Cell*Mate™ V3 System User Manual

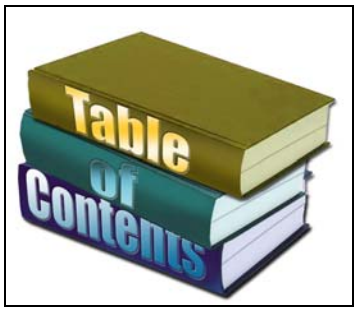

Table Of Contents

This manual uses the following notice and safety conventions:

 **DANGER:** Alert to potential injury

 **CAUTION:** Alert to potential equipment damage

Read and follow these instructions carefully.

Upon receipt of the equipment, examine thoroughly 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 described in this manual.

MLI expects that the user is familiar and shall comply with acceptable safe operating practices for lifting and weighing 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**

The capacity indicates the maximum load a system can carry and monitor under normal working conditions. Overloading a system above its rated capacity is dangerous and could cause injury or death.

- Avoid bending, side loading, and off-axis loading.

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.

System Overview

The Motion Laboratories Cell*Mate System is fully integrated and capable of measuring single loads up to 10,000lbs. The system is based on building blocks comprised of:

The Load*Cell (Series A-17-003)

The Load*Cell is the load bearing component in the Cell*Mate System. Manufactured from stainless steel with chrome plated steel spherical bearings and supplied as standard with rated shackles. The Load*Cells are calibrated to reference standards traceable to the National Institute of Standards and Technology (NIST).
Models:

PART NUMBER	CAPACITY
A-17-003-0001	2 TON (Metric)
A-17-003-0002	5 TON

The Cell*Mate Hub (Series A-17-002)

The Cell*Mate Hub is the data processing center of the Cell*Mate System. It is can receive 8 channels of Load Cell. Each Load*Cell sends digital information to the Cell*Mate Hub where it is collected and passed on to the Cell*Mate Display. The Cell*Mate Hub is designed to be truss mounted to allow easy access to the Load*Cells. They come standard with pass thru power connectors to allow you to string Cell*Mate Hubs together.

PART NUMBER	CAPACITY
A-17-002-0001	2 TON (Metric)
A-17-002-0003	5 TON

The Cell*Mate Display (Series A-17-001)

The Cell*Mate Display provides the user with the means to monitor multiple Load Cells from one or more remote locations. Each of the 8 channels on the Cell*Mate Display has a high visibility numeric readout as well as a ten segment multicolored bar graph representing percentage of load based on user programmable range. Cell*Mate Displays are capable of being chained together for multiple location readout and can be selected to read in pounds or kilograms.
Models:

PART NUMBER	CAPACITY
A-17-001-0001	2 TON (Metric)
A-17-001-0002	5 TON

The WardeN, a Cell*Mate Controller (Series A-17-004)

The WardeN provides for the interface between the Cell*Mate System and the Chain Hoist Control System. Based on a rugged PLC design, The WardeN will stop movement of any hoist being monitored by a Load*Cell within tolerances determined and programmed by the user. The WardeN will recognize overweight as well as underweight conditions and stop all movement until the problem is identified and corrected. The WardeN is designed to integrate directly with any Motion Laboratories Chain Hoist Control System. The WardeN may be operated as a stand alone device or in conjunction with our Touch Screen Operating System (TSOS) that will allow multiple WardeNs to be linked and operated from one point of control

Models:

PART NUMBER	CAPACITY
A-17-004-0001	2 TON (Metric)
A-17-004-0002	5 TON

The Touch Screen Operating System (Series A-17-005)

The TSOS provides the brain that combines one or more Cell*Mate Systems each with WardeN oversight into a fully integrated control package. The TSOS allows the operator to create grid points with channel assignment and set weight limit parameters. The TSOS display shows the weight of each individual Load*Cell, the subtotal for each Cell*Mate Hub, and the total weight for all Cell*Mate Hubs in the system. The TSOS will then allow the user to select one or more hoists for operation under the watchful eye of The WardeN Controller. Touch Screen systems are available in a variety of screen sizes and form factor from Desktop to Handheld. All are part of the A-17-005 Series of Part Numbers. As this current line is changing rapidly, please call for part number.

SCREEN SIZE	CAPACITY
7.5”	1-16 Channels
12”	1-32 Channels
15”	1-64 Channels

The Load Cell Data Logger (Series A-17-008)

The Motion Laboratories Load Cell Data Logger interface records data from the Cell*Mate System in real time and allows the user to create configurable time stamped CSV files for easy spreadsheet manipulation and archiving. This systems requires a user provided PC.

PART NUMBER	CAPACITY
A-17-008-0001	4 PORT
A-17-008-0002	8 PORT

LOAD CELLS

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The **Load*Cell** is the primary component in the Motion Laboratories manufactured weight monitoring system, the **Cell*Mate**. The stainless steel **Load*Cells** work in unison with the eight channel **Cell*Mate Hub** and **Cell*Mate** Digital Display module, giving users the opportunity to monitor both dynamic and static loads in unlimited quantities, from one or more remote locations.

2-Ton **Load*Cells** are fitted with standard 5/8" rigging shackles with a 3/4" shaft. 5-Ton **Load*Cells** are fitted with standard 3/4" rigging shackles with a 7/8" shaft.

Each universal **Load*Cell** has a 2-Ton or 5-Ton rating with a built-in 5:1 safety factor.

Each **Load*Cell** transmits inline force measurements to the eight channel hub unit via a 6 Pin XLR cable. The **Cell*Mate Hub** unit then sends all channels of data to the **Cell*Mate** Digital Display module via a single 6 Pin XLR cable. This design greatly decreases setup time by eliminating multiple cable home runs.

Spherical bearings at either end allow the **Load*Cells** to self-align, eliminating side-load interference and providing the most accurate measurements possible.

The **Load*Cell** also works with **The WardeN**, a new addition to the **Cell*Mate** family. See Cut Sheet for further details.

Load*Cell | features & functions

Stainless Steel Construction: Each **Load*Cell** is made of rugged stainless steel with either a 2-Ton or 5-Ton rated capacity.

Safety Factor: All structural components in the **Load*Cell** have been engineered using a 5:1 safety factor, per industry standards.

Pre-Rigged: Each **Load*Cell** comes pre-rigged from Motion Laboratories with standard 5/8" or 3/4" shackles.

Universal Load*Cell: Whether hanging 10 lbs. or 10,000 lbs. the measuring capacity of our Universal **Load*Cell** will fulfill all your weight monitoring needs.

Spherical Bearings: Load*Cells are designed with a spherical bearing at each end. This feature allows the **Load*Cell** to self-align when under load. This design prevents the **Load*Cell** from binding on any of the rigging components and creating added torque which can affect load measurements. This condition, known as side-loading, is all but eliminated with our precision steel bearings.

Digital Signal: The **Load*Cell** transmits load data to the **Cell*Mate Hub** unit digitally, using RS485 communication protocols. Each **Load*Cell** must be connected to the hub unit with a 6 Pin XLR cable. Distance is not a limiting factor for these cables. Each data cable is effective up to lengths of 1000 feet.

Calibration: Each **Load*Cell** is calibrated and thoroughly tested by Motion Laboratories before it leaves our facility. Calibration dates are documented on each **Load*Cell**. It is mandatory that you schedule annual recertification with Motion Laboratories for all of your **Load*Cells**.

Maintenance: Load*Cells require very little maintenance during their lifespan. Aside from annual certification and general safe handling techniques, you should regularly lubricate the spherical bearings in each cell to maintain accurate results.

2-Ton / 5-Ton Load*Cell | specifications

Part Number: A-17-003-0001 / A-17-003-0002
Load*Cell Material: Stainless Steel
Spherical Bearing Material: Bearing Steel
Electronics Housing Material: Steel
Weight: 5.1 lbs. / 8.7 lbs.

Load Rating 2-Ton: 2 Metric Tons - rated 4500 lbs. (2000 kg)
Load Rating 5-Ton: 5 Tons - rated 10,000 lbs. (4480 kg)
engineered using a 5:1 safety factor (all structural components)

Communication Protocols: RS485
Cable: 22AWG 3 Tw Pair Shielded M/F 6 Pin XLR

Load*Cell | more information

For more information on this or any other products please contact our sales department via phone, fax, or e-mail. Our qualified sales representatives are determined to help you succeed.

Be sure to visit our website **[www.motionlabs.com]** for more information about Motion Laboratories and our products & services. Thank you for making Motion Laboratories your premier source for all of your power distribution and motor control solutions.

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Cell*Mate v3

The **Load*Cell** is the primary component in the Motion Laboratories manufactured weight monitoring system, the **Cell*Mate**. Stainless steel **Load*Cells** work in unison with the eight channel **Cell*Mate Hub** and **Cell*Mate LCD Display** giving users the ability to monitor both dynamic and static loads in one or more remote locations.

2-Ton **Load*Cells** are fitted with standard 5/8" rigging shackles with 3/4" shaft. 5-Ton **Load*Cells** are fitted with standard 3/4"rigging shackles with 7/8" shaft.

Each Universal **Load*Cell** has a 2-Ton or 5-Ton rating with a built-in 5:1 safety factor.

Each **Load*Cell** transmits inline force measurements to the eight channel hub via 6 Pin M/F XLR cable. The **Cell*Mate Hub** then send all channels of data to the **Cell*Mate LCD Display** via a single 6 pin M/F XLR cable. This design greatly decreases setup time by eliminating multiple cable home runs.

Spherical bearings at either end allow **Load*Cells** to self-align eliminating side-load interference and providing the most accurate measurements possible. All **Load*Cells** also work with the WardeN. See cut sheet for further details.

FEATURES AND FUNCTIONS

Stainless Steel Construction: Each **Load*Cell** is made of rugged stainless steel available in 2-Ton, 5-Ton and 6-Ton rated capacities.

Safety Factor: All structural components in the **Load*Cell** have been engineered using a 5:1 safety factor per industry standards.

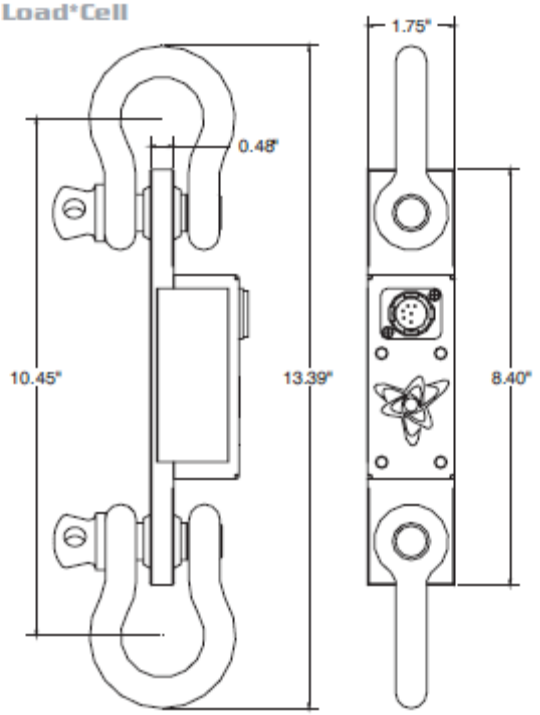
Spherical Bearings: Load*Cells are designed with a spherical bearing at each end. This feature allows the **Load*Cell** from binding on any of the rigging components and creating added torque which can affect load measurements. This condition, know as side-loading, is all but eliminated with our precision steel bearings.

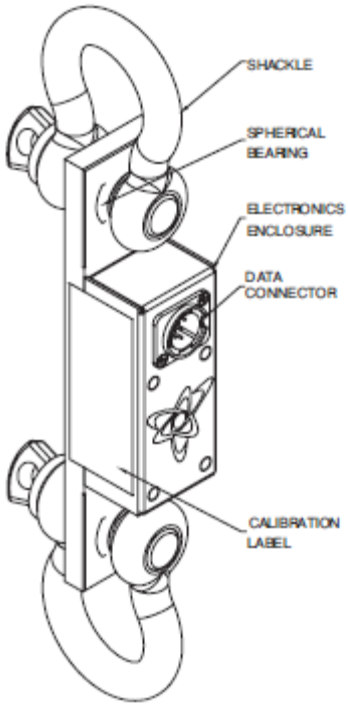
Digital Signal: The **Load*Cell** transmits load data to the **Cell*Mate Hub** digitally using RS-485 communication protocols. Each **Load*Cell** must be connected to the Cell*Mate Hub with a 6 pin M/F shielded XLR cable. Cables up to 1000 feet in length may be used. **Load*Cells** are continuously measured at 1200 samples per second by a 24 bit A/D converter using AC excitation. This configuration is noted for its low offset drift. Data is output as single digit increments in pounds or kilograms. In between the time when Load*Cell data is requested, it continuously takes readings so the highest measured peak will be returned at the next data request.

Calibration: Each **Load*Cell** is calibrated and thoroughly tested by Motion Laboratories before it leaves our facility. Calibration dates are documented on each **Load*Cell**. It is mandatory that you schedule annual recertification with Motion Laboratories for all of your **Load*Cells**.

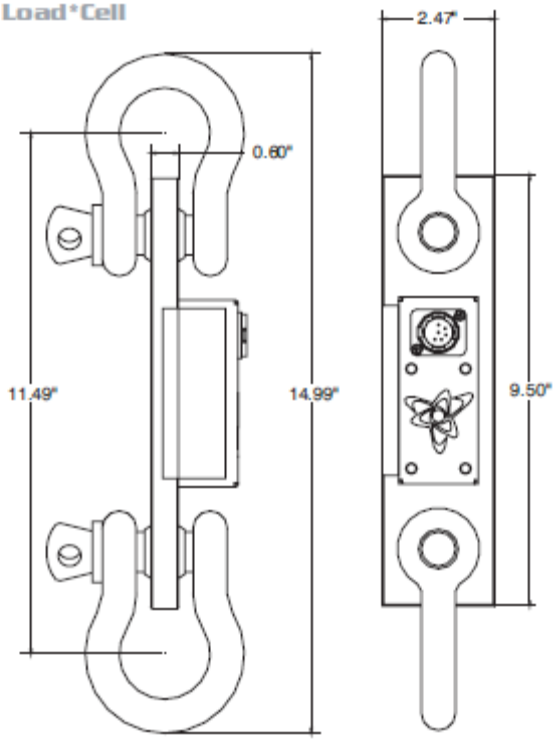
Maintenance: Load*Cells require very little maintenance during their lifespan. Aside from annual certification and general safe handling techniques you should regularly clean and lubricate the spherical bearings in each **Load*Cell** to maintain accurate results. Automotive engine oil is a suitable lubricant.

