CubiScan® 225

Operations and Technical Manual

Version 1.0

Quantronix, Inc.
Cubing and Weighing Systems

380 South 200 West
P.O. Box 929
Farmington, Utah 84025
U. S. A.
Phone:+1 (801) 451-7000
Fax:+1 (801) 451-0502
Web Site: http://www.cubiscan.com

CUBISCAN
CUBING & WEIGHING SYSTEMS BY QUANTRONIX

CubiScan 225 Operations and Technical Manual

CubiScan® and the Quantronix logo are registered trademarks of Quantronix, Inc.

Scanning New Dimensions™, Qbit™, QbitWIN™, and The FreightWeigh System™ are trademarks of Quantronix, Inc.

Windows® is a registered trademark of Microsoft Corporation.

CubiScan® software and firmware are protected by international and domestic copyrights.

CubiScan® 150 measurement products are protected by one or more of U.S. Patents Re42,430 and D490,328 and foreign patents.

CubiScan® 110 measurement products are protected by one or more of U.S. Patent Re42,430 and foreign patents.

CubiScan® 125 measurement products are the subject of U.S. Patent 8,928,896. Another U.S. patent is pending.

CubiScan® 225 measurement products are the subject of a pending U.S. patent application.

⚠ CAUTION	The CubiScan 225 should only be serviced by qualified personnel.
	Observe precautions for handling electrostatic sensitive devices when setting up or operating the CubiScan 225.

⚡ WARNING	Disconnect all power to the CubiScan 225 before servicing or making any connections.
	Do not climb on the CubiScan 225 conveyor. Keep fingers, hair, loose fitting clothes, etc., away from the conveyor belt while it is in motion.

Limited Warranty
Quantronix New Product

Statement of Warranty. Quantronix, Inc.'s, warranty obligations are limited to the terms set forth below: Quantronix (hereinafter referred to as the "Seller") warrants that its new product is in accordance with Seller's published specifications (or those agreed upon with Buyer in writing) at the time of sale or lease and that it is free from defects in materials and workmanship under normal use for a period of one (1) year from the date of sale or the commencement date under a written equipment lease or rental agreement (the "Warranty Period"). If a hardware defect arises and a valid claim is received within the Warranty Period, at its option, Seller will either (i) repair the hardware defect at no charge, using new or refurbished replacement parts, or (ii) exchange the product with a product that is new or which has been manufactured from new or serviceable used parts and is at least functionally equivalent to the original product, or (iii) refund the purchase price of the product. For purposes of this warranty agreement, "Buyer" shall mean and refer to (i) the party which originally – whether from Seller directly, or from a distributor, agent or reseller authorized by Seller – purchases, or leases under a written equipment lease or rental agreement, the Seller's product which is the subject of this warranty, or (ii) any subsequent purchaser or transferee that acquires valid title to the equipment within the Warranty Period.

In the event of the occurrence of a claim under this warranty, the Buyer shall have thirty (30) days to notify Seller in writing of the nature and specifics of the claimed defect; provided, however, that any and all claims must be received before the expiration of the Warranty Period. Failure to notify Seller within such time period shall void this warranty. Any claim of a warrantied defect is subject to inspection and analysis by Seller to conclusively identify or confirm the nature and cause of failure and application of this warranty.

This is a factory warranty and any defective components, mechanical or electrical, will be repaired or replaced, at the discretion and authorization of Seller, at Seller's facilities in Utah. It shall be the Buyer's responsibility to return the faulty equipment or components to Seller at Buyer's expense. Seller's obligation shall not include transportation charges, nor labor, material, or service charges involved in the removal, return or installation of equipment or components. Seller reserves the right to incorporate improvements in material and design of its products without notice and is not obligated to incorporate the same improvements in equipment previously manufactured.

Exclusions and Limitations. This limited one (1) year warranty is applicable exclusively to original equipment products and components that were manufactured by Seller. Seller also warrants its replacement parts, subject to the terms and conditions set forth herein, for the lesser period of ninety (90) days from the date of delivery or until the expiration of the original warranty, whichever is greater. Seller does not warrant, for any purpose, any external accessories, including but not limited to computers, controllers and/or barcode scanners, that are manufactured by another manufacturer and sold under a separate label, even if they are packaged or sold with Seller's product. Seller's obligation and liability under this warranty is expressly limited to repair or replacement (at its option) of the warrantied equipment or components within the Warranty Period. A purchase by Buyer of equipment that it had first leased or rented shall not start a new Warranty Period. Seller does not warrant that the operation of the product will be uninterrupted or error-free.

This warranty shall not apply to equipment or components which has/have:

1. Been the subject of repairs or modifications not authorized by Seller.
2. Been used with incompatible products.
3. Been operated under abnormal conditions or in an unintended manner.
4. Not been operated or maintained in accordance with Seller's instructions.
5. Been subject to misuse or abuse, negligent handling, improper installation, accident, damage by fire, flood, water or other liquid damage, abnormal electrical condition and/or power surge, earthquake, or other act of God.
6. Had serial numbers altered, defaced or removed.
7. Been operated beyond capacity.

TO THE EXTENT PERMITTED BY LAW, THIS WARRANTY AND THE REMEDIES SET FORTH ABOVE ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, REMEDIES AND CONDITIONS, WHETHER ORAL OR WRITTEN, STATUTORY, EXPRESS OR IMPLIED. AS PERMITTED BY APPLICABLE LAW, SELLER SPECIFICALLY DISCLAIMS ANY AND ALL STATUTORY OR IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND WARRANTIES AGAINST HIDDEN OR LATENT DEFECTS. IF SELLER CANNOT LAWFULLY DISCLAIM STATUTORY OR IMPLIED WARRANTIES THEN TO THE EXTENT PERMITTED BY LAW, ALL SUCH WARRANTIES SHALL BE LIMITED IN DURATION TO THE DURATION OF THIS EXPRESS WARRANTY AND TO REPAIR OR REPLACEMENT SERVICE AS DETERMINED BY SELLER IN ITS SOLE DISCRETION. This statement sets forth the full extent of Seller's liability for breach of any warranty or deficiency in

connection with the sale or use of the product. No employee, representative or reseller of Seller is authorized to change this warranty in any way or grant any other warranty.

EXCEPT AS PROVIDED IN THIS WARRANTY AND TO THE EXTENT PERMITTED BY LAW, SELLER IS NOT RESPONSIBLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM ANY BREACH OF WARRANTY OR CONDITION, OR UNDER ANY OTHER LEGAL THEORY, INCLUDING BUT NOT LIMITED TO LOSS OF USE; LOSS OF REVENUE; LOSS OF ACTUAL OR ANTICIPATED PROFITS (INCLUDING LOSS OF PROFITS ON CONTRACTS); LOSS OF THE USE OF MONEY; LOSS OF ANTICIPATED SAVINGS; LOSS OF BUSINESS; LOSS OF OPPORTUNITY; LOSS OF GOODWILL; LOSS OF REPUTATION; LOSS OF, DAMAGE TO OR CORRUPTION OF DATA; OR ANY INDIRECT OR CONSEQUENTIAL LOSS OR DAMAGE HOWSOEVER CAUSED INCLUDING THE REPLACEMENT OF EQUIPMENT AND PROPERTY, AND ANY COSTS OF RECOVERING, PROGRAMMING, OR REPRODUCING ANY PROGRAM OR DATA STORED OR USED WITH SELLER PRODUCTS.

CONSUMER PROTECTION LAWS. FOR CONSUMERS WHO ARE COVERED BY CONSUMER PROTECTION LAWS OR REGULATIONS IN THEIR COUNTRY OF PURCHASE OR, IF DIFFERENT, THEIR COUNTRY OF RESIDENCE, THE BENEFITS CONFERRED BY THIS WARRANTY ARE IN ADDITION TO ALL RIGHTS AND REMEDIES CONVEYED BY SUCH CONSUMER PROTECTION LAWS AND REGULATIONS. Some countries, states and provinces do not allow the exclusion or limitation of incidental or consequential damages or exclusions or limitations on the duration of implied warranties or conditions, so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights, and you may also have other rights that vary by country, state or province.

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 December 2, 2015.

Table of Contents

List of Figures

Chapter 1

Product Description

The CubiScan® 225 is installed, set up, and calibrated by trained Quantronix technicians. The CubiScan 225 can be used as a stand-alone unit, or it can be installed in an "in-line" configuration with auxiliary conveyors.

This system is a precision, in-line dimensioning system that is integrated into a conveyor—allowing objects to be measured quickly and accurately. The CubiScan 225 is capable of measuring boxes and irregularly-shaped objects with high precision.

The CubiScan 225 provides the solution to on-demand box making and results in higher degrees of accuracy, reduced packaging and shipping costs, and economized use of storage.

The measurement capacity is 24 x 24 x 60 inches (61 x 61 x 152 cm) with a resolution of 0.05 inches (1.3 mm) while requiring an interval of only 6 inches (15 cm) between objects. The integrated belt conveyor has a variable speed of 10 to 50 ft (3 to 15 m) per minute. This system includes a built-in touchscreen interface but can also be connected and operated by PC. An optional laptop tray can be attached directly to the CubiScan 225. CubiScan software, Qbit, can be used with the CubiScan 225 to create menu-driven operator controls, data storage, transfer, and diagnostics. The CubiScan 225 comes ready to fit your dimensioning needs.

Figure 1
CubiScan 225

Specifications

Power Requirements

110 to 240 VAC single-phase, 50 to 60 Hz

Environmental

Operating Temperature: 32° to 104° F (0° to 40° C)

Humidity: 0 to 90% non-condensing

Measuring Sensor

Infrared light beam

Measuring Capacities

Measurement Range

Length:	6.00 to 60.00 in (15.0 to 150.0 cm) Accuracy +/- 0.25 in (0.6 cm)
	6.00 to 96.00 in (15.0 to 240.0 cm) Accuracy +/- 0.50 in (1.0 cm)
Width:	0.50 to 24.00 in (1.0 to 60.0 cm) Accuracy +/- 0.10 in (0.3 cm)
Height:	0.20 to 24.00 in (0.5 to 60.0 cm) Accuracy +/- 0.10 in (0.3 cm)

Weight Limit: 50 lb (23 kg)

Measurement Increment: 0.05 in (0.1 cm)

Belt Speed: 10 to 50 ft (3 to 15 m) per minute

Minimum Interval Between Objects: 6.00 in (15.0 cm)

Object Colors: Opaque

Physical

Length: 102 in (259 cm)

Width: 35 in (90 cm)

Height: 61 to 69 in (154 to 175 cm) (Adjustable legs)

Weight: 665 lb (301 kg)

User Interface

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

Quantronix' Qbit™ software can be used to interface with the CubiScan 225.

Display:
Integrated TFT LCD Touchscreen (800 x 600) displays L, W, H, unit of measure, 2D and height profile, diagnostic codes.

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

Chapter 2

Getting Started

The CubiScan 225 is installed and setup by an installation professional. This chapter provides instructions for getting started with the CubiScan 225. It describes the operating environment, various components of the CubiScan 225, and how to connect to a computer (optional).

Operating Environment

The CubiScan 225 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 225 to extremes in temperature or humidity. Locate the CubiScan 225 inside, as far from open freight doors as possible.
- Protect the CubiScan 225 from static electricity, especially the touchscreen.
- Orient the CubiScan 225 so the touchscreen faces the operator.
- Place the CubiScan 225 on a level floor. The CubiScan 225 must be level to operate properly.

Components of the CubiScan 225

Below is an overall view of the CubiScan 225 and its main components. The laptop tray is an optional feature.
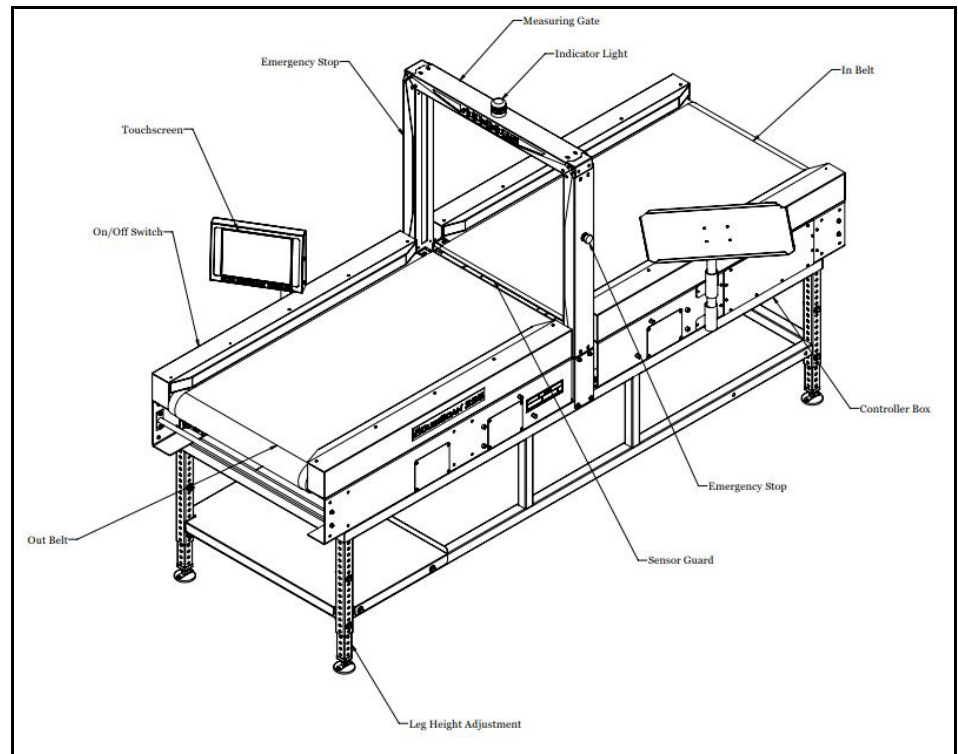
Figure 2
Overall Drawing

Turning the CubiScan 225 On/Off

To turn the CubiScan 225 on, turn the switch to the on position, shown below.

To turn the CubiScan 225 off, turn the switch to the off position.

If the CubiScan 225 is not turning on when you turn the switch to the **ON** position, you may need to reset the breaker. When the circuit is popped, the **10** button (shown below) will pop out. Simply push the **10** button back in to reset the system.

Figure 3
On/Off Switch

Connecting to a Computer (Optional)

To connect the CubiScan 225 to a computer, do the following.

1. Place the computer close to the CubiScan 225.

2. Locate your preferred port. See Figure 4.

3. Choose from one of the following operating methods.

*   Connect the CubiScan 225 to a host system via a standard 10/100 Base-T Ethernet TCP/IP port. You can use Qbit software or the touchscreen options to configure the CubiScan 225 for TCP/IP communication. Contact Quantronix for information on available software. Or, refer to Appendix A "Communications Protocol" on page 81 for command protocol and setup parameters.

*   Connect the CubiScan 225 to a PC using a USB cable, or use an Ethernet to USB adapter through the Ethernet port on the controller box. You will need to load the USB driver to use this port. Follow the instructions on page 11 to load the driver.

*   Connect the CubiScan 225 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 225.

- Operate the CubiScan 225 without a computer using the touchscreen. Refer to "Dimensioning Using the Touchscreen" on page 19 for information.
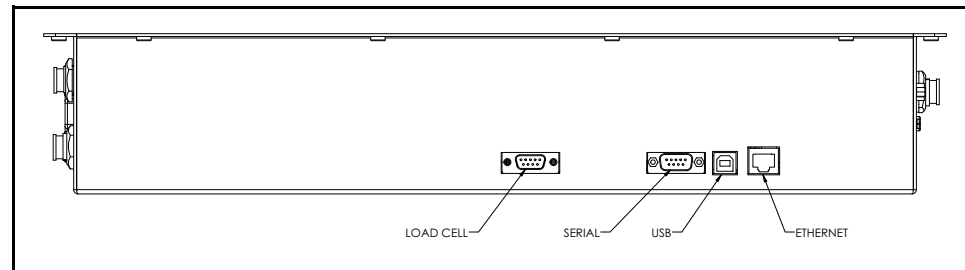
Figure 4
Drawing Showing Ports

Connecting to a Computer via Ethernet to USB Adapter

This section describes how to use a TRENDnet Ethernet to USB adapter to connect a computer to the CubiScan 225.

For information on the Ethernet cable pin-outs, refer to "Ethernet (TCP/IP) Cable Pin Assignments" on page 82.

Use Quantronix' Qbit software (refer to the *Qbit User Guide*) or the touchscreen options (see Chapter 4 "Configuration") to configure the CubiScan 225 for TCP/IP communication, or refer to Appendix A "Communications Protocol" for information on the TCP/IP command protocol and setup parameters. Contact Quantronix if you need additional assistance.

If you are using the Ethernet to USB connection option:

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

2. Connect the Ethernet cable to the CubiScan 225's Ethernet port, as shown in Figure 4.

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.
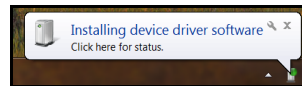
Figure 5
Installation Bubble

•   You can wait a few moments for the installation process to finish and the following bubble will pop up.
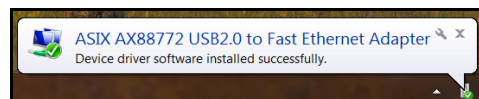
Figure 6
Device Installed Bubble

•   If you clicked on the installation bubble, the following window will open.
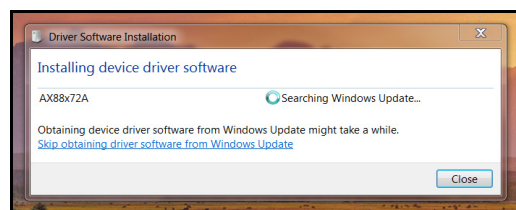
Figure 7
Installation Process Bubble

- Once the driver has finished the installation process it will report that the adapter is ready to use.
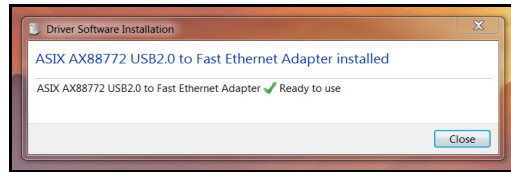
Figure 8
Adapter is Ready to Use

Access Ethernet Network Settings

Once the driver is installed you should set the static IP address and the Subnet mask. 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.
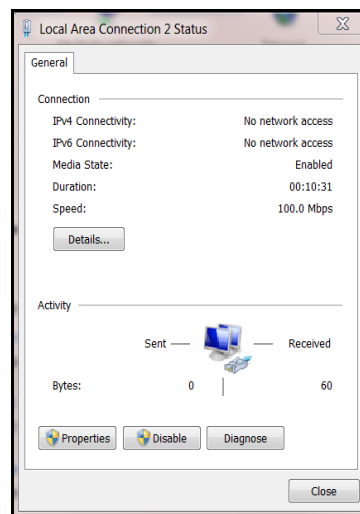
Figure 9
Status Window

2. Select **[Properties]**. Double-click **Internet Protocol Version 4** to bring up the general properties window.
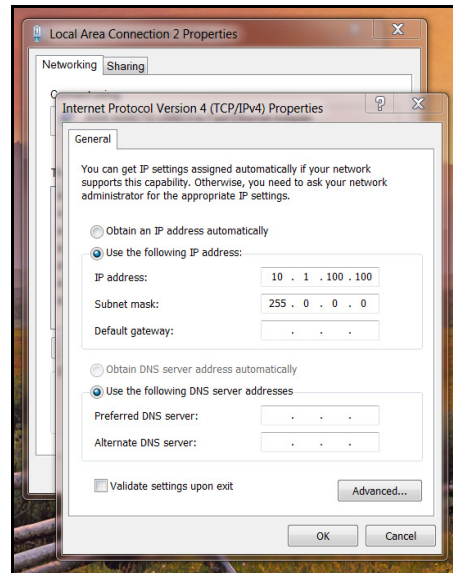
Figure 10
General Properties Window

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 will communicate with the CubiScan 225.

Connecting to a Computer via USB

This section describes how to use a USB connection to connect a computer to the CubiScan 225. This method is not recommended for the CubiScan 225.

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

1. Connect the USB cable to the CubiScan 225's USB port located on the controller box, as shown in Figure 4.

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 225 via the USB port. Complete the following steps to install the driver.

1. With the CubiScan 225 turned on, connect the USB cable to your computer's USB port and to the USB port on the CubiScan 225.

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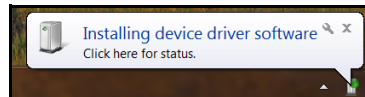
   The driver will be automatically installed. A notification bubble will pop up in the bottom right-corner of the screen when the installation process is finished.

   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.
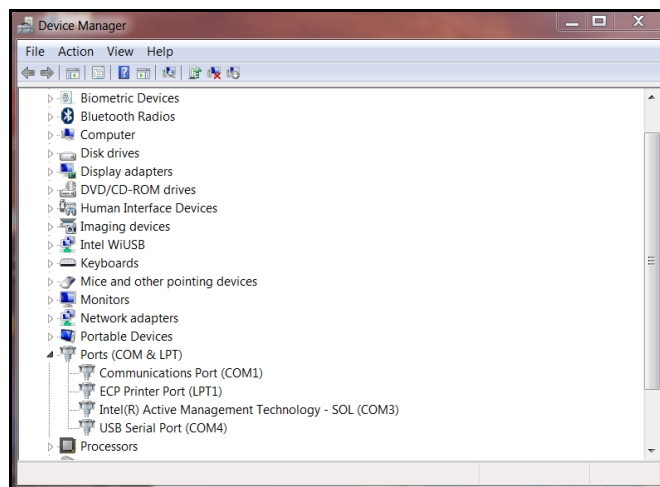
4. Click the arrow next to **Ports** to display the available ports. Locate the COM port assigned to the CubiScan 225. It will read **USB Serial Port**. This is the COM port you will use when setting up Qbit applications to communicate with the CubiScan 225. In this example, the CubiScan 225 was assigned to COM4.

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

   When it is turned on, the CubiScan 225 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 83.

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 225's serial port, as shown in Figure 4.

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).

   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 81.

Installing Qbit (Optional)

A CD-ROM is available containing the Qbit software program, which can be used to operate the CubiScan 225.

