

CryoFill 2.0 Medical Device User manual



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1 Revision history

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2 Notices

This equipment contains batteries and other components which have a limited shelf life. To ensure the shelf life of the equipment and a trouble-free operation, we recommend that you join our maintenance and support services. Please contact your Cryo-Products distributor.

The CryoFill 2.0 can control the liquid nitrogen level in the vessel without the need for the user to interfere. Still it is highly recommended to gauge the liquid nitrogen level regularly in order to verify the correct functioning of the vessel.

Cryo Products B.V. reserves all the rights to alter products and their specifications without any notice.

2.1 Disposal

Local or national environmental laws and regulations may prohibit disposal of electrical and/or electronic equipment such as the CryoFill 2.0 controller. Contact the local city or town offices for instructions on proper disposal of electrical or electronic equipment. Alternately, Cryo Products B.V. may be contacted for disposal information.

3 Pictogram explanation

The following pictograms are found in this manual and/or on the product:



General warning pictogram



Consult manual pictogram



CE pictogram;

The CE marking is the manufacturer's declaration that the product meets the requirements of the applicable EC directives. The "xxxx" below the CE marking indicates the Notified Body identification number.

4 Safety precautions

IT IS IMPORTANT TO READ THIS SAFETY NOTICE PRIOR TO OPERATING ANY EQUIPMENT.

4.1 First aid

IF IN DOUBT, SEEK IMMEDIATE MEDICAL ATTENTION. If any quantity of liquid nitrogen comes into contact with the skin or eyes, immediately flood that area of the body with large quantities of unheated water, apply cold compresses and seek medical attention. If the skin is blistered or there is any possibility that eyes have been affected, the patient should be taken to a doctor or hospital for immediate treatment.

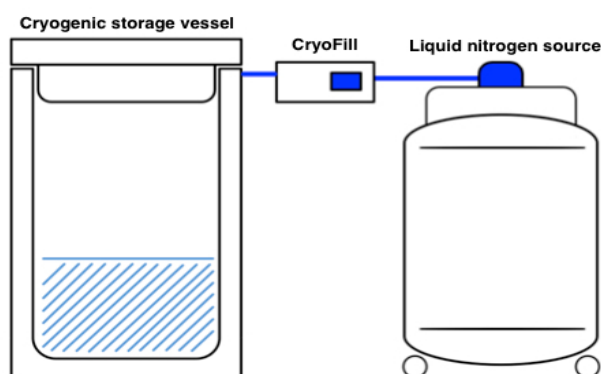
4.2 Safety

- * Operating the system in a manner not specified in this manual or under conditions outside of the specifications may result in the protection offered by the equipment being impaired.
- * Avoid nitrogen build up: Wherever liquid nitrogen is used; space must be well ventilated to reduce the risk of the oxygen level in the room becoming too low. Small volumes of liquid nitrogen convert to very large volumes of gas, which will expel oxygen from the room. This can result in drowsiness, or in extreme cases, asphyxiation.
- * When liquid nitrogen is used in confined spaces, oxygen-deficiency alarms must be installed.
- * When there is a risk of reduced or insufficient ventilation in an unoccupied room alarms must be installed to indicate oxygen deficiency and positioned outside of the room so that operators are aware of the hazard before entering. The operational status of such an alarm should also be visible outside the room.
- * If liquid nitrogen is used in an area that requires forced ventilation, an alarm to indicate its failure should be fitted.
- * An independent temperature sensor to monitor the temperature of the vessel should be installed in the vessel. This independent sensor should be connected to an monitoring / alarming system.
- * When dispensing or potentially being exposed to liquid nitrogen, protect the face with a shield and wear gloves, boots and a protective apron. Prevent spillage onto shoes and unprotected parts of the body.
- * Handle vessels containing liquid nitrogen carefully. Liquid nitrogen boils at -196°C. Nitrogen in liquid and gas state can cause rapid and severe frostbite. Delicate tissue, e.g. the eyes, can already be damaged by an exposure to the cold gas, which normally may be too brief to affect the skin of the hands or face.
- * Use tongs or wear cryo gloves when handling cold or hot objects. Cryo gloves are available as an accessory from Cryo Products B.V..
- * Only use vessels designed for working with liquid nitrogen.
- * Ensure that the delivery pipe connections are secure and leak-free before supplying liquid nitrogen to the vessel.
- * Pressure of the liquid nitrogen supply must not exceed 3.5 bar (50 psi).
- * Servicing by a user is limited to cleaning of the controller enclosure and the valve assembly cover. The advised cleaning agent to use for cleaning is: ECOLAB INCIDIN FOAM

All other servicing must only be undertaken by suitably qualified engineers.

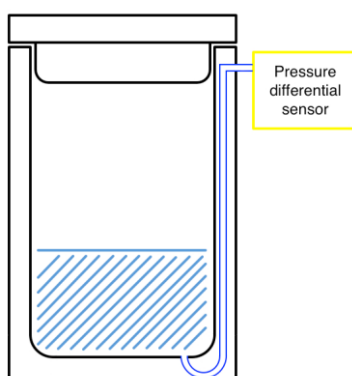
5 Product description

The CryoFill 2.0 controls and monitors the liquid nitrogen level within a cryogenic storage vessel.

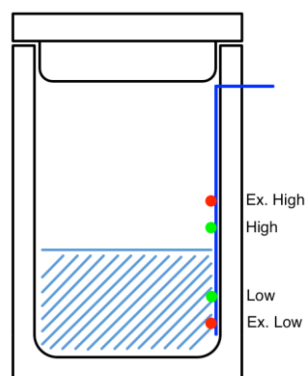


One of the unique features of the CryoFill 2.0 is its compatibility with multiple measurement techniques. It can be combined with almost every storage vessel on the market. In the world of cryogenic controllers and filling units there are two industry standards for measuring the liquid nitrogen level. The simple 'four point level sensor' or 'pressure differential measurement'.

Cryo Products B.V. has developed a new automatic filling controller for biological storage vessels that can operate with both standards.



Pressure-Differential measurement



Four-Point NTC measurement

The status, settings, events and alarms of the controller are displayed on a TFT touchscreen display and is simple to understand. The alarms are displayed in a different colour on the TFT display. For extra awareness an audible alarm can be played. The user interface of the controller is easily accessible.

6 Intended environment

Cryogenic storage vessels for the preservation of biological material are commonly used in hospitals and research facilities. Mostly they are placed in dedicated “cryo / bio banks”, the vessels are also placed in a laboratory environments. These rooms or laboratories have a liquid nitrogen supply infrastructure, for example vacuum insulated piping from a large bulk tank. Or a more simple solution in the form of one or more pressurised vacuum containers, containing liquid nitrogen.

Since these rooms contain a significant quantity of liquid nitrogen, an oxygen deficiency monitoring and alarming system is mandatory and preferably with adequate ventilation.

A laboratory (alarm) monitoring system is used to monitor all vital equipment used, this includes temperature monitoring of the Cryogenic storage vessels. This measurement is done independently of the liquid nitrogen level controller, using a separate temperature sensor which is placed inside the vessel.

7 Intended use

The intended use of the CryoFill is to monitor and control the liquid nitrogen level of a cryogenic storage vessel. In doing so it supports the intended use of the cryogenic storage vessel.

The cryogenic storage vessel’s intended use is defined as: “To maintain cryogenic temperatures for the purpose of storing blood, other body liquids, organs, parts of organs, or body tissues.”

8 Indications for use

The CryoFill 2.0 only supports the intended use of the Cryogenic storage vessel.

9 Intended patient population

The CryoFill 2.0 is not intended to interact with patients.

10 Intended users

The intended user of the CryoFill 2.0 controller is classified as an operator. Interaction with the operator will occur when he or she wants to interact with the cryogenic storage vessel, for example to retrieve or place material inside the vessel. Most common occupations titles are: Embryologist, analyst or laboratory technician.

11 Contraindications

The temperature sensor data are contraindicated to be used for validation of the material stored inside the cryogenic storage vessel. For this purpose an independent temperature sensor separate from the CryoFill 2.0 has to be used. Such sensor is connected to a laboratory/alarm monitoring system.

See also chapter 19.3 Temperature measurement (Principles of operation).

12 Intended (clinical) benefits

The CryoFill 2.0 does not come into direct contact with a patient or patient related materials. Therefore it is concluded that the CryoFill 2.0 does not have a Clinical Benefit.

Despite the lack of clinical benefits the CryoFill 2.0 does have benefits that relate to the support of patient management. The intended benefits for users are:

- Automated filling of liquid nitrogen, based on level within the storage vessel without user interference and therefor reducing the risk of being exposed to liquid nitrogen related hazards.
- Visible alarms and audible alarms.
- Automated alarm forwarding to building management and/or laboratory monitoring systems.
- Supply the storage vessel with a continuous sufficient level of liquid nitrogen to support the cryogenic storage vessel's intended use.
- Create better visibility inside the cryogenic storage vessel.
- Compatible with two industry standards for measuring the liquid nitrogen level.
- Optimizing the filling sequence of multiple cryogenic storage vessels.

13 Product specifications

Model name	CryoFill 2.0
Basic UDI DI	87193268205CF252
Model number	203129
Intended environment	In door use only
Rated voltage	24DC
Rated frequency	50Hz
Power dissipation	Max 2.5A (~ 60Watt)
Power supply information	Mean Well GSM60A-P1J Input: 230VAC Output: 24VDC 2.5A
Temperature and humidity range for normal use	10°C - 30°C 0% - 80%
Temperature range for storage	-20°C - 50°C
Minimal air pressure	80 kPa
Pollution Degree	2
Mass	~ 2 kg
Dimensions (W x H x D)	220 x 85 x 120 mm



13.1 Warnings



- Do not use the CryoFill 2.0 controller for any other purposes than intended!
- Do not replace the power supply with any other power supply than a Mean Well GSM60A-P1J
- Do not replace the detachable main power supply inadequately rated cords. (250VAC 10A) .
- The earthing of the power supply is used functional, therefor use an earthed wall socket.
- Do not modify the CryoFill 2.0 controller in any way without contacting Cryo Products B.V.
- Make sure the placement of the vessel does not hinder the ability to pull the power supply cord/plug from the wall socket.
- Make sure the placement of the vessel does not hinder the ability to close the liquid nitrogen supply tap-valve on the liquid nitrogen supply source.

14 Product features

Level measurement & Control
Pressure differential sensor for real time level display (20mm accuracy)
Four point level sensors (Five: level indications: Extra Low, Low, Normal, High, Extra High)
Gas bypass valve
Optional Safety valve
Temperature control function *

Temperature measurement
Two PT100 temperature sensors with two degree accuracy (°C)
Two point sensor validation report

Alarm types
Level alarm low and high
High temperature alarm
Fill timer alarm
Bypass timer alarm
Sensor / NTC fault alarm
Lid open alarm
General alarm

Communication
Three RS485/422 ports for communication with other controllers or monitoring systems (Modbus / XiltriX) *

Data logging
Datalogging information is stored on the internal SD card
Data can be extracted via a download program *

User interaction
TFT touchscreen (480x320)
Display of the liquid level plus the two temperature sensors
Alarms visual in different colour and global information about the alarm
Audible alarm
Three programmable NC/NO alarm contacts

Basic controller options
Daily or weekly fill
One Fill All Fill *
Lid switch operated defog and / or quick chill

* This feature requires a license, for more information please contact your Cryo-Products distributor.

15 Product overview/photos



16 Product connections

The CryoFill 2.0 controller has several connections, described in the table below.



