Electron

Bag & Membrane Relay

Manual

INDEX

INTRODUCTION

The Bag and Membrane Relay – RBM, was developed to supervise the presence of liquid (Oil, Water, etc.) in places such as transformer sealing bags and/or membranes in order to continuously monitor their integrity, so that there is no contamination of the insulating oil in case of seal rupture and used for leak detection and presence of liquids in containment tanks, liquid temperatures can range from -40 to 125°C.

The circuit of the Relay module is Microprocessed, fully isolated and protected against electrical surges and inductions, it was built according to strict quality standards and use state-of-the-art electronic components (SMD), its hardware was designed to withstand severe working conditions, and can be installed directly in Power Transformers and Reactors, in panels in the yard of power substations, offshore platforms and chemical industries. It meets the levels of requirements, supportability and reliability according to IEC, DIN, IEEE and ABNT standards.

In addition to monitoring the detection of liquids locally through an indicative LED on the front, the RBM has a reversible relay that can switch even with inverted logic, also an RS-485 Serial port with Modbus RTU protocol and DNP 3 L1 that allows remote access to the instrument so that monitoring can be done online through a supervisory system.

MAIN FEATURES

- Universal power supply 24 to 265 Vdc/Vac;
- Microprocessor and High Speed Operation Relay Module;
- Compact Box with 22.5x100x113.5 mm in ABS for DIN rail 35 mm;
- AISI-304 Stainless Steel Sensor, dimensions 14x70mm;
- 1 x 6A relay with NAF contact with programmable logic;
- 1 x 6A relay with NC contact for indication of instrument or sensor faults (watchdog)
- Pluggable Connectors;
- RS485 Digital Output with Modbus RTU and DNP 3 L1 protocol;
- Auto Baud Rate, communication speed with automatic detection and selection from 2,400 to 57,600 bps
- Front USB 2.0 for parameterization via UseEasy™ software;
- Easy Installation and Application;
- 2 years warranty.

RBM TECHNICAL DATA

Bag and Membrane Relay	
Feeding	48 a 265 Vcc/Vac 50/60 Hz
Sensor Input	SLE
Switching Operating Temperature	-40 to +85°C
Maximum Switching Capacity	70W/250VA
Maximum Driving Current	6.0 Amps
Outbound Contact	1 NAF and 1NF
Serial Communication Port	RS-485
Communication Protocol	MODBUS-RTU e DNP3.0 Lv.1
Auto Baud Rate (automatic detection and selection)	2,400 to 57,600 bps
Fixation	DIN Rail
Box	25,5 x 100 x 113,5 mm

Table 1 – RBM technical data

LIQUID SENSOR TECHNICAL DATA

Liquid Sensor – SLE	
Sensor Type	Photo: Transistor
Dimension	Dia. 14x70mm / M16x70mm
Material	AISI-304 Stainless Steel
Sensor Operating Temperature	-40 to +125°C
Degree of Protection	IP67
Response Time	50 µS
Working Pressure	0 to 5bar
Fixation	Smooth Body
Cape	3x18 AWG with Grounding Mesh

Table 2 – SLE Technical Data

TECHNICAL DATA JUNCTION BOX

Cylinder Head Type Junction Box	
Material	Injected aluminum (Or according to specifications)
Degree of Protection	IP 65
Connection Head	4 wires

Table 3 – CPC Technical Data

TYPE TESTS ATTENDED

- Applied Voltage (IEC 60255-5): 2KV / 60Hz / 1 min. (against the ground);
- Voltage Impulse (IEC 60255-5): 1.2/50µsec. / 5KV/ 3neg. and 3 pos. / 5 secs. Interval;
- Immunity to Electrical Transients (IEC 60255-4) (IEC 60255-6): 2.5KV / 1.1 MHz / 2sec, 400 surges / sec. – Cycles;

