motionlabs™

We Manufacture Solutions For Your Challenges

Install Motor Controller

User Manual

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Proudly Made in the USA

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1. Warranty

Limited One-Year Warranty; Limitations of Liability. MLI warrants that for a period of one year from delivery, MLI Products will be free from defects in material and workmanship under normal use. In the event that a defect in any MLI Product is discovered within the one-year warranty period, then the customer must notify MLI in writing within thirty (30) days of discovering the defect or before expiration of the one-year warranty period, whichever shall occur first. No claim may be made against MLI without strict compliance wit this notice requirement. MLI shall have the option to repair or replace the MLI Product or any of its components solely to the extent that MLI deems it necessary to remedy the defect. Any incidental costs, including without limitation, the cost to ship the defective MLI Product or affected components to MLI, or to such other repair facility as Motion Laboratories, in its discretion, may designate, shall be the responsibility of the buyer.

THIS WARRANTY SHALL NOT APPLY, AND MLI SHALL HAVE NO OBLIGATIONS HEREUNDER UPON THE OCCURRENCE OF ANY OF THE FOLLOWING: (A) IF THE MLI PRODUCT IS SUBJECT TO ANY USE FOR WHICH IT WAS NOT INTENDED; (B) IF THE MLI PRODUCT IS MODIFIED IN ANY WAY BY ANY PARTY OTHER THAN MLI; OR (C) IF ANY PARTY OTHER THAN MLI ATTEMPTS TO REPAIR OR REPLACE ANY DEFECT IN THE MLI PRODUCT OR IN ANY COMPONENT THEREOF.

To the fullest extent permitted by applicable law, this Warranty shall be for the exclusive benefit of the buyer with which or with whom MLI is in privity of contract, and shall not inure to the benefit of any third party whatever.

UNDER NO CIRCUMSTANCES SHALL MLI BE LIABLE TO ANY PERSON OR BUSINESS ENTITY, INCLUDING THE BUYER, UNDER ANY CAUSE OF ACTION INCLUDING, BUT NOT LIMITED TO, THOSE BASED UPON CONTRACT, NEGLIGENCE, BREACH OF WARRANTY OR TORTIOUS CONDUCT, FOR DIRECT, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, INCLUDING ANY CLAIMS FOR LOST PROFITS.

THE ABOVE IS THE ONLY WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, BY STATUTE OR OTHERWISE, REGARDING ALL MLI PRODUCTS , INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILTY AND/OR OF FITNESS FOR A PARTICULAR PURPOSE. ANY WARRANTIES IMPLIED BY LAW ARE HEREBY EXPRESSLY DISCLAIMED.

2. Safety

2.1) This manual uses the following notice and safety conventions:

DANGER: Alert to potential injury.

CAUTION: Alert to potential equipment damage.

2.2) Read and follow these instructions carefully :

- Upon opening the package, examine the equipment to become familiar with the system and all of its component parts before trying to install, operate or maintain them.
- MLI products are sold in the expectation that the user is thoroughly familiar with their correct application and proper use, as more thoroughly described in this manual.
- MLI expects that the user is familiar and shall comply with acceptable safe operating practices for lifting loads of the types in connection with which the MLI Product is to be utilized. In addition, please observe the following safety guidelines:
    - Check the system thoroughly before use, including all rigging accessories. Replace or repair damaged or worn components.
    - Rigging Systems should be installed, operated, serviced and maintained only by qualified personnel

DANGER

- All Motor Control products and their associated components utilize voltages at current handling capacities sufficient to cause fire, generate destructive forces, and inflict injury or death to personnel if used as other than intended, in a careless manner, or are operated in a state of disrepair.
- Only Qualified Personnel should be allowed to hook-up, interconnect, energize, de-energize, and maintain or repair this equipment.

CAUTION

- Opening, modifying or altering equipment will nullify your warranty and could lead to personal injury. All repairs should be done by a representative authorized by Motion Laboratories, Inc.

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3. Introduction

3.1) This Manual describes how to use the Motion Laboratories Install Motor Control System.

3.2) The data and illustrations found in this manual are not binding. We reserve the right to modify our products in line with our policy of continuous product development. The information in this document is subject to change without notice and should not be construed as a commitment by Motion Laboratories.

3.3) Motion Laboratories assumes no responsibility for any errors that may appear in this document. If you have any suggestions for improvements, amendments, or have found errors in this document, please notify us. No part of this document may be reproduced in any form or by any means, without the express written permission of Motion Laboratories. All rights reserved.

3.4) All pertinent state, regional, and local safety regulations must be observed when installing and using this product. For reasons of safety and to assure compliance with the documented system data, only the manufacturer should perform repairs to the components.

