PROGRAMMABLE NUMERIC

INDICATOR

95200

CONFIGURATION HANDBOOK

LOREME 12, rue des Potiers d'Etain
Actipole BORNY - B.P. 35014 - 57071 METZ CEDEX 3
Telephone 03.87.76.32.51 - Fax 03.87.76.32.52
Contact: Commercial@Loreme.fr - Technique@Loreme.fr

Date: 13/09/04

Rev 0.7c

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DIALOGUE - TERMINAL MODE

Numeric devices can converse with all terminal emulation mode systems. As the dialogue and configuration part are in device's memory, no software or specific interface are necessary for their configuration.
Two terminal emulation mode systems are presented: the PSION and the PC. Differents procedures are enumerated below.

1) PSION serie 2:

First of all manipulation, plug in "COMMS LINK" on the PSION. To start up the PSION, push on the **"ON"** key.
The PSION displays this menu: **RECH SAUV AGENDA**
CALC PROG EFFACE

Push on the **"C"** key until the menu **"COMMS"**, and validate with **"EXE"**.
The PSION displays this menu: **TRANSMIT RECEIVE**
SETUP TERM AUTO

Push on the **"T"** key until the menu **"TERM"**, and validate with **"EXE"** to obtain a empty screen. The PSION is now in terminal mode and you can link the PSION to the device, by plugging in the RS 232. The measure is displayed, to configurate, push on the **"C"** key.

2) PSION Workabout:

To start up the PSION push on the **"ON"** key.
At the presentation, push on the **"MENU"** key. Select **"SYSTEME SCREEN"** mode and validate by **"ENTER"**.

Icons display: **DATA CALC SHEET PROGRAM COMMS**

Select icon **"COMMS"** and validate by **"ENTER"**, on display, a cursor flashing. The **PSION** is in terminal mode. Plug in "RS232" on PC. The measure is displayed and, to configure, push **"C"** on keyboard.

To quit terminal mode and switch off PSION, push on **"OFF"** key. When you re-start the **PSION** in terminal mode, it start automaticaly and directely in terminal mode without re-start configuration.

3) PC with DOS:

The terminal emulation mode software with DOS **"IBM®-PC KERMIT-MS V2.26"** is available at simple request. After the PC has booted, type **"a: K"** then press **"ENTER"**. The PC is in terminal mode and uses COM port 1.
If you want to use the second serial communication port (COM2), type:

"A:KERMIT" and **"ENTER"** to launch the program,
"SET PORT 2" and **"ENTER"** to select **COM2**,
"SET BAUD 9600" and **"ENTER"** to select speed,
"CONNECT" and **"ENTER"**, to enter in the terminal mode.

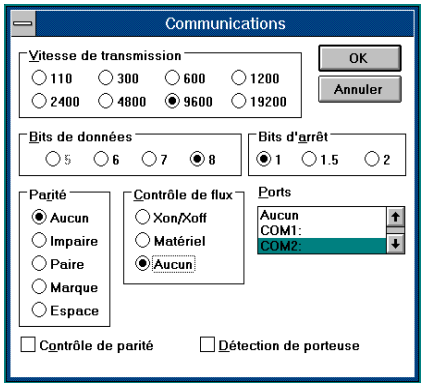
The PC is now emulating a terminal and may be connected to the device by plugging in the RS 232 link cable.
Measure is now displayed and configuration's acces allowed by a press on **"C"** key.

To quit kermit, press **"CTRL-$"** then press the key **"C"**.
When the message KERMIT-MS appears, type **"QUIT"** to return to MS-DOS commands.

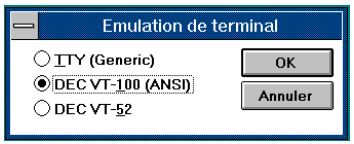
4) PC with WINDOWS 3.11:

Start **WINDOWS** and in "**ACCESSOIRES**" group, double-click on  icon wich get access to terminal mode.

In "**PARAMETRES**" menubar, click on "**COMMUNICATION**" sub-menu. We access to the following windows. Configure communication parameters, 9600 bauds, no parity, 8 data bits, 1 stop bit, no flow control and validate.



Begin terminal emulation by click on "**PARAMETRES**", then on "**EMULATION TERMINAL**". the following board is displayed.