RBM DIMENSIONS

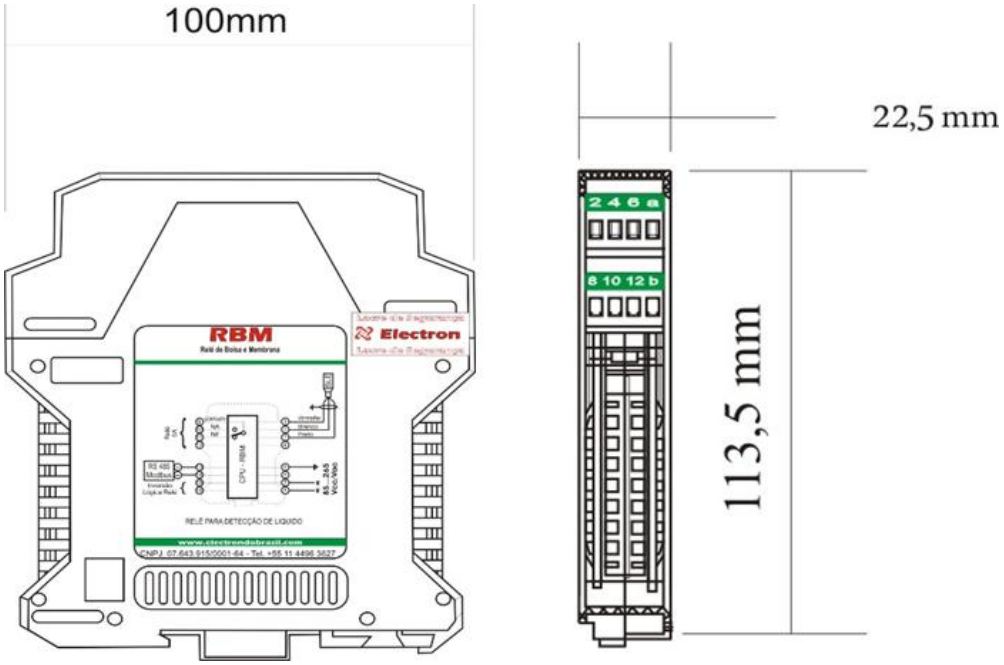


Figure 1 – RBM Dimension

SLE DIMENSIONS

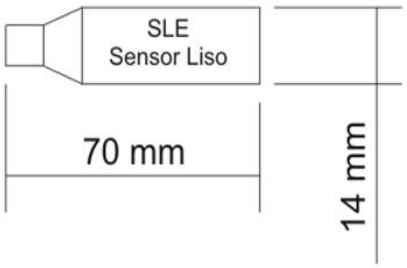


Figure 2 – SLC Dimension

CPC DIMENSIONS

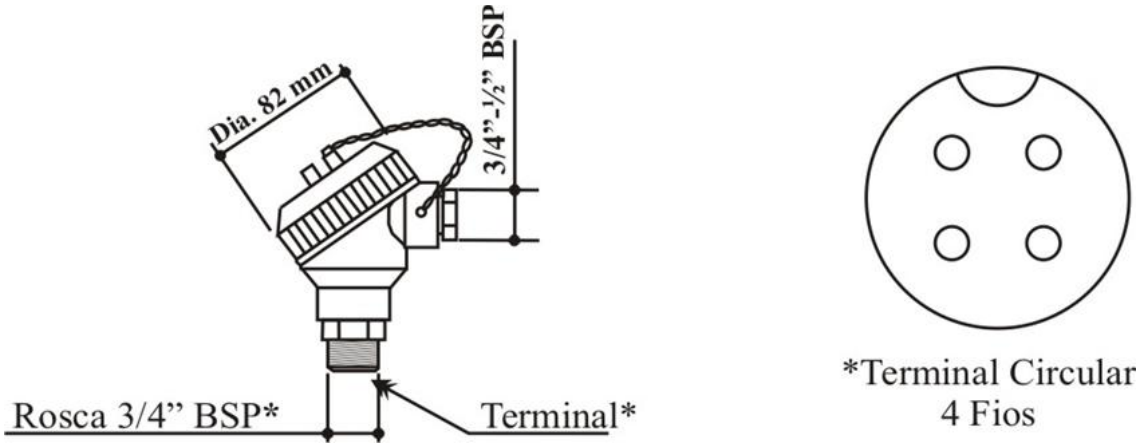


Figure 3 – CPC Dimension

CONNECTION DIAGRAM

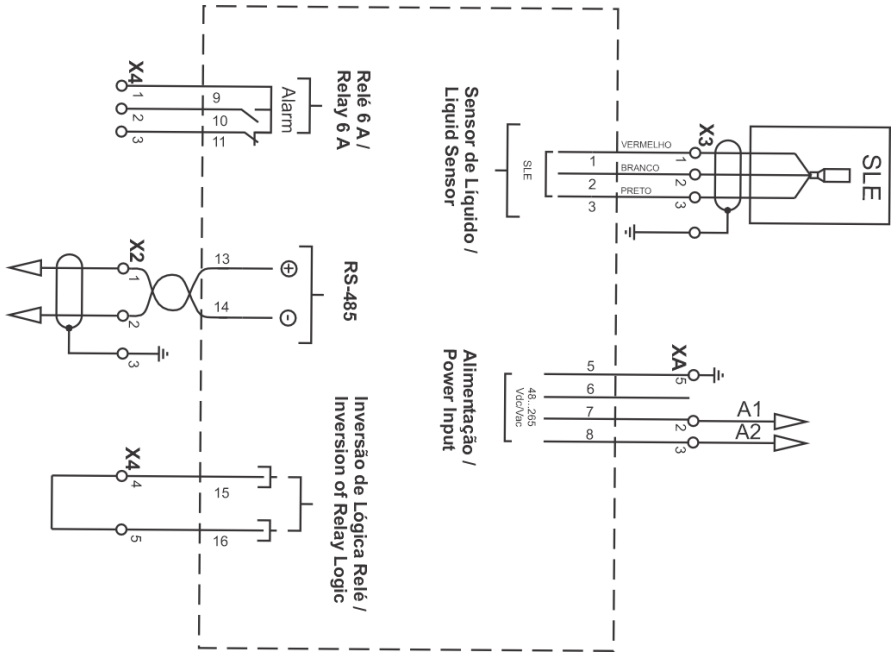


