Cryoview level indicator

User's manual

NH78378

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The information given in this manual is accurate to the best of our knowledge.

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1. About this manual

1.1 OBJECTIVE OF THE MANUAL

This manual describes the *Cryoview* level indicator. It provides details on the mechanical and electrical assembly of the indicator, its Ethernet connection configurations, and how to use and monitor the data transmitted to the computer connected to the indicator.

1.2 WHO THIS MANUAL IS FOR

This manual is for professionals wishing to monitor the status of their cryogenic tanks.

1.3 STRUCTURE OF THE MANUAL

For ease of consultation, the structure of this manual follows the steps normally taken by the user, as described below:

Topic	Page
Presentation of the *Cryoview* level indicator	9
Configuring the *Cryoview* level indicator	38
The application	55
Mechanical assembly and wiring	89
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1.4 HOW TO USE THIS MANUAL

The manual is ordered in the same read and configuration sequences as those followed by the users of the product (*see* section 1.3).

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1.5 QUICK CONSULTATION OF THE MANUAL

In view of the highly technical nature of the indicator and its field of application, we do not recommend quick consultation of this manual. The reader is strongly advised to read the manual in the order presented.

1.6 THE ACCOMPANYING CD

The accompanying CD contains the following elements:

- Notices issued by L'air Liquide – DMC.
- The present manual in electronic (pdf) format.
  Note: you will need to have Acrobat Reader installed on your computer to be able to read or print from the manual in pdf format.

1.7 BRANDS MENTIONED IN THE MANUAL

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2. Safety

2.1 SYMBOLOGY

	This symbol means: Underlined information. Failure to follow the instructions given for this point does not pose danger for the user.
	This symbol means: **Warning: danger. In this manual, failure to observe or implement the instructions preceded by this symbol may cause bodily harm or damage to the apparatus and installations.**
	This symbol means: Instructions must be followed.
	This symbol means: Name and address of manufacturer.
	This symbol means: You **must** read the notice for use.
	This symbol means: You **must** wear the appropriate hand protection gear.
	This symbol means: **Warning**: low temperature.

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This apparatus is compliant to standard NF EN ISO 60601-1-2 applicable in the medical sector. It has been manufactured and tested to compliance with IEC standards on electromagnetic compatibility (EMC) and leaves the factory in a condition of perfect technical integrity. To keep the apparatus in perfect condition and ensure that it is used safely, you must follow the instructions and respect the symbols given in this manual.

Before installing the apparatus, check that rated voltage and power supply voltage are the same.

When the device cannot be used in conditions of total safety, the apparatus should be withdrawn from service and protected against accidental usage.

Full safety cannot be guaranteed in the following cases:

- The apparatus is visibly damaged.
- The apparatus no longer works.
- After prolonged storage in unsuitable conditions.
- After serious damage sustained during transit.

2.2 OPERATOR SAFETY

2.2.1 General safety precautions

Only personnel who have fully read the present safety notice and the safety recommendations (*see* NH78380) are authorized to handle and use the apparatus described in this document.

Like all similar devices, this apparatus is susceptible to electrical, electronic and mechanical failure. The manufacturer cannot be held responsible for any products placed in storage subsequent to defective operation of the kind described above, even during the equipment warranty period.

The apparatus described in this manual is designed exclusively for use by qualified personnel. Maintenance operations should only be carried out by qualified and authorized personnel. To ensure the safe and correct use of the apparatus during service and maintenance, it is essential that all personnel observe standard safety procedures.

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2.2.2 Safe use of liquid nitrogen

The temperature of liquid nitrogen is -196 °C. Therefore:

You must never touch objects which have been in contact with liquid nitrogen with your bare hands.

Always wear special gloves and visors when handling liquid nitrogen.

Liquid nitrogen used in storage tanks evaporates into the air; 1 litre of liquid nitrogen releases around 700 litres of nitrogen in the gaseous state. Nitrogen is an inert, non-toxic gas, but displaces oxygen when released into the atmosphere. Once the atmospheric oxygen content falls below 19% the human organism is at risk.

All rooms and areas housing tanks containing liquid nitrogen should be well ventilated at all times and equipped with at least one oxygen gauge. All personnel should be informed of the risks associated with the use of nitrogen.

2.2.3 The CE mark

The *Cryoview* level indicator bears the CE mark on the upper part of its casing (*see Figure 4-9* on page 17). The CE declaration of conformity is contained in section 23 on page 115.

2.3 PRECAUTIONS IN THE EVENT OF FAILURE

If you suspect the integrity of the apparatus has been compromised (for example as a result of damage sustained during transit or during use), it should be withdrawn from service. Make sure there is no risk that the withdrawn apparatus can be accidentally used by others. The defective apparatus should be handed over to authorized technicians for inspection.

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2.4 DESTRUCTION OF THE APPARATUS

Under directive WEEE 2002/96/EC, this device may contain electronic components which are hazardous to the environment. Owners are requested to contact the manufacturer or vendor of the apparatus to find out the procedure to be followed for the safe disposal of the apparatus. The manufacturer cannot be held responsible for the consequences of failure to follow the prescribed recycling procedure.

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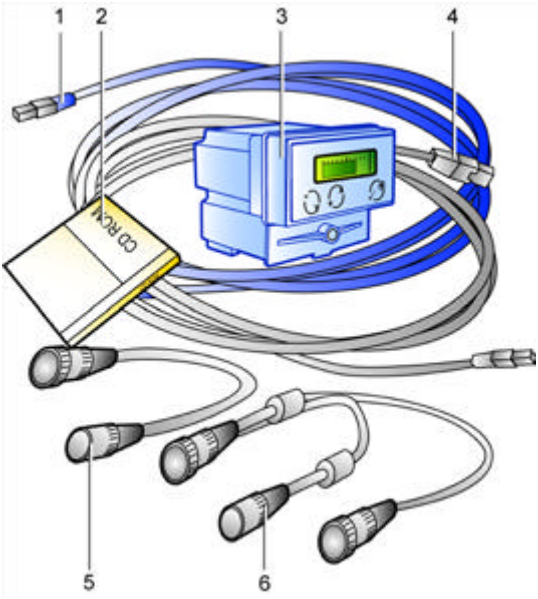
3. Elements delivered with the apparatus

The product is delivered complete with:

Table 1: Elements delivered

	Designation	Quantity
1.	RJ45 twisted-pair Ethernet cable (white); length 2 m.	1
2.	The present manual on CD Rom.	1
3.	The *Cryoview* level indicator.	1
4.	RJ45 standard Ethernet cable (blue); length 3 m.	1
5.	Power cable; length 2 m.	1
6.	RS485 "Y" cable; length 1.2 m.	1

Figure 3-1: Elements delivered



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The Cryoview level indicator

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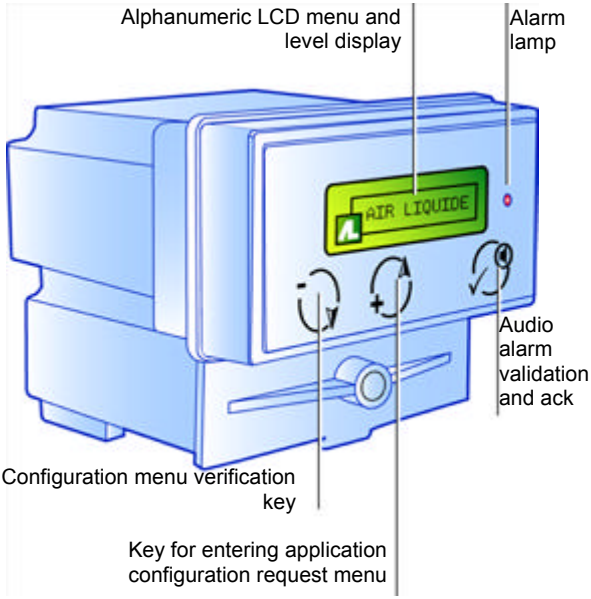
4. Presentation

4.1 GUIDE TO COMPONENTS

The illustration below shows the front panel of the level indicator. This is described in more detail in the following pages.

Figure 4-1: General view of the front panel of the Cryoview level indicator



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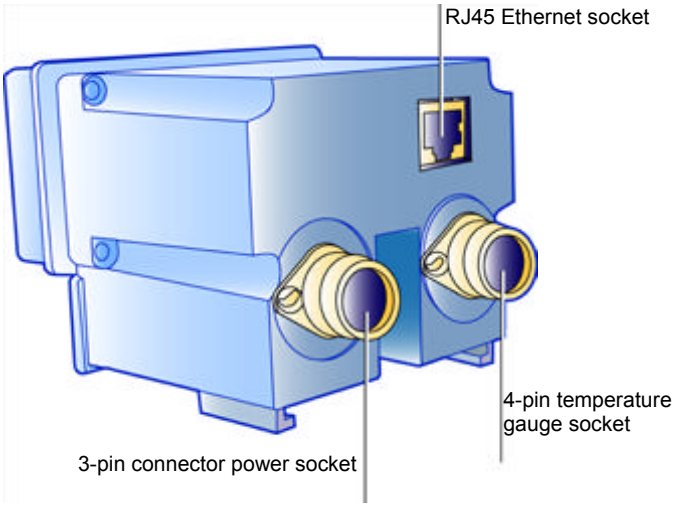
The illustration below shows the back of the level indicator. This is described in more detail in the following pages.

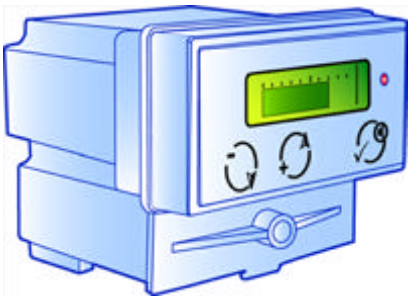
Figure 4-2: Back of the Cryoview level indicator



4.2 FUNCTION

The *Cryoview* level indicator displays information on the nitrogen level of the tank to which it is fitted, while it also receives information from a temperature indicator and relays this information to a PC via an Ethernet connection. The level indicator is connected to the temperature indicator (NH102886-TNL or NH102886-TNG) via a RS485 connection; the temperature indicator regulates the nitrogen level and measures the temperature of the nitrogen contained in the tank, whether in gaseous or liquid state.

Figure 4-3: The Cryoview level indicator



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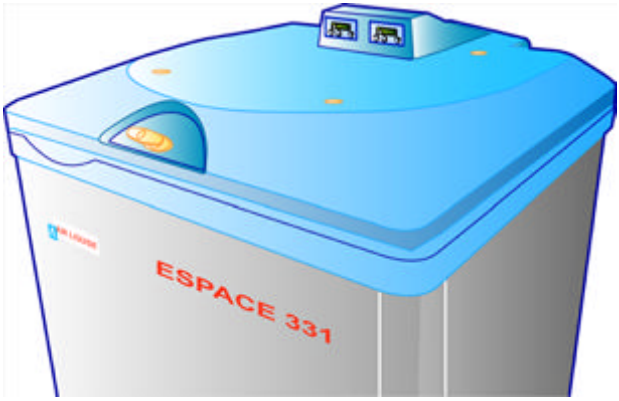
4.2.1 Location of the indicator

The *Cryoview* level indicator is permanently attached to the tank in a special compartment on the cover beside the temperature indicator.

Figure 4-4: The Cryoview level indicator fitted to a tank



4.2.2 Minimum installation requirements

In most cases, minimum installation requirements are:

- A power source (5).
- The temperature indicator (4), which measures the level and temperature of the nitrogen contained in the tank and displays the temperature reading on its LCD display.
- The *Cryoview* level indicator (3), which is connected to the temperature indicator and performs three functions:
  - It indicates the level of liquid nitrogen in the tank on its LCD display. (This information comes from the temperature indicator.)
  - It sends level and temperature readings to a PC via an Ethernet connection.
  - It receives configuration parameters (IP address, alarms etc.) from the PC.
- A PC equipped with a web browser (1). The Cryoview level indicator communicates with the PC either via a direct Ethernet connection (2) or over an Ethernet LAN (2).

This configuration can be schematically illustrated as follows:

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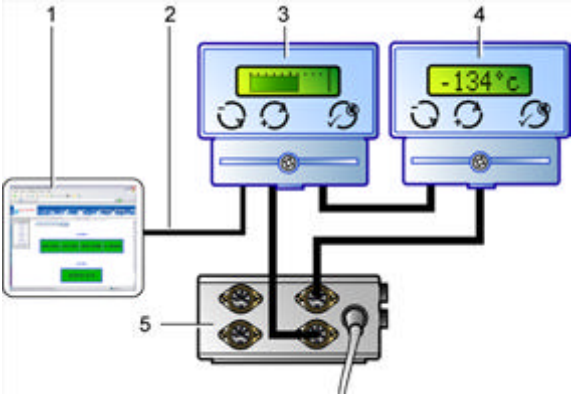

Figure 4-5: In a minimum installation, the system monitors only one level indicator and one temperature indicator (in this case over a direct indicator-PC Ethernet connection)

4.2.3 Complex installations

In a complex monitoring system, several *Cryoview* level indicators are connected over an Ethernet LAN. In this configuration personnel can use the PC's browser to select available level indicators and view the information they send.

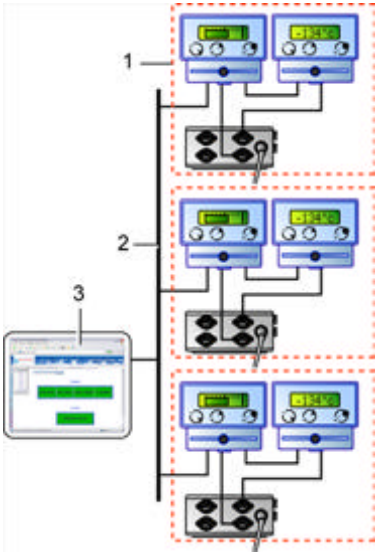

Figure 4-6: Complex installations are similar to the minimum installation: the only difference is the number of level indicators

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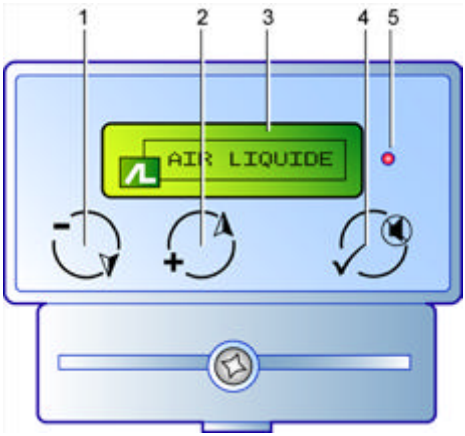
4.3 FRONT PANEL

The front panel of the *Cryoview* level indicator comprises the following elements:

Figure 4-7: Front panel of the Cryoview level indicator



No.	Function
1.	Soft key (-) for entering the application configuration menu (*see* § 6.6).
2.	Soft key (+) for entering parameter verification menu.
3.	Backlit alphanumeric LCD display.
4.	Soft key (✓) for confirming and acknowledging audio alarm.
5.	LED alarm lamp (measurement or sensor).

- Soft key (-⩛) (1) only works at power-up. Pressing this key repeatedly for around 5 seconds during power-up opens the menu authorizing communication with the PC at the indicator configuration stage (*see* paragraph 5.2.1 on page 22).
- Soft key (+⩓) (2) is for selecting settings during configuration (*see* paragraph 5.2.1 on page 22).
- The continuously backlit alphanumeric LCD display (3) shows the level reading. The information shown by the display is described in detail in section 5 on page 19.
- Soft key (✓) (4) is for validation and disablement of the audio alarm. In the event of an audio alarm, pressing this key acknowledges (i.e. silences) the audio alarm.

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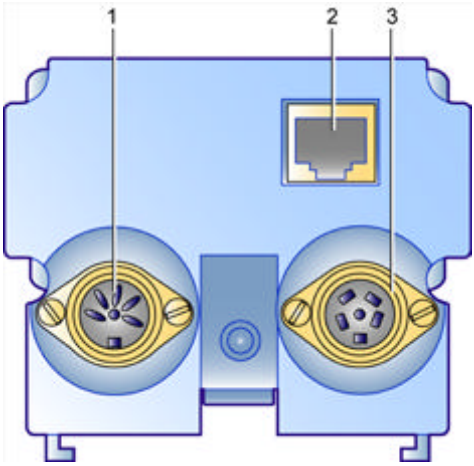
- The alarm lamp (5) lights in the event of a fault in the temperature or level sensors. This lamp remains lit for the duration of the fault; it cannot be disabled.
- A buzzer is located in the indicator casing. It can be disabled by pressing the (✓) soft key (4).