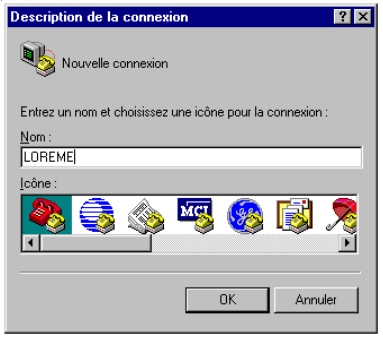
Choose terminal mode **DEC-VT-100(ANSI)** and validate. The PC is in terminal mode, connect it to device by plugging the RS232 link cable. Measure is now displayed and to access at configuration, press on **"C"** key.

5) PC with WINDOWS 95/98:

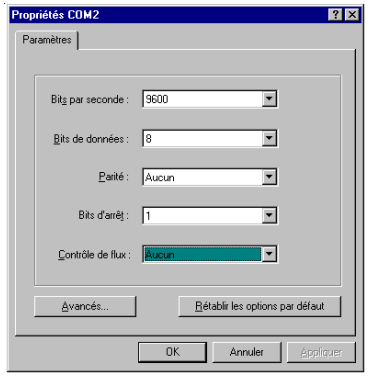
To start up terminal program:
1 - Clique on button **"START"**,
2 - Tick off **"PROGRAMS"**, **"ACCESSOIRES"**, and **"HYPER TERMINAL"**,
3 - Click twice on  .

Hypertrm.exe

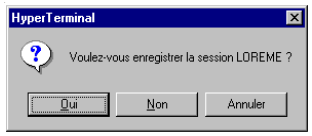
The following window is displayed. Enter a name for a new connection and validate, the hereunder window will appear



Choose a communication port and validate. The belowing windows is displayed



Configure communication parameters, 9600 bauds, no parity, 8 data bits, 1 stop bit, no flow control and validate. The PC is in terminal mode, connect to device by plugging in the RS232 link cable. Measure is now displayed and to access at the configuration, press on **"C"** key .



When quitting HyperTerminal will be diplayed the following window. To dialog with all LOREME devices without re-start all the method, click on **"OK"**

To load LOREME session directly:
1 - Click on button **"Start"**.
2 - Tick off **"Programs"**, **"Accessories"**, and **"HyperTerminal"**.
3 - Click twice on the icon 

LOREME.ht

6) Visualization:
When it starts up, the device is in measure mode.

6.1) Indicator mode:
Only an information is send at the terminal:

285.5 DC	Measure value

6.2) Calculator mode:
Several informations can be saw on terminal:

CHANNEL 1	Channel n° 1 displayed, key access **"1"**
255.2 M3/h	Measure value
CHANNEL 2	Channel n° 2 displayed, key access **"2"**
52.1 DC	Measure value
RESULT	Channel n° 3 displayed, key access **"3"**
180.5 M3/h	Result value

To change the visualization of one information to another, use **"1"**, **"2"**, **"3"** or **"$"** keys for a complete visualization (only on PC). To return in 2 lines display, use the **"ENTER"** key.

DEVICE PRESENTATION

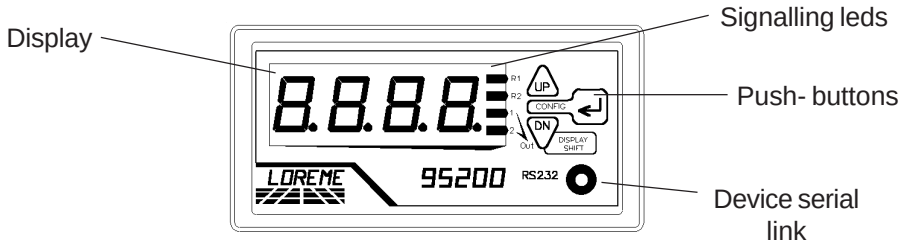
The purpose of this configuration handbook is to allow to become familiar with the functions supplied by the device.

The device is equipped of an universal input wich can measure more of 10 input types. It can have 1 or 2 slots. Each slot can receive either an analog output or a relay (slots number and type to define at the order).
The device has two differents ways to run, configurable by the user in function of this requirements.

The twos differents modes are:
- indicator mode,
- calculator mode.

This two modes are gived again in details in configuration rubrics differents.

