

DL2-RP

DL2-RPplus

Program for data visualization from DL2 device

Version: 181109EN

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Before using this software, read the User Manual of the device.



The Manufacturer reserves the right to make changes due to the continuous upgrade of the software.

1 BASIC INFORMATION

1.1 System requirements

Operating system	WINDOWS 7 (32b, 64b) or later
RAM memory	1 GB or more

1.2 Software versions

Software is available in two versions: basic, with limited functionality **DL2-RP** and extended, offering additional functions - **DL2-RPplus**. After the purchase of the extended version it is required to [register the software](#).

The table below presents the functions available depending on a version:

Function	DL2-RP	DL2-RPplus
Opening data files	yes	yes
Opening totalizers files	yes	yes
Opening events files	yes	yes
Merge files	no	yes
Generating chart of archive data	yes	yes
Split graph into screens with a set number of points	yes	yes
Print the chart	no	yes
Export chart to: PDF, HTML, JPG, BMP	no	yes
Generating data table	yes	yes
Print the table	no	yes
Data selection	no	yes
Find from date to date	no	yes
Find smaller than / larger than selected or within / outside the range	no	yes
Search for / calculate minimum / maximum / mean minute / hour / day / month value	no	yes
Download archive files (Ethernet)	no	yes
Download archive files directly from device	no	yes
Saving IP addresses of devices with added description	no	yes

1.3 Language selection

Language setting can be changed on the startup window of the software, by clicking a flag pictogram in the upper left corner of the window (available languages: English, German, Spanish, French, Italian, Polish, Portuguese).

1.4 Software registration and launching

Extended version – **DL2-RPplus** is provided with a software registration card. This card contains a serial number, which is necessary for a registration (*Fig. 1.1*).

REGISTRATION CARD			
1. Software			
Program name: <small>(filled in by manufacturer)</small>	XXXXXX	Program version: <small>(filled in by manufacturer)</small>	XXXXXX
Serial No: <small>(filled in by manufacturer)</small>	XXXXXX		
Licence Code: <small>(filled In by user)</small>			

Fig. 1.1 Software registration card with a highlighted field – serial number.

After launching unregistered software, the startup window is displayed (*Fig. 1.2*).

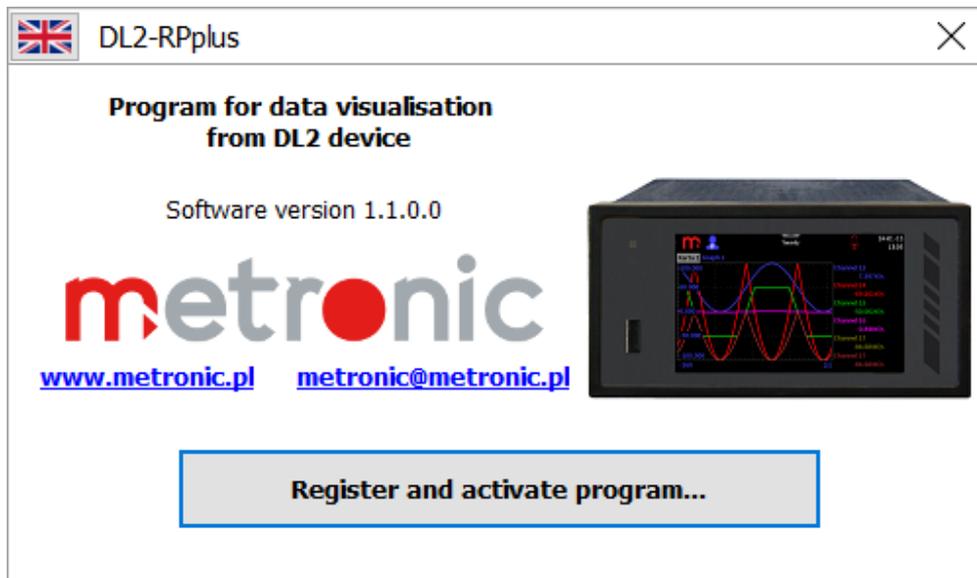


Fig. 1.2 Startup window displayed before DL2-RPplus software registration.

After clicking the **Register and activate program...** button a window containing two fields will be displayed: *Licence code* field (number entered automatically) and *Activation code* field - manually entered by the User (*Fig. 1.3*).

In order to obtain an activation code click the **Register... (email)** button and fill in the fields of an automatically generated message: *Program code* (entered automatically), *Serial number* (provided on the software registration card *Fig. 1.1*), personal data, address and telephone number.

The message should be sent to an automatically entered address. Activation code will be sent by an email message.

After receiving the activation code, enter it into the software into the field *Activation code* and select the **Confirm** button (*Fig. 1.3*). Free version does not require any registration.

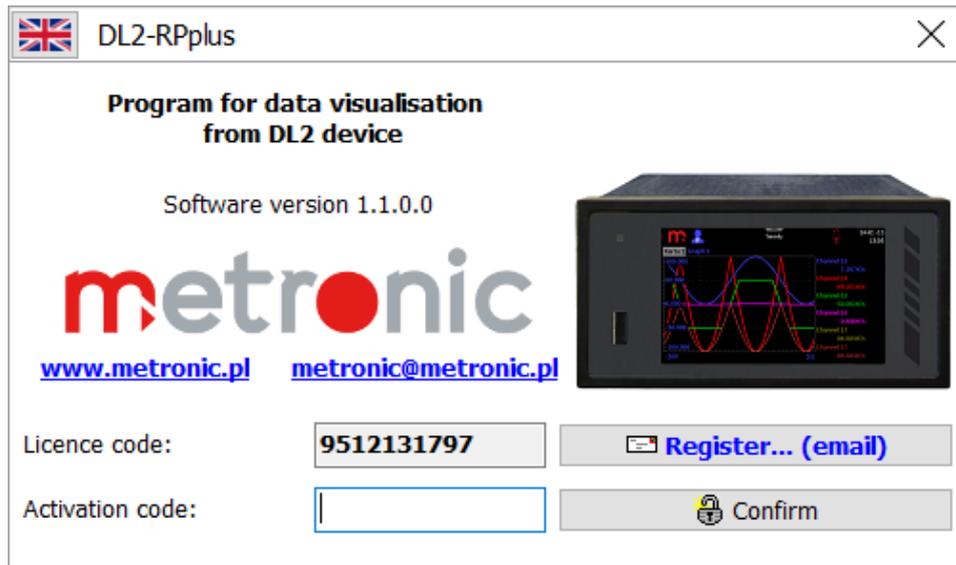


Fig. 1.3 Software DL2-RPplus registration.

After launching the registered software (in the case of the free version without a registration) the startup window will be displayed (Fig. 1.4).

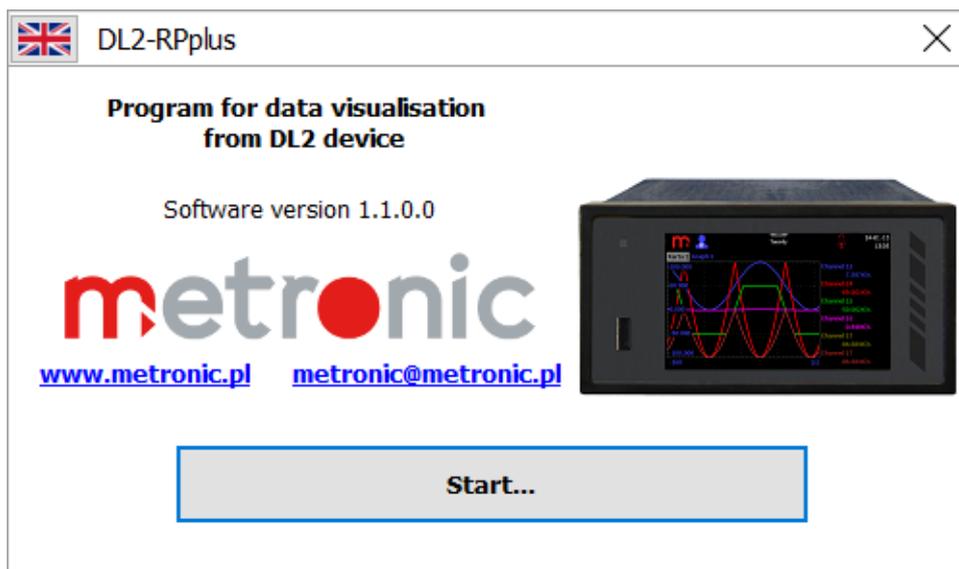


Fig. 1.4 Startup window of the registered DL2-RPplus software.

