

Master Loader Load Frame



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Unpacking

Initial inspection should include checking for physical damage during shipping and obvious external damage to the product.

Package contents are defined by your packing list. Each Load Frame is configured according to customer specifications. In your inspection, make certain that the contents of your shipment match the documentation provided by your packing list.

Place unit on a flat, smooth surface and use leveling feet (supplied) and a bubble level to ensure that the unit is level side-to-side and back-to-front.

Installation and Equipment Setup

Electrical Connections

The HM-5030 is equipped with an internal digital switching power supply, which allows it to be used with most power configurations throughout the world. The unit is supplied with an IEC electrical cord with a standard 110V plug.

The HM-5030 arrives ready for operation. Attach the supplied IEC electrical cord to the machine and plug into a standard wall receptacle for use in the United States. For locations other than the U.S., replace the supplied electrical cord with an IEC cord that has the correct plug for your application. The supplied cord can also be used by cutting the standard plug from the cord and attaching the correct plug.

Power Switch

The Power Switch is located on the left side of the back of the machine, above the electrical cord inlet. The Fuse Compartment is located between the electrical cord inlet and the Power Switch. The HM-5030 uses a 10 amp fuse. To begin operation, attach the supplied electrical cord, plug it in and press the Power Switch.

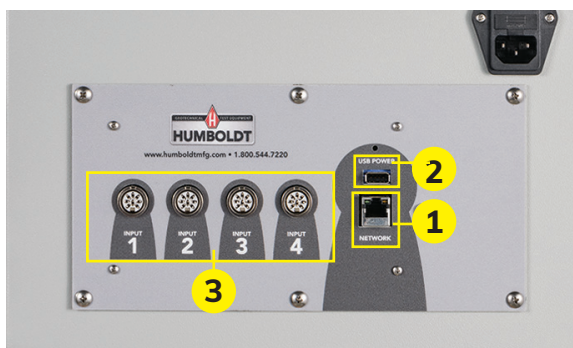
Fuse Compartment



Fig. 1 Power Switch

Instrumentation Connections and Setup

HM-5030 Rear Instrumentation Panel



Above is a photo of the rear instrumentation panel of the HM-5030.

Network (1)

Ethernet input for connecting machine to a local area network (LAN) and/or the internet.

USB Power (2)

The USB Power port is used for powering a wireless access appliance for those who want to use a wireless LAN setup.

Instrument Inputs (3)

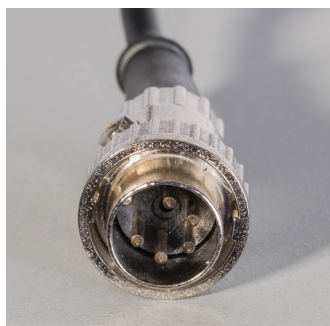
The panel features four (4) inputs for connecting instrumentation to the machine. Each input represents a separate channel.

If you have purchased instrumentation from Humboldt with your HM-5030, it has been assigned to a specific channel and calibrated. Instrumentation will have a numbered tag attached to it and should be plugged into the corresponding input on the machine.

Below are photos of an instrumentation input and the instrumentation plug. Install the plugs into the inputs by lining up the guide at the bottom of the plug with the slot at the bottom of the input.



Instrumentation Input



Instrumentation Plug

Once you have installed the instrumentation into the correct inputs, your rear panel should look like this if you are using all four inputs.



If you purchased multiple load cells and/or transducers with your machine, they will either be mounted and calibrated, or in the case of more than four (4) load cells/transducers, calibrated and assigned to a specific input, but not mounted.

Additional load cells/transducers will be marked to indicate what input channel was used in their calibration. These load cells/transducers should be connected to the indicated channels when desired for use, however you will have to import the correct calibration information to that input before use. This information can be found on a USB thumb-

drive that was included with your machine. Refer to the Equipment Setup section of this manual, page 25 for additional information and instructions on how to accomplish this.

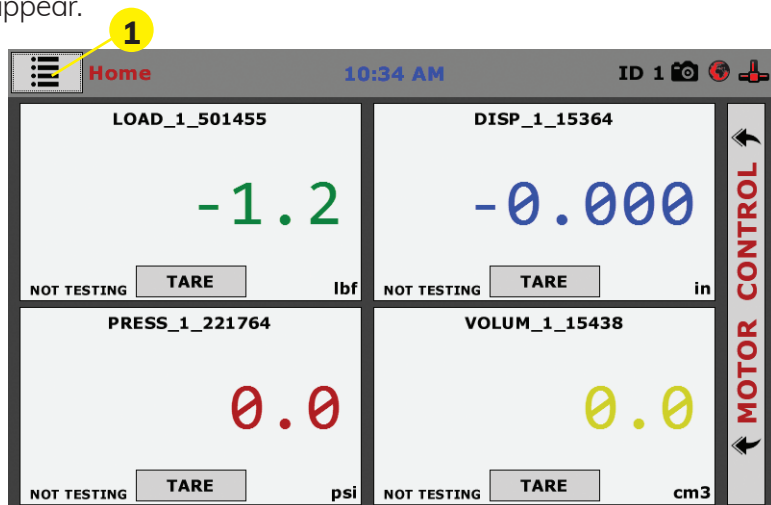
Third-party instrumentation, which is compatible, can also be used with the HM-5030. If you plan to use third-party load cells and/or transducers, please refer to the Equipment Setup section of this manual, page 30 for instructions.

Initial Set Up

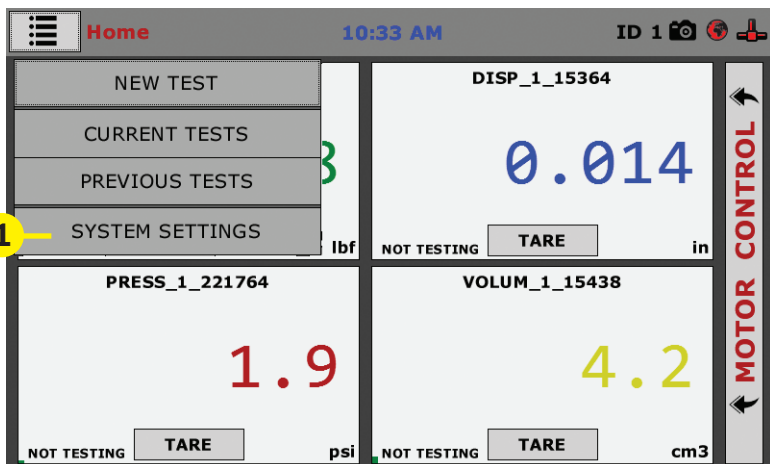
Remember, if you purchased Humboldt instrumentation with your HM-5030, it is already calibrated and assigned to a channel and will not need calibration, however you should confirm that the instrumentation has been set up and calibrated. If you are using 3rd-party instrumentation, go to the Equipment Setup section for calibration instructions.

DO NOT RECALIBRATE!

When your HM-5030 is first turned on, the screen below will appear.

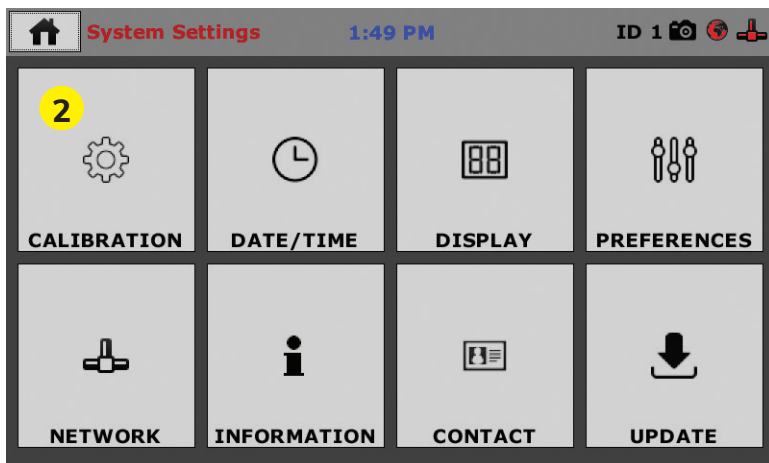


From this screen, to confirm your machine instrumentation has been calibrated, navigate to the Calibration section by clicking the Menu icon in the top left corner of the screen (1). When you click on this button, you will see a drop-down menu appear, see below.



Navigate to the bottom of this drop-down menu and click on System Settings **(1)**. You will see the following screen.

Initial Set Up — Calibration



Click on the Calibration tab in the top left corner **(2)**. You will see the following screen.

Calibration 3:38 PM ID 1

Input	Units	Value	Counts	Calibrate
LOAD_1_501455 0.0 - 2000.0 lbf <input checked="" type="checkbox"/> LIMITS ON	lbf	0.0	6236	
DISP_1_15364 0.000 - 2.000 in <input checked="" type="checkbox"/> LIMITS ON	in	0.014	-1967	
PRESS_1_221764 0.0 - 150.0 psi <input checked="" type="checkbox"/> LIMITS ON	psi	1.9	-7952	
VOLUM_1_15438 0.0 - 108.0 cm3 <input checked="" type="checkbox"/> LIMITS ON	cm3	4.1	2633	

Note: An input in testing cannot be calibrated.

Calibration Input Screen

The Calibration Input Screen (above) is used to monitor and calibrate instrumentation and assign them to specific channels of the HM-5030. The Calibration Input Screen provides a summary of the calibration status of each channel. At this time, verify the calibration information.

A green box at the left of a channel indicates that the channel has instrumentation assigned to it and that it is calibrated and ready for use **(1)**.

Calibration 3:38 PM ID 1

Input	Units	Value	Counts	Calibrate
LOAD_1_501455 0.0 - 2000.0 lbf <input checked="" type="checkbox"/> LIMITS ON	lbf	0.0	6236	
DISP_1_15364 0.000 - 2.000 in <input checked="" type="checkbox"/> LIMITS ON	in	0.014	-1967	
PRESS_1_221764 0.0 - 150.0 psi <input checked="" type="checkbox"/> LIMITS ON	psi	1.9	-7952	
VOLUM_1_15438 0.0 - 108.0 cm3 <input checked="" type="checkbox"/> LIMITS ON	cm3	4.1	2633	

Note: An input in testing cannot be calibrated.

Each channel has a "Limits On" check box. Use the Limits On to keep the machine from exceeding the sensor limits of the instrumentation. By selecting this option, before the test can exceed the limits of the sensors, all tests will stop

running and the motor will stop to avoid damaging connected instrumentation.

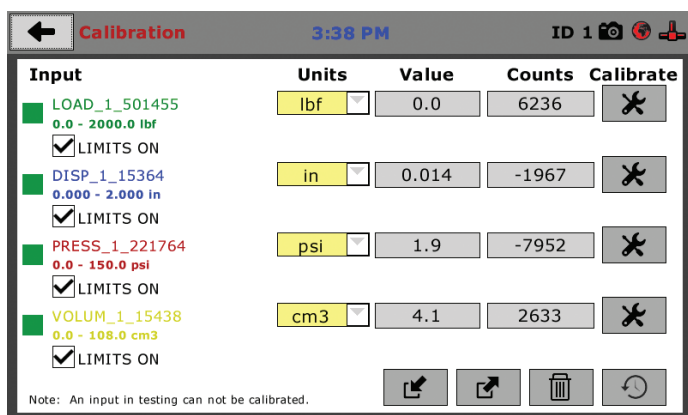
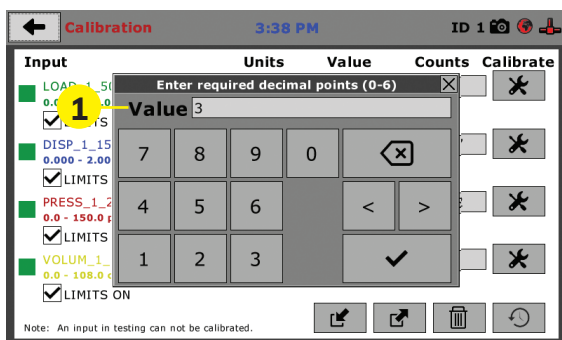
Note: An input cannot be calibrated during testing.

Units (2)

In this field, a calibrated instrument will display the units that were chosen for use at the time of calibration. This field can also be used to automatically toggle conversion of units between lb.-in. and SI units if the need arises.

Value (3)

This field displays the current calibration value. This value should already be set with 3 decimal point accuracy. If the instrument is not calibrated, the unit will read "N/A." To change the numbers of decimels shown, click on the field and the following window will appear. Fill in the number of decimal points desired **(1)**.



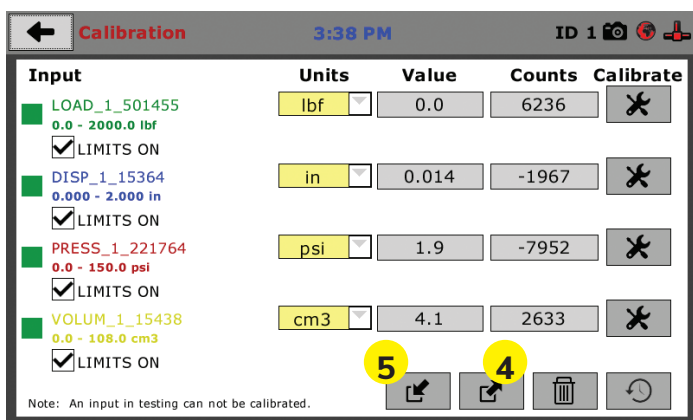
The screen above shows a typical calibration setup. In this example, the HM-5030 has been set up for a standard Consolidated Drained or Undrained Triaxial setup. Input One has been set up for the load cell with a value of 0.000 to

2000.000 lbf. Input Two has been set up for the LSCT with a value of 0.000 to 2.000 inches. Input three has been set up for the pore pressure reading with a value of 0.000 to 150.000 psi. And, Input 4 has been set up for Pressure/volume Controller with a value of 0.000 to 108.000cm³.

Export Calibration via USB (4)

It is a good practice to export all your calibrations to a thumb drive. In case of a problem this practice allows you to recover your calibration data quickly.

On the screen below, press the Export Calibration button (4) to select calibrations to export via USB.

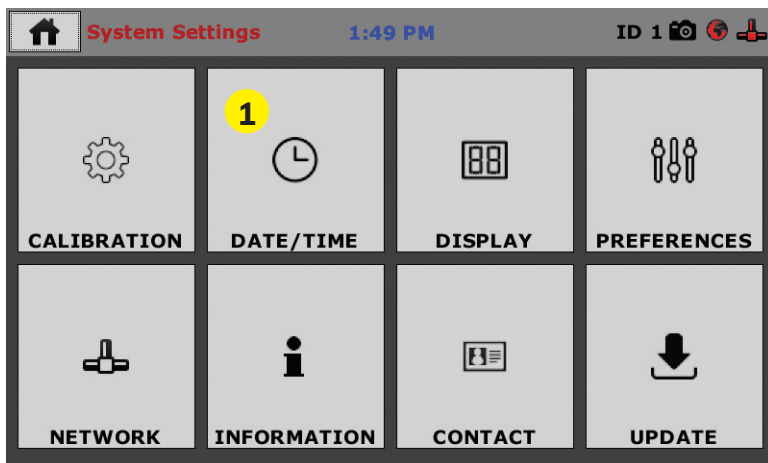


Also, if you purchased more than four instruments for multiple setups, you will find a USB thumbdrive packed with your HM-5030 Load Frame.

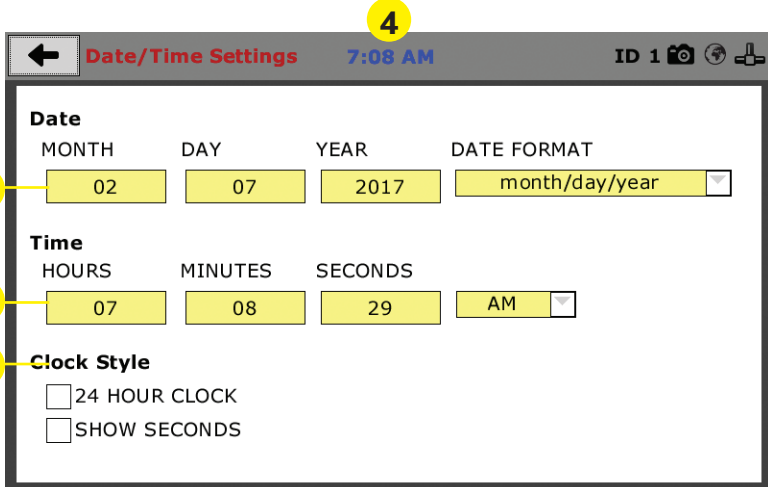
This thumbdrive will contain the calibration data for the extra instrumentation. To use this calibration information, it is recommended to first export all your HM-5030's calibration data to the thumbdrive and then download the additional calibration data you need for your additional test setups (5).

Initial Set Up — Date and Time

To set up Date and Time settings, return to the System Settings screen and click on the Date/Time Panel. (1)



Click on the Date/Time tab **(1)**. You will see the following screen.



Date (1)

Set the month, day, year, and date display format.

Time (2)

Set the hours, minutes, seconds, and am/pm.

Clock Style (3)

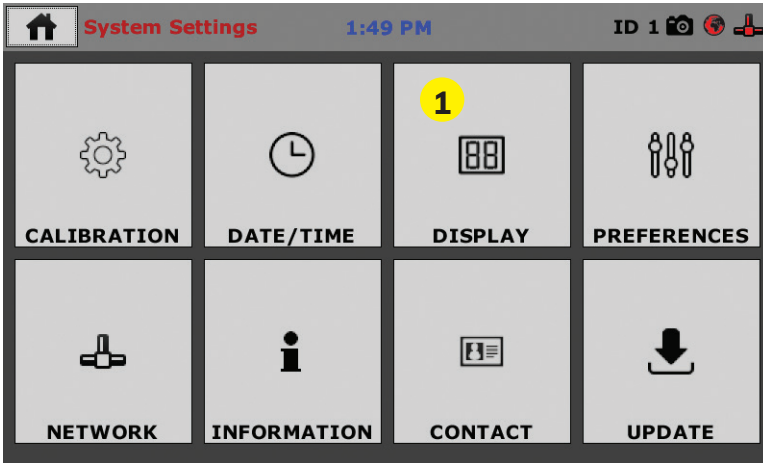
Select a clock view, either a 24-hour or 12-hour clock, as well as the option to show seconds or not.

