



CryoPod™ Carrier Operator Manual

Part Number: 257437 Rev. A



Brooks Automation, Inc.

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Accelerating Innovation



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Revision History

Part Number: 257437

CryoPod™ Carrier Operators Manual



Revision	ECO Number	Date	Explanation of Changes
Revision A	90760	1/19/15	Initial completion of the manual.

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1. Safety

 WARNING	
	<p>Failure to review the Safety chapter and follow the safety warnings can result in death or serious injury.</p> <ul style="list-style-type: none">• All personnel involved with the operation or maintenance of this product must read and understand the information in this safety chapter.• Follow all applicable safety codes of the facility as well as national and international safety codes.• Know the facility safety procedures, safety equipment, and contact information.• Read and understand each procedure before performing it.

NOTICE	
<p>It is the responsibility of each person working on this product to know the applicable regulatory safety codes as well as the facility safety procedures, safety equipment, and contact information.</p>	

Authorized Personnel Only

The CryoPod™ Carrier is intended for use by trained and experienced laboratory personnel. It's operators are advised to comply with applicable organizational standard operating procedures, industry standard guidelines, and local, regional, national, and international laws and regulations.

Explanation of Hazards and Alerts

This manual and this product use industry standard hazard alerts to notify the operator of personal or equipment safety hazards. Hazard alerts contain Safety Text, Safety Icons, Signal Words, and Color.

Safety Text

Hazard alert text follows a standard, fixed-order, three-part format.





- Identify the hazard,
- State the consequences if the hazard is not avoided,
- State how to avoid the hazard.

Safety Icons

- Hazard alerts contain Safety Icons that graphically identify the hazard.
- The safety icons in this manual conform to ISO 3864 and ANSI Z535 standards.

Signal Words and Color

Signal Words inform of the level of hazard.

	<p>Danger indicates a hazardous situation which, if not avoided, will result in death or serious injury.</p> <p>Danger signal word is white on a red background with an iconic exclamation point inside a yellow triangle with black border.</p>
	<p>Warning indicates a hazardous situation which, if not avoided, could result in death or serious injury.</p> <p>Warning signal word is black on an orange background with an iconic exclamation point inside a yellow triangle with black border.</p>
	<p>Caution indicates a hazardous situation or unsafe practice which, if not avoided, may result in minor or moderate personal injury.</p> <p>Caution signal word is black on a yellow background with an iconic exclamation point inside a yellow triangle with black border.</p>
	<p>Indicates a situation or unsafe practice which, if not avoided, may result in equipment damage.</p> <p>Notice signal word is white on blue background with no icon.</p>

Alert Example

The following is an example of a WARNING hazard alert.

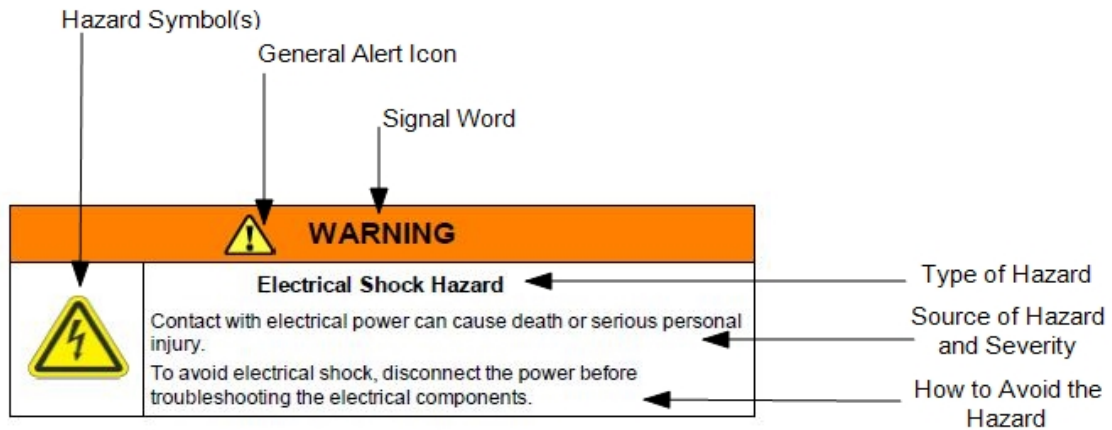





Figure 1-1: Components of a Safety Alert

General Safety Considerations



 CAUTION	
 	<p style="text-align: center;">Personal Protective Equipment</p> <p>This product contains objects that may cause personal harm.</p> <ul style="list-style-type: none">• Wear protective eye wear when setting up or testing the system.• Use appropriate thermal protective gloves when working with components of the system.

 CAUTION	
	<p style="text-align: center;">Inappropriate Use</p> <p>Use of this product in a manner or for purposes other than for what it is intended may cause equipment damage or personal injury.</p> <ul style="list-style-type: none">• Only use the product for its intended application.• Do not modify this product beyond its original design.• Always operate this product with the covers in place.

 CAUTION	
	<p style="text-align: center;">Damaged Components</p> <p>The use of this product when components appear to be damaged may cause equipment malfunction or personal injury.</p> <ul style="list-style-type: none">• Do not use this product if components appear to be damaged.• Place the product in a location where it will not get damaged.

 CAUTION	
	<p style="text-align: center;">Seismic Restraint</p> <p>The use of this product in an earthquake prone environment may cause equipment damage or personal injury.</p> <p>The operator is responsible for determining whether the product is used in an earthquake prone environment and installing the appropriate seismic restraint in accordance with local regulations.</p>

NOTICE
Do not use the CryoPod Carrier as a cryogenic shipper.

NOTICE
Do not place near or immerse in water or other liquids.

NOTICE
Do not remove the electronic module from the system.

Safety and Identification Labels

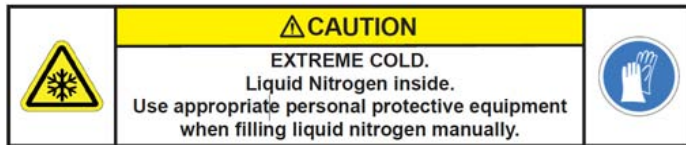
Safety labels are placed on the CryoPod Carrier to identify hazards. Identification labels provide information about the product. Safety Labels provide instructions on how to avoid the hazard.