Figure 4 – Connection Diagram

CYLINDER HEAD JUNCTION BOX CONNECTION DIAGRAM

Figure 5 – Junction Box Connection Diagram

APPLICATION EXAMPLE

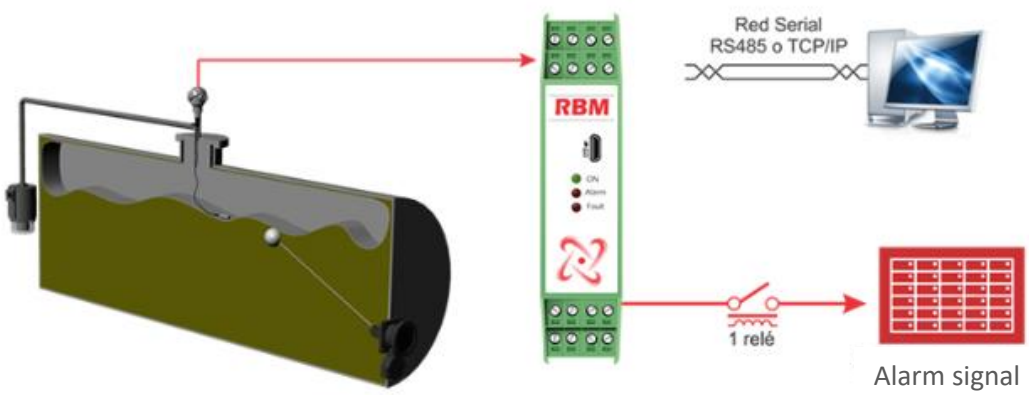


Figure 6 – Application Example

OPERATION CHART

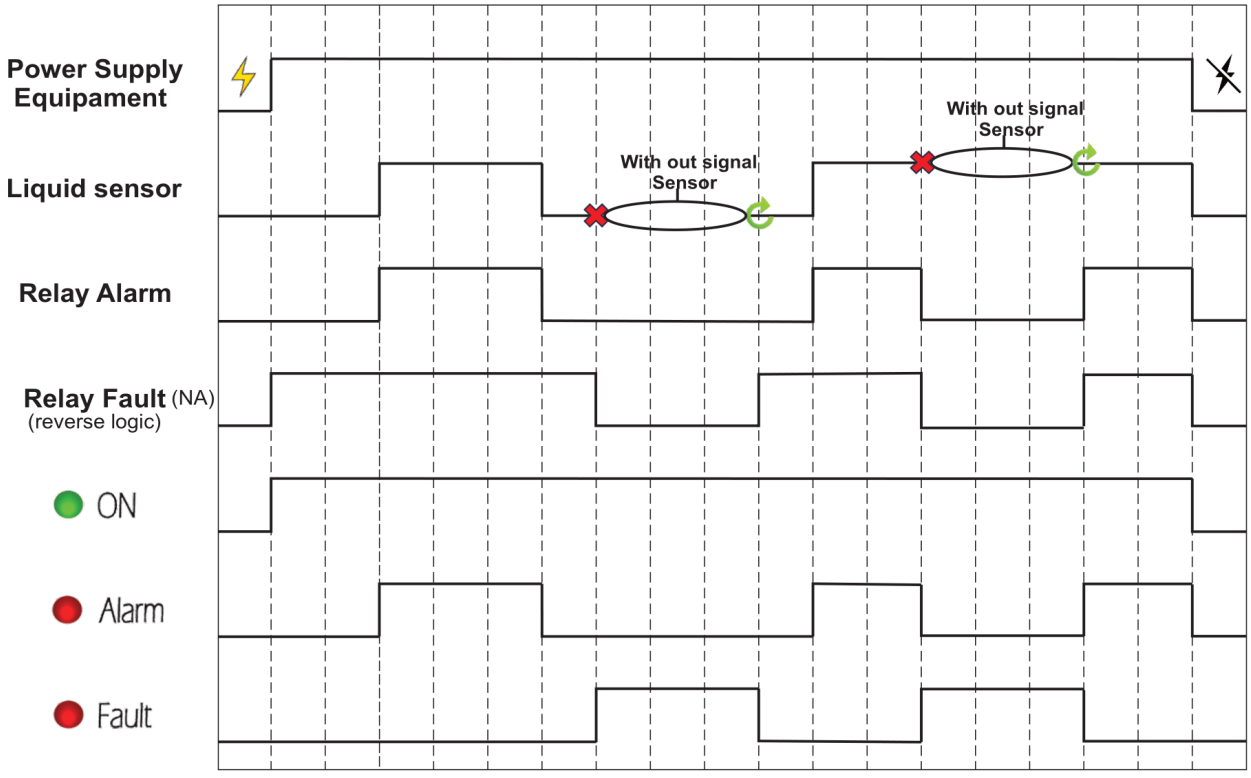
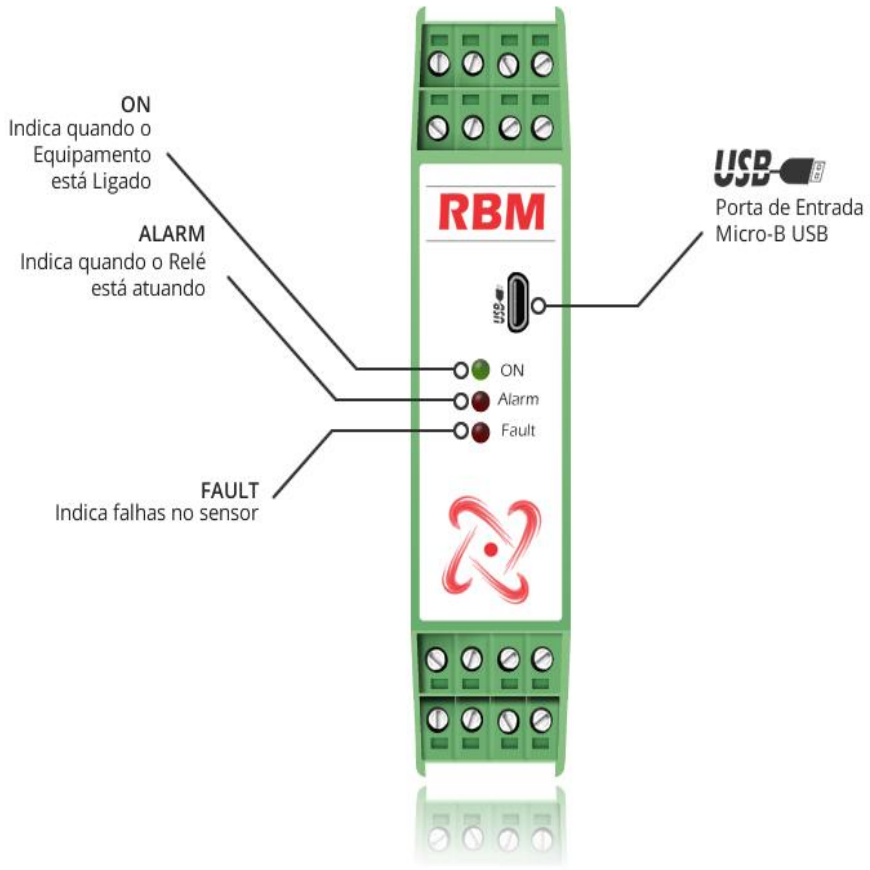


