

## CONFIGURATION HANDBOOK

### RPB45S RPB35S



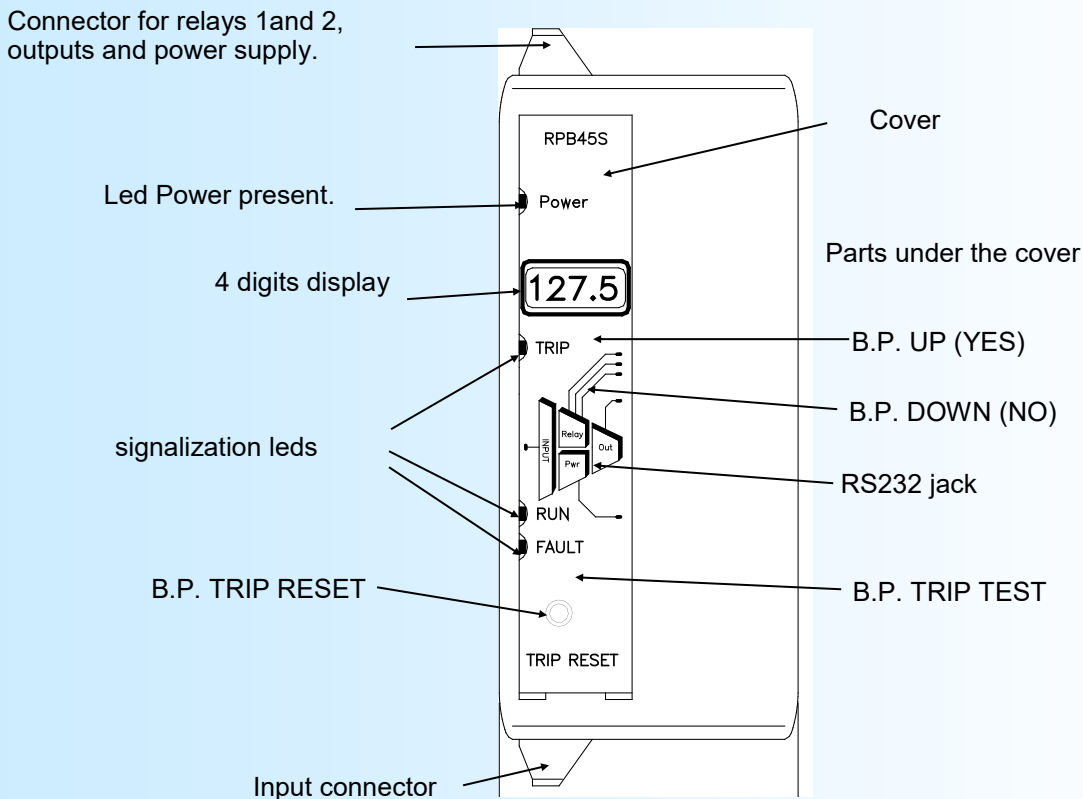
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# Device Presentation

The purpose of this configuration handbook is to allow to become familiar with the functions supplied by the device. The RPB45S, RPB35S is able to protect a battery by monitoring his charging and discharging current. It is fully customizable by the front face pushbuttons and can be adapted to any type of batteries. It includes 21 models of batteries, with 20 standard models, preconfigured at the factory (see list p. 15). The mainly difference between the RPB45S and the RPB35S is the energy reserve. The RPB45S has twice much energy reserve than the RPB35S and is able to function during 45 seconds after power loss and no occurring trip (20 s for the RPB35S).

## USER INTERFACE:



The front of the unit is composed of:

- 1 four digit alphanumeric display.
- 3 LED lights:
  - 1 red LED 'TRIP', flashing when triggered by exceeding the charge or short circuit (discharge) current.
  - 1 green LED 'RUN', flashing in normal operation.
  - 1 red LED, 'FAULT', steady light in the event of default detection (see next page).
- 1 Ø 3.5 mm stereo jack for RS232,
- 3 push button out from the lid:
  - BP UP, access to the configuration or <YES> button or increment button.
  - BP DOWN, access to the configuration viewing or <NO> button or decrement button.
  - BP TRIP TEST allows manual activation of the relays by simulating excessive discharge current.
- 1 push button out from the lid.
  - BP TRIP RESET, to reset the relay when tripped.