Select a language ([language selection](#)) and click the **Start...** button. The main program window containing the following tabs will be displayed:

- *Program*,
- *Files*,
- *Reports*,
- *Device online...* (only for **DL2-RPplus**).

Load an archive file by using the *Files* tab and following the instructions described in the next chapter ([Load archive files into the program](#)).

Exit the program by selecting the *Program* tab:

Program → *Exit*

2 LOAD ARCHIVE FILES INTO THE PROGRAM

Archive files saved by a device are divided into three types: data files (YYAXX.csv), totalizers files (YYTXX.csv) and events files (YYEXX.csv).

XX – Archive file number, numbering starts with 01 and ends with 99, in the case of exceeding the number 99 numbering restarts with 0.

YY – Device ID, value consistent with the User settings, in the case of ID modification a new file will be created.

This software enables an analysis / visualization of each type of the archive files.

Use the *Files* tab to load a file saved on a computer's hard drive into the program. In order to load a file, select:

Files → *Open archive file...*

Select the file location in an open window.

2.1 Information about a file

Information about the currently open archive file is available in the *Files* tab.

Files → *Information about file...*

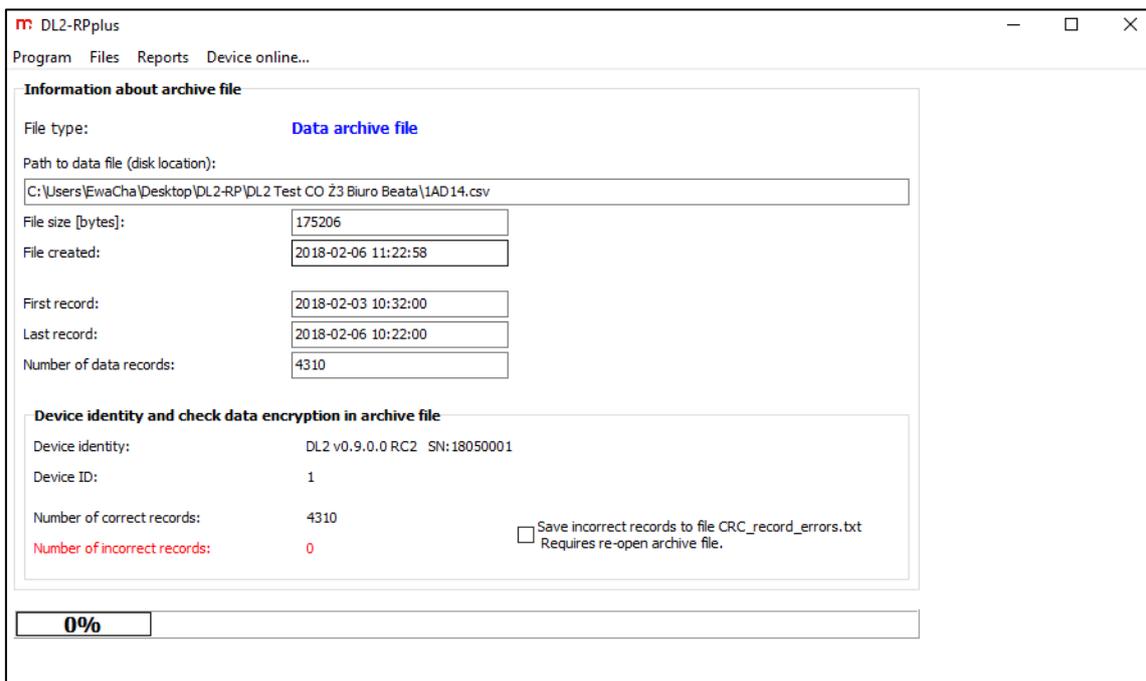


Fig. 2.1 Window with the information about the currently open archive file.

This window contains information about the archive file (i.e. type and size of the file, number of data records, archive start and end date) and information enabling a device identification. Additionally, information regarding a number of the incorrect records in an archive file was marked in red – archive continuity correctness is verified (CRC control). Incorrect records are created as a result of archive file modification or damage.

2.1.1 Save records with incorrect CRC to a file

The [Information about a file](#) window contains an option of saving incorrect records (CRC control errors) to the file *CRC_record_errors.txt*. Select the „Save incorrect records...” check-box and reload the file:

Files → *Open archive file...*

A file containing the incorrect archive records will be created in a folder in which the software **DL2-RP (DL2-RPplus)** is saved.

2.2 Merge archive files (only in DL2-RPplus)

A merge archive files option is available only in the extended version of the software (**DL2-RPplus**), in the *Files* tab. This function facilitates data review in the case of analyzing several archive files (e.g. archive files from the two consecutive months). In order to access the merging archive files window select respectively:

Files → *Merge files...*

Merges files need to be of the same type i.e. an archive data file with an archive data file, an archive totalizers file with an archive totalizers file, an archive events file with an archive events file.

An primary file is a currently loaded file into the program (see chapter 2.1 – [Information about a file](#)). Select a location of an attached file by using the **Open file to attach ...** button.

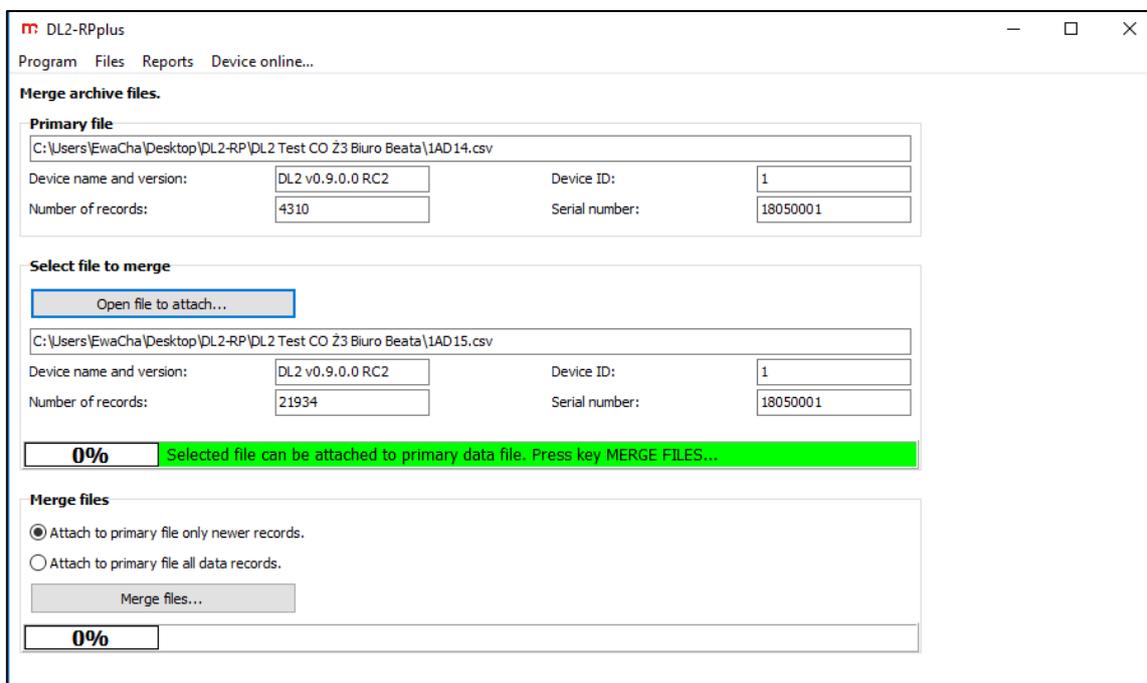


Fig. 2.2 Window enabling merging several archive data, events or totalizers files into one file.