Figure 7 – Operation chart

PREVENTIVE AND CORRECTIVE MAINTENANCE							
Items to be checked preventively			Verification Frequency				Corrective action
SHARE	Verification Elements	ACTIVITIES	Every Month	Every 3 Months	Every 6 Months	Every 1 Year	When Needed
VERIFICATION	Fastening clip and snapping to the rail	Fixing to the panel door or panel bottom		X			Retightening, Fitting, Terminal Change, or Screw Change
	Terminal Blocks and Connector Comb	Attachment and attachment to equipment		X			
		Tightening of the screws in the fastening of the conductors		X			
	Sensors	Integrity / Positioning / Fastening			X		Replacement, repositioning and/or fixing of sensors
	Sensor well in oil transformers	Oil level in the well			X		Oil filling to indicated level
TESTS & MEASUREMENTS	Relays and Digital Outputs	Individual drive test			X		Forward to Electron do Brasil technical assistance
	Led's e Displays	Test Triggering Led's and Display Segments			X		
	Navigation buttons	Navigation test of the navigation buttons			X		
	Sensor Input	Gauge sensor inputs using a standard				X	
	Input voltage of equipment supply	Measure Supply Input Voltage			X		Override voltage input values according to equipment model
	RS-485 Communication Outputs	Communication and command testing in the supervisory system			X		Forward to Electron do Brasil technical assistance
	Milliampere Current Signal Inputs	Measure, compare and measure input signal in passive and/or active mode			X		
	Signal Outputs of milliampere current	Measure, compare and measure input signal in passive and/or active mode			X		
CLEANING	Terminal blocks and connector comb and connection box	Debris, Impurities and Moisture	X				Cleaning with a dry cloth, compressed air and vacuum cleaner
	Aluminum Equipment Enclosure		X				
	Front of the Equipment Display		X				
ATENÇÃO	**1 - Keeping the equipment within the ideal working temperature (50°C to 60°C) extends the useful life and avoids corrective maintenance.** **2 - The accumulation of dust and impurities in the facilities can cause short-circuiting and burning of equipment and sensors.** **3 - After 10 years of use, it is recommended to replace the equipment.**						

Table 4 – Preventive maintenance table

GETTING TO KNOW RBM



The configurations of the Equipment are made through the RBM Software through the Micro-B USB port

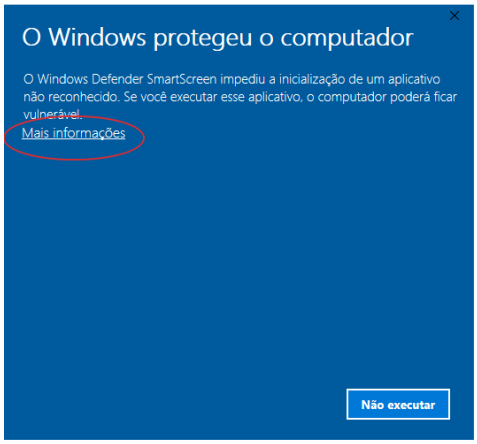
INSTALLATION OF RBM SOFTWARE ON WINDOWS 10

1) Go to our Website https://electron.com.br/pt-br/produtos/rbm/ in the menu and click on the Downloads tab of the product page and then click on "Software" to initialize the RBM software download.

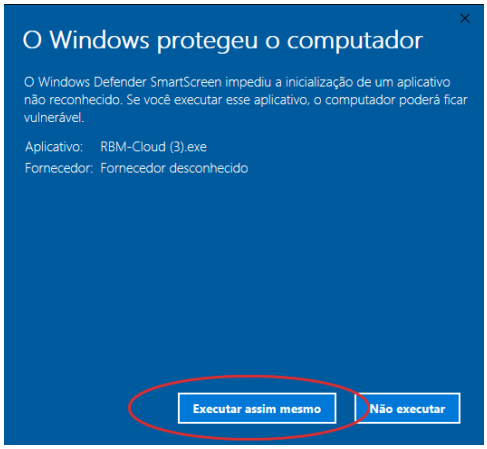
INSTALLATION OF RBM SOFTWARE ON WINDOWS 10

2) After downloading the application, run the file '**RB-Cloud.exe**'.
IMPORTANT: Hold your browser or your anti-virus for a few minutes to complete the download. The same procedure should be repeated when running the file, as some anti-viruses or even Windows Defender block functions of our software.