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

Moving the Touchscreen

The touchscreen can be moved to either side of the CubiScan 225, depending on your configuration needs. The optional laptop tray can also be moved if needed. The placement options are shown below.
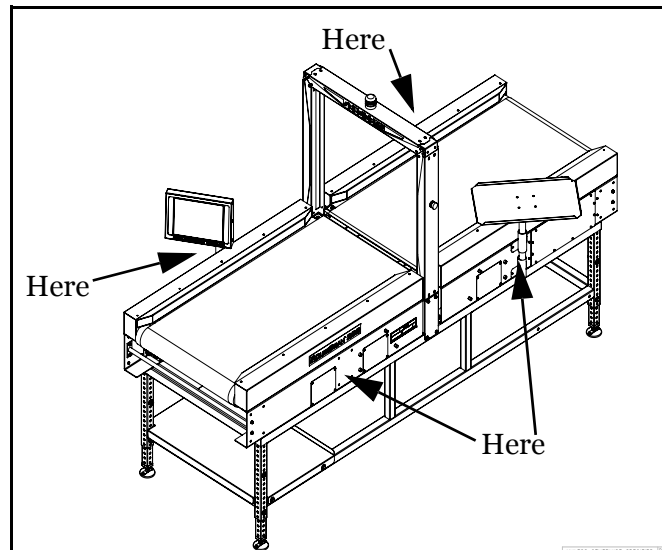
Figure 11
Placement Options

To move the touchscreen, complete the following steps.

1. Power off the CubiScan 225.

2. Disconnect the cord from the touchscreen.

3. Lift the touchscreen stand out of the touchscreen holder and place it in a safe location.

4. Use a 3/16" Allen wrench to remove the socket head cap screws that are holding the brackets in place.
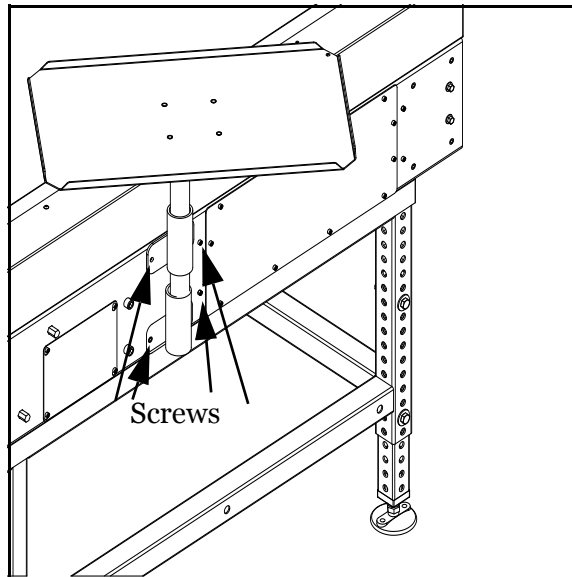
Figure 12
Removing the Brackets

5. Reattach the touchscreen holder in your preferred location.

6. Place the touchscreen stand into the touchscreen holder.

7. Reattach the cable from step 2.

Chapter 3
Operation

This chapter provides instructions for operating the CubiScan 225.

CubiScan 225 Touchscreen

You can use the CubiScan 225 touchscreen (shown below) to configure and control the CubiScan 225 as well as display measurement results.

Figure 13
CubiScan 225 Main Screen

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

The main screen displays the XY view (top-down view) and the Z view (side view).

The green cursor follows a measurement that is being taken.

L W H	These display the measured dimensions in inches (in) or centimeters (cm) as selected.
All	Tap this button to toggle between the following options:

- All
  When this mode is selected, the CubiScan 225 includes whatever it sees pass through the measurement gate.
- Filter
  When this mode is selected, the CubiScan 225 attempts to filter out smaller items. It only measures the largest item that passes through the measurement gate. For more information on this feature, see "Filter" on page 33.
- Tray
  When this mode is selected, the CubiScan 225 can measure items that would normally be too small for the gap in the conveyor belts. For more information on this feature, see "Tray" on page 36.

Menu	Tap this key to go to the configuration menu to set up, calibrate, or diagnose the CubiScan 225.

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 25 for information on configuration and to "Diagnostics" on page 59 for information on diagnostics.

Indicator Light

The indicator light located at the top of the measurement gate displays the CubiScan 225's current status according to color.

Green	This means that the CubiScan 225 is ready to measure.
Red	This means that the CubiScan 225 has experienced an emergency stop or other failure.
No light	This means that the CubiScan 225 is not ready to measure. There may be an object in the measurement field or there is LED blockage.

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.

Dimensioning

The CubiScan 225 can be used to measure irregularly-shaped objects and boxes (refer to "Specifications" on page 2 for specifications and size limitations).

Objects are measured by the infrared light beams on the CubiScan 225's gate when the object is moved underneath the gate by the conveyor belt.

Measurement results will only display when the CubiScan 225 touchscreen is displaying the main screen.

Refer to the appropriate following section for instructions.

Figure 14
Main Screen

Dimensioning 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 CD-ROM or you can download it from the Quantronix Web site at *www.cubiscan.com*.

Dimensioning Using the Touchscreen

All controls and displays for the CubiScan 225 are shown on the touchscreen. If a computer is not connected, you can use the touchscreen to measure objects. Measurements cannot be recorded; they are displayed on the touchscreen.

Measurement results will only display when the CubiScan 225 touchscreen is displaying the main screen.
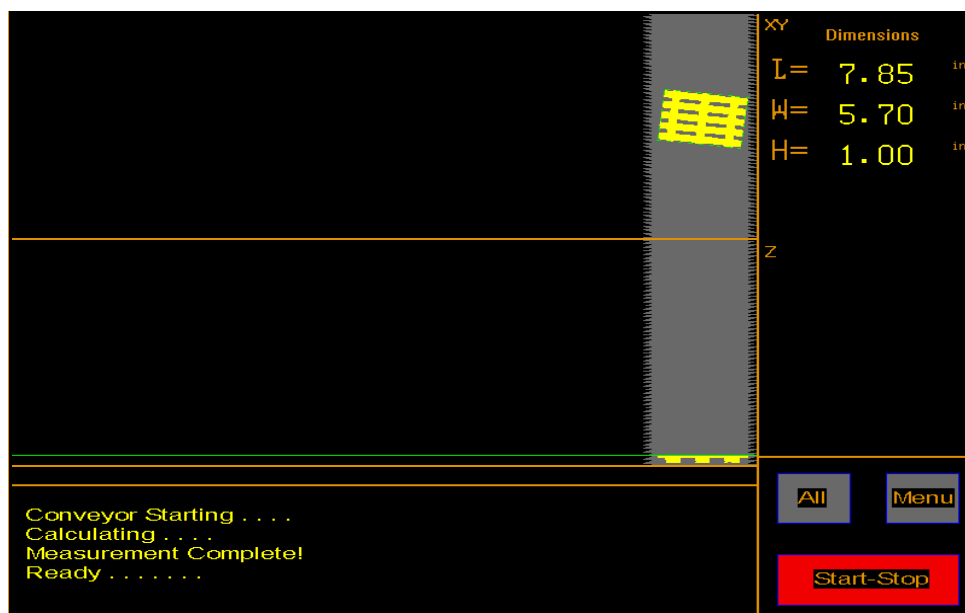
Figure 15
Measurement Display

NOTE ☞ *If you have not already done so, remove the thin protective film that covers the CubiScan 225 touchscreen. Peel it back from one of the corners using your fingernail, and then pull it off.*

Measuring Items

To measure items, complete the following steps.

1. Make sure that the conveyor belt is free of objects.

2. Turn the CubiScan 225 on.

3. Tap **Start-Stop**. The following screen appears.
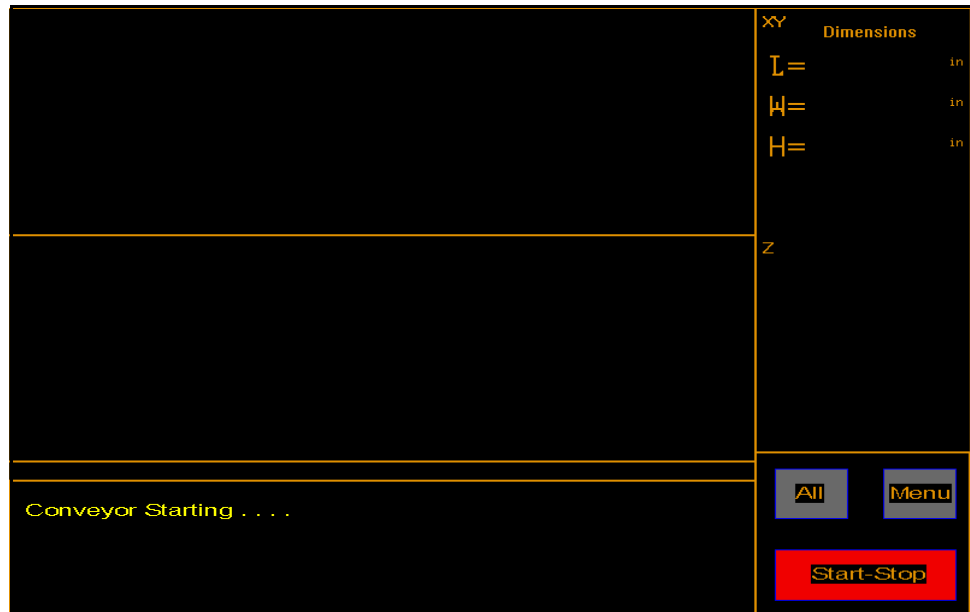
Figure 16
Conveyor Starting

4. Place an item on the conveyor belt.

    After the item passes through the measurement gate, the measurement results will be displayed on the touchscreen.

    The measurement results will be displayed until the CubiScan 225 measures another item. Examples of measurement results are shown below.

    The CubiScan 225 requires only a 6 inch (15 cm) gap between objects.
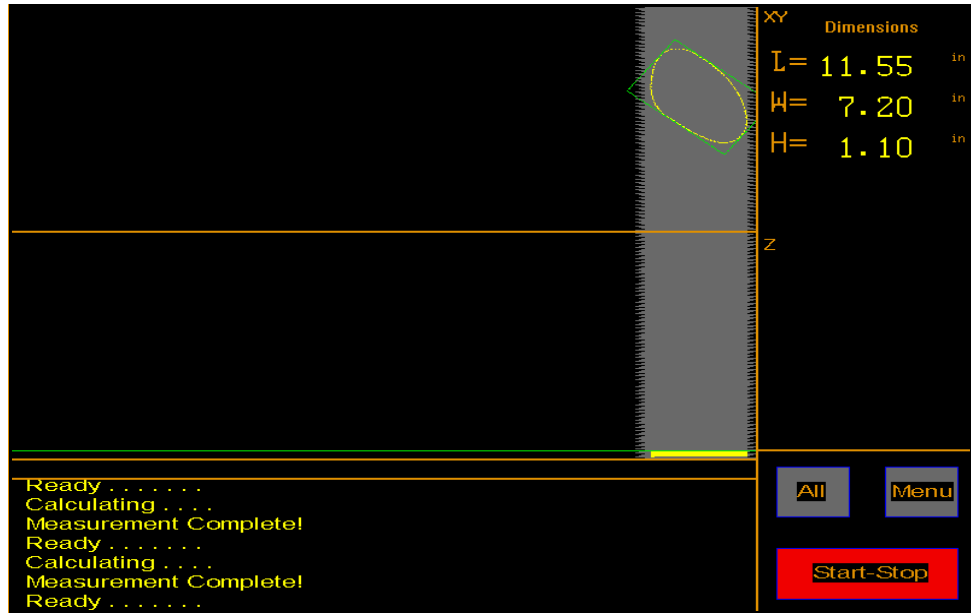
Figure 17
Irregular Item Measurement Results
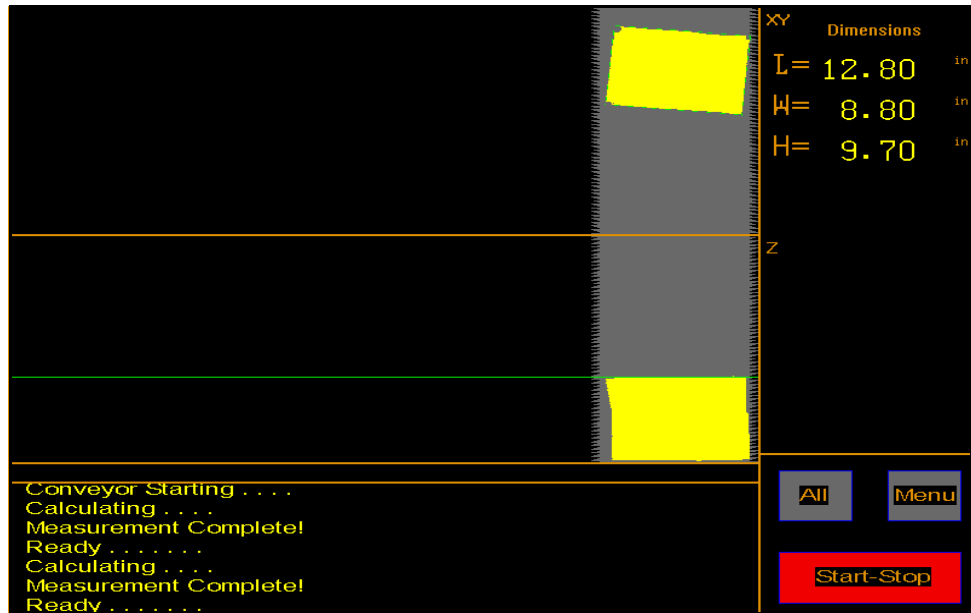
Figure 18
Box Measurement Results

When measuring items, be careful of pinch points. Refer to Figure 19 below.
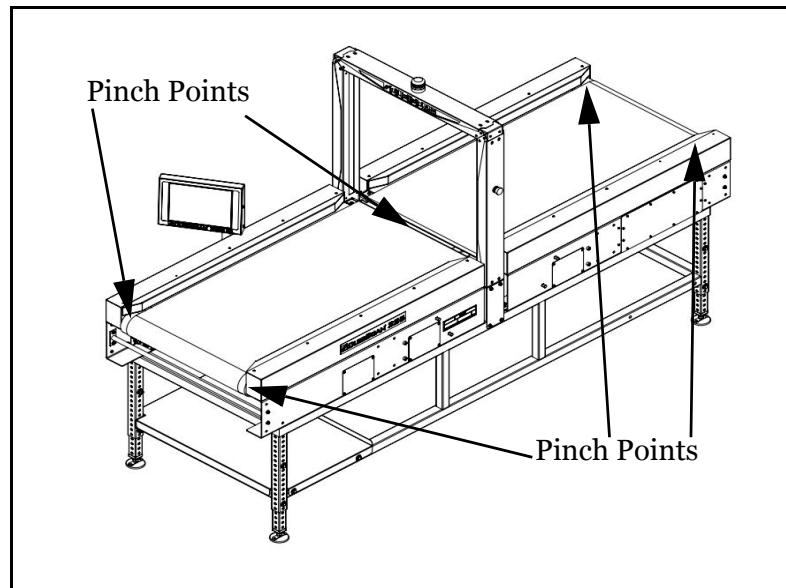
Figure 19
Pinch Points

Emergency Stops

The CubiScan 225 has emergency stops located on both sides of the measuring gate, see Figure 20 below. These emergency stops should be used if the CubiScan 225 needs to be stopped immediately.
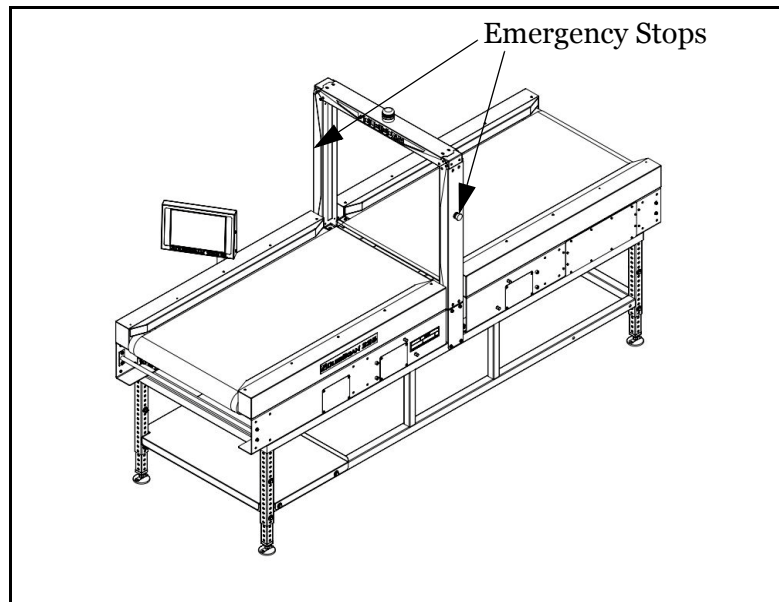
Figure 20
Emergency Stops

To activate the emergency stops, press either one of the emergency stop buttons in. This will cause all belt movement to cease.

To resume measuring after an emergency stop, you will need to twist the emergency stop button clockwise until it pops back out to its former position.

If you tap the **[Start-Stop]** button while one of the emergency buttons is pushed in the following screen will appear.

Figure 21
Emergency Stop

Chapter 4

Configuration

This chapter provides instructions for using the CubiScan 225 touchscreen to set up the length, width, and height measurements, as well as special features that the CubiScan 225 offers. This chapter also provides instructions for configuring the units, com port, and other settings. For information on calibrating the CubiScan 225 touchscreen, refer to Chapter 5 "Calibration" on page 48.

If you have a computer connected to the CubiScan 225 with Qbit installed, you can use Qbit to set up the measurement units, select the CubiScan 225 communications port, 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 CD-ROM with the Qbit application, or you can download it from the Quantronix Web site at www.cubiscan.com.

Navigating the Touchscreen and Saving Changes

To use the touchscreen to change configuration options, you will tap the following keys:

- Tap a function key to select a function.
- Tap **[Prev]** to return to the previous screen. Tap **[Next]** to move to the next screen.
- Tap the option you want to change and it will turn green.
- Tap **[+]** or **[-]** to change the selected (green) option.
- Tap **N** and then tap **[+]** at the **Save Data** field on the menu screen to save any changes.
- Power the CubiScan 225 on and off so that the changes made are recognized by the system.

System Configuration

The following options can be used to configure your CubiScan 225.

1.   Tap **[Menu]** at the main screen.

Figure 22
Main 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* *.*

The menu buttons are displayed.

Figure 23
Menu Screen

2. Tap **[Setup]** to display the system settings.
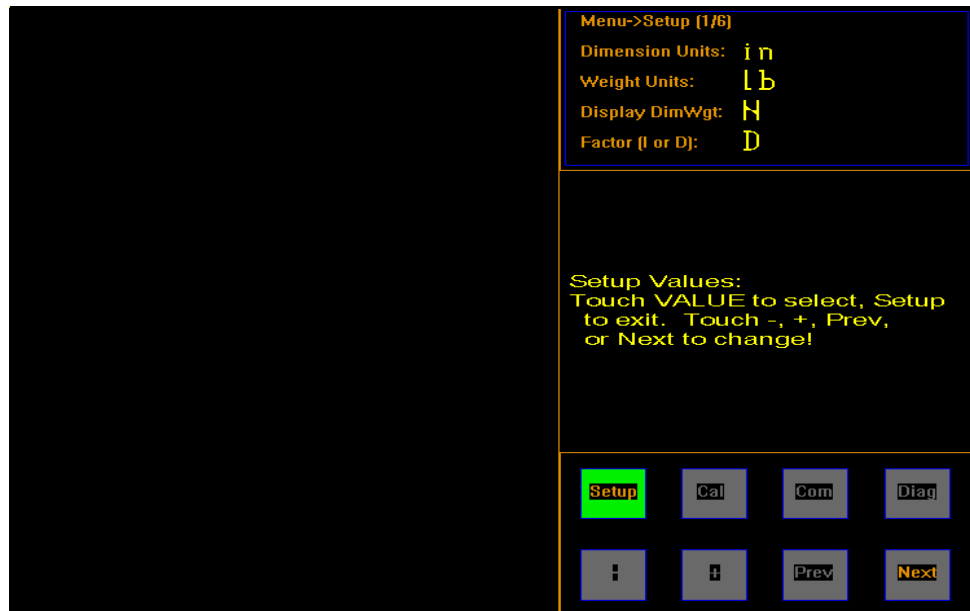
Figure 24
System Settings, First Screen

From this screen you can change the dimensional units to **in** (inch) or **cm** (centimeter), the weight units to **lb** (pound) or **kg** (kilogram), determine whether or not to display the dimensional weight, and change the dimensional factor to **I** (international) or **D** (domestic).

3. Tap **[Next]** to go to the next screen.
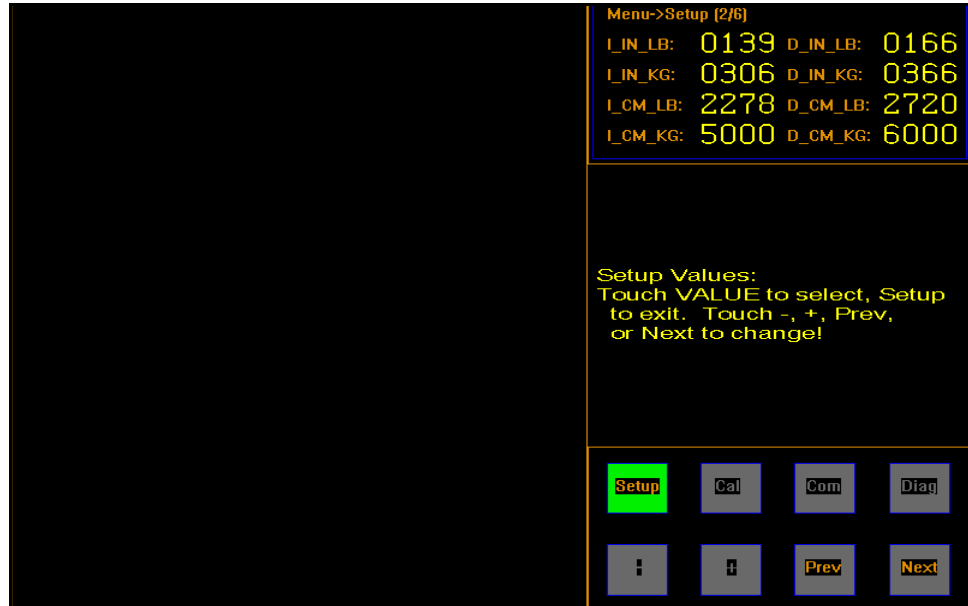
Figure 25
System Settings, Second Screen

From this screen you can change the dimensional factor values. Refer to the table below for the default values.