Two options of files merging are available:

- by attaching to an primary file records newer than those saved to this file,
- by attaching to an primary file all the records from a selected file.

After loading an attached file into the program and selecting the files merging option, click the **Merge files...** button. In the displayed saving window enter the name of a file to

which all the data should be saved after merging the files (save in *.csv format). Similarly, another archive file can be attached to the saved file.

After this operation execution, a file created from merging an primary file with an attached one is automatically loaded into the program. In the case of a file created as a result of archive merging, CRC control is erased.

2.3 Data selection (only for DL2-RPplus)

Data selection option is available only for the extended version of the software (**DL2-RPplus**), in the *Reports* tab. This function facilitates archive files analysis, enabling important data selection. All types of files can be subjected to this process, depending on an archive type various selection options are available.

File being subjected to the selection is the file which is currently loaded into the program (see chapter 2.1 – [Information about a file](#)). This file is called *Primary file* by the software.

Reports → *Data selection...*

As a result of a data selection process, a new archive file is being saved and then automatically loaded into the software. In the case of a file created after archive selection, CRC control is being erased.

2.3.1 Selection

Selection tab enables a criterion selection by which data should be looked up: in a required period of time, values less than, within a range, outside a range or greater than defined by the User.

Reports → *Data selection...* → *Selection* → *Find from date to date...*
Find less than...
Find from range...
Find outside range...
Find greater than...

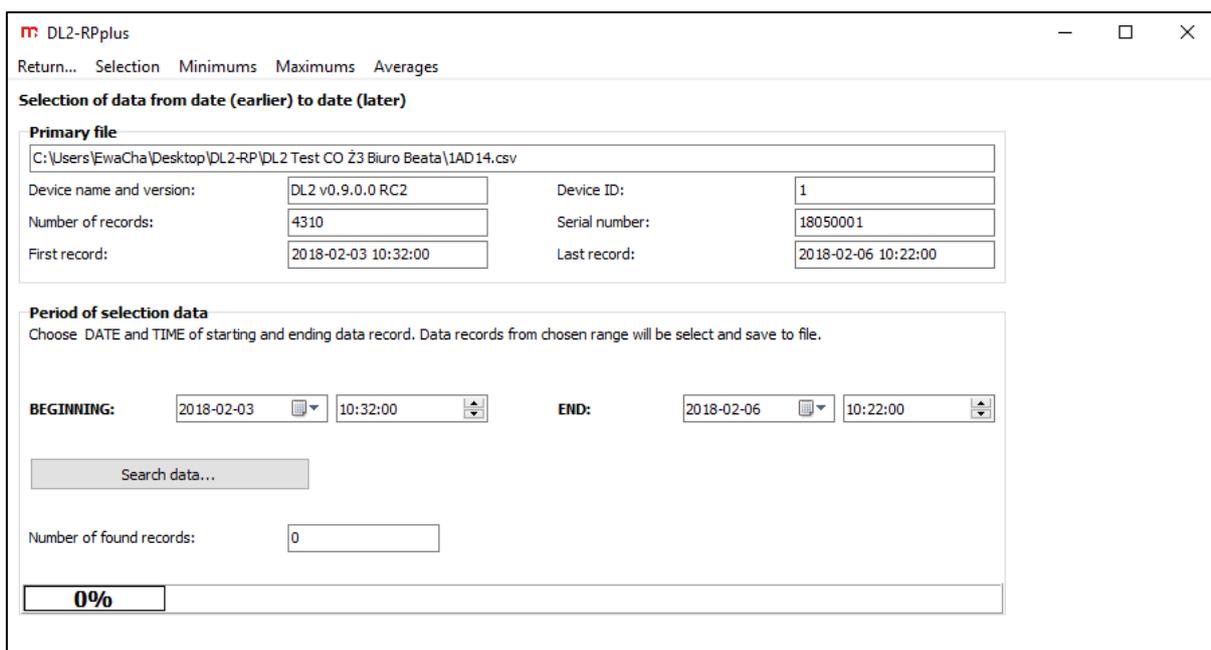


Fig. 2.3 Exemplary data selection window. Data selection from date to date.

After selecting the option, define exact lookup criteria. Looking up within a given period of time requires entering a start and an end date as well as the start and end times of a data record.

In the case of lookup based on values, for each measurement input it is possible to set a different limit value and choose a selection based on the given measurement inputs. All channels data will be saved at the time when the criteria for at least one measurement input are fulfilled (after displaying a chart it is recommended to enable an option *show data points* in order to see the filtered points).

After entering selection parameters, click the **Search data...** button. In the displayed window enter the name of a file to which data will be saved. File will be saved in *.csv format.

Select the *Return...* tab after finishing a data selection process.

2.3.2 Minimums

The *Minimums* tab enables a time interval selection, within which the minima should be looked up: minute, hour, day and month.

Reports → *Data selection...* → *Minimums* → *Minutely minimums...*
Hourly minimums...
Daily minimums...
Monthly minimums...

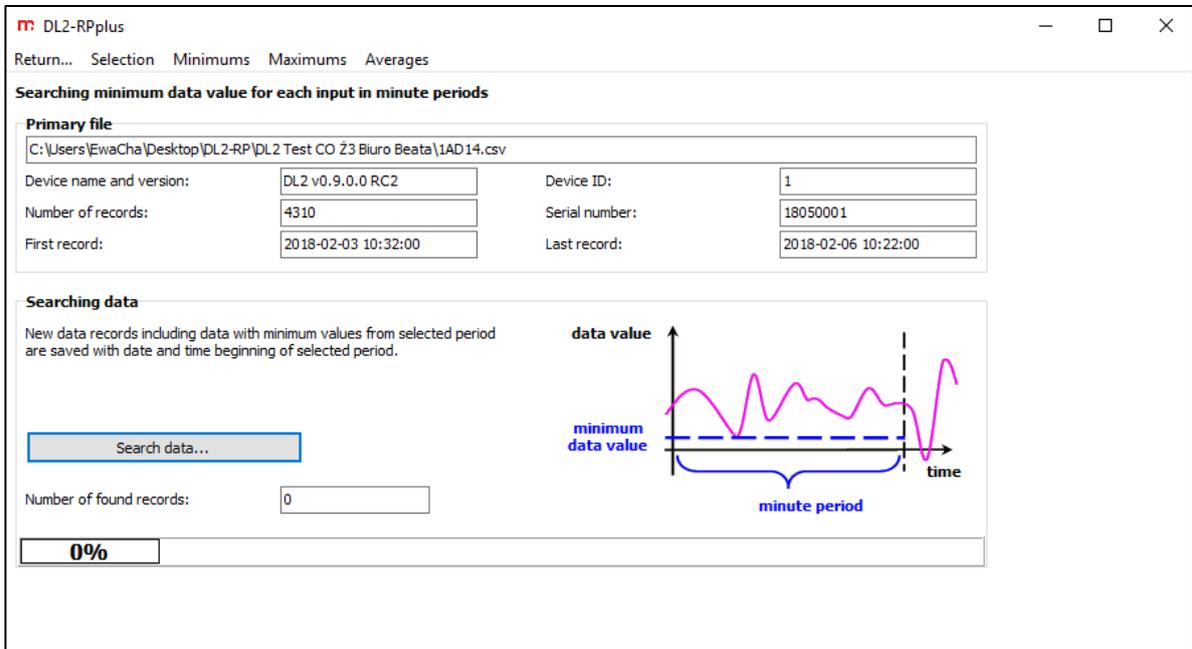


Fig. 2.4 Exemplary data selection window – Minimums. Minutely minimums.