If you are using Windows 10, the same windows should appear on your computer, requiring the appropriate permissions to continue and access our application. Our applications and files are completely safe and free from malicious resources.

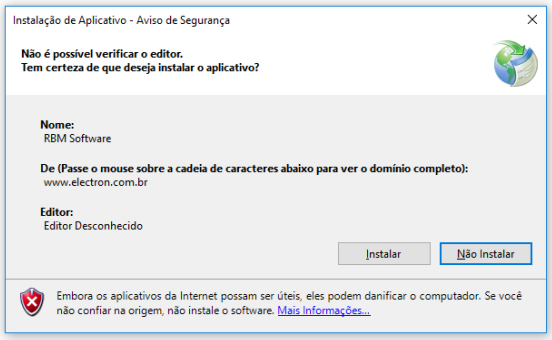


3) If this window has appeared on your computer, click on the underlined option "**More Info**" and then,
Go to step 4.

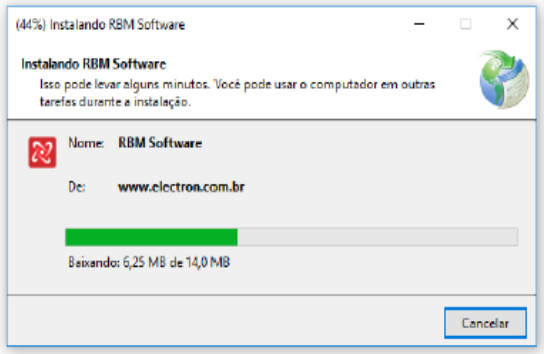


4) Now click on the 'Run Anyway' button allowing the features of our application to be accessed.

INSTALLATION OF RBM SOFTWARE ON WINDOWS 10



5) In this step, click on the "**Install**".



6) Wait for the download to finish.

CONFIGURING RBM VIA SOFTWARE

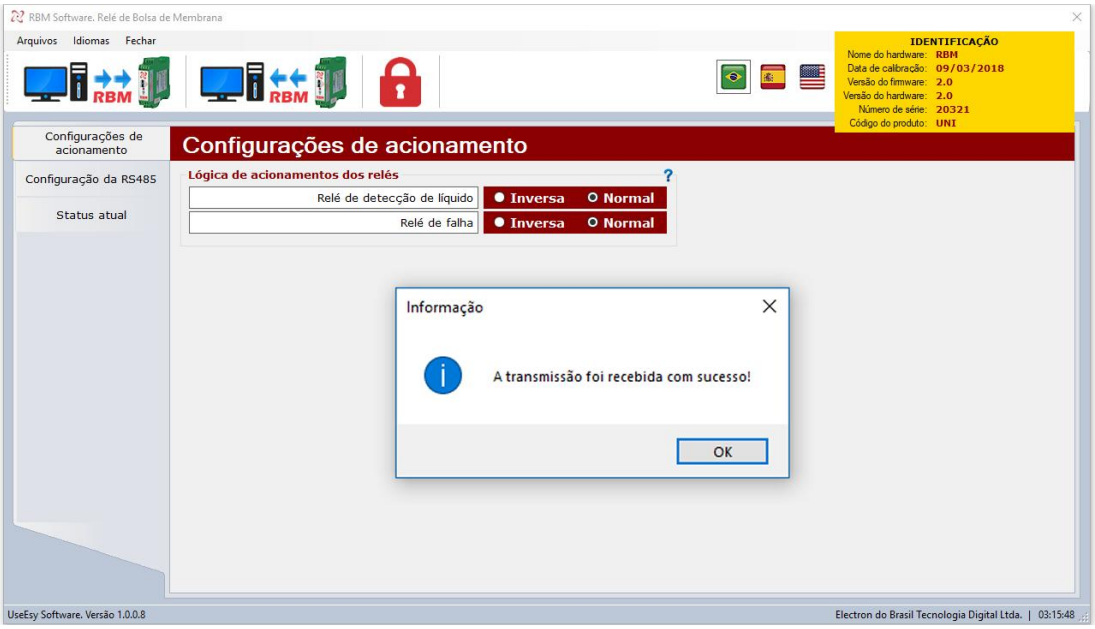
Upon completion of the download and installation of RBM Software, the home screen opened as shown in the image below:

