

Cubiscan N9



Operations and technical manual

Version [1.1]

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Cubing and weighing systems

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Cubiscan N9 operations and technical manual

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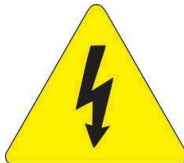
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CAUTION

The Cubiscan N9 should only be serviced by qualified personnel.

Observe precautions for handling electrostatic sensitive devices when setting up or operating the Cubiscan N9.



WARNING

Disconnect all power to the Cubiscan N9 before servicing or making any connections.



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CHAPTER 1

PRODUCT DESCRIPTION

The Cubiscan N9 is a space-saving, static dimension scanning device that measures multi-piece, palletized, or non-palletized freight. The Cubiscan N9 can work with a heavy-capacity floor scale or in a stand alone capacity. Its overhead-mounted sensor configuration provides a comprehensive view of the freight measurement area in compact format.

The Cubiscan N9 is commonly used to dimension freight, for packaging planning, calculating transportation shipping charges, and storage space optimization. It may be customized to user needs. Barcode scanning and printing devices can be used with the Cubiscan N9 to create a versatile measurement system.

Freight is measured using Class 1 infrared laser sensing technology. Two laser scanners are mounted parallel to each other over the freight measurement area. Capacity for freight can be measured up to 8 x 8 x 8 feet. An optional floor or wall-mounted touchscreen display allows for a simple user operation process.

The Cubiscan N9 uses powerful sensing technologies to create a flexible and economical solution for today's most demanding dimensioning applications.

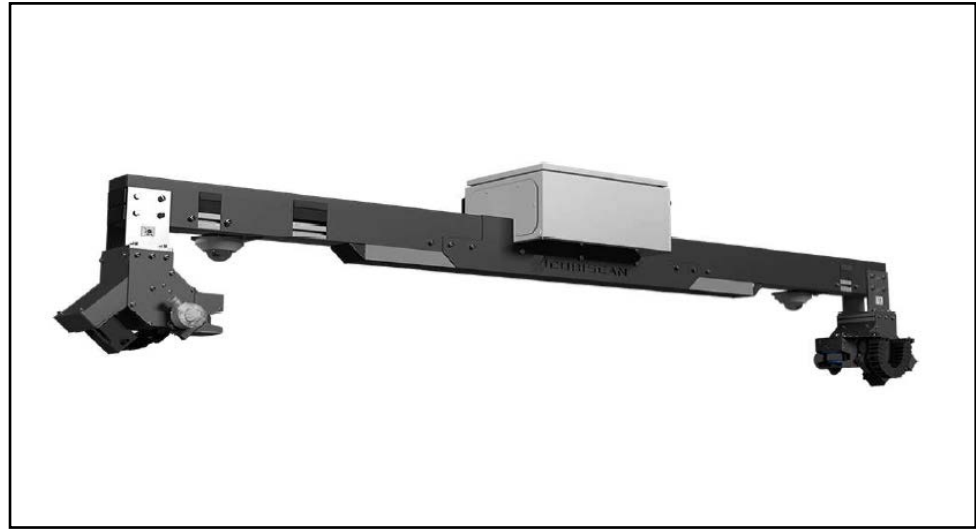


Figure 1
Cubiscan N9

Specifications

Power Requirements

200-250 V 16 A

Environmental

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

Humidity: 0 to 85% non-condensing

Measuring Sensor

Two infrared laser scanners, 905 nm, Class 1, (eye-safe), according to DIN EN 60825-1

Measurement Capacities

Measurement Range

Length: 1 in to 98.4 in (2.5 to 250 cm)

Width: 1 in to 98.4 in (2.5 to 250 cm)

Height: 1 in to 98.4 in (2.5 to 250 cm)

Measurement Increment: 1 in (2.5 cm)

Measurement Time: < 2.5 seconds

Physical

Length: 170 in (431 cm)

Width: 24 in (61 cm)

Height: 20 in (51 cm)

Suspended weight: 425 lb (193 kg)

Recommended ceiling height: 192 in (488 cm)

User Interface

Touchscreen (optional), mounted display.

Chapter 2

Getting Started

This chapter provides instructions for proper measurement, powering the Cubiscan N9 on and off, and connecting to the software interface using a computer. It also describes the different windows and functions that are found on the home screen.

The Measuring Area

It is recommended that you paint or tape lines on the floor to designate the measurement area, as shown in the figure below.



Figure 2
Measurement Area

Keep the measuring area free of debris that may affect the dimensioning of product. When dimensioning product, do not enter the measuring area until the measurement is complete.

If there is concern that product is not measuring correctly, please contact **Cubiscan Support** at 801.451.0500 for assistance.

Powering the Cubiscan N9 On/Off

Before powering the system on or off, ensure that the measuring area is clear.