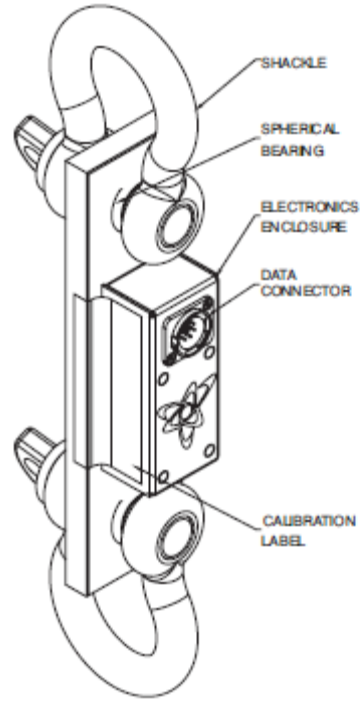
2-Ton Load*Cell





5-Ton Load*Cell





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The CELL*MATE Hub

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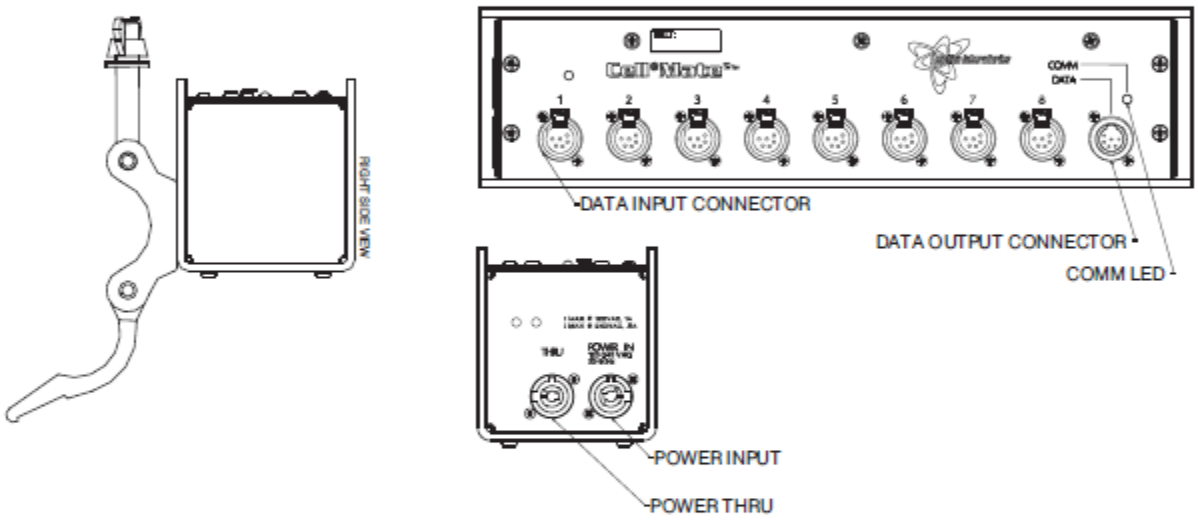
The eight channel **Cell*Mate Hub**, combined with the **Load*Cell** and **Cell*Mate** Digital Display module, form the most reliable load monitoring system on the market today.

The **Cell*Mate Hub** gathers data from up to eight **Load*Cells** and routes it to the Digital Display module via a single 6 Pin XLR cable. The digital signal can be transmitted as far as 4000 feet to the Digital Display module. The Hub requires a separate power input and can accept 120/240VAC through a PowerCon Input Connector.

The **Cell*Mate Hub** comes complete with a truss clamp, allowing it to be mounted in the rig for flexibility in your setup, which greatly reduces cable clutter by allowing for shorter runs from each **Load*Cell**.

The **Cell*Mate Hub** also works with **The WardeN**, a new addition to the **Cell*Mate** family. See Cut Sheet for further details.

Cell*Mate Hub



Cell*Mate Hub | features & functions

Long Cable Runs: Any XLR cable may be run up to 1000' from **Load*Cell** to **Cell*Mate Hub**. Any XLR cable may be run up to 4000' from the **Cell*Mate Hub** to the **Cell*Mate** Digital Display module.

Truss Mount: Cell*Mate Hub unit comes with a truss clamp as standard equipment, making setup easy and efficient.

Individual Fuse Protection: An individual self-resetting fuse protects each **Load*Cell** port.

2-Ton / 5-Ton Cell*Mate Hub | specifications

Part Number: A-17-002-0001 / A-17-002-0003
Cell*Mate Hub Top/Side Material: Aluminum
Cell*Mate Hub Finish: Blue Anodize
Cell*Mate Hub Enclosuire Material: Boltaron
Dimensions: 3.89"W x 7.43"H x 15.50"D
Weight: 5.9 lbs

Communication Protocols: RS485
Cable Protocol: 22AWG 3 Tw Pair Shielded M/F 6 Pin XLR

Power Requirements:
Cell*Mate Hub: 100-240 VAC 50/60 Hz

Cell*Mate Hub | more information

For more information on this or any other products please contact our sales department via phone, fax, or e-mail. Our qualified sales representatives are determined to help you succeed.

Be sure to visit our website **[www.motionlabs.com]** for more information about Motion Laboratories and our products & services. Thank you for making Motion Laboratories your premier source for all of your power distribution and motor control solutions.

The eight channel **Cell*Mate Hub**, combined with the **Load*Cell** and **Cell*Mate LCD Display** form the most reliable load monitoring system on the market today.

The **Cell*Mate Hub** gathers data from up to eight Load*Cells and routes it to the **Cell*Mate LCD Display** via a single 6 pin M/F XLR cable. The digital signal can be transmitted up to 4000 feet from hub to display. The **Cell*Mate Hub** requires a separate power input and can accept 100/240 VAC through a PowerCon input connector.

The **Cell*Mate Hub** comes complete with a truss clamp allowing it to be mounted in the rig for simple setup. His reduces cable clutter by allowing shorter runs from each **Load*Cell** to the **Cell*Mate Hub**.

The **Cell*Mate Hub** is also compatible with The WardeN and Data Logger products. See Cut Sheet for further information.

FEATURES AND FUNCTIONS

Long Cable Runs: ANY XLR cable may be run up to 1000' from Load*Cell to Cell*Mate Hub. Any XLR cable may be run 4000' from the Cell*Mate Hub to the Cell*Mate LCD Display.

Truss Mount: Cell*Mate Hub comes with a truss clamp as standard equipment making setup easy and efficient.

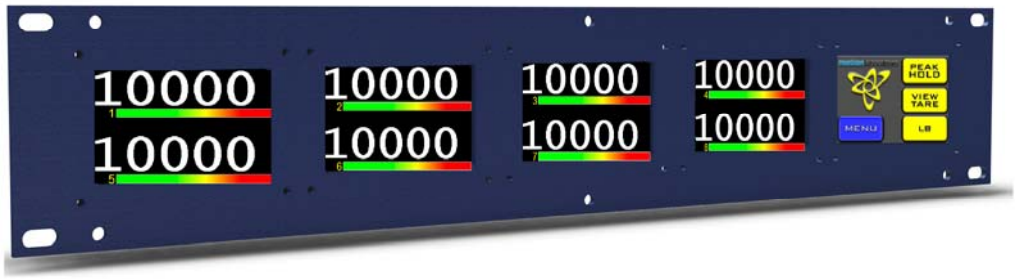
Individual Fuse Protection: An individual self_resetting fuse protects each Load*Cell port

Part Number:

Cell*Mate Hub Top/Side Material: Aluminum
Cell*Mate Hub Finish: Blue Powder Coat
Cell*Mate Hub Enclosure Finish: Boltaron
Dimensions: 3.89"W x 7.43"H x 15.5"D
Weight: 6 lbs

Communications Protocol: RS-485
Cable Protocol: shielded 22AWG 6 conductor twisted pair M/F 6 Pin XLR

Power Requirements:
Cell*Mate Hub: 100-240VAC 50/60Hz



The CELL*MATE Display

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The **Cell*Mate** Digital Display module allow users the ability to monitor up to eight channels of **Load*Cell** data simultaneously from a remote location.

Working together with our universal **Load*Cell** and **Cell*Mate Hub**, the display module gives users a wide variety of options for viewing load data.

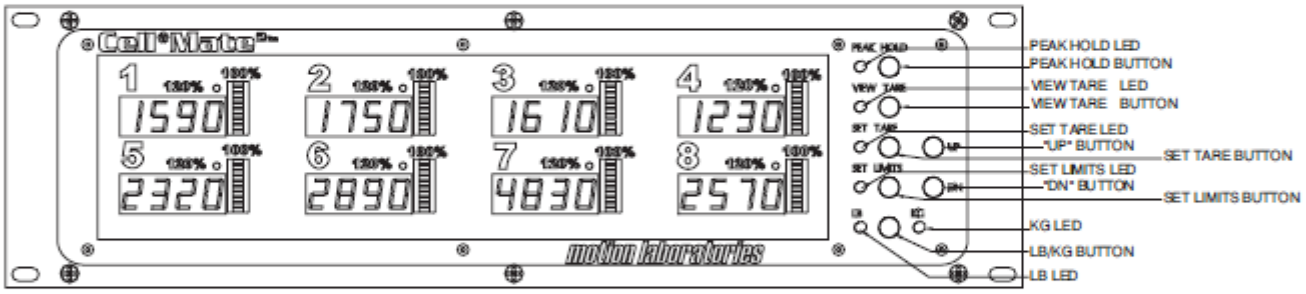
Each channel provides real time weight measurement displayed in pounds or kilograms. Additionally, each channel has a ten-segment multicolor bar graph representing a percentage of load based on a user-selectable weight limit.

There is a 120% overload watchdog function that will trigger both an LED indicator and a normally open set of contacts. These contacts can be used for a buzzer, siren, light etc to warn the user of an overload situation.

The **Cell*Mate** Digital Display module receives digitized load data from the **Cell*Mate Hub** via a single 6 Pin XLR cable. Multiple display units can be used in series for additional monitoring locations. The Peak Hold function allows the user to view peak weight statistics for each **Load*Cell**. A user-adjustable tare function allows the user to view a secondary weight measurement, i.e. the load minus the weight of the hoist. All products in the **Cell*Mate** family, **The WardeN**, The **Cell*Mate** Digital Display module and the **Cell*Mate Hub**, are designed with auto switching 100/240VAC 50/60 Hz power supplies allowing for versatility in the field.

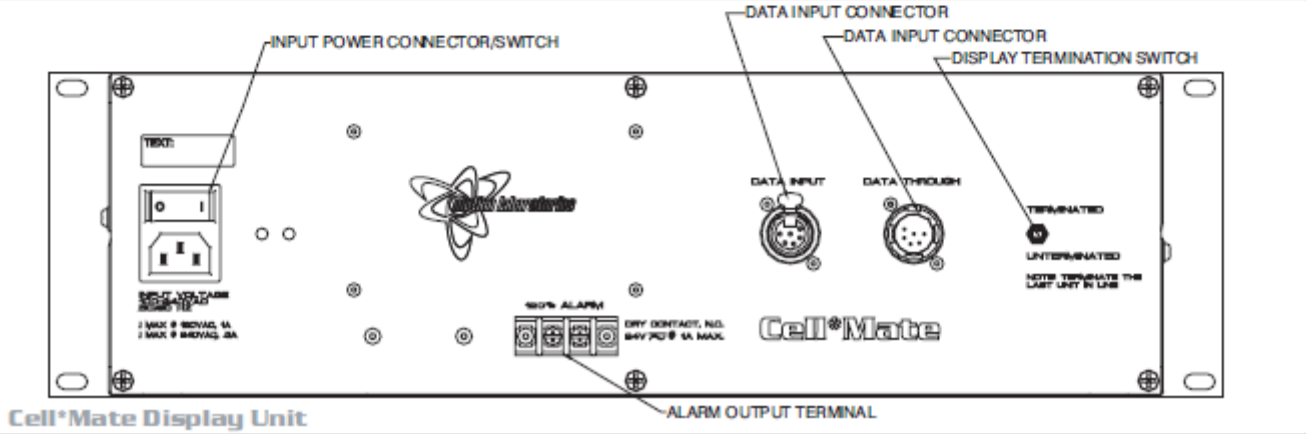
The **Cell*Mate** Digital Display module also works with **The WardeN**, a new addition to the **Cell*Mate** family. See Cut Sheet for further details.

FRONT



Cell*Mate Display Unit

REAR



Cell*Mate Display Unit

The Cell*Mate Display allows users the ability to monitor up to 8 channels of Load*Cell data simultaneously from a remote location.

Working together with our universal Load*Cell and Cell*Mate Hub, the display module gives wide variety of options for viewing load data.

Each channel provides real time weight measurement displayed in pounds or kilograms. Additionally each channel has a multicolor bar graph representing a percentage of load based on a user-selectable weight limit.

There is a 120% overload watchdog function that will cause the numeric weight readout numerals to turn red and activate a SPDT relay with user assignable normally open and normally closed contacts. These contacts can be used for a buzzer, siren or other safety function to warn the user of an overload condition.

The Cell*Mate LCD Display receives digital load data from the Cell*Mate Hub via a single 6 pin XLR cable. Multiple display units can be used in series for additional monitoring locations. The peak hold function allows the user to view peak weight statistics for each Load*Cell. A user-adjustable tare function allows the user to view a secondary weight measurement i.e. the load minus the weight of the hoist. All products in the Cell*Mate family, The WardeN, The Cell*Mate Display and the Cell*Mate Hub are designed with auto switching 100/240VAC 50/60Hz power supplies allowing for versatility in the field.

The Cell*Mate LCD Display is also compatible with the WardeN.

Cell*Mate | features & functions

4 Digit Numeric Display: High visibility .56 inch numeric LED display indicates measured inline force in pounds or kilograms for each channel (user selectable.)

4 Level Display Brightness: Display brightness level is stored in non-volatile memory, so **Cell*Mate** Digital Display returns to former brightness level on power up.

10-Segment Multicolor Bar Graph Display: A separate bar graph display indicates total load percentage. Scaling is individually adjustable for each channel in 10 unit increments (lb or kg) and is stored in non-volatile memory, which is not susceptible to power loss.

Overload LED Indication: At 120% of user-adjustable load setting, a red LED indicator will alert the operator to an overload. An overload indication on any channel will activate a relay with user-assignable normally open contacts.

User Adjustable Tare Setting: Individual tare values for each channel are stored in non-volatile memory. The tare value will be subtracted from the true weight value and displayed for 10 seconds when the view tare button is pressed. While in the view tare mode, the percent load limits are still based on the true weight and will indicate accordingly.

Line Fault Indicator: Any **Load*Cell** channel disconnected or inactive due to a wire fault is indicated by a single dash (-) on the **Cell*Mate** Digital Display module for that channel.

Long Cable Runs: Any 6 Pin XLR cable may be run up to 1000 feet from **Load*Cell** to **Cell*Mate Hub**. 6 Pin XLR cables may be run 4000 feet from **Cell*Mate Hub** to the **Cell*Mate** Digital Display module.

