CubiScan® 100-L

Operations and Technical Manual

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Cubing and Weighing Systems

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CubiScan® 100-L Operations and Technical Manual

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The CubiScan 100-L is to be used to determine freight charges of rigid, non-sound-absorbing, cuboidal objects only. Dimensions shown on the display are of the smallest cuboidal shape in which the object may be enclosed.

⚠ **CAUTION**	The CubiScan 100-L should only be serviced by qualified personnel.
	Observe precautions for handling electrostatic sensitive devices when setting up or operating the CubiScan 100-L.

⚡ **WARNING**	Disconnect all power to the CubiScan 100-L before servicing or making any connections.

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Table of Contents

Table of Illustrations

Chapter 1
Product Description

The CubiScan® 100-L is a precision volume measuring and weighing instrument for use in applications in which precise weighing and measuring is required.

The CubiScan 100-L design is unique because it combines parcel dimensional measuring and weighing into one operation. The collected data are formatted and transmitted to a PC computer or multiplexor via the CubiScan 100-L RS-232-C serial port. The CubiScan 100-L may also be interfaced with other host systems via a standard 10-BaseT Ethernet TCP/IP port (contact Quantronix for details). The collected data are also displayed on the control panel.

An additional RS-232-C port is provided for connection to a barcode scanner (contact Quantronix for information on supported scanners).

The CubiScan 100-L has three sensors (ultrasonic transducers) that determine the length, width, and height of an object placed on its measuring surface. The object is simultaneously weighed by a precision aluminum load cell. The load cell and sensors are controlled by a proprietary Quantronix controller. The controller, load cell, and support circuitry are located in the base of the CubiScan 100-L.

The CubiScan 100-L has been designed for use in industrial environments. The load cell, frame, and sensor housings are made of forged and machined aluminum.

The CubiScan 100-L is easy to assemble, set up, operate, and maintain. Its simple design and extreme accuracy coupled with intelli-

gent, self-contained circuitry make the CubiScan 100-L a valuable weighing/measuring tool.

The CubiScan 100-L was calibrated at the factory, but *may* require recalibration due to handling during shipping. Complete calibration instructions for the CubiScan 100-L are provided in Chapter 4 "Calibration."
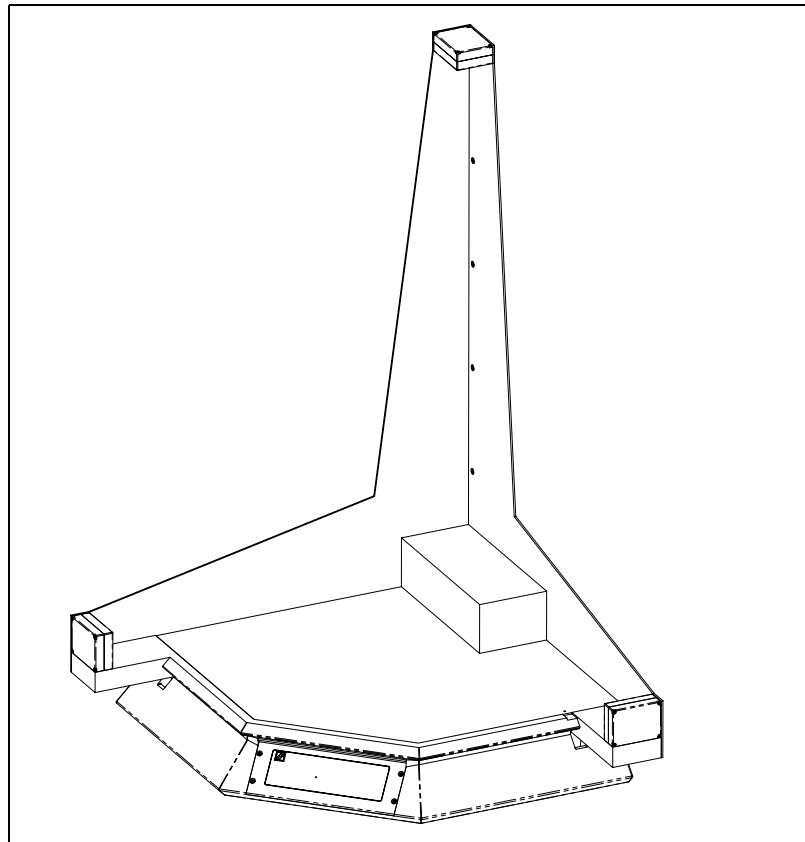
Figure 1
CubiScan 100-L

Specifications

Electrical

Voltage: 100 – 240 VAC, 47 – 63 Hz, 1.2 A

Current: 1.5 A maximum current draw, 1.0 A typical

Power Supply: External switching
+12 V @ 3.66 A

Measuring Capacities

Minimum Package Dimensions: 0.5 x 0.5 x 0.5 in
(1.3 x 1.3 x 1.3 cm)

Maximum Package Dimensions: 24 x 24 x 36 in
(60 x 60 x 91 cm)

Dimension Increment: 0.1 in (0.2 cm)

Maximum Package Weight: 100 lb (45 kg)

Weight Increment: .05 lb (.02 kg)

Environmental

Operating Temperature: 40° to 104° F
(5° to 40° C)

Humidity: 0 to 90% non-condensing

Physical

Measuring Surface:	24 x 24 in (60 x 60 cm)
Total Footprint Required:	30 x 30 in (76 x 76 cm)
Height:	46 in (117 cm)
Shipping Weight:	70 lb (32 kg)
Net Weight:	57 lb (26 kg)
Shipping Dimensions:	34 x 46.5 x 8.5 in

Outputs

Two (2) EIA RS-232-C serial communications ports
See Appendix A for communications protocol.

10-BaseT Ethernet TCP/IP port
See Appendix A for communications protocol and setup parameters. Qbit™ for Windows®, QbitTCP software can be used to configure (through the RS-232-C port) the CubiScan 100-L for TCP/IP communication. Contact Quantronix for information.

Load Cell

The load cell is made of forged, machined and anodized aluminum, environmentally sealed up to IP65 levels Dual bridge 350 Ohm strain gage. The standard net capacity is 100 lb (45 kg)

Chapter 2
Setup

This chapter provides instructions for assembling and setting up the CubiScan 100-L. Perform the steps to set up the CubiScan in the following order:

- Unpack the CubiScan (page 6)

- Place the CubiScan where you will be using it (page 7)

- Assemble the CubiScan (page 8)

- Remove the shipping bolts (page 16)

- Level the CubiScan (page 17)

- Connect the CubiScan to a computer or network (optional) (page 19)

- Connect the CubiScan to a barcode scanner (optional) (page 23)

- Connect power to the CubiScan and place the sound dampening cover and base cover on the base (page 24)

- Turn on the CubiScan 100-L (page 25)

- Install the Qbit for Windows PC control software (optional) (page 26)

Unpacking

Examine the container and the CubiScan 100-L carefully for any damage. If, after unpacking, you discover any damage to the Cubi-Scan 100-L, contact the carrier immediately.

The CubiScan is shipped in a single container with all components. Refer to Figure 2 and the list below it to identify the components.
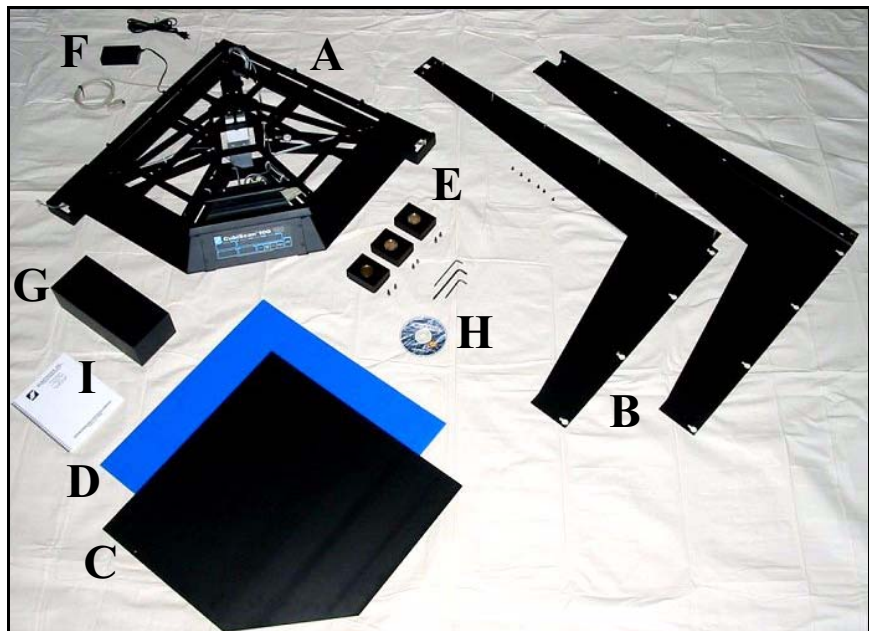
Figure 2
CubiScan 100-L Components

A Base
B Side panels (right side panel has standoffs, left side panel has wrap-around edge)
C Base cover
D Blue sound dampening pad
E (3) sensors in aluminum housings with mounting screws

    F AC power adapter, AC power cord, and RS-232 communications cable

    G Calibration block

    H Qbit software CD (optional)

    I   Operations and Technical Manual (this manual)

Accessories and tools packed with the CubiScan 100-L include the following:

> (6) M5 x 0.8 x 14 screws (for sensor mounting)
> (6) M5 split washers (for sensor mounting)
> (6) 10-32 x $^1/_4$ screws (for vertical edge panel mounting)
> 2.5 mm allen wrench
> 4.0 mm Allen wrench
> 5.0 mm Allen wrench
> 6.0 mm Allen wrench
> $^1/_8$" Allen wrench
> 12" x 5" x 3.6" calibration cube

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

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

Placement

The CubiScan 100-L is designed to be operated in a warehouse environment; however, for proper operation the following conditions should be met if possible.

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

- Protect the CubiScan from static electricity, especially the control panel.

- Place the CubiScan on a flat, sturdy surface as free from vibration as possible. Excess vibration can reduce the accuracy of the CubiScan 100-L scale.

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

- If a computer is used, place it as close to the CubiScan as possible. The operator needs to use the keyboard or mouse on the computer while cubing and weighing packages using the CubiScan 100-L.

- Orient the CubiScan so the control panel faces the operator.