NOTICE

Do not change or remove the safety or equipment identification labels.

To replace a lost or damaged label call Brooks Life Science Systems Technical Support.

Table 1-1: Safety Labels placed on Product



Hazard Label Type or Name: Extreme Cold

p/n: 255864

Qty: 1

Location: Top of CryoPod Carrier

Possible injuries: Tissue Damage, Cold Burns, and Frostbite

How to avoid the hazards: PPE Safety Gloves



Illustration of Label Location






Fire Hazards

The CryoPod Carrier provides no direct fire hazard.



Explosion Hazards

 CAUTION	
	<p>Improper Use of liquid nitrogen</p> <p>Do not place objects on top of the CryoPod Carrier.</p> <p>Do not overfill with liquid nitrogen.</p> <p>Do not tightly seal the CryoPod Carrier.</p>

Thermal Hazards



 WARNING	
 	<p>Extreme Temperature</p> <p>Contact with cold surfaces can cause death or serious injury from frost bite.</p> <p>Do not operate the product without all covers in place.</p> <p>Do not touch components that show signs of frost. Wait for them to defrost or use insulated gloves or appropriate protective equipment.</p> <p>Use extreme care to prevent contact with LN₂ by spilling or splashing.</p>

Chemical Hazards



 CAUTION	
	<p>Asphyxiation</p> <p>The liquid nitrogen used in this product is non-flammable and non-toxic. However, as with any gas, death or serious injury due to asphyxiation could occur if concentrated gas is inhaled.</p> <ul style="list-style-type: none">• When working with refrigerant gases, follow all facility and local regulatory and environmental procedures regarding the storage, handling, and disposal of the gases.• Fill, service, and use the unit in a well ventilated area.

Ergonomic Hazards

Tip Hazard

 CAUTION	
	<p>Tip Hazard</p> <p>Do not place product above typical laboratory bench level. Maximum height of 106.7 cm (42 in) to minimize risk of tipping or knocking the unit over.</p>

Lift Hazard

 CAUTION	
	<p>Lift Hazard</p> <p>This product weighs greater than 9.0 kg (20 lb) but less than 11.3 kg (25 lb). Improper lifting may result in personal injury.</p> <p>Use appropriate lift techniques when lifting this product.</p>

Environmental Information

Noise Emission

The CryoPod Carrier provides no direct noise hazard during operation.

Vibration

The CryoPod Carrier provides no direct vibration hazard during operation. Any vibrations produced during normal operation are minimal and cause no hazardous conditions.

Decommissioning and Disposal

Brooks Life Science Systems complies with the EU Directive 2002/96/EU Waste Electrical and Electronic Equipment (WEEE). The obligations for disposal for the product and components are passed to the end user for responsible disposal. No cost for disposal is included in the initial cost of the equipment.

For further information and assistance in disposal, please contact the Brooks Life Science Systems technical support.

Regulatory Compliance and Declaration of Conformity (DOC)

The Product meets the requirements of the European Union's Machinery Directive 2006/42/EC as a completed machine. In accordance with the Directive, BioCision has issued a Declaration of Conformity and the Product has a CE mark affixed.

	
DECLARATION OF CONFORMITY	
<i>Manufacturer's Name:</i>	BioCision, LLC
<i>Manufacturer's Address:</i>	101 Glacier Point Road, Suite E San Rafael, California 94901 U.S.A.
<i>Declares, that the product</i>	SAMPLE
	CryoPod™ Carrier, Model Number: CP3L (BCS-514 and BRO-514)
	<i>is manufactured in accordance with "professional practices" and manufacturing instructions, and conforms to the following European Council Directives:</i>
2006/95/EC	Low Voltage Directive
2004/108/EC	EMC Directive
2011/65/EU	Restriction of Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS)
2012/19/EU	Waste Electrical and Electronic Equipment (WEEE)
<i>Supplementary Information:</i>	
Safety:	EN 61010-1:2010
EMC:	EN 61326-1:2013 Class B
EMI:	FCC Part 15 Subpart B Class B
<i>Year in which CE marking was affixed:</i> 2015	
<i>Where applicable the Notified Body Bay Area Compliance Laboratories Corporation, Sunnyvale, CA, USA performed testing and completed attestations reports that correspond with the above listed standards.</i>	
<i>This Declaration of Conformity is issued under the sole responsibility of the BioCision LLC.</i>	
<i>Issued on March 8, 2016</i>	
	
<i>Mark Allen, Vice President of Operations</i>	



2. Overview

The CryoPod™ Carrier is a portable liquid nitrogen (LN₂) based system that, with the CryoPod Carrier lid secure, provides over four hours of < -150°C temperature stability for the handling and transportation of cryogenic biospecimens. The system's battery powered electronic module displays the cryogenic chamber temperature as well as operator defined parameters such as date, time, instrument identification, alarms and log function activation.

The included manual fill kit facilitates the system LN₂ charging process utilizing approximately 3 liters of LN₂. The cryogenic chamber consists of an aluminum basket that is seated above the LN₂ absorbent pad assembly, eliminating contact between the chamber's biological contents and LN₂.

With a built-in handle and compact dimensions, the CryoPod Carrier can be hand-carried over short distances such as around a laboratory or research campus to extend the cryogenic cold chain.

Using this Manual

 WARNING	
	<p>Failure to review the Safety chapter and follow the safety warnings can result in death or serious injury.</p> <ul style="list-style-type: none">• All personnel involved with the operation or maintenance of this product must read and understand the information in this safety chapter.• Follow all applicable safety codes of the facility as well as national and international safety codes.• Know the facility safety procedures, safety equipment, and contact information.• Read and understand each procedure before performing it.

The CryoPod Carrier is intended for use in a laboratory environment by trained laboratory personnel. The manuals and related materials are intended for use by trained and experienced technical personnel.

