



RSD

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1. General information

RSD - Universal Data Recorder

RSD is a modern and simple electronic device for recording any type of data sent from RS 232 serial port. Proper data frame receipt is signalled by a flash of led diode or through activating solid for a fixed time set earlier in configuration. Saved data frames can be quickly downloaded onto USB key. The encoded results can be comfortably viewed thanks to enclosed RSD software.



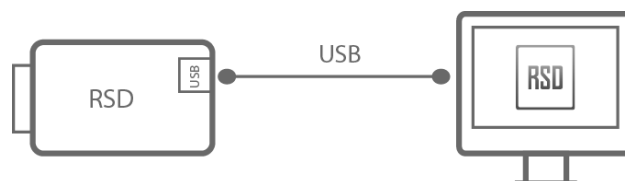
Device usage can be divided into 2 stages:

- **Project based** – preparing device to work/operate
 - Device configuration – 2 poniżej, **Błąd! Nie można odnaleźć źródła odwołania.**
 - Preparing RSD to support other external device – **Błąd! Nie można odnaleźć źródła odwołania.**
 - Data download – 4 niżej
 - Creating projects – **Błąd! Nie można odnaleźć źródła odwołania.**
- **User based** – downloading and modifying data
 - Data download – 4 niżej
 - Reading data – 0 niżej
 - Managing data – 0 niżej

2. Device configuration (selecting working mode)

2.1 Connecting RSD device to PC

Before using RSD for the first time, the device need to be properly configured. If user has a .crsd file *he may load the settings it contains.



Device configuration requires using USB cable A-A type. At this stage of configuration, when RSD recorder is powered by USB cable, the external **power supply can't be connected**.

When configuration is completed and USB cable is disconnected from the device, external power supply must be connected.

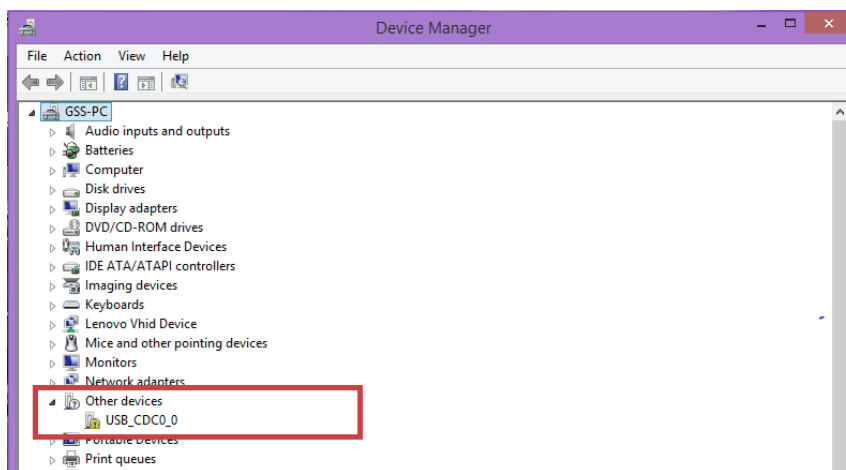
2.2 Drivers installation

To configure the device connect it to a PC and install the drivers available under the following location:

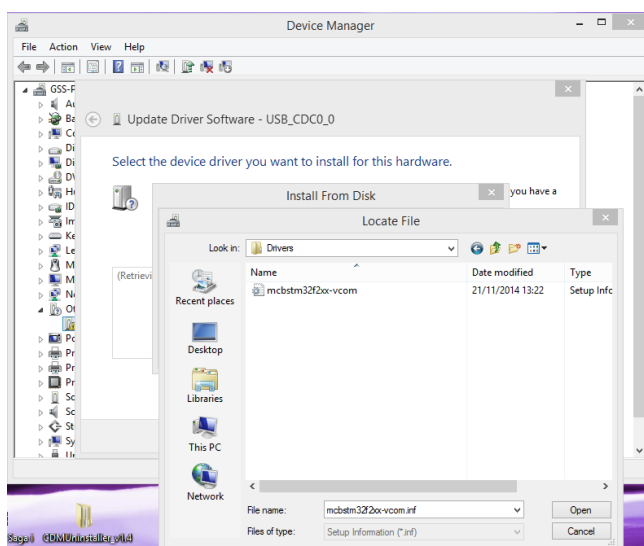
www.gs-software.pl/download/RSD/RSD_Drivers.zip