4.4 THE BACK OF THE INDICATOR

The back of the indicator looks like this:

Figure 4-8: Back of the Cryoview level indicator



No.	Function
1.	Power socket
2.	RJ45 Ethernet socket

No.	Function
3.	T° indicator socket and button

- Screw connector outlet (1) receives the power cable (24 V AC)
- The RJ45 socket (2) connects the indicator to an Ethernet LAN (flat cable) or directly to the PC (twisted pair). The protocol is TCP/IP. A 10 Base T Ethernet category 5 cable should be used. The RJ45 router or hub connection should be located under 100 m from the indicator.
- Screw connector outlet (3) receives the cable from the temperature indicator and the fill override button. Information leaves this outlet in ModBus format.

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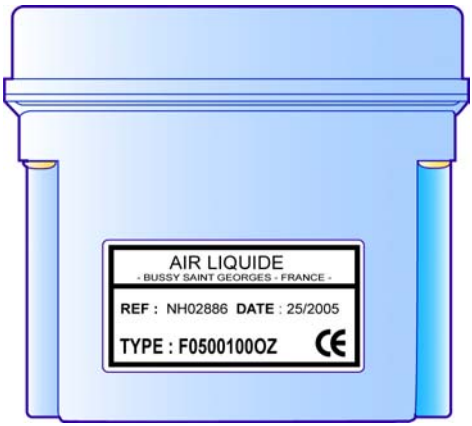
4.5 BOTTOM OF THE CASING

The principal feature of the bottom of the casing are the grooves designed to receive the mounting bracket used for securing the *Cryoview* level indicator to the tank.

4.6 TOP OF THE CASING

The top of the casing bears a label indicating the reference number of the apparatus, its date of manufacture, type number and the CE mark.

Figure 4-9: The top of the Cryoview level bears manufacturing information



4.7 DATA MEMORY

The *Cryoview* level indicator incorporates two independent memories:

- An events memory. This memory can store up to 4096 events in order of occurrence.
- A data memory. The *Cryoview* level indicator takes temperature and level readings every 10 minutes and stores them in its memory for 366 days.

Note: “events” are considered as any of the following: opening of tank cover, solenoid valve command, low level indicator, low level alarm, high level alarm, high temperature alarm. **Users are responsible for backing up measurements and events which they wish to store.**

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4.8 DEFAULT SETTINGS

The level indicator can be reset to the factory settings given in the table below. The procedure for resetting the indicator to its factory settings is described in paragraph 7.4.2 on page 47.

Table 2: Cryoview default settings

IP address	192.168.168.20
Subnet mask	255.255.255.0
Modification of parameters permission	Yes
Command of solenoid valve permission	Yes
General password	EISCOM
Relays password	EISCOM
1st line text	CRYO
2nd line text	WEB

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5. The display

The Cryoview level indicator has an alphanumeric LCD display. This display presents different information during power-up, normal operation or configuration. This section examines display information in detail.

5.1 DISPLAY INFORMATION

5.1.1 At power-up

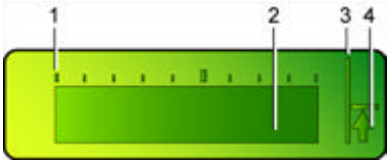
First the `Air Liquide` logo appears, then the IP address and subnet mask of the *Cryoview* level indicator.

Figure 5-1: Cryoview display sequence on power-up

5.1.2 In normal operation

The nitrogen level in the tank is indicated in bar form. Graduations are in increments of 10%. An arrow (4) indicates the presence of an alarm (*see* paragraph 5.1.3 on page 20).

Figure 5-2: Cryoview display during normal operation



No.	Function
1.	0% level marker.
2.	Level bar

No.	Function
3.	100% level marker.
4.	Alarm arrow

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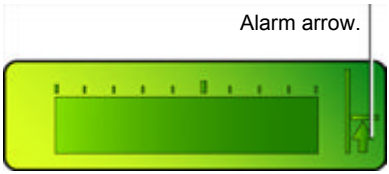
5.1.3 Nitrogen level alarm

An arrow appears to the right of the level bar:

- ↑ (arrow pointing up): the upper alarm threshold has been reached (*see Figure 5-2*).
- ↓ (arrow pointing down): the lower alarm threshold has been reached.

Figure 5-3: An arrow appears in the event of a level alarm (in this example, an upper threshold alarm)



When an alarm appears, pressing the acknowledge (disable) key stops the alarm buzzer. The arrow automatically disappears once the alarm has been disabled.

5.1.4 Faults

The display indicates the presence of faults as described below:

- Fault in connection to temperature indicator: `ERR Measure` appears on the display.
- Level probe error: `ERR Probe` (probe disconnected or defective).
- Level probe measurement out of range: `ERR Measure` appears on the display (if the level is below 0% or above 106%).

Figure 5-4: Error indicated

When an error is detected, pressing the acknowledge (disable) key stops the audio alarm. The error remains on the display for as long as it persists; it only disappears once a normal measurement has been restored.

A full list of error messages is given in section 20 on page 107.

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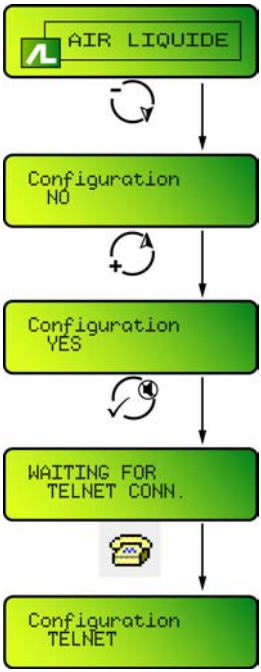
5.1.5 During configuration

When a connection is established between the HyperTerminal application and the *Cryoview* level indicator (*see* paragraph 6.6 on page 32 for details of this procedure), the display presents the following sequence:

Figure 5-5: Message sequence in configuration mode



Configuration procedures are described in section 6 on page 27 and section 7 on page 37.

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5.2 MENUS

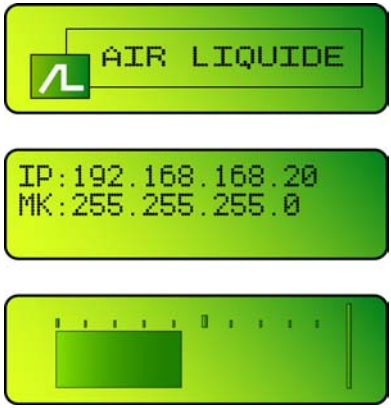
5.2.1 At power-up

The three menu options available at powerup are indicated in the table below and are described in this section:

Key pressed	Mode
No key pressed	The indicator enters normal mode, i.e. it displays the nitrogen level.
	The indicator enters configuration mode.
	Restores factory settings; this option can be cancelled.

- **No key pressed**: the indicator enters normal mode, i.e. it displays the nitrogen level.
  First the `Air liquide` logo appears, then the indicator's IP address and subnet mask, then the level of nitrogen in the tank (as described in paragraph 5.1.2 on page 19), unless an error is detected.

Figure 5-6: Cryoview display sequence on power-up



- **Press the** **key repeatedly:** the indicator enters configuration mode.

  Pressing the key repeatedly while the Air Liquide logo appears on the display puts the indicator into configuration standby; `Configuration No` appears on the display.

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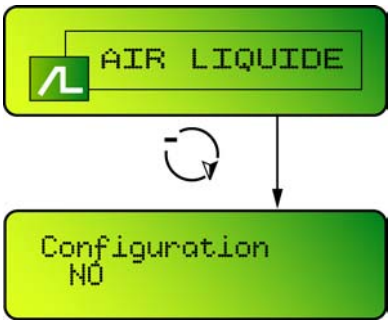
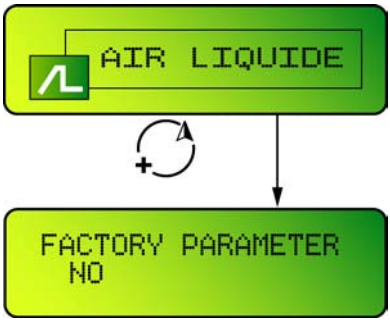
Figure 5-7: Display sequence in configuration mode



- **Press the key repeatedly:** the indicator goes into factory settings standby.

  Pressing the key repeatedly while the Air Liquide logo appears on the display puts the indicator into factory settings standby; **`Factory paramet No`** appears on the display.

Figure 5-8: Procedure for restoring factory settings



Press to switch to **`Yes`** or to keep **`No`**.

- **`Yes` appears on the display**: confirming this selection will return the indicator to its factory settings. Press to restore the factory settings (*see* paragraph 7.4.2 on page 47 for details of factory settings). `Parameter stored` appears on the display. This message indicates that the factory settings have been successfully restored. If no key is pressed in the next 20 seconds, `No change stored` appears on the display; the indicator then returns to normal display mode and no changes to the settings are stored.
- **`No` appears on the display**: confirming this selection cancels the restoration of factory settings. Press to save the current settings.

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After pressing or if no key is pressed in the next 20 seconds, or if No change stored appears on the display, followed by the IP address, the indicator returns to normal display mode and no changes to the settings are stored.

5.2.2 In normal operation

No menu is accessible in normal operation. The display indicates only the level of nitrogen in the tank (*see* paragraph 5.1.2 on page 19).

5.2.3 Error

No menu is accessible when an error occurs. The display indicates only the error. *See* paragraph 5.1.4 on page 20.

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Configuration

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6. Introduction

We recommend that you configure the Cryoview level indicator before fitting it to the tank. As the indicator uses a standard Ethernet connection, it can be conveniently configured and checked for connectivity outside the laboratory environment. After this the indicator can be quickly fitted and put into service.

6.1 EQUIPMENT NECESSARY FOR CONFIGURATION

You will need the following equipment:

- The Cryoview level indicator to be configured.
- A computer running *Windows® 95*, *98*, *XP* or *2000*.
- The twisted pair Ethernet cable (white cable) delivered with the indicator.
- The power cable delivered with the indicator.

6.2 CONFIGURATION SEQUENCE

This paragraph describes the principal stages in the configuration sequence. These are:

- **Step 1**: the indicator is connected to a temporary power source and Ethernet PC connection (*see* paragraph 6.3).
- **Step 2**: The PC is assigned a temporary IP address for direct communication with the *Cryoview* level indicator using the Network Connections option on the PC's control panel (*see* paragraph 6.4).
- **Step 3**: The *Cryoview* level indicator is assigned an IP address using the PC's HyperTerminal application (*see* paragraph 6.5).
- **Step 4**: A connection is established between the PC and the indicator (*see* paragraph 6.6).
- **Step 5**: The *Cryoview* level indicator is configured using the HyperTerminal application (*see* section 7 on page 37). The *Cryoview* level indicator is then fitted to the tank, and a definitive Ethernet connection established. It is then checked before being put into use.

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6.3 STEP 1 – TEMPORARY CONNECTION

At this stage the *Cryoview* level indicator is connected to a PC using a twisted pair Ethernet cable. The procedure is as follows:

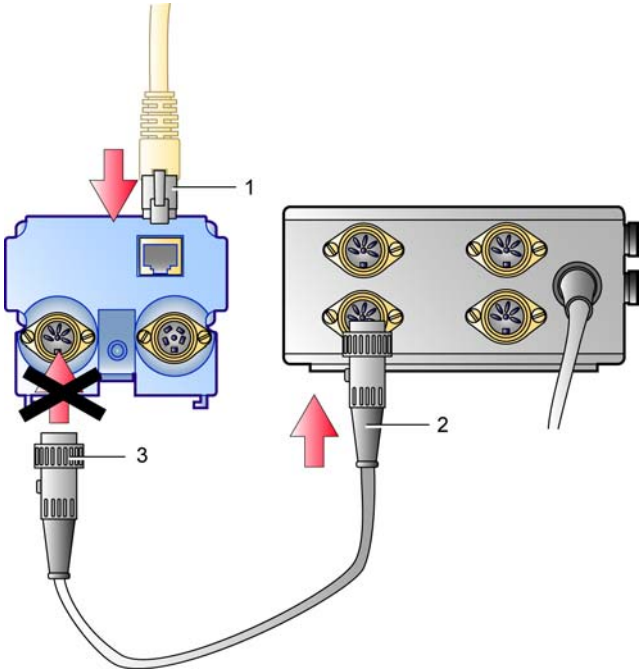
1. **Switch on the PC.**
   The operating system (*Windows* or other) boots up.
2. **Connect the twisted pair Ethernet cable (white cable) (1) to the computer and the RJ45 socket on the back of the *Cryoview* level indicator.**

> **Use the white twisted pair Ethernet cable delivered with the equipment.**

3. **Connect the power cable to the mains supply (2).**

> **Do not connect the other end of the power cable (3) to the *Cryoview* level indicator yet.**

Figure 6-1: Connecting the indicator before configuration



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6.4 STEP 2 – ASSIGNING A TEMPORARY IP ADDRESS TO THE PC

6.4.1 Explanation of the procedure

This step consists in assigning to the PC a temporary IP address in the same IP segment as the *Cryoview* level indicator, making it easier to set up communication.

When it leaves the factory, the *Cryoview* level indicator has the following IP address: 192.168.168.20.

We strongly recommend you observe the following procedure closely:

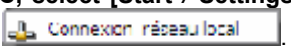
1. **Set the definitive IP address for the *Cryoview* level indicator.**
   If the *Cryoview* level indicator is to be connected to an Ethernet LAN, ask your sysadmin to assign the IP address.
2. **Assign an address near the indicator's address to the PC used for configuring the indicator. For instance: (IP-1) or (IP+1).**
   For instance: 192.168.168.019 or 192.168.168.021.

This procedure is described in detail in paragraph *6.4.2 – Operating mode*.

6.4.2 Operating mode

At this step the computer is assigned a temporary IP address using the *LAN Properties* option in *Windows*.

(Note: at this point the *Cryoview* level indicator is still disconnected from the power supply.) The procedure is as follows:

1. **On the PC, select [Start / Settings / Network Connections / Local Area Network]** 

   .

   The *LAN Properties* window appears (Figure 6-2, left).
2. **Click on *TCP/IP Protocol* and then on *Properties*.**
3. **The *(TCP/IP)* window appears (**Figure 6-2**, right).**

   Check the *Use the following IP address* box if not already selected.

   Note: if this box is already checked, take a note of the IP address and subnet mask in case you need to restore these settings in the future (Figure 6-2, right).

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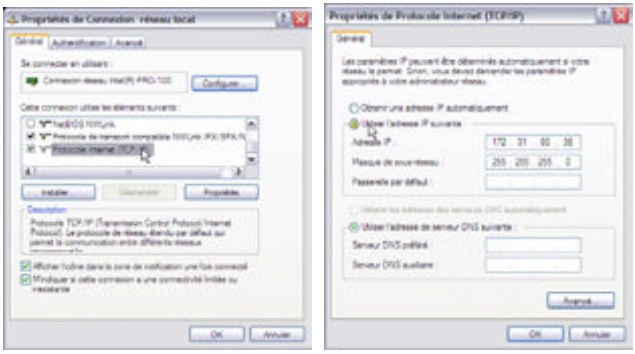
Enter the computer's current IP address and subnet mask below.

Is *Obtain an IP address automatically* selected?	☐ Yes	☐ No
Is *Use the following IP address* selected?	☐ Yes	☐ No
IP address (if present):	. . .	
Subnet mask (if present):	. . .	

4. **To test connectivity, enter the PC's temporary IP address.**
   In the present example, the computer's IP address is 172.31.80.38. *See* paragraph 6.4.1 - *Explanation of the procedure* for setting the IP address.
5. **Enter 255.255.255.0 for the subnet mask.**
6. **Close both windows by clicking on *OK* each time.**

Figure 6-2: Setting a temporary IP address on the PC



6.5 STEP 3 – SETTING THE INDICATOR'S IP ADDRESS

At this step the final IP address of the *Cryoview* level indicator is set using the *HyperTerminal* application included in *Windows*.

(Note: at this point the *Cryoview* level indicator is still disconnected from the power supply.)