Peak Hold Function: Allows user to view peak weight measurements for all channels.

2-Ton / 5-Ton Cell*Mate | specifications

Part Number: A-17-001-0001 / A-17-001-0002
Cell*Mate Display Module: 19.0"W x 5.25"H x 5.5"D
Weight: 8.3 lbs.

Front / Rear Panel Materials: Aluminum
(Blue Anodize or PowderCoat)
Enclosure Materials: 18ga. Steel, Yellow Zinc Plated

Communication Protocols: RS485 Full Duplex 9600 Baud 8N1

Cable Protocol: 22AWG 3 Tw Pair Shielded M/F 6 Pin XLR

Power Requirements:
Cell*Mate Display Module: 100-240 VAC 50/60 Hz

Cell*Mate | more information

For more information on this or any other products please contact our sales department via phone, fax, or e-mail. Our qualified sales representatives are determined to help you succeed.

Be sure to visit our website **[www.motionlabs.com]** for more information about Motion Laboratories and our products & services. Thank you for making Motion Laboratories your premier source for all of your power distribution and motor control solutions.

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Cell*Mate Features and Functions

5 Digit numeric display: High visibility white numerals indicate measured inline force in pounds or kilograms for each channel (user selectable)

Multicolor Bargraph Display: A separate bargraph display indicates total percentage load. Scaling is individually adjustable for each channel in 10 unit increments (lb or kg) and is stored in non-volatile memory.

Overload Indication: At 120% of user_adjustable load setting, the LCD display numerals will change from white to red indicating an overload condition. An overload condition on any channel will activate a SPDT relay with user assignable contacts. Relay activation minimally provides a 2.5 second contact closure.

Underload Indication: When a channel is below a user set lower limit the display will alternate between a yellow LOWER LIMIT warning and the current weight. The relay will operate in the same manner as for and overload indication.

User Adjustable Tare Setting: Individual tare values for each channel are stored in non-volatile memory. The tare value will be subtracted from the true weight value and displayed for 10 seconds when the VIEW TARE button is pressed. While in the view tare mode the percentage load limits are still based on the true weight and will indicate accordingly.

Line Fault Indicator: Any Load*Cell channel disconnected or inactive due to a wire fault is indicated by a LOAD*CELL NOT CONNECTED graphic displayed in place of the numeric readout for that channel.

Long Cable Runs: Any 6 Pin XLR cable may be run up to 1000 feet from Load*Cell to Cell*Mate Hub. 6 Pin XLR cables may be run 4000 feet from Cell*Mate Hub to the Cell*Mate LCD Display.

Peak Hold Function: Allows user to view peak weight measurements for all channels

Cell*Mate LCD Display 19.0”W x 3.5”H x 5.5”D
Weight : 5.6 lbs

Front / Rear Panel Materials: Powder Coated Aluminum

Enclosure Material: 18ga. Black Powder coated Steel

Communications Protocol: RS-485 Full Duplex 9600 baud 8N1

Cable: 22 AWG 6 conductor shielded twisted pair M/F 6 Pin XLR

Power Requirements:
Cell*Mate LCD display: 100-240 VAC 50/60Hz


Cell*Mate
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1
2
3
4
5
6
7
8
120%
100%
PEAK HOLD
SET LOWER LIMIT
UP
SET UPPER LIMIT
DN
LR
KG
THE WardeN

THE WARDEN

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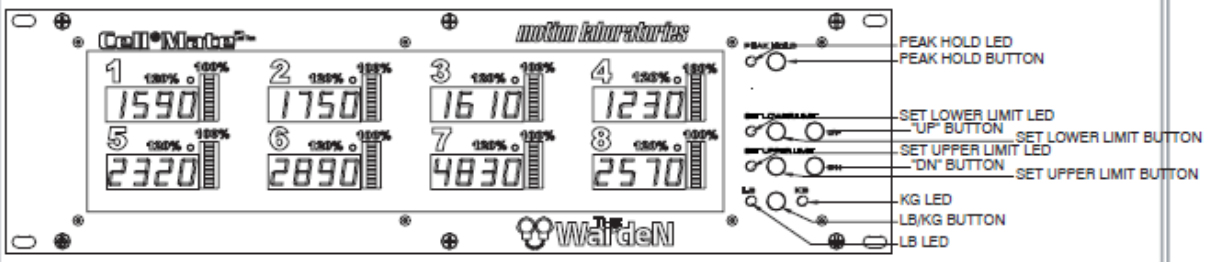
The WardeN Cell'Mate Controller allows users the ability to remotely monitor up to eight channels of **Load'Cell** data simultaneously. It offers many of the same features as its predecessor, the **Cell'Mate** Digital Display module, but adds the ability to interface with Motion Laboratories chain hoist control systems. This new and revolutionary feature allows **The WardeN** Cell'Mate Controller to instantly detect any Overload / Underload conditions that could arise and automatically stop all motor movement. It also shows the operator as to which channel has the potentially unsafe condition.

Working together with our universal **Load'Cell** and **Cell'Mate Hub**, **The WardeN** Cell'Mate Controller gives users a wide variety of options for viewing load data. Each channel provides real time weight measurement displayed in pounds or kilograms.

Additionally, each channel has a ten-segment multicolor bar graph representing a percentage of load based on a user-selectable weight limit. There is a 120% overload watchdog function that will trigger an LED indicator for each channel.

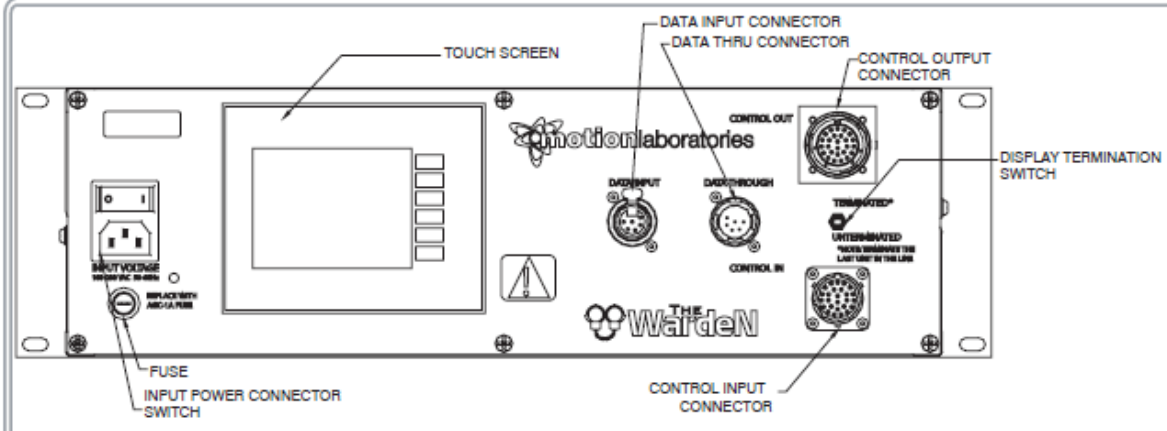
The WardeN Cell'Mate Controller receives digitized load data from the **Cell'Mate Hub** via a single 6 Pin XLR cable. The Peak Hold function allows the user to view peak weight statistics for each **Load'Cell**. All products in the **Cell'Mate** family, **The WardeN**, The **Cell'Mate** Digital Display module and the **Cell'Mate Hub**, are designed with auto switching 100/240VAC 50/60 Hz power supplies allowing for versatility in the field.

FRONT



The WardeN Display Unit

REAR



The WardeN Display Unit

The WardeN | features & functions

PLC: The WardeN Cell*Mate Controller utilizes an engineered Programmable Logic Control based monitoring protocol to instantly detect any Overload / Underload condition.

Rear Panel Touch Screen: 4" monochromatic touch screen panel provides access to program mode for setting and viewing of weight parameters.

User Programmable Settings (Actual Weight): The WardeN Cell*Mate Controller allows the user to set both underload and overload parameters in 10lb increments per channel.

User Programmable Settings (% of Weight): The WardeN Cell*Mate Controller allows the user to set both underload and overload parameters expressed as a percentage value. This percentage value applies to the weight on each channel regardless of load distribution.

4 Digit Numeric Display: High visibility .56 inch numeric LED display indicates measured inline force in pounds or kilograms for each channel.

4 Level Display Brightness: Front panel display brightness level is stored in non-volatile memory, so **The WardeN Cell*Mate** Controller returns to former brightness level on power up.

10-Segment Multicolor Bar Graph Display: Separate bar graph display indicates total load percentage. Scaling is individually adjustable for each channel in 10 unit (lb or kg) increments and is stored in non-volatile memory, which is not susceptible to power loss.

Overload LED Indication: At 120% of user-adjustable load setting, a red LED indicator will alert the operator to an overload.

User Adjustable Tare Setting: Individual tare values for each channel are stored in non-volatile memory. The tare value will be subtracted from the true weight value and displayed for 10 seconds when the view tare button is pressed. While in the view tare mode, the percent load limits are still based on the true weight and will indicate accordingly.

Line Fault Indicator: Any **Load*Cell** channel disconnected or inactive due to a wire fault is indicated by a single dash (-) on **The WardeN Cell*Mate** Controller for that channel.

Long Cable Runs: Any 6 Pin XLR cable may be run up to 1000 feet from **Load*Cell** to **Cell*Mate Hub**. 6 Pin XLR cables may be run 4000 feet from **Cell*Mate Hub** to **The WardeN Cell*Mate** Controller.

Peak Hold Function: Allows user to view peak weight measurements for all channels.

2-Ton / 5-Ton WardeN | specifications

Part Number: A-17-004-0001 / A-17-004-0002
Dimensions: 19.0"W x 5.25"H x 15"D
Weight: 20.3 lbs.

Front / Rear Panel Materials: Aluminum
(Blue Anodize or PowderCoat)
Enclosure Materials: 18ga. Steel, Yellow Zinc Plated

Communication Protocols: RS485 Full Duplex 9600 Baud 8N1

Cable Protocol: 22AWG 3 Tw Pair Shielded M/F 6 Pin XLR

Power Requirements:
The WardeN Display Module: 100-240 VAC 50/60 Hz

The WardeN | more information

For more information on this or any other products please contact our sales department via phone, fax, or e-mail. Our qualified sales representatives are determined to help you succeed.

Be sure to visit our website **[www.motionlabs.com]** for more information about Motion Laboratories and our products & services. Thank you for making Motion Laboratories your premier source for all of your power distribution and motor control solutions.

520 Furnace Dock Rd., Cortlandt Manor, NY 10567
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STANDARD HAND HELD TOUCH-SCREEN, 7.5”

EREGONOMIC HAND HELD TOUCHSCREEN, 7.5”

THE DATA LOGGER

motionlaboratories
• 520 Furnace Dock Road, Cortlandt Manor, NY 10567 • V:800.227.6784 • F:914.788.8866 • www.motionlabs.com •

Product Specifications:
Load*Cell Data Logger™

Functional Specifications

The Motion Laboratories' Load*Cell Data Logger™ interface shall be designed to record data from the Cell*Mate System and allow the user to create configurable time stamped CSV files for easy spreadsheet manipulation and archiving

Front View

Rear View

Features:

The system shall consist of a Windows based PC application and a 2RU Interface module.
The system shall utilize a 6 Pin XLR for data input.
The system shall utilize an Ethernet port for data output.
The system shall utilize a Push-Pull Locking Ethernet connection for linking multiple units together.
The system shall consist of a 4 Port version or an 8 Port version.
The system shall operate with Windows XP or Windows 7 software.
The system shall be manufactured in the USA.

Physical Specifications:

The front panel shall have a 19 inch rack width and be constructed of .125 inch thick 5052 aluminum with a blue powder-coated finish. The rear panel shall be 17 inches wide and be constructed of .090 inch thick 5052 aluminum with a blue powder-coated finish. The chassis shall be made out of 18 gauge 1020 steel and have a black powder coat finish.

All systems shall be labeled with the following information, using diamond scratch etching, laser etching, and/or molecularly-bonded thermal ink:

- Manufacturer's name/trademark.
- Electrical and environmental ratings.
- All necessary safety information.

PC Screen Shots

Single Hub with 8 Load*Cells displayed

Electrical Specifications

Unit powered by IEC input connector. 90-240 VAC, 50/60 Hz.

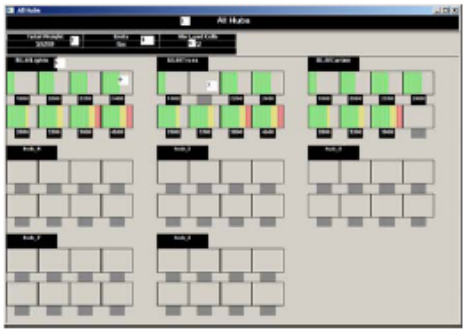
Environmental Specifications

The unit shall be NEMA 1 Rated, for indoor use only.

Computer Specifications

Windows XP or Windows 7
1.4 GHz Processor
3GB SDRAM
Ethernet Port

8 Hubs with 24 Load*Cells selected



motionlaboratories
• 520 Furnace Dock Road, Cortlandt Manor, NY 10567 • V:800.227.6784 • F:914.788.8866 • www.motionlabs.com •

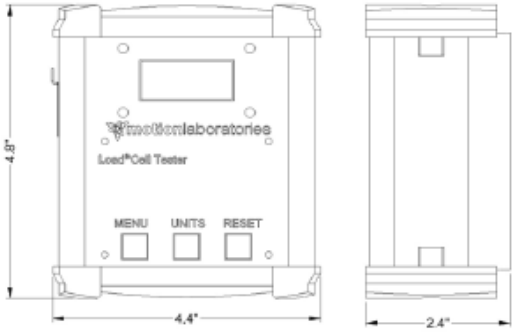
Product Specifications:
Hand Held Load*Cell Tester

Functional Specifications

Motion Laboratories' Load*Cell tester is a battery powered , hand held device with a 6 pin xlr input that will read the output functionality of any MLI 2T or 5T Load Cell

Top Panel Buttons provide access to the following features:

- Power On, Power Off
- Auto Turn Off (2 Minutes)
- Digital Readout of Weight
- Switch Between Lbs and KG
- Access to Stored Peak
- Peak Hold Function



Features

- Rugged Extruded Aluminum Case
- Backlit LCD Display
- Powered by 6 AAA Batteries
- The unit shall be manufactured in the USA.

Physical Specifications

Extruded Aluminum Case with Santoprene molded end caps.
End caps removable for Access to Battery Replacement
The unit dimensions shall be 4.8" L x 4.4" W x 2.4" H.
The unit shall have an approximate weight of 1 lbs.

The unit shall be labeled with the following information, laser etching, and/or molecularly-bonded thermal label:
- Motion Laboratories name/trademark.
- Optional customer logo.