## VISUALIZATION:

At power up, the device automatically enters the measurement mode and loads the energy storage capacitors. This takes about 45 seconds for the RPB45S and 20 seconds for the RPB35S. The display is switched into a mode of low power consumption, lighting up briefly every 1.2 seconds, then lights fixed and displays the battery current in Amps. For charging, the current displayed will be negative and for discharging, it will be positive.

For example, for a charging current of 22 A, the display will be (fixed):

**-22**

When tripped, the device displays the trip current (flashing):

**9950** for a discharge current (short circuit) of 9950 A.

**9950** or

**102k** for a discharge current of 10200 A.

**102k**

In case of a trip failure, the watchdog relay opens and the red LED FAULT lights.

Other failures can cause the opening of the watchdog relay and the displaying of the following messages:

breaking of the external current shunt or failure of internal measurement.

**FLT1** relay 1 lack of continuity of the coil.

**FLT2** relay 1 trip fault.

**FLT3** relay 2 lack of continuity of the coil.

**FLT4** relay 2 trip fault.

**FLT5** charging default of the energy storage capacitors (Voltage <15 V).

**FLT6**

Rq:

After tripping, when the energy reserve of the capacitors falls below a certain threshold, the display switches to low power mode (see above).

## **CONFIGURATION:**

The relay is entirely configurable via the front face buttons and display. If the user wishes to view the configuration parameters, a configuration viewing only mode is accessible. In this mode no modifications are possible.

### **1) Method**

Different rubrics are available, allowing to configure or to view:

- The battery and the battery parameters.
- The Input parameters.
- The output parameters.

For each rubric, a message is streaming on the display and the <YES> button permits to access the rubric or validate a function. The <NO> button permits to skip the rubric or devalidate a function.

During an adjustment rubric, the BP UP increment the value and the BP DOWN decrement the value and the display is flashing. All the parameters are limited (LOW or HIGH is displayed on overflow). The adjustment is terminated automatically after 4 seconds if no button is pressed.

In viewing mode, the value is displayed fix and it is necessary to push a button to skip to the next rubric.

### **2) Access to the configuration viewing**

Pressing the <DOWN> button provides direct access to the configuration viewing mode.

### **3) Access to the configuration**

Access to the configuration is protected by a four digits password. Pressing the <UP> button provides access to the password input. The following temporary message scrolls on the display:

PASSWORD?

Then, a cursor is displayed on the left, indicating that the device is waiting for the first digit. The seizure of the character is done with the buttons 'UP' and 'DOWN'. Accepted characters are the digits '0' to '9' and the letters 'A' to 'Z'. Digit validation is done automatically after 3 seconds if no button is pressed for this time and the device switches to the next digit:

```
1_
12_
123_
1234
```

After the fourth digit and if the password is correct, the device enters the configuration mode. If the password is incorrect, the unit will temporary display the message **Err!** and return to the measure mode.

### **4) Setting the battery**

The device has a library of 21 models of battery (1 to 21). The 20 standard models (1-20) are not configurable (configuration locked, unlokable via RS232 configuration). Only the 21 battery is entirely configurable.

<b>BATTERY CONFIG. ?</b>	Access to the battery configuration (viewing).
<b>01:C1.1:NiCd 320 Ah</b>	Battery choice. The <YES> button validate the battery, the <NO> button skips to the next battery.
...	
<b>21:NO NAME</b>	Undefined battery. If the user validates this model, the following rubrics for configuring the battery parameters are accessible.

#### **4.1) Configuration of the battery parameters**

<b>SHORT CIRCUIT CONFIG. ?</b>	Access the configuration (viewing) of the battery discharge settings.
<b>THRESHOLD?</b>	Access the threshold configuration (viewing) for the discharge current detection.
<b>0</b>	Setting the threshold value with <UP>, <DOWN> buttons (0 to 15000 A).



