Ethernet / RS485 Gateway

CONFIGURATION HANDBOOK

ICL70

REV0.1.2 - 07/07/17

Table of contents

Device Presentation

RJ45 Ethernet

24 V DC power supply terminals

Ethernet 10/100

Power Supply 24Vdc

OLED display
2 lines of 8
characters

ICL70   F031 774 001

P1: 5.8
T1: 28.5

Push buttons

RS485 end-of-line resistors
(125 Ohms) switch.

Heating relay output,
between C / R contacts

2 RS485 links (A1/B1, A2/B2)
+
Switched 24 V DC outputs (V1, V2),
for the sensors (server module)

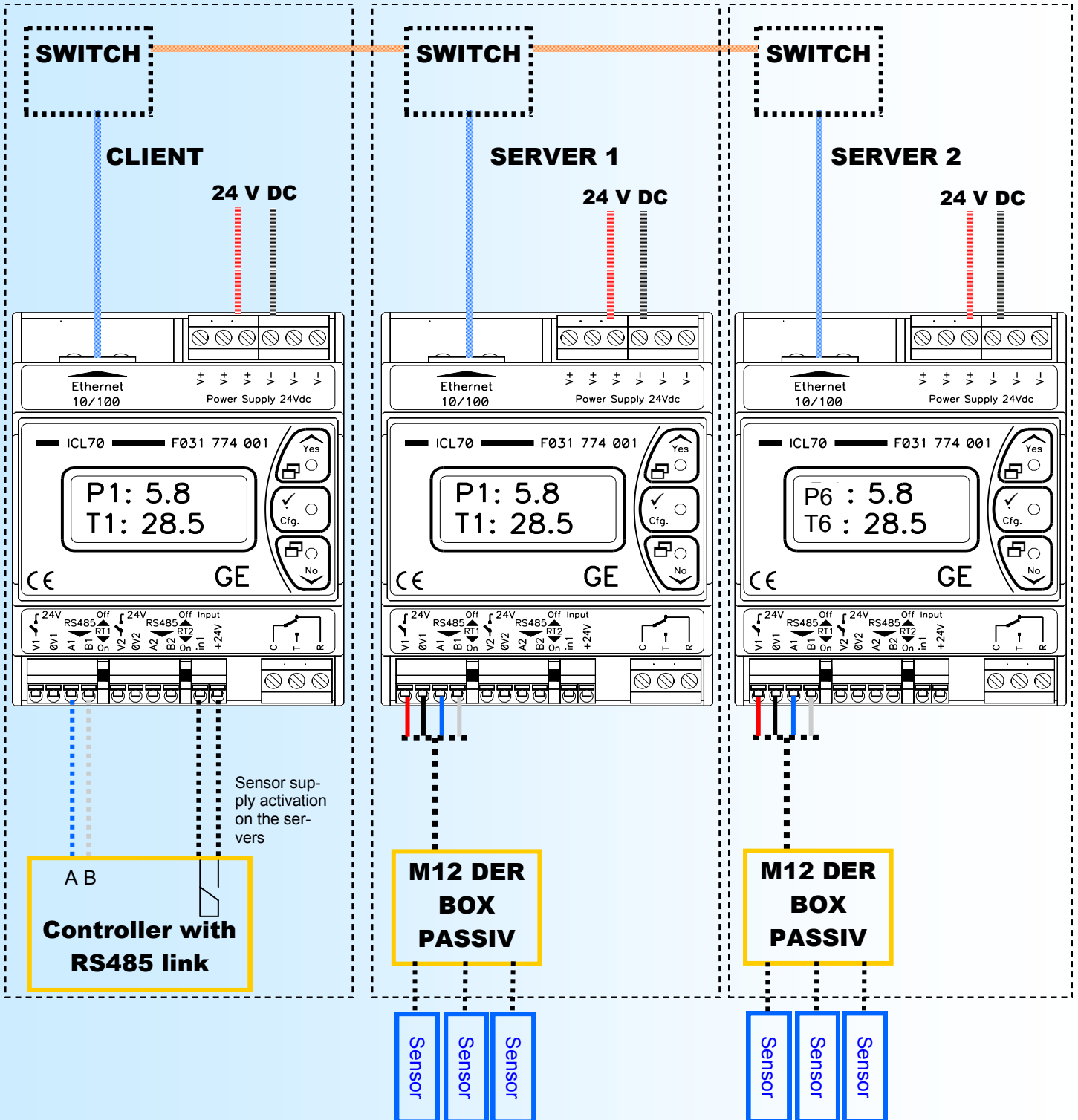Dry contact connection terminals
with 24 V DC bias (client module)