Electrical Specifications

Unit Runs on 9V.
Expected operating time is 4 hours but may vary due to of usage, "on" cycle time, and condition of battery.

Environmental Specifications

for indoor use only.

Getting Started

The Cell*Mate System is simple to install, set up, and use. All that is required are data and power cables. Each data cable supplies power and bi-directional data to and from the Load Cells.

Six Easy Steps

1. Choose location for Load Cells: (in rigging, vertical orientation, above load to be measured).
2. Locate Cell*Mate Hub near Load Cells.
3. Run 6 Pin XLR (data) cables from each Load Cell to the Cell*Mate Hub.
4. Choose location for the Cell*Mate Display and/or WardeN.
5. Run data cable from Cell*Mate Hub to Cell*Mate Display and/or WardeN.
6. Connect AC power to Cell*Mate Hub, Cell*Mate Display and/or WardeN.

Cable Specifications:
All data transmission cables are 6 Pin XLR and based on RS485 data transmission.
Cable Distance limitations:
Load Cell to Cell*Mate Hub……1000 Feet
Cell*Mate Hub to Cell*Mate Display…… 4000 Feet

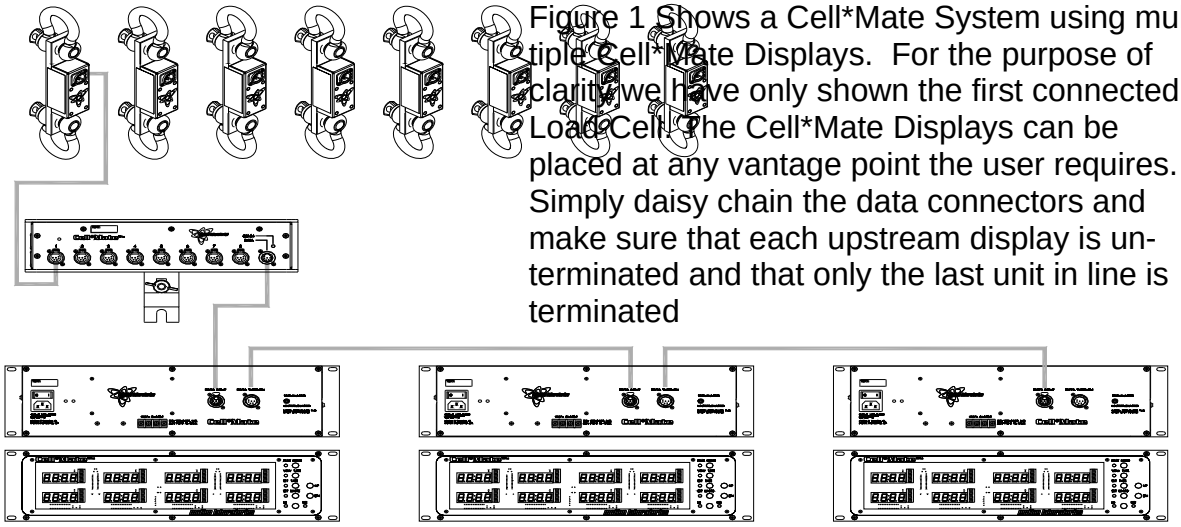


Figure 1 Shows a Cell*Mate System using multiple Cell*Mate Displays. For the purpose of clarity we have only shown the first connected Load Cell. The Cell*Mate Displays can be placed at any vantage point the user requires. Simply daisy chain the data connectors and make sure that each upstream display is unterminated and that only the last unit in line is terminated

CELL*MATE Display Indicators and Controls

1. **PEAK HOLD LED** when lit indicates that the Peak Hold Mode has been selected.
2. **PEAK HOLD BUTTON** when pressed toggles on and off the Peak Hold Mode.
3. **VIEW TARE LED** when lit indicates that the View Tare Mode has been selected.
4. **VIEW TARE BUTTON** when pressed allows the user to globally view the tare weight.
5. **SET TARE LED** when blinking indicates that the Set Tare Mode has been selected.
6. **SET TARE BUTTON** when pressed allows the user to enter, scroll thru channels and exit Set Tare Mode.
7. **SET LIMIT LED** when blinking indicates that the Set Limit Mode has been selected.
8. **SET LIMIT BUTTON** when pressed allows the user to enter, scroll thru channels and exit Set Limit Mode.
9. **LB LED** when lit indicates the display is reading in pounds.
10. **LB/KG BUTTON** when pressed toggles between lbs and kilograms.
11. **KG LED** when lit indicates the display is reading in kilograms.
12. **UP BUTTON** when pressed increases selected values in a positive direction.
13. **DN BUTTON** when pressed increases selected values in a negative direction.
14. **DISPLAY SECTION**, The display section includes a high visibility 4 digit LED for numeric display, a10-segment multicolor LED bar for graphic display and a 120% overload LED indicator. An overload indication on any channel will activate a relay with user assignable normally open contacts.
15. **DATA INPUT CONNECTOR** 6 Pin XLR Female receives RS485 protocol from the Cell*Mate Hub.
16. **DATA OUTPUT CONNECTOR** 6 Pin XLR Male transmits RS485 protocol to another Cell*Mate Display or WardeN.
17. **TERMINATION SWITCH** used to terminate the last Cell*Mate Display or WardeN in line.
18. **ALARM OUTPUT** provides the user with a set of dry contacts, N.O.
19. **INPUT POWER CONNECTOR** IEC C13 100-240 VAC.

Operation with Systems Using The Cell*Mate V3 LCD Display

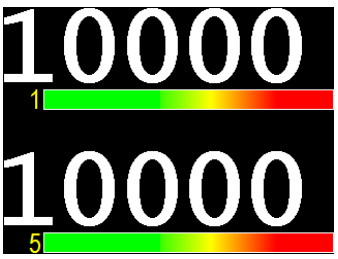
DANGER

During installation, you MUST verify the Load Cell and Load Cell Hub channel assignment. Load Cell #1 must correspond to channel 1 of the hub and other components throughout the system. Crossed patching can lead to incorrect readings and hazardous conditions.

POWER UP

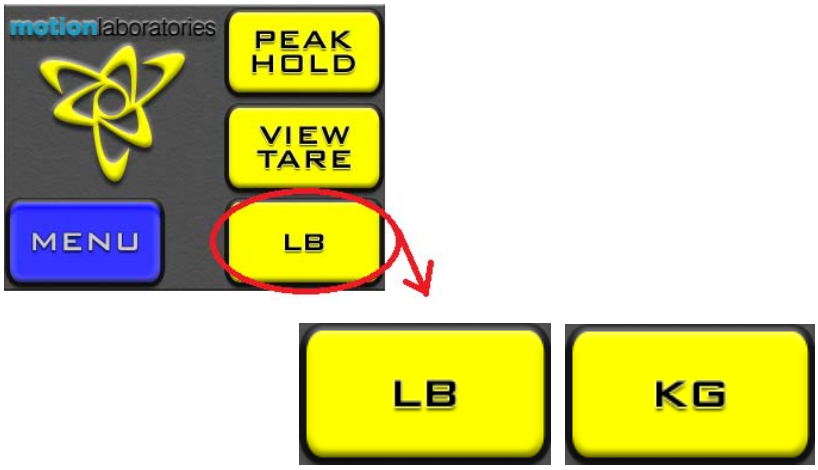
When you first power up the **Cell*Mate** system the display will show a version number screen on each of 5 individual display panels. The display will then begin to receive data from the Cell*Mate Hub. The system recalls the last used unit of measure (lb or kg). If no hub is connected each display will show the CELL*MATE HUB NOT CONNECTED graphic on all numeric displays indicating data loss from the hub to the display.

Any **Load*Cells** connected will indicate a numerical weight value during normal operation. If a load cell is not connected to a channel or a cable fault exists, the corresponding channel will indicate LOAD*CELL NOT CONNECTED graphic in place of the numeric readout. Using less than 8 cells does not affect the **Cell*Mate** system.



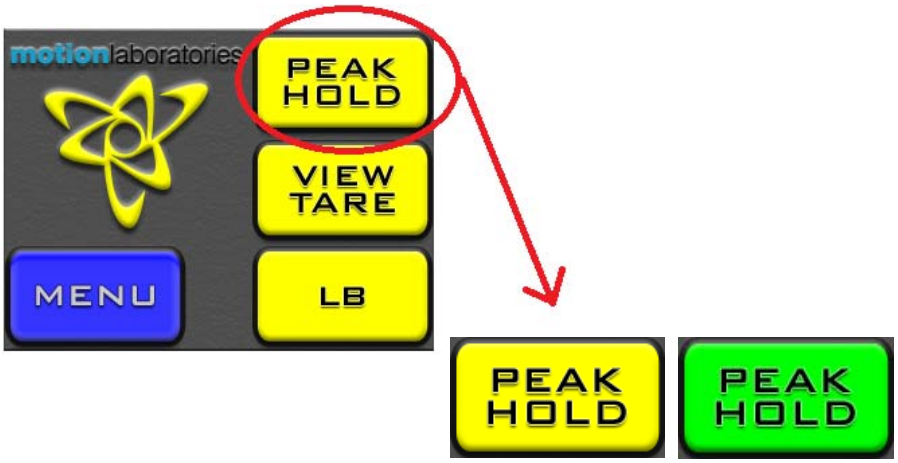
Selecting Pounds or Kilograms

The **Cell*Mate** can be set to measure pounds or kilograms in 1 pound or 1 kilogram increments. The pound/ kilogram button indicates which mode the Cell*Mate is in. To change units press the lb/kg button.



Peak Hold

Peak hold allows the user to view the maximum weight value measured on all channels while the **Cell*Mate Display** has been placed in the peak hold mode. While in this mode the bar graph displays and limit alarms function normally. This function toggles on and off by pressing the peak hold button. Peak hold is a local display function. If you are using multiple **Cell*Mate Displays**, only the **Cell*Mate Display** that has the peak hold function activated will indicate peak readings. Deselecting the peak hold button will clear the stored value.

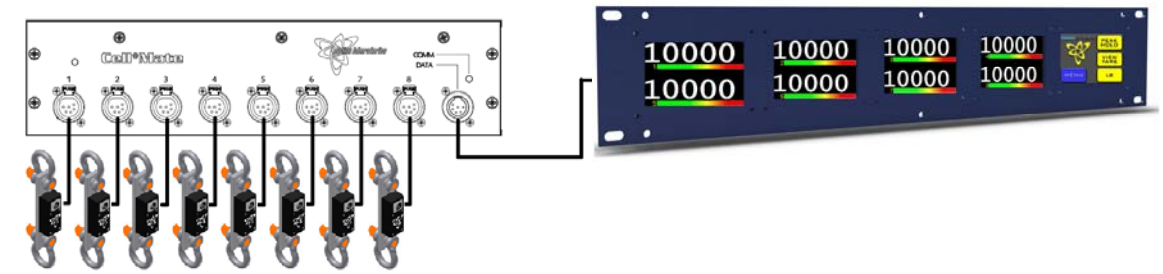


Line Termination
A termination switch is provided to correct the line impedance in the RS-485 data cable. This requires that the last device in the data path be terminated.

If a single **Cell*Mate Display** is used it is the last device and must be terminated. When multiple **Cell*Mate Displays** are used, only the last one in the chain should be terminated. All others shall have the switch set to the un-terminated position.

CAUTION
Never attempt to make “Y” cables or try to home run cables to separate **Cell*Mate Displays** from a **Cell*Mate Hub**. Multiple **Cell*Mate Displays** must ALWAYS be connected in series, daisy chaining through one another.

Line Termination Examples
8-channel system setup with single display. Note termination switch turned on for the single display.



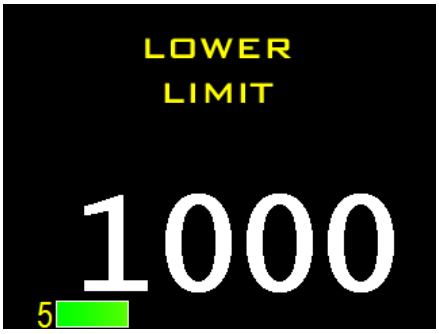
8-channel system setup with more than one display. Note termination switch turned on only on the last display in the chain.

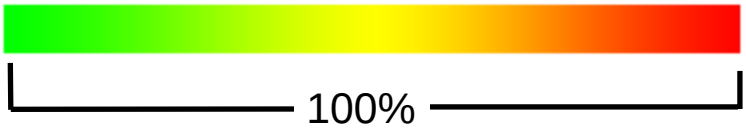
Termination Off **Termination On**

Setting Percentage Load Limits

The Limit function allows the user to monitor a variety of hoists and lifting devices at different load ratings in one system. ¼, ½, 1, 2 and 5 Ton devices can all be monitored by the same **Cell*Mate** System. Setting limits can accommodate structural and architectural elements of a rig by custom tailoring your monitors to account for weaker or stronger points.

A limit is a 100% weight value you set to be displayed in 10% increments on the bar graph display. Limits are individually adjustable for each channel and are stored in non-volatile memory. You can also set a lower limit so the Cell*Mate display can also provide a warning if you go below a user set lower limit. The display will alternately show the current weight and the yellow LOWER LIMIT warning message.





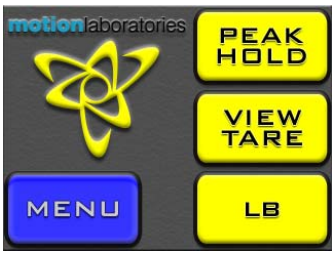
The 10 segment bar graph display is multicolor in order to provide you with a visual telltale of the measured weight. The weight readout numerals will turn red once you have reached a 120% overload threshold. Additionally, this activates a SPDT relay with normally open and normally closed contacts. This can be used as a safety shutdown, to operate an external audible or visual alarm or any other user defined application.

CAUTION

Remember the value you set as a limit is the 100% value. 20% beyond this value will cause an overload indication. For example, if you set a limit to 1000 pounds the bar graph will display all 10 segments at exactly 1000 pounds. The overload indication will not occur until the weight reaches 1200 pounds.

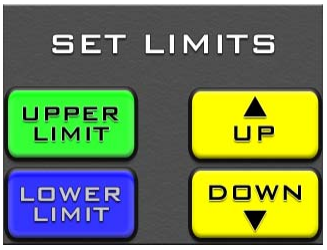
To Set Limits

1. Press the ‘MENU’ button.

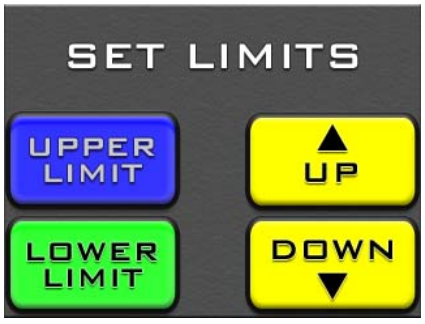


2. Press the ‘SET LIMITS’ button

3. Numeric displays will clear and current channel 1 limits will be displayed. UPPER LIMIT button will be green.



4. Use up and down buttons to adjust upper limit.
5. To adjust lower limit press the LOWER LIMIT button. It will change to green.

