4117-DOC002

Option User Manual

Cart with Electronics Rack

Cryostation s-series

Version: 1.1
July 2020

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Specifications and product information listed in this document are accurate to the time of publishing for a standard system. Options, custom designs, and/or other modifications may cause slight differences. Future design changes to the system, including software updates, may change information.

Table of Contents

Section 1 - Preface

⚠ WARNING

Read all instructions before using this product
All users must read and understand this manual and all other safety instructions before using the equipment. Retain these instructions for future reference.

This manual is intended for users of the Montana Instruments products and systems described herein. Users include anyone who may physically interact with the system or peripheral equipment, including installing, setting up, or configuring the system or anyone who may operate system components via operating panels, the supplied user interface, or remote interfaces.

This manual may be used by facilities personnel for determining infrastructure requirements in the room or building where the equipment will be installed.

This manual should be referenced by authorized service personnel for important safety and hazard information and other product restrictions.

1.1 Conventions Used in this Manual

The following style conventions are used in this document:

- Vertical bar (|)
  - Indicates alternative selections. The bar may be used in place of “and” or “or”.
- Alphanumeric List (1., 2., 3…| a., b., c…)
  - Indicates instructions or actions which should be completed in a specific ordered sequence.
- Bulleted List (• | ◦ | -)
  - Indicates instructions, commands, or additional information about an action.
  - May alternatively be used for unordered lists of materials or additional reference notes.
- `Courier Font`
  - Indicates a label or indicator on a physical product or part.
  - Indicates a system output, such as a display reading.
  - May also be used for URLs, file paths, file names, scripting language, prompts, or syntax.

1.1.1 Abbreviations

The following abbreviations may be used:

- ACM: Ancillary Control Module
- CAN: Controller Area Network
- DMM: Digital Multimeter
- HDMI: High Definition Multimedia Interface
- MI: Montana Instruments
- PCB: Printed Circuit Board
- TCM: Temperature Control Module
- UI: User Interface
- UPS: Uninterruptible Power Supply
- USB: Universal Serial Bus
- VNC: Virtual Network Computing
- International System of Units (SI) symbols
- System of Imperial Units symbols
- Element, molecule, and compound abbreviations

1.1.2 Explanation of Safety Warnings

Safety and hazard information includes terms, symbols, warnings, and instructions used in this manual or on the equipment to alert users to precautions in the care, use, and handling of the system. The following hazard levels and information are considered:

⚠ DANGER

Serious personal injury
Imminent hazards which, if not avoided, will result in serious injury or death.

⚠ WARNING

Serious personal injury
Potential hazards which, if not avoided, could result in serious injury or death.

⚠ CAUTION

Possible personal injury
Potential hazards which, if not avoided, could result in minor or moderate injury.

NOTICE

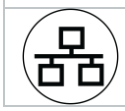
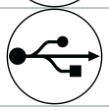
Command or Product Safety Notice
Potential hazards which, if not avoided, could result in product damage.

» NOTE

Points of particular interest for more efficient or convenient equipment operation; additional information or explanation.

1.1.3 Graphical Symbols

The following symbols may be used in diagrams, supporting text, and on physical parts:

	Hazard Alert: General Warning		Hazard Alert: High Voltage
	Hazard Alert: Laser Radiation		HDMI port
	CAN bus module		USB port

1.2 General Hazard Information

The following descriptions are of general hazards and unsafe practices that may result in product damage, severe injury, or death.

- The products, parts, and components in this manual are to be serviced by authorized Montana Instruments service representatives only. Failure to do so will void the warranty and may damage the product and/or create a safety hazard.
- Only use all components provided for the intended purpose described herein.
- If the equipment or any component is used or modified in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

The following hazards may be typical for this product:

⚠ WARNING

Risk of injury when lifting or moving system components

System components, including standalone equipment and installed assemblies, may be heavy.

- Use caution when lifting or moving equipment or assemblies. Ensure proper lifting principles are used to avoid injury.
- Equipment or assemblies >20 kg should always be lifted by two or more people or with a suitable lifting device.

⚠ WARNING

High voltage: danger of electric shock

Electric shocks and burns from capacitor discharge or power circuits could lead to serious injury or death.

- Before turning on any power supply, the ground prong of the power cord plug must be properly connected to the ground connector of the wall outlet. The wall outlet must have a third prong or must be properly connected to an adapter that complies with these safety requirements.
- Only use replacement power cords or power plugs with the same polarity and power rating as that of the original ones. Do NOT use inadequately rated cables.

If the equipment or the wall outlet is damaged, the protective grounding could be disconnected.

- Do NOT use damaged equipment until its safety has been verified by authorized personnel.
- Do NOT disconnect or tamper with the operation of the protective earth terminal inside or outside the apparatus.