Drivers installation:

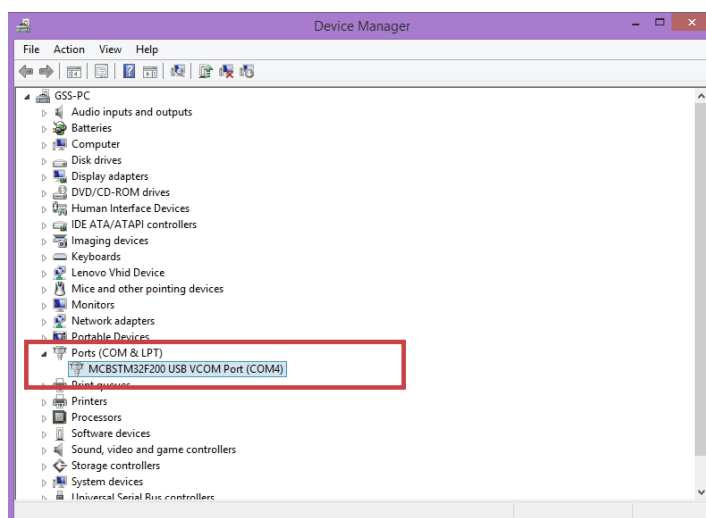
- Connect the device to PC by the use of USB A-A cable type.
- All driver files must be located in a the same folder.
- Run Task Manager. Right-click onto "USB_CDC0_0" device and select "Update driver software..." option.



- Select below options:
 - „Browse my computer for driver software“
 - „Let me pick from a list of device drivers on my computer“
- In the "Select the type of device from the list below." window, click "Next".
- Indicate a file path to „mcbstm32f2xx-vcom.inf“.



When drivers are properly installed , RSD should be visible in the Device Manager as a serial port “MCBSTM32F200 USB VCOM Port (COM*)”.

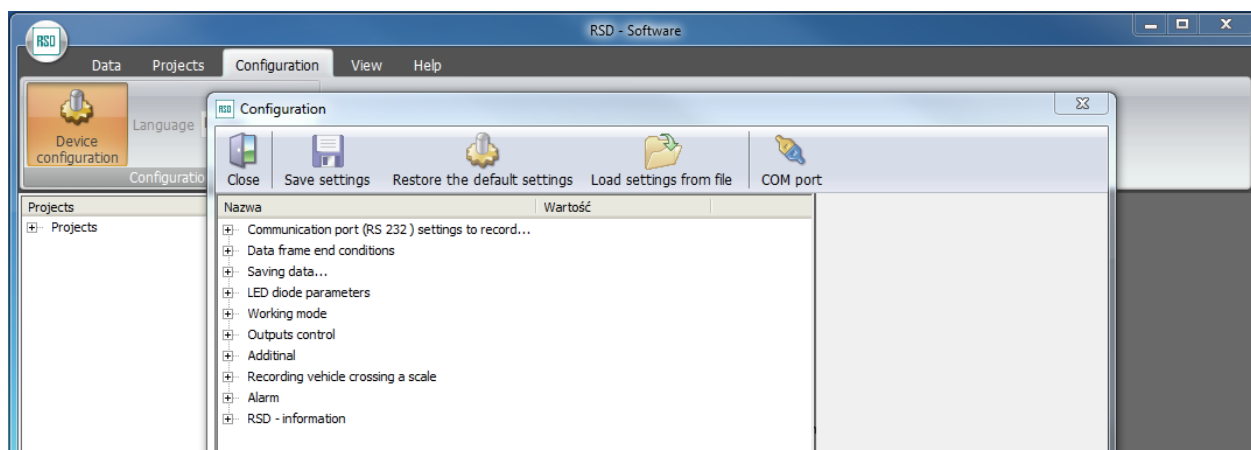


After following the steps above, **WE PRESUME**, that RSD recorder is connected to a PC and properly installed.