The manufacturer accepts no liability for any other use of the equipment or its individual parts and components. This also applies to service and repair work carried out by unauthorized service personnel. All warranties are declared null and void in the event of non-compliance with these instructions. This also applies to parts not directly affected by any unauthorized repair work.

This manual contains information on safety, specifications, and operation as well as troubleshooting and maintenance of the CryoPod Carrier. If there are any questions regarding this manual or use of this system or to order additional copies of this publication, contact Brooks Automation.

Specifications

Parameter	Specifications
Internal Basket dimensions	17.4 x 18.8 x 7.8 cm (6.9 x 7.4 x 3.1 in)
External CryoPod Carrier dimensions	34.0 x 32.0 x 26.0 cm (13.4 x 12.6 x 10.2 in)
Capacity	One 2" tall cryobox, two SBS Microplates, or small cassettes
Weight (without samples)	5.1 kg (11.2 lbs) without LN ₂ 6.9 kg (15.2 lbs) fully charged with LN ₂
LN ₂ fill volume (full charge)	~3 L
Operating Environment	15 – 35 °C (59 – 95 °F)
Hold Time at < - 150°C	Lid On: >4 hours Lid Off: >1 hour
Relative Humidity (RH)	10 - 85% recommended, 30 - 70% ideal
Power Rating	5 watts
Battery Requirements	3 "AA" (LR6) Alkaline (included)
3 "AA" Battery expected life	Over 2 years of routine use
Maximum data log hours	100 hours
Display temperature increments	1°C
Temperature acquisition and data logging rate	60 sec
Display temperature range	-199 to 49 °C
Display temperature accuracy	±5°C
Alarms	Two programmable temperature alarms
Compliance	CE Mark, RoHS, WEEE, FCC, EN 61010, EN 61326

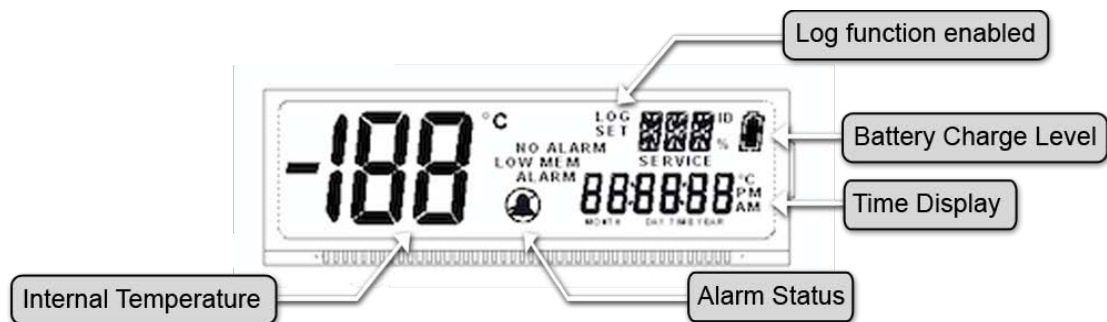
System Button Selections



The system select buttons, located below the LCD screen, are used to interact and program the CryoPod Carrier. Each button can be pressed for a "short press" or held for a "long press" to perform different functions.

LCD System Display



The CryoPod Carrier LCD display shows the operator the settings, such as temperature and battery life of the system.



LCD Lighting

The LCD white back light's main function is to allow the operator to view the LCD screen under low lighting conditions.





Table 2-1: LCD Lighting





LCD Options	Manual Action
Turn white Back Light ON	Short press the star burst button  . NOTE: The white back light cannot be turned on when the red back light is flashing or the system is in standby mode.
Turn white Back Light OFF	Short press the star burst button  . NOTE: If the back light is not manually turned off, it will automatically turn off after 10 seconds.





The LCD red back light's main function is to alert the operator that an alarm has been triggered. The operator is not able to manually control the red back light and the red back light will begin flashing whenever an alarm is triggered.

NOTE: The red back light will also flash when the unit is powered on as a functionality check.

LCD Control Buttons

Operation Mode – CryoPod Off and On (with no alarms running)				
				
Short Press	On	Toggle Date/Time	Back light On/Off	
Long Press	Off	Enter SET Mode	Log Event	

Alarm Engaged – Alarm being sounded				
				
Short Press		Toggle Date/Time	Back light On	Silent Alarm
Long Press	System Off		Log Event	

In Set Mode – Operator has already entered into SET Mode				
				
Short Press		Toggle through each setting	Change Value Up	Change Value Down
Long Press	Off	Save Changes (Beep confirmation)		
NOTE: If no button is actively pressed for 10 seconds when in SET Mode, the system will exit the SET Mode without saving any changes.				

LCD Indicators and Symbols



Indicator/ Symbol	Description
Alarm	"ALARM" text and alarm number with red back light will display if the alarm is triggered.
Battery Symbol	A battery symbol consisting of an outline of a battery and three internal sections indicating the charge remaining: <ul style="list-style-type: none"> All three sections filled: >75% Two sections filled: >50% One sections filled: >25% Battery outline <13%
Bell	The bell shaped symbol indicates that the unit will beep if an alarm is triggered; if it does not appear on the LCD, then the sound was turned off for both alarms.
CaL	CaL text in the ID Code field indicates TDISPLAY issue which must be addressed by Brooks Automation technical support.
Crossed Bell	Crossed bell symbol indicates that the alarm was silenced by the operator.
Firmware ID	An Alpha-numeric code indicating Firware ID in the date/time field that will be displayed temporary when the system is turned on.
ID Code	The ID Code is shown as three alpha numeric digits on the upper right hand corner of the LCD screen.
Log	LOG text appears on the LCD screen to indicate that a log event was turned on.
Low Memory	LOW MEM is displayed when the available memory is not sufficient for six hours of log data.
No Alarm	NO ALARM indicates that none of the alarms have been enabled.
OP	OP text on the LCD screen indicates an open sensor issue which must be addressed by Brooks Automation technical support.

