CubiScan® 325

Operations and Technical Manual

Version 1.1

CUBISCAN®
CUBING & WEIGHING SYSTEMS BY QUANTRONIX

CubiScan 325 Operations and Technical Manual

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⚠ **CAUTION**	The CubiScan 325 should only be serviced by qualified personnel.
	Observe precautions for handling electrostatic sensitive devices when setting up or operating the CubiScan 325.

⚡ **WARNING**	Disconnect all power to the CubiScan 325 before servicing or making any connections.

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6. Had serial numbers altered, defaced or removed.
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What's New in Version 1.1?

Updated Sections

- Added CE certification
- Updated assembly (gate placement) instructions "Placing the Gate" on page 8

This document was created with the purpose of providing the most accurate and complete information. If you have comments or suggestions for improving this manual, contact Quantronix at manual@cubiscan.com.

Manual updated June 20, 2017.

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Chapter 1

Product Description

The CubiScan 325 is a large, static cubing system that uses sensing technologies to measure and weigh irregularly-shaped parts and components as well as boxed items. Small and large items are measured with great precision using infrared sensing technology. The sensing gate is moved by hand to allow the user complete control over the measuring process.

The CubiScan 325 is commonly used to improve storage-space planning, for carton size selection, repacking, check-weighing, and shipment manifesting in medical, pharmaceutical, apparel, hardware, and consumer goods distribution. It has an integrated touchscreen display and outputs to a user-supplied PC. Capacity for irregular items can be measured up to 36 x 24 x 24 inches with a resolution of 0.05 inches. The CubiScan 325 also includes an integrated, high-accuracy 50 x 0.005 lb scale.

Each unit has one active serial communication port, one Ethernet port, and one USB port. Proprietary interface software, called Qbit™, is available and allows for menu-driven operator control, data storage/transfer, and diagnostics. A mobile cart and useful accessories such as a portable power supply are available to create a completely mobile cubing, weighing, and identification workstation.

The CubiScan 325 uses powerful sensing technologies to create a flexible and economical solution for today's most demanding cubing and weighing applications.
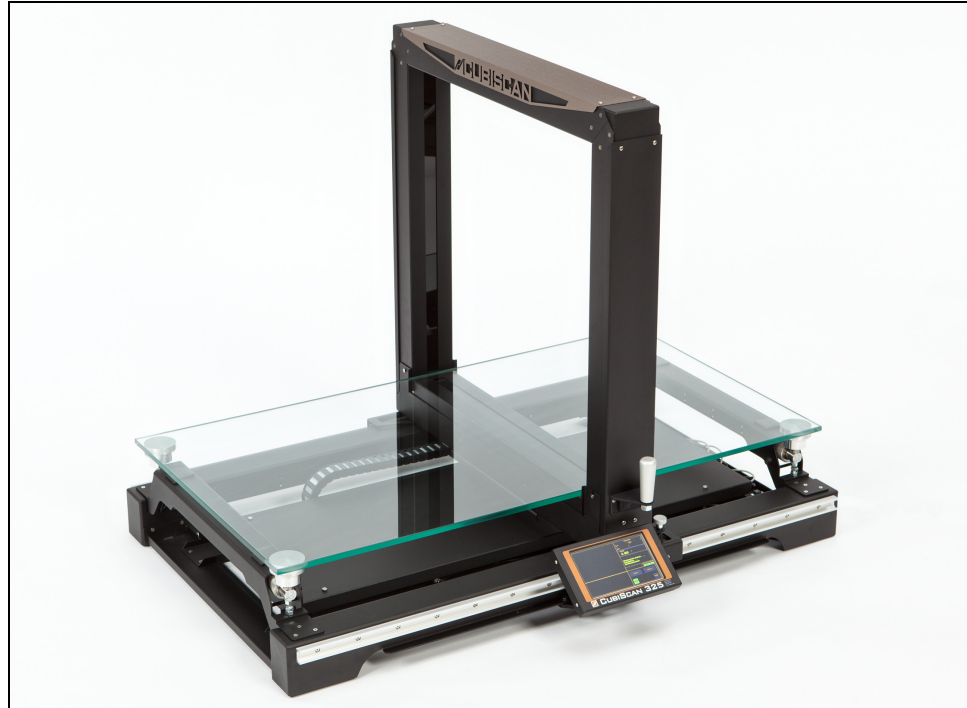
Figure 1
CubiScan 325

Specifications

Power Requirements

100 – 240 VAC, 50 – 60 Hz

Environmental

Operating Temperature: 14° to 104° F (-10° to 40° C)

Humidity: 0 to 90% non-condensing

Measuring Sensor

Infrared light beam

Weight Sensor

Four load cells

Measuring Capacities

Measurement Range

        Length: 0.10 to 36.00 in (0.2 to 90.0 cm)

        Width: 0.10 to 24.00 in (0.2 to 60.0 cm)

        Height: 0.10 to 24.00 in (0.2 to 60.0 cm)

Measurement Increment: 0.05 in (0.1 cm)

Measurement Time: 3-7 seconds

Object Characteristics: Opaque

Weight Capacity: 0.005 to 50.000 lb (0.002 to 25.000 kg)

Weight Increment: 0.005 lb (0.002 kg)

Physical

Length: 49 in (125 cm)

Width: 38 in (97 cm)

Height: 38 in (97 cm)

Weight: 173 lbs (78.5 kg)

User Interface

Minimum PC Specifications:
Windows 7/XP/95/98/NT/2000, Pentium II processor, 20 megabytes of disk space, screen resolution setting of 800 X 600

Quantronix's QBIT™ software can be used to interface with the CubiScan 325.

Display:
Integrated TFT LCD touchscreen displays L, W, H, weight, unit of measure, 2D and height profile, and diagnostic codes.

Outputs:
Serial (1), Ethernet (1), USB (1)

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Chapter 2
Setup

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This chapter provides instructions for assembling and setting up the CubiScan 325. Perform the steps to set up the CubiScan 325 in the following order:

- Unpacking (page 4)
- Placement (page 6)
- Assembly (page 6)
  - Removing the shipping material (page 7)
  - Placing the gate (page 8)
  - Placing the platform (page 9)
  - Attaching the touchscreen (page 10)
  - Loosening the gate stop (page 12)
- Connecting power (page 13)
- Turning the CubiScan 325 on (page 13)
- Connecting to a computer or network (optional) (page 14)
- Installing the Qbit software (optional) (page 20)

Unpacking

The CubiScan 325 is shipped in a crate with all components. The glass platform is packed in a separate cardboard box inside the crate.

Remove the glass platform from the box and place it in a safe location. The platform is in a protected cardboard box inside the top of the crate.

Remove the box of accessories packed on the side of the crate.
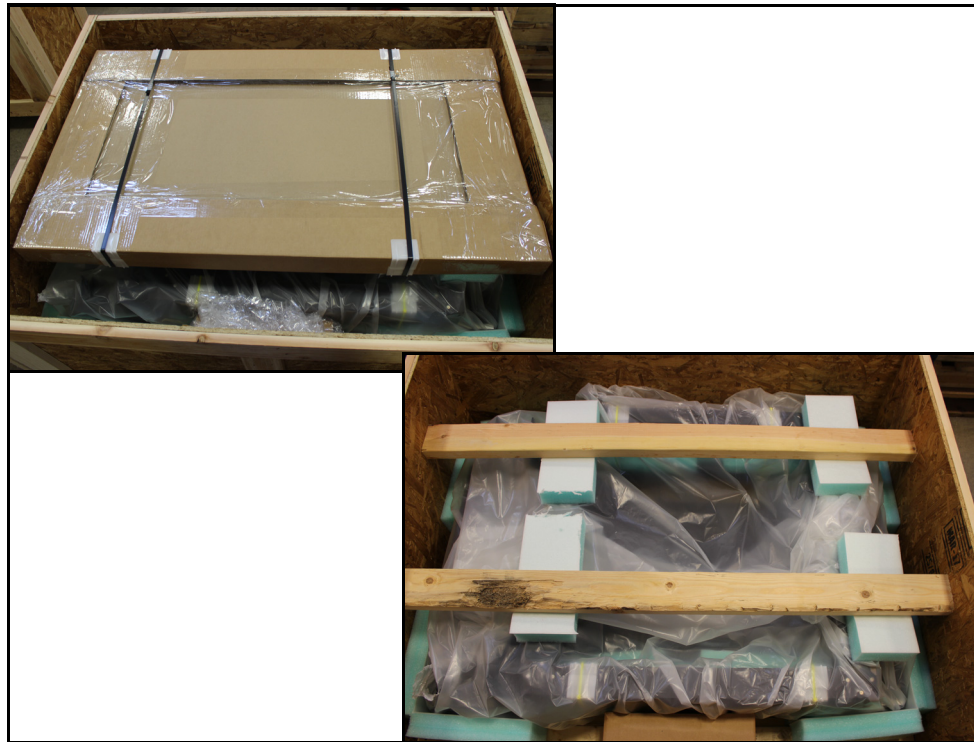
Figure 2
CubiScan 325 in Crate

Examine the container and the CubiScan 325 carefully for any damage. If, after unpacking, you discover any damage to the CubiScan 325, contact the carrier immediately.

Remove the wooden supports holding the CubiScan 325 in place.

Refer to the list below to identify the components.

- AC power cord
- Calibration Cube, 5" x 3" x 2"
- Ethernet cable
- Hardware (Phillips screws, load cell balls, T-handle pins, glass platform ball sockets)
- Touchscreen
- TRENDnet Ethernet adapter

If any of the components or accessories are missing or defective, contact Quantronix or your system integrator.

Lift the CubiScan 325 out of the shipping crate. It is best to have two people do this because the CubiScan 325 weighs about 173 lbs (78.5 kg) and may be awkward to handle.

Placement

The CubiScan 325 is designed to be operated in a warehouse environment; however, for proper operation the following conditions should be met if possible.

- Do not subject the CubiScan 325 to extremes in temperature or humidity. Locate the CubiScan 325 as far from open freight doors as possible. Heaters or air conditioners should not blow directly on the CubiScan 325.

- Avoid placing the CubiScan 325 in direct sunlight, as it may affect measurement readings.

- Protect the CubiScan 325 from static electricity, especially the touchscreen.

- Place the CubiScan 325 on a flat, sturdy surface as free from vibration as possible. Excess vibration can reduce the accuracy of the CubiScan 325 scale.

- The CubiScan 325's platform is free-floating—it is resting on four springs (load cells). Maintain a minimum of one-inch clearance at the back and sides of the CubiScan 325. Do not rest objects against or set objects on the CubiScan 325 when not in use.

- If a computer is used, place it as close to the CubiScan 325 as possible. The operator needs to use the keyboard or mouse on the computer while cubing and weighing packages using the CubiScan 325.

- Orient the CubiScan 325 so the touchscreen faces the operator.

Assembling the CubiScan 325

The CubiScan 325 is almost completely assembled when shipped.

- Place the base assembly of the CubiScan 325 on a stable surface. Make sure that the CubiScan 325 is level. Adjust the leveling feet located in each corner if necessary.

- An optional cart, custom-designed for the CubiScan 325, is available from Quantronix. If you purchased this cart, use the two T-handle pins to secure the CubiScan to the cart. See Figure 3.
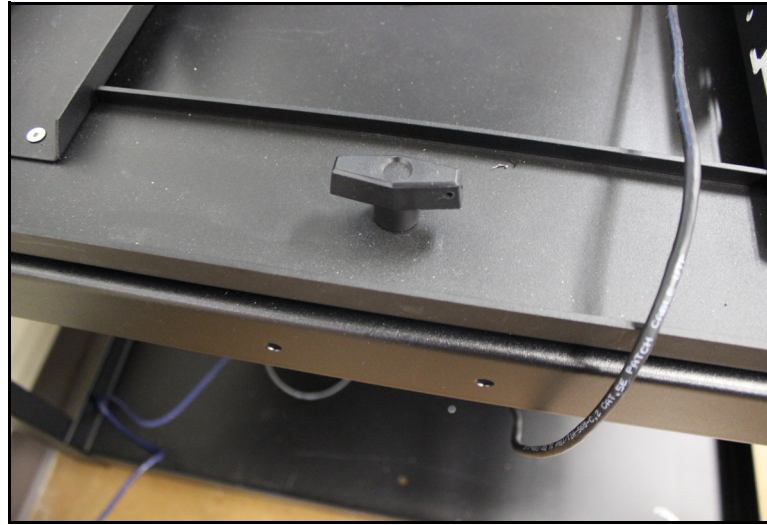
Figure 3
T-Handle

Removing the Shipping Material

1. Remove the zip ties holding the gate in place.
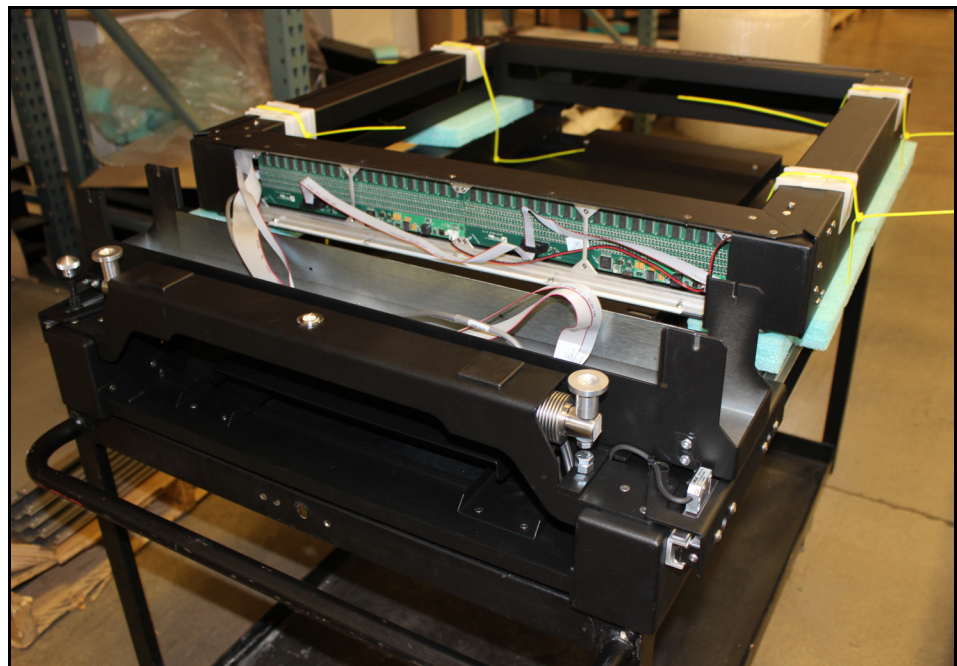
Figure 4
Gate Zip Ties

Placing the Gate

1. Use two people to carefully lift the gate up and place it in the gate tray; avoid pinching any cables. The front of the gate (the side with the handle attached), must face the front of the system. If this side of the gate is not in front, the CubiScan will not work properly.

2. Secure the gate to the gate tray using the eight Phillips screws provided. The four slot screws may already be screwed into the gate, if they are, you only need to screw four Phillips screws into place.
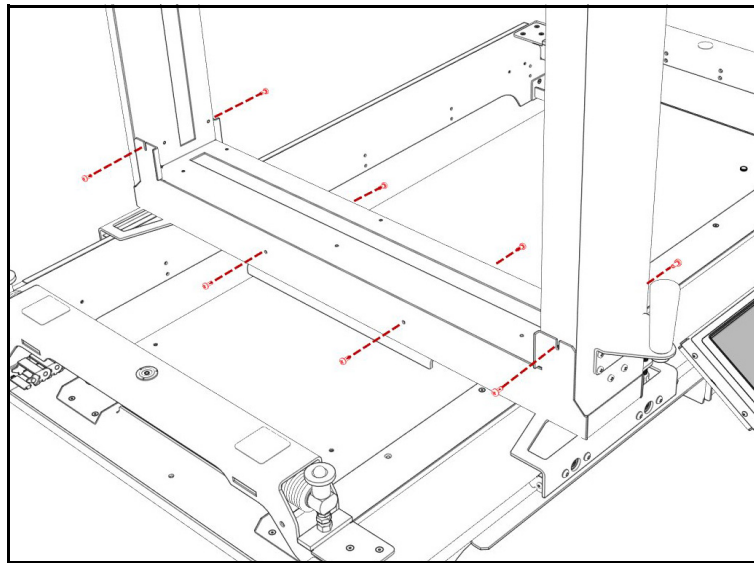
Figure 5
Gate Screws

Placing the Glass Platform

1. Place the four load cell balls in the load cell cups.
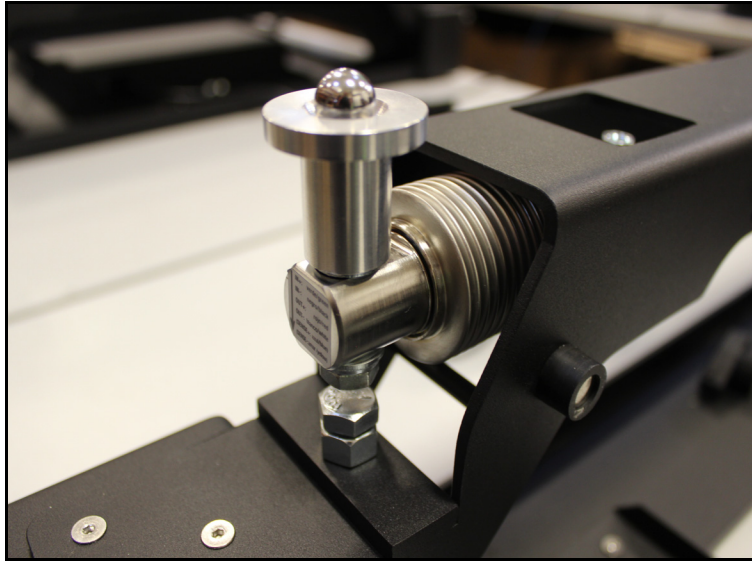
Figure 6
Load Cell Balls