Clock (4)

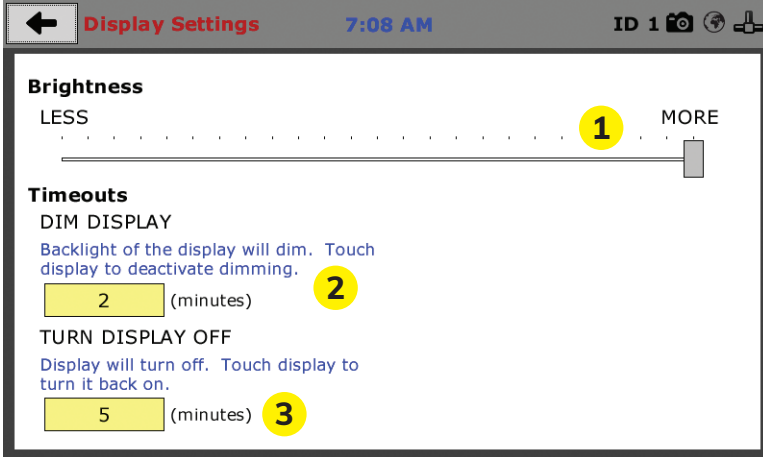
The current time is displayed is located on every controller screen. Clicking on the time from any screen, you will be taken to the Date/Time Settings Screen.

Initial Set Up — Display

To set up Date and Time settings, return to the System Settings screen and click on the Date/Time Panel. **(1)**



Click on the Display tab **(1)**. You will see the following screen.



Brightness **(1)**

Slide the gray bar to the left or right to adjust brightness.

Dim Display **(2)**

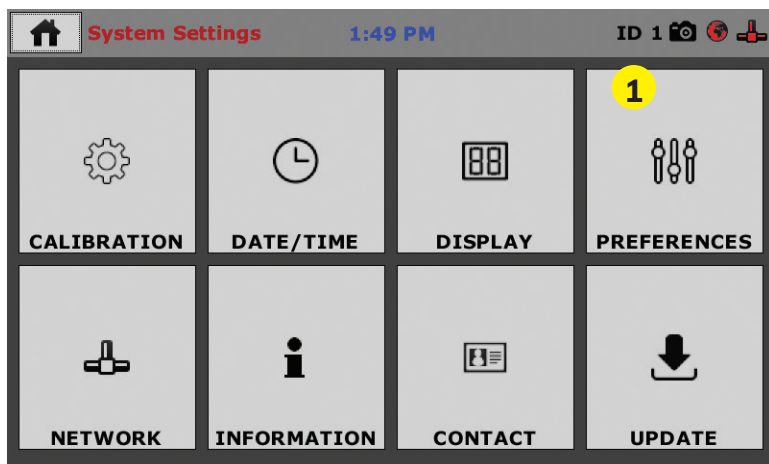
The backlight of the display will automatically dim to save power. Click the yellow box to change the number of minutes before the display goes dim. After the time has elapsed, touch the display to deactivate dimming.

Turn Display Off (3)

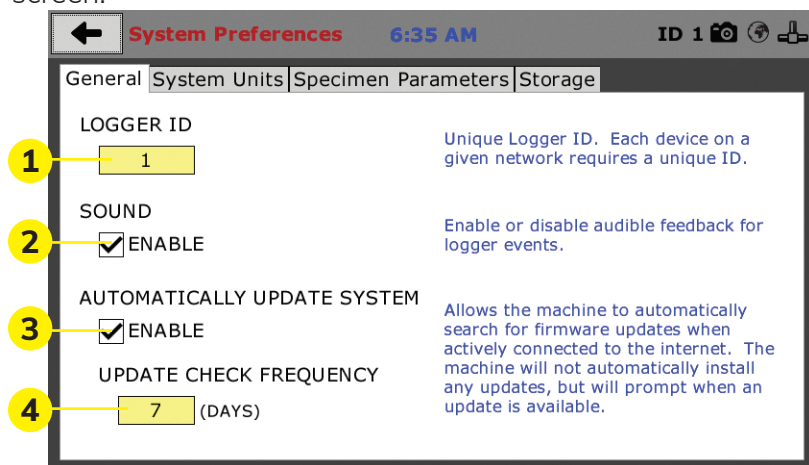
The display will automatically turn off to save power. Click the yellow box to change the number of minutes before the display powers off.

Initial Set Up — Preferences

This screen is accessed by clicking on the “Preferences” button. **(1)**



Click on the Preferences tab **(1)**. You will see the following screen.



Preferences – General Tab

The Preferences panel is comprised of four (4) tabs and defaults to the General tab, see above.

Logger ID (1)

Each machine that is connected to your network requires a unique Logger ID. These numbers can be assigned any number between 1-245. In most cases, if you are setting up a new machine it has been given the Logger ID 1. This would show in the Logger ID field. (1). If this number conflicts with another machine's Logger ID, one of the machines will have to be changed to another Logger ID.

Sound (2)

Checking this box enables or disables audio feedback for logger events.

Automatically Update System (3)

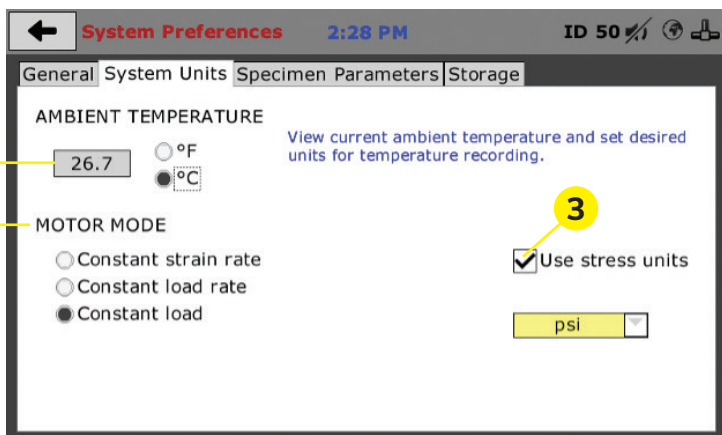
Checking this box allows the machine to automatically search for firmware updates when actively connected to the Internet. The machine will not automatically install updates; it will prompt when an update is available.

Update Check Frequency (4)

The number placed in this box represents the frequency (how many days) the machine checks for updates.

Preferences – System Units Tab

This screen is accessed by clicking on the “System Units” Tab under System Preferences.



Ambient Temperature (1)

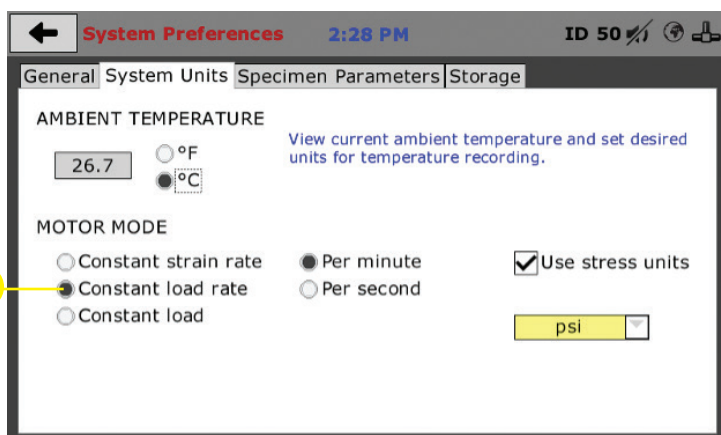
This field displays the current ambient temperature and allows you to select desired units (Fahrenheit or Celsius) for temperature recording.

Motor Mode (2): Constant Strain Rate:

This feature allows the 5030 to run at a constant speed that is determined by the operator. This strain rate can be measured either in mm/min or inches/minute, depending on the operator's preference.

Use Feedback (3):

Select this option if you wish to have the strain rate adjusted based on feedback from a selected strain transducer instead of the software controlling the strain rate by monitoring the motor speed. Once the Use Feedback box is checked, choose the input desired from the Input box below.

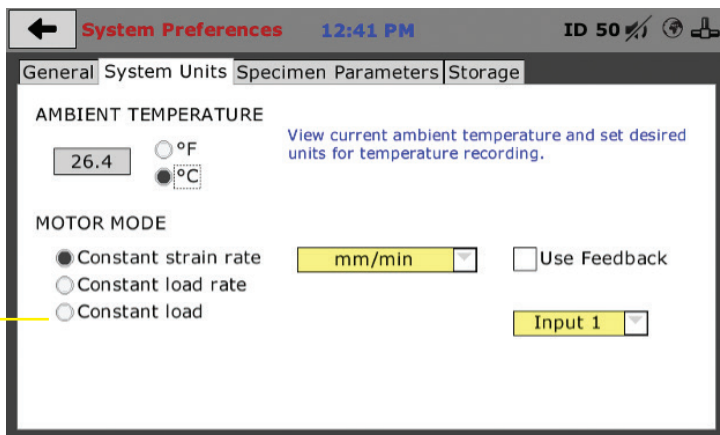


Constant Load Rate (4):

Similar to how Constant Strain Rate works, this option will allow the machine to maintain a set loading rate throughout the test. Just like the Use Feedback feature with the Constant Strain Rate, selecting the Use Stress Units allows the HM-5030 to determine the load rate based on feedback from the loadcell to maintain a constant target load throughout the test.

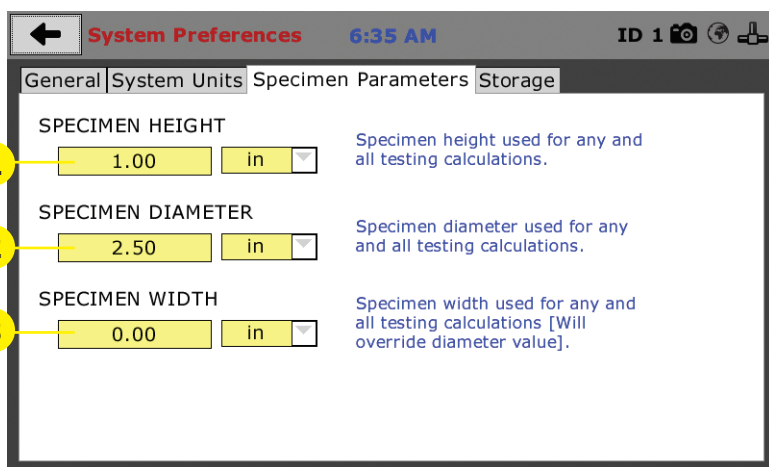
Constant Load (5):

The Constant Load mode will allow the machine to move to a specific target load and maintain this load throughout the test. If the Use Stress Units box is selected the user can choose between English and SI units of measure for the load value.



Preferences – Specimen Parameters Tab

This screen is accessed by clicking on the Specimen Parameters Tab under System Preferences.



Specimen Height (1)

This field allows you to set the specimen height that will be used for all testing calculations.

Specimen Diameter (2)

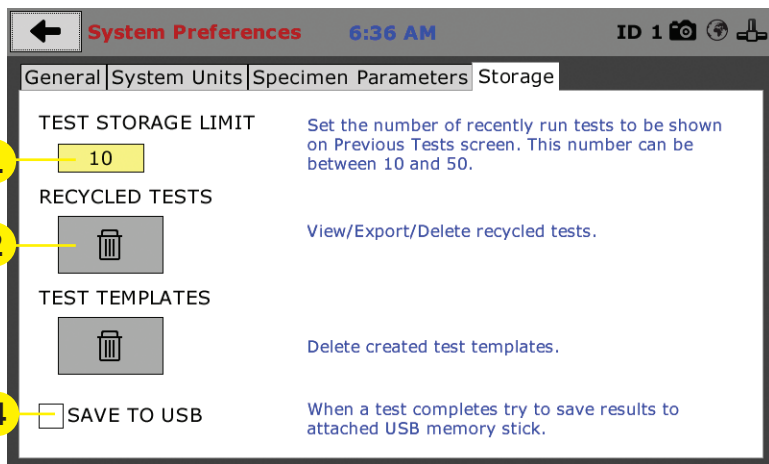
This field allows you to set the specimen diameter that will be used for all testing calculations.

Specimen Width (3)

This field allows you to set the specimen width that will be used for all testing calculations.

Preferences – Storage Tab

This screen is accessed by clicking on the Storage Tab under System Preferences.



Test Storage Limit (1)

This field allows you to set the number of previously run tests to be available on the “Previous Tests” screen. This number can be between 10-50.

Recycled Tests (2)

This refers to previously run tests that are not displayed in the “Previous Tests” window. These tests are not deleted; they are recycled for later use. Select this button to view/export/delete recycled tests.

Test Templates (3)

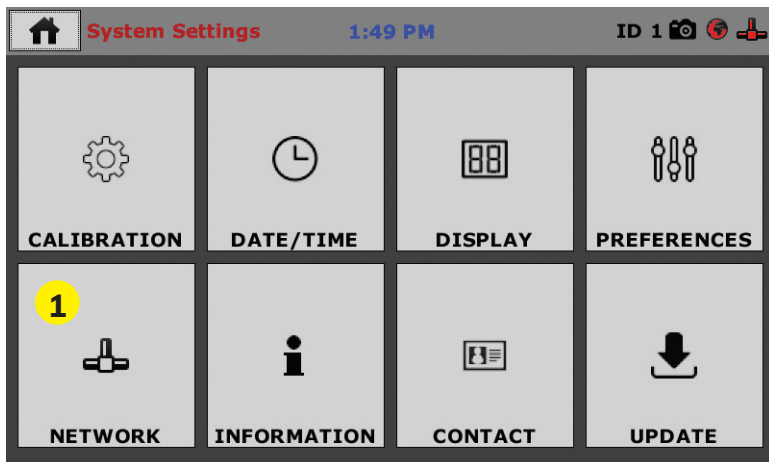
Select this button to delete test templates that have been created, but are no longer desired.

Save to USB Check Box

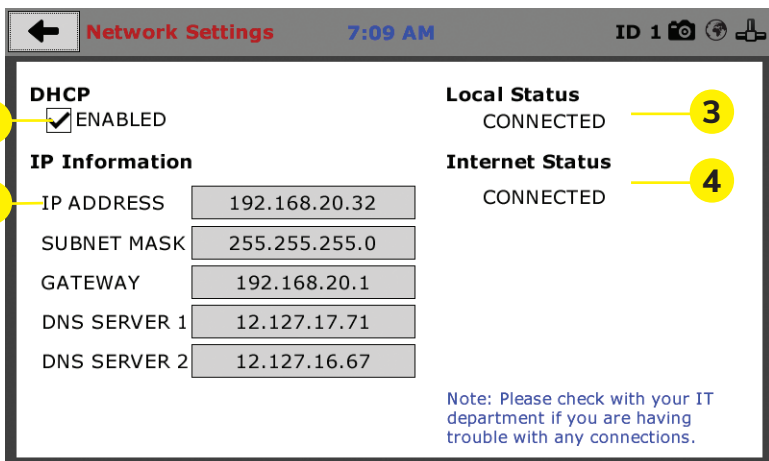
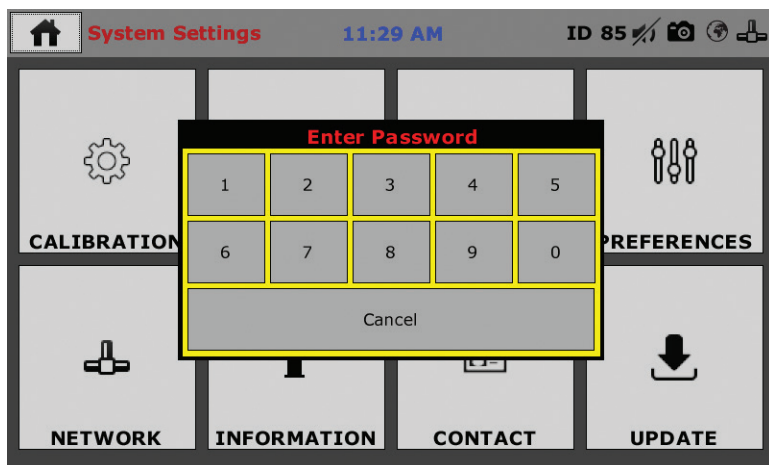
Checking this Box saves the results of a test to USB thumb drive inserted into the front USB slot on the machine. (4)

Initial Set Up — Network

To set up Network settings, return to the System Settings screen and click on the Network panel. (1)



A password is required to access the Network Settings.
That password is: **27604**.



Network Settings Screen

The screen above is the Network Settings screen, it provides information on your IP information and network status.

DHCP (1)

Check this box to enable/disable the Dynamic Host Configuration Protocol (DHCP). If enabled, your machine will pick up IP information from your router. If disabled, you will need to manually enter the network information for a static IP, please consult your network administrator for this.

IP Information (2)

This information will be filled in automatically if the DHCP is checked, otherwise you will have to manually supply this information. The IP address must be unique for each machine.

Local Status (3)

This indicates the status of the local network connection, Connected or Disconnected.

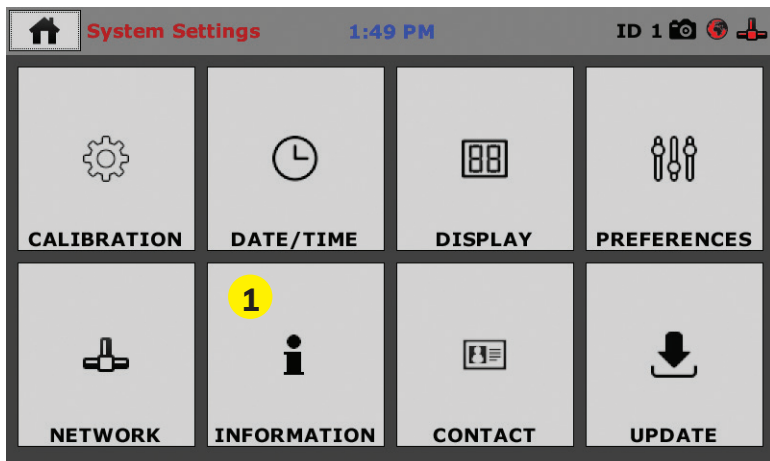
Internet Status (4)

This indicates the status of your Internet connection, Connected or Disconnected.

Note: If you are experiencing issues with any connections, please contact your IT department for assistance.

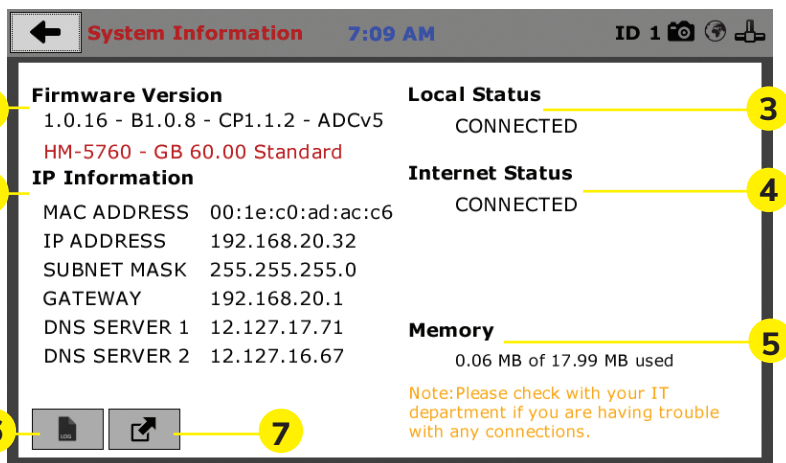
Initial Set Up — Information

Clicking on this panel provides a view of the current status of the machine. (1)



System Information

Below is a view of the System Information screen. It provides a current status of the machine.