A minimum value will be looked up within a selected time interval and then it will be saved at the beginning of this interval (e.g. after selecting a minute minimum option the software will look up the smallest values from the respective minutes and then it will save them at the beginning of each full minute).

After selecting a minimum lookup option, click the **Search data...** button. In the displayed window enter the name of a file to which data will be saved. File will be saved in *.csv format.

Select the *Return...* tab after finishing a data selection process.

2.3.3 Maximums

The *Maximums* tab enables a time interval selection, within which the maxima should be looked up: minute, hour, day and month.

Reports → *Data selection...* → *Maximums* → *Minutely maximums...*
Hourly maximums...
Daily maximums ...
Monthly maximums...

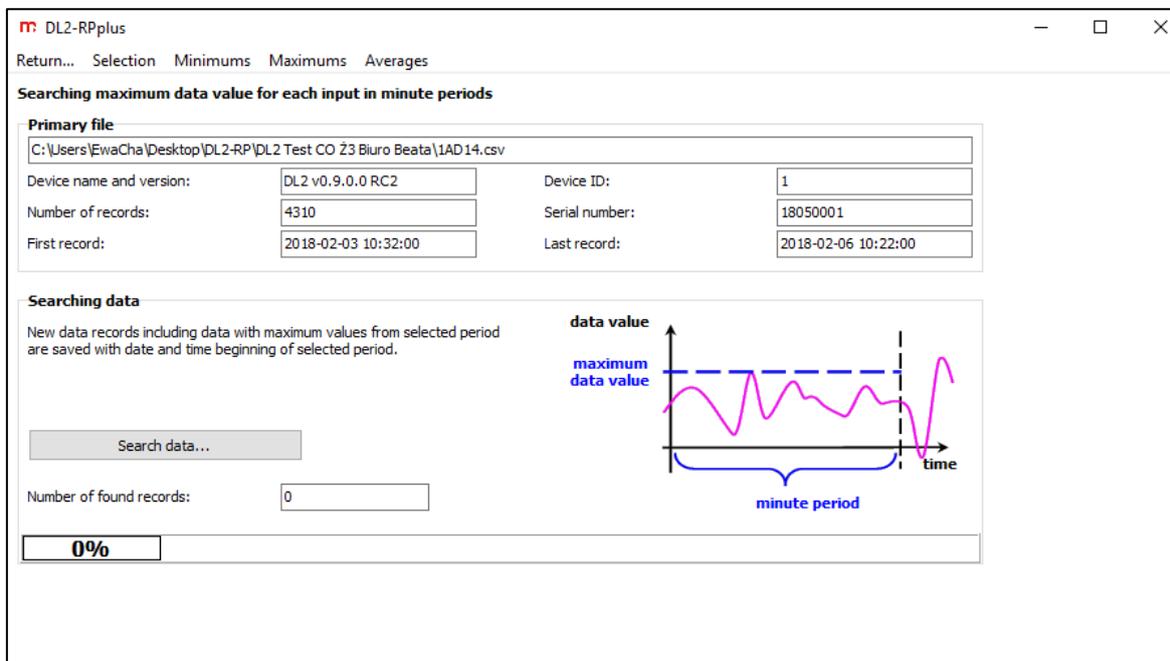


Fig. 2.5 Exemplary data selection window – Maximums. Minutely maximums.

A maximum value will be looked up within a selected time interval and then it will be saved at the beginning of this interval (e.g. after selecting a minute maximum option the software will look up the biggest values from the respective minutes and then it will save them with an interval every full minute).

After selecting a maximum lookup option, click the **Search data...** button. In the displayed window enter the name of a file to which data will be saved. File will be saved in *.csv format.

Select the *Return...* tab after finishing a data selection process.

2.3.4 Averages

The *Averages* tab enables a time interval selection, within which the mean values should be calculated: minute, hour, day and month.

Reports → *Data selection...* → *Averages* → *Minutely averages...*
Hourly averages...
Daily averages...
Monthly averages...

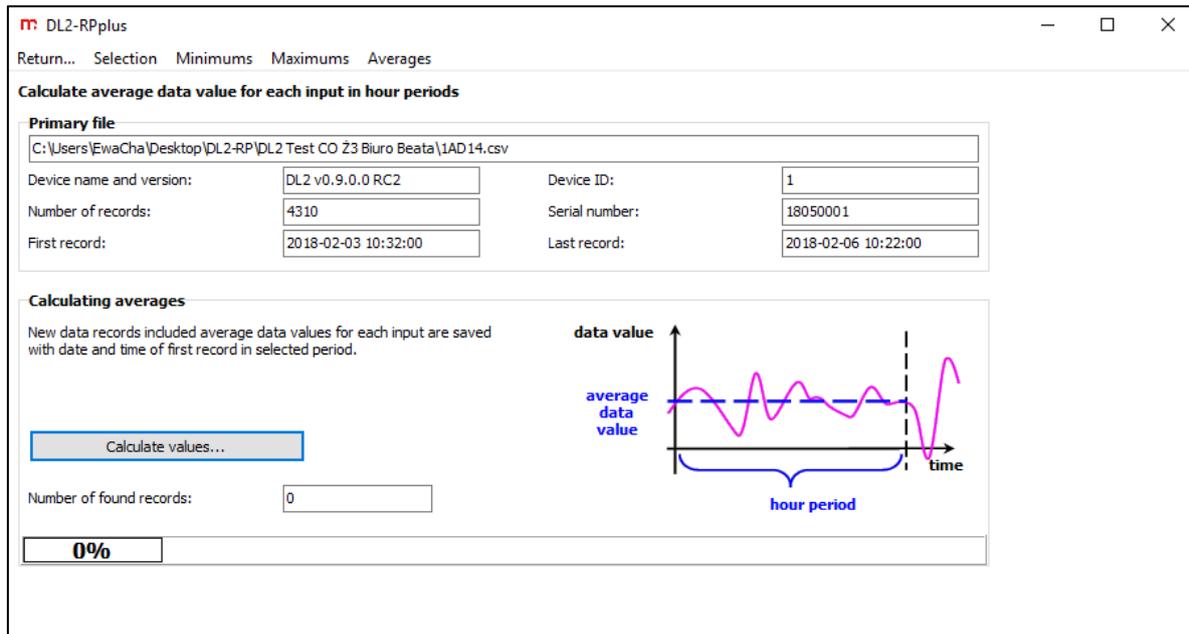


Fig. 2.6 Exemplary data selection window – Averages. Hourly averages.

A mean value will be calculated within a selected time interval and then it will be saved at the beginning of this interval (e.g. after selecting an hour mean value option the software will calculate mean values from the respective hours and then it will save them with an interval every full hour).

After selecting a mean value calculating option, click the **Calculate values...** button. In the displayed window enter the name of a file to which data will be saved. File will be saved in *.csv format.

Select the *Return...* tab after finishing a data selection process.