Push buttons functions

- ▲   Display mode auto / <YES> response / increasing the displayed value.

- ▼   Display mode manual / change displayed page / <NO> response/ decreasing the displayed value.

- ✓   Configuration access / value validation.

Implementation diagram

LOREME

LOREME

Front face visualization

When powering up, the device reads and displays the current revision of the measurement and Ethernet part for about 1 second.

R:0.1.2   0.1: Hard & Soft revision of the measurement part.

2 : Soft revision of the Ethernet part.

R:0.1.-   "-" displayed if there is a reading fault on the Ethernet part or if the Ethernet part revision is not compatible.

Then it goes into measurement mode with visualization in manual mode. The first page displayed corresponds to the temperature and relative humidity measurements of the embedded sensor. The following pages correspond to the measurement of the pressure sensors 1 to 31 and the configuration parameters: operating mode, port number, IP address, IP mask. To scroll through the pages, press the ▼ button. A press on the ▲ button switch to auto display. The scrolling speed in auto display mode is 1 page every 2 seconds. The user can at any time switch to manual display mode by pressing the ▼ button.

| `Hi45.3%` `Ti22.5°C` | Relative Humidity and temperature measurement page of embedded sensor. | page 0 |

| `P01:2.50` `T01:28.0` | Sensor 1 pressure measurement in absolute bar. Sensor 1 temperature measurement in °C. |

`P02:1.00`
`T02:37.0`

....

| `P30:----` `T30:----` | Uninitialized sensor 30 measurements. |

| `P31:----` `T31:----` | Measurements of the reference sensor at address 230. |

| `SERVER` `10000` | Operating mode. Port number. |

| `192.168.` `000.253` | IP address. |

| `255.255.` `255.000` | IP mask. |

Notes:

- In manual display mode, the uninitialized pressure and temperature measurement pages are not displayed.

- In case of measurements loss of the embedded sensor, the following page 0 is displayed:

`Hi------`
`Ti------`

- The following message may also be displayed on power on:

ER XPORT

This message indicates that the Ethernet part of the device has a problem.

Configuration via the front face

The ICL70 can be fully configured by the front panel. Pressing the ✓ button accesses the configuration.
A temporary message is displayed.

```
CONFIG.
R:x.y.z          Revision x:Hard, y:Soft, z:Ethernet.
```

Notes:
- ***The display can be "R: 0.1.-". This indicates that the Ethernet part has not been read or that its revision is not compatible. If so, then power off/on the device, or access the Ethernet configuration to have a memorization and a new reading.***

- ***The device leaves the configuration mode if no action are made within 90 seconds. It's only at the end of configuration that the new parameters are saved in memory.***

1) Password enter

Entering a code is necessary to access the configuration ('1234' per default).

```
CODE?            Use the ▲ and ▼ button to change the character.
----              (only alphanumeric characters are accepted: '0' to '9' and 'A' to 'Z').
                 The ✓ button validate the character.
```

If the password is wrong the message 'WRONG CODE ' is displayed for 3 seconds then the device return to measure mode.