2.3 Device working mode configuration

In the next step RSD recorder should be configured so to enable it to work with an external device (e.g. weight indicator). To configure the RSD use program available under following location. By the use of this program you will set the serial port parameters which will receive data frames sent from external device, as well as data frame parameters and a working mode.

www.gs-software.pl/download/RSD/RSD_Software.zip



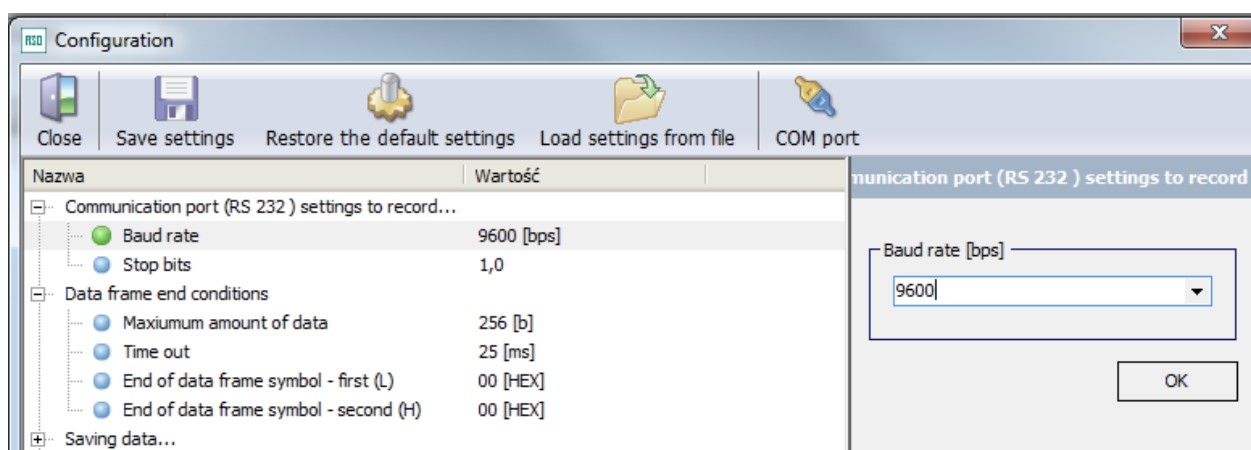
Start the program, then go to program configuration window. In configuration window you can define RSD recorder and COM port settings. After clicking on COM port icon – you can select a serial port number under which RSD recorder has been installed onto your system.

If you already have a *.crsd configuration file you can import the settings. To import settings click on "Load file settings" button in the device configuration window. Then select the *.crsd setting file.

If you don't have a file with already prepared settings, you can configure the RSD by changing certain parameters. **All the parameters are displayed in Błąd! Nie można odnaleźć źródła odwołania..**

To change selected parameter:

- Select and unfold the category of a given parameter
- Select the parameter from the list – in the panel, on the right side of the window, displayed parameter values can be edited
- Set the parameter
- Confirm with "OK"



2.4 RSD recorder configuration examples

2.4.1 Configuring RSD to enable it to work with an external device that sends data frames at long intervals on operator's demand

Worked examples:

- RSD device connected to a weight indicator which is set into printing protocol (Print) – after pressing "Print", weight indicator sends a data frame with current readouts
- RSD device connected to a driver, which send a data frame when loading of a rail tank car is complete

In order to make RSD recorder work properly, the parameters should be set as follows (the remaining parameters have to be left with default values):

Working modes:	
Working mode	Mode 1 – continuous recording (In this mode the device will record all the incoming data frames)
Communication port (RS 232) settings to record data:	
Baud rate	It is necessary to set the baud rate value of RS 232 serial port conform with the baud rate value of external device (e.g. 9600)
Stop bits	It is necessary to set the stop bit value of RS 232 serial port conform with the baud rate value of external device(e.g. 1)
Data frame end conditions:	
Maxiumum size of a data frame	256 [bytes] – default value
Time out	25 [milliseconds] – default value
End of data frame symbol - first (L)	00 - skips the condition
End of data frame symbol - second (H)	00 - skips the condition

2.4.2 Configuring RSD to enable it to work with an external device which sends data frames in continuous mode

Worked examples:

- RSD device connected to a weight indicator which is set into auto send protocol - weight indicator continually sends data frames with current readouts at fixed, very short intervals
- RSD device connected to a temperature sensor , which sends the results in the continuous mode (at a very short intervals)