Port	Type	Pinout	Insulation	Maximum Voltage	Maximum Current	Only connected equipment compliant with:
PT100s / NTCs	Input (sensors)	-	No separation	5V	50mA	-
Input 1	Input (voltage)	1-GND	No separation	30V	100mA	-
Input 2	Input (digital)	1-2-COM	No separation	5V	20mA	-
Com 1 RS422/RS485	Communication	-	No separation	5V	-	RS422/RS485 IEC60950 / IEC62368-1
Com 2 RS422/RS485	Communication	-	No separation	5V	-	RS422/RS485 IEC60950 / IEC62368-1
Com 3 RS422/RS485	Communication	-	No separation	5V	-	RS422/RS485 IEC60950 / IEC62368-1
Eth. * Ethernet	Communication	-	Functional separation	-	-	IEC60950 / IEC62368-1
Purge	Output (valve)	-	No separation	12V	100mA	-
Alarm 1 ⚠	Output	nc-com-no	Separated	30V	500mA	-
Alarm 2 ⚠	Output	nc-com-no	Separated	30V	500mA	-
Alarm 3 ⚠	Output	nc-com-no	Separated	30V	500mA	-
Power ** ⚠	Input	-	No separation	24V	2.5A	-
Fill	Output (valve)	GND-1-2	No separation	24V	500mA	-
Bypass	Output (valve)	GND-1-2	No separation	24V	500mA	-
Safety	Output (valve)	GND-1-2	No separation	24V	500mA	-
Pres. Dif.	Input	-	-	-	-	-

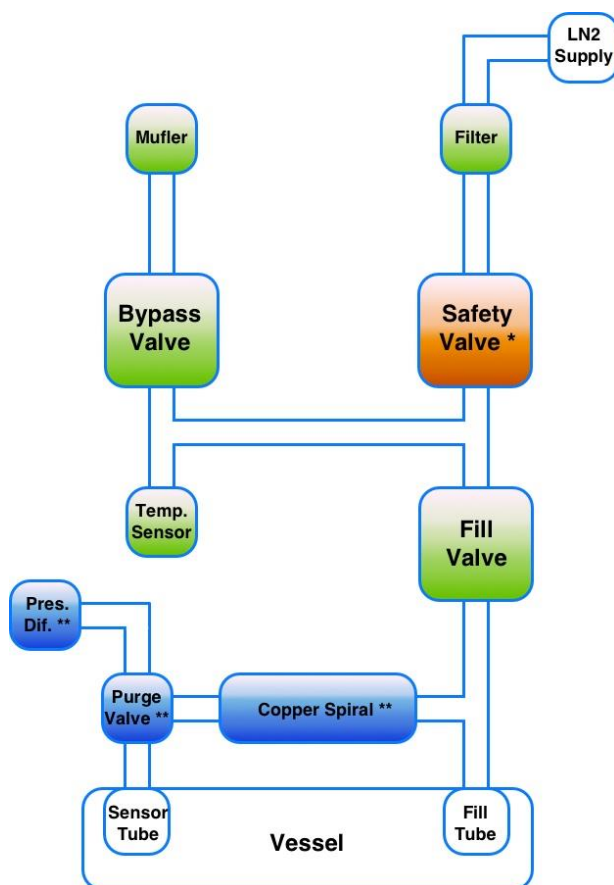
* Ethernet port not used, for future use.

** Only use a Mean Well GSM60A-P1J as the power supply.

17 Valve configuration

The CryoFill 2.0 controller comes with a valve configuration which enables the controller to fill the vessel with liquid nitrogen. In the diagram below the valve configuration is displayed. The purge circuit (**) is only installed and usable when the controller is set for pressure differential measurement. The safety valve(*) is an optional extra.

LN2 Supply 	LN2 source: Max pressure: 50PSI / 3.5BAR Advised pressure: 20PSI / 1.5BAR
Filter	Filters the LN2
Safety valve	Prevent overfilling when the fill valve leaks/fails or prevents spillage when the bypass valve leaks.
Bypass valve	Enables the controller to cool the fill piping to prevent excessive (hot) gas entering the vessel.
Temp. sensor	For measuring to determine when bypassing is done.
Muffler	Silencing noise
Fill valve	Valve to fill to vessel
Copper spiral	To prevent liquid nitrogen reaching the purge valve.
Purge valve	3-Way valve in normal condition it passes on the sensor tube to the controller. When Purging the LN2 supply blow dirt out of the sensor tube
Pres. Dif.	The actual pressure differential sensor. Situated inside the CryoFill 2.0 controller



17.1 Safety valve

The CryoFill 2.0 has to option to be fitted with an additional valve in the valve configuration. This valve is placed before the bypass and the fill valve. In case either the bypass or the fill valve does not close properly the liquid nitrogen flow will be stopped by the safety valve.

18 Connection to other systems

The CryoFill 2.0 controller can be connected to other external systems like cryobank systems, monitoring systems, other liquid nitrogen level controller and computers. The main objective of the CryoFill 2.0 controller is to control the liquid nitrogen level inside the vessel. All other things, as mentioned above, are additions to this. If for whatever reason the controller cannot perform all functions, the additions are skipped during operation. This is done to ensure the controller can perform its main objective.

Connections with other systems have to be setup by a qualified engineer, for more technical information regarding these connection please consult your Cryo Products B.V. distributor.

18.1 Integration into Cryobank

The CryoFill 2.0 can be integrated into a cryobank system. To optimise filling and liquid nitrogen usage, the CryoFill 2.0 will accept the request made by the cryobank system, if the conditions of the liquid nitrogen in the vessel allow this. The CryoFill 2.0 will still be leading regarding when to start filling and for how long the fill process of the vessel takes. Input 1 or Input 2 can be used for this feature, for more information please consult your Cryo Products B.V. distributor.

18.2 Alarm contacts

The CryoFill 2.0 is equipped with three remote alarm relays that allow remote monitoring of alarm conditions. Once activated, these latching contacts will retain their alarm state until the alarm condition is corrected and cleared. The alarm contacts can be wired for normally open or normally closed, see chapter 16 for more details. For each contact the user can specify which alarms need a response. When desired a delay can be specified per contact. For configuring of the alarm contact, see chapter 23.6 for more details.

18.3 XiltriX connection

The CryoFill 2.0 is able to connect to the XiltriX remote alarm and monitoring system. This allows the user to remotely monitor the CryoFill2.0's status from his/her computer via the XiltriX console. For example if there is an alarm the user can check the status of the unit remotely and determine whether immediate action is needed or not. Please consult your Cryo Products B.V. distributor for more information regarding the XiltriX connection.

Data type	Info
The liquid nitrogen level in millimetres 0-950 millimeters	Displays the current liquid nitrogen level, for controllers using pressure deferential measurement
The liquid nitrogen level in percentage 0% = Extra low 25% = Low 50% = Normal 75% = High 100% = Extra High)	Displays the current liquid nitrogen level, for controllers using four-point measurement
Temperature sensor A	Displays the temperature of sensor A
Temperature Sensor B	Displays the temperature of sensor B
Fill status	Indicates whether the unit is filling or not
Alarm status	Indicates whether there is an alarm or not
Lid status *	Indicates whether the lid is open or closed
Power failure **	Indicates whether the unit is using battery backup

* This only applies to vessels fitted with a lid switch

** This only applies to units fitted with a battery backup, which will be released in the near future.

18.4 Modbus connection

The CryoFill 2.0 is able to connect to a RS485 Modbus RTU network for remote alarm and monitoring purposes. The CryoFill 2.0 will act as a Modbus slave and will allow to read several registers filled with information. The monitoring system can present this information to allow the user to remotely monitor the CryoFill2.0's status from his/her computer. For example if there is an alarm the user can check the status of the unit remotely and determine whether immediate action is needed or not. Please consult your Cryo Products B.V. distributor for more information regarding the Modbus connection.

Data type	Info
The liquid nitrogen level in millimetres 0-950 millimeters	Displays the current liquid nitrogen level, for controllers using pressure deferential measurement
The liquid nitrogen level in percentage 0% = Extra low 25% = Low 50% = Normal 75% = High 100% = Extra High)	Displays the current liquid nitrogen level, for controllers using four-point measurement
Temperature sensor A	Displays the temperature of sensor A
Temperature Sensor B	Displays the temperature of sensor B
Fill status	Indicates whether the unit is filling or not
Alarm status	Indicates whether there is an alarm or not
Lid status *	Indicates whether the lid is open or closed
Specific alarms	Indicates information regarding what specific alarms are active.

18.5 One Fill All Fill (OFAF)

A group of CryoFill 2.0 controllers* can be connected in order to coordinate fill cycles. This function will increase the filling efficiency and drastically reduce liquid nitrogen consumption over time. A sequential or simultaneous OFAF network is possible.

The OFAF feature allows multiple controllers to be linked together such that they all will fill whenever any networked controller initiates filling. When multiple vessels are connected to a common liquid nitrogen source, it is advantageous to fill all the vessels at the same time.

When any controller in the network initiates filling, the Master controller (OFAF ID 001) recognizes this and monitors status of this controller. When the controller reaches the high level setpoint and stops filling, the master will send a fill command to the next controller in the network. This process repeats until all the controllers in the network filled.

There are multiple parameters configurable in the CryoFill 2.0 to further optimize this process. For example the option to have the filling process take place in pairs, or to set an ignore time after the fill process is complete to avoid repeated fill processes.

Please consult your Cryo Products B.V. distributor for more information regarding the One Fill All Fill feature, see chapter 23.8.7 setting up the OFAF feature.

* It is possible to use MVE TEC200/TEC3000 controllers with the One Fill All Fill feature.

19 Principles of operation

The CryoFill 2.0 can operate with two types of level measurement: pressure differential measurement and Four-point measurement.

19.1 Pressure differential measurement

The CryoFill 2.0 uses a dedicated sensor tube inside the vessel to measure the pressure of the liquid column inside the vessel. The controller translates this pressure into a level indication in millimetres. The software of the controller enables the user to specify the level requirements of the vessel; as e.g. start and stop filling and alarm.

In order to use this measurement type the vessel must be equipped with this sensor tube. MVE brand vessels all have this tube and most CAB and CBS vessels do as well.

In addition to the sensor tube, the valve configuration will need a 3-way “purge valve”; this valve connects the sensor tube with the CryoFill 2.0 controller. Before each filling the controller switches the purge valve for 10 seconds to connect the sensor tube to the liquid nitrogen fill tube. This way dirt or moist in the sensor tube will be purged out. The procedure increases the reliability of the level measurement.

19.2 Four-point measurement

The CryoFill 2.0 uses a set of four sensors which must be installed in the vessel. Each sensor represents a level: extra-low, low, high, extra-high. The controller uses these sensors to detect the liquid nitrogen and check the level in the vessel.

The controller will start filling the vessel when the low sensor is no longer submerged and the controller will stop filling when the high sensor submerged in liquid nitrogen. When the extra-low sensor is no longer submerged or when the extra-high is submerged in liquid nitrogen the controller will start alarming.

19.3 Temperature measurement

The CryoFill 2.0 has two temperature sensors, Temperature sensor A and Temperature sensor B, that can be placed inside the vessel, but this is no necessity. The CryoFill 2.0 can function without the temperature sensors. The sensors can be used to give an indication of the temperature inside the vessel. This is especially useful when working inside the vessel. When the lid is opened the top part of the vessel may warm up a little over time. The current temperatures can be read on the CryoFill 2.0 to determine when to close the lid. The bigger the lid opening of the vessel, the faster the temperature in the top part of the vessel will rise when opened.

The sensors of the CryoFill 2.0 are not intended to be used to demonstrate that the material has always been stored at certain temperatures. For this purpose an independent temperature sensor has to be used that is connected to a (laboratory) monitoring system.

20 Manual level measurement

It is advised to gauge the liquid nitrogen level inside the vessel regularly and check whether the displayed level on the controller is accurate. It depends on the usage of the vessel how often gauging is necessary. When the vessel is used daily, gauging the level monthly is sufficient, when the vessel is used for long-term storage gauging the level on a weekly basis is advised.

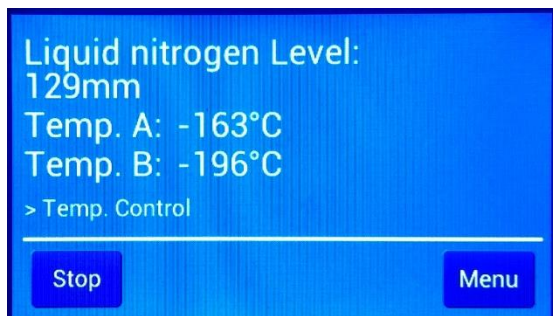
20.1 How to gauge the level

Place the dip-stick in the vessel (all the way to the bottom), keep it there for about 5 seconds, take the dip-stick out of the vessel. The dip-stick will freeze up to the point where the liquid nitrogen is in the vessel. The reading should be within +/- 20mm of the level the controller displays.

21 Temperature control

The CryoFill 2.0 has the option to activate the temperature control software. Normally the CryoFill 2.0 only controls the liquid nitrogen level inside the vessel, the temperature sensors only function as a reference for the user of the vessel.

Temperature control is used to inject a small amount of liquid nitrogen into the vessel in order to get the temperature down. The option is activated when one of the two temperature sensors are above the set point according to the settings.