2) Operating mode

```
MODE?            Press ▲ (Yes) button to access to the operating mode selection.
(Y-N)            Press ▼ (No) button to skip the rubric.

SERVER           Use the buttons ▲ and ▼ to select the choice. Validate with ✓.
 Y <N>

CLIENT           Use the buttons ▲ and ▼ to select the choice. Validate with ✓.
<Y> N
```

3) Ethernet communication

```
IP ADR.?         Press ▲ (Yes) button to access to the IP address configuration.
(Y-N)            Press ▼ (No) button to skip the rubric.

192.168.         Modify the field value with ▲ and ▼ buttons.
000.253          go to next field with ✓ button. The default IP address is 192.168.0.253.

MASK?            Press ▲ (Yes) button to access to the IP mask configuration.
(Y-N)            Press ▼ (No) button to skip the rubric.

255.255.         Modify the field value with ▲ and ▼ buttons.
255.000          go to next field with ✓ button. The default parameter is 255.255.255.000.

PORT?            Press ▲ (Yes) button to access to the port number configuration.
(Y-N)            Press ▼ (No) button to skip the rubric.

PORT?            Press ▲ to increase or ▼ to decrease the port number and ✓ to validate it.
10000            The default port number is 10000.
```

4) Heating relay thresholds

TEMP AL?   Press ⌃ (Yes) button to access to the temperature threshold setting.
(Y-N)   Press ⌄ (No) button to skip the rubric.

THRESH.?   Use ⌃ and ⌄ to modify the value in 0.1 °C step.
5.0°C   Press ✓ button to validate the threshold. The default value is 5 °C.

RH AL?   Press ⌃ (Yes) button to access to the relative humidity threshold setting.
(Y-N)   Press ⌄ (No) button to skip the rubric.

THRESH.?   Use ⌃ and ⌄ to modify the value in 1% step.
80%   Press ✓ button to validate the threshold. The default value is 80 %.

5) Embedded sensor measurements offset

Ti OFST?   Press ⌃ (Yes) button to access to the temperature offset setting.
(Y-N)   Press ⌄ (No) button to skip the rubric.

Ti22.3°C   Temperature measurement with offset.
0°C   Offset value. Use ⌃ and ⌄ to modify the value, ✓ button to validate it.

Hi OFST?   Press ⌃ (Yes) button to access to the relative humidity offset setting.
(Y-N)   Press ⌄ (No) button to skip the rubric.

Hi52.3%   Relative humidity measurement with offset.
0%   Offset value. Use ⌃ and ⌄ to modify the value, ✓ button to validate it.

6) Embedded sensor measurements filtering
This parameter is used to filter the measurement by increasing its response time. It is configurable from 0 to 60 seconds.

FILTER?   Press ⌃ (Yes) button to access to the filter setting.
(Y-N)   Press ⌄ (No) button to skip the rubric.

Ti?   Temperature response time setting in step of 1 second.
2s   Response time value. Use ⌃ and ⌄ to modify the value, ✓ button to validate it.

Hi?   Relative humidity response time setting in step of 1 second.
2s   Response time value. Use ⌃ and ⌄ to modify the value, ✓ button to validate it.

7) End of configuration
MEMO...   This message is displayed only if the user has changed the communication settings.
*****

OK   This message means the end of the configuration and indicates that the changes have been
             successfully saved.

Terminal link setting

The device can be configured or updated in terminal mode via the Ethernet link.

Setting of terminal emulation software (PC with windows).

1 The terminal emulation software for PC « HyperTerminal » is resident in windows up to XP version. For later versions, it is downloadable on : **www.loreme.fr in download part** (http://www.loreme.fr/HyperTerm/htpe63.exe)

=> Run the downloaded software to install it.

2 Start a "HyperTerminal" connection :
- Click on **"START"** button
<u>Up to XP version</u>
- Go to **"Programs \ Accessories \ Communication \ Hyper Terminal"**
- Click on **"Hypertrm.exe"**
<u>Or if the software was downloaded</u>
- Go to **"All programs \ HyperTerminal Private Edition"**
- Click on **"HyperTerminal Private Edition"**

3 Enter name for the new connection

4 Choose the TCP/IP Winsock communication port

5
- Enter the IP address of the device (192.168.0.253 is the default address)
- The port number must be: 23

Attention the PC must be in the same address field as the device !!