3 DATA AND TOTALIZERS ARCHIVE FILES

Loaded data (see chapter 2.1 – [Information about a file](#)) from the present values files and totalizers files may be presented in the form of a [chart](#) or a [data table](#). Table display requires previous chart generation. This option is available in the *Reports* tab. In order to generate a chart select respectively:

Reports → *Chart...*

Above a table/chart there is an icon bar which functions are described in the table below.

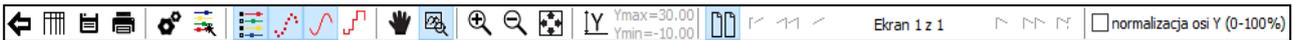


Fig. 3.1 Functional icon bar visible above a chart (DL2-RPplus).



Fig. 3.2 Functional icon bar visible above a tabel (DL2-RPplus).

The software basic version (**DL2-RP**) does not contain a chart/table printing, chart saving in the form of a JPG file and Y axis normalization (0-100%) option.

Icon	Function
	Return to previous window
	Display a data table – containing data only from the selected measurement inputs, from a time period visible in a chart
	Save the chart as a JPG file (only for DL2-RPplus)
	Print the chart (only for DL2-RPplus)
	Chart settings
	Change a line color
	Legend, show / hide a legend
	Show data points
	Link measurement points - linearly
	Link measurement points - stepwise
	Scroll chart
	Chart selection and zoom
	Chart zoom in
	Chart zoom out
	Show the whole chart
	User's scale for a Y axis
	Chart division into the screens
	Previous / next screen
	Previous / next screen x10
	First / last screen
<input checked="" type="checkbox"/>	Y axis normalization (0-100%) (only for DL2-RPplus)

3.1 Charts

In order to generate a chart select:

Reports → *Chart...*

Below a chart there is a legend (if it is enabled) and information about the current position of the cursor (coordinates X and Y). Hovering the cursor over the chart bolds the chart's name in the legend's field as well as bolds and marks in red a part of the chart, which value is displayed in the cursor's coordinate.

Selecting option enables marking and zooming in/out any area selected by the User (clicking on and dragging from left to right magnifies an image, clicking on and dragging from right to left reduces an image). Return to the whole chart view after clicking icon.

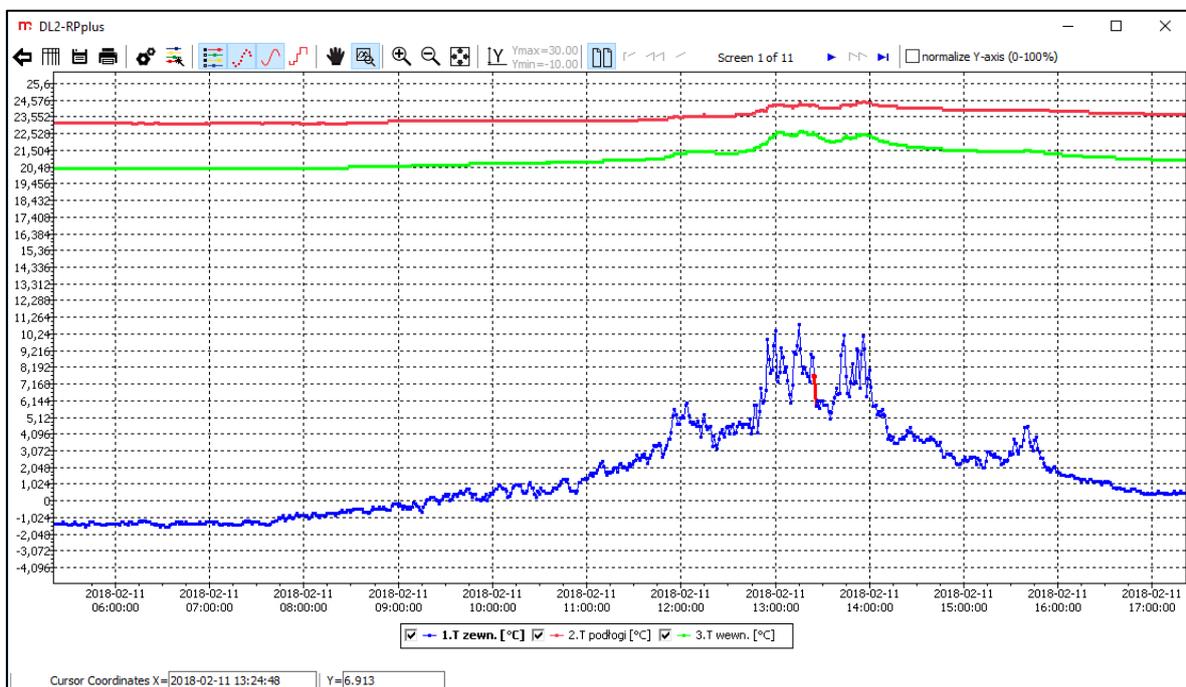


Fig. 3.3 Charts window.

In order to enable/disable displaying of a selected measurement input, click on its name in the legend field (the legend enabling/disabling after clicking the button).

The program enables easy configuration of the measurement data display, in order to match the User's needs in the best possible way.

Measurement points can be displayed or hidden (); unconnected or connected linearly () or stepwise (). Click the button in order to change a chart line color.

Clicking the button displays a chart settings window, where the following items can be modified: chart line thickness, measurement points size; User's scale and number of points on the screen can be defined, as well as background and descriptions color can be set.

The software extended version (**DL2-RPplus**) enables chart export. More information in chapter 5 - [Data export](#).

3.2 Data table

In order to display the data in the form of a table, first generate the chart.

Reports → *Chart...*

Select the pictogram on the functional icon bar visible above a chart. Select the icon in order to return to the chart view.

A generated table contains data only from a time period visible on the chart. If two out of five measurement inputs are selected to be displayed on the chart (marked in the legend), and the chart was magnified, then a table will contain data only for two selected inputs, within the time period visible on the chart. The table presents the measurement data from a loaded file arranged in chronological order. First two columns contain a date and a time of records saving, consecutive columns present data from successive channels.

Date	Time	1.T zewn. [°C]	2.T podłogi [°C]	3.T wewn. [°C]
18-02-11	05:35:00	-1.4	23.2	20.4
18-02-11	05:36:00	-1.5	23.2	20.4
18-02-11	05:37:00	-1.5	23.2	20.4
18-02-11	05:38:00	-1.5	23.2	20.4
18-02-11	05:39:00	-1.4	23.2	20.4
18-02-11	05:40:00	-1.4	23.2	20.4
18-02-11	05:41:00	-1.6	23.2	20.4
18-02-11	05:42:00	-1.5	23.2	20.4
18-02-11	05:43:00	-1.5	23.2	20.4
18-02-11	05:44:00	-1.3	23.2	20.4
18-02-11	05:45:00	-1.3	23.2	20.4
18-02-11	05:46:00	-1.3	23.2	20.4
18-02-11	05:47:00	-1.4	23.2	20.4
18-02-11	05:48:00	-1.4	23.2	20.4
18-02-11	05:49:00	-1.4	23.2	20.4

Fig. 3.4 Data table window (data archive files).

In the extended version – **DL2RPplus**, for the totalizers archive files, above a data table there is a field *Report from... to...*. Set the start and end date as well as record time and then click the **Calculate** button. Program will display the records values for the selected times and it will calculate the difference between them. Click the **Show totalizers** button in order to return to all the records view.

Date	Time	2.T1.Amount of water injected	2.T2.Amount of water injected	7.T1.Water level tank 1	7.T2.Water level tank 1	8.T1.Water level tank 2
18-04-20	15:58:00	993597	993597	7816156	7816156	8539434
18-04-21	10:41:00	1052119	1052119	8040358	8040358	8782395
SUBSTR.		58522.0000	58522.0000	224202.0000	224202.0000	242961.0000

Fig. 3.5 Data table window (totalizers archive files – report in a required period of time).