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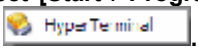
The procedure is as follows:

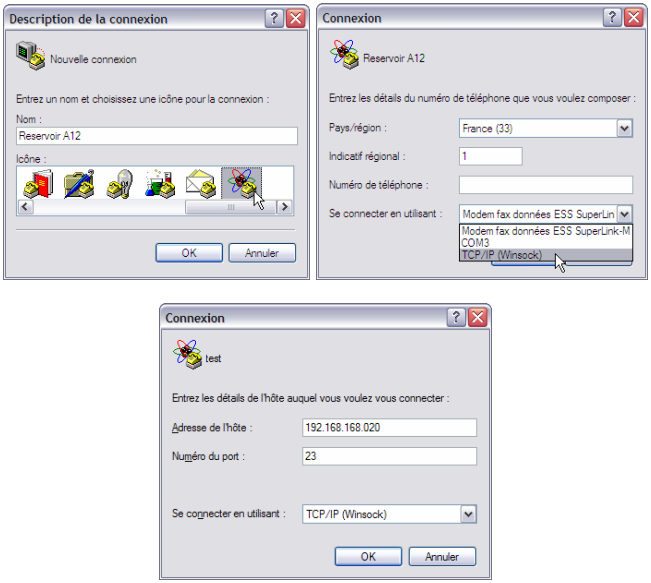
1. **On the PC, select [Start / Programs / Accessories / Communications / HyperTerminal]**  .
   The *New Connection* window appears (Figure 6-3, left).

2. **Enter the name of the *Cryoview* level indicator in the Name field. Select an icon from the Icon bar and click OK.**
   This name could be of the type *Pool A12*, for example.

3. **The *Connect To* window appears. In the *Connect using* field, select *TCP/IP (Winsock)*.**

4. **In the *Host address* field in the *Connection* window, enter the definitive IP address of the *Cryoview* level indicator.**
   In the present example, the indicator's IP address is 192.168.168.020 (the default address). *See* paragraph *6.4.1 - Explanation of the procedure* for setting the IP address.

Figure 6-3: Setting the indicator's final IP address – configuration sequence



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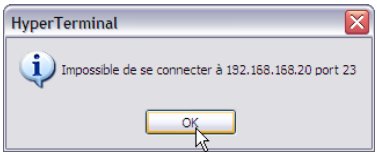
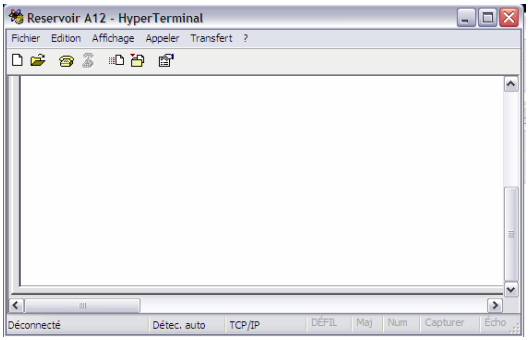
5. **Click on *OK*.**
   The message *Unable to connect to…* appears. (This is perfectly normal, as the *Cryoview* level indicator has not yet been connected to the power supply.)

Figure 6-4: At this point, the message is normal



6. **Click on *OK* to close the dialog box and return to the main *HyperTerminal* window.**

Figure 6-5: The main HyperTerminal window



6.6 STEP 4 – ESTABLISHING A CONNECTION BETWEEN THE PC AND THE *CRYOVIEW* LEVEL INDICATOR

This step provides instructions on how to establish a connection between the PC (HyperTerminal) and the *Cryoview* level indicator.

Please read these instructions carefully before proceeding.

On the *Cryoview* level indicator:

1. **Connect the *Cryoview* level indicator to the power supply *(1)*.**
   Notification of the connection appears in the lower left of the PC's monitor.

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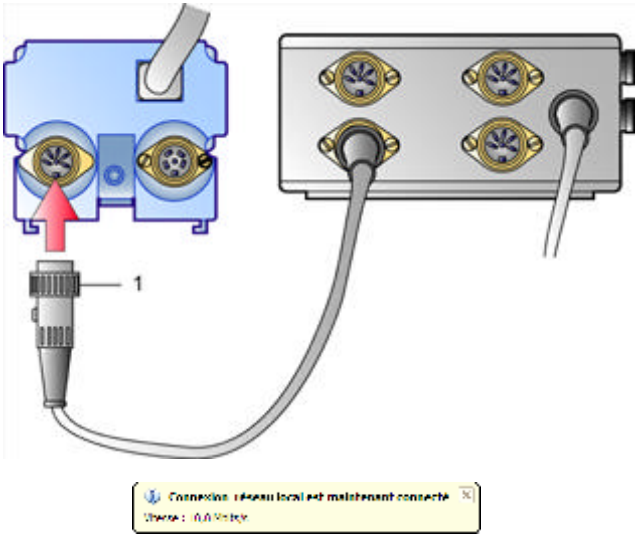
Figure 6-6: Connecting the Cryoview level indicator to the power supply



2. **The `Air Liquide` logo appears on the *Cryoview* level indicator's display.**

Figure 6-7: The display shows Air Liquide

3. **Press the key on the indicator several times in quick succession until the `Configuration NO` message appears.**

Figure 6-8: Configuration prompt

4. **With the display indicating `Configuration NO`, press to change `No` to `Yes`.**

Figure 6-9: Configuration confirmation prompt

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5. **Press the key to confirm. *Waiting for TELNET conn* appears on the display.**

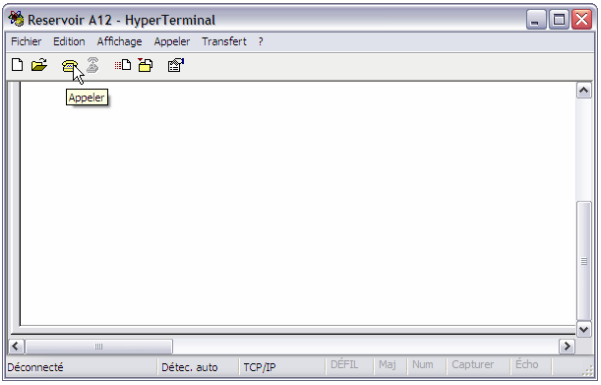
   From the moment this message appears the indicator has 30 seconds to establish a connection with *HyperTerminal* (point 6).

Figure 6-10: Waiting for connection with PC

On the PC, proceed as follows:

6. **In the main HyperTerminal window, click on the icon to establish communication with the *Cryoview* level indicator.**

Figure 6-11: Requesting connection with Cryoview



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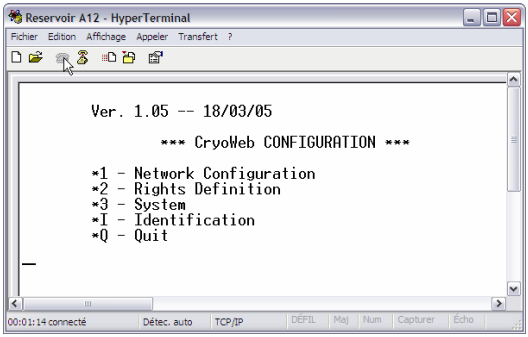
7. `Configuration TELNET` appears on the *Cryoview* display.
The *Cryoview* level indicator is now ready to be configured and HyperTerminal brings up the start menu.

Figure 6-12: Once the connection between HyperTerminal and the Cryoview indicator has been established the following message appears in Cryoview. The start menu appears in the HyperTerminal window



6.7 STEP 5 – FINAL CONFIGURATION OF THE *CRYOVIEW* LEVEL INDICATOR

This procedure is described in full in section *7 – Configuring the Cryoview level indicator* on page 37.

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7. Configuring the *Cryoview* level indicator

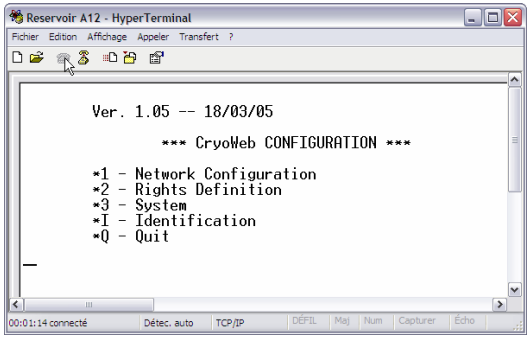
With this procedure the settings of the Cryoview level indicator can be configured using the HyperTerminal application included with Windows. The procedure comprises three main stages, plus a fourth stage in which the settings are tested to make sure they are correct.

7.1 THE START MENU

The procedure is as follows:

1. The **`CryoWeb CONFIGURATION` start menu appears in the HyperTerminal window.**
   A flashing cursor appears until a choice is entered (`1`, `2`, `3`, `I` or `Q`).

Figure 7-1: The start menu



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The options available are:

Option	Function	*See*
1	Defines the indicator's IP address and subnet mask.	§ 7.2, page 38.
2	Defines access rights (general configuration, relay automatic refill command, general and relay password) for the *Cryoview* level indicator.	§ 7.3, page 41.
3	Deletes the memory and returns the indicator to the factory settings, and enables a name to be given to the indicator for easier recognition in the browser.	§ 7.4, page 46.
I	Displays the configuration settings for the application.	§ 7.5, page 51.
Q	Closes the configuration window.	§ 7.6, page 52.

For the initial configuration you must follow the procedure described in paragraphs 7.2 to 7.6.

7.2 STAGE A: CONFIGURING THE IP ADDRESS AND SUBNET MASK

This section provides instructions on how to change the IP address of the *Cryoview* level indicator.

If the initially configured address (paragraph 6.5 on page 30) is correct, go directly to paragraph 7.3 on page 41.

To change the IP address of the *Cryoview* level indicator, proceed as follows:

1. **In the `CryoWeb CONFIGURATION` start menu, enter 1 on the PC keyboard.**
   The `*** Network configuration***` menu appears.

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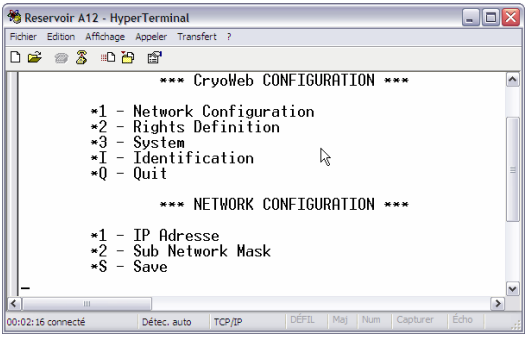
Figure 7-2: The network configuration menu



7.2.1 Defining the indicator's IP address

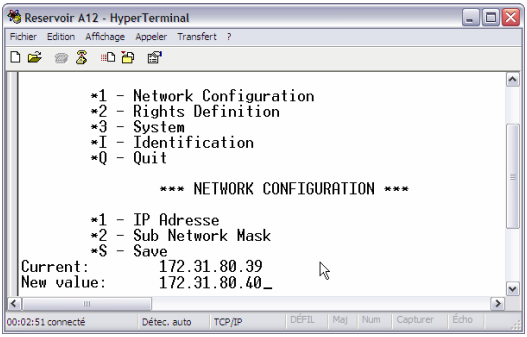
1. **To change the IP address, enter "1" (`IP Address`) on the PC keyboard.** The `Current` field indicates the current IP address of the *Cryoview* level indicator.

2. **Enter the new IP address (which appears in the `New value` line) in `xxx.xxx.xxx.xxx` format (`xxx` can be any value between 000 and 255 inclusive) and confirm by pressing Enter ↵.**

For *Cryoview* level indicators connected to an Ethernet LAN, you must ask your sysadmin to provide a legitimate IP address.

The change is stored and the **Configuration** menu appears again. Make sure you save the changes (*see* paragraph 7.2.3).

Figure 7-3: Changing the IP address (example)



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7.2.2 Changing the indicator's subnet mask

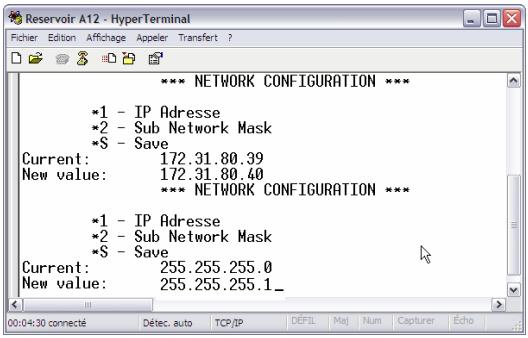
1. To change the indicator's subnet mask, enter "2" on the PC keyboard.
The `Current` line indicates the current IP address of the *Cryoview* level indicator.

2. **Enter the new subnet mask (which appears in the `New value` line) in `xxx.xxx.xxx.xxx` format (`xxx` can be any value between 000 and 255 inclusive) and confirm by pressing Enter ↵.**
A summary of address classes is given in the table below.

	Addresses	
Class	**Lower limit**	**Upper limit**
A	0.0.0.0	126.255.255.255
B	128.0.0.0	191.255.255.255
C	192.0.0.0	223.255.255.255

The change is stored and the **Configuration** menu appears again. Make sure you save the changes (*see* paragraph 7.2.3).

Figure 7-4: Changing the subnet mask (example)



7.2.3 Saving changes

In the `*** Network configuration ***` menu, proceed as follows:

1. **Enter "S" on the PC keyboard to save the changes you have made.**
The `Configuration` menu appears once again.

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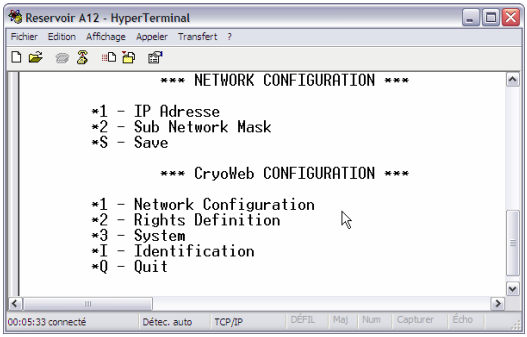
Figure 7-5: Return to start menu after saving changes

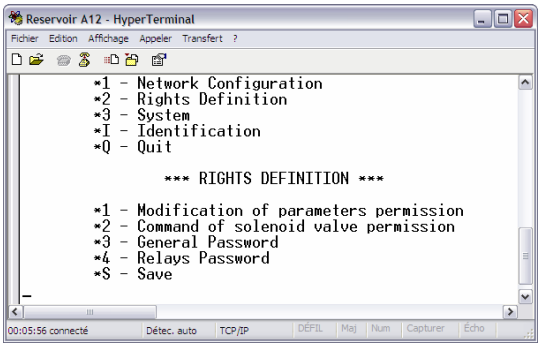


7.3 STAGE B: CONFIGURING ACCESS RIGHTS

This section gives instructions on how to define access rights (general configuration, solenoid relay automatic refill command, general and solenoid relay password) for the *Cryoview* level indicator. To change access rights, proceed as follows:

1. **In the `*** CryoWeb CONFIGURATION***` start menu, enter 2 (`Rights definition`) on the PC keyboard**.
   The `*** Rights definition ***` menu appears.

Figure 7-6: The rights definition menu



7.3.1 Modification of parameters permission

The procedure is as follows:

1. **To select the `Modification of parameters permission` option, enter "1" on the PC keyboard.**
   The following prompt appears: `Allowed? (Y/N).`

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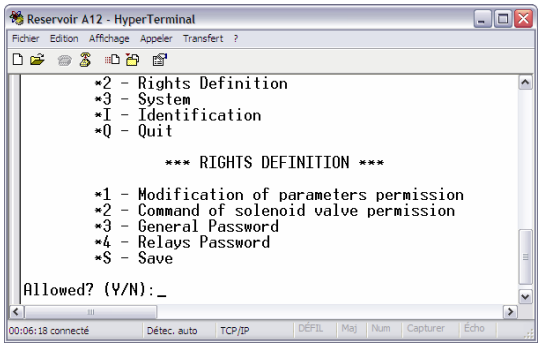
2. **Enter "`Y`" (yes) or "`N`" (no) on the PC keyboard.**

   - `Y` (yes): the user has permission to change all parameters. All the changes available on the **`Settings`** menu (*see* section 14 on page 79) are authorized.
   - `N` (no): the user does not have permission to change the parameters. The changes available on the **`Settings`** menu (*see* section 14 on page 79) are not authorized.

   The application automatically returns to the menu shown in Figure 7-6 (no need to press ↵).