In this case there are 2 options available:

- a) Recording the measurement by the use of a swither connected to the RSD device – when pressing the swither RSD saves the first complete data frame it receives

In order to make RSD recorder work properly, the parameters should be set as follows (the remaining parameters have to be left with default values):

Working modes:	
Working mode	Mode 2 – recording on demand (In this 2 nd working mode the RSD device is supported by a swither)
Communication port (RS 232) settings to record data:	
Baud rate	It is necessary to set the baud rate value of RS 232 serial port conform with the baud rate value of external device (e.g. 9600)
Stop bits	It is necessary to set the stop bit value of RS 232 serial port conform with the baud rate value of external device(e.g. 1)

Data frame end conditions:	
Maximum size of a data frame	256 [bytes] – default value
Time out	25 [milliseconds] – default value
End of data frame symbol - first (L)	00 - skips the condition
End of data frame symbol - second (H)	00 - skips the condition

- b) periodic record of measurements – recording measurements at a fixed intervals

In order to make RSD recorder work properly, the parameters should be set as follows (the remaining parameters have to be left with default values):

Working modes:	
Working mode	Mode 1 – continuous recording (In this mode the device will record all the incoming data frames)
Communication port (RS 232) settings to record data:	
Baud rate	It is necessary to set the baud rate value of RS 232 serial port conform with the baud rate value of external device (e.g. 9600)
Stop bits	It is necessary to set the stop bit value of RS 232 serial port conform with the baud rate value of external device (e.g. 1)
Data frame end conditions:	
Maximum size of a data frame	256 [bytes] – default value
Time out	25 [milliseconds] – default value
End of data frame symbol - first (L)	00 - skips the condition
End of data frame symbol - second (H)	00 - skips the condition
Additional:	
Recording with time interval	It is necessary to set the interval at which the RSD device will record a data frame. Available parameter values, given in milliseconds: : 1, 3, 5, 10, 15, 30, 60, 120, 240

2.4.3 Configuring RSD to enable it to work with an external device which works with a transmission ratio: "question - response"

In order to use RSD device to record data frames in a "question – response" mode it is necessary to know the data frame containing the question for the external device (e.g. weight indicator, sensor). In device configuration it is necessary to enter question in a hex format.

In the event of recording in the question- response mode, it is forbidden to connect the external led

Worked examples:

- RSD device connected to a weight indicator which works in "question-response" transmission mode – RSD device sends a data frame with a question to a weight indicator. In response, weight indicator sends a data frame with a current weight value readout.
- RSD device connected to temperature sensor, which works in "question-response" transmission mode – RSD device sends a data frame containing a question for a sensor. In response, sensor sends a data frame with current temperature readout.

In this case there are 2 options available (comparable as in subsection 2.4.2):

- a) Recording the measurement by the use of a switcher connected to the RSD device – when pressing the switcher RSD sends a data frame with a question to the external device, then it saves the first complete data frame containing the response.

In order to make RSD recorder work properly, the parameters should be set as follows (the remaining parameters have to be left with default values):

Working modes:	
Working mode	Mode 2 – recording on demand (In this 2 nd working mode the RSD device is supported by a switcher)
Communication port (RS 232) settings to record data:	
Baud rate	It is necessary to set the baud rate value of RS 232 serial port conform with the baud rate value of external device (e.g. 9600)
Stop bits	It is necessary to set the stop bit value of RS 232 serial port conform with the baud rate value of external device(e.g. 1)
Data frame end conditions:	
Maxiumum size of a data frame	256 [bytes] – default value
Time out	25 [milliseconds] – default value
End of data frame symbol - first (L)	00 - skips the condition
End of data frame symbol - second (H)	00 - skips the condition
Additional:	
Recording with time interval	0
Request to be send	It is necessary to enter a question which RSD device will send to external device. This question must be in hex format, separated by comas, e.g. „31,32,0D,0A”

- b) Periodic record of measurements – at a fixed interval RSD sends a data frame with a question to the external device, and then it saves all the complete data frames, that it receives.