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)

4.   Tap **[Next]** to go to the next screen.
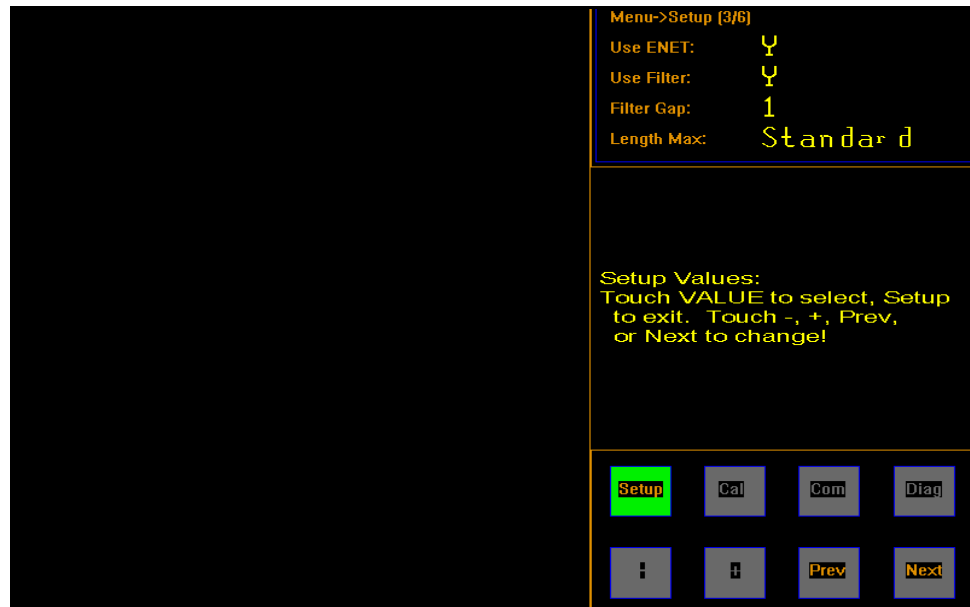
Figure 26
System Settings, Third Screen

From this screen you have the option to enable or disable the Ethernet port, the filter, select the filter gap, and the maximum length.

If you want to measure objects that are longer than 60 in (150 cm) then you must change the Length Max setting from Standard to Extended. The resolution is +\-0.50 in instead of +\-0.25 in when the CubiScan 225 is in Extended mode.

5. Tap **[Next]** to go to the next screen.
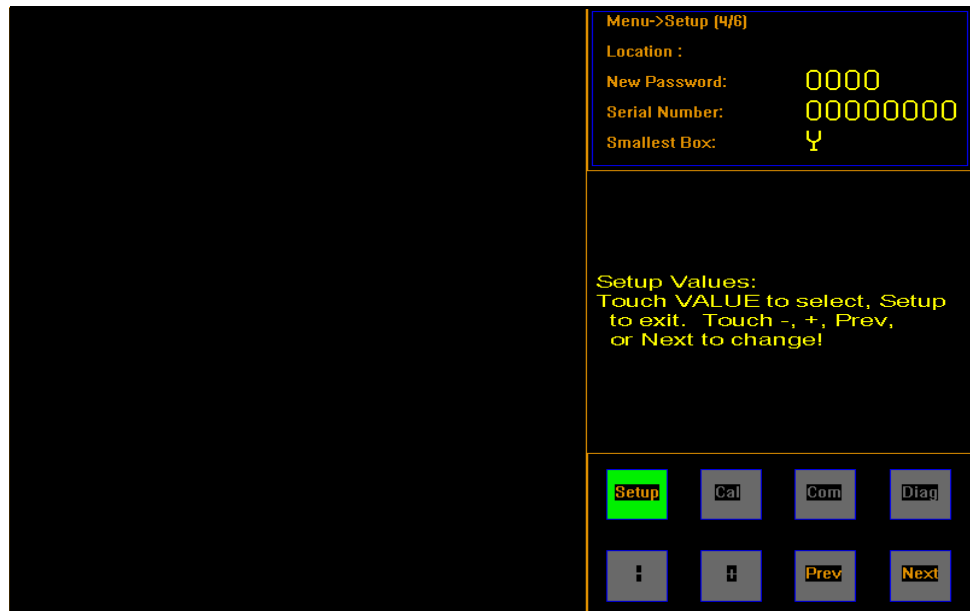
Figure 27
System Settings, Fourth Screen

At this screen, you can view an optional location code and enter a password. If you set up a password, it must be entered each time you want to access the touchscreen menu.

The location code is used to identify the CubiScan 225 in the communications data. If you have more than one CubiScan 225, you need to set up a unique location number for each one.

The serial number is the product number that is unique to each CubiScan 225.

For information on the smallest box feature refer to "Smallest Box" on page 34.

6. Tap **[Next]** to go to the next screen.

Figure 28
System Settings, Fifth Screen

From this screen you can view the tachometer (encoder) multiplier, set the belt speed, tray height, and the auto stop settings. When auto stop mode is activated, the CubiScan 225 will automatically stop the conveyor belt after a measurement has been taken.

For more information on the Tray feature, see "Tray" on page 36.

7.   Tap **[Next]** to go to the next screen.
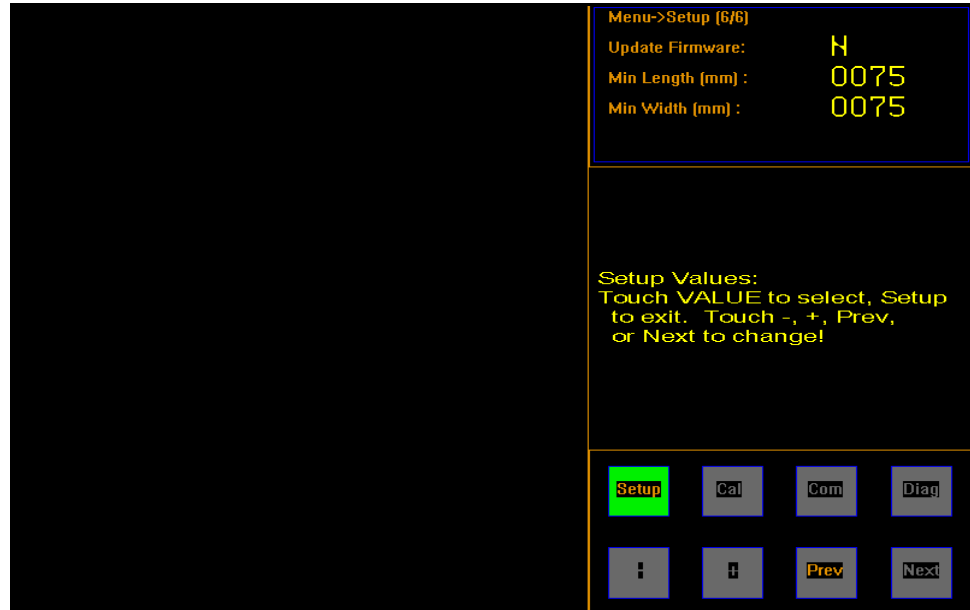
Figure 29
System Settings, Sixth Screen

This screen includes the option to update firmware that is found on the internal SD card. This option automatically turns off once the update is complete.

The Min Length and Min Width have a default setting of 0075 mm. This means that if the CubiScan 225 measures a width or length smaller than 0075 mm, it will not transmit the measurement data, although it will display the data on the main screen. This is to prevent unwanted data being transmitted that may have been falsely prompted by dust or other small objects.

8. When you are finished, tap **[Setup]** and you will return to the menu screen.

Figure 30
Menu Screen

Special Features

The following options are special features that the CubiScan 225 offers.

Filter

The filter mode measures only the largest item (items cannot be touching), if multiple items are found in the measurement field. Items that have been excluded from the measurement process are displayed in red. The item that was measured is displayed in yellow (see Figure 31 below).

To turn this feature on, tap the **[All]** button once.
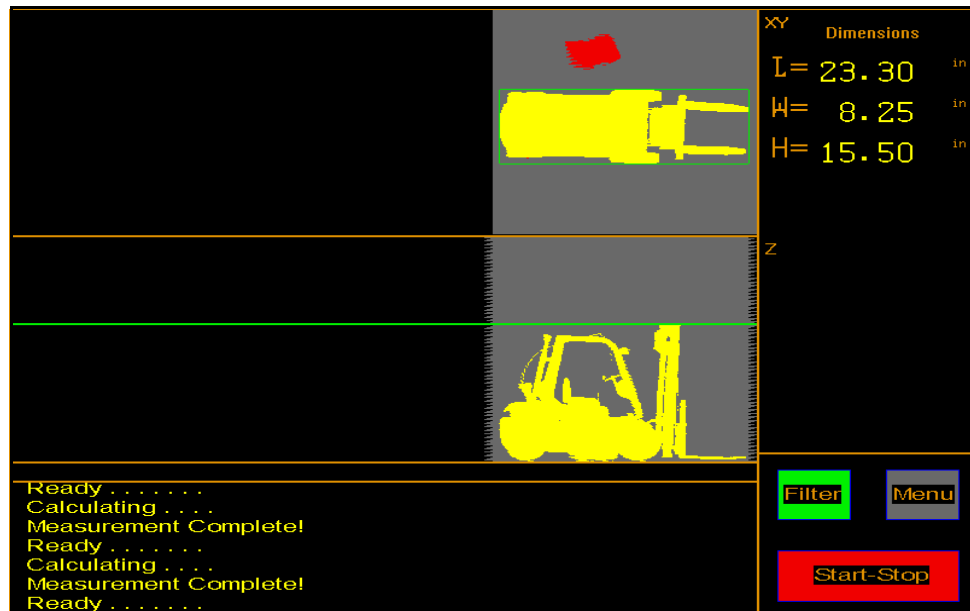
Figure 31
Filter Mode

Smallest Box

Smallest box mode is the default mode. This mode determines the smallest bounding 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.

To turn smallest box mode off and on, go to the fourth system settings screen (see Figure 27).

The images shown below illustrate the difference between having the smallest box mode on or off.
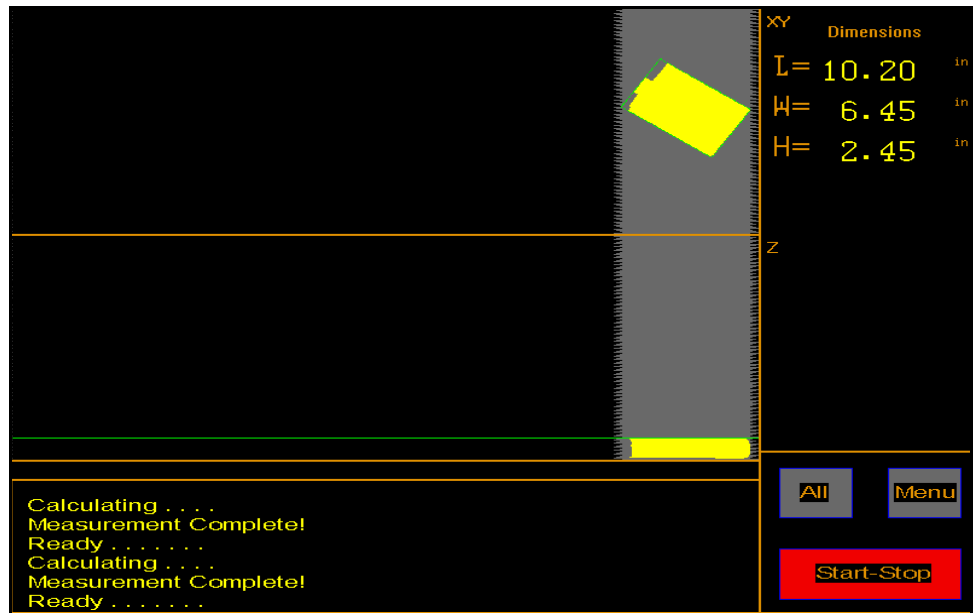
Figure 32
Smallest Box Mode On

Figure 33
Smallest Box Mode Off

Tray

The Tray mode is an optional feature that requires a standard clear acrylic tray (24 in x 18 in) that can be supplied by Quantronix. This tray enables the CubiScan 225 to measure very small items that would normally fall into the gap between conveyor belts.

When the CubiScan 225 is in Tray mode, it automatically deducts the dimensions of the tray and displays the actual measurements of the small item that was measured.

When in tray mode, the CubiScan 225 also filters out all but the largest object that is found in the measurement field.

The item that is being measured cannot exceed the tray's width or length.

To measure an item using the Tray mode, complete the following steps:

1. Turn the CubiScan 225 on.

2. Tap the **[All]** button until it displays **[Tray]**.

3. Tap **Start-Stop**.

4. Carefully place the tray on the conveyor belt.

5. Quickly and carefully place the item that is to be measured roughly in the center of the tray.

    Your measurement results will be displayed on the touchscreen (shown below).
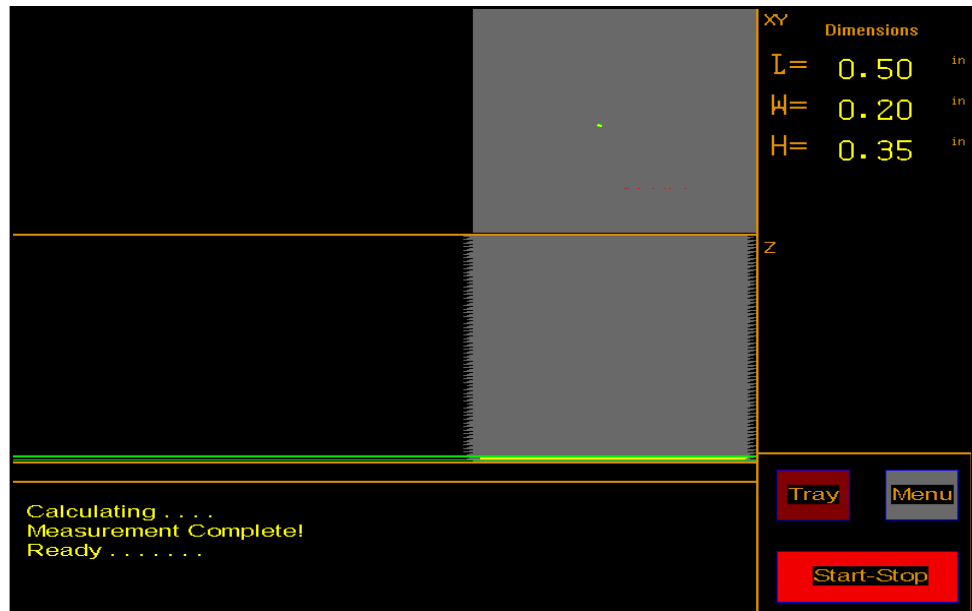
Figure 34
Tray Mode

Communications Configuration

The following options can be used to configure communications.

1. Tap **[Menu]** at the main screen.

Figure 35
Main Screen

The menu buttons are displayed.

Figure 36
Menu Screen

2. Tap **[Com]** to display the communication settings.

Figure 37
Communication Settings

3. Tap **[Ser]** if you are using a serial communications port.

Figure 38
Communication Settings, Serial

From this screen you can view the baud rate, parity, data bits, and stop bits. Tap **[Ser]** to exit the serial communications screen.

4. Tap **[Eth]** if you are using the Ethernet port.
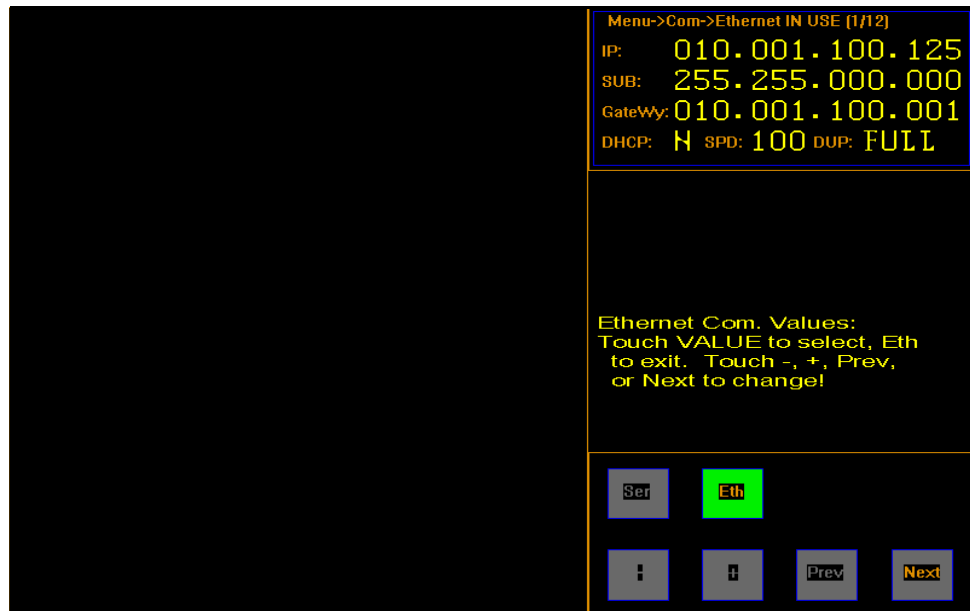
Figure 39
Communication Settings, Ethernet First Screen

From this screen you can view the IP, subnet, and gateway addresses in use, and you can turn DHCP on or off. This screen also displays the Ethernet connection speed (SPD) and the Ethernet duplex information (DUP).

5. Tap **[Next]** to go to the next screen.

Figure 40
Communication Settings, Ethernet Second Screen

From this screen you can change the static IP, subnet, gateway addresses, and port value.

6. Tap **[Next]** to go to the next screen.
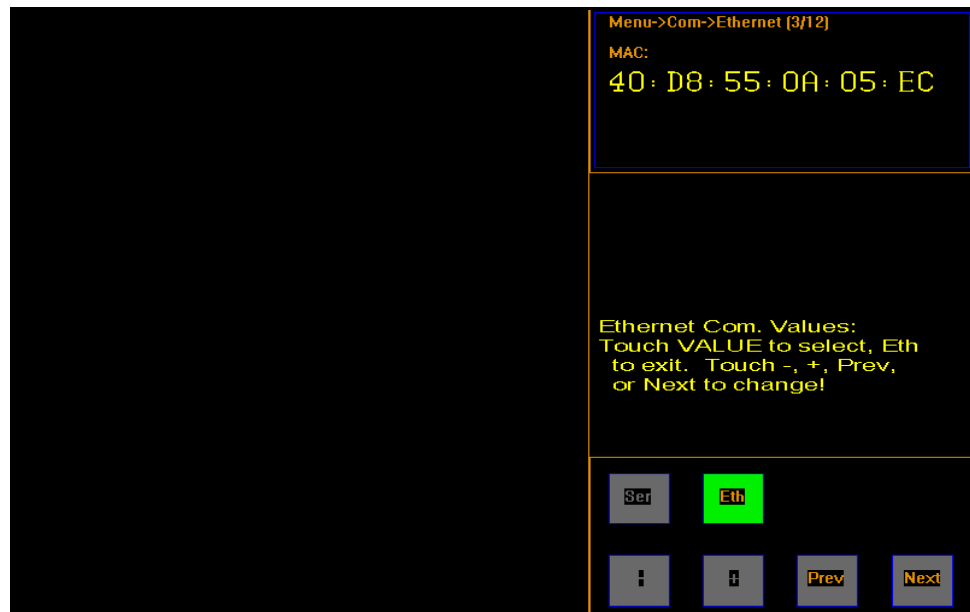
Figure 41
Communication Settings, Ethernet Third Screen

From this screen you can view the MAC Ethernet address.

7. Tap **[Next]** to go to the next screen.

Figure 42
Communication Settings, Ethernet Fourth Screen

From this screen you can view the Ethernet function statistics. The fields listed are:

- The number of ping commands the CubiScan 225 has received.
- The number of trivial file transfer protocol commands processed.
- The number of Ethernet link disconnects.
- The receiver reset count.

8. Tap **[Next]** to go to the next screen.

Figure 43
Communication Settings, Ethernet Fifth Screen

From this screen you can view some of the Ethernet interrupt statistics (more of these statistics can be found on the sixth Ethernet screen). The fields listed are:

- The total interrupts.
- The total transmit interrupts.
- The total transmit errors.
- Transmit under runs.

9. Tap **[Next]** to go to the next screen.

Figure 44
Communication Settings, Ethernet Sixth Screen

From this screen you can view additional Ethernet interrupt statistics. The fields listed are:

*   The total receive interrupts.
*   The receive errors.
*   The receive overruns.
*   The receive empty errors.

10. Tap **[Next]** to go to the next screen.
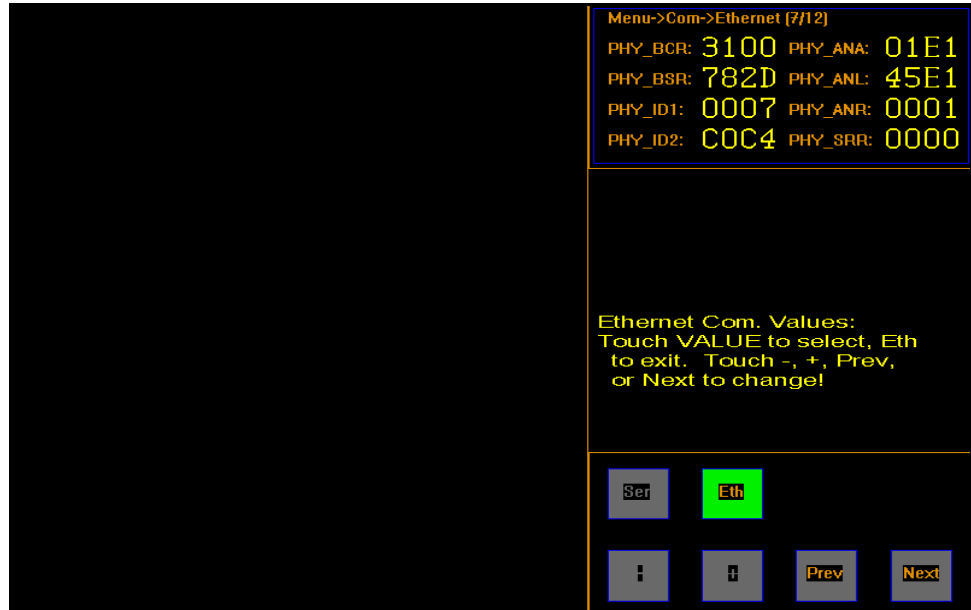
Figure 45
Communication Settings, Ethernet Seventh Screen

From this screen you can view some of the Ethernet PHY registers (more of these registers can be found on the eighth Ethernet screen). These registers are for diagnostic purposes only.

11. Tap **[Next]** to go to the next screen.
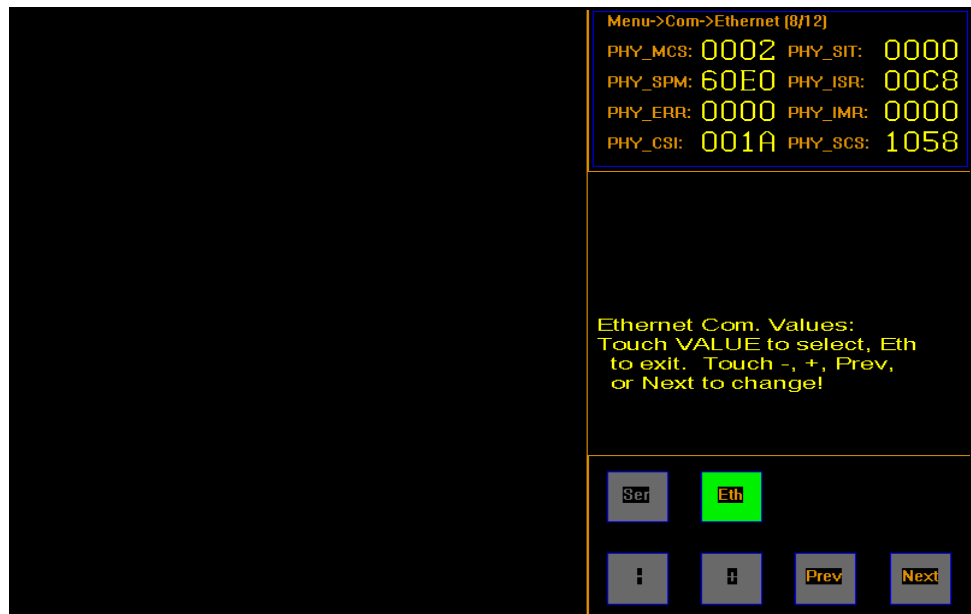
Figure 46
Communication Settings, Ethernet Eighth Screen

From this screen you can view additional Ethernet PHY registers. These registers are for diagnostic purposes only.