To turn the Cubiscan N9 on, locate the red knob located on the control box, see Figure 3. Turn the red knob clockwise into the ON position.



Figure 3
On/Off Knob

Once the system has been powered on, the measure screen will appear on the display mounted to the Cubiscan. The Cubiscan N9 is ready to measure.

Connecting to the Cubiscan N9

The Cubiscan N9 may be accessed by a computer through an ethernet connection. Through the operating system, the Cubiscan N9 may be configured and calibrations may be performed. A user may perform other operations such as updating the system software or reviewing logs for diagnostic purposes.

To access the Cubiscan N9 with a computer, enter the IP Address of the system in a browser window. The operating system desktop will display.

To run the Cubiscan N9 software, open the **N9.exe** file within the

root folder (typically C:\Cubiscan\n9).

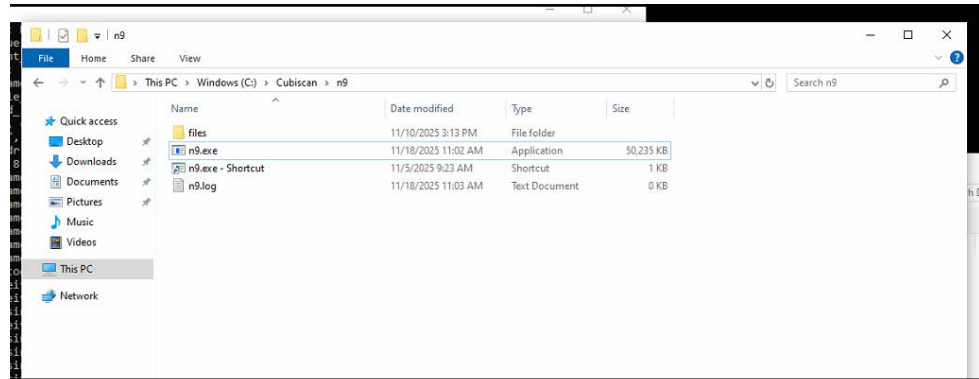


Figure 4
N9 executable file

The Cubiscan N9 software will launch and the home screen will appear.

Cubiscan N9 Home Screen

This chapter describes the different areas and windows found on the

home screen.

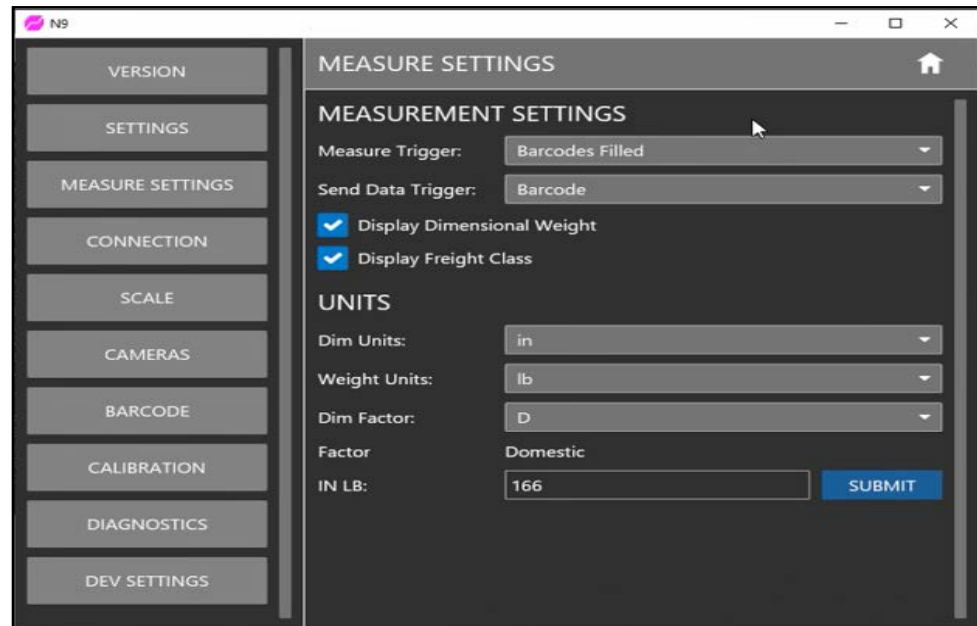


Figure 5
Home Screen

- Version** The Version screen displays general information about the system related to software version. For more information on the Version options, see "Version" on page 27.
- Settings** The Settings screen provides general options for configuring the system software and machine identification such as language selection. For more information on Setting options, see "Settings" on page 11.
- Measure Settings** The Measure Settings screen provides options for configuring triggers for measuring and how units will be displayed. For more information on configuring Measure Settings, see "Measure Settings" on page 12.
- Connection** The Connection screen provides options for configuring the connection to the Cubiscan N9 and the transfer of data. This includes Ethernet and Post settings. For more information on setting up connections to the Cubiscan N9 and other connection related options, see "Connection" on page 14.
- Scale** The Scale screen provides options for connecting a scale to the Cubiscan N9. Pre-configured options are provided along with the ability to enter custom settings. For more information on connecting and configuring a scale for the Cubiscan N9, see "Scale" on

page 16.