<b>DELAY?</b>	Access the delay configuration (viewing) for the discharge current detection.
<b>0.02</b>	Setting the delay value with <UP>, <DOWN> buttons (0.02 to 0.99 s).
<b>RELAY 1?</b>	Choice or viewing of the relay to switch for short-circuit detection (relay 1, 2 or 1+2).
<b>CHARGING CONFIG.?</b>	Access the configuration (viewing) of the battery charge settings.
<b>THRESHOLD?</b>	Access the threshold configuration (viewing) for the charging current detection.
<b>-56</b>	Setting the threshold value with <UP>, <DOWN> buttons (0 à -500 A).
<b>DELAY?</b>	Access the delay configuration (viewing) for the charging current detection.
<b>0</b>	Setting the delay value with <UP>, <DOWN> buttons (0 à 9999 s).
<b>RELAY 1?</b>	Choice or viewing of the relay to switch for charging (relay 1, 2 or 1+2).

**5) Input parameters configuration**

Configurable parameters are:

- The sensitivity of the current measuring sensor (shunt) in A / mV.
- The low scale of measurement (A).
- The high scale of measurement (A).

Low and high scales are used to calculate the value of the analog output.

<b>INPUT CONFIG.?</b>	Access the input configuration (viewing).
<b>SENSOR SENSIBILITY?</b>	Access the sensor sensibility configuration (viewing).
<b>2.0</b>	Setting the sensor sensibility value with <UP>, <DOWN> buttons (0.1 to 9999 A/mV).
<b>LOW SCALE?</b>	Access the low scale configuration (viewing).
<b>-100</b>	Setting the value with <UP>, <DOWN> buttons (-999 to 15000 A).
<b>HIGH SCALE?</b>	Access the high scale configuration (viewing).
<b>600</b>	Setting the scale value with <UP>, <DOWN> buttons (-999 à 15000 A).

**6) Analog output parameters configuration**

Analog output parameters configuration are:

- Output type:
  - current output (mA),
  - voltage output (V).
- the low and high scale,
- security value,
- limited output,
- response time.

**The security value** allows to set the output to a known state when there is a sensor breaking or a measure error. This value will be transferred to output.

**The limited output** allows to bound the output signal swing to the configured output scales for all input signal values. Only security value goes beyond this function.

**The response time** permits to filter the output signal.

<b>OUTPUT CONFIG. ?</b>	Access to the output configuration (viewing).
<b>CURRENT?</b>	Output type choice (current or voltage). The <YES> button validate the choice, The <NO> button skips to the next choice.
<b>LOW SCALE?</b>	Access the low scale configuration (viewing).
<b>4.00</b>	Setting the value with <UP>, <DOWN> buttons (0 mA, V to 22 mA or 11 V).
<b>HIGH SCALE?</b>	Access the high scale configuration (viewing).
<b>20.00</b>	Setting the value with <UP>, <DOWN> buttons (0 mA, V to 22 mA or 11 V).
<b>SECURITY VALUE?</b>	Access the security value configuration (viewing).
<b>22.00</b>	Setting the value with <UP>, <DOWN> buttons (0 mA, V to 22 mA or 11 V).
<b>RESPONSE TIME?</b>	Access the response time configuration (viewing).
<b>5.0</b>	Setting the value with <UP>, <DOWN> buttons (0 to 60 s).
<b>LIMITED OUTPUT?</b>	Activation, deactivation or viewing of the limited output fonction. <YES> button to activate, <NO> button to deactivate

# Configuration with RS232 terminal **LOREME**

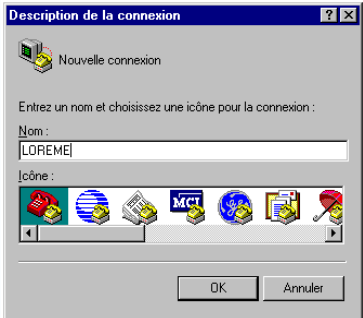
The device can be configured in Terminal mode via an RS232 link. The terminal emulation software for PC "HyperTerminal" is resident in Windows up to XP version, for later versions, it has to be installed.


The different procedures for the terminal are detailed below.