2. Remove the glass cubing and weighing platform from the cardboard box that was in the shipping crate. You will need to screw the four ball sockets into place. Locate the ball sockets and 16 screws among the hardware provided. Screw the ball sockets in place as shown below.
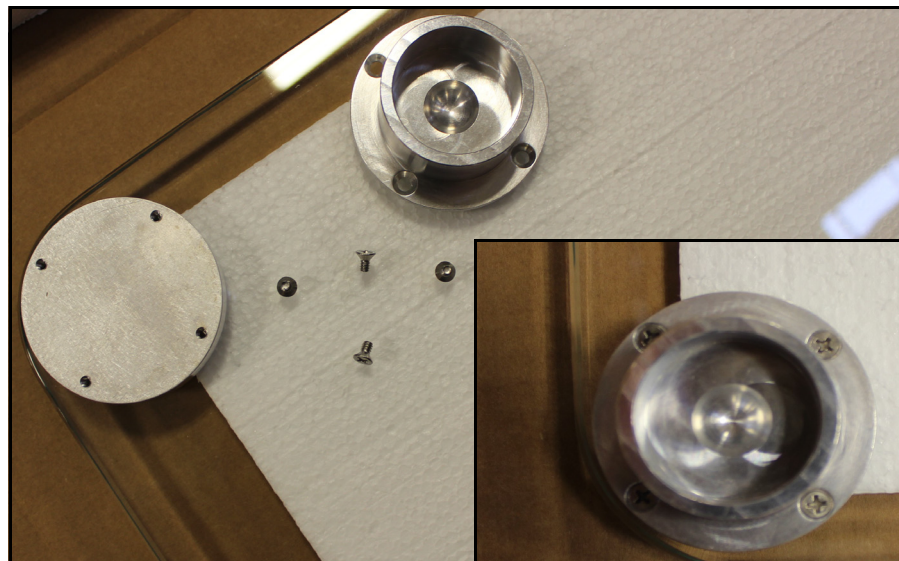
Figure 7
Glass Platform Ball Socket

3. Carefully place the glass platform on the load cells, as shown below. It is best to use two people to move the glass. Avoid placing excessive force or stress on the load cells.
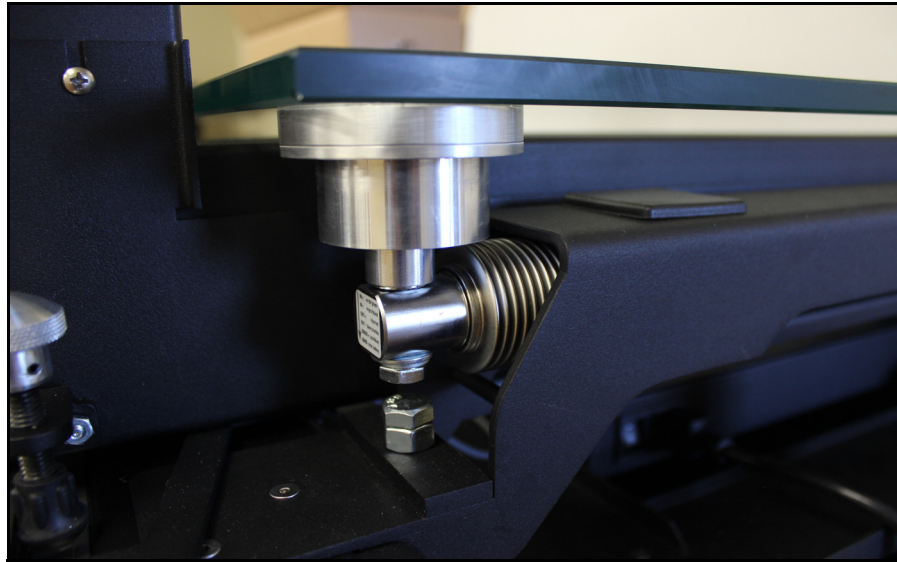
Figure 8
Glass Platform

Attaching the Touchscreen

1. Remove the two wing nuts from the back of the touchscreen.

Figure 9
Touchscreen Wing Nuts

2. Attach the touchscreen to the mount on the front of the CubiScan. Secure the touchscreen using the two wing nuts.
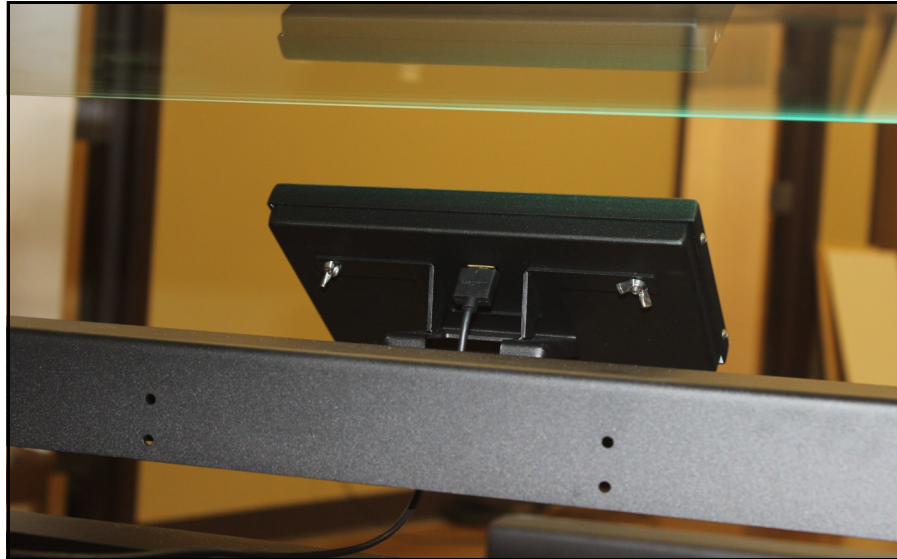
Figure 10
Touchscreen Attached

3. Plug the display cable into the back of the touchscreen.

Loosen the Gate Stop

1. Loosen the gate stop by turning it counter-clockwise. If you ever want to lock the gate in place, simply turn the gate stop clockwise until the gate no longer moves.
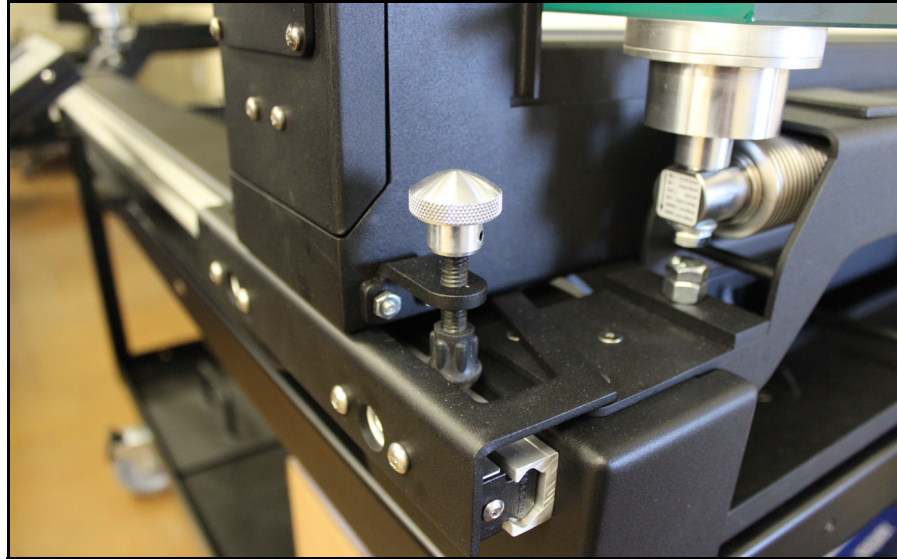
Figure 11
Gate Stop

Connecting Power

1. Locate the AC power cord (supplied), and connect it to the power connection on the right side of the controller box, as shown below.

Figure 12
Connecting Power

2. Route the AC power cord so it cannot be crushed, bent, or pulled loose.

3. Connect the other end of the AC power cord to a standard power outlet.

4. Use the power switch on the right side of the controller box (shown above) to turn the CubiScan 325 on and off.

NOTE ☞ *The CubiScan 325 should be powered on before running the Qbit program to cube and weigh packages.*

Turning On the CubiScan 325

Specific procedures must be followed each time you turn on the CubiScan 325, as follows:

1. Make sure there are no packages or other objects on the CubiScan 325 platform.

2. Make sure the gate is in the home position (right-hand side).

3. Turn on the CubiScan 325 with the power switch located on the right side of the controller box.

4. Zero the CubiScan 325. For instructions, See "Zeroing the CubiScan 325" on page 28.

The CubiScan 325 performs self-calibration and diagnostic procedures that take about 5 seconds. Do not touch the CubiScan 325 platform during these 5 seconds.

Connecting to a Computer or Network (Optional)

To connect the CubiScan 325 to a computer, do the following.

1. Place the computer close to the CubiScan 325. (Refer to "Placement" on page 6 for information.)

2. Remove the center cover by removing the two thumb screws located on the right-hand side of the cover. Slide the cover off to the left so that you can access the ports on the left side of the controller.

3. Locate the controller box. The controller box can be found beneath the measuring gate's home position (the right-hand side).

4. Choose from one of the following operating methods.

- Connect the CubiScan 325 to a host system via a standard 10/100Base-T Ethernet TCP/IP port. This is the recommended method and all parts needed to connect the CubiScan 325 to a computer via an Ethernet connection have been supplied by Quantronix. You may need to load the driver. To load the driver onto the computer follow the instructions on page 15. You can use Qbit software or the touchscreen options to configure the CubiScan 325 for TCP/IP communication. Contact Quantronix for information on available software. Or, refer to the Communications Protocol.

- Connect the CubiScan 325 to a PC using a USB cable (not provided) through the USB port on the controller box. You will need to load the USB driver to use this port. Follow the instructions on page 19 to load the driver.

- Connect the CubiScan 325 to a PC through the RS-232-C serial port on the controller box. Use the Qbit software on the computer to run the CubiScan 325.

- Operate the CubiScan 325 without a computer using the touchscreen. Refer to "Measuring/ Weighing Items" on page 26 for information.
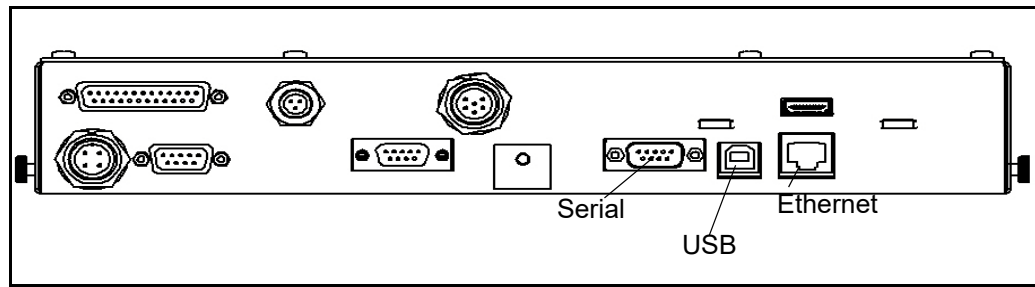

Figure 13
Ethernet, Serial, and USB Connectors

Connecting to a Computer via Ethernet

This section describes how to use Ethernet to connect a computer to the CubiScan 325 (recommended method).

For information on the Ethernet cable pin-outs, refer to "Ethernet (TCP/IP) Cable Pin Assignments" on page 2.

Use Quantronix's Qbit software (refer to the *Qbit User Guide*) or the touchscreen options (see Chapter 4 "Configuration") to configure the CubiScan 325 for TCP/IP communication. Contact Quantronix if you need additional assistance.

If you are using the Ethernet connection option:

1. Install the driver that is needed, for further information on installing the driver, see below.

2. Connect the Ethernet cable (supplied) to the CubiScan 325's Ethernet port, as shown in Figure 13.

3. Attach the Ethernet cable to the TRENDnet USB to Ethernet cable adapter (supplied).

4. Connect the TRENDnet cable adapter to the PC.

NOTE ☞   *The following screen images were taken from a Windows 7 operating system. Your screen images may appear different if you are using a different operating system.*

Installing and Configuring the Ethernet Driver

To install the Ethernet driver there are two options.

1. You can install the driver using the TRENDnet CD-ROM and User's Guide.

Or you can complete the following steps:

1. Plug the white TRENDnet USB to Ethernet adapter into the computer. The following bubble will appear in the bottom right corner of the screen.
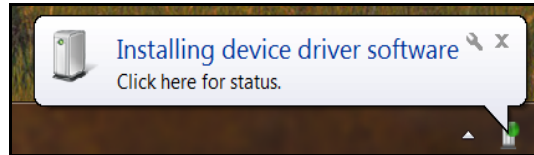
Figure 14
Installation Bubble

• Wait a few moments for the installation process to finish and the following bubble will pop up.
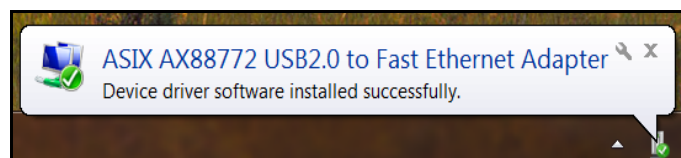
Figure 15
Device Installed Bubble

• If you clicked on the installation bubble, the following window will open.
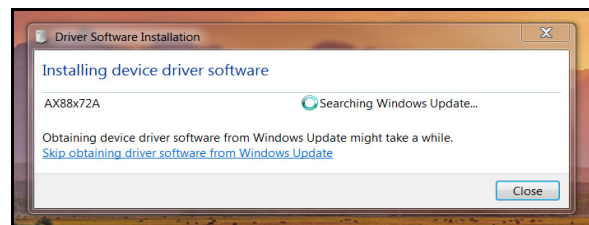
Figure 16
Installation Process Bubble

- Once the driver has finished the installation process it will report that the adapter is ready to use.
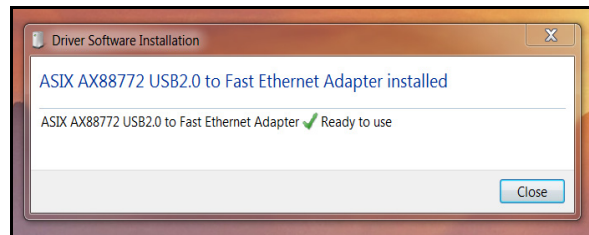
Figure 17
Adapter is Ready to Use

Access Ethernet Network Settings

Once the driver is installed you need to set the static IP address and the Subnet mask of the adapter. You can access these network settings by completing the following steps:

1. Under Control Panel > Network and Internet > Network and Sharing Center locate and click on the correct connection to bring up the status window.
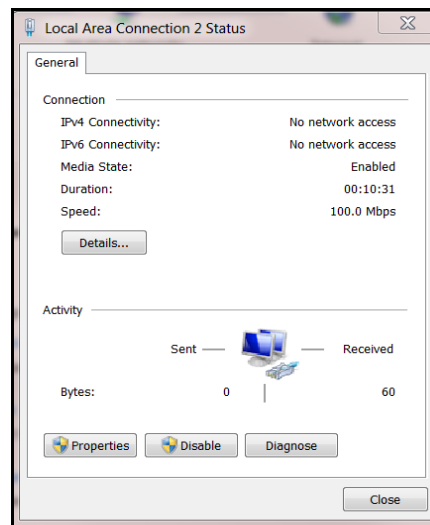
Figure 18
Status Window

2. Select **[Properties]**. Double click **Internet Protocol Version 4** to bring up the general properties window.
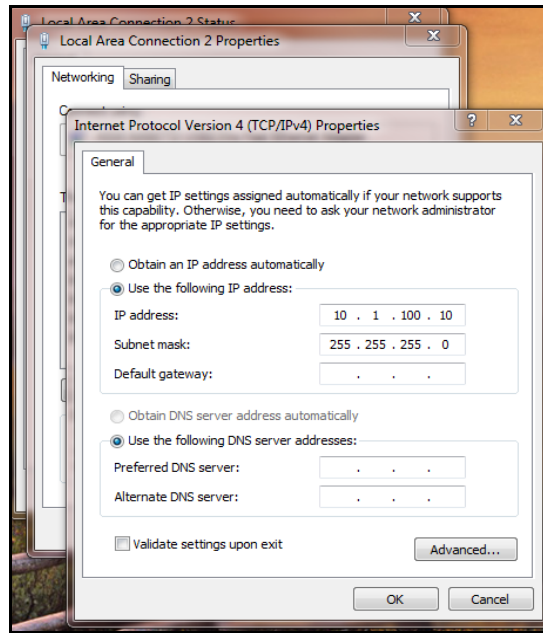
Figure 19
General Properties Window

From this screen you can set the IP address and Subnet mask. The recommended IP address setting is 10.1.100.10. The recommended Subnet mask setting is 255.255.255.0.

3. Click **[OK]** to exit when you are finished. Close any other remaining windows.

Once you have completed this setup process, the computer should communicate with the CubiScan 325.

Connecting to a Computer via USB

This section describes how to use a USB connection to connect a computer to the CubiScan 325.

If you are using the USB cable (not supplied) connection:

1. Connect the USB cable to the CubiScan 325's USB port located on the controller box, as shown in Figure 13.

2. Make sure that the proper driver has been installed on the PC (see below).

3. Connect the USB cable to the PC.

Installing and Configuring the USB Driver

You must install a driver on your computer before it can recognize and communicate with the CubiScan 325 via the USB port. Complete the following steps to install the driver.

1. With the CubiScan 325 turned on, connect the USB cable to your computer's USB port and to the USB port on the CubiScan 325.

    In the bottom right corner of the monitor, a bubble appears indicating that new hardware has been found.
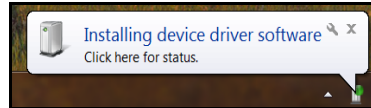
    The driver will be automatically installed. A notification bubble will pop up in the bottom right corner of the screen when the installation process is finished.

    If you are using Windows XP, the driver will need to be loaded manually.