- Cameras** The Cameras screen provides options for connecting various rgb cameras to the Cubiscan N9 for capturing product images. Among the options are settings for how images will be captured and transferred. For more information on connecting cameras on the Cubiscan N9 and other image options, see "Cameras" on page 19.
- Barcode** The Barcode screen provides options for connecting barcode scanners to the Cubiscan N9. Options are available to parse data and to provide modes for validating barcode information. For more information on connecting barcode scanners and configuring barcode features, see "Barcode" on page 21.
- Calibration** The Calibration screen provides operations for performing a calibration of the Cubiscan N9. At this time, all calibrations are done at install by trained technicians. If a recalibration is needed, please contact **Cubiscan Support** at **801.451.0500** for assistance.
- Diagnostics** The Diagnostic screen provides logs for troubleshooting issues and tracking software changes and updates. For more information on diagnostic logs available and how to access them, see "Diagnostic" on page 28.

Chapter 3

Operation

This chapter provides instructions for operating the Cubiscan N9.

Measuring Freight with Barcode Trigger

To configure the Cubiscan N9 to trigger with a barcode scan, first enable this option in setting, see “Measure Trigger” on page 13. Complete the following steps to measure freight with barcode trigger enabled:

1. Power on the Cubiscan N9. For information on how to do this, see “Powering the Cubiscan N9 On/Off” on page 5.
2. Make sure that the freight you want to measure is in the measurement area.
3. Scan or enter a barcode into the barcode field. With barcode trigger configured, scanning a barcode will automatically begin the measurement process.
4. A yellow light will appear on the measurement screen mounted to the Cubiscan N9, indicating that measurement is in process.

Do not move freight or move into the measurement area while the light is yellow as this will disrupt the measurement.

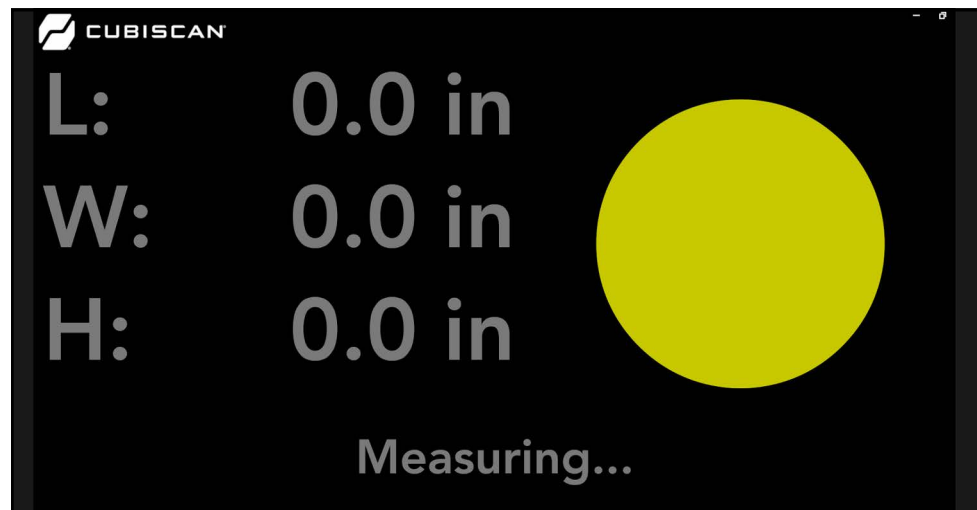


Figure 6
Measurement in progress

5. The Cubiscan N9 arm will move over the freight. This process usually takes about 15 seconds. Once the measurement is complete a green light will appear with a message indicating the measurement is complete. The dimensioned values will be displayed on the measurement screen.



Figure 7
Measurement Results

6. You can export the information by configuring the Cubiscan S9 to send data in the settings, see "Post Settings" on page 16.

Chapter 4

Configuration

This chapter provides instructions for using the Cubiscan N9 touchscreen to set up preferences and operate special features that the Cubiscan N9 offers.

Settings

The following options are settings that you can select to configure the Cubiscan N9 to your specifications.