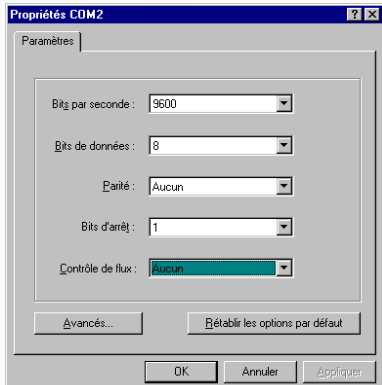
## PC with WINDOWS:

Step for start up terminal program:

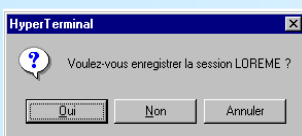
- 1 - Clic on **"START"** bouton.  
Up to Windows XP version  
 - Tick off **"Programs \ Accessories \ Communication \ Hyper Terminal"**  
 - Clic on **"Hypertrm.exe"**  
Later versions  
 - Tick off **"All programs \ HyperTerminal Private Edition"**  
 - Clic on **"HyperTerminal Private Edition"**

- 2 Enter a name for the new connection  


- 3 Choose a communication port  


- 4 Choose:  
 - 9600 bauds  
 - 8 data bits  
 - no parity  
 - 1 stop bit  
 - XON / XOFF  


- 5 PC is now in terminal mode, connect to device by plugging the RS232 link cable. The measure is now displayed. To access configuration, press **"C"** key .

- 6 When leaving HyperTerminal, the following window will appear. By accepting the recording of the session, terminal mode will be able to start again without using this procedure..  


Thus, the created shortcut will permit to communicate with the RPB45S or RPB35S.

**Note:** to modify parameters of terminal mode whereas this one is already started, it is necessary, after having carried out the modifications, to close the terminal and to open it again so that the modifications are effective.

## USB / RS232 adaptator:

If your PC don't have RS232 connector, you have to use a cable wich can adapt a USB port in RS232 port.



- Insert the CD or USB key provided
  - Select **"USB 1.1 to RS232 cable"** or **"USB to RS232 cable"** and click **"Setup.exe"** or **"PL2303 driver installer.exe"** to install the driver,
  - Plug the adaptator in a USB port
  - Start and configure the **HyperTerminal** as described above (in the step 3, choose the new port com)
- Note:**  
 The use of the adapter on another USB port, or the use of a different adapter generates a new different communication port (COM1, COM2, ...) and requires the hyperterminal reconfiguration.



**VISUALIZATION:**

Once link to the PC, the device displays the following measures:

-30 A	Battery current value (example for a charging current)
5.60 mA	Analogical output value.

**CONFIGURATION:**

To enter the configuration mode, press the 'C' key.

**1) Method:**

When configuring, different types of questions are asked to the user. For each one, several answers are possible. You will find below the detailed description of each case.

**1.1) Menu selection:**

example: INPUT      The user makes a choice by pressing the keys "Y" or "N".  
 (Y-N) This choice allows to access the different menus of configuration.

**1.2) Parameter selection:**

example: VOLTAGE      or      VOLTAGE  
 (Y-N) YES                              (Y-N) NO

Previous choice = YES: - pressing "Y" => choice validation = YES,  
 - pressing "Enter" => choice validation = YES,  
 - pressing "N" => choice changing = NO.

Previous choice = NO: - pressing "N" => choice validation = NO,  
 - pressing "Enter" => choice validation = NO,  
 - pressing "Y" => choice changing = YES.

Choice is made by pressing "Y" or "N" keys, and validation is made by pressing corresponding key to displayed answer ("Y" for YES and "N" for NO) or "Enter". Pressing "Enter" key without modification allows to validate the previous answer.

**1.3) Value acquisition:**

example: LOW SCALE  
 4 mA

Two cases are possible:

- validation without modification, just press "Enter",
- value modification on keyboard (simultaneous display), followed by validation with "Enter".

It is possible, when a mistake is made during a value acquisition, before validating it, to go back by pressing the backspace key, which re-displays the message without taking notice of the wrong value.

