

# Cubiscan 110-XT



## Operations and technical manual

Version 1.0

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**CUBISCAN®**



## Cubiscan 110-XT operations and technical manual

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### CAUTION

The Cubiscan 110-XT should only be serviced by qualified personnel.

Observe precautions for handling electrostatic sensitive devices when setting up or operating the Cubiscan 110-XT.



### WARNING

Disconnect all power to the Cubiscan 110-XT before servicing or making any connections.

The Cubiscan 110-XT is to be used to determine freight charges of rigid, non-sound-absorbing, cuboidal objects only. Dimensions shown on the display are of the smallest cuboidal shape in which the object may be enclosed.

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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 Cubiscan at [manual@cubiscan.com](mailto:manual@cubiscan.com).

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# CHAPTER 1

## DESCRIPTION

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The Cubiscan 110-XT is a valuable tool which precisely measures cube-shaped items and packages by volume and weight. It's able to instantly identify all dimensions of an object simultaneously. The data displayed on the freestanding touchscreen can then be sent to a host computer via serial RS-232, Ethernet, or USB port for ultimate efficiency.

The Cubiscan 110-XT's four sensors (ultrasonic transducers) determine the length, width, and height of an item while four precision aluminum load cells measure its weight.

Designed for use in industrial environments, the Cubiscan 110-XT's load cells, frame, and sensor housing are made to endure a harsh environment. 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 110-XT is easy to assemble, set up, operate, and maintain because of its simple design and extreme accuracy coupled with intelligent, self-contained circuitry.

The Cubiscan 110-XT was calibrated at the factory, but may require recalibration due to handling during shipping. Complete calibration instructions for the Cubiscan 110-XT are provided in CHAPTER 5 "Calibration" on page 38.



FIGURE 1  
*Cubiscan 110-XT*

## Specifications

---



### **Power requirements**

100-240 VAC, 47-63 Hz, 0.15 A

### **Environmental**

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

Humidity: 0 to 90% non-condensing

### **Measuring sensors**

Four ultrasonic transducers

### **Weight sensor**

Four load cells

## Measuring capacities

Measurement range

Length: 0.5 to 36.0 in (1.0 to 90.0 cm)

Width: 0.5 to 24.0 in (1.0 to 60.0 cm)

Height: 0.5 to 30.0 in (1.0 to 75.0 cm)

Minimum package dimensions: 0.5 x 0.5 x 0.5 in  
(1.0 x 1.0 x 1.0 cm)

Maximum package dimensions: 36.0 x 24.0 x 30.0 in  
(90.0 x 60.0 x 75.0 cm)

Dimensional increment: 0.1 in (0.2 cm)

Maximum package weight: 100.0 lb (50.00 kg)

Weight increment: 0.05 lb (0.02 kg)

Object characteristics: Opaque, cuboidal

Measurement time: Less than 2 seconds

## Physical

Measuring surface: 36W x 30H x 24D in (91W x 76H x 60D cm)

Total footprint required: 49W x 39H x 39D in (125W x 100H x 100D cm) with  
mobile cart

44W x 27H x 32D in (112W x 69H x 82 cm) without mobile cart

Height: 38.5 in (98 cm)

Shipping weight: 75 lb (34 kg)

Net weight: 70lb (31.75 kg)

Shipping dimensions: 52 x 50 x 18 in (132 x 127 x 46cm)

## User interface

Minimum PC specifications:

Windows XP or newer, 20 megabytes of disk space, screen resolution  
setting of 800 x 600

Cubiscan's QBIT™ software can be used to interface with the Cubiscan 110-XT.

Display:

Integrated TFT LCD touchscreen displays L, W, H, weight, unit of measure, and diagnostic messages

Outputs:

Serial (1), Ethernet (1), USB-A (1), USB-B (1)

# CHAPTER 2

## SETUP

---

This chapter provides instructions for assembling and setting up the Cubiscan 110-XT. Perform the steps to set up the Cubiscan 110-XT in the following order:

- [Unpack the Cubiscan \(page 5\)](#)
- [Set up the back panel \(page 9\)](#)
- [Attach the sensors \(page 10\)](#)
- [Adjust the shipping bolts \(page 12\)](#)
- [Place the Cubiscan where you will be using it \(page 14\)](#)
- [Connect power to the Cubiscan \(page 15\)](#)
- [Turn on the Cubiscan 110-XT \(page 16\)](#)
- [Connect the Cubiscan to a computer or network \(optional\) \(page 16\)](#)
- [Connect the Cubiscan to a barcode scanner \(optional\) \(page 19\)](#)
- [Install the Qbit for Windows PC software \(optional\) \(page 20\)](#)

## Unpacking

---



To unpack the Cubiscan 110-XT, take the following steps.

1. Remove the top of the box.

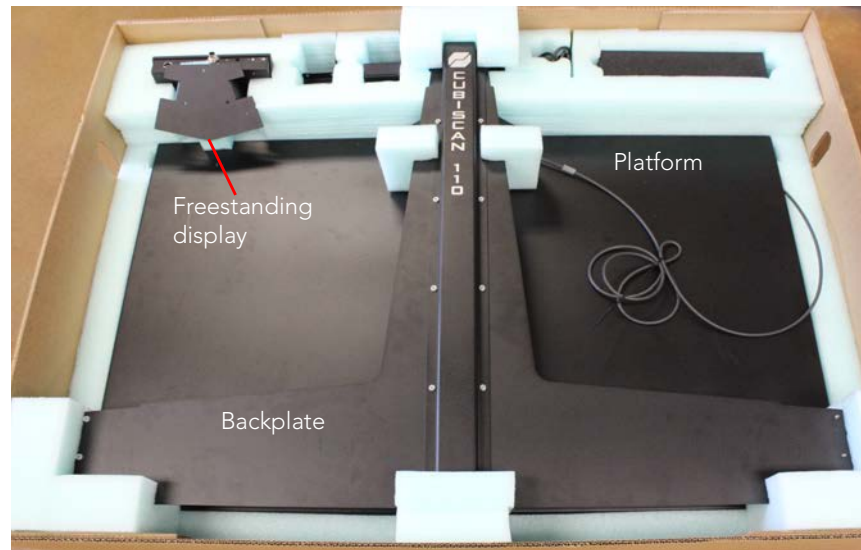
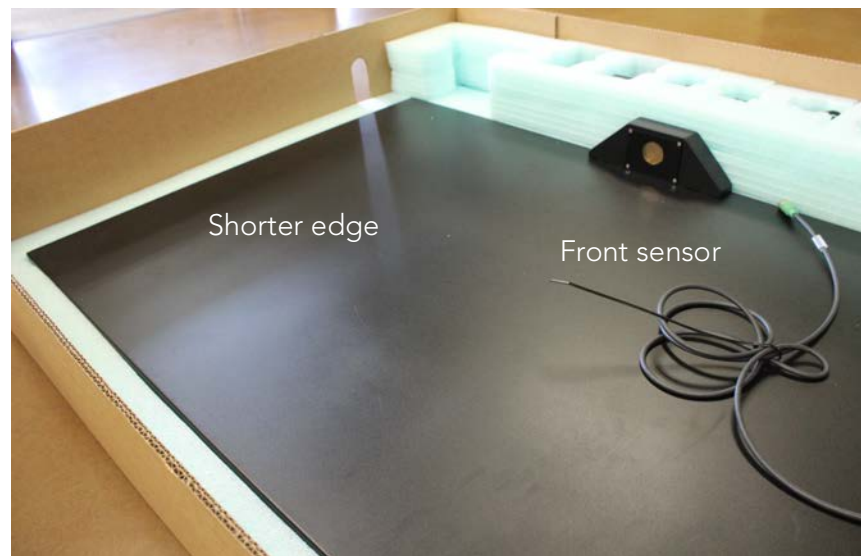


Figure 2  
*Cubiscan 110-XT in box*

2. Lift the back panel from the box, remove the foam packing material around it, and set the back panel aside.
3. Remove the freestanding display, and set it aside.
4. With two people, carefully lift the Cubiscan 110-XT platform from the box on the shorter edges. Gently lift one edge at a time.

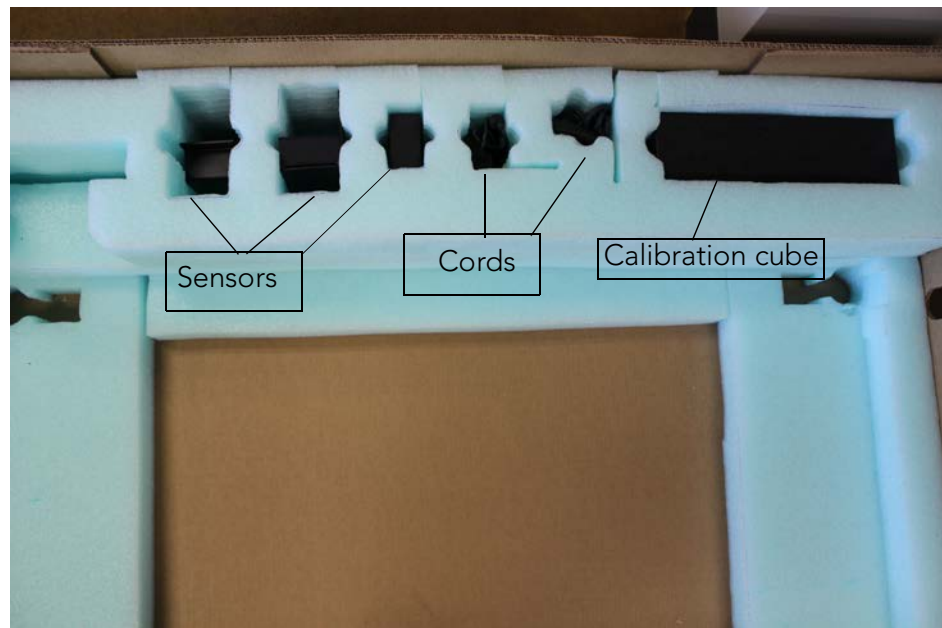




**Figure 3**  
*Cubiscan 110-XT with shorter edge and front sensor marked*

5. Place the platform on a stable work surface with the front sensor, as shown in Figure 4, at the front of the work surface.

Examine the container and the Cubiscan 110-XT carefully for any damage. If, after unpacking, you discover any damage to the Cubiscan 110-XT, contact the carrier immediately.



**Figure 4**  
*Additional Cubiscan 110-XT components in box*

The Cubiscan 110-XT is shipped in a single container with all components. Refer to the list below to identify the components.

- Cubiscan 110-XT platform
- Cubiscan 110-XT backplate
- Right sensor
- Left sensor
- Top sensor
- AC power cord
- USB cable
- Calibration cube
- Qbit software flash drive (optional)
- Operations and Technical Manual (in PDF form on the flash drive)

Accessories and tools packed with the Cubiscan 110-XT include the following:

- 5/32" Allen wrench
- 3/8" nut driver

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

**NOTE** > A power strip (not included) is recommended for turning power off and on.

A Phillips screwdriver will also be needed to assemble the Cubiscan 110-XT.

## Setting up the back panel



Take the following steps to attach the back panel.

1. Loosen the four screws on the back edge of the platform with a Phillips screwdriver.
2. Place the backplate keyholes over the loosened screws, slide the plate down, and secure the screws.



Figure 5  
*Keyhole with tightened screw*

## Attaching the sensors

---



Attach the left and right sensors using the instructions below.

1. Use three lock nuts, as shown below, to attach the sensor bracket to the backplate. To ensure the correct sensor is on the correct side, be sure that the semi-oval groove is at the bottom of the bracket when you are attaching it to the backplate. Repeat with the other sensor bracket.