When temperature control is enabled the controller will open the fill valve if the temperature of sensor A or temperature sensor B is above the set temperature. The controller will keep the filling valve open for the specified input time, then wait for the set wait time and repeat this cycle until the temperature is below the set temperature.

Please consult your Cryo Products B.V. distributor for more information regarding the temperature control feature.

22 Using the CryoFill 2.0

This chapter describes the handling of the CryoFill 2.0.

The controller uses a touchscreen to interact with the user. Every menu/screen is build following the same pattern. The top 3/4 of the screen is used to display information and the bottom 1/4 is used to display buttons.

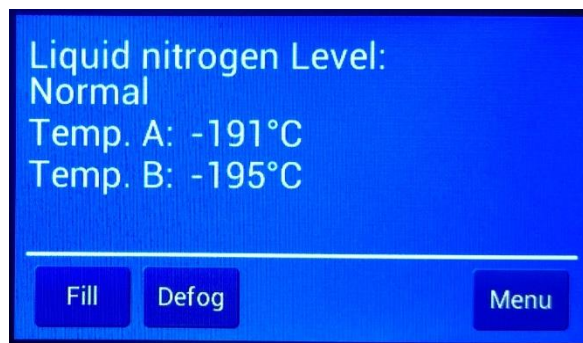
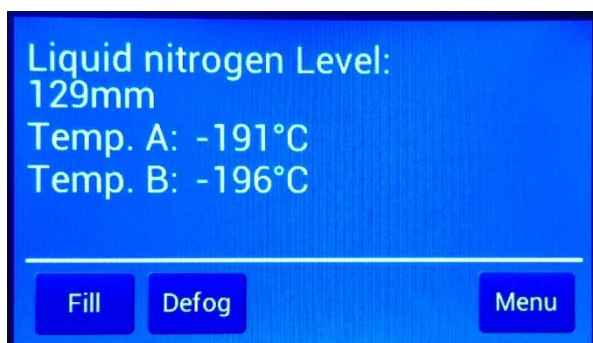
22.1 Home screen

During normal operation the homescreen is displayed. This screen shows the liquid nitrogen level and the temperatures inside the vessel. The user has the option to manually start filling or defogging. A CryoFill 2.0 used for pressure differential measurement will display the level in millimetres and a CryoFill 2.0 used for 4-point measurement it will display a level indication.

Buttons:

Fill	Manually start filling of the vessel
Defog / Quick	Manually start defogging / quick chilling
Menu	Enter the menu

Below the home screens are displayed with pressure differential measurement (left) and with 4-point level measurement (right).

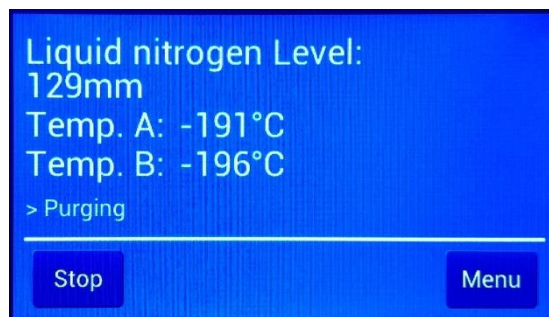


22.2 Purging

When the controller is set to be used for pressure differential measurement, it will first purge for ~ 10 seconds before filling the vessel. This function is not used when the controller is set to be used for four-point measurement.

Buttons:

Stop	Stop purging of the vessel
Menu	Enter the menu

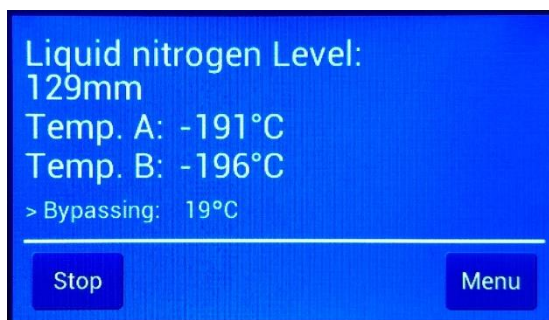


22.3 Bypassing

When bypassing is enabled the controller will cool down the fill piping before it actually starts filling the vessel. The cut-off temperature is configurable inside the menu.

Buttons:

Stop	Stop bypassing of the vessel
Menu	Enter the menu

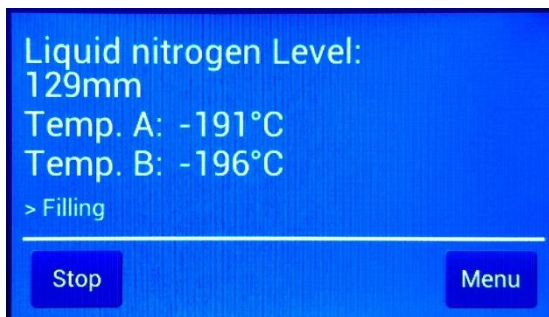


22.4 Filling

The CryoFill 2.0 is filling the vessel until it reaches the set high level.

Buttons:

Stop	Stop filling of the vessel
Menu	Enter the menu

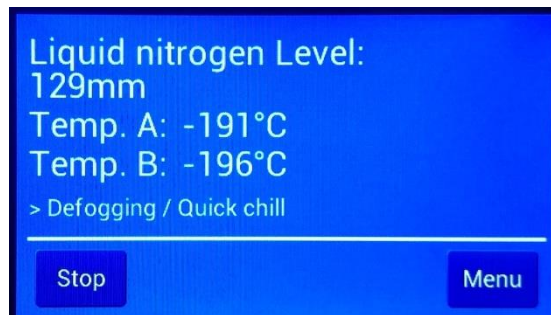


22.5 Defogging / Quick chilling

Defogging is used to clear out the fog in the vessel when the lid is opened, in order for the user to work inside the vessel. After the user is done working, liquid nitrogen is let into the vessel again to cool it down quickly and press out any warm air. Defogging and quick chilling can also be done automatically by using a lid switch. For settings regarding defogging / quick chilling, see 23.7.14.

Buttons:

Stop	Stop defogging of the vessel
Menu	Enter the menu

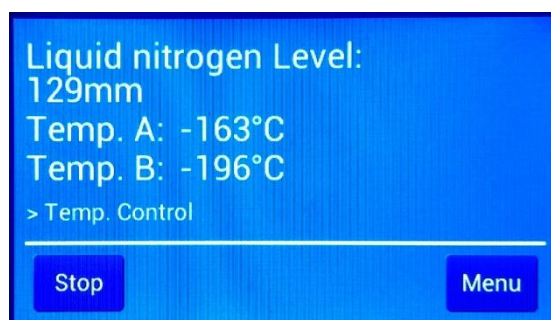


22.6 Temperature control

Temperature control is used to inject a small amount of liquid nitrogen into the vessel in order to get the temperature down. The option is activated when one of the two temperature sensors are above the set point according to the settings. For further information regarding temperature control please see chapter 21 and 23.7.6.

Buttons:

Stop	Stop temp. control of the vessel
Menu	Enter the menu



22.7 Alarms of the CryoFill 2.0

If the CryoFill 2.0 encounters a problem with the vessel, the controller will generate an alarm. There are 10 different types of alarms, all described in this chapter.

22.8 Low level alarm

This alarm indicates that the liquid nitrogen level is below the set low alarm. The controller will already have begun the filling procedure. So this alarm may be temporary as the level will start to rise again. However there could be a problem with the liquid nitrogen supply, please check the pressure and connection.

Buttons:

Alarm list	Open the alarm list menu
Mute	Silence the sound alarm for 30 minutes
Menu	Enter the menu



22.9 High level alarm

This alarm indicates the liquid nitrogen level is above the set high alarm. The controller will keep the valves closed until this alarm is resolved. In case the fill valve is stuck open and liquid nitrogen level keeps rising, for example when there is ice in the valve preventing it from closing properly. Please close the supply tap on the liquid nitrogen source. Keep the safety precautions in mind and check whether it is safe to enter the room regarding the oxygen level.

In order for the alarm to resolve the liquid nitrogen level has to decline (evaporate) below the set high alarm level. It is advised to gauge the level of the vessel to check what the actual liquid nitrogen level is. In case the supply tap is closed, please open it again when the alarm is resolved.

Buttons:

Defog	Start defogging of the vessel
Alarm list	Open the alarm list menu
Mute	Silence the sound alarm for 30 minutes
Menu	Enter the menu



22.10 Temperature A / B high alarm

This alarm indicates temperature sensor A (or B) is above its set minimum. When “warm” (bio)material is placed inside the vessel it can cause a temperature rise which should resolve quickly. If this is not the case, please check the liquid nitrogen level and start the filling procedure.

Buttons:

Alarm list	Open the alarm list menu
Fill	Start filling of the vessel
Defog	Start defogging of the vessel
Mute	Silence the sound alarm for 30 minutes
Menu	Enter the menu



22.11 Temperature Sensor fault alarm

This alarm indicates temperature sensor A (or B) is out of specification. When this alarm is generated the sensor needs to be re-calibrated or replaced.

Buttons:

Alarm list	Open the alarm list menu
Fill	Start filling of the vessel
Defog	Start defogging of the vessel
Mute	Silence the sound alarm for 30 minutes
Menu	Enter the menu



22.12 Bypass timer alarm

This alarm indicates the controller has been bypassed for more than the set maximum time. Most likely this means the liquid nitrogen supply is low on pressure or empty. When the supply is checked and correct again the filling procedure can be restarted with the fill button; the alarm will disappear. If the user takes no action for 2 hours, the controller will restart the filling procedure by itself.

Buttons:

Alarm list	Open the alarm list menu
Fill	Restart filling of the vessel.
Defog	Start defogging of the vessel
Mute	Silence the sound alarm for 30 minutes
Menu	Enter the menu



22.13 Fill timer alarm

This alarm indicates the controller has been filling for more than the set maximum time. Most likely this means the liquid nitrogen supply is low on pressure or empty. When the supply is checked and correct again the filling procedure can be restarted with the fill button; the alarm will disappear. If the user takes no action for 2 hours, the controller will restart the filling procedure by itself.

Buttons:

Alarm list	Open the alarm list menu
Fill	Restart filling of the vessel.
Defog	Start defogging of the vessel
Mute	Silence the sound alarm for 30 minutes
Menu	Enter the menu



22.14 NTC / PD sensor fault alarm

This alarm indicates that the controller has a problem with its level sensors. One or more level sensor have an implausible state. The actual liquid nitrogen level is unknown therefore the controller will stop filling until the sensor assembly is tested and/or repaired. The NTC sensor fault alarm corresponds with the usage of 4-point measurement and the PD sensor fault corresponds with the usage of Pressure differential measurement.

Buttons:

Alarm list	Open the alarm list menu
Fill	Start filling of the vessel.
Defog	Start defogging of the vessel
Mute	Silence the sound alarm for 30 minutes
Menu	Enter the menu



22.15 Lid open alarm

This alarm indicates that the lid of the vessel has been opened for more than the set maximum time. When the lid is properly closed again, the alarm will resolve.

Buttons:

Alarm list	Open the alarm list menu
Fill	Start filling of the vessel.
Defog	Start defogging of the vessel
Mute	Silence the sound alarm for 30 minutes
Menu	Enter the menu



22.16 General alarm

This alarm indicates that the controller has a problem with reading/writing settings information, or that there is a problem with the datalogging. Please contact your Cryo-Products distributor. Despite the alarm the controller remains fully functional in controlling the liquid nitrogen level.

Buttons:

Alarm list	Open the alarm list menu
Fill	Start filling of the vessel.
Defog	Start defogging of the vessel
Mute	Silence the sound alarm for 30 minutes
Menu	Enter the menu

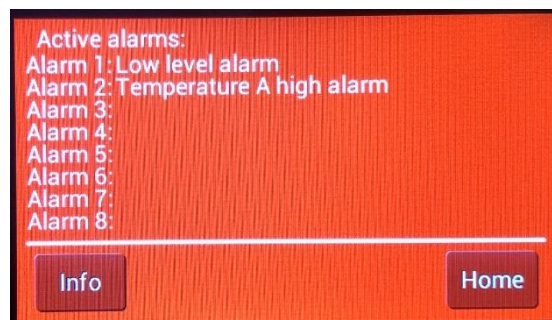


22.17 Alarm list menu

When an alarm appears the user can press the alarm list button to receive a list displaying all currently active alarms. By opening the alarm info menu the user can see specific information regarding the alarms.