3.5) We value and welcome your comments about this product and product documents. You can reach us at www.motionlabs.com.

4. System Overview

4.1) The Motion Laboratories Install Motor Controller System consists of the following components:

Power Box (Series 1225-A)

The Power Box encloses the main power components for the system including the main breaker, contactor(s), E-stop relay, and fuses for each motor circuit as well as fuses for control circuit.

The front door panel has a mechanically interlocked disconnect switch and comes standard with an E-stop switch and illuminated reset switch. Options for the system include the addition of remote E-stop switch locations. The rating label will indicate the number and horsepower of the hoists for which the system is intended to be used. Components are referenced in cut sheets supplied with each system.

The Power Box is referenced with the letter [**P**] on all documentation (i.e. P1, P2).

Part Number Prefix	-	**Part Number Suffix 1**	-	**Part Number Suffix 2**
1225-A	-	XX	-	XXX
		Number of Channels		System Variables

Control Box (Series 1225-B)

The Control Box encloses the components for the control system including the control relay board, power supply, contactor drive relay, local remote card, associated fuses and terminal blocks that allow access to additional remote control connection locations. Components are referenced in cut sheets supplied with each system.

The front door panel has a 26 Pin control connector(s) and a key switch that de-energizes power to the control circuit power supply. Options for the system include the addition of remote 26 Pin control connector(s) locations.

The Control Box is referenced with the letter [C] on all documentation (i.e.; C1, C2).

Part Number Prefix	-	**Part Number Suffix 1**	-	**Part Number Suffix 2**
1225-B	-	XX	-	XXX
		Number of Channels		System Variables

4. System Overview (Continued)

Handheld Control Station (Series A-16-300)

The Handheld Control Station connects to the control box by means of a military style 26 Pin connector and allows the user to operate the UP and DOWN functions of the electric chain hoist that are connected to the system.

A-16-301 Series	Part Number	Number of Channels
	A-16-301-0001	4 Channel
	A-16-301-0002	6 Channel
	A-16-301-0003	8 Channel

A-16-303 Series	Part Number	Number of Channels
	A-16-303-0001	48 Channel (6x8)
	A-16-303-0002	24 Channel (6x4)

A-16-302 Series	Part Number	Number of Channels
	A-16-302-0001	12 Channel
	A-16-302-0002	16 Channel
	A-16-302-0003	24 Channel
	A-16-302-0004	32 Channel

4.2) The Power and Control Boxes are interconnected as per wiring diagrams detailed in the schematics provided with the system.

The contactor drive relay in the Control Box energizes the contactor in the Power Box whenever a Handheld Control Station is plugged in and the following conditions are met:

- The Control and Power boxes are energized.
- The KILL switch on the Handheld Control Station is disengaged.
- The E-stop switch is in its normal position and the circuit is reset.

4.3) Engaging the KILL switch will de-energize the contactors as long as the switch is engaged.

4.4) Activating the E-stop circuit will require a reset to re-energize the contactor as indicated by a lit condition of the reset switch.

4.5) The movement of the hoist is initiated by a set of relays providing contact closure for the UP and DOWN control of the direction contactor inside the hoist. The control circuit power for each individual hoist comes from the transformer within the hoist itself.

5. Getting Started

5.1) The Install Control System should have arrived with the following documents:

- **System Ladder Diagram**. This document details the main components selected and accessories that maybe provided by MLI. Also included are basic requirements with respect to minimum wire gauge sizes and installation steps as well a list of other related documents.
- **System Schematic**. This document details the basic power and control schematic of the system from the power panel to the hoist and includes reference to the control contact points for each hoist.
- **Power Panel Mechanical Drawing**. This document details the major upper level components and assemblies of the Power Box. Other indented bills of material are available upon request.
- **Power Panel Schematic**. This document details the wiring that is required between the Power Box and the Control Box and is specific to the system design.
- **Control Panel Mechanical Drawing**. This document details the major upper level components and assemblies of the Control Box. Other indented bills of material are available upon request.
- **Control Panel Schematic**. This document details the control panel overview wiring from the power supply to the relay board and the relay board out to the hoists. Also indicated are 26 Pin connector wiring as required.
- **64303001 Enclosure Installation Sheet**. This document is provided by the manufacturer of the enclosure.
- **Other Documents**. Any other documents associated with additional accessories supplied by MLI.

