

# Operating manual RCP2A - English

SEFELEC REFERENCE PENT0421



**EATON**

*Powering Business Worldwide*

## **WARRANTY**

**SEFELEC warrants that units are free from defects in material and workmanship. SEFELEC warrants also that, when properly used, that units will perform in accordance with specifications of this manual.**

**If within one year after original delivery it is found not to meet this standard, it will be repaired at no charge in SEFELEC service facility in Lognes.**

**Changes in the unit not approved by SEFELEC will cancel this warranty.**

**SEFELEC will not be liable for any indirect damages resulting of the use of the unit.**

**This warranty is in lieu of all other warranties.**

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| <b>Sefelec</b>                                                | <b>MILLIOHMMETER</b> | <b>RCP2A</b> |
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## SECTION 1 : INTRODUCTION - SPECIFICATIONS



**Warning :** This unit must be used by qualified people. Every precautions for the use of units connected to the mains must be taken during its use. In particular, this unit must be connected to earth.

The specifications of this manual, the correct operation of the unit as well as the operator's security are guaranteed only when the supplied accessories are used. The measurement probes can include limitation or protective elements, therefore it is forbidden to modify without written agreement from SEFELEC company.

In case of use under other conditions than the one specified in this manual, the security of the user will be in danger.

## MEANING OF THE DIFFERENT SYMBOLS ON THE INSTRUMENT

|                                                                                     |                                  |
|-------------------------------------------------------------------------------------|----------------------------------|
|   | Warning (See document attached)  |
|  | Warning, risk of electric chock. |
|  | DC voltage.                      |
|  | AC and DC voltages.              |
|  | AC voltage.                      |
|  | Earth connection.                |

## 1-1 MAIN SPECIFICATIONS:



### 1-1-1 Presentation

- Robust case, dust and water proof.
- Portable device with small weight and carrying strap.
- In option, a suitcase to store the unit, its accessories and measurement leads.
- Optional a lid of protection (that this does not return of the suitcase)

### 1-1-2 Functions and specifications

- 4 measurement ranges :  $6\text{m}\Omega$  ,  $60\text{m}\Omega$  ,  $600\text{m}\Omega$  ,  $6000\text{m}\Omega$
- Auto or manual range selection
- Measurement current: 100mA, 1A , 10A
- Impulse current shape with 100msec. width
- 6000 points LCD display
- Measurement accuracy :  $\pm (0,1\% \text{ reading} + 0,1\% \text{ full scale})$
- Measurement threshold with adjustable low and high limits
- Alarm beeper
- 999 memories with measurement results, date and time. ( With 250 series maximum on version 2.4 and subordinate and with 999 series maximum on version 2.5 and superior)
- Both direction transfers for test sequence and measurement results on a PC under excel format files.
- RS232 serial interface to download data between the RCP2A and a PC.
- Remote Control Unit with LCD display (similar to the RCP2A main unit display) and memory.
- RS232 serial interface for the handshake between the RCU and the RCP2A from 3 up to 15 meters.

### 1-1-3 Power supply

- Removable Nickel METAL ( NiMH ) battery pack . 3 AH Capacity
- External universal battery charger
- 2 charging mode: fast and trickle
- A fully charged battery pack allows 1000 measurements @10A.
- For energy saving the RCP2A switch off the LCD backlight after a time adjustable in the SETUP menu with automatic switch on when pressing on a key. Even without backlight the display stays readable.

## 1-2 TECHNICAL SPECIFICATIONS:

### 1-2-1 Front panel

#### **Main display on the unit:**

- 64 x 240 points LCD matrix (liquid crystal display) with electroluminescent diode backlight.
- 6000 digits measurement and location test point display in big size characters and small size characters for:
  - unity
  - measurement range
  - measurement current
  - battery charge level
  - error code ( measurement, polarity...)

#### **Keyboard:**

- 5 function keys changing according to the menus.
- 4 navigation keys: arrows UP, DOWN, RIGHT, LEFT.
- 1 data enter key
- 1 software power ON key
- 1 mechanical key to trigger the measurement.

#### **Visual and audible signal:**

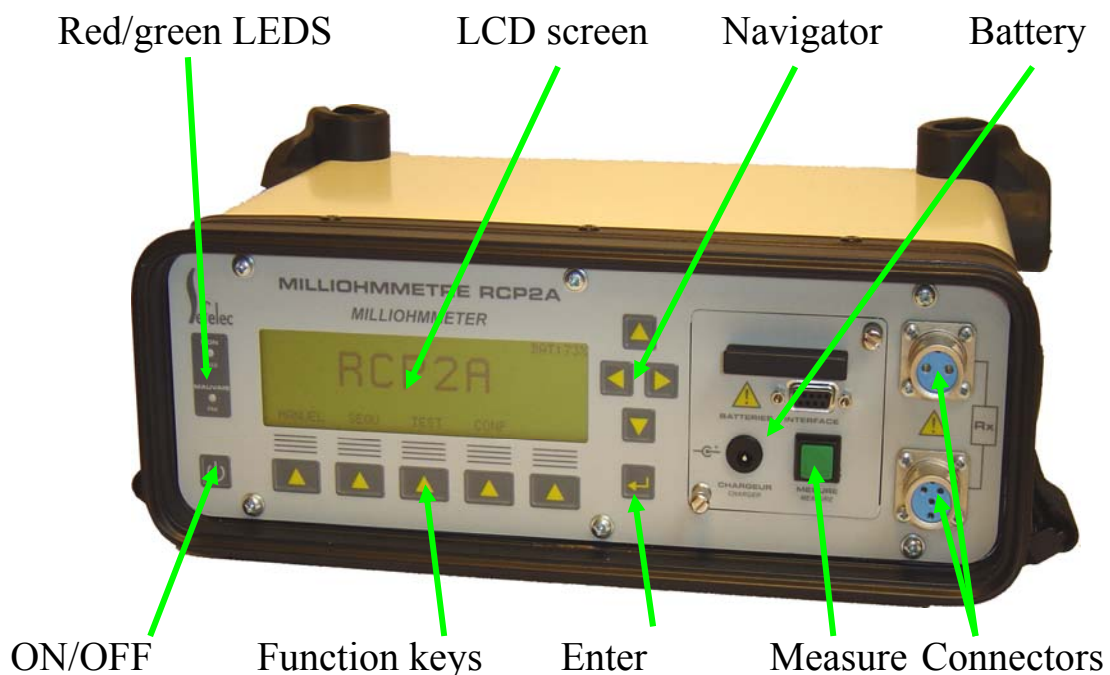
- Audible signal when pressing keyboard ( can be disabled)
- Audible signal with error message and FAIL measurements
- Red and Green LEDS for PASS/FAIL measurement results.

#### **Measurement connection:**

- 2 circular connectors ( 3 and 4 pins) with locking system from JAEGER

#### **RS232 interface:**

- sub-D 9 pins connector for PC and RCU connection



### 1-2-2 Measurement ranges

The RCP2A measurement capacity is made by 4 resistance ranges manually or automatically selected:

| Range  | Current   | Resolution | Accuracy              |
|--------|-----------|------------|-----------------------|
| 6mΩ    | 1A / 10A  | 1μΩ        | (0,1% read + 0,1% FS) |
| 60mΩ   | 1A / 10A  | 10μΩ       | (0,1% read + 0,1% FS) |
| 600mΩ  | 1A / 10A  | 100μΩ      | (0,1% read + 0,1% FS) |
| 6000mΩ | 0,1A / 1A | 1mΩ        | (0,1% read + 0,1% FS) |

read = reading FS = Full scale

Each measurement range can be operated with 2 currents (high and low currents) selected by the operator. The current generator is permanently controlled by the microprocessor and error message is displayed if the current is out of specs.

The maximum current value cannot exceed +10% of the rated value.

### 1-2-3 Manual or auto triggering mode

In MANUAL triggering mode, by pressing on the mechanical push button MEASURE, the unit starts a measurement cycle in generating a short current pulse and measuring the voltage drop across the resistor to be measured. Using the Ohm's law ( $R = U / I$ ), the unit computes the resistance value and displays the result on the LCD screen.

In AUTO triggering mode, the measurement is triggered by the current flowing through the specimen under test detection.

The triggering mode is set in the SETUP menu.

### 1-2-4 Measurement quality control

- The error cancellation of the thermocouple EMF is done either by the ZERO mode method consisting in a first measurement without current followed by a measurement with current from which unwanted voltages are subtracted or by the AVERAGE mode method consisting in two measurements with both current polarity and then average of the results.
- The maximum resistance leads for the current connection is 170 mΩ .
- AUTOTEST is automatically performed at each unit power ON and a calibration check can be done with the TEST function.
- When a measurement default occurs (bad accessory contact, too high resistance for the range, ...) warning message with clear and easy understanding are displayed on the LCD screen.



### 1-2-5 SEQUENCE mode

In SEQUENCE mode, the RCP2A allows to store 999 measurements with location number, limit, current, resistance ,date ,time and operator ID according to a protocol written under an excel file format. The excel file is created on a PC and then downloaded in the RCP2A.

Protocol header:

- Operator name : T DURANT
- ID: NT76207521
- Date: 02/10/03
- Plane n°: 1234567

Each protocol line includes:

- Mechanical drawing n° 1234567890
- Bounding n° 23
- Threshold value 5m $\Omega$
- Measurement current : 1 or 10A
- Measurement value: 4,99m $\Omega$

Those data are saved even when the main battery pack is fully discharged and when replacing the battery pack.

The keyboard allows to quickly select the functions: search for the points to be measured, scrolling the screen pages, ...

### 1-2-6 RS232 serial interface:

The RCP2A comes in standard with a RS232 serial interface with the following specifications:

- ANSI/EIA/TIA-232-E61991 specs.
- Baud rate : 9600 bauds
- Start bit : 1
- Bit number : 8
- Parity check : no
- Stop bit : 1

Using the RTS and CTS 5 wires mode provides a hardware synchronisation of the serial interface.

The commands to control the unit and the SEQUENCE download are in accordance with the IEEE488-2 standard and follow the SCPI language rules.

### 1-2-7 Power supply

The RCP2A is powered by an easy removable NiMh (Nickel Metal) battery pack.

Operating time is about 20 hours or 1000 measurements @10A.

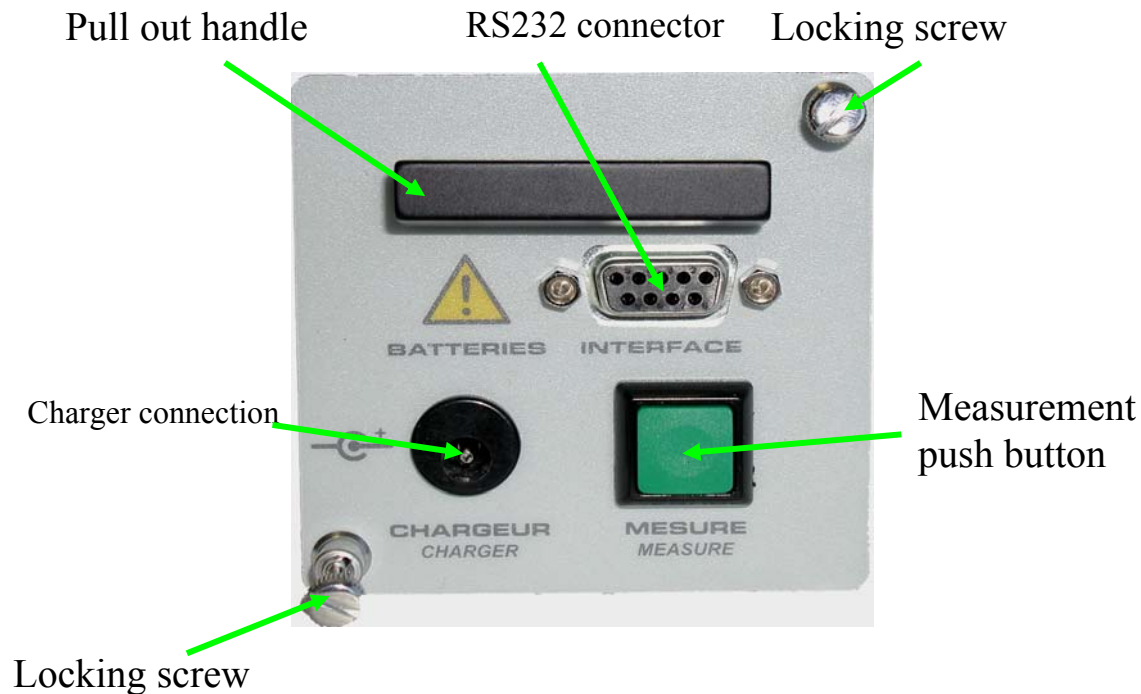
Visual information on the LCD screen with a numerical value in %, gives the battery discharge level.

Plugged in the RCP2A or outside of the RCP2A, the battery pack can be recharged with the provided charger connected to the mains (90 -250 volts).

The charge control is fully automatic and the charge time is less or equal to 3 hours.

Additional battery pack can be purchased separately (RCP-02)

A pack extra batteries ( RCP-02) can be separately furnished with the milliohmmeter.



### 1-2-8 Unit Dimensions

The RCP2A is presented in a clear ivory cream colour polyester resin and glass fiber case.

- High : 250mm
- Length : 340mm
- Width : 120mm

### 1-2-9 Weight

< 4.5 kg

### 1-2-10- Remote Control Unit (RCU) specifications (RCP-01)

On option, the RCP2A unit can work in conjunction with a remote control unit ( RCP-01)

The RCP2A RCU is made in a chocproof black colour polystyrene case. It includes a 64x240 dot matrix graphic LCD screen with backlight, a beeper, red and green LED, a set of 5 function keys and a 4 direction navigator with an enter key.

The RCU includes also a battery back up memory allowing uploading measurement results in to a PC computer without having to transport the RCP2A main unit.

The RCU is connected to the RCP2A with 3 meters long cable which can be extended to 15 meters.

**RCU dimensions:**

- Length : 200 mm
- Width : 120 mm
- High : 60 mm

**Weight:**

- 600 g

**Display:**

64x240 points LCD matrix (liquid crystal display) with electroluminescent diode backlight.

