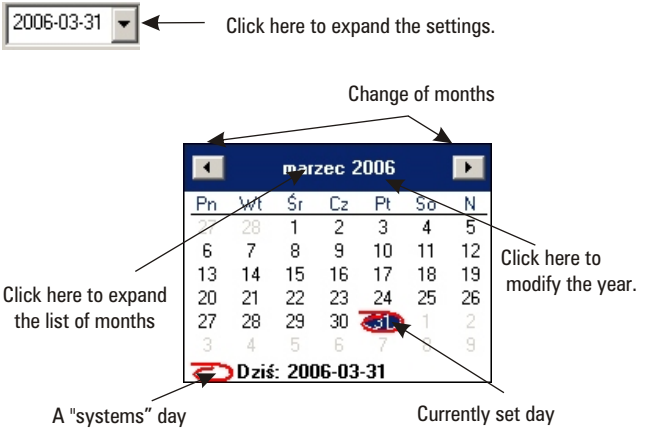
The second: Also press the left mouse button on the downward-pointing arrow. A new window will appear, which is shown next.

The day corresponding to the computer's system time is marked with a red border.

The currently set day is highlighted in blue, to change it, select another day from the calendar with the mouse and press the left key.

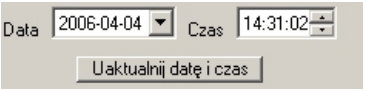
Changing the month is possible by pressing the left mouse button on the currently set month, the new one should be selected from the list.Or you can use two arrows pointing left and right, the left one decreases the month by one and the right one increases it.

To change the year, you need to select the currently set one by pressing the left mouse button and either enter a new one or use the up and down arrows to modify it.



3.3 Setting the internal clock

The newly purchased recorder is set to winter time. Before the device starts working, this time should be verified and corrected if necessary. For this purpose, use the current time area, which is shown below



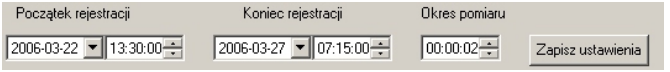
The time is read from the recorder only once, immediately after the connection is established, so the contents of the above windows cannot be treated later as the current time on the recorder.

To correct the internal time of the recorder, set the desired values as described in the previous section (Entering dates and time) and press the "Update date and time" button.

Note ! The internal time will be changed to the one selected right when the button is pressed.

3.4 Registration settings

The registration process is determined by three values: the start of registration, the end of registration and the interval between measurements. All are entered in the registration settings area as below.



Początek rejestracji - (Registration startpoint) stands for the date and time of the start of the registration process. Enter these values as described in Section 3.2 (Entering dates and time).

Koniec rejestracji - (Registration endpoint) stands for the date and time of completion of the registration process. Enter these values as described in Section 3.2 (Entering dates and time).

Okres pomiaru - (measurement period) Determines the interval between each temperature measurement. The value of this interval must be entered as described in section 3.2 (Entering dates and time).

After entering all the desired parameters and making sure they are correct, press the "Save Settings" button. As soon as you press it, the registration parameters will be updated in the recorder.

In the situation when it is requested to register more than the allowed number of measurements, i.e. 204800, the number of measurements will be set to the maximum allowed. So, the registration time will be shortened (it will finish faster).

3.5 Start of registration

The prerequisite for the start of registration is an empty internal memory.

To clear the memory, press the "Erase Data" button. This will erase all previously recorded data !

The data deletion operation, depending on how full the memory is, can take up to tens of seconds. During this time, a progress bar is displayed. Wait until the message "Memory erased" appears. If for some reason the memory cannot be cleared, the message "Memory could not be cleared" will appear.

Only thus prepared, the logger will start registration automatically at the time designated by the "Start of registration" field.

In a nutshell: to register, you need to:

- determine its start, end and measurement interval
- approve, i.e. click "Save settings"
- Reset the memory i.e. click "Delete data"

3.6 Registration process

Since the device's power supply is battery-powered, it does not contain any signaling elements about its status, so you can view the recorder's settings on your computer while the recording process is in progress. You can also read the data recorded so far.

The end of registration will occur at a predetermined time by the user automatically.

The data memory used is non-volatile memory, which means that even if the battery runs out (life span of about 5 years) the temperatures recorded up to that time will be readable.

3.7 Reading out the recorded data

To read data from the recorder, use the "Read Data" button available after the connection to the device is established.