12. Tap **[Next]** to go to the next screen.
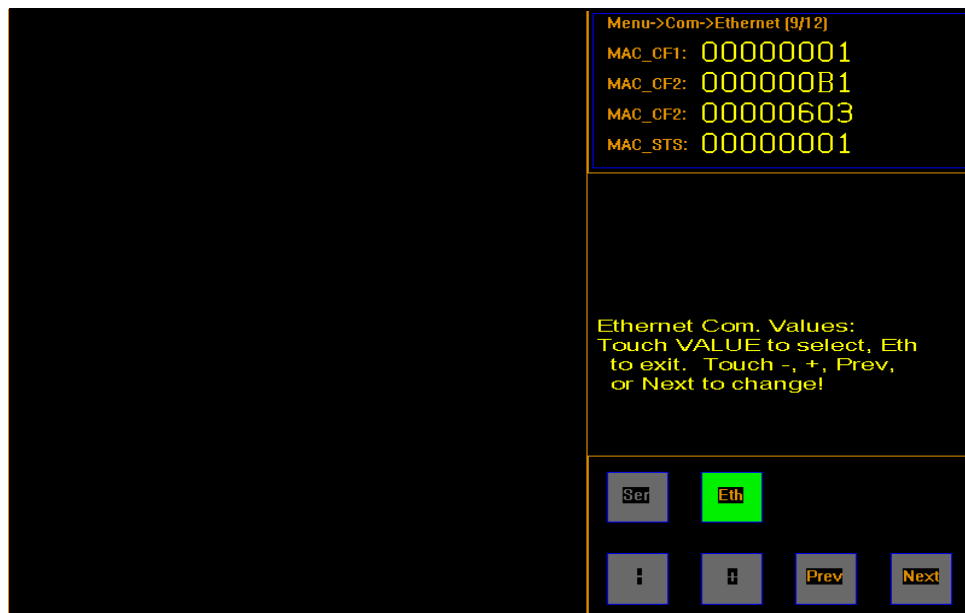
Figure 47
Communication Settings, Ethernet Ninth Screen

Ethernet screens nine through twelve display the Ethernet MAC registers. These registers are for diagnostic purposes only.

13. Tap **[Eth]** to exit the Ethernet communications screen.

14. When you are finished, tap **[Eth]** and then **[Prev],** to return to the menu screen.

Figure 48
Menu Screen

15. To save any changes, see "Navigating the Touchscreen and Saving Changes" on page 25

Chapter 5
Calibration

This chapter provides instructions for calibrating the CubiScan 225 gate and touchscreen. The CubiScan 225 is calibrated at the factory; however, recalibration may occasionally be required.

Calibrate the gate if you suspect that the CubiScan 225 is not measuring accurately, or if the calibration cube is not being measured correctly.

Calibrate the touchscreen if you have trouble making selections on the screen.

Gate Calibration

Take the following steps to calibrate the gate.

1. Tap **[Menu]** at the main screen.

Figure 49
Main Screen

The menu buttons are displayed.

2.   Tap **[Cal]**. The calibration menu is displayed.
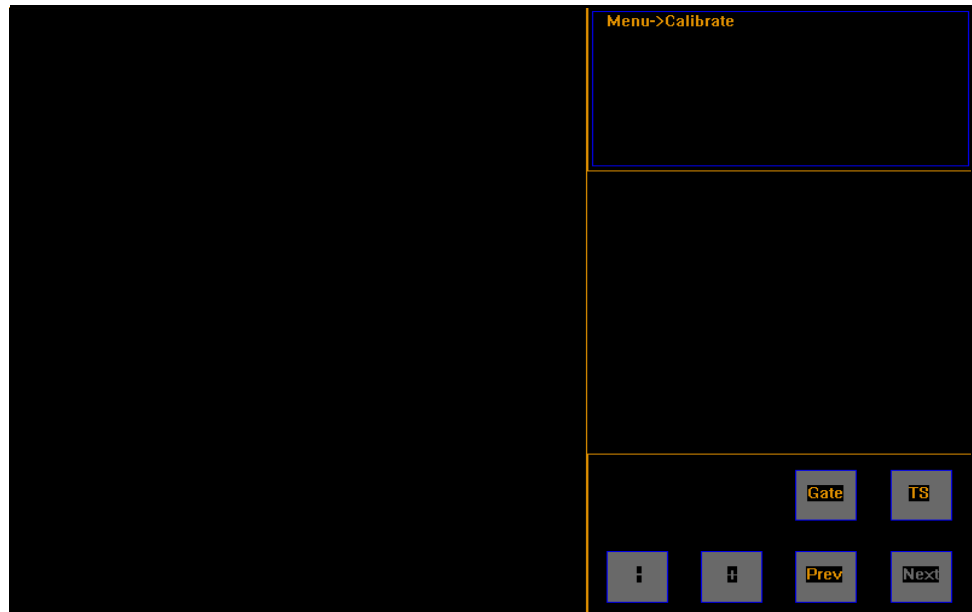
Figure 50
Calibration Menu

3.   Tap **[Gate]**. The gate calibration screen is displayed.
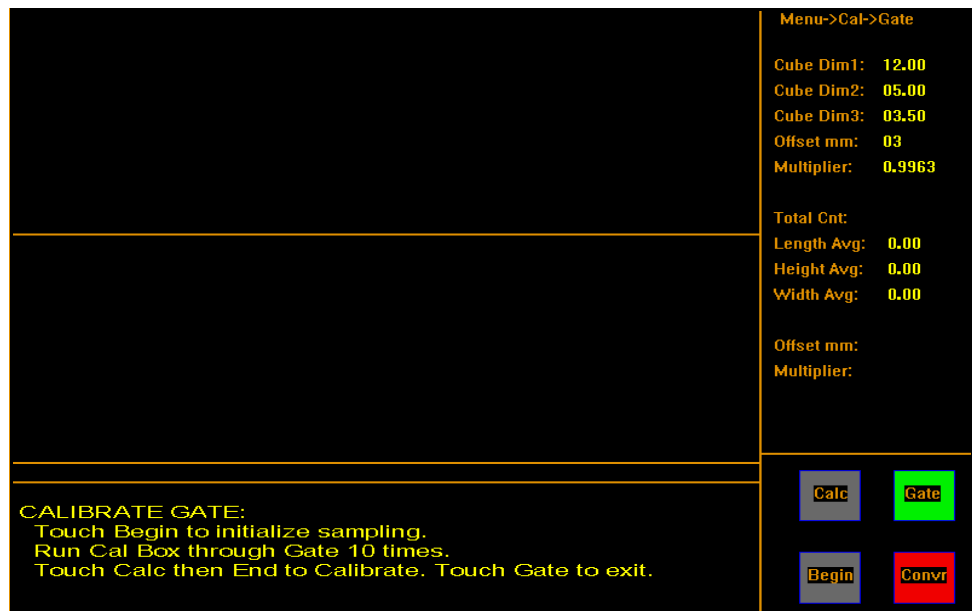
Figure 51
Gate Calibration

The dimensions of the calibration cube, the height offset, and the multiplier are displayed.

4. Turn the conveyor belt on using the **[Convr]** button.

5. Tap **[Begin]**.

6. Run the calibration cube through the CubiScan 225's gate 10 times. The number of times an object has passed through the gate is displayed in the **Total Cnt:** field. The average length, width, and height will be displayed.

7. When you are finished running the calibration cubes through the gate, tap **[Calc]** to calculate the Offset mm and Multiplier.

8. If you would like to calibrate the CubiScan 225 with the new settings, tap **[End]**.

9. When you are finished, tap **[Gate]** to exit. If you would like the CubiScan 225 to retain the changes that were made, save your changes. For more information on saving changes, see "Navigating the Touchscreen and Saving Changes" on page 25.

Touchscreen Calibration

Take the following steps to calibrate the touchscreen.

1. Tap **[Menu]** at the main screen.
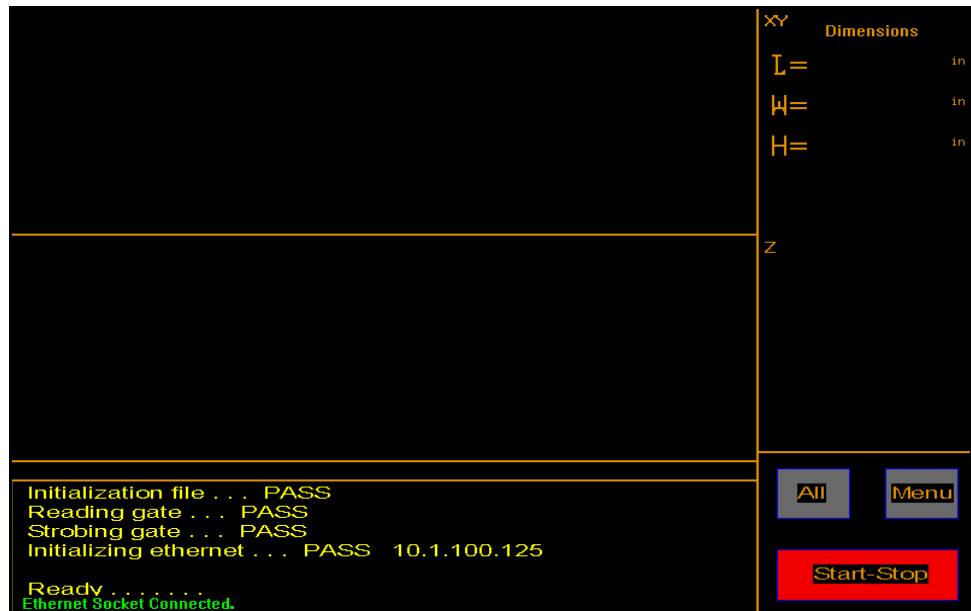
Figure 52
Main Screen

The menu buttons are displayed.

2. Tap **[Cal]**. The calibration menu is displayed.
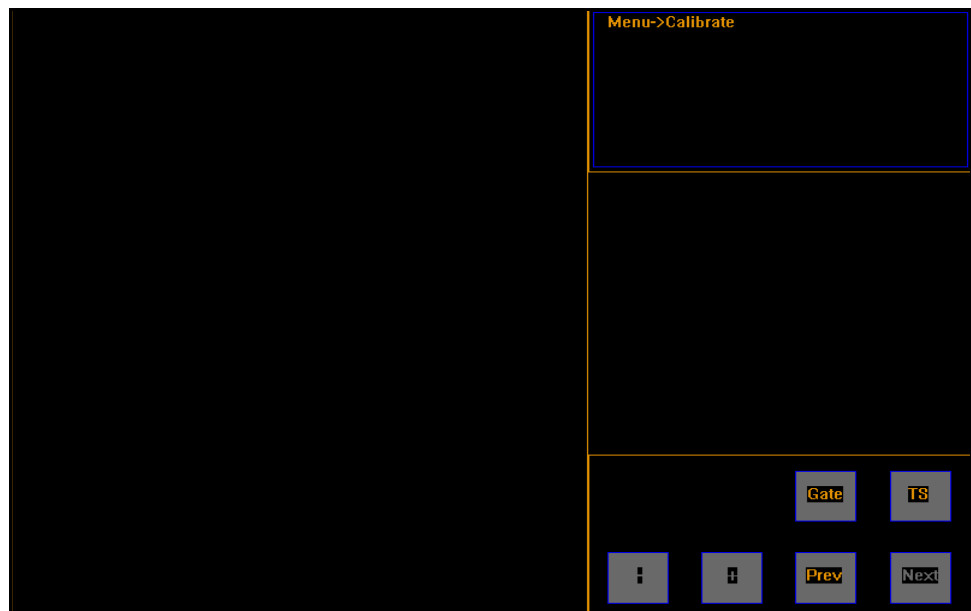
Figure 53
Calibration Menu

3. Tap **[TS]**. The touchscreen calibration screen is diplayed.

Figure 54
Touchscreen Calibration

4. Touch the center of each **x** on the screen until the **x** turns green. There
    are five calibration points on the screen.
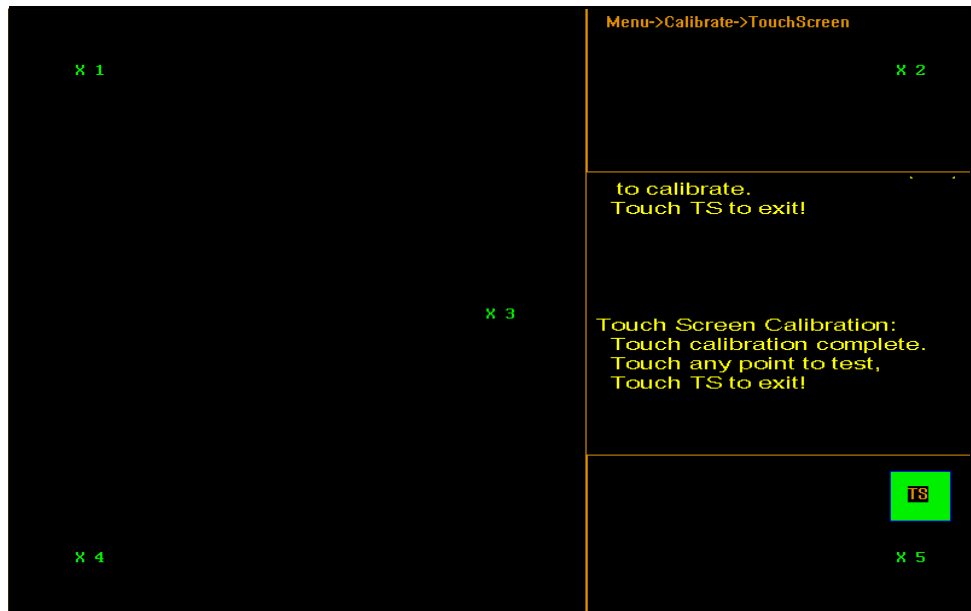
Figure 55
Touchscreen Calibration Complete

5. Tap **[TS]** again to exit the calibration screen.

Chapter 6
Maintenance

This chapter provides information on the maintenance and care of the CubiScan 225. Routine inspection and careful handling will help identify problems before they become serious and may prevent service calls or repairs.

Tracking the Belt

The conveyor belt must be tracked when it is out of square. This means that the conveyor belt is uneven and moving to one side of the conveyor bed.

Belt tracking will be needed as the belt stretches or moves over time. If the belt is not tracked when needed, it can cause damage to the belt and disrupt the accuracy of dimensioning.

Inaccurate tension on the belt may also be causing the belt to move. See "Belt Tension" on page 55 for more information.

Be sure that the belt is clean, as built-up debris can cause the belt to shift and move.

To track the belt you will need the following tools.

- 9/64" Allen wrench
- 9/16" ratchet

To track the belt, complete the following steps:

1. Make sure that the CubiScan 225 is on and the conveyor belt is running. Belt tracking must be done while the conveyor is moving.

2. Using the 9/64" Allen wrench, remove the 10 hex head screws, shown below in Figure 56.

3. Carefully remove the cover guards and store them in a safe place.
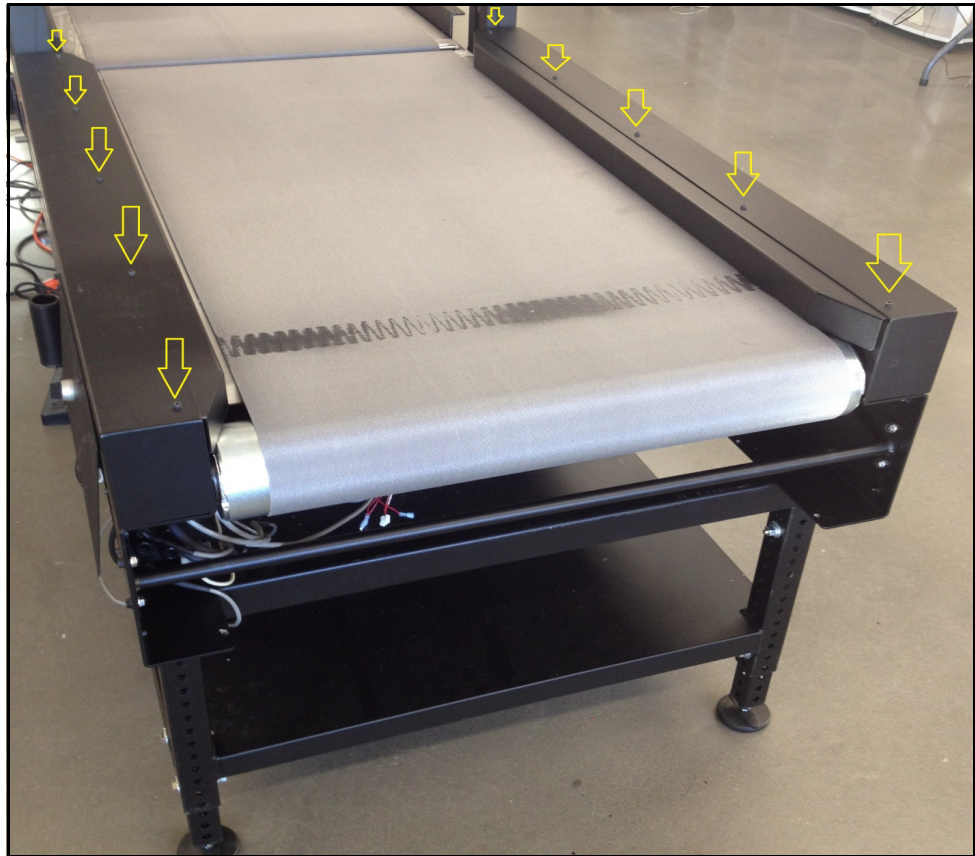
Figure 56
Removing Hex Screws

4. Check the belt's tension. See the section on "Belt Tension" below for more information.

5. Using the 9/16" ratchet, loosen the axel bolt so that the axel is able to move (shown below).
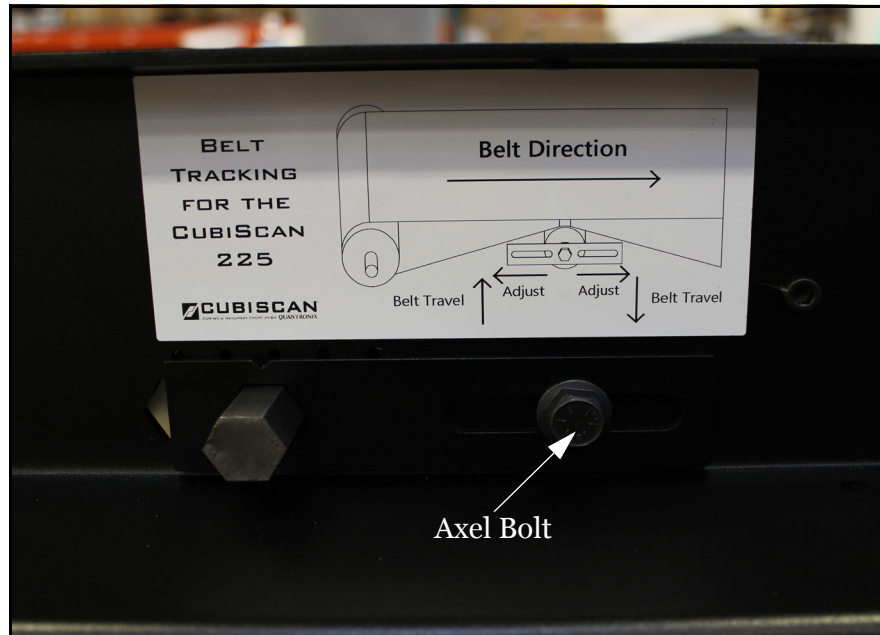
Figure 57
Axel Bolts

6. Use the bracket to slide the axel back and forth to steer the belt across the conveyor bed. Small adjustments are typically all that is needed.

    The belt moves towards the end that it contacts first, so if you need the belt to move to the left, move the axel to the left.

    In addition to moving the axel, you can also try moving the belt by hand. Push the belt in the direction that you would like it to move. Try to center it on the conveyor bed.

7. When your adjustments are done, tighten the axel bolt.

    Tracking the belt is a process that may take some time, making small adjustments as needed; especially if the amount of correction that is needed is small. To make this process faster, you can go into Menu > Diagnostics > Encdr. Tap **[Track]**. This will make the conveyor run twice as fast, which will show belt unevenness more quickly.

    For further help on tracking the belt, see the sticker located on each corner of the CubiScan 225.

Belt Tension

To check or adjust your belt tension, complete the following steps.

1. Make sure that the CubiScan 225 is turned off.

2. Remove the cover guards shown in Figure 56 by removing the 10 hex head screws.

3. Measure from the edge of the conveyor to the axel, as shown below.
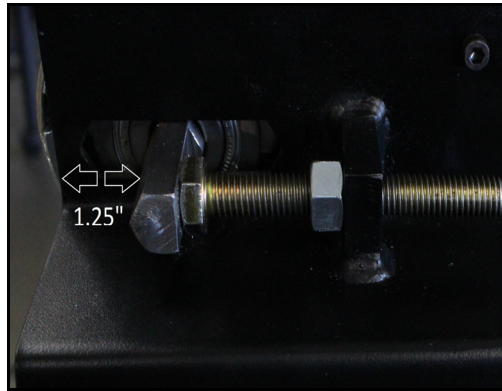
Figure 58
Tension Bolt

4. The measurement should be approximately 1.25″. Each belt may require slightly different tension, especially as a belt stretches over time. Adjust the tension bolt as needed.

5. This process will need to be repeated on the other side of the conveyor. The tension should be the same on both sides of the conveyor.

Cleaning the Sensors

The gate 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 wipe the surface with a dry, microfiber cloth.

Cleaning the Sensor Guard

There is a plastic sensor guard located over the gate's bottom LED sensor strip. This guard is in place to prevent objects from falling onto the sensor strip and damaging it. If objects, debris, or dust are on this guard, it may cause interference in dimensioning objects.