6000 digits measurement and location test point display in big size characters and small size characters for:

- unity
- measurement range
- measurement current
- battery charge level
- Error code (measurement, polarity...)

**Keyboard:**

- 5 function keys changing according to the menus.
- 4 navigation keys: arrows UP, DOWN, RIGHT, LEFT.
- 1 data enter key
- 1 software power ON key
- 1 mechanical key to trigger the measurement.

**Visual and audible signal:**

- Audible signal when pressing keyboard ( can be disabled)
- Audible signal with error message and FAILED measurements
- Red and Green LEDS for PASS/FAIL measurement results.

**Battery charge level:**

From 0 to 99%

**Operation:**

The RCU can be operated either in hands or strapped on the front arm to make the measurement easier.

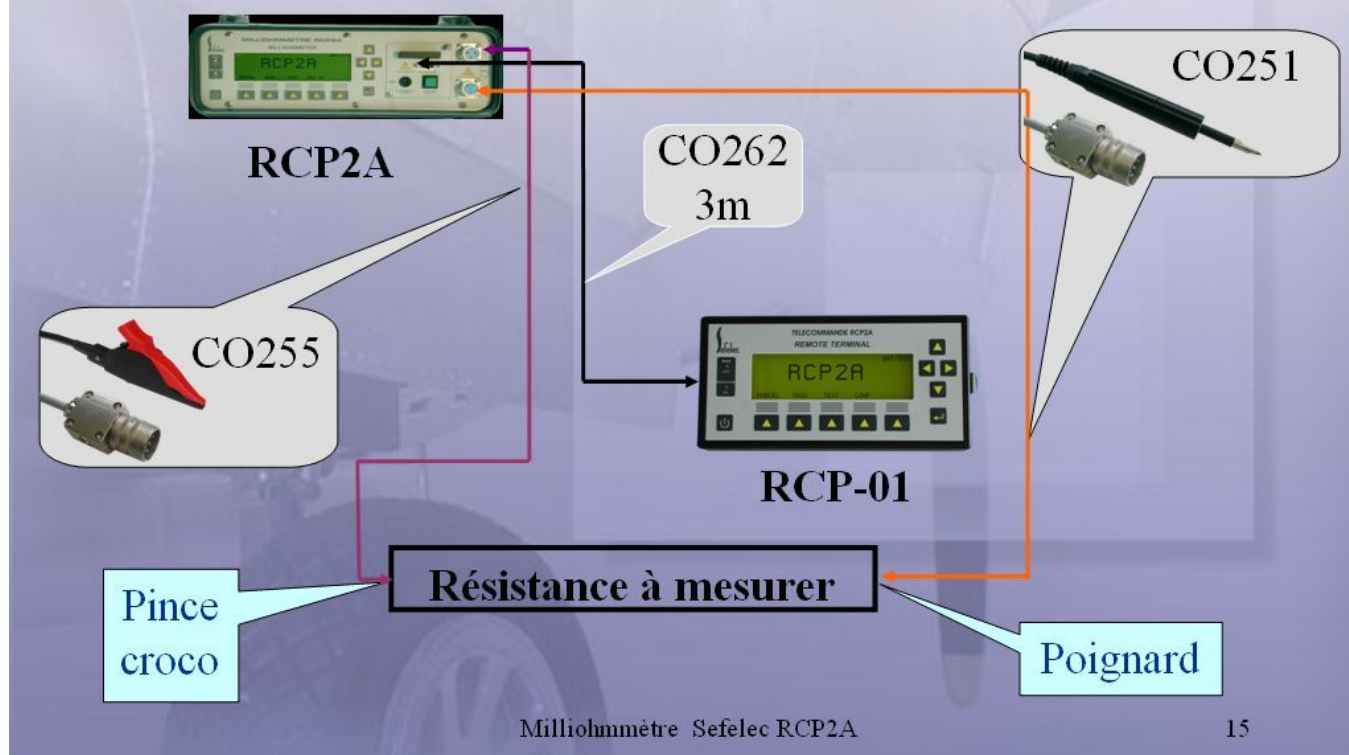
### 1-2-10-1 Data transfer between PC computer and the Remote Control Unit (RCU):

The RCP2A unit and the RCU (RCP-01 option) exchange data through a serial RS232 interface.

When the RCU is connected to the RCP2A (with a special cable CO262 provided by Sefelec), the whole control is done from the RCU.

The memorisation of the protocol as well as the measurement results are done in the RCU memory.

## Connexion RCP2A vers RCP-01 via CO262 avec CO251 et CO255

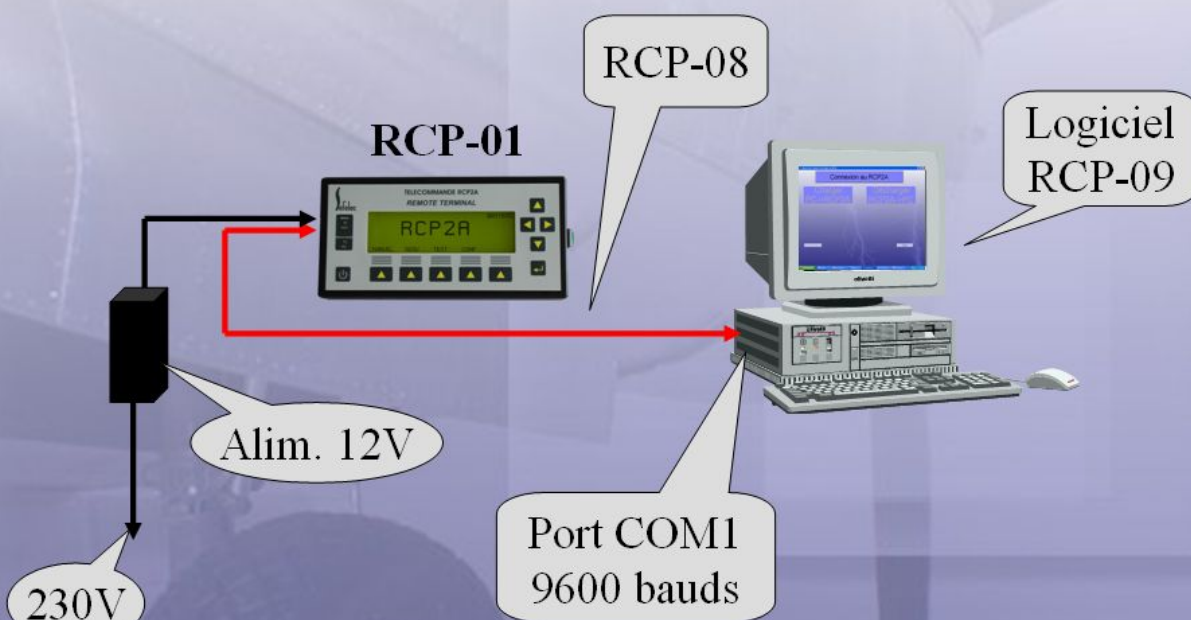


When the measurement protocol (complete or partial) is over, the connection cable between the RCP2A and the RCU can be disconnected (on the RCU side). The operator brings the RCU to the data storage PC computer equipped with the RCP-08 option (RCU/PC adaptor with power supply).

The RCU is connected on the RCP-08 and the RCP2APRO software (RCP-09 option) allows RCU memory transfer into the PC computer.

Then the RCU memory can be cleared and downloaded with a new measurement protocol. After RCU re-connection to the RCP2A main unit the device is ready to perform the new measurement protocol.

## Connexion RCP-01 vers PC via RCP-08 pour Chargement / Déchargement



Milliohmètre Sefelec RCP2A

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1-2-10-2 Remote Control Unit presentation :



### 1-2-11 Data transfer between PC computer and the RCP2A

The RCP2A unit and the RCP2A exchange data through a serial RS232 interface ,with a special cable CO179A provided with RCP2APRO software (RCP-09 option).

The operator brings the RCP2A to the data storage PC computer equipped with the CO179A cable and download a mesurement sequence into the RCP2A memory.

The memorisation of the protocol as well as the measurement results are done in the RCP2A unit.

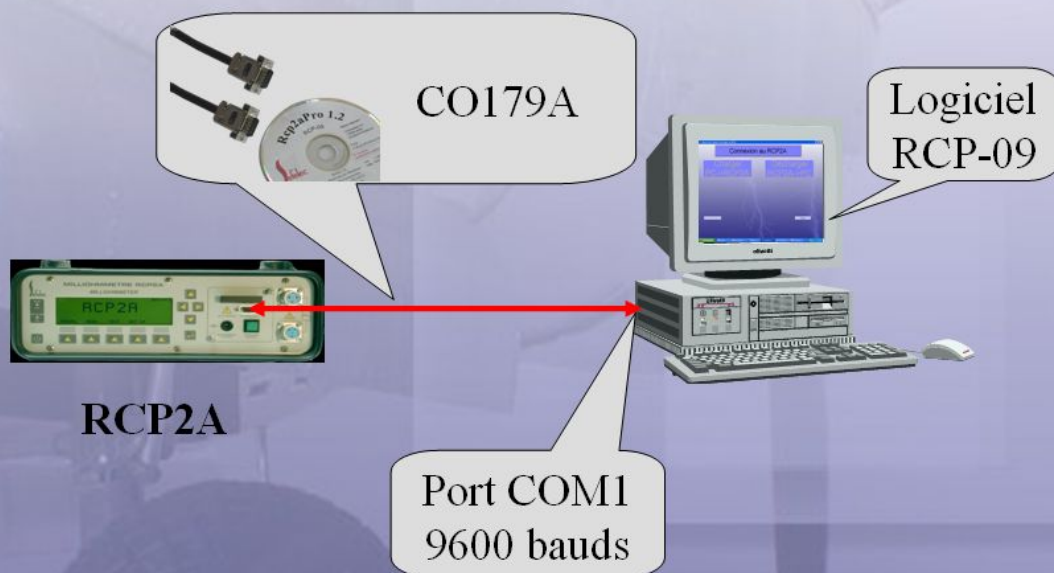
Then , the operator brings the RCP2A in production area and execute all the measurements.

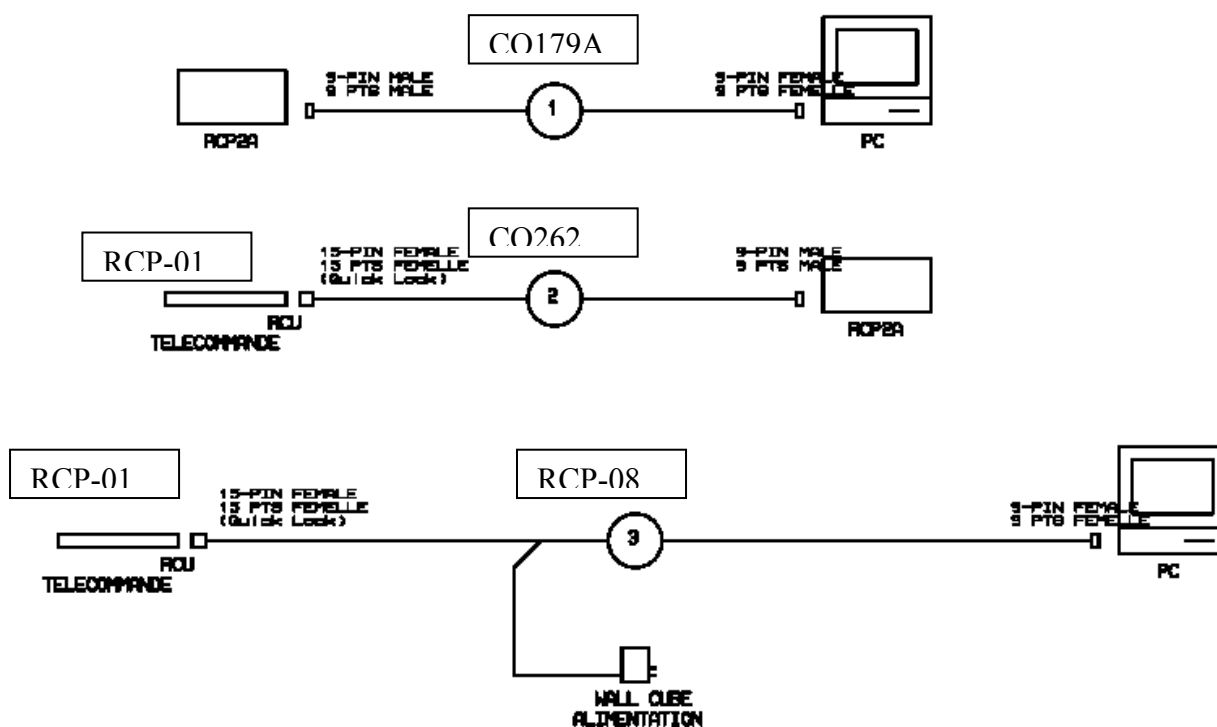
When the measurement protocol (complete or partial) is over , the operator brings the RCP2A to the data storage PC computer equipped with the CO179A cable.

The RCP2A unit is connected on the CO179A and the RCP2APRO software (RCP-09 option) allows RCP2A memory transfer into the PC computer.

Then the RCP2A memory can be cleared and downloaded with a new measurement protocol.