NOTICE

Only clean exterior surfaces with acceptable fluids

- Only use deionized water, glass cleaner, or isopropyl alcohol to clean the exterior surfaces of any enclosure. Do NOT use any volatile chemicals other than isopropyl alcohol.
- Apply fluid to a clean, lint-free cloth and wipe surface with cloth. Do NOT apply fluid directly to any surfaces or enclosures.

1.3 Technical Support Information

Any technical questions or issues with the system that cannot be resolved with the information in this manual should be referred to an authorized Montana Instruments service representative.

1.3.1 Warranty & Repairs

If the system or parts need to be returned to the Montana Instruments factory or an authorized service center for repair or service, contact an authorized service representative for a return merchandise authorization (RMA) number and instructions on returning the unit.

For a copy of the Limited Warranty Agreement, visit: www.montanainstruments.com/About/Warranty

1.3.2 Accessories & Replacement Parts

Only use cables, hoses, accessories, and parts provided or approved by the manufacturer. Follow all instructions for proper installation or replacement.

- To order spare or replacement parts, please contact your local service representative.
- To order new accessories or options, or for more information on other Montana Instruments products and technologies, please contact your local sales representative.

1.3.3 Contact Details

For a complete list of sales and service centers visit: www.montanainstruments.com/Contact

North American Authorized Service

- M-F 8:30am-5pm MST | Call: +1.406.551.2796
- Email: support@montanainstruments.com

North American Sales

- M-F 8:30am-5pm MST | Call: +1.406.551.2796
- Email: sales@montanainstruments.com

International Sales & Authorized Service

- Visit www.montanainstruments.com/Contact/Sales-Offices for contact information for your local representative.

Section 2 - Option Overview

2.1 Cart with Electronics Rack

Models	Part Numbers
Control Rack	4117-530

Cart with Electronics Rack
(rear view shown with VC1110 bottom and SC1160 top)

2.1.1 Intended Use

The cart with electronics rack is a rack mount enclosure designed for housing the Montana Instruments system control unit and vacuum control unit. In some configurations, the rack may also contain other rack-mountable control devices supplied by Montana Instruments.

The cart is designed to power the system control and vacuum control units with additional power outlets for configuration-specific devices. All other connections and interfaces to the independent control devices remain unchanged.

2.1.2 Components

The cart with electronics rack consists of an outer enclosure with front and rear locking doors, four exterior locking casters for mobility, an interior 19-inch rack mount system, and a power module with C13 power receptacles.

Installation Requirements

The cart should be populated with Montana Instruments-supplied equipment only. The user assumes all risk for populating empty rack spaces with other ancillary equipment. Equipment must be installed in the following order:

- The vacuum control unit must always be placed in the bottom-most location in the rack.
- The primary system control unit should be mounted directly above the vacuum control unit. The system control unit with the greatest number of installed peripheral cards should be considered the primary unit.
- Any other configuration-specific devices (including a secondary system control unit), should be mounted directly above the primary system control unit.

NOTICE

Take care when moving the cart

- Do NOT move unit while rack-mounted devices are operational. Remove all connected cables and hoses and disconnect power prior to moving the cart.
- The cart should only be moved by rolling on its four casters. Ensure casters are locked prior to operating any components inside.
- When rolling, the cart can be pushed by the corners of the outer enclosure or pulled by the handles on the sides of the enclosure. The handles are NOT intended for lifting the unit.

Installation requirements

- Allow 90 cm clearance on the front and back for cables and door access and 30 cm on the sides for air flow.
- The unit is designed to be located on the floor only. It should not be located on a mezzanine or other elevated surface.
- The specified order of installation of rack-mounted devices must be followed to ensure proper center of gravity.

2.1.3 Technical Specifications

Environmental Specifications

Temperature of Environment	5 – 25 °C
Humidity	5 – 80% non-condensing
Altitude	<2000 m

Power Specifications

Model		4117-530
Mains Power Connector on Unit		IEC 60320 C20
Line Voltage		100 – 240 VAC
Frequency		50 – 60 Hz
Maximum Current Draw		15 A
Maximum Power Consumption		1500 W
Wall Outlet / Receptacle	N. America & non-EU	Standard NEMA 5-15
	CEE Europe (non-UK)	CEE 7/3 or CEE 7/5 w/ common ground terminal
	UK	BS1363 (UK) w/ common earth ground terminal
	Israel	I-32-3 w/ common earth ground terminal

Physical Dimensions

Component	L x W x H	Mass
4117-530	71.1 cm x 58.4 cm x 91.4 cm	52 kg (empty) – 110 kg (fully-loaded)

2.1.4 Safety Information

The following hazards may be typical for this product:

⚠ WARNING

Risk of injury due to sharp edges

The interior of the enclosure contains sheet metal parts that may have sharp edges.