Assembling the CubiScan 100-L

This section provides instructions for assembling the CubiScan 100-L by taking the following steps:

- Attach the side panels to the base (page 9).
- Route the height sensor cable through the corner channel where the right and left panels meet (page 12).
- Attach the sensors to the frame (page 14).
- Connect the RJ-45 connectors on the sensor cables to the sensors (page 14).
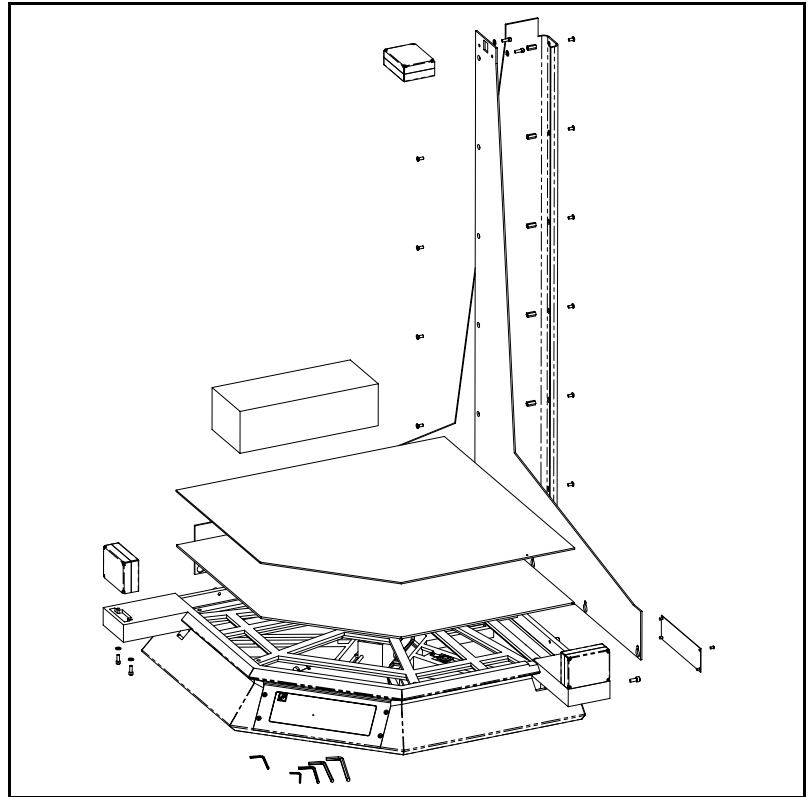
Figure 3
CubiScan 100-L Assembly Overview

Attaching the Side Panels

The left and right side are determined when facing the front of the CubiScan. The left side panel as a wrap-around edge and the right side panel has standoffs that extend from the edge. Each side panel has five tapered holes that align with the mounting screws. Figure 4, on the next page, shows the panels aligned but not attached. Figure 5, on page 12, shows the panels attached.

NOTE ☞ *Do not remove the five mounting screws along each side of the CubiScan base.*

Take the following steps to attach the two side panels to the Cubi-Scan 100-L base.
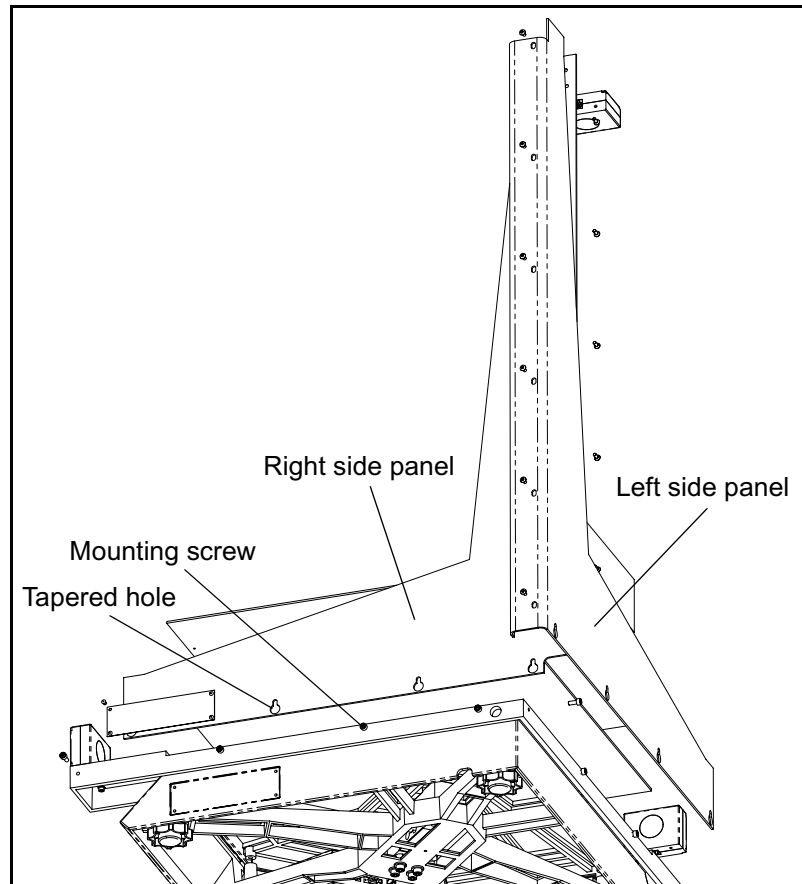
Figure 4
Side Panels Aligned (not attached)

1. Align the tapered holes along the **right** side panel's bottom edge with the five mounting screws on the right side (when facing the front of the CubiScan) of the CubiScan base.

2. Push the panel into place so that the widest part of the holes are over the screws, and let the screws slide into the narrow part of the holes.

3. Using the 5.0 mm Allen wrench, tighten all of the screws except the one closest to the front (you will tighten it later).

4. Align the tapered holes along the **left** side panel's bottom edge with the five mounting screws on the left side (when facing the front of the CubiScan) of the CubiScan base. The back edge of the panel will wrap around the back edge of the right panel.

5. Push the panel into place so that the widest part of the holes are over the screws, and let the screws slide into the narrow part of the holes.

6. Using the 5.0 mm Allen wrench, tighten all of the screws except the one closest to the front (you will tighten it later).

NOTE ☞ *Do not attach the six screws that hold the side panels together at the back. You will attach them later.*
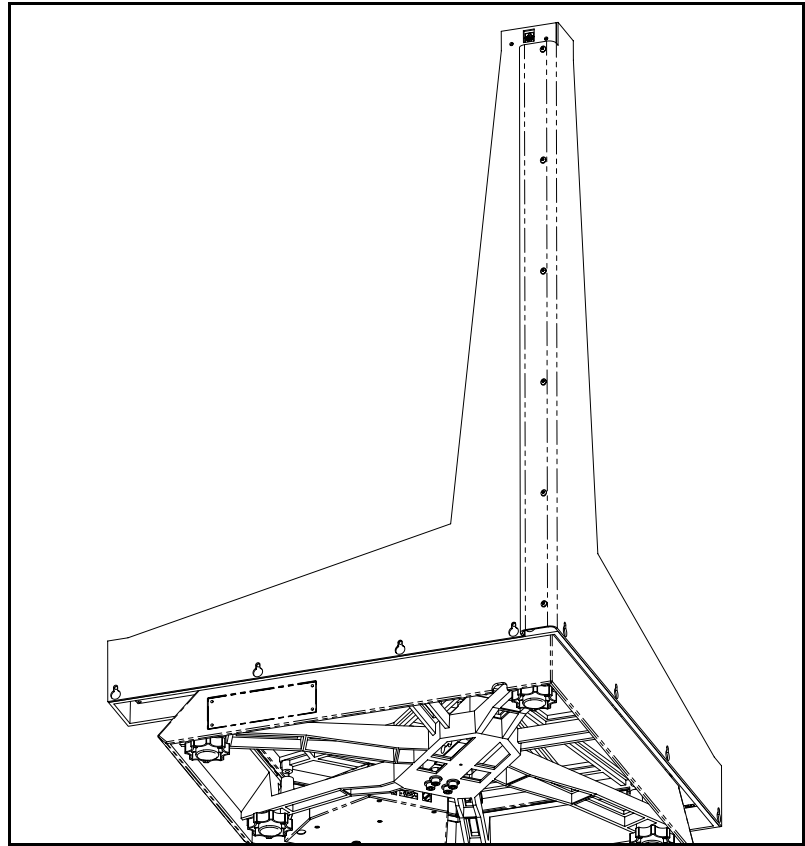
Figure 5
Side Panels Attached

Routing the Height Sensor Cable

The height sensor cable (gray cable with an RJ-45 connector) is coiled and tied inside the base frame. Do the following to route the cable to the top of the CubiScan.

1. Untie the cable and route the end of it through the hole in the back corner of the base.

2. Moving to the outside of the CubiScan, pull the length of the cable out through the hole.

NOTE ☞   ***Do not pull the cable too tightly****. Because the height sensor cable crosses between the scale platform and the base, if the cable is too tight, the resulting tension may restrict scale movement.*

The screws that hold the two panels together should not be attached. If they are, you need to remove them.

3. Slip the cable between the panels into the channel that is formed at the corner (see Figure 6).

Figure 6
Routing the Height Sensor Cable Between the Side Panels

4. Route enough of the cable through the channel so the connector extends from the top. Use a tie or bend the cable to keep it from falling back into the channel. Do not apply pressure to the other end of the cable.

5. Attach the six 10-32 x $^1/_4$" screws to the back corner where the two panels come together. Verify that the cable is free and the connector still extends from the top, and then tighten the screws.

Attaching the Sensors

Though the height, width, and length sensors are each the same type of sensor, they have been calibrated to position. The height sensor is labeled "Top," the length sensor is labeled "Left," and the width sensor is labeled "Right." Take the following steps to attach the three sensors to the CubiScan frame.

! **CAUTION** Do not touch the gold foil screens on the front of the sensors.

1. Place the width sensor, labeled "Right," on the right, front corner of the base (see Figure 7). You will need to push the side panel out slightly to place the sensor in the correct position. If you tightened the front-most screw, you need to loosen it.