Figure 7-7: The rights definition menu for modification of parameters



7.3.2 Command of solenoid valve permission

Access rights for this option are independent of parameter modification rights (paragraph 7.3.1). The procedure is as follows:

1. **To select the `Command of solenoid valve permission` option, enter "2" on the PC keyboard.**
   The following prompt appears: `Allowed? (Y/N).`

2. **Enter "`Y`" (yes) or "`N`" (no) on the PC keyboard.**

   - `Y` (yes): the user can remotely operate the refill solenoid. In other words, remote control of the solenoid relay via the **`Commands`** menu (*see* section 15 on page 85) is authorized.
   - `N` (no): the user cannot remotely operate the refill solenoid. In other words, remote control of the solenoid via the **`Commands`** menu (*see* section 15 on page 85) is forbidden.

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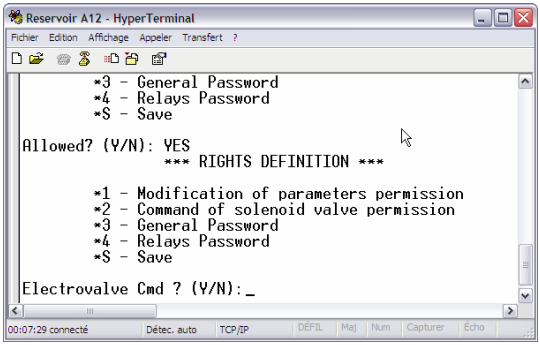
The application automatically returns to the menu shown in Figure 7-6 (no need to press ↵). Make sure you save the changes you've made (*see* paragraph 7.3.5).

Figure 7-8: The command of solenoid valve rights definition prompt



7.3.3 Setting the general password

This password is the one requested by the application in the **Settings** menu (*see* paragraph 14.3.4 on page 83). The default password is **DMC**.

This password is case-sensitive (upper or lower case).

The procedure is as follows:

1. **To set the general password, enter "3" on the PC keyboard.**
   The **Current** line indicates the current password.

2. **Enter the new password in the New value line. The password can be any sequence of alphanumeric characters to a maximum of 8 characters. Confirm by pressing ↵.**
   The change is stored and the menu shown in Figure 07-6 appears again. Make sure you save the changes you've made (*see* paragraph 7.3.5).

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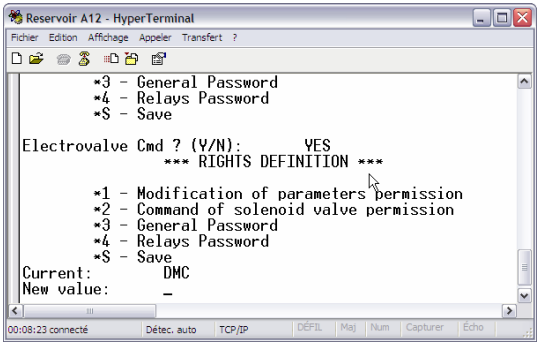
Figure 7-9: Changing the general password on the rights definition menu



7.3.4 Setting the relays password

This is the password requested by the application in the **Commands** menu for online control of the refill solenoid (*see* paragraph 15.2 on page 86). The default password is **DMC**.

This password is case-sensitive (upper or lower case).

The procedure is as follows:

1. **To define the relays password, enter "4" on the PC keyboard.**
   The **Current** line indicates the current password.

2. **Enter the new relay password in the New value line. This password may be any sequence of alphanumeric characters to a maximum of 8 characters. Confirm by pressing ↵.**
   The change is stored and the menu shown in Figure 7-6 appears again. Make sure you save the changes you've made (*see* paragraph 7.3.5).

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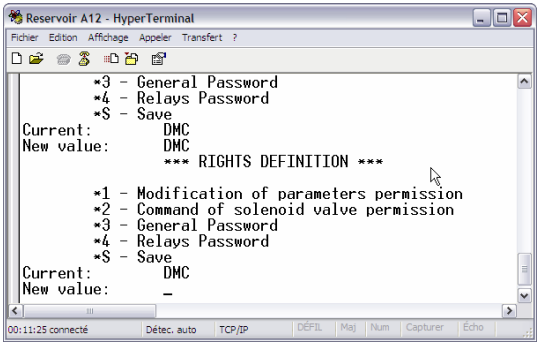
Figure 7-10: Changing the relays password on the rights definition menu

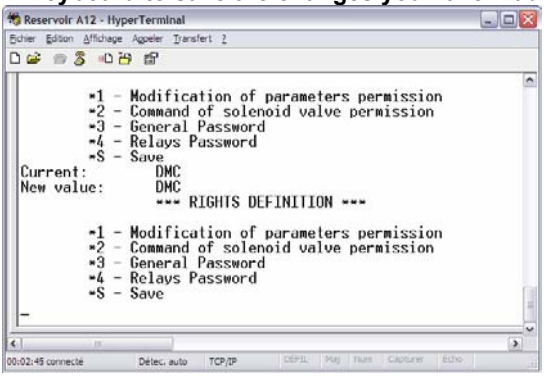


7.3.5 Saving changes

In the **`*** Rights definition ***`** menu, proceed as follows:

1. Enter "S" on the PC keyboard to save the changes you have made.

Figure 7-11: Waiting for save confirmation



The **`Configuration`** menu appears once again.

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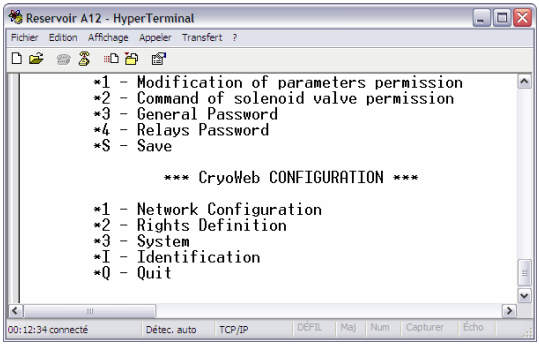
Figure 7-12: Return to start menu after changes are saved

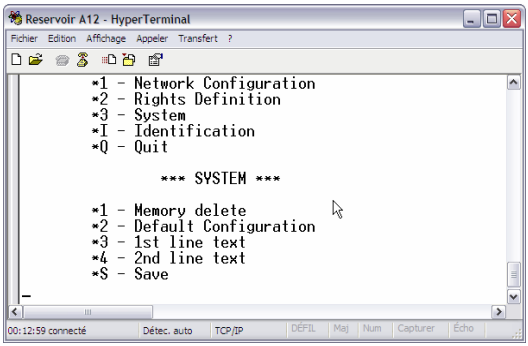


7.4 STAGE C: CONFIGURING THE SYSTEM

At this stage you can delete the application's memory, reset its factory settings, and define a name of your choice for the indicator for easier recognition in the browser. The procedure is as follows:

1. **In the `*** CryoWeb CONFIGURATION***` menu, enter 3 (`System`) on the PC keyboard**.
   The `*** System ***` menu appears.

Figure 7-13: The System menu



7.4.1 Deleting the memory of the Cryoview level indicator

This action resets the data memory and events log of the *Cryoview* level indicator (*see* paragraph 4.7 on page 17). The procedure is as follows:

1. **To delete the memory, enter "1" (`Memory delete`) on the PC keyboard.**
   The prompt `Memory delete?` appears.

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2. **Enter "Y" (yes) or "N" (no) on the PC keyboard.**

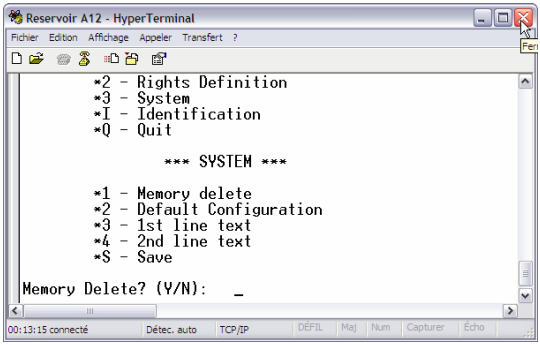
   - **Y** (yes): deletes all data from the *Cryoview* level indicator's memory.

   This operation may take up to 4 minutes.

   - **N** (no): returns to the menu shown in Figure 7-13 without deleting the memory.

   The application automatically returns to the menu shown in Figure 7-6 (no need to press ↵).

Figure 7-14: The memory delete prompt



7.4.2 Restoring the default configuration

This action returns the level indicator to its factory settings (*see* paragraph 4.8 on page 18). The procedure is as follows:

1. **To reset the level indicator to its factory settings, enter "2" (`Default configuration`) on the PC keyboard.**
   The `Default configuration?` prompt appears.

2. **Enter "Y" (yes) or "N" (no) on the PC keyboard.**

   - **Y** (yes): resets the *Cryoview* level indicator to its default configuration.

   Reset is immediate.

   - **N** (no): returns to the menu shown in Figure 7-13 without resetting the indicator.

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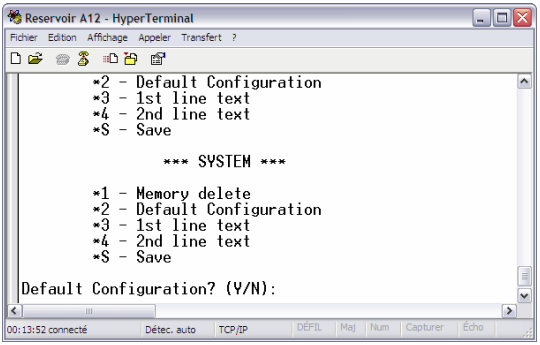
The application automatically returns to the menu shown in Figure 7-6 (no need to press ↵).

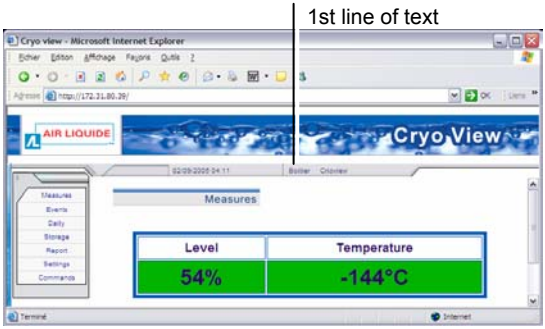
Figure 7-15: The restore default configuration prompt



7.4.3 Defining the first line of text

This action defines the first line of text displayed by the browser.

Figure 7-16: Location of the first line of text on the browser



The procedure is as follows:

1. **To define the first line of text, enter "3" on the PC keyboard.**
   The line shows `Current`.

2. **Enter the new line of text in the form of a sequence of alphanumeric characters to a maximum of 8 characters in the `New text` line. Confirm by pressing ↵.**
   The change is stored and the menu shown in Figure 7-6 appears again. Make sure you save the changes you've made (*see* paragraph 7.4.5).

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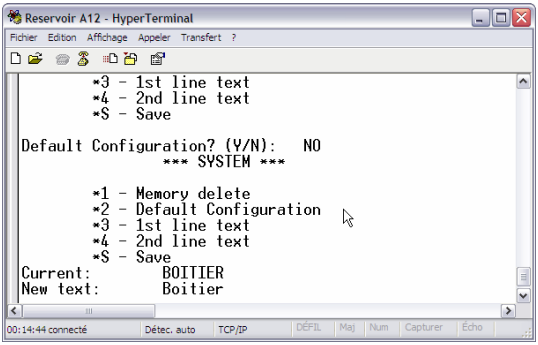
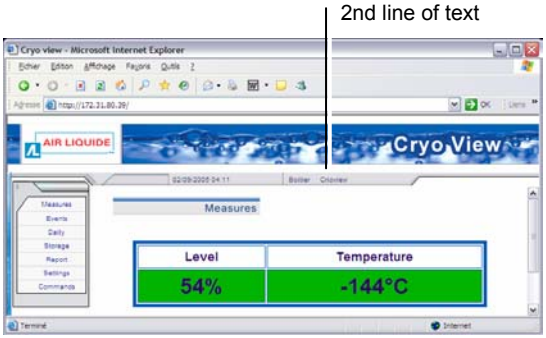
Figure 7-17: Defining the first line of text



7.4.4 Defining the second line of text

This action defines the second line of text displayed by the browser.

Figure 7-18: Location of the second line of text on the browser



The procedure is as follows:

1. **To define the second line of text, enter "4" on the PC keyboard. The** line shows **`Current`**.

2. **Enter the new line of text in the form of a sequence of alphanumeric characters to a maximum of 8 characters in the `New text` line. Confirm by pressing ↵.**
   The change is stored and the menu shown in Figure 7-6 appears again. Make sure you save the changes you've made (*see* paragraph 7.4.5).

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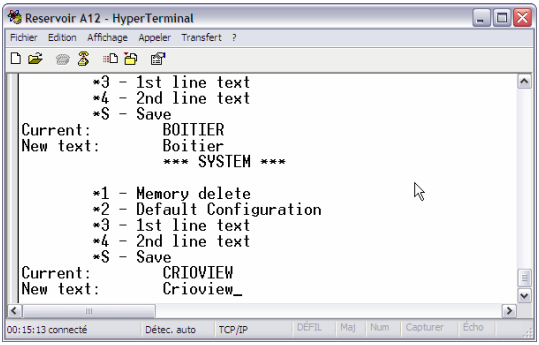
Figure 7-19: Defining the second line of text

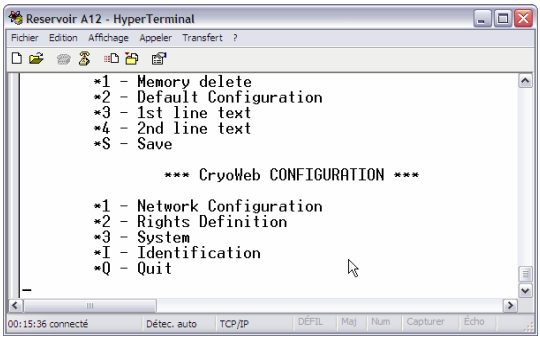


7.4.5 Saving changes

In the **`*** System ***`** menu, proceed as follows:

1. **Enter "S" on the PC keyboard to save the changes you've made.**
   The **`Configuration`** menu appears once again.

Figure 7-20: Return to Configuration menu after saving changes



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7.5 STAGE D: CHECKING CONFIGURATION

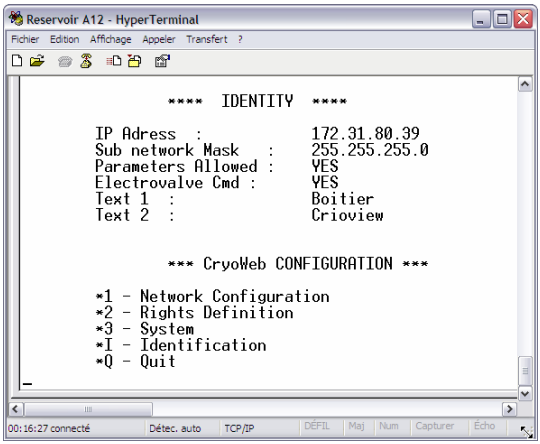
At this stage you can view the following parameters set by the application:

Parameter	*See* paragraph
IP address	7.2.1, page 39.
Subnet mask	7.2.2, page 40.
Parameters allowed	7.3.1, page 41.
Electrovalve cmd	7.3.2, page 42.
Text 1	7.4.3, page 48.
Text 2	0, page 49.

To view these settings, proceed as follows:

1. **In the `*** CryoWeb CONFIGURATION***` menu, enter "I" (`Identification`) on the PC keyboard.**
   The **`*** Identity ***`** menu appears.
   The application automatically returns to the *** `CryoWeb CONFIGURATION ***` menu.

Figure 7-21: Display of indicator parameters



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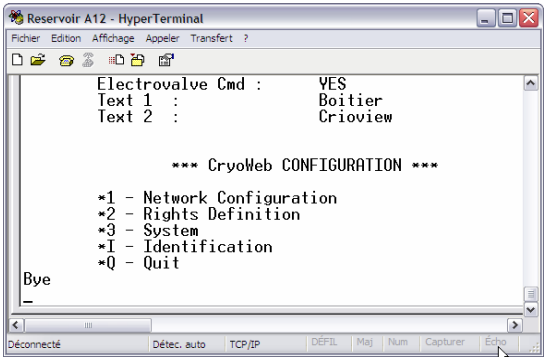
7.6 CLOSING HYPERTERMINAL

Once you have finished configuring the Cryoview level indicator you can quit the application. The procedure is as follows:

1. **In the `CryoWeb CONFIGURATION` (Figure 7-22) menu, enter "Q" on the PC keyboard.**
   A `Bye` message appears.