2. To determine which COM port the computer has assigned to the USB port, go to Control Panel > Hardware and Sound.

3. Click on **Device Manager** to display the Device Manager window.
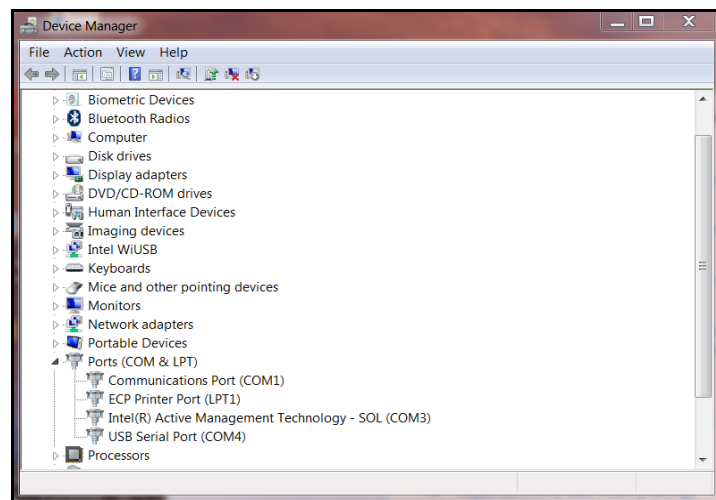
4. Click the arrow next to **Ports** to display the available ports. Locate the COM port assigned to the CubiScan 325. It will read **USB Serial Port**. This is the COM port you will use when setting up Qbit applications to communicate with the CubiScan 325. In this example, the CubiScan 325 was assigned to COM4.

5. Close the Device Manager and the System Properties window.

When it is turned on, the CubiScan 325 will recognize the cable connection and, if configured correctly, will respond to a connection request from the host.

For information on the USB cable pin-outs, refer to "USB Port Cable Pin Assignments" on page 3.

Connecting to a Computer via Serial (RS-232-C)

If you are using the RS-232 serial communications cable (not supplied), complete the following steps:

1. Route the RS-232 serial communications cable so it cannot be crushed, bent, or pulled loose. Make sure that the cable does not interfere with the scale.

2. Connect the serial cable to the CubiScan 325's serial port, as shown in Figure 13.

3. Locate a free RS-232-C serial port on your computer. Refer to your computer's documentation, if necessary, to identify the ports. If the serial port is 9-pin, connect the serial cable directly to the serial port. If it is 25-pin, use a 25-pin to 9-pin adapter (not supplied).

4. To secure the RS-232 serial cable, tighten both screws at each end of the cable. It is important that the cable be secure. For information on the serial cable pin-outs, refer to "Serial (RS-232-C) Cable Pin Assignments" on page 1.

Installing Qbit (Optional)

A flash drive is available containing the Qbit software program, which can be used to operate the CubiScan 325.

The *Qbit User Guide,* located on the drive, provides instructions for installing and using Qbit. You can also download the user guide from the Quantronix website at www.cubiscan.com.

Setup Checklist

Before using the CubiScan 325 for the first time, verify the following:

1. Have the CubiScan 325 and the computer (if applicable) been placed in the proper operating environment? (page 6)

2. Has the CubiScan 325 been fully assembled? (page 6)

3. Has all shipping material been removed? (page 7)

4. Is the CubiScan 325's glass platform free moving? The CubiScan 325 should not be pushed up against a wall and no object, cable, etc., should be resting on it or against it.

5. Has the Ethernet, RS-232, or USB cable been attached to the CubiScan 325 and the computer (if applicable)? (page 14)

6. Has the AC power cord been connected correctly? (page 13)

7. If you are using Qbit to operate the CubiScan 325, has the software been copied onto your computer's hard-disk drive? (Refer to the *Qbit User Guide* for information.)

8. Does the CubiScan 325 require recalibration? The CubiScan 325 was calibrated at the factory, but *may* require recalibration due to handling during shipping. Refer to page 41 for information on calibrating the CubiScan 325. If you are using Qbit software, check the status of the CubiScan 325 before operating it. Refer to the *Qbit User Guide* for information on checking the CubiScan 325's status.

Operation

This chapter provides instructions for operating the CubiScan 325.

NOTE ☞ *The CubiScan 325's glass platform should be kept clean and free of objects that are not being measured.*

Before You Begin

Follow the procedures below to turn on the CubiScan 325. The CubiScan 325 should be turned on before you start Qbit (if applicable).

1. Make sure there are no objects on the CubiScan 325's platform.

2. Make sure that the gate has enough room to move freely.

3. Turn on the CubiScan 325. The CubiScan 325 performs self-diagnostic procedures that take about 5 seconds. **Do not touch the CubiScan 325 platform during these 5 seconds**.

4. The CubiScan 325 must be zeroed each time it is turned on. For instructions on zeroing the CubiScan 325 see "Zeroing the CubiScan 325" on .

NOTE ☞ *Do not lean on or touch the CubiScan 325 glass platform or the object while the object is being measured and weighed. Any kind of contact with the platform during the measurement process can alter the weight or sensor reading.*

⚠ CAUTION	While the CubiScan 325 has overload protection, objects heavier than 50 pounds (25 kg) should not be placed on the platform. Overloading the scale or shock loading (dropping a heavy object on the scale) can cause permanent zero shift, making the scale inoperable.

CubiScan 325 Touchscreen

You can use the CubiScan 325 touchscreen (below) to configure and control the CubiScan 325 as well as display measurement results.
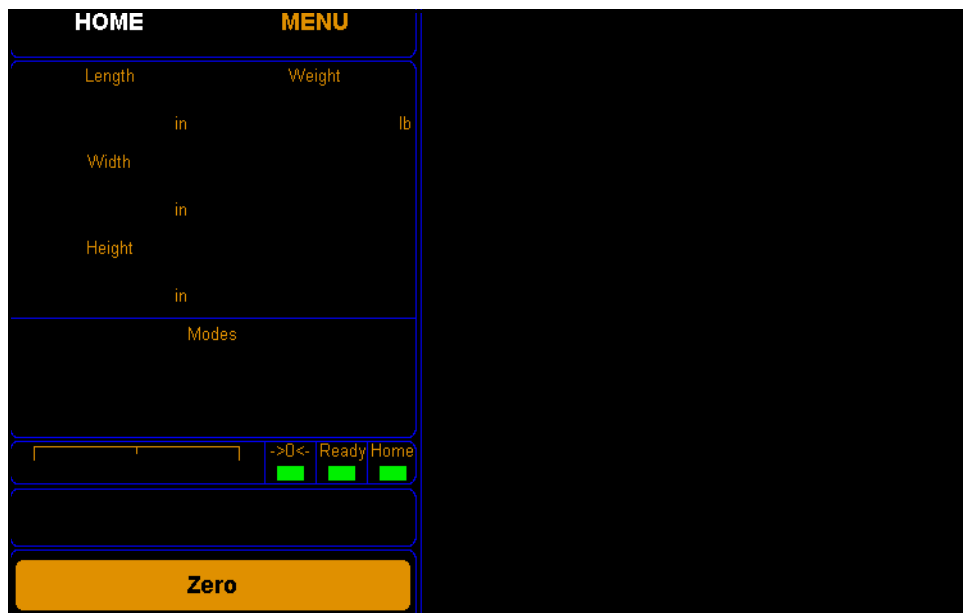
Figure 20
CubiScan 325 Touchscreen

All measurement, setup, and diagnostic information is shown on the touchscreen. You tap touch keys on the display to change the configuration and perform diagnostics.

• Tap a key to select a function.

• Tap **[Zero]** to "zero" the CubiScan 325 (see "Zeroing the CubiScan 325 on page 28).

• Tap **[Menu]** to select configuration or calibration functions.

Other touch keys may be used for specific functions and are described in the instructions for that function. Refer to Chapter 4 "Configuration" on page 29 for information on configuration and to "Diagnostics" on page 60 for information on diagnostics.

Touchscreen Care

Never use a sharp or hard-tipped object to tap on the touchscreen. It is glass and can scratch or break. You can tap lightly on the screen with your fingertip, or you can use the eraser end of a pencil or a stylus with a soft point. Use a light touch, just hard enough for the screen to respond.

To clean the touchscreen, moisten a soft cloth with water, then gently wipe the screen clean with the cloth. Do not spray liquid directly on the touchscreen.

Cubing and Weighing

The CubiScan 325 can be used to measure irregularly-shaped, opaque objects as small as 0.1 inch (refer to "Specifications" on page 2 for specifications and size limitations).

Objects are measured by the infrared light beams on the CubiScan 325's gate by moving the gate over the object on the platform.

Refer to the appropriate following section for instructions.

Cubing and Weighing Using Qbit

Refer to the *Qbit User Guide* for instructions on measuring, weighing, and other functions in Qbit. The *Qbit User Guide* is provided on the flash drive or you can download it from the Quantronix website at www.cubiscan.com.

Cubing and Weighing Using the Touchscreen

All controls and displays for the CubiScan 325 are shown on the touchscreen at the front of the base. If a computer is not connected, you can use the touchscreen to measure and weigh objects.

Measurement and weight results will only display when the CubiScan 325 touchscreen is displaying the home screen.

Figure 21
Measurement Display

Length Width Height	These display the measured dimensions in inches (in), centimeters (cm), or millimeters (mm) as selected.
Weight	This displays the measured weight in pounds (lb) or kilograms (kg) as selected.
->0<- (indicator)	This indicates that the scale is zeroed and ready to receive an object. This indicator must be lit before you can place an object on the platform. When you place an object on the platform, the indicator goes off.
Ready (indicator)	This indicates that the CubiScan 325 is ready for cubing and weighing.
Home (indicator)	This indicates that the measuring gate is positioned in the "home" position (on the right-hand side).
Zero (button)	Tap this key to reset the scale to "zero" (make sure the platform is empty). Refer to "Zeroing the CubiScan 325" on page 28.
Menu	Tap this key to go to the configuration menu to set up or calibrate the CubiScan 325.
Home	Tap this key to return to the home screen.

**Measuring/
Weighing Items**   Take the following steps to measure and weigh an item using the touchscreen. The measuring gate can measure opaque objects as small as .1 inch (2 mm). An image of the object is displayed on the touchscreen as it is measured.When you begin measuring with the measuring gate, you must start with the gate on the right side of the CubiScan 325, or home position (indicated by the **home** indicator on the touchscreen).

You can then use either of the following two methods to measure an object.

- Place the item anywhere on the glass platform. Starting with the measuring gate on the right side, or home position, move the gate over the object, and then move it back to the home position to complete the measurement.

- Place the item anywhere on the glass platform. Move the gate past the item that you are measuring to complete the measurement. You can then remove the item, place another item on the platform, and measure the new item by moving the gate over it.

1. Verify that the CubiScan 325 scale is at zero. The **zero** indicator should be lit.

2. Place the object on the glass platform. The **zero** indicator light will go out.

NOTE ☞   *Do not lean on or touch the CubiScan 325 platform or the object while an object is being measured. Any kind of contact with the platform during the measurement process can alter the weight or sensor reading.*

3. Using one of the gate movement methods described above, move the measurement gate slowly using the handle. If the measurement was successful the length, width, height, and weight of the object are displayed.

4. Remove the object from the platform. Wait for the **zero** indicator to light before placing the next object on the platform.

5. If the **zero** indicator does not light, it means that the CubiScan 325
    needs to be zeroed. To zero the scale, make sure that the platform is free
    of all objects, then tap **[Zero]**.

Figure 22
Measuring Gate

NOTE ☞   *Do not move the gate too quickly across the platform. A gate speed error is
displayed on the touchscreen if you move it too quickly.*

A two-dimensional image of the object shows the top-down view of the
object. An image of the side view of the object appears below the image
of the top-down view. The length, width, height, and weight are
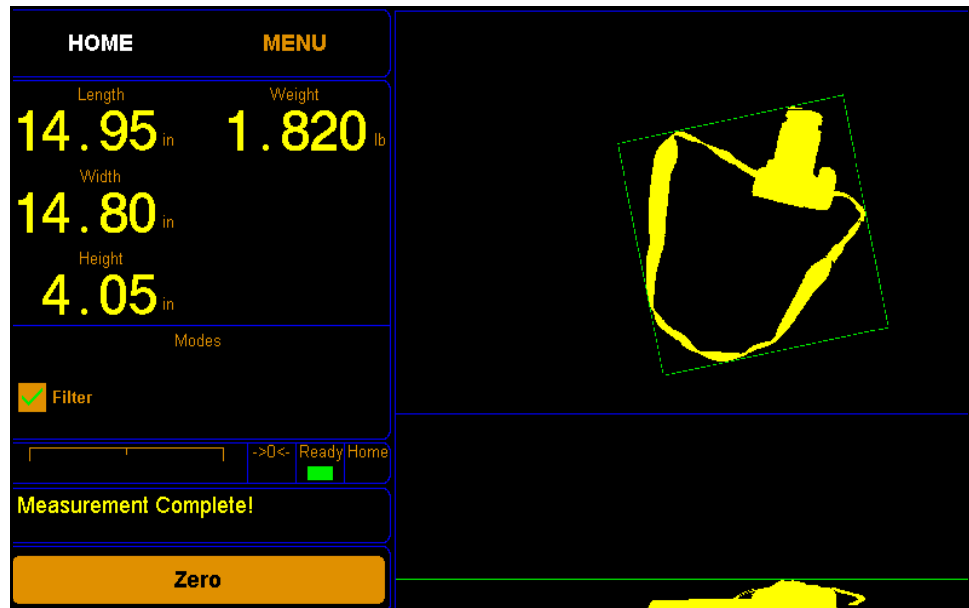displayed on the touchscreen.

Figure 23
Measuring Gate Display

Zeroing the CubiScan 325

Tap the **[Zero]** button on the touchscreen to "zero" the CubiScan 325 (set all empty measurements and weight to zero). The weight when the platform is empty must be set to zero for the CubiScan 325 to operate properly. The CubiScan 325 tries to zero itself automatically. However, you may need to use this option in the following circumstances.

- If, during a long measuring session, environmental conditions (temperature and humidity) have changed noticeably.

- If you suspect that the last zeroing was in error (something was on the platform).

NOTE ☞   *Make certain that the platform is free of all objects before using Zero. If not, the zero reading will not be accurate.*

Chapter 4
Configuration

This chapter provides instructions for using the CubiScan 325 touchscreen to set up the length, width, and height measurements, as well as special features that the CubiScan 325 offers. This chapter also provides instructions for configuring the units, dimensional weight factor, com port, and other settings. For information on calibrating the CubiScan 325 gate, touchscreen, or scale, refer to Chapter 5 "Calibration".

If you have a computer connected to the CubiScan 325 with Qbit installed, you can use Qbit to set up the measurement and dimensional weight units, select the CubiScan 325 communications port, perform calibration, and other functions. Refer to the *Qbit User Guide* for instructions on measuring and other functions in Qbit. The *Qbit User Guide* is provided on the flash drive with the Qbit application, or you can download it from the Quantronix website at www.cubiscan.com.

System Configuration

The following options can be used to configure your CubiScan 325. The options available on the configure menu are Operation, Units, Ethernet, and Other.

Operation

This section discusses the options available on the Operation menu. Complete the following steps to access the Operation menu.
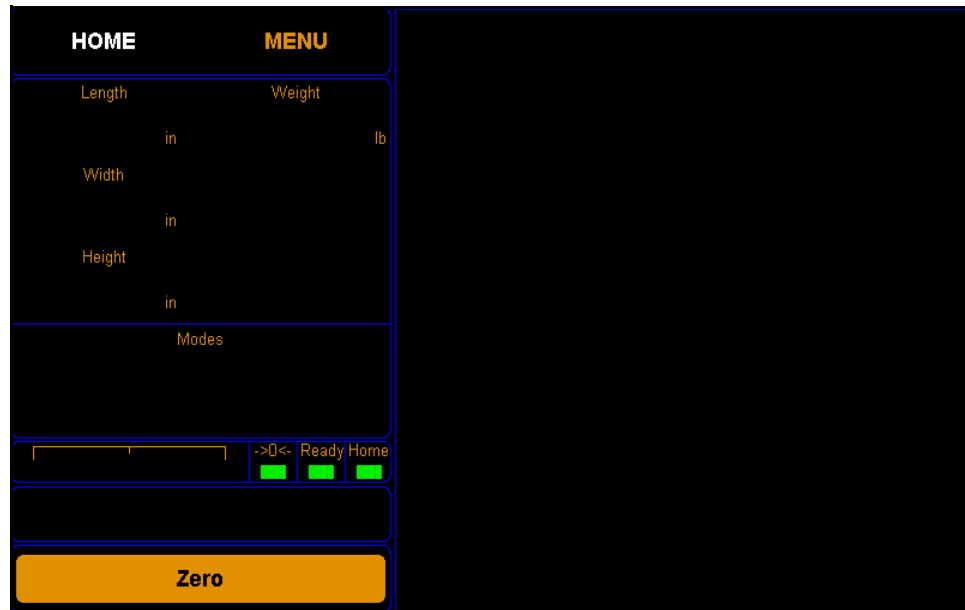
1. From the home screen, tap **MENU**.

Figure 24
Home Screen

NOTE ☞ *If you have set up a password previously in the system configuration, you need to enter the password to unlock the menu. Refer to page 33.*

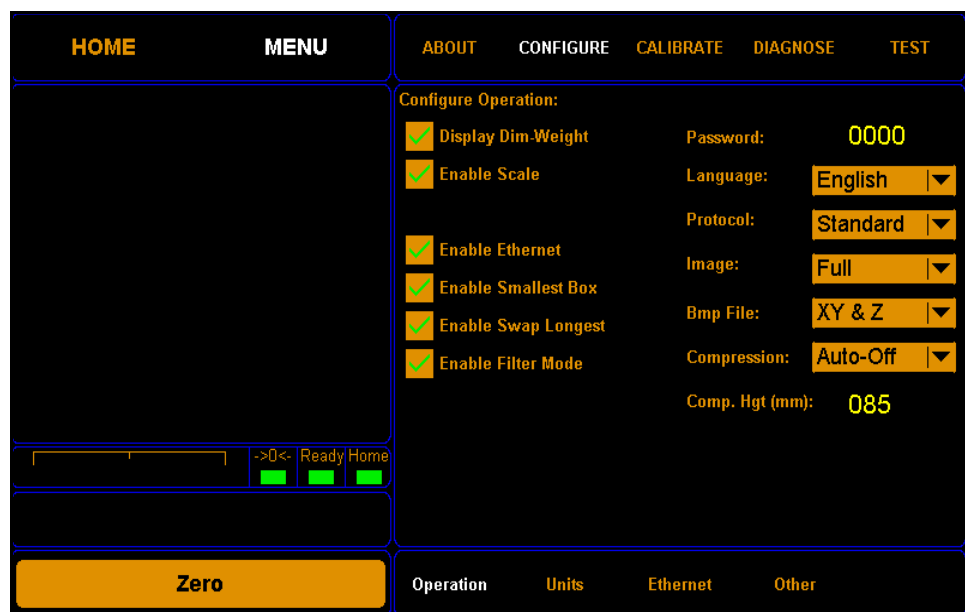2. Tap **CONFIGURE**. Select the Operation option if it is not already selected.