## Connexion RCP2A vers PC via CO179A pour Chargement / Déchargement



1-2-12 Wiring synoptic between PC, RCP2A and RCP-01



**1-2-13 Environmental**

- Operating temperature range: 0 degC to +50 degC
- Storage temperature range; -20 degC to +50 degC
- Relative humidity; up to 80% non-condensing
  
- To withstand 2-3mtr drop test without significant damage
- All components soldered or clamped for robust construction

**1-2-14 Reliability**

To be >97%, based on:

20 on/off transitions per day  
18 hours operation per day

## 1-2-15 Electromagnetic Compatibility

Emissions:

Generic Standard BSEN61326:1998

|                     |                        |
|---------------------|------------------------|
| Conducted Emissions | BSEN 55022:1998Class B |
| Radiated Emissions  | BSEN 55022:1998Class B |

Immunity:

Generic Standard BSEN6132:1998

|                                       |                   |           |
|---------------------------------------|-------------------|-----------|
| Electric Fast Transient (power lines) | EN 61000-4-4:1995 | 1KV       |
| Conducted Immunity (signal lines)     | EN 61000-4-6:1996 | 3V        |
| Radiated Field Immunity               | EN 61000-4-3:1996 |           |
| 3V/m                                  |                   |           |
| Electrostatic Discharge               | EN 61000-4-2:1996 | 4KV       |
| Surge                                 | IEC 61000-4-5     | 0.5/1.0KV |
| Voltage Dips                          | IEC 61000-4-11    |           |
| Harmonics                             | BSEN 61000-3-2    | Class A   |
| Flicker                               | BSEN 61000-3-3    |           |

## 1-2-16 Electrical Safety

Conforms to EN 61010-1

|                         |                  |
|-------------------------|------------------|
| Main Instrument         | Class III (SELV) |
| Battery Pack            | Class III (SELV) |
| Remote Key/Display Unit | Class III (SELV) |
| External Mains Charger  | Class II         |
| External DC Chargers    | Class III (SELV) |

### 1-3 OPTIONS and ACCESSORIES:

|          |                                                                                                 |
|----------|-------------------------------------------------------------------------------------------------|
| * RCP-01 | Remote Control Unit (RCU) with memory                                                           |
| * RCP-02 | Additional battery pack                                                                         |
| * RCP-03 | Additional battery charger                                                                      |
| * RCP-04 | 12 meters extension cable for Remote control unit & measurement leads ( 4pts mâle/ 4pts female) |
| * RCP-05 | Fiber glass suitcase for RCP2A & accessories                                                    |
| * RCP-06 | 15 meters extension cable on reel (3 pts mâle/3 pts female)                                     |
| * RCP-07 | 90 meters extension cable on reel with wheels (3 pts mâle/3 pts female)                         |
| * RCP-08 | RCU / PC adaptor with power supply                                                              |
| * RCP-09 | RCP2PRO software and PC connection cable                                                        |
| * RCP-10 | 20 meters extension cable on reel with embase 3 pts mâle/ fiche 3pts male                       |
| * RCP-11 | 20 meters extension cable on reel with embase 3 pts mâle/ fiche 3pts female                     |
| * RCP-13 | Battery charger with power cord                                                                 |
| * RCP-14 | Jaeger adaptor 3 pins male to 4 pins female                                                     |
| * RCP-15 | Protection lid                                                                                  |
| * RCP-16 | Bag for RCP2A accessories                                                                       |
| * RCP-17 | Shunt 1 m $\Omega$ 0.5 % for RCP2A                                                              |
| * RCP-18 | Shunt 5 m $\Omega$ 0.5 % for RCP2A                                                              |
| * RCP-19 | Shunt 10 m $\Omega$ 0.5 % for RCP2A                                                             |
| * RCP-20 | Shunt 50 m $\Omega$ 0.5% for RCP2A                                                              |
| * RCP-21 | USB serial adapter to add a serial port on a PC                                                 |
| * RCP-22 | Money-bags for remote control RCP-01 and accommodation for CO251 or CO258                       |
| * RCP-91 | Calibration box for RCP2A                                                                       |

### Lead and probes:

|         |                                                                                                                                                                     |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| C0250   | 4 wire lead with banana plugs and tips ( VN-VG)                                                                                                                     |
| CO251   | 2 wire probe , 4 pins male plug , concentric tips , length = 150mm                                                                                                  |
| CO255   | 2 wire lead , 3 pins male plug , Kelvin crocodile clip                                                                                                              |
| CO255-5 | Cordons de mesures courant de retour de 5 mètres équipé d'une pince petit modèle type Kelvin) avec fiche 3 point male                                               |
| CO258   | 2 wire probe , 4 pins male plug , concentric tips , length = 180mm                                                                                                  |
| CO261   | 2 wire probe , 4 pins male plug , concentric tips , length = 180mm                                                                                                  |
| TE9/1   | Cordon de mesure (2 fils) de métallisation de 3 mètres équipé d'un poignard à pointes de touches bipolaires grand modèle (longueur = 180mm) avec fiche 4 point male |
| TE28/1  | 2 wire probe , 4 pins male plug , parallel tips , length = 180mm , remote control push-button                                                                       |
| CO10    | 2 wire lead , 3 pins male plug , large Kelvin crocodile clip                                                                                                        |
| CO179A  | Connection cable between RCP2A and PC (include in RCP-09 software)                                                                                                  |
| CO262   | Connection cable between RCP-01 (remote control unit) and PC (include in RCP-01)                                                                                    |

Picture of some accessories:

**CO258**



**CO255**



**TE28/1**



**CO10**



**RCP-06 ,RCP-10,RCP-11**



**RCP-07**



CO262



RCP-03



RCP-08



RCP-09 (avec CO179A)



CO179A



RCP-22



CO250 1/3



CO250 2/3



CO250 3/3



CO250



### 1-3-1 Transportation suitcase RCP-05

On option (RCP-05) an ivory cream colour (RAL1015) polyester resin and glass fiber suitcase can be provided.

Dimensions: Length: 660mm  
Width: 460mm  
High : 180mm

This suitcase allows the transport of the following accessories:

- Milliohmmeter RCP2A
- Spare battery pack RCP-02
- External universal battery charger RCP-03
- 2 wire lead , 3 pins male plug , Kelvin crocodile clip
- 2 wire probe , 4 pins male plug , concentric tips , length = 150mm
- Remote Control Unit RCP-01

### ***SUITCASE PRESENTATION***





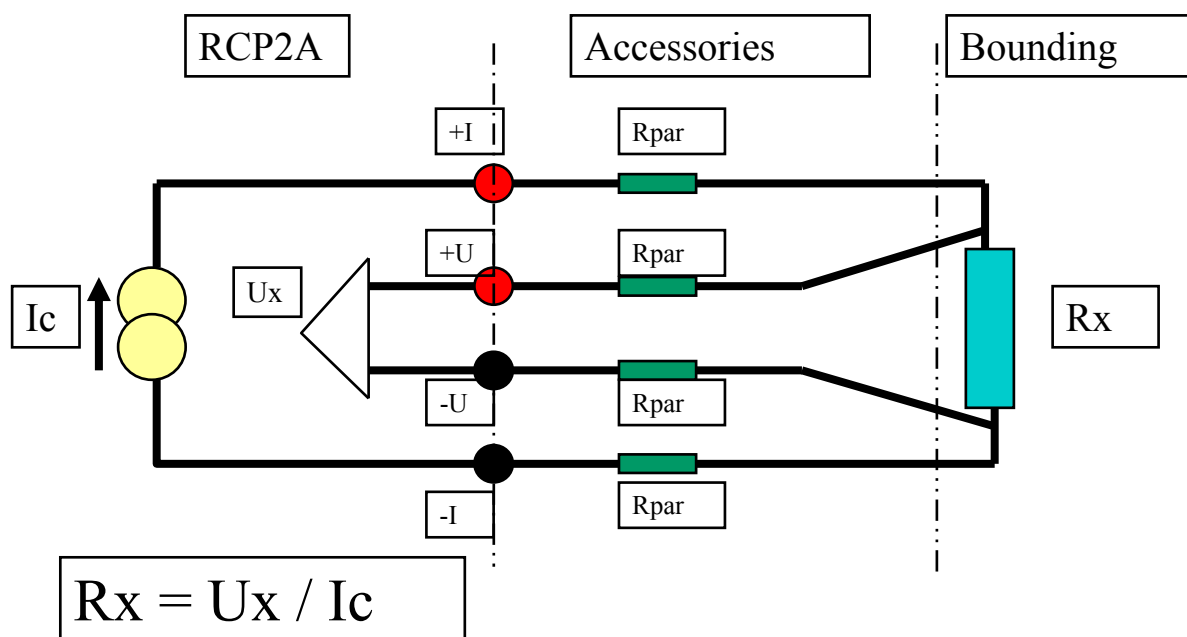
## 1-4 MEASUREMENT METHOD:

In order to perform high accuracy low resistance measurements, the RCP2A uses a 4 wire method named Kelvin method.

- 2 wires are used to connect a constant current source to the specimen under test
- 2 wires are used to measure the voltage difference directly on the specimen under test terminals.

With this method the measurement leads resistance doesn't introduce error but should not exceed 170 mΩ for the current connection.

## Kelvin method



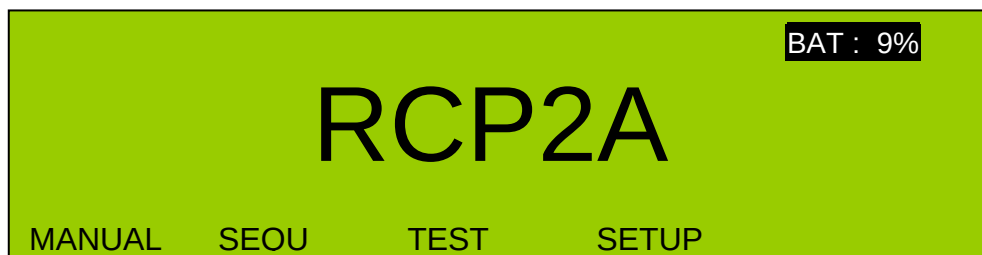
## SECTION 2: BATTERY CHARGER AND ACCESSORIES OPERATION

Switch ON the RCP2A by pressing on the key located on the left hand side corner of the front panel (see chapter 1-2-1 Front panel)

### 2-1 Battery charger operation :



When the battery level indicator gives a value lower than 10%, it is necessary to charge the battery pack or to replace it by a fully charged one.



#### 2-1-1 Battery charge in the RCP2A:



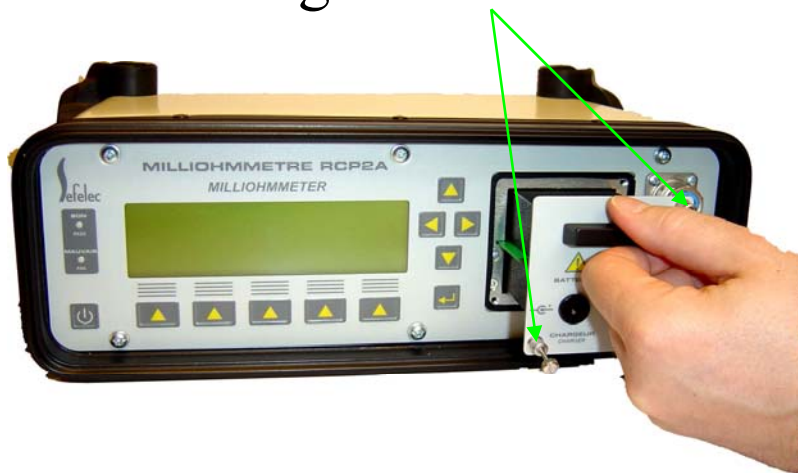
- Switch OFF the RCP2A with the ON/OFF key (left hand side on the front panel).
- Connect the charger circular connector in the front panel battery pack terminal named *CHARGER*
- Connect the charger to a mains plug (90- 230 VAC)
- The red lamp on the charger turns on permanently. It will flash to indicate the charge end ( < 3 hours)
- Then disconnect the circular connector from the RCP2A front panel.
- Switch ON the RCP2A and check that the battery level gives a value = 99 %
- **NOTED:** when the load does not rise to 99 % while the charger flashed at the end of the load, to proceed in the following way:
- Put the block in a device by configuring in the menu
- CONF: ECRAN : ON
- AUTO-OFF : OFF
- **IMPORTANT:** to wait for the complete discharge, detected by the automatic stop of the device, is approximately 8 am for a well charged battery.
- The discharge which can not be linear for a block presenting a defect of charge maxi
- - extract the block of the device RCP2A
- - connect the charger: red Led and fixed
- - wait for the complete charge (between 3 and 4 hours) seeing red twinkling
- - put back the block in the device RCP2A
- - Switch on the RCP2A and verify that the indicator of load batteries gives a value 99 %

## Red lamp



### 2-1-2 Battery charge outside of the RCP2A:

## Locking screws



- Switch OFF the RCP2A with the ON/OFF key (left hand side on the front panel).
- Unscrew the 2 locking screws and pull out the battery pack with the help of the handle.
- Connect the charger circular connector in the front panel battery pack terminal named *CHARGER*
- Connect the charger to a mains plug (90- 230 VAC)
- The red lamp on the charger turns on permanently. It will flash to indicate the charge end ( < 3 hours)
- Then disconnect the circular connector from the RCP2A front panel.
- Pull in the battery pack and screw the 2 locking screws
- Switch ON the RCP2A and check that the battery level gives a value = 99 %

- **NOTED:** when the load does not rise to 99 % while the charger flashed at the end of the load, to proceed in the following way:
- Put the block in a device by configuring in the menu
- CONF: ECRAN : ON
- AUTO-OFF : OFF
- **IMPORTANT:** to wait for the complete discharge, detected by the automatic stop of the device, is approximately 8 am for a well charged battery.
- The discharge which can not be linear for a block presenting a defect of charge maxi
- - extract the block of the device RCP2A
- - connect the charger: red Led and fixed
- - wait for the complete charge (between 3 and 4 hours) seeing red twinkling
- - put back the block in the device RCP2A
- - Switch on the RCP2A and verify that the indicator of load batteries gives a value 99 %