Figure 7-22: Quitting the application



The *Cryoview* level indicator display reads:

Figure 7-23: Indicator display sequence on closure of HyperTerminal

Since the *Cryoview* level indicator is not yet connected to the temperature indicator and therefore is receiving no temperature data, this error message is normal. Press the key on the indicator to disable the audio alarm.

2. **Select *Exit* from the HyperTerminal *File* menu to close the application.**

3. **Check the new configuration by launching the browser (*Internet Explorer* or other). Enter the IP address assigned to the indicator (*see* paragraph 7.2.1 on page 39) in the *Address* field. A screen similar to the one shown in Figure 8-1 on page 57 appears.**

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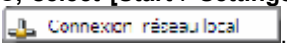
7.7 RESTORING THE COMPUTER'S INITIAL IP ADDRESS

This option allows you to restore the computer's initial IP address using the *LAN Properties* feature in Windows.

(This is the IP address noted in paragraph 6.4.2 on page 29.)

The procedure is as follows:

1. **On the PC, select [Start / Settings / Network Connections / Local Area Network]** 

.

   The *LAN Properties* window appears (Figure 6-2, page 30, left).

2. **Click on *Internet Protocol TCP/IP* and then on *Properties*.**

3. **The *Internet Protocol TCP/IP Properties* window appears (**Figure 6-2, page 30**, right).**

4. **Enter the address you noted in paragraph 6.4.2 on page 29.**
   - If the option *Obtain an IP address automatically* was checked, confirm this option and go to point 5.
   - If the *Use the following IP address* option was checked, enter the initial IP address and subnet mask. Continue to point 5.

5. **Close all windows by clicking on OK.**

7.8 DISCONNECTING THE INDICATOR

The *Cryoview* level indicator can now be disconnected (from Ethernet and the power supply) prior to normal installation. Consult section *16 – Assembly* on page 91 and section *17 – Connecting the Cryoview level indicator* on page 95.

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The application

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8. Introduction to the Cryoview application

This section describes the menus available for viewing the information transmitted by one or more Cryoview level indicators.

8.1 HOW TO VIEW INFORMATION

The measurements and other readings taken by the *Cryoview* level indicator(s) can be viewed via any common web browser on a computer running *Windows, Apple, Unix, Linux,* etc.

Once the *Cryoview* level indicator is online, all you have to do is launch the browser (*Internet Explorer, Netscape*, *Firefox*, etc.) on your computer (*PC, Mac*, etc.) and enter the IP address of the indicator.

8.2 PURPOSE OF THE APPLICATION

The application typically appears as shown below:

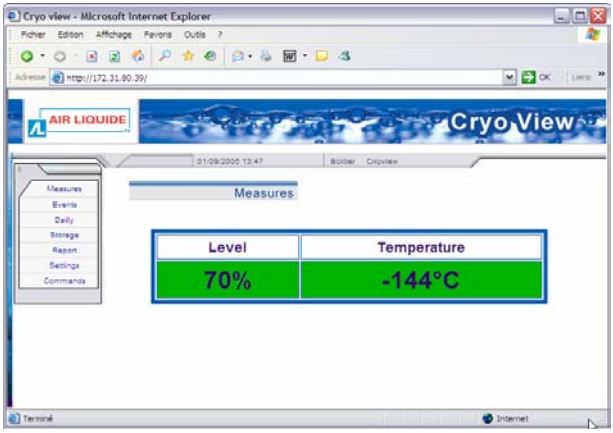

Figure 8-1: How Cryoview level indicator information typically appears on the web browser

This application allows you to:

- View the measurements taken by the *Cryoview* level indicator and the temperature indicator.

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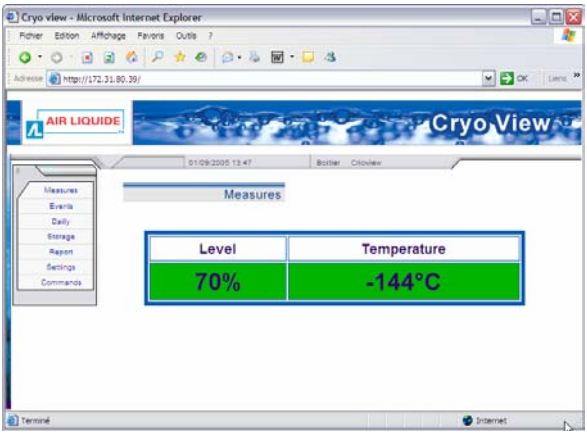
- Consult current and past events logs.
- Set alarm thresholds (this function is protected by the *general password*).
- Remotely operate the relay controlling nitrogen refill (this function is protected by the *relay password*).

8.3 MENU

All menu items are in English and are displayed on the left hand side of the page.

Figure 8-2: The menu is on the left



Menu item	What it does	*See*
Measures	Displays real-time level and temperature readings for the nitrogen contained in the tank monitored by the level and temperature indicator (its IP address is shown in the browser's Address bar).	9, page 61.
Events	Displays real-time details on alarms triggered by measurements of the level and temperature of the nitrogen contained in the tank monitored by the level and temperature indicator (its IP address is shown in the browser's Address bar) and the status of the solenoid relay which controls refill operations.	10, page 63.

Cont. on following page.

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Table cont. from previous page.

Menu item	What it does	See
Daily	Displays a report for the current day in the form of measurements taken every 10 minutes by the level and temperature indicators mounted on the tank (the IP address is shown on the browser's Address bar).	11, page 67
Storage	Displays, in graph form, a report for the tank monitored by the level and temperature indicators on the day indicated (the IP address is shown in the browser's Address bar).	12, page 75
Report	Displays, in table form, a report of the measurements and events recorded by the level and temperature indicators monitoring the tank on the day selected (the IP address is shown in the browser's Address bar).	13, page 77
Settings	Defines time and alarm threshold parameters (level and temperature) for the tank monitored by the level and temperature indicators (the IP address is shown in the browser's Address bar). Access to this menu is protected by the *general password*.	14, page 79.
Commands	Remotely activates control of the nitrogen refill solenoid relay in the tank monitored by the level and temperature indicators (the IP address is shown in the browser's Address bar). Access to this menu is protected by the relays password.	15, page 85.

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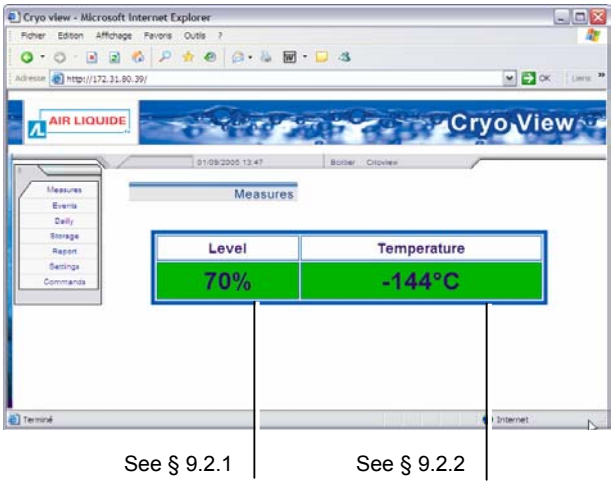
9. The *Measures* menu item

This item displays real-time level and temperature readings for the nitrogen contained in the tank monitored by the level and temperature indicators (the IP address is shown in the browser's Address bar).

9.1 SCREEN

The screen appears as follows:

Figure 9-1: The Measures page



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9.2 INFORMATION DISPLAYED

Information is displayed in a numeric and colour-code combination:

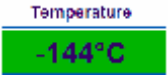
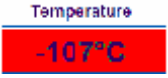
9.2.1 Level

This field displays the level of liquid nitrogen in the tank being monitored.

Description	Example
Spot nitrogen level reading for the tank being monitored, expressed as a percentage of the tank's maximum capacity (in the example, 70%). Maximum capacity is mechanically limited by a factory-installed level cutoff.	
Green background: the level of liquid nitrogen in the tank is within the upper and lower alarm thresholds. In other words, neither of the programmed nitrogen level alarm thresholds (*see* § 14.3.4 on page 83) has been breached.	
Red background: the nitrogen level has fallen below the lower alarm threshold or exceeded the upper alarm threshold (*see* § 0 on page 83). The background reverts to green once the level is once again within the acceptable limits. The threshold which triggered the alarm can be viewed by selecting *Events* (*see* paragraph 10.2 on page 64). The level indicator emits an audio alarm.	

9.2.2 Temperature

This field displays the temperature of the liquid nitrogen in degrees Celsius.

Description	Example
Spot temperature of the liquid nitrogen in °C.	
Green background: the temperature of the liquid nitrogen in the tank is within the programmed thresholds; i.e. the alarm thresholds (*see* § 0 on page 83) have not been breached.	
Red background: the temperature of the liquid nitrogen in the tank is outside the programmed thresholds; i.e. one of the alarm thresholds (*see* § 14.3.4 on page 83) has been exceeded. The temperature indicator emits an audio alarm.	

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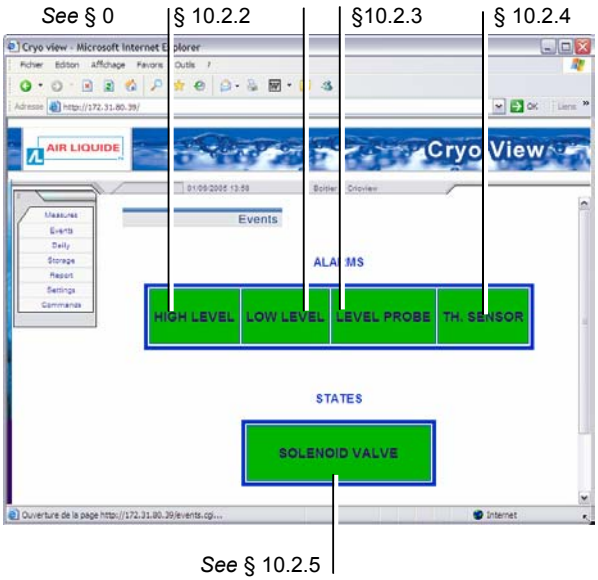
10. The Events menu item

This item displays real-time details on alarms triggered by measurements of the level and temperature of the nitrogen contained in the tank monitored by the level and temperature indicators (the IP address is shown in the browser's Address bar) and the status of the solenoid relay which controls refill operations.

10.1 SCREEN

The screen appears as follows:

Figure 10-1: The alarms page



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10.2 INFORMATION DISPLAYED

Information is displayed in a numeric and colour-code combination. Alarm thresholds are defined below.

10.2.1 High level

This field displays the alarm status for the liquid nitrogen level in the tank being monitored.

Description	Example
Alarm status for the upper threshold of the liquid nitrogen contained in the tank relative to the programmed alarm threshold (*see* § 0 on page 83).	
• **Green background**: the level is below the upper alarm threshold.	
• **Red background**: the level is above the upper alarm threshold. When the upper alarm threshold has been exceeded, the level indicator emits an audio alarm. The display indicates the level accompanied by an upward arrow ↑ and the LED lights up (*see* § 0 on page 83).	

10.2.2 Low level

This field displays the alarm status for the lower alarm threshold of the liquid nitrogen in the tank being monitored.

Description	Example
Alarm status for the lower threshold of the liquid nitrogen contained in the tank relative to the programmed alarm threshold (*see* § 0 on page 83).	
• **Green background**: the level is above the lower alarm threshold.	
• **Red background**: the level is below the lower alarm threshold. When the lower alarm threshold has been exceeded, the level indicator emits an audio alarm. The display indicates the level accompanied by a downward arrow ↓ and the LED lights up (*see* § 0 on page 83).	

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10.2.3 Level probe

This field displays the alarm status for the liquid nitrogen level probe in the tank being monitored.

Description	Example
Alarm status for the tank's level sensor.	
• **Green background**: the sensor is connected and working properly.	
• **Red background**: fault in level acquisition. The level indicator's display shows either `Err Probe` or `Err measure`, depending on the nature of the mechanical problem in the level indicator (*see* § 20.1 on page 107).	

10.2.4 Th sensor (thermometer)

This field displays the alarm status for the liquid nitrogen temperature sensor in the tank being monitored.

Description	Example
Alarm status for the tank's temperature sensor.	
• **Green background**: the temperature sensor is connected and working properly.	
• **Red background**: problem with temperature sensor. The level indicator's display shows either `Err Probe` or `Err measure`, depending on the nature of the mechanical problem (*see* § 20.1 on page 107).	

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10.2.5 Solenoid valve

This field displays the status of the remote command link to the liquid nitrogen refill solenoid in the tank being monitored.

Description	Example
Status of the remote command link to the liquid nitrogen refill solenoid	
• **Green background**: solenoid closed (no refill).	
• **Orange background**: solenoid open, refill in progress.	

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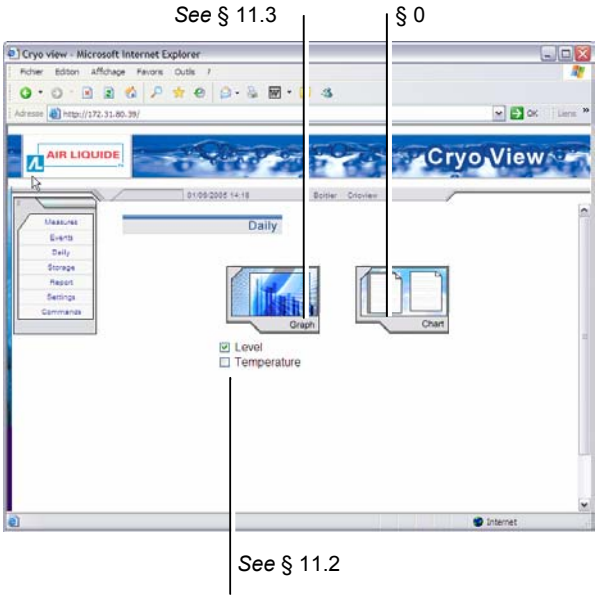
11. The Daily menu item

This item displays a report for the current day, in the form of measurements taken every 10 minutes by the level and temperature indicators mounted on the monitored tank (the IP address is shown on the browser's Address bar).

11.1 SCREEN

The screen appears as follows:

Figure 11-1: The Daily page



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11.2 SELECTING WHICH DATA IS DISPLAYED

To select which data you want to be displayed, proceeds as follows:

Figure 11-2: Selecting which data is displayed

1. Select Level or Temperature by checking the appropriate box (Level or Temperature).
2. Display the selection (Level or Temperature) in Graph or Chart format by clicking on the appropriate icon.

11.3 DISLAY IN GRAPH FORMAT

After selecting Level or Temperature and then selecting Graph format, a new window opens as shown in the example below.