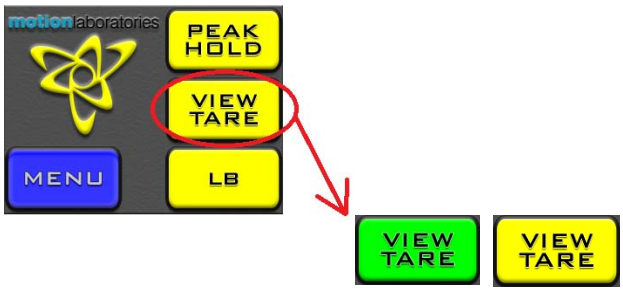


6. Use UP and DOWN buttons to adjust.
7. Pressing UPPER LIMIT button again will advance to the next channel
8. Repeat for all 8 channels or keep pressing UPPER LIMIT to escape

Setting and Viewing Tare Values

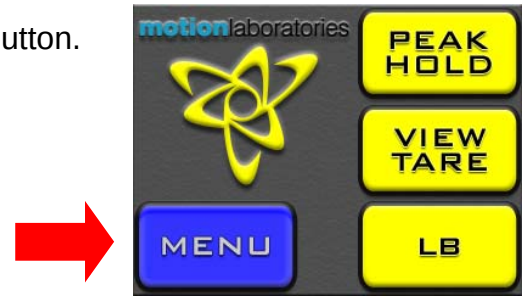
A tare is a value that is subtracted from the true weight when you want to measure from a reference point other than zero. For example, if you had a chain hoist that has a known weight of 150 pounds but you wanted to know what your load was without the weight of the hoist, you could set 150 pounds as a tare value. When you press the view tare button, the **Cell*Mate Display** will subtract 150 pounds from the true weight so you can see what your actual load is.

When you press the VIEW TARE button it changes to green to show the view tare mode is active. A timer allows the display to view the true weight minus the tare for ten seconds and then reverts back to normal weight readings. This is so one does not accidentally exceed a weight by leaving it in the view tare mode. While in the view tare mode, the bar graph readings are still based on true weight and will accurately show percentage of the limit. Tare settings are stored in non-volatile memory. NOTE: If tare value is greater than the measured value, TARE UNDER will be indicated on that channel.

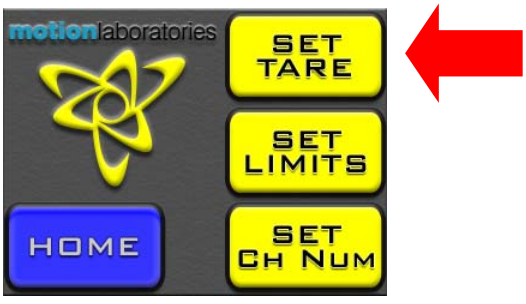


TO SET TARE

1. Press the 'MENU' button.



2. Press SET TARE button

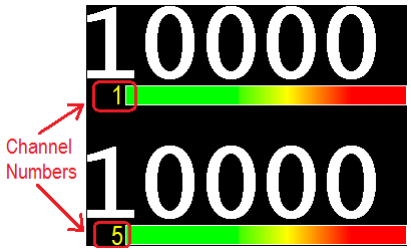


3. Numeric displays will clear and current channel 1 tare will be displayed.

4. Use UP and DOWN buttons to adjust tare.
5. Press SELECT to go to the next channel to adjust.
6. If no adjustments need to be made press SELECT until normal display returns

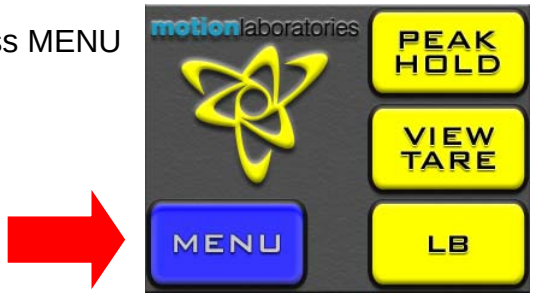
NOTE: When changing tare values, the Cell*Mate System will not read any measurements.

SET CHANNEL NUMBER

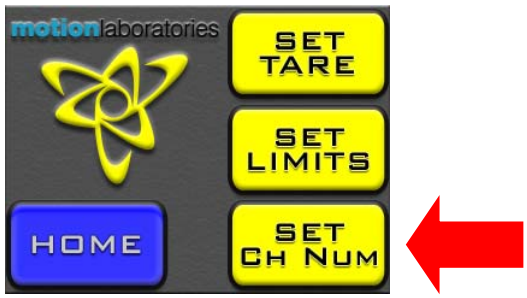


Each of the 8 weight readout displays have a user settable number. If your setup has more than one **Cell*Mate Display** you can assign a number to any channel you wish from 1 to 999. This number is only a numeric label and does not affect the Cell*Mate system in any way.

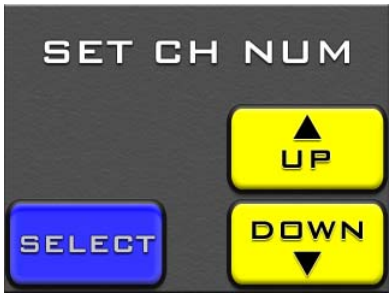
1. Press MENU



2. Press SET CH NUMBER. Display will clear and then display channel number for first display.



3. Press UP and DOWN buttons to change channel number



4. Press SELECT button to advance to next channel or continue to escape to main display

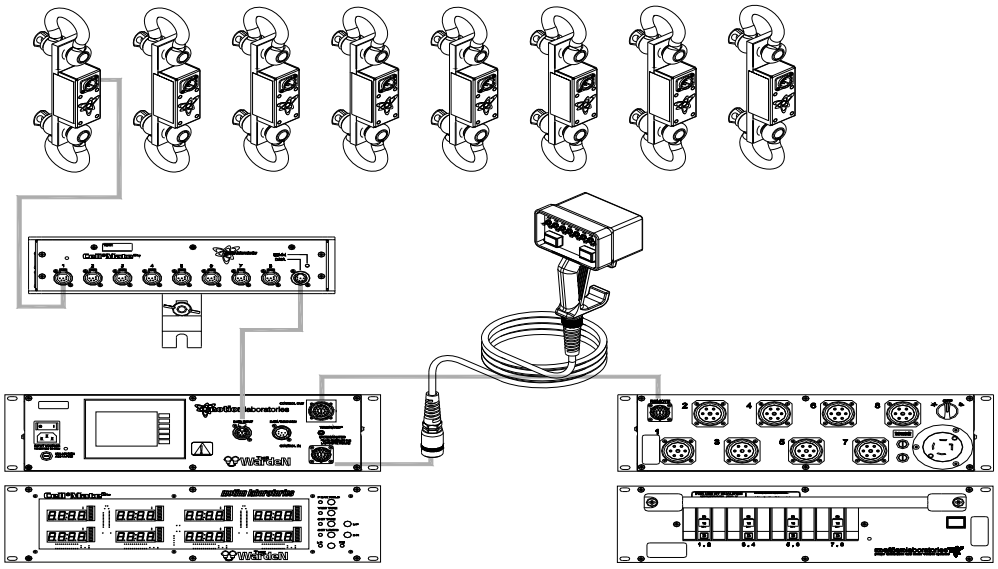


Figure 2 Shows a Cell*Mate System using the The WardeN to oversee a Chain Hoist Control System. For the purpose of clarity we have only shown the first connected Load Cell. Run the data cable(s) and connect each Load Cell to its assigned channel connector on the Cell*Mate Hub. Connect the data cable from the Cell*Mate Hub to The WardeN. Connect a standard MLI Remote Hand Held Station to The WardeN. Connect The WardeN to a MLI Chain Hoist Controller using a standard P26 Remote Cable.

Operation with System Using The WardeN Control:

General.

The WardeN will interrupt up and/or down commands to the Chain Hoist Control System based on data provided by the Cell*Mate Hub matched against user defined limits. The WardeN will maintain this control on any/all channels that are integrated into the system. Channels of control without a Load Cell will not operate.

The WardeN will:

- React to overweight conditions by stopping all movement and then prevent upward movement of any overweight channel(s).
- React to underweight conditions by stopping all movement and then prevent downward movement of any underweight channel(s).
- Allow for user correction or 'recovery'. This will allow the user to move underweight channels up and overweight channel down.

CAUTION

There are two modes of operation;

'Setup' which means that the system is "online" and ready to operate. All parameters are available and once set will be functional.

'In Setup' means that the system has been functionally bypassed.

DANGER

Make sure during installation that the Channel 1 Hoist and Load Cell, are properly connected to the correct channel of the Chain Hoist Controller and WardeN. Crossed channels or incorrect patching can lead to incorrect readings and hazardous conditions.

Power Up

When you first power up the WardeN, the display performs a self test, illuminating all LED's at maximum brightness. After the display test is completed, it will begin to receive data from the Cell*Mate Hub. If no Cell*Mate Hub is connected each display will show "EEEE" indicating a loss of data from the Cell*Mate Hub.

Any Load cells connected will indicate a numerical weight value during normal operation. If a Load Cell is not connected to a channel or a cable fault exists, the corresponding channel will indicate a single "-". Using less than 8 Load Cells does not affect The WardeN, however any channel that does not have a connected Load Cell will be inoperable.

Display Intensity

The intensity of the WardeN's front panel display is adjustable to 4 levels of brightness. This can be adjusted any time the WardeN is in the normal weight-measuring mode. Each press of the up or down button will increase or decrease the intensity one level. The WardeN display remembers the intensity you set as this information is stored in memory.

Selecting Pounds or Kilograms

The WardeN front panel display can be set to read in pounds or kilograms. The 2Ton system will display in 10 pound or kilogram increments. The 5Ton system will display in 25 pound or kilogram increments. The pound and kilogram LED's indicate which mode the WardeN is in. To change units press the lb/kg button. The LED will change to the selected mode and weight will be displayed. On power up, the default setting for the WardeN front panel display is pounds.

Peak Hold

Peak hold allows the user to view the maximum weight value measured on all channels while the system has been placed in the peak hold mode. While in this mode the bar graph displays and limit alarms function normally. This function toggles on and off by pressing the peak hold button. Peak hold is a local display function. If you are using a WardeN with multiple Cell*Mate Displays, only the display that has the peak hold function activated will indicate peak readings. Deselecting the peak hold button will clear the stored value.

Line Termination

A termination switch is provided to correct the line impedance in the RS485 data cable. This requires that the last device in the data path be terminated.

If a just a WardeN is used it is the last device and must be terminated. When multiple Cell*Mate Displays are added, only the last one in the chain should be terminated, all others shall have the switch set to the un-terminated position.

CAUTION

Never attempt to make "Y" cables or try to home run cables to separate Cell*Mate Displays and or WardeN from a Cell*Mate Hub. When multiple Cell*Mate Displays are added to a WardeN they must ALWAYS be connected in series, daisy chaining through one another.

CAUTION

Never connect multiple WardeNs from a single Cell*Mate Hub.

Setting Upper Limits

The Limit function allows the user to monitor a variety of hoists and lifting devices at different load ratings in one system. ¼, ½, 1, 2 and 5Ton devices can all be monitored and controlled by the same WardeN. Setting limits can accommodate structural and architectural elements of a rig by custom tailoring your monitors to account for weaker or stronger points.

An upper limit is a 100% weight value you set to be displayed in 10% increments on the bar graph display. Upper limits are individually adjustable for each channel and are stored in non-volatile memory. Upper limits can be set using the front panel controls; however, can be viewed on the rear Touch Screen.

CAUTION

If you set an upper limit in kilograms and then change to pounds it will not carry over and vice versa.

The 10 segment bar graph display is multicolor in order to provide you with a visual telltale of the measured weight. The first 6 LED segments are indicated in green, the next 3 in yellow and final LED in red. An additional high intensity red overload LED is located above the four digit display. This is triggered once you have reached a 120% overload threshold.

To Set Upper Limits

1. Press the 'Set Upper Limit' button.
2. Display will clear and current channel 1 limits will be displayed, 'Set Upper Limit' LED will blink.
3. To change the upper limit value, press the 'Up' or 'Down' button. Minimum limit is 100 lb/kg. You can toggle the up/down buttons to move in 10lb increments for a 2Ton System or 25lb increments for a 5Ton system. You may also hold the buttons down for auto advancing in the direction selected. They will auto advance slowly for the first 8 counts and then faster for quick adjustments of larger changes.
4. To advance to the next channel press the 'Set Upper Limit' button again.
5. A channel may be skipped by pressing the 'Set Upper Limit' button again if no adjustment is necessary.
6. After adjustments to channel 8, pressing the 'Set Upper Limit' button again will return the WardeN Display to the normal mode and the 'Set Upper Limit' LED will stop blinking. NOTE: When changing upper limits, the Warden System will not read any measurements.
7. Confirm upper limits by pressing the 'View Upper' button on the rear Touch Screen.

 **CAUTION**

Remember the value you set as an upper limit is the operating value. If this value is reached the WardeN will stop all movement.

The WardeN is intended to provide overload protection for rigging points and as such, these settings are critical. An overlooked setting could result in the system not performing properly.

These settings should not be higher than the lifting capacity of the hoist or the rating of the anchorage point whichever is lower.

Setting Lower Limit (Slack Chain) Values

A lower limit is the operating value designed to indicate the presence of a slack chain condition. Lower limits are individually adjustable for each channel and are stored in non-volatile memory. Lower limits can be set using the front panel controls; however, can be viewed on the rear Touch Screen.

 **CAUTION**

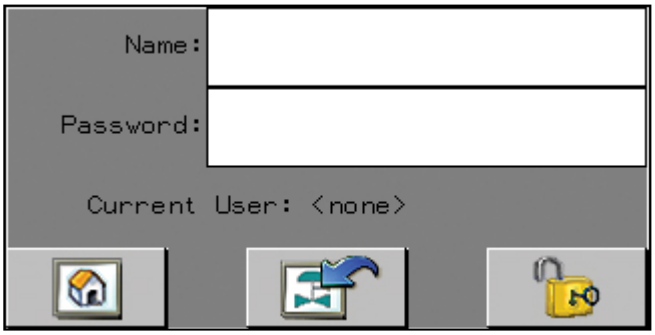
If you set a lower limit in kilograms and then change to pounds it will not carry over and vice versa.