## 2-2 Accessories connection:

### 2-2-1 Method of connection of Jaeger plugs :

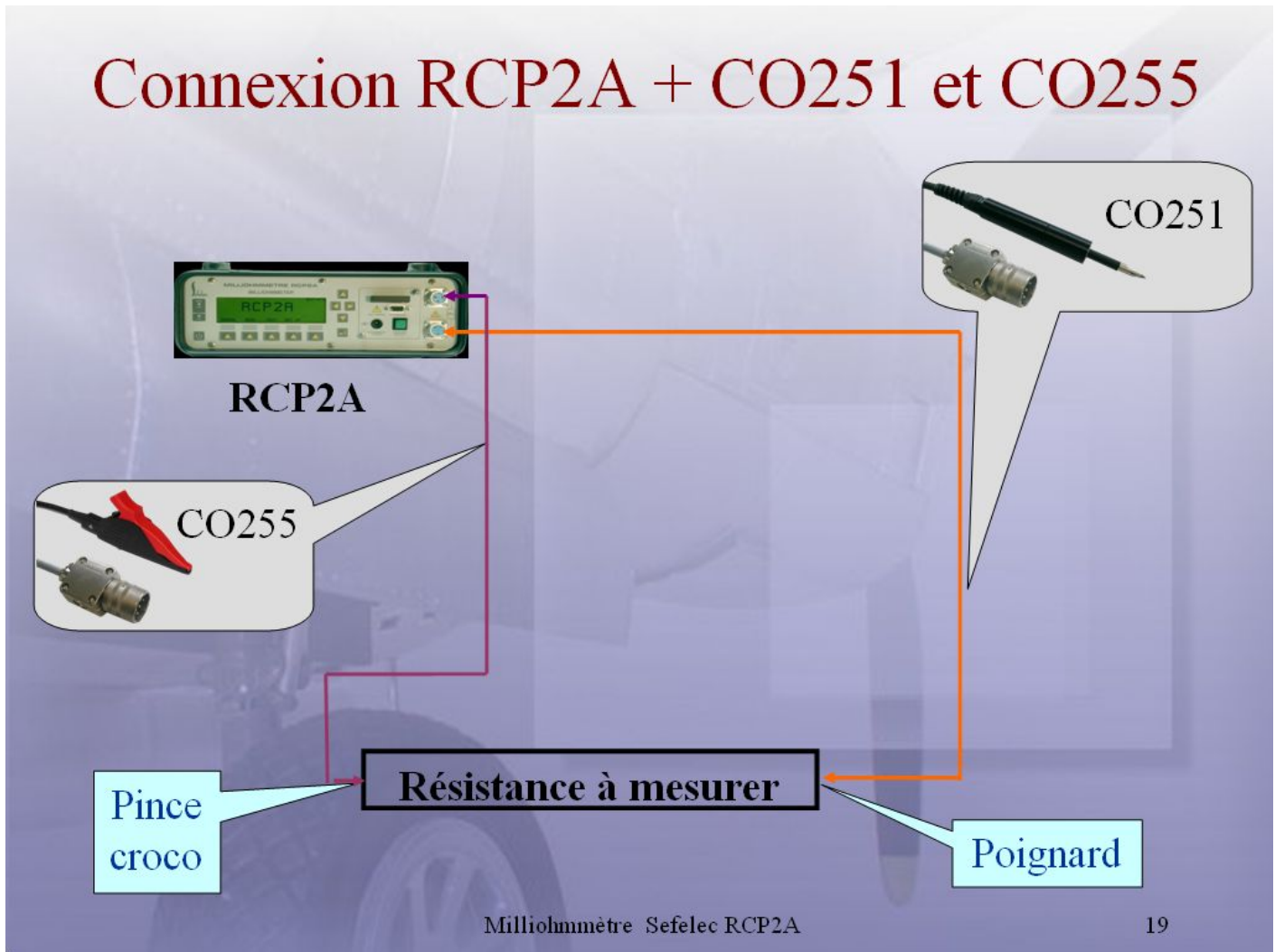
- The RCP2A accessories are equipped with 3 or 4 pins JAEGER connectors.
- Check the pin number of your accessory and connect it the right plug.
- Pull the connector in the plug and then rotate the stripped collar  $\frac{1}{4}$  clockwise to lock.
- Turn the stripped collar  $\frac{1}{4}$  anti-clockwise and pull out the connector to disconnect.



### 2-2-2 Connection of the accessories for use with RCP2A without remotecontrol RCP-01 and extension:

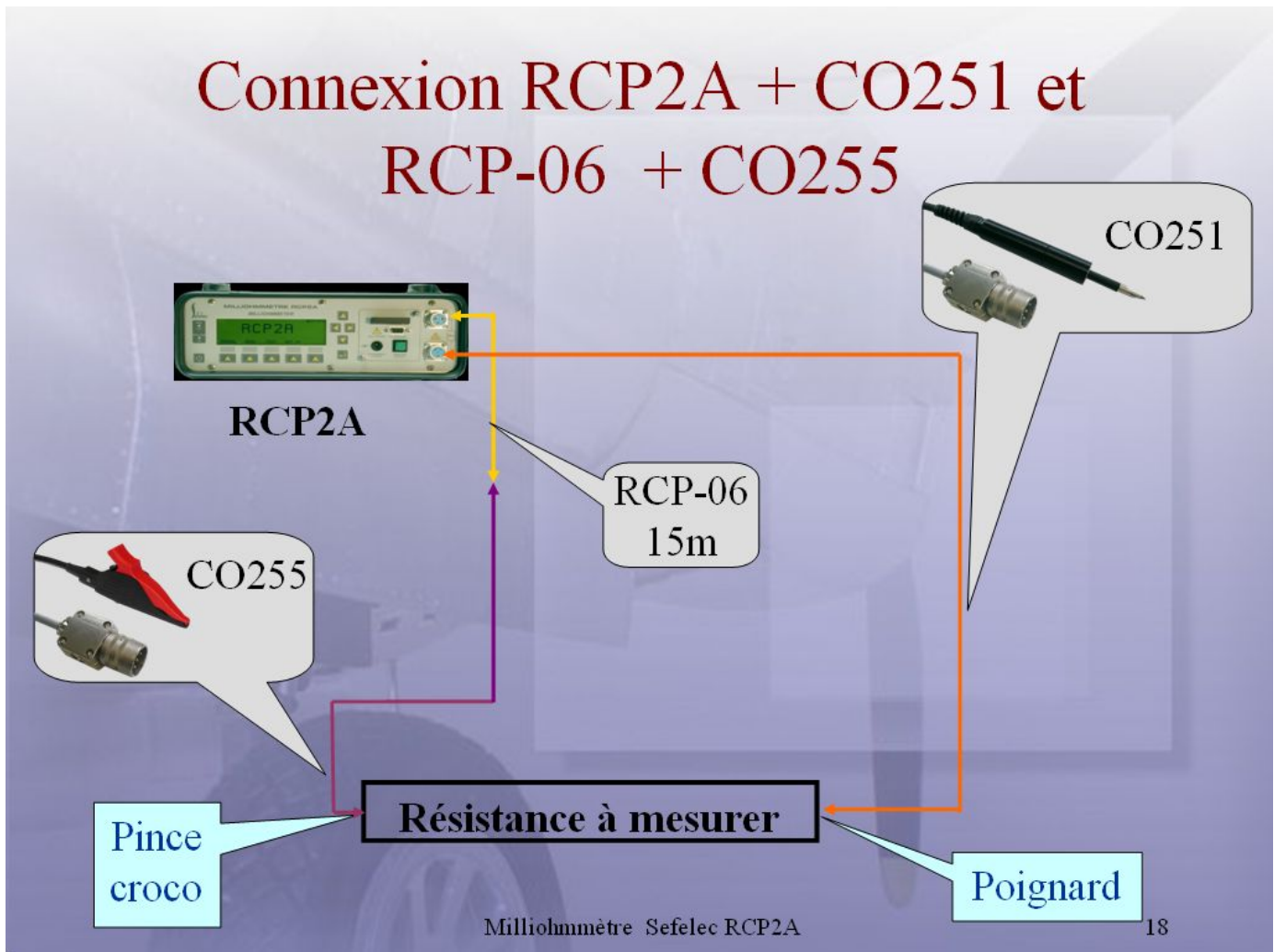
- Connect a cord equipped with a crocodile clip (**CO255** or CO10 or CO8) on the Jaeger base plate 3 pins of the **RCP2A**
- Connect a dagger with test probe (**TE9/1** or **CO251** or CO258 or CO261 or TE28/1) on the Jaeger base plate 4 pins of the **RCP2A**

## Connexion RCP2A + CO251 et CO255



2-2-3 Connection of the accessories for use with RCP2A without remotecontrol RCP-01 and extension RCP-06 on the connection of the crocodile clip:

- Connect a extension **RCP-06** (15m) on the Jaeger base plate 3 pins of the **RCP2A**
- Connect a cord equipped with a crocodile clip (**CO255** or CO255-5) on the Jaeger base plate 3 pins of the extension
- Connect a dagger with test probe (**TE9/1** or **CO251** or CO258 or CO261 or TE28/1) on the Jaeger base plate 4 pins of the **RCP2A**



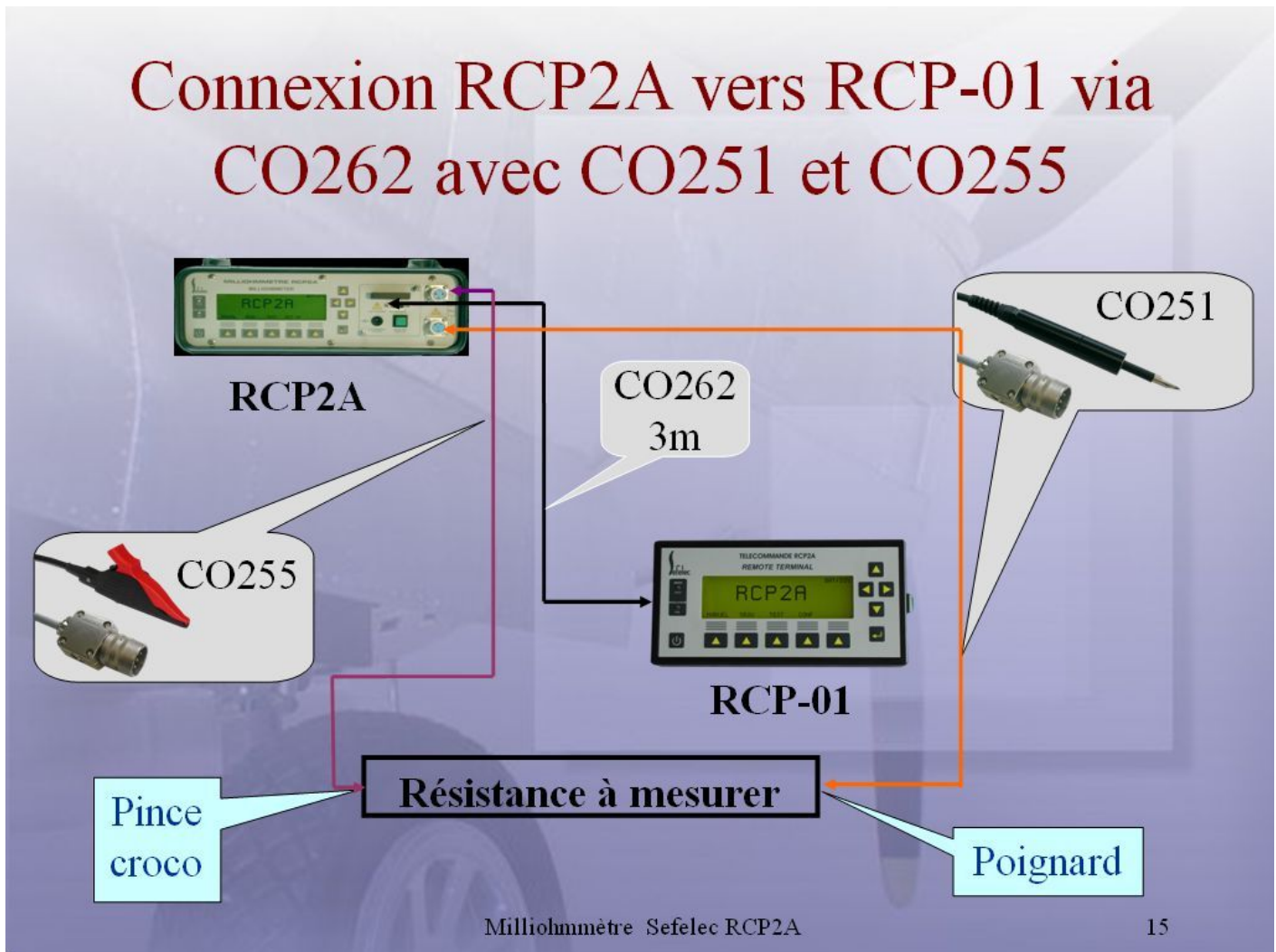
Note: It is misadvised using a CO8 or a CO10 with a extension RCP-06 bus in this case the total resistance of wire of power is likely to be too high and to prohibit measurements of resistances until 600mOhm on 10A



2-2-4 Connection of the accessories for use with RCP2A with remote control RCP-01 and without extension :

- Connect a cord **CO262** between base plate SUBD 9B of the **RCP2A** and base plate SUBD 15B of remote control RCP-01
- Connect a cord equipped with a crocodile clip (**CO255** or CO255-5 or CO10 or CO8) on the Jaeger base plate 3 pins of the RCP2A
- Connect a dagger with test probe (**TE9/1** or **CO251** or CO258 or CO261 or TE28/1) on the Jaeger base plate 4 pins of the **RCP2A**