**1.4) Note:**

- In configuration mode, if there is no action, device goes back in operating mode after a two minutes delay without taking notice of modifications made before.
- In configuration mode, if you want to go back to measure mode without taking notice of the modifications made before, just press "ESC".

**2) Configuration access:**

**PASSWORD?**      Password required to access the configuration.  
 Entering the password of 4 digits. For each digit entered, the device displays "\*" and passes to the next digit. To validate the input, press "Enter." To correct, use the backspace key. If the password entered is incorrect the following message is displayed and the device returns to measurement mode.

**WRONG PASSWORD!**

**3) Configuration rubrics:**

- LANGUAGE CONFIGURATION?** Access the language configuration (french or english).  
(Y-N)
- PASSWORD?** Access the password configuration.  
(Y-N)
- PASSWORD?**  
1234 Entering the new password. Accepted characters are the digits '0' to '9' and the letters 'A' to 'Z'.
- BATTERIES CONFIGURATION?** Access the batteries configuration.  
(Y-N)

If the user types the 'Y' key, the following configuration page is displayed.

NAME	SHORT CIRCUIT			CHARGING		
	THRESHOLD	DELAY	RELAY	THRESHOLD	DELAY	RELAY
*01:C1.1:NiCd 320 Ah	3000 A	0.12 s	1	-71 A	5 s	1 L
02:C1.2:NiCd 280 Ah	3000 A	0.12 s	1	-62 A	5 s	1 L
03:C1.3:VLRA 302 Ah	3000 A	0.12 s	1	-34 A	5 s	1 L
04:C1.4:VLRA 330 Ah	3000 A	0.12 s	1	-37 A	5 s	1 L
05:C2.1:NiCd 320 Ah	3000 A	0.12 s	1+2	-71 A	5 s	1+2 L
06:C2.2:NiCd 280 Ah	3000 A	0.12 s	1+2	-62 A	5 s	1+2 L
07:C2.3:VRLA 302 Ah	3000 A	0.12 s	1+2	-34 A	5 s	1+2 L
08:C2.4:VLRA 330 Ah	3000 A	0.12 s	1+2	-37 A	5 s	1+2 L
09:C3.1:NiCd 360 Ah	3000 A	0.12 s	1	-80 A	5 s	1 L
10:C3.2:NiCd 340 Ah	3000 A	0.12 s	1	-75 A	5 s	1 L
11:C3.3:VLRA 366 Ah	3000 A	0.12 s	1	-41 A	5 s	1 L
12:C3.4:VLRA 375 Ah	3000 A	0.12 s	1	-42 A	5 s	1 L
13:C4.1:NiCd 360 Ah	3000 A	0.12 s	1+2	-80 A	5 s	1+2 L
14:C4.2:NiCd 340 Ah	3000 A	0.12 s	1+2	-75 A	5 s	1+2 L
15:C4.3:VLRA 366 Ah	3000 A	0.12 s	1+2	-41 A	5 s	1+2 L
16:C4.4:VLRA 375 Ah	3000 A	0.12 s	1+2	-42 A	5 s	1+2 L
17:C5.1:NiCd 360 Ah	4000 A	0.12 s	1	-80 A	5 s	1 L
18:C5.2:NiCd 340 Ah	4000 A	0.12 s	1	-75 A	5 s	1 L
19:C5.3:VLRA 366 Ah	4000 A	0.12 s	1	-41 A	5 s	1 L
20:C5.4:VLRA 375 Ah	4000 A	0.12 s	1	-42 A	5 s	1 L
21:NO NAME	0 A	0.02 s	1	-56 A	0 s	1+2

LEAVE --> 0                      YOUR CHOICE?:

Front face configuration is Locked

The symbol '\*' indicates the battery model currently monitored by the relay. To change the parameters of a battery, you must type its number and press <Enter>. To exit the setup, type '0'.

Configurable parameters are:

- The name of the battery on maximum 16 characters.
- The parameters of short-circuit (discharge) and charging:
  - The detection threshold.
  - The detection delay.
  - The relay to switch (1, 2 or 1+2).
- The front face configuration lock.

At the end of the configuration, the device stores the settings in nonvolatile memory and displays the message "OK" and returns to the configuration page.