In order to make RSD recorder work properly, the parameters should be set as follows (the remaining parameters have to be left with default values):

Working modes:	
Working mode	Mode 1 – continuous recording (In this mode the device will record all the incoming data frames)
Communication port (RS 232) settings to record data:	
Baud rate	It is necessary to set the baud rate value of RS 232 serial port conform with the baud rate value of external device (e.g. 9600)
Stop bits	It is necessary to set the stop bit value of RS 232 serial port conform with the baud rate value of external device(e.g. 1)
Data frame end conditions:	
Maxiumum size of a data frame	256 [bytes] – default value
Time out	25 [milliseconds] – default value
End of data frame symbol - first (L)	00 - skips the condition
End of data frame symbol - second (H)	00 - skips the condition
Additional:	
Recording with time interval	It is necessary to set the interval at which the RSD device will record a data frame. Available parameter values, given in milliseconds: : 1, 3, 5, 10, 15, 30, 60, 120, 240
Request to be send	It is necessary to enter a question which RSD device will send to external device. This question must be in hex format, separated by comas, e.g. „31,32,0D,0A”

2.4.4 Example of configuring steering RSD's outputs

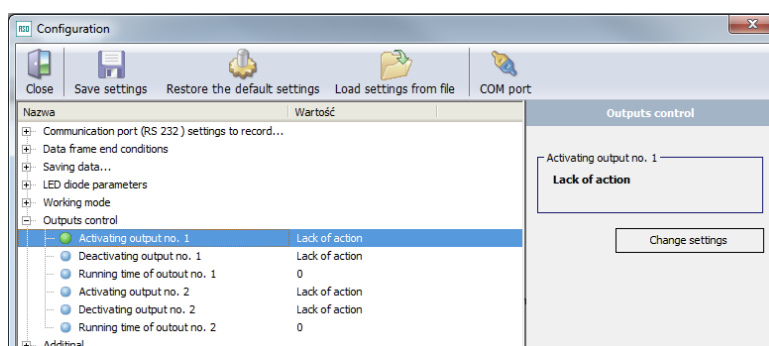
RSD device contains 2 digital outputs which support solid state relays. RSD device enables to change the output status from active into non active after the cases mentioned above. Additionally, there is an option to deactivate the outputs after fixed interval.

The list of events activating/deactivating digital outputs:

- Receiving complete data frame (data package)
- Receiving bite
- The begin of recording data onto SD card
- The end of recording onto SD card
- The begin of copying data onto USB stick
- The end of copying data onto USB stick
- Setting the marking gauge after pressing the switcher
- Setting the marking gauge so it knows about new data ready to be copied on a USB stick
- Deleting the marking gauge so it knows about new data ready to be copied on a USB stick
- Recording the passing: receiving the proper scale indication
- Recording the passing: setting indication as a stable on
- Recording the passing: exceeding the minimum value
- Recording the passing: going below the minimum value
- Recording the passing: alarm activation
- Recording the passing: alarm deactivation

Outputs control:	
Activating output no. 1	Events activating output no. 1
Deactivating output no. 1	Events deactivating output no. 1
Running time of outout no. 1	Output no. 1 running time (0 = unlimited, to the moment of activation)
Activating output no. 2	Events activating output no. 2
Dectivating output no. 2	Events deactivating output no. 2
Running time of outout no. 2	Output no. 2 running time (0 = unlimited, to the moment of activation)

In order to change the settings it is necessary to go to settings and unfold the category: "Steering outputs", then select one of the given parameters responsible for changing current state and then press "Change settings" button.



Worked examples:

- RSD device records proportioning of material – after loading the fixed amount of given material, the weight indicator sends a data frame with the weight value indication. RSD, after receiving the data frame activates the output what results in pause of material proportioning.

- RSD mounted in the external device from which it is about to record the measurements. RSD device after receiving the data frame for a 2 seconds activates the output, what results in sending a light/audio information to an operator that the action has been completed.