Indicator/ Symbol	Description
Service	The SERVICE indicator on the LCD screen indicates a technical support issue; SERVICE indicator is automatically turned OFF if the issue is resolved. NOTE: <i>Contact Brooks Automation Technical Support to resolve service issues that can not be solved by troubleshooting the system. See "Troubleshooting" on page 35</i>
Set	SET appearing on the LCD screen indicates that the unit is now in SET Mode.
Standby	The OFF text appearing on the LCD screen indicates that the unit is in Standby Mode.
TDISPLAY	Temperature in °C
Time and Date	Time Display: Hours:Minutes and AM/PM Six digit date display: MM:DD:YY

Concepts and Terminology

The concepts and terminology defined in the section are used throughout this document.

Term	Definition	Functional Impact
Absorbent Pad Assembly	Consists of two Absorbent Pads and one re-usable metal plate located below the cryogenic chamber basket	Helps to minimize movement of free LN ₂ and facilitate optimum cryogenic thermal conductivity Absorbent pads should be changed once a year.
Alarm 1	Temperature Warning Alarm (-155°C default)	Alarm 1 is activated when the cryogenic chamber temperature reaches or exceeds TWARNING to alert the operator that LN ₂ charge is nearly spent. Biospecimens should be transferred to appropriate cryogenic storage within a few minutes to avoid warming to the critical biospecimen temperature or the CryoPod should be recharged.
Alarm 2	Temperature Critical Alarm (-140°C default)	Alarm 2 is activated when the cryogenic chamber temperature exceeds TCRITICAL to alert the operator that LN ₂ charge is now insufficient to maintain samples below critical biospecimen temperature. Biospecimens should be transferred immediately to appropriate cryogenic storage or the CryoPod should be recharged.
Firmware ID	Alpha-numeric code indicating firmware identity	The Firmware ID is needed when working on technical support issues. It is displayed on the LCD screen in the time field for a few seconds after Power ON. NOTE: This can be downloaded in the CryoPod Carrier Data Log Software.
ID Code	Three digit alpha-numeric code to indicate individual CryoPod Carrier identity. This can be set by the operator.	Used to facilitate differentiating units for data log file downloads, service visits and other laboratory use.
LCD (Liquid Crystal Display)	The display on the electronics module.	Used to display temperature, time, alarm status, and ID code.
Liquid Level Sensor	Tool that fits just outside the back right corner of the chamber basket. Used to indicate correct fill level of LN ₂ during the manual fill process.	A marked indicator rod connected to a float provides a visual confirmation that the correct volume of LN ₂ has been added to the CryoPod Carrier

Term	Definition	Functional Impact
"LOW MEM"	"LOW MEM" is displayed when the available memory is not sufficient for six or more hours of log data.	Notifies the operator to download the log data to a PC and free up memory space; if no download is done and memory is full, then unit will stop logging data and display "MEM" in upper right corner of display
Power OFF	The OFF mode is automatically entered when $T_{DISPLAY} \geq T_{OFF}$	Enables unit to indicate temperature until cryogenic chamber temperature warms up to safer handling temperature (e.g. -20°C)
Power ON	Power ON can be achieved by a short press of the power button  on the CryoPod Carrier.	Unit will stay ON if $T_{DISPLAY} \geq T_{STANDBY}$, otherwise the unit will automatically switch into "Standby Mode" after 1 minute
ON Mode	After being powered ON, unit remains in ON Mode if $T_{DISPLAY} \leq T_{STANDBY}$ (Default $T_{STANDBY} = -100\text{ °C}$)	ON Mode enables all built-in functionality (excluding those not enabled by the operator) such as displays of date/time, $T_{DISPLAY}$, alarm on, audible alarm on, log on, unit ID Code, and battery level
SET Mode	To access settable functions, Set Mode can be entered by long pressing the date/time button  when unit is powered ON	Settable functions include alarms, date/time, $T_{STANDBY}$, and ID Code
Standby Mode	The Standby Mode is automatically entered when $T_{DISPLAY} \geq T_{STANDBY}$.	Enables unit to switch to power saving Standby Mode while allowing operator to see $T_{DISPLAY}$ until unit warms to safer T_{OFF} temperature
TCRITICAL	Temperature setting for Alarm 2.	The $T_{CRITICAL}$ is used to alert the operator that LN_2 charge is now insufficient to maintain samples
TDISPLAY	Temperature displayed in large font to the left side of the LCD screen while unit is in ON Mode.	$T_{DISPLAY}$ indicates the temperature of the basket.
TOFF	The unit will automatically power OFF at this temperature or warmer.	Enables power T_{OFF} conditions such as no temperature display after $T_{DISPLAY}$ warms to relatively safer temperature level of -20°C
TSTANDBY	Temperature setting for automatic switch to Standby Mode.	When the temperature inside the basket reaches a temperature warmer than the $T_{STANDBY}$ temperature, the system will switch into Standby Mode.
TWARNING	Temperature setting for Alarm 1.	When the temperature reaches or exceeds $T_{WARNING}$ to alert the operator that LN_2 charge is nearly spent.

3. Installation

Unpacking

Carefully lift the CryoPod Carrier from its box compartment using the unit's built in handle. All other package components can be found in the accessory box.

Package Components

- CryoPod Carrier
- CryoPod Carrier lid
- 3 "AA" (LR6) alkaline Batteries
- Funnel Assembly
- Liquid Level Sensor
- L - wrench, 2.5mm
- USB Cable (6ft USB 2.0 A-Male Micro-B Male)
- Operators Manual







NOTE: If you are missing any of the above package components, contact Brooks Automation, see Technical Support [on page iii](#) for more contact information.



CryoPod Carrier Registration and Software Download

The CryoPod Carrier must be registered to download the Data Log software:
<http://www.brooks.com/cryopodregistration>

Save the software installer to your desktop.