2. Align the threaded holes in the bottom of the sensor casing with the holes in the base frame.

3. Insert the M5 hex-head screws with split washers up through the frame and thread them into the sensor casing.

4. Attach the length sensor, labeled "Left," on the left front corner, in the same manner.
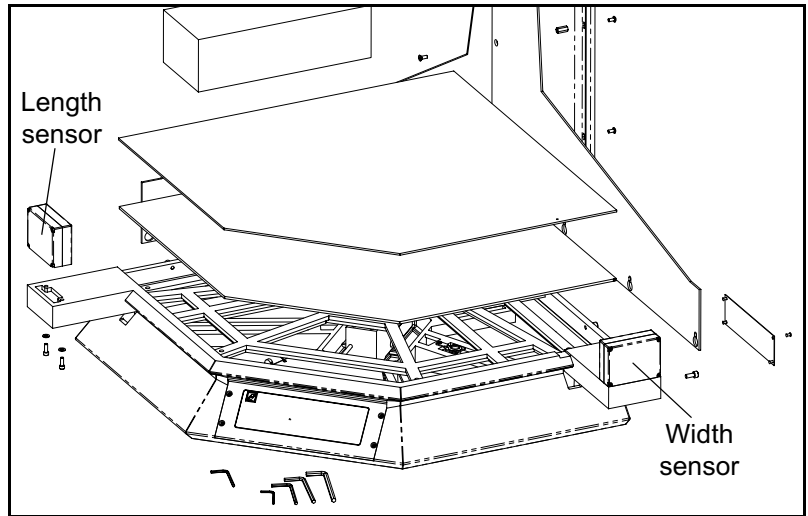
Figure 7
Attaching the Length (Left) and Width (Right) Sensors

5. Place the height sensor, labeled "Top," at the top of the corner
    where the side panels meet (see Figure 8), and align the screw
    holes.
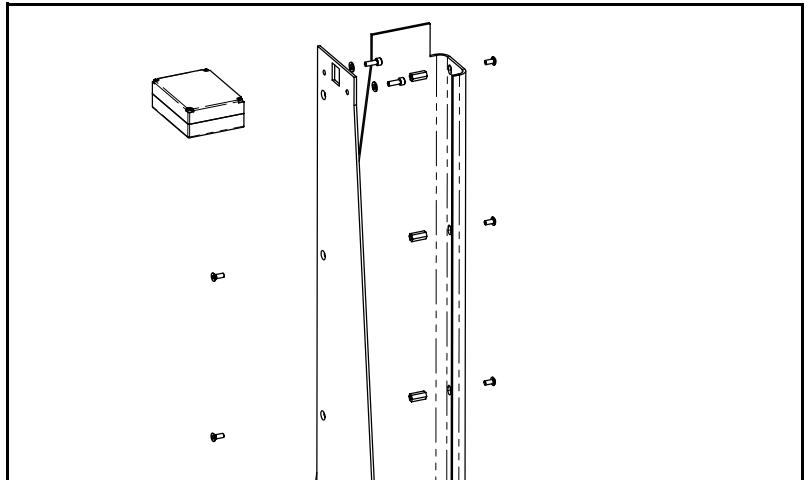
Figure 8
Attaching the Height (Top) Sensor

6. Insert the M5 hex-head screws with split washers through the holes in the back of the corner, and thread them into the sensor casing.

7. Connect the RJ-45 connector at each sensor location to the connector on the back of the sensor.

8. Tighten the front screws that hold the side panels to the base, and verify that all screws are securely tightened.

Removing the Shipping Bolts

Three to five shipping bolts are located on the CubiScan base to anchor the load cell to the base during shipping. The shipping bolts are fastened through the frame arm and the base leg. The pointers in Figure 9 show the bolt locations.
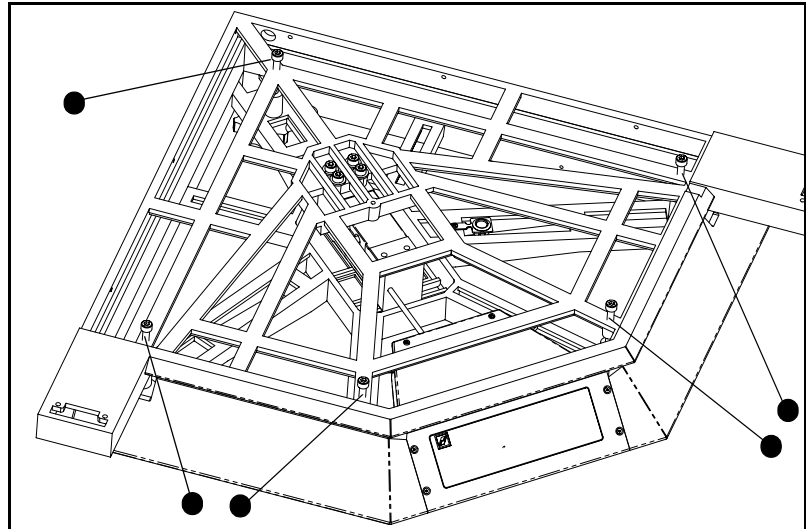
Figure 9
Shipping Bolt Locations

1. After the CubiScan is assembled, use the 6.0 mm Allen wrench to remove the shipping bolts.

2. Proceed to the next section for information on leveling the CubiScan. Do not place the sound dampening pad and base cover on the base until you have leveled the CubiScan and connected all cables, as described in the following sections.

NOTE ☞   *The bolts protect the load cell from damage during shipment. Retain the shipping bolts and reattach them if you move the CubiScan or ship it to a different location.*

Leveling

After assembling the CubiScan and removing the shipping bolts, take the following steps to level the CubiScan base.

1. Locate the five leveling legs under the base. Their positions are indicated by the pointers in Figure 10 below.
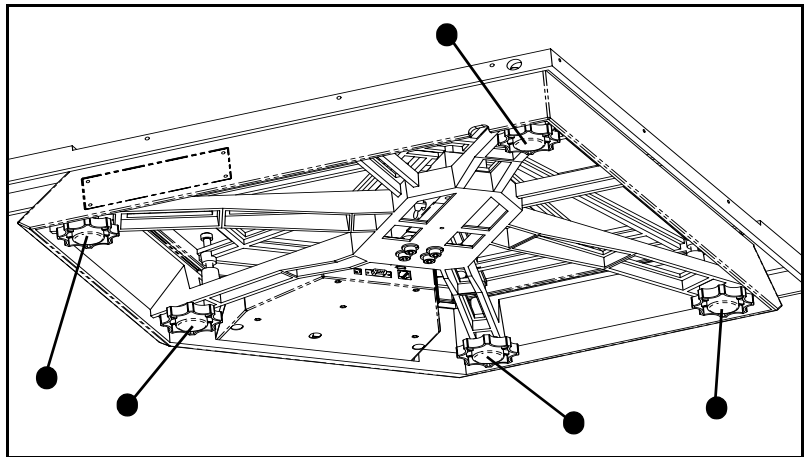
Figure 10
Leveling Legs Positions

2. Figure 11 shows the location of the leveling bubble. Look at the leveling bubble and determine if the CubiScan 100-L is level.
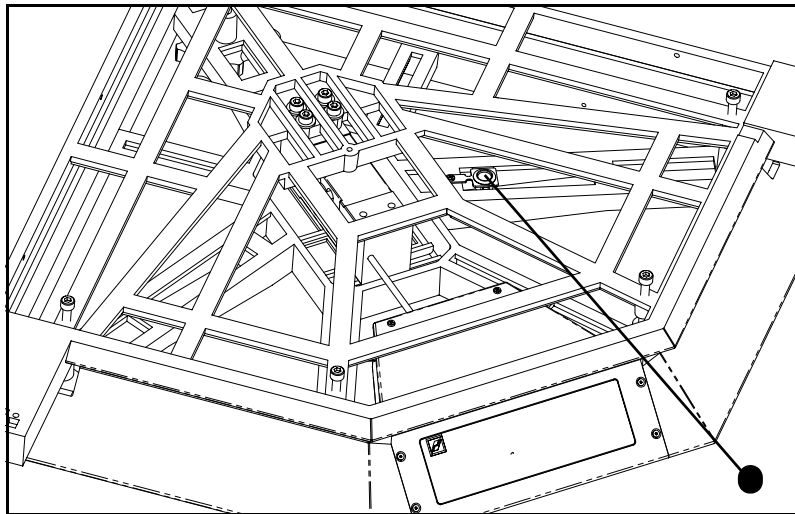
Figure 11
Leveling Bubble Location

A close-up of the bubble level is shown below.

Figure 12
Leveling Bubble Close-up

3. If the base is not level, adjust the legs up or down until the bubble is centered in or touching the center circle of the level. To adjust the height of a leg, lift the base slightly and turn the threaded leg. Looking toward the leg, turn it clockwise to lower it and counterclockwise to raise it.

NOTE ☞ *When you are finished leveling the CubiScan, verify that all five of the CubiScan's legs are resting on the supporting surface. If the CubiScan does not sit flat, it may wobble or vibrate during measurement, which can cause errors.*

4. Proceed to the following sections for information on connecting a computer (optional), a barcode scanner (optional), and power to the CubiScan. Do not place the sound dampening pad and base cover on the base until you have connected all cables.

Connecting to a Computer or Network

To operate the CubiScan 100-L, you can connect it to a computer or a network, or you can use the control panel, as follows:

*   Connect it to a PC or compatible computer through the RS-232-C serial port on the back of the control panel. Use the Qbit for Windows software on the computer to run the CubiScan 100-L.

*   Connect it to a host system via a standard 10-BaseT Ethernet TCP/IP port. You can use Qbit for Windows software to configure the CubiScan through the RS-232-C port for TCP/IP communication (QbitTCP) and to run the CubiScan from a workstation. Contact Quantronix for information on available software. Or, refer to Appendix A "Communications Protocol" on page 57 for command protocol and setup parameters.

- Operate the CubiScan without a computer using the control panel. Refer to "Cubing and Weighing Using the Control Panel" on page 30 for information.

NOTE ☞   *If you are not going to connect the CubiScan to a computer or network, proceed to page 24 for information on connecting power.*

Connecting to a Computer (Optional)

To connect the CubiScan 100-L to a computer, do the following.

⚠	**CAUTION**	Disconnect power from the CubiScan 100-L and the computer before connecting them.

1. Place the computer in its permanent location, generally close to the CubiScan. (Refer to "Placement" on page 7 for information.)

2. Route the RS-232 serial communications cable (supplied) through the opening in the base so it cannot be crushed, bent, or pulled loose.