## Connexion RCP2A vers RCP-01 via CO262 avec CO251 et CO255

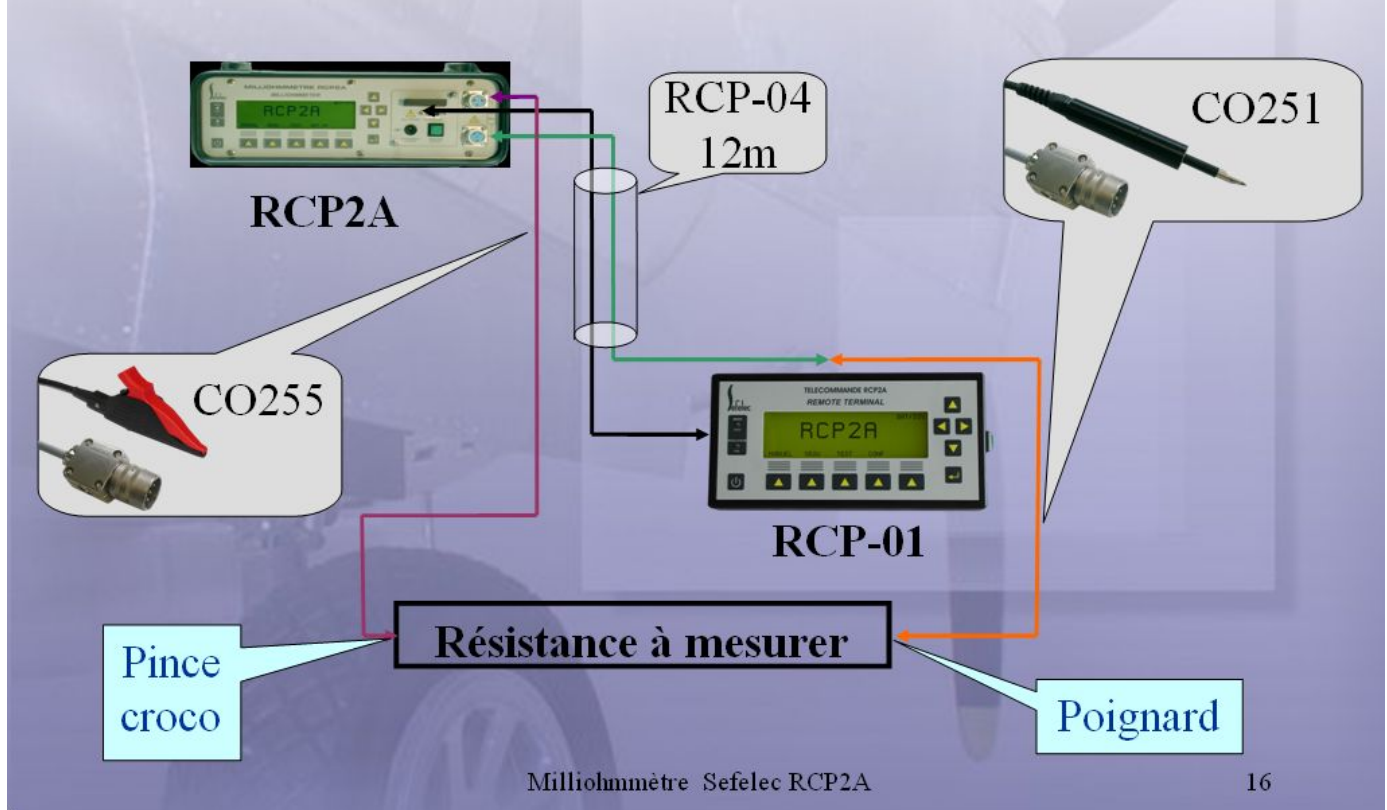




2-2-5 Connection of the accessories for use with RCP2A with remote control RCP-01 and extension RCP-04 for the remote control in satchel RCP-22:

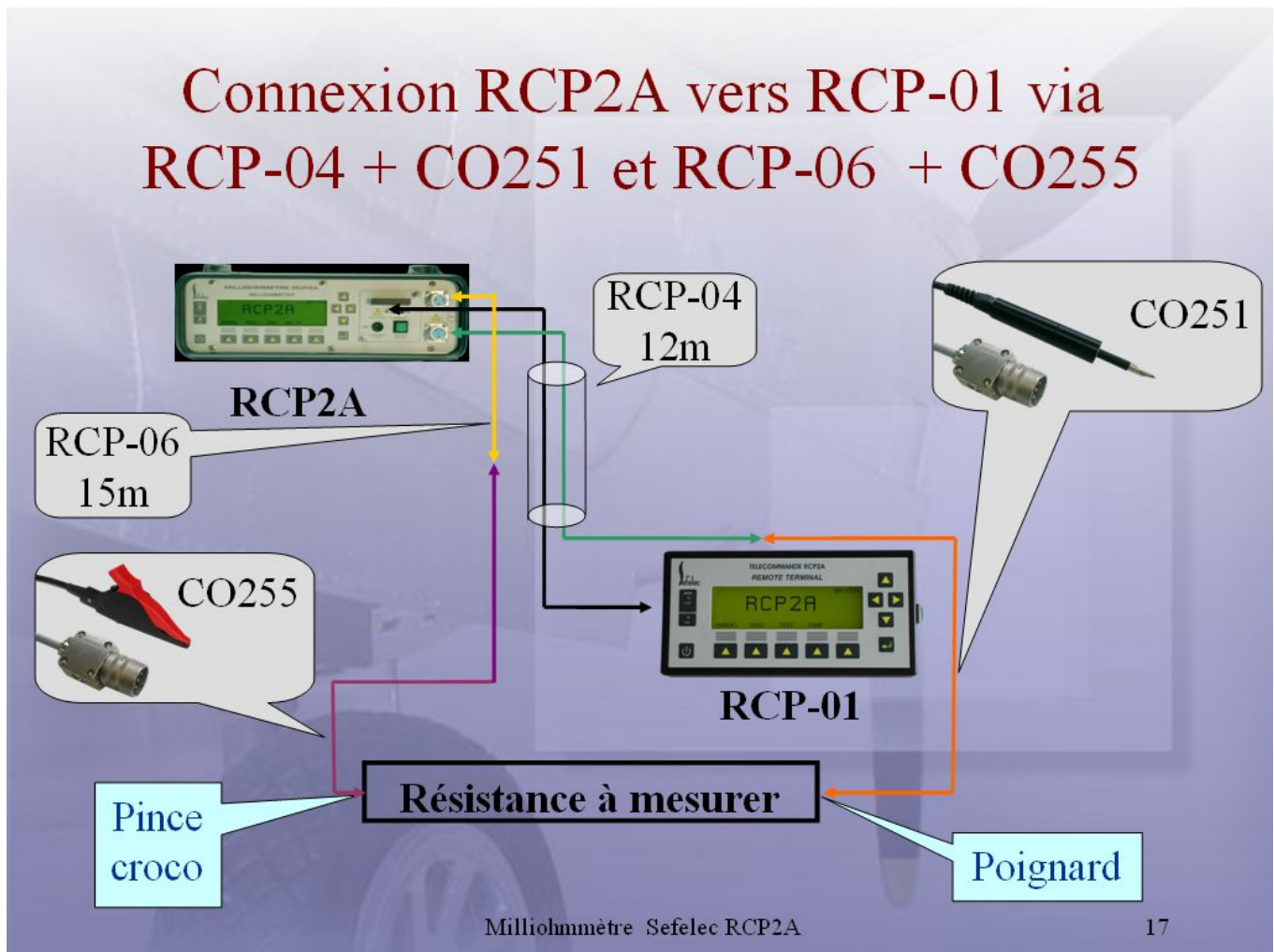
- Connect plug SUBD 9B extension **RCP-04** (12m) on base plate SUBD 9B of the **RCP2A** and to connect plug SUBD 15B this extension on baseplate SUBD 15B of remote control **RCP-01**
- Connect the Jaeger plug 4 pins extension **RCP-04** (12m) on the Jaeger base plate 4 pins of the RCP2A
- Connect a dagger with test probe (TE9/1 or **CO251** or CO258 or CO261) on the Jaeger base plate 4 pins at the end of extension RCP-04
- Connect a cord equipped with a crocodile clip (**CO255** or CO255-5) on the Jaeger base plate 3 pins of the **RCP2A**

## Connexion RCP2A vers RCP-01 via RCP-04 + CO251 et CO255



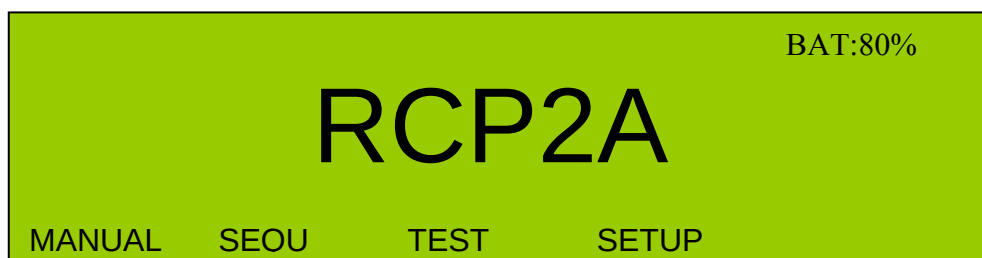
**2-2-6 Connection of the accessories for use with RCP2A with remote control RCP-01 and extension RCP-04 for the remote control in satchel RCP-22and with extension RCP-06 on the connection of the crocodile clip :**

- Connect plug SUBD 9B extension **RCP-04** (12m) on base plate SUBD 9B of the **RCP2A** and to connect plug SUBD 15B this extension on baseplate SUBD 15B of remote control **RCP-01**
- Connect the Jaeger plug 4 pins extension **RCP-04** (12m) on the Jaeger base plate 4 pins of the **RCP2A**
- Connect a dagger with test probe (TE9/1 or **CO251** or CO258 or CO261) on the Jaeger base plate 4 pins at the end of extension **RCP-04**
- Connect a extension **RCP-06** (15m) on the Jaeger base plate 3 pins of the **RCP2A**
- Connect a cord equipped with a crocodile clip (**CO255** or CO255-5) on the Jaeger catch 3 socket contacts of the extension

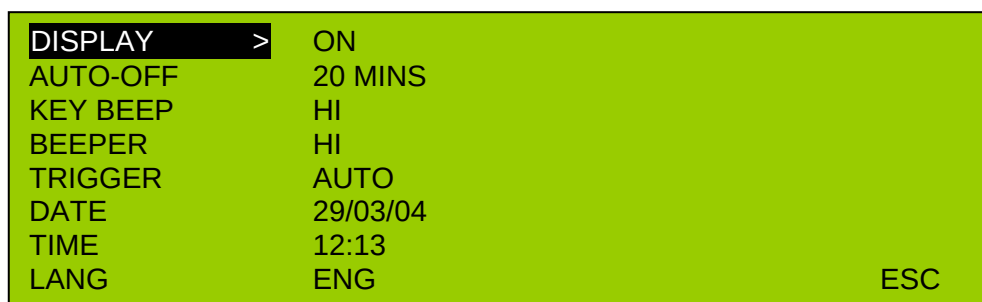


## SECTION 3: RCP2A CONFIGURATION

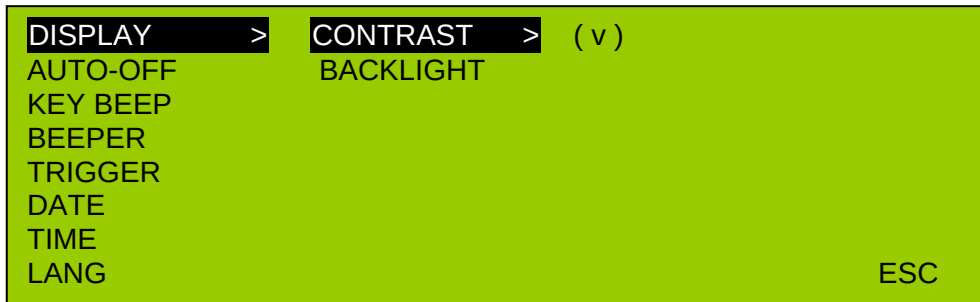
From the power ON screen or from any menu level which allows the operation, press on the SETUP key to reach the RCP2A setup menu.



- ☞ With the UP and DOWN arrows, move the reverse video area to select the line to modify.
- ☞ With the RIGHT arrow or the enter key, enter in the menu level to set the parameters.

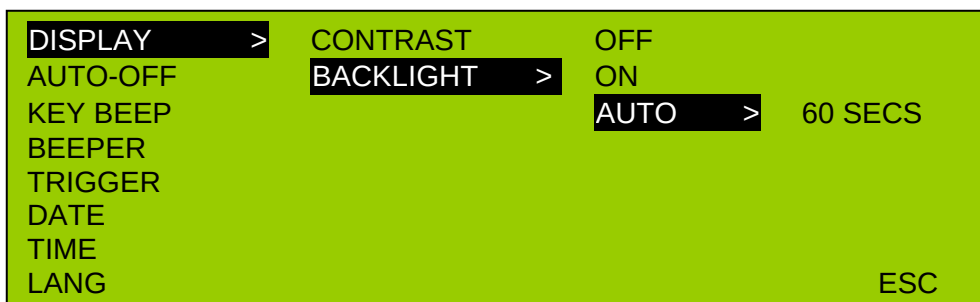


### 3-1 LCD screen setup: the contrast



- ☞ Select the DISPLAY line
- ☞ Press on the RIGHT arrow or on the enter key
- ☞ Select the CONTRAST line
- ☞ Press on the RIGHT arrow or on the enter key
- ☞ Set the LCD contrast according to the environmental light with the UP and DOWN arrows.
- ☞ Enter the setup either with the LEFT arrow or the Enter key

### 3-2 LCD screen setup: the backlight



- ☞ Select the DISPLAY line
- ☞ Press on the RIGHT arrow or on the enter key
- ☞ Select the BACKLIGHT line
- ☞ Press on the RIGHT arrow or on the enter key
- ☞ Select the LED backlight operating mode with the UP and DOWN arrows :
  - ON = permanent (ATTENTION to the battery life time !)
  - OFF = without backlight
  - AUTO = set the backlight time from 5 to 60 seconds (by 5 sec. steps) with the RIGHT then UP and DOWN arrows key.
- ☞ Enter the setup either with the LEFT arrow or the Enter key
- ☞ Press on the LEFT arrow to come back to the previous menu level

### 3-3 Auto switch off mode :



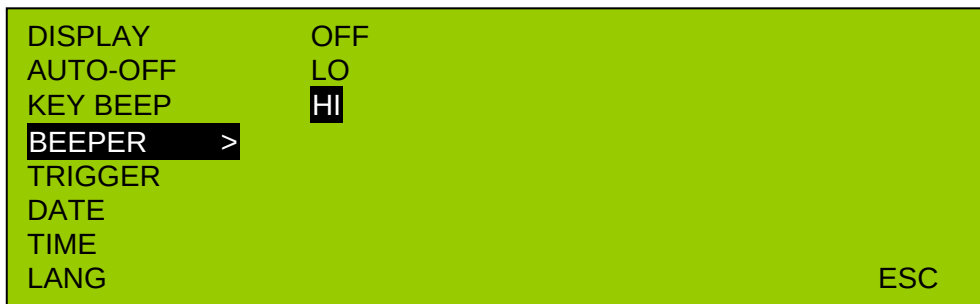
- ☞ Select the AUTO-OFF line
- ☞ Press on the RIGHT arrow or on the enter key
- ☞ Set the automatic switch off mode with the UP and DOWN arrows:
  - OFF= permanent operation mode ( ATTENTION to the battery life time !)
  - ON = set the time before the unit switch off from 10 to 60 minutes with the RIGHT arrow and then the UP and DOWN arrows.
- ☞ Enter the setup either with the LEFT arrow or the Enter key
- ☞ Press on the LEFT arrow to come back to the previous menu level