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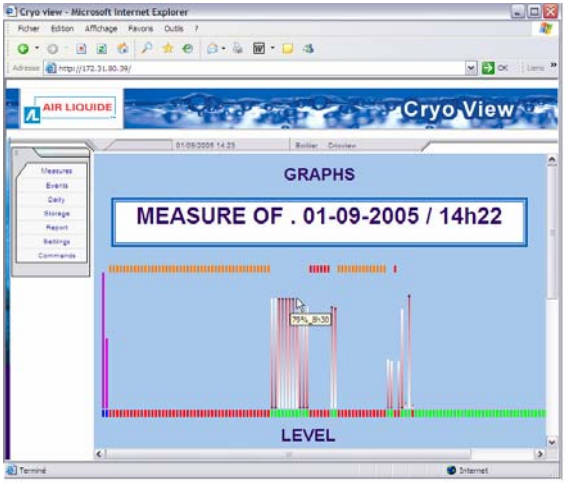
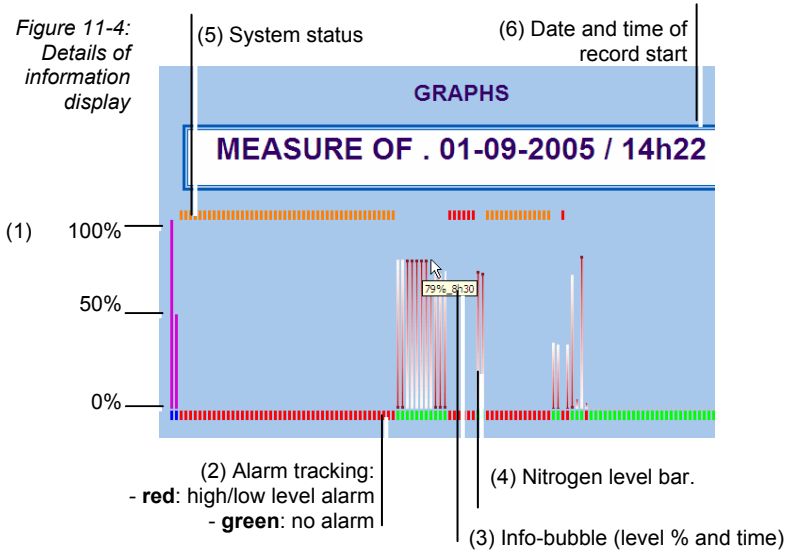
Figure 11-3: Information is displayed in graph format



How to read the information:

Figure 11-4: Details of information display



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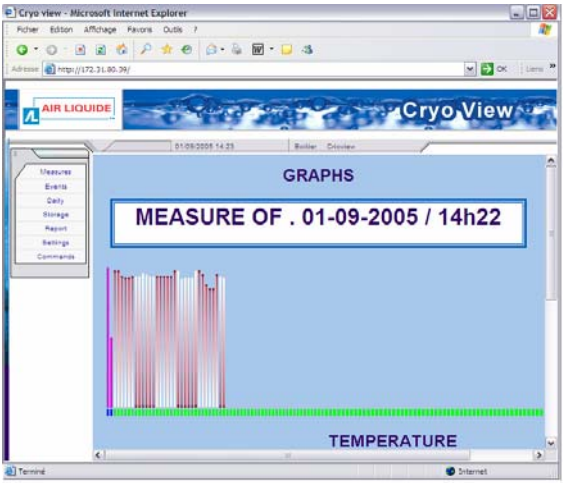
No.	Description
1	Vertical axis plotting level values by 0, 50 and 100% of level.
2	Horizontal (time) axis: each block of 6 bars represents one hour of measurements. Horizontal alarm axis: - green bar: no upper or lower threshold alarm triggered - red bar: upper or lower alarm threshold alarm triggered
3	Info-bubble: move the mouse pointer over the top of a graph bar to bring up an info-bubble showing the level measured and the time the measurement was taken.
4	Level barometer: each block of 6 bars represents one hour of measurements.
5	Alarm status bars: - red bar: system stopped - orange bar: no measurement - no bar: system working properly
6	Date and time of beginning of measurements.

Readings for the temperature of the liquid nitrogen in the tank being monitored can be displayed in similar form, as shown below.

Figure 11-5: Temperature information displayed in graph format



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Temperature and level readings can be combined in the same graph by checking both boxes as follows: ☑ Level and ☑ Temperature (Figure 11-3).

11.4 DISPLAY IN CHART FORMAT

This selection displays level and temperature information in the form of two charts which open in a new window. The chart window is divided into two areas:

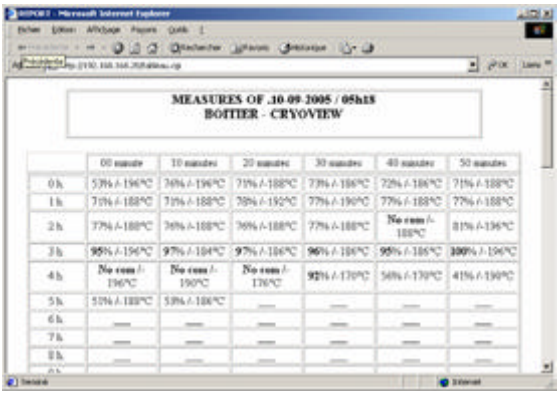
- **Top** – contains data (*see* paragraph 11.4.1).
- **Bottom** – displays the events log (*see* paragraph 11.4.2).

11.4.1 Top part of the window (data)

This area displays the data in chart form as follows:

- Each line represents one hour of readings; the start time is shown at the top.
- Each column represents an interval of 10 minutes relative to the line's start time.
- Each square therefore displays the level and temperature readings at a certain time.
- Readings displayed in bold indicate that an alarm is associated with the reading. This alarm reading is included in the events log table (*see* paragraph 11.4.2).

Figure 11-6: The top part of the window displays the readings; each box represents an interval of 10 minutes



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11.4.2 Bottom part of the window (log)

This area presents data in the form of an events log. All actions invoked by the *Cryoview* level indicator are classed as events.

Table 3: Events in alphabetical order.

Cap Closing
Cap Opening
Communication Restart
Communication Stop
End of High Level Alarm
End of Level Detector Alarm
End of Low Level Alarm
End of Overflow Alarm
End of th comm. Alarm
End of Thermometer Alarm
High Level Alarm
Level Detector Alarm
Loc. solenoid valve Closing
Loc. solenoid valve Opening
Low Level Alarm
Low Level Reached
Low level Return
Overflow Alarm
Solenoid valve Closing
Solenoid valve Opening
System Restart
Th comm. Alarm
Thermometer Alarm

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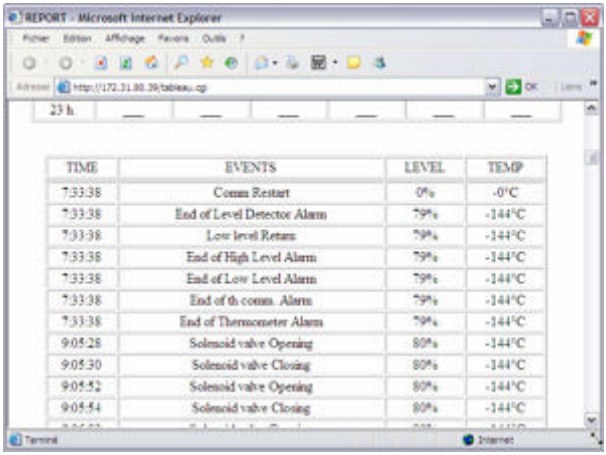
How to read the table:

- Each line represents an event detected by the *Cryoview* level indicator, either in the indicator itself or in the temperature indicator.
- The *TIME* column indicates the time the event was detected.
- The *EVENTS* column specifies the type of event logged.
- The *LEVEL* column indicates the liquid nitrogen level at the time of the event.
- The *TEMPERATURE* column indicates the liquid nitrogen temperature at the time of the event.

Figure 11-7: The bottom part of the window displays the events log



The events log table shows all events logged for the current day. Up to 4096 timestamped events can be logged for any given period. Once more than 4096 events are logged, the oldest events are deleted.

The events log table can be manually deleted (*see* 7.4.1 on page 46).

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The *Cryoview* level indicator takes temperature and level readings once every 10 minutes and stores them in its memory for 366 days.

Only the 4096 most recent events are memorized by the *Cryoview* level indicator.

Users are responsible for saving the logs events they wish to preserve.

11.5 SAVING LOGS AND EVENTS

The logs and events displayed by the browser in HTML format can be saved by selecting *Save as* from the *File* menu. **Air Liquide cannot accept responsibility for data lost as a result of save operations**.

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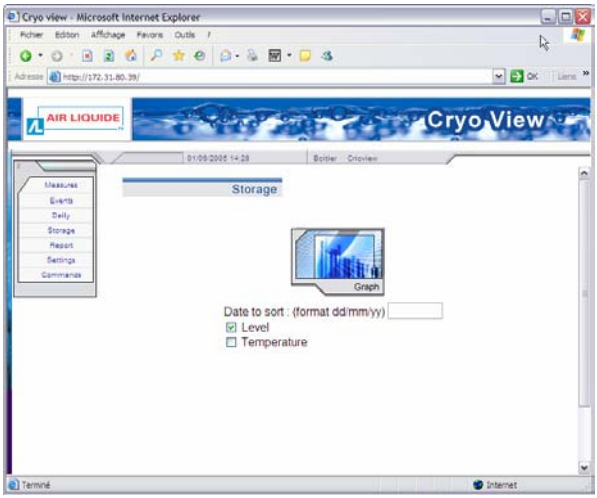
12. The *Storage* menu item

This menu displays, in graph form, a report for the tank monitored by the level and temperature indicators on the day indicated (the IP address is shown in the browser's Address bar).

12.1 SCREEN

The screen appears as follows:

Figure 12-1: The Storage page



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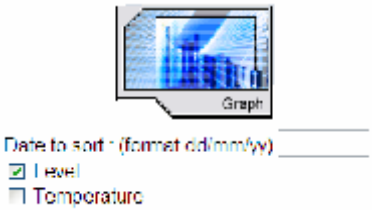
12.2 SELECTING WHICH DATA IS DISPLAYED

To select which data you want to be displayed, proceed as follows:

Figure 12-2: Selecting which data is displayed



1. Select the date in DD/MM/YY format, for instance 05/09/05 for 5 September 2005.
2. Select Level and/or Temperature by checking the appropriate box (Level or Temperature).
3. Click on the *Graph* icon to open the corresponding graph in a new window.

12.3 VIEWING MEASUREMENTS

The window displays data in the form of a graph as described in paragraph 11.4.1 on page 71. The only difference is in the duration of display, which is always 24 hours.

12.4 SAVING MEASUREMENTS

The measurements displayed by the browser in HTML format can be saved by selecting *Save as* from the *File* menu. **Air Liquide cannot accept responsibility for data lost as a result of save operations**.

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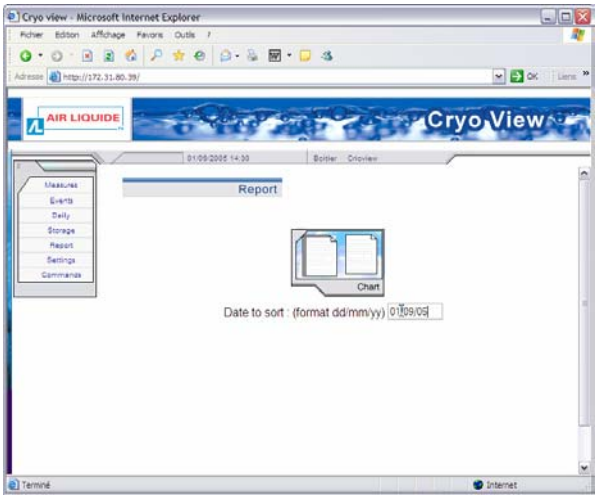
13. The *Report* menu item

This item displays, in table form, a report of the measurements and events recorded by the level and temperature indicators monitoring the tank on the day selected (the IP address is shown in the browser's Address bar).

13.1 SCREEN

The screen appears as follows:

Figure 13-1: The Report page



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13.2 SELECTING WHICH DATA IS DISPLAYED

To select which data you want to be displayed, proceed as follows:

Figure 13-2: Selecting which data is displayed

1. Select the date in DD/MM/YY format, for instance 05/09/05 for 5 September 2005.
2. Click on the *Chart* icon to open the corresponding chart in a new window.

13.3 VIEWING MEASUREMENTS

The page displays data in the form of a chart as described in paragraph 11.4.2 on page 72. The only difference is in the duration of display, which is always 24 hours.

13.4 SAVING MEASUREMENTS

The information displayed by the browser in HTML format can be saved by selecting *Save as* from the *File* menu. **Air Liquide cannot accept responsibility for data lost as a result of save operations**.

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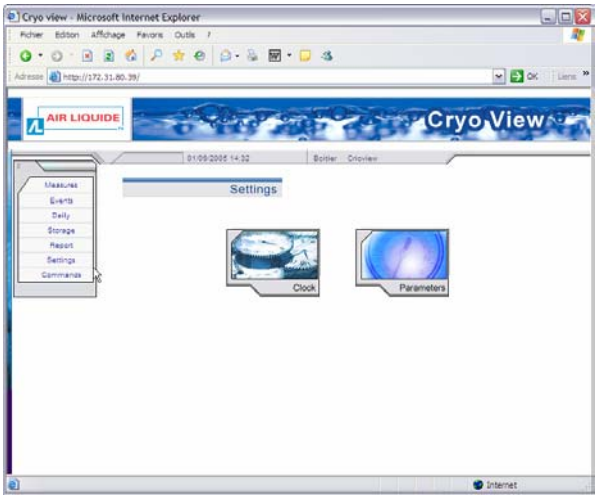
14. The *Settings* menu item

This item lets you set clock and alarm threshold (level and temperature) parameters for the tank monitored by the level and temperature indicators (the IP address is shown in the browser's Address bar). Access to this item is protected by the general password.

14.1 SCREEN

The screen appears as follows:

Figure 14-1: The Settings page



Access to the Settings page is protected by the General password defined during configuration of the *Cryoview* level indicator (*see* paragraph 7.3.3 on page 43).

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14.2 ADJUSTING THE CLOCK SETTINGS

The clock is resident in the *Cryoview* level indicator's internal circuitry. It remains active even when the level indicator is disconnected from the power supply. Clock settings are preserved for around 1 hour after the level indicator is disconnected from the power supply.

The procedure is as follows:

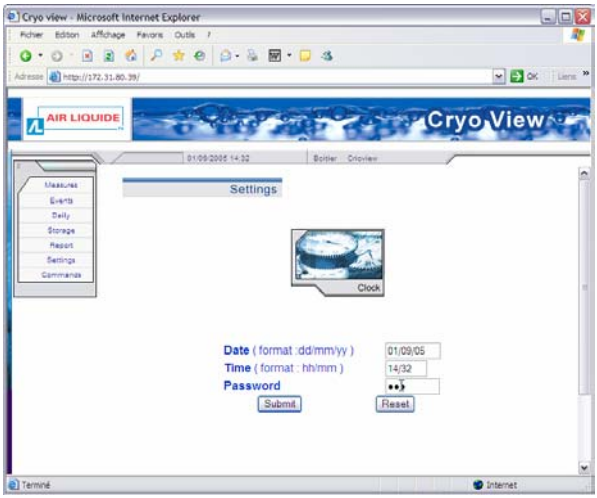
1. **In the *Settings* page (14-1), select *Adjust Clock Settings* and click on the *Clock* icon.**

Figure 14-2: Adjusting clock settings

2. **In the page which now opens (14-3), enter the values:**

   - **Date**: enter the date in **DD/MM/YY** format, e.g. **12/09/05** for 12 September 2005.
   - **Time**: enter the time in **HH/MM** format, e.g. **12/34** for 12.34 pm.

Figure 14-3: Adjusting the clock settings



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3. **Enter the password.**

   (This password is the general password defined during configuration of the *Cryoview* level indicator (*see* paragraph 7.3.3 on page 43).

4. **Click on the *Submit* button.**

   - If the password is correct and the clock settings have been correctly sent to the *Cryoview* level indicator, an icon (*Time setting done)* with the current date and time appears.
   - If the password is incorrect or the clock settings have not been correctly sent to the *Cryoview* level indicator, an *Invalid action* icon appears.

Figure 14-4: Icons displayed for successful (left) or unsuccessful (right) adjustment to clock settings

5. **Return to the *Settings* page (14-1) by clicking on the *Settings* menu.**

14.3 SETTING ALARM THRESHOLDS

14.3.1 Overview

Alarm thresholds are stored in the *Cryoview* level indicator's memory. There are five thresholds in all. A description of how they are defined is given below.

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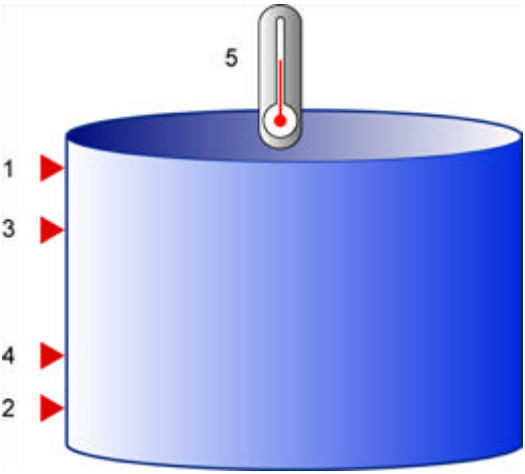
Each threshold is associated to a parameter for monitoring the level of liquid nitrogen in the tank, distributed as follows:

Figure 14-5: Distribution of alarm threshold monitors in the tank



No.	Description
1.	High level alarm
2.	Low level alarm
3.	Threshold high level
4.	Threshold low level
5.	Temp. alarm

14.3.2 Alarm threshold restrictions

All user-configured alarm thresholds must respect the following conditions:

- [Low level alarm] ≥ 5%
- [Low level alarm] ≤ [Threshold low level] - 5%
- [Threshold low level] ≥ 10%
- [Threshold low level] ≤ 90%
- [High level alarm] ≥ [Threshold high level] +5%
- [High level alarm] ≤ 95%

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14.3.3 Recommended alarm thresholds

The generally used alarm thresholds are:

	Phase	
Threshold	**Liquid**	**Gas**
Threshold high level	80%	80% (*)
Threshold low level	50%	40% (*)
High level alarm	90%	95% (*)
Low level alarm	40%	25% (*)
Temp. alarm	-130 °C	-130 °C

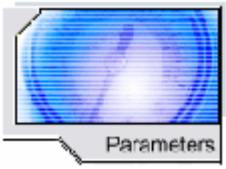
(*) These thresholds cannot be changed. They are set by default for indicators monitoring tanks containing nitrogen in the gaseous state.