Rq: The battery that has been configured, becomes the monitored battery (symbol '\*' at the beginning of line).

```

INPUT CONFIGURATION?          Access the input configuration.
(Y-N)

SENSOR SENSIBILITY
2.0 A/mV

LOW SCALE
-100 A

HIGH SCALE
600 A

OUTPUT CONFIGURATION?        Access the analogical output configuration.
(Y-N)

CURRENT
(Y-N) YES

LOW SCALE
4.00 mA

HIGH SCALE
20.00 mA

SECURITY VALUE
22.00 mA

RESPONSE TIME
0 s

LIMITATED OUTPUT
(Y-N) NO

OK
    
```

## **OFFSET:**

Sometimes, it may be interesting to modify the measure by a simple terminal keyboard intervention.

To shift the measure, it is necessary:

- to be in measure mode,
- type on "+" or "-" to access the function,
- on terminal the display become:
  - 100 A**           measure value with offset,
  - OFFSET 10**       offset function, offset value.
- use keys "+" and "-" to adjust offset, measure is directly modified.
- type on "ENTER" to memorize offset.

When the device is not supplied or is in configuration mode, offset stay active. To reset offset, it is necessary to start the "OFFSET" function, put the value to zero with the "+" and "-" keys, then validate by "ENTER". In offset control mode, when there is no action on "+", "-" or "ENTER" keys during 2 minutes, the device leave the mode without keeping the adjusted offset.

# Firmware upload



To access to the firmware uploaded function, Power on the device and press quickly on the « F » key. The following message appears in the hyperterminal windows:

> The device sends this character when it waiting the « F » key during 0.5s

```
FIRMWARE LOADER Rev2.1  
READY TO TRANSFER...
```

The device is now in file waiting mode, This file is provided by LOREME. This file contain the firmware code in intel HEX format. Selected the « Transfert », « Send a text file... » in the hyperterminal menu  
Select the directory and the file, click on « OPEN ». The hyperterminal program begins to send the file to the device.

```
FIRMWARE LOADER Rev2.1  
READY TO TRANSFER...
```

\*\*\*\*\* The star characters appears to show the progress of the uploading.

At the end, the message « **PROGRAMMING OK !** » is display if no error occurs. If not, several messages are display:

- **SERIAL COM ERROR !** Error during receipt.
- **SERIAL TIMEOUT !** Waiting time of receipt elapsed.
- **PROGRAMMING FAILED !** Programming error in the internal flash memory..

Attention!

If an error occurs during the programming process, It is necessary to start again the whole procedure.  
A bad programming leads to incorrect operation of the device.

## **1) Introduction:**

In order to satisfy its policy as regards EMC, based on the Community directive 89/336/CE, the LOREME company takes into account the standards relative to this directive from the very start of the conception of each product.

As the devices are devised to work in industrial environments, the various tests are carried out in the sight of the EN 50081-2 and EN 50082-2 standards, in order to make out a statement of conformity.

As the devices lie in certain typical configurations during the tests, it is not possible to secure the outcomes in any possible configuration. To ensure the best functioning of each device, it would be judicious to comply with several recommendations of use.

## **2) Recommendations of use:**

### **2.1 ) General remarks:**

- Comply with the recommendations of assembly indicated in the technical sheet (direction of assembly, spacing between the devices, ...).
- Comply with the recommendations of use indicated in the technical sheet (temperature range, protection index).
- Avoid dust and excessive humidity, corrosive gas, considerable sources of heat.
- Avoid disturbed environments and disruptive phenomena or elements.
- If possible, group together the instrumentation devices in a zone separated from the power and relay circuits.
- Avoid the direct proximity with considerable power distance switches, contactors, relays, thyristor power groups, ...
- Do not get closer within fifty centimeters of a device with a transmitter (walkie-talkie) of a power of 5 W, because the latter can create a field with an intensity higher than 10 V/M for a distance fewer than 50 cm.