### 3-4 Keys sound level:



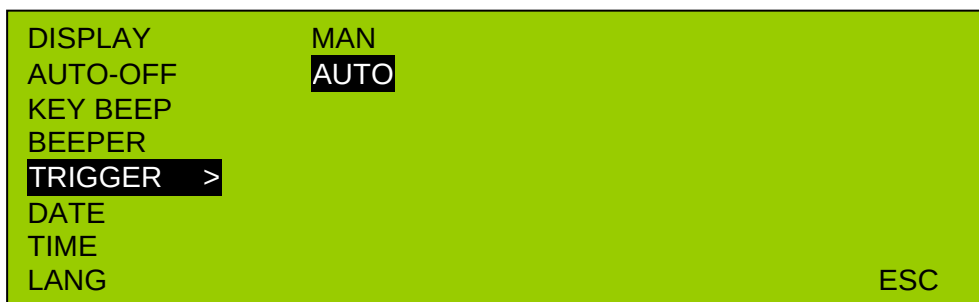
- ☞ Select the KEY BEEP line
- ☞ Press on the RIGHT arrow or on the enter key
- ☞ Set the keys sound level with the UP and DOWN arrows:
  - OFF= no sound when pressing a key
  - LO =low sound level.
  - HI = high sound level
- ☞ Enter the setup either with the LEFT arrow or the Enter key

### 3-5 Alarm sound level:



- ☞ Select the BEEPER line
- ☞ Press on the RIGHT arrow or on the enter key
- ☞ Set the alarm sound level with the UP and DOWN arrows:
  - OFF= no sound when error or failed result
  - LO = low alarm sound level.
  - HI = high alarm sound level
- ☞ Enter the setup either with the LEFT arrow or the Enter key

### 3-6 Measurement trigger mode :



- ☞ Select the TRIGGER line
- ☞ Press on the RIGHT arrow or on the enter key
- ☞ Set the measurement trigger mode with the UP and DOWN arrows:
  - MAN= measurement trigger by the front panel green push button ( MEASURE)
  - AUTO = automatic measurement trigger by detection of 100mA current flowing through the specimen under test, then current pulse according to the current setup.
- ☞ Enter the setup either with the LEFT arrow or the Enter key

### 3-7 Date setup:

|          |          |     |
|----------|----------|-----|
| DISPLAY  | ON       |     |
| AUTO-OFF | 20 MINS  |     |
| KEY BEEP | HI       |     |
| BEEPER   | HI       |     |
| TRIGGER  | AUTO     |     |
| DATE     | 29/03/04 |     |
| TIME     | 12:13    |     |
| LANG     | ENG      | ESC |

- ☞ Select the DATE line
- ☞ Press on the RIGHT arrow or on the enter key
- ☞ Set the Day with the UP and DOWN arrows.
- ☞ Move to the Month field with RIGHT arrow.
- ☞ Set the Month with the UP and DOWN arrows.
- ☞ Move to the Year field with RIGHT arrow.
- ☞ Set the Year with the UP and DOWN arrows.
- ☞ Enter the setup with the enter key.

### 3-8 Time setup:

|          |          |     |
|----------|----------|-----|
| DISPLAY  | ON       |     |
| AUTO-OFF | 20 MINS  |     |
| KEY BEEP | HI       |     |
| BEEPER   | HI       |     |
| TRIGGER  | AUTO     |     |
| DATE     | 29/03/04 |     |
| TIME     | 12:13    |     |
| LANG     | ENG      | ESC |

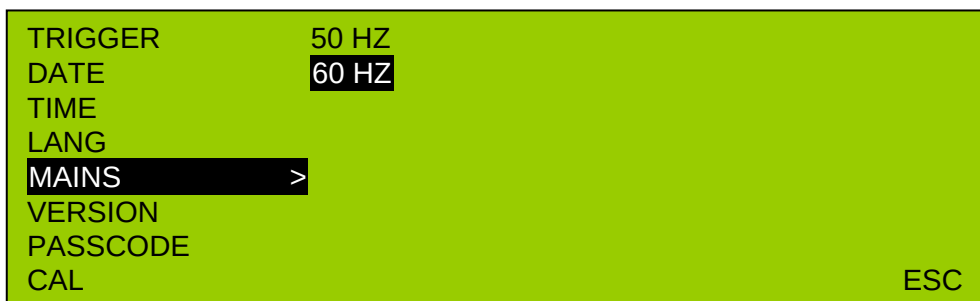
- ☞ Select the TIME line
- ☞ Press on the RIGHT arrow or on the enter key
- ☞ Set the Hour with the UP and DOWN arrows.
- ☞ Move to the Minute field with RIGHT arrow.
- ☞ Set the Minute with the UP and DOWN arrows.
- ☞ Enter the setup with the enter key.

### 3-9 Language selection:



- ☞ Select the LANG line
- ☞ Press on the RIGHT arrow or on the enter key
- ☞ Set the language with the UP and DOWN arrows:
  - ENG = English
  - FRA = Français ( French)
  - DEU = Deutsch ( German)
- ☞ Enter the setup either with the LEFT arrow or the Enter key

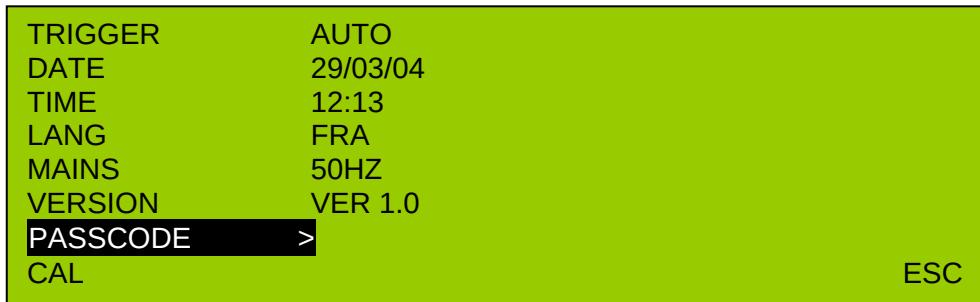
### 3-10 Mains frequency selection :



- ☞ With the DOWN arrow, scroll the reverse video area on the underneath lines
- ☞ Select the MAINS line
- ☞ Press on the RIGHT arrow or on the enter key .
- ☞ Select the mains frequency to optimize the measurement stability with the UP and DOWN arrows:
  - 50HZ = for 50 and 400Hz
  - 60HZ = for 60Hz
- ☞ Enter the setup either with the LEFT arrow or the Enter key



### 3-11 Calibration access code:



- ☞ With the DOWN arrow, scroll the reverse video area on the underneath lines
- ☞ Select the PASSCODE line
- ☞ Press on the RIGHT arrow or on the enter key .
- ☞ Enter your previous calibration passcode with the UP, DOWN, RIGHT, LEFT arrows.
- ☞ Enter the passcode with the Enter key
- ☞ Then enter your new passcode with the UP, DOWN, RIGHT, LEFT arrows.
- ☞ Enter the new passcode with the Enter key
- ☞ If you don't remember your passcode , please call the Sefelec's service department ( +33 (0) 1 64 11 83 48)
- ☞ Enter the setup either with the LEFT arrow or the Enter key

To perform a unit calibration, please refer to the Calibration manual.

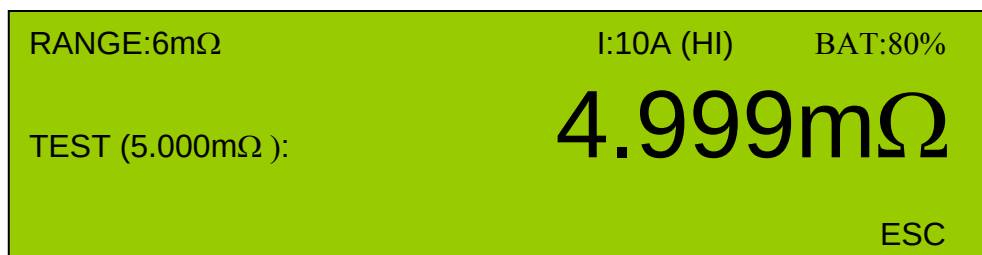
### 3-12 RCP2A AUTOTEST:

At anytime the RCP2A auto-test function allows checking the current generator and measurement correct operation.

From the initialization menu, press on the TEST function key:



Then the RCP2A performs a checking routine and display the measurement result of a built-in 5 mΩ resistor.



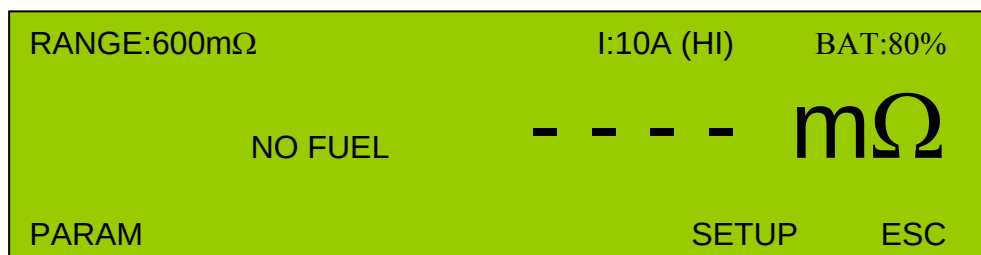
If the measurement result is within the tolerances (incertitude of RCP2A unit + built-in resistor equal about +/- 19 digits) then the green LED lights, if not the red LED lights. If red LED lights, we recommend to stop operating the unit and to send it back to our Service department for diagnostic.

## SECTION 4: OPERATING THE RCP2A IN MANUAL MODE

The RCP2A MANUAL operating mode allows performing single measurement as any ordinary measurement unit.

In addition the RCP2A SEQUENCE operating mode performs measurement sequence according to memorised protocol through PC download (see section 5)

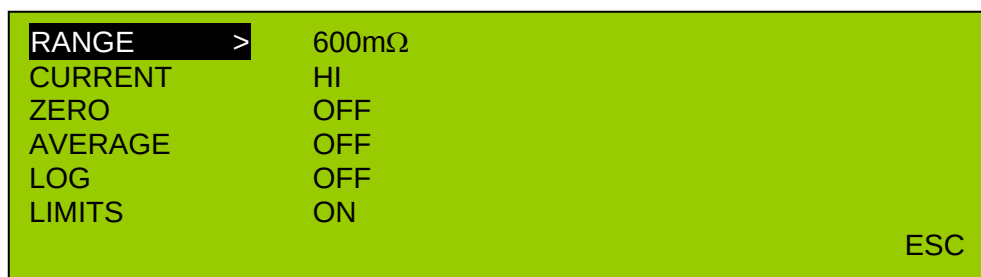
From the power ON screen, press on the MANUAL function key to reach the MANUAL menu.



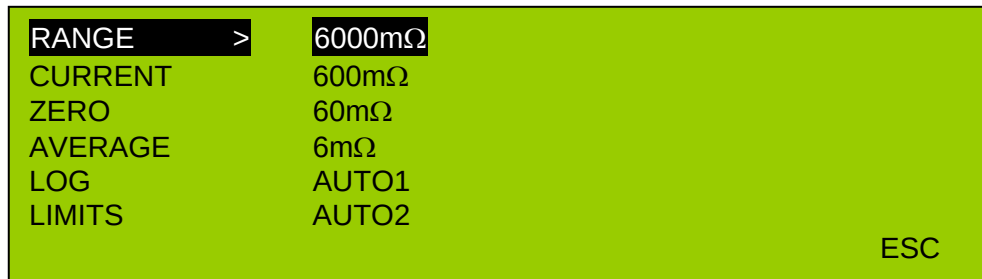
- ☞ The LCD screen upper line gives range and current parameters.
- ☞ After each power ON, those parameters will be reset to default values (60mΩ ,10A, ZERO mode ) or memorized (according to manufacture setup).
- ☞ The **NO FUEL** message is displayed (according to manufacture setup) for current values :1A and 10A

### 4-1 MANUEL mode parameters:

- ☞ To change the measurement ranges, press on the UP or DOWN arrows.
- ☞ To change the other parameters, press on the PARAM function key.



- ☞ With the UP and DOWN arrows, move the reverse video area to select the line to modify.
- ☞ With the RIGHT arrow or the enter key, enter in the menu level to set the parameters.

**4-1-1 Measurement range selection:**

- ☞ Select the RANGE line
- ☞ Press on the RIGHT arrow or on the enter key .
- ☞ Select the measurement range with the UP and DOWN arrows:
  - 6000mΩ : from 0001 to 6000 mΩ
  - 600mΩ : from 000.1 to 600.0 mΩ
  - 60mΩ : from 00.01 to 60.00 mΩ
  - 6mΩ : from 0.001 to 6.000 mΩ
  - AUTO1 : automatic searching range from the last measurement range.
  - AUTO2 : automatic searching range from the highest range (6000mΩ )
- ☞ Enter the selection with the Enter key.

**4-1-2 Measurement current selection:**

- ☞ Select the CURRENT line
- ☞ Press on the RIGHT arrow or on the enter key.
- ☞ Select the measurement current with the UP and DOWN arrows:
  - HI = 10A for the 6 to 600mΩ ranges and 1A for the 6000 mΩ range.
  - LO = 1A for the 6 to 600mΩ and 0.1A for the 6000 mΩ range.
- ☞ Enter the selection with the Enter key.

### 4-1-3 Thermocouple error:

Putting in contact 2 metals from different material generates unwanted voltages (EMF) proportional to the ambient temperature.