The software extended version (**DL2-RPplus**) enables export of data table. More information in chapter 5 - [Data export](#).

4 EVENTS ARCHIVE FILES

Loaded data (see chapter 2.1 – [Information about a file](#)) from the events files are presented in the form of a table. In order to generate a data table select respectively:

Reports → *Events...*

Click the  icon in order to return to the previous view.

By default, all the data saved to the archive is displayed (the *Number of events* field allows to verify if all the data is displayed).

The table consists of four columns: events date, time, code and description. There is the  icon next to each column's name. Clicking this icon displays a drop-down list and gives the possibility to select a pattern which will be used for filtering the data.

It is possible for the User to enter a new filtering pattern by date and time (filling in the *Filter for events period* field is required) and a filtering pattern based on an event description (filling in the *Filter for events description* field is required).

In the *Filter for events description* it is permissible to use the following symbols:

- * – replacement of a character string,
- ? – replacement of a one character,
- ! – negation of an entered text.

It is impermissible to enter a description containing a space character.

Exemplary filters for the *Event description* column:

START	All records described as 'START' will be displayed (Any other words or characters cannot be included in a description)
ALL*	All records starting with 'ALL' will be displayed ('ALL' can be followed by any character string)
*ADMIN	All records ending with 'ADMIN' will be displayed ('ADMIN' can be preceded by any character string)
AL	All records containing 'AL' in their description will be displayed (before and after the 'AL' characters there can be any freely chosen character string)
!STOP	All records not containing 'STOP' in their description will be displayed
CH0?1*	All records starting with the 'CH0' characters will be displayed, then containing any freely chosen sign, then '1' and ending with any freely chosen character string

Symbols of the records saved in the *Event code* column:

AL	An event regarding alarms (e.g. exceeding the alarm threshold)
ARCH	An event regarding an archiving process (e.g. turning the archiving process off)
SYS	An event regarding a system (e.g. turning a supply on/off)

Symbols of the names in the *Event description* column (event code included):

AL	ACK	Acknowledged alarms
AL	CHx ALy ON	Activated the "y" alarm on the "x" channel
AL	CHx ALy OFF	Deactivated the "y" alarm on the "x" channel
ARCH	NEW	Created a new archive file
ARCH	STOP	Stopped archivization
ARCH	START	Started archivization
SYS	STOP	Power supply switched off
SYS	START	Power supply switched on
SYS	NEW SETTINGS	New settings saved
SYS	TIME CHANGED	Changed time
SYS	DATE CHANGED	Changed date
SYS	CHx: AUX VALUES RESET	Reset auxiliary values for "x" channel (min, max, totalizers)
SYS	ALL CHANNELS: AUX VALUES RESET	Reset auxiliary values for all the channels (min, max, totalizers)
SYS	BOARD x RESET	Restarted the „x” board due to a communication error
SYS	LOGIN: xxxxx	User login xxxxx
SYS	LOGOUT	User logout

In fields of editing filters can be used wildchars: * - for multi characters, ? - for single character, ! - for negation, Enter filtering pattern (eg. *CH003*), filter will be enabled in column header filter list.

Filter for the events period (Date, Time)

BEGINNING: 2018-02-08 12:22:46
 END: 2018-02-10 12:02:59

Filter for events description

*
 Number of events: 21 / 21

Date	Time	Event code	Event description
18-02-08	12:22:46	SYS	STOP
18-02-08	12:22:46	SYS	START
18-02-08	12:24:45	SYS	NEW SETTINGS
18-02-08	12:29:54	SYS	LOGOUT
18-02-08	12:36:37	SYS	LOGIN:ADMIN
18-02-08	12:38:13	SYS	NEW SETTINGS
18-02-08	12:48:05	SYS	LOGOUT
18-02-08	14:19:06	SYS	LOGIN:ADMIN
18-02-08	14:28:20	SYS	LOGOUT
18-02-08	16:11:10	SYS	LOGIN:ADMIN
18-02-08	16:29:41	SYS	LOGOUT
18-02-08	16:50:19	SYS	LOGIN:ADMIN
18-02-08	16:52:16	SYS	STOP
18-02-09	14:02:21	SYS	START
18-02-09	14:06:51	SYS	STOP
18-02-09	14:06:51	SYS	START
18-02-09	14:10:30	SYS	STOP

Fig. 4.1 Events table window.

The software extended version (**DL2-RPplus**) enables export of events table. More information in chapter 5 - [Data export](#).

5 DATA EXPORT (only for DL2-RPplus)

A chart or a data/events table which was generated in the program can be exported to a file in PDF, HTML, JPG or BMP format.

In order to export data from an archive file a chart or a table need to be generated by following the instructions below:

- **Charts export** *Reports* → *Chart* →
- **Data table export** *Reports* → *Chart* → →
- **Events table export** *Reports* → *Events* →

In the case of a chart, an image visible in a chart window will be exported to a file (if a chart was magnified only its close-up will be saved to the file). In the case of a table – all the data in the table will be exported to a file. If the *Report from...to...* option will be enabled in a totalizers archive file, a report table will be saved to a file.

After clicking the icon on the functional icon bar a new window will be displayed where it is possible to enter an additional, optional description which will be visible in a printout. Do not enter any characters if no additional description is required for a printout.

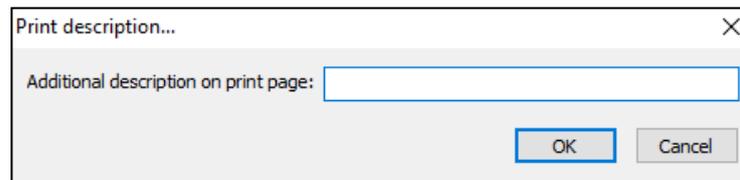


Fig. 5.1 Entering an additional, optional description for a printout.

After confirmation (**OK**), a new window will be displayed – *Print preview*.



Fig. 5.2 Functional icon bar visible in the Print Preview window.

There is an icon bar in the upper part of the window which functions are described in the table below.

Icon	Function
	Close the Print Preview window
	Page settings (size, orientation, margins)
	Printing (selection of a printer, numbers of pages, a number of copies)
	Export to the selected format
	Zoom in
	Zoom out
	Previous / next page
	First / last page

In order to print directly from a program click the icon.

An option for exporting to a file is available after clicking the icon. From a drop-down list select a format (PDF, HTML, JPG, BMP) in which the data should be saved.