Figure 25
Configure Operation

Display Dim Weight Check this box if you want the dim weight and factor to be displayed on the home screen.

Enable Scale Check this box if you want to enable the CubiScan 325's scale. If this box is not checked, weight will not be reported on the home screen or sent in the data packet.

Enable Ethernet Check this box if you want to enable Ethernet communication.

Enable Smallest Box Check this box if you want to enable the smallest box mode. This mode boxes items into the smallest box possible, the placement of the item on the platform makes no difference. Turning off the smallest box mode measures items depending on their placement on the platform.

The images below illustrate the difference between having the smallest box mode on or off.
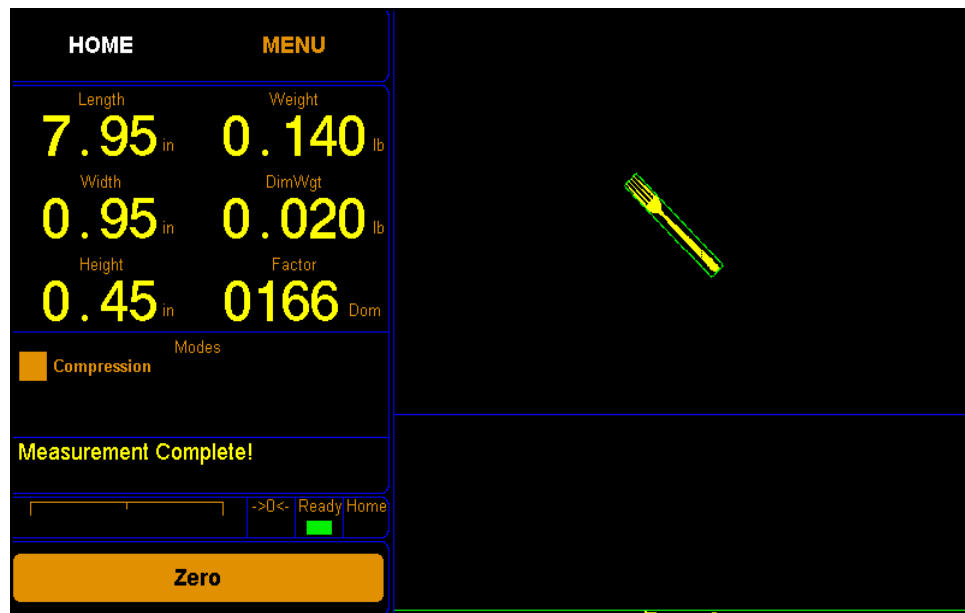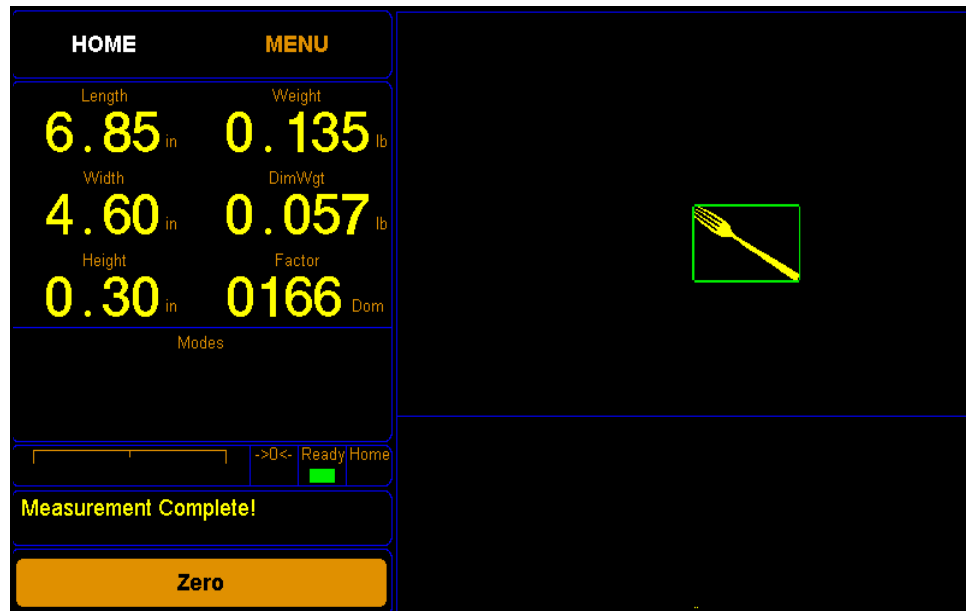

Figure 26
Smallest Box Mode On

Figure 27
Smallest Box Mode Off

Enable Swap Longest	Check this box if you want to enable the Swap Longest feature. This feature will automatically report the longest dimension as the length.
Enable Filter	Check this box if you want the filter mode option available on the home screen. You can then enable or disable the filter mode from the home screen. In this mode the CubiScan 325 measures only the largest item that is on the platform (the item that takes up the most pixels). Height is not taken into account. As shown below, the largest item's measurements are displayed even though it is not the tallest item. Items that were excluded

from the measurement process are shown in red while the item that was measured is shown in yellow.
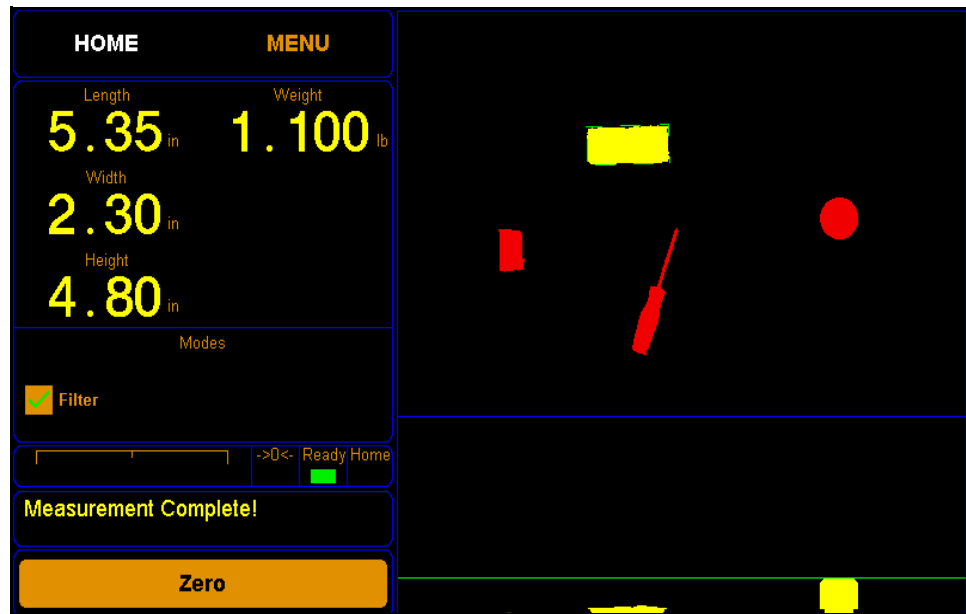

Figure 28
Filter Mode On

Password: In this field you can enter a four-digit password. If you set up a password, it must be entered each time you try to access any of the menu screens (except for the About menu).

Language: From this drop-down box you can select which language is used. The options are: English, French, and Spanish.

Protocol: From this drop-down box you can select which protocol is used. The options are: Standard, Expanded, CS 100-L, and Custom.

The Standard option is the default and works the best with Qbit software.

The Expanded option includes more information in the data packet, such as the packet number and date and time.

The CS 100-L option makes the data packet backwards compatible with the CubiScan 100-L.

The Custom option allows the use of a custom communication protocol file that has been saved on the SD card.

Image: From this drop-down box you can select your image transfer type. The options are: Full and Compact.

Bmp File: From this drop-down box you can select your Bmp file type. This controls the XY and Z image options that may be downloaded. The CubiScan 325 measures more quickly with this option disabled. The options are: Disabled, XY, and XY & Z.

Compression: From this drop-down box you can select your preferred compression mode option. This mode weighs down items such as apparel or books in order to get a more accurate measurement of the height. The options are: Disabled, Enabled, and Auto-Off.

When you select the Disabled option, the compression feature is disabled.

When you select the Enabled option, a Compression checkbox appears on the home screen. Compression mode can then be enabled or disabled from the home screen.

When you select the Auto-Off option, a Compression checkbox appears on the home screen. With this option selected, you can measure an object in compression mode once, then compression mode is automatically turned off. Compression mode can easily be turned on again with the compression checkbox on the home screen, though it will automatically turn off after each use.

Complete the following steps to measure an object in compression mode.

Figure 29
Compression Mode

1. After you have enabled the Compression check box, place the item on the glass platform with the compression plate on top.

2. Move the gate slowly across the object. You will then be prompted to remove the compression plate and set it aside.

3. Complete the measurement by moving the gate back across the item. The end result shows the actual weight of the item that was measured. The red line shows the compressed height of the item and the green line shows the actual height. The height figure that is reported is the compressed value.

Comp. Hgt (mm): This field displays the height of the compression plate in millimeters. The default setting for this field is 085, the height of the compression plate that Quantronix can provide. This value should not be changed unless you are using a different compression weight. To change the tare value simply tap on the number and enter the new value.

Units

This section discusses the options available on the Units menu. Complete the following steps to access the Units menu.

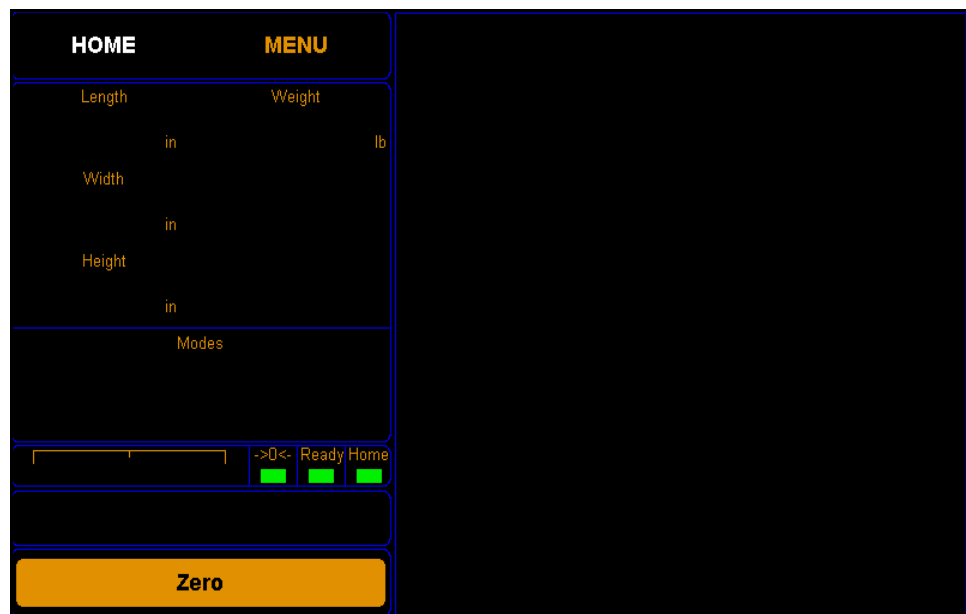1. From the home screen, tap **MENU**.

Figure 30
Home Screen

NOTE ☞   *If you have set up a password previously in the system configuration, you need to enter the password to unlock the menu. Refer to* .

2. Tap **CONFIGURE**. Select the Units option if it is not already selected.
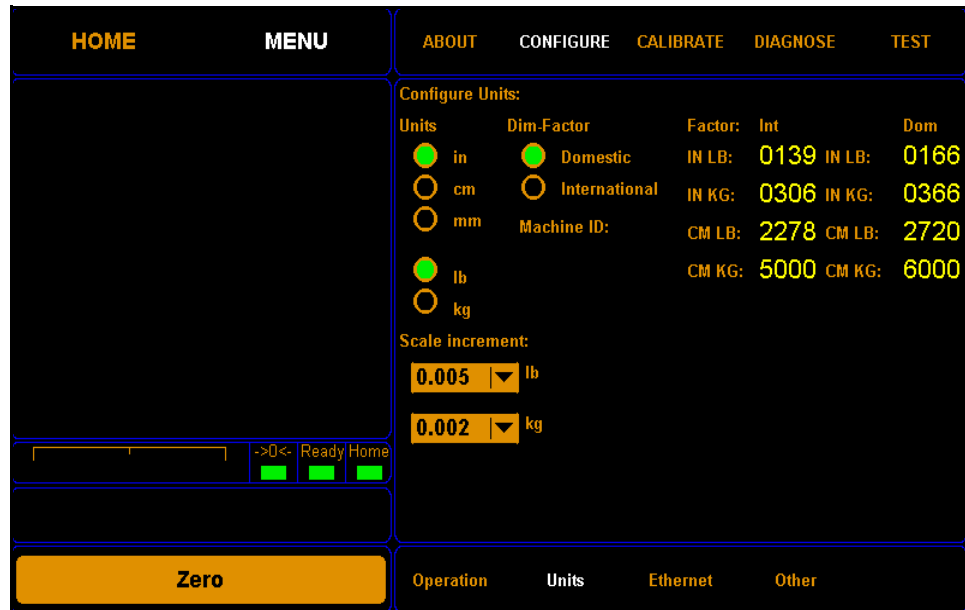

Figure 31
Configure Operation

Units   In this field you can select the units that will be used. The options are inches (in), centimeters (cm), millimeters (mm), pounds (lb), or kilograms (kg).

Scale Increment   In this drop-down box you can select the accuracy of the scale in pounds or kilograms. The options for pounds are 0.005, 0.01, or 0.02. The options for kilograms are 0.002, 0.005, or 0.01.

Dim-Factor   In this field you can select the dim factor that will be used. The options are domestic and international.

Factors   In these fields you can view or change the current dim factor values.

The following table displays the default dimensional weight factors used by the CubiScan.

139	International:	inches, pounds (in lb)
166	Domestic:	inches, pounds (in lb)
306	International:	inches, kilograms (in kg)
366	Domestic:	inches, kilograms (in kg)
2278	International:	centimeters, pounds (cm lb)
2720	Domestic:	centimeters, pounds (cm lb)
5000	International:	centimeters, kilograms (cm kg)
6000	Domestic:	centimeters, kilograms (cm kg)

Ethernet

This section discusses the options available on the Ethernet menu. Complete the following steps to access the Ethernet menu.

1. From the home screen, tap **MENU**.

Figure 32
Home Screen

NOTE ☞   *If you have set up a password previously in the system configuration, you need to enter the password to unlock the menu. Refer to* page 33.

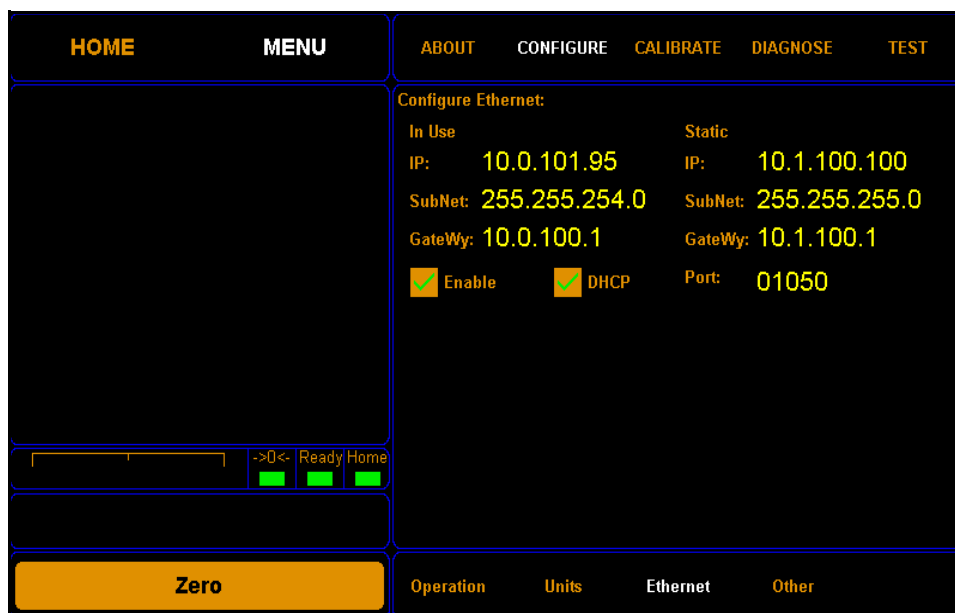2. Tap **CONFIGURE**. Select the Ethernet option if it is not already selected.

Figure 33
Configure Operation

In Use

This section describes the various settings and options of the Ethernet in use.

IP   This is the static IP address.

SubNet   This is the subnet mask.

GateWy   This is the gateway setting.

Enable   Check this box to enable the in use Ethernet.

DHCP   Check this box to enable the DHCP.

Static

This section describes the various settings and options of the static Ethernet.

IP   This is the current IP address.

SubNet   This is the current subnet mask.

GateWy   This is the current gateway setting.

Port   This is the current port setting.

Other

This section discusses the options available on the Other menu. Complete the following steps to access the Other menu.