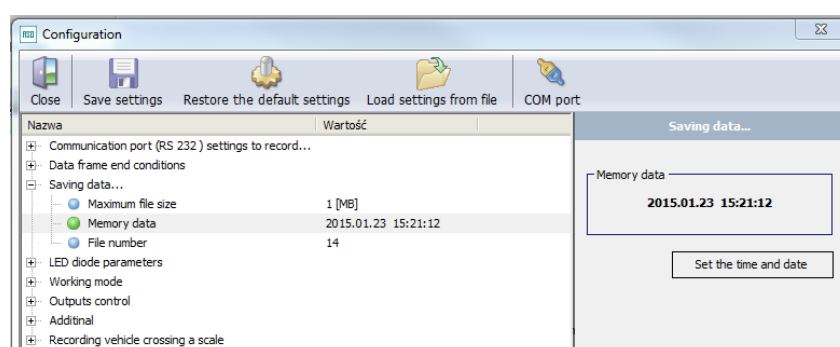
Setting outputs for the above examples

Outputs control:	
Activating output no. 1	Receiving data frame – after receiving a data frame, output is activated
Deactivating output no. 1	No action
Running time of outout no. 1	2 – after 2 seconds output is deactivated
Activating output no. 2	No action
Dectivating output no. 2	No action
Running time of outout no. 2	0

2.4.5 Setting current date – compliant with Windows system

RSD device has an internal real-time clock thanks to what to every readout value a certain time and date is assigned. Clock has no auto-update function.

To update the clock it is necessary to connect the RSD device to a PC. Then go to “Device configuration” and unfold the category “Data recording” and select “Memorize the date” parameter. In the panel, on the right side of it, should appear “Set the current time and date” button. After pressing it, the device will synchronize the clock with the PC’s system clock.



2.4.6 Configuring Led flash

RSD device has 2 signalling diode Leds . Flashing time can be configured.

Worked examples of using the diode leds:

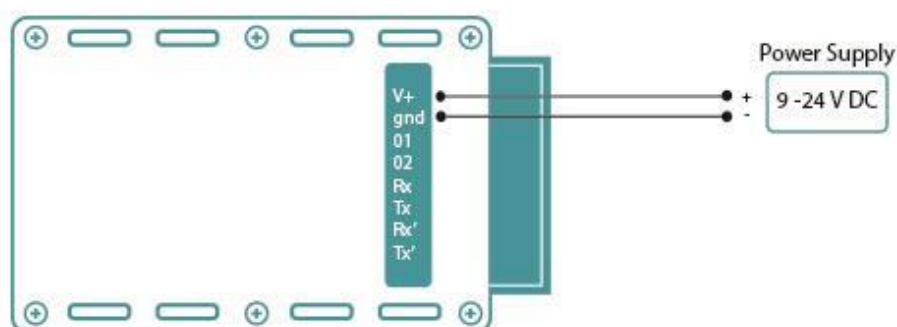
- Device ready to work – red led does not flash, green – rare impulse
- Receiving a data frame – red diode flashes at a fixed interval set in configuration
- Device properly connected to a PC – red beacons, green flashes continually

By the use of device configuration program it is possible to set the led diode flashing time

LED diode parameters:	
Data reception	Interval describing flashing frequency of led diode signaling proper functioning of device. Possible values: 5, 10, 20, 30, 60 seconds
Proper functioning	Flashing time of red led diode after receiving the data frame. Possible values: 0,5, 1, 2, 3, 5 seconds

3. Connecting the device

After proper device configuration, disconnect the USB cable from the computer. To enable working with external device (such as weighing scale) it's necessary to connect the 9-24 V DC power supply.

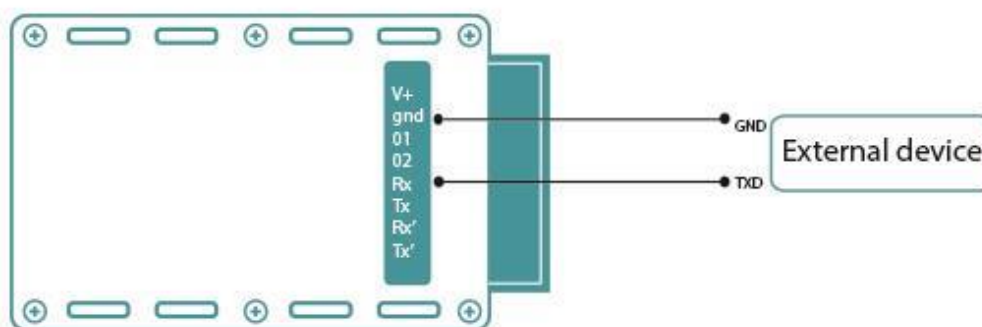


3.1 "I working mode" - continuous transmission

In the 1st working mode, the RSD device saves all the incoming data (frames).