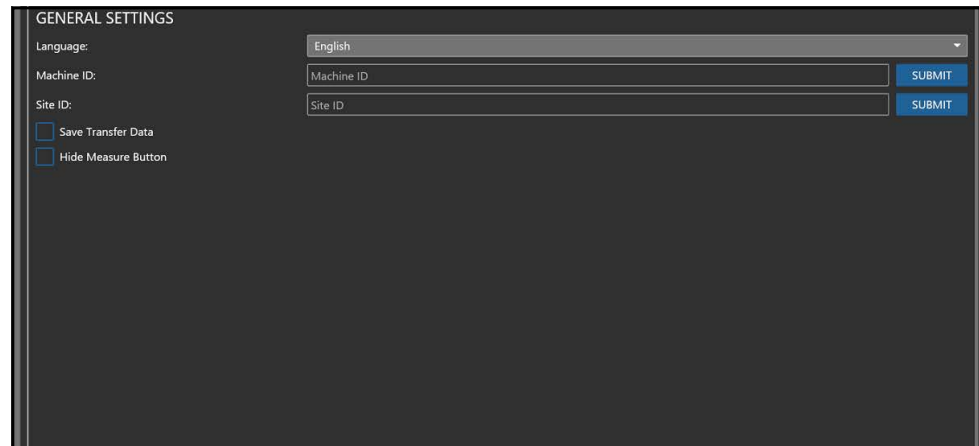


Figure 8
Settings

- | | |
|---------------------------|---|
| Language | Select your desired language from the following options: English, French, Spanish, Japanese, Korean, Chinese, and German. |
| Machine ID | Set the Machine ID for the unit by entering the ID into the text field and clicking [SUBMIT]. |
| Site ID | Set the Site ID for the unit by entering the ID into the text field and clicking [SUBMIT]. |
| Save Transfer Data | Click in the check box to enable the saving of transfer data during measurements. A field will appear below the setting to select |

location where the data will be saved. Click in this field to open a file browser to select where to save data.

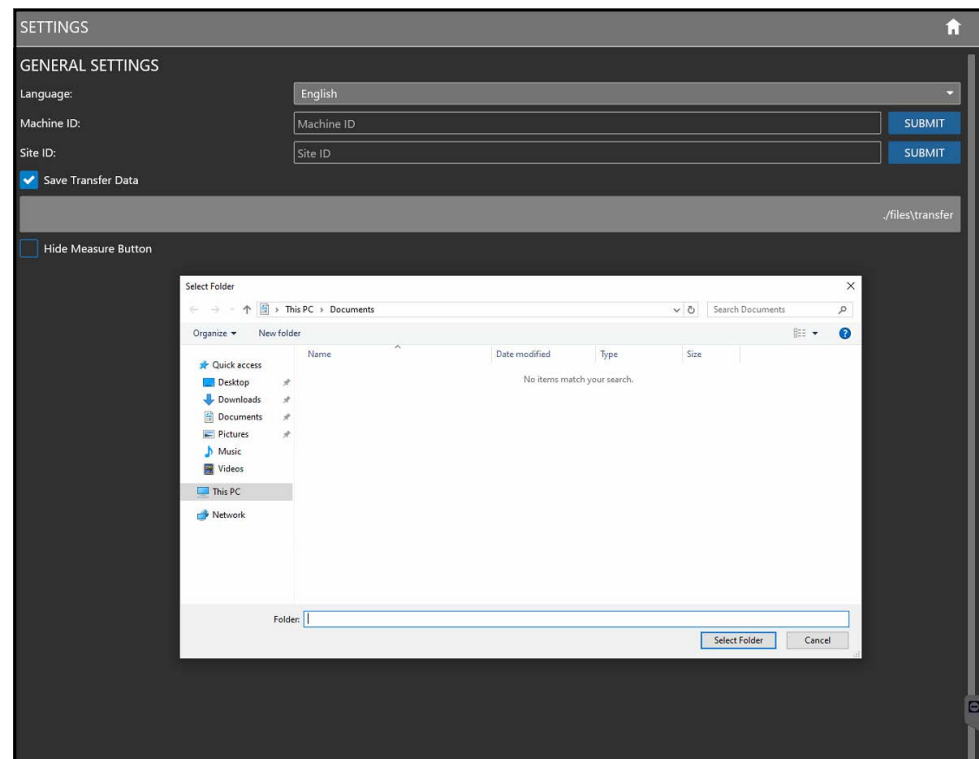


Figure 9
Save Transfer Data

Hide Measure Button Click the check box to hide the measure button on the main screen. This may help where barcode is enabled to ensure that the scanning of the barcode initiates measurement.

Measure Settings

The following options can be set to configure the measurement

settings.