6

For the firmware update function a minimum delay of 30 ms is required between each transmitted line.

For it:
In the properties of the connection, click the "Settings" tab then on "ASCII Setup"

Enter 30 in the field "Line delay"

7 When leaving Hyper terminal, the following window will appear. By saving, next time the terminal session will start with the same configuration.

Thus, the shortcut LOREME.ht will permit to communicate with the ICL70 device.

Note:
To modify the terminal parameters while the latter is connected, it is necessary to disconnect it. When reconnecting, the new parameters will be taken into account.

Terminal mode

1) Visualization

When the terminal connection is established, the ICL70 displays the temperature and relative humidity measurements from the embedded sensor every 2 seconds.

```
RH:     45.3 %
Temp:   26.3 °C
```

Note:

When connecting to a client device, frames from the controller may be momentarily displayed on the terminal.

2) Configuration

To enter configuration mode, simply press the "C" key on the terminal.
On the front panel, instead of measurements, the device displays the message:

```
CONF BY
TERMINAL
```

And on the terminal:

```
CONFIGURATION
Rx.y.z                    "x" & "y" are the Hard & Soft revision of the measurement part. "z" is the Soft revision of the
                          Ethernet part.
```

Note:

The display can be "R: 0.1.-". This indicates that the Ethernet part has not been read or that its revision is not compatible. If so, then power off/on the device, or access the Ethernet configuration to have a memorization and a new reading.

2.1) Method

At the configuration time, different types of questions are displayed. For each one, several answers are possible.
You will find below the detailed description of each case.

2.1.1) Menu selection

example: COMMUNICATION   The user makes a choice by pressing the keys **"Y"** or **"N"**.
            (Y-N)

2.1.2) Parameter selection

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

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

2.1.3) Value acquisition

Example: LOW SCALE
            4 mA

There are two possibilities:
- The validation without modification by typing "**Enter**",
- The modification with simultaneous display followed by validation with "**Enter**".

Remarks:

- It is possible, when a mistake is made during a value acquisition, before validating it, to go back by pressing on backspace key. This re-displays the message without taking notice of the mistake.
- In configuration mode, if there is no action on a key during 2 minutes, device goes back in measure mode without taking notice of the modifications made before.
- In configuration mode, if you want go back to measure mode without taking notice of modifications made before, just press the escape key.

Configuration

2.2) Password

This rubric allows you to change the password for accessing the configuration from the front face of the device.

PASSWORD CONFIGURATION?
(Y-N)

> **PASSWORD?**
> **1234**   Enter of new password with simultaneous display ('1234' is the default password).

2.3) Operating mode

This rubric permits to choose between the client or server operating mode.

MODE CONFIGURATION?
(Y-N)

> **SERVER?**   Choice of server operating mode if key 'Y'. Next choice if key 'N' or 'enter'.
> **(Y-N)NO**
>
> **CLIENT?**   Choice of client operating mode if key 'Y' or 'enter'. Next choice if key 'N'.
> **(Y-N)YES**

2.4) Communication

Configuration of the Ethernet communication parameters.

COMMUNICATION?
(Y-N)

> **IP ADDRESS?**   Address configuration.
> **192.168.000.253**   Enter of address with simultaneous display.
>
> **IP MASK?**
> **255.255.255.000**   Enter of mask with simultaneous display.
>
> **PORT?**
> **10000**   Enter of port number with simultaneous display (0 to 65535 except ports 69 & 30718).

2.5) Heating relay

The parameters of the heating relay are the threshold of temperature and relative humidity that activate the heating alarm. The relay is switched on (contacts C/R are open) when there is no alarm and switched off (contacts C/R are closed) in alarm.