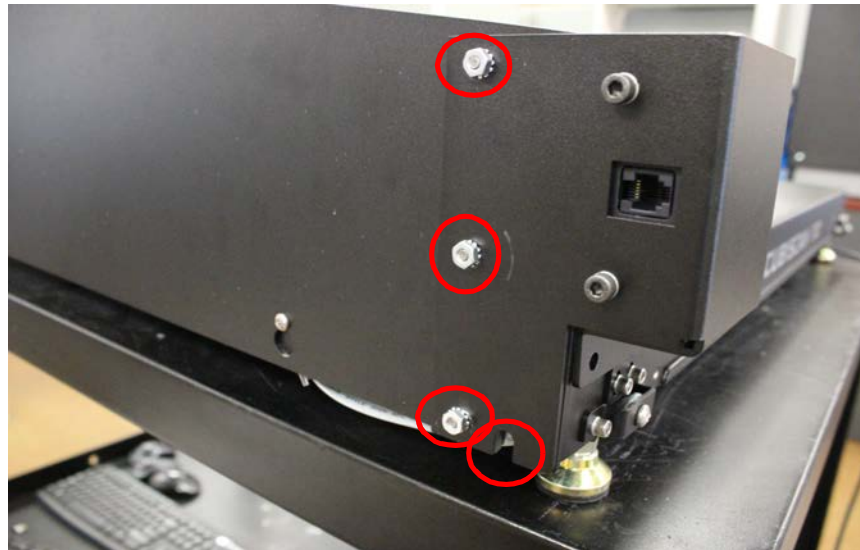


Figure 6

*Lock nuts and semi-oval groove*

2. Secure two screws beneath the bracket. Tighten them well to hold the sensor correctly. Repeat with the other side.



Figure 7  
*Two screws beneath bracket*

3. Attach the top sensor with the provided 5/32" wrench using the bolts and lock washers provided.

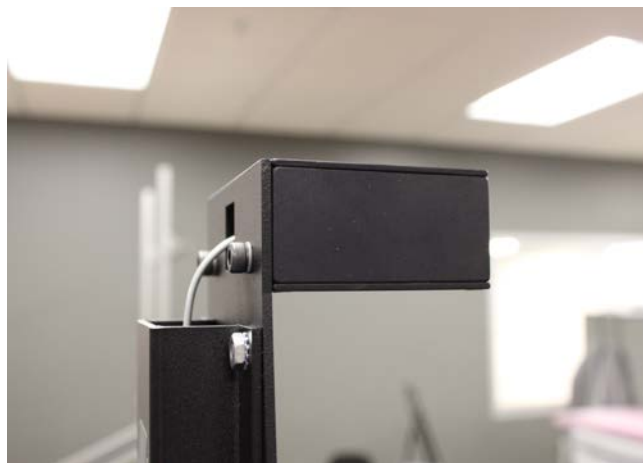


Figure 8  
*Top sensor attached*

**NOTE** > Avoid touching the delicate gold foil on the sensor.

## Connecting the sensor cables

---

1. Locate the gray cables coming from each end of the platform, and plug them into the indicated receptors on the left and right sensors. The cables should click into place.

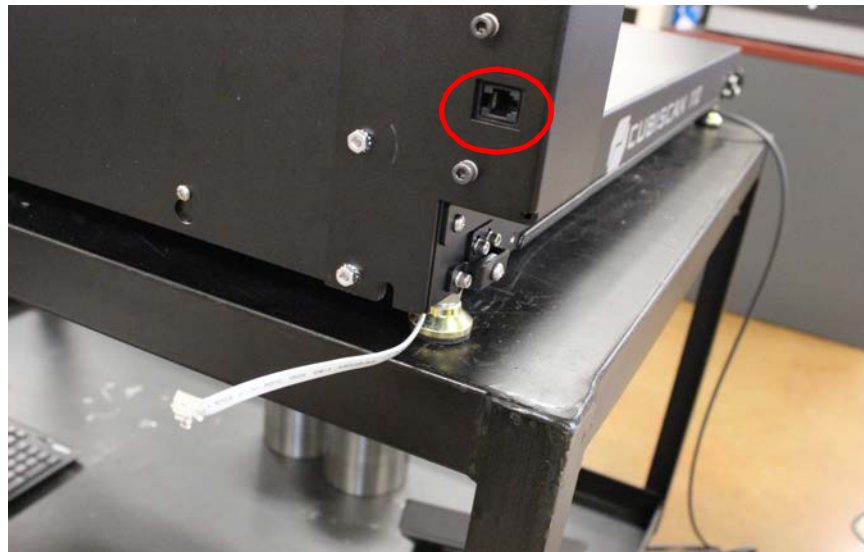


Figure 9

*Plug the gray cables into each receptor*

2. Locate the long gray cable coming from the back center of the platform. Thread it through the channel on the backplate, and plug it into the receptor on the top sensor. It should click into place.

## Setting up the display

---

Plug the tethering cable with the green end into its port on the freestanding display. The ports are located below the screen. Using the screw mechanism, tighten it into place.

Orient the display so that it faces the operator.



Figure 10  
Setting up the display

## Removing the shipping bolts

---

Four shipping bolts are located near the corners of the Cubiscan platform to anchor the scale to the base. The bolts must be removed and placed adjacently after shipping for proper operation of the scale. Complete the following steps to adjust the shipping bolts.

1. Locate the shipping bolt. Using a Phillips screwdriver, remove the bolt and hidden washer.

2. Place the bolt and washer in the adjacent hole and tighten securely so they are flush with the side of the Cubiscan platform.

Repeat these steps with the other three bolts.



Figure 11  
*Shipping bolt and adjacent hole*

## Placement

---



The Cubiscan 110-XT 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 to extremes in temperature or humidity. Locate the Cubiscan as far from open freight doors as possible. Heaters or air conditioners should not blow directly on the Cubiscan.
- Protect the Cubiscan from static electricity, especially the display.
- Place the Cubiscan on a flat, sturdy surface as free from vibration as possible. Excess vibration can reduce the accuracy of the Cubiscan 110-XT scale.
- The Cubiscan's platform is free-floating—it is resting on springs (load cells). Maintain a minimum of one-inch clearance at the back and sides



of the Cubiscan. Do not rest objects against or set objects on the Cubiscan when not in use.

- If a computer is used, place it as close to the Cubiscan as possible. The operator may need to use the keyboard or mouse on the computer while cubing and weighing packages using the Cubiscan 110-XT.

## Leveling the Cubiscan 110-XT

---



After meeting the above criteria as best as possible, complete the following steps to level the Cubiscan 110-XT, if necessary.

1. Place the Cubiscan 110-XT on a solid, stable surface. Be sure that nothing touches the back wall or top platform, as this may affect the scale.
2. Adjust the four leveling feet under the Cubiscan 110-XT to level the scale. Make sure all feet are touching the supporting surface.

An optional cart and portable power supply are available from Cubiscan to create a completely mobile cubing, weighing, and identification workstation.

## Connecting power

---



The Cubiscan 110-XT uses an external AC power adapter. Take the following steps to connect power to the Cubiscan.

1. Connect the power cord and AC power adapter.
2. Plug the respective ends into a standard power strip equipped with an ON/OFF switch and the freestanding display. When plugging the power cable into its port on the freestanding display, be sure to line up the prongs and place it with the cord's marked arrows on the bottom.
3. Use the power strip switch to turn the Cubiscan on and off (see "Turning on the Cubiscan" on page 16).

## Turning on the Cubiscan

---

Specific procedures must be followed each time you turn on the Cubiscan 110-XT, as follows:

1. Make sure there are no packages or other objects on the Cubiscan platform.
2. Turn on the Cubiscan 110-XT via the power strip (see “Connecting power” on page 15).

### **NOTE** >

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

## Connecting to a computer or network

---

To operate the Cubiscan 110-XT, you can connect it to a computer or a network, or you can use the display, as follows:

- Connect it via an USB to USB cable. Use Qbit software on the computer to run the Cubiscan 110-XT.
- Connect it to a host system via a standard 10-BaseT Ethernet TCP/IP port.
- Connect it to a PC using a serial RS-232 cable.

### USB connection

Complete the following steps to connect the Cubiscan 110-XT to a computer using a USB connection. The USB connection method is the recommended method, and all materials needed for communicating with a computer are supplied.

1. Place the computer in its permanent location, generally close to the Cubiscan. (Refer to “Placement” on page 14 for more information.)
2. Route the USB cable so it cannot be crushed, bent, or pulled loose.
3. Connect one end of the USB cable to the USB connector on the bottom edge of the freestanding display, as shown below.

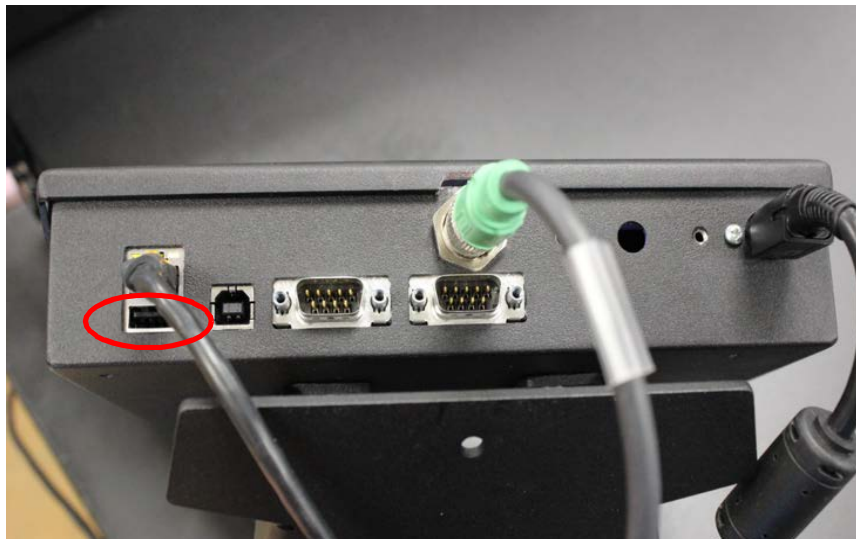


Figure 12  
*USB connection port*

4. Locate a free USB port on your computer and connect the other end of the USB cable to the port.

When you have completed these steps, the Cubiscan 110-XT should communicate with a computer.

## Ethernet connection

Complete the following steps to connect the Cubiscan 110-XT to a computer using an Ethernet connection.

1. Place the computer in its permanent location, generally close to the Cubiscan. (Refer to "Placement" on page 14 for more information.)
2. Route the Ethernet cable so it cannot be crushed, bent, or pulled loose.
3. Connect one end of the Ethernet cable to the Ethernet connector on the bottom edge of the freestanding display. Push the connector in until it locks. There should be an audible snap when it locks.
4. Insert the connector on the other end of the cable into the computer's network socket until it locks.
5. Refer to the communication protocol if needed. Contact Quantronix if you need additional assistance.

For information on the Ethernet cable pin-outs, refer to Ethernet cable pin assignments on page 65.

## Serial connection

Complete the following steps to connect the Cubiscan 110-XT to a computer using a serial connection.

1. Place the computer in its permanent location, generally close to the Cubiscan. (Refer to "Placement" on page 14 for more information.)
2. Route the RS-232 serial communications cable so it cannot be crushed, bent, or pulled loose.
3. Connect one end of the serial cable to the serial connector on the bottom edge of the freestanding display, as shown below.



Figure 13  
*Serial connection port*

4. Locate the COM serial port below the green tethering cable on the back of your computer, if available, and connect the other end of the serial cable to the port.
5. To secure the serial cable, tighten the screws (two on each connector) at both ends of the cable. It is important that the cable be secure.

For information on the serial cable pin-outs, refer to cable pin assignments on page 64.

## Connecting to a barcode scanner (optional)

The Cubiscan 110-XT has an additional USB port for connecting to a barcode scanner. To connect the Cubiscan to a barcode scanner, complete the following steps.

### NOTE >

*This barcode connection option is for non-Qbit software users. If you are using Qbit software, you will connect the barcode scanner directly to the PC.*

1. Route the barcode scanner USB cable so it cannot be crushed, bent, or pulled loose.
2. Connect the free end of the cable to the barcode scanner connector on the bottom of the freestanding display, as shown below.