Figure 10
Measure settings

Measure Trigger	Set the trigger for measurement. Options include: Manual Only or Barcode Filled. Manual Only: Measurement only triggers when manually triggered. Barcode Filled: Measurement is automatically triggered when barcode is scanned.
Send Data Trigger	Set the trigger for sending data. Options include: Dimensions , Weight , Barcode , and Data Filled . Dimensions: Data will be sent once dimensions are collected. Weight: Data will be sent once weight is collected. Barcode: Data will be sent once barcode is scanned. Data Filled: Data will be sent once all data is collected.
Display Dimensional Weight	Toggle to enable display of dimensional weight on home and view screen.
Display Freight Class	Toggle to enable display of freight class on home and view screen.

Units

The Units section, provides configuration of measuring units. These

units will be displayed on the measurement screen and will be posted to data acquired during measurements.



Figure 11
Units

- Dim units** In this field you can select **inches**, **centimeters**, or **millimeters** for your dimensional units.
- Weight units** In this field you can select **pounds** or **kilograms** for your weight unit.
- Dim-factor** In this field you can select a **domestic** or **international** dim-factor.
- Factor** Will automatically set to the selected **Dim-Factor** (domestic or international). Below in the **IN LB**, the pre-configured factor will be displayed for the given units and dim-factor selected. This factor may be adjusted as needed by entering the desired factor in the text field.

Connection

The following options are settings that you can select to configure

the Cubiscan N9 to your specifications.

CONNECTION

MQTT Settings

MQTT IP Address: 10.1.9.1

MQTT Port: 1883

UPDATE MQTT

Ethernet Settings

Connection: Ethernet

MAC Address: EC-8E-85-72-32-93

IP Address: 10.0.100.129

Subnet Mask: 255.255.254.0

Gateway: 10.0.100.1

Status: Up

☒ Enabled

☒ DHCP

UPDATE ETHERNET SETTINGS

Machine Port: 1050

POST SETTINGS

☐ Enable Post

SUBMIT

Figure 12
Connection

MQTT Settings

The MQTT is used to connect to the Cubiscan N9 from the controller. Although, the settings of the MQTT may be adjusted, they need to match the IP Address and port of the Cubiscan N9 to ensure connection.

MQTT IP Address Enter the IP address to connect to the Cubiscan N9. The address must match the IP of the system.

MQTT Port Set the port to connect to the Cubiscan N9. The port must match the port used by the system. In most cases, this should be port 1883.

Ethernet Settings

The Ethernet Settings field allows you to select the Ethernet settings for the Cubiscan. The following information is displayed to help you connect with the Cubiscan: **MAC Address**, **IP Address**, **Subnet**, and **Gateway**.

Connection Select the type of connection from the dropdown menu options.

Status: Enabled Toggling this option enables or disables the Cubiscan’s ability to communicate via Ethernet.

Status: DHCP Check box to enable or disable a Dynamic Host Configuration Protocol (DHCP) connection.

Machine Port Enter the port number for the webserver.

Post Settings

Enable Post Toggle to enable/disable posting of measurement data.

Post URL Enter the address of the network to post data.

Post Port Enter the network port used to post data.

Post Auth. Choose the type of authorization key from dropdown. Options include: **Basic**, **Bearer**, or **Qbit**.

Basic: Server uses a simple username password combo to validate if data from the sender should be accepted.

Bearer: Server uses a token recognized by both server and sender to validate if data from the sender should be accepted.

Qbit: Like Bearer, server uses a token recognized by both server and sender to validate data. Used specifically to work with Qbit products.

Scale

The following options are settings that you can select to configure the scale for the Cubiscan.

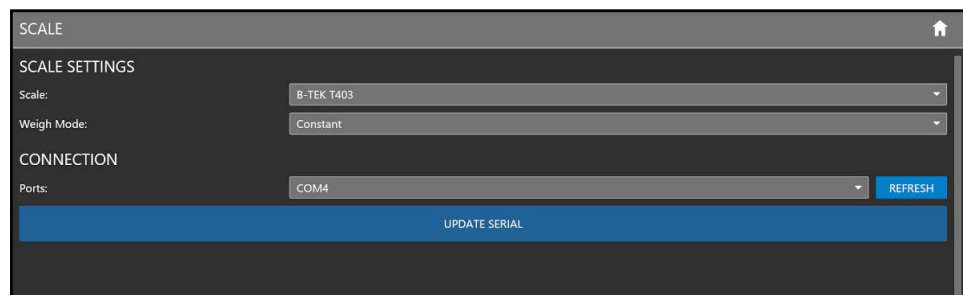


Figure 13
Scale settings

Scale Select the appropriate scale from the dropdown or add a custom scale configuration if scale is not listed.

The following scales are pre-configured: FW-150, MyWeigh HD150, FB2250, Cardinal, MT IND-231, CAS PB-150, DWP-440, Veritas HL-318L, Ishida IWX-D or IGX, B-TEK T403, or USB HID.

To add a custom scale configuration, see "Custom Scale Connection" on page 17.