3. The CubiScan controller is located just behind the control panel at the front of the base. Connect one end of the serial cable to the computer serial connector on the back of the CubiScan controller, as shown below.
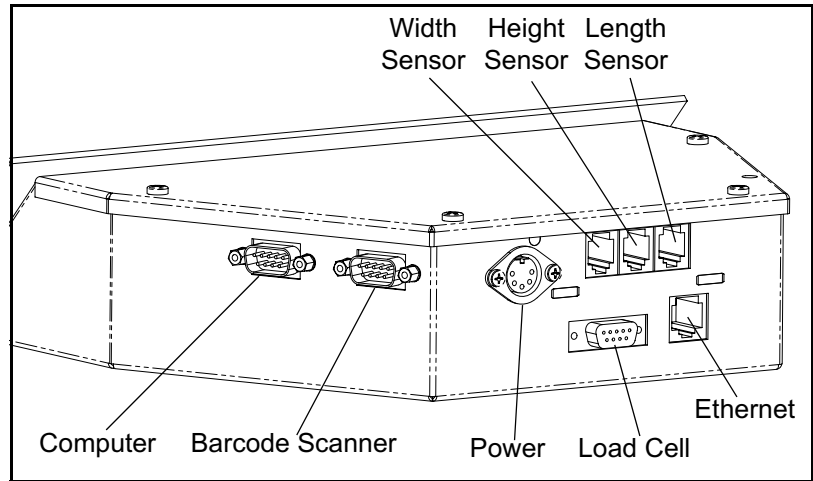
Figure 13
Serial Cable Connector

4. Locate a free serial (communications) port on the back of your computer. Determine whether the port is 9-pin or 25-pin. Refer to your computer's documentation, if necessary, to identify the ports.

5. Connect the other end of the serial communications cable to your computer's serial port. If the 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).

6. To secure the serial cable, tighten the screws (two on each connector) at both ends of the cable. It is important that the cable be secure.

For information on the serial cable pin-outs, refer to "Serial (RS-232-C) Cable Pin Assignments" on page 57.

Connecting to a Network (Optional)

You can connect the CubiScan 100-L to a network through a standard 10-BaseT Ethernet TCP/IP port. You will need a standard Ethernet cable with RJ-45 connectors (see "Ethernet (TCP/IP) Cable Pin Assignments" on page 58). The network host device determines whether a straight-through or crossover cable is required. Consult your network administrator, if necessary, to determine your local cabling requirements.

Do the following to connect the CubiScan 100-L to a network:

1. Route the Ethernet cable under the base so it cannot be crushed, bent, or pulled loose.

2. The CubiScan controller is located just behind the control panel at the front of the base. Connect one end of the Ethernet cable to the Ethernet connector on the back of the CubiScan controller, as shown below. Push the connector in until it latches. There should be an audible snap when the connector latches.
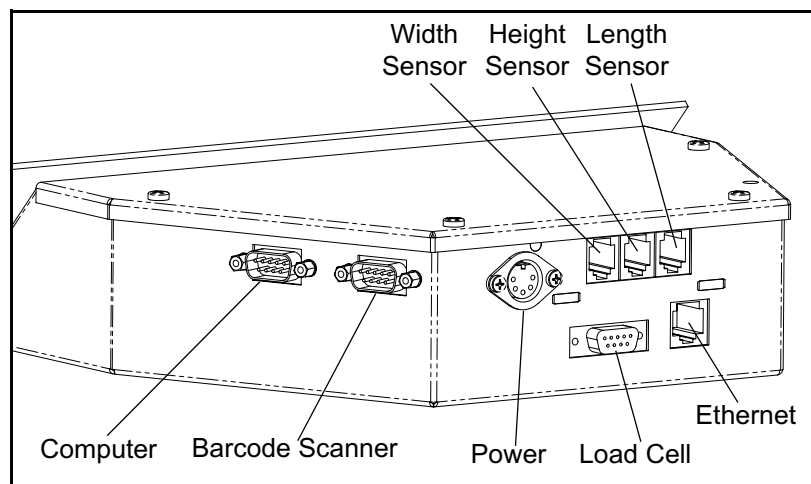
Figure 14
Ethernet Cable Connector

3. Insert the RJ-45 connector on the other end of the cable into the network socket and push until it latches.

   For information on the Ethernet cable pin-outs, refer to "Ethernet (TCP/IP) Cable Pin Assignments" on page 58.

4. Use Quantronix' QbitTCP software to configure the Cubiscan 100-L (through the RS-232-C port) for TCP/IP communication, or refer to Appendix A "Communications Protocol" on page 57 for information on the TCP/IP command protocol and setup parameters. Contact Quantronix if you need additional assistance.

When it is turned on, the CubiScan 100-L will recognize the cable connection and, if configured correctly, will respond to a connection request from the host.

NOTE ☞ *You can also connect the CubiScan 100-L directly to a computer through a 10-BaseT Ethernet TCP/IP port via a standard Ethernet cable. A crossover cable is required.*

Connecting to a Barcode Scanner (Optional)

The CubiScan 100-L has an additional RS-232-C port for connection to a barcode scanner. Contact Quantronix for details on supported scanners. To connect the CubiScan to a barcode scanner, do the following.

1. Route the RS-232 serial communications cable from the barcode scanner under the CubiScan base so it cannot be crushed, bent, or pulled loose.

2. The CubiScan controller is located just behind the control panel at the front of the base. Connect the free end of the serial cable to the barcode scanner connector on the back of the CubiScan controller, as shown below.
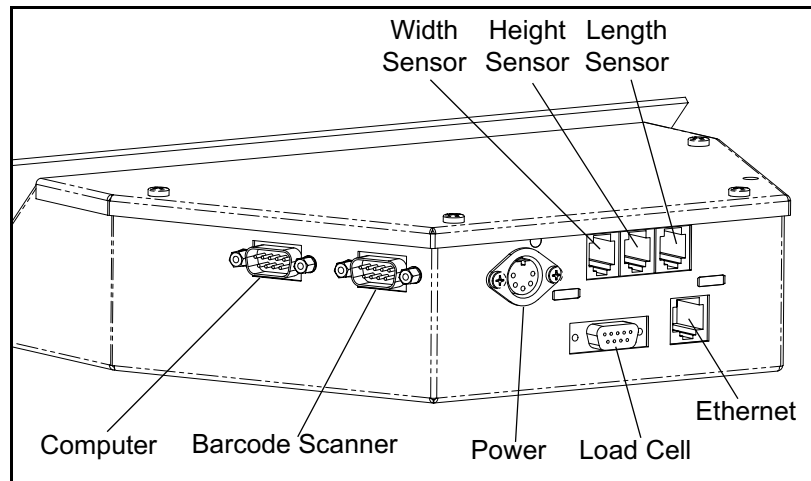
Figure 15
Barcode Scanner Connector

3. To secure the serial cable, tighten the screws on the cable connector. 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 57.

Connecting Power

The CubiScan 100-L uses an external AC power adapter. Take the following steps to connect power to the CubiScan.

1. Locate the AC power adapter, which is bundled inside the Cubi-Scan base. The DC power cord from the power adapter is attached to the controller box.

2. Locate the AC power cord (supplied), and connect it to the AC power adapter.

3. Route the AC power cord under the CubiScan base so it cannot be crushed, bent, or pulled loose.

4. Connect the other end of the AC power cord to a standard power strip equipped with an ON/OFF switch.

5. Place the blue sound dampening pad and then the black base cover on the top of the base. When properly inserted, the cover should rest flush with the edge of the base.

6. Use the power strip switch to turn the CubiScan on and off (see "Turning On the CubiScan" on the next page).

NOTE ☞   *A power strip with surge protection is recommended.*

If you are using a computer, you can plug the computer into the same power strip so that they will both be powered on at the same time. The CubiScan should be powered on before running the Qbit for Windows program to cube and weigh packages.

Turning On the CubiScan

Specific procedures must be followed each time you turn on the CubiScan 100-L, as follows:

1. Make sure there are no packages or other objects on the Cubi-Scan platform.

2. Turn on the CubiScan 100-L via the power strip (see "Connect-
    ing Power" on page 24).

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

Installing Qbit for Windows (Optional)

A CD-ROM is provided containing the applicable version(s) of the
Qbit for Windows software program, which can be used to operate
the CubiScan 100-L, as follows:

**QbitWin or
QbitWin with FTP**
QbitWin is the basic Qbit for Windows application. QbitWin with
FTP includes the QbitFTP utility to create an output file for FTP dis-
tribution.

**QbitWMS or
QbitWMS with FTP**
QbitWMS (Warehouse Measurement System) is the Qbit for Win-
dows software for warehouse measurement applications. QbitWMS
with FTP includes the QbitFTP utility to create an output file for
FTP distribution.

QbitEST
QbitEST (Emulation Screen Transfer) is a Qbit for Windows appli-
cation for the CubiScan 100-L that connects to a host session and
transfers measurements to predefined host field locations.

QbitTCP
QbitTCP is a Qbit for Windows application for configuring the
Cubiscan 100-L (through the RS-232-C port) for TCP/IP communi-
cation.

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

Setup Checklist

Before using the CubiScan 100-L for the first time, verify the following:

❐ Have the CubiScan 100-L and the computer (if applicable) been placed in the proper operating environment? (page 7)

❐ Has the CubiScan been fully assembled? (page 8)

❐ Have the three sensors been attached to the CubiScan, and have the sensor cables been connected to the sensors? (page 14)

❐ Have all screws, bolts, and nuts been tightened?

❐ Have the shipping bolts been removed? (page 16)

❐ Has the base of the CubiScan been leveled? (page 17)

❐ Is the CubiScan free moving? The CubiScan should not be pushed up against a wall and no object, cable, etc., should be resting on it or against it.

❐ Has the serial communications or RJ-45 cable been attached to the CubiScan 100-L and the computer or network (if applicable)? (page 19)

❐ (Optional) Has the barcode scanner been connected properly? (page 23)

❐ Has the AC power adapter been connected correctly? (page 24)

❐ If you are using Qbit for Windows to operate the CubiScan 100-L, has the software been copied onto your computer's hard-disk drive? (Refer to the *Qbit for Windows User Guide* for information.)

❒   Does the CubiScan require recalibration? The CubiScan 100-L
     was calibrated at the factory, but *may* require recalibration due
     to handling during shipping. Refer to page 35 for information
     on calibrating the CubiScan 100-L. If you are using Qbit for
     Windows software, check the status of the CubiScan before
     operating it. Refer to the *Qbit for Windows User Guide* for
     information on checking the CubiScan's status.

Chapter 3
Operation

This chapter provides instructions for operating the CubiScan 100-L.