To Set Lower Limit Values

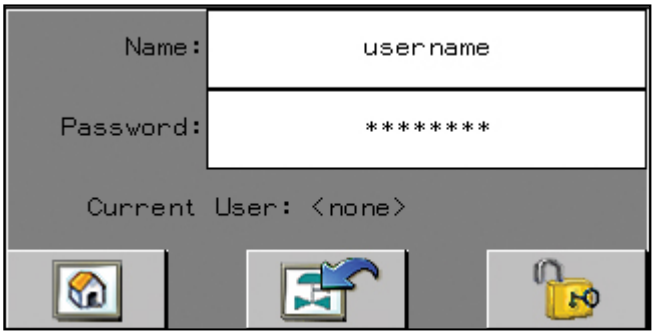
1. Press the ‘Set Lower Limit’ button.
2. Display will clear and current channel 1 lower limit value will be displayed, ‘Set Lower Limit’ LED will blink.
3. To change the lower limit value, press the ‘Up’ or ‘Down’ button. Minimum lower limit value is 0 lb/kg. You can toggle the up/down buttons to move in 10lb increments for a 2Ton system or 25lb increments for a 5Ton system. You may also hold the buttons down for auto advancing in the direction selected. They will auto advance slowly for the first 8 counts and then faster to account for higher tare values.
4. To advance to the next channel press the ‘Set lower Limit’ button again.
5. A channel may be skipped by pressing the ‘Set Lower Limit’ button again if no adjustment is necessary.
6. After adjustments to channel 8, pressing the ‘Set Lower Limit’ button again will return the WardeN to the normal mode and the ‘Set Lower Limit’ LED will stop blinking. NOTE: When changing lower limit values, the WardeN will not read any measurements.
7. Confirm lower limits by pressing the ‘View Lower’ button on the rear Touch Screen.

Warden Touch Screen Settings
Upon power up the Touch Screen will open to the ‘Login’ page.

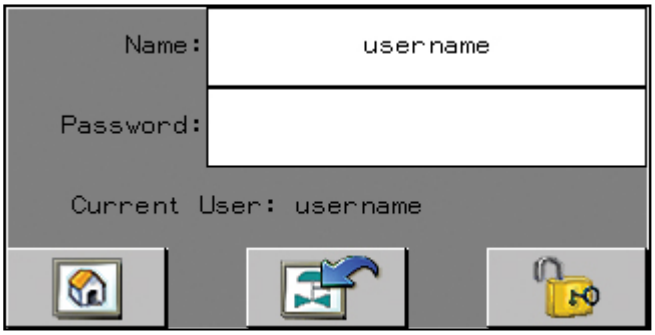
Warden Touch Screen Login.
Step1. – Press the “Login” button and you will be redirected to the Login page.



Step2. - Click the text field and enter your login name and press enter.
Enter your password and click enter. (case sensitive)



Step3. - Click the unlock button  .
Your are now logged in and the Current User is shown.



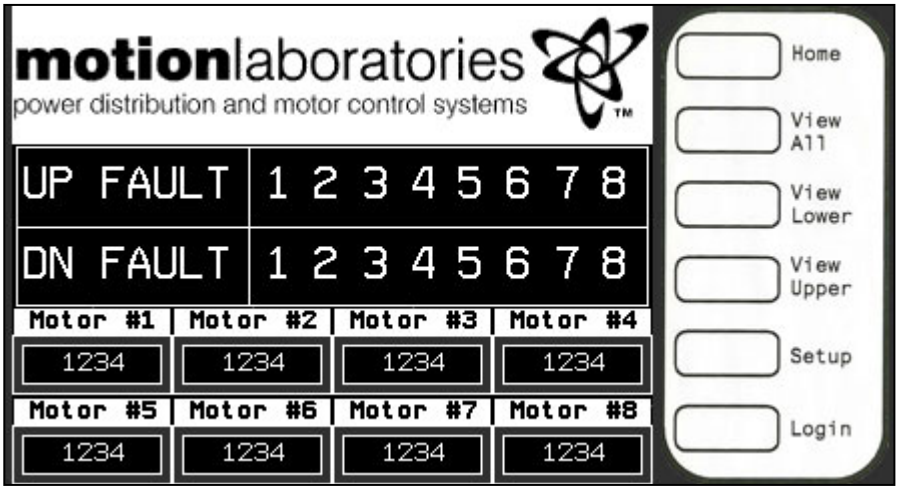
Note: You will also notice the ‘Back’ button  . After entering the username and password you can hit the ‘Back’ button and you will be redirected to the previously viewed page.

Warden Touch Screen ‘Main’ Page.

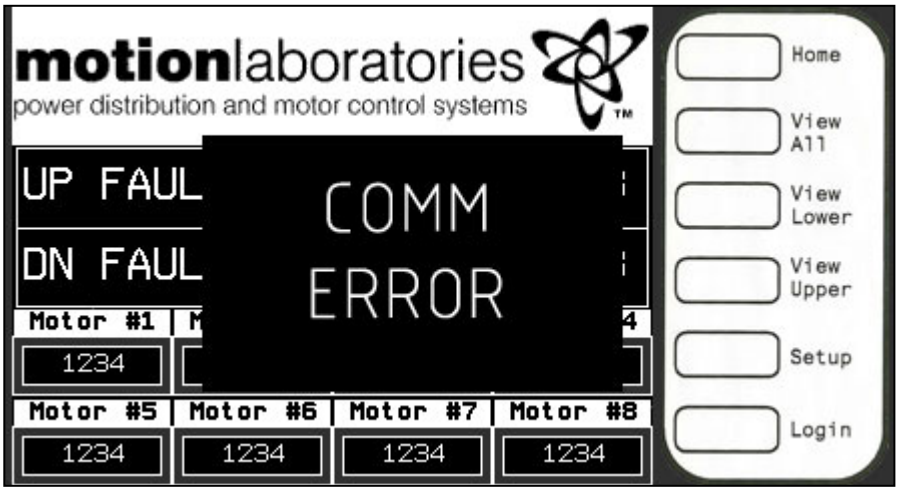
This page display’s the up or down fault status for any motors. A fault is indicated by a blinking number. If the Cell*Mate Hub is not connected, or unpowered you will get a ‘COMM ERROR’ sign.

The Buttons on the right column allow you to toggle trough the different setup and limit pages.

Main Page

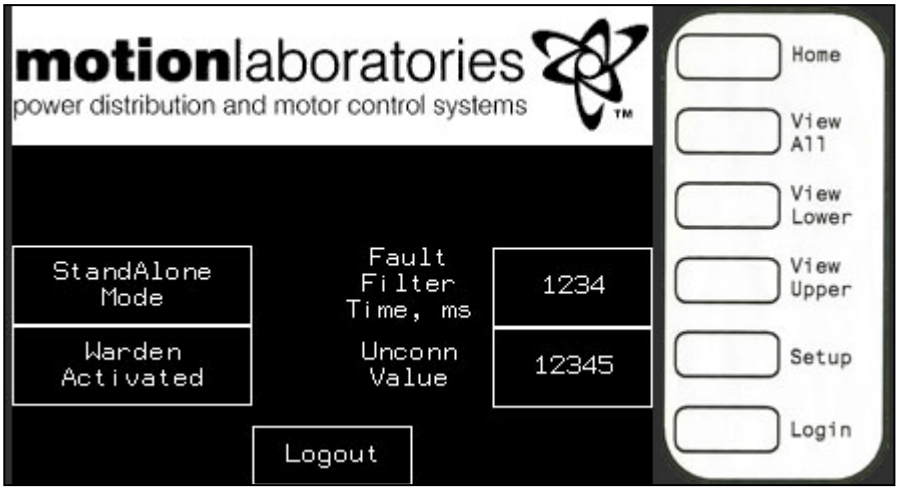


Communication Error



Warden Touch Screen 'Setup' Page.
Click the 'Setup' button to open up the Setup page. This page allows access to the 'Fault Filter Time' setting, 'Unconnected Value' setting, 'Warden Activated/Deactivated' toggle, 'Standalone/TSOS Mode' and the 'Main' page button.

Setup Page



NOTE: All parameters that require a setting by the users are marked **PROGRAM SETTING!**

PROGRAM SETTING!
'Fault Filter Time' setting will place an operational delay on shutdown to account for any errant information or shock peaks. The recommended setting for this is 400ms.

PROGRAM SETTING!
'Unconn Value' The unconnected value is determined by the Cell*Mate System in use. For 2Ton systems, the value should be 10,000. For 5Ton systems the value should be 25,000. These are the numeric values the Cell*Mate Hub sends out if a Load Cell is not connected.

PROGRAM SETTING!
Toggle between 'Standalone Mode/TSOS Mode'.
You can place the WardeN into 'Standalone Mode' mode by pressing the 'Standalone Mode/TSOS Mode' button which will allow the user to operate the 8 Channel Warden system. When you click the 'Standalone Mode/TSOS Mode' button the icon will highlight and go into 'TSOS Mode' mode.
The WardeN may be placed back into 'Standalone Mode' mode by pressing the 'Standalone Mode/TSOS Mode' button putting the system back into 'Standalone Mode'. 'TSOS Mode' is used when operated in the Warden with a TSOS (Touch Screen Operating System). In order to operate multiple Wardens together you MUST have a TSOS and all Wardens MUST be in 'TSOS Mode'.

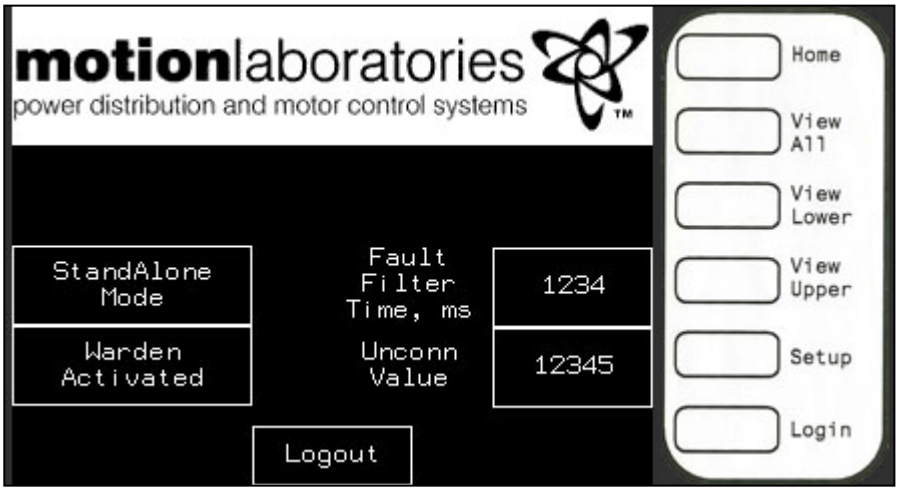
CAUTION

Remember that if the system is placed into ‘Standalone Mode’ mode, the weight monitoring functions will only operate that 8 channel Warden.

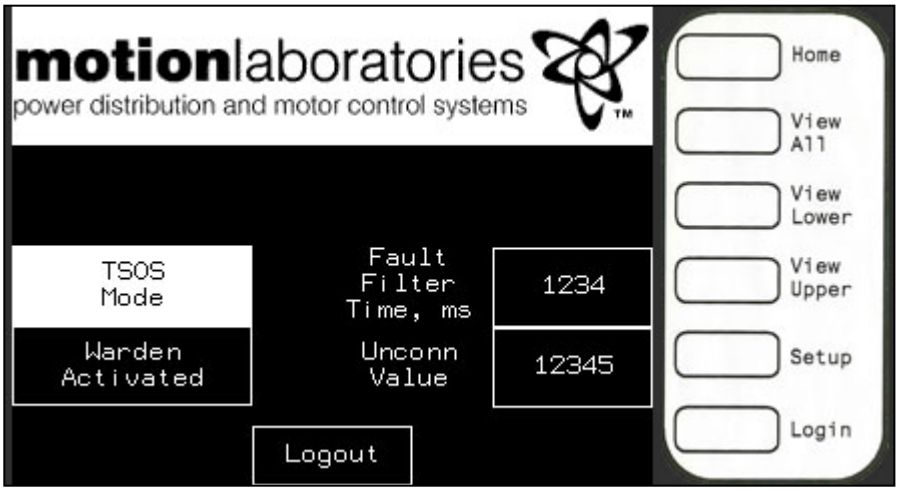
If the system is placed in ‘TSOS Mode’ and you try to operate in ‘Standalone Mode’ the weight monitoring safety functions will not operate correctly.

THE CORRECT MODE MUST BE SELECTED FOR PROPER OPERATION.

In ‘Standalone Mode’ Mode



In ‘TSOS Mode’ Mode



PROGRAM SETTING!

Toggle between ‘Warden Activated/DeActivated’.

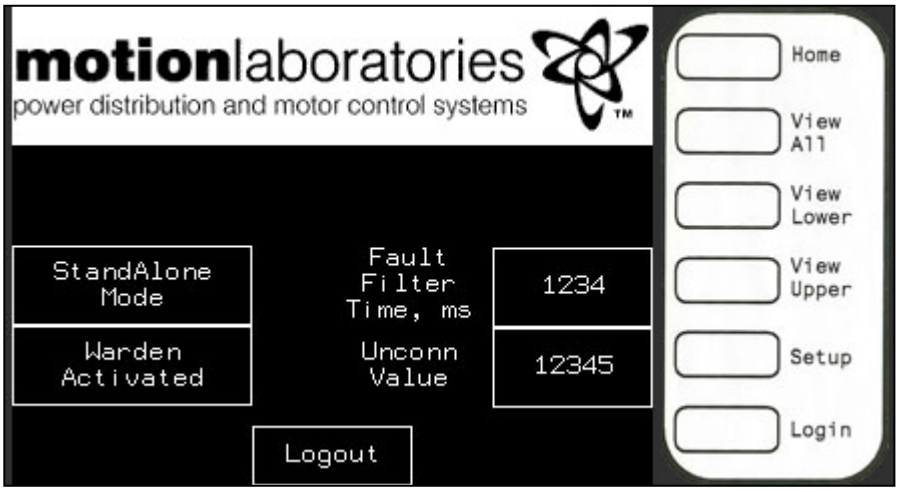
You can place the Warden into ‘Warden DeActivated’ mode by pressing the ‘Warden Activated/DeActivated’ button which will allow the user to perform any unrestricted movement. When you click the ‘Warden Activated/DeActivated’ button the icon will highlight and go into ‘Warden DeActivated’ mode.

The Warden may be placed back into ‘Warden Activated’ mode by pressing the ‘Warden Activated/DeActivated’ button putting the system back into operating mode with all parameters active.