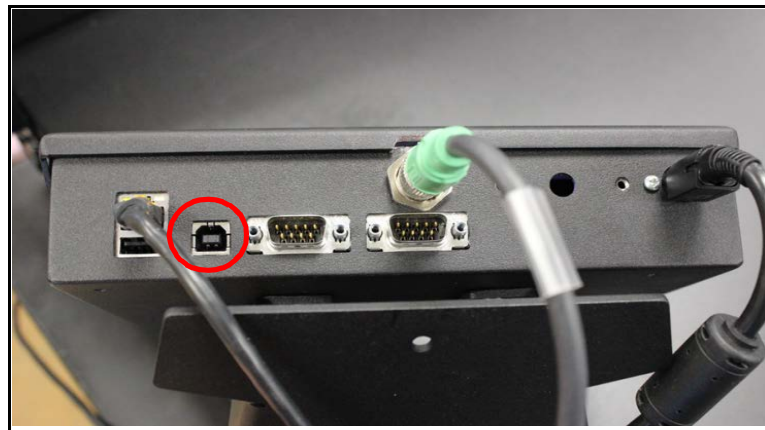


Figure 14  
Barcode port

3. Once the barcode scanner is connected to the Cubiscan 110-XT, you need to turn the barcode feature on. On the Cubiscan 110-XT touchscreen, go to **CONFIGURE > Operation**.

4. Check the **Enable Barcode** box, as shown below. Make sure to select **Enable Expanded Protocol**. This option must be enabled for the barcode option to work properly.

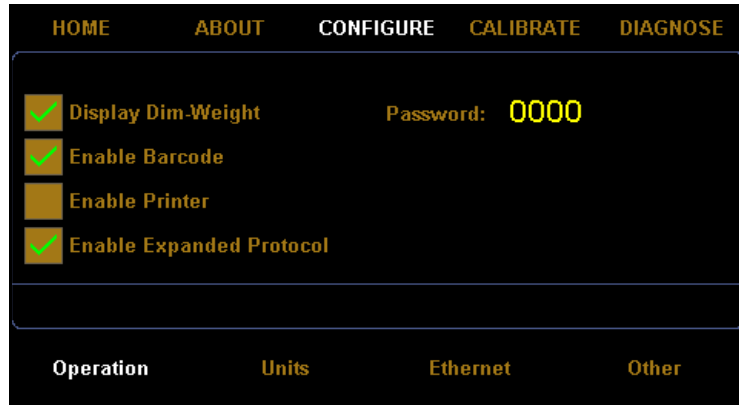


Figure 15  
*Barcode enabled*

A new barcode field will appear on the home screen and the barcode data will be included in the data packet.

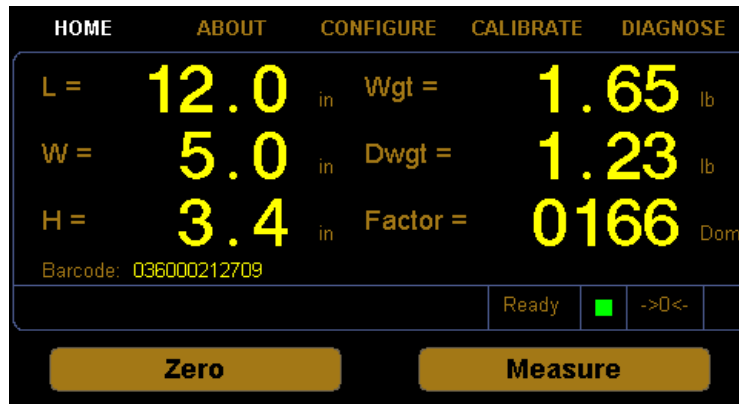


Figure 16  
*Home screen barcode enabled*

## Installing Qbit (optional)



A flash drive is available containing the Qbit software program, which can be used to operate the Cubiscan 110-XT.

The Qbit User Guide, also located on the flash drive, provides instructions for installing and using Qbit. You can also download the user guide from the Quantronix website at [www.cubiscan.com](http://www.cubiscan.com).

# Setup checklist

---



Before using the Cubiscan 110-XT for the first time, verify the following:

- Have the Cubiscan 110-XT and the computer (if applicable) been placed in the proper operating environment? (page 14)
- Has the Cubiscan been fully assembled? (page 15)
- Have the sensor cables been connected to the sensors? (page 9)
- Has the back panel been secured? (page 9)
- Have the shipping bolts been removed? (page 12)
- Has the base of the Cubiscan been leveled? (page 14)
- Is the Cubiscan free moving? The Cubiscan should not be pushed up against a wall and no object, cable, etc., should be resting on it or against it. (page 14)
- Has the AC power adapter been connected correctly? (page 15)
- Has the Cubiscan 110-XT been set up to communicate with a computer (if applicable)? (page 16)
- (Optional) Has the barcode scanner been connected properly? (page 19)
- If you are using Qbit to operate the Cubiscan 110-XT, has the application been copied onto your computer's hard-disk drive? (Refer to the Qbit User Guide for information.)
- Does the Cubiscan require recalibration? The Cubiscan 110-XT was calibrated at the factory, but may require recalibration due to handling during shipping. Refer to page 38 for information on calibrating the Cubiscan 110-XT. If you are using Qbit software, check the status of the Cubiscan before operating it. Refer to the Qbit User Guide for information on checking the Cubiscan's status.

# CHAPTER 3

## OPERATION

---

This chapter provides instructions for operating the Cubiscan 110-XT.

**NOTE** >

*The platform of the Cubiscan 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. The Cubiscan should be turned on before you start Qbit (if applicable).

1. Make sure there are no packages or objects on the Cubiscan platform.
2. Turn on the Cubiscan 110-XT via the power strip. The Cubiscan performs diagnostic procedures that take about five seconds. Do not touch the Cubiscan platform during these five seconds.

**NOTE** >

*Do not lean on or touch the Cubiscan platform or the package while a package is being cubed and weighed. Any kind of contact with the platform during the measurement process can alter the weight or sensor reading.*

**NOTE** >

*You should occasionally verify that the zero settings on the Cubiscan are correct. To do this, take a measurement with nothing on the scale and see if all values recorded are zero. The Cubiscan's empty weight and measurements can be reset to zero (zeroed) at any time (refer to the Qbit User Guide or to "Zeroing the Cubiscan 110-XT" on page 26).*



**WARNING**

Disconnect all power to the Cubiscan 110-XT before servicing or making any connections.



# Cubiscan 110-XT touchscreen



You can use the Cubiscan 110-XT freestanding touchscreen (below) to configure and control the Cubiscan 110-XT as well as display measurement results.

**Figure 17**

*Cubiscan 110-XT freestanding touchscreen*



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

- Tap **[Zero]** to “zero” the Cubiscan 110-XT (see “Zeroing the Cubiscan 110-XT on page 26).
- Tap **[Measure]** after placing an item on the Cubiscan 110-XT platform to find its dimensions.

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 31 for information on configuration.

## Touchscreen care

Never use a sharp or hard-tipped object to tap on the touchscreen. It is hard plastic that 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.

## Measuring and weighing using Qbit

---

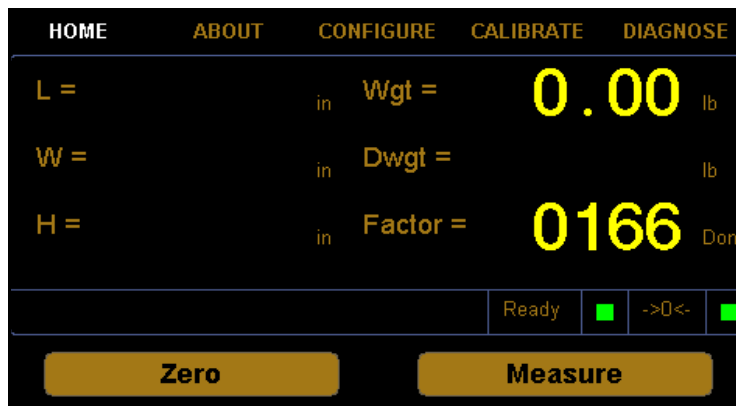


Refer to the Qbit User Guide for instructions on cubing and weighing and other functions in Qbit. The Qbit User Guide is provided on a USB flash drive or you can download it from the Cubiscan website at [www.cubiscan.com](http://www.cubiscan.com).

# Measuring and weighing using the touchscreen



All controls, displays, and results for the Cubiscan 110-XT are located on the freestanding touchscreen.



**Figure 18**  
Cubiscan 110-XT touchscreen

**L=** These display the measured dimensions in inches (in) or centimeters (cm) as selected. See "Units" on page 33 for instructions on selecting measurement units.

**W=**

**H=**

**Wgt=** This displays the measured weight in pounds (lb) or kilograms (kg) as selected. See "Units" on page 33 for instructions on selecting measurement units.

**Dwgt=** This displays the dimensional weight in pounds (lb) or kilograms (kg) as selected. See "Units" on page 33 for instructions on selecting measurement units.

**Factor=** This displays the dimensional factor currently being used to calculate the dimensional weight. This option can be turned on or off.

**Ready (indicator)** When the green square indicator is lit, this indicates that the Cubiscan 110-XT is ready for cubing and weighing.

**->0<- (indicator)** When the green square indicator is lit, this indicates that the scale platform is empty and ready to receive a package. This indicator must be lit before you can place a package on the platform. When you place a package on the platform, the indicator goes off.

**Zero (button)** Tap this key to reset the sensors and scale to “zero” (make sure the platform is empty). Refer to “Zeroing the Cubiscan 110-XT” on page 26.

**Measure (button)** Tap this key to prompt a measurement. The weight and dimensions of the object on the platform will be displayed on the screen.

Take the following steps to measure and weigh a package using the touchscreen to control the Cubiscan.

1. Verify that the Cubiscan platform is empty. The **->0<-** indicator should be lit, and **0.00** should be displayed in the **Wgt=** field. Except for the **Factor** field, the rest of the display should be clear.
2. Place the package or object to be measured and weighed on the platform and slide it against the center of the back panel. The **->0<-** indicator light should go out.

**NOTE** >

*Do not lean on or touch the Cubiscan platform or the package while a package is being cubed and weighed. Any kind of contact with the platform during the measurement process can alter the weight or sensor reading.*

3. Tap **Measure**. The length, width, height, weight, and dim weight of the package are displayed. The factor used to determine the dim weight is also displayed.
4. Remove the package from the platform. Wait for the **->0<-** indicator to light before placing the next package on the platform.

If the **->0<-** does not light, it means that the scale needs to be zeroed. To zero the scale, make sure that the platform is free of all objects, then press **Zero**.

## Zeroing the Cubiscan 110-XT



Tap the **[Zero]** button on the touchscreen to “zero” the Cubiscan 110-XT (set all empty measurements and weight to zero). The Cubiscan 110-XT tries to zero itself automatically every five seconds when it is not in the Measure mode. 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** >

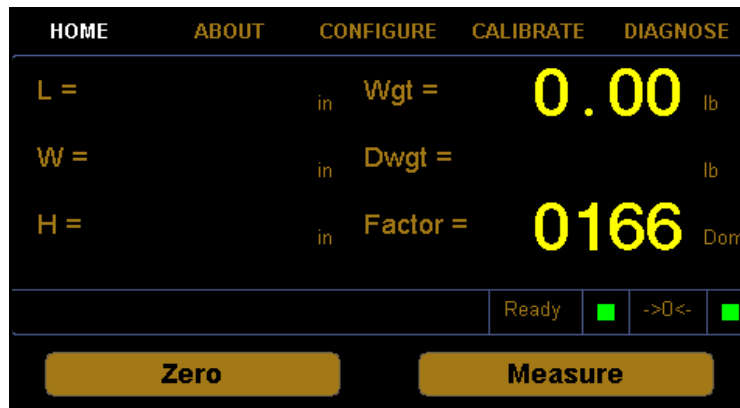
Make certain that the platform is free of all objects before using Zero. If not, the zero reading will not be accurate.

# Menus

---



The home screen of the Cubiscan 110-XT displays four menus at the top of the screen. These are **ABOUT**, **CONFIGURE**, **CALIBRATE**, and **DIAGNOSE**. When a menu or sub-menu is selected, its letters are white.