Firmware Version (1)

The current version of the machine firmware is shown here. If you contact product support, you will need to supply this information.

IP Information (2)

This information will be filled in automatically if DHCP is checked, otherwise you will have to manually supply this information. The IP address must be unique for each machine.

Local Status (3)

This indicates the status of the local network connection, Connected or Disconnected.

Internet Status (4)

This indicates the status of your Internet connection, Connected or Disconnected.

Memory (5)

This indicates the current status of how much available memory is being used by the machine

Factory Screen (6)

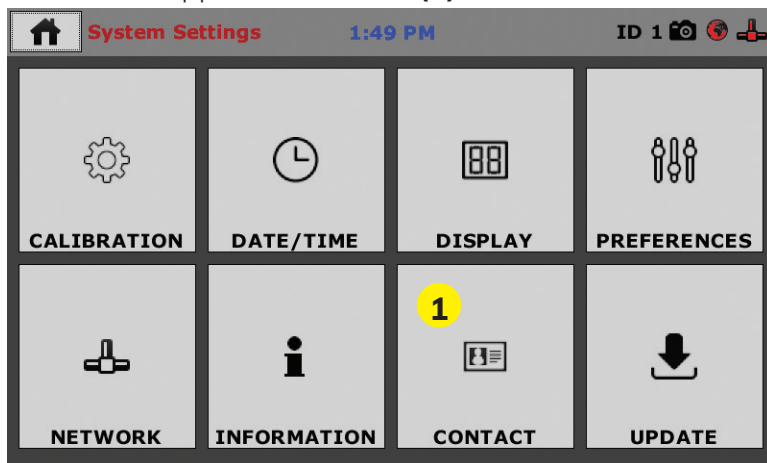
This is for Humboldt use only.

Export Log File (7)

This button exports a log file from the machine to a USB thumb drive. Be sure to insert a thumb drive before exporting the file or you will receive an error. This file can be helpful in trouble shooting by Humboldt Support.

Initial Set Up —Contact

Clicking on this panel provides contact information for Humboldt Support and Service(1)

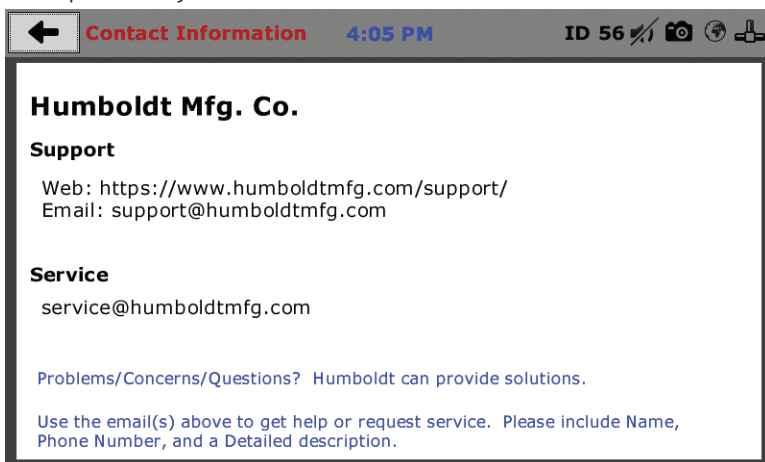


Contact Information

Below is a view of the Contact Information screen showing contact information for Humboldt Support and Service.

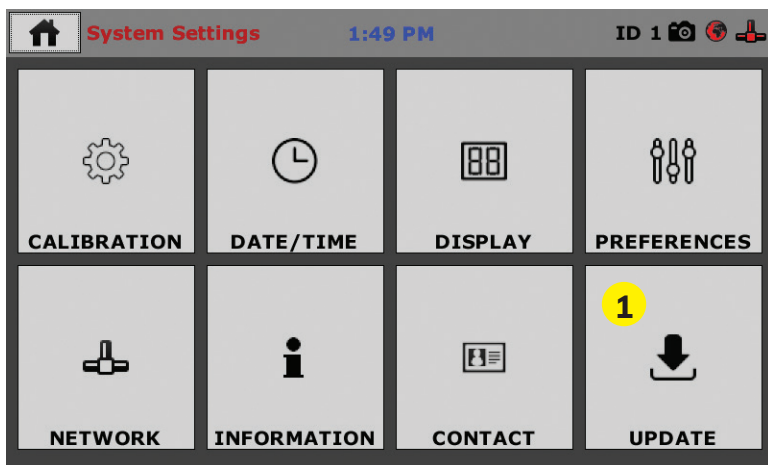
For quickest response go to this link on our website: <https://www.humboldtmfg.com/support> and fill in the support form. This will provide us with the necessary information to assist you and you will be added to the next position in the support cue.

You can also email Humboldt Support at support@humboldtmfg.com or Humboldt Service at service@humboldtmfg.com. Please include contact information and a detailed description of your reason for contact.

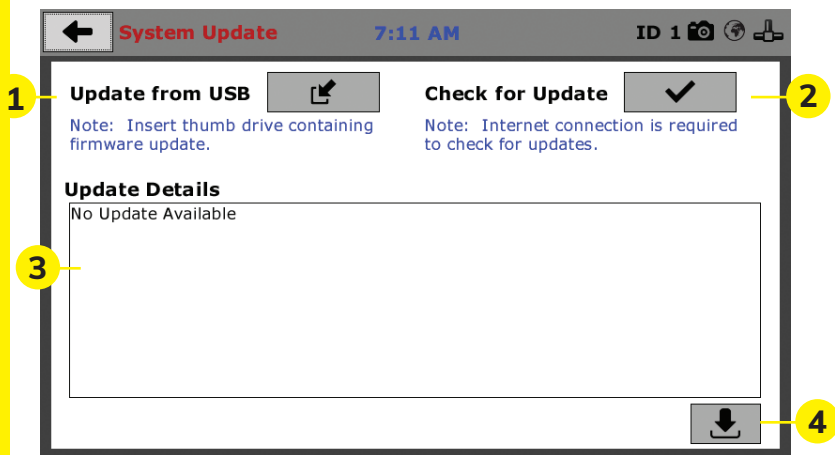


Initial Set Up — Update

Clicking on this panel provides information on checking for Updates, performing updates and an update history for the machine. (1)



Clicking on the Update Panel brings up the following screen.



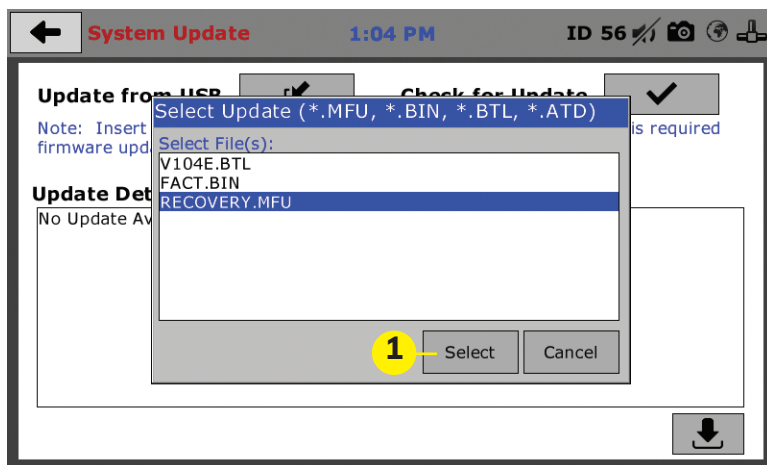
Update from USB (1)

If your HM-5030 is not connected to the internet, Software updates for your machine can be downloaded from the Humboldt website Support Area using a computer. To access the Software Update area, go to: <https://www.humboldtmg.com/support/software.php>.

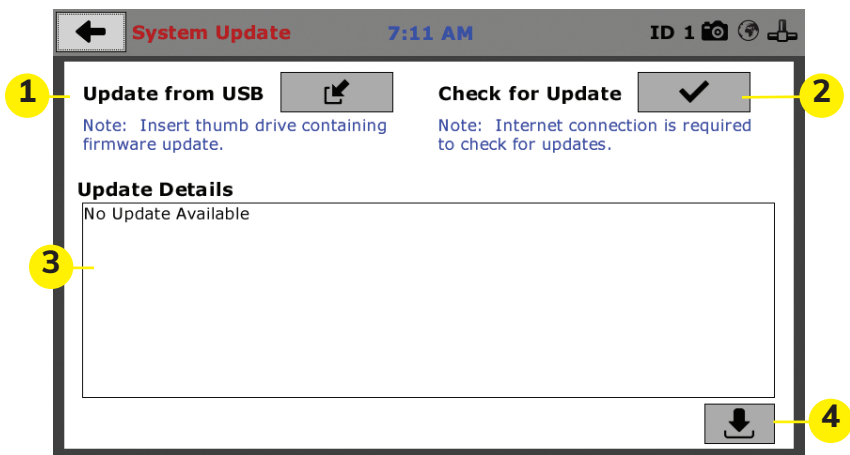
Once on this page, click on the Elite Series Firmware tab. You will see a list of Humboldt Elite Series machines. Click

on the HM-5030 Current Version link and the firmware update will begin to download to your computer. Once the download is complete. Load the file onto a USB thumb drive and insert the thumb drive into the USB port on the front of the HM-5030. With the USB thumb drive inserted into the USB port, click on Update from USB **(1)**.

A window will open and you will see a list of Updates. Select a file to use for your update and click the Select button.



The update process will begin. This may take several minutes. Your HM-5030 may reboot several times during the update, do not turn off or reset machine during this process.



Check for Update (2)

If your HM-5030 is connected to the internet, you can have the machine check automatically for updates, which can be found under System Settings – Preferences button. How often the machine checks for updates can be customized under Preferences. However, you may click on the Check for Update button **(2)** to force an immediate check for updates.

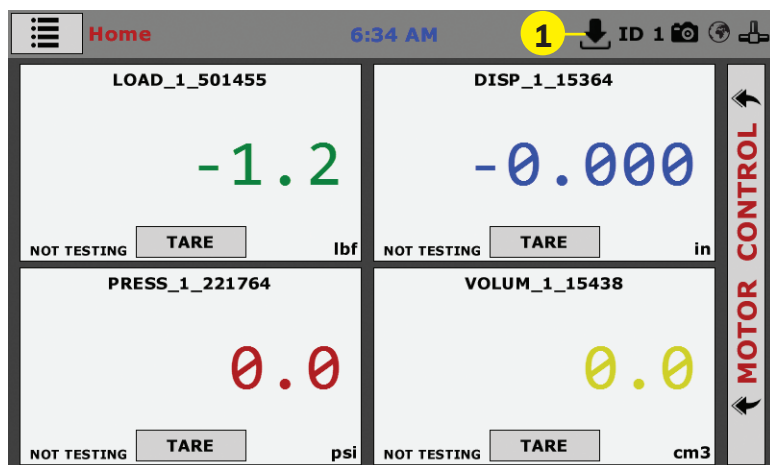
Update Details (3)

If you have chosen to have the HM-5030 check for updates automatically, this box will display a running list of updates currently available for your machine, but, which have not been installed.

Download Updates (4)

Clicking this button will download updates for your machine and automatically install them. To accomplish this, the machine must be connected to the internet. Machine will install, turn-off and restart. Wait until installation is complete and the window indicates: Ready for Testing.

You can tell that there is an update available by the appearance of the following icon in the window header **(1)**.



Operation from a Computer and NEXT Software

This manual covers the setup and operation of the HM-5030.3F Load Frame in Stand-alone Mode only. For information on operating your load frame with Humboldt's NEXT Software and a computer, please refer to the Humboldt NEXT software manual.



Equipment Setup

Installation and Equipment Setup

Electrical Connections

The HM-5030 is equipped with an internal digital switching power supply, which allows it to be used with most power configurations throughout the world. The unit is supplied with an IEC electrical cord with a standard 110V plug.

The HM-5030 arrives ready for operation. Attach the supplied IEC electrical cord to the machine and plug into a standard wall receptacle for use in the United States. For locations other than the U.S., replace the supplied electrical cord with an IEC cord that has the correct plug for your application. The supplied cord can also be used by cutting the standard plug from the cord and attaching the correct plug.

Power Switch

The Power Switch is located on the left side of the back of the machine, above the electrical cord inlet. The Fuse Compartment is located between the electrical cord inlet and the Power Switch. The HM-5030 uses a 10 amp fuse. To begin operation, attach the supplied electrical cord, plug it in and press the Power Switch.

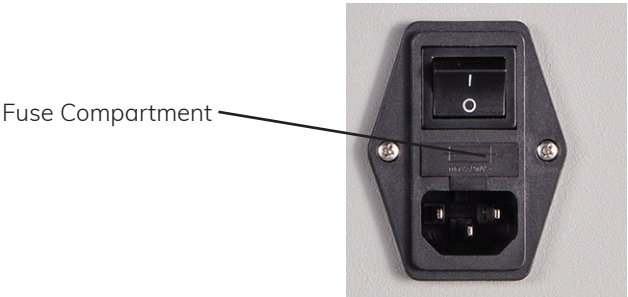
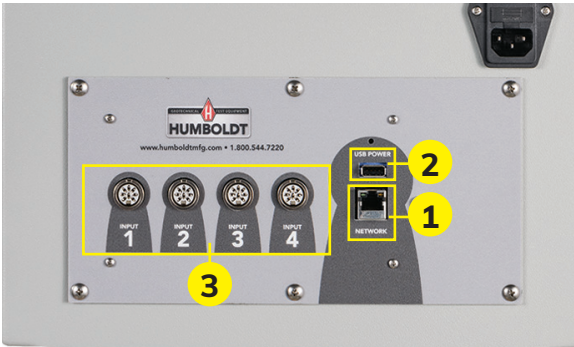


Fig. 1 Power Switch

Instrumentation Connections and Setup

HM-5030 Rear Instrumentation Panel



Above is a photo of the rear instrumentation panel of the HM-5030.

Network (1)

Ethernet input for connecting machine to a local area network (LAN) and/or the internet.

USB Power (2)

The USB Power port is used for powering a wireless access appliance for those who want to use a wireless LAN setup.

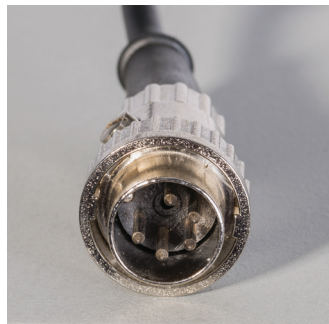
Instrument Inputs (3)

The panel features four (4) inputs for connecting instrumentation to the machine. Each input represents a separate channel. If you have purchased instrumentation from Humboldt with your HM-5030, it has been assigned to a specific channel and calibrated. Instrumentation will have a numbered tag attached to it and should be plugged into the corresponding input on the machine.

Below are photos of an instrumentation input and the instrumentation plug. Install the plugs into the inputs by lining up the guide at the bottom of the plug with the slot at the bottom of the input.



Instrumentation Input



Instrumentation Plug

Once you have installed the instrumentation into the correct inputs, your rear panel should look like this if you are using all four inputs.



If you purchased multiple load cells and/or transducers with your machine, they will either be mounted and calibrated, or in the case of more than four (4) load cells/transducers, calibrated and assigned to a specific input, but not mounted.

Additional load cells/transducers will be marked to indicate what input channel was used in their calibration. These load cells/transducers should be connected to the indicated channels when desired for use, however you will have to import the correct calibration information to that input for correct operation. Calibration information for additional instrumentation can be found on a USB thumbdrive that was shipped with your HM-5030.

For information on calibration, see Page 31 of this manual.

Instrumentation Setup

On the next page are examples of typical instrumentation setups for different tests the HM-5030 is capable of running. When you receive your unit, if you purchased instrumentation from Humboldt, your instrumentation will be attached to the machine for shipping. Please use the photographs on the following page as a guide for setting up the instrumentation for testing.

Typical Triaxial Test Setups with the HM-5030



Consolidated
Drained and
Undrained



Unconsolidated
Undrained



Unconfined
Compression

Other Typical Test Setups with the HM-5030



CBR/LBR



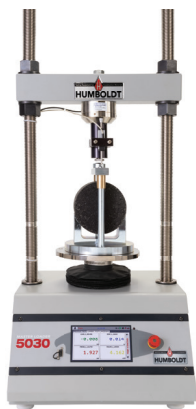
Marshall



Semi-Circular Bending



IDEAL-CT



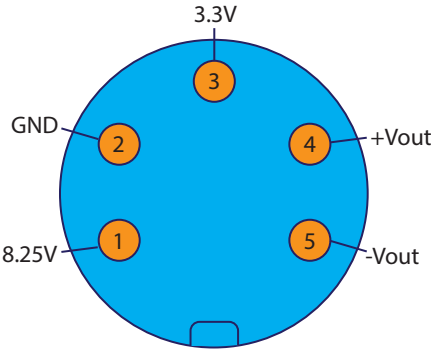
IDEAL-R1



TSR

Third-Party Instrumentation

Third-party load cells/transducers, which are compatible, can also be used with the HM-5030. Compatible units must work with an excitation voltage of 8.25 volts and produce an output of 0-5 volts. Prior to use, all third-party instrumentation must be configured and calibrated. If you are using third-party cables for load cells/transducers connections, make sure they are wired to be compatible with the HM-5030, see illustration below. Plugs to connect third-party instrumentation to the Humboldt HM-5030 are available; order part HS-000474.



Calibration of Instrumentation

All instrumentation included with your HM-5030 has been calibrated and assigned to specific channels for use. These channels are marked on the corresponding instrumentation and the correct calibration information will appear in the channel calibration parameters, once you have installed the instrumentation to the correct inputs.

DO NOT RECALIBRATE!

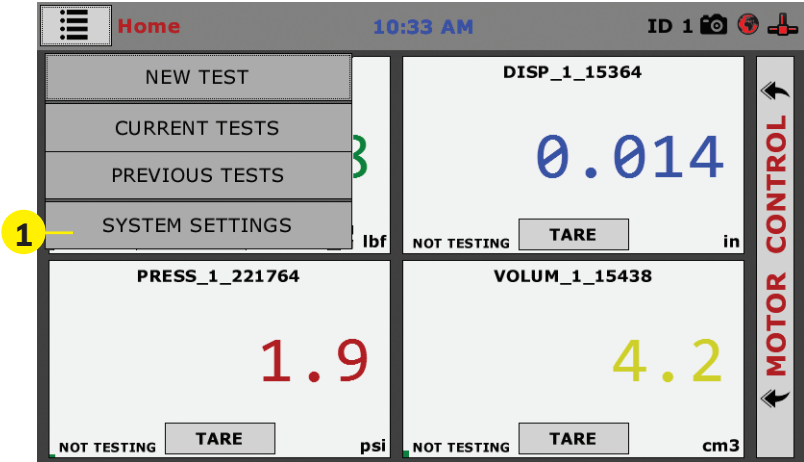
How to Perform a Calibration

All instrumentation included with this unit has been calibrated and assigned to specific channels for use. Humboldt recommends and standard lab practice dictates that your HM-5030 should be calibrated periodically. For most, this period is usually a year, though other rules may apply to the frequency of calibration.