The alarm works in this manner:
- The alarm is active when the temperature is equal or below the temperature threshold or if the relative humidity is greater than the humidity threshold.
- The alarm is deactivated when the temperature is greater than the temperature threshold + 5 ° C and the humidity is below the humidity threshold - 10%.

HEATING RELAY CONFIGURATION?
(Y-N)

> **TEMPERATURE THRESHOLD?**
> **5.0 °C**   Enter the threshold value for the temperature (5 °C at factory out).
>
> **HUMIDITY THRESHOLD?**
> **80.0 %**   Enter the threshold value for the relative humidity (80 % at factory out).

2.6) Embedded measures filtering

This parameter allows a filtering of the measurement of temperature and relative humidity by increasing its response time. It is configurable from 0 to 60 seconds.

MEASURE FILTER CONFIGURATION?
(Y-N)

       TEMPERATURE FILTER?
       2.0 s

       HUMIDITY FILTER?
       2.0 s

2.7) End of the configuration. Saving of the parameters

2 cases are possible:

1- The communication parameters or the operating mode have not been changed. The device memorize all the parameters in non-volatile memory and displays on the terminal the message "**OK**".

2- The communication parameters or the operating mode have been changed. The device memorize all the parameters in non-volatile memory and reset the Ethernet component, so there is a loss of the terminal connection. The following message is displayed on the front panel:
     MEMO...
     * * * * *

Embedded sensor measurements offset

In terminal mode, it is possible to offset the temperature and the humidity measurements.

To shift the measure, it is necessary type on the "**+**" or "**-**" key to access the function.
On the terminal the display becomes:

       OFFSET: 0.1 °C   offset function, offset value.
       Temp: 25.4 °C   measure value with offset.

- Use the **"+"** and **"-"** keys to adjust the offset, the measure is directly modified.
- Type on **"Enter"** to save the adjusted offset.
- The ICL70 switches to the offset setting mode of the relative humidity measurement.

       OFFSET: 0 %   offset function, offset value.
       RH: 45.4 %   measure value with offset.

- Use the **"+"** and **"-"** keys to adjust the offset, the measure is directly modified.
- Type on **"Enter"** to save the adjusted offset.

Notes:
- The offset remains active when the power is turned off. To cancel the offset, call the offset function, reset the value to zero with the "+" or "-" keys, then confirm with "Enter".
- If, in the offset setting mode, there has been no action on the "+", "-" or "Enter" keys for more than 2 minutes, the device automatically returns to measurement mode without taking into account the modified offset value.

ETHERNET PART FIRMWARE UPDATE

To update the Ethernet component firmware, you must use a program named « Deviceinstaller ». You should download and install it following this procedure.