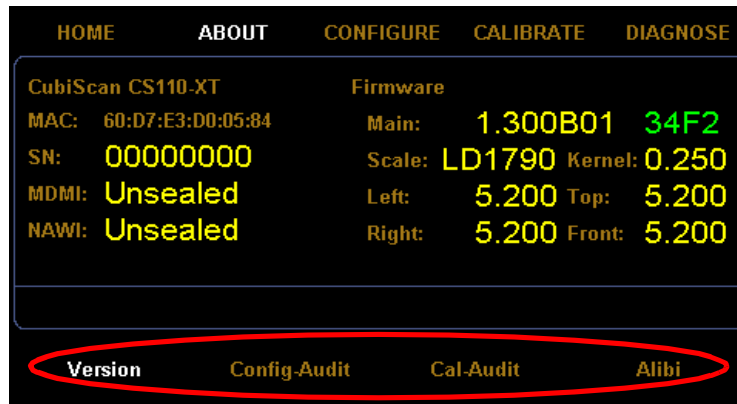


**Figure 19**  
*Menu display*

The **DIAGNOSE** menu is primarily used for quality testing by the manufacturer. The other three menus are described below.

## About

The **ABOUT** menu has four options available at the bottom of the screen. They are **Version**, **Config-Audit**, **Cal-Audit**, and **Alibi**.



**Figure 20**  
*About screen sub-menus*

**Version** This option displays details about the type of device, its firmware, and identification.

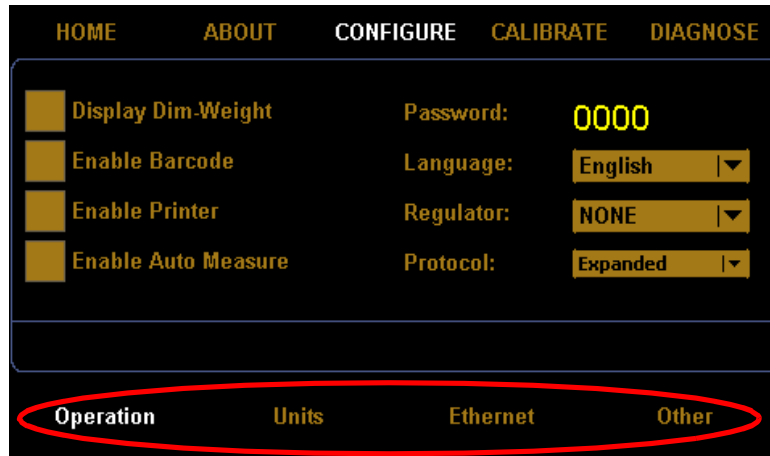
**Config-Audit** This option displays details about the history of changed units, or the Configuration Audit Trail.

**Cal-Audit** This option displays the history of scale and sensor calibrations.

**Alibi** This option is another feature which is especially useful in Europe. You can enter a previously measured package number, and details of that package will be displayed.

## Configure

The **CONFIGURE** menu has four options available at the bottom of the screen. They are **Operation**, **Units**, **Ethernet**, and **Other**.



**Figure 21**  
Configure sub-menus

**Operation** This option displays functions that can be enabled on the Cubiscan 110-XT. By tapping the corresponding box on the touchscreen, you can turn on or off functions which display the dimensional weight, or enable a barcode scanner, a printer, or auto measure. See “Operation” on page 31 for more details.

**NOTE** > When the **Enable Auto Measure** feature is selected, an item will be measured when it is detected on the platform.

In this sub-menu, you can also set the display’s language, regulator setting, and protocol. You can also set a password to be entered for full functionality of the Cubiscan 110-XT. See “Password” on page 33 for more information on setting the password.

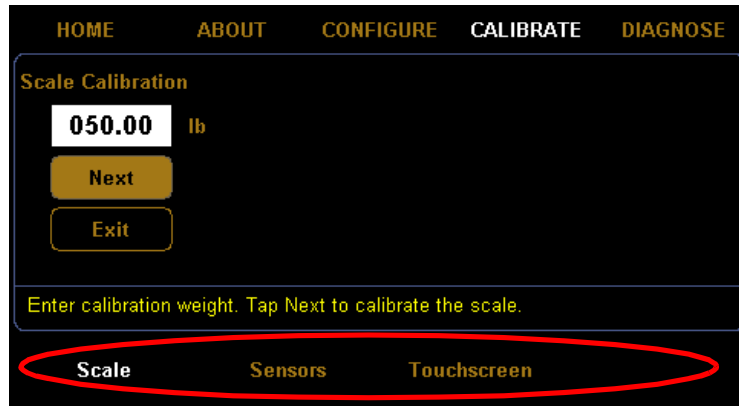
**Units** You can switch between metric and standard units under the Units sub-menu. You can also change the dimensional factor to be domestic or international. Additionally, you can change the dimensioning factor or give the Cubiscan 110-XT a unique ID by tapping on the numbers to bring up a keypad. See “Units” on page 33 for more details.

**Ethernet** This option displays details about the Ethernet connection, with an option to post data to a specified URL. See “Ethernet” on page 34 for more information, or see the Cubiscan web services manual.

**Other** The Other option allows you to set the date and time, as well as update firmware if needed. See “Other” on page 36 for more details.

# Calibrate

The **CALIBRATE** menu has three options available at the bottom of the screen. They are **Scale**, **Sensors**, and **Touchscreen**. See "Calibration" on page 38 for calibration instructions.



**Figure 22**  
*Calibrate screen sub-menus*

- Scale** This option allows you to calibrate the scale so that it weighs packages correctly.
- Sensors** This option allows you to calibrate the sensors to ensure that they are measuring correctly.
- Touchscreen** This option allows you to calibrate the touchscreen for easier use.



# CHAPTER 4

## CONFIGURATION

---

This chapter provides instructions for using the Cubiscan 110-XT touchscreen to set up the height, width, and length measurements, configure the units, dimensional weight factor, and other settings.

If you have a computer connected to the Cubiscan 110-XT with Qbit installed, you can use Qbit to set up the measurement and dimensional weight units, 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 USB flash drive with the Qbit application, or you can download it from the Cubiscan website at [www.cubiscan.com](http://www.cubiscan.com).

### System configuration

---



The following options can be used to configure your Cubiscan 110-XT. The options available on the configuration menu are **Operation**, **Units**, **Ethernet**, and **Other**.

#### Operation

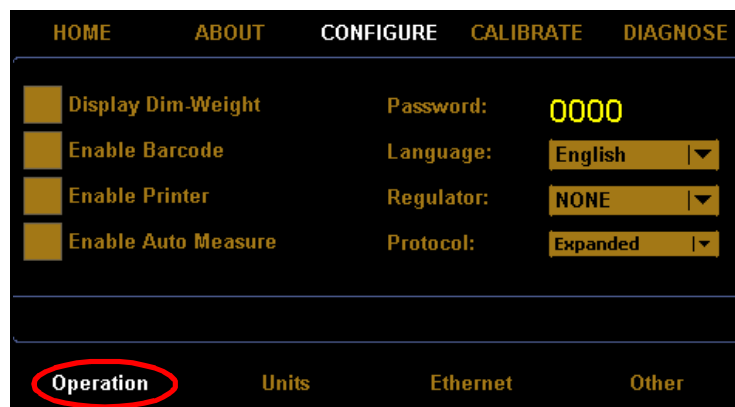
This section discusses the options available on the **Operation** menu. Complete the following steps to access the **Operation** menu.

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



**Figure 23**  
*Home screen*

2. The configuration menu is displayed at the bottom of the screen. Select the **Operation** option if it is not already selected.



**Figure 24**  
*Configure Operation*

- |                                 |  |
|---------------------------------|--|
| <b>Display dim-weight</b>       | Check this box if you want the dim-weight and factor to be displayed on the home screen.   |
| <b>Enable barcode</b>           | Check this box if you want to enable a barcode scanner to work with the Cubiscan 110-XT. If this box is enabled a new barcode field will appear on the home screen. The <b>Enable Expanded Protocol</b> box must also be checked for the barcode option to work. |
| <b>Enable printer</b>           | Check this box if you want to enable a printer to work with the Cubiscan 110-XT. When this box is enabled a label will be printed each time a measurement is taken.  |
| <b>Enable expanded protocol</b> | Enabling the expanded protocol allows more information to be sent in a data packet. When this option is disabled, the Cubiscan 110-XT is   |

backwards compatible with the Cubiscan 100. When the expanded protocol is enabled it includes, among other things, the packet number, date and time, length, width, height, weight, dimensional weight, the dimensional factor, and barcode information.

This option must also be enabled when enabling a barcode scanner.

**Password** This field displays the current password.

To set a password, tap the digits displayed in the password field. Enter your preferred password. When the Cubiscan 110-XT is first turned on the password must be entered before access is granted to the Configure, Calibrate, and Diagnose menus.

If the password is set to all zeros, no password is required to access the Cubiscan 110-XT.

## Units

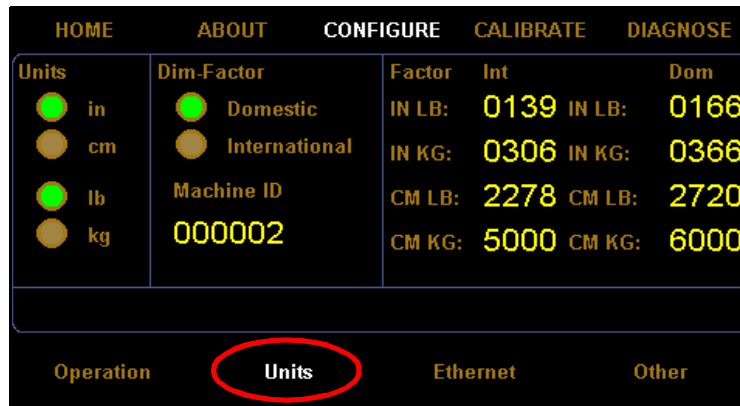
This section discusses the options available on the **Units** menu. Complete the following steps to access the units menu.

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



**Figure 25**  
*Home screen*

- The configuration menu is displayed at the bottom of the screen. Select the **Units** option if it is not already selected.



**Figure 26**  
*Configure Units*

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

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

**Machine ID** In this field you can enter a unique ID for your Cubiscan 110-XT. This can be helpful if you have more than one Cubiscan on site.

**Factors** In this field you can view or change the current dim factor values.

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

Dimensional factor	Domestic	International
Cubic inches per pound	166	139
Cubic inches per kilogram	366	306
Cubic centimeters per pound	2720	2278
Cubic centimeters per kilogram	6000	5000

## Ethernet

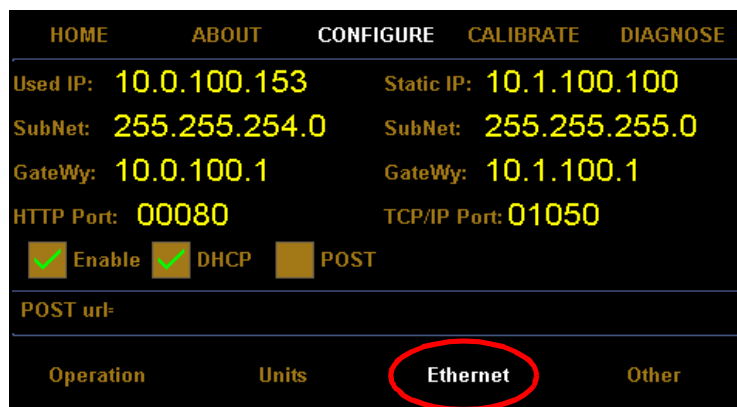
This section discusses the options available on the **Ethernet** menu. Complete the following steps to access the **Ethernet** menu.

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



**Figure 27**  
*Home screen*

2. The configuration menu is displayed at the bottom of the screen. Select the **Ethernet** option if it is not already selected.



**Figure 28**  
*Configure Ethernet*

### In use

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

- IP** This is the current IP address.
- SubNet** This is the current subnet mask.
- GateWy** This is the current gateway setting.
- Enable** Check this box to enable or disable the in use Ethernet.
- DHCP** Check this box to enable or disable the DHCP.

## Static

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

- IP** This is the IP address.
- SubNet** This is the subnet mask.
- GateWy** This is the gateway setting.
- Port** This is the port setting.