Buttons:

Info	Open the alarm info menu
Home	Return to the homescreen



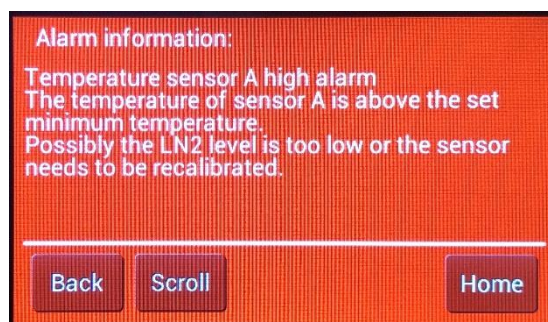
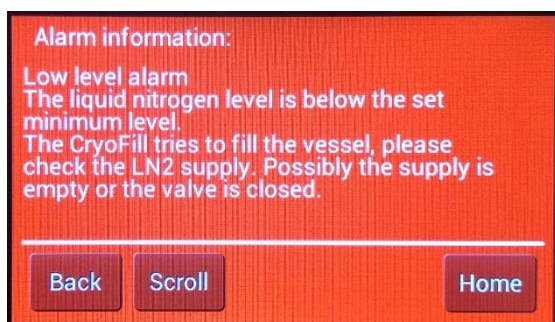
22.18 Alarm info menu

When an alarm appears the user can press the info button to receive some information regarding the active alarm(s) of the controller. Using the scroll button the user can scroll through all the active alarms.

Buttons:

Back	Return to the alarm list menu
Scroll	Scroll to the next alarm
Home	Return to the homescreen

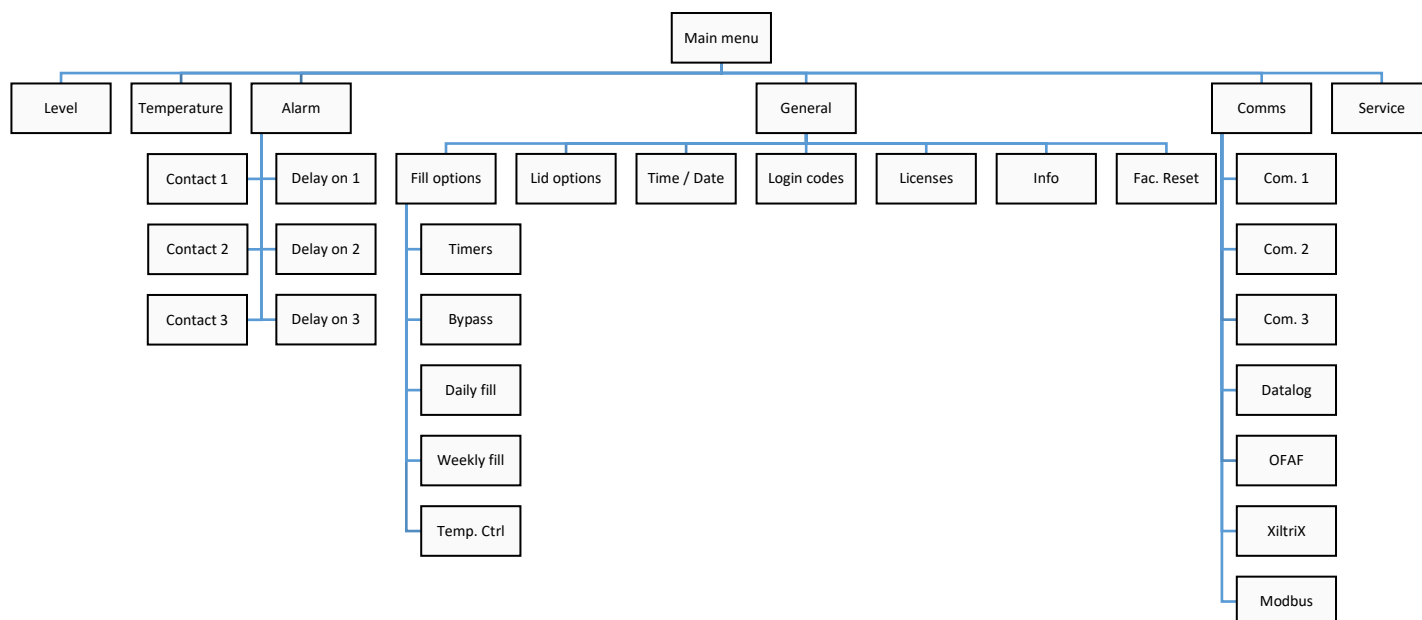
Below are two examples of the information screens:



23 Configuring the CryoFill 2.0

23.1 Menu structure

The menu is displayed in the figure below. In this chapter every menu will be explained.

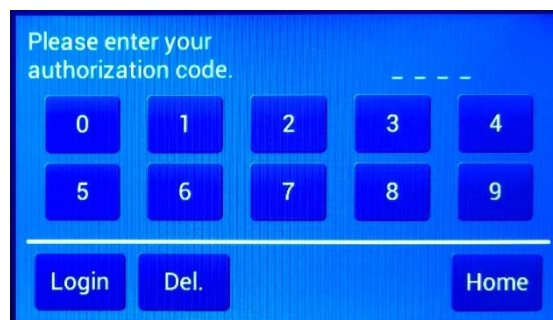


23.2 Authorisation

The settings of the controller are freely visible in the menus. When the user wants to edit settings, a login screen will ask for an authorisation code. After entering the correct code the user can change the settings in all the authorised menus. The controller will lock the menus again after 5 minutes of inactivity.

Buttons:

0 - 9	Enter the selected digit
Login	Verify the entered code
Del.	Delete the last entered digit
Home	Return to the home screen



23.3 Main menu

The main menu displays the six submenus: Levels, Temps, Alarms, General, Comms and Service. The first five menus are user accessible. The service menu is locked, only authorised users are allowed to view this menu.

Buttons:

Levels	Enter the level settings menu
Temps	Enter the temperature settings menu
Alarms	Enter the alarm settings menu
General	Enter the general settings menu
Comms	Enter the communication settings menu
Service	Enter the service menu
Home	Return to the home screen



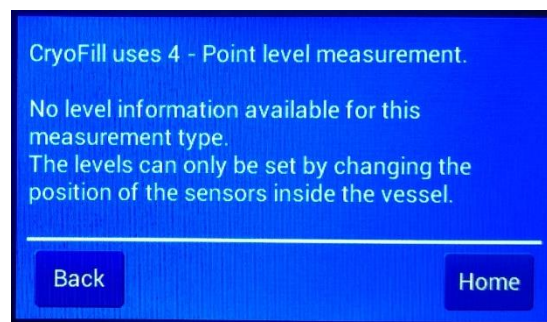
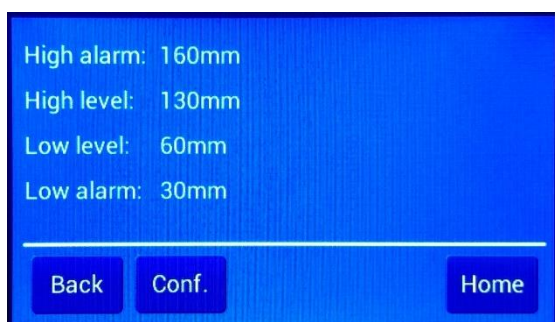
23.4 Levels menus

The level menu displays the levels the controller uses to control the liquid nitrogen level. This only applies if the controller uses pressure differential measurement.

Buttons:

Back	Return to the main menu
Conf.	Open the configuration menu.
Home	Return to the home screen

Below the level menu is shown with pressure differential measurement and with 4-point measurement.



23.4.1 Levels configuration menu

This menu shows the configuration levels, choose one of the levels to start editing.

Buttons:

High alarm	Open the edit screen for high alarm
High level	Open the edit screen for high level
Low level	Open the edit screen for low level
Low Alarm	Open the edit screen for low alarm
Back	Return to the level menus
Home	Return to the home screen



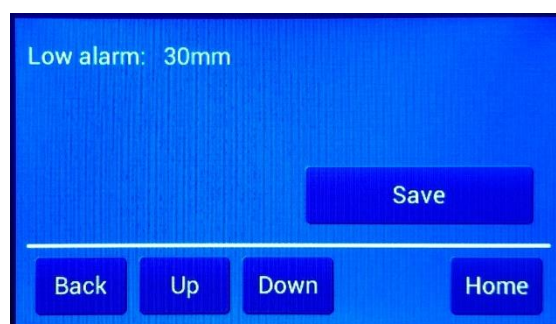
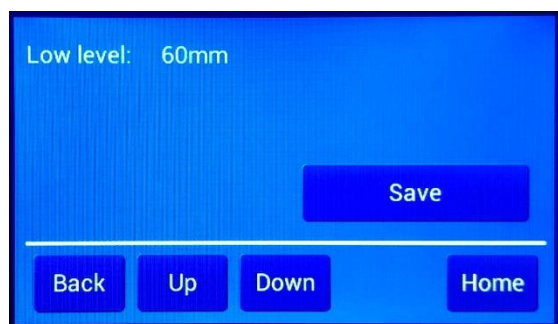
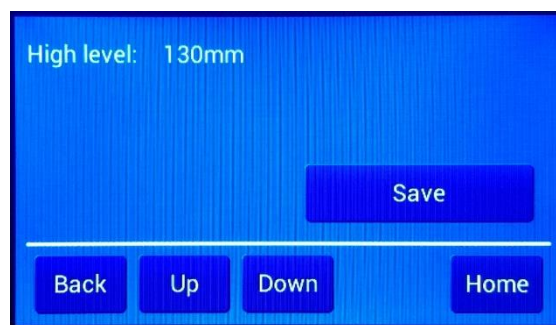
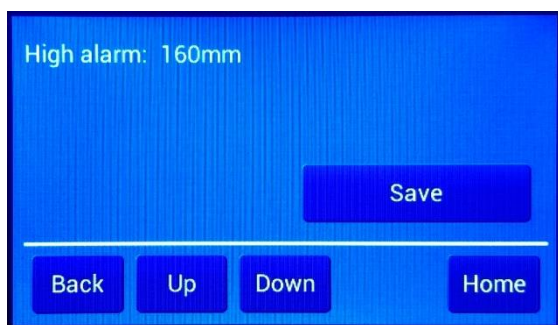
23.4.2 Level editing menu

This menu is used to edit the requested level. The level can't be set within 30mm of its adjacent level. The minimum level for low alarm is 30mm and the maximum level for high alarm is 950mm.

Buttons:

Save	Save the setting and return to the level menus.
Back	Return to the level configuration menu
Up	Increase the level by 5mm
Down	Decrease the level by 5mm
Home	Return to the home screen

Below the editing screens for the four levels.

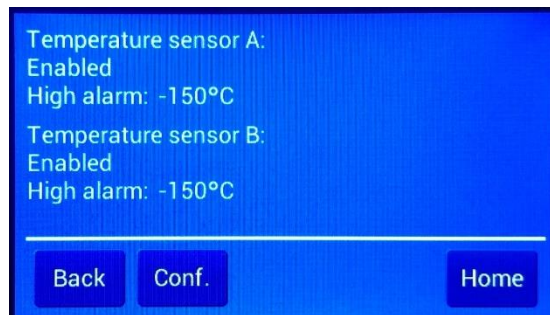


23.5 Temperature menus

The temperature menu contains information about the two temperature sensors inside the vessel. It states whether they are enabled/disabled and what the alarm temperature is.

Buttons:

Back	Return to the main menu
Conf.	Open the configuration menu
Home	Return to the home screen

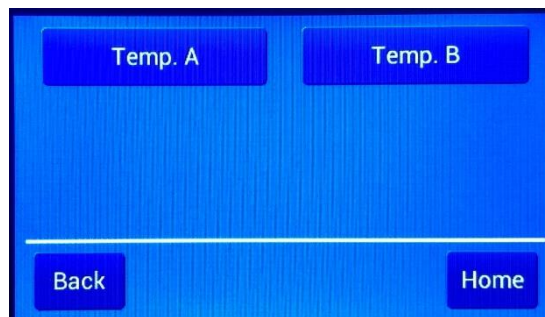


23.5.1 Temperature configuration menu

This menu shows the temperature configuration menu, choose one of the options to start editing.