- Weigh Mode

Select the weigh mode from the dropdown menu. Select Constant for continued display of the weight. Select hold stable to display the weight once the a consistent weight is read on the scale.
- Connection:
Ports

Select the communication port of the scale.

Custom Scale Connection

Generally only a port is needed to set up the scale. However, if the scale model is not found in the scale drop down list, a custom connection may be created.

To setup a custom connection, select Add Custom from the scale dropdown list and enter the information in the required text fields under Connection.

The screenshot shows a software interface for configuring a scale. It is divided into two main sections: 'SCALE SETTINGS' and 'CONNECTION'.
In the 'SCALE SETTINGS' section, there are three dropdown menus: 'Scale' (with 'Add Custom...' selected), 'Weigh Mode' (with 'Constant' selected), and 'Custom Name' (with 'Name' entered). Below these are two buttons: 'SAVE' and 'DELETE'.
In the 'CONNECTION' section, there are several dropdown menus: 'Connection' (with 'Serial' selected), 'Ports' (with 'COM4' selected), 'Baud Rate' (with '9600' selected), 'Parity' (with 'None' selected), 'Stop Bits' (with 'One' selected), and 'Data Bits' (with 'Eight' selected). A 'REFRESH' button is located next to the 'Ports' dropdown.

Figure 14
Custom scale connection

- Connection

Select the type of connection for the scale form the drop down. Options include: **USB HID**, **Serial**, or **Ethernet**.
- Ports

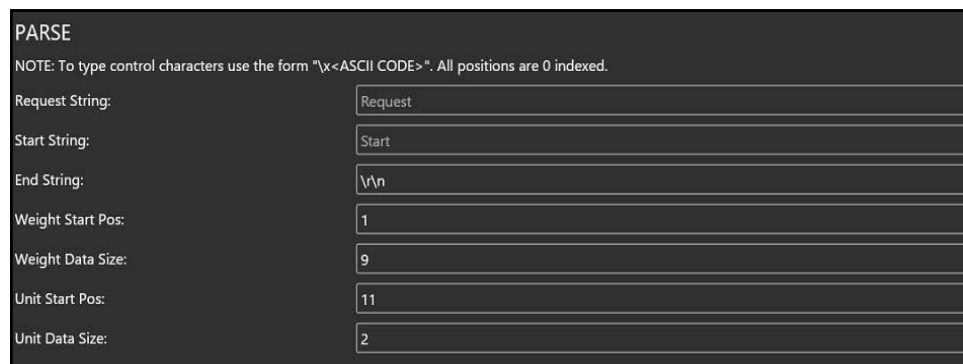
Select the port the scale will connect to form the drop down. If the

port does not show in the drop down, click **[REFRESH]**. If it still does not display in the drop down, check connections and refresh again.

- Baud Rate** Select the baud rate for the scale from the drop down. Options include: **1200, 2400, 4800, 9600, 19200, 57600, or 115200.**
- Parity** Select the parity of the scale form the drop down. Options include: **None, Odd, or Even.**
- Stop Bits** Select the number of stop bits used when transmitting data. Options from the drop down include: **One or Two.**
- Data Bits** Select the number of data bits in a data packet form the drop down. Options include: **Five, Six, Seven, or Eight.**

Parse Settings

The following settings are for setting up parsing of data transmitted from the scale.



PARSE

NOTE: To type control characters use the form "\x<ASCII CODE>". All positions are 0 indexed.

Request String:	Request
Start String:	Start
End String:	\r\n
Weight Start Pos:	1
Weight Data Size:	9
Unit Start Pos:	11
Unit Data Size:	2

Figure 15
Custom scale connection

- Request String** Enter the string to request string for requesting data from the custom scale.
- Start String** Enter the string to start the transmitting of data from the custom scale.
- End String** Enter the string to end the transmitting of data from the custom scale.
- Weight Start Post** Set the number of start position for data packet.

Weight Data Size Set the size of data transmitted from the scale.

Cameras

The following options are settings that can be selected to configure the cameras for the Cubiscan N9.