## Other

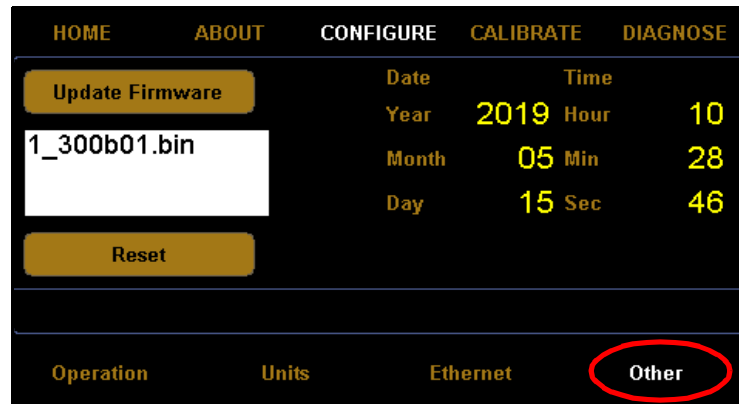
This section discusses the options available on the **Other** menu. Complete the following steps to access the **Other** menu.

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



**Figure 29**  
*Home Screen*

- The configuration menu is displayed at the bottom of the screen. Select the **Other** option if it is not already selected.



**Figure 30**  
*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 110-XT to a certain firmware file, select it in the list displayed and tap **[Update Firmware]**.
- Reset** Tap this button to reboot the system with the updated firmware. The system must be rebooted each time the firmware is updated.
- Date/time** This displays the current date and time. You can update these numbers by tapping on each one and entering the correct number on the pop-up keypad, and then tapping **Enter**.

# CHAPTER 5

## CALIBRATION

---

This chapter provides instructions for calibrating the Cubiscan 110-XT. The Cubiscan 110-XT is calibrated at the factory; however, some circumstances in which recalibration may be required include the following:

- Calibrate the Cubiscan 110-XT if you have problems cubing and weighing after assembly and setup.
- Calibrate the Cubiscan if it is subjected to any type of mechanical shock or collision with a heavy object.
- Calibrate the Cubiscan as part of a regular maintenance schedule. If the Cubiscan is used heavily, scale calibration should be performed monthly and sensor calibration yearly.



*If an error message appears during calibration, power the Cubiscan off and back on and start calibration over.*

### Before you begin

---



Before calibrating the Cubiscan 110-XT, remove all packages or other material from the platform, and blow any dust off the sensor screens. Refer to [page 48](#) for information on cleaning the sensors.

All controls and displays for the Cubiscan 110-XT are located on the freestanding touchscreen. For information on the controls and indicators, refer to “Measuring and weighing using the touchscreen” on [page 25](#).

If you want to calibrate using Qbit, refer to the *Qbit User’s Guide*.



*The calibration cube should be kept clean and undamaged—you will need it each time you calibrate the Cubiscan 110-XT.*



# Calibrating the scale

To perform the calibration, you will need the following:

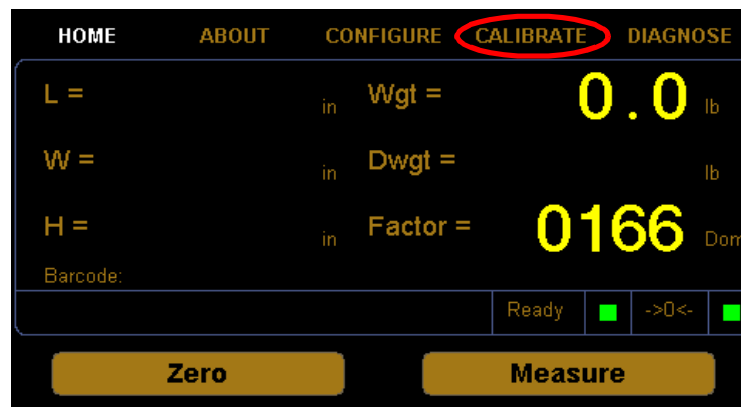
- Official test weight in the range of 50-100 pounds (25-50 kg) (it is recommended that you calibrate with the maximum weight)

Calibrating without an accurate known weight can make all future weight readings inaccurate. To calibrate the scale using the touchscreen, proceed as follows.

## NOTE >

When calibrating the scale, the Cubiscan 110-XT must be stable with no movement of the platform such as that caused by vibration or air movement.

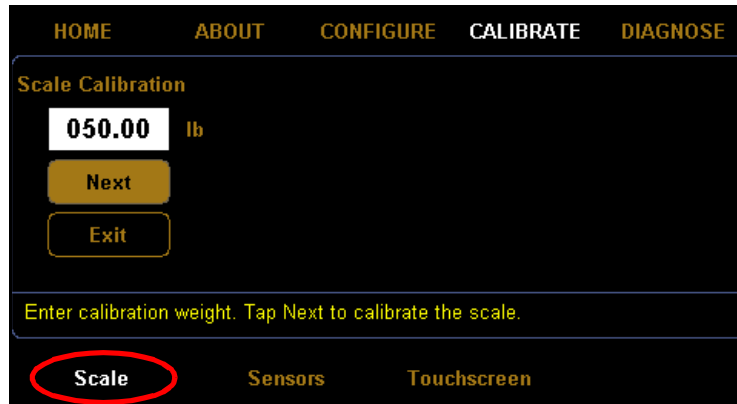
1. At the home screen, tap **CALIBRATE**.



**Figure 31**  
Home screen

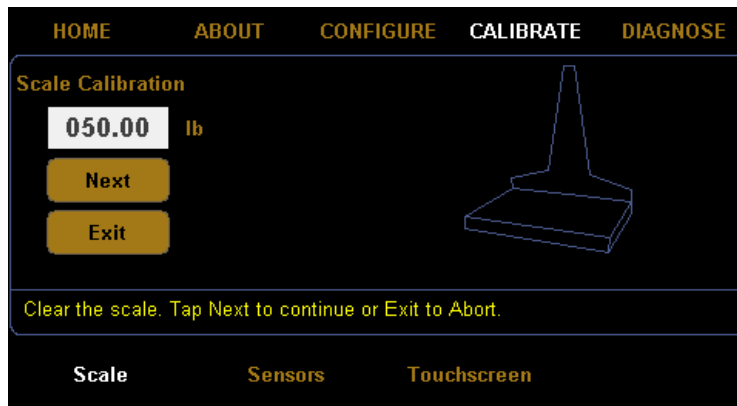
2. The calibration menu is displayed at the bottom of the screen. Select the **Scale** option if it is not already selected. If the weight units displayed are correct for the test weight you are using, tap **[Next]** to

begin the scale calibration. If the numbers are not correct, tap them and enter the correct numbers on the pop-up keypad.



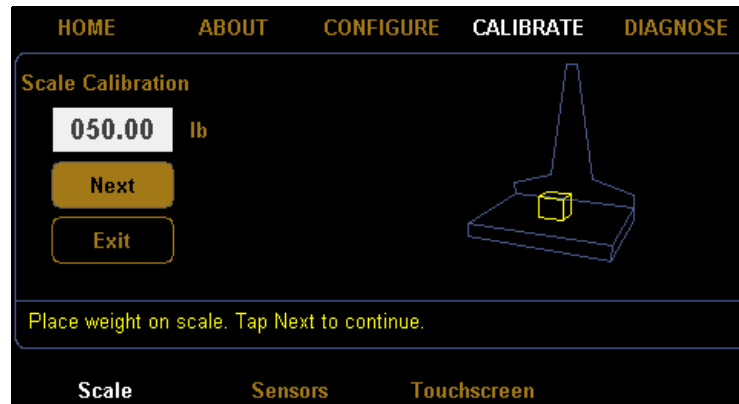
**Figure 32**  
*Scale calibration menu*

3. Make sure there is nothing on the Cubiscan 110-XT platform, then tap [Next].



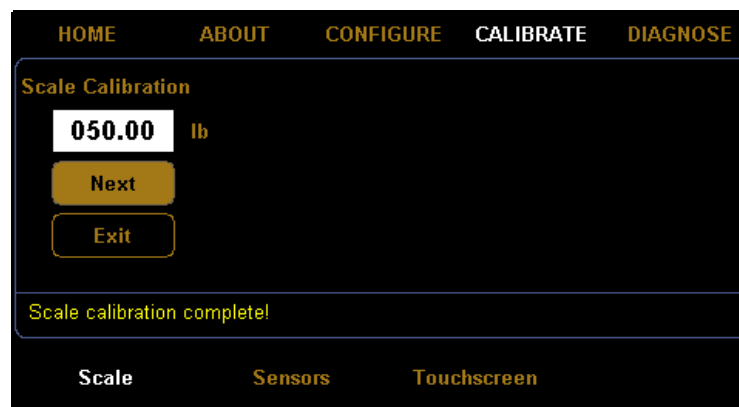
**Figure 33**  
*First scale calibration screen*

- The following screen is displayed. Place the calibration weights on the Cubiscan 110-XT platform.



**Figure 34**  
*Second scale calibration screen*

- Tap **[Next]** to continue, and the following screen is displayed.



**Figure 35**  
*Scale calibration complete*

- 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]**.

## Calibrating the ultrasound sensors

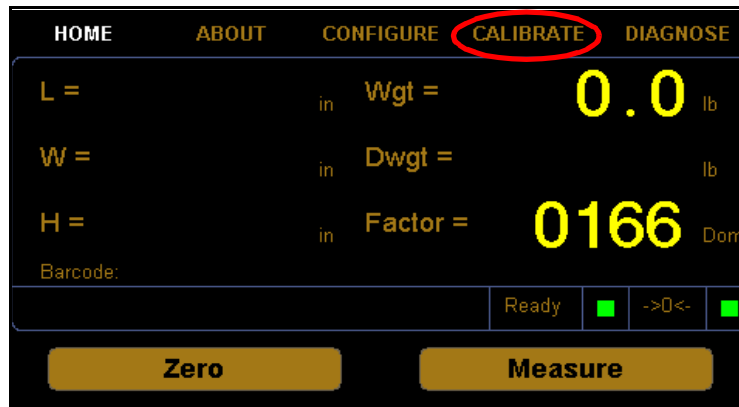


To perform the calibration, you will need the following:

- 12" x 5" x 3.6" calibration cube, supplied with the Cubiscan

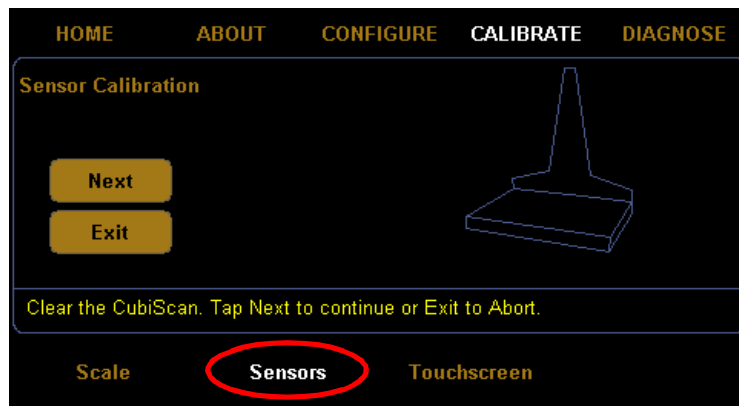
To calibrate the sensors using the touchscreen, proceed as follows.

1. At the home screen, tap **CALIBRATE**.



**Figure 36**  
*Home screen*

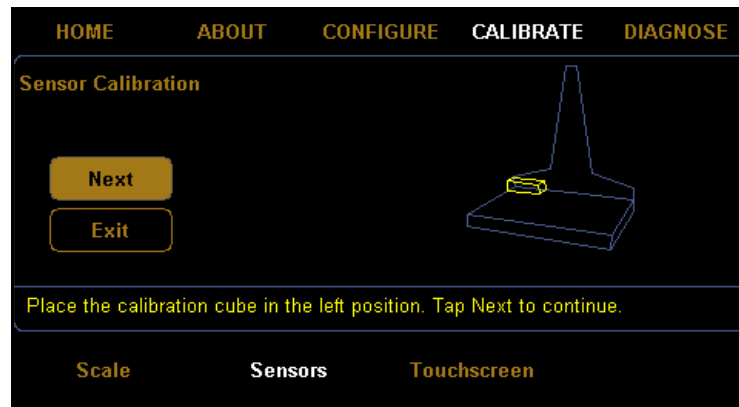
2. The calibration menu is displayed at the bottom of the screen. Select the **Sensors** option if it is not already selected.