Buttons:

Temp. A	Open the temperature A edit menu
Temp. B	Open the temperature B edit menu
Back	Return to temperature menu
Home	Return to the home screen

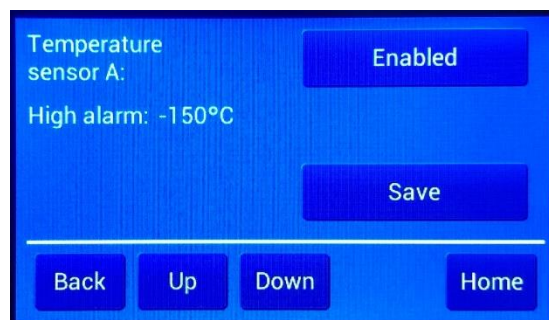


23.5.2 Temperature A editing menu

This menu is used to enable or disable temperature sensor A. The configuration of the alarm high temperature for temperature sensor A is also possible here. When the temperature of the sensor is above the set temperature the controller will generate a temperature high alarm.

Buttons:

Enabled / Disabled	Enable or disable temperature sensor A
Save	Save the setting and return to the temperature menu
Back	Return to the temperature configuration menu
Up	Increase the high alarm temperature by 1°C
Down	Decrease the high alarm temperature by 1°C
Home	Return to the home screen

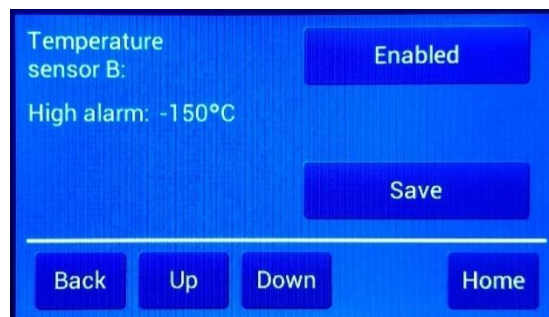


23.5.3 Temperature B editing menu

This menu is used to enable or disable temperature sensor B. The configuration of the alarm high temperature for temperature sensor B is also possible here. When the temperature of the sensor is above the set temperature the controller will generate a temperature high alarm.

Buttons:

Enabled / Disabled	Enable or disable temperature sensor B
Save	Save the setting and return to the Temperature menu
Back	Return to the temperature configuration menu
Up	Increase the high alarm temperature by 1°C
Down	Decrease the high alarm temperature by 1°C
Home	Return to the home screen



23.6 Alarm menu

The alarm menu allows the user to configure the three alarm contacts. These can be wired for normally open or normally closed, see chapter 10 for more details. For each contact the user can specify which alarms need a response. The delay can also be specified per contact.

Buttons:

Contact 1	Open the contact 1 menu
Contact 2	Open the contact 2 menu
Contact 3	Open the contact 3 menu
Delay on 1	Open the contact 1 delay menu
Delay on 2	Open the contact 2 delay menu
Delay on 3	Open the contact 3 delay menu
Back	Return to the main menu
Home	Return to the home screen

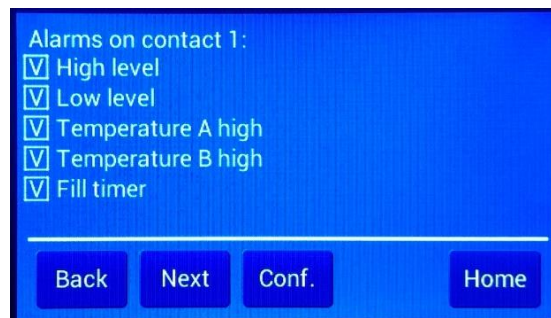


23.6.1 Contact 1 menu

These menus show which alarms are activated for the contact. A 'V' indicates that the alarm is enabled and an 'X' indicates that it is disabled.

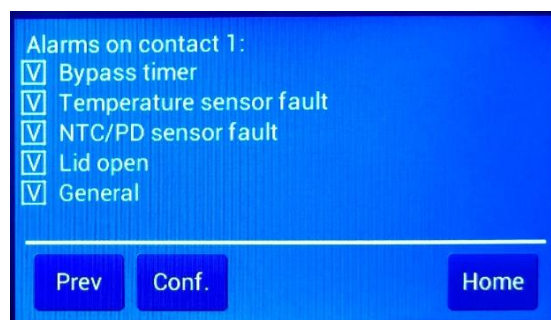
Buttons:

Back	Return to the main menu
Next	Open the next page of contact 1
Conf.	Open the corresponding editing screen of contact 1
Home	Return to the home screen



Buttons:

Prev.	Open the previous page of contact 1
Conf.	Open the corresponding editing screen of contact 1
Home	Return to the home screen



23.6.2 Contact 1 editing menus

These menus give the user the opportunity to enable or disable alarms on contact 1.

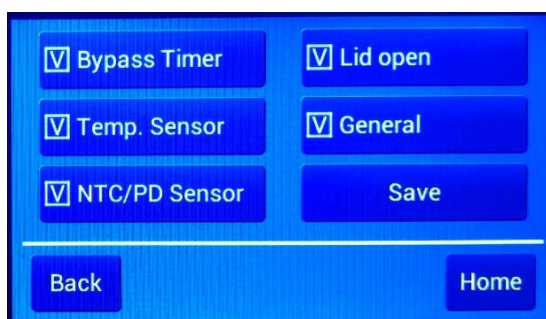
Buttons:

High level	Enable/disable the high level alarm
Low level	Enable/disable the low level alarm
Temp. A High	Enable/disable the high alarm for temperature sensor A
Temp. B High	Enable/disable the high alarm for temperature sensor B
Fill Timer	Enable/disable the filling timer alarm
Save	Save the setting and return to the corresponding screen of contact 1
Back	Open the corresponding screen of contact 1
Home	Return to the home screen



Buttons:

Bypass timer	Enable/disable the bypass timer alarm
Temp. Sensor	Enable/disable the alarm for a temperature sensor fault
NTC / PD sensor	Enable/disable the alarm for a level sensor fault
Lid open	Enable/disable the lid open alarm
General	Enable/disable the general alarm
Save	Save the settings and return to the corresponding screen of contact 1
Back	Open the corresponding screen of contact 1
Home	Return to the home screen

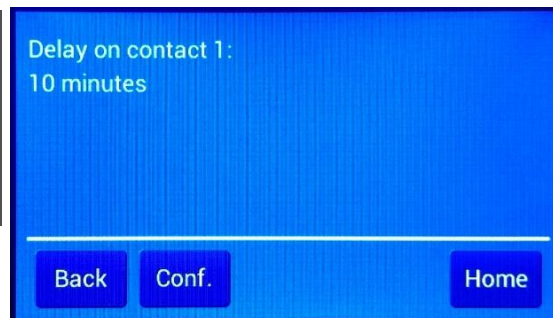


23.6.3 Delay on contact 1 menu

The delay on contact 1 menu shows the delay on contact 1. In order to prevent unnecessary alarms a delay can be specified. Only if the duration of the alarm is longer than configured, the controller activates alarm contact 1. So brief alarms caused by normal handling such as opening the lid too long will not immediately activate alarm contact 1.

Buttons:

Back	Return to the alarm menus
Conf.	Open the editing screen of delay on contact 1
Home	Return to the home screen

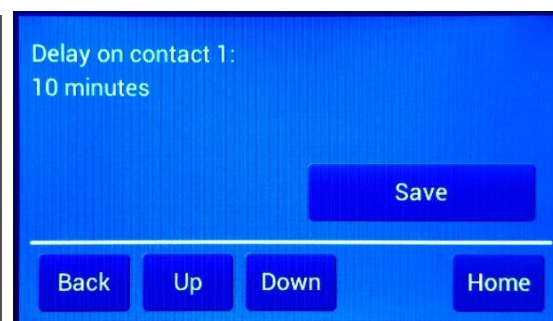


23.6.4 Delay on contact 1 editing menu

This menu is used to set the alarm delay time for contact 1.

Buttons:

Save	Save the setting and return to the delay on contact 1 menu
Back	Return to the delay on contact 1 menu
Up	Increase the delay by 5 minutes
Down	Decrease the delay by 5 minutes
Home	Return to the home screen



23.6.5 Contact 2 menu

Contact 2 is configurable the same way as contact 1.

23.6.6 Delay on contact 2 menu

Delay on contact 2 is configurable the same way as delay on contact 1.

23.6.7 Contact 3 menu

Contact 3 is configurable the same way as contact 1.

23.6.8 Delay on contact 3 menu

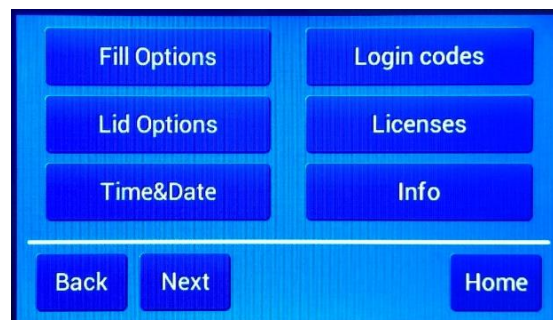
Delay on contact 3 is configurable the same way as delay on contact 1.

23.7 General menu

This menu displays general settings of the controller. Topics involving the filling procedure (timers, bypass settings, daily filling, weekly filling), lid options, time and date, login codes, licences and information about the CryoFill 2.0. It is also possible to perform a factory reset from the factory reset menu.

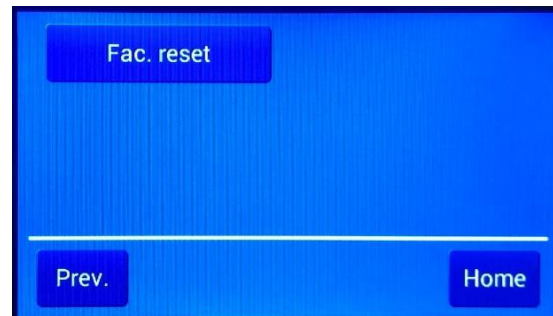
Buttons:

Fill options	Open the filling option menus
Lid options	Open the lid option menus
Time/Date	Open the time/date menus
Login codes	Open the login code menus
Licences	Open the licence menus
Info	Open the info menus
Back	Return to the main menu
Next	Opens the next page of the general menu
Home	Return to the home screen



Buttons:

Fac. Reset	Open factory reset menu
Back	Opens the previous page of the menu
Home	Return to the home screen

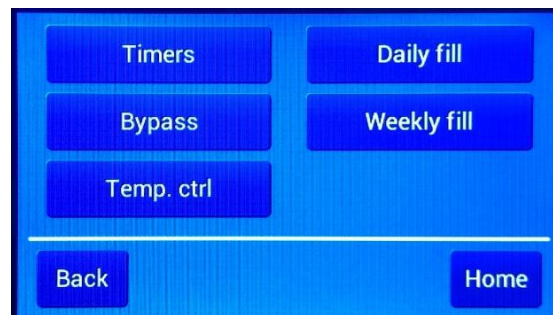


23.7.1 Fill option menu

This menu contains the following sub menus involving the filling of the vessel.

Buttons:

Timers	Open the timer menu
Bypass	Open the bypass menu
Temp. ctrl	Open the temperature control menu
Daily Fill	Open the daily filling menu
Weekly Fill	Open the weekly filling menu
Back	Return to the general menu
Home	Return to the home screen



23.7.2 Timers menu

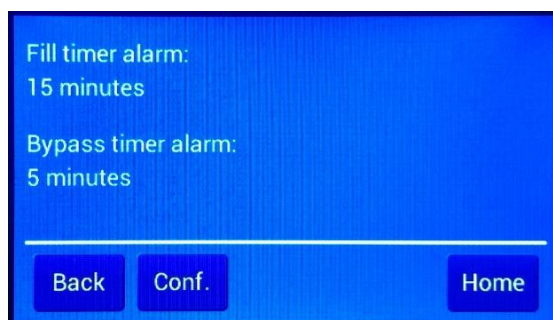
The timers menu displays the set time for the fill timer and the bypass timer.

If filling the vessel takes longer than the set time, the controller will stop filling and generate a fill timer alarm.

If cooling down the fill piping takes longer than the set time for the bypass timer, the controller will stop bypassing and generate a bypass timer alarm.