CAUTION

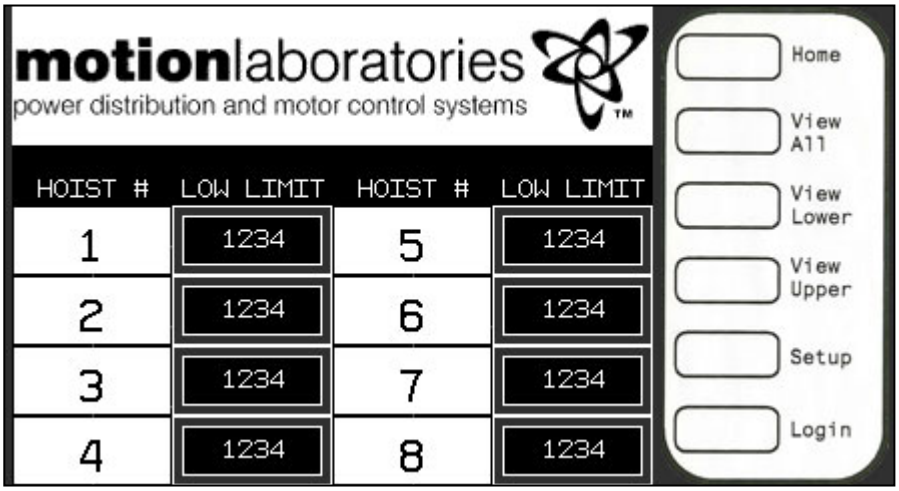
Remember that until the system is placed into ‘Warden Activated’ mode, the weight monitoring functions will only display on the front panel. Failure to place in ‘Warden Activated’ mode will defeat the operating ability of the Warden

In ‘Warden Activated’ Mode

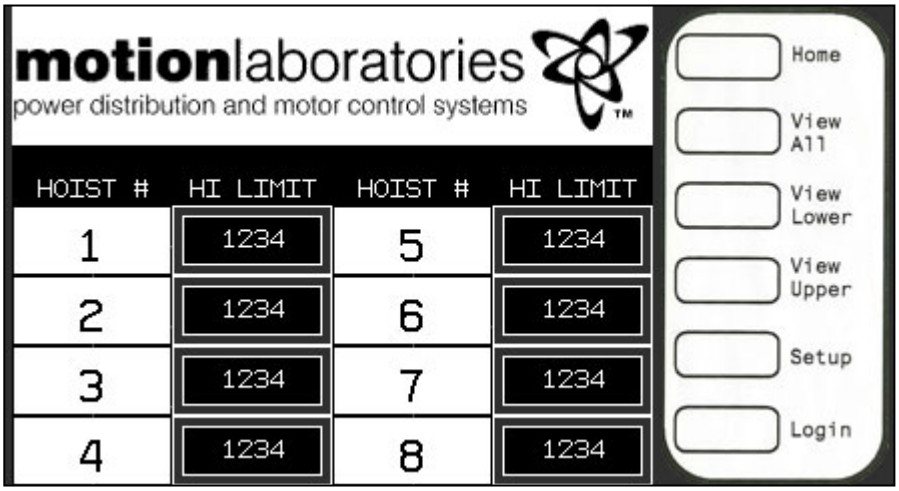


In ‘Warden DeActivated’ Mode

Warden Touch Screen ‘View Lower’ Page.
Click the ‘View Lower’ button to open up the ‘View Lower’ page. This page allows the user to see the Lower Limits on all channels.



Warden Touch Screen ‘View Upper’ Page.
Click the ‘View Upper’ button to open up the ‘View Upper’ page. This page allows the user to see the Upper Limits on all channels.



Warden Touch Screen ‘View All’ Page.

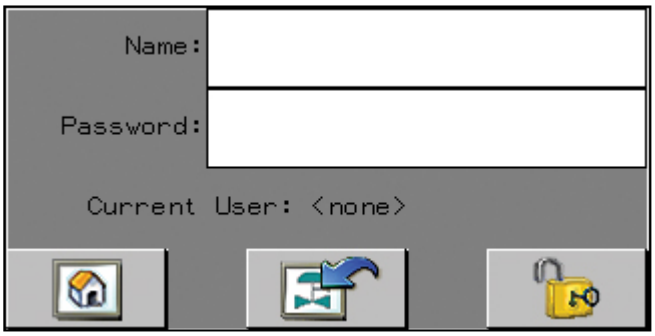
Click the ‘View All’ button to open up the View All page. This page allows the user to see the weight on all channels, upper limits and lower limits.

Guide to using the Touch Screen Operating System (TSOS).

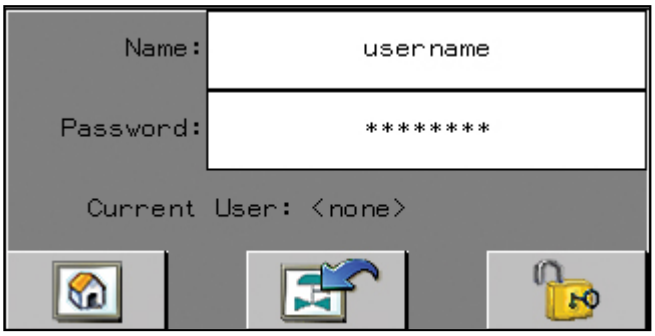
Step 1 – Plug in and Turn ON power to all products.
(Chain Hoist Controller, WardeN, Cell*Mate Hub, Displays, Load Cells, TSOS, etc.)

Step 2 – The TSOS Display will start automatically and will remain on the ‘Home’ page. You will notice on the bottom left of the page a ‘Login’ and ‘Logout’ button. When logged out, the ‘Logout’ button flashes.

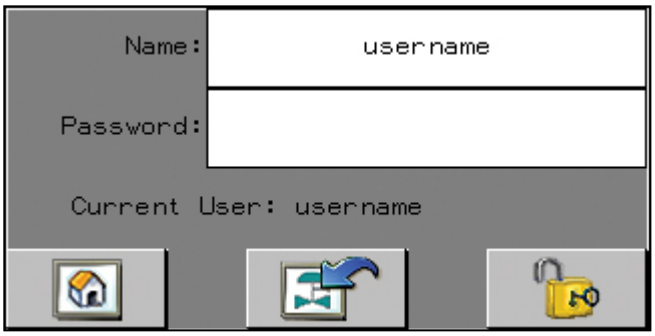
Step 3 – Press the ‘Login’ button  and you will be redirected to the Login page.



Click the text field and enter your login name and press enter.
Enter your password and click enter. (case sensitive)



Click the unlock button  .
Your have now logged in and the Current User is shown.



NOTE: You will also notice the ‘Back’ button  . After entering the username and password you can hit the ‘Back’ button and you will be redirected to the previously viewed page. The TSOS is designed to automatically logout after 30 minutes of idle time.

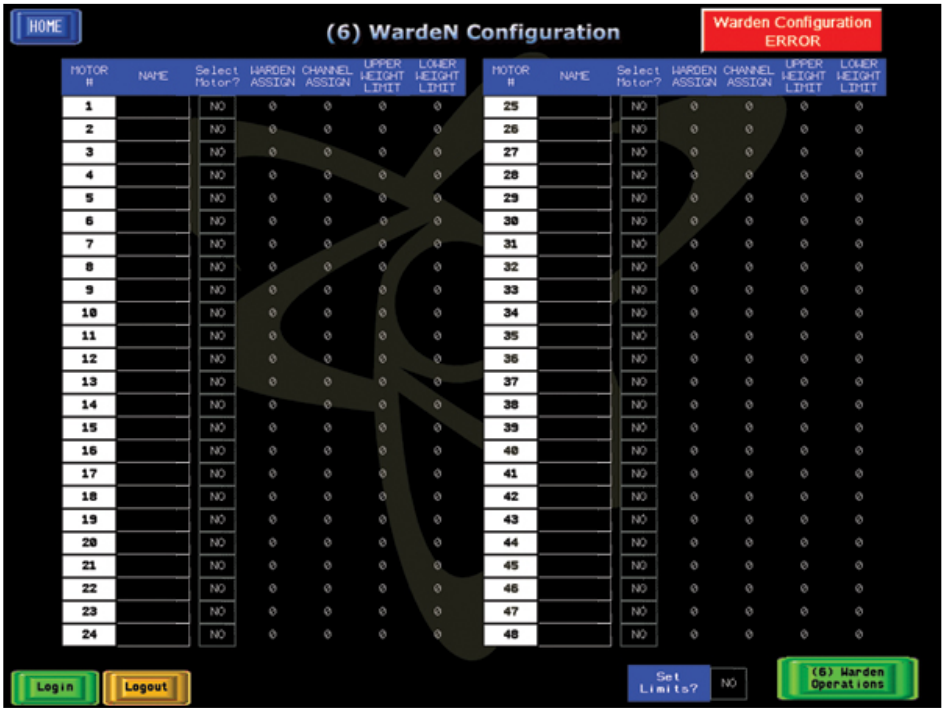
Click the ‘Home’ button  and you will be redirected to the ‘Home’ page. Notice the ‘Logout’ button is no longer blinking.

Step 4 – Click the ‘Warden Selector’ button 

.

Step 5 – The ‘Warden Selector’ page is where you will select the number of WardeN’s that will be used with this system. You can choose from 1-6 WardeNs.

Step 6 – (6) WardeN Set-Up (Configuration) in shown below.



This page is where you will be setting up the system.

Column #1 – MOTOR #: The location of the motor on the operations page. Locations are displayed from left à right (8 motors per row).

Column #2 – NAME: Allows the user to enter their own text to label the motors.

Column #3 – SELECT MOTOR: This will activate the motor in the operations page and allow the user to control the hoist.

Column #4 – WARDEN ASSIGN: WardeN Number this motor will be plugged into.

Column #5 – CHANNEL ASSIGN: Channel Number this motor will be plugged into.

Column #6 – UPPER WEIGHT LIMIT: Maximum operating weight limit.

Column #7 – LOWER WEIGHT LIMIT: Minimum operating weight limit.

Step 7 – You need to first determine if you are using all the channels of control and turn on the corresponding motor. In the 'Select Motor' column you toggle between YES/NO. Verify that any motor that will be controlled with the TSOS is selected, 'YES'. You should also name the motors at this point.

Step 8 – Now that the motors are selected for operation you must program them to the appropriate WardeN and Channel assignment.

PLEASE NOTE: Please pay close attention when programming the WardeN and Channel assignment. You MUST have the same motor and Load Cell plugged into the corresponding channel on the Motor Controller, Cell*Mate Hub and WardeN.
Example #1 – Lets say that you are setting up your system to run with a single WardeN set-up. It is fairly straight forward. Look at the motor that is plugged into channel one of the controller. You MUST have the corresponding Load Cell plugged into channel one of the Cell*Mate Hub and insure that the Cell*Mate Hub is plugged into the WardeN #1.
The TSOS must be programmed for WardeN 1~ Channel 1.

Example #2 – We have a 2-WardeN setup with a 16 Channel Controller. We will use the motor that is plugged into channel one of the Motor Controller. You MUST have the corresponding Load Cell plugged into channel one of the Cell*Mate Hub #1 and insure that the Cell*Mate Hub is plugged into the WardeN #1. The TSOS must be programmed for WardeN 1~Channel 1.
Next we will take the motor that is plugged into channel 12 of the Motor Controller. You MUST have the corresponding Load Cell plugged into channel four of the Cell*Mate Hub #2 and insure that the Load Cell Hub is plugged into the WardeN #2.
The TSOS must be programmed for WardeN 2~Channel 4.

You will notice on the top right on the ‘WardeN Configuration’ page the Warden Configuration OK / ERROR.

This is designed to assist the user in setting up the system. Once you have selected the motors for operation this message window helps determine if there are any errors. You cannot have more then one motor assigned to the same WardeN and Channel assignment. As long as there are no duplicate entries on selected motors you will see ‘Warden Configuration OK’ in green. If there is a duplicate entry, the ‘Warden Configuration ERROR’ will be displayed in red.

Step 9 – Program the ‘Upper Weight Limit’ by pressing the number associated with that motor and change to the desired maximum operating weight.

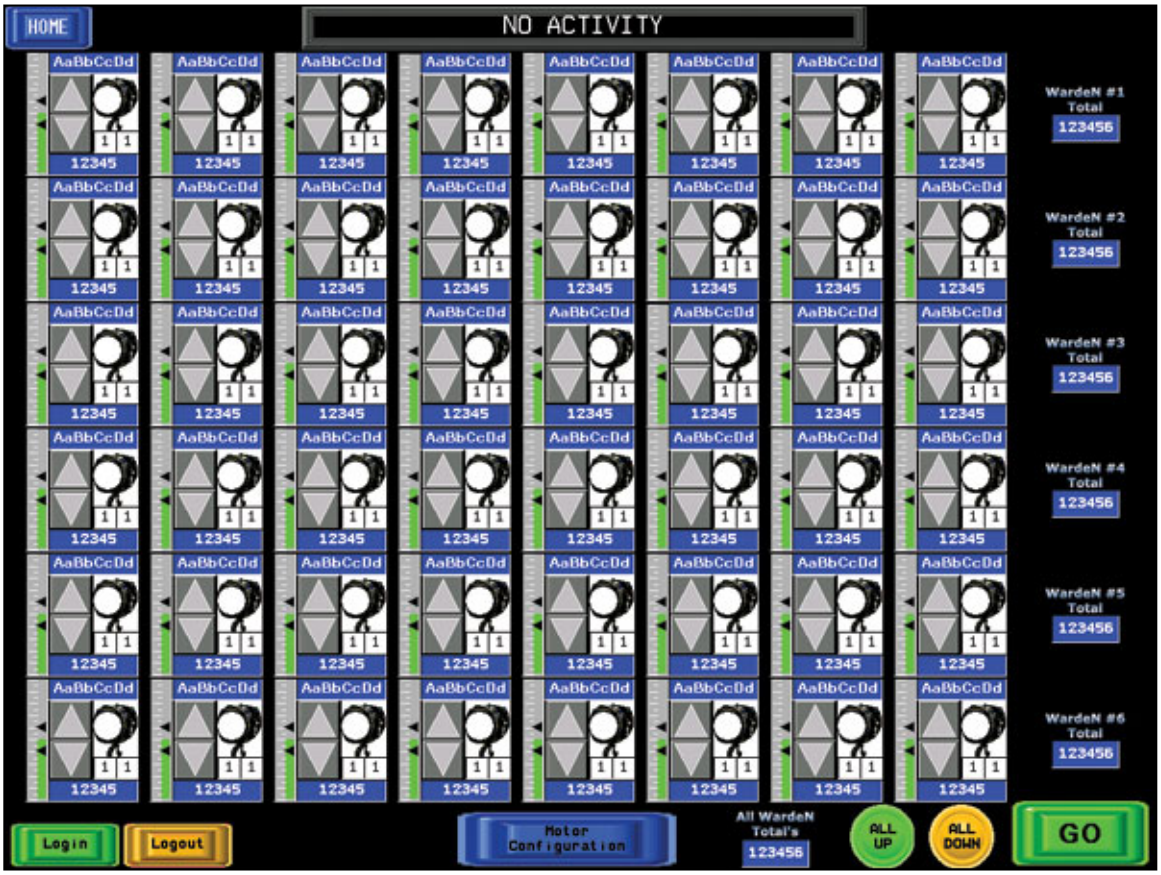
Step 10 – Program the ‘Lower Weight Limit’ by pressing the number associated with that motor and change to the desired minimum operating weight.