**Figure 37**  
*Sensors calibration menu*

3. Make sure there is nothing on the Cubiscan 110-XT platform, and tap **[Next]** to continue.

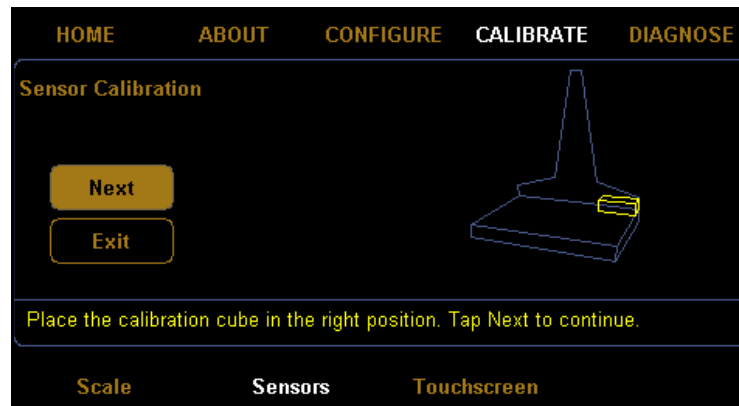
- The following screen is displayed. Place the calibration cube on the platform in the left position, as shown below. Be sure the cube is touching the sensor box.



**Figure 38**

*First sensor calibration screen*

- Tap **[Next]** to continue, and the following screen is displayed.

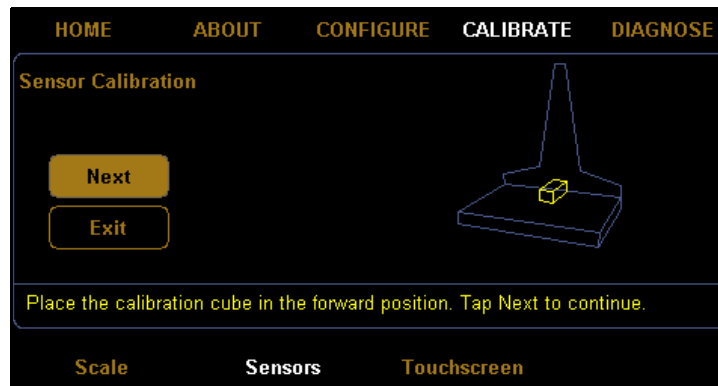


**Figure 39**

*Second sensor calibration screen*

- Place the calibration cube on the platform in the right position, as shown above. Be sure the cube is touching the sensor box.

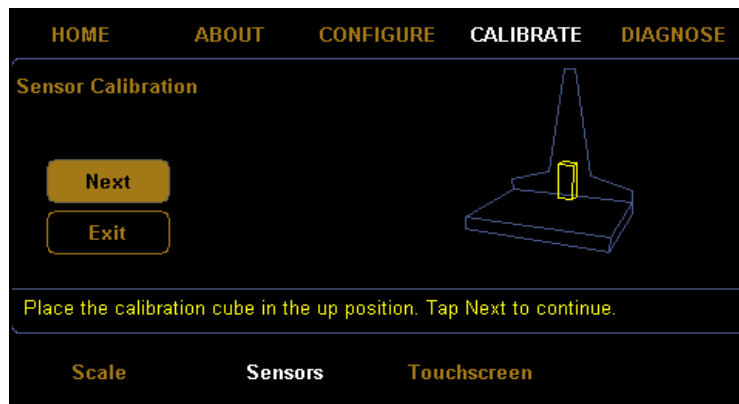
7. Tap **[Next]** to continue, and the following screen is displayed.



**Figure 40**

*Third sensor calibration screen*

8. Place the calibration cube on the platform in the forward position, as shown above. Be sure the cube is centered on the back edge of the platform.
9. Tap **[Next]** to continue, and the following screen is displayed.

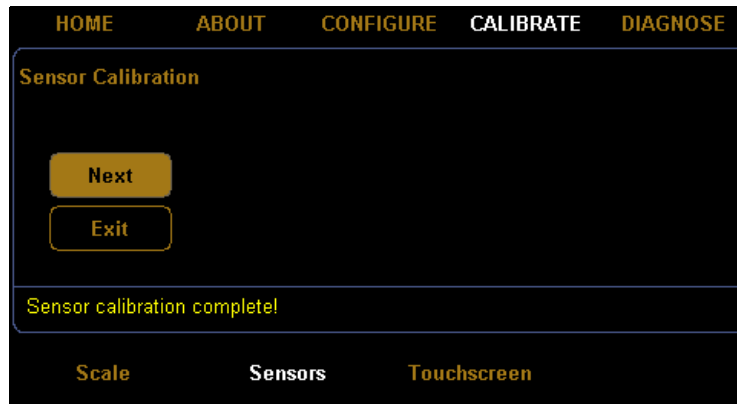


**Figure 41**

*Fourth sensor calibration screen*

10. Place the calibration cube in the up position, as shown above.

11. Tap **[Next]** to complete the sensor calibration. The following screen is displayed.



**Figure 42**  
*Sensor calibration complete*

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

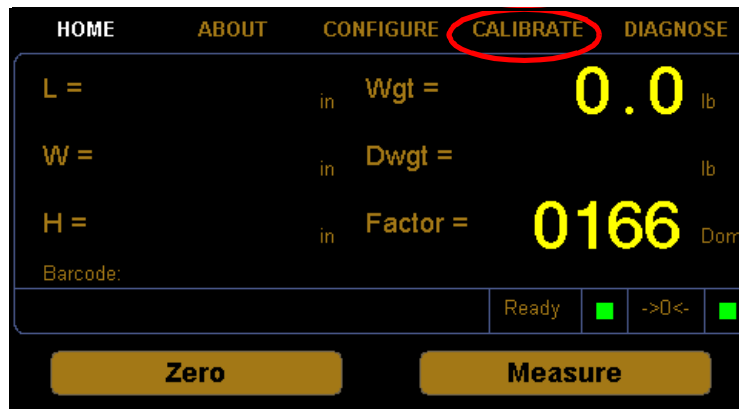
## Calibrating the touchscreen



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.

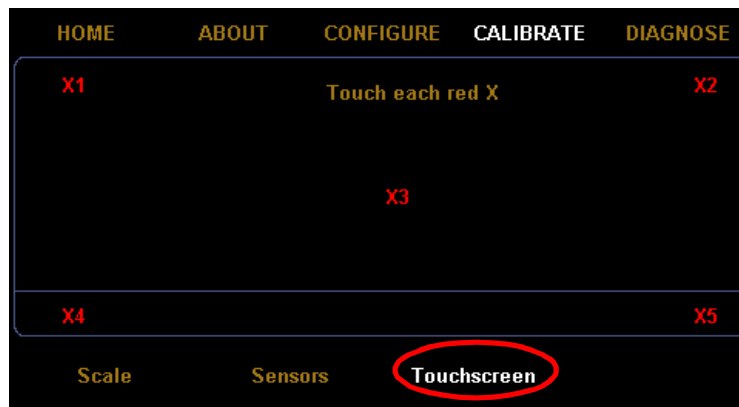
Take the following steps to calibrate the touchscreen.

1. At the home screen, tap **CALIBRATE**.



**Figure 43**  
*Home screen*

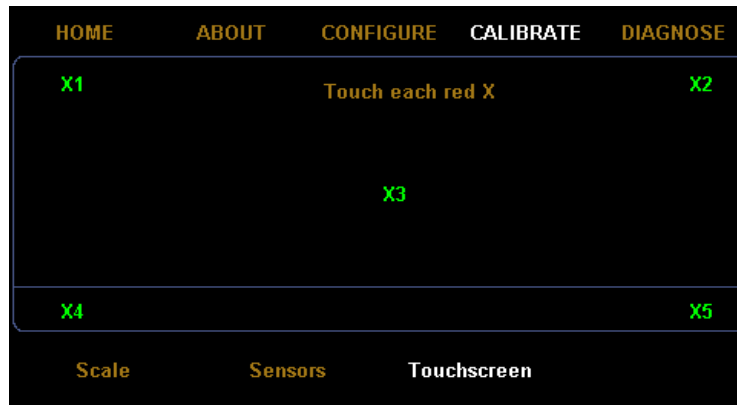
2. The calibration menu is displayed at the bottom of the screen. Select the **Touchscreen** option if it is not already selected.



**Figure 44**  
*Touchscreen calibration*



3. Tap each red **X** until it turns green.



**Figure 45**  
*Touchscreen calibration complete*

4. When each **X** has turned green, the touchscreen calibration is complete. Tap **HOME** to return to the home screen.

# CHAPTER 6

## MAINTENANCE

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This chapter provides information on the care and maintenance of the Cubiscan 110-XT. Routine maintenance and careful handling will help keep the Cubiscan 110-XT in good operating condition and prevent service calls or repairs.

### Precautions

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The Cubiscan 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 14.

Do not put packages on the platform that are known to be over 100 pounds (50 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 cells.

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

### Cleaning the sensors

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The sensors 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, gently blow dust from the gold foil surface.



#### **CAUTION**

The gold foil screen on the front of the sensor is delicate. Do not use high pressure air or water lines to clean the surface of the gold foil and do not touch it with fingers, tools, or brushes. Doing so may result in damage.





# CHAPTER 7

## TROUBLESHOOTING

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This chapter provides assistance in identifying and solving common problems with the Cubiscan 110-XT. If you encounter problems not covered in this chapter, or if a defect is suspected, contact your system integrator or call Cubiscan Technical Assistance at 801.451.7000 for assistance.

After installation, most problems are caused either by incorrect cabling or because the system setup is not correct. If you are having problems with the Cubiscan 110-XT, first verify that all cables attached to the controller box under the freestanding touchscreen (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.

Problems with your computer may affect operation of the Cubiscan 110-XT 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.

### Readings are not accurate

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If you suspect that the Cubiscan 110-XT readings are inaccurate, do the following:

1. Zero the scale 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 **[Zero]** on the touchscreen.)

If the Cubiscan does not return to zero or is slow to return to zero, level the Cubiscan and make certain that all four leveling legs are resting on the supporting surface. Refer to "Leveling the Cubiscan 110-XT" on page 15.

2. Move the Cubiscan if it is located close to open freight doors or where hot air is blowing on it. Extreme changes in temperature and humidity can affect the accuracy of the Cubiscan 110-T. Refer to "Placement" on page 14.
3. Recalibrate the Cubiscan. Refer to "Calibration" on page 38.

## Computer error messages

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

**No  
communication  
with Cubiscan**

This message indicates that no communication is taking place between the computer and the Cubiscan 110-XT.

**Transmission  
error**

This message indicates that erroneous data or garbled data is being sent from the Cubiscan.

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

1. Is the Cubiscan turned on and securely connected to power?
2. Is the USB, serial, or Ethernet cable securely connected?
3. Is there a problem with the Cubiscan 110-XT? Perform the Status function in Qbit to check the status of the Cubiscan.
4. 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

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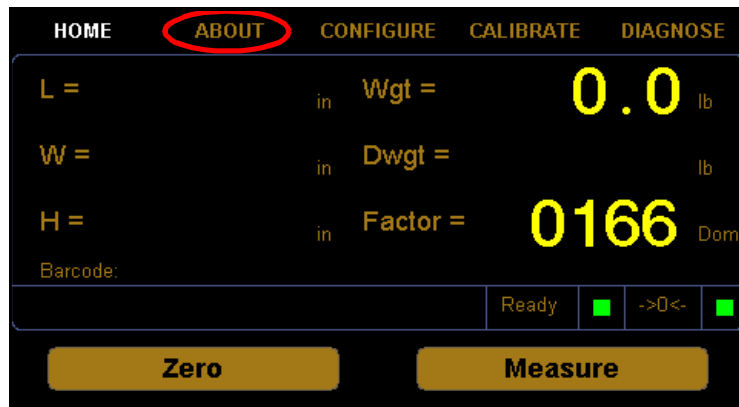


This section describes the About menu of the Cubiscan 110-XT. The **About** menu contains useful information and records of the Cubiscan 110-XT.