- When working inside the enclosure (authorized service personnel only), exercise caution to avoid getting cut by these edges.

⚠ WARNING

High voltage: danger of electric shock

Electric shocks and burns from capacitor discharge or power circuits could lead to serious injury or death.

- Prior to accessing the enclosure or when otherwise servicing the unit (authorized service personnel only), completely power down any components mounted in the rack and unplug the power cable.
- If power must be applied to diagnose issues or otherwise, a grounding strap must be applied to the arm interfacing internal components.

Section 3 - Option Installation & Handling

3.1 Packaging Contents

The cart with electronics rack will arrive in a wooden crate. When ordered with a full system, compatible rack-mounted components, including the Vacuum and System Control Units, may ship pre-loaded in the rack. The main power cord for the cart can typically be found in the system accessory box with all other cables.

3.2 Unpacking the Components

If an installation was ordered, we recommend leaving the system packed until a service representative arrives.

NOTICE

Inspect shipment upon receipt

Before unpacking the system, please note the condition of the boxes, shock watch sensors and tilt watch sensors. The boxes should be intact and strapped to the pallets. If there is any visible damage or if the sensors have been tripped, contact an authorized service representative immediately and do NOT proceed with unpacking.

Shock watch

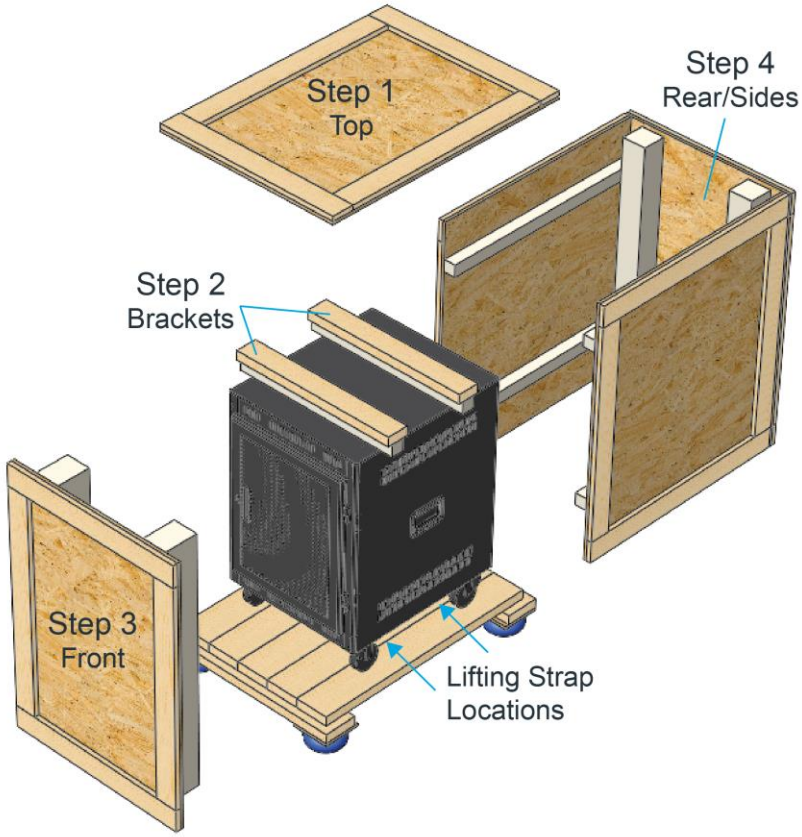
Tilt watch

Retain equipment packaging for future use

We recommend saving the original equipment packaging (foam, box, and pallets). The packaging is specially designed to support and stabilize the equipment and will be required if the unit needs to be transported in the future. Some components must be packed upright on a pallet to avoid damage.

3.2.1 Unpacking the Cart with Electronics Rack

The cart with electronics rack ships in a custom crate, typically with all control devices pre-mounted. Locate the rack crate.