14.3.4 Setting alarm thresholds

To set alarm thresholds, proceed as follows:

1. **On the *Settings* page (Figure 14-1), click on the *Parameters* icon to open parameter options.**

Figure 14-6: Setting alarm thresholds



2. **Enter values for the alarm thresholds in the new page (Figure 14-7).** *See* paragraphs 14.3.1 and 14.3.3 for more details on this operation.

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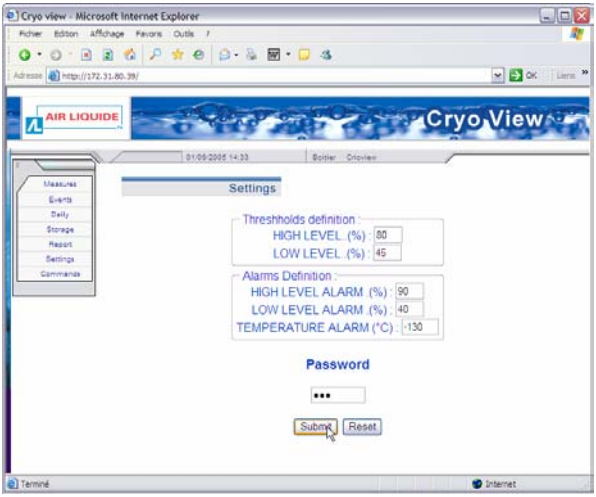
Figure 14-7: Setting alarm thresholds



3. **Enter the password.**
   This password is the general password defined during configuration of the *Cryoview* level indicator (*see* paragraph 7.3.3 on page 43).

4. **Click on the *Submit* button.**

   - If the password is correct and the settings have been correctly sent to the *Cryoview* level indicator, a *Success* icon appears.
   - If the password is incorrect or the settings have not been correctly sent to the *Cryoview* level indicator, an *Invalid action* icon appears.

Figure 14-8: Icons displayed after successful (left) or unsuccessful (right) definition of alarm thresholds

5. **Return to the *Settings* page (Figure 14-1) by clicking on the *Settings* menu item.**

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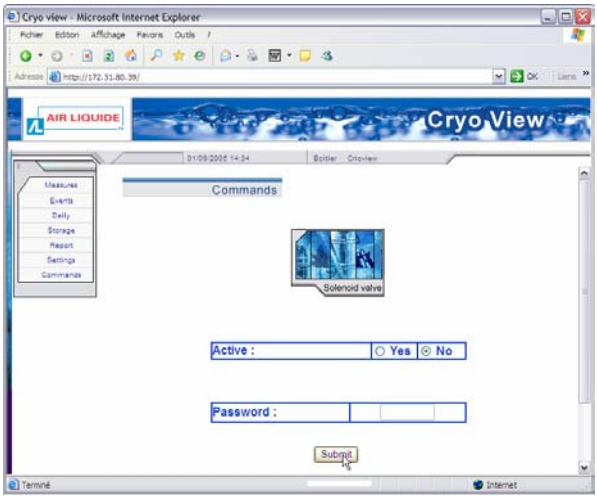
15. The *Commands* menu item

This menu lets you remotely control of the nitrogen refill solenoid in the tank monitored by the level and temperature indicators (the IP address is shown in the browser's Address bar). Access to this item is protected by the relays password.

15.1 SCREEN

The screen appears as follows:

Figure 15-1: The Commands page



Adjustment of these settings is protected by the relays password defined during configuration of the *Cryoview* level indicator (*see* paragraph 7.3.4 on page 44).

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15.2 ACTIVATING THE SOLENOID RELAY

To remotely operate the solenoid (open or close), proceed as follows:

1. **On the *Commands* page (15-1), select:**

   - **Active – Yes** to open the relay (refill activated) then click on the *Submit* button.
   - **Active – No** to close the relay (refill stopped) then click on the *Submit* button.

Figure 15-2: Relay status and commands

3. **Enter the password.**
   This password is the relays password defined during configuration of the *Cryoview* level indicator (*see* paragraph 7.3.4 on page 44).

4. **Click on the *Submit* button.**

   - If the password is correct and the command has been correctly sent to the *Cryoview* level indicator, the relay opens to allow the tank to refill with nitrogen (on condition that the alarm thresholds have not been exceeded) (*see* 14.3 on page 81).
   - If the password is incorrect or command has not been correctly sent to the *Cryoview* level indicator, an *Invalid action* icon appears.

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Figure 15-3: Icons displayed for successful (left) or unsuccessful (right) relay commands

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Installation

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16. Assembly

In most cases the Cryoview level indicator comes ready-fitted to the tank. This section provides instructions on how to replace older indicators with the new model. ***Indicators (i.e. temperature) which are not replaced must previously be returned to the manufacturer for reprogramming****.*

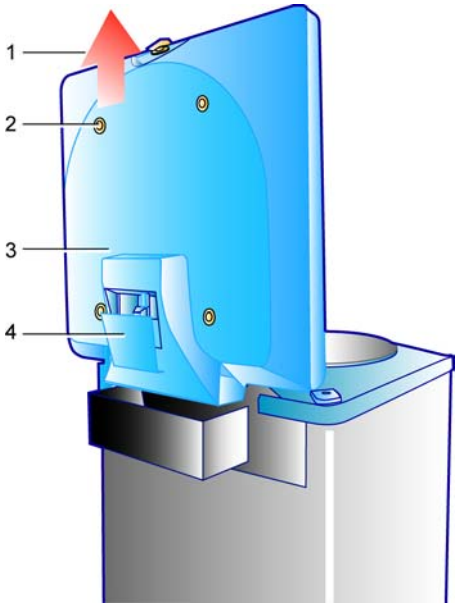
16.1 REPLACING AN OLD INDICATOR

16.1.1 Indicators fitted to *Espace* type streamlined tanks

The procedure is as follows:

1. Remove the 4 attachment screws (Figure 16-1: Procedure for fitting the indicator to an *Espace* type container, (2)) from the cap of the tank.
2. Position the plastic protective cover (3) in the vertical position. Free the protective cover (3) by sliding it upwards (1) and set it aside in a safe place. The cap should be open for as little time as possible to avoid a loss of refrigeration in the tank.

Figure 16-1: Procedure for fitting the indicator to an Espace *type container*



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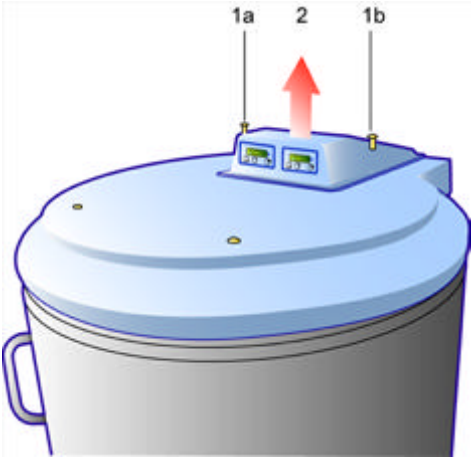
3. Close the cap (3) and place a weight of around 1kg on it to prevent it from springing open.
4. Remove the indicator cover (4) by loosening the 2 screws.
5. Disconnect the old indicator and remove it.
6. Slide the new *Cryoview* level indicator into place in its mounting bracket.
7. Wire up the indicator as described in section 17 on page 95.
8. Replace the covers (4 and 3) and tighten their screws to secure them in place.

16.1.2 Indicators fitted to *Espace* type non-streamlined tanks

1. Remove the 2 attachment screws (1) and lift off the cover (2).

Figure 16-2: Procedure for fitting the indicator to an Espace type non-streamlined tank



2. Disconnect the old indicator and remove it.
3. Slide the new *Cryoview* level indicator into place on its mounting bracket.
4. Wire up the indicator as described in section 17 on page 95.
5. Replace the indicator cover and secure in place by tightening the 2 screws (1).

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16.1.3 *Arpège* tanks

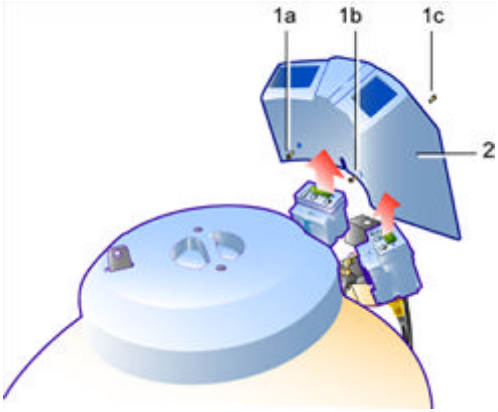
The procedure is as follows:

1. Remove the 3 attachment screws (1), 2 on the front and one at the back.
2. Remove the protective cover (2) by lifting it free.
3. Two scenarios are possible at this point:

   - *both indicators are old models*: remove the indicators by lifting them free. Disconnect them. Position the new indicators on the mounting brackets.

   - *only the level indicator is to be replaced*: remove the old indicator by lifting it free. Disconnect the old indicator and position the new indicator on the mounting bracket.
4. Wire up the indicator as described in section 17 on page 95.
5. Replace the plastic fairing and secure it by tightening the 3 screws.

Figure 16-3: Procedure for fitting the indicator to Arpège *type tank*



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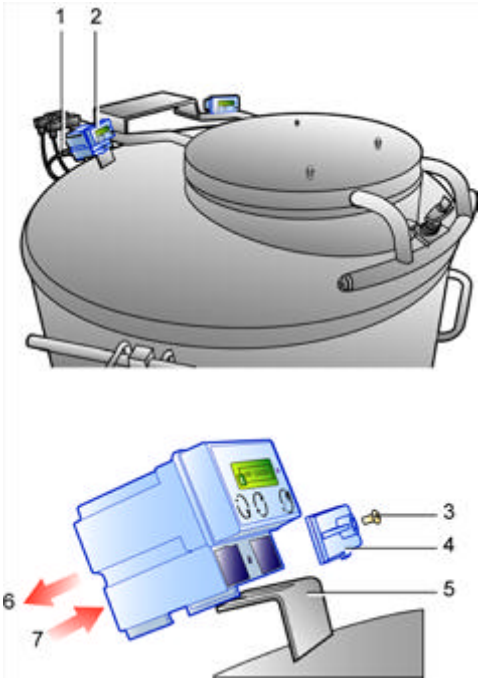
16.1.4 *RCB* tanks

1. Disconnect (1) the old indicator and remove it (2).
2. Remove the front screw (3) and faceplate (4).
3. Slide the indicator backwards (6) until it is clear of its mounting bracket (5).
4. Slide (7) the new indicator into place on the mounting bracket (5), replace the faceplate (4) and screw into place (3).
5. Wire up the indicator as described in section 17 on page 95.

Figure 16-4: Procedure for attaching the indicator to a RCB *tank*



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17. Connecting the Cryoview level indicator

This section provides details on how to wire up the Cryoview level indicator.

17.1 DIRECT ETHERNET CONNECTION

In this scenario the *Cryoview* level indicator is directly connected to a PC via a twisted pair Ethernet cable. This is the most basic configuration.

Connect the level indicator as follows (*see* Figure 17-1):

No.	Cable
1.	Connection between the *Cryoview* level indicator's Ethernet socket and the PC's RJ45 port. The cable delivered is a white twisted pair cable.
3.	To temperature sensor.
4.	Connection between level indicator and temperature indicator.
5.	To level sensor.
6.	Connection between level indicator and the nitrogen refill push button (9).
7.	Connection between level indicator and the power unit (2).
8.	Connection between temperature indicator and the power unit (2).

The *Cryoview* level indicator has no ON/OFF switch.

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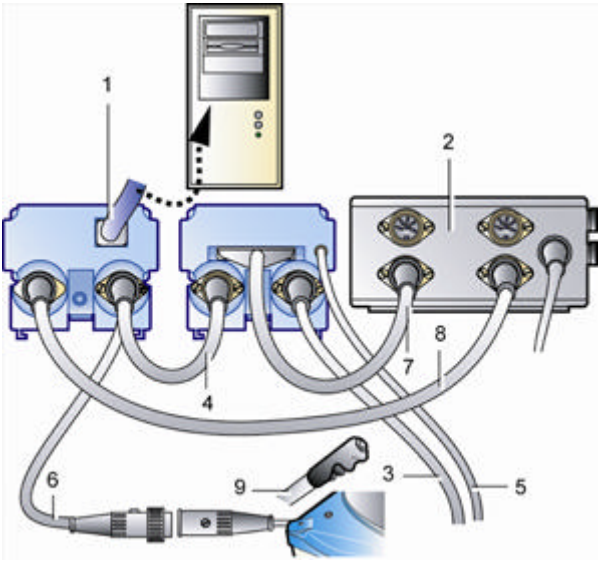

Figure 17-1: Connection schema for a direct Ethernet connection

17.2 INDIRECT ETHERNET CONNECTION

In this scenario, the *Cryoview* level indicator(s) is (are) connected to the PC over an Ethernet LAN. This configuration enables a pool of *Cryoview* level indicators to be monitored from a single PC. The connection procedure is as follows (*see* Figure 17-1):

No.	Cable
2.	Connection between the *Cryoview* level indicator's Ethernet socket and the RJ45 Ethernet port of the network switch / hub (4) which is connected to the PC (1). This configuration uses a flat (i.e. not twisted pair) cable (blue as delivered).
5.	To temperature sensor.
6.	Connection between level indicator and the temperature indicator.
7.	To level sensor.
8.	Connection between level indicator and the nitrogen refill push button (11).
9.	Connection between level indicator and the power unit (3).
10.	Connection between the temperature indicator and the power unit (3).

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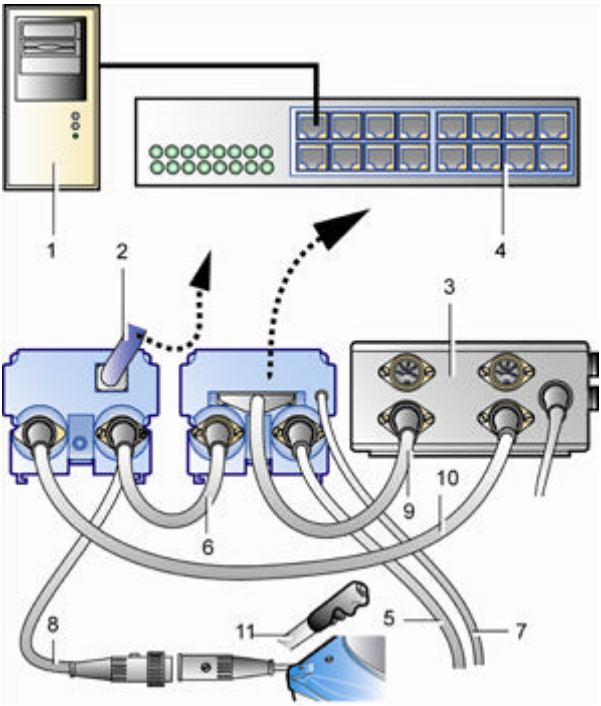
The *Cryoview* level indicator has no ON/OFF switch.

Figure 17-2: Connection schema for an Ethernet LAN configuration



17.3 CONFIGURATION

Instructions for configuring the *Cryoview* level indicator are given in section 7 – *Configuring the Cryoview level indicator* on page 37.

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Use

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18. Using the *Cryoview* level indicator and the monitoring application

18.1 USING THE *CRYOVIEW* LEVEL INDICATOR

This paragraph gives details on the principal stages of use of the *Cryoview* level indicator with references to the appropriate explanatory paragraphs. At this point the *Cryoview* level indicator is considered as mechanically and electrically fitted to the tank.

Action	**See**
Defining the indicator's IP address	6.5, page 30
Establishing connection between the PC and the *Cryoview* level indicator	6.6, page 32
Configuring the *Cryoview* level indicator	7, page 37
Viewing information on the display	5, page 19
Viewing information via the application	8.3, page 58

18.2 USING THE APPLICATION

The web application allows you to view measurement data, adjust alarm thresholds and consult logs. The table below summarizes the actions which can be launched from the application.