Buttons:

Back	Return to the fill option menus
Conf.	Open the editing screen of the filling timer
Home	Return to the home screen

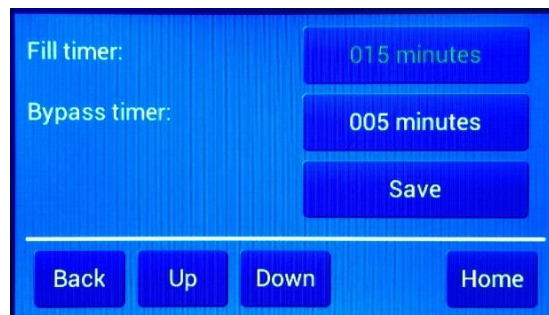


23.7.3 Timers editing menu

This menu is used to edit the fill and bypass timers.

Buttons:

Fill timer	Select the fill timer
Bypass timer	Select the bypass timer
Save	Save the settings and return to the timer menu
Back	Return to the timers menu
Up	Increase the timer by 5 minutes
Down	Decrease the timer by 5 minutes
Home	Return to the home screen

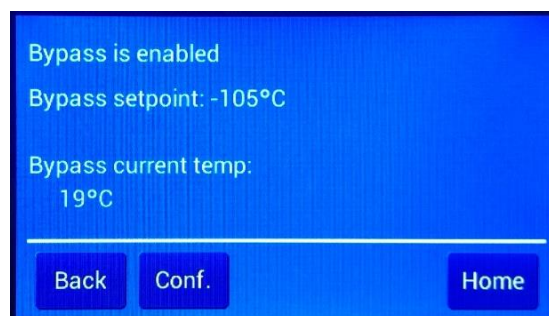


23.7.4 Bypass settings menu

This menu displays the bypass settings. When bypassing is enabled the controller will first cool down the fill piping until the bypass sensor is below the set point.

Buttons:

Back	Return to the fill option menus
Conf.	Open the editing screen of the bypass settings
Home	Return to the home screen



23.7.5 Bypass settings editing menu

This menu is used to edit the bypass settings.

Buttons:

Enabled / Disabled	Enable/disable the bypass functionality
Save	Save the settings and return to the bypass settings menu
Back	Return to the bypass settings menu
Up	Increase the temperature by 5°C
Down	Decrease the temperature by 5°C
Home	Return to the home screen

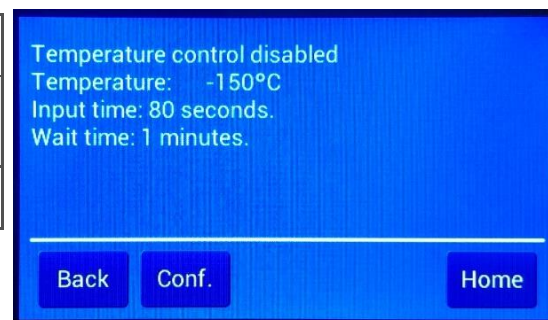


23.7.6 Temperature control settings menu

This menu displays the temperature control settings. When temperature control is enabled the controller will open the fill valve if the temperature of sensor A or sensor B is above the set temperature. The controller will keep the filling valve open for the specified input time, then wait for the set wait time and repeat this cycle until the temperature is below the set temperature. Note: This feature requires a license, for more information please contact your Cryo-Products distributor.

Buttons:

Back	Return to the fill option menus
Conf.	Open the editing screen of the temperature control settings
Home	Return to the home screen



23.7.7 Temperature control settings editing menu

This menu is used to edit the temperature control settings.

Buttons:

Enabled / Disabled	Enable/disable the temperature control functionality
Input	Select the input time (sec)
Temp	Select the temperature
Wait	Select the wait time (min)
Save	Save the setting and return to the temperature control settings menu
Back	Return to the temperature control settings menu
Up	Increase the selected option
Down	Decrease the selected option
Home	Returns to the home screen

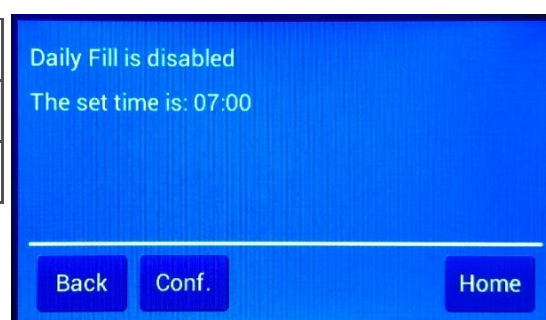


23.7.8 Daily fill menu

This menu displays the settings regarding the daily automatic filling. When daily fill is enabled the controller will start filling the vessel every day at the set time. This creates a more consistent liquid nitrogen usage. When daily fill is enabled, weekly fill is automatically disabled.

Buttons:

Back	Return to the general menu
Conf.	Open the daily fill editing menu
Home	Return to the home screen

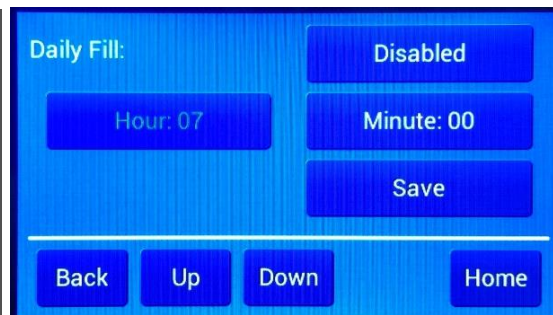


23.7.9 Daily fill editing menu

This menu is used to edit the daily fill settings.

Buttons:

Enabled / Disable	Enable/disable the daily fill functionality
Hour	Select/display the hour
Minute	Select/display the minute
Save	Save the settings and return to the daily fill menu
Back	Return to the daily fill menu
Up	Increase the selected option by 1
Down	Decrease the selected option by 1
Home	Return to the home screen



23.7.10 Weekly fill menu

This menu displays the settings regarding the weekly automatic filling. When weekly fill is enabled the controller will start filling on the configured time on the selected days, this creates a more consistent liquid nitrogen usage. When weekly fill is enabled, daily filling is automatically disabled.

Buttons:

Back	Return to the general menu
Conf.	Open the weekly fill configure menu
Home	Return to the home screen



23.7.11 Weekly fill configuration menu

These menus display the weekly fill configuration menu, choose one of the options to start editing.

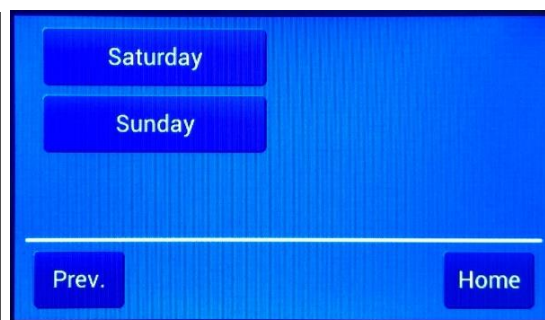
Buttons:

En/Disabled	Open the weekly fill editing menu
Monday	Open the corresponding weekly fill day editing menu
Tuesday	Open the corresponding weekly fill day editing menu
Wednesday	Open the corresponding weekly fill day editing menu
Thursday	Open the corresponding weekly fill day editing menu
Friday	Open the corresponding weekly fill day editing menu
Back	Return to the weekly fill menu
Next	Open the next weekly fill configuration menu
Home	Return to the home screen



Buttons:

Saturday	Open the corresponding weekly fill day editing menu
Sunday	Open the corresponding weekly fill day editing menu
Prev.	Open the previous weekly fill configuration menu
Home	Return to the home screen

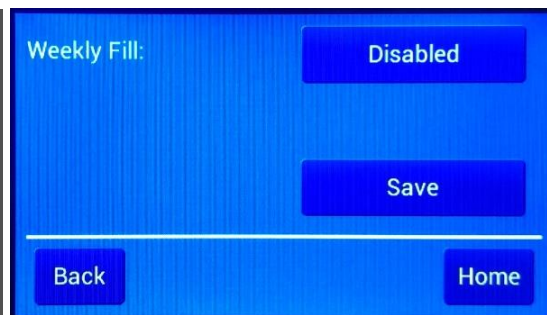


23.7.12 Weekly fill editing menu

This menu is used to enable or disable the weekly fill.

Buttons:

Enabled / Disabled	Enable/disable weekly fill
Save	Save the settings and return to the weekly fill menu
Back	Return to the weekly fill configuration menu
Home	Return to the home screen

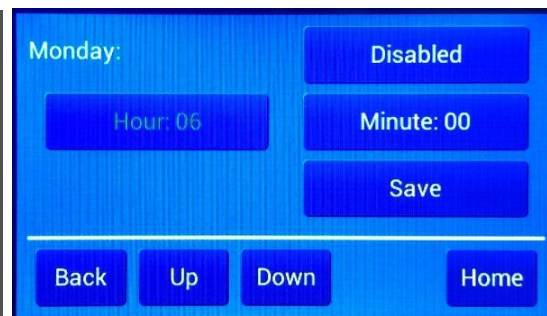


23.7.13 Weekly fill day editing menu

This menu is used to enable or disable and specify the time for the weekly fill of the selected day.

Buttons:

Enabled / Disabled	Enable/disable weekly fill for the specified day
Hour	Select/display the set hour
Minute	Select/display the set minute
Save	Save the settings and return to the weekly fill menu
Back	Return to the weekly fill configuration menu
Up	Increase the selected option by 1
Down	Decrease the selected option by 1
Home	Return to the home screen



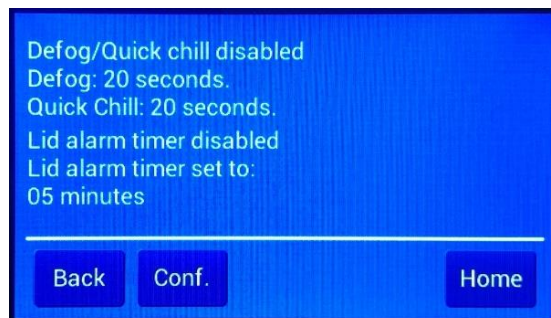
23.7.14 Lid option menu

This menu displays the lid options of the vessel. If a lidswitch is present the defog/quick chill options can be enabled. The controller will automatically defog for the set duration when the lid is opened and also quick chill for the set duration when lid is closed again.

The alarm timer can be enabled when a lid switch is present. When the lid is opened for more than the set duration the controller will generate a lid timer alarm.

Buttons:

Back	Return to the fill option menus
Conf.	Open the configuration menu
Home	Return to the home screen

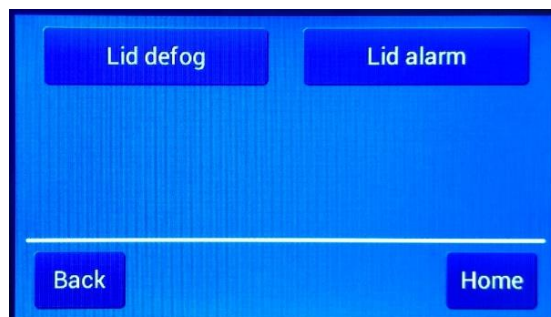


23.7.15 Lid option configuration menu

This menu shows the lid options configuration menu, choose one of the options to start editing.

Buttons:

Lid defog	Open the lid defogging menu
Lid alarm	Open the lid alarm menu
Back	Return to the lid options menu
Home	Return to the home screen

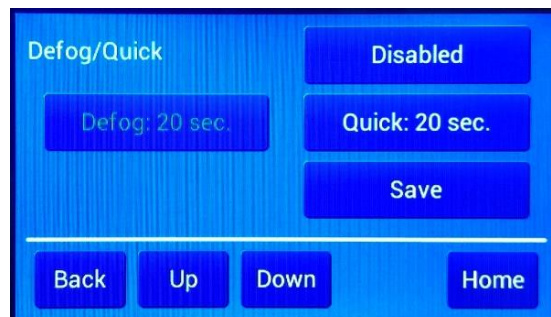


23.7.16 Lid defog editing menu

This menu is used to edit the lid defog and quick chill settings.

Buttons:

Enabled / Disabled	Enable/disable the defog/quick chill functionality
Defog	Select the defogging time (sec)
Quick	Select quick chilling time (sec)
Save	Save the settings and return to the lid option menus
Back	Return to the lid option configuration menu
Up	Increase the selected time by 1 sec
Down	Decrease the selected time by 1 sec
Home	Return to the home screen

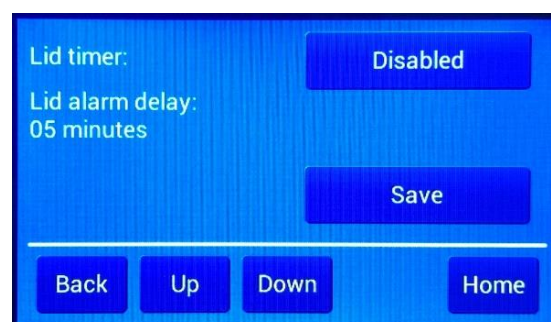


23.7.17 Lid alarm editing menu

This menu is used to edit the lid alarm settings.