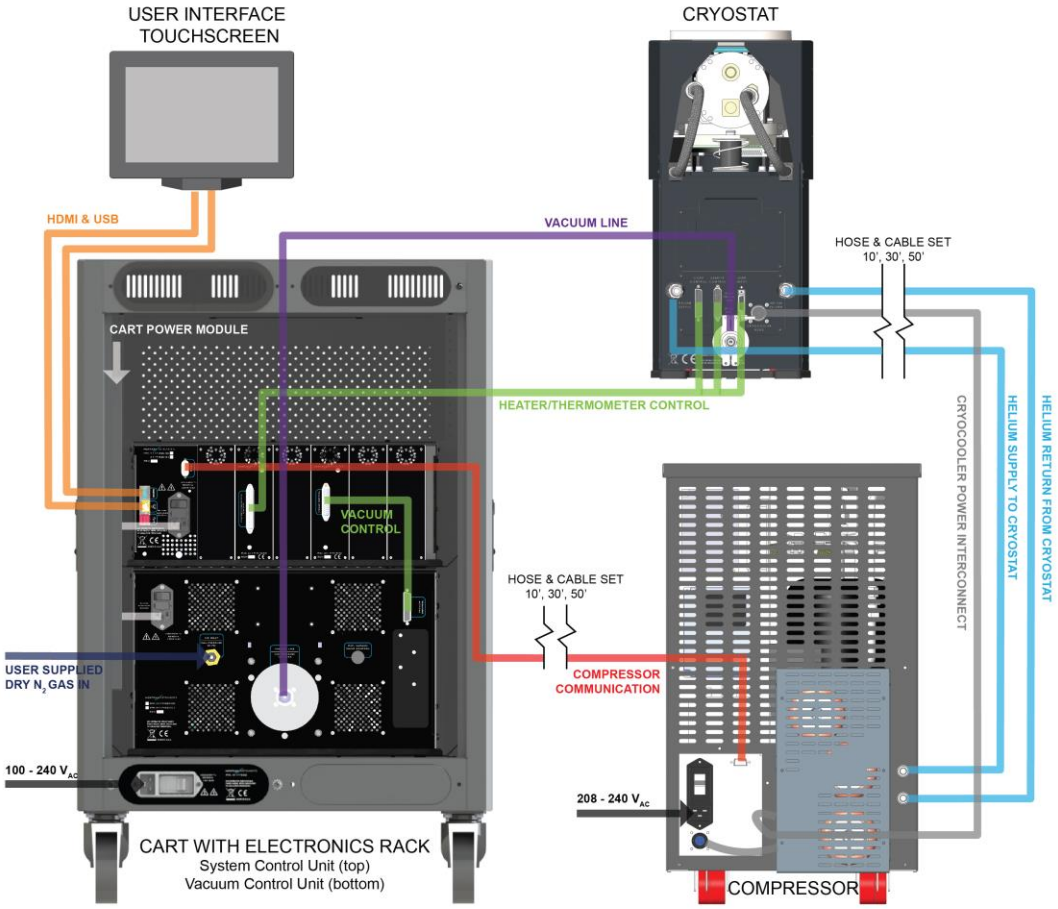


1. Unscrew and remove the top lid of the crate.
2. Remove the two top anchor brackets holding the rack in place.
3. Unscrew and remove the front panel.
4. The sides and rear panels are removable as a single unit. With two people, remove the rear and side panel assembly.
5. Place two lifting straps under the sides of the enclosure as close to the casters as possible. Straps should be at least 1-inch wide and rated to at least 500 lbs each.
6. Connect the straps to a hoist to lift the unit off the crate base and onto the floor. The hoist should be rated to at least 500 lbs (1000 lb+ capacity preferred).
7. The cart has casters for moving it. Unlock the casters and roll the unit to its desired location by pushing on the outer enclosure corners or pulling by the handles on the sides of the enclosure.
8. Lock all casters prior to operating the unit.

3.3 Connecting System Cables and Power

The standard communication cables and hoses between system components do not change. Refer to the System User Manual for instructions on connecting system cables and other components. The system control unit and vacuum control unit mounted inside the cart will plug into the cart's power module instead of the wall. The cart then plugs into the facility wall power.

NOTICE
Only use cables and hoses provided or approved by the manufacturer Only use the cables and hoses in the manner described below.



System Power: ▬▬

Be sure to connect all other cables and hoses prior to connecting system power.

If the system control and vacuum control units are not connected to power, connect those first.

1. Locate the C13-C14 main power cords. Ensure the rocker switches on the back of the system control unit and vacuum control units are off (o).
2. Connect the C13 ends to the C14 connectors located on the rear of each enclosure.

3. Connect the C14 ends to the C13 connectors located on the power distribution module in the cart.

Next, connect the cart with electronics rack to power.

4. Locate the C19 main power cord. Ensure the rocker switch on the back base of the cart with electronics rack is off (o).
5. Connect the main power cord to the C20 connector located on the rear of the cart enclosure.
6. Connect the power plug to the appropriate 100 – 240 VAC wall outlet power source.

Section 4 - Appendices

4.1 Related Documentation

For a copy of associated documentation, see below:

Document Number	Document Title	Location
4100-DOC001	System User Manual: Cryostation s-series	www.montanainstruments.com/library/files/4100-DOC001.pdf
DOC102	General Terms and Conditions of Sale	www.montanainstruments.com/About/Terms
DOC103	Limited Warranty Agreement	www.montanainstruments.com/About/Warranty
DOC104	End User License Agreement	http://www.montanainstruments.com/about/EULA

Notes

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