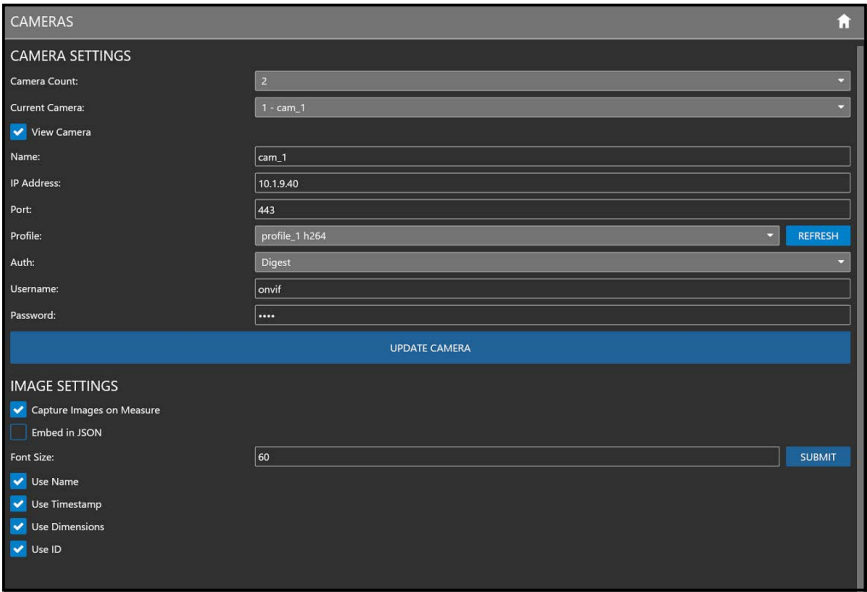


Figure 16
Camera settings

Camera Count Displays the number of rgb cameras used by the N9.

Current Camera Select the camera to configure from the camera count drop down.

View Camera Click in the box to enable or disable the camera view on the main screen.

Name Displays the assigned name of the camera selected from the camera count dropdown. Type in the text box to change the name of the camera.

IP Address Displays the IP Address of the camera selected from the camera count dropdown. Type in the text box to change the IP Address for accessing the camera.

Port Displays the Port of the camera selected from the camera count dropdown. Type in the text box to change the Port for accessing the

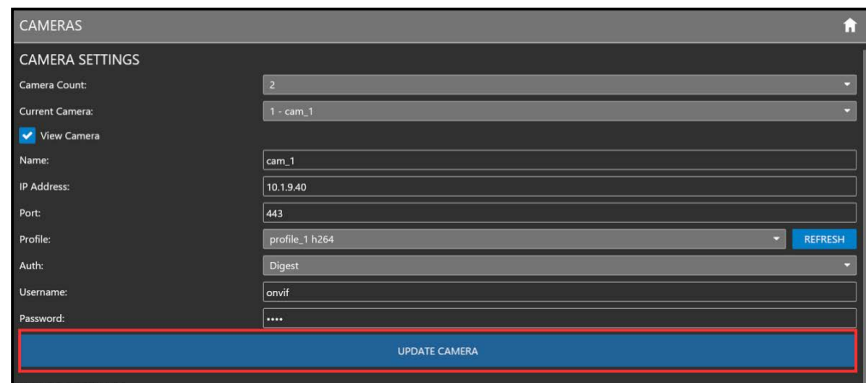
camera.

Profile Select the profile for the images captured by the camera. Options include: **h264** and **jpeg**.

Auth. Select the type of authentication used for accessing the camera. Options include **digest** or **none**.

Username/Password Enter the username and password for accessing the camera.

When setting or updating settings for a selected camera, remember to click **[UPDATE CAMERA]** in order to keep the desired settings.



The screenshot shows a web interface titled 'CAMERAS' with a home icon in the top right. Below the title is a section labeled 'CAMERA SETTINGS'. The settings are as follows:

- Camera Count: 2 (dropdown menu)
- Current Camera: 1 - cam_1 (dropdown menu)
- ☒ View Camera
- Name: cam_1 (text input)
- IP Address: 10.1.9.40 (text input)
- Port: 443 (text input)
- Profile: profile_1 h264 (dropdown menu) with a 'REFRESH' button to its right
- Auth: Digest (dropdown menu)
- Username: onvif (text input)
- Password: **** (text input)

At the bottom of the settings section is a large blue button labeled 'UPDATE CAMERA', which is highlighted with a red rectangular border.

Figure 17
Update camera

Image Settings

The following options can be set to configure image settings for

images captured by the Cubiscan N9.

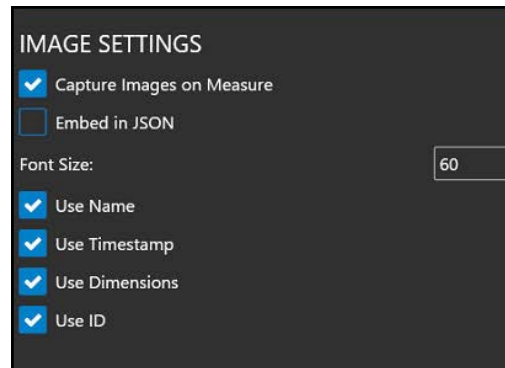


Figure 18
Image settings

Capture Images on Measure	Click check box to toggle image capture during measurement.
Embed in JSON	Click check box to toggle the embedding of JSON with image file.
Font Size	Set the font size of the text rendered onto images captured after measurement. Allows for text to be reasonably sized when varying image resolutions.
Use Name	Click Check box to toggle the use of the camera name with images captured.
Use Timestamp	Click Check box to toggle the use of the timestamp with images captured.
Use Dimensions	Click Check box to toggle the use of the measured dimensions with images captured.
Use ID	Click Check box to toggle the use of the item ID with images captured.