To clean this guard, first make sure that the CubiScan 225 is turned off. Carefully remove the guard by wiggling it free. You can then wipe it clean with a soft, dry cloth. Carefully replace the guard and make sure it is in place before starting the CubiScan 225.

If you do not want to remove the guard, use a feather duster to clean it.

NOTE ☞   *Do not operate the CubiScan 225 without the sensor guard in place. When the sensor guard is not in place debris and dust fall directly onto the bottom sensor strip and are much more difficult to remove.*

Chapter 7

Troubleshooting

This chapter provides assistance in identifying and solving common problems with the CubiScan 225. If you encounter problems not covered in this chapter, contact Quantronix Service and Support at +1 (801) 451-7000 or your system integrator for assistance.

No Response When You Turn Power On

If there is no response when you power on the CubiScan 225, do the following:

1. Check the fuse in the motor control box.

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

3. Was the circuit broken? Check the circuit breaker located near the OFF/ON switch. Push the **10** button back in if it has popped out.

Contact Quantronix if you require additional help.

Dimension Readings Are Not Accurate

If you suspect that the CubiScan 225 dimension readings are inaccurate, do the following:

1. Check the gate sensors and the sensor guard for dust or debris. Clean the sensors and sensor guard with a dry, microfiber cloth.

2. Verify that the image is representative of the measured item. If not, check gate diagnostics of the CubiScan 225. Refer to "Diagnostics" on page 59 for further information.

3. Is there a correct amount of tension on the belts? Refer to "Belt Tension" on page 55 for further information.

4. Do the belts need to be tracked or tensioned? Refer to "Tracking the Belt" on page 53 for further information.

Computer Error Messages

The following error messages generated by Qbit indicate a communications problem between the CubiScan 225 and the computer.

No
Communications
with CubiScan
225

This message indicates that no communication is taking place between the computer and the CubiScan 225.

Transmission
Error

This message indicates that erroneous or garbled data is being sent from the CubiScan 225.

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

1. Is the CubiScan 225 turned on and securely connected to power?

2. Is the serial cable or Ethernet cable connected to both the CubiScan 225 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 225 properly configured to the TCP/IP communication? (Qbit software can be used to configure the CubiScan 225.)

6. Is there a problem with the CubiScan 225? Perform the Status function in Qbit to check the status of the CubiScan 225.

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.

Diagnostics

This section describes the diagnostic capabilities of the CubiScan 225.

1. Tap **[Menu]** at the main screen.

Figure 59
Main Screen

The menu buttons are displayed.

Figure 60
Menu Screen

2. Tap **[Diag]**. The diagnostics menu is displayed.

Figure 61
Diagnostics Menu

3. Tap **[Next]** to go to the second diagnostics screen.

Figure 62
Second Diagnostics Screen

This screen displays some new buttons.

4. Tap **[Encdr]** to go to the encoder diagnostics screen.
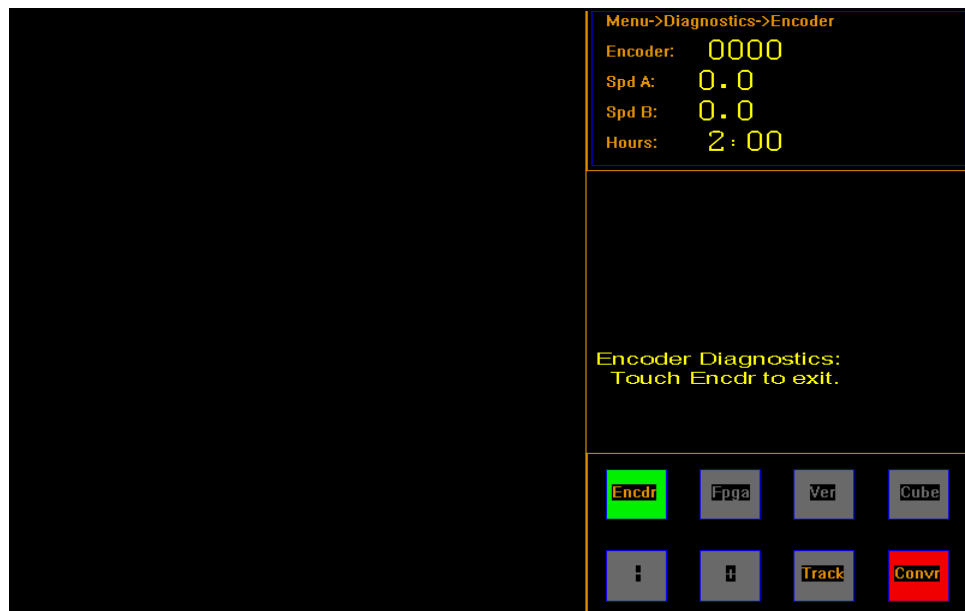
Figure 63
Diagnostics Encoder Screen

The **Encoder** field reports the encoder wheel's revolutions.

Spd A reports the speed of belt A in ft/min.

Spd B reports the speed of belt B in ft/min.

Hours displays the total hours and minutes that the motor has been running.

5. Tap **[FPGA]** to go to the field programmable gate array information
    screens.
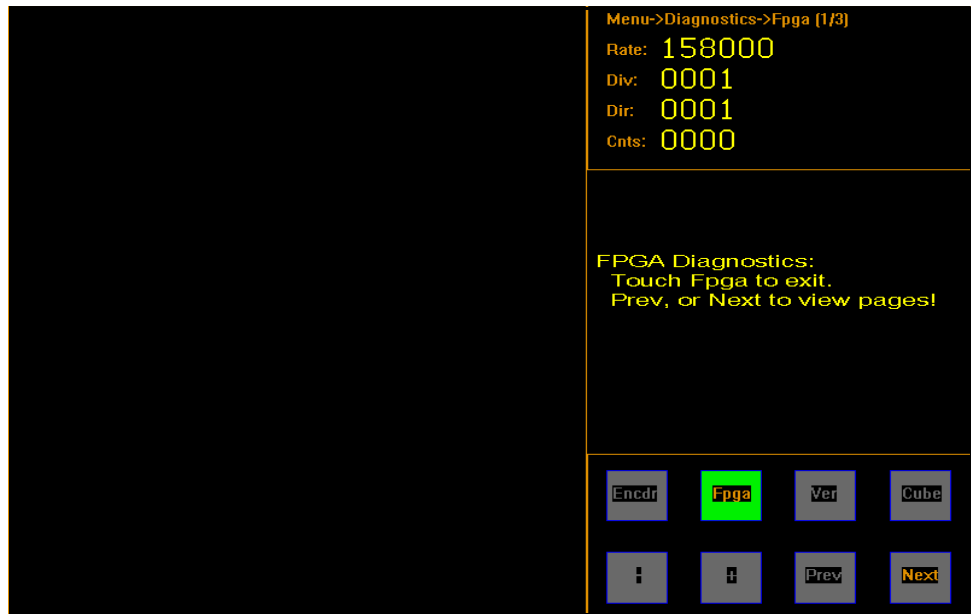
Figure 64
Diagnostics FPGA Screen

This screen displays the field programmable gate array information
across three different screens. Tap **[Next]** if you would like to view these
screens.

6. Tap **[Ver]** if you would like to go to the firmware information screens.

Figure 65
Diagnostics Version

This screen displays firmware information. The **Main** field reports which version of firmware is being used.

7. Tap **[Next]** to view the second Version screen.

Figure 66
Diagnostics Version

From this screen you can view the relay and sum firmware information.

The **relay** field displays the firmware version of the relay board.

The **sum** field displays the check sum of the program.

8. Tap **[Cube]** to display the cube test mode screen.
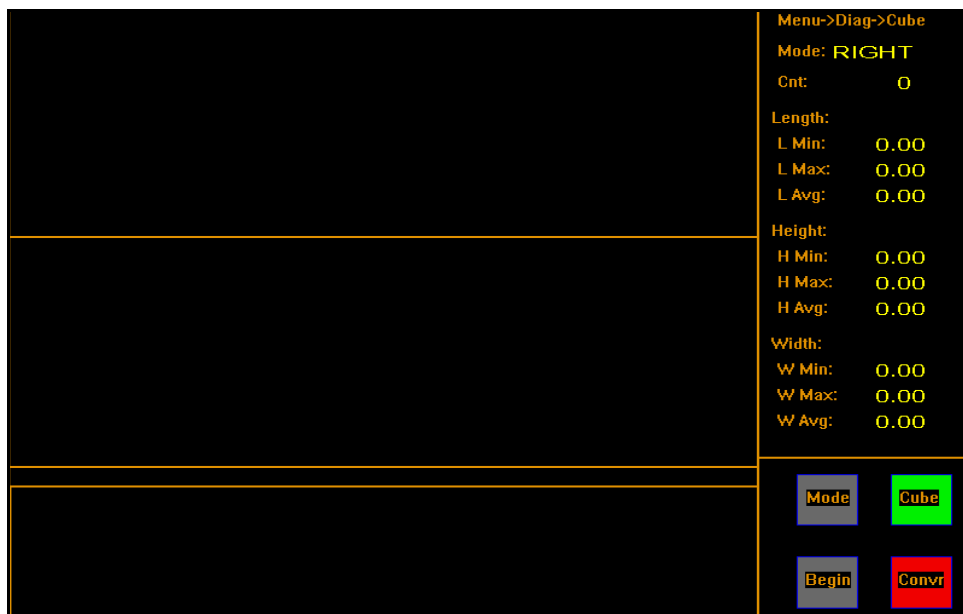
Figure 67
Diagnostics Cube Screen

This screen displays the cube test mode information. The mode determines how the calibration cube should be placed on the belt. This screen is for internal diagnostic testing purposes only.

9. When you are finished with the second diagnostics screen, tap **[Prev]** twice to return to the main screen, or tap **[Prev]** once to return to the first diagnostics screen.

Gate Diagnostics

1.   Tap **[Menu]** at the main screen.
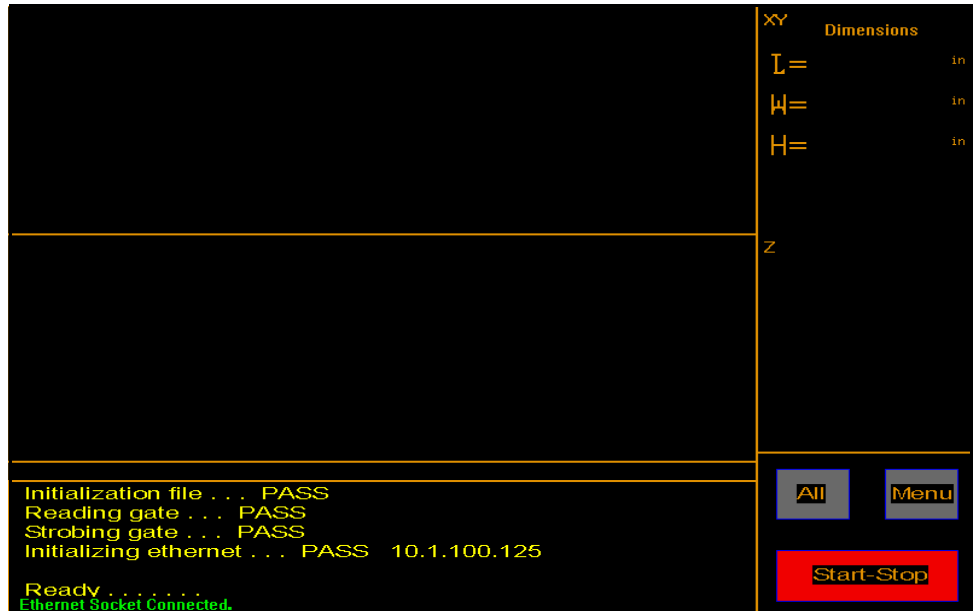
Figure 68
Main Screen

The menu buttons are displayed.

Figure 69
Menu Screen

2. Tap **[Diag]**. The diagnostics menu is displayed.

Figure 70
Diagnostics Menu

3. Tap **[Gate]** and the button will turn green. The first gate diagnostics screen will be displayed.
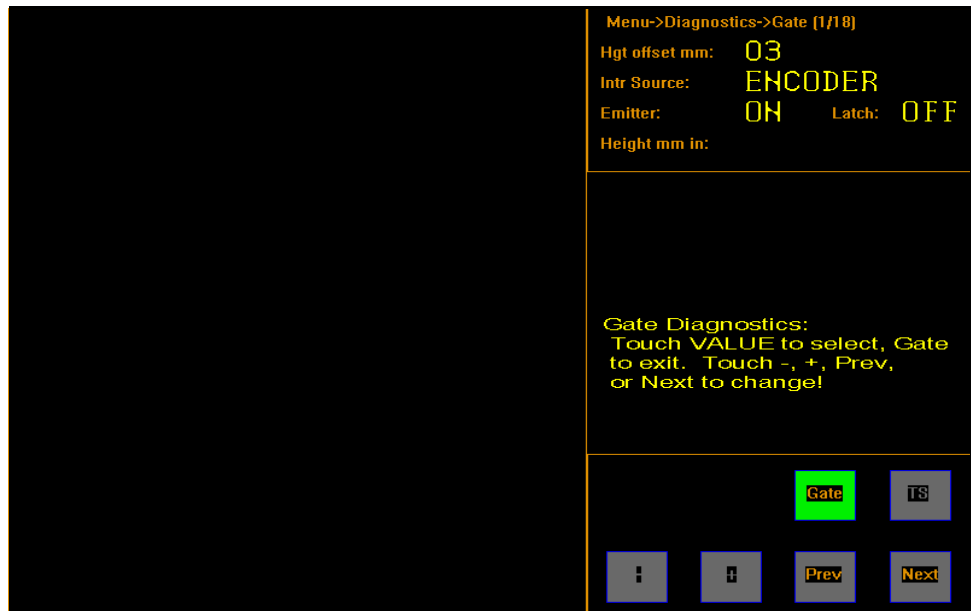
Figure 71
Gate Diagnostics, First Screen

The **hgt offset mm** field allows the gate height to be calibrated.

The **Intr Source** field displays the interrupt source information. This is what prompts the CubiScan 225 to take a measurement. The encoder wheel is the default setting, but it can also be changed to a timer.

The **emitter** field allows you to stop the sensors from emitting light when it is turned off.

The **height mm in** field displays the height of an object that is in the measuring field in millimeters and inches.

The **latch** field is for diagnostic purposes only.

4. Tap **[Next]** to go to the next gate diagnostic screen.
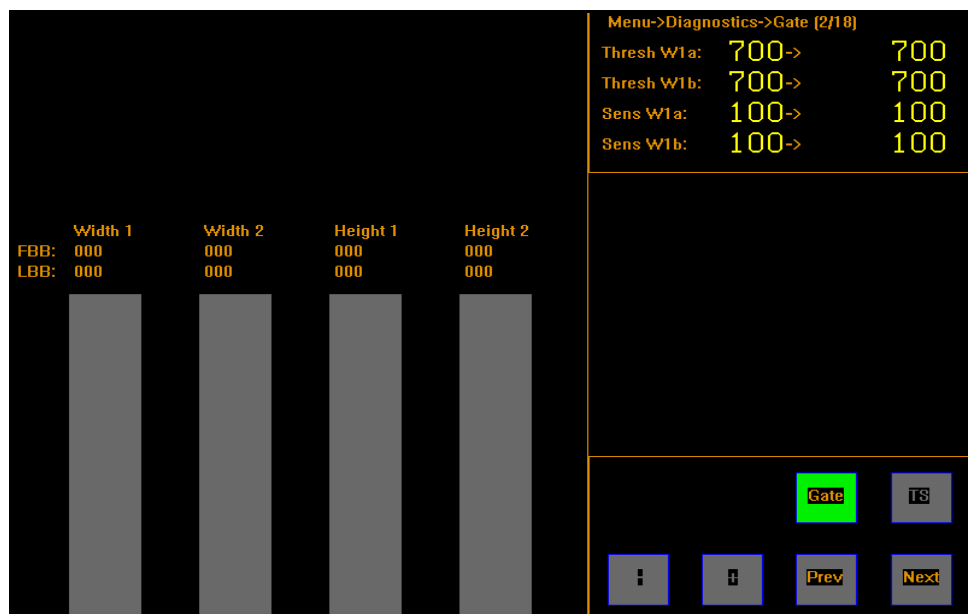
Figure 72
Gate Diagnostics, Second Screen

From this screen you can view the width 1 board threshold values and the sensor width 1 threshold values.

The width board values should fall within the range of 550 to 750.

The sensor board values should be 100.

The four LED beam bars now shown on the display represent the LED beams that the CubiScan 225 uses to measure objects. This is a useful screen for determining the functionality of the LED beams and is displayed in gate diagnostic screens 2 through 18.

FBB stands for first beam broken and LBB stands for last beam broken. The corresponding value fields will display the specific beams that are

being broken, if any. These values can range from 1 to 320. If no beams are being broken then the values will read zero.

The width and height bars correspond to the CubiScan 225's measurement area.

LED beam bars are gray when no light beams are being broken (as seen above in Figure 72), which typically means that there is no object in the CubiScan 225's measurement range.
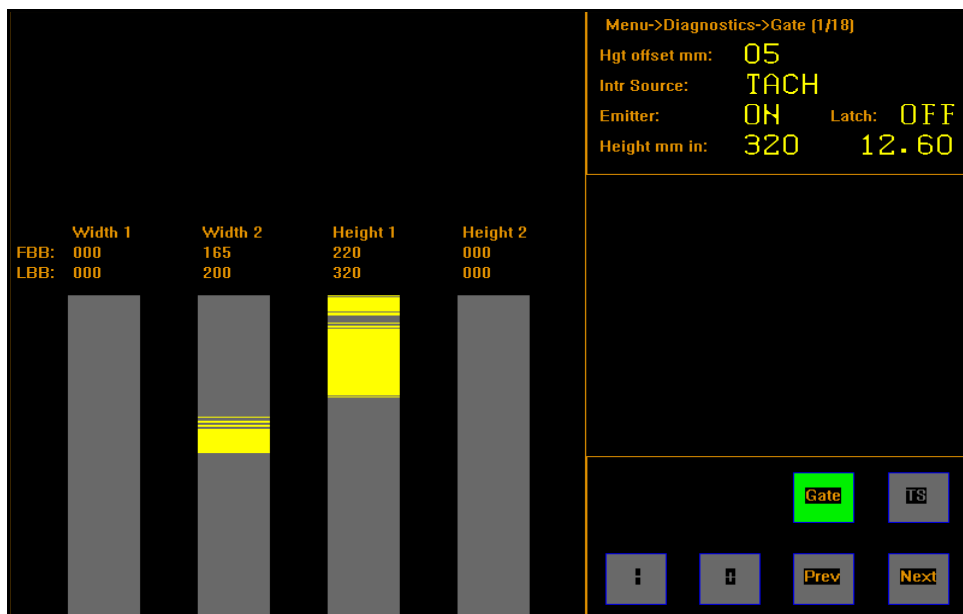
Figure 73
Gate Diagnostics, Second Screen

Figure 73 displays yellow lines on the LED beam bars, which means that light beams are being broken. This could mean that there is something on the CubiScan 225's platform or sensors. If the measuring area and sensors are clear (see "Cleaning the Sensors" on page 56) then the LED beams may not be functioning properly. The values of the first and last beams that are broken are listed for the width and height.

To test the functionality of the LED beams, complete the following steps.

• Make sure that the gate sensors and sensor guard are clean and free of all dust and debris.

• If all LED sensors are functioning properly, the LED beam bars should be all gray, with no yellow lines visible (as shown in Figure 72).

- If yellow lines are visible (as shown in Figure 73) even though there is no object in the measuring field or debris on the sensors, contact Quantronix Technical Assistance at +1 (801) 451-7000.

5. Tap **[Next]** to go to the next gate diagnostics screen.
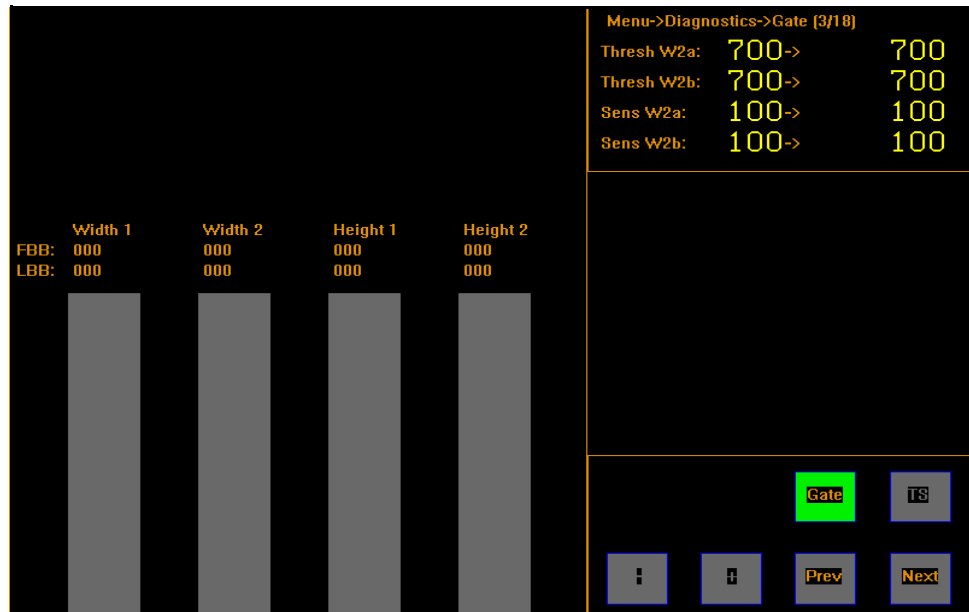
Figure 74
Gate Diagnostics, Third Screen

From this screen you can view the width 2 board threshold values and the sensor width 2 threshold values.

The width board values should fall within the range of 550 to 750.

The sensor board values should be 100.

6. Tap **[Next]** to go to the next gate diagnostics screen.
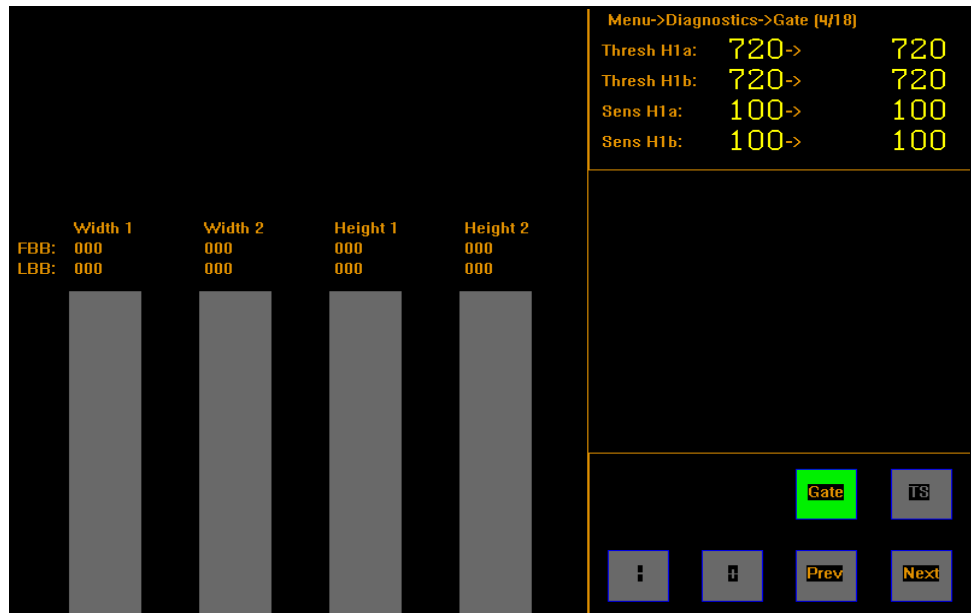
Figure 75
Gate Diagnostics, Fourth Screen

From this screen you can view the height board 1 threshold values and sensor height 1 threshold values.