Open this link to go to the download page.   http://ltxfaq.custhelp.com/app/answers/detail/a_id/644
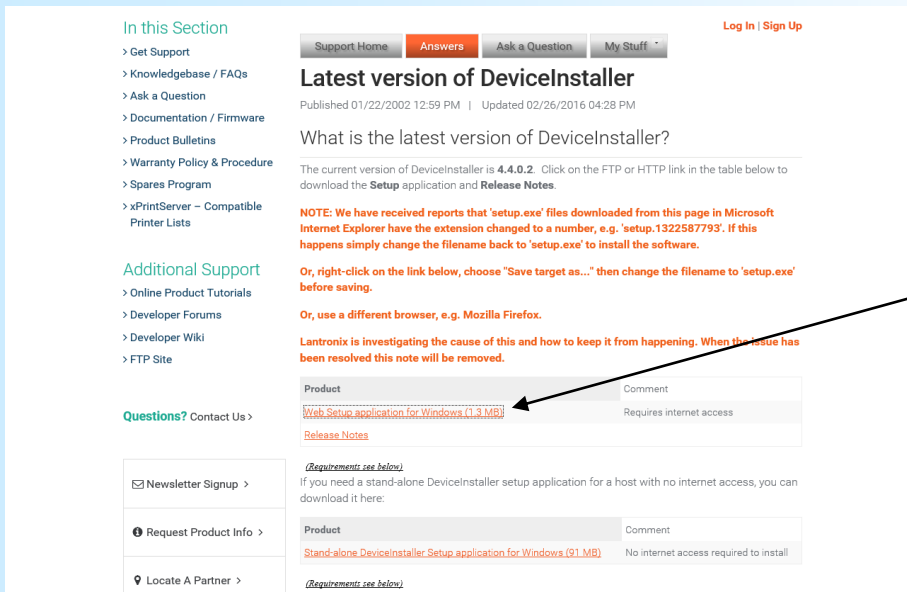
With Internet explorer:
Right click on the link.
Choose save target as ..
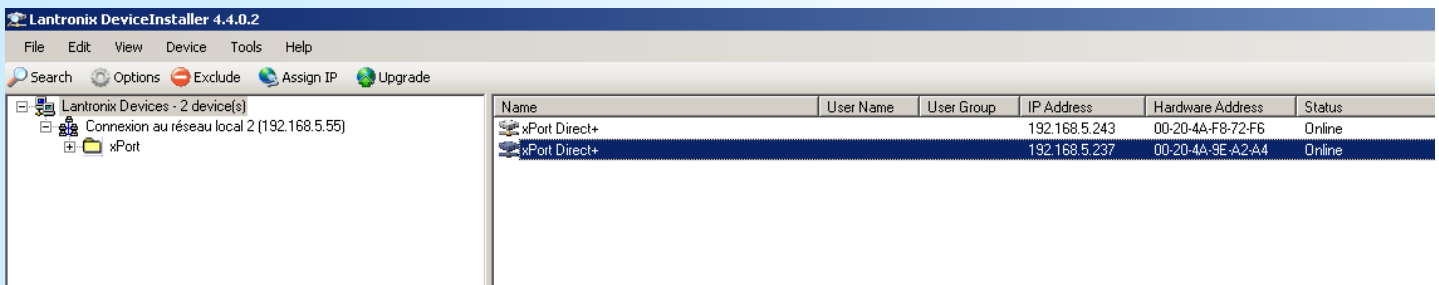Rename the file to "setup.exe" before saving.

No problem with other browsers.

Ethernet component update

Plug the Ethernet cable on the device.
Run the 'DeviceInstaller' : menu Start / programs / Lantronix / Device installer 4.4 / Deviceinstaller

At the beginning, the program search the components present on the network (they should be in the same field).
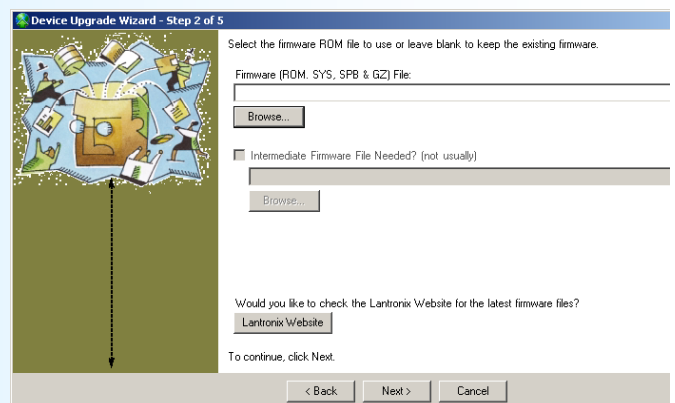