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

Before You Begin

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

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

2. Turn on the CubiScan 100-L via the power strip. The CubiScan performs self-calibration and diagnostic procedures that take about 5 seconds. **Do not touch the CubiScan platform during these 5 seconds**.

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

NOTE ☞ *You should occasionally verify that the zero settings on the Cubi-Scan are correct. To do this, take a measurement with nothing on the scale and see if all values recorded are either zero or the tare value (if the tare option is enabled). The CubiScan's empty weight and measurements can be reset to zero (zeroed) at any time (refer to the Qbit for Windows User Guide or to "zero" on page 32).*

⚠ **CAUTION** | While the CubiScan has overload protection, objects heavier than 100 pounds (45 kg) should not be placed on the platform. Overloading the scale or shock loading (dropping a heavy object on the scale) can cause permanent zero shift, making the scale inoperable.

Cubing and Weighing Using Qbit for Windows

Refer to the *Qbit for Windows User Guide* for instructions on cubing and weighing and other functions in Qbit for Windows. The *Qbit for Windows User Guide* is provided on CD-ROM or you can download it from the Quantronix Web site at *www.cubiscan.com*.

NOTE ☞ *For information on measuring odd shaped packages, refer to "Measuring Odd-Shaped Packages" on page 33.*

Cubing and Weighing Using the Control Panel

All controls and displays for the CubiScan 100-L are located on the control panel at the front of the base. If a computer is not connected, you can use the control panel to cube and weigh packages. Measure-

ments and weight cannot be recorded; they are displayed on the control panel.
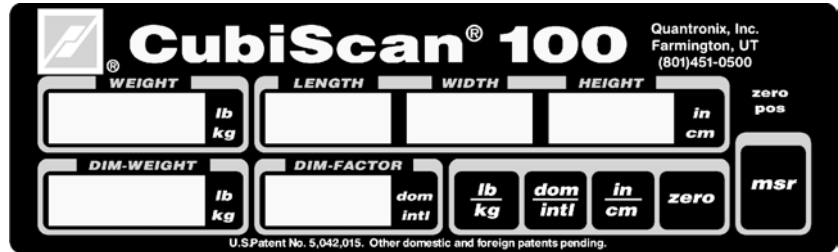
Figure 16
CubiScan 100-L Control Panel

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

WEIGHT   This displays the measured weight in pounds (lb) or kilograms (kg) as selected.

LENGTH   These display the measured dimensions in inches (in) or centimeters
WIDTH   (cm) as selected.
HEIGHT

DIM-WEIGHT   This displays the dimensional weight in pounds (lb) or kilograms (kg) as selected.

DIM-FACTOR   This displays the dimensional factor currently being used to calculate the dimensional weight.

zero (Indicator)   This indicates that the scale platform is empty and ready to receive a package. This indicator must be lit before you can place a package on the platform. When you place a package on the platform, the indicator goes off.

$\frac{lb}{kg}$ Press this key before you place a package on the platform to change the weight and dimensional weight from pounds to kilograms and vice versa.

$\frac{dom}{intl}$ Press this key before you place a package on the platform to change the dimensional weight factor from domestic to international standard values and vice versa.

Following are the dimensional weight factors used by the CubiScan.

Dimensional Factor	Domestic	International
Cubic inches per pound	194	166
Cubic inches per kilogram	428	366
Cubic centimeters per pound	3179	2720
Cubic centimeters per kilogram	7009	5997

$\frac{in}{cm}$ Press this key before you place a package on the platform to change the length, width, and height from inches to centimeters and vice versa.

zero   Press this key to reset the scale to "zero" (make sure the scale is empty).

msr   Press this key to display the weight and dimensions of the object on platform.

Take the following steps to cube and weigh a package using the control panel to control the CubiScan.

1. Verify that the CubiScan platform is empty. The **zero** indicator should be lit, and **0.00** should be displayed in the WEIGHT window. The rest of the display should be clear.

2. Place the package or object to be cubed and weighed on the platform and slide it against the back corner until it is in contact with both side panels. The **zero** indicator light goes out.

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

3. Press **\<msr>**. The weight, length, width, height, and dim-weight of the package are displayed.

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

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

Measuring Odd-Shaped Packages

The CubiScan 100-L is designed to measure dimensions on "cube-like" packages (packages that are square or rectangular) with a distinct width, length, and height. Packages that have odd shapes or irregular surfaces may be measured using the CubiScan 100-L; however, the dimensions will be determined by the closest straight edge or corner and may not accurately represent the actual width, height, and length of the package.

When measuring objects with irregular or porous surfaces that do not reliably reflect sound, it may be necessary to place a rigid sheet of plastic or metal against the irregular side or sides so the sensors can record the dimensions. For example, when measuring books, a rigid sheet should be placed against the paper edge of the books.

NOTE ☞ *If rigid sheets are used when measuring objects, tare values should be entered to compensate for the thickness and weight of the sheet. Set tare values using the Options function on the Tools menu of Qbit for Windows (refer to the Qbit for Windows User Guide).*

NOTES

<div align="right">

Chapter 4
Calibration

</div>

This chapter provides instructions for calibrating the CubiScan 100-L. The CubiScan 100-L is calibrated at the factory; however, some circumstances in which recalibration may be required include the following:

- Calibrate the CubiScan 100-L if you have problems cubing and weighing after assembly and setup.

- Calibrate the CubiScan if it is subjected to any type of mechanical shock or collision with a heavy object.

- Calibrate the CubiScan as part of a regular maintenance schedule. If the CubiScan is used heavily, scale calibration should be performed monthly and sensor calibration yearly.

NOTE ☞ *If an error message appears during calibration, power the CubiScan off and back on and start calibration over (refer to "Computer Error Messages" on page 53 or "Control Panel Error Messages" on page 54 for more information).*

Before You Begin

Before calibrating the CubiScan 100-L, remove all packages or other material from the platform, and blow any dust off the sensor screens. Refer to page 48 for information on cleaning the sensors.

To perform the calibration, you will need the following:

- Official test weight in the range of 50–100 pounds (25–45 kg) (it is recommended that you calibrate with the maximum weight)

- 12" x 5" x 3.6" calibration cube, supplied with the CubiScan (remove the wrapping from the calibration cube before use)

NOTE ☞   *The calibration cube should be kept clean and undamaged—you will need it each time you calibrate the CubiScan 100-L.*

The sensors and the scale (load cell) are calibrated separately.

Calibrating Using the Control Panel

NOTE ☞   *The following sections provide instructions for sensor and scale cal- ibration using the CubiScan's control panel. For instructions on calibrating the CubiScan using Qbit for Windows, refer to the Qbit for Windows User Guide.*

All controls and displays for the CubiScan 100-L are located on the control panel at the front of the base. For information on the con- trols and indicators, refer to "Cubing and Weighing Using the Control Panel" on page 30.

If a computer is not connected, you can use the control panel to cal- ibrate the sensors and the scale.

NOTE ☞   *In calibration mode, the weight/dimension units (lb/kg, in/cm) are automatically set to those last used to weigh and measure a pack- age. If the units are in question, you may want to turn on the Cubi- Scan before calibrating it to determine the settings, and change them if necessary.*

Preparing the CubiScan for Calibration

To prepare the CubiScan 100-L for calibration, proceed as follows.

1. Turn off the power switch (on the power strip), and disconnect the power cord from the power strip.

2. Remove the base cover from the CubiScan base. The cover is recessed and can simply be lifted out.

3. Remove the blue sound dampening pad.

4. Place the cover and blue pad in a safe location where they will not get stepped on or bent.

5. Locate the controller box (the metal box directly behind the control panel) inside the base, and remove its cover by removing the four screws (one at each edge) and sliding it back. Be careful not to press the cover against any of the cables within the base.

6. Locate the DIP switch inside the controller box, as shown below, and locate switch number 6 on the DIP switch.
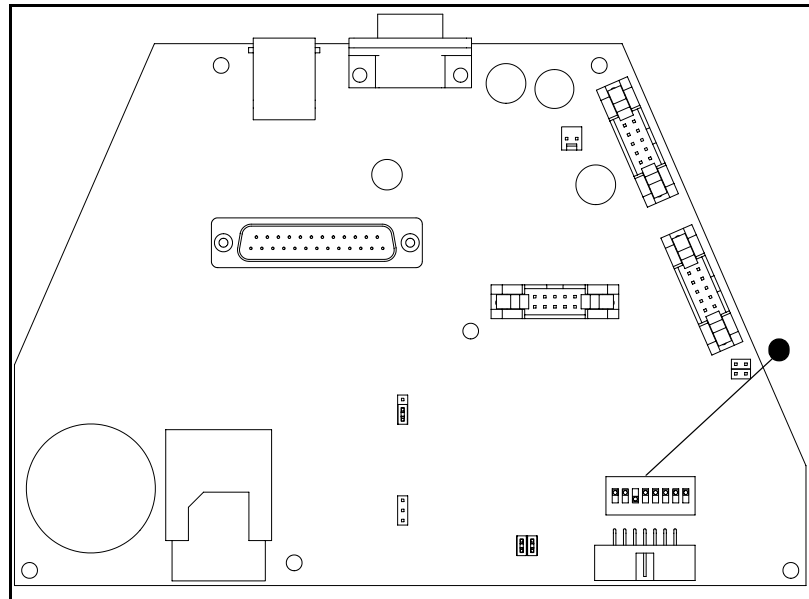
Figure 17
Controller DIP Switch

7. Use the tip of a pen or pencil or similar device to move switch 6 to the "closed" position. (One side of the DIP switch is labeled OPEN.)

8. Slide the cover back into place over the controller box, but do not attach the screws yet.

9. Place the sound dampening pad and base cover back on the base of the CubiScan.

10. Plug the power cord back into the power strip, and turn it on.

After running self-diagnostics (about five seconds), the CubiScan 100-L is in calibration mode.

In calibration mode, the weight/dimension units (lb/kg, in/cm) are automatically set to those last used to weigh and measure a package. Indicators on the control panel show the current settings.

A zero is displayed in the DIM-FACTOR window to indicate that
the CubiScan is in calibration mode.

Calibrating the Sensors

You will need the 12" x 5" x 3.6" calibration cube, supplied with the
CubiScan, to calibrate the sensors. Remove the wrapping from the
calibration cube before using it.

To calibrate the sensors using the control panel, proceed as follows.

1. If you calibrated the scale first, turn the power to the CubiScan
    off and on, then wait about five seconds for self-diagnostics to
    finish before calibrating the sensors.