CryoPod Carrier Assembly

Step	Action
1.	Remove the battery panel on the lower front of the unit using the built-in clip.
2.	Insert the provided 3 "AA" alkaline batteries in the battery wells as indicated by the embossed schematic. When replacing batteries, all three must be replaced at a time.
3.	Replace the battery panel.
4.	Put the instrument lid on.
5.	Turn the CryoPod Carrier on by pressing the power button  . The LCD screen will display the start-up sequence.
6.	Enter SET Mode by long pressing the time button  . The SET text will display.
7.	<p>Short press  to consecutively cycle through settable elements.</p> <p>Elements appear in the following order:</p> <ul style="list-style-type: none"> • Alarm 1 (TWARNING) set temperature, • Alarm 1 ON/OFF, • Alarm 1 sound ON/OFF, • Alarm 2 (TCRITICAL) set temperature, • Alarm 2 ON/OFF, • Alarm 2 sound ON/OFF, • Date (day), Date (Month), Date (Year), • Time (hr), Time (min), Time (AM/PM), • ID number, • Standby (TSTANDBY) set temperature
8.	<p>Set values for each settable element by short pressing the star burst button  or the silent alarm button . Once the value is set, short press  to move to the next functional element.</p>

Step	Action
9.	<p>Long press  to Save once all settable elements are set. A single beep will sound to confirm that the settings have been saved.</p> <p>OR</p> <p>Long press  to exit without saving new settings.</p>

SET Mode

The SET mode allows the operator to change settings and properties of the CryoPod Carrier.

NOTE: If no button is actively pressed for 10 seconds when in SET Mode, the system will exit the SET Mode without saving any changes.



Default SET Mode settings

SET Mode	Default Setting
Alarm 1 (TWARNING) set temperature	-155°C
Alarm 1 ON/OFF	ON
Alarm 1 sound ON/OFF	ON
Alarm 2 (TCRITICAL) set temperature	-140°C
Alarm 2 ON/OFF	ON
Alarm 2 sound ON/OFF	ON
Date (day), Date (Month), Date (Year)	No Default Setting
Time (hr), Time (min), Time (AM/PM)	No Default Setting
ID number	Different for each system
Standby (TSTANDBY) set temperature	No Default Setting

Manually Setting the CryoPod Carrier Displays

If the settings are not manually set, the default settings will be used and "NOT SET" will be displayed in the SET position on the LCD screen. To manually set the display follow steps **6-9** of the CryoPod Carrier Assembly Procedure. [See "CryoPod Carrier Assembly" on page 21.](#)




4. Operation

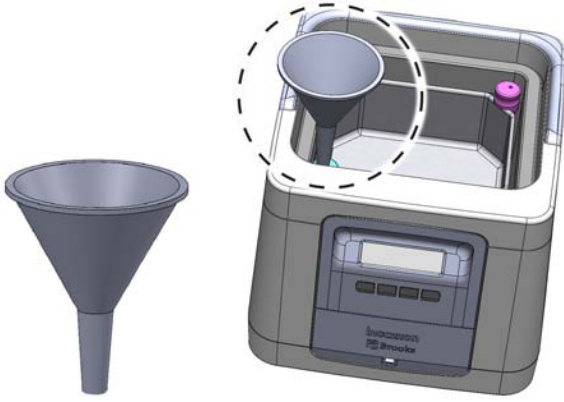
 WARNING	
	<p>Failure to review the Safety chapter and follow the safety warnings can result in death or serious injury.</p> <ul style="list-style-type: none">• All personnel involved with the operation or maintenance of this product must read and understand the information in this safety chapter.• Follow all applicable safety codes of the facility as well as national and international safety codes.• Know the facility safety procedures, safety equipment, and contact information.• Read and understand each procedure before performing it.



Materials needed (not provided by Brooks Automation)

- 4-5 Liter Dewar Flask with handle designed to store and transport LN₂
- Personal Protective Equipment (PPE)
- Accessories to store biospecimens such as cryoboxes or cryogenic vial racks
- Liquid nitrogen and suitable source container such as Dewar or tank with equipment to dispense liquid nitrogen into Dewar Flask
- **Optional:** PC with a minimum of Windows 7 64-bit operating system

Manual Filling of LN₂





 WARNING	
 	<p style="text-align: center;">Extreme Temperature</p> <p>Contact with cold surfaces can cause death or serious injury from frost bite.</p> <p>Do not operate the product without all covers in place.</p> <p>Do not touch components that show signs of frost. Wait for them to defrost or use insulated gloves or appropriate protective equipment.</p> <p>Use extreme care to prevent contact with LN₂ by spilling or splashing.</p>


Step	Action
1.	Check that the unit is powered off and remove the lid.
2.	Remove any contents that are inside the CryoPod Carrier basket.
3.	<p>Position the funnel assembly into the interior front left corner of the unit. The notched side of the assembly should be touching the corner cut edge of the internal basket.</p> <p>NOTE: Ensure that the funnel is fully inserted into the corner to avoid tipping.</p> <div style="text-align: center;">  </div>

Step	Action
4.	<p>Position the liquid level sensor into the back interior corner diagonally opposite the funnel assembly with the notch on the sensor touching the corner cut edge of the internal basket.</p> <p>NOTE: The rod must be in the lowest position.</p> 
5.	<p>Fill the Dewar flask (not provided) with approximately 3 Liters of liquid nitrogen (not provided).</p>
6.	<p>Slowly pour approximately one liter of LN₂ into the funnel. Wait for the LN₂ to stop boiling.</p> <p>NOTE: The funnel should never be more than half full at any time.</p>
7.	<p>Turn on the unit by short pressing .</p>
8.	<p>Wait approximately 15 minutes until the temperature reaches -15°C. The LCD screen will reflect the cooling chamber temperature.</p> <p>NOTE: If the CryoPod Carrier warms up over -20°C, the electronics will turn off automatically after 1 minute.</p>
9.	<p>Slowly pour the remaining LN₂ from the Dewar Flask into the funnel. Stop filling when the sensor rod stops bouncing and the bottom of the colored fill bar is visible.</p> <p>NOTE: The funnel should never be more than half full at all times.</p>
10.	<p>Remove the funnel and fill sensor using cryogenic gloves. Place the lid back onto the unit. Allow 10-15 minutes for the chamber temperature to equilibrate. When the CryoPod Carrier Chamber reaches -170°C or below, the unit is ready for use.</p>

Inserting and Transporting Biospecimens

NOTE: Due to the potential increased risk of mishandling, do **not** hand-carry more than one CryoPod Carrier at a time.