USING INTERFACE



The device front panel is composed by:
- one 4 digits display (10000 pts) for the measure visualization,
- 4 leds:
  - ■ R1, alarm 1,
  - ■ R2, alarm 2,
  - ■ 1, channel 1 calculator
  - ■ 2, channel 2 calculator

  } calculator result
- 1 jack 3.5 for the RS 232 link,
- 3 push-buttons:
  - CONFIG ↵ access to the alarms thresholds configuration,
  - UP threshold incrementation in thresholds configuration mode.
  - DN threshold decrementation in thresholds configuration mode, display changing in measure mode, in calculator function (channel 1,channel 2, result).

CONFIGURATION

This manual recapitulates a detailed account of several configuration possibilities: language, input, display range, special functions, analog slot, relay slot.
To access configuration mode, type on **"C"** key.

1) Method:
At configuration, several question types are asked. For each of them, several answers are possibles. Description of each of them:

1.1) Menu selection:

Example: INPUT
Y - N

The choice is done by typing on **"Y"** or **"N"** keys.
This choice allows access to different configuration menus.

1.2) Parameter selection:

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

Previous choice = YES:
- push on **"Y"** => Validation of choice = YES,
- push on **"↵"** => Validation of choice = YES,
- push on **"N"** => Change of choice = NO.

Previous choice = NO:
- push on **"N"** => Validation of choice = NO,
- push on **"↵"** => Validation of choice = NO,
- push on **"Y"** => Change of choice = YES.

Choices are made pushing on **"Y"** or **"N"** keys, and validation by pushing on **"↵"** (PC) / **"EXE"** (PSION) when the answer **"Y"** or **"N"** is displayed. Pushing on the key **"↵"** / **"EXE"** without modification allows validate previous answer.

1.3) Value acquisition:

Example: LOW SCALE
4 mA

Two possibilities:
- The validation without modification by pushing on **"↵"** / **"EXE"**,
- The keyboard value modification (simultaneous display), then the validation by **"↵"** / **"EXE"**.

Note concerning the value acquisition:
- It is possible, when a mistake is made during a value acquisition, before validating it, to go back pressing "DEL" key (only on PSION), which re-displays the message without taking notice of the wrong value.
- In configuration mode, if there is no action, the device goes back in operating mode after a two minutes delay without taking notice of the modifications made before.
- In configuration mode, if you want to shift to measure mode without taking notice of the modifications made before, you just have to press "ESC" (PC) or "SHIFT + DEL" (PSION) key.

2) Working modes:

This device provide, in standard, two differents ways to run:

- indicator mode: one input (mV, V, mA, W, Hz, Pt100 or Tc), measure range, special functions (square root, special linearization).

- calculator mode: two input not isolated (forced in mV), one measure range for each input, calculations functions (two coefficients by input, one operation on inputs, one range for output).

To change runing mode:
- being in measure mode,
- type **"MODE",** function access code (after each code, wait a **"BIP"**),
- select the desired mode (indicator or calculator),
- the **"OK !"** message is displayed, the runing mode is validate.

3) Language:

The possibilities of language are:
- french,
- english.

4) Input:

4.1) Indicator mode:

The input possibilities are:
- Voltage (mV, V),
- Current (mA),
- Resistance (Ω),
- Pt 100 (°C),
- Thermocouple (°C).

for each input type, configure:
- low scale,
- high scale.

Particularity:
- Differential voltage (mV):
To realize a gauge bridge measure, select the differential mV voltage input. Characteristics as the sensitivity and the power supply (2.5 V) of the gauge bridge are necessary to adjust the measure scale:
Example: sensitivity 2 mV/V,
power supply 2.5 V.

The measure scale for the full range of the signal is:
- low scale: -5 mV,
- high scale: 5 mV.

View wiring diagram for gauge bridge wiring.

- Sensor power supply:
To supply a converter in 2 wires technical and measure the current in the loop, it's necessary to configure the device in 4-20 mA current input and select "SENSOR POWER".
View wiring diagram for sensor power supply and current input wiring.

- Resistance, Pt 100:
It's possible to choose between two measure modes, 3 or 4 wires.
3 or 4 wires selecte is realized by configuration. The 2 wires mode is realized by a bridge with the third wire on the terminal block.

- Thermocouple:
Choice of thermocouple type (B, E, J, K, R, S, T),
Choice of compensation type (internal or external).
Choose the **internal compensation** when the thermocouple is connected on device with a compensation cable.
Choose the **external compensation** when a compensation box where the temperature will be know and fixed is used. Enter this temperature as the external compensation value.
Choose the **carried off compensation** when the compensation measure is realized by the device at the meeting point of the couple with the copper cable by a sensor of carried off temperature (on request in order) .