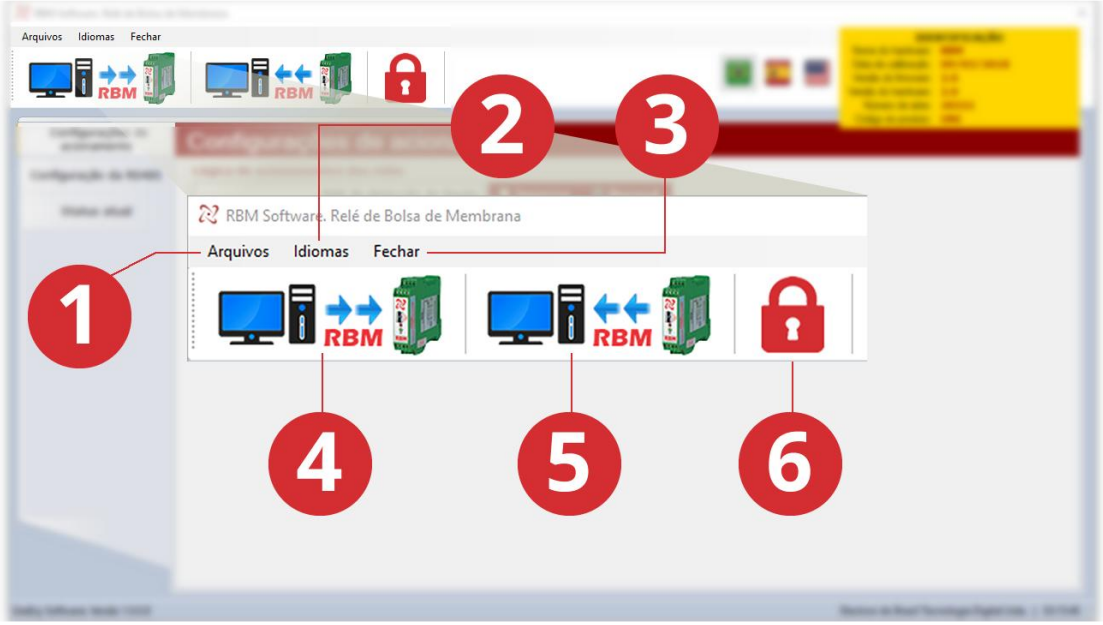
CONFIGURING RBM VIA SOFTWARE

Connect your RBM equipment using the USB micro-B cable, after plugging it into your equipment, plug the USB end into a computer or notebook so that the software can identify it.

When connecting the machine, the software will display an Information window with the following message: **The transmission was successfully received."**, as shown in the figure below. Click **OK**.

Note that the settings options at the top of the software that were previously unavailable will be available for the device setup.





CONFIGURING RBM VIA SOFTWARE

1 – Files

Open Parameters File...
It allows you to open a file of RBM equipment parameters in the software.

Save Parameters File...
Export the current parameters of your device by creating a file in the format . RBM.

Print the RBM Parameter Values ...
Allows printing with the machine's parameters. RBM.

2 – Languages

Portuguese – Standard
Sets the software to the Portuguese language.

Spanish
Sets the software to the Spanish language.

English
Sets the software to the English language.

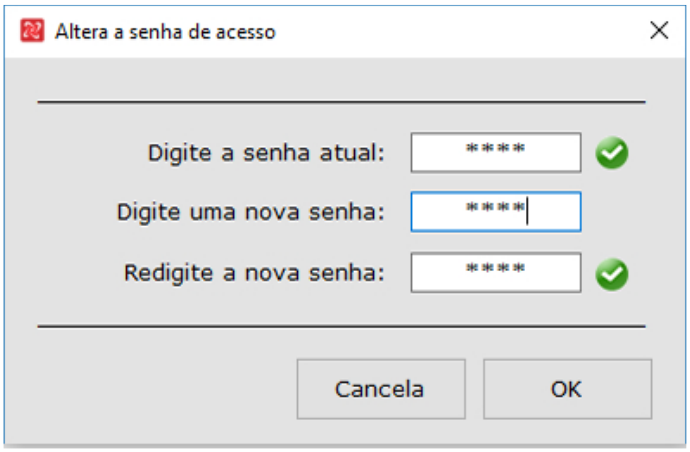
3 – Close the software
Close the software.

4 – Send parameters
Sends equipment parameters to the Software.
NOTE: A window will appear asking for the password, by default manufacture, the password is 0000. If the password entered is incorrect, no parameter will be sent to the Software.

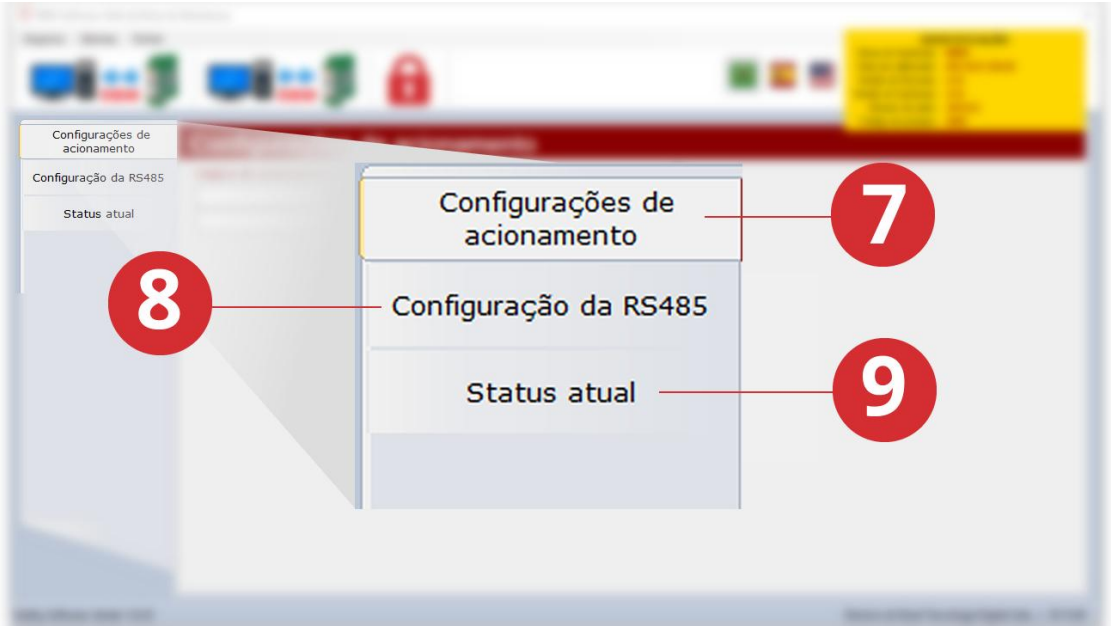
5 – Receive parameters
Receives parameters from the equipment in the Software.