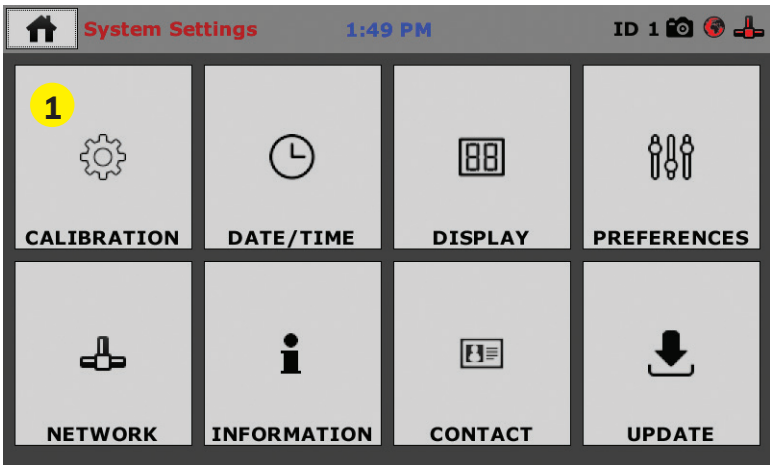
To perform a calibration, it will be necessary to either hire a calibration service to come in to calibrate your machine or have the

necessary calibration equipment to perform this service.

To begin a calibration, navigate to the Calibration section by clicking the Menu icon in the top left corner of the screen (1). When you click on this button, you will see a drop-down menu appear, see below.



Navigate to the bottom of this drop-down menu and click on System Settings (1). You will see the following screen.



Click on the Calibration tab in the top left corner (1). You will see the following screen.

The screenshot shows the 'Calibration' screen with a title bar containing a back arrow, the word 'Calibration', the time '3:38 PM', and 'ID 1' with icons for camera, help, and print. The main area is a table with columns: Input, Units, Value, Counts, and Calibrate. There are four rows of calibration data. Callout 1 points to the green square next to the first channel. Callout 2 points to the 'Units' dropdown menu. Callout 3 points to the 'Value' field.

Input	Units	Value	Counts	Calibrate
LOAD_1_501455 0.0 - 2000.0 lbf <input checked="" type="checkbox"/> LIMITS ON	lbf	0.0	6236	
DISP_1_15364 0.000 - 2.000 in <input checked="" type="checkbox"/> LIMITS ON	in	0.014	-1967	
PRESS_1_221764 0.0 - 150.0 psi <input checked="" type="checkbox"/> LIMITS ON	psi	1.9	-7952	
VOLUM_1_15438 0.0 - 108.0 cm3 <input checked="" type="checkbox"/> LIMITS ON	cm3	4.1	2633	

Note: An input in testing can not be calibrated.

Calibration Input Screen

The Calibration Input Screen (above) is used to monitor and calibrate instrumentation and assign them to specific channels of the HM-5030. The Calibration Input Screen provides a summary of the calibration status of each channel. At this time, verify the calibration information.

A green box at the left of a channel indicates that the channel has instrumentation assigned to it and that it is calibrated and ready for use **(1)**.

Each channel has a "Limits On" check box (1). Use the Limits On to keep the machine from exceeding the sensor limits of the instrumentation. By selecting this option, before the test can exceed the limits of the sensors, all tests will stop running and the motor will stop to avoid damaging connected instrumentation.

Note: An input cannot be calibrated during testing.

Units (2)

In this field, a calibrated instrument will display the units that were chosen for use at the time of calibration. This field can also be used to automatically toggle conversion of units between lb.-in. and SI units if the need arises. To view choices for types of Units, click on the Units field and the Unit choices will be displayed, see on next page.

←

Calibration

9:29 AM

ID 1

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Input	Units	Value	Counts	Calibrate
<div>LOAD_1_501455</div> <div>0.0 - 2000.0 lbf</div> <div>✓ LIMITS ON</div>	lbf	0.0	4639	✕
<div>DISP_1_15364</div> <div>0.000 - 2.000 in</div> <div>✓ LIMITS ON</div>	in	0.000	925	✕
<div>PRESS_1_221764</div> <div>0.0 - 150.0 psi</div> <div>✓ LIMITS ON</div>	psi	0.0	-56859	✕
<div>VOLUM_1_15438</div> <div>0.0 - 108.0 cm3</div> <div>✓ LIMITS ON</div>	kPa psi ksf MPa kgf/cm2	0.0	-32745	✕

Note: An input in testing can not be calibrated.

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Value (3)

This field displays the current calibration value. This value should already be set with 3 decimal point accuracy . If the instrument is not calibrated, the unit will read “N/A”. Clicking on this field will bring up a window where you can enter the required decimal points required for the value.

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Calibration

3:38 PM

ID 1

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Input	Units	Value	Counts	Calibrate
<div>LOAD_1_501455</div> <div>0.0 - 2000.0 lbf</div> <div>✓ LIMITS ON</div>				✕
<div>DISP_1_15364</div> <div>0.000 - 2.000 in</div> <div>✓ LIMITS ON</div>				✕
<div>PRESS_1_221764</div> <div>0.0 - 150.0 psi</div> <div>✓ LIMITS ON</div>				✕
<div>VOLUM_1_15438</div> <div>0.0 - 108.0 cm3</div> <div>✓ LIMITS ON</div>				✕

Note: An input in testing can not be calibrated.

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Enter required decimal points (0-6)

Value 3

7

8

9

0

✕

4

5

6

<

>

1

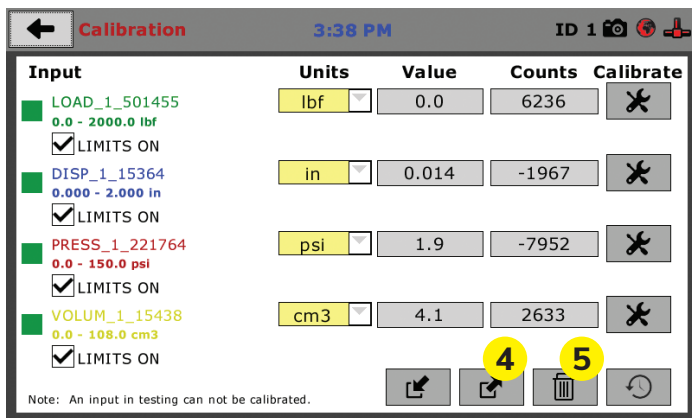
2

3

✓

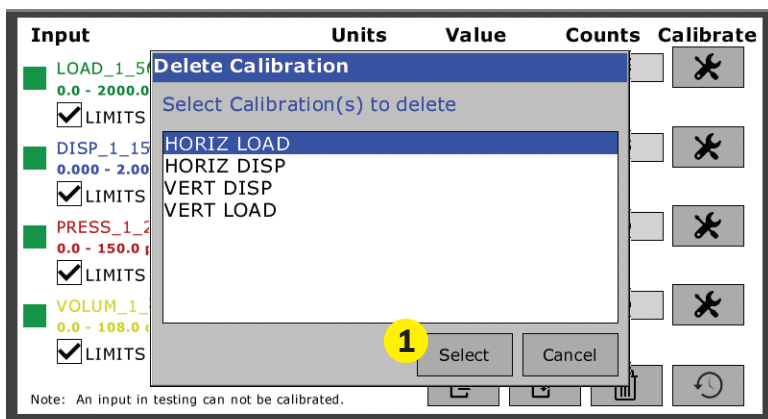
Performing a New Calibration

The first step in calibrating instrumentation to an input is to remove any calibration that is already being used for that input. To do this, Press the Export Calibration Button (4) (see next page) to select calibrations to export via USB. It is a good practice to export all your calibrations to a thumb drive. In case of a problem this practice allows you to recover your calibration data quickly.



Once your calibrations have been saved, you will see a pop up screen that says: Calibration Export Successful.

To begin to remove existing calibrations, click on the trash can icon **(5)** to begin to erase the Input calibrations you wish to recalibrate. When you press the trash can icon, this screen will appear.



On this screen select an Input calibration to delete, one at a time, and then press the Select button **(1)**. The calibration will be deleted. You can do this for all Inputs you wish to calibrate.

Once all Input calibrations have been cleared, your Calibration window should look like the one below with no Inputs calibrated.

←

Calibration





3:45 PM

ID 1





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Input	Units	Value	Counts	Calibrate
<div>INPUT 1 UNCALIBRATED</div> <div>NA</div> <div><input type="checkbox"/> LIMITS ON</div>	NA	---	189	
<div>INPUT 2 UNCALIBRATED</div> <div>NA</div> <div><input type="checkbox"/> LIMITS ON</div>	NA	---	-109597	
<div>INPUT 3 UNCALIBRATED</div> <div>NA</div> <div><input type="checkbox"/> LIMITS ON</div>	NA	---	12374	
<div>INPUT 4 UNCALIBRATED</div> <div>NA</div> <div><input type="checkbox"/> LIMITS ON</div>	NA	---	-3440	

Note: An input in testing can not be calibrated.

Calibrating your instrumentation to the appropriate Input requires a separate device, which can provide precise and specific loads or displacement, and, which has been certified to be accurate. The calibration process involves plugging the instrumentation into the HM-5030 while placing the instrumentation into the certified calibration device, which provides a specific set load or displacement.

Once this has been done, click the Calibrate button next to the appropriate Input **(1)**.

←

Calibration





3:45 PM

ID 1





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Input	Units	Value	Counts	Calibrate
<div>INPUT 1 UNCALIBRATED</div> <div>NA</div> <div><input type="checkbox"/> LIMITS ON</div>	NA	---	189	 1
<div>INPUT 2 UNCALIBRATED</div> <div>NA</div> <div><input type="checkbox"/> LIMITS ON</div>	NA	---	-109597	
<div>INPUT 3 UNCALIBRATED</div> <div>NA</div> <div><input type="checkbox"/> LIMITS ON</div>	NA	---	12374	
<div>INPUT 4 UNCALIBRATED</div> <div>NA</div> <div><input type="checkbox"/> LIMITS ON</div>	NA	---	-3440	

Note: An input in testing can not be calibrated.

A pop-up window will appear requiring you to enter the password, which is **22234**.

← Calibration 3:46 PM ID 1

Input	Units	Value	Counts	Calibrate
INPUT 1 UNCALIBRATED NA	NA	---	191	
INPUT 2 UNCALIBRATED NA			9658	
INPUT 3 UNCALIBRATED NA			062	
INPUT 4 UNCALIBRATED NA			359	

Note: An input in testing can not be calibrated.

Enter Password

1	2	3	4	5
6	7	8	9	0
Cancel				

Icons:

Upon filling in the password, you will see this screen, Tab 1 Sensor Details of the Calibration settings.

← Input 1 Calibration 2:04 PM ID 1

1. SENSOR DETAILS 2. LIMITS 3. MULTI POINT 4. NAME

Select Connected Sensor:
Please choose the instrumentation type that is connected.

1 TYPE LOAD

2 CAPACITY 2000.000 lbf

3 FS OUTPUT 3.000 mV/V

4

On Tab 1, the Sensor Type **(1)** will default to Load. For Capacity **(2)**, fill in the maximum capacity of the sensor and choose either lbf or kN. For FS output **(3)**, refer to the calibration sheet, which came with the instrument your are using and enter it here and then choose mV/V. The next page shows typical calibration sheets with the FS Output information highlighted in orange.



Humboldt Calibration Certificate

Model	HM-2300.020
Full Scale Output	3.0002mV/V
NTE#	06-080
Serial#	216907
Capacity	2,000 lb
Date	01/20/2017

Zero Balance	1.00% FS
Rated Excitation	10 Vdc
Compensated Temp. Range	14 to 104 °F (-10°C to 40°C)
Insulation Res.	>1,000 Megohms at 50V DC
Barometric Effect	Nil
Input Resistance	385± 15Ω
Output Resistance	350± 5Ω
Minimum Dead Load	40LB
Vmin	0.080LB
Safe overload (150%)	150% of capacity
Ultimate Overload (200%)	

Wiring Code			
Red	+ Excitation	Black	- Excitation
Green	+ Output	White	- Output

Caution: Cutting cable will affect the Full Scale Output calibration and Voids warranty!

Data obtained utilizing standards traceable to the National Institute of Standards & Technology.

Humboldt Mfg. Co.
Test Report & Data

Linear Displacement Sensor 3500 Full Bridge balance output

Model **HM-2310.10** Serial No **15869**

Test Results

Test Volts	5.00	Volts Sensitivity @ 25mm	6.880 mV/V
Displacement	25.69 mm	Non Linearity	0.04% Full Scale

Test data is based on best fit line (worst case for error)

Input Volts 2-10 AC or DC

Wiring Connections

Excitation +	Red	1	Signal +	Green	4
Excitation -	Blue	2	Signal -	Yellow	5

Pin No. - Only when factory fitted with DIN plug

Operational Notes

- 1 The outer case must not be distorted when clamping the sensor, a full diameter clamp is strongly recommended.
- 2 The sensor is not recommended for use in hostile or extreme environments without protection.
- 3 Special tools are required to remove the plunger tip (anvil). This Anvil forms the mechanical stop for the extent of the plunger travel and must only be removed under controlled conditions that prevent the spindle being depressed into the body of the sensor.

Notes

Humboldt Mfg. Co
875 Tollgate Road, Elgin, IL 60123, USA
Fax +1708-456-0137, Email hms@humboldtmgf.com Web www.humboldtmgf.com

Once this is complete, click on the Right Arrow **(4)**, in the bottom right-hand corner of the screen to save these settings. You will be taken to Tab 2, Limits.

← Input 1 Calibration 10:17 AM ID 1

1. SENSOR DETAILS
2. LIMITS
3. MULTI POINT
4. NAME

Select Calibration Limit:
This is the maximum calibrated limit of the sensor. This value should also contain the number of significant digits.

1 CALIBRATION LIMIT kN ▼

2 ☒ LIMITS ON

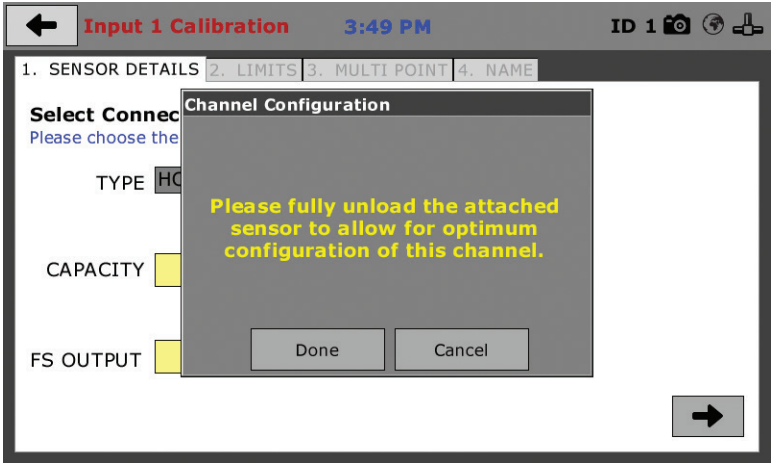
CALIBRATION METHOD
Please select to calibrate based on full scale output or multi-point curve.

3 ☐ Per FS Output
☒ Multi-Point Curve

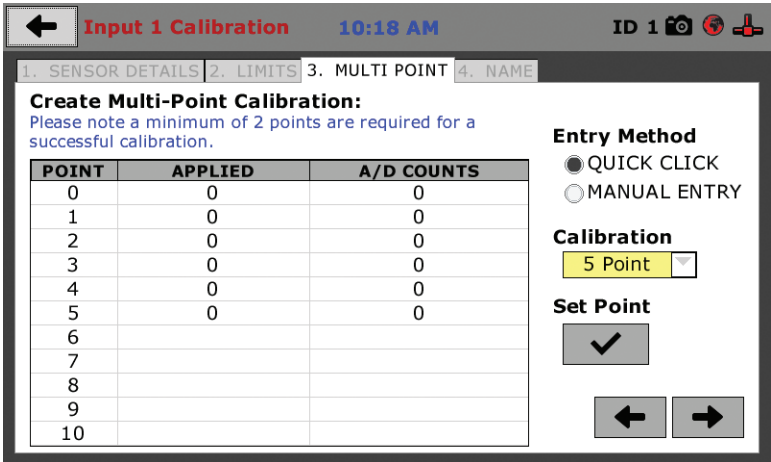
←
→

On Tab 2, in the Calibration Limit field **(1)**, enter the maximum calibrated limit of the sensor. This value should contain the number of decimal points you require for degree of accuracy, up to 5 points. Limits On **(2)**, should be checked if you don't want the machine to apply a load greater than the Calibration Limit **(1)**. Calibration Method **(3)** determines whether this calibration will be based only on the maximum load capacity of the sensor or upon a multi-point curve of up to a maximum of 10 points.

If you choose Per FS Output (not a recommended calibration method) it will base your calibration on the maximum load capacity of the sensor vs. zero load capacity of the sensor. If you choose this method and click on the Right Arrow in the bottom right-hand corner of the screen. You will be prompted to remove any load on the sensor and click on Done (4) when you have done so.



If you choose Multi-Point (Recommended calibration method) Curve and click on the Right Arrow in the bottom right-hand corner of the screen, you will be taken to Tab 3.



On Tab 3 you will be able to set the number of points you want to use for your calibration. You can choose 1-point, 5-point, 10-point or Custom, which allows you to use any number of points up to a total of 10. In the example on the previous screen shot above, a 5-point calibration has been chosen.

With your instrumentation sensor placed in a calibration frame and the sensor plugged into the an Input on the HM-5030. You will set the “0” point at 0 with no load applied to the sensor. The “5” point will be set with the maximum load capacity of the sensor applied. Points “1” through “4” are usually determined by spacing them out evenly between the no load reading and the maximum load reading. As an example, if you have a sensor with a 1,000 lb maximum force capability, you would set the “0” point at “0” and the “5” point at 1,000. Points “1” through “4” would typically be set at: “1” 200; “2” 400; “3” 600; “4” 800 and “5” 1000. Or, divide the maximum load number by the number of points, in this case 5, which works out to 200 point increments between points. See below.

←

Input 3 Calibration

5:03 PM

ID 1

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1. SENSOR DETAILS

2. LIMITS

3. MULTI POINT

4. NAME

Create Multi-Point Calibration:

Please note a minimum of 2 points are required for a successful calibration.