1.   From the home screen, tap **MENU**.

Figure 34
Home Screen

NOTE ☞   *If you have set up a password previously in the system configuration, you need to enter the password to unlock the menu. Refer to page 33.*

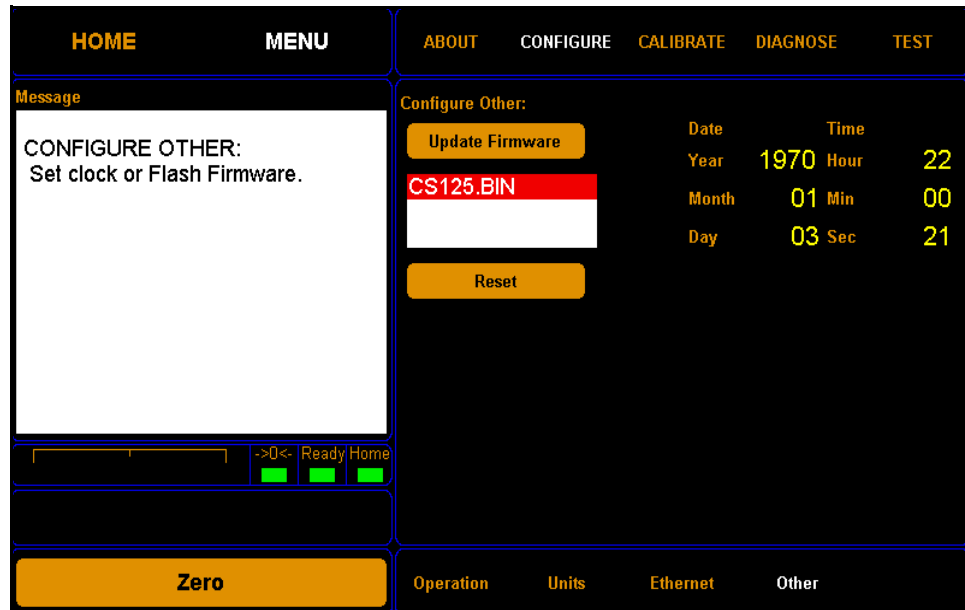2. Tap **CONFIGURE**. Select the Other option if it is not already selected.

Figure 35
Configure Other

Update Firmware	Tap this button to update the firmware. The field below the button displays all firmware files that are saved on the SD card. If you would like to update the CubiScan 325 to a certain firmware file, select it in the list displayed and tap **[Update Firmware]**.
Reset	Tap this button to reboot the system after updating the firmware. The system must be rebooted each time the firmware is updated.
Date/Time	This displays the current date and time.

Chapter 5

Calibration

This chapter provides instructions for calibrating the CubiScan 325 touchscreen, measurement gate, and scale (load cells). The CubiScan 325 is calibrated at the factory; however, some circumstances in which recalibration may be required include the following:

- Calibrate the touchscreen if you have trouble making selections on the screen.
- Calibrate the CubiScan 325 if you have problems cubing and weighing after assembly and setup.
- Calibrate the CubiScan 325 if it is subjected to any type of mechanical shock or collision with a heavy object.
- Calibrate the CubiScan 325 as part of a regular maintenance schedule. Calibration of the scale is recommended at least annually. If the CubiScan 325 is used heavily, scale calibration should be performed monthly.
- Perform quality checks as needed, depending on how critical the accuracy of the data is to you. Recalibrate if you are outside the tolerance of +/- 0.05 inches (+/- 0.1 cm) for the gate or +/- 0.010 pounds (+/- 0.005 kg) for the scale.

During quality checks or when calibrating, make sure that the CubiScan 325 is not affected by external forces that may affect readings, such as sunlight or fans.

Before You Begin

Before calibrating the CubiScan 325, remove all items or other material from the platform and blow any dust off the measurement sensors. Refer to page 50 for information on cleaning the sensors.

NOTE ☞ *The following sections provide instructions for calibration using the CubiScan 325's touchscreen. For instructions on calibrating the CubiScan 325 using Qbit, refer to the Qbit User Guide.*

Calibrating the Scale

To perform the calibration, you will need the following:

- Official test weight up to 50 pounds (25 kg) (it is recommended that you calibrate with the maximum weight)

IMPORTANT: Do not begin scale calibration until you have the test weight. Calibrating without an accurate known weight (within .01 of a lb/kg) can make all future weight readings inaccurate.

Take the following steps to calibrate the CubiScan 325 scale.

NOTE ☞   *When calibrating the scale, the CubiScan 325 must be stable with no movement of the platform such as that caused by vibration or air movement.*
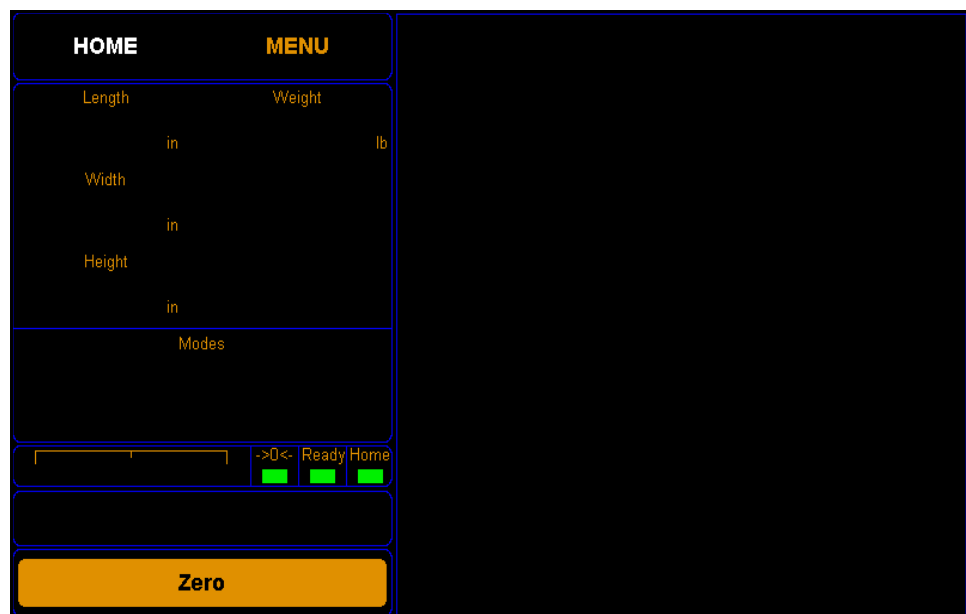
1. At the home screen, tap **MENU**.

Figure 36
Home Screen

NOTE ☞   *If you have set up a password previously in the system configuration, you need to enter the password to unlock the menu. Refer to page 33.*

2. Tap **CALIBRATE**. Select the Scale option if it is not already selected. Make sure the weight units displayed are correct for the test weight you are using. Tap **[Next]** to begin the scale calibration.
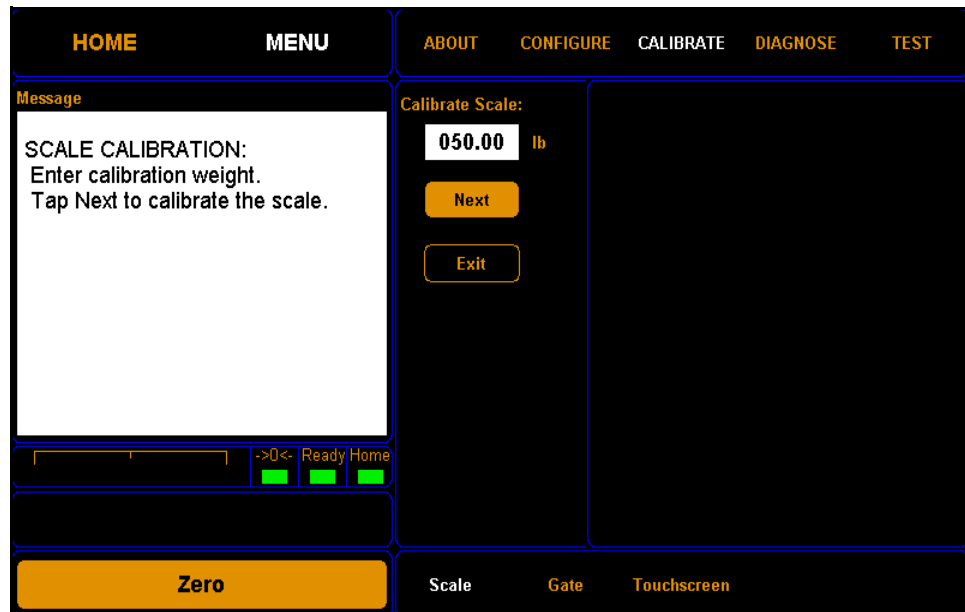

Figure 37
First Scale Calibration Screen

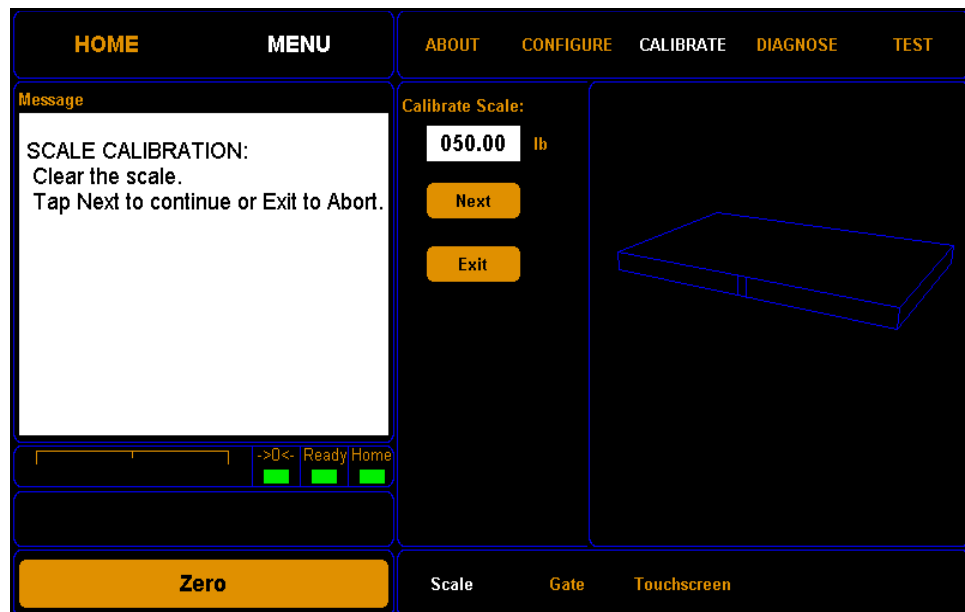3. The following screen is displayed. Clear the scale of all objects, and tap **[Next]** to continue.

Figure 38
Second Scale Calibration Screen

4. Place the calibration weights on the CubiScan 325 platform. Tap **[Next]** to continue.
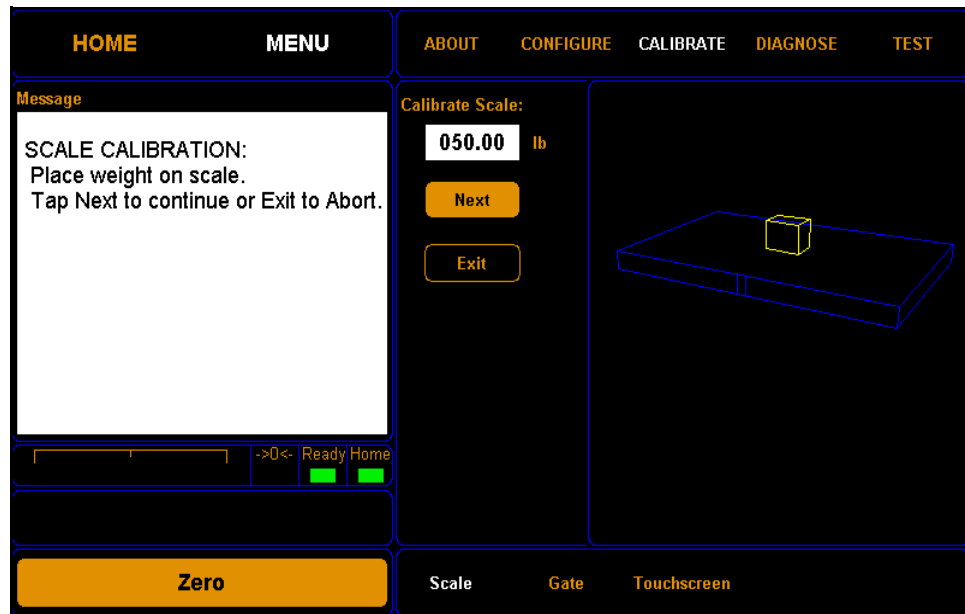

Figure 39
Second Scale Calibration Screen

5. You have now finished calibrating the scale. Tap **HOME** to return to the home screen or if you would like to try calibrating the scale again, tap **[Next]**.
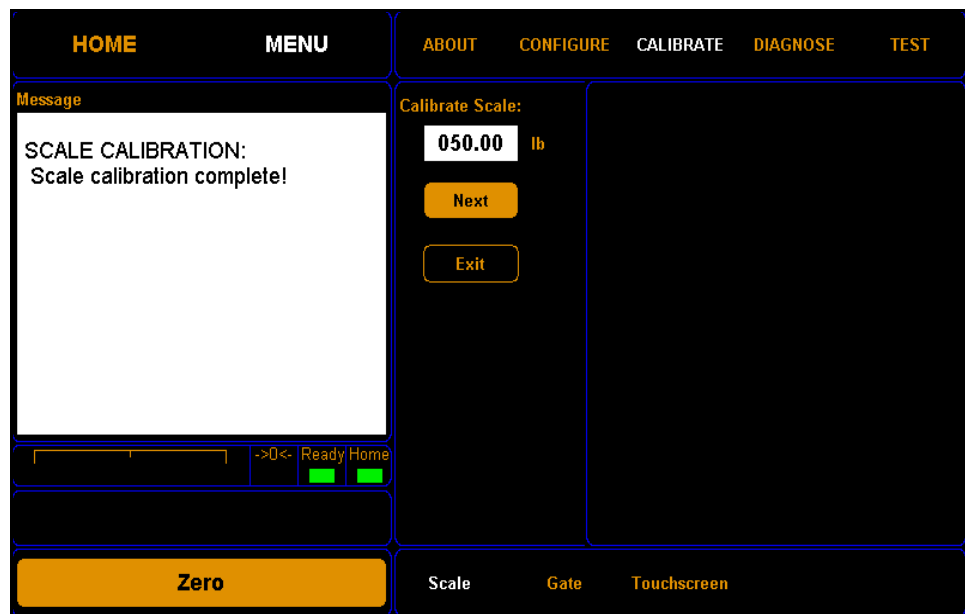

Figure 40
Scale Calibration Complete

Calibrating the Gate

To calibrate the gate using the touchscreen, proceed as follows.
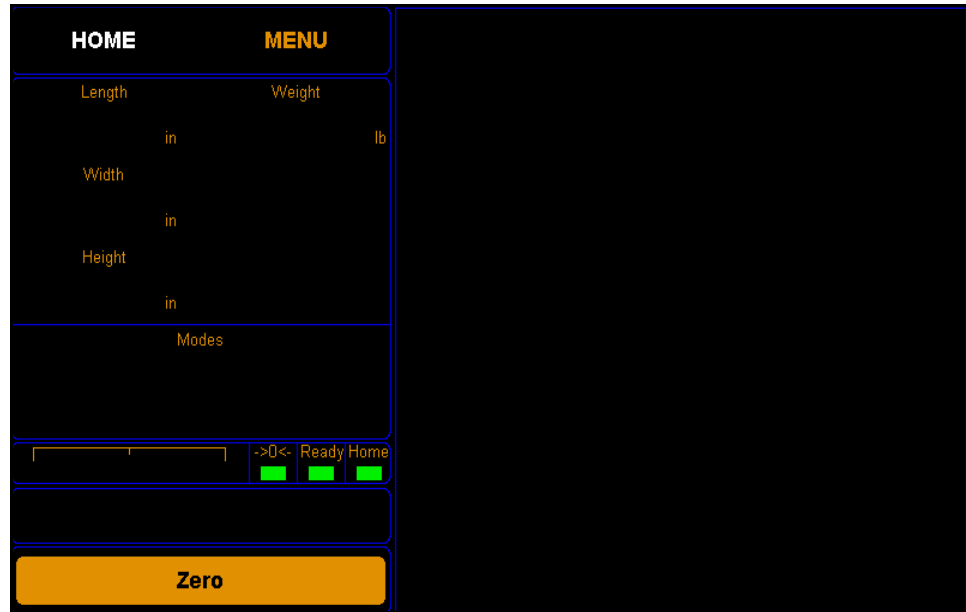
1.   Tap **MENU** at the home screen.

Figure 41
Home Screen

NOTE ☞   *If you have set up a password previously in the system configuration, you need to enter the password to unlock the menu. Refer to page 33.*

2.   Tap **CALIBRATE**. Select the Gate option if it is not already selected.
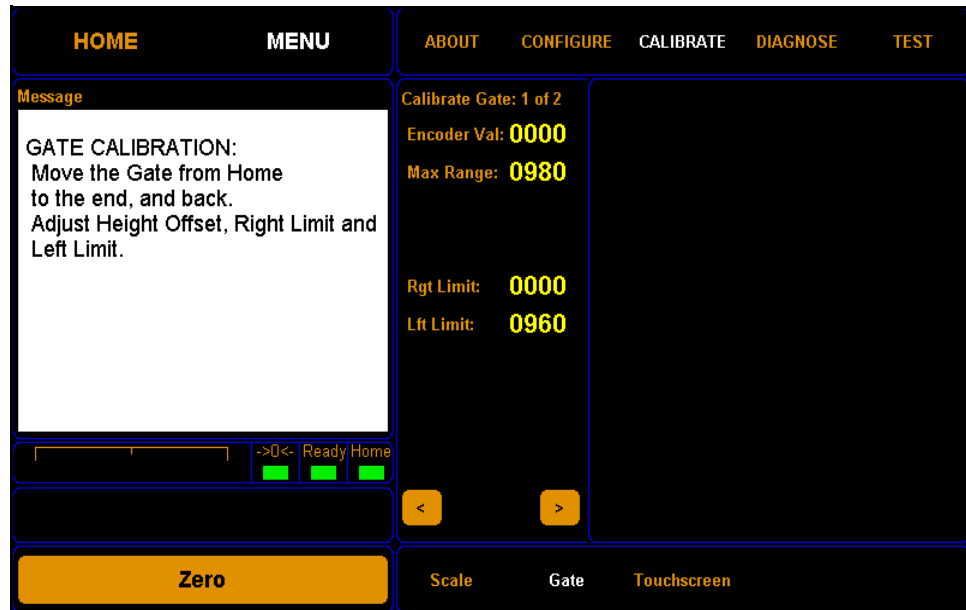

Figure 42
First Gate Calibration Screen

The encoder val field shows the movement of the gate and should read between 0940 and 0930 when the gate is the furthest from the home position. The max range value should be set a little lower than the highest encoder val.