6 – Change access password

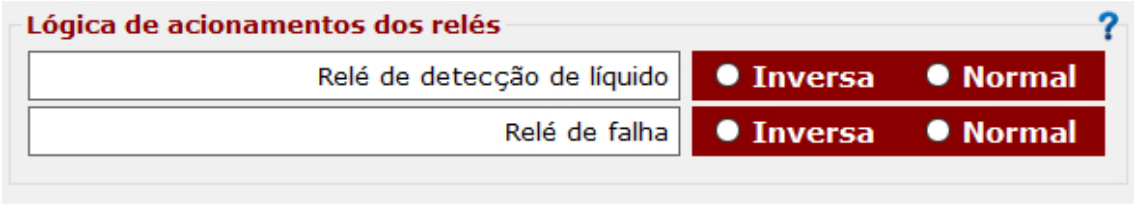
Change your password to a new password. To do this, enter the current password and in the following fields, enter your new password and click the OK button, as illustrated in the figure below.



CONFIGURING RBM VIA SOFTWARE



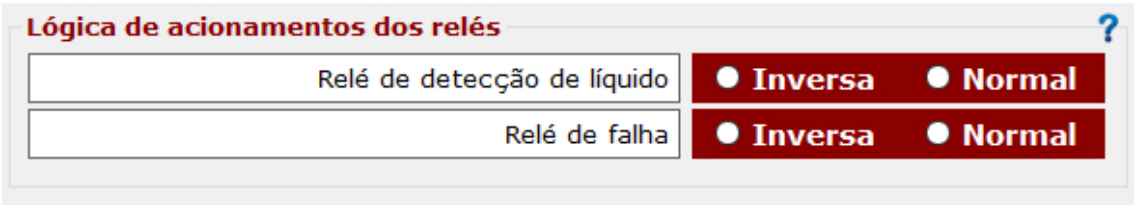
7 – Trigger Settings



Liquid Detection Relay:

REVERSE
When the operation is reversed, the initial conditions of the Relay is triggered.

NORMALWhen operation is normal, the initial conditions of the Relay is turned off



Fault Relay:

REVERSE
When the operation is reversed, the initial conditions of the Relay is triggered.

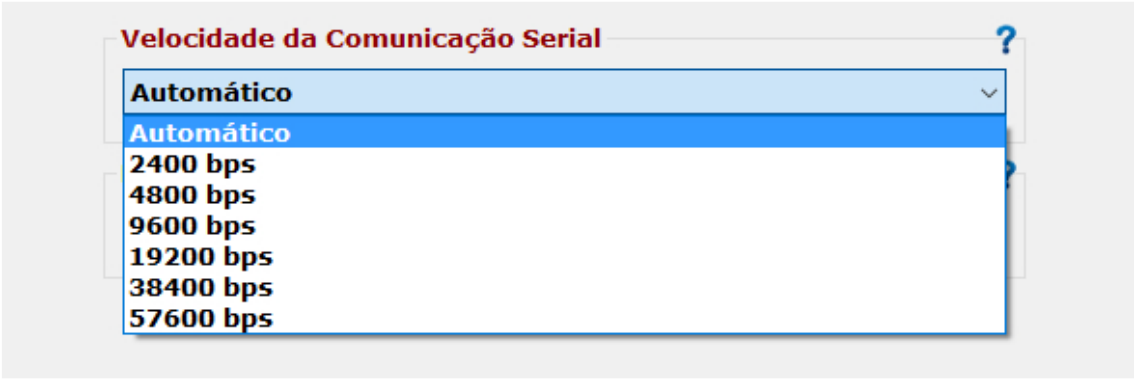
NORMALWhen operation is normal, the initial conditions of the Relay is turned off

CONFIGURING RBM VIA SOFTWARE

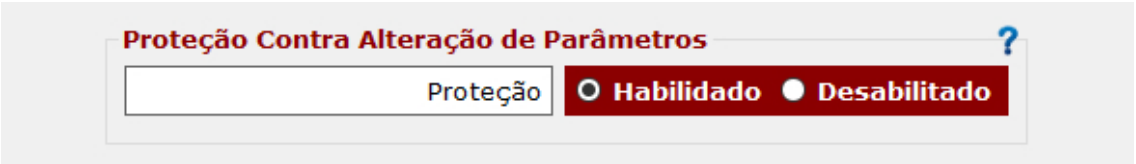
8 – RS-485 Settings

DNP 3 – Level 1
DNP 3.0 Lv.1 Communication Protocol Selection

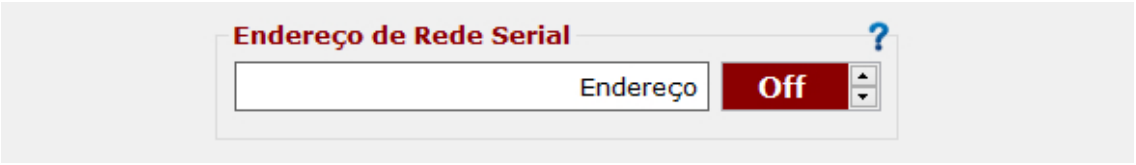
Modbus RTU
MODBUS RTU Communication Protocol Selection