POINT	APPLIED	A/D COUNTS
0	0.00000	834
1	0.40000	40511
2	0.80000	79998
3	1.20000	107513
4	1.60000	837
5	2.00000	191003
6		
7		
8		
9		
10		

Entry Method

☒ QUICK CLICK
 ☐ MANUAL ENTRY

Calibration

5 Point

Set Point

✓

1

←

→

Each point would be chosen by clicking on the corresponding point row above. The load would be applied to the sensor and an A/D Counts reading would appear. To set the point, click on the Set Point button **(1)**. This would be repeated until all points have been set. In the example above, Point 3 is being calibrated and is ready to have the Set Point button **(1)** clicked. Point 4 still needs to be calibrated.

Once all Points have been calibrated, click on the Right Arrow in the bottom right-hand corner of the screen. You will be taken to Tab 4.

On Tab 4, you will be asked to name the calibrated Input.

← **Input 3 Calibration** 3:23 PM ID 1 [camera] [globe] [red crosshair]

1. SENSOR DETAILS 2. LIMITS 3. MULTI POINT 4. NAME

Select Input Name:
Please create a name for the input (Max 25 characters).

NAME

DEFAULT NAME [INPUT 3 VERT DISP]

← [disk icon] **1**

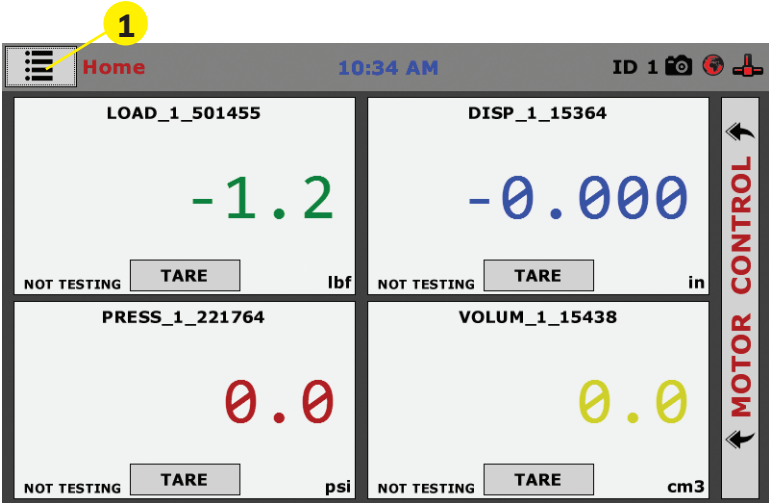
The screen will provide a default name, but you can name the Input anything you'd like. Once you've named the Input, click on the disk icon in the lower, right-hand corner **(1)**. This will save it. Use this method for calibrating any additional Inputs necessary.



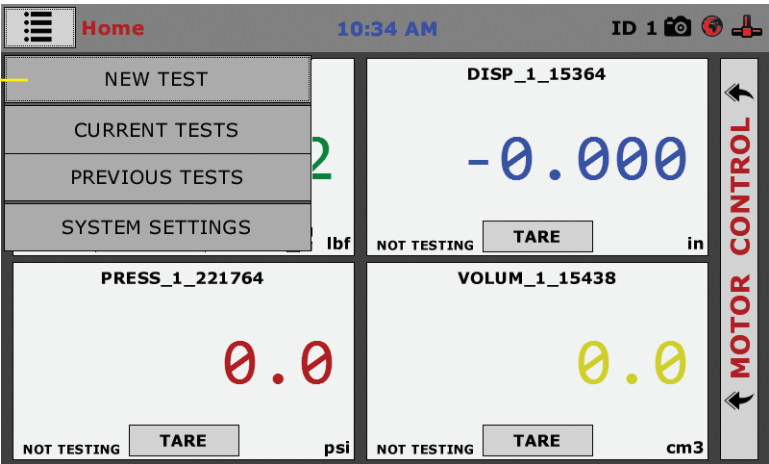
Test Setup

Test Setup

To begin a new test, Click on the Menu icon in the top left corner of the screen **(1)**.

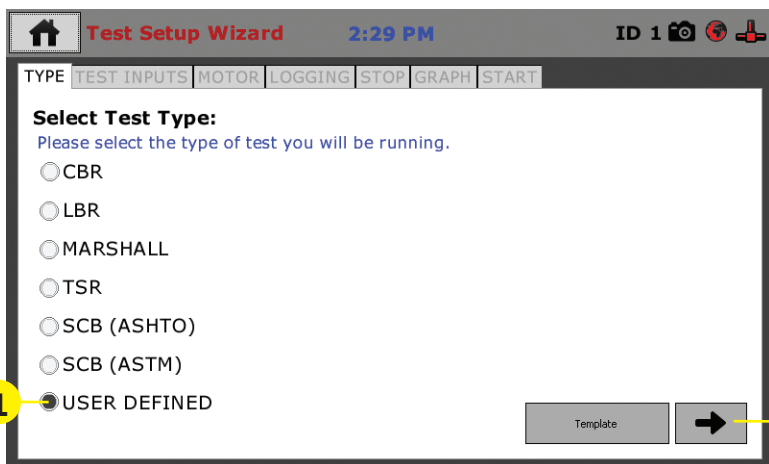


When you click on this button, you will see a drop-down menu appear, see below. Click on NEW TEST (1).



Test Setup Wizard – Select Test Type

Clicking on NEW TEST **(1)** above brings up the Test Setup Wizard (see next page). On the first screen of the Wizard, you can select the type of test you want to perform — CBR; LBR; MARSHALL; TSR; SCB (ASHTO), SCB (ASTM) and USER DEFINED.



Select USER DEFINED **(1)** for all triaxial tests, such as Unconfined Compression, Consolidated Drained and Undrained and Unconsolidated Undrained, as well as any custom tests you would like to set up.

In our example here, we will be setting up a triaxial test, so we would choose USER DEFINED.

Test Setup Wizard – Template

If you are just beginning to use your new machine, there will be no templates, which have been saved, so at this point, clicking on the template button will provide no templates to choose from.

To create templates, you essentially save a completed test as a template. Once you have completed some tests and save them as templates, they will then show up when you press the template button. This will allow you to quickly repeat tests with the same parameters, as well as a fast way to create new tests by choosing a template and then changing some of the parameters.

Test Setup Wizard – Select Test Inputs

Once you have chosen the type of test you'd like to run, for our example we have chosen USER DEFINED, click on the Right Arrow button **(2)** in the bottom right-hand corner. You will see the screen on the following page.

Note: All inputs may not be available for testing. An unavailable input is either all ready in use by another test or the input is uncalibrated.

Test Setup Wizard 9:17 AM ID 1

TYPE TEST INPUTS MOTOR LOGGING STOP GRAPH START

Select Test Inputs:
Please check the inputs you would like to use for testing.

☒ LOAD_1_501455 ☐ USE TARE

☒ DISP_1_15364 ☐ USE TARE

☒ PRESS_1_221764 ☐ USE TARE

☒ VOLUM_1_15438 ☐ USE TARE

Note: All inputs may not be available for testing. An unavailable input is either in use by another test or is uncalibrated.

← →

As seen in the screen above, choose the test inputs required for the test you want to run. If an input has not been calibrated or if it is in use by another test, you will not be able to choose that input. If you want the test to begin from a tared value (0), check the box next to USE TARE (1).

Test Setup Wizard – Select Motor Condition

Once you have chosen the test inputs you want to use, click on the Right Arrow button (2) in the bottom right-hand corner. You will see the following screen.

Test Setup Wizard 9:21 AM ID 1

TYPE TEST INPUTS MOTOR LOGGING STOP GRAPH START

Select Motor Condition:
Please choose the speed for testing. The use of motor is not required.

☒ NO MOTOR CONTROL

☐ MOTOR CONTROL

← →

Choose NO MOTOR CONTROL OR MOTOR CONTROL based on the test parameters you are using. If your test requires no sample compression, choose NO MOTOR CONTROL, and click on the right Arrow (1) in the lower right-hand corner of the screen to continue.

Test Setup Wizard 8:56 AM ID 1

TYPE TEST INPUTS **MOTOR** LOGGING STOP GRAPH START

Select Motor Condition:
Please choose the speed for testing. The use of motor is not required.

☐ NO MOTOR CONTROL
☒ MOTOR CONTROL

Select Motor Parameters:

DIRECTION **1**

SPEED in/min **2**

SEAT LOAD kN **3**

☐ RETURN HOME **4**

5

If your test requires motor control, as in our example here, choose MOTOR CONTROL. When you select MOTOR CONTROL, the screen will change to show the Select Motor Parameters, see above. For DIRECTION, use the field drop-down menu **(1)** to select up or down. In our example we have chosen the direction as Up and we have set the SPEED **(2)** to 0.002 in/min., which would be determined previously in the consolidation stage of the test. In this test example there is no SEAT LOAD **(3)**, unlike a CBR test, which would require one.

Use the Return Home **(4)** check box in the lower left-hand corner if you would like the motor to return to its starting position after the test is complete. If not, the motor will remain where it is when the test is complete. Once you have chosen your test inputs, click on the Right Arrow button **(5)** in the bottom right-hand corner. You will see the following screen.

Test Setup Wizard 9:31 AM ID 1

TYPE TEST INPUTS MOTOR **LOGGING** STOP GRAPH START

Select Logging Condition:
Please choose how you would like the test to record data.

☒ INTERVAL LOGGING ☐ INTERVAL LOGGING TABLE
☐ LINEAR TIME INTERVAL ☐ ELAPSED TIME TABLE

Select Logging Parameters:

LOGGING INPUT

LOGGING DIRECTION

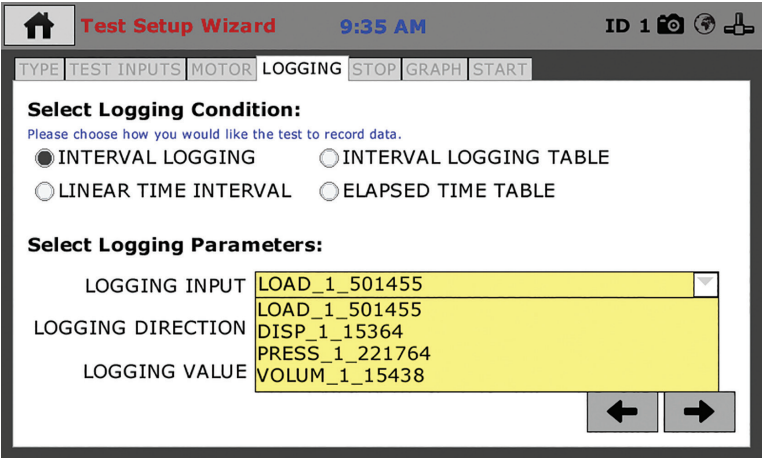
LOGGING VALUE (kN)

Test Setup Wizard – Logging Condition

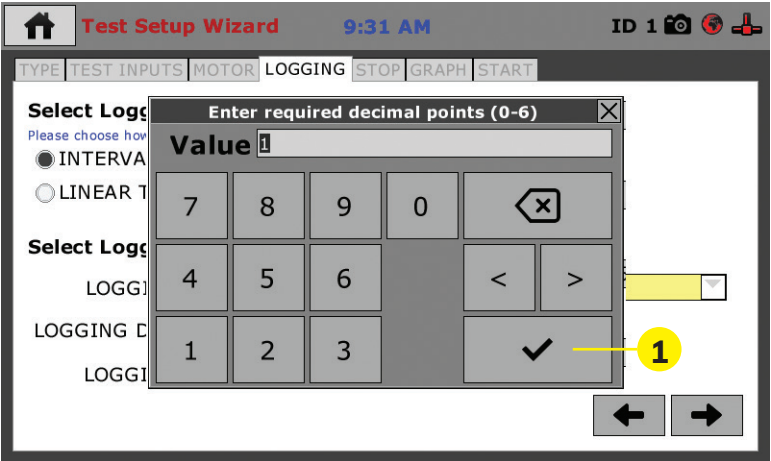
This screen allows you to choose the Logging Condition you wish to use for your test. The available options are “Interval Logging,” “Interval Logging Table,” “Linear Time Interval,” and “Elapsed Time Table.” You will choose **ONE** of these conditions:

Interval Logging

With INTERVAL LOGGING, selected, click on the LOGGING INPUT field to individually choose each Input in the Pop-up Field and set the desired LOGGING DIRECTION AND LOGGING VALUE for each Input.



To set the LOGGING VALUE, click on the yellow field to the right of LOGGING VALUE and fill in a value from the pop up window that appears, see below. Once you have entered a value, Click the Check Mark **(1)** in the lower right-hand corner to save the value.



Test Setup Wizard 10:10 AM ID 1

TYPE TEST INPUTS MOTOR **LOGGING** STOP GRAPH START

Select Logging Condition:
 Please choose how you would like the test to record data.
☒ INTERVAL LOGGING ☐ INTERVAL LOGGING TABLE
☐ LINEAR TIME INTERVAL ☐ ELAPSED TIME TABLE

Select Logging Parameters:
 LOGGING INPUT LOAD_1_501455
 LOGGING DIRECTION UP
 LOGGING VALUE 0.500 (kN)

← → **2**

The screen will now look like this. Click the Arrow **(2)** in the lower, right-hand corner of the window to continue the Test Setup process.

Linear Time Interval

With LINEAR TIME INTERVAL, selected, click on the LOGGING VALUE field to choose an interval of time in seconds, which you want the machine to log data.

Test Setup Wizard 3:35 PM ID 1

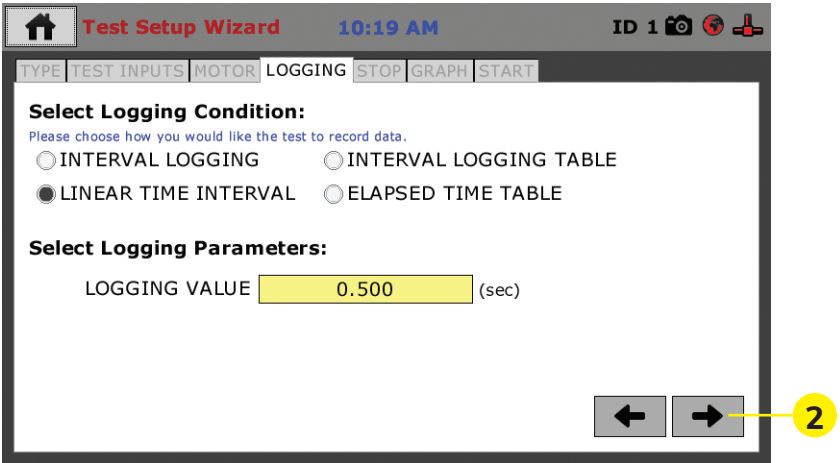
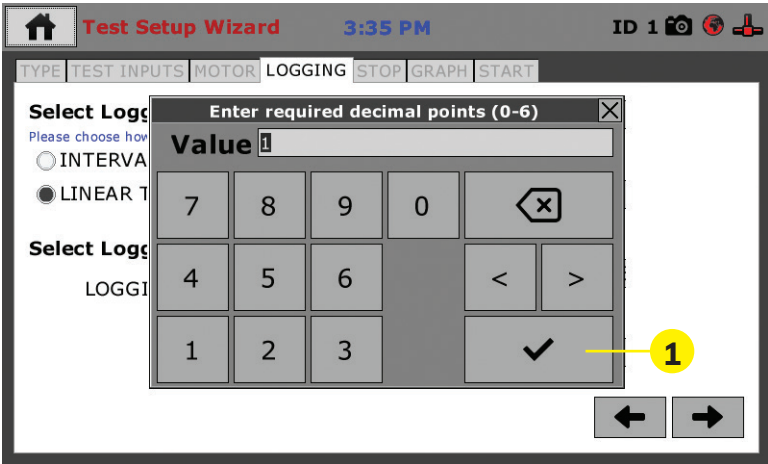
TYPE TEST INPUTS MOTOR **LOGGING** STOP GRAPH START

Select Logging Condition:
 Please choose how you would like the test to record data.
☐ INTERVAL LOGGING ☐ INTERVAL LOGGING TABLE
☒ LINEAR TIME INTERVAL ☐ ELAPSED TIME TABLE

Select Logging Parameters:
 LOGGING VALUE 0 (sec)

← →

To set the LOGGING VALUE, click on the yellow field to the right of LOGGING VALUE and fill in a value from the pop up window that appears, see below. Once you have entered a value, Click the Check Mark **(1)** in the lower right-hand corner to save the value.



The screen will now look like this. Click the Arrow **(2)** in the lower, right-hand corner of the window to continue the Test Setup process.

Interval Logging Table

With INTERVAL LOGGING TABLE, selected, click on the LOGGING INPUT field to individually choose each Input in the Pop-up Field and set the desired LOGGING DIRECTION AND LOGGING VALUE for each Input.

Test Setup Wizard
9:36 AM
ID 1

TYPE TEST INPUTS MOTOR LOGGING STOP GRAPH START

Select Logging Condition:

Please choose how you would like the test to record data.

☐ INTERVAL LOGGING
☒ INTERVAL LOGGING TABLE
☐ LINEAR TIME INTERVAL
☐ ELAPSED TIME TABLE

Select Logging Parameters:

LOGGING INPUT LOAD_1_501455

LOGGING DIRECTION

LOGGING VALUE

←

→

To set the LOGGING VALUE, click on the gray box **(1)** to the right of LOGGING VALUE and fill in the table values in the pop up window that appears, see below.

Test Setup Wizard
9:35 AM
ID 1

TYPE TEST INPUTS MOTOR LOGGING STOP GRAPH START

Select Logging Condition:

Please choose how you would like the test to record data.

☐ INTERVAL LOGGING
☒ INTERVAL LOGGING TABLE
☐ LINEAR TIME INTERVAL
☐ ELAPSED TIME TABLE

Select Logging Parameters:

LOGGING INPUT LOAD_1_501455

LOGGING DIRECTION UP

LOGGING VALUE

←

→

Test Setup Wizard
9:32 AM
ID 1

TYPE TEST INPUTS MOTOR LOGGING STOP GRAPH START

Select Logging Condition:

Please choose how you would like the test to record data.

☐ INTERVAL LOGGING
☒ INTERVAL LOGGING TABLE
☐ LINEAR TIME INTERVAL
☐ ELAPSED TIME TABLE

Select Logging Parameters:

LOGGING INPUT

LOGGING DIRECTION

LOGGING VALUE

←

→

Logging Interval Table

INDEX	VALUE (lbf)
0	0.000000
1	0.000000
2	0.000000
3	0.000000
4	0.000000
5	0.000000
6	0.000000
7	0.000000

CLEAR TABLE

1

SELECT

CANCEL


Above is a blank INTERVAL LOGGING TABLE. In order for the logging table to function, you will need to fill in the table with values from either an ASTM standard or your own values. Once you have completed the table for all inputs, Click the SELECT Button **(1)** in the lower right-hand side of the window to save the table.

To continue the Test Setup process, click the Arrow **(2)** in the lower, right-hand corner of the window.