Barcode

The following options are settings that you can select to configure

the barcode scanner for the Cubiscan.

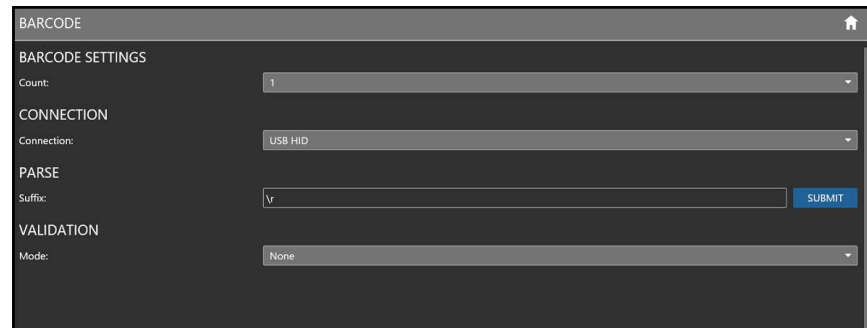
The image shows a software window titled 'BARCODE' with a home icon in the top right corner. The window contains four sections: 'BARCODE SETTINGS' with a 'Count' dropdown set to '1'; 'CONNECTION' with a 'Connection:' label and a dropdown set to 'USB HID'; 'PARSE' with a 'Suffix:' label, a text input field containing 'v', and a blue 'SUBMIT' button; and 'VALIDATION' with a 'Mode:' label and a dropdown set to 'None'.

Figure 19
Barcode settings

- Count** Set the number of barcodes required to scan during measurement.
- Connection** Select the type of connection for the barcode scanner from the dropdown. Options include: **USB HID**, **Serial**, and **Ethernet**.
- Parse: Suffix** Enter the required suffix to parse at the end of the data packet. After entering the suffix, click **[SUBMIT]** to keep setting.
- Validation: Mode** Select the mode to restrict which barcodes are included in the final measurement. Options include: **None**, **Exact**, and **Min Max**.
- None:** No restriction is placed on the barcode.
- Exact:** Select for a set number of characters in the barcode.
- Min Max:** set a range of characters in the barcode. To set the range, enter the minimum and maximum number of characters.

Chapter 5

Maintenance

This chapter provides information on the care and maintenance of the Cubiscan N9. Routine maintenance and careful handling will help keep the Cubiscan N9 in good operating condition and prevent service call or repairs.

Touchscreen Care

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.
Do not let the touchscreen come into contact with any sharp objects.

Cleaning the Cubiscan N9 Lasers

The laser heads should be kept clean. While some dust normally won't interfere with sensor operation, they should be cleaned routinely to prevent the possibility of interference. The frequency with which the laser heads should be cleaned depends on the Cubiscan N9's operating environment.

To clean the laser heads, you will need the following.

- Ladder (or another means of reaching the Cubiscan N9 laser heads)
- Clean, dry microfiber cloth

Once the laser heads are within reach, gently wipe the laser head surfaces with a dry microfiber cloth.

When you clean the laser heads be sure that you are following all required safety regulations.

Change the Control Box Filters

This chapter provides information on how to change the control box

filters. These filters should be changed as needed, depending on the N9's operating conditions.

To change the filters, complete the following steps:

1. Locate the two filters located on the front and side of the control box (shown below).



Figure 20
Control Box Front Filter



Figure 21
Control box side filter

2. Gently wiggle the filter guards free. They should simply pop out.
3. Clean the filters or replace them with new ones.



Figure 22
Control Box Filter

4. Snap the filter guards back into place.

Chapter 6

Troubleshooting

This chapter provides assistance in identifying and solving common problems with the Cubiscan N9. If you encounter problems not covered in this chapter, or if a defect is suspected, contact your system integrator or call **Cubiscan Support** at 801.451.0500 for assistance.

Cubiscan N9 Is Not Responding

If the Cubiscan N9 is not responding, try powering it off. For information on how to do this, see “Powering the Cubiscan N9 On/Off” on page 5. Make sure that the power switch is turned off for 20 seconds or more to ensure that all power has been drained from the system.



Figure 23
Power switch

If powering the Cubiscan N9 off does not work, contact **Cubiscan Support** at 801.451.0500 for assistance.

Version

This section describes the Version menu of the Cubiscan N9. The Version menu contains useful information and records of the Cubiscan N9.

To access the version information, perform the following steps:

- 1. From the menu side panel, select **VERSION**.