- Potentiometer:
Configure voltage input (V):
- low scale: 0 V,
- high of scale: 2.5 V.

Move the potentiometer at the start and at the end of range and measure the values.

Change the voltage input (V):
- low scale: value of start plage,
- high scale: value of end plage.

View wiring diagram for potentiometer wiring.

4.2) <u>Calculator mode:</u>
Both of input channels are forced in voltage (mV).
For each channels, configure:
- low scale,
- high scale.

5) <u>Display range:</u>
The range converts the input signal to a physical quantity. This one facilitates the measures' interpreting.
Ex: Input 4-20 mA / Range 0 - 1000 kg
➔ Input = 12 mA, Range = 500 kg

For display range, configure:
- unit,
- low scale,
- high scale,
- decimals number.
- display filter,
- measure limitation.

The unit of the range-display is facultative. It allows only to interpret the real value. It's limited to 4 characters.

The number of decimals is the digit number displayed after the decimal point. This number is limited by the input type, the scale of the display range and the device resolution.

The display filter allows to reduce the display instability when the measured value is disturbing. When device comes out of factory, the filter value is 5.

The measure limitation allows to indicate an overstepping high or low of the display range superior to 1 %. A high overstepping is indicated by **"Hi"** display message and a low overstepping by **"Lo"** display message.

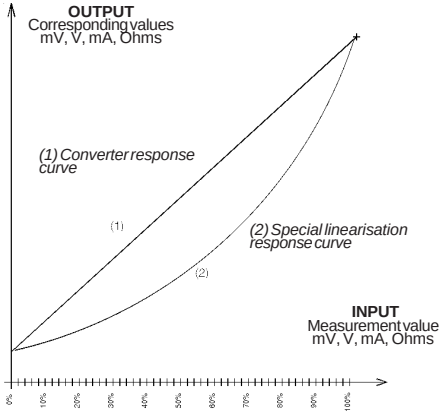
6) <u>Special functions:</u>
6.1) <u>Indicator mode:</u>

Square root: this function executes a square root on the measure percentage of the input range and is reported on the display range and analog output.

Special linearization: when this function is choosed, it is directly validated, but the linearization configuration isn't modified. To modify the special linearization, it

is necessary to validate by YES the configuration suggest.
When the special linearization is enabled, the indicator will use the curve that you program (2).

To have a special linearization curve (2), it's necessary to put for each curve point the physical input value and the corresponding linearized value (max.: 14 points including 0 % and 100 % of the input). So, for each measure in the input range (***device can't use the linearization function out of range***), the device will make the corresponding of linearized value.



6.2) <u>Calculator mode:</u>
For each measure channel, it is possible to define 2 calculation values A and B (span and offset) to realize the Ax+ B operation.
The span is a coefficient without unit. The shifting is exprimed in the input or the display range unit of the configured channel.
The operation between two channels defining the calcul result can be:
- an addition,
- a substraction,
- a multiplication,
- a divison.

Now, configure final result range. It corresponds at the output scale (for an analog slot). See display range chapter.

7) <u>Analog slot:</u>
Analog slots configuration is presented through 2 rubrics:

- Output type:
  - current output (mA),
  - voltage output (V).

with for each output type, the choice of:
- low scale,
- high scale.

- Output parameters:
  - security value,
  - response time,
  - limitation.

The security value allows to set the output on a known state when there is a sensor breaking or a measure range overflow.
The acquisition value is sended to the output.

The response time is adjustable from 100 ms to 60 s. It allows to filter the output signal when the measure is disturbed.

The limitation allows, for all input signal values, to peak clip the output signal swing at scale configuration.
Only the **security value** goes beyond this function.

8) <u>Relay slot:</u>
The configuration of a relay slot is presented through 2 rubrics:

- Detection type:
  - breaking detection,
  - threshold detection.

The breaking detection activates the alarm on sensor breaking or on measure range overflow.

The threshold detection activates the alarm on threshold overstepping. It is necessary to choose the threshold type (high or low), threshold and hysteresis values.

The two **detections types** can be chosen simultaneous.