### **2.2 ) Power supply:**

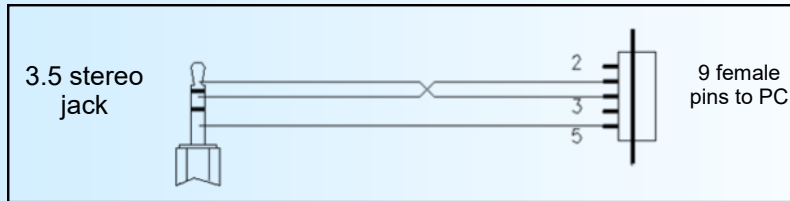
- Comply with the features indicated in the technical sheet (power supply voltage, frequency, allowance of the values, stability, variations ...).
- It is better that the power supply should come from a system with section switches equipped with fuses for the instrumentation element and that the power supply line be the most direct possible from the section switch.
- Avoid using this power supply for the control of relays, of contactors, of electrogates, ...
- If the switching of thyristor statical groups, of engines, of speed variator, ... causes strong interferences on the power supply circuit, it would be necessary to put an insulation transformer especially intended for instrumentation linking the screen to earth.
- It is also important that the installation should have a good earth system and it is better that the voltage in relation to the neutral should not exceed 1V, and the resistance be inferior to 6 ohms.
- If the installation is near high frequency generators or installations of arc welding, it is better to put suitable section filters.

### **2.3 ) Inputs / Outputs:**

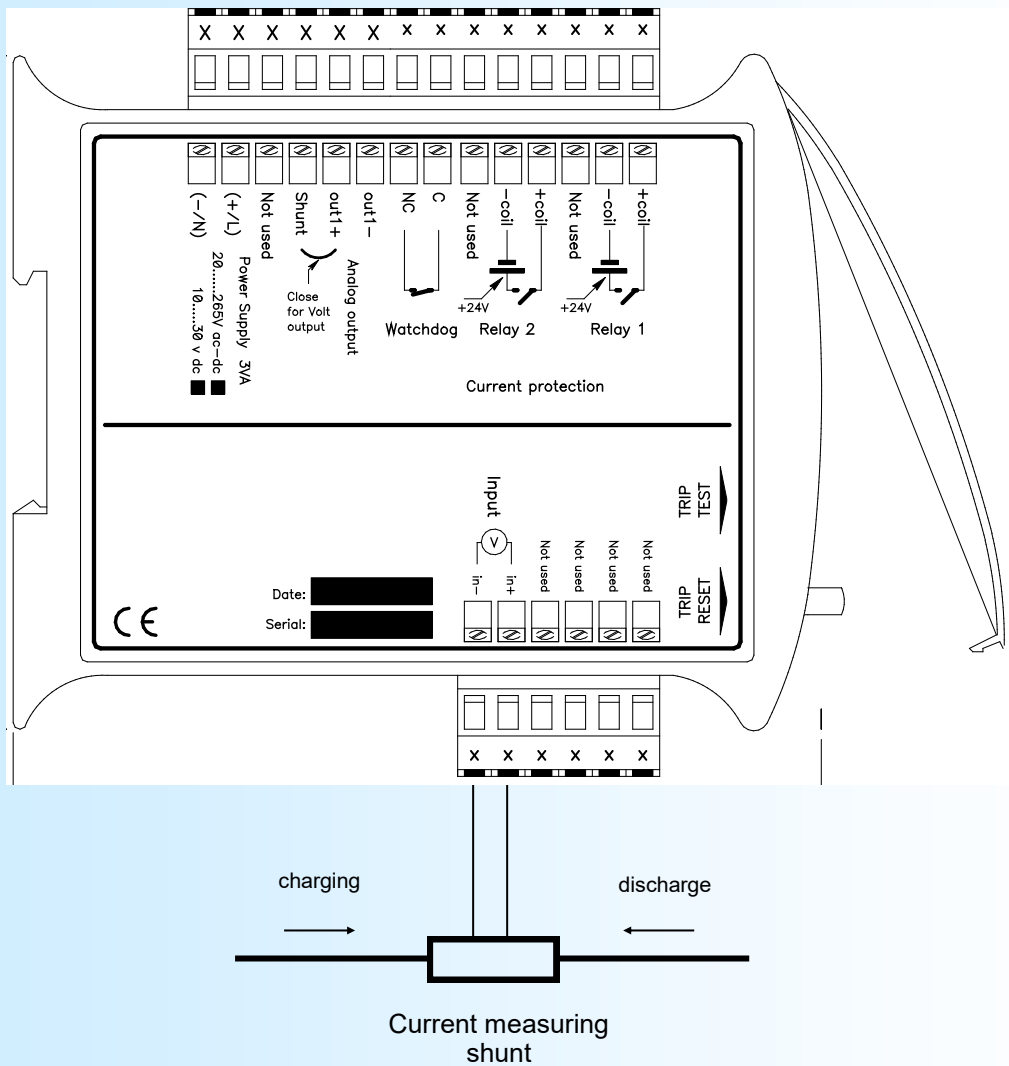
- In harsh conditions, it is advisable to use sheathed and twisted cables whose ground braid will be linked to the earth at a single point.
- It is advisable to separate the input / output lines from the power supply lines in order to avoid the coupling phenomena.
- It is also advisable to limit the lengths of data cables as much as possible.