2. Make certain that the CubiScan platform is free of all objects.

3. Press $\frac{\text{in}}{\text{cm}}$ on the control panel. The LENGTH, WIDTH, and
    HEIGHT windows display **0.0**, and the DIM-FACTOR window
    displays a command code of **1**.

4. Make sure there is nothing on the CubiScan platform, and press
    <msr>.

    Do not disturb the CubiScan until the LENGTH window dis-
    plays **12.0**, and the DIM-FACTOR window displays a com-
    mand code of **2**.

5. Place the calibration cube on the platform and slide it against
    the back corner until it is in contact with both side panels with
    the 12" side against the left side panel (when looking from the
    front) as shown below.
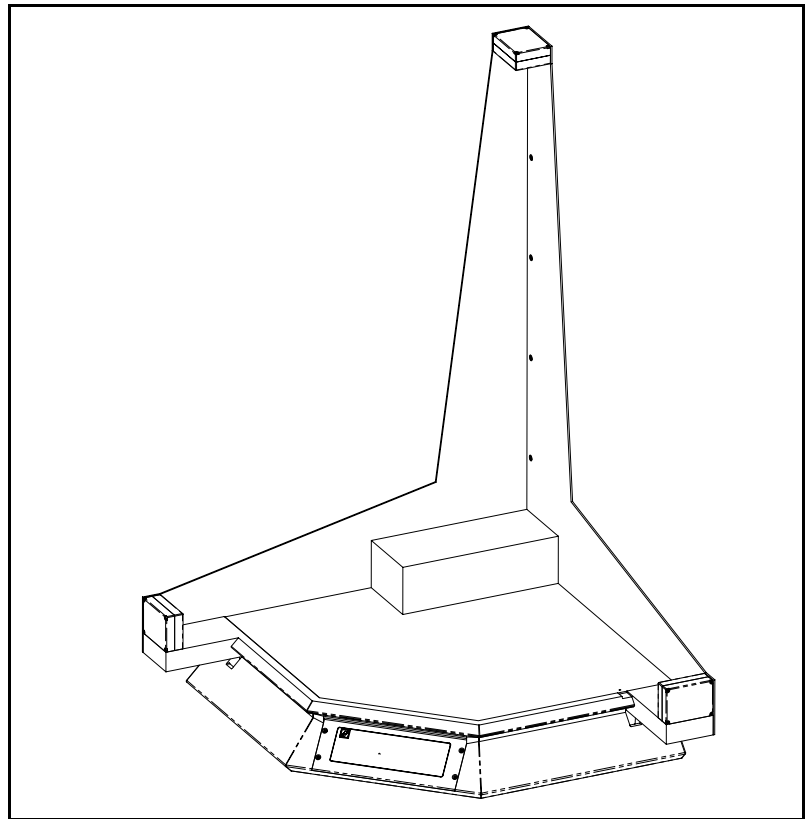
Figure 18
Calibration Cube Placement for Length Sensor

6. Press **\<msr\>**. The WIDTH window displays **12.0**.

7. Turn the calibration cube so that the 12" side is against the right side panel (make certain it is touching both side panels), as shown below.
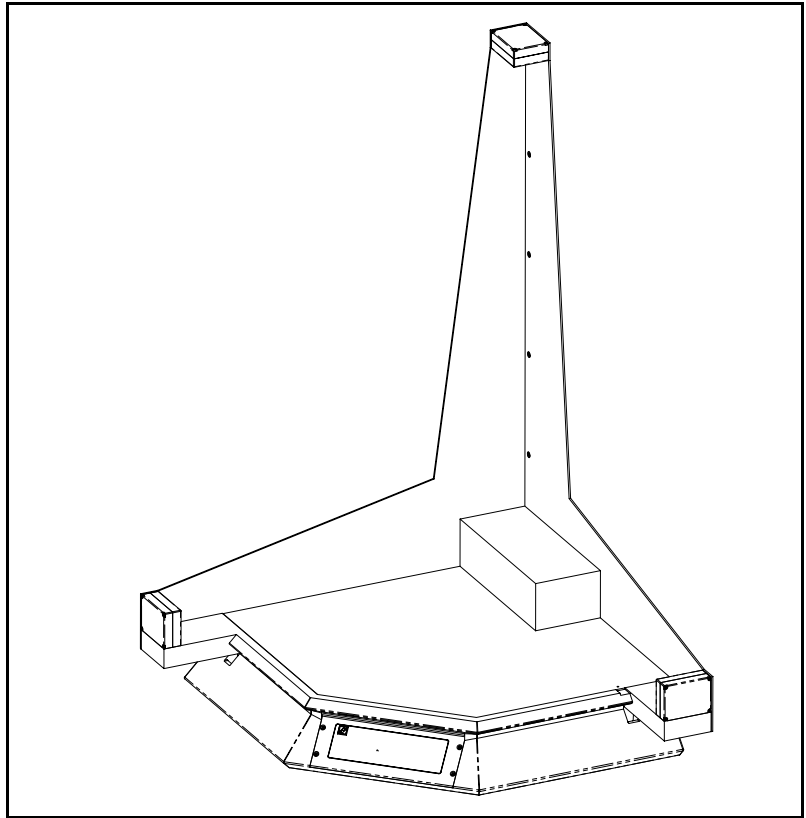
Figure 19
Calibration Cube Placement for Width Sensor

8. Press **<msr>**. The HEIGHT window displays **12.0**.

9. Turn the calibration cube so that it is standing on its end in the corner with the 12" side perpendicular to the platform (make certain the calibration cube is touching both side panels), as shown below.
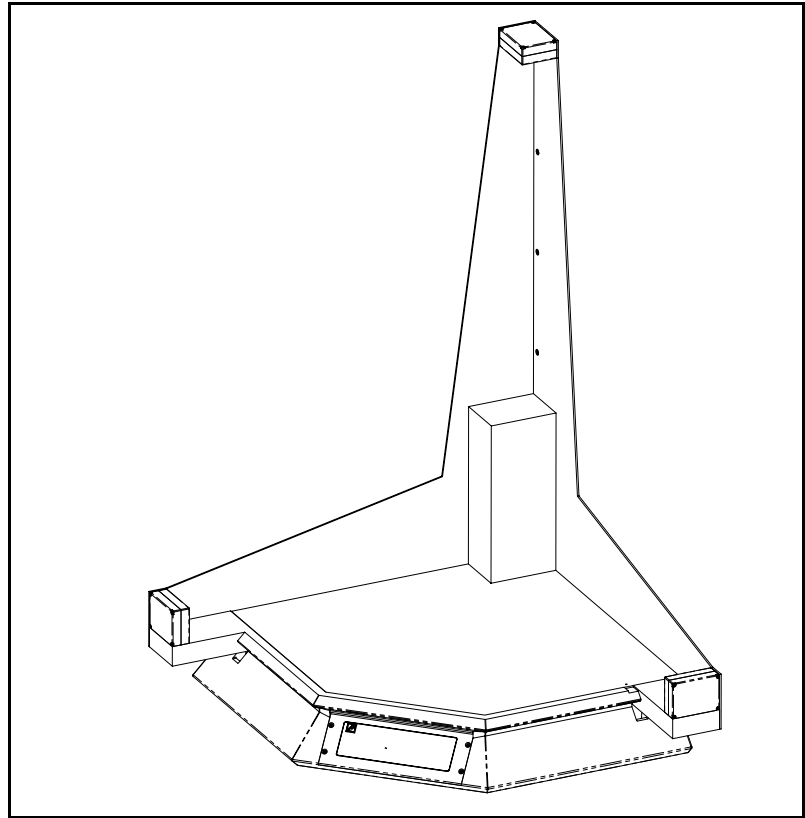
Figure 20
Calibration Cube Placement for Height Sensor

10. Press **<msr>**. The LENGTH, WIDTH, and HEIGHT windows
    should all be blank. This completes sensor calibration.

If you need to calibrate the scale, refer to the next section for
instructions. To prepare the CubiScan for operation, refer to page 44
for instructions.

Calibrating the Scale

To calibrate the CubiScan scale, you need an official test weight in the range of 50–100 pounds (25–45 kg) (it is recommended that you calibrate with the maximum weight).

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

Take the following steps to calibrate the CubiScan scale.

NOTE ☞   ***When calibrating the scale, the CubiScan must be stable with no movement of the platform such as that caused by vibration or air movement***.

1. If you calibrated the sensors first, turn the CubiScan off and on, then wait about five seconds for self-diagnostics to finish before calibrating the scale.

2. Make certain that the CubiScan platform is free of all objects.

3. Press $\dfrac{\text{lb}}{\text{kg}}$ on the control panel. After a short processing delay, the WEIGHT window displays **0.00,** and the DIM-FACTOR window displays a command code of **11**.

4. Make sure there is nothing on the CubiScan platform, and press **<msr>**.

   Do not disturb the CubiScan until the WEIGHT window displays the calibration weight (the weight of the last test weight used to calibrate the scale).

5. If the calibration weight displayed matches the test weight you are using, proceed to the next step.

   If not, change the displayed weight as follows:

First, locate the cursor (_) in the DIM-WEIGHT window (under one of the calibration weight digits). The cursor position determines which digit can be changed. If necessary, move the cursor to a different digit by pressing $\frac{lb}{kg}$ to move to the left or $\frac{dom}{intl}$ to move to the right. To increase the amount of the digit at the cursor, press $\frac{in}{cm}$; to decrease the digit, press **<zero>**.

6. Place the test weight on the CubiScan platform, and push it into the corner (exact positioning is not required). Allow the scale to completely stabilize.

7. Press **<msr>**. The test weight value is displayed in the WEIGHT window, and the CubiScan calibrates the scale based on the test weight. This completes scale calibration.

If you need to calibrate the sensors, refer to page 39 for instructions. To prepare the scale for operation, refer to the section below for instructions.

Preparing for Operation

To return the CubiScan to operation mode after calibration, proceed as follows.

1. Turn off the power switch (on the power strip), and disconnect the power cord from the power strip.

2. Remove the base cover and blue sound dampening pad from the CubiScan base.

3. Slide the controller box cover off to expose the DIP switch. Be careful not to press the cover against any of the cables in the base.

4. Use the tip of a pen or pencil or similar device to move switch 6 on the DIP switch back to the "open" position.

5. Slide the cover back into place over the controller box, and reattach the screws.

6. Place the sound dampening pad and base cover back on the base of the CubiScan.

7. Plug the power cord back into the power strip, and turn it on.

NOTES

Chapter 5
Maintenance

This chapter provides information on the care and maintenance of the CubiScan 100-L. Routine maintenance and careful handling will help keep the CubiScan 100-L in good operating condition and prevent service calls or repairs.