### Version

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

1. Tap **ABOUT** at the home screen.



**Figure 46**  
*Home screen*

The about menu is displayed at the bottom of the screen. Select the **Version** option if it is not already selected.



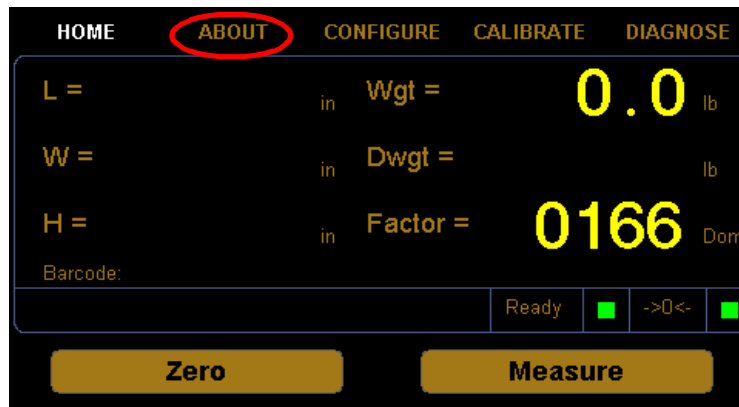
**Figure 47**  
*About version*

- MAC** This field displays the Media Access Control (MAC) address.
- SN** This field displays the Serial Number (SN) of the Cubiscan.
- MDMI** This field displays the Multiple Dimensional Measuring Instrument (MDMI) status. This status can either be sealed or unsealed.
- NAWI** This field displays the Non-Automatic Weighing Instrument (NAWI) status. This status can either be sealed or unsealed.
- Firmware** The fields listed under the firmware heading list the firmware being used for that specific part. Firmware information is displayed for the main, scale, kernel, left sensor, top sensor, front sensor, and right sensor.

## Configure-audit

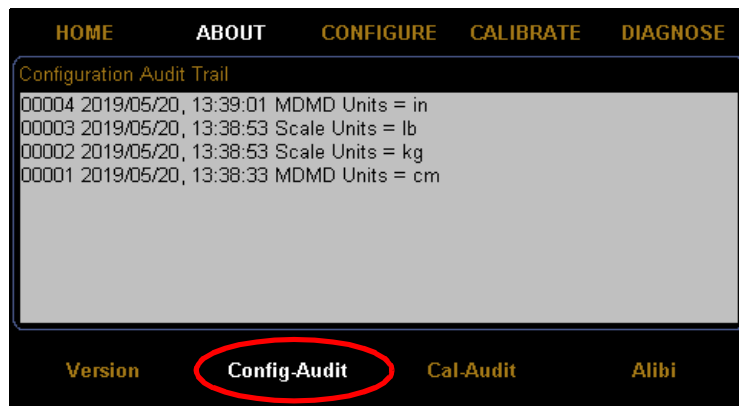
This section discusses the options available on the configure-audit menu. Complete the following steps to access the configure-audit menu.

1. Tap **ABOUT** at the home screen.



**Figure 48**  
*Home screen*

2. The about menu is displayed at the bottom of the screen. Select the **Config-Audit** option if it is not already selected.



**Figure 49**  
*About config-audit*

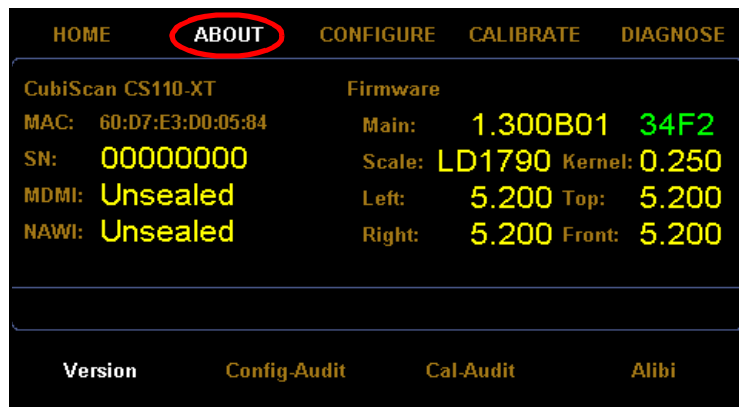
**Configuration Audit Trail** This field displays the scale calibration history.

## Cal-Audit

This section discusses the options available on the Cal-Audit menu. Complete the following steps to access the Cal-Audit menu.

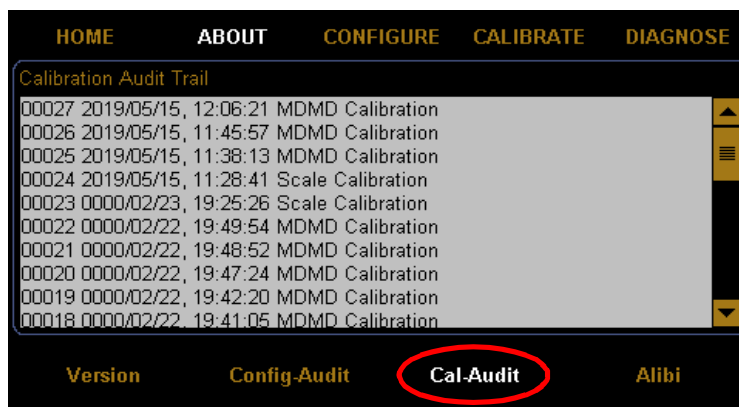


1. Tap **ABOUT** at the home screen.



**Figure 50**  
*Home screen*

2. The about menu is displayed at the bottom of the screen. Select the **Cal-Audit** option if it is not already selected.



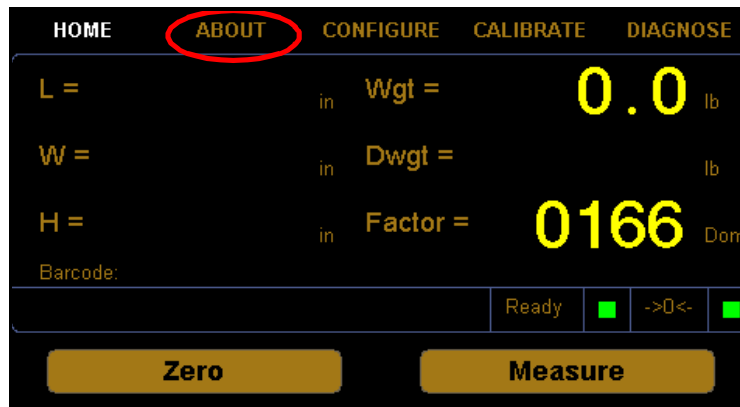
**Figure 51**  
*About Cal-Audit*

**Calibration Audit Trail**

This field displays the calibration history.

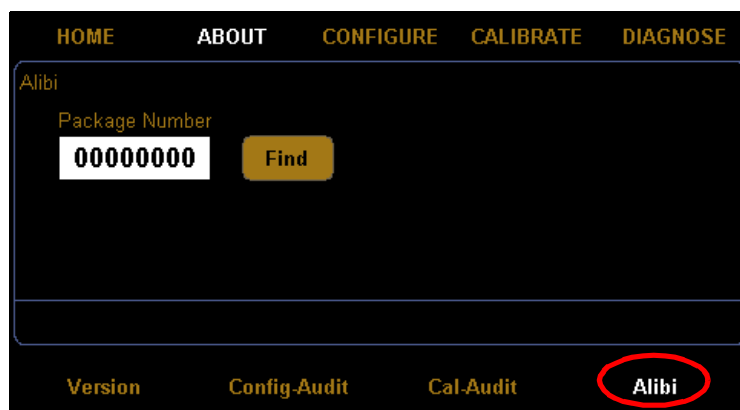
This section discusses the options available on the version menu. Complete the following steps to access the version menu.

1. Tap **ABOUT** at the home screen.



**Figure 52**  
*Home screen*

2. Select the **Alibi** option if it is not already selected.

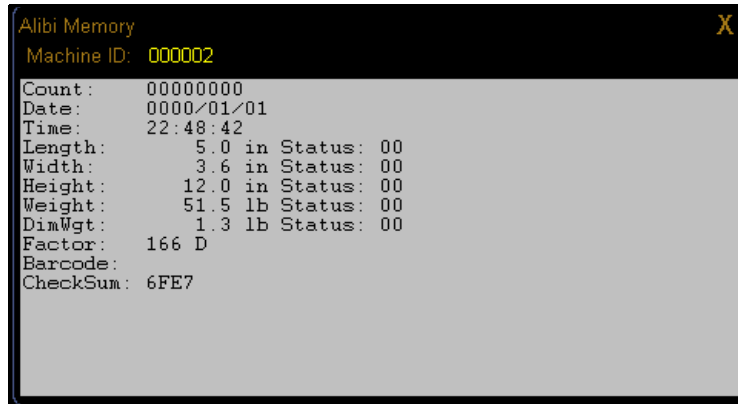


**Figure 53**  
*About Alibi*

From this screen you can look up measurement data.

**Package number** Enter the package number of the measurement you are looking for. The package number automatically increments after each measurement.

**Find** Tap this button to look up the measurement data after you have entered the package number.



**Figure 54**  
*Alibi memory*

## Diagnostics



This section describes the diagnostic capabilities of the Cubiscan 110-XT.

### Scale Diagnostics

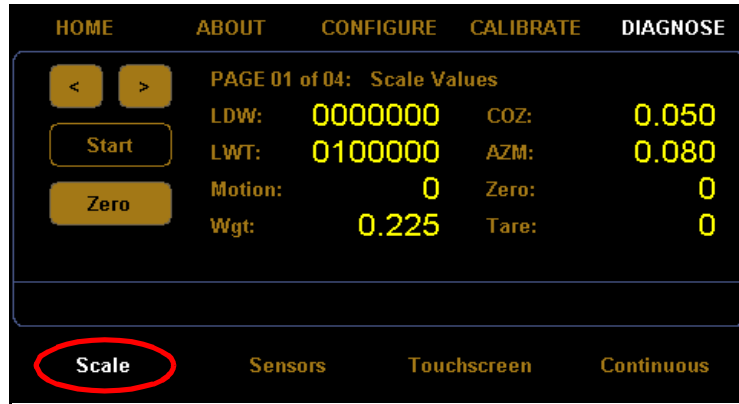
Complete the following steps to view the scale diagnostics.

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



**Figure 55**  
*Home screen*

- The diagnostic menu is displayed at the bottom of the screen. Select the **Scale** option if it is not already selected.



**Figure 56**  
First scale diagnostic screen

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

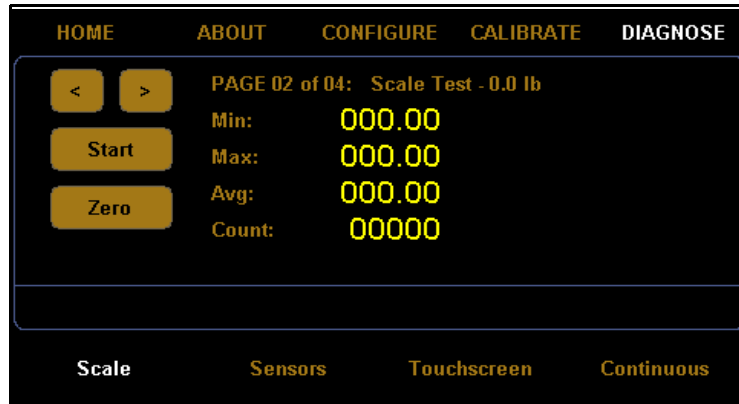
**Wgt** This field displays the current weight.

**COZ** This field displays the center of zero.

**AZM** 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. This value should typically be near zero.



**Figure 57**  
Second scale diagnostic screen

## Scale Testing

Scale diagnostic screens two through four are for factory scale testing at various weights (0, 25, and 50 lbs). To begin the test, place the appropriate weight on the platform, and tap **[Start]**.