5. Getting Started (Continued)

5.2) A review of the installation and verification of all wiring should include the following:

- All enclosures have been installed in accordance with local codes and supplied manufactures instruction.
- The Power Box (P1) has been supplied with the proper branch rated circuit supply power.
- The Control Box (C1) has been supplied with the proper branch rated circuit supply power.
- All conduit runs from Power and Control Boxes to Hoist Fly Boxes have been installed as indicated and in accordance with local codes.
- All panels have been properly re-installed (if removed for enclosure installation).
- All wiring harnesses have been properly re-installed (if removed for enclosure installation).
- All hoist power connections properly connected to the correct fuse block. For example, hoist 1 to fuse block 1, etc.
- All hoist control connections properly connected to the correct relay board connection. For example:
    - On 4 thru 8 channel systems, hoist 1 to relay board channel 1, etc.
    - On systems 12 channel and larger there are two relay boards.
    - Relay board 1, hoist 1 to channel 1.
    - On 12 channel systems, relay board 2, hoist 7 to channel 1.
    - On 16 channel systems, relay board 2, hoist 9 to channel 1.
- Contactor control connections between P1 and C1 properly installed as detailed in the power panel schematic.
- If specified in system design, all Handheld Control Station connections between C1 and the remote 26 Pin locations properly installed. Reference the 26 Pin remote box connection installation diagram which will be provided if required.
- All chain hoist mechanical limits have been properly set by a qualified technician.

5.3) Once the above items have been verified, the system is ready to power up.

6. Power Up

6.1) Verify that the supply voltage of both the Power Box and the Control Box match the voltage ratings of each unit.

6.2) Energize the Power Box by closing the panel door and moving the disconnect switch to the "ON" position.

6.3) Energize the Control Box by turning the Key Switch to the "ON" position. Connect the Handheld Control Station to the preferred connector. The Handheld Control Station is connected via a 26 pin connector. The connector is keyed with a locating slot at the 12 o'clock position.

***NOTE:** Depending on the system design, the control connector(s) may be located on the Control Box door or at a remote location.

6.4) Verify that the Handheld Control Station is active.

***NOTE**: This will be evident by the illumination of the GO and KILL switches as well as the illumination of the UP and DOWN LED indicators, when selected.

6.5) When you first power up the system, you should check the functionality of several items:

- Verify that the contactors have engaged.
- Verify that the contactors react to the KILL switch activation. (See section 7.7)
- Verify that the contactors react to the E-stop activation. (See section 7.8)
- Select Channel 1 UP and verify that the chain moves in the upward direction when the GO switch is pushed.

DANGER

All movement should be in the direction indicated by the Handheld Control Station. Never operate the system when the direction of travel is contrary to the control indicators. If this condition exists you must determine whether the problem is related to the power phasing or a wiring error, and correct the condition.

6. Power Up (Continued)

DANGER

Operating hoists as above will bypass the limit switches in the hoist which can result in serious damage to equipment or injury.

- Select Channel 1 DOWN and verify that the chain moves in the downward direction when the GO switch is pushed.
- Repeat this process for all channels in the system.

7. Operation

7.1) The system contactor will not be energized unless the Handheld Control Station is plugged in, The KILL switch is disengaged (lit) and the E-stop circuit reset.

On systems larger than 8 channels, with more than one Handheld Control Station connector (one for channels 1-8 and one for channels 9-16), both connectors must be plugged in.

7.2) The Handheld Control Station may be plugged in at various access points depending on the system design. The standard configuration allows the door mounted 26 Pin connector to override all other remote 26 Pin access points.

7.3) The Handheld Control Station will be energized when plugged into any 26 Pin connector.

7.4) The direction indicators will illuminate when selected. This will indicate to the user what hoists will move in which direction when the GO switch is pushed.

7.5) The Handheld Control Station will then energize any UP or DOWN relay that is selected, upon activation of the GO switch. This will result in the hoist contact closure and movement of the Hoist(s).

7.6) The GO switch is a momentary switch and movement will stop as soon as the switch is released.

7.7) The KILL switch is a maintained switch. The switch will remain engaged when pushed until it is pushed again to disengage.

- Engaging the KILL switch will shut down power to the hoists by de-energizing the contactor. It will also shut off the illumination of both the GO and KILL switches. As soon as it is disengaged it will re-energize power to the contactors.

7.8) The E-stop circuit may be activated by pressing down on the mushroom head of the switch. To reset the circuit, rotate the switch head clockwise to de-activate and then push the illuminated reset switch.

8. Maintenance

DANGER

Any maintenance performed within the enclosures and/or involving any current carrying parts must be done by Qualified Personnel with the power off and disconnected.

8.1) General

Keep equipment clean, dry and free of dust and/or containments.

Check screws periodically and tighten as needed. This includes mechanical mounting as well as electrical connections.

Check the condition of the 26 pin connector on the Handheld Control Station cable and all extension cables and ensure that all pins are in good condition and straight.

Periodically, check the functionality of all operating controls and indicators. Repair or replace as necessary.

8.2) Fuse Replacement

All fuses must be replaced with the equivalent listed on the enclosure doors.