Test Setup Wizard 9:35 AM ID 1

TYPE TEST INPUTS MOTOR **LOGGING** STOP GRAPH START

Select Logging Condition:
Please choose how you would like the test to record data.
☐ INTERVAL LOGGING ☒ INTERVAL LOGGING TABLE
☐ LINEAR TIME INTERVAL ☐ ELAPSED TIME TABLE

Select Logging Parameters:
LOGGING INPUT
LOGGING DIRECTION
LOGGING VALUE 

← → **2**


Elapsed Time Table

With ELAPSED TIME TABLE, selected, click on the gray box **(1)** to the right of LOGGING VALUE and fill in the table values in the pop up window that appears, see next page.

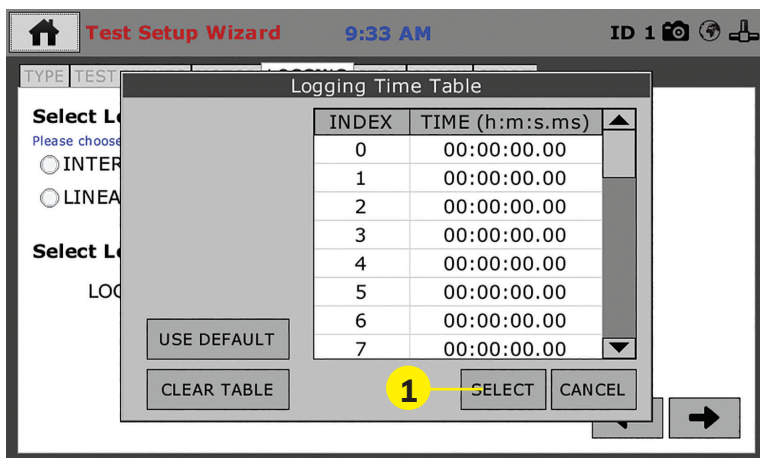
Test Setup Wizard 9:35 AM ID 1

TYPE TEST INPUTS MOTOR **LOGGING** STOP GRAPH START

Select Logging Condition:
Please choose how you would like the test to record data.
☐ INTERVAL LOGGING ☐ INTERVAL LOGGING TABLE
☐ LINEAR TIME INTERVAL ☒ ELAPSED TIME TABLE

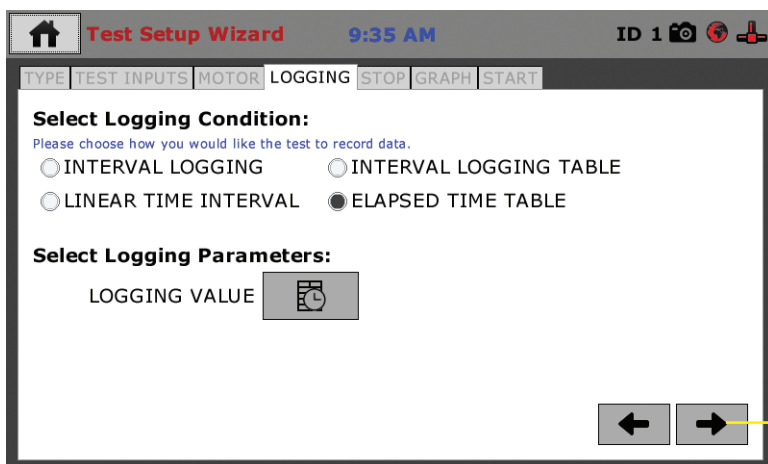
Select Logging Parameters:
LOGGING VALUE  **1**

← →



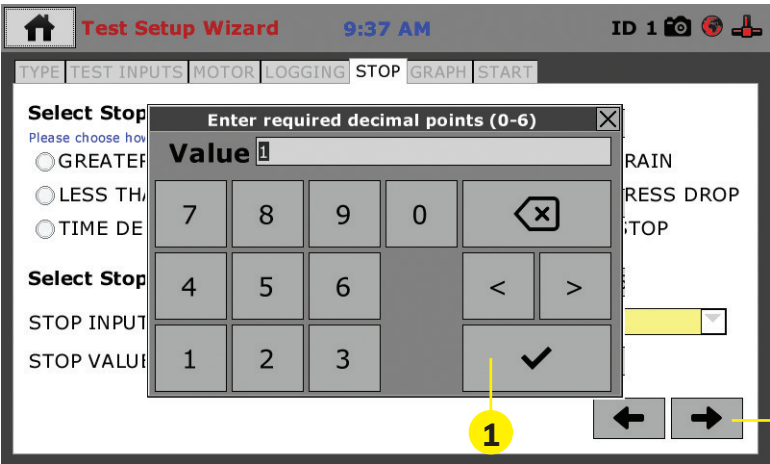
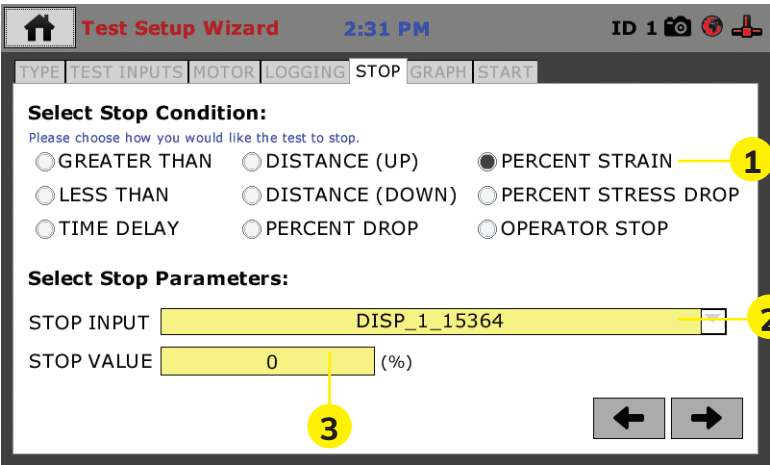
Above is a blank LOGGING TIME TABLE. In order for the logging table to function, you will need to fill in the table with values from either an ASTM standard or your own values. Once you have completed the table for all inputs, Click the **SELECT** Button **(1)** in the lower right-hand side of the window to save the table.

To continue the Test Setup process, click the **Arrow (2)** in the lower, right-hand corner of the window.



Test Setup Wizard – Stop Condition

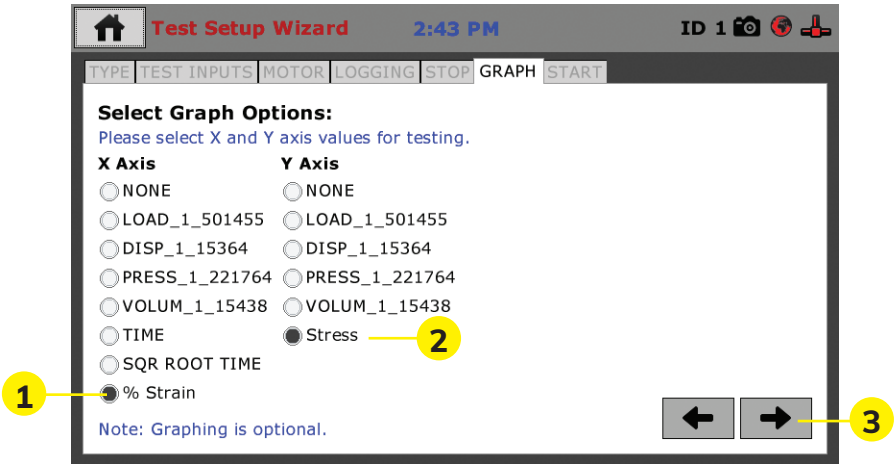
To set the Stop Condition for the test, select one condition from the list of nine choices, see screen below. PERCENT STRAIN **(1)** has been chosen for our example here. Then choose the appropriate input device to coincide with your choice, in this case DISP, from the Stop Input field **(2)**. Also, add a value in the The Stop Value field **(3)**, by clicking on it and using the pop-up window to enter a value.



Click the Check Mark **(1)** in the lower right-hand corner to save the value. Click the Arrow **(2)** in the lower, right-hand corner of the window to continue the Test Setup process.

Test Setup Wizard – Graph Options

To set the Graph Options for the test, choose the values for the X and Y axis values you want to use for your test. For this test, we have chosen % Strain for the X Axis **(1)** and Stress for the Y Axis **(2)**. Click the Arrow **(3)** in the lower, right-hand corner of the window to continue the Test Setup process.



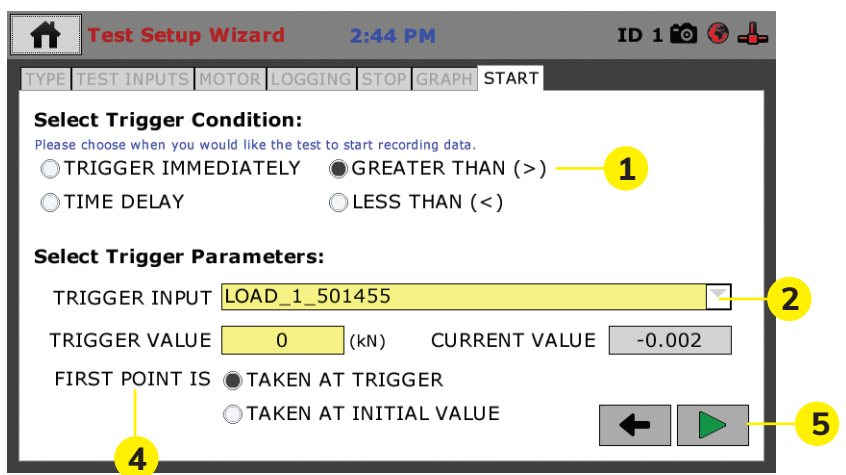
Test Setup Wizard – Start Options

On this next screen you will choose when you would like the test to start recording data. The options include: “Trigger Immediately,” “Greater Than,” “Time Delay,” and “Less Than.”



Trigger Immediately— Choose this option if you would like the test to start recording data without delay. You are now setup to run your test. Proceed with your test by pressing the Green Arrow **(5)** in the bottom, right-hand corner of the screen.

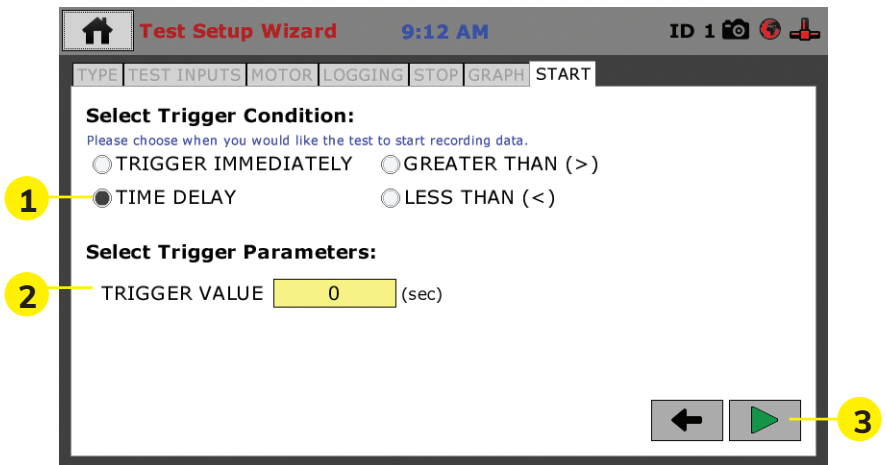
Greater Than (>) (1)— Choose this option if you would like the test to start recording data once you have reached a specified value.



After selecting GREATER THAN (>) (1), select the TRIGGER INPUT (2) you'd like to use for this condition, here we have chosen LOAD. Fill in the TRIGGER VALUE you'd like to use, here we have used "0" (3). Now choose whether you want the FIRST POINT to be taken at the TRIGGER or taken at the INITIAL VALUE, here we have chosen TAKEN AT TRIGGER (4).

You are now setup to run your test. Proceed with your test by pressing the Green Arrow (5) in the bottom, right-hand corner of the screen.

Time Delay (1)— Choose this option if you would like the test to start after a specified amount of time.



After choosing TIME DELAY, Enter the TRIGGER VALUE (delay) **(2)** in seconds after which you would like the test to start recording data. You are now setup to run your test. Proceed with your test by pressing the Green Arrow **(3)** in the bottom, right-hand corner of the screen.

Less Than (<) (1)— Choose this option if you would like the test to start recording data before you have reached a specified value.

After selecting LESS THAN (>) **(1)**, select the TRIGGER INPUT **(2)** you'd like to use for this condition, here we have chosen LOAD. Fill in the TRIGGER VALUE you'd like to use, here we have used "0" **(3)**. Now choose whether you want the FIRST POINT to be taken at the TRIGGER or taken at the INITIAL VALUE, here we have chosen TAKEN AT TRIGGER **(4)**.

You are now setup to run your test. Proceed with your test by pressing the Green Arrow **(5)** in the bottom, right-hand corner of the screen.

Test Setup Wizard – Start

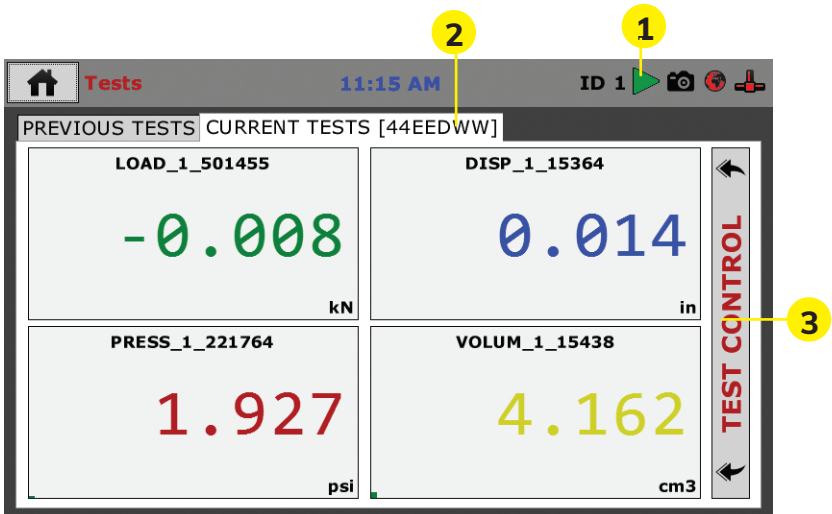
When you press the Green Arrow **(5)** in the bottom, right-hand corner of the screen. You will see the following screen.

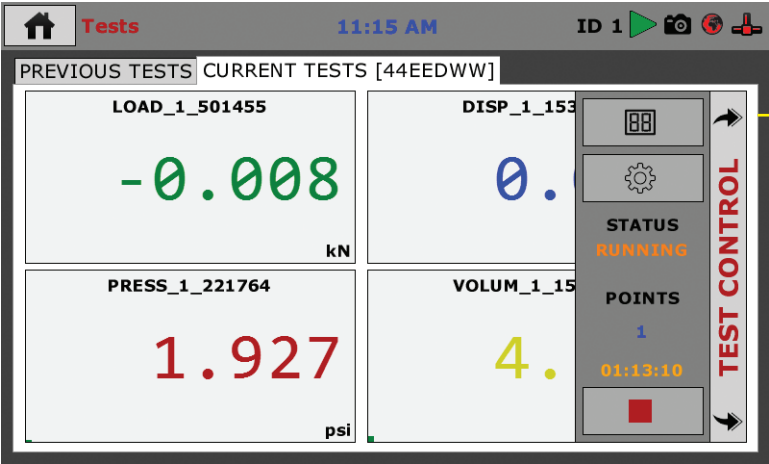


In the Value Field (1) give your test a name. When finished, click on the check mark key (2) to save. Once saved, you will see the following screen, showing the test you just saved. The test will begin to run automatically, depending upon what you set your Start Parameters to.

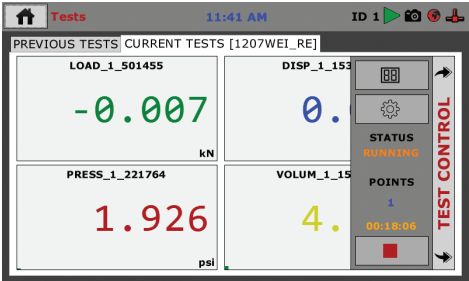
Tests — Current Tests Tab

On the screen below, the Green Arrow (1) in the screen header indicates that a test is currently running. The name of the test (2) is shown in the current tab. To access different views, control or stop the current test, click on the Test Control tab (3) at the right of the screen. Clicking on this tab opens the Test Control panel, see screen below.

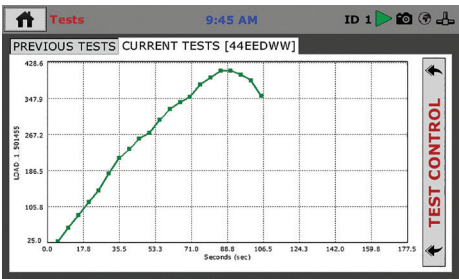




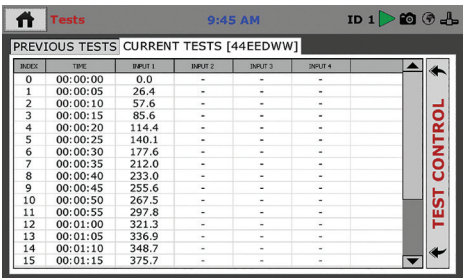
To Toggle through the different available views of your active test, click on the Switch Views button (1). The views that are available are: Live Readouts, Graph or Tabulation. Examples of these screens are below.



Live Readouts



Graph



Tabulation

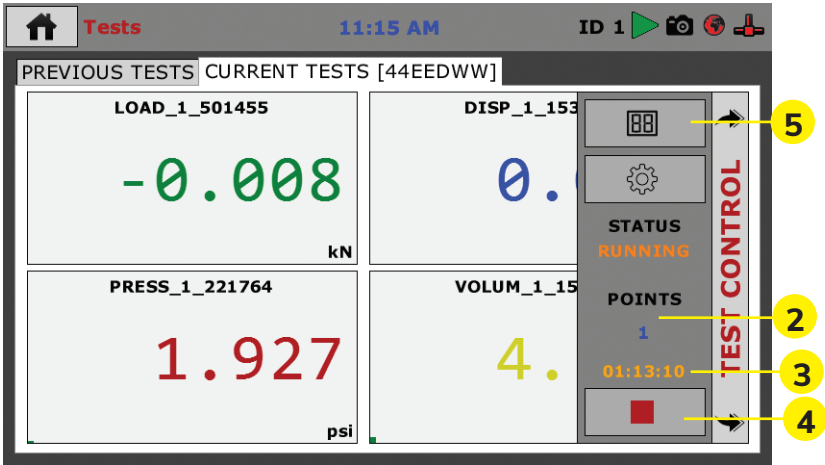
Also available on the Test Control Panel is the:

Status Monitor (1), which indicates whether a test is running or not running.

Points (2) indicates how many total test points have been recorded.