Precautions

The CubiScan should not be subjected to extremes in temperature or humidity, nor should it be subjected to excessive vibration. For environmental recommendations, see "Placement" on page 7.

Do not put packages on the platform that are known to be over 100 pounds (45 kg). All objects, especially heavy ones, should be placed on the platform gently. Shock loading will occur if an object is dropped or thrown onto the platform. This puts unnecessary and potentially damaging pressure on the load cell.

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

Cleaning the Sensors

The sensors should be kept clean. While dust normally won't inter-fere with sensor operation, they should be cleaned routinely to pre-vent the possibility of interference. To clean, gently blow dust from the gold foil surface.

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

Removing the Controller Box

If you suspect a problem with the CubiScan 100-L controller, first review the Troubleshooting chapter and take any recommended action. If the problem persists, contact Quantronix Technical Assis-tance at (801) 451-7000 for assistance.

If Quantronix recommends removing the controller box and return-ing it for service, proceed as follows.

1. Turn off the power switch (on the power strip), and disconnect the power cord from the power strip.

2. Remove the base cover from the CubiScan base. The cover is recessed and can simply be lifted out.

3. Remove the blue sound dampening pad.

4. Place the cover and blue pad in a safe location where they will not get stepped on or bent.

5. Locate the controller box (the metal box directly behind the control panel) inside the base.

6. Disconnect all connectors that are attached to the controller box, as follows:

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

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

    • To remove the load cell connector, turn the screws to loosen the connector, and pull it straight out.

    • To remove the power connector, take hold of the connector close to the panel, and pull it straight out using even pressure.

    • To remove a serial cable, loosen the screws (with a screw-driver if necessary), and pull the cable connector out using even pressure.

7. Remove the four Allen head screws on the corners of the controller box mounting plate using the 2.5 mm Allen wrench. The control panel is in the center of the mounting plate, and the mounting plate is attached to the front of the CubiScan base.
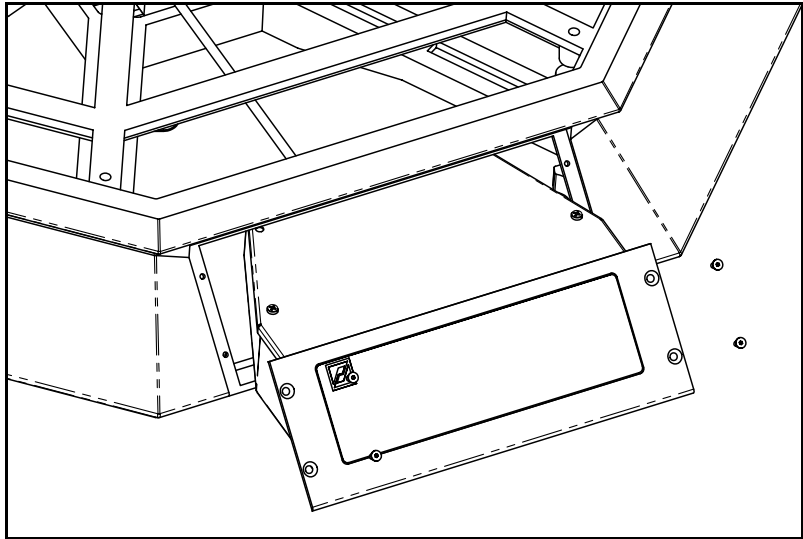
Figure 21
Removing the Controller Box

8. Verify that all cables have been removed from the controller
    box, then pull the box out through the front panel.

Chapter 6
Troubleshooting

This chapter provides assistance in identifying and solving common problems with the CubiScan 100-L. If you encounter problems not covered in this chapter, or if a defect is suspected, contact your system integrator or call Quantronix Technical Assistance at (801) 451-7000 for assistance.

After installation, most problems are caused either by incorrect cabling or because the system setup is not correct. If you are having problems with the CubiScan 100-L, first verify that all cables attached to the controller box inside the base (serial communications cables, sensor cables, power cord, Ethernet cable, load cell cable) are fully seated and secure (locking rings, clips, or screws). Then, verify that the setup is correct. For information on Setup, refer to the "Configuring Qbit*XXX*" chapter in the *Qbit for Windows User Guide*.

Problems with your computer may affect operation of the CubiScan 100-L system. If you have trouble starting Qbit for Windows or if you encounter problems with your computer (including computer related error messages), refer to your computer manual or contact your computer representative or dealer for assistance.

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

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

No Response When You Turn Power On

If there is no response when you power on the CubiScan 100-L, do the following:

1. Verify that the power strip is "live" and that the AC power cord is properly and securely connected to the power adapter and to the power strip.

2. Verify that the DC power cord is securely connected to the power connector on the back of the CubiScan.

Readings Are Not Accurate

If you suspect that the CubiScan 100-L readings are inaccurate, do the following:

1. Zero the scale by making sure the platform is free of all objects and then selecting **Zero** from the toolbar or Tools menu in Qbit for Windows. (If a computer is not connected, press **<zero>** on the control panel.)

    If the CubiScan does not return to zero or is slow to return to zero, level the CubiScan and make certain that all five leveling legs are resting on the supporting surface. Refer to "Assembling the CubiScan 100-L" on page 8 for more information.

2. Move the CubiScan if it is located close to open freight doors or where hot air is blowing on it. Extreme changes in temperature and humidity can affect the accuracy of the CubiScan 100-L. Refer to "Placement" on page 7 for information.

3. Recalibrate the CubiScan. Refer to page 35 for instructions.

Computer Error Messages

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

No Communications with CubiScan

This message indicates that no communication is taking place between the computer and the CubiScan 100-L.

Transmission Error

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

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

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

2. Is the serial cable or Ethernet cable connected to both the CubiScan 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 100-L properly configured for TCP/IP communication? (QbitTCP software is used to configure the CubiScan through the RS-232-C port.)

6. Is there a problem with the CubiScan 100-L? Perform the Status function in Qbit for Windows to check the status of the CubiScan.

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.

Control Panel Error Messages

Several predefined error codes are programmed into the CubiScan 100-L and, if a computer is not connected, may be displayed to identify specific errors. All errors are identified by a 2-digit code, which is displayed on the control panel in the display window appropriate for the message.

Error codes may appear occasionally during operation. This does not necessarily indicate a problem with the CubiScan. The first time an error code occurs, ignore it and redo the measurement. If the error code is displayed again immediately or frequently, review the sections below for information on specific codes.

NOTE ☞   *If an error message appears during calibration, power the Cubi-Scan off and back on and start calibration over.*

Timeout Error 01

If error code 01 is displayed in any window on the control panel, it may imply a problem that can be easily corrected. If, after following the suggestions below, the error code continues to be displayed, contact Quantronix for assistance.

Length, Width, Height   If timeout error 01 appears in the LENGTH, WIDTH, or HEIGHT window, it indicates that no communication is taking place between the sensor and the controller. The error code will appear in the display window (length, width, height) of the sensor that is at fault. Consider the following.

1. Verify that the sensor connector has not been disconnected.

2. Inspect the sensor cable for damage. Replace the sensor cable if it is damaged.

3. The sensor may be defective. Replace the sensor or contact Quantronix.

Weight   If timeout error 01 appears in the WEIGHT window, it indicates that no communication is taking place between the load cell and the controller. Consider the following.

1. Verify that the load cell connector has not been disconnected.

2. The load cell or its cabling may be defective or damaged. Inspect and replace the load cell if suspect, or contact Quantronix.

Other Error Codes

If any of the following error codes appear in any display window on the control panel repeatedly, make note of the error code and contact Quantronix for assistance.

-02-	Zero error
-03-	Load cell dead weight
-04-	Load cell weight total
-05-	Load cell dead weight query
-06-	Load cell weight total query
-07-	Load cell dead weight set
-08-	Load cell weight total set
-09-	Tare
-10-	Transmit device data
-11-	Calibrate
-12-	Measure signal value
-13-	Configure output format
-14-	Internal analog to digital rate
-15-	Amplifier signal filter
-16-	Amplifier signal selection
-17-	Corrective function switch
-18-	Automatic calibration switch
-19-	Restart

-20-   Set password
-21-   Define Password
-22-   External Interrupt

Appendix A
Communications Protocol

This appendix contains the cable pin assignments and command set description for the interface between the CubiScan 100-L and a host computer via a serial RS-232 connection as well as for the interface between the CubiScan 100-L and a network via an Ethernet TCP/IP connection.

"CubiScan 100-L Command Set" on page 59 lists the commands in the CubiScan 100-L command set used for cubing and weighing and to set up the CubiScan for cubing and weighing. "TCP/IP Communications Setup Command Set" on page 76 lists the commands used to set up the CubiScan for TCP/IP communications with a network.

Serial (RS-232-C) Cable Pin Assignments

The CubiScan 100-L 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 100-L Ethernet port uses the 10-BaseT 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

CubiScan 100-L Command Set

This section describes the commands recognized by the CubiScan 100-L to cube and weigh packages and to set up the CubiScan for cubing and weighing (dimension units, factor toggle, calibration, zero, and so on).

All command packets begin with an STX (start of text) and end with a 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 has an "A" in the third character position and may include a data field. A NACK has an "N" in the third character position, indicating that an error occurred. For example:

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

The CubiScan 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, the operation associated with that command is aborted due to the error.

The CubiScan 100-L recognizes the following commands from the command set for both a serial and Ethernet connection.

Continuous Measure

This command toggles on or off a continuous measure mode. The readings transmitted are Length, Height, Width, and Weight. Both dimensions and counts are transmitted.