Click on the line which has the device IP address you wanted to upgrade, the name must be 'XPort-05'.
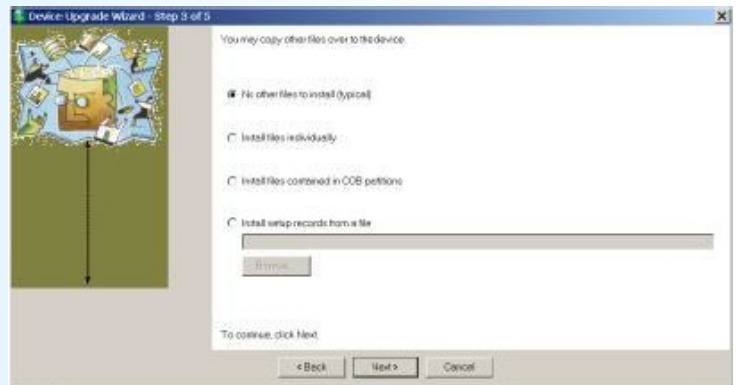Click on "Upgrade" button.

- Step 1 : select the « Create a custom installation by ... » and click on « Next ».

- Step 2: Click on « Browse.. » and search the file « xxxxx. rom » that you receive by e-mail.

- Click on « Next »

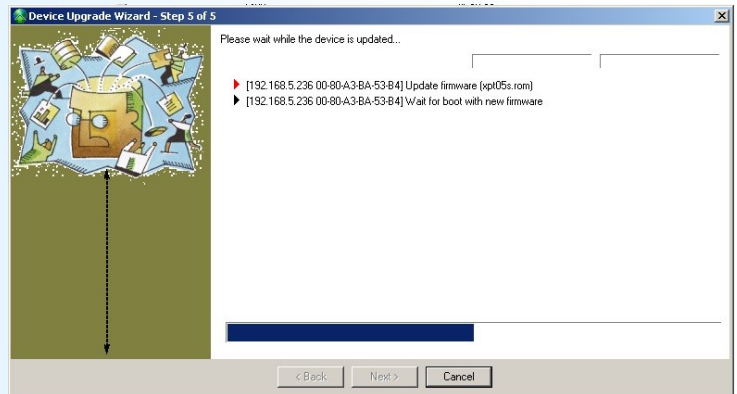- select the line « No other file to install »

- Click on « Next »

- Click on « Next »

- Wait that all lines become green and end with
 « succeeded.. » message.

- Close the windows and quit the "Deviceinstaller" pro-
gram.

Measurement part FIRMWARE update

The ICL70 is connected in terminal mode and displays the embedded temperature and humidity measurements.
Press the '@' key to access the firmware update. The following message is displayed in the HyperTerminal windows:

FIRMWARE LOADER Rev3
READY TO TRANSFER...

The device is now in the firmware load mode and is waiting for the firmware file. This file is provide by LOREME and contain the firmware code in Intel HEX format.

Select the « Transfer », « Send a text file ... » in the HyperTerminal menu.
Select the directory and open the file. The HyperTerminal program begins to send the file to the device.

FIRMWARE LOADER Rev3
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 errors occurs. Otherwise, these following message could be displayed:

- **SERIAL COM ERROR !**   Error during receipt.
- **PROGRAMMING FAILED !**   Programming error in the internal flash memory.

Attention
In the event of a programming error or an incomplete programming, the device, after a power-up, remains locked in a waiting mode for updating the firmware and sends every 2 seconds the ' > ' character to the terminal.
To access the firmware update again, simply press the ' F ' key on the keyboard.

EMC Consideration

1) Introduction

To meet its policy concerning EMC, based on the Community directives **2014/30/EU** & **2014/35/EU**, the LOREME company takes into account the standards relative to this directives from the very start of the conception of each product.

The set of tests performed on the devices, designed to work in an industrial environment, are made in accordance with **IEC 61000-6-4** and **IEC 61000-6-2** standards in order to establish the EU declaration of conformity. The devices being in certain typical configurations during the tests, it is impossible to guarantee the results in every possible configurations. To ensure optimum operation 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 data sheet (direction of assembly, spacing between the devices, ...).
- Comply with the recommendations of use indicated in the technical data 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.

Wirings

Dry contact of the PLC on a client module.

Link to sensors on a server:

Pair Red / Black: 24 VDC supply.
Pair Blue / White: RS485 A / B connection.