Continuous mode - worked example:

Connect RSD device to a weight indicator. The weight indicator is set into printing mode. RSD device is set into continuous recording mode. At the time in which you want to perform the weighing press "print" button on a weight indicator. The weight indicator sends a data frame through the serial port, which is automatically received and saved by the RSD recorder.

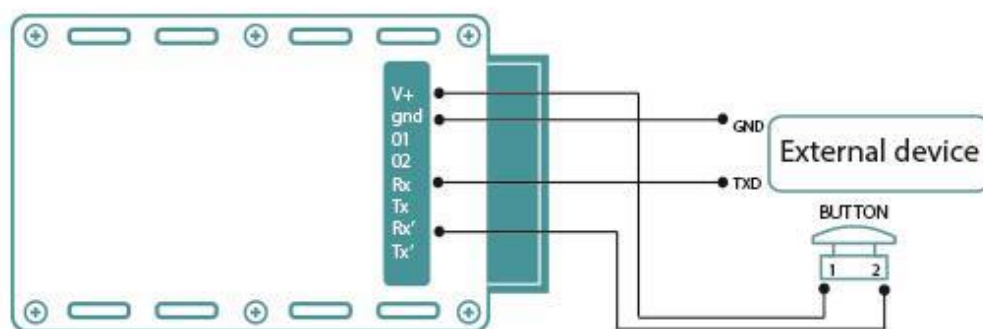


3.2 "II working mode" - on demand

In the 2nd working mode the recorder allows to select the specific moment in time (RSD digital input activation) for saving a data frame in device memory. At the push of a switcher, device saves the first received data frame.

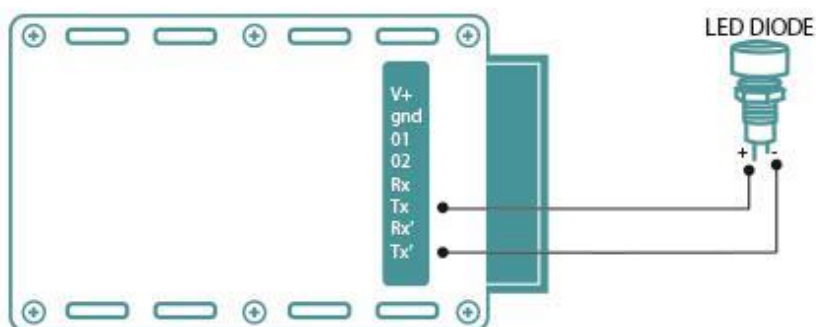
Worked example:

Connect RSD to the weight indicator set into continuous transmission "Auto" mode (RSD device is set into on-demand mode, with button fastened to it). At the time in which you want to save the weighing, you must press the button connected to the recorder, the RSD will save the first correct data frame received from the weight indicator. This example shows how easily you can save the results of each weighing. Please note that this worked example of RSD recorder applies solely to devices with continuous transmission mode.

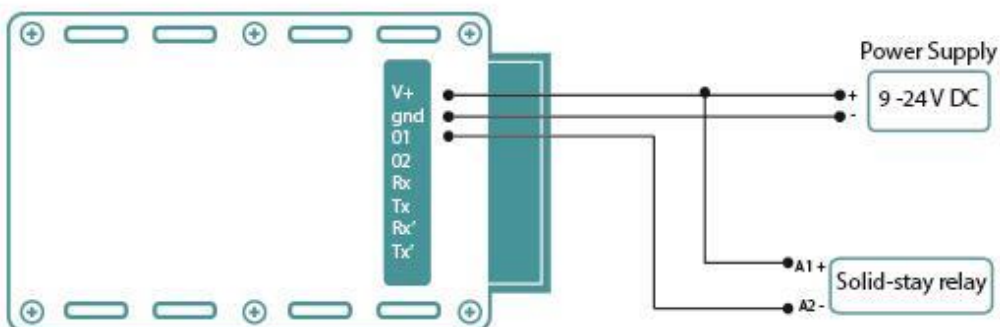


3.3 Connecting Led diode

There is a possibility to connect to the device LEDs. The led will signalling proper functioning of RSD and the moment of receiving a data frame.



3.4 Connecting the relay



Attention!