Step 11 – On the bottom of the screen you will notice ‘Set Limits’ that can be toggled between YES/NO. When in the ‘YES’ mode, the system uses the limits that you have set in the previous steps. If you select ‘NO’, the system will use the limits that are set in each individual unit.

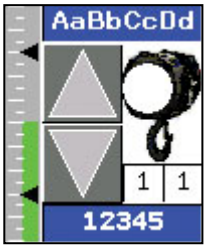
Step 12 – Once all programming is complete and ‘Warden Configuration OK’ is displayed click the ‘(6) Warden Operations’ button.

Motor Operations Page

Shown below is the operations page. This is where the user can control all the motors and monitor the weight simultaneously as the systems moves.



Each selected motor on the 'Configuration Page' will appear on the 'Operations Page' as follows.



Here is a breakdown of the above image.
You will notice the bar graph on the left that indicates the amount of weight on that particular Load Cell. In that bar graph you will notice two black triangles. They represent your upper and lower limits. The bar graph starts at zero pounds and maxes out at 125% of your upper limit.

On the top of the box you will see a text field that displays 

. If you chose to enter a ‘NAME’ on the ‘Configuration Page’ it will be displayed here.

There are two larger triangles located in the center of the image. This is where you select the motor movement in the ‘Up’ or ‘Down’ direction. Hit the “UP” arrow changes color to green and selects. Hit “UP” arrow a second time to deselect. While “UP” arrow is green hitting the “DOWN” arrow will deselect “UP” and select “DOWN” changing “DOWN” arrow to yellow.

On the right side there is an image of a motor. This will show you status of that motor. The color of the motor will change depending on the motors status. (See Motor Status Icon)

Under the motor icon there are two digits, they are displayed as 

. These were programmed on the ‘Configuration Page’. The first digit is the WardeN Assignment and the second is the Channel Assignment.

On the bottom of the box you will see a text field that displays 

. The weight on the motor will be displayed here.

Also shown on this page are the following.

This displays the total weight on all Load Cells plugged into the corresponding Cell*Mate Hub and WardeN.

This displays the total weight on all Load Cells plugged into ALL Cell*Mate Hubs and WardeNs in use.

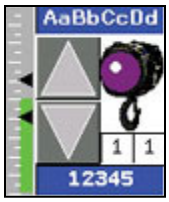
This button will return you to the ‘Configuration Page’.

When pressed, it will select ALL motors in the ‘Up’ position. If pressed again it will de-select ALL motors.

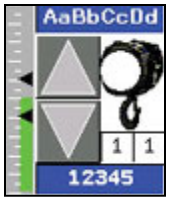
When pressed, it will select ALL motors in the ‘Down’ position. If pressed again it will de-select ALL motors.

Triggers all selected motors to move in the selected direction.

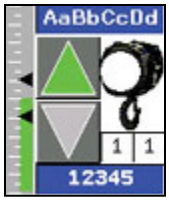
Motor Status Icon’s



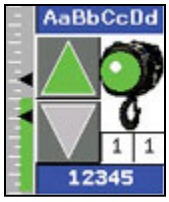
Motor status Icon shown in purple indicates that the Load Cell is NOT plugged into the Cell*Mate Hub or the data cable from the Load Cell to the Cell*Mate Hub is damaged.



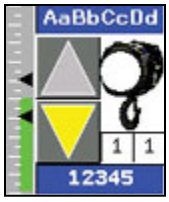
Motor status icon shown in white indicates motor ready to be selected for movement in either direction.



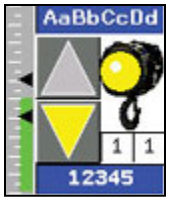
‘Up’ arrow shown in green indicates motor is ready for movement in the ‘Up’ direction.



Motor status Icon and ‘Up’ arrow shown in green indicates motor is moving in the ‘Up’ direction.

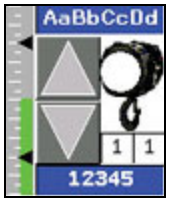


‘Down’ arrow shown in yellow indicates motor is ready for movement in the ‘Down’ direction.

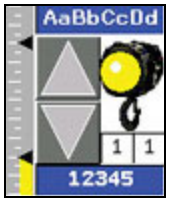


Motor status Icon and ‘Down’ arrow shown in yellow indicates motor is moving in the ‘Down’ direction.

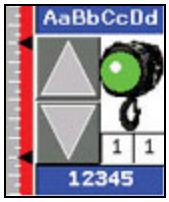
Motor Fault Icon’s



Shows motor status as ‘OK’.



Shows motor status as ‘Under Weight (Slack Chain)’. The bar graph will be yellow in color and the motor status icon will be yellow and blinking. Once any channel that has reported an underweight (slack chain) fault, it will ONLY be allowed to move in the up position.



Shows motor status as ‘Over Weight’. The bar graph will be red in color and the motor status icon will be green and blinking. Once any channel that has reported an overweight fault, it will ONLY be allowed to move in the down position.

Operations Page Message Window

This message bar is shown when the system is idle.

This message bar is shown when a Hand Held Remote is plugged into the system.

This message bar is shown when the system is moving in either the ‘Up’ or ‘Down’ direction.

This message bar flashes when the system is moving in High Speed Mode in either the ‘Up’ or ‘Down’ direction.

This message bar is shown when the system has faulted in either the ‘Up’ or ‘Down’ direction.

This message bar is shown when the system has faulted due to an Overweight Condition. While in ‘Recovery Mode’ any faulted motor can ONLY move in the ‘Down’ direction.

This message bar is shown when the system has faulted due to an Underweight (Slack Chain) Condition. While in ‘Recovery Mode’ any faulted motor can ONLY move in the ‘Up’ direction.

This message bar is shown when the system has lost communication to the Cell*Mate Hub. In this condition the system will not operate

This message bar is shown when the system has lost communication to the any one of the WardeN Units. In this condition the system will not operate

DATA LOGGER OPERATING MANUAL

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Overview:

The Cell*Mate system displays the weight output of Motion-Laboratories load cell sensors. The sensor's weight, unit and load percentage are transmitted via a serial stream. The load cell data is displayed as a graphical bar and digital readout. The cells percentage load is shown as a graphical bar from 0 to 120%. Each load cell is uniquely identified via its hub and cell number. Each hub contains eight cells numbered 1 to 8. Users can add up to 15 hubs assign and assign descriptive names. Each hubs total weight, units and communications status is displayed as tabs and pages on the main window. The hubs can be added or removed from the main system menu. Hub configuration can be done via the setup window

Users can group and configure load cells from different hubs to create a graphical representation of their hoist system. A group can be assigned a unique name and can contain one or all the available load cells. A group is configured in the setup window and will display the total weight and number of cells in the group.

The Cell*Mate system supports data-logging, the data logging time and file name are configurable from the system setup screen.

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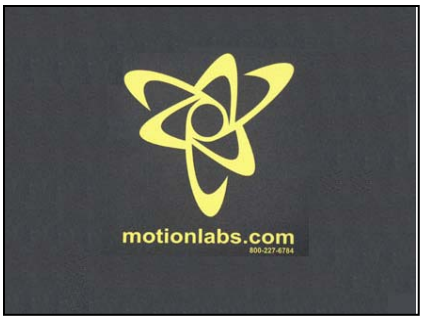
Windows:

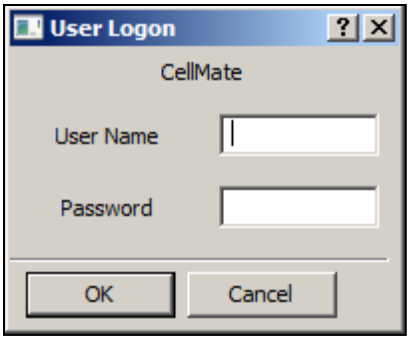
Splash Screen:

The splash is displayed during Cell*Mate initialization.



Logon Screen:

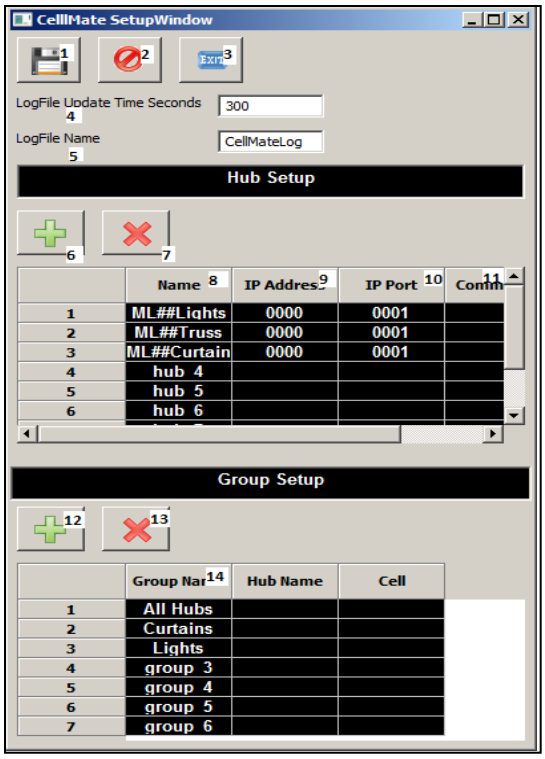
The Logon window is displayed after Splash screen or by selecting the logon option from Cell*Mates main window. The setup window can be accessed by entering an administrative password.



The default admin password is “cell*mate”. The username should be left blank.

Setup Window:
The setup window can be accessed by entering an administrative password from the logon window.

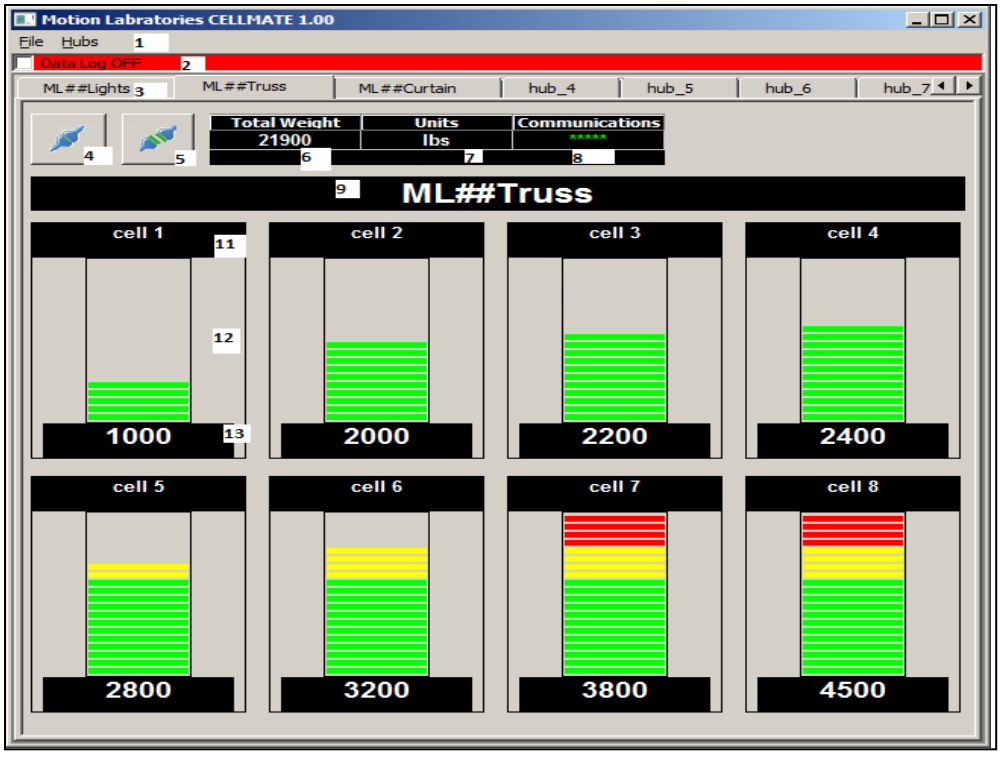
1	Save Button: Saves the current values for hub group and data-logging.
2	Cancel Button: Discards current changes reverts back to previous saved values
3	Exit Button: Quits the setup window with no changes
4	Log File Update Text Control: Amount of time in seconds between logging of csv file data.
5	Log File Name: Base name of the csv log file created, the log file name has the following format ***baseName***_MMDDYYY_##: Base Name is user defined name. MMDDYYYY: Month, Day and Year the log file was created. ## 2 digit number assigned by the Cell*Mate, incremented each time a new file is created. The csv log files are stored in the cellmates applications subdirectory “log”.
6	Add Hub Button adds a hub to current list of hubs.
7	Remove: Removes the selected hub from the list.
8	Hub Name: User defined name of hub
9	IP Address: IP address of the hub (typical 192.168.0.241)
10	Port Address of hub (typical 4001)
11	NA
12	Add Group button: adds a group to current list of groups
13	Remove Group: Removes selected group from list.



Main Window:

The Main window displays the menu options the currently selected hub and tabs, any hub can be accessed by selecting its associated tab.

1	Main Menu: Allows user to access logon screen, add and remove hubs.
2	Data-Logger Enabled: This check box allows user to enable or disable csv logging. The panel is red when logging is halted and green when logging is in process.
3	Hub Tabs: Each Hub is represented by tab, select the hubs tab to view its cell information.
4	Connect Hub Button: Each hub disconnected upon power up, this button will enable hub communications using the parameters (IPAddress and Port) defined in the setup window.
5	Disconnect Hub Button: Disconnects the communications link with associated hub.
6	Total Weight: The weight total of all load cells in the selected hub.
7	Units: Unit indicator for the hub (lb, kg)
8	Communications indicator: Will display green dots when hub communications is in progress.
9	Hub Name: The user defined name for the hub as defined in the setup screen.
10	Cell-id: Cell identifier number 1 to 8
11	Cell Load Indicator: Green 10 to 120%, Yellow 130-160%, Red >160%
12	Cell weight.



Group Screen:
Groups can be added or removed from the setup window. Individual cells can be added or removed from the group once a group is defined in the setup window.
Cells are enabled or disabled from a group by clicking on cells bar-graph in the group window.
Disabled cells are grayed out. If a user is logged in as administrator all hubs are displayed (enabled and disabled). Non administrative users will only see hubs that have cells defined in the group.

1	Name of group as defined in the setup window
2	Load cell weight total for the group
3	Units indicator (lbs, kg)
4	Total Number of enabled load cells in the group
5	Name of hub in the group
6	Shows enabled load cell in the group (enabled load cells are black)
7	Shows a disabled load cell in the group, (disabled loadcells are gray)