Step	Action
1.	Ensure that the unit is placed securely on a flat and stable surface free from vibrations when filling, loading, handling, and unloading samples.
2.	<p>Retrieve biospecimens from cryostorage and transfer to the internal basket of the CryoPod Carrier that is charged with LN₂.</p> <p>NOTE: Take care to minimize exposure of biospecimens to room temperature air.</p> <div style="border: 1px solid black; padding: 5px;"> <div style="background-color: yellow; text-align: center; padding: 5px;">  CAUTION </div> <div style="display: flex; align-items: center;"> <div style="border: 1px solid black; border-radius: 50%; width: 40px; height: 40px; margin-right: 10px; display: flex; align-items: center; justify-content: center;">  </div> <div> <p>Personal Protective Equipment</p> <p>This product contains objects that may cause personal harm.</p> <ul style="list-style-type: none"> • Use appropriate thermal protective gloves when working with components of the system. </div> </div> </div>
3.	Long press button  to register a log event into the data file (Sample IN). The LOG text will appear on the LCD screen and a single beep will occur.
4.	Transport the CryoPod Carrier over a short distance to the intended destination. Transfer specimens in the CryoPod Carrier NOTE: Always check the temperature display before removing the CryoPod Carrier lid for any reason.
5.	Once all biospecimens are removed from the CryoPod Carrier, long press  to register a log event (Sample OUT). The LOG text will disappear from the LCD screen and a single beep will occur.
6.	<p>If the CryoPod Carrier is not to be used further, place in a location where the unit can safely warm up and go into Standby Mode. Standby Mode will be indicated on the LCD screen by displaying TDISPLAY, OFF and battery indicator.</p> <p>If ALARM 1 or ALARM 2 are enabled, they will be triggered as the unit warms above each alarm temperature threshold.</p> <p>NOTE: All Biospecimens should be removed before the unit goes into Standby Mode.</p>

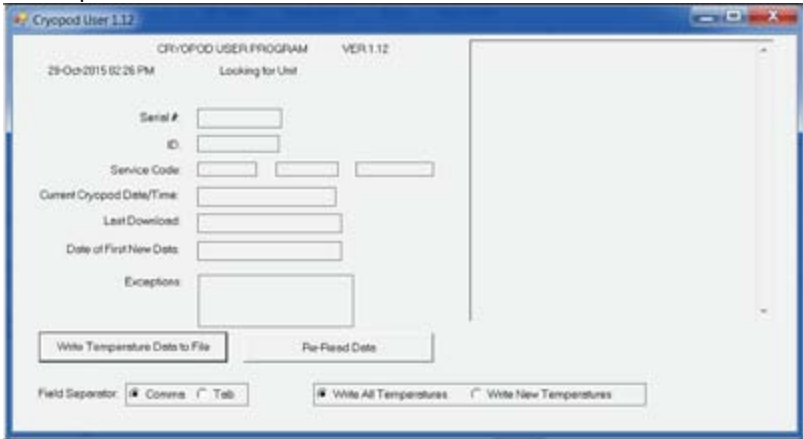
Step	Action
7.	<p>Once the unit warms to TOFF, the unit will automatically power off. The LCD screen will then turn off.</p> <p>NOTE: Long press  to place the system in standby mode.</p>

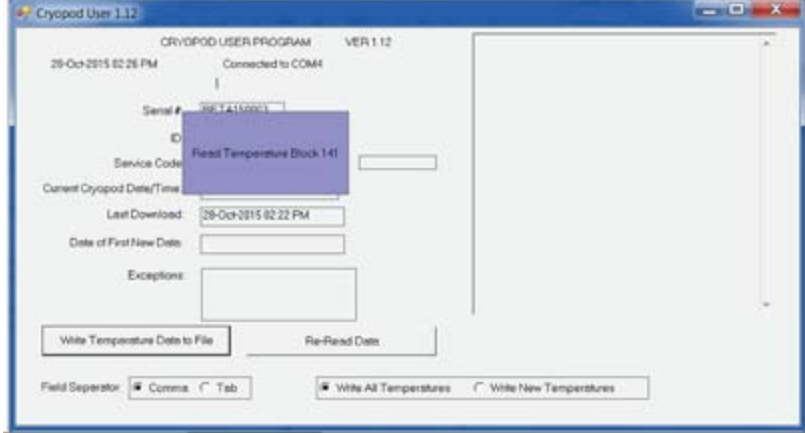
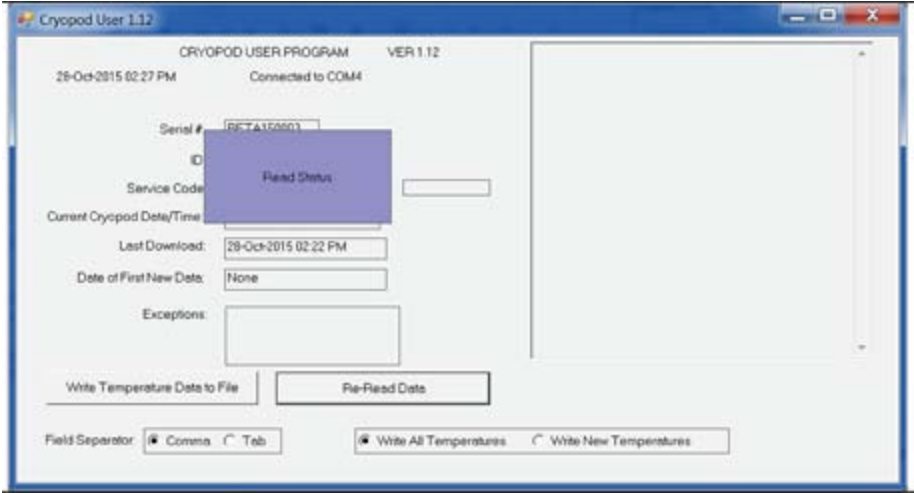
NOTE: The CryoPod Carrier is **NOT** intended for use as an extended time period (e.g. overnight) cryogenic storage device. Do **NOT** use as a cryogenic shipper.