Pos	Len	Description	Type	Range	ASCII
		Command Format			
1	1	Start of Text	Control	(STX)	02h
2	1	Continuous Msr. Com.	Alpha	(C)	43h
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	Measure Command	Alpha	(M)	4Dh
3	1	Acknowledge	Alpha	(A)	41h
4	1	CubiScan/Host Originated	Alpha	(C/H)	43h or 48h
5	6	City Code	Alpha	000000-ZZZZZZ	
11	1	Comma	Alpha	(,)	2Ch
12	1	Length Identifier	Alpha	(L)	4C
13	5	Length	Numeric	000.0-999.9*	
18	1	Comma	Alpha	(,)	2Ch
19	1	Width Identifier	Alpha	(W)	57h
20	5	Width	Numeric	000.0-999.9*	
25	1	Comma	Alpha	(,)	2Ch
26	1	Height Identifier	Alpha	(H)	48h
27	5	Height	Numeric	000.0-999.9*	
32	1	Comma	Alpha	(,)	2Ch
33	1	Dimension Unit	Alpha	(E/M)	45h or 4Dh

Pos	Len	Description	Type	Range	ASCII
34	1	Comma	Alpha	(,)	2Ch
35	1	Weight Identifier	Alpha	(K)	4Bh
36	6	Weight	Numeric	000.00-999.99*	
42	1	Comma	Alpha	(,)	2Ch
43	1	Dim. Wgt. Identifier	Alpha	(D)	44h
44	6	Dim. Weight	Numeric	000.00-999.99*	
50	1	Comma	Alpha	(,)	2Ch
51	1	Wgt./Dim.Wgt Unit	Alpha	(E/M)	45h or 4Dh
52	1	Comma	Alpha	(,)	2Ch
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	Corner Sensor / Measure / Zero Error	Alpha	(C/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

* This field may contain underscores, dashes, or overscores indicating an under, unstable, or over error condition, respectively.

Dimension Calibration

This function is required when one of the sensors is replaced or moved, when a new controller is installed, or for routine calibration. This command causes the CubiScan to reply with a dimension calibration code each time it is issued. This command must be issued FIVE times to complete sensor calibration. Dimension calibration codes are defined below.

Pos	Len	Description	Type	Range	ASCII
Command Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Dim.Calibration	Alpha	(D)	44h
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	Dim. Calibration	Alpha	(D)	44h
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	Dim. Calibration	Alpha	(D)	44h
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 Calibration Code Descriptions:

DA01   Clear the CubiScan
DA02   Place 12" Target facing LEFT
DA03   Place 12" Target facing RIGHT
DA04   Place 12" Target facing UP
DA05   Dimension Calibration Complete

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

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

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

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

Location Id/City Code

This command is used to set the CubiScan location identification. This data is stored in permanent memory and need only be set once for each CubiScan 100-L.

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	City Code	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					
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

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

Measure

Receipt of this command causes the CubiScan to measure and weigh the package in the measuring field. The CubiScan immediately formats the data collected and transmits it to the host computer.

Pos	Len	Description	Type	Range	ASCII
		Command Format			
1	1	Start of Text	Control	(STX)	02h
2	1	Measure Command	Alpha	(M)	4Dh
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	Measure Command	Alpha	(M)	4Dh
3	1	Acknowledge	Alpha	(A)	41h
4	1	CubiScan/Host Originated	Alpha	(C/H)	43h or 48h
5	6	City Code	Alpha	000000-ZZZZZZ	
11	1	Comma	Alpha	(,)	2Ch
12	1	Length Identifier	Alpha	(L)	4C
13	5	Length	Numeric	000.0-999.9*	
18	1	Comma	Alpha	(,)	2Ch
19	1	Width Identifier	Alpha	(W)	57h

Pos	Len	Description	Type	Range	ASCII
20	5	Width	Numeric	000.0-999.9*	
25	1	Comma	Alpha	(,)	2Ch
26	1	Height Identifier	Alpha	(H)	48h
27	5	Height	Numeric	000.0-999.9*	
32	1	Comma	Alpha	(,)	2Ch
33	1	Dimension Unit	Alpha	(E/M)	45h or 4Dh
34	1	Comma	Alpha	(,)	2Ch
35	1	Weight Identifier	Alpha	(K)	4Bh
36	6	Weight	Numeric	000.00-999.99*	
42	1	Comma	Alpha	(,)	2Ch
43	1	Dim. Wgt. Identifier	Alpha	(D)	44h
44	6	Dim. Weight	Numeric	000.00-999.99*	
50	1	Comma	Alpha	(,)	2Ch
51	1	Wgt./Dim.Wgt Unit	Alpha	(E/M)	45h or 4Dh
52	1	Comma	Alpha	(,)	2Ch
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

Pos	Len	Description	Type	Range	ASCII
5	1	Corner Sensor / Measure / Zero Error	Alpha	(C/M/Z)	43h or 4Dh
6	1	End of Text	Control	(ETX)	03h
7	1	Carriage Return	Control	(CR)	0Dh
8	1	Line Feed	Control	(LF)	0Ah

* This field may contain underscores, dashes, or tildes indicating an under, unstable, or over error condition, respectively. Leading spaces (20h) will be used when the actual data does not fill the entire field.

Scale Calibration

This function is required when the load cell is replaced, when a new controller is installed, or for routine calibration. This command causes the CubiScan to reply with a scale calibration code. This command must be issued THREE times to complete scale calibration. Scale calibration codes are defined below.

Pos	Len	Description	Type	Range	ASCII
Command Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Scale Calibration	Alpha	(S)	53h
3	6	Test Weight Value	Numeric	050.00-100.00	
9	1	End of Text	Control	(ETX)	03h
10	1	Carriage Return	Control	(CR)	0Dh
11	1	Line Feed	Control	(LF)	0Ah
Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Scale Calibration	Alpha	(S)	53h
3	1	Acknowledge	Alpha	(A)	41h

Pos	Len	Description	Type	Range	ASCII
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	Scale Calibration	Alpha	(S)	53h
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

Scale Calibration Code Descriptions:

SA01 Clear the CubiScan
SA02 Place Test Weight in Corner
SA03 Scale Calibration Complete

Test

This command causes the CubiScan to reply with an error code. A response of TA00 means that the CubiScan 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

Pos	Len	Description	Type	Range	ASCII
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 to report its current modes of operation.

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

Pos	Len	Description	Type	Range	ASCII
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
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./City Code	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 to report all of its 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
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

Pos	Len	Description	Type	Range	ASCII
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=100,150,201
93	1	Comma	Alpha	(,)	2Ch
94	5	Firmware Version	Alpha	0.000-9.999	

Pos	Len	Description	Type	Range	ASCII
99	28	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

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
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

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
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 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 packages! Never issue this command when a package 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
3	1	Acknowledge	Alpha	(A)	41h

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
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 100-L to set up the CubiScan 100-L for communications with a network using the TCP/IP protocol.

You can use the Qbit for Windows, QbitTCP software to configure the CubiScan 100-L for TCP/IP communications. Contact Quantronix for information.

Configuration of the CubiScan 100-L for TCP/IP communication is performed through the RS-232-C serial communications port using the following commands.

Set Port

This command is used to set the CubiScan 100-L 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 100-L 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	(1) 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

Pos	Len	Description	Type	Range	ASCII
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 100-L.

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	(1) 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

Pos	Len	Description	Type	Range	ASCII
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 IP Address

This command is used to set the CubiScan 100-L 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 100-L. 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

Pos	Len	Description	Type	Range	ASCII
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 IP Address

This command is used to read the current IP address setting from the CubiScan 100-L.

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

Pos	Len	Description	Type	Range	ASCII
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 Subnet Mask

This command is used to set the CubiScan 100-L subnet mask. 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. Subnet masking allows the router to move packets more quickly. Like the IP address, the subnet mask is usually expressed in "dot" notation. Consult your network administrator to obtain a subnet mask.

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

Read Subnet Address

This command is used to read the current subnet mask setting from the CubiScan 100-L.

Pos	Len	Description	Type	Range	ASCII
		Command 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	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	Subnet 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

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 100-L. 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	Gateway 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

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

Read Gateway Address

This command is used to read the current gateway address setting from the CubiScan 100-L.

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	Gateway Address	Alpha	(0.0.0.0) to (255.255.255.255)	

Pos	Len	Description	Type	Range	ASCII
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	Gateway Address Command	Alpha	(G)	47h
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 Inactivity Timeout

This command is used to set the CubiScan 100-L Ethernet inactivity timeout. When a network connection has been established, if the network cable is disconnected or the user leaves the CubiScan for a period of time, the network connection is dropped by the CubiScan. This is necessary for someone else to connect to the CubiScan, possibly from a different network node, without cycling the power on the CubiScan. This value is programmable from 1 to 255 minutes.

Pos	Len	Description	Type	Range	ASCII
1	1	Start of Text	Control	(STX)	02h
2	1	Set Command	Alpha	(@)	40h
3	1	Timeout Command	Alpha	(T)	54h
4	3	Value in Minutes	Alpha	(001-255)	
5	1	End of Text	Control	(ETX)	03h
6	1	Carriage Return	Control	(CR)	0Dh
7	1	Line Feed	Control	(LF)	0Ah

Pos	Len	Description	Type	Range	ASCII
Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Set Command	Alpha	(@)	40h
3	1	Timeout Command	Alpha	(T)	54h
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	Timeout Command	Alpha	(T)	54h
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 Inactivity Timeout

This command is used to read the current inactivity timeout setting from the CubiScan 100L.

Pos	Len	Description	Type	Range	ASCII
1	1	Start of Text	Control	(STX)	02h
2	1	Read Command	Alpha	(~)	7Eh
3	1	Timeout Command	Alpha	(T)	54h
4	1	End of Text	Control	(ETX)	03h
5	1	Carriage Return	Control	(CR)	0Dh
6	1	Line Feed	Control	(LF)	0Ah

Pos	Len	Description	Type	Range	ASCII
Acknowledge Format					
1	1	Start of Text	Control	(STX)	02h
2	1	Read Command	Alpha	(~)	7Eh
3	1	Timeout Command	Alpha	(T)	54h
4	1	Acknowledge	Alpha	(A)	41h
5	3	Value in Minutes	Alpha	(001-255)	
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	Read Command	Alpha	(~)	7Eh
3	1	Timeout Command	Alpha	(T)	54h
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 100-L as spare parts or if replacement is necessary.

Part No.	Description	Quantity/Unit
Q0120300	Main Controller Assembly	1
Q0129100	Sensor Assembly *	3
Q0127900	Plate, Scale Top (Base cover)	1
Q0128000	Plate, Sound Deadening (Blue sound dampening pad)	1
Q0149300	Serial Communications Cable, 10 ft. *	1
Q0155500	Power Supply, 12 VDC, 44 Watt *	1
Q0008300	Cord, AC Power *	1
Q0027300	Calibration Cube, 12" x 5" x 3.6", Black	1
Q0131700	Sensor Cable Assembly, 2 ft.	2
Q0132300	Sensor Cable Assembly, 5.5 ft.	1

* recommended spares

NOTES