From this screen you can set the measurement window for the CubiScan 325 using the left and right limit fields.

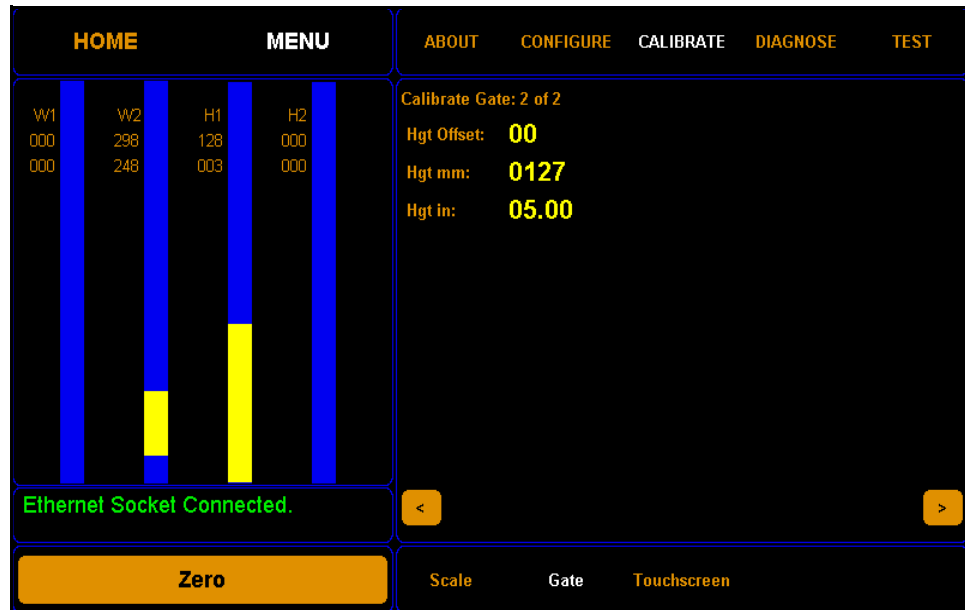3.   Tap the **[>]** button to go to the next screen.

Figure 43
Second Gate Calibration Screen

From this screen you can adjust the height offset field. Adjust the height offset only if your height measurements are inaccurate.

To adjust the height offset, complete the following steps.

Step 1.0   Place the calibration cube in the gate measurement field with the long side (the five inch side) upwards. The **Hgt in** field will display the current height in inches.

Step 1.1   Click on the **Hgt Offset** field to adjust the height offset. Adjust this field until the **Hgt in** field reads as close to 5.00 inches as possible. The height offset value may be slightly different for each CubiScan.

Calibrating the Touchscreen

If you are having problems selecting functions on the touchscreen, you may need to recalibrate it. You should recalibrate any time it becomes difficult to select options on the screen.

Take the following steps to calibrate the touchscreen.
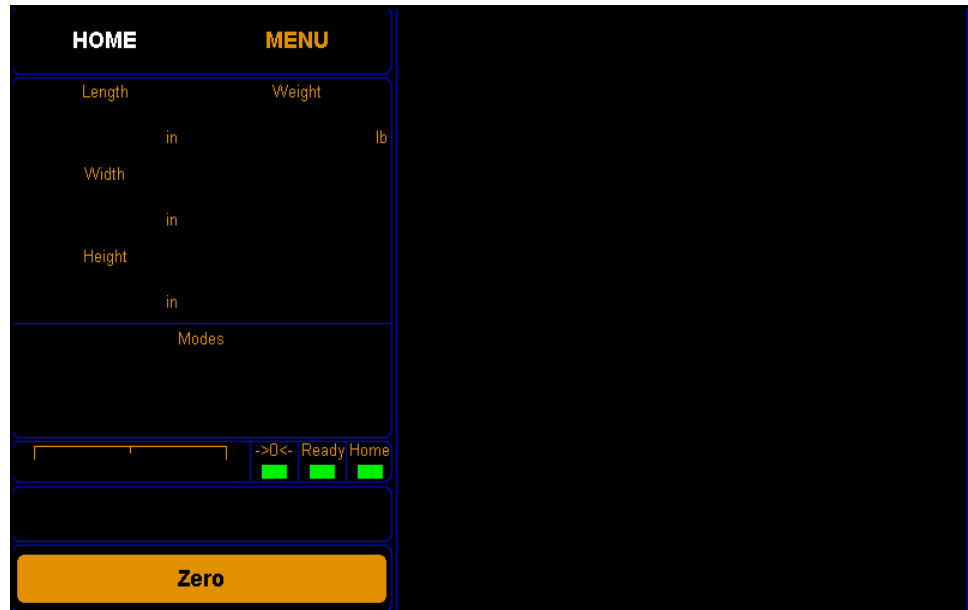
1. Tap **MENU** at the home screen.

Figure 44
Home Screen

NOTE ☞   *If you have set up a password previously in the system configuration, you need to enter the password to unlock the menu. Refer to page 33.*

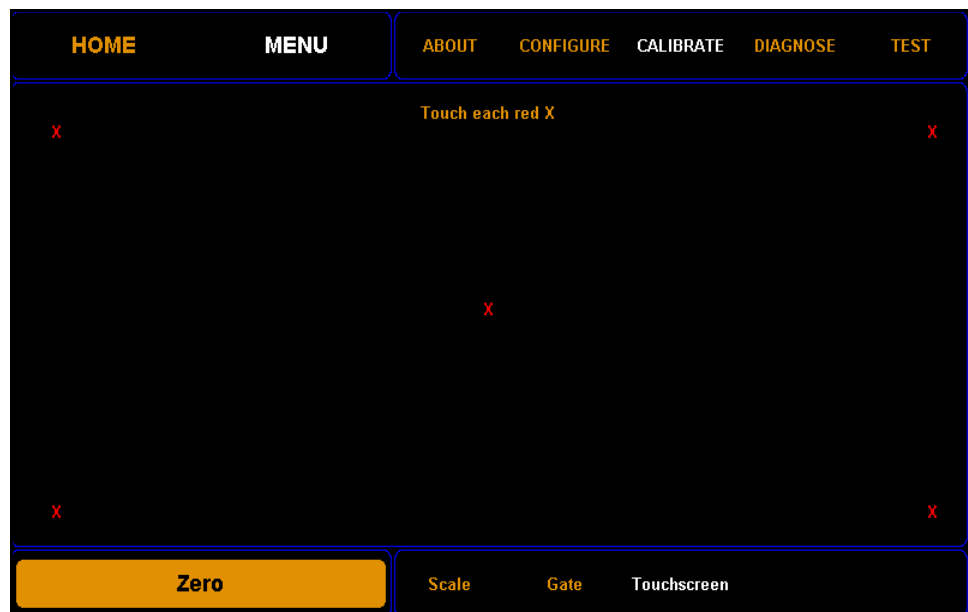2. Tap **CALIBRATE**. Select the Touchscreen option if it is not already selected.

Figure 45
Touchscreen Calibration

3. Using a stylus or your finger, touch the center of each **x** on the screen until the "x" turns green. There are five calibration points on the screen.

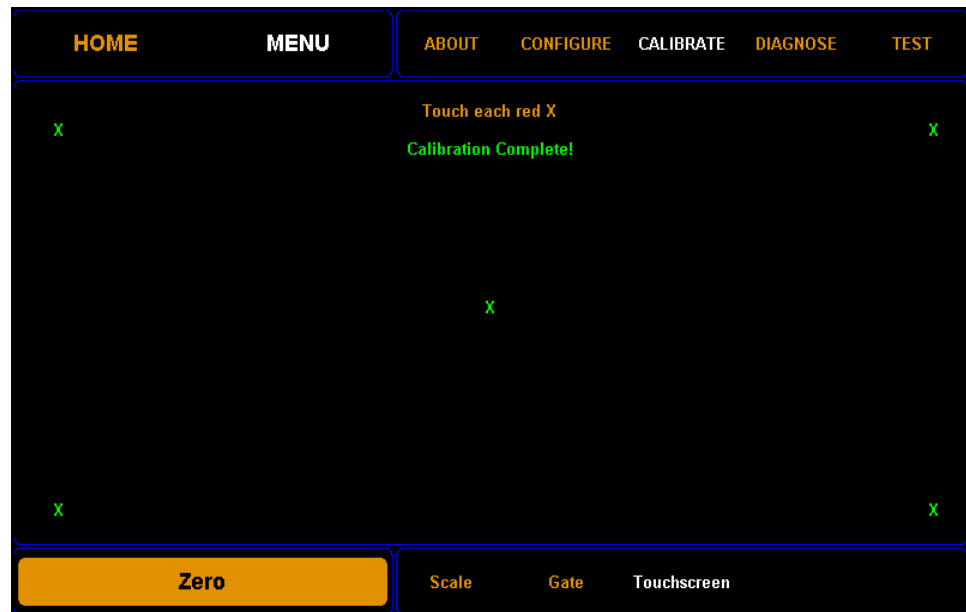Figure 46
Touchscreen Calibration

4. When all the **x**'s are green, the calibration is complete.

Chapter 6
Maintenance

This chapter provides information on the care and maintenance of the CubiScan 325. Routine maintenance and careful handling will help keep the CubiScan 325 in good operating condition and prevent service calls or repairs.

Precautions

The CubiScan 325 should not be subjected to extremes in temperature or humidity, nor should it be subjected to excessive vibration. For environmental recommendations, see "Placement" on page 6.

Do not put packages on the platform that are known to be over 50 pounds (25 kg). All objects, especially heavy ones, should be placed on the platform gently. Shock loading will occur if an object is dropped or thrown onto the platform. This puts unnecessary and potentially damaging pressure on the load cell.

The CubiScan 325 has been designed to accept overload without damage. However, rough handling and abuse, over time, can cause the load cell to lose much of its spring action. In addition, severe shock loading can cause permanent zero shift, making the scale inoperable.

Cleaning the Gate Filters

This section describes how to clean the gate filters. The gate filters should be kept clean. While dust normally won't interfere with sensor operation, they should be cleaned routinely to prevent the possibility of interference.

To clean the gate filters, use a clean, damp (if needed) microfiber cloth. Use water to dampen the cloth; **do not clean the gate filters with a solvent as this could cause damage**.

Removing the Controller

If you suspect that there is a problem with the CubiScan 325 controller, first review the Troubleshooting chapter and take any recommended action. If the problem persists, contact Quantronix Technical Assistance at +1 (801) 451-7000 for assistance.

If Quantronix recommends removing the controller and returning it for service, proceed as follows.

1. Turn off the power switch, and disconnect the power cord from the controller.

2. Remove the two center cover thumb screws that are located on the right side of the system. Slide the cover to the left so that you can access the controller cables.

3. You can try to remove the controller without removing the glass, or you can remove the glass platform using two people. It can simply be lifted off the CubiScan 325 base. Place the platform in a safe location where it will not get stepped on or broken.

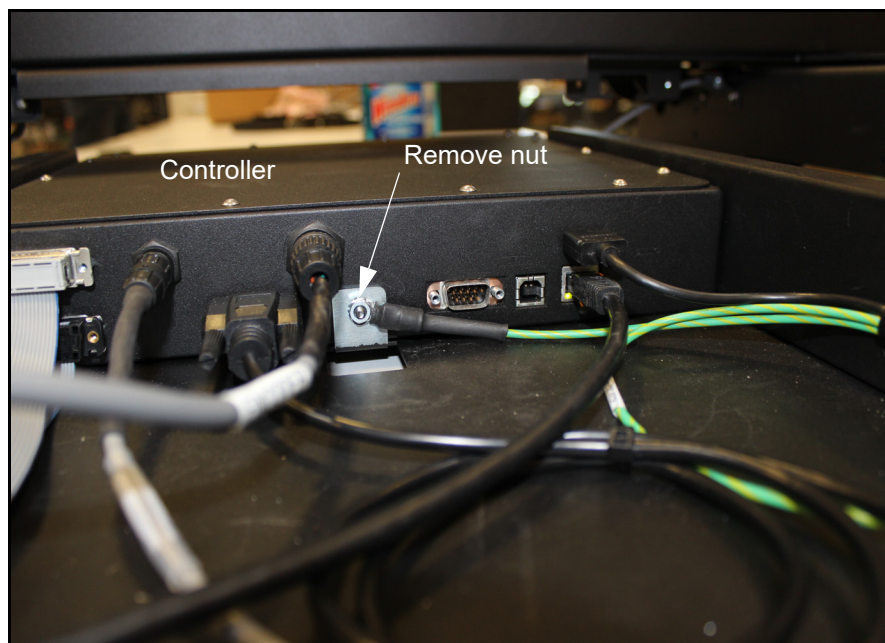4. Move the gate to the far left position.

Figure 47
Controller Box

5. Locate the controller (the black box located below the gate's home position). Remove the nut using an 11/32" nut driver (see Figure 47).
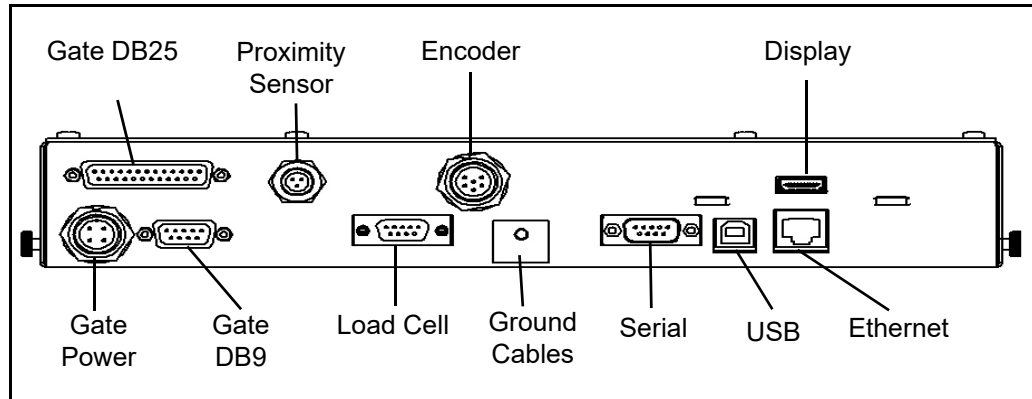

Figure 48
Drawing of Controller

6. Disconnect all connectors that are attached to the controller box (refer to Figure 48 as needed), as follows:

   • To remove the Ethernet cable connector, press the tab on the connector to release it, and pull it straight out.

   • To remove the USB and display cable, simply pull it straight out using even pressure.

   • To remove the serial and load cell cables, loosen the screws and pull the cable connectors out using even pressure.

   • To remove the gate DB9 connector and the gate DB25 connector, use a Phillips head screwdriver to loosen the screws, and pull the cables straight out.

   • To remove the gate power, proximity sensor, and encoder cables; unscrew the cables and pull them straight out.

   • Remove the nut holding the ground cables in place and detach the ground cables from the controller.

7. Verify that all cables have been removed from the controller, then lift the box up and pull it out sideways (to the right) until it is clear of the metal frame of the CubiScan 325.

Chapter 7

Troubleshooting

This chapter provides assistance in identifying and solving common problems with the CubiScan 325. If you encounter problems not covered in this chapter, or if a defect is suspected, contact your system integrator or call Quantronix Technical Assistance at +1 (801) 451-7000 for assistance.

After installation, some problems are caused either by incorrect cabling or because the system setup is not correct. If you are having problems with the CubiScan 325, first verify that all cables attached to the controller box (serial communications cables, sensor cables, power cord, Ethernet cable, load cell cable) are fully seated and secure (locking rings, clips, or screws). Then, verify that the setup is correct. For information on the setup, refer to Chapter 4 "Configuration" or to the *Qbit User Guide*.

Problems with your computer may affect operation of the CubiScan 325 system. If you have trouble starting Qbit or if you encounter problems with your computer (including computer-related error messages), refer to your computer manual or contact your computer representative or dealer for assistance.

Frequent computer errors may be caused by dust or static electricity. It is important that your computer be kept as clean and static free as possible. Consult your computer manual for information.

If problems continue, review the following sections for more information.

No Response When You Turn Power On

If there is no response when you power on the CubiScan 325, do the following:

1. Verify that the AC power cord is pressed firmly into the power socket.

2. Check the fuse in the fuse drawer next to the power switch.

3. Verify that the AC power source is working properly.

Contact Quantronix if you require additional help.

Scale Readings Are Not Accurate

If you suspect that the CubiScan 325 scale readings are inaccurate, do the following:

1. Zero the CubiScan 325 by making sure the platform is free of all objects and then selecting **Zero** from the toolbar or Tools menu in Qbit. (If a computer is not connected, tap the **[Zero]** button on the touchscreen.)

2. Make sure that the CubiScan 325 is on a level surface.

3. Move the CubiScan 325 if it is located close to open freight doors or where air is blowing on it. Extreme air flow can affect the accuracy of the CubiScan 325. Refer to "Placement" on page 6 for information.

4. Recalibrate the CubiScan 325. Refer to page 41 for instructions.

Dimension Readings Are Not Accurate

If you suspect that the CubiScan 325 dimension readings are inaccurate, do the following:

1. Check the glass platform and gate filters for dirt or debris. Clean the glass platform with a clean, damp cloth.

2. Verify that the image is representative of the measured item. If not, check gate diagnostics of the CubiScan 325. Refer to "Gate Diagnostics" on page 61 for further information.

Computer Error Messages

The following error messages generated by Qbit indicate a communications problem between the CubiScan 325 and the computer.

No Communications with CubiScan 325   This message indicates that no communication is taking place between the computer and the CubiScan 325.

Transmission Error   This message indicates that erroneous data or garbled data is being sent from the CubiScan 325.

If you receive one of these messages, verify the following.