Buttons:

Enabled / Disabled	Enable/disable the lid timer functionality
Save	Save the settings and return to the lid option menus
Back	Return to the lid option configuration menu
Up	Increase the timer by 5 minutes
Down	Decrease the timer by 5 minutes
Home	Return to the home screen

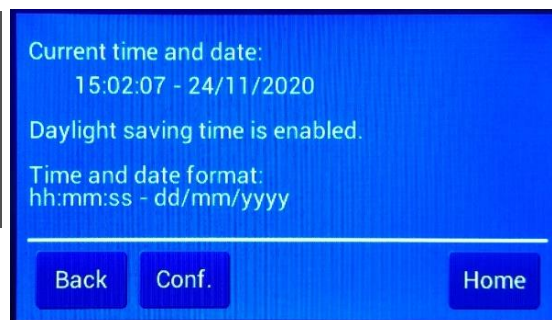


23.7.18 Time/Date menu

This menu displays the time and date settings of the controller as well as the time and date format, this format is not adjustable.

Buttons:

Back	Return to the general menu
Conf.	Open the Time/Date configuration menu
Home	Return to the home screen



23.7.19 Time/Date configuration menu

This menu shows the Time/Date options configuration menu, choose one of the options to start editing.

Buttons:

Time&Date	Open the Time/Date edit menu
DST	Open daylight saving time edit menu
Back	Return to the Time/Date options menu
Home	Return to the home screen



23.7.20 Time/Date editing menu

This menu is used to edit the time settings.

Buttons:

Hour	Select the hour
Minute	Select the minute
Day	Select the day
Month	Select the month
Year	Select the year
Save	Save the settings and return to the time/date menu
Back	Return to the time/date configuration menu
Up	Increase the selected option by 1
Down	Decrease the selected option by 1
Home	Return to the home screen

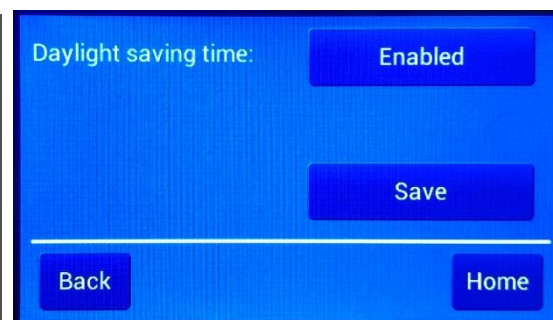


23.7.21 Daylight saving time editing menu

This menu is used to edit the daylight saving time settings.

Buttons:

Enabled / Disabled	Enable/disable daylight saving time
Save	Save the settings and return to the Time/Date menu
Back	Return to the Time/Date configuration menu
Home	Return to the home screen

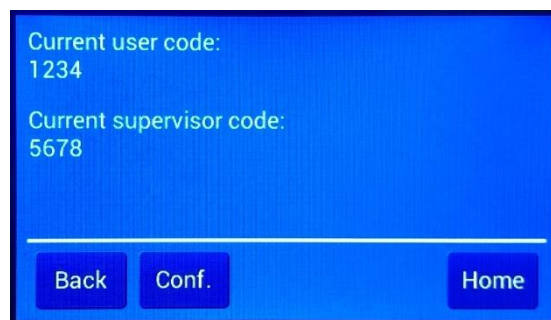


23.7.22 Login codes menu

The menu displays the login codes of the CryoFill 2.0. To enter this menu the user has to login with the supervisor code. The user code can be used to change settings in the levels, temperature and alarm menus with the supervisor code changes can be made to the general and comms menus.

Buttons:

Back	Return to the general menu
Conf.	Open the login codes configuration menu
Home	Return to the home screen

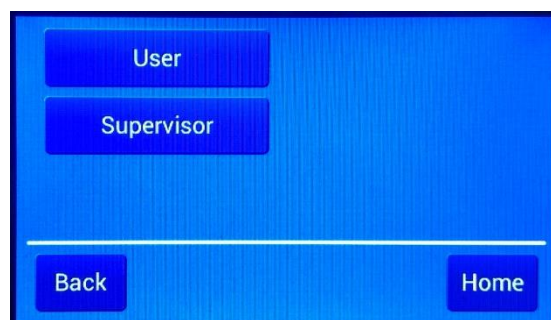


23.7.23 Login codes configuration menu

This menu shows the login codes configuration menu, choose one of the keys to start editing.

Buttons:

User	Open the user key editing menu
Supervisor	Open the supervisor key editing menu
Back	Return to the login codes menu
Home	Return to the home screen



23.7.24 User key editing menu

This menu shows the login user key editing menu, here the user can define a new user login code.

Buttons:

0 - 9	Enter the selected digit
Save	Save the entered code
Del.	Delete the last entered digit
Home	Return to the home screen

23.7.25 Supervisor key editing menu

This menu shows the login supervisor key edit menu, here the user can define a new supervisor login code.

Buttons:

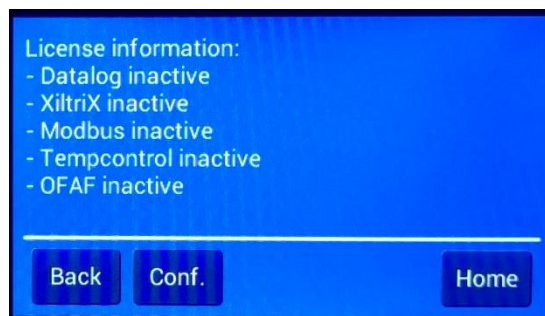
0 - 9	Enter the selected digit
Save	Save the entered code
Del.	Delete the last entered digit
Home	Return to the home screen

23.7.26 Licence menu

This menu displays the licences of the CryoFill 2.0. There are five licences available, datalog licence, XiltriX licence, Modbus licence, Temp Control license and One Fill All Fill license. For more information on the available licenses, please contact your Cryo-Products distributor.

Buttons:

Back	Return to the general menu
Conf.	Open the licence configuration menu
Home	Return to the home screen



23.7.27 Licence configuration menu

This menu used to enter a new license codes in order to activate the associate functionality.

Buttons:

0 - 9	Enter the selected digit
Enter	Verify the entered code
Del.	Delete the last entered digit
Home	Return to the home screen

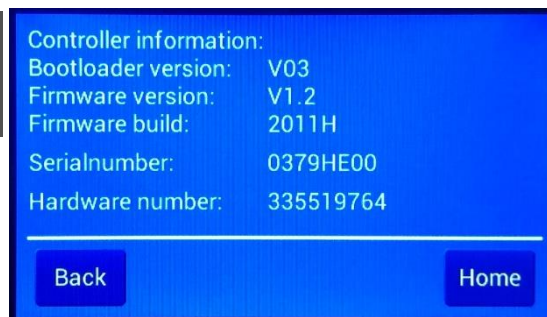


23.7.28 Info menu

This menu displays general information about the controller. Specified are the Bootloader version, Firmware version and build, serial number and a hardware identification number.

Buttons:

Back	Return to the general menu
Home	Return to the home screen

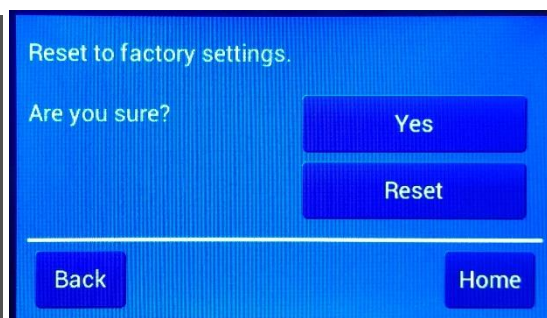


23.7.29 Factory reset menu

In this menu the controller can be reset to its factory settings. To enter this menu the user has to login with the supervisor code.

Buttons:

Yes / No	To prevent unwanted reset first select "Yes" and then press reset.
Reset	Performs the reset and restarts the controller
Back	Returns to the general menu
Home	Return to the home screen



23.8 Communications menu

This menu displays the communication settings of the controller. The drie communication ports can be configured as well as the specific protocol settings. Some menus may not be available, if the required license is not present.

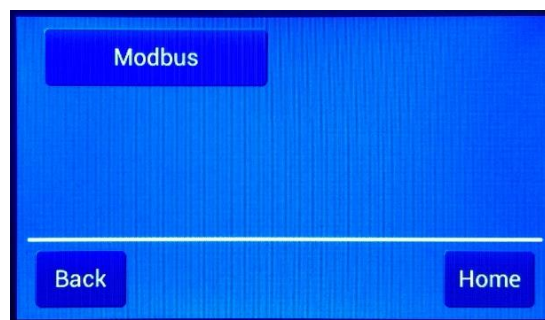
Buttons:

Com. 1	Open the communication 1 menu
Com. 2	Open the communication 2 menu
Com. 3	Open the communication 2 menu
OFAF	Opens the OFAF menu
Datalog	Open the Datalog menu
XiltriX	Open the XiltriX menu
Modbus	Open the Modbus menu
Back	Return to the main menu
Next	Open the next page of the communications menu
Home	Return to the home screen



Buttons:

Modbus	Open the Mobus menu
Back	Opens the previous page of the menu
Home	Return to the home screen

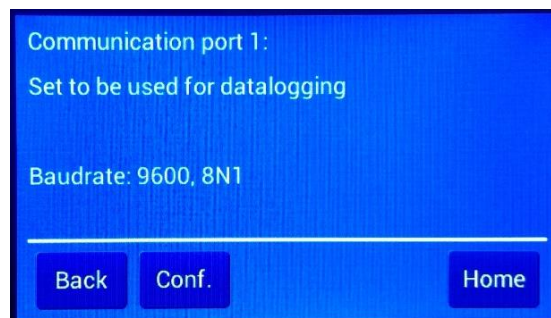


23.8.1 Communication 1 menu

This menu displays the settings for communication port 1. The protocol used is displayed as well as the baud rate. This communication port can be used for datalogging purposes.

Buttons:

Back	Return to the communication menu
Conf.	Open the communication 1 editing menu
Home	Return to the home screen

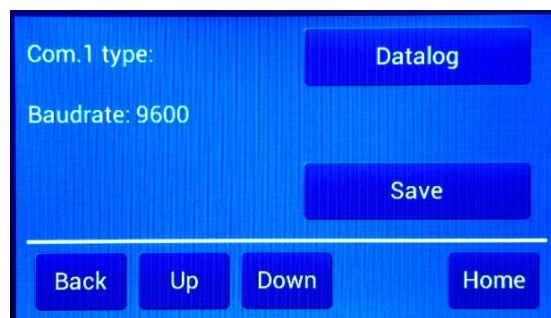


23.8.2 Communication 1 editing menu

This menu is used to edit the communication port 1 settings. The protocol type can be selected, this can be none or Datalogging. The baud rate can be configured as 4800/9600/19200/38400/115200.

Buttons:

None / Datalog	Select the type of communication
Save	Save the settings and return to the Communication 1 menu
Back	Return to the communication 1 menu
Up	Increase the baud rate
Down	Decrease the baud rate
Home	Return to the home screen

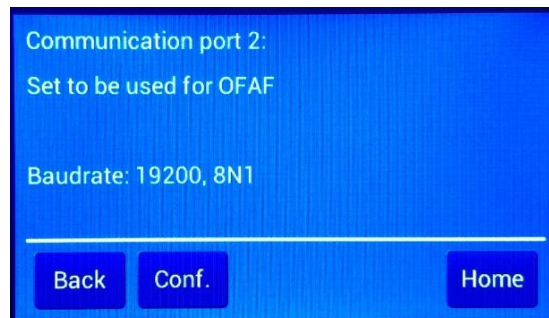


23.8.3 Communication 2 menu

This menu displays the settings for communication port 2. The protocol used is displayed as well as the baud rate. This communication port can be used for One Fill All Fill communication with other controller.