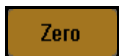
Tap the left arrow button [**<**] to navigate left through the diagnostic scale screens.



Tap the right arrow button [**>**] to navigate right through the diagnostic scale screens.



Tap the **[Start]** button to start the diagnostic test. After the test has started, this button will read **[Stop]**. Tap this button to stop the test.



Tap the **[Zero]** button to zero the scale. Make sure nothing is on or touching the platform when you zero the scale, or all future scale readings will be inaccurate.

**Min** This field displays the minimum weight detected during the scale test.

**Max** This field displays the maximum weight detected during the scale test.

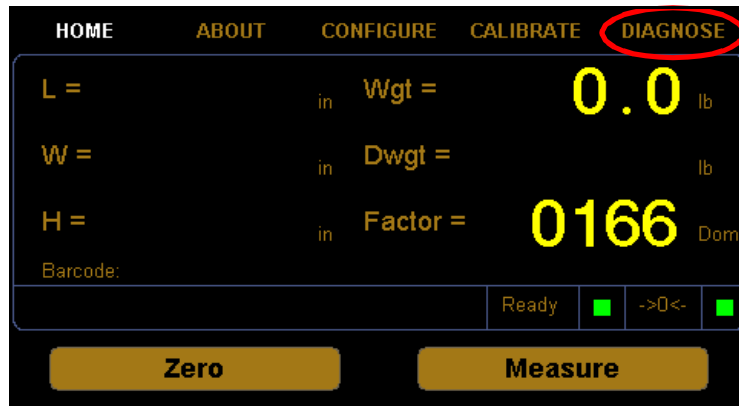
**Avg** This field displays the average weight detected during the scale test.

**Count** This field displays the count accrued during the scale test.

## Sensor diagnostics

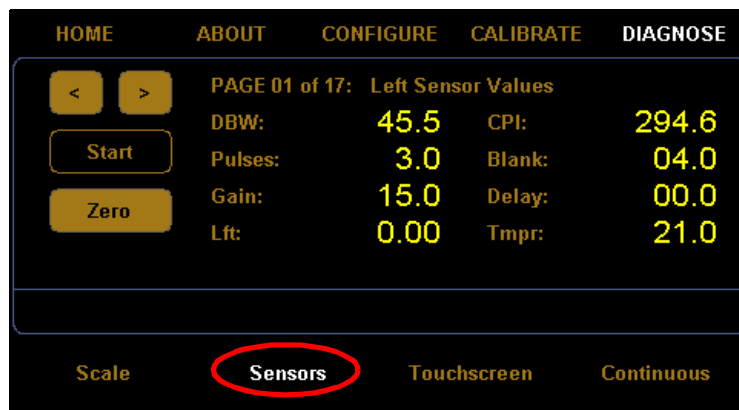
Complete the following steps to view the sensor diagnostics.

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



**Figure 58**  
Home screen

2. The diagnostic menu is displayed at the bottom of the screen. Select the **Sensors** option if it is not already selected.



**Figure 59**  
First sensor diagnostic screen

Sensor diagnostic screens one through four display information for the left, right, top, and front sensor. From the example shown you can view the left sensor diagnostic values. To view the values for the right, top, and front sensors, tap the **[>]** button.

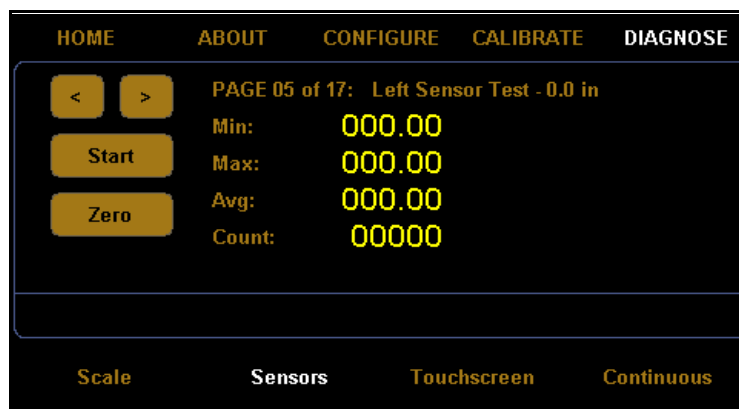
**DBW** This field displays the Distance to the Back Wall (DBW).

**Pulses** This field displays the number of pulses the sensor sends.

**Gain** This field displays the gain step distance and affects the sensor sensitivity.

- Lft** This field displays the distance in inches of how far sound waves travel from the sensor before they are interrupted. (Lft stands for left sensor, Rgt stands for right sensor, and Top stands for top sensor.)
- CPI** This field displays the Counts Per Inch (CPI).
- Blank** This field displays the blanking zone, which is the dead zone in front of the sensor.
- Delay** This field displays the internal timing parameter in milliseconds.
- TMPR** This field displays the internal temperature of the sensor.

3. Tap the [➤] button until you reach the left sensor test screen.



**Figure 60**  
Second sensor diagnostic screen

Sensor diagnostic screens five through seventeen are for factory sensor testing at various sensors and lengths (0, 12, and 24 inches). To begin the test, place the calibration cube in the appropriate position on the platform.



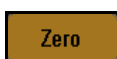
Tap the left arrow button [◀] to navigate left through the diagnostic sensor screens.



Tap the right arrow button [▶] to navigate right through the diagnostic sensor screens.



Tap the **[Start]** button to start the diagnostic test. After the test has started, this button will read **[Stop]**. Tap this button to stop the test.



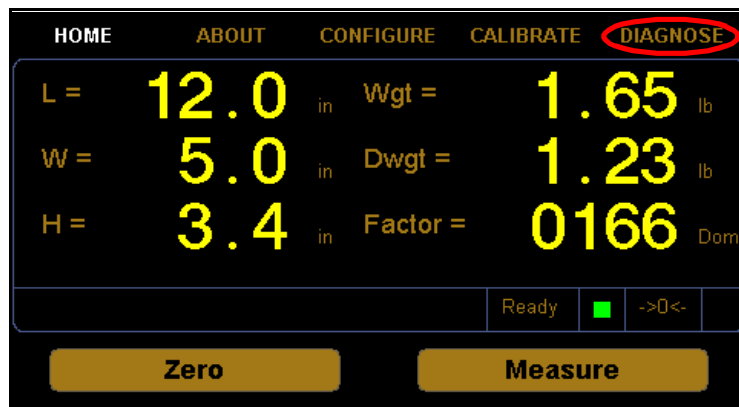
Tap the **[Zero]** button to zero the scale. Make sure nothing is on or touching the platform when you zero the scale, or all future scale readings will be inaccurate.

- Min** This field displays the minimum length detected during the sensor test.
- Max** This field displays the maximum length detected during the sensor test.
- Avg** This field displays the average length detected during the sensor test.
- Count** This field displays the count accrued during the sensor test.

## Touchscreen diagnostics

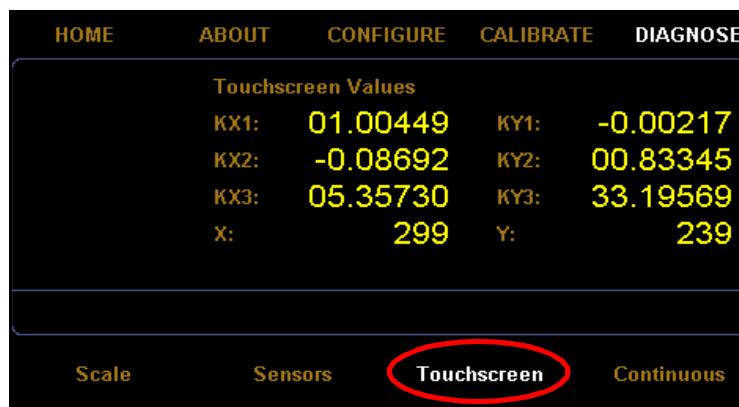
Complete the following steps to view the touchscreen diagnostics.

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



**Figure 61**  
*Home screen*

2. The diagnostic menu is displayed at the bottom of the screen. Select the **Touchscreen** option if it is not already selected.



**Figure 62**  
*Touchscreen diagnostics*

From this screen you can view the touchscreen calibration values.





# Appendix A

## COMMUNICATIONS

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This appendix contains the cable pin assignments for the interface between the Cubiscan 110-XT and a host computer via a serial RS-232 connection as well as for the interface between the Cubiscan 110-XT and a network via an Ethernet TCP/IP connection.

The communications command set can be found in a separate document titled *Cubiscan 110-XT Communications Command Set*.

### Serial (RS-232-C) Cable Pin Assignments

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The Cubiscan 110-XT serial ports use the EIA RS-232-C communications protocol. The data are serially transmitted ASCII characters.

The following table shows the serial connector pin assignments. All other pins are not connected.

RS-232-C Male DB 9-Pin Assignments		
Pin	Signal	Description
Pin 2	RXD	Commands from the host computer
Pin 3	TXD	Data from the control unit to the host
Pin 5	SGND	Signal ground (DB-9 connector)

The following table shows the parameters for asynchronous communications through the RS-232 serial cable.

Asynchronous Communication Parameters	
Baud Rate	9600
Parity	None
Data Bits	8
Start Bits	1
Stop Bits	1

## Ethernet (TCP/IP) cable pin assignments

The Cubiscan 110-T Ethernet port uses the 10/100Base-T TCP/IP communications protocol. The following table shows the Ethernet RJ-45 connector pin assignments.

RJ-45 Connector Pin Assignments		
Pin	Signal	Description
1	TD+	Transmit Data
2	TD-	Transmit Data
3	RD+	Receive Data
4	NC	No Connection
5	NC	No Connection
6	RD-	Receive Data
7	NC	No Connection
8	NC	No Connection

## USB port cable pin assignments

The USB port is configured as a HID device. VID = 0x1FC9, PID = 0x0081.

The Cubiscan 110-XT includes a USB 2.0 type B connector, as shown below.



The following table shows the USB 2.0 type B connector pin assignments.

USB 2.0 type B Connector Pin Assignments			
Pin	Name	Cable Color	Description
1	VCC	Red	+5 VDC
2	D-	White	Data -
3	D+	Green	Data +
4	GND	Black	Ground

## Barcode port

The scanner/barcode port can be enabled in the menus of the main controller. The Expanded Communication Protocol is utilized when it is enabled.

The barcode reader should be configured to send the barcode with a suffix of <CR>. The Cubiscan uses the "End of Barcode" character as an indicator that the barcode has been scanned in its entirety. Scanned barcodes are transmitted with the next "Measure" command. If two barcodes are scanned and then a measurement is taken, the most recent barcode will be transmitted. If one barcode is scanned and then two measurements are taken, the first measurement will contain the barcode while the second measurement will contain no data for the barcode.

The bar code port is also a USB 2.0 type B connector, as shown below.



The following table shows the USB 2.0 type B connector pin assignments.

USB 2.0 type B Connector Pin Assignments			
Pin	Name	Cable Color	Description
1	VCC	Red	+5 VDC
2	D-	White	Data -
3	D+	Green	Data +
4	GND	Black	Ground

## LFT (Sealed)

The Cubiscan is placed into LFT mode by moving two sided switches to the "ON" position. This seals metrological parameters.

## **Long term storage (Alibi memory)**

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The long term storage is always enabled. An SD card must be installed in the main controller. This causes the Cubiscan to write all measurement transactions to the SD card, where they are stored until they expire. The long term storage may be queried at any time.

# Appendix B

## PARTS LIST

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Following is a list of parts that can be purchased for the Cubiscan 110-XT as spare parts or if replacement is necessary.

<b>Part No.</b>	<b>Description</b>	<b>Quantity/Unit</b>
10083	Cord, AC power	1
10273	Calibration block, 12" x 5" x 3.6", black	1
14062	Power supply 12 VDC, 3.75A	1
15380	Main controller assembly	1
14540	USB cable	1
12780	Ultrasound Sensor Assembly	1
15390	Main Controller Interface Cable	1