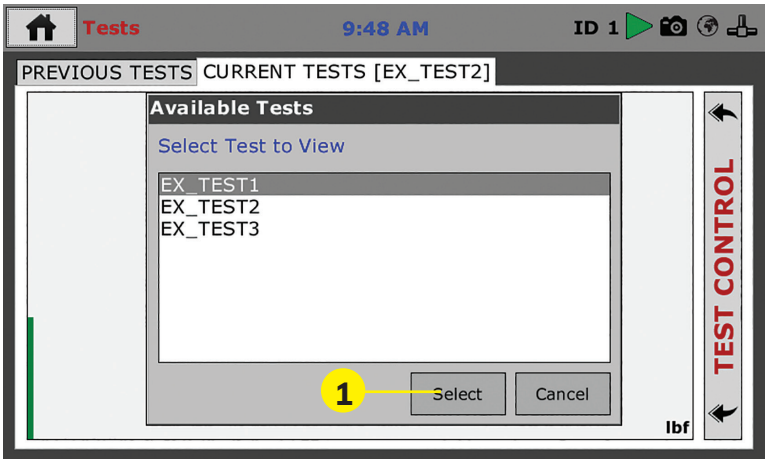
Start Time (3) indicates the starting time the current test was triggered. And, the

Stop Test button (4), which will stop the test when clicked.







Available Tests (5)

Clicking on the Available Tests icon brings up a screen that lists all currently running tests, see below. By clicking on a test in the list and clicking on the Select Button (1) you can see the current status of that test.



Tests — Previous Tests Tab

Once a test is completed or stopped by the operator, the results of that test immediately appear on the Previous Tests Tab **(1)**.

 Tests 2:27 PM ID 1   

1


PREVIOUS TESTS

345 - 04/13/2017 15:05:42 PM


TYPE	PEAK VALUES	UNITS
LOAD_1_501455	0.000	kN
DISP_1_15364	0.000	in
PRESS_1_221764	0.000	psi
VOLUM_1_15438	0.000	cm3
Temperature @ START	77.4	°F
Temperature @ FINISH	77.4	°F


Choose Test

2




3









Points Recorded
2



To Toggle through different views of your completed test, click on the Switch Views button **(2)**. The views that are available are: Peak Values, Graph or Tabulation.

To create a Test Template for this test or to Export the test data to a connected USB flash drive, click on the Test Actions button **(3)** and the following screen will appear.

 Tests 9:49 AM ID 1   

PREVIOUS TESTS

Choose a Previous Test Action

Choose 'Export Test(s)' to copy this test to a connected USB flash drive.

Choose 'Create Template' to generate a setup template from this test.


Export Test(s)


1


Create Template

Cancel


Choose Test







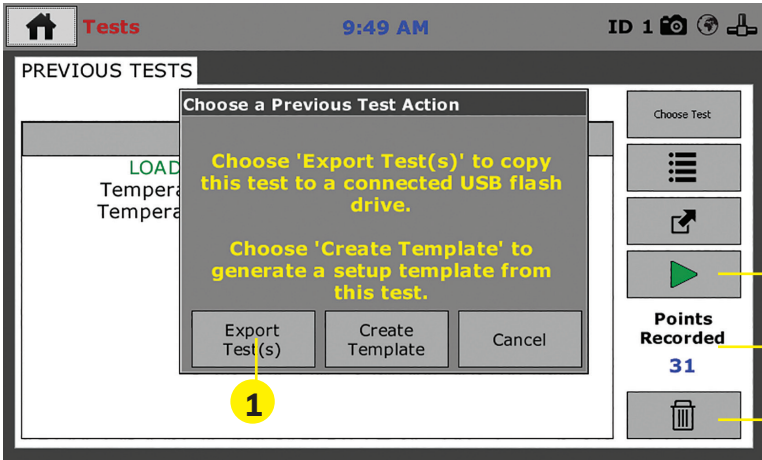
Points Recorded
31



Click on the Create Template button **(1)** a pop up window will appear asking you to name your template, see next page. Name your template and click on the Check Mark **(2)** to save the template for future use.



To export the test data to a USB Flash Drive, insert a Flash Drive into the USB slot on the machine's front panel. Click on the Export Tests button (1). The machine will transfer your file to the USB Flash Drive and you can take the drive with you.

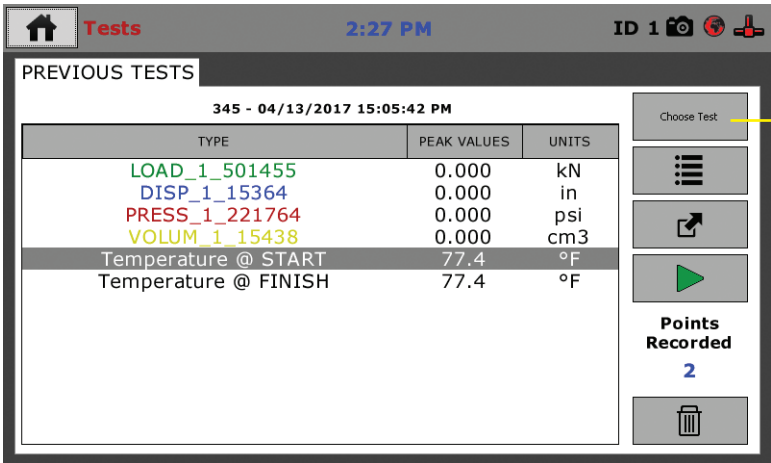


To begin a new Test, click on the Green Arrow key (2) and you will be taken to the Test Setup Wizard to create a new Test or to choose a Test Template.

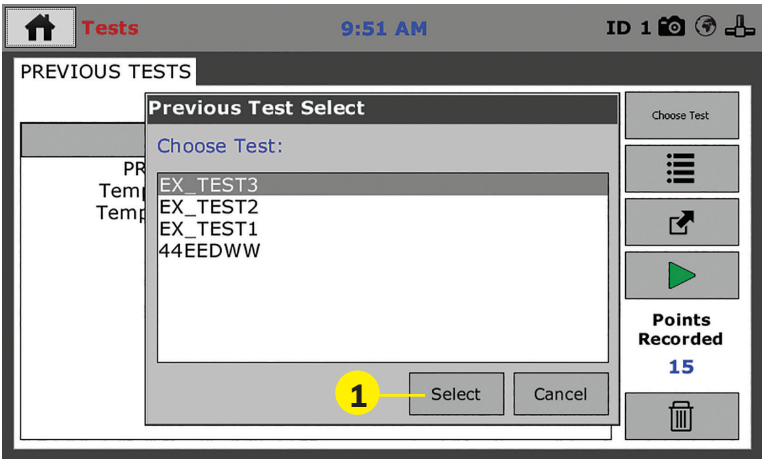
Also on the Previous Tests Tab, on each previous test page you will see how many points were recorded during the test (3).

You can also delete Previous Tests by clicking on the Trash button (4).

On the Previous Tests Tab you can also select any of your previous tests by clicking on the Choose Test button (1), below.



When this button is clicked, a pop up screen will show a number of your previous tests, based on the number you specified in the preferences panel for this feature, see below. By clicking on a test in the list and clicking on the Select Button (1) you can see the current status of that test.



Operation from a Computer and NEXT Software

This manual covers the setup and operation of the HM-5030.3F Load Frame in Stand-alone Mode only. For information on operating your load frame with Humboldt's NEXT Software and a computer, please refer to the Humboldt NEXT software manual.

HM-5030.3F Specifications

Designed for applications requiring multi-purpose loading systems, such as road construction projects in either mobile or fixed labs, educational institutions and consulting firms, the HM-5030 Master Loader is ideal for just about any application from road construction to high-volume commercial and educational laboratories.

While the HM-5030.3F has been specifically designed for soil testing labs conducting multiple testing operations including: UU, CU and CD triaxial, UC, CBR and LBR, it is also perfect for running Marshall, Hveem, TSR and SCB asphalt tests as well. Its heavy-duty design and precise stepper-motor control provide a stable platform for years of reliable service allowing the HM-5030.3F to perform any tests required up to its load capacity of 11000 lbf (50kN).

Like all Elite Series load frames, the HM-5030.3F is built around Humboldt's integral, 4-channel data logger with touch-screen control, which allows the load frame to be used as a standalone device capable of full test control and data logging. It can also be controlled by a networked computer at any location with access to the network.

Load Frame Specifications:	
Load capacity	11000 lbf (50kN)
Speed range	0.00001 – 2.00000 in/min (0.00001 – 50.80000 mm/min)
Data channels	4
Platen Size / Travel	10" (254mm) / 4" (100mm)
Data storage	1000 tests and up to 3000 readings per test
Clearance, vertical	40" (1000mm)
Clearance, horiz.	15" (380mm)
Voltage	110/220V 50/60Hz. 5.0 amps

Controller Specifications:	
Display (Resistive Touch)	7" (178mm) VGA (480 x 800)
Real-time test data	Graphic and tabulation
Processor	Dual 32-bit ARM
RAM	64MB
Memory, non-volatile	4GB
Analog to digital converter	24 bit
Data acquisition	4 Channels
Logging speed	up to 50 readings per second
Multi-test storage	1000
Points per test	3000
USB port (front)	export data, import/ export calibration data, WiFi
USB port (back)	provides external power for wireless access point
Ethernet connection	for network connectivity
Emergency stop	Large button
24-bit differential analog to digital converter	4
Ambient temperature sensor	1
Limit switches	2
Firmware Update	Ethernet or flash drive

General Warnings

Use appropriate PPE while operating device. Keep body parts clear of moving surfaces when operating machine. Ensure all motion has stopped prior to adding or removing testing samples or support equipment.

Safety Warnings

Operators should take care to operate this machine under maximum load restrictions. The machine is programmed at the factory to provide safety shutdown if the upper or lower maximum travel is exceeded, as well as if the upper instrument calibration is exceeded.

Electrical Warnings

Typically, there is no reason for the operator to open the machine. However, if the customer's engineers attempt to change settings to the circuit board connected to the back panel, the machine must first be unplugged. Unplugging the internal connection to the back panel circuit board while the machine is under power will result in permanent damage to the circuit board.

Important Notice

The information contained herein is supplied without representation or warranty of any kind. Humboldt Mfg. Co. therefore assumes no responsibility and shall have no liability, consequential or otherwise, of any kind arising from the use of the described equipment contained in this manual.

Updated Products

The manufacturer reserves the right to change or modify product design or construction without prior notice and without incurring any obligation to make such changes and modifications on products previously or subsequently sold.

Fitness for Application

The manufacturer makes no recommendations or claims regarding fitness for applications other than the specific tests as defined in this User Guide.

Unpacking

Initial inspection should include checking for physical damage during shipping and obvious external damage to the product.

Package contents are defined by your packing list. Each Loader is configured according to customer specifications. In your inspection, make certain that the contents of your shipment match the documentation provided by your packing list.

Place unit on a flat, smooth surface and use leveling feet (supplied) and a bubble level to ensure that the unit is level side-to-side and back-to-front.

Warranty

Humboldt Mfg. Co. warrants its products to be free from defects in material or workmanship. The exclusive remedy for this warranty is Humboldt Mfg. Co., factory replacement of any part or parts of such product, for the warranty of this product please refer to Humboldt Mfg. Co. catalog on Terms and Conditions of Sale. The purchaser is responsible for the transportation charges. Humboldt Mfg. Co. shall not be responsible under this warranty if the goods have been improperly maintained, installed, operated or the goods have been altered or modified so as to adversely affect the operation, use performance or durability or so as to change their intended use. The Humboldt Mfg. Co. liability under the warranty contained in this clause is limited to the repair or replacement of defective goods and making good, defective workmanship.

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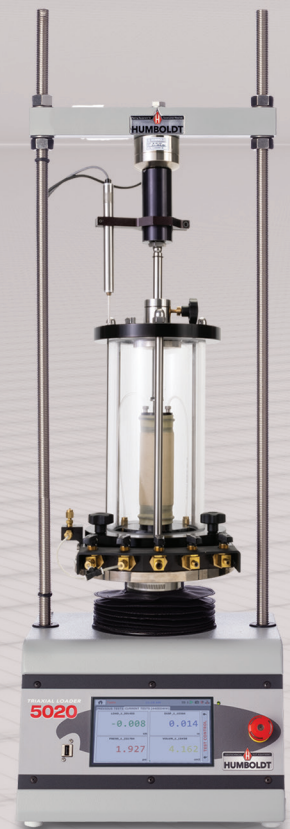
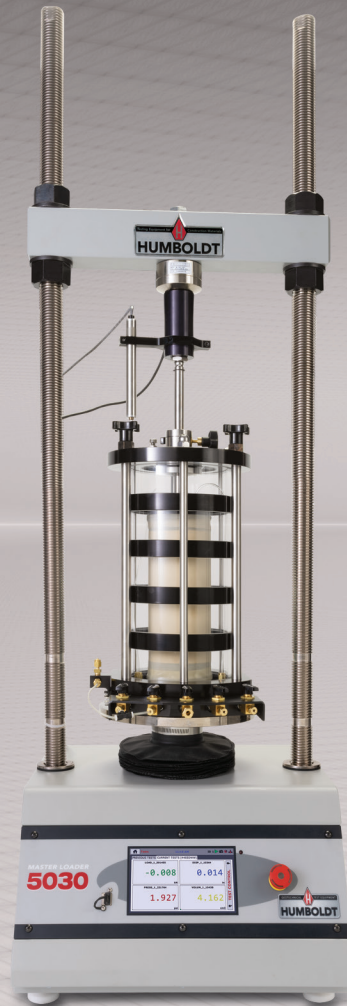
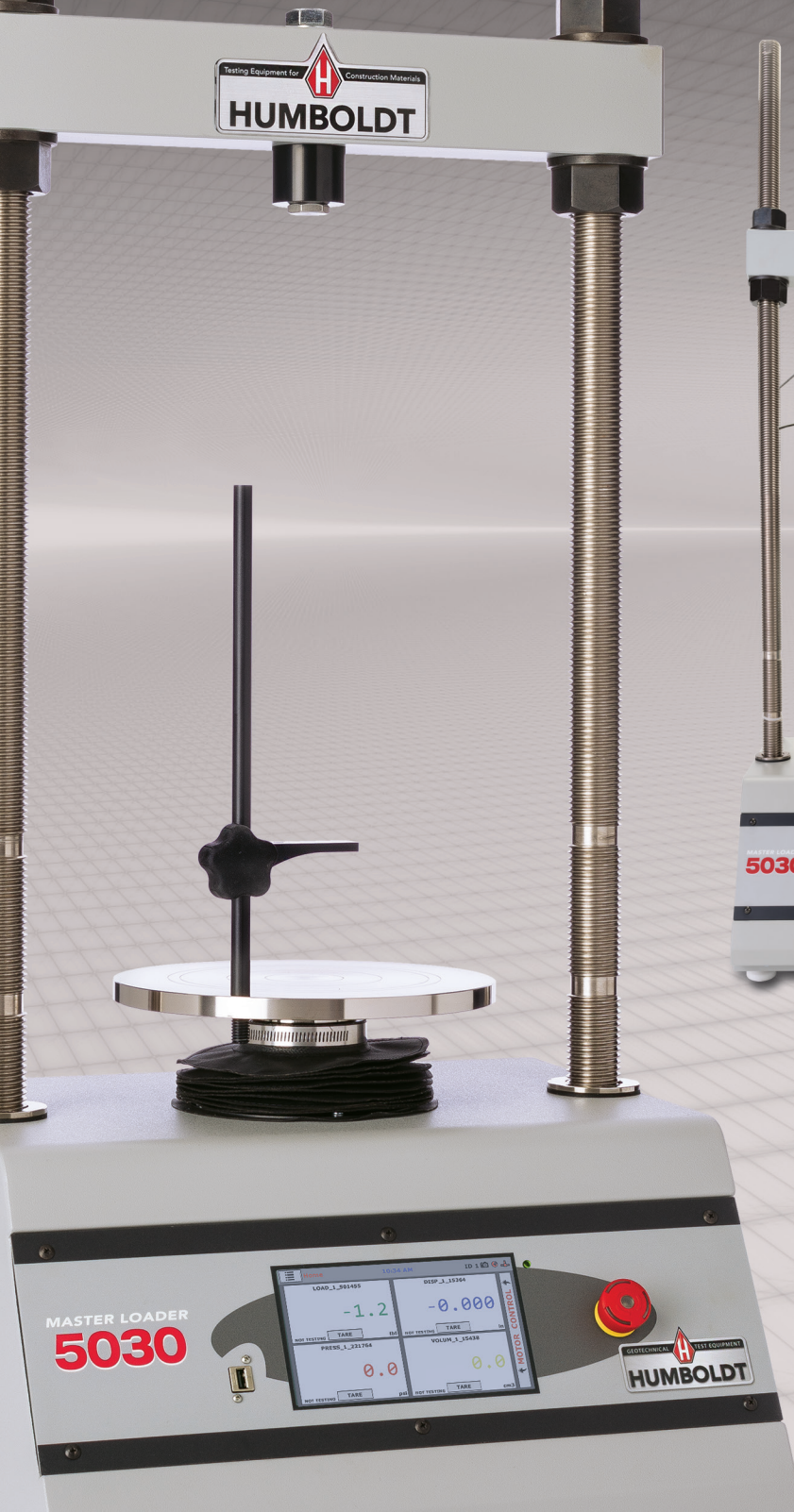
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ELITE SERIES LOAD FRAMES



ELITE SERIES LOAD FRAMES

Humboldt's Elite Series Load Frames provide the materials testing lab with a choice of three, highly-versatile and precision-built loading systems covering a range of testing applications. The HM-5030 is the workhorse of the group, capable of handling any testing need up to 50kN or 11,000 lbf. The HM-5020 is a machine designed specifically for triaxial testing and other testing requirements up to 15kN or 3,000 lbf. and, the HM-5040, is a heavy-duty machine capable of handling testing requirements up to 100kN or 22,000 lbf.

These machines provide four (4) integral and independent data acquisition channels, which can be utilized in stand-alone configurations or accessed through a LAN-networked computer using Humboldt's Next Software.

Elite Series load frames are built with durable, high-quality components and feature the use of a stepper motor, precision gears and gear box to ensure smooth and reliable operation, as well as precise results.

In stand-alone mode, these load frames provide a 7" (178mm) touch-screen controller. These new waterproof, touch screens provide colorful, at-a-glance monitoring of testing functions without the use of a computer. Operators can see all the data in several formats at the machine while the test is running. Data can then be downloaded later to a computer in the lab, in the next room or at a different location, while also providing report generation capabilities from within Humboldt's NEXT software or our enhanced test-specific modules.



NOTES

Elite Series load frames are sold as load frames only though shown here with typical triaxial setups.