The height board values should fall within the range of 550 to 750.

The sensor board values should be 100.

7.   Tap **[Next]** to go to the next gate diagnostics screen.
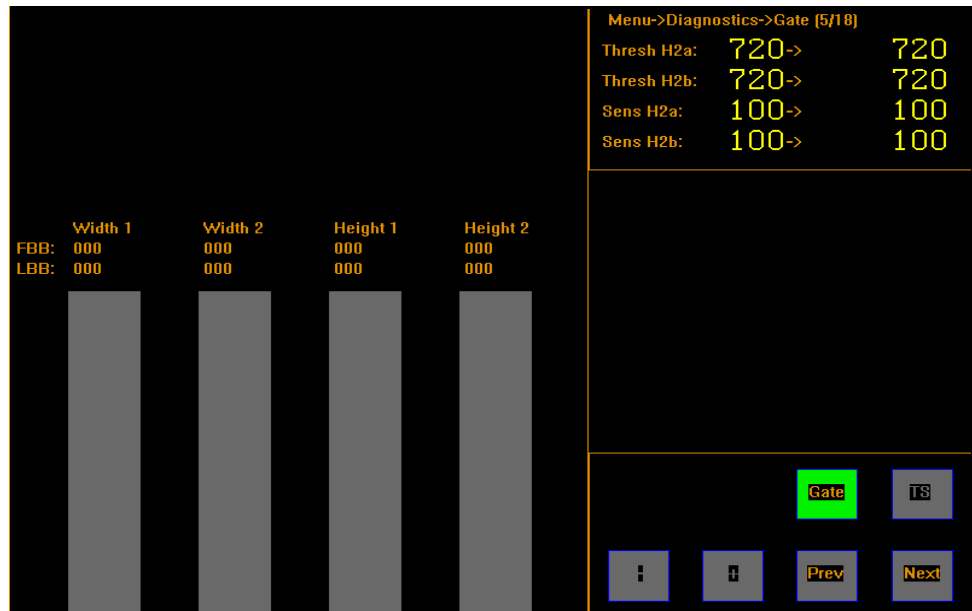
Figure 76
Gate Diagnostics, Fifth Screen

From this screen you can view the height board 2 threshold values and sensor height 2 threshold values.

The height board values should fall within the range of 550 to 750.

The sensor board values should be 100.

8. Tap **[Next]** to go to the next gate diagnostics screen.
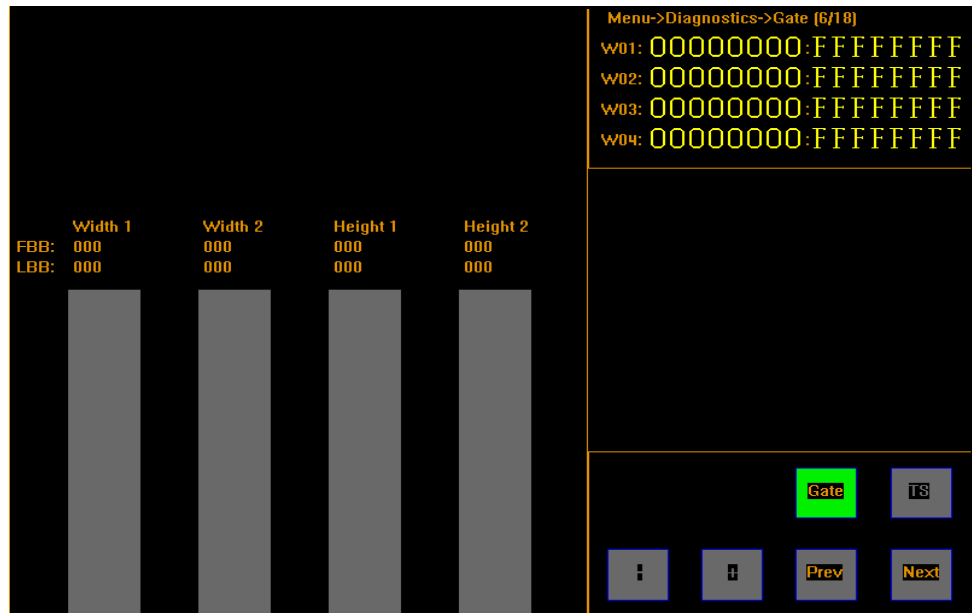
Figure 77
Gate Diagnostics, Sixth Screen

The sixth through the tenth gate diagnostics screens display the status of each width LED beam.

The values on the left show the beam's on/off status and the values on the right show which beams are included in the measuring process using hexadecimal code.

9. Tap **[Next]** to go to the next gate diagnostics screen.
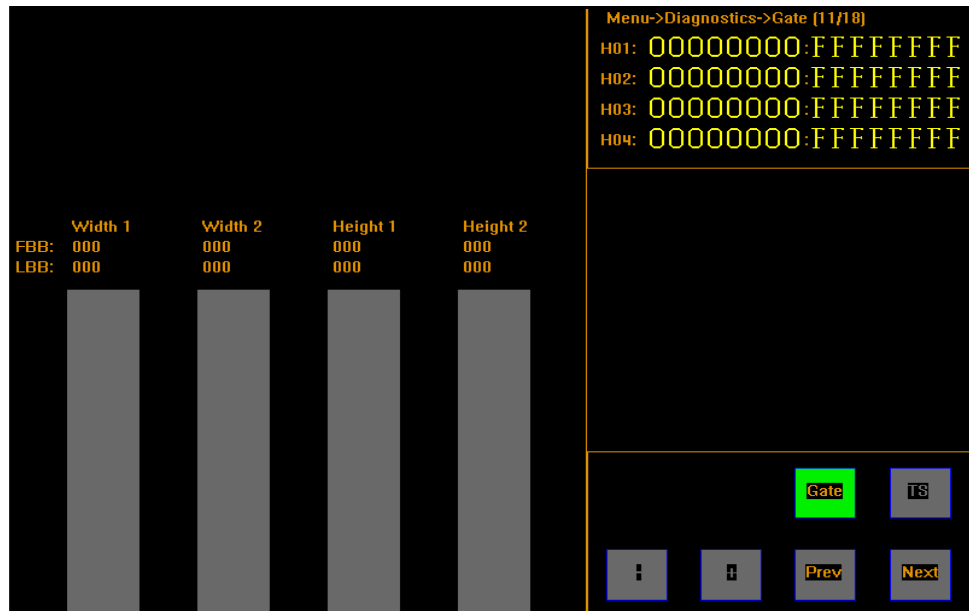
Figure 78
Gate Diagnostics, Eleventh Screen

The eleventh through the fifteenth gate diagnostic screens display the status of each height LED beam.

The values on the left show the beam's on/off status and the values on the right show which beams are included in the measuring process using hexadecimal code.

10. Tap **[Next]** to go to the next gate diagnostic screen.
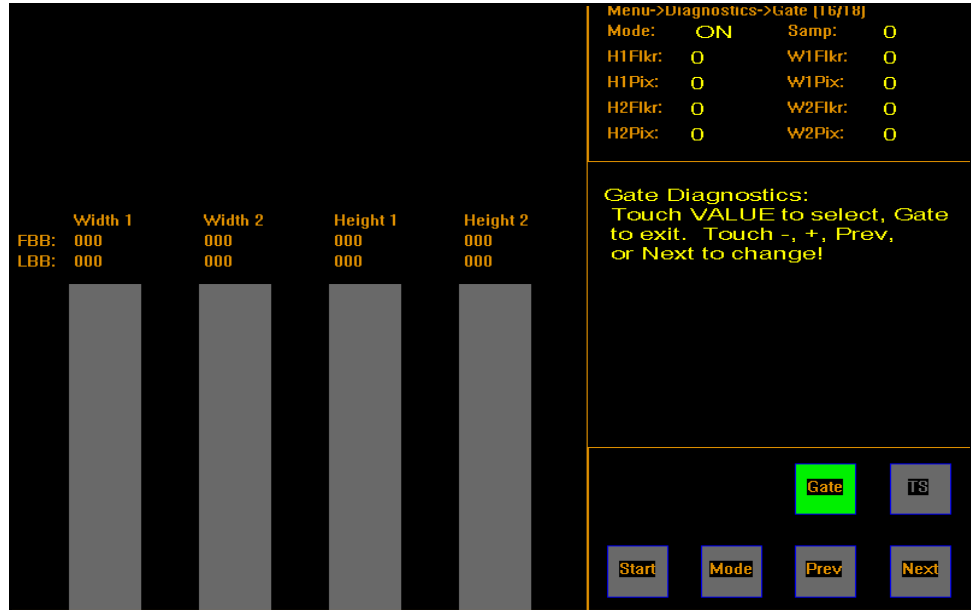
Figure 79
Gate Diagnostics, Sixteenth Screen

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

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

Tapping the **[Mode]** button that appeared in the place of the **[+]** button will turn the mode on and off.

[Mode] on means that the LED beams are transmitting and receiving light.

[Mode] off means that the beams are not transmitting light. The LED beam bars should be completely yellow in this mode because they are not receiving light. This test is useful to check for ambient light interference.

11. Tap **[Next]** to go to the next gate diagnostic screen.
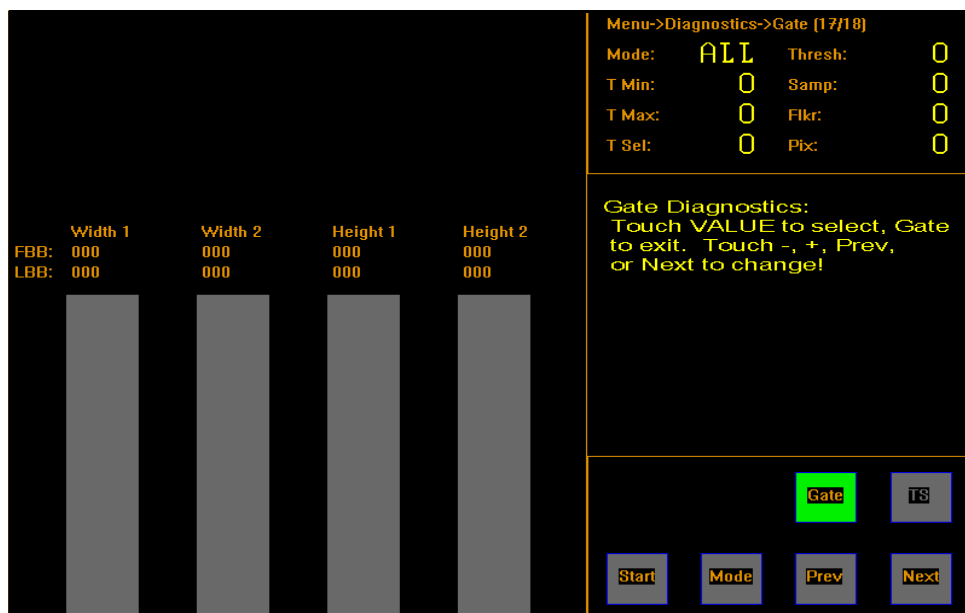
Figure 80
Gate Diagnostics, Seventeenth Screen

From this screen you can run an automatic threshold setting test for the LED beams. When this test is run the CubiScan 225 finds the top and bottom limits and automatically picks the best values.

This test should only be run if you are instructed to by a Quantronix employee.

This test may take several minutes.

The CubiScan 225 will not retain these changes unless they are saved at the menu screen. For instructions on how to do this refer to "Navigating the Touchscreen and Saving Changes" on page 25.

12. Tap **[Next]** to go to the next gate diagnostic screen.
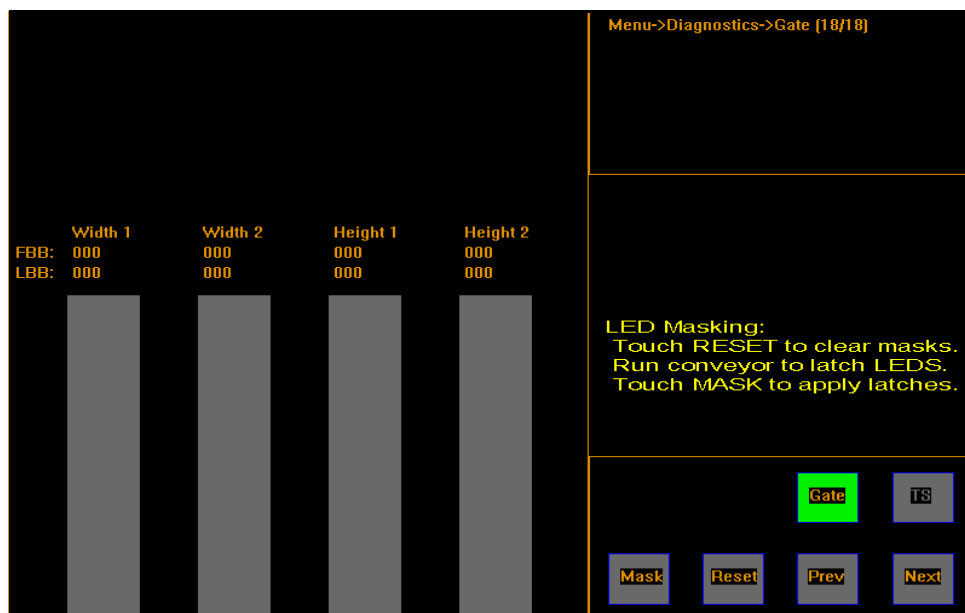
Figure 81
Gate Diagnostics, Eighteenth Screen

From this screen you can run the mask LED test that will identify blocked LED beams and mask (exclude) them from being used in the measurement process.

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

To run this test complete the following steps.

- Run the conveyor.
- Wait to see if any LEDs flicker.
- If any LEDs flicker, tap **[Mask]** to mask the LEDs that flickered.

Masked LEDs will no longer be used in the measurement process. Masking more than three LEDs may affect measurement accuracy.

These changes must be saved for the CubiScan 225 to retain them. For instructions on saving changes, see "Navigating the Touchscreen and Saving Changes" on page 25.

The **[Reset]** button will return the LED masks to their original settings.

13. When you are finished, tap **[Gate]** to return to the diagnostics menu.

Touchscreen Diagnostics

1. Tap **[Menu]** at the main screen.

Figure 82
Main Screen

The menu buttons are displayed.
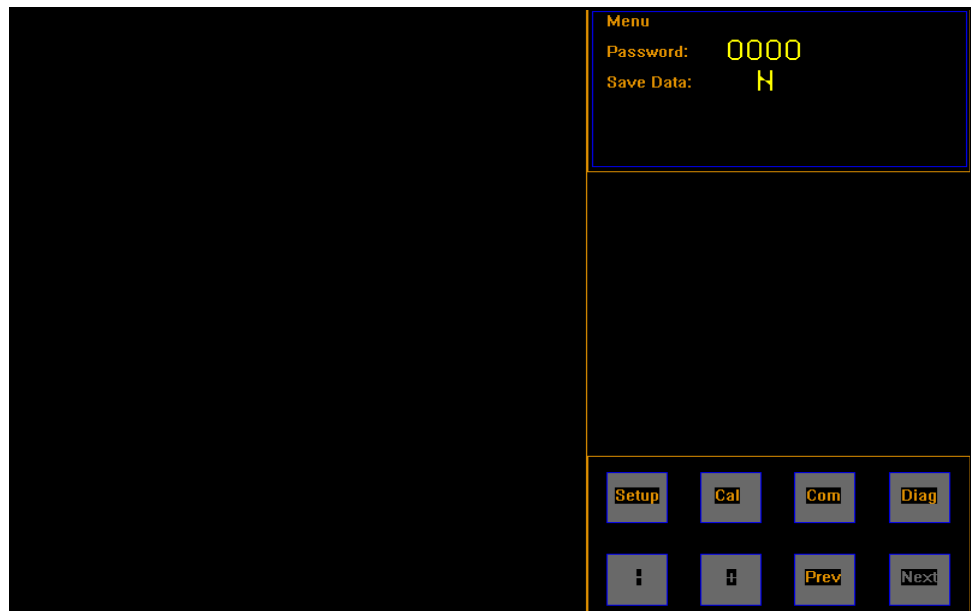
Figure 83
Menu Screen

2. Tap **[Diag]**. The diagnostics menu is displayed.

Figure 84
Diagnostics Menu

3. Tap **[TS]** and the touchscreen diagnostics screen will be displayed.
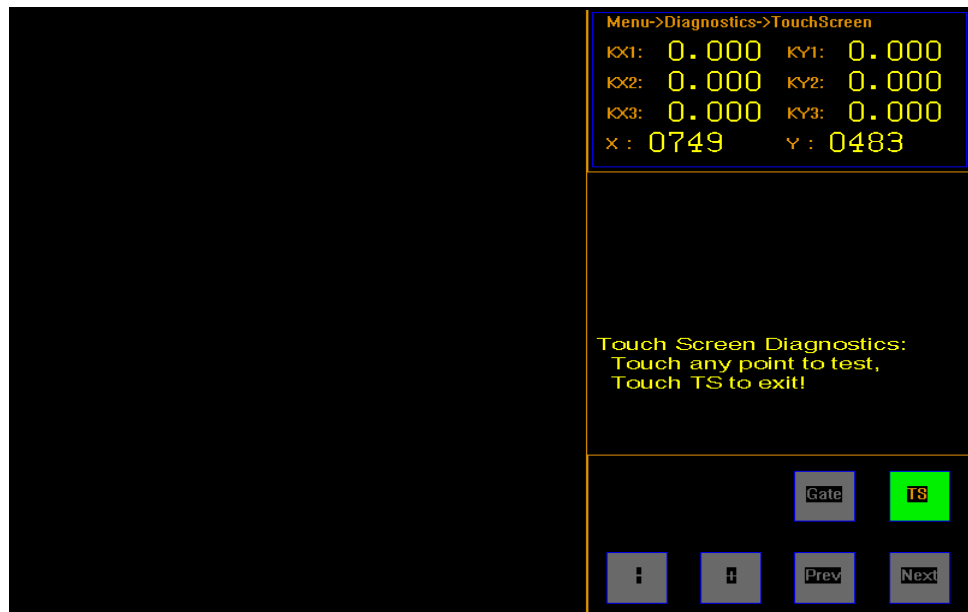
Figure 85
Touchscreen Diagnostics

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 an "x" should appear.

4. When you are finished tap **[TS]** again to return to the diagnostics menu.

Appendix A

Communications Protocol

This appendix contains the cable pin assignments and command set description for the interface between the CubiScan 225 and a host computer via a serial RS-232 connection, a USB connection, as well as for the interface between the CubiScan 225 and a network via an Ethernet TCP/IP connection.

The "Command Set Summary" on page 85 lists the command sets that can be used to set up the CubiScan 225 for dimensioning. These command sets can also be used in the actual cubing process.

The "TCP/IP Command Set Summary" on page 108 lists the commands used to set up the CubiScan 225 for TCP/IP communications with a network.

Serial (RS-232-C) Cable Pin Assignments

The CubiScan 225 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 controller 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 225 Ethernet port uses the 10/100 Base-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

The following table shows the parameters for the default Ethernet port settings.

Ethernet Port (default settings)	
IP Address	DHCP or Static (Default static 10.1.100.100)
IP Com Port	1050
TFTP Port	69

The Ethernet port can be configured via this command set or through the touch interface. Commands exist to configure the Port, IP address, Subnet address and Gateway address. Ethernet port configuration (TCP) commands may be sent via the PC/COM (RS-232) or USB ports, but NOT the Ethernet port.

NOTE ☞   *To establish Ethernet communication, open the PORT and send a command to complete the connection (like the Build Number). Failure to do this will impede communication on the Ethernet port.*

The following lists show the files available for TFTP binaries.

Files available for TFTP binary GET.

- cs125img.bmp
- cs125imz.bmp
- cs125isc.bmp
- param125.txt

Files available for TFTP binary PUT.

- param125new.txt
- cs125.bin

USB Port Cable Pin Assignments

The CubiScan 225 includes a USB 2.0 type B connector, as shown below.
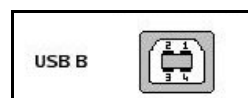
The following table shows the USB 2.0 type B connector pin assignments.

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

It is configured as a communications device class (or USB CDC). The device attaches, on the USB side, to an RS-232 communications line and the computer operating system. This makes the USB device appear as a traditional RS-232 port.

The CubiScan 225 command set can be sent, via USB, using RS-232 communication software.

The following table shows the parameters for asynchronous communications through the USB cable.

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

CubiScan 225 Command Set

This section describes the commands recognized by the CubiScan 225 to cube and weigh objects and to set up the CubiScan 225 for cubing and weighing (dimension units, factor toggle, calibration, and so on).

All command packets begin with an STX (start of text) and end with an ETX (end of text), CR (carriage return), and LF (line feed). Each command has a Command field and an optional Data field. For example:

> <STX><COMMAND><DATA><ETX><CR><LF>

All commands receive either an Acknowledge response (ACK), or a Negative Acknowledge response (NACK). An ACK includes the Command followed by an "A" and may include a data field. A NACK includes the Command followed by a "N," indicating that an error occurred. For example:

ACK: <STX><COMMAND><A><DATA><ETX><CR><LF>
NACK: <STX><COMMAND><N><ETX><CR>

The CubiScan 225 responds with a question mark NACK to any unrecognized Command. For example:

> <STX><?><N><ETX><CR><LF>

When a NACK is sent by the CubiScan 225, the operation associated with that command is aborted due to the error.

Command Set Summary

The CubiScan 225 recognizes the following commands from the command set for a serial, USB, or Ethernet connection.

The table below shows the Command Set Summary.