CryoPod Carrier Data Log Software

Minimum PC Requirements: Windows 7, 64-bit

Software Installation and Set Up

Step	Action
1.	Double click the software installer on the desktop.
2.	<p>After the software is finished being installed, launch the software by double clicking the software desktop icon.</p> 

Step	Action
3.	<p>Using the USB cable included in the CryoPod Carrier kit, connect the PC to the CryoPod Carrier. The software will automatically detect the unit.</p> <p>NOTE: If the unit is not automatically detected, or re-establishing connection is needed, select Re-Read Data.</p>  <p>The screenshot shows the 'Cryopod User 1.12' window. At the top, it says 'CRYPOD USER PROGRAM VER 1.12' and 'Connected to COM4'. The date and time are '29-Oct-2015 02:26 PM'. The 'Serial #' field contains 'RCA10003'. The 'ID' field is highlighted with a purple box and contains 'Read Temperature Block 141'. Other fields include 'Service Code', 'Current Cryopod Date/Time', 'Last Download: 29-Oct-2015 02:22 PM', and 'Date of First New Date'. There are buttons for 'Write Temperature Data to File' and 'Re-Read Data'. At the bottom, there are radio buttons for 'Field Separator' (set to 'Comma') and 'Write All Temperatures' (checked).</p>
4.	<p>When the connection has been established the data will automatically sync to the system and top fields will automatically populate with information extracted from the CryoPod Carrier.</p>  <p>The screenshot shows the 'Cryopod User 1.12' window. At the top, it says 'CRYPOD USER PROGRAM VER 1.12' and 'Connected to COM4'. The date and time are '29-Oct-2015 02:27 PM'. The 'Serial #' field contains 'RCA10003'. The 'ID' field is highlighted with a purple box and contains 'Read Status'. Other fields include 'Service Code', 'Current Cryopod Date/Time', 'Last Download: 29-Oct-2015 02:22 PM', and 'Date of First New Date: None'. There are buttons for 'Write Temperature Data to File' and 'Re-Read Data'. At the bottom, there are radio buttons for 'Field Separator' (set to 'Comma') and 'Write All Temperatures' (checked).</p>

Downloading Temperature Log Data

Step	Action
1.	Create a destination folder on the PC for the CryoPod Carrier log data.
2.	<p>Indicate the preferred Field Separator (Comma/Tab), and whether all of the temperature data will be downloaded each time or if just the new data will be captured.</p>
3.	Click Write temperature Data to File and navigate to the destination folder created in Step 1. A dialog box will pop-up stating that the Log File will be created.
4.	<p>Upon completion, the window on the right side will display your file location.</p>
5.	When done, close out of the window by exiting the software.

System Alarms

The CryoPod Carrier has system alarms, Alarm 1 and Alarm 2, to inform the operator when the internal basket warms. Alarm 1 is set to the colder temperature while Alarm 2 is set to a warmer temperature. However, these alarms can be manually set to any temperature by the operator.

NOTE: If only one alarm is enabled, then the alarm will automatically become a TCRITICAL alarm and assigned to Alarm 2.

NOTE: If both Alarm 1 and Alarm 2 are disabled, the "NO ALARM" indicator will be displayed on the LCD screen.

Alarm 1: TWARNING

Default Settings for Alarm 1

Default Alarm 1: -155°C


Sound: One single long beep every 30 seconds. If the sound is disabled for either alarm, both will be disabled.

LCD Screen: ALARM 1 appears on the LCD screen while the back light flashes red every 10 seconds.

Reset the Alarm: The alarm will reset once the system drops to 5°C below the TWARNING level.

To Silence the audible alarm and stop the alarm back light: Short press  and the "crossed bell" symbol will appear on the LCD screen.



NOTE: Unless the operator short presses button  to silence the alarm, the back light will flash red and the sound will continue until the system reaches the TCRITICAL level.

Alarm 1 is activated when the cryogenic chamber temperature reaches or exceeds the TWARNING level. This alerts the operator that the LN₂ charge is almost over and needs to be recharged. The biospecimens should be transferred to the appropriate cryogenic storage within a few minutes to avoid warming or the system should be recharged.

Alarm 2: TCRITICAL

Default Settings for Alarm 2


Default Alarm 2: -140°C

Sound: Triple Beep Sequence every 10 seconds. If the sound is disabled for either alarm, both will be disabled.

LCD Screen: ALARM 2 appears on the LCD screen while the back light flashes red every 2 seconds.

Reset the Alarm: The Alarm will reset once the system drops to 5°C below the TCRITICAL level.

To Silence the audible alarm and stop the alarm back light: Short press  and the "crossed bell" symbol will appear on the LCD screen.

NOTE: Unless the operator short presses button  to silence the alarm, the back light will flash red and the sound will continue for twenty minutes before turning off.

Alarm 2 is activated when the cryogenic chamber temperature exceeds TCRITICAL to alert the operator that LN₂ charge is now **insufficient** to maintain samples below critical biospecimen temperature. Biospecimens should be transferred immediately to appropriate cryogenic storage.

NOTE: If the TDISPLAY warms above the TCRITICAL and then lowers to below TCRITICAL, the Alarm 2 sound and back light will continue until the system reaches the TSTANDBY temperature.

5. Preventative Maintenance

Cleaning the CryoPod Carrier



The CryoPod Carrier should be cleaned after each use unless specified otherwise in the table below.


NOTE: Ensure that the CryoPod Carrier is off and at room temperature before cleaning.