1. Is the CubiScan 325 turned on and securely connected to power?

2. Is the serial cable or Ethernet cable connected to both the CubiScan 325 and the computer or network, and are both connections secure?

3. (Computer connection) Is the serial cable connected to the computer at either the COM1 or COM2 port?

4. (Computer connection) Is the Com Port in the Options dialog box (Tools menu) configured for the correct port?

5. (Network connection) Is the CubiScan 325 properly configured for TCP/IP communication? (Qbit software is used to configure the CubiScan 325.)

6. Is there a problem with the CubiScan 325? Perform the Status function in Qbit to check the status of the CubiScan 325.

7. Is there a problem with the computer or network? Refer to your computer manual for information on troubleshooting the computer, or contact your network administrator.

About

This section describes the About menu of the CubiScan 325. The About menu contains useful information and records of the CubiScan 325.

Version

This section discusses the options available on the Version menu. Complete the following steps to access the Version menu.
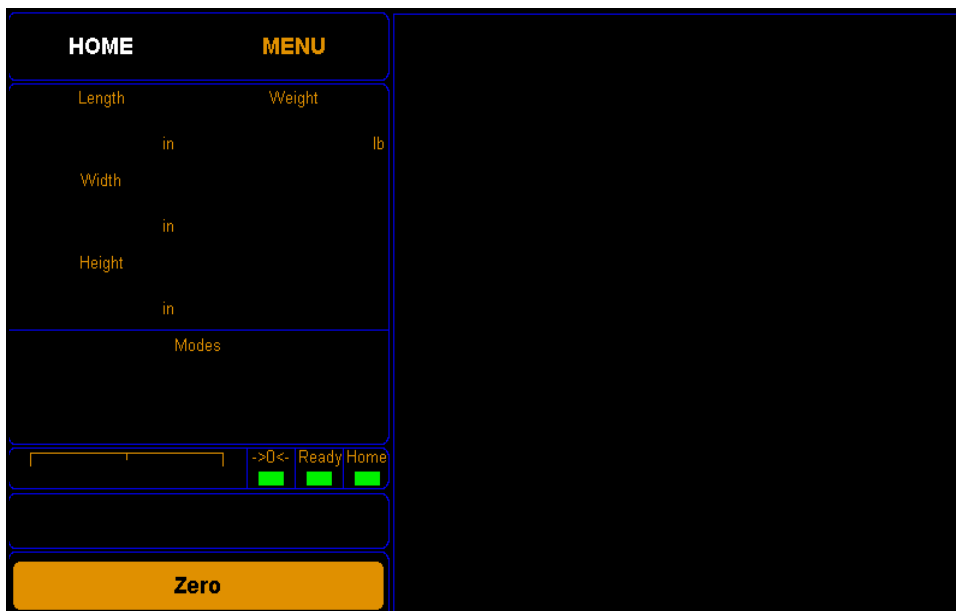
1. Tap **MENU** at the home screen.

Figure 49
Home Screen

2. Tap **About**. Select the **Version** option if it is not already selected.

Figure 50
About Version

MAC   This field displays the Media Access Control (MAC) address.

SN   This field displays the product number that is unique to each CubiScan 325.

Main   This field displays the firmware version used for the main controller.

FPGA   This field displays the firmware version used for the FPGA.

Kernel   This field displays the firmware version used for the kernel.

Scale   This field displays the firmware version used for the scale.

W1, W2   These fields display the firmware used for the width 1 and 2 boards, as well
H1, H2   as the height 1 and 2 boards.

Config-Audit

This section discusses the Config-Audit menu. Complete the following steps
to access the Config-Audit menu.
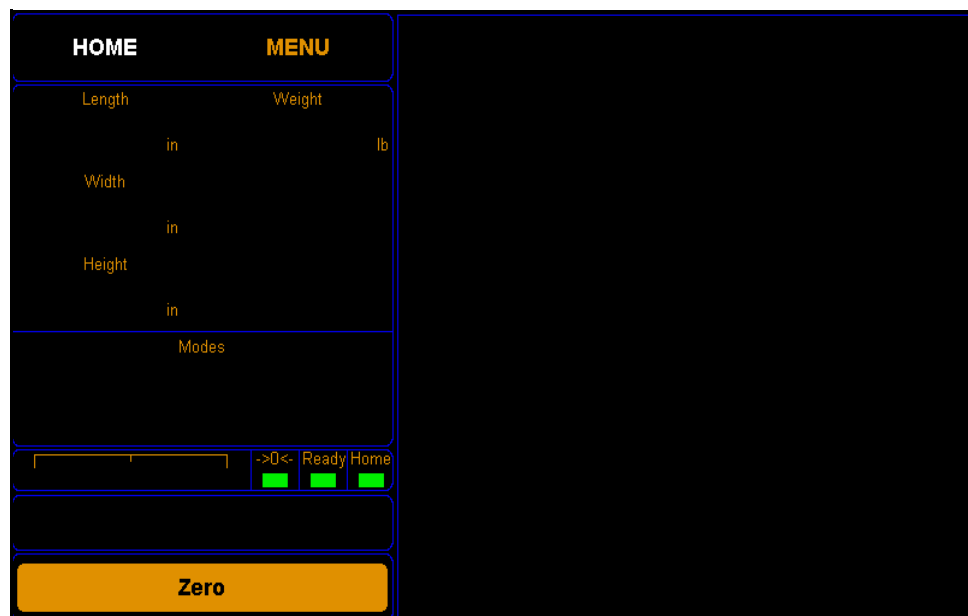
1. Tap **MENU** at the home screen.

Figure 51
Home Screen

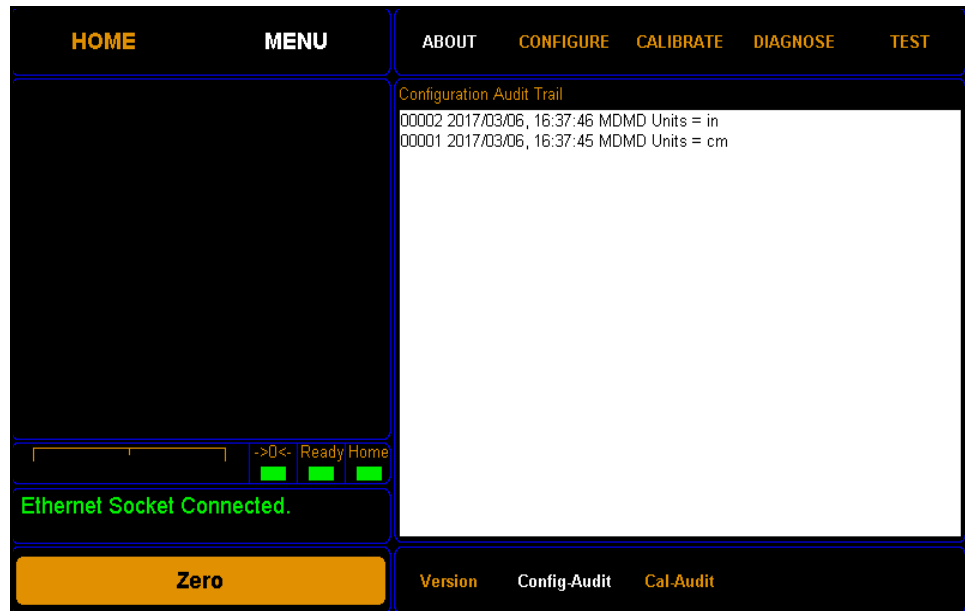2. Tap **About**. Select the **Config-Audit** option if it is not already selected.

Figure 52
About Config-Audit

Configuration Audit Trail   This field displays the configuration audit history.

Cal-Audit

This section discusses the Cal-Audit menu. Complete the following steps to access the Cal-Audit menu.
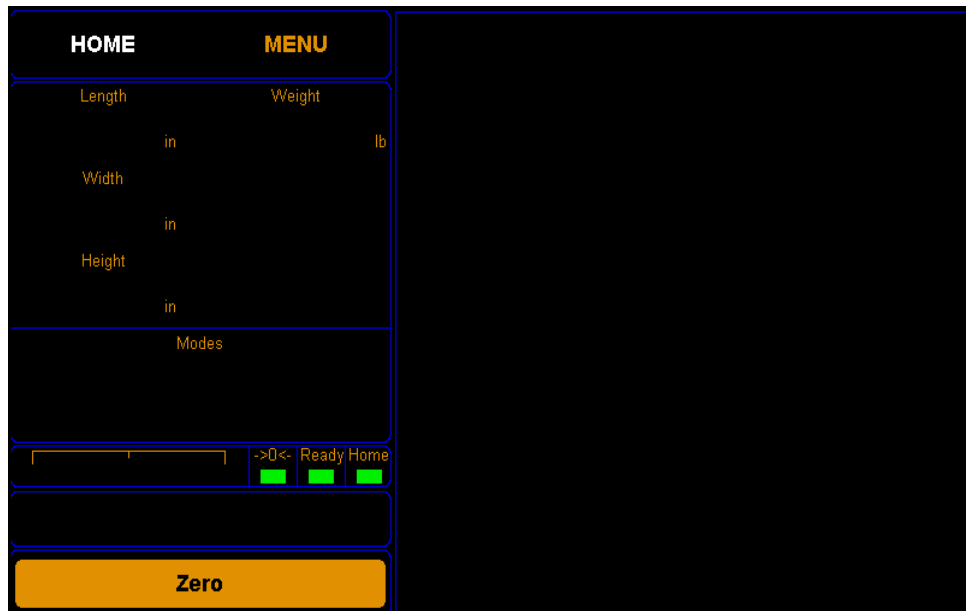
1. Tap **MENU** at the home screen.

Figure 53
Home Screen

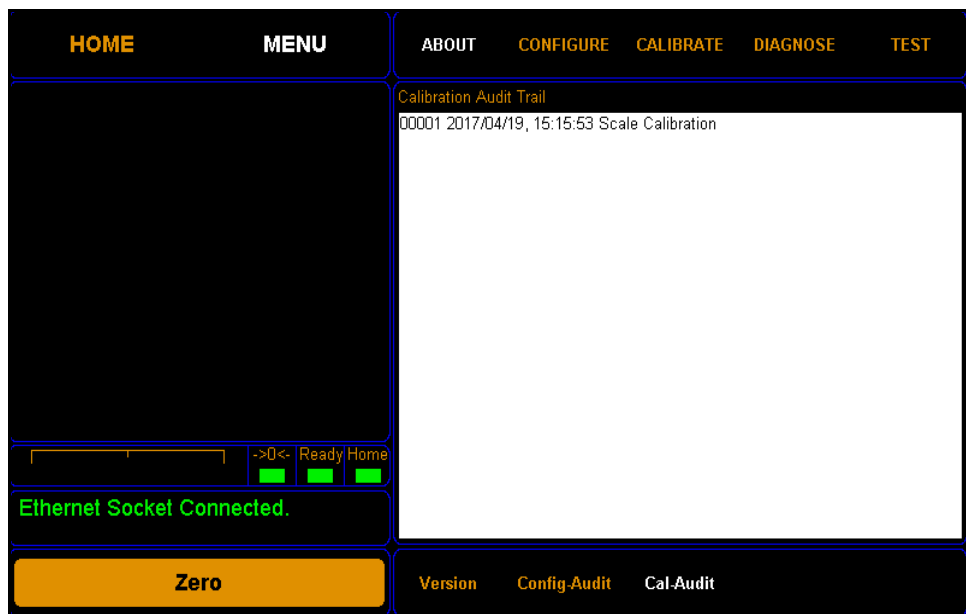2. Tap **About**. Select the **Cal-Audit** option if it is not already selected.

Figure 54
About Cal-Audit

Calibration Audit Trail   This field displays the scale calibration history.

Diagnostics

This section describes the diagnostic capabilities of the CubiScan 325.

Scale Diagnostics

Complete the following steps to view the Scale Diagnostics.

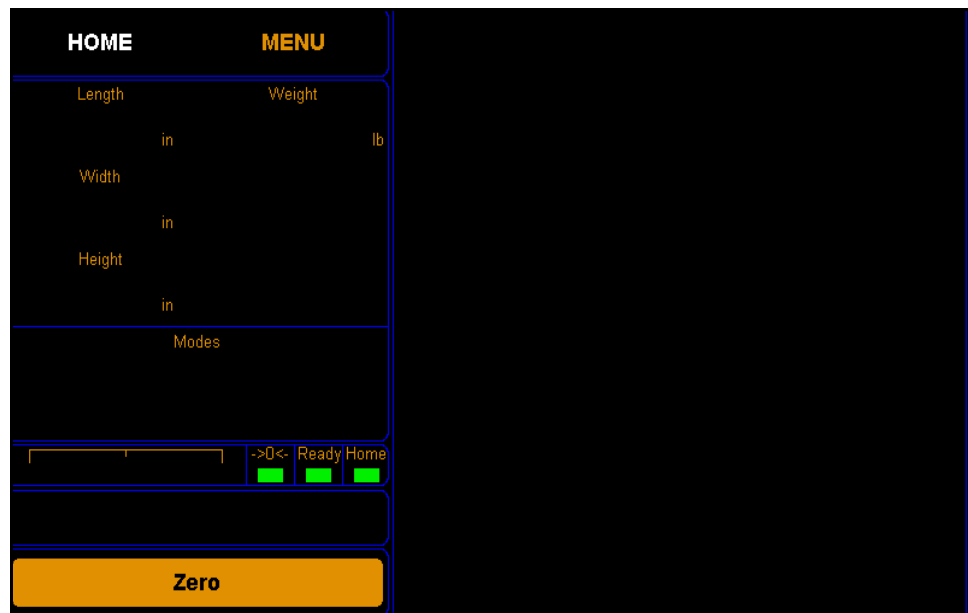1.   From the home screen, tap **MENU**.

Figure 55
Home Screen

NOTE ☞   *If you have set up a password previously in the system configuration, you need to enter the password to unlock the menu. Refer to* *.*

2.   Tap **DIAGNOSE**. Select the Scale option if it is not already selected.

Figure 56
Scale Diagnostics

From this screen you can view the diagnostic scale values.

LDW   This field displays the dead weight count.

LWT   This field displays the full weight count.

Motion   This field displays the motion status of the scale.
0=No motion
1=Motion

Wgt   This field displays the current weight.

COZ   This field displays the center of zero.

AM   This field displays the auto zero tracker.

Zero   This field displays whether there is weight on the scale or not.
0=Weight on scale
1=No weight on scale

Tare   This field displays the zero adjustment count.

Gate Diagnostics

Complete the following steps to view the gate diagnostics.

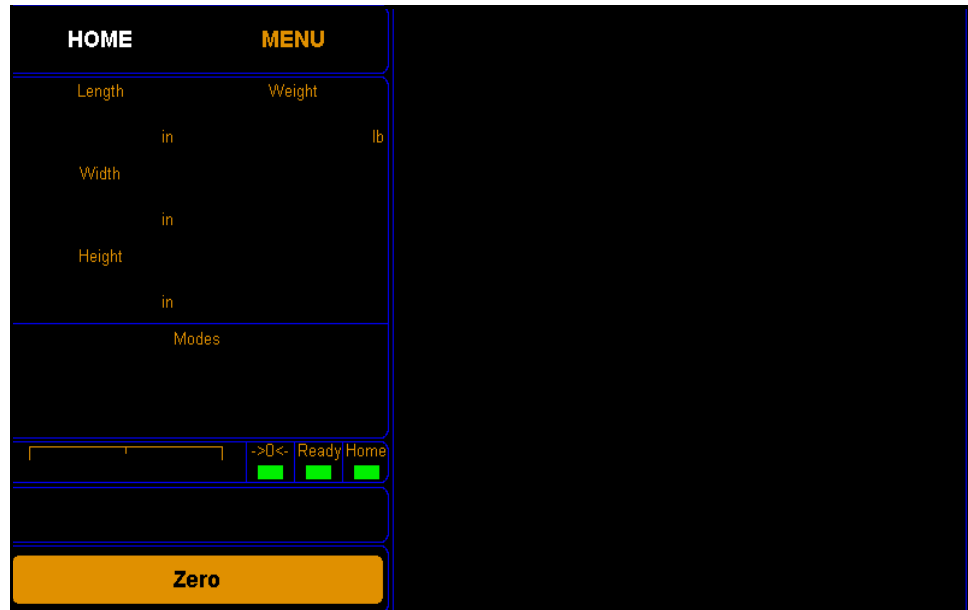1.   From the home screen, tap **MENU**.

Figure 57
Home Screen

NOTE ☞   *If you have set up a password previously in the system configuration, you need to enter the password to unlock the menu. Refer to page 33.*

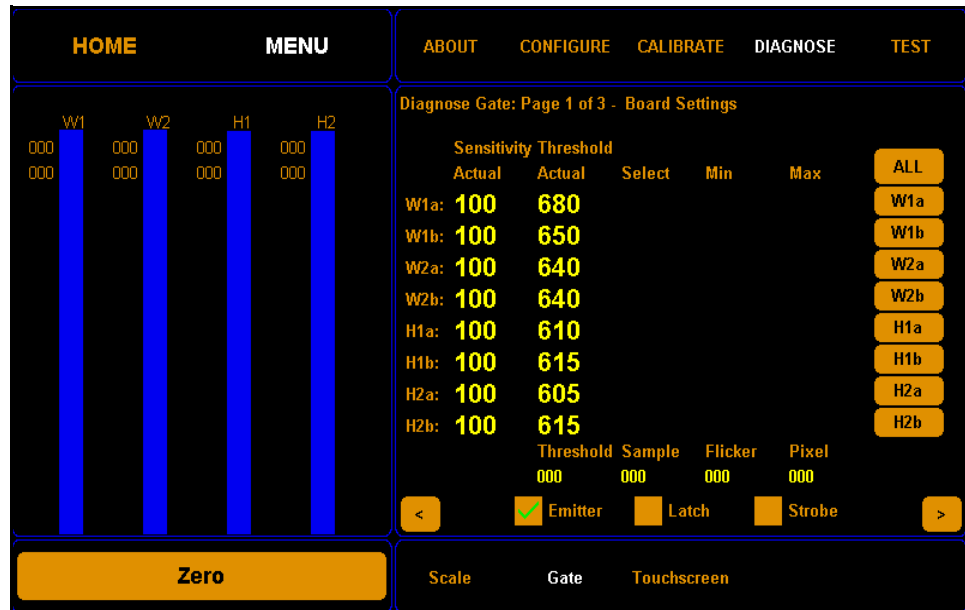2.   Tap **DIAGNOSE**. Select the Gate option if it is not already selected.