(A) - Command Character
(B) - Command Hex Value(s)

User Command Name	(A)	(B)	Page
"Build Number"	b	62h	86
"Dimension Units"	"	22h	87
"Emitter Toggle"	e	65h	88
"Factor Table"	f	66h	88
"Factor Toggle"	F	46h	90
"Flash Firmware"	l	6Ch	90
"Gate Measure"	m	6Dh	91
"Identification/Serial Number"	I	49h	93
"Key Coordinates"	k	6Bh	93

"Location Identification"	L	4Ch	94
"Model"	!	21h	95
"Reset System"	x	78h	96
"Save Parameters"	s	73h	97
"Scrape Screen"	a	61h	97
"Serial Get"	g	67h	98
"Serial Loop Back"	P	50h	99
"Serial Put"	p	70h	100
"Smallest Box Mode"	j	6Ah	101
"Test"	T	54h	101
"Units"	U	55h	102
"Values"	V	56h	103
"Values 2"	v	76h	105
"Weight Units"	#	23h	106
"Zero"	Z	5Ah	107

Build Number

This command causes the CubiScan 225 to report the build number. This is a non-lft function.

Pos	Len	Description	Type	Range	ASCII
Command Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Build Command	Alpha	(b)	62h
3	1	End of Text	Control	(ETX)	03h
4	1	Carriage Return	Control	(CR)	0Dh
5	1	Line Feed	Control	(LF)	0Ah
Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Build Command	Alpha	(b)	62h
3	1	Acknowledge	Alpha	(A)	41h
4	2	Build Number	Numeric	00-99	
6	1	End of Text	Control	(ETX)	03h
7	1	Carriage Return	Control	(CR)	0Dh
8	1	Line Feed	Control	(LF)	0Ah
Negative Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h

Pos	Len	Description	Type	Range	ASCII
2	1	Build Command	Alpha	(b)	62h
3	1	Neg. Acknowledge	Alpha	(N)	4Eh
4	1	End of Text	Control	(ETX)	03h
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah

Dimension Units

This command is used to set the dimension units to either English (inches) or metric (centimeters) mode.

Pos	Len	Description	Type	Range	ASCII
Command Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Dim. Unit Command	Alpha	(")	22h
3	1	English or Metric	Alpha	(E/M)	45h or 4Dh
4	1	End of Text	Control	(ETX)	03h
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah
Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Dim. Unit Command	Alpha	(")	22h
3	1	Acknowledge	Alpha	(A)	41h
4	1	End of Text	Control	(ETX)	03h
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah
Negative Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Dim. Unit Command	Alpha	(")	22h
3	1	Neg. Acknowledge	Alpha	(N)	4Eh
4	1	End of Text	Control	(ETX)	03h
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah

Emitter Toggle

This command causes the CubiScan 225 to turn On/Off the gate emitters.

Pos	Len	Description	Type	Range	ASCII
		Command Format			
1	1	Start of Text	Control	(STX)	02h
2	1	Emitter Command	Alpha	(e)	65h
3	1	End of Text	Control	(ETX)	03h
4	1	Carriage Return	Control	(CR)	0Dh
5	1	Line Feed	Control	(LF)	0Ah
		Acknowledge Format			
1	1	Start of Text	Control	(STX)	02h
2	1	Emitter Command	Alpha	(e)	65h
3	1	Acknowledge	Alpha	(A)	41h
4	1	End of Text	Control	(ETX)	03h
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah
		Negative Acknowledge Format			
1	1	Start of Text	Control	(STX)	02h
2	1	Emitter Command	Alpha	(e)	65h
3	1	Neg. Acknowledge	Alpha	(N)	4Eh
4	1	End of Text	Control	(ETX)	03h
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah

Factor Table

This command causes the CubiScan 225 to store new dimensional weight factors. There are eight factors used, depending on the current shipping mode (international or domestic), dimension unit (in or cm), and weight unit (lb or kg).

Pos	Len	Description	Type	Range	ASCII
		Command Format			
1	1	Start of Text	Control	(STX)	02h
2	1	Factor Toggle Command	Alpha	(f)	66h
3	4	Dom. In/Lb	Numeric	0000-9999	
7	1	Comma	Alpha	(,)	2Ch

Pos	Len	Description	Type	Range	ASCII
8	4	Int. In/Lb	Numeric	0000-9999	
12	1	Comma	Alpha	(,)	2Ch
13	4	Dom. In/Kg	Numeric	0000-9999	
17	1	Comma	Alpha	(,)	2Ch
18	4	Int. In/Kg	Numeric	0000-9999	
22	1	Comma	Alpha	(,)	2Ch
23	4	Dom. Cm/Lb	Numeric	0000-9999	
27	1	Comma	Alpha	(,)	2Ch
28	4	Int. Cm/Lb	Numeric	0000-9999	
32	1	Comma	Alpha	(,)	2Ch
33	4	Dom. Cm/Kg	Numeric	0000-9999	
37	1	Comma	Alpha	(,)	2Ch
38	4	Int. Cm/Kg	Numeric	0000-9999	
42	1	End of Text	Control	(ETX)	03h
43	1	Carriage Return	Control	(CR)	0Dh
44	1	Line Feed	Control	(LF)	0Ah
Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Factor Table Command	Alpha	(f)	66h
3	1	Acknowledge	Alpha	(A)	41h
4	1	End of Text	Control	(ETX)	03h
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah
Negative Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Factor Table Command	Alpha	(f)	66h
3	1	Neg. Acknowledge	Alpha	(N)	4Eh
4	1	End of Text	Control	(ETX)	03h
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah

Factor Toggle

This command is used to set the dimensional factor to either domestic or international.

Pos	Len	Description	Type	Range	ASCII
Command Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Fact. Toggle Command	Alpha	(F)	46h
3	1	Dom./Int'l	Alpha	(D/I)	44h or 49h
4	1	End of Text	Control	(ETX)	03h
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah
Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Fact. Toggle Command	Alpha	(F)	46h
3	1	Acknowledge	Alpha	(A)	41h
4	1	End of Text	Control	(ETX)	03h
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah
Negative Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Fact. Toggle Command	Alpha	(F)	46h
3	1	Neg. Acknowledge	Alpha	(N)	4Eh
4	1	End of Text	Control	(ETX)	03h
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah

Flash Firmware

This command causes the CubiScan 225 to flash file cs125.bin stored on the SD card.

Pos	Len	Description	Type	Range	ASCII
Command Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Flash Command	Alpha	(f)	66h
3	1	End of Text	Control	(ETX)	03h
4	1	Carriage Return	Control	(CR)	0Dh

Pos	Len	Description	Type	Range	ASCII
5	1	Line Feed	Control	(LF)	0Ah
Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Flash Command	Alpha	(f)	66h
3	1	Acknowledge	Alpha	(A)	41h
4	1	End of Text	Control	(ETX)	03h
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah
Negative Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Flash Command	Alpha	(f)	66h
3	1	Neg. Acknowledge	Alpha	(N)	4Eh
4	1	End of Text	Control	(ETX)	03h
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah

Gate Measure

The CubiScan 225 will automatically send measurement data upon completion of a gate measurement. The dimensions of the object that was measured will be sent.

Pos	Len	Description	Type	Range	ASCII
Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Measure Command	Alpha	(m)	6Dh
3	1	Acknowledge	Alpha	(A)	41h
4	1	CubiScan/Host Originated	Alpha	(C/H)	43h or 48h
5	6	Location Identifier	Alpha	000000-ZZZZZZ	
11	1	Comma	Alpha	(,)	2Ch
12	1	Length Identifier	Alpha	(L)	4C
13	5	Length	Numeric	00.00 - 99.99	
18	1	Comma	Alpha	(,)	2Ch
19	1	Width Identifier	Alpha	(W)	57h
20	5	Width	Numeric	00.00 - 99.99	
25	1	Comma	Alpha	(,)	2Ch

Pos	Len	Description	Type	Range	ASCII
26	1	Height Identifier	Alpha	(H)	48h
27	5	Height	Numeric	00.00 - 99.99[1]	
32	1	Comma	Alpha	(,)	2Ch
33	2	Dimension Unit	Alpha	(in/cm)	45h or 4Dh
35	1	Weight Identifier	Alpha	(K)	4Bh
36	6	Weight	Numeric	00.000 - 99.999[2]	
42	1	Comma	Alpha	(,)	2Ch
43	1	Dim. Wgt. Identifier	Alpha	(D)	44h
44	6	Dim. Weight	Numeric	000.00-999.99[1]	
50	1	Comma	Alpha	(,)	2Ch
51	2	Wgt./Dim.Wgt Unit	Alpha	(lb/kg)	
53	1	Factor Identifier	Alpha	(F)	46h
54	4	Factor	Numeric	0000-9999	
58	1	Comma	Alpha	(,)	2Ch
59	1	Domestic/Int'l. Unit	Alpha	(D/I)	44h or 49h
60	1	End of Text	Control	(ETX)	03h
61	1	Carriage Return	Control	(CR)	0Dh
62	1	Line Feed	Control	(LF)	0Ah
Negative Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Measure Command	Alpha	(M)	4Dh
3	1	Neg. Acknowledge	Alpha	(N)	4Eh
4	1	CubiScan/Host Originated	Alpha	(C/H)	43h or 48h
5	1	Measure/Zero Error	Alpha	(M/Z)	43h or 4Dh or 5Ah
6	1	End of Text	Control	(ETX)	03h
7	1	Carriage Return	Control	(CR)	0Dh
8	1	Line Feed	Control	(LF)	0Ah

Identification/Serial Number

This command causes the CubiScan 225 to change its current serial number data field. The serial number is an eight-digit code which uniquely identifies the CubiScan 225.

Pos	Len	Description	Type	Range	ASCII
		Command Format			
1	1	Start of Text	Control	(STX)	02h
2	1	ID Serial # Command	Alpha	(I)	49h
3	8	Serial Number	Numeric	00000000-99999999	
11	1	End of Text	Control	(ETX)	03h
12	1	Carriage Return	Control	(CR)	0Dh
13	1	Line Feed	Control	(LF)	0Ah
		Acknowledge Format			
1	1	Start of Text	Control	(STX)	02h
2	1	ID Serial # Command	Alpha	(I)	49h
3	1	Acknowledge	Alpha	(A)	41h
4	1	End of Text	Control	(ETX)	03h
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah
		Negative Acknowledge Format			
1	1	Start of Text	Control	(STX)	02h
2	1	ID Serial # Command	Alpha	(I)	49h
3	1	Neg. Acknowledge	Alpha	(N)	4Eh
4	1	End of Text	Control	(ETX)	03h
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah

Key Coordinates

This command causes the CubiScan 225 to accept keyboard input in touch pad coordinates. The X coordinate is horizontal, the Y coordinate is vertical.

Pos	Len	Description	Type	Range	ASCII
		Command Format			
1	1	Start of Text	Control	(STX)	02h
2	1	Key Command	Alpha	(k)	6Bh

Pos	Len	Description	Type	Range	ASCII
3	4	X Coordinate	Numeric	0000-9999	
7	1	Comma	Alpha	(,)	2Ch
8	4	Y Coordinate	Numeric	0000-9999	
12	1	End of Text	Control	(ETX)	03h
13	1	Carriage Return	Control	(CR)	0Dh
14	1	Line Feed	Control	(LF)	0Ah
Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Key Command	Alpha	(k)	6Bh
3	1	Acknowledge	Alpha	(A)	41h
4	1	End of Text	Control	(ETX)	03h
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah
Negative Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Key Command	Alpha	(k)	6Bh
3	1	Neg. Acknowledge	Alpha	(N)	4Eh
4	1	End of Text	Control	(ETX)	03h
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah

Location Identification

This command is used to set the CubiScan 225 location identification. The location identification is a six-digit code which uniquely identifies the CubiScan 225 within the user's operation. This location identification is included in each measurement packet. This data is stored in permanent memory and need only be set once for each CubiScan 225.

Pos	Len	Description	Type	Range	ASCII
Command Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Location ID Command	Alpha	(L)	4Ch
3	6	Location ID	Alpha	000000-ZZZZZ	
9	1	End of Text	Control	(ETX)	03h
10	1	Carriage Return	Control	(CR)	0Dh
11	1	Line Feed	Control	(LF)	0Ah
Acknowledge Format					

Pos	Len	Description	Type	Range	ASCII
1	1	Start of Text	Control	(STX)	02h
2	1	Location ID Command	Alpha	(L)	4Ch
3	1	Acknowledge	Alpha	(A)	41h
4	1	End of Text	Control	(ETX)	03h
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah
Negative Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Location ID Command	Alpha	(L)	4Ch
3	1	Neg. Acknowledge	Alpha	(N)	4Eh
4	1	End of Text	Control	(ETX)	03h
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah

Model

This command causes the CubiScan 225 to change its current model designation. The CubiScan 225 = 07.

Pos	Len	Description	Type	Range	ASCII
Command Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Model Command	Alpha	(!)	21h
3	2	Model Number	Numeric	05-07	
5	1	End of Text	Control	(ETX)	03h
6	1	Carriage Return	Control	(CR)	0Dh
7	1	Line Feed	Control	(LF)	0Ah
Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Model Command	Alpha	(!)	21h
3	1	Acknowledge	Alpha	(A)	41h
4	1	End of Text	Control	(ETX)	03h
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah
Negative Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Model Command	Alpha	(!)	21h

Pos	Len	Description	Type	Range	ASCII
3	1	Neg. Acknowledge	Alpha	(N)	4Eh
4	1	End of Text	Control	(ETX)	03h
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah

Reset System

This command causes the CubiScan 225 to reboot.

Pos	Len	Description	Type	Range	ASCII
Command Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Reset Command	Alpha	(x)	78h
3	1	End of Text	Control	(ETX)	03h
4	1	Carriage Return	Control	(CR)	0Dh
5	1	Line Feed	Control	(LF)	0Ah
Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Reset Command	Alpha	(x)	78h
3	1	Acknowledge	Alpha	(A)	41h
4	1	End of Text	Control	(ETX)	03h
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah
Negative Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Reset Command	Alpha	(x)	78h
3	1	Neg. Acknowledge	Alpha	(N)	4Eh
4	1	End of Text	Control	(ETX)	03h
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah

Save Parameters

This command causes the CubiScan 225 to save all current parameters to the file param125.txt on the SD card.

Pos	Len	Description	Type	Range	ASCII
		Command Format			
1	1	Start of Text	Control	(STX)	02h
2	1	Save Command	Alpha	(s)	73h
3	1	End of Text	Control	(ETX)	03h
4	1	Carriage Return	Control	(CR)	0Dh
5	1	Line Feed	Control	(LF)	0Ah
		Acknowledge Format			
1	1	Start of Text	Control	(STX)	02h
2	1	Save Command	Alpha	(s)	73h
3	1	Acknowledge	Alpha	(A)	41h
4	1	End of Text	Control	(ETX)	03h
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah
		Negative Acknowledge Format			
1	1	Start of Text	Control	(STX)	02h
2	1	Save Command	Alpha	(s)	73h
3	1	Neg. Acknowledge	Alpha	(N)	4Eh
4	1	End of Text	Control	(ETX)	03h
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah

Scrape Screen

This command causes the CubiScan 225 to save the current touchscreen image to the file cs125isc.bmp.

Pos	Len	Description	Type	Range	ASCII
		Command Format			
1	1	Start of Text	Control	(STX)	02h
2	1	Scrape Command	Alpha	(a)	61h
3	1	End of Text	Control	(ETX)	03h
4	1	Carriage Return	Control	(CR)	0Dh
5	1	Line Feed	Control	(LF)	0Ah

Pos	Len	Description	Type	Range	ASCII
		Acknowledge Format			
1	1	Start of Text	Control	(STX)	02h
2	1	Scrape Command	Alpha	(a)	61h
3	1	Acknowledge	Alpha	(A)	41h
4	1	End of Text	Control	(ETX)	03h
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah
		Negative Acknowledge Format			
1	1	Start of Text	Control	(STX)	02h
2	1	Scrape Command	Alpha	(a)	61h
3	1	Neg. Acknowledge	Alpha	(N)	4Eh
4	1	End of Text	Control	(ETX)	03h
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah

Serial Get

This command causes the CubiScan 225 to transfer a file from the virtual file system via RS-232 or USB packets.

Pos	Len	Description	Type	Range	ASCII
		Command Format			
1	1	Start of Text	Control	(STX)	02h
2	1	Serial Get Command	Alpha	(g)	67h
3	1	Mode	Numeric	(1=Read, 4=Ack, 5=Error)	
4	n	Index or Filename	Alpha	0000-9999 or filename	
4+n	1	End of Text	Control	(ETX)	03h
5+n	1	Carriage Return	Control	(CR)	0Dh
6+n	1	Line Feed	Control	(LF)	0Ah
		Acknowledge Format			
1	1	Start of Text	Control	(STX)	02h
2	1	Serial Get Command	Alpha	(g)	67h
3	1	Data Mode	Numeric	(3)	33h
4	4	Index	Numeric	(0000-9999)	

Pos	Len	Description	Type	Range	ASCII
8	3	Size	Numeric	(000-500)	
11	n	Data	Binary		
11+n	1	End of Text	Control	(ETX)	03h
12+n	1	Carriage Return	Control	(CR)	0Dh
13+n	1	Line Feed	Control	(LF)	0Ah
Negative Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Serial Get Command	Alpha	(g)	67h
3	1	Neg. Acknowledge	Alpha	(N)	4Eh
4	1	End of Text	Control	(ETX)	03h
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah

Serial Loop Back

This command causes the CubiScan 225 to report a command code to the display.

Pos	Len	Description	Type	Range	ASCII
Command Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Loop Back Command	Alpha	(P)	50h
3	1	End of Text	Control	(ETX)	03h
4	1	Carriage Return	Control	(CR)	0Dh
5	1	Line Feed	Control	(LF)	0Ah
Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Loop Back Command	Alpha	(P)	50h
3	1	Acknowledge	Alpha	(A)	41h
4	1	End of Text	Control	(ETX)	03h
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah
Negative Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Loop Back Command	Alpha	(P)	50h
3	1	Neg. Acknowledge	Alpha	(N)	4Eh

Pos	Len	Description	Type	Range	ASCII
4	1	End of Text	Control	(ETX)	03h
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah

Serial Put

This command causes the instrument to receive a file into the virtual file system via RS-232 or USB packets.

Pos	Len	Description	Type	Range	ASCII
Command Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Serial Put Command	Alpha	(p)	70h
3	1	Mode	Numeric	(2=Write, 3=Data, 5=Error)	
4	n	Index or Filename	Alpha	0000-9999 or filename	
4+n	3	Size	Numeric	(000-500)	
7+n	m	Data	Binary		
7+n+m	1	End of Text	Control	(ETX)	03h
7+n+m	1	Carriage Return	Control	(CR)	0Dh
7+n+m	1	Line Feed	Control	(LF)	0Ah
Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Serial Put Command	Alpha	(p)	70h
3	1	Acknowledge	Alpha	(4)	34h
4	4	Index	Numeric	(0000-9999)	
8	1	End of Text	Control	(ETX)	03h
9	1	Carriage Return	Control	(CR)	0Dh
10	1	Line Feed	Control	(LF)	0Ah
Negative Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Serial Put Command	Alpha	(p)	70h
3	1	Neg. Acknowledge	Alpha	(N)	4Eh
4	1	End of Text	Control	(ETX)	03h

Pos	Len	Description	Type	Range	ASCII
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah

Smallest Box Mode

This command causes the CubiScan 225 to calculate measurements based on the smallest box.

Pos	Len	Description	Type	Range	ASCII
Command Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Smallest Box Command	Alpha	(j)	6Ah
3	1	End of Text	Control	(ETX)	03h
4	1	Carriage Return	Control	(CR)	0Dh
5	1	Line Feed	Control	(LF)	0Ah
Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Smallest Box Command	Alpha	(j)	6Ah
3	1	Acknowledge	Alpha	(A)	41h
4	1	End of Text	Control	(ETX)	03h
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah
Negative Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Smallest Box Command	Alpha	(j)	6Ah
3	1	Neg. Acknowledge	Alpha	(N)	4Eh
4	1	End of Text	Control	(ETX)	03h
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah

Test

This command causes the CubiScan 225 to reply with an error code. A response of TA00 means that the CubiScan 225 is ready and responding to transmissions from the host. If the host receives no response from the control unit after sending this command, an error condition exists in the communications between the host and controller.

Pos	Len	Description	Type	Range	ASCII
Command Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Self Test Command	Alpha	(T)	54h
3	1	End of Text	Control	(ETX)	03h
4	1	Carriage Return	Control	(CR)	0Dh
5	1	Line Feed	Control	(LF)	0Ah
Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Self Test Command	Alpha	(T)	54h
3	1	Acknowledge	Alpha	(A)	41h
4	2	Identifier	Numeric	(00-99)	
6	1	End of Text	Control	(ETX)	03h
7	1	Carriage Return	Control	(CR)	0Dh
8	1	Line Feed	Control	(LF)	0Ah
Negative Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Self Test Command	Alpha	(T)	54h
3	1	Neg. Acknowledge	Alpha	(N)	4Eh
4	1	End of Text	Control	(ETX)	03h
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah

Units

This command causes the CubiScan 225 to report its current unit settings, dimensional factor, and location ID.

Pos	Len	Description	Type	Range	ASCII
Command Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Values Command	Alpha	(U)	55h
3	1	End of Text	Control	(ETX)	03h
4	1	Carriage Return	Control	(CR)	0Dh
5	1	Line Feed	Control	(LF)	0Ah
Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Units Command	Alpha	(U)	55h

Pos	Len	Description	Type	Range	ASCII
3	1	Acknowledge	Alpha	(A)	41h
4	1	Dimension Units	Alpha	(E/M)	45h or 4Dh
5	1	Weight Units	Alpha	(E/M	45h or 4Dh
6	1	Factor Units	Alpha	(D/I)	44h or 49h
7	4	Dimensional Factor	Numeric	0000-9999	
11	6	Location ID	Alpha	000000-ZZZZZZ	
17	1	End of Text	Control	(ETX)	03h
18	1	Carriage Return	Control	(CR)	0Dh
19	1	Line Feed	Control	(LF)	0Ah
Negative Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Units Command	Alpha	(U)	55h
3	1	Neg. Acknowledge	Alpha	(N)	4Eh
4	1	End of Text	Control	(ETX)	03h
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah

Values

This command causes the CubiScan 225 to report various internal parameters. This is useful for troubleshooting.