Part of CryoPod Carrier	Cleaning Procedure
Exterior Shell	Clean with a soft, non-abrasive laboratory wipe with 70% alcohol before and after each use.
Interior Liner	Clean with a soft, non-abrasive laboratory wipe with 70% alcohol before and after each use.
CryoPod Carrier Foam Lid	Clean with water and mild soap and dry thoroughly. Do not autoclave. <ul style="list-style-type: none">• Maximum temperature of lid exposure: 60°C• Avoid prolonged exposure to UV light sources.
Internal Basket	Wipe down with 70% alcohol. When needed, remove the internal basket from the system and wash with water and mild soap.
Electronic Module	Wipe down with a soft, non-abrasive laboratory wipe, moistened with 70% alcohol. Take care to avoid getting moisture in the USB port or button edges.
Foam Absorbent Padding	The foam absorbent padding cannot be disinfected. If the padding becomes dirty or contaminated, change the pads. Even if they do not become dirty, these pads should be changed once a year.

Removing the Replacing the LN₂ Absorbent Pads

The LN₂ Absorbent pads should be changed once a year, unless they become dirty or contaminated. When dirty or contaminated, they should be replaced immediately.

Step	Action
1.	Turn the unit ON to confirm that TDISPLAY is at room temperature.
2.	Turn the unit back OFF.
3.	Remove the lid and use the included L-wrench to remove the two screws and washers that secure the internal basket to the liner. NOTE: Take care to save the screws and washers for the re-installation process.
4.	Lift the internal basket out of the unit. Thoroughly clean with mild soap and water, rinse, dry and wipe with 70% alcohol, set aside.
5.	Carefully lift out absorbent pad assembly and discard used pads per applicable organizational Standard Operating Procedures, local, regional and national regulations. 
6.	Thoroughly clean metal conductor with mild soap and water, rinse, dry and wipe with 70% alcohol, let dry.
7.	Open the new package of absorbent pads and retrieve two pads.
8.	Put together absorbent pads and metal conductor in the same configuration as the used pads and plate. The metal conductor flanges should slide into the cuts in the absorbent pads. 

Step	Action
9.	<p>Carefully place the absorbent pad assembly back into the unit, restoring it to its previous orientation. Failure to orient the absorbent pad assembly correctly may negatively impact units hold time performance.</p> 
10.	<p>Re-install internal basket, taking care to orient the basket according to the "Front" marks on the internal basket and tighten the screws with the washers firmly using the L-wrench. NOTE: Do NOT over-tighten screws.</p>

6. Troubleshooting

Functionality Check

Ensure that every time the unit is turned ON, a beep sounds and the red back light flashes to indicate that the unit is functioning properly. When the beep sounds and the red back light flashes, the system has turned on without any detectable issues.

Service indicator

If the SERVICE indicator turns on, the operator must contact Brooks Automation technical support. The SERVICE indicator will appear on the LCD screen if the unit detects an error or issue. These include thermocouple detachment (OP), corrupted temperature correlation (TMP), stuck key (KEY), EPROM reading error (EP), and thermocouple chip error (TIC).

NOTE: The SERVICE error will automatically turn off once the error or issue is resolved.

Service and Error Codes

Error Code	Description	Solution
ALARM	ALARM text and an alarm number with a red back-light will display if the alarm is triggered. An audio alert will also sound for 20 minutes before automatically shutting off.	Resolve the Alarms as needed. See "System Alarms" on page 30
Empty battery indicator	A battery symbol consisting of an outline of a battery and three internal sections indicating the charge remaining: <ul style="list-style-type: none">• All three sections filled: >75%• Two sections filled: >50%• One sections filled: >25%• Battery outline <13%	Replace batteries as needed.

Error Code	Description	Solution
CaL	Displayed in the ID field, indicating the temperature display issue.	Contact Technical Support.
HI	The Cryogenic Chamber temperature is above +49°C; no data is recorded.	Add LN ₂ as needed.
HL	The connection point between thermocouple wires and the instrument electronics module is <i>above</i> its operating limit of +49°C; "Not Valid" temperature will be reported in the log file.	Contact Technical Support.
Key	Displayed in three digits in the ID Code area. This indicates one of more keys lodged in a depressed position.	Depress keys to dislodge.
LL	The connection point between thermocouple wires and the instrument electronics module is <i>below</i> its operating limit of -49°C; "Not Valid" temperature will be reported in the log file.	Contact Technical Support.
LO	Chamber temperature is below -199°C and "Not valid" temperature will be reported in the log file.	Contact Technical Support.
Low Memory	The available memory on the system is running low and will only record up to six additional hours of log data after it is first displayed.	Download log data immediately to free up space.
not SET (Date/Time)	"not SET" indicates that the date/time are not set. If the date/time are not programmed, "not SET" will be displayed at all times.	Program date and/or time in Set-Up.
OFF	OFF indicates that the internal basket is above -20°C. If OFF is displayed while the unit is on, the unit will turn OFF automatically within one minute as long as no button activity is detected.	Fill the unit with LN ₂ as needed.
OP	Service issue: Thermocouple detachment detected.	Contact technical Support.
Service	The SERVICE message indicates a technical support issue such as a thermocouple detachment (OP) or a corrupted temperature correlation (TMP), a stuck key (KEY), an EPROM reading error (EP), or a thermocouple chip error (TIC). The message will automatically turn off when the issue is resolved.	Contact Technical Support.
TMP	Displayed in the three digit ID code area, this indicates that the pre-loaded data needed for the temperature indication is corrupted.	Contact Technical Support.

Contact Information for Brooks Life Science Systems

For the CryoPod Carrier use the following contact information when troubleshooting:

Corporate Headquarters

15 Elizabeth Drive
Chelmsford, MA 01824 U.S.A.

Location	GUTS® Contact Number
North America	+1-800-FOR-GUTS (1-800-367-4887) +1-978-262-2900
Europe	+49-1804-CALL-GUTS (+49-1804-2255-4887)
Japan	+81-45-477-5980
China	+86-21-5131-7066
Taiwan	+886-3-5525225
Korea	+82-31-288-2500
Singapore	+65-6464-1481

Technical Support Customer Care: <http://www.brooks.com/services/contact-customer-care>