The **threshold detection** runs in this way:
- **high threshold** detection:
  .the alarm is activated when the measure goes above the threshold,
  . the alarm is removed when the measure goes below the threshold less the hysteresis.
- **low threshold** detection:
  .the alarm is activated when the measure goes below the threshold,
  . the alarm is removed when the measure goes above the threshold more the hysteresis.

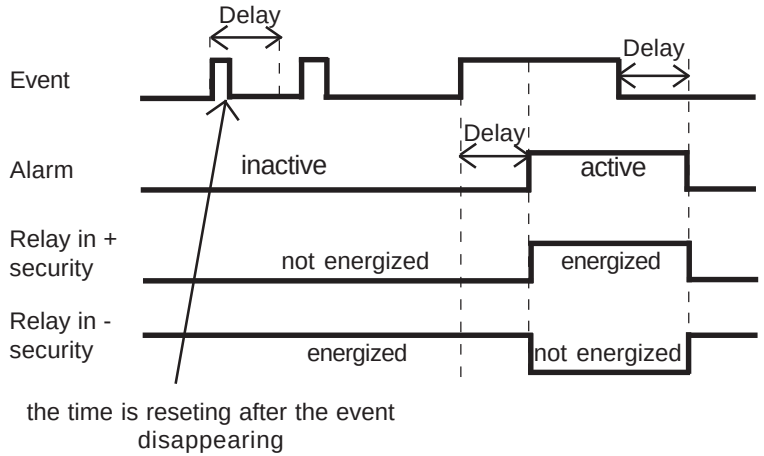
- Relay parameter:
  - security,
  - delay,
  - control.

The security works in this way:
- in positive security, the relay is energized when the alarm is active,
- in negative security, the relay is energized when the alarm is inactive.

The delay value (in seconds), determines the time above which the alarm changes his statement after detection of the event. The delay is active at the appearance and disappearance of the event.

When the alarm is using in threshold detection, it's possible to access at the **threshold control** of the alarm by **press buttons**.
This possibility can be desactivate on configuration.

Alarms and relays runing:



the time is reseting after the event disappearing

OFFSET

Sometimes, it may be interesting to modify measure by a keyboard intervention. It can be used in many situations as a sensor's degradation or to calibrate the input with magnifying effect to obtain a better accuracy in the measure window.

To shift the measure, it is necessary:
- be in measure mode,
- type on **"+"** or **"-"** to access at the function,
- the display on terminal is:
  105.2 DC measure value with offset taked in consideration,
  OFFSET 10 offset function, offset value.
- use keys **"+"** and **"-"** to regulate the offset, the measure is directly modify.
- type on **"ENTER"** to save the offset.

When the device is not supplyed or in configuration, the offset is active.
To reset the offset, it is necessary to start the **"OFFSET"** function, to put this value to zero by keys **"+"** and **"-"**, then validate by **"ENTER"**.
In offset control mode when there is no action on keys **"+"**, **"-"** or **"ENTER"** during 15 s, the device exits of this mode without take it into consideration.

EMC CONSIDERATION

1) Introduction

In order to insure its policy concerning EMC, based on the European directive 89/336/CE, LOREME takes into account all the standards relative to this directive as soon as the design of each device starts.
All the tests made on our devices, designed to work in industrial plants, have been made regarding the EN 50081-2 and EN 50082-2 standards in order to edit a conformity certificate.
It is difficult to guarantee all the results concerning EMC because tests are made in a standard and typical configuration. Results may vary when a change of configuration occurs.
In order to be sure to use all the capabilities of the device, it will be necessary to respect a few rules concerning its installation.

2) Installation and utilization rules

2.1) General remarks

- Installation should be made with respect to the informations given in technical documents (installation, spacing between each device ...).
- Utilization conditions should be in accordance with specifications of the transmitter (temperature range, protection level) specified in technical datasheet. Dust, excessive humidity, corrosives atmospheres or important heat sources should be prohibited in order to insure an optimum utilization.
- Noisy environment or elements creating perturbations should be avoided.
If it is possible, it will be better to install instrumentation devices separately from hi-power or commutation devices.
Do not install measurement devices close to hi-power relays, thyristor groups, contactors or all electromagnetic noise generators.
Do not use a portable transmitter (walkie-talkie) at less than 50 cm of the device. A 5 W transmitter may generate a field which intensity may be more than 10 V/m at a distance near of 50 cm.