RSD recorder works most properly with semiconductor relays!

5.2 Export and import of an existing project

Import:

- If you already have *.prsd project files you can import them by the use of “Project import” function
- If you have more than 1 project and you want to import them at once, you can select several project simultaneously by holding the “Ctrl” key

Export:

- In order to export the project you must first select it from the list of projects and click on “Project export”.
- If instead of project you will select a category, all projects belonging to a given category will be exported at once.

6. Reading data

Readout of data copied onto USB stick:

- Click twice on the project, according to which, you want to read data, or select the project with the left mouse button and click on "Read data".
- Click on “Open” button
- Indicate the directory with the files (*.rsd) downloaded from the device.

RSD device program enables to:

- save read data to a file (*.csv), or (*.txt).
- display the data as a chart
- save the chart along with the data

7. RSD device parameters:

Communication port (RS 232) settings to record data:	
Baud rate	RS 232 Baud rate Possible values: 110, 300, 600, 1200, 2400, 4800, 9600, 14400, 19200, 38400, 56000, 57600, 115200, 128000, 256000
Stop bits	Stop bits Possible values: 0,5; 1,0; 1,5; 2,0
Data frame end conditions:	
Maximum amount of data	Maximum size of a data frame (preferable size - 256[bytes]).
Time out	The amount of milliseconds after which the device states that a data frame was fully received (preferable time - 25[ms]).
End of data frame symbol - first (L)	End of data frame symbol (younger bite) – when appeared RSD device states that a data frame was fully received. If [00] the device dismisses the condition
End of data frame symbol - second (H)	End of data frame symbol (older bite) when appeared, the device states that a data frame was fully received. "Older" bite will be considered only if the "younger" one is set on. If [00] the device dismisses the condition
Saving data:	
Maximum file size	Maximum size of a single file with received data frames saved in the RSD device memory. (preferable size - 1[MB]).
Memory data	Time and date of recording every single data frame
File number	Numbering of files containing data frames
LED diode parameters:	
Data reception	Interval describing the beaconing/flashing frequency of led diode which signals proper functioning of RSD device. Possible values: 5, 10, 20, 30, 60 seconds
Proper functioning	Flashing time of red led after receiving a data frame Possible values: 0,5, 1, 2, 3, 5 seconds
Working modes:	
Working mode	1 WORKING MODE – continuous transmission – recording all the incoming data frames. 2 WORKING MODE –recording on demand – enables to select the right moment in time, when RSD device saves data frames in its memory. This mode turns out useful only during serial transmission.
Outputs control:	
Activating output no. 1	Events/actions activating output no. 1
Deactivating output no. 1	Events/actions deactivating output no. 1
Running time of output no. 1	Output no. 1 running time (0 = unlimited, to the moment of activation)
Activating output no. 2	Events activating output no. 2
Deactivating output no. 2	Events deactivating output no. 2
Running time of output no. 2	Output no. 2 running time (0 = unlimited, to the moment of activation)
Additional:	
Recording with time interval	Stable time interval describes when to send a request (if parameter "Request to send" is correctly filled in)/ or

	when to record a data frame. If 0 appears, RSD sends no requests and records all received data frames. Possible values: 1, 3, 5, 10, 15, 30, 60, 120, 240 seconds
Break in recording	USB data download interruption if pendrive is plugged into device port while recording data.
Request to be send	It is necessary to enter a question which RSD device will send to external device. This question must be in hex format, separated by comas, e.g. „31,32,0D,0A” No data = question will not be sent
Recording vehicle crossing a scale:	
Recording the crossing	A full description of the parameters and configure the "Recording vehicle crossing a scale" is in a supplement to the manual.
Minimum frame capacity	
Bytes to be deleted from the beginning of a data frame	
Bytes to be deleted from the end of a data frame	
Data frame condition - data frame beginning	
Data frame condition - data frame end	
Decoding method	
Decoding format	
Weight value multiplier	
Save to a file - item type	
Save to a file - further options	
Minimum reading	
Stability - time	
Stability - number of frames	
Alarm – dotyczy tylko w przypadku rejestracji przejazdu przez wagę	
Activating while reading	Indication at which the alarm is activated
Deactivation when going below/descend	Indication below which deactivates the alarm