## PC - DEVICE LINK



## DIAGRAMS OF CONNECTIONS



# Batteries models



## Standard battery models:

- conf1.1: NiCd 320Ah - 3000A - 0,12s - Relay 1 - 71A - 5s - Relay 1
- conf1.2: NiCd 280Ah - 3000A - 0,12s - Relay 1 - 62A - 5s - Relay 1
- conf1.3: VRLA 302Ah - 3000A - 0,12s - Relay 1 - 34A - 5s - Relay 1
- conf1.4: VRLA 330Ah - 3000A - 0,12s - Relay 1 - 37A - 5s - Relay 1
  
- conf2.1: NiCd 320Ah - 3000A - 0,12s - Relay 1+2 - 71A - 5s - Relay 1+2
- conf2.2: NiCd 280Ah - 3000A - 0,12s - Relay 1+2 - 62A - 5s - Relay 1+2
- conf2.3: VRLA 302Ah - 3000A - 0,12s - Relay 1+2 - 34A - 5s - Relay 1+2
- conf2.4: VRLA 330Ah - 3000A - 0,12s - Relay 1+2 - 37A - 5s - Relay 1+2
  
- conf3.1: NiCd 360Ah - 3000A - 0,12s - Relay 1 - 80A - 5s - Relay 1
- conf3.2: NiCd 340Ah - 3000A - 0,12s - Relay 1 - 75A - 5s - Relay 1
- conf3.3: VRLA 366Ah - 3000A - 0,12s - Relay 1 - 41A - 5s - Relay 1
- conf3.4: VRLA 375Ah - 3000A - 0,12s - Relay 1 - 42A - 5s - Relay 1
  
- conf4.1: NiCd 360Ah - 3000A - 0,12s - Relay 1+2 - 80A - 5s - Relay 1+2
- conf4.2: NiCd 340Ah - 3000A - 0,12s - Relay 1+2 - 75A - 5s - Relay 1+2
- conf4.3: VRLA 366Ah - 3000A - 0,12s - Relay 1+2 - 41A - 5s - Relay 1+2
- conf4.4: VRLA 375Ah - 3000A - 0,12s - Relay 1+2 - 42A - 5s - Relay 1+2
  
- conf5.1: NiCd 360Ah - 4000A - 0,12s - Relay 1 - 80A - 5s - Relay 1
- conf5.2: NiCd 340Ah - 4000A - 0,12s - Relay 1 - 75A - 5s - Relay 1
- conf5.3: VRLA 366Ah - 4000A - 0,12s - Relay 1 - 41A - 5s - Relay 1
- conf5.4: VRLA 375Ah - 4000A - 0,12s - Relay 1 - 42A - 5s - Relay 1

**Nota :**

- conf1x : 6B, 6BBS, 6C, 9E with battery in the PEECC.
- conf2x : 6B, 6BBS, 6C, 9E with battery in separate container or in building.
- conf3x : 9EQB with battery in the PEECC.
- conf4x : 9EQB with battery in separate container or in PEECC building.
- conf5x : 6FA with battery in separate container or in building.