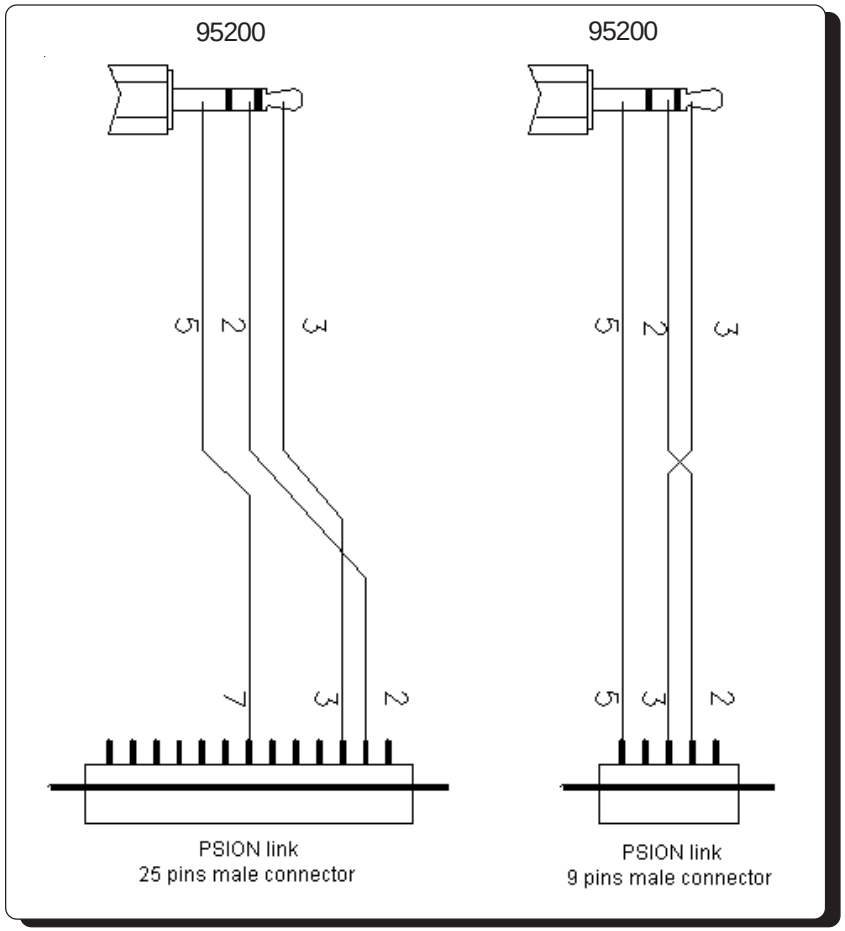
2.2) Power supply

- At first, it's important to install the equipment with respect to the technical specifications given in the device's datasheet (supply voltage, frequency, tolerance of values, stability, variations ...).
- The power supply of the device should be issued from a supply system using section switches and fuses made for instrumentation devices, and the supply line should be as direct as possible from section switch.
Don't use this power supply for relays, contactors or valves command.
- An isolating transformer, with its screen shorted to ground may be necessary if the supply circuit is made noisy with commutation of thyristors, relays, motors, speed variators ...
- It's important that the installation hast to be connected to ground.
The voltage between neutral and earth must be less than 1 V and the resistance must be less than 6 Ohms.
- If the equipment has been installed near hi-frequency generators or arc welding installations, it may be useful to install adequat filters on the mains supply.