Buttons:

Back	Return to the communication menu
Conf.	Open the communication 2 editing menu
Home	Return to the home screen

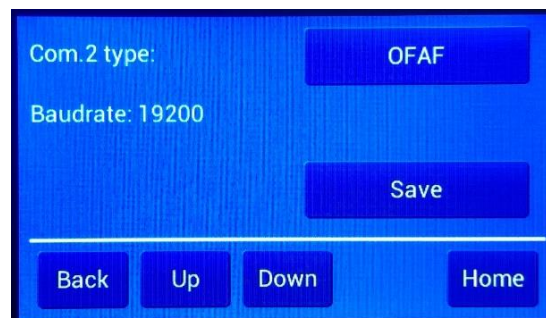


23.8.4 Communication 2 editing menu

This menu is used to edit the communication port 2 settings. The protocol type can be selected, this can be none or One Fill All Fill. The baud rate can be configured as 4800/9600/19200/38400/115200.

Buttons:

None / OFAF	Select the type of communication
Save	Save the settings and return to the communication 2 menu
Back	Return to the communication 2 menu
Up	Increase the baud rate
Down	Decrease the baud rate
Home	Return to the home screen

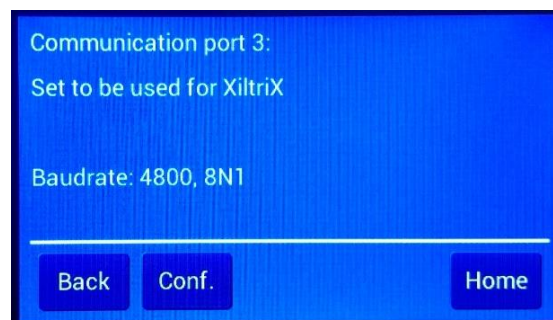


23.8.5 Communication 3 menu

This menu displays the settings for communication port 3. The protocol used is displayed as well as the baud rate. This communication port can be used for communication with XiltriX or a Modbus connection.

Buttons:

Back	Return to the communication menu
Conf.	Open the communication 3 editing menu
Home	Return to the home screen

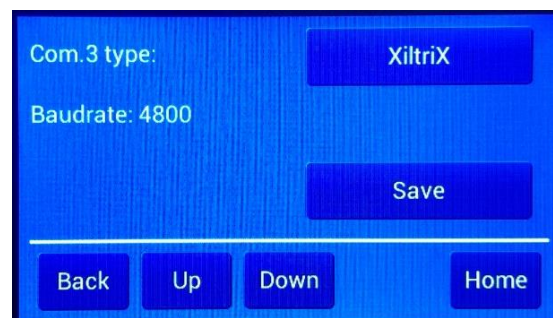


23.8.6 Communication 3 editing menu

This menu is used to edit the communication port 3 settings. The protocol type can be selected, this can be none, XiltriX or Modbus. The baud rate can be configured as 4800/9600/19200/38400/115200.

Buttons:

None / XiltriX / Modbus	Select the type of communication
Save	Save the settings and return to the communication 3 menu
Back	Return to the communication 3 menu
Up	Increase the baud rate
Down	Decrease the baud rate
Home	Return to the home screen



23.8.7 One Fill All Fill menu

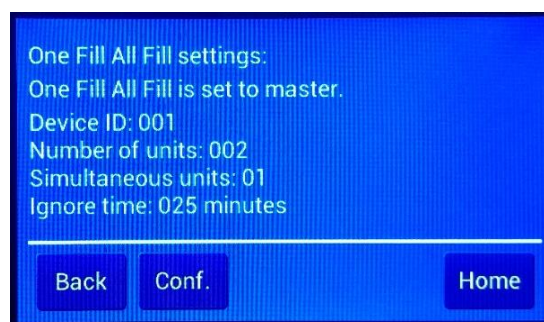
This menu displays the settings for the One Fill All Fill functionality.

- The CryoFill 2.0 can be used to act as the Master or as a Slave.
- The Device ID is used to identify the controllers, the master must have device ID 1.
- Number of units is the total controller number in the OFAF chain including the master. (this setting only applies to the master)
- Simultaneous units is the number of controller filling at the same time. (this setting only applies to the master)
- Ignore time, is the time the master ignores new filling sequences after the last complete OFAF filling sequence. This to prevent unwanted filling, when filling recently took place.

For more information about this feature please contact your Cryo-Products distributor.

Buttons:

Back	Return to the Communication menu
Conf.	Open the OFAF configuration menu
Home	Return to the home screen

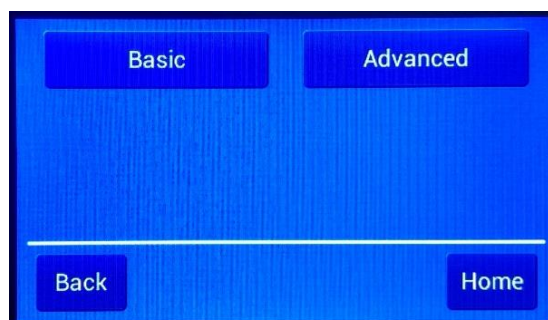


23.8.8 One Fill All Fill configuration menu

This menu shows the One Fill All Fill configuration menu, choose one of the options to start editing.

Buttons:

Basic	Open the basic OFAF edit menu
Advanced	Open the advance OFAF edit menu
Back	Return to the OFAF menu
Home	Return to the home screen

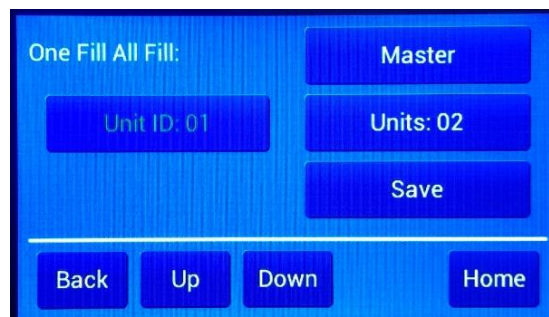


23.8.9 One Fill All Fill basic editing menu

This menu is used to edit the basic One Fill All Fill settings. The unit ID and Units values can range from 0 – 20.

Buttons:

Master / Slave	Set OFAF Master or Slave
Unit ID	Select the Device ID
Units	Select the number of units
Save	Save the settings and return to the OFAF menu
Back	Return to the OFAF configuration menu
Up	Increase the selected value
Down	Decrease the selected value
Home	Return to the home screen

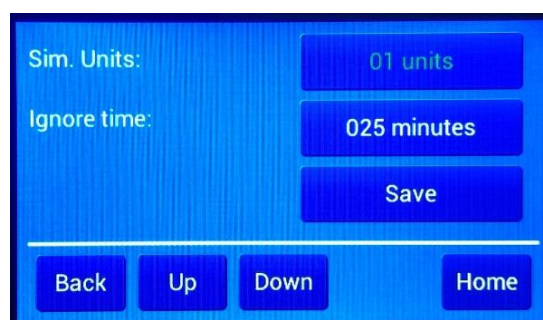


23.8.10 One Fill All Fill advanced editing menu

This menu is used to edit the advanced One Fill All Fill settings. The sim units value can range from 0 – 15 and the ignore time can be set from 15 to 720 minutes.

Buttons:

Sim. units	Select the Simultaneous units
Ignore time	Select the ignore time.
Save	Save the settings and return to the OFAF menu
Back	Return to the OFAF configuration menu
Up	Increase the selected value
Down	Decrease the selected value
Home	Return to the home screen

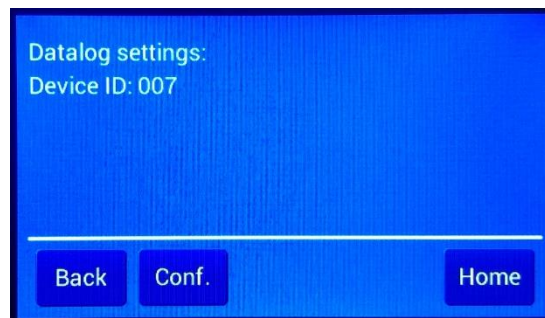


23.8.11 Datalog menu

This menu displays the settings for the datalog option. The download tool for PC makes it possible to extract the historical data from the CryoFill 2.0. The device ID is used to correctly identify the CryoFill 2.0.

Buttons:

Back	Return to the Communication menu
Conf.	Open the Datalog editing menu
Home	Return to the home screen

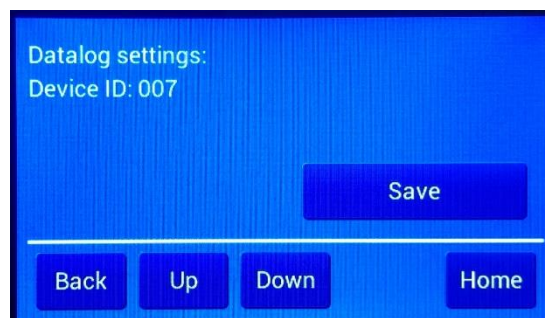


23.8.12 Datalog editing menu

This menu is used to edit the device ID for the datalog functionality. The device ID can range from 0 – 254.

Buttons:

Save	Save the settings and return to the Datalog menu
Back	Return to the Datalog menu
Up	Increase the device ID
Down	Decrease the device ID
Home	Return to the home screen

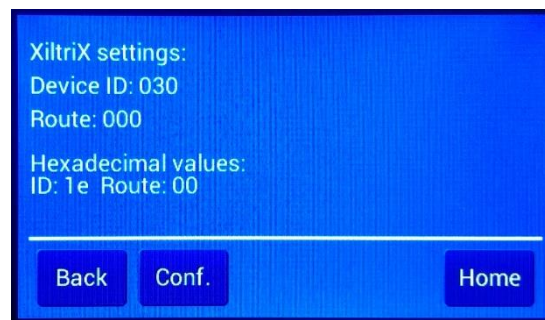


23.8.13 XiltriX menu

This menu displays the settings for the XiltriX option. This enables the CryoFill 2.0 to function as a substation to the XiltriX monitoring system. The device ID and the route number are used to correctly identify the CryoFill 2.0. The device ID and the route are also displayed as Hexadecimal values.

Buttons:

Back	Return to the Communication menu
Conf.	Open the XiltriX editing menu
Home	Return to the home screen

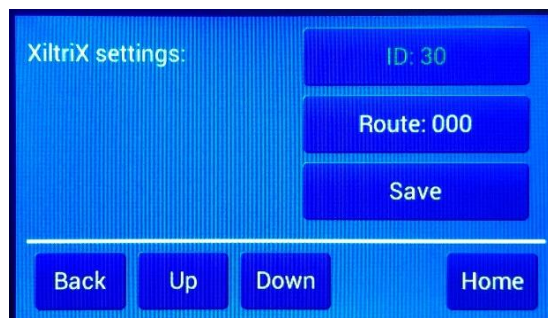


23.8.14 XiltriX editing menu

This menu is used to edit the device ID and route number for the XiltriX functionality. The device ID and the route number can range from 0 – 254.

Buttons:

Save	Save the settings and return to the XiltriX menu
ID	Select the device ID
Route	Select the route
Back	Return to the XiltriX menu
Up	Increase the device ID or route
Down	Decrease the device ID or route
Home	Return to the home screen

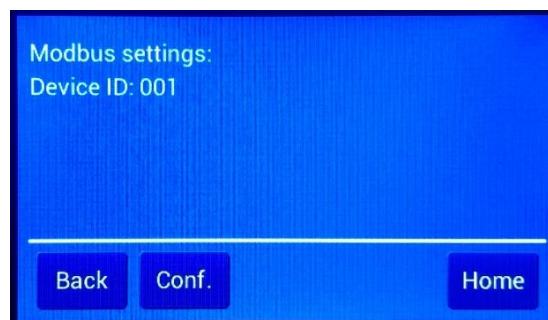


23.8.15 Modbus menu

This menu displays the settings for the Modbus option. This enables the CryoFill 2.0 to function Modbus slave to a monitoring system. The device ID is used to correctly identify the CryoFill 2.0. For more information regarding available data and protocol specifications, please contact your Cryo-Products distributor.

Buttons:

Back	Return to the Communication menu
Conf.	Open the Modbus editing menu
Home	Return to the home screen



23.8.16 Modbus editing menu

This menu is used to edit the device ID for the Modbus functionality. The device ID can range from 0 – 254.

Buttons:

Save	Save the settings and return to the Modbus menu
Back	Return to the Modbus menu
Up	Increase the device ID
Down	Decrease the device ID
Home	Return to the home screen