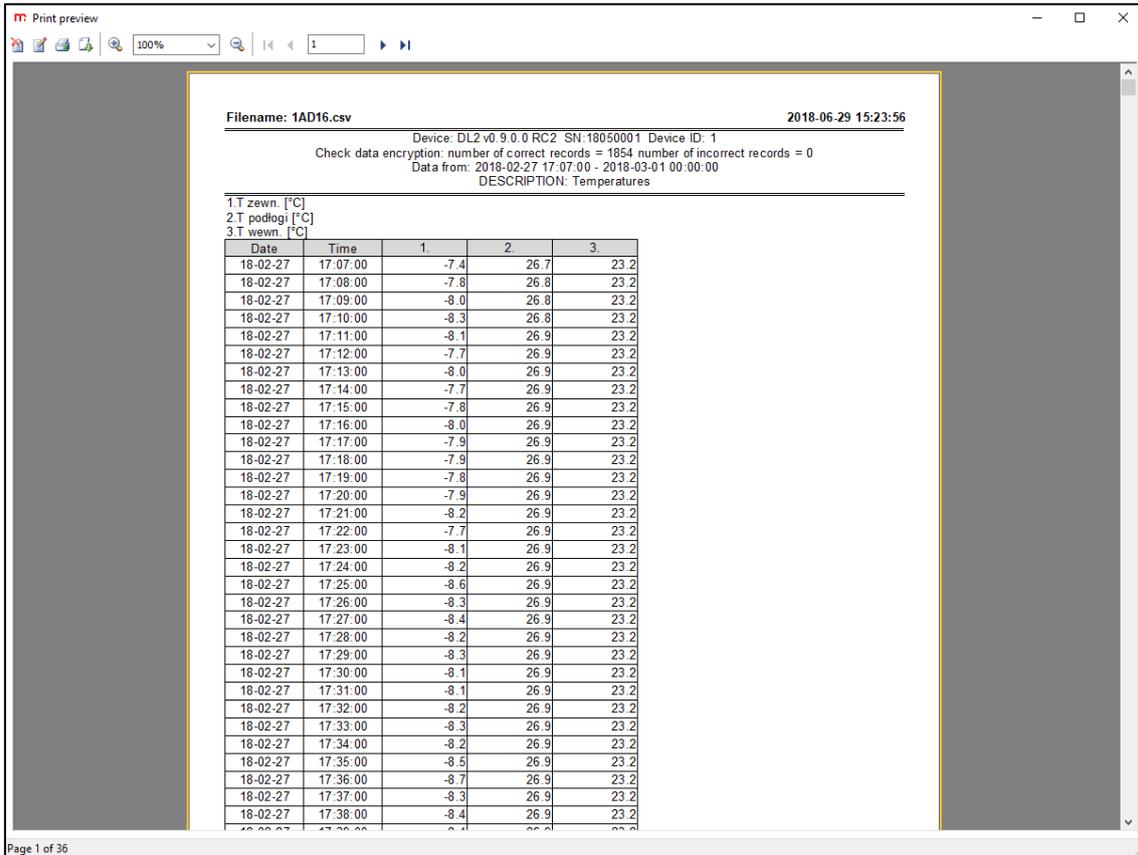


Fig. 5.3 Data table printing preview.

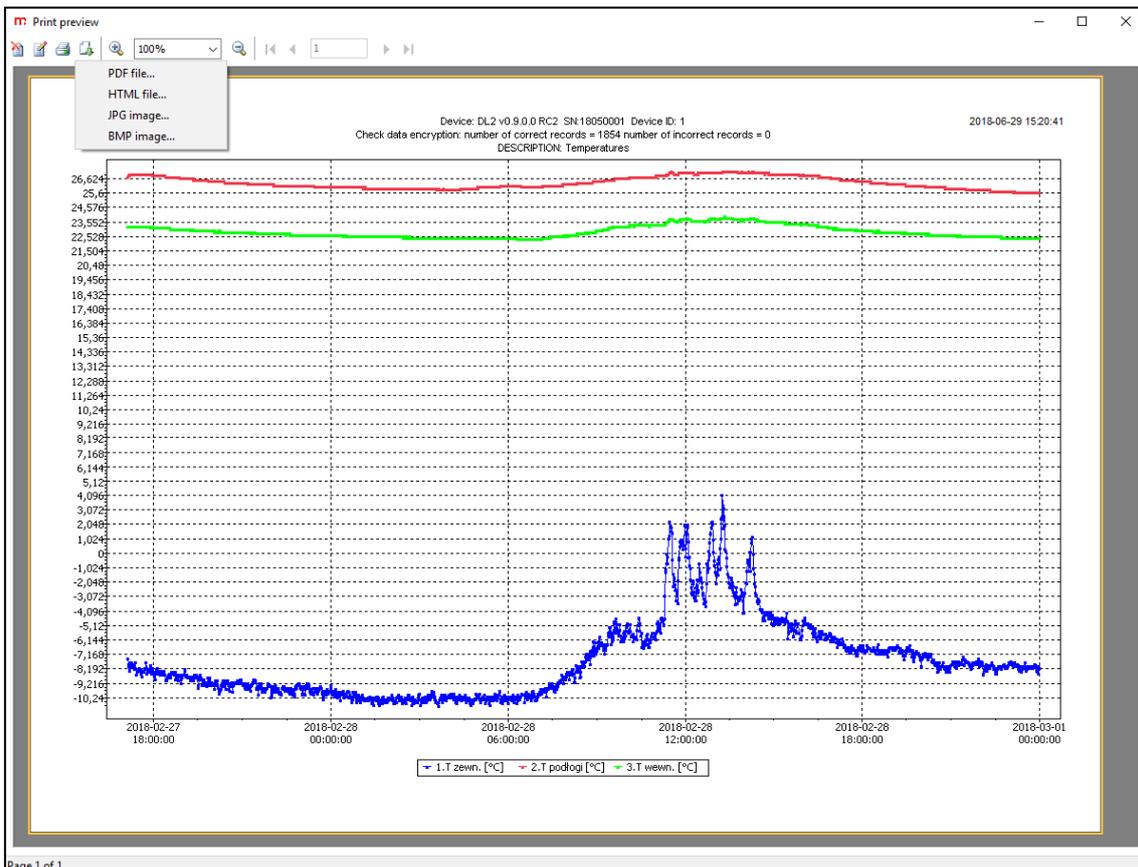


Fig. 5.4 Chart printing preview.

6 ARCHIVE DOWNLOAD (only for DL2-RPplus)

In the **DL2-RPplus** program, in the *Device online...* tab, there is an available option for downloading archive files from a device connected via an Ethernet cable.

Enter a device address in the *Device IP address* field, then select the **Connect** button.

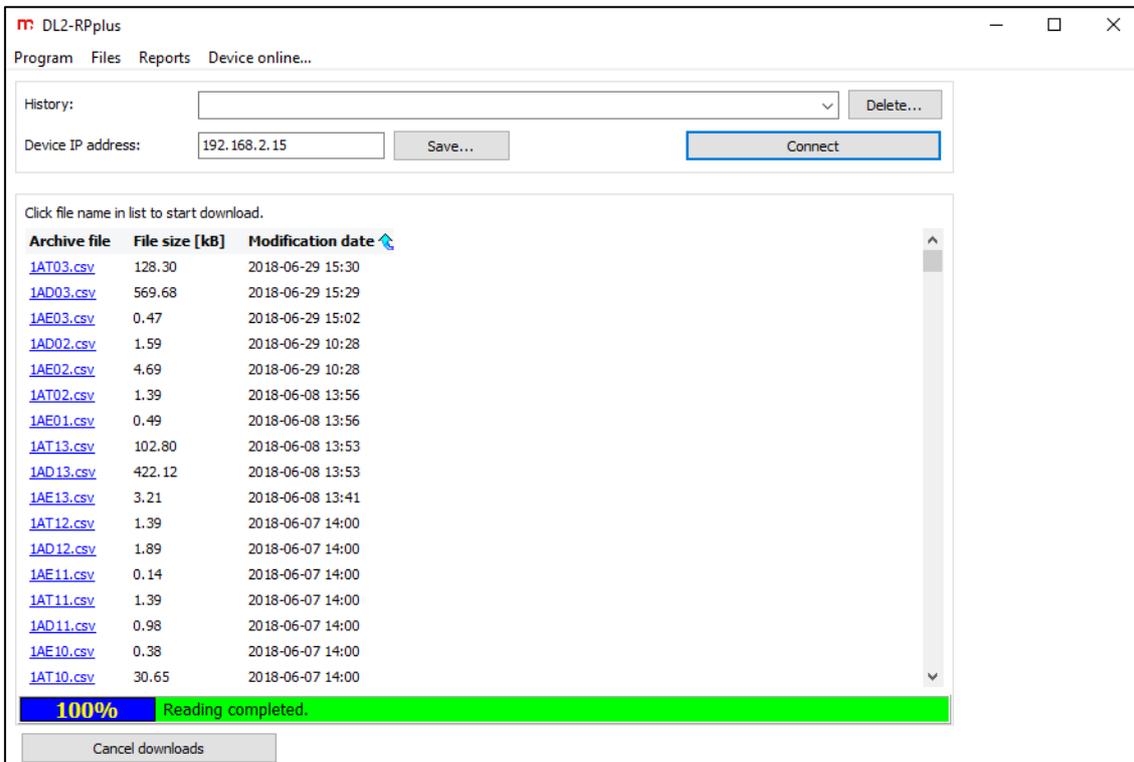


Fig. 6.1 Window enabling archive downloading by using an IP address of a device.