Note! the duration of the data reading operation depends on the amount of recorded data and can take 10 minutes in extreme cases! A progress bar is displayed at the bottom of the application window. The fact that the data is copied to the computer is signaled by two light-emitting diodes located on the circuit board of the recorder.

After reading all the data, the graph will show the temperature course of the entire measurement period, and the default logger.txt file will store all the measurements in text format.... Each entry (line) in the file corresponds to one temperature and humidity measurement and contains in turn: measurement number, date, time and measured temperature and measured humidity.

4. Viewing recorded data

Once the data is loaded, it can be presented in the form of your choice: save to a file of your choice, plot on a chart, print a detailed report, print a chart

However, it is most convenient to view them on a chart, especially if the number of records goes into the tens of thousands.

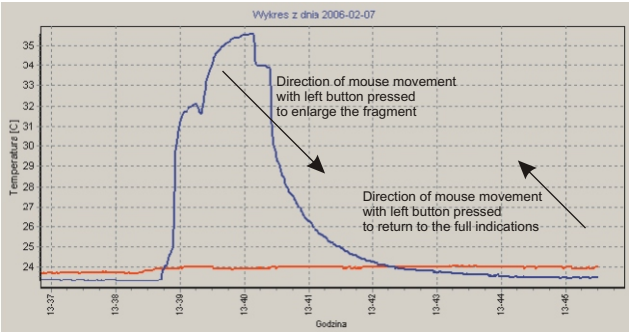
4.1 Chart

The chart shows the recorded temperature and/or humidity read directly from the recorder or archived, stored in a text file on a computer disk.

The chart is scaled in both axes automatically, but there is a function that allows you to enlarge a selected part of it. This is especially useful when the number of measurement points on the chart is significantly larger than the ability to display them, which is about 700 points.

Zoom in on a selected section of the chart

To zoom in on a section of the chart, hover the mouse cursor over the area of interest, press the left key and with a right downward motion select the selected section. If you want to restore the entire area, you need to make a similar move but to the left up, also holding the left key.



4.2 Saving data to a file.

Data in text form can be saved to a file under a different name than the default one. The "Save to file" button is used for this. After pressing it, you need to select the file, or give a new name under which the recorded measurement data should be placed. It should be noted that the size of such a file will significantly exceed 6 MB, for the maximum amount of measurement data.

4.3 Printing the chart

To print the chart, use the "Print Chart" button. Importantly, the chart will be printed in the same form as it is currently displayed on the computer screen. This allows you to print only the interesting part, enlarged in advance accordingly.

5. Information functions

At the top right of the chart is an information area, as illustrated below. This area contains only three items:

The identifier of the currently supported device indicates what type of device is currently supported. For example, "RT-01" means a temperature logger. "RTW-02" means a logger that also allows humidity recording.

Battery voltage allows you to estimate the approximate operating time of the recorder on the built-in battery. The nominal voltage is 3.6V, when this voltage drops below 3.3V you should contact the manufacturer to replace the battery with a new one.

The logger's operation status message indicates whether the device has been found, whether the memory erase operation was successful, etc.

6. Package contents

The package contains:

- recorder including battery
- USB cable type A<->B for communication with a computer
- user's manual with warranty

7. Technical data

Temperature measurement range	RT-11-1	-55°C...+85°C
	RT-11-2	-55°C...+125°C
Temperature measurement error	RT-11	± 0,5°C (-10°C...+85°C); ± 2,0°C (-55°C...-10°C) i (85°C...125°C)
Temperature measurement range	RTW-12-1	-40°C...+85°C
	RTW-12-2	-40°C...+120°C
Temperature measurement error	RTW-12	± 0,4°C (5°C...+40°C); ± 1,5°C (-40°C...+5°C) i (40°C...+85°C)
		± 2°C (85°C...+120°C)
Humidity measurement range	RTW-12	0...100% RH
Humidity measurement error	RTW-12	± 2%RH (10...90%); ± 4%RH (0...10%) i (90...100%)
Resolution		0,1°C; 0,1%RH
Measurement repetition time		10 seconds to 24 hours, programmable
Memory type / capacity		internal, non-volatile / 204800 measurements
Power supply		Built-in 3.6V AA size lithium battery to be soldered in
Dimensions (W x H x D) / weight (Without sensor)		64 x 58 x 35 mm / approx. 60 g
Interface / connector with the computer		USB / USB-B4 socket
Housing protection		IP65