When measuring low resistances, consequently low voltages, the accessories and specimen under test conductive metals can introduce important errors.

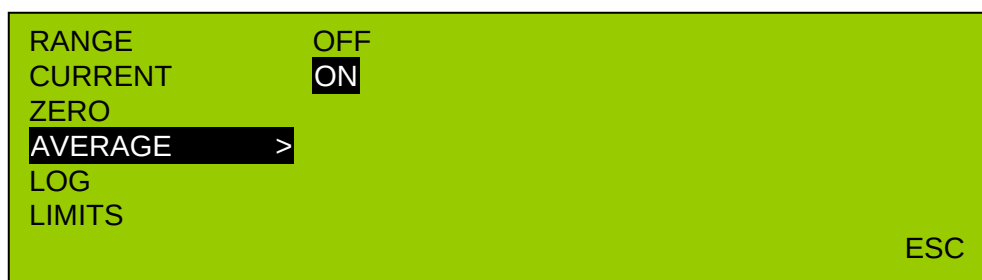
Two methods exist to cancel this problem: the Zero method and the Average method. Those 2 methods are available with the RCP2A.

*The ZERO method:*

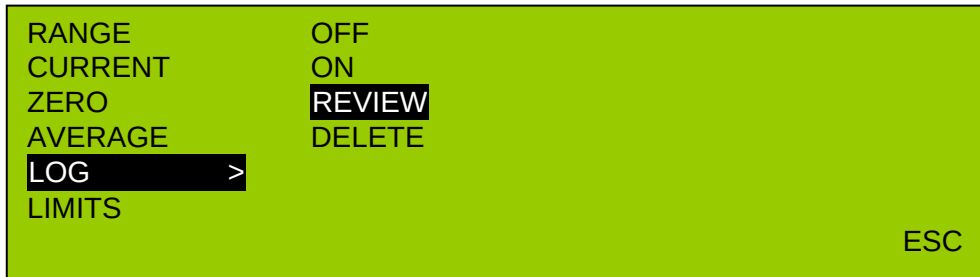


- ☞ Select the ZERO line
- ☞ Press on the RIGHT arrow or on the enter key.
- ☞ The Zero method consists in a voltage measurement without current, then a voltage measurement with current and subtraction of EMF voltages before resistance calculation. Select with the UP and DOWN arrows:
  - ON = Zero method operating
  - OFF = Zero method not operating
- ☞ Enter the selection with the Enter key.

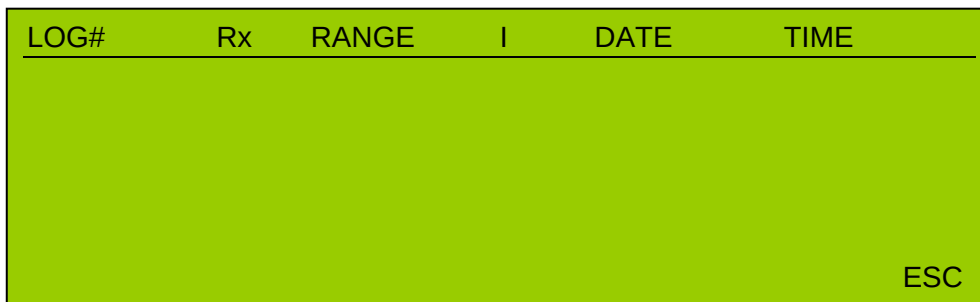
*The AVERAGE method:*



- ☞ Select the AVERAGE line
- ☞ Press on the RIGHT arrow or on the enter key.
- ☞ The Average method consists in a voltage measurement with a positive current, then a voltage measurement with negative current and average of the 2 measurements to get the resistance calculation. Select with the UP and DOWN arrows:
  - ON = Average method operating
  - OFF = Average method not operating
- ☞ Enter the selection with the Enter key.

4-1-4 Log mode:

- ☞ Select the LOG line
- ☞ Press on the RIGHT arrow or on the enter key.
- ☞ When the SEQUENCE mode is empty (no Sequence downloaded in the RCP2A), the MANUAL mode allows storing up to 995 measurements with the measurement number, the resistance value, the current, the range, the time and the date.
- ☞ Select the Log mode with the UP and DOWN arrows:
  - OFF = no log mode
  - ON = log mode operating if no sequence loaded
  - REVIEW = to review the already stored values
  - DELETE = to delete the memory
- ☞ Enter the selection with the Enter key.



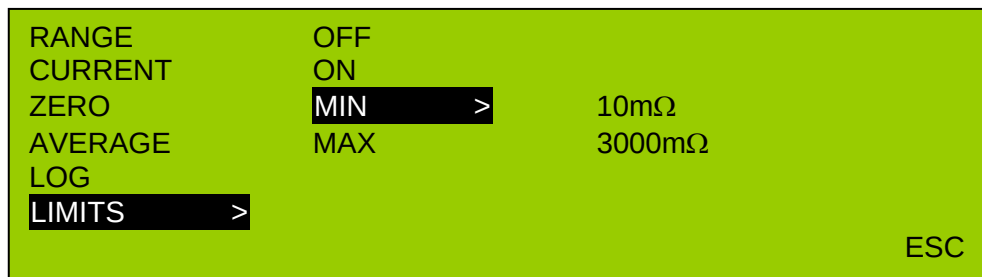
#### 4-1-5 The limit function:

On the RCP2A in MANUAL mode a maximum and a minimum resistance values can be adjusted.

Within those 2 values, the measurement is correct ( PASS), the green LED lights and the OK message is displayed on the LCD screen.

For values higher than the maximum limit or lower than the minimum limit the measurement is failed ( FAIL), the red LED lights, a beep signal sounds and the message “HI” or “LO” is displayed on the LCD screen.

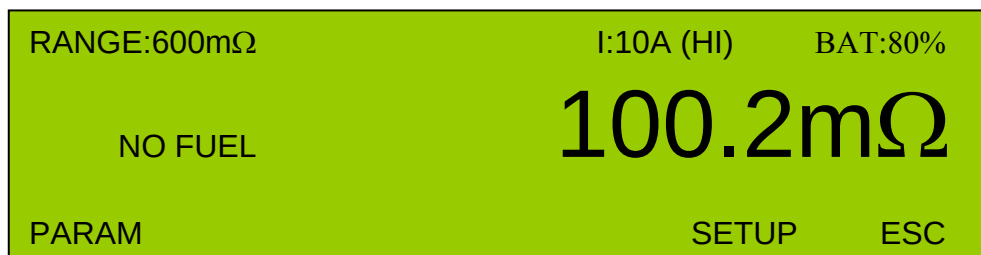
*Limits ajustement :*



- ☞ Select the LIMITS line
- ☞ Press on the RIGHT arrow or on the enter key.
- ☞ Select the Limits mode and values with the UP and DOWN arrows:
  - OFF= limit function not operating
  - ON= limit function operating
  - MIN = adjust the minimum value from 0.001 to 6000 mΩ with the RIGHT arrow and then with the UP or DOWN arrows.
  - MAX = adjust the minimum value from 0.001 to 6000 mΩ with the RIGHT arrow and then with the UP or DOWN arrows.
- ☞ Enter the selection with the Enter key.
- ☞ Press on the LEFT arrow to come back to the previous menu level

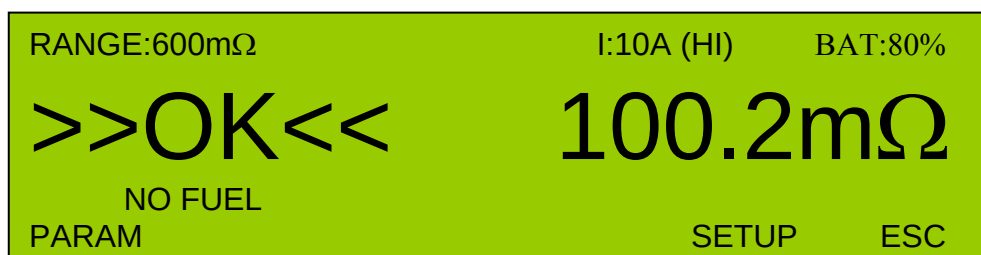
## 4-2 Measurements in MANUAL mode:

- ☞ Trigger a measurement with the green push button on the battery pack front panel or by making contact on the specimen under test with the probes ( see trigger modes in section 3-6)
- ☞ If measurement probes or leads are not correctly connected to the specimen under test, the following error messages can be displayed :
  - “CIRCUIT INCOMPLETE CHECK +VE CABLES”
  - “CIRCUIT INCOMPLETE CHECK -VE CABLES”
  - “+I RESISTANCE TOO HIGH”



## 4-3 Measurements in MANUAL mode with the limit function:

- ☞ Set the LIMITS mode (see chapter 4-1-5) and trigger a measurement with the green push button on the battery pack front panel or by making contact on the specimen under test with the probes.
- ☞ If the measurement result is :
  - Within the limits, the display shows : **OK**
  - Lower than the low limit, the display shows : **LO**
  - Higher than the high limit, the display shows : **HI**





#### 4-4 Measurement in MANUAL mode with the log mode:

**WARNING:** this feature is only available if there is no Sequence downloaded in the RCP2A (see chapter 5). To delete the loaded sequence, please refer to the RCP2PRO software manual.

- ☞ Set the Log mode (see section 4-1-4) and trigger a measurement with the green push button on the battery pack front panel or by making contact on the specimen under test with the probes.
- ☞ Each of the measurements will be stored together with the range, current, date and time.
- ☞ To review the measured values:
  - Press on the PARAM function key
  - Select the LOG line
  - Press on the Enter key
  - Select the REVIEW line
  - Press on the Enter key
  - The LCD screen shows the values as follows:

| LOG# | Rx    | RANGE | I  | DATE     | TIME   |
|------|-------|-------|----|----------|--------|
| 1    | 10.01 | 60    | HI | 19/07/04 | 13 :14 |
| 2    | 10.03 | 60    | HI | 19/07/04 | 13 :15 |
| 3    | 10.01 | 60    | HI | 19/07/04 | 13 :16 |
| 4    | 10.05 | 60    | HI | 19/07/04 | 13 :17 |
| 5    | 10.01 | 60    | HI | 19/07/04 | 13 :18 |
| ESC  |       |       |    |          |        |

- Scroll the values with the DOWN or UP arrows.
- Escape this menu with the ESC function key.

To delete the whole memorised measurements:

- Press on the PARAM function key
- Select the LOG line
- Press on the Enter key
- Select the DELETE line
- Press on the Enter key
- Confirm the delete by selecting the CONFIRM line
- Press on the Enter key.
- Select the CANCEL line to stop delete operation
- Press on the Enter key

## SECTION 5: SEQUENCE MODE

The measurement protocols are made with the RCP2A software. This software operates on a PC computer with Excel format files.

Files are downloaded in the RCP2A, then after complete or partial measurement performing, the files with the measurement data are uploaded from the RCP2A to the PC computer.

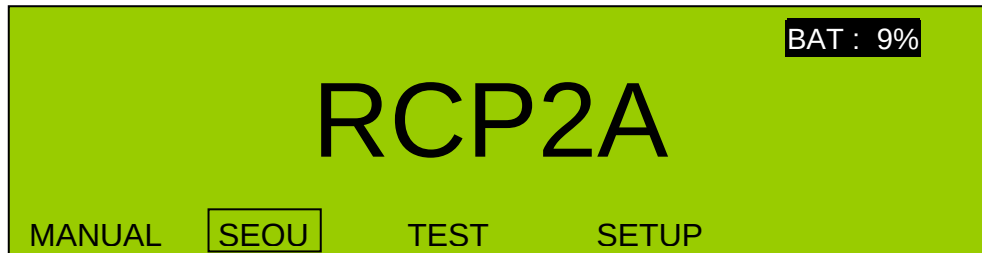
File example with measurement protocol description:

| MSM AVION       | AV<br>1234567    |            |             |                |             |          |       |                          |              |
|-----------------|------------------|------------|-------------|----------------|-------------|----------|-------|--------------------------|--------------|
| Ref Préparateur | A6/789           |            |             |                |             |          |       |                          |              |
|                 |                  |            |             |                |             |          |       |                          |              |
| Gammes          | Numéro de mesure | Seuil mOhm | Courant (A) | Valeur mesurée | Résultat    | Date     | Heure | Identification opérateur | Numéro série |
| ABCDE0123456789 | 1                | 500,0      | 10          | 423,5          | Bon         | 16.12.03 | 14:00 | A6/123                   | 201          |
|                 | 2                | 500,0      | 10          | 438,8          | Bon         | 16.12.03 | 14:01 | A6/123                   | 201          |
|                 | 3                | 500,0      | 10          | 454,1          | Bon         | 16.12.03 | 14:02 | A6/123                   | 201          |
|                 | 4                | 500,0      | 10          | 469,4          | Bon         | 16.12.03 | 14:05 | A6/123                   | 201          |
|                 | 5                | 500,0      | 10          | 484,7          | Bon         | 16.12.03 | 14:10 | A6/123                   | 201          |
|                 | 6                | 500,0      | 10          | 500,0          | Bon         | 16.12.03 | 14:11 | A6/123                   | 201          |
|                 | 7                | 500,0      | 10          | 515,3          | Mauvais     | 16.12.03 | 14:12 | A6/123                   | 201          |
|                 | 8                | 500,0      | 10          | 530,6          | Mauvais     | 16.12.03 | 14:13 | A6/123                   | 201          |
| BBCDE0123456789 | 1                | 30,00      | 1           | 41,23          | Mauvais     | 16.12.03 | 15:00 | A6/456                   | 201          |
|                 | 2                | 30,00      | 1           | 38,73          | Mauvais     | 16.12.03 | 15:02 | A6/456                   | 201          |
|                 | 3                | 30,00      | 1           | 36,23          | Mauvais     | 16.12.03 | 15:04 | A6/456                   | 201          |
|                 | 4                | 30,00      | 1           | 33,73          | Mauvais     | 16.12.03 | 15:06 | A6/456                   | 201          |
|                 | 5                | 30,00      | 1           | 31,23          | Mauvais     | 16.12.03 | 15:08 | A6/456                   | 201          |
|                 | 6                | 30,00      | 1           | 28,73          | Bon         | 16.12.03 | 15:10 | A6/456                   | 201          |
|                 | 7                | 100,0      | 10          | 120,5          | Mauvais     | 16.12.03 | 15:12 | A6/456                   | 201          |
|                 | 8                | 100,0      | 10          | 115,1          | Mauvais     | 16.12.03 | 15:14 | A6/456                   | 201          |
|                 | 9                | 100,0      | 10          | 109,7          | Mauvais     | 16.12.03 | 15:16 | A6/456                   | 201          |
|                 | 10               | 100,0      | 10          | 104,3          | Mauvais     | 16.12.03 | 15:18 | A6/456                   | 201          |
|                 | 11               | 100,0      | 10          | 98,9           | Bon         | 16.12.03 | 15:20 | A6/456                   | 201          |
|                 | 12               | 100,0      | 10          | 93,5           | Bon         | 16.12.03 | 15:22 | A6/456                   | 201          |
|                 | 13               | 100,0      | 10          | 88,1           | Bon         | 16.12.03 | 15:24 | A6/456                   | 201          |
|                 | 14               | 100,0      | 10          | 82,7           | Bon         | 16.12.03 | 15:26 | A6/456                   | 201          |
|                 | 15               | 100,0      | 10          | 9999           | Absent      | 16.12.03 | 15:28 | A6/456                   | 201          |
|                 | 16               | 100,0      | 10          | 8888           | Dépassement | 16.12.03 | 15:30 | A6/456                   | 201          |
| CBCDE0123456789 | 1                | 500,0      | 10          | 7777           | Non fait    |          |       |                          |              |
|                 | 2                | 500,0      | 10          | 7777           | Non fait    |          |       |                          |              |
|                 | 3                | 500,0      | 10          | 7777           | Non fait    |          |       |                          |              |
|                 | 4                | 500,0      | 10          | 7777           | Non fait    |          |       |                          |              |
|                 | 5                | 500,0      | 10          | 7777           | Non fait    |          |       |                          |              |