Pos	Len	Description	Type	Range	ASCII
Command Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Values Command	Alpha	(V)	56h
3	1	End of Text	Control	(ETX)	03h
4	1	Carriage Return	Control	(CR)	0Dh
5	1	Line Feed	Control	(LF)	0Ah
Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Values Command	Alpha	(V)	56h
3	1	Acknowledge	Alpha	(A)	41h
4	4	Length DBW	Numeric	00.0-99.9	
8	1	Comma	Alpha	(,)	2Ch
9	4	Width DBW	Numeric	00.0-99.9	
13	1	Comma	Alpha	(,)	2Ch

Pos	Len	Description	Type	Range	ASCII
14	4	Height DBW	Numeric	00.0-99.9	
18	1	Comma	Alpha	(,)	2Ch
19	4	Length CPI	Numeric	0000-9999	
23	1	Comma	Alpha	(,)	2Ch
24	4	Width CPI	Numeric	0000-9999	
28	1	Comma	Alpha	(,)	2Ch
29	4	Height CPI	Numeric	0000-9999	
33	1	Comma	Alpha	(,)	2Ch
34	4	Length Blanking	Numeric	0.00-9.99	
38	1	Comma	Alpha	(,)	2Ch
39	4	Width Blanking	Numeric	0.00-9.99	
43	1	Comma	Alpha	(,)	2Ch
44	4	Height Blanking	Numeric	0.00-9.99	
48	1	Comma	Alpha	(,)	2Ch
49	4	Length Gain	Numeric	00.0-99.9	
53	1	Comma	Alpha	(,)	2Ch
54	4	Width Gain	Numeric	00.0-99.9	
58	1	Comma	Alpha	(,)	2Ch
59	4	Height Gain	Numeric	00.0-99.9	
63	1	Comma	Alpha	(,)	2Ch
64	2	Length Pulses	Numeric	00-99	
66	1	Comma	Alpha	(,)	2Ch
67	2	Width Pulses	Numeric	00-99	
69	1	Comma	Alpha	(,)	2Ch
70	2	Height Pulses	Numeric	00-99	
72	1	Comma	Alpha	(,)	2Ch
73	3	Length Wait Time	Numeric	000-999	
76	1	Comma	Alpha	(,)	2Ch
77	3	Width Wait Time	Numeric	000-999	
80	1	Comma	Alpha	(,)	2Ch
81	3	Height Wait Time	Numeric	000-999	
84	1	Comma	Alpha	(,)	2Ch
85	4	Model Number	Alpha	"50" / "100L"	
89	1	Comma	Alpha	(,)	2Ch
90	3	Scale Capacity - English	Numeric	000-999	50=10,20,30 100=100,150,2 01

Pos	Len	Description	Type	Range	ASCII
93	1	Comma	Alpha	(,)	2Ch
94	5	Firmware Version	Alpha	0.000-9.999	
99	1	Future Growth	Alpha	Space	0h
100	2	Firmware Build Number	Numeric	00-99	
102	1	Comma	Alpha	(,)	2Ch
103	4	FPGA Build Number	Numeric	0.00-9.99	
107	1	Comma	Alpha	(,)	2Ch
108	8	Serial Number	Numeric	00000000-99999999	
116	1	Comma	Alpha	(,)	2Ch
117	10	Future Growth	Alpha	Space	0h
127	1	End of Text	Control	(ETX)	03h
128	1	Carriage Return	Control	(CR)	0Dh
129	1	Line Feed	Control	(LF)	0Ah
Negative Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Values Command	Alpha	(V)	56h
3	1	Neg. Acknowledge	Alpha	(N)	4Eh
4	1	End of Text	Control	(ETX)	03h
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah

Values 2

This command causes the CubiScan 225 to report more of its various internal parameters. This is useful for troubleshooting.

Pos	Len	Description	Type	Range	ASCII
Command Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Values Command	Alpha	(v)	76h
3	1	End of Text	Control	(ETX)	03h
4	1	Carriage Return	Control	(CR)	0Dh
5	1	Line Feed	Control	(LF)	0Ah
Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Values Command	Alpha	(v)	76h

Pos	Len	Description	Type	Range	ASCII
3	1	Acknowledge	Alpha	(A)	41h
4	4	Length CPI	Numeric	0000-9999	
8	1	Comma	Alpha	(,)	2Ch
9	4	Width CPI	Numeric	0000-9999	
13	1	Comma	Alpha	(,)	2Ch
14	4	Height CPI	Numeric	0000-9999	
18	1	Comma	Alpha	(,)	2Ch
19	2	Length Pulses	Numeric	00-99	
21	1	Comma	Alpha	(,)	2Ch
23	2	Width Pulses	Numeric	00-99	
25	1	Comma	Alpha	(,)	2Ch
26	2	Height Pulses	Numeric	00-99	
28	1	Comma	Alpha	(,)	2Ch
29	2	Length Temperature	Numeric	00.99	
31	1	Comma	Alpha	(,)	2Ch
32	2	Width Temperature	Numeric	00-99	
34	1	Comma	Alpha	(,)	2Ch
35	2	Height Temperature	Numeric	00.99	
37	1	End of Text	Control	(ETX)	03h
38	1	Carriage Return	Control	(CR)	0Dh
39	1	Line Feed	Control	(LF)	0Ah
Negative Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Values Command	Alpha	(V)	56h
3	1	Neg. Acknowledge	Alpha	(N)	4Eh
4	1	End of Text	Control	(ETX)	03h
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah

Weight Units

This command is used to set the weight units to either English (pounds) or metric (kilograms) mode.

Pos	Len	Description	Type	Range	ASCII
Command Format					
1	1	Start of Text	Control	(STX)	02h

Pos	Len	Description	Type	Range	ASCII
2	1	Wgt. Unit Command	Alpha	(#)	23h
3	1	English or Metric	Alpha	(E/M)	45h or 4Dh
4	1	End of Text	Control	(ETX)	03h
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah
Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Wgt. Unit Command	Alpha	(#)	23h
3	1	Acknowledge	Alpha	(A)	41h
4	1	End of Text	Control	(ETX)	03h
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah
Negative Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Wgt. Unit Command	Alpha	(#)	23h
3	1	Neg. Acknowledge	Alpha	(N)	4Eh
4	1	End of Text	Control	(ETX)	03h
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah

Zero

This command should be issued periodically to force the CubiScan 225 to perform internal compensations to adjust to changes in temperature and humidity. This command should only be issued when the measuring field is free of objects! Never issue this command when an object is present in the measuring field.

Pos	Len	Description	Type	Range	ASCII
Command Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Zero Command	Alpha	(Z)	5Ah
3	1	End of Text	Control	(ETX)	03h
4	1	Carriage Return	Control	(CR)	0Dh
5	1	Line Feed	Control	(LF)	0Ah
Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Zero Command	Alpha	(Z)	5Ah

Pos	Len	Description	Type	Range	ASCII
3	1	Acknowledge	Alpha	(A)	41h
4	1	End of Text	Control	(ETX)	03h
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah
Negative Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Zero Command	Alpha	(Z)	5Ah
3	1	Neg. Acknowledge	Alpha	(N)	4Eh
4	1	End of Text	Control	(ETX)	03h
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah

TCP/IP Communications Setup Command Set

This section describes the commands recognized by the CubiScan 225 to set up the CubiScan 225 for communications with a network using the TCP/IP protocol.

You can use the Qbit, QbitTCP software to configure the CubiScan 225 for TCP/IP communications. Contact Quantronix for information.

Configuration of the CubiScan 225 for TCP/IP communication is performed through the RS-232-C serial communications port using the following commands.

TCP/IP Command Set Summary

The table below shows the Command Set Summary for TCP/IP.
(A) - Command Character
(B) - Command Hex Value(s)

TCP Configuration Name	(A)	(B)	Page
"Read Gateway Address"	~G	40h+47h	109
"Set Gateway Address"	@G	7Eh+47h	110
"Read IP Address"	~I	40h+49h	111
"Set IP Address"	@I	7Eh+49h	112
"Read MAC Address"	~M	40h+4Dh	113
"Set MAC Address"	@M	7Eh+4Dh	114

"Read Port"	~P	40h+50h	115
"Set Port"	@P	7Eh+50h	115
"Read Subnet Address"	~N	40h+4Eh	116
"Set Subnet Address"	@N	7Eh+4Eh	117

Read Gateway Address

This command is used to read the current gateway address setting from the CubiScan 225.

Pos	Len	Description	Type	Range	ASCII
Command Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Read Command	Alpha	(~)	7Eh
3	1	Gateway Address Command	Alpha	(G)	47h
4	1	End of Text	Control	(ETX)	03h
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah
Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Read Command	Alpha	(~)	7Eh
3	1	Gateway Address Command	Alpha	(G)	47h
4	1	Acknowledge	Alpha	(A)	41h
5	7-15 or n	IP Address	Alpha	(0.0.0.0) to (255.255.255.25 5)	
5+n	1	End of Text	Control	(ETX)	03h
6+n	1	Carriage Return	Control	(CR)	0Dh
7+n	1	Line Feed	Control	(LF)	0Ah
Negative Acknowledge Format					
Pos	Len	Description	Type	Range	ASCII
1	1	Start of Text	Control	(STX)	02h
2	1	Read Command	Alpha	(~)	7Eh
3	1	Gateway Address Command	Alpha	(G)	47h
4	1	Neg. Acknowledge	Alpha	(N)	4Eh
5	1	End of Text	Control	(ETX)	03h

Pos	Len	Description	Type	Range	ASCII
6	1	Carriage Return	Control	(CR)	0Dh
7	1	Line Feed	Control	(LF)	0Ah

Set Gateway Address

This command is used to set the network gateway address on the CubiScan 225. It can be the address of a network server or router and is expressed in "dot" notation. Consult your network administrator to obtain the network gateway address.

Pos	Len	Description	Type	Range	ASCII
		Command Format			
1	1	Start of Text	Control	(STX)	02h
2	1	Set Command	Alpha	(@)	40h
3	1	Gateway Address Command	Alpha	(G)	47h
4	7-15 or n	IP Address	Alpha	(0.0.0.0) to (255.255.255.255)	
4+n	1	End of Text	Control	(ETX)	03h
5+n	1	Carriage Return	Control	(CR)	0Dh
6+n	1	Line Feed	Control	(LF)	0Ah
		Acknowledge Format			
1	1	Start of Text	Control	(STX)	02h
2	1	Set Command	Alpha	(@)	40h
3	1	Gateway Address Command	Alpha	(G)	47h
4	1	Acknowledge	Alpha	(A)	41h
5	1	End of Text	Control	(ETX)	03h
6	1	Carriage Return	Control	(CR)	0Dh
7	1	Line Feed	Control	(LF)	0Ah
		Negative Acknowledge Format			
1	1	Start of Text	Control	(STX)	02h
2	1	Set Command	Alpha	(@)	40h
3	1	Gateway Address Command	Alpha	(G)	47h
4	1	Neg. Acknowledge	Alpha	(N)	4Eh

Pos	Len	Description	Type	Range	ASCII
5	1	End of Text	Control	(ETX)	03h
6	1	Carriage Return	Control	(CR)	0Dh
7	1	Line Feed	Control	(LF)	0Ah

Read IP Address

This command is used to read the current IP address setting from the CubiScan 225.

Pos	Len	Description	Type	Range	ASCII
Command Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Read Command	Alpha	(~)	7Eh
3	1	IP Address Command	Alpha	(I)	49h
4	1	End of Text	Control	(ETX)	03h
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah
Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Read Command	Alpha	(~)	7Eh
3	1	IP Address Command	Alpha	(I)	49h
4	1	Acknowledge	Alpha	(A)	41h
5	7-15 or n	IP Address	Alpha	(0.0.0.0) to (255.255.255.255)	
5+n	1	End of Text	Control	(ETX)	03h
6+n	1	Carriage Return	Control	(CR)	0Dh
7+n	1	Line Feed	Control	(LF)	0Ah
Negative Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Read Command	Alpha	(~)	7Eh
3	1	IP Address Command	Alpha	(I)	49h
4	1	Neg. Acknowledge	Alpha	(N)	4Eh
5	1	End of Text	Control	(ETX)	03h
6	1	Carriage Return	Control	(CR)	0Dh
7	1	Line Feed	Control	(LF)	0Ah

Set IP Address

This command is used to set the CubiScan 225 IP address. The IP address, or Internet address, is usually expressed in "dot" notation; for example, "121.43.6.234." The first three groups of numbers (e.g., 121.43.6) are usually specific to the network to which you are connecting. The last number (e.g., 234) is specific to a particular CubiScan 225. Consult your network administrator to obtain an available IP address.

Pos	Len	Description	Type	Range	ASCII
Command Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Set Command	Alpha	(@)	40h
3	1	IP Address Command	Alpha	(I)	49h
4	7-15 or n	IP Address	Alpha	(0.0.0.0) to (255.255.255.255)	
4+n	1	End of Text	Control	(ETX)	03h
5+n	1	Carriage Return	Control	(CR)	0Dh
6+n	1	Line Feed	Control	(LF)	0Ah
Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Set Command	Alpha	(@)	40h
3	1	IP Address Command	Alpha	(I)	49h
4	1	Acknowledge	Alpha	(A)	41h
5	1	End of Text	Control	(ETX)	03h
6	1	Carriage Return	Control	(CR)	0Dh
7	1	Line Feed	Control	(LF)	0Ah
Negative Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Set Command	Alpha	(@)	40h
3	1	IP Address Command	Alpha	(I)	49h
4	1	Neg. Acknowledge	Alpha	(N)	4Eh
5	1	End of Text	Control	(ETX)	03h
6	1	Carriage Return	Control	(CR)	0Dh
7	1	Line Feed	Control	(LF)	0Ah

Read MAC Address

This command is used to read the current MAC address setting from the CubiScan 225.

Pos	Len	Description	Type	Range	ASCII
Command Format
1	1	Start of Text	Control	(STX)	02h
2	1	Read Command	Alpha	(~)	7Eh
3	1	MAC Address Command	Alpha	(M)	4Dh
4	1	End of Text	Control	(ETX)	03h
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah
Acknowledge Format
1	1	Start of Text	Control	(STX)	02h
2	1	Read Command	Alpha	(~)	7Eh
3	1	MAC Address Command	Alpha	(M)	4Dh
4	1	Acknowledge	Alpha	(A)	41h
5	12	MAC Address	Alpha	000000000000 - FFFFFFFFFFFF	
17	1	End of Text	Control	(ETX)	03h
18	1	Carriage Return	Control	(CR)	0Dh
19	1	Line Feed	Control	(LF)	0Ah
Negative Acknowledge Format
Pos	**Len**	**Description**	**Type**	**Range**	**ASCII**
1	1	Start of Text	Control	(STX)	02h
2	1	Read Command	Alpha	(~)	7Eh
3	1	MAC Address Command	Alpha	(M)	4Dh
4	1	Neg. Acknowledge	Alpha	(N)	4Eh
5	1	End of Text	Control	(ETX)	03h
6	1	Carriage Return	Control	(CR)	0Dh
7	1	Line Feed	Control	(LF)	0Ah

Set MAC Address

This command is used to set the MAC address on the CubiScan 225.

Pos	Len	Description	Type	Range	ASCII
		Command Format			
1	1	Start of Text	Control	(STX)	02h
2	1	Set Command	Alpha	(@)	40h
3	1	MAC Address Command	Alpha	(M)	4Dh
5	12	Mac Address	Alpha	000000000000 - FFFFFFFFFFFF	
17	1	End of Text	Control	(ETX)	03h
18	1	Carriage Return	Control	(CR)	0Dh
19	1	Line Feed	Control	(LF)	0Ah
		Acknowledge Format			
1	1	Start of Text	Control	(STX)	02h
2	1	Set Command	Alpha	(@)	02h
3	1	MAC Address Command	Alpha	(M)	4Dh
4	1	Acknowledge	Alpha	(A)	41h
5	1	End of Text	Control	(ETX)	03h
6	1	Carriage Return	Control	(CR)	0Dh
7	1	Line Feed	Control	(LF)	0Ah
		Negative Acknowledge Format			
Pos	Len	Description	Type	Range	ASCII
1	1	Start of Text	Control	(STX)	02h
2	1	Set Command	Alpha	(@)	40h
3	1	MAC Address Command	Alpha	(M)	4Dh
4	1	Neg. Acknowledge	Alpha	(N)	4Eh
5	1	End of Text	Control	(ETX)	03h
6	1	Carriage Return	Control	(CR)	0Dh
7	1	Line Feed	Control	(LF)	0Ah

Read Port

This command is used to read the current TCP Port number setting from the CubiScan 225.

Pos	Len	Description	Type	Range	ASCII
Command Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Read Command	Alpha	(~)	7Eh
3	1	Port Command	Alpha	(P)	50h
4	1	End of Text	Control	(ETX)	03h
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah
Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Read Command	Alpha	(~)	7Eh
3	1	Port Command	Alpha	(P)	50h
4	1	Acknowledge	Alpha	(A)	41h
5	1-5 or n	Port	Alpha	(0) to (65535)	
5+n	1	End of Text	Control	(ETX)	03h
6+n	1	Carriage Return	Control	(CR)	0Dh
7+n	1	Line Feed	Control	(LF)	0Ah
Negative Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Read Command	Alpha	(~)	7Eh
3	1	Port Command	Alpha	(P)	50h
4	1	Neg. Acknowledge	Alpha	(N)	4Eh
5	1	End of Text	Control	(ETX)	03h
6	1	Carriage Return	Control	(CR)	0Dh
7	1	Line Feed	Control	(LF)	0Ah

Set Port

This command is used to set the CubiScan 225 TCP port number. In TCP/IP networks, port numbers are used to distinguish between different logical channels on the same network interface on the same computer. For example, port 80 is used for HTTP traffic on the Internet. Some ports have numbers assigned to them by the Internet Assigned Numbers Authority (IANA). These are known as "well-known ports" and are limited to numbers 0 through 1023. Ports 1024 through 49151 are "registered ports"

listed by the IANA, and can be used by ordinary user processes on most systems. Ports 49152 through 65535 are called "dynamic and/or private ports" and are free for use. It is recommended that the CubiScan 225 TCP port be set to a number between 49152 and 65535 to avoid conflicts. Consult your network administrator to select the port number.

Pos	Len	Description	Type	Range	ASCII
		Command Format			
1	1	Start of Text	Control	(STX)	02h
2	1	Set Command	Alpha	(@)	40h
3	1	Port Command	Alpha	(P)	50h
4	1-5 or n	Port	Alpha	(0) to (65535)	
4+n	1	End of Text	Control	(ETX)	03h
5+n	1	Carriage Return	Control	(CR)	0Dh
6+n	1	Line Feed	Control	(LF)	0Ah
		Acknowledge Format			
1	1	Start of Text	Control	(STX)	02h
2	1	Set Command	Alpha	(@)	40h
3	1	Port Command	Alpha	(P)	50h
4	1	Acknowledge	Alpha	(A)	41h
5	1	End of Text	Control	(ETX)	03h
6	1	Carriage Return	Control	(CR)	0Dh
7	1	Line Feed	Control	(LF)	0Ah
		Negative Acknowledge Format			
1	1	Start of Text	Control	(STX)	02h
2	1	Set Command	Alpha	(@)	40h
3	1	Port Command	Alpha	(P)	50h
4	1	Neg. Acknowledge	Alpha	(N)	4Eh
5	1	End of Text	Control	(ETX)	03h
6	1	Carriage Return	Control	(CR)	0Dh
7	1	Line Feed	Control	(LF)	0Ah

Read Subnet Address

This command is used to read the current subnet address setting from the CubiScan 225.

Pos	Len	Description	Type	Range	ASCII
		Command Format			
1	1	Start of Text	Control	(STX)	02h

Pos	Len	Description	Type	Range	ASCII
2	1	Read Command	Alpha	(~)	7Eh
3	1	Subnet Address Command	Alpha	(N)	4Eh
4	1	End of Text	Control	(ETX)	03h
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah
		Acknowledge Format			
1	1	Start of Text	Control	(STX)	02h
2	1	Read Command	Alpha	(~)	7Eh
3	1	Subnet Address Command	Alpha	(N)	4Eh
4	1	Acknowledge	Alpha	(A)	41h
5	7-15 or n	IP Address	Alpha	(0.0.0.0) to (255.255.255.255)	
5+n	1	End of Text	Control	(ETX)	03h
6+n	1	Carriage Return	Control	(CR)	0Dh
7+n	1	Line Feed	Control	(LF)	0Ah
		Negative Acknowledge Format			
1	1	Start of Text	Control	(STX)	02h
2	1	Read Command	Alpha	(~)	7Eh
3	1	Subnet Address Command	Alpha	(N)	4Eh
4	1	Neg. Acknowledge	Alpha	(N)	4Eh
5	1	End of Text	Control	(ETX)	03h
6	1	Carriage Return	Control	(CR)	0Dh
7	1	Line Feed	Control	(LF)	0Ah

Set Subnet Address

This command is used to set the CubiScan 225 subnet address. The subnet (sub-network) is a separate part of an organization's network. A subnet address tells the network's router where on the network to send incoming packets of information.

Pos	Len	Description	Type	Range	ASCII
		Command Format			
1	1	Start of Text	Control	(STX)	02h
2	1	Set Command	Alpha	(@)	40h
3	1	IP Address Command	Alpha	(N)	4Eh
4	7-15 or n	IP Address	Alpha	(0.0.0.0) to (255.255.255.255)	

Pos	Len	Description	Type	Range	ASCII
4+n	1	End of Text	Control	(ETX)	03h
5+n	1	Carriage Return	Control	(CR)	0Dh
6+n	1	Line Feed	Control	(LF)	0Ah
Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Set Command	Alpha	(@)	40h
3	1	Subnet Address Command	Alpha	(N)	4Eh
4	1	Acknowledge	Alpha	(A)	41h
5	1	End of Text	Control	(ETX)	03h
6	1	Carriage Return	Control	(CR)	0Dh
7	1	Line Feed	Control	(LF)	0Ah
Negative Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Set Command	Alpha	(@)	40h
3	1	Subnet Address Command	Alpha	(N)	4Eh
4	1	Neg. Acknowledge	Alpha	(N)	4Eh
5	1	End of Text	Control	(ETX)	03h
6	1	Carriage Return	Control	(CR)	0Dh
7	1	Line Feed	Control	(LF)	0Ah

Appendix B
Parts List

Following is a list of parts that can be purchased for the CubiScan 225 as spare parts or if replacement is necessary.

Part No.	Description	Quantity
14262	On/Off Switch Assembly	1
13210	PCB Assembly, Mother Board	1
14350	Relays (TE Connectivity, KUP-11d15-5)	2
13218	AC/DC Power Supply Single-Out 12 V 8.33A 150 W	1
13764	DC Motor Controller	1
13866	Window, Dust Cover	1
14251	Roller 1.9 OD x 33L 7/16 HEX	1
14253	Roller 2.5 OD x 26L 11/16 HEX	1
14254	Roller 4 OD x 27L 11/16 HEX Flat	1
14255	Drive Roller 4.5 OD x 27L	1
14285	Bearing, 0.75ID Flange Mount	2
14244	Conveyor Belt 24W x 132L	2
14283	Timing Belt, 1" W x 33" L H Series	2
14257	L Encoder TR1 Mounting Bracket	1
14258	Trutrac-TR1 Encoder Assembly	1
14210	Nose Roller Assemly	2
14248	Bision 480DC Parallel Shaft DC Motor	1
10273	Calibration Cube, 12" x 5" x 3.6", Black	1
13411	USB to Ethernet Adapter	1
13413	Ethernet Cable, 10 ft	1
14510	Acrylic Tray (24" x 18") (Optional)	1
14437	User Manual (PDF)	1