Serial Communication Speed
Select the Auto mode that will identify the network speed automatically, or select one of the available values to fix the serial communication speed (2,400 bps, 4,800 bps, 9,600 bps, 19,200 bps, 38,400 bps, or 57,600 bps).

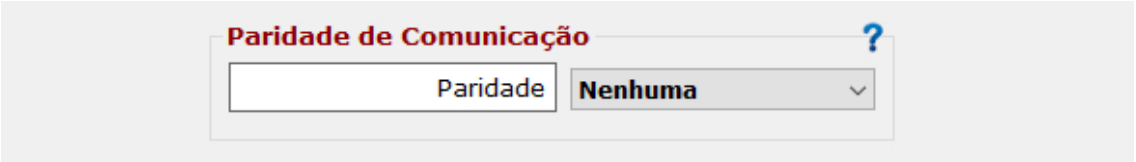


Parameter Change Protection
To inhibit writing on the recorder parameters.

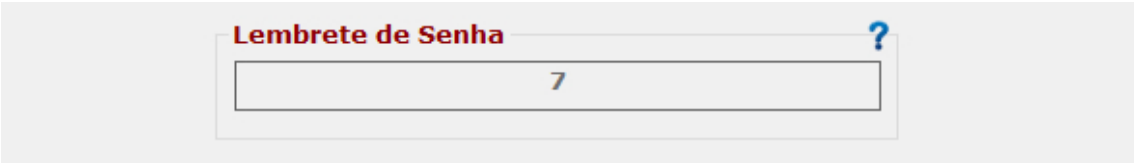


Parameter Change Protection
To configure the serial network address, each equipment connected to the RS485 network must have only a single address that is different from the others. So that the supervisor can identify you.

CONFIGURING RBM VIA SOFTWARE



Communication Parity
For parity setting, i.e. the last bit to be transmitted in the message to check the integrity of the data.



Password reminder
In case of loss or forgetfulness of password, please contact Electron do Brasil and provide the connection

9 – Current Status

Run Status
Runs the equipment showing the status of the sensors
Save to file
Uploads the current condition of the Relay by generating a . RBM

SPECIFICATION FOR ORDER

RBM - [ ] [ ] [ ]

INPUT SENSOR	
0	Without Sensor
1	Sensor with circular connection
2	Sensor without connection
3	Special Sensor

JUNCTION BOX	
0	Without Junction Box
1	With Junction Box

CABLE LENGHT
X

IMPORTANT RECOMMENDATIONS

Before putting the equipment into operation, check the following recommendations:

1. The sensor as well as the equipment must be grounded, do not use the same point of grounding for the power supply and the sensor so that there is no potential difference.

2. The correctly grounded sensor and power prevent malfunction or damage in cases of disturbances, surges, and inductions in the equipment.

3. Use 120 Ohm resistors at the 2 ends of the line in the communication network (Rs485) transmission (start and end) in order to generate potential difference necessary for the correct functioning of the communication network.

4. Do not use the sensor in liquids with temperatures above 125°C or below -40°C.

WARRANTY TERM

The Bag and Membrane Relay – has a warranty period of two years from the date of sale stated on the invoice, with coverage for any manufacturing defects that make it unsuitable or unsuitable for the applications for which it is intended.

Disclaimer of Warranty

The warranty does not cover transportation expenses for technical assistance, freight, and insurance for shipment of a product with evidence of defect or malfunction. The following events are also not covered: Natural wear and tear of parts due to continuous and frequent use, damage to the outside caused by falls or improper packaging; attempt to repair/violate a seal with damage caused by people not authorized by Electron do Brasil and in disagreement with the instructions that are part of the technical description.

Loss of Warranty

Product will automatically lose warranty when:

- If the instructions for use and assembly contained in this manual and the installation procedures of the NBR 5410 standard are not observed;

- Subjected to conditions outside the limits specified by the respective technicians;

- Tampered with or repaired by a person who is not part of the technical team of Electron do Brasil;

- The damage is caused by water or any other liquid;

- Infiltration of water or any other liquid;

- Overload occurs that causes degradation of the components and parts of the product;

Use of the Warranty

To take advantage of this warranty, the customer must send the product to Electron do Brasil along with a copy of the purchase invoice, properly packaged, so that no damage occurs during transport. For an emergency service, it is recommended to send as much information as possible regarding the defect detected. This will be analysed and subjected to full functional testing.

The analysis of the product and its eventual maintenance will only be carried out by the technical team of Electron do Brasil at its headquarters.

LETTER OF CONFORMITY

Available for Downloads on the Website:
http://www.electron.com.br/downloads/artigos-tecnicos/