For more information, please refer to the RCP2PRO software manual

If no Sequence file has been downloaded the following error message is displayed  
« NO SEQUENCE FILE LOADED ».

- ☞ After sequence file download, and from the initialisation menu, press on the SEQU function key



### 5-1 Measurement protocol selection:

A sequence is made with several measurement protocols( or series) . Each measurement protocol describes a series of measurements to be performed with the physical location or part number and test parameters (current, resistance threshold) for every test points.



- ☞ Select the measurement protocol by setting in reverse video the line with UP or DOWN arrows.
- ☞ Enter the selection with the Enter key.

## 5-2 Measurement protocol header display:

```

ABCDE123456789                                BAT:90%
DATE :                04 -12- 03
TIME :                15:35
OPERATOR :            A
AIRCRAFT:             AV1234567
                                                                ESC
  
```

- ☞ Enter the operator code with the UP or DOWN arrows to scroll the numbers and the letters and with the RIGHT or LEFT arrows to select the characters position.
- ☞ Enter with the Enter key
- ☞ Check the aircraft number, and make correction if necessary with the A/C function key.
- ☞ If the number is not the good, reload the correct file since the PC
- ☞ Press on the NEXT function key to start the measurement protocol.

```

ABCDE123456789                                BAT:90%
DATE :                04 -12- 03
TIME :                15:36
OPERATOR :            AB100
AIRCRAFT:             AV1234567
OPER   A/C           NEXT                      ESC
  
```

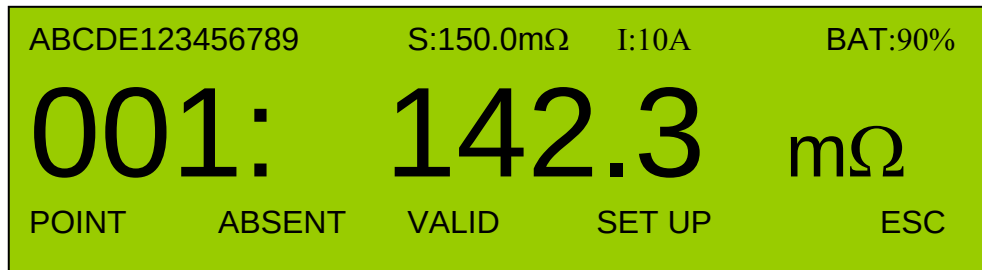
## 5-3 First measurement of the protocol:

```

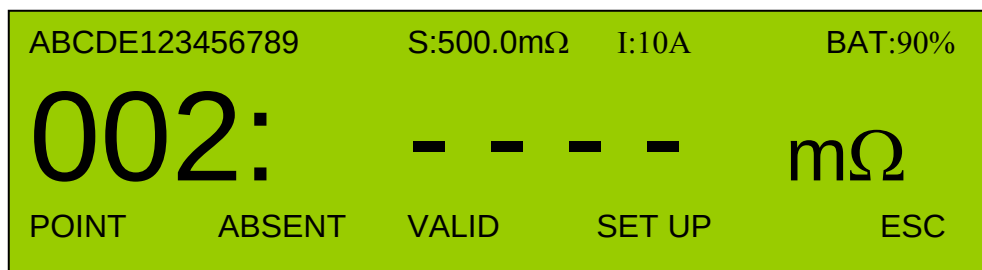
ABCDE123456789      S:150.0mΩ   I:10A      BAT:90%
001:                - - - -      mΩ
POINT   ABSENT   VALID   SET UP      ESC
  
```

- ☞ Trigger a measurement with the green push button on the battery pack front panel or by making contact on the specimen under test with the probes.
- ☞ **IMPORTANT:** in AUTO trigger mode, it is mandatory to have first an open circuit, then to make a contact with the probe on the specimen under test to trigger a measurement.

### 5-3-1 Example for a PASS measurement:



If the measurement is lower than the limit, the green LED lights, the value is memorised in the memory and the unit jumps automatically to the next protocol step.

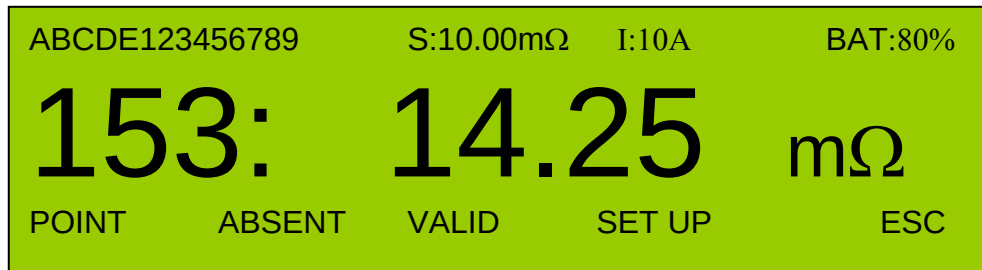


- ☞ The next measurement is the next protocol step which is either :
  - To Be Done = - - - - (= 7777 excel file)
  - Over = OVER (= 8888 excel file)
  - Absent = ABS (= 9999 excel file)
  - Fail = previous fail measurement
- ☞ The PASS measurements are skipped.

### 5-3-2 Direct access to a test step:

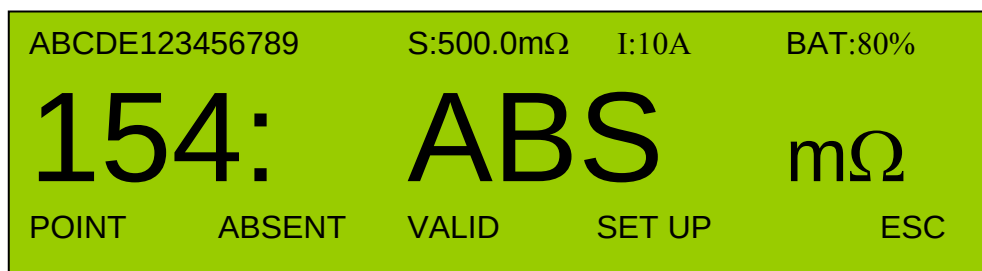
- ☞ Press on the POINT function key to set in flashing mode the point number enter area.
- ☞ Enter the point number with the UP or DOWN arrows to scroll the numbers and with the RIGHT or LEFT arrows to select the position.
- ☞ Enter the value with the Enter key.
- ☞ For a direct access to the first sequence point or to the last sequence point, use the RIGHT or LEFT arrows.
- ☞ **The direct access feature allows the operator to reach all the sequence points whatever their status (PASS,FAIL,TO BE DONE, ABSENT)**

### 5-3-3 Example for a FAIL measurement:



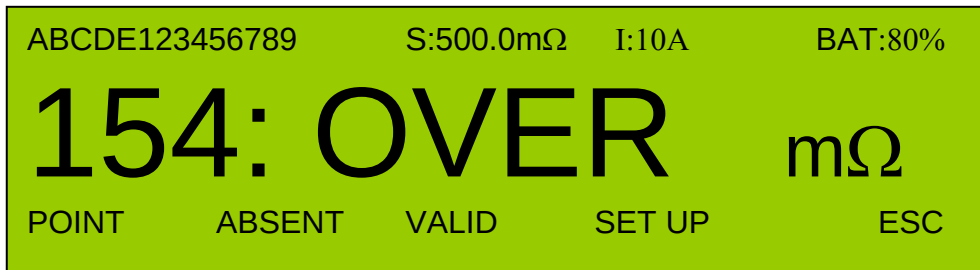
- ☞ Trigger a new measurement.
- ☞ If the value is higher than the limit, an audible signal (2 beeps) sounds, the red LED lights, and the RCP2A unit stays on the same test step.
- ☞ To re-test, trigger a new measurement either with the probe contact or the green front panel push button.
- ☞ To store a FAIL measurement, press on the VALID function key.
- ☞ Confirm the validation by pressing on the YES function key.
- ☞ Then the RCP2A unit jumps to the next test step.
- ☞ To cancel the FAIL confirmation, press on the NO function key and trigger a new measurement.

### 5-3-4 Example for an ABSENT point:



- ☞ If a point to be measured is absent or non available for the measurement, then press on the ABSENT function key.
- ☞ Confirm the ABSENT status by pressing on the YES function key.
- ☞ Then the unit jumps to the next test step.
- ☞ To cancel the ABSENT confirmation, press on the NO function key and trigger a new measurement.

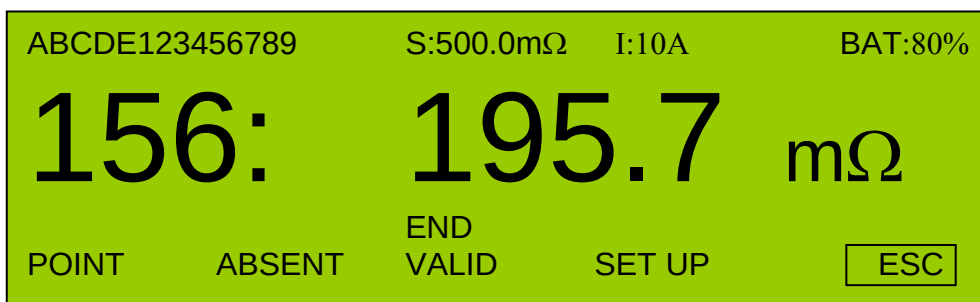
### 5-3-4 Example for an OVER measurement:



- ☞ If the measurement is out of the unit ranges, an audible signal sounds, the red LED lights with above display.
- ☞ To re-test, trigger a new measurement either with the probe contact or the green front panel push button.
- ☞ To store the OVER status, press on the VALID function key.
- ☞ Confirm by pressing on the YES function key.
- ☞ Then the unit jumps to the next test step.
- ☞ To cancel the OVER confirmation, press on the NO function key and trigger a new measurement.

### 5-4 Sequence end:

After the last sequence measurement, the END message is displayed.  
Press on the END function key to select the next measurement protocol.



## **SECTION 6 MAINTENANCE and CALIBRATION :**

### **6.1 PRELIMINARY**

Our warranty (refer to the beginning of this manual) attests the quality of materials and workmanship in our products. If malfunction should be suspected or other information be desired call our technical assistance: (33) 1.64.11.83.40 for FRANCE or contact your local distributor.

### **6.2 INSTRUMENT RETURN**

Before returning an instrument to our Service Department, please call them at the above phone number for shipment instructions. Use packaging that is adequate to protect it from damage.

### **6.3 MAINTENANCE**

Our units don't need particular maintenance except an annual calibration. If problems, please follow the brief check list here after. If the problem continues, call our service department at the above number.

- **LCD SCREEN DOESN'T COME UP:**

- Check that the battery block is correctly fitting into the RCP2A unit.
- Recharge the battery block for at least 3 hours.

The other possibilities for a bad functioning need an intervention inside the unit by qualified people. However we can supply a service manual including schematics of our units. Please get in contact with our Service department in order to know price and delivery time.

### **6.4 CLEANING**

Only clean the instrument with a mild rag or slightly soaked with water.

### **6.5 CALIBRATION**

We recommend calibrating our units each year. The calibration must be performed by qualified people having the complete procedure as well as correctly checked standards. Our Maintenance department is at your service to perform the annual calibration. Nevertheless, if you wish to perform yourself the calibration, we can provide a calibration kit including a manual and a calibration box.

Please get in contact with our Maintenance department in order to know the price and the delivery time.



## *6.6 Characteristics of the B1 pile*

This B1 pile is a pile of safeguard of some data, date and hour:

Pile with lithium

Nominal capacity 2250 mAH

Lifespan minimum for the application: 20 years

Discharge from the pile: 1% per year

Ref equivalent:

Sonnenschein SL-360/PT

Saft LST 14500 3PF





Eaton is dedicated to ensuring that reliable, efficient and safe power is available when it's needed most. With unparalleled knowledge of electrical power management across industries, experts at Eaton deliver customized, integrated solutions to solve our customers most critical challenges.

Our focus is on delivering the right solution for application. But, decision makers demand more than just innovative products. They turn to Eaton for an unwavering commitment to personal support that makes customer success a top priority.

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