Figure 58
First Gate Diagnostic Screen

From this screen you can view the sensitivity threshold board settings.

The four LED beam bars now shown on the display represent the LED beams that the CubiScan 325 uses to measure objects. This is a useful screen for determining the functionality of the LED beams.

The width and height bars correspond to the width and height boards in the measurement gate.

These LED beams bars are blue when no light beams are being broken (as seen above), which typically means that there is no object in the measurement field.

The emitter checkbox should always be checked when you are measuring objects. When this box is unchecked, the gate is not emitting light and cannot measure objects.

3. Tap the **[>]** button to go to the next screen.

Figure 59
Second Gate Diagnostic Screen

From this screen you can view the gate width array settings and automatically mask width LEDs that are malfunctioning. No more than three LEDs should be masked at one time, or measurements may be affected.

To mask malfunctioning LEDs, complete the following steps.

Step 1.0   Clear the glass platform of all objects.

Step 1.1   Tap **Reset** to clear any masks that may have been previously set.

Step 1.2   Move the gate slowly from the home position (right-hand side) all the way to the left side and back to the home position. Malfunctioning LEDs appear as yellow tick marks

on the blue LED beam bars. The image below shows three malfunctioning LEDs that could be masked.
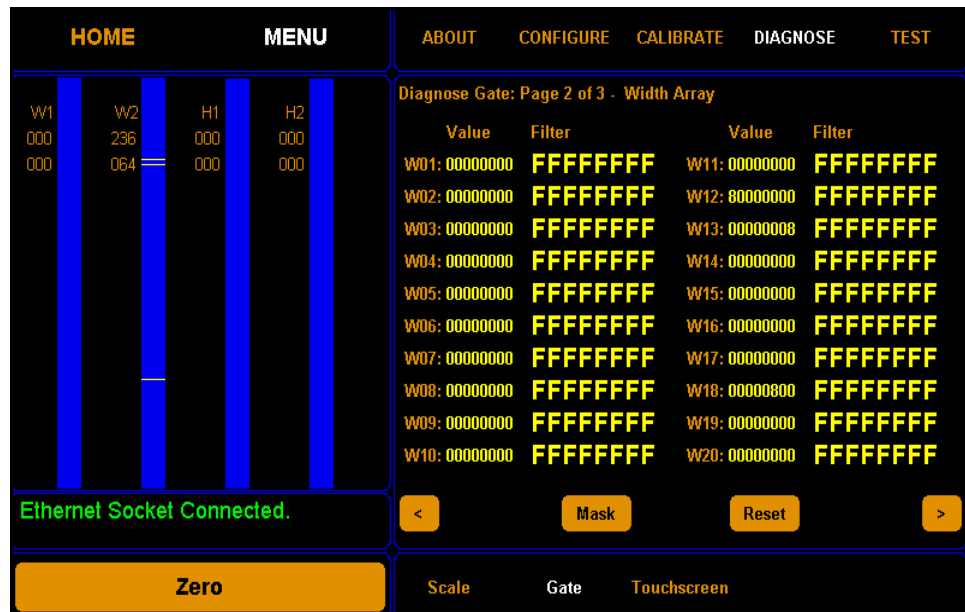

Figure 60
Gate Mask Tick Marks

Step 1.3   Tap **Mask** to mask the LEDs shown on the blue beam bars. When the LEDs are masked, they will no longer be used to take measurements. If you want to clear all masks, tap **Reset**.

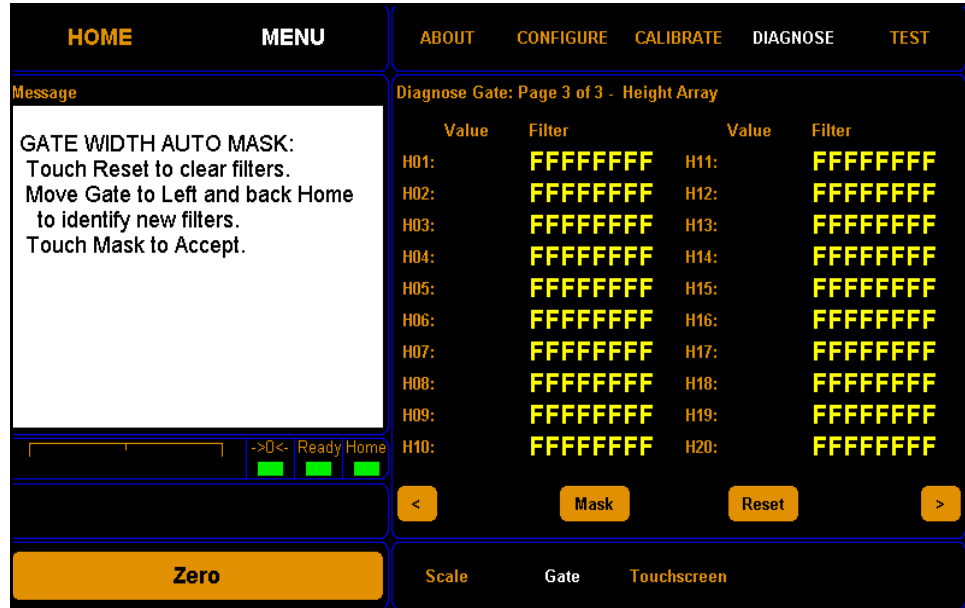2. Tap the **[>]** button to go to the next screen.

Figure 61
Third Gate Diagnostic Screen

Touchscreen Diagnostics

Complete the following steps to view the touchscreen diagnostics.
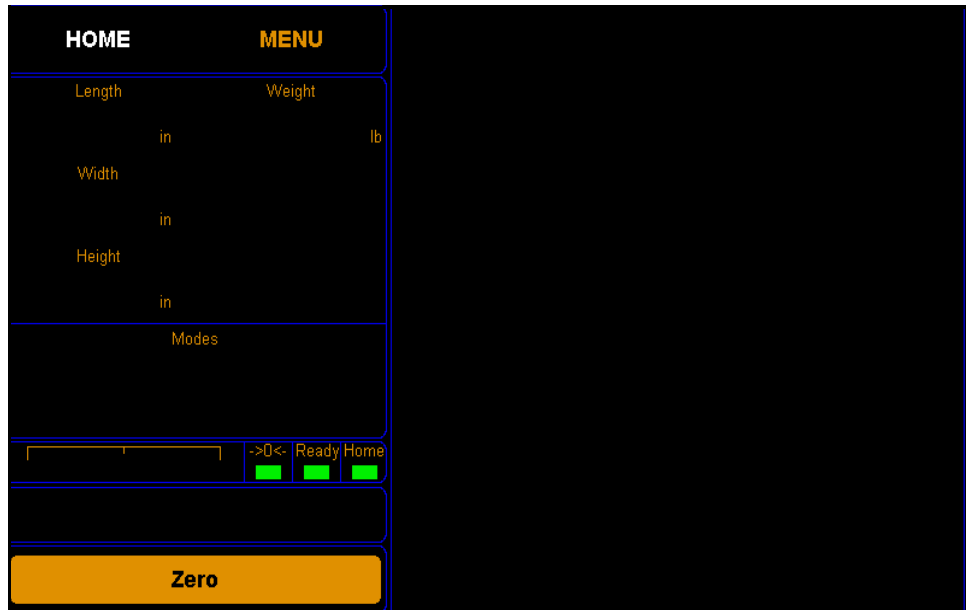
1. From the home screen, tap **MENU**.

Figure 62
Home Screen

NOTE ☞ *If you have set up a password previously in the system configuration, you need to enter the password to unlock the menu. Refer to page 33.*

2. Tap **DIAGNOSE**. Select the Touchscreen option if it is not already selected.
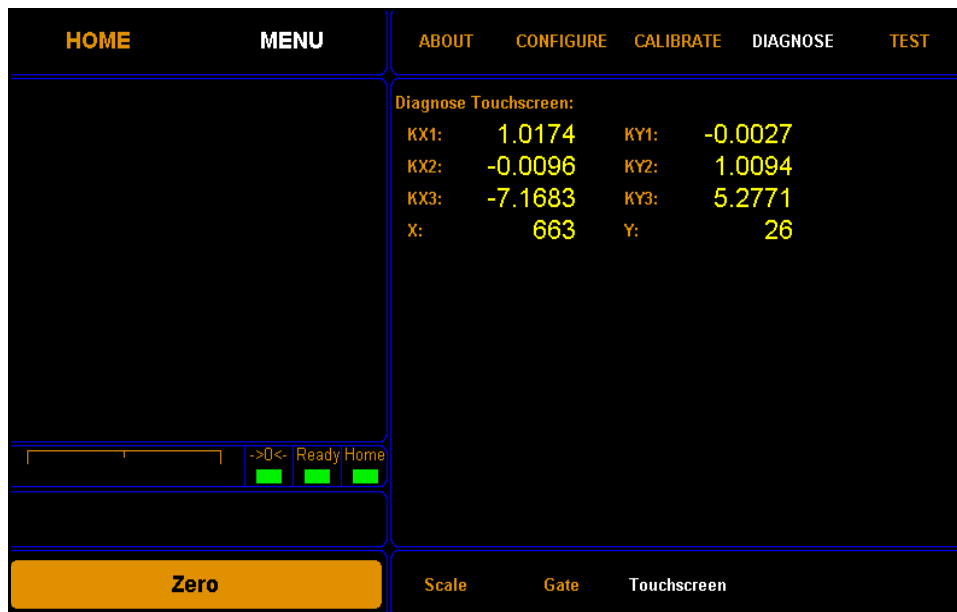

Figure 63
Diagnostic Touchscreen

From this screen you can view the linearization parameters of the touchscreen.

To test the calibration of the touchscreen you can touch the screen and a **x** should appear.

Testing

This section describes the factory testing capabilities of the CubiScan 325. Data in this section should not be altered unless you are instructed to do so by a Quantronix employee.

Scale

Complete the following steps to view the Scale Testing.

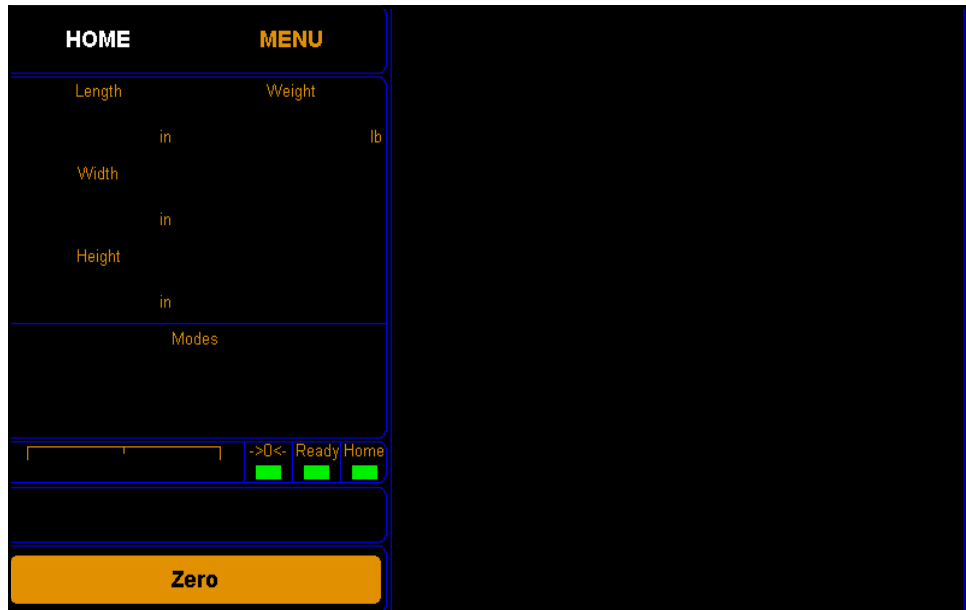1. From the home screen, tap **MENU**.

Figure 64
Home Screen

NOTE ☞   *If you have set up a password previously in the system configuration, you need to enter the password to unlock the menu. Refer to page 33.*

2.   Tap **TEST**. Select the Scale option if it is not already selected.

Figure 65
Test Scale

From this screen you can test for scale repeatability. Only run this test if instructed to by a Quantronix employee.

Gate

Complete the following steps to view the Gate Testing.

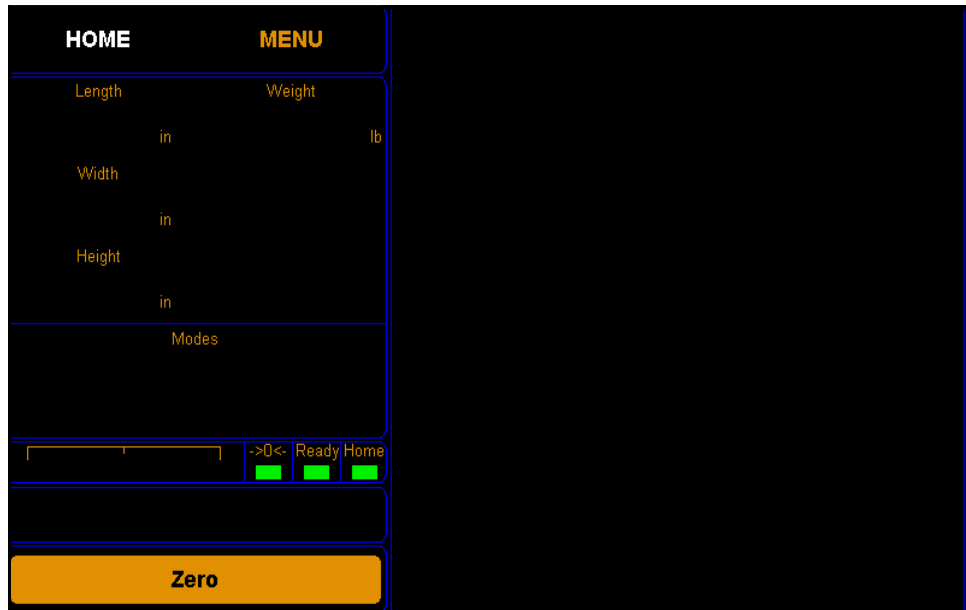1. From the home screen, tap **MENU**.

Figure 66
Home Screen

NOTE ☞   *If you have set up a password previously in the system configuration, you need to enter the password to unlock the menu. Refer to page 33.*

2. Tap **TEST**. Select the Gate option if it is not already selected.

Figure 67
First Gate Test Screen

From gate diagnostic screens one through two, you can run and view the results of the cube test. Only run this test if instructed to by a Quantronix employee.

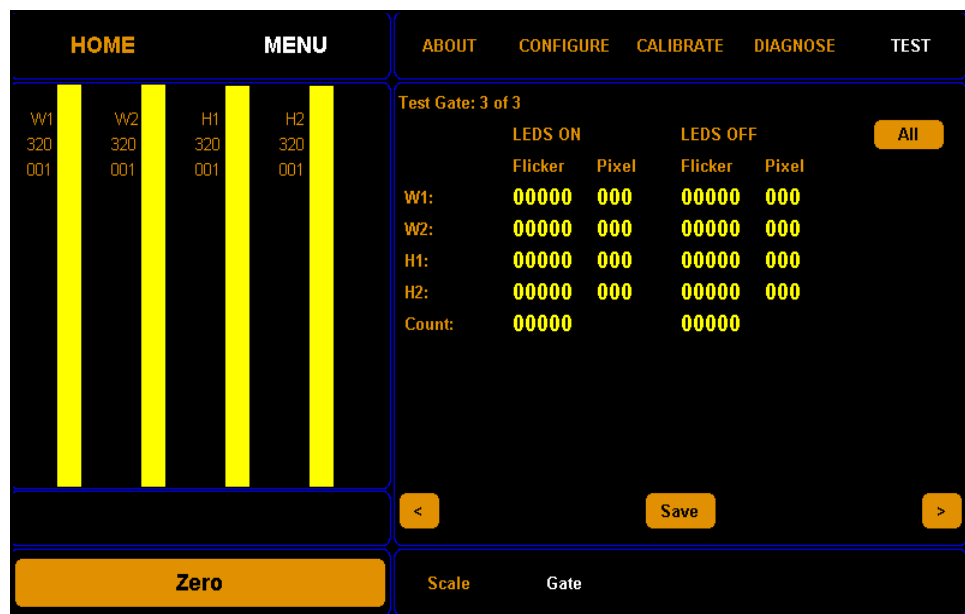3. Tap **[>]** twice to reach the third gate diagnostic screen.

Figure 68
Third Gate Diagnostic Screen

From this screen you can run a flicker test for internal gate testing purposes.

You should only run this test if you are instructed to by a Quantronix employee.

Appendix A

Parts List

Following is a list of parts that can be purchased for the CubiScan 325 as spare parts or if replacement is necessary.

Part No.	Description	Quantity/Unit
10083	AC Power Cord	1
10558	Scale Card PCB	1
12344	1/2" Diameter Ball	4
12841	Infrared Receive PCB	4
12844	Infrared Transmit PCB	4
13340	Proximity Sensor	1
13351	1 Amp Fuse	2
13372	Load Cell Summing PCB	1
13411	USB to Ethernet Adapter	1
13624	Calibration Cube, 5" x 3" x 2"	1
14066	Leveling Foot	4
14090	Touchscreen Assembly (Display)	1
14100	Main Controller Assembly	1
14124	Scale Plate	1
14309	Load Cell	4
14326	CAT 5e Patch (Ethernet Cable), 10 ft	1
14697	Infrared Filter, 14"	4
14721	Glass Plate	1
14725	Encoder Magnet	1
14743	Motion Encoder with Connector	1
14849	User Manual (PDF)	1

Appendix B
Firmware Log

Following is the firmware log that records updates and changes to the CubiScan 325 firmware.

Firmware	Build	Date	By	Description
3.00	B01	2017/3/28	RLK	Initial Build