After establishing a connection, a list of archive files saved in a device memory is displayed. It is presented in the form of a table containing the *Archive file*, *File size [kB]* and *Modification date* columns.

By default, this table presents the files arranged from the most recent to the oldest. In order to change files display order click on a name of a column – it is possible to sort by:

- archive type (click the *Archive file* column header),
- size (click the *File size [kB]* column header),
- date (click the *Modification date* column header).

In order to start downloading, click on an archive file name.

It is possible to save an IP address of a device: in order to save it, enter its address and select the **Save...** button. An additional description (simplifying identification) can be entered in the displayed window. Confirm the operation by selecting the **OK** button.

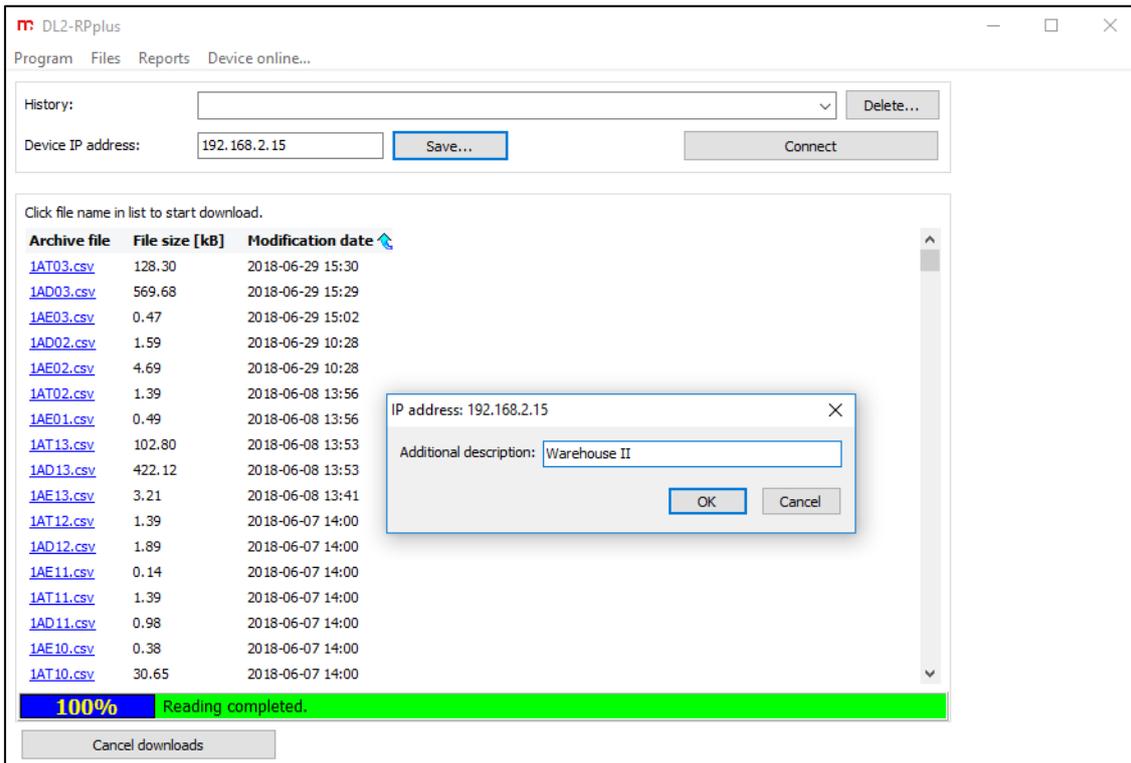


Fig. 6.2 Option for saving an IP address of a device with an additional description enabling easy identification.

Added devices can be selected from a drop-down list in the *History* field.

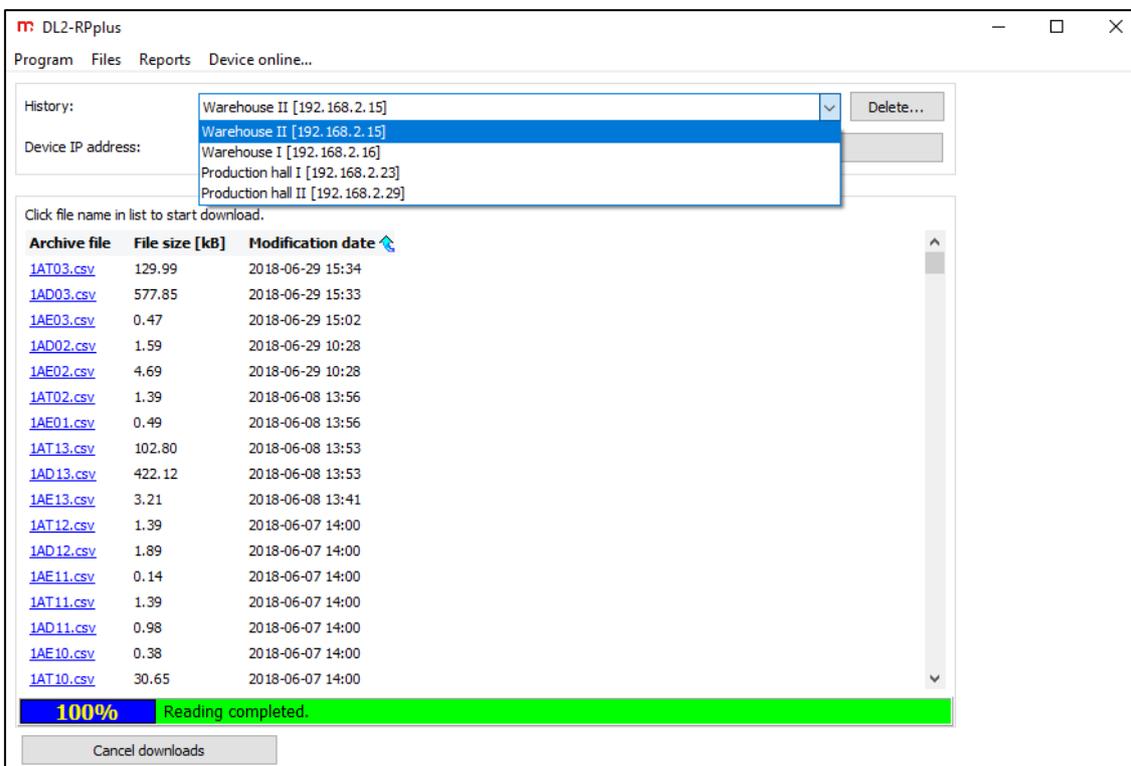


Fig. 6.3 Selection of a saved device from a drop-down list in the *History* window.

In order to delete a device which was added to the history (e.g. in the case of IP address modification of a device), select the **Delete....** button.



7 ENTITY LAUNCHING THE PRODUCT ON EUROPEAN UNION MARKET

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