HM-5035 MASTER LOADER PLUS

Load capacity	15000 lbf (68KN)
Speed Range Testing: Fast Approach:	0.00001– 2.20000 in/min (0.00001– 55.00000 mm/min)
Data channels	4
Platen Size / Travel	10" (254mm) / 4" (101mm)
Data storage	1000 tests and up to 3000 readings per test
Clearance, vertical	44" (1118mm)
Clearance, horiz.	21" (533mm)
Voltage	110/220V 50/60Hz. 5.0 amps

Humboldt's New HM-5035.3F Master Loader Plus is ideal for just about any application from road construction to high-volume commercial and educational laboratories, which require higher loading capacities up to 15000 lbf (68KN), such as those involving larger sized samples and samples comprised of aggregate/asphalt/soil or mixtures. It's wider stance and large vertical and horizontal clearances allows it to accommodate much larger samples. Its heavy-duty design and precise stepper-motor control provide a stable platform for years of reliable service allowing the HM-5035.3F to perform any tests required up to its load capacity of 15000 lbf (68KN). Like all Elite Series load frames, the HM-5035.3F is built around Humboldt's integral, 4-channel data logger with touch-screen control, which allows the load frame to be used as a standalone device capable of full test control and data logging. It can also be controlled by a networked computer.

Master Loader Plus, 110/220V 50/60 Hz HM-5035.3F



Shipping wt. 725 lb (329kg)



HM-5020 TRIAXIAL LOADER

Load capacity	3000 lbf (15kN)
Speed Range Testing:	0.00001 – 2.00000 in/min (0.00001 – 50.80000 mm/min)
Fast Approach:	2.25 in/min (57.1 mm/min)
Data channels	4
Platen Size / Travel	10" (254mm) / 4" (101mm)
Data storage	1000 tests and up to 3000 readings per test
Clearance, vertical	27" (686mm)
Clearance, horiz.	11" (286mm)
Voltage	110/220V 50/60Hz. 5.0 amps

A small-footprint, triaxial-specific load frame that provides the versatility, precision and durability found throughout Humboldt's Elite Series load frames.

The HM-5020 Triaxial Loader has been specifically designed to handle triaxial testing applications, including: UU, CU and CD triaxial and UC. From educational institutions and consulting firms to high-volume commercial labs and construction projects, the Triaxial Loader can handle any application with ease. Its heavy-duty design and precise stepper-motor control provide a stable platform for years of reliable service allowing the HM-5020 to perform any tests required up to its load capacity of 3000 lbf (15kN).

Like all Elite Series load frames, the HM-5020 is built around Humboldt's integral, 4-channel data logger with touch-screen control, which allows the load frame to be used as a standalone device capable of full test control and data logging. It can also be controlled by a networked computer at any location with access to the network.

Triaxial Loader, 110/220V 50/60 Hz
HM-5020.3F

Shipping wt. 120 lb (54kg)

HM-5030 MASTER LOADER

Load capacity	11000 lbf (50kN)
Speed Range Testing:	0.00001 – 2.00000 in/min (0.00001 – 50.80000 mm/min)
Fast Approach:	2.25 in/min (57.1 mm/min)
Data channels	4
Platen Size / Travel	10" (254mm) / 4" (101mm)
Data storage	1016 tests and up to 3000 readings per test
Clearance, vertical	40" (1000mm)
Clearance, horiz.	15" (381mm)
Voltage	110/220V 50/60Hz. 5.0 amps

Designed for applications requiring multi-purpose loading systems, such as road construction projects in either mobile or fixed labs, educational institutions and consulting firms, the HM-5030 Master Loader is ideal for just about any application from road construction to high-volume commercial and educational laboratories.

While the HM-5030 has been specifically designed for soil testing labs conducting multiple testing operations including: UU, CU and CD triaxial, UC, CBR and LBR. It is also perfect for running Marshall, Hveem, TSR and SCB asphalt tests as well. Its heavy-duty design and precise stepper-motor control provide a stable platform for years of reliable service allowing the HM-5030 to perform any tests required up to its load capacity of 11000 lbf (50kN).

Like all Elite Series load frames, the HM-5030 is built around Humboldt's integral, 4-channel data logger with touch-screen control, which allows the load frame to be used as a standalone device capable of full test control and data logging. It can also be controlled by a networked computer at any location with access to the network.

Master Loader, 110/220V 50/60 Hz
HM-5030.3F

Shipping wt. 300 lb (136kg)

HM-5040 GRAND LOADER

Load capacity	22000 lbf (100kN)
Speed Range Testing:	0.00001 – 0.49999 in/min (0.00001 – 12.674 mm/min)
Fast Approach:	0.5 in/min (12.7 mm/min)
Data channels	4
Platen Size / Travel	10" (254mm) / 4" (101mm)
Data storage	1000 tests and up to 3000 readings per test
Clearance, vertical	44" (1118mm)
Clearance, horiz.	21" (533mm)
Voltage	110/220V 50/60Hz. 5.0 amps

The HM-5040 Grand Loader is ideal for just about any application from road construction to high-volume commercial and educational laboratories, which require higher pressure loading capacities up to 22000 lbf (100kN), such as those involving larger sized samples and samples comprised of rock and rock/soil mixtures. Its wider stance and large vertical and horizontal clearances allows it to accommodate much larger sample-size cells. Its heavy-duty design and precise stepper-motor control provide a stable platform for years of reliable service allowing the HM-5040 to perform any tests required up to its load capacity of 22000 lbf (100kN). Like all Elite Series load frames, the HM-5040 is built around Humboldt's integral, 4-channel data logger with touch-screen control, which allows the load frame to be used as a standalone device capable of full test control and data logging. It can also be controlled by a networked computer. HM-5040 includes a storage base with casters.

Grand Loader, 110/220V 50/60 Hz
HM-5040.3F

Shipping wt. 725 lb (329kg)

ELITE SERIES

Soil Mechanics Equipment

Humboldt's Elite Series testing machines feature a 7", full-color touch-screen controller that provides you with full, graphical monitoring of all testing functions in stand-alone applications, while maintaining full PC control when desired. With Elite Series machines you can have full, finger-tip control and monitoring of all testing functions with the touch-screen controllers, found on our load frames, consolidation and direct-shear machines, as well as our other data acquisition loggers and controllers.

Elite Series machines provide at-a-glance monitoring of testing functions, in a real-time graphical display, without the use of a PC, building upon Humboldt's dedication to modular, stand-alone, data-acquisition.

Stand-Alone Control

In stand-alone applications, you will be able to run tests and display results while viewing tabulation, basic x-y graphs and instrument readings in real-time during the test, using user-defined basic data acquisition. Test data is stored in the device and can be downloaded to a USB drive via the machine's USB port or the data can be transferred to a networked computer. The USB port can also be used to power a wireless access point, which can provide a wireless hook-up with the PC, if no LAN is available.

Computer Control

Humboldt's Next, Basic software is included with all Elite Series machines. This software provides robust machine control, calibration, data

acquisition and report generation for those using a computer to control various testing operations.

In addition, operators have the ability to view and control testing operations from a PC in the lab, in the next room or at a different location, while also providing report generating capabilities using Humboldt NEXT software test-specific modules.

So, whether you are controlling a single load frame, controlling multiple machines or even a complete geotechnical lab, Humboldt's NEXT Basic software, in conjunction with Humboldt's Elite Series machines provide a complete solution for the acquisition, recording and presentation of testing data in data tabulation and graphic chart formats.



HM-3000.3F Upgrade to HM-5030.3F	Upgrade	HM-5030U
HM-2900.3F Upgrade to HM-5020.3F	Upgrade	HM-5020U
HM-2450.3F and HM-2315 Upgrade to HM-5240.3F		HM-5240U
HM-2325A.3F Upgrade to HM-5320.3F	Upgrade	HM-5320U
HM-2330D.3F Upgrade to HM-5330.3F	Upgrade	HM-5330U
HM-2470.3F Upgrade to HM-5470.3F	Upgrade	HM-5470U
HM-2560.3F Upgrade to HM-5560.3F	Upgrade	HM-5560U
HM-2750A.3F Upgrade to HM-5750A.3F	Upgrade	HM-5750AU
HM-2750D.3F Upgrade to HM-5750D.3F	Upgrade	HM-5750DU
HM-4469C Upgrade to HM-4470C	Upgrade	HM-4470U

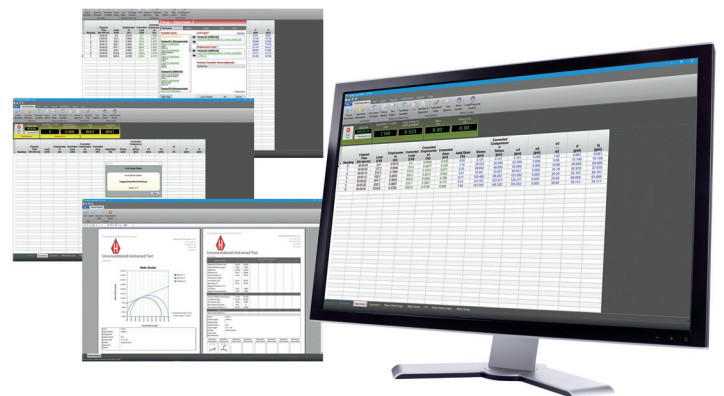
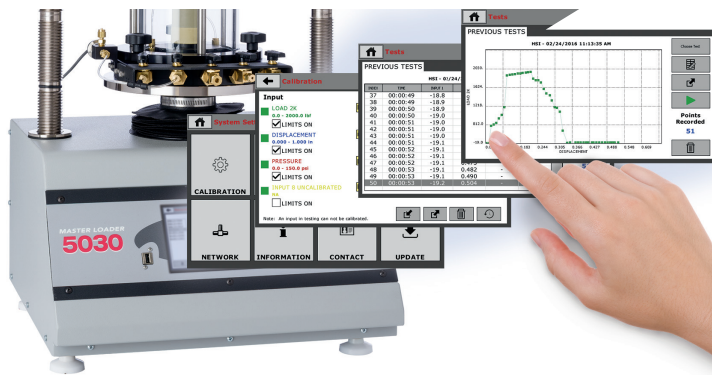
Upgrade your existing Humboldt Geotechnical Testing machines to Elite Series machines.

You can upgrade your existing Humboldt testing equipment to our Elite Series machines. These upgrades require your existing machine to be sent to Humboldt for a complete refurbishment and upgrade to the new equipment. Upgrades include the new 7", full-color touch-screen controller, and a new enclosure. Refer to the chart on the left for available upgrades.

(When upgrading machines, return transducers and load cells along with machine for recalibration.)



control and monitoring of all testing functions



Choose: Stand-Alone or Computer Control

NEXT Test-Specific Software Modules

Humboldt NEXT Basic software can be enhanced with the purchase of test-specific modules. These modules provide you with the following capabilities beyond the standard software included with your ELITE Series load frames.

- Test-specific setup, which guides you through the process and includes selecting data collection parameters that best fit the specific test
- Input specific project information for each test, such as project name, client information, etc.
- All test-specific initial, intermediate, and final parameters required by ASTM and BS standards are dynamically calculated for you, based on your input of specimen information, such as size, weight, etc.
- Tabulated test data, graphs and all test-specific calculations are provided in real time, allowing you to monitor tests in process
- Generate test-specific reports that include all graphs and data presented in a project
- Simultaneously run multiple tests on one computer, involving any of the available NEXT modules and any compatible Humboldt equipment up to 255 device connections, which is up to 1020 inputs
- Create and store test-specific test setup templates for rapid setup of future tests
- Produce test-specific graphs, which allow you to draw construction lines to calculate angles and other test-specific parameters
- Automatically recover from a PC shutdown without loss of data
- All unit parameters can be adjusted individually
- Easily change between different test standards
- Access free, downloadable software upgrades for purchased modules
- Additional modules are available, please inquire

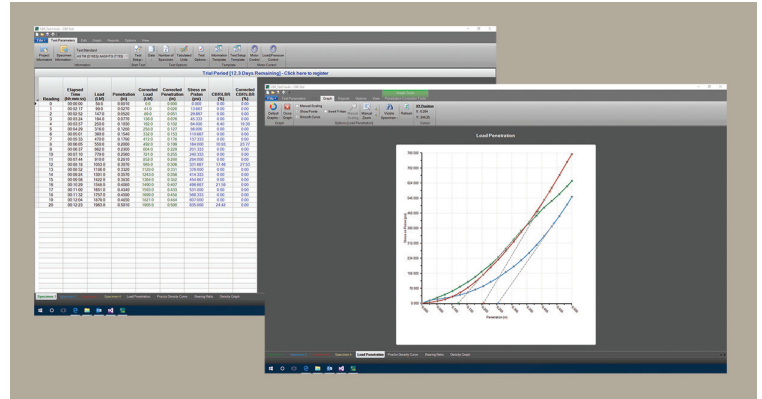
Consolidation Module	HM-5100SW
Direct Shear Module	HM-5700SW
CBR/LBR Module	HM-5001SW
Unconsolidated Undrained (UU) Module	HM-5002SW
Consolidated Undrained (CU) Module	HM-5003SW
Unconfined Compression (UC) Module	HM-5004SW
Consolidated Drained (CD) Module	HM-5006SW
Marshall Module	HM-5005SW
Permeability Module	HM-5007SW

**YOU CAN PURCHASE
AND REGISTER
YOUR SOFTWARE
MODULES ONLINE!**

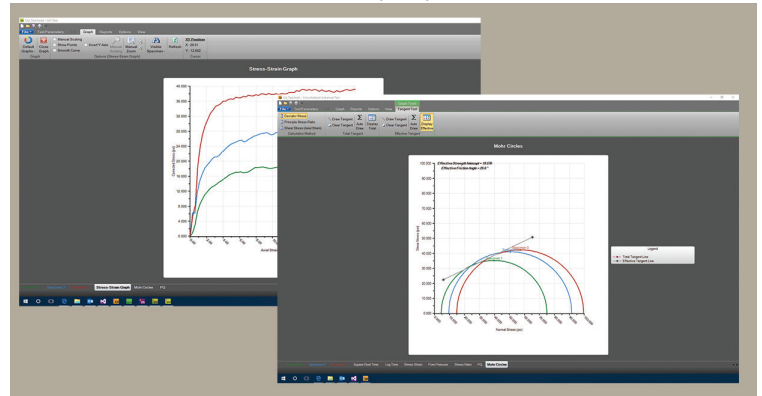


www.humboldtmg.com/elitenextsoftware

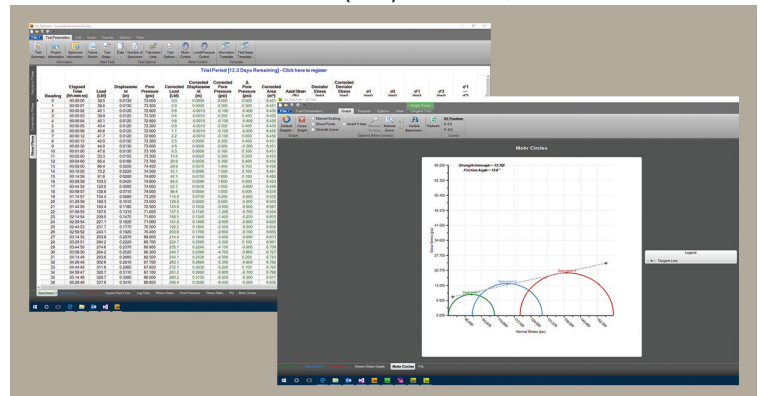
CBR/LBR Module, HM-5001SW



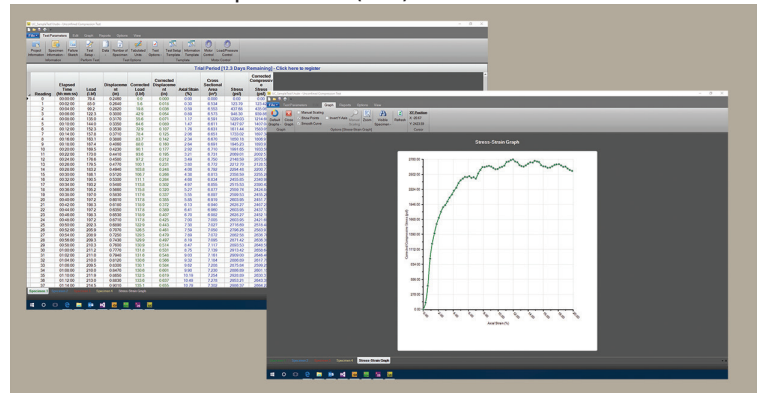
Unconsolidated Undrained (UU) Module, HM-5002SW



Consolidated Undrained (CU) Module, HM-5003SW



Unconfined Compression (UC) Module, HM-5004SW



Typical Triaxial Test Setups with the HM-5030

Controller Specifications

Specifications for the touch-screen controller, instrumentation and data acquisition used with Humboldt Elite series load frames

Controller Specifications:	
Display (Resistive Touch)	7" (178mm) VGA (480 x 800)
Real-time test data	Graphic and tabulation
Processor	Dual 32-bit ARM
RAM	64MB
Memory, non-volatile	4GB
Analog to digital converter	24 bit
Data acquisition	4 Channels
Logging Rate	effective rate of 320 readings per second
Multi-test storage	1000
Points per test	3000
USB port (front)	export data, import/export calibration data
USB port (back)	provides external power for wireless access point
Ethernet connection	for network connectivity
Emergency stop	Large button
24-bit differential analog to digital converter	4
Ambient temperature sensor	1
Limit switches	2
Firmware Update	flash drive



Consolidated
Drained and
Undrained



Unconsolidated
Undrained

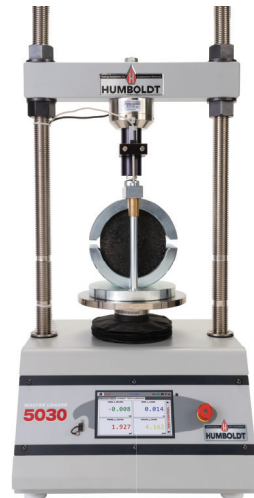


Unconfined
Compression

Other Typical Test Setups with the HM-5030



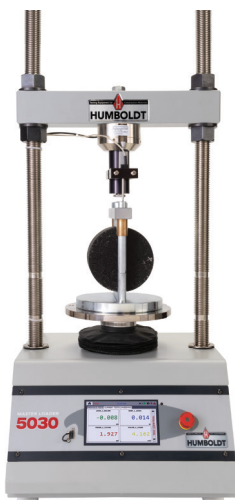
CBR/LBR



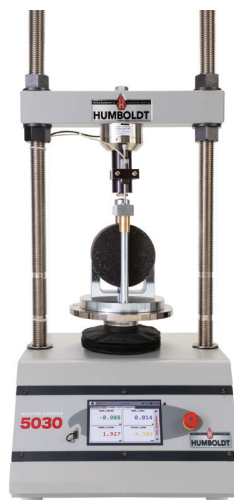
Marshall



Semi-Circular Bending



IDEAL-CT



IDEAL-RT



TSR

www.humboldt-mfg.com

1.800.544.7220