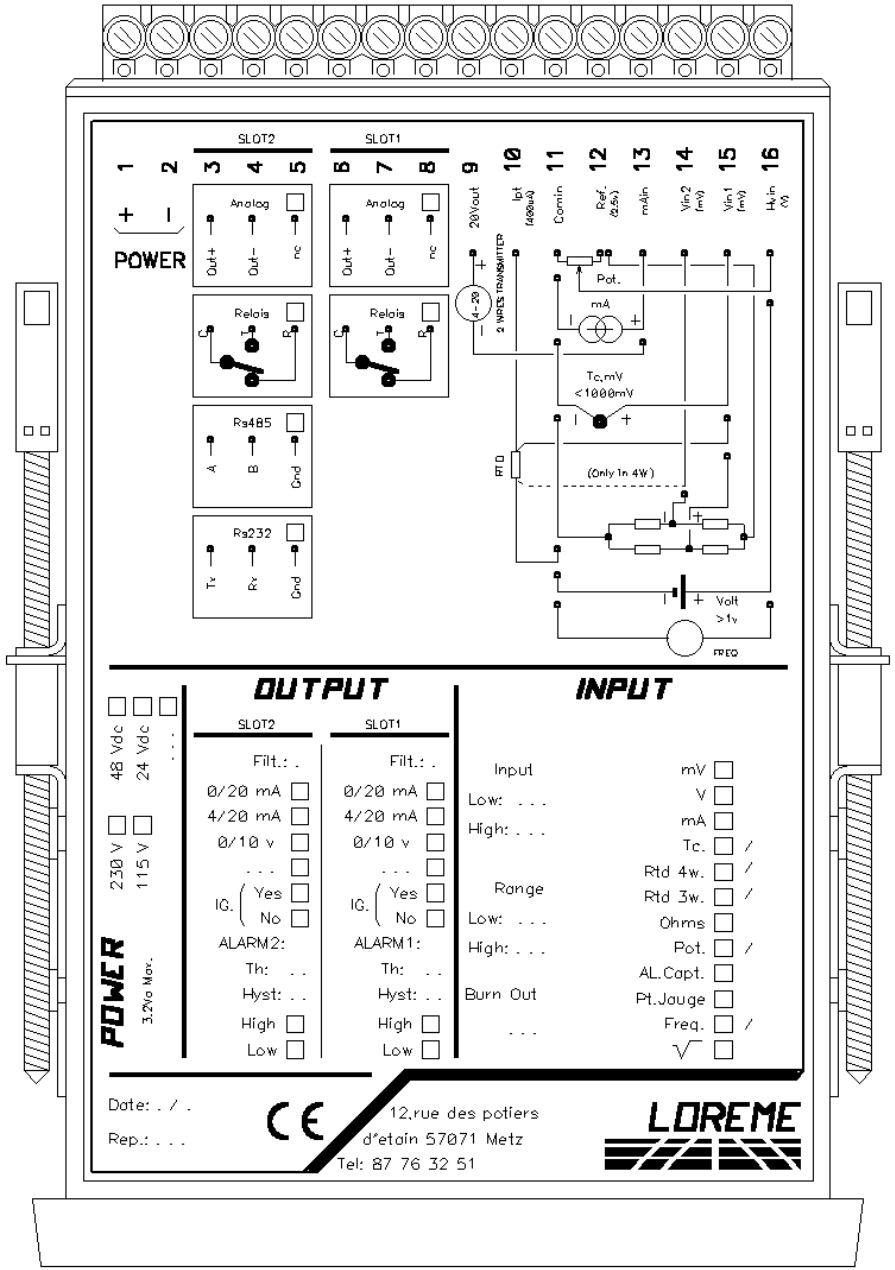
2.3) Inputs / Outputs

- In a noisy environment, it will be better to use shielded and twisted wires. The ground connection will be made at a single end of the wire.
- I/O lines should be well separated from supply wires in order to avoid coupling between these wires.
- Data wires length should be as short as possible.

TERMINAL - DEVICE LINK



INPUTS / OUTPUTS WIRING



mV, Tc input	terminal 15 (+), terminal 11 (-)
V input	terminal 16 (+), terminal 11 (-)
Hz input	terminal 16 (~), terminal 11 (~)
mA input	terminal 13 (+), terminal 11 (-)
Sensor power supply	terminal 9 (+), terminal 13 (-),
Resistance, Pt 100 (2 wires) input	terminal 10 and 15 (+), terminal 11 (-)
Resistance, Pt 100 (3 wires) input	terminal 10 (+), terminal 15 (line), terminal 11 (-)
Resistance, Pt 100 (4 wires) input	terminal 15 (+), terminal 14 (-) terminal 10 (power supply +) terminal 11 (power supply -)
Potentiometre input	terminal 12 (reference) terminal 16 (+), terminal 11 (-)
Gauge bridge input	terminal 12 (power supply +) terminal 11 (power supply -) terminal 15 (measure +) terminal 14 (measure -)
Analog 1 slot	terminal 6 (out+), terminal 7 (out-)
Analog 2 slot	terminal 3 (out+), terminal 4 (out-)
Relay 1 slot	terminal 6 (C), terminal 7 (T), terminal 8 (R)
Relay 2 slot	terminal 3 (C), terminal 4 (T), terminal 5 (R)
Power supply	terminal 1 (~), terminal 2 (~)