Action	***See***
Nitrogen level sensor alarm: view alarm status	10.2.3, page 65.
Nitrogen temperature alarm: view temperature alarm status	10.2.4, page 65.
Setting nitrogen level alarm thresholds for the *Cryoview* level indicator	0, page 83.
Nitrogen level alarms: view status of level alarms	0, page 64. 10.2.2, page 64.
Nitrogen refill solenoid: remote open / close	15.2, page 86.
Nitrogen refill solenoid: view status (open/closed)	10.2.5, page 66.

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Time/date (definition of system date) of the *Cryoview* level indicator	14.2, page 80.
Passwords: defines the passwords used by the application	7.3.3, page 43. 7.3.4, page 44
Nitrogen level displays system log for a selected previous date (in graph format)	12.2, page 76
Nitrogen level: displays system log for a selected previous date (in chart format)	13.2, page 78
Nitrogen level: display daily report (in graph format)	11.3, page 68
Nitrogen level: display daily report (in chart format)	11.4, page 71
Nitrogen level: sets alarm thresholds for the *Cryoview* level indicator	0, page 83
Nitrogen level: view nitrogen level	0, page 62
Nitrogen refill: remote open / close of solenoid relay	15.2, page 86
Nitrogen temperature: displays system log for a selected previous date (in chart format)	12.2, page 76
Nitrogen temperature: displays system log for a selected previous date (in graph format)	13.2, page 78
Nitrogen temperature: display daily report (in graph format)	11.3, page 68
Nitrogen temperature: display daily report (in chart format)	11.4, page 71
Nitrogen temperature: view nitrogen temperature	9.2.2, page 62
Temperature: set temperature alarm threshold	0, page 83

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19. Viewing information on the *Cryoview* level indicator

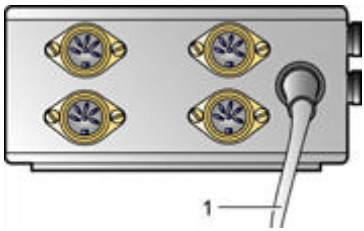
This section describes how to view the information sent by one or more Cryoview level indicators.

19.1 DISCONNECTING THE *CRYOVIEW* LEVEL INDICATOR

In normal operation the *Cryoview* level indicator is constantly connected to the power supply. The power unit of the *Cryoview* level indicator also powers the temperature indicator. As soon as the power unit is connected to the mains, the *Cryoview* level indicator and the temperature indicator are operational.

In the event that either device (level indicator or temperature indicator) has to be disconnected (e.g. for maintenance), simply unplug the power cable (Figure 19-1, (1)) from the power unit.

Figure 19-1: The power unit cable



19.2 THE BROWSER

The measurements and other readings sent by the *Cryoview* level indicator(s) can be viewed using any web browser. Once the *Cryoview* level indicator is plugged in and online, all you have to do is launch the browser (*Internet Explorer, Netscape, Firefox,* etc.) on the computer (PC, Mac, etc.).

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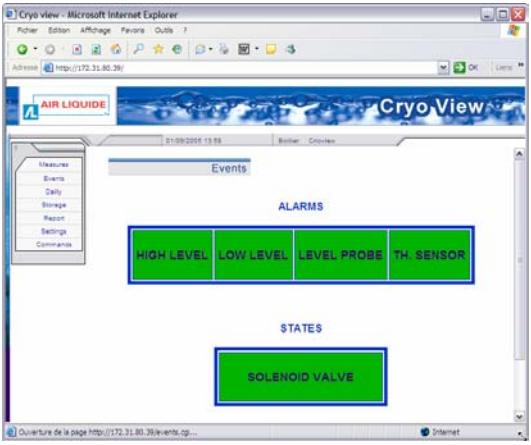
Figure 19-2: An example of the information displayed on the Cryoview level indicator by Internet Explorer



No other software is necessary. The *Cryoview* level indicator has all the electronic components necessary for communicating with the web browser.

In configurations where a pool of level indicators is monitored via the same browser, it's a good idea to record the IP addresses of each indicator in the browser's *Favourites* folder.

Example: in *Internet Explorer*, once the browser is connected to a level indicator, proceed as follows:

1. In the menu bar, select *Favourites* and then *Add to Favourites*.
2. Click on *Create In* and then *Create New Folder*. Enter a name for the new folder (e.g. *Cryoview*) and click on *OK*.
3. In the Add Favourites window, enter the indicator's name, e.g. `192.168.30.10`, then click on OK.
4. Repeat steps 2 and 3 for each successive indicator.

To view the measurements recorded by a selected indicator, all you have to do is select the indicator's IP address from the *Cryoview* menu bar (e.g. `192.168.30.10`). There's no need to manually enter the IP address.

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19.3 VIEWING INFORMATION

Information can be quickly viewed by clicking on the selected menu item (Figure 19-3).

Figure 19-3: Clicking on the selected menu item displays the respective information

These menu items are discussed in detail in sections 8 to 15. For convenience a summary of these items is given below:

Menu item	What it does	*See*
Measures	Displays real-time level and temperature readings for the nitrogen contained in the tank monitored by the level and temperature indicators (the IP address is shown in the browser's Address bar).	9, page 61.
Events	Displays real-time details on alarms triggered by measurements of the level and temperature of the nitrogen contained in the tank monitored by the level and temperature indicators (the IP address is shown in the browser's Address bar) and the status of the solenoid valve which controls refill operations.	10, page 63.
Daily	Displays a report for the current day in the form of measurements taken every 10 minutes by the level and temperature indicators mounted on the tank (the IP address is shown on the browser's Address bar).	11, page 67.
Storage	Displays, in graph form, a report for the tank monitored by the level and temperature indicators on the day indicated (the IP address is shown in the browser's Address bar).	12, page 75.

Cont. on the following page.

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Table cont. from previous page.

Menu item	What it does	*See*
Report	Displays, in table form, a report of the measurements and events recorded by the level and temperature indicators monitoring the tank on the day selected (the IP address is shown in the browser's Address bar).	13, page 77.
Settings	Defines clock and alarm threshold parameters (level and temperature) for the tank monitored by the level and temperature indicators (the IP address is shown in the browser's Address bar). Access to this menu is protected by the general password.	14, page 79.
Commands	Remotely activates control of the nitrogen refill solenoid in the tank monitored by the level and temperature indicators (the IP address is shown in the browser's Address bar). Access to this menu is protected by the relays password.	15, page 85.

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20. Error messages

Although discussed earlier in this manual, a recapitulation of the error messages generated by the level indicator and web browser is given below for convenience.

20.1 MESSAGES GENERATED BY THE INDICATOR

The indicator's display indicates the presence of faults as described below:

Display	Cause	Corrective action
EEE	Measurement out of range.	Check the level with the *Air Liquide* dipstick; contact dealer.
ERR Measure	Fault in connection to temperature indicator.	Check connections.
	Level probe measurement out of range: ERR Measure appears on the display (if the level is below 0% or above 106%).	Level probe error. Check installation and contact dealer.
ERR Probe	Level probe error: (probe disconnected or faulty).	Check connection, check probe, and contact dealer if necessary.
ERR internal	Internal electronic error.	Contact dealer.

Figure 20-1: Error indicated

When an error is detected, pressing the acknowledge (disable) key stops the audio alarm. The error remains on the display for as long as it persists; it only disappears once a normal measurement has been restored.

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20.2 MESSAGES GENERATED BY THE WEB APPLICATION

Message displayed	Cause	Corrective action
	Data entered correctly.	None.
	Incorrect data entered.	Check validity of data entered.

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Appendices

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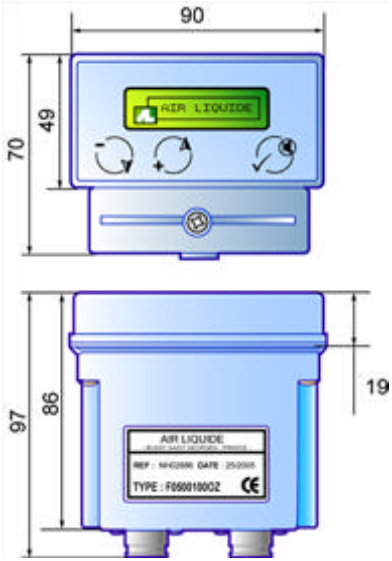
21. Datasheet

21.1 THE *CRYOVIEW* LEVEL INDICATOR

21.1.1 Physical characteristics

Datum	Principal characteristics
Dimensions:	*See* 21-1.
Weight:	Approx. 250 grams.
Casing:	Coloured plastic.
Environment:	Operating temperature: +10 °C to +45 °C. Storage temperature: 0°C to +60 °C. Relative humidity (operating): 20 to 80% non-condensed. Relative humidity (storage): 10 to 90% non-condensed.

Figure 21-1: Dimensions (mm)



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21.1.2 Electrical characteristics

Datum	Principal characteristics
Input voltage:	24 V AC
Power consumption:	Approx. 100 mA at 24 V AC
Connectors:	Ethernet: RJ45. Standard 10-BASE-T interface. Category 5 Ethernet cable, maximum length 100 m. Power input: 3-pin DIN plug. Temperature indicator connector: 4-pin DIN plug.
Communication:	ModBus (inter-indicator data) and Ethernet (to computer).
Display:	Alphanumeric and graphic LCD.

21.2 VIEWING APPLICATION

Datum	Principal characteristics
Type:	built into the *Cryoview* level indicator.
Viewing	any browser-enabled computer (Internet *Explorer, Netscape, Firefox*, etc.).
Menu:	7 main menu items:
Measures	Displays real-time information on nitrogen level and temperature.
Events	Displays detailed, real-time information on the status of the different nitrogen level and temperature alarms.
Daily	Displays reports for the current day in the form of measurements taken every 10 minutes.
Storage	Displays report information (in graph form only) for the selected day.
Report	Displays (in chart form only) a report of measurements and events for the selected day.
Settings	Allows clock settings and alarm thresholds (level and temperature) to be adjusted. This function is protected by the general password.
Commands	For remote activation of the tank's nitrogen refill solenoid. This function is protected by the relays password.

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22. Accessories available

Item	Code
Cryoview level indicator	ACC-CRYOVIEW-5
Liquid level temperature indicator	ACC-GNL-12
Gas level temperature indicator	ACC-GNL-5
PT100 temperature sensor	ACC-GNL-2
ESPACE 151 liquid phase capacitive level sensor	ACC-CRYOBIO-2
ESPACE 331 liquid phase capacitive level sensor	ACC-CRYOBIO-3
ESPACE 661 liquid phase capacitive level sensor	ACC-ESP-205
RCB 500 liquid phase capacitive level sensor	ACC-CRYOBIO-3
RCB 600 liquid phase capacitive level sensor	ACC-RCB-102
RCB 1000 liquid phase capacitive level sensor	ACC-RCB-103
RCB 1001 liquid phase capacitive level sensor	ACC-CRYOBIO-2
ESPACE 151 gaseous phase capacitive level sensor	ACC-ESP-200
ESPACE 331 gaseous phase capacitive level sensor	ACC-ESP-201
ESPACE 661 gaseous phase capacitive level sensor	ACC-ESP-202
RCB 600 gaseous phase capacitive level sensor	ACC-RCB-101
RCB 1001 gaseous phase capacitive level sensor	ACC-RCB-100
ARPEGE 40 liquid phase capacitive level sensor	ACC-ARP-201
ARPEGE 55/75 liquid phase capacitive level sensor	ACC-ARP-200
ARPEGE 70 liquid phase capacitive level sensor	ACC-ARP-202
ARPEGE 110 liquid phase capacitive level sensor	ACC-ARP-203
ARPEGE 140 liquid phase capacitive level sensor	ACC-ARP-204
ARPEGE 170 liquid phase capacitive level sensor	ACC-ARP-205
Degassing kit for ESPACE 151	ACC-ESP-100
Degassing kit for ESPACE 331	ACC-ESP-101
Degassing kit for ESPACE 661	ACC-ESP-102
Degassing kit for RCB 500/600	ACC-RCB-1
Degassing kit for RCB 1000/1001	ACC-RCB-2

Cont. on following page.

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Item	Code
Anti-splash kit for *Espace* & *RCB* with 2 gauge wells on rear	ACC-ESP-106
Anti-splash kit for *Espace* and *RCB* with 1 gauge well on rear	NH100454
Anti-splash kit for RCB 500, 600, 1000 old generation	NH100692
Flat RJ45 cable (blue)	NH103384
Twisted pair RJ45 cable (white)	NH103385
Power cable for Cryoview level indicator	4H103333
Power cable for regulated level or temperature indicator (liquid or gas)	NH102990
RS485 cable for indicator-to-indicator connection	4H103375
Solenoid valve	ACC-GNL-1
220/24 V power unit – four way	ACC-GNL-19

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23. European Union Declaration of Conformity

Manufacturer
L'air liquide – DMC
Parc Gustave Eiffel
8 Avenue Gutenberg
Bussy Saint Georges
77607 Marne la vallée Cedex 3 - France

Declares that the ***Cryoview Level Indicator***

to which the present declaration refers is in conformity with the basic requirements on electromagnetic compatibility in effect in the medical field.

The equipment bears the CE mark indicating that it conforms with current European Union regulations.

To ensure that it observes good practice requirements as indicated in the directive, it has been manufactured in accordance with the following standard:

NF EN 60601-1-2: Electromagnetic compatibility of medical electrical equipment and medical electrical systems.

10 September 2005

The Director

T. Bardon

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24. Guarantee and limit of liability

24.1 GUARANTEE

The guarantee period takes effect on the date of issue of the equipment delivery slip and has a duration of one year.

Goods are delivered at the vendor's liability where delivered by a carrier appointed by AIR LIQUIDE DMC. In other cases delivery is at the buyer's liability.

The vendor guarantees the equipment against all design faults and defects of manufacture and construction affecting the recipient thereof.

The guarantee offered by the vendor is strictly limited, at the vendor's discretion, to the repair or the replacement of parts which it acknowledges as defective and to the cost of labour, not including packaging and shipping costs.

Replaced defective parts become the property of the vendor.

The repair, modification or replacement of parts during the guarantee period does not extend the duration of the guarantee.

To qualify for the guarantee, the user must submit a claim to the vendor within 15 days of its reception of the equipment, accompanied by the delivery slip.

Repairs, modifications or replacements necessary as a consequence of normal wear and tear, of damage and accidents consequent upon incorrect handling, faulty monitoring or maintenance, negligence, overloading, incorrect use, and shock, falls, or damage caused by the action of inclement climatic conditions are not covered by the guarantee (*see* technical notes on use).

This guarantee immediately loses effect in the event of the replacement or repair of original parts by persons not duly authorized by AIR LIQUIDE DMC.

Within the limits imposed by applicable legislation, it is expressly agreed that the guarantee awarded in this article is the only guarantee implicitly, explicitly or lawfully granted by the vendor with regard to the materials sold, and that, except where stated to the contrary in writing, the buyer renounces entitlement to any legal action which the buyer (or its employees, affiliate companies, successors or concession holders) might move against the vendor, its employees, affiliate companies, successors or concession holders, in connection with the materials sold; this provision includes without limitation actions concerning personal injury, damage to goods outwith the object of the agreement, indirect or immaterial losses or damage and particularly loss of use or of profit, loss of cryogenic liquid

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or of products in storage etc. Within the limits imposed by applicable legislation, the buyer undertakes to compensate the vendor, its employees, affiliate companies, successors and concession holders, for all claims, complaints, demands, court orders, convictions or liabilities of any nature, as well as all costs and expenses incurred by or imposed on the vendor in connection with the materials sold.

Replacement parts must be used in the conditions of service originally defined by the vendor. In particular, safety devices sold as replacement parts must be installed as replacements for the original safety devices in conditions of service (pressure, temperature, gas, valve diameter etc.) identical to the original.

Application of this guarantee takes place in accordance with the vendor's general terms and conditions of sale.

24.2 LIMIT OF LIABILITY

Neither *L'AIR LIQUIDE-DMC* nor any company associated thereto, and in no circumstances, can be held liable for any damage, including and without limitation to damage incurred as a result of loss of manufacture, interruption of manufacture, loss of information, failure of the *Cryoview* level indicator or of its accessories, bodily injury, loss of time, financial or material loss or any indirect or ancillary consequences of loss arising from the use, or impossibility of use of, the product, even in cases where *L'AIR LIQUIDE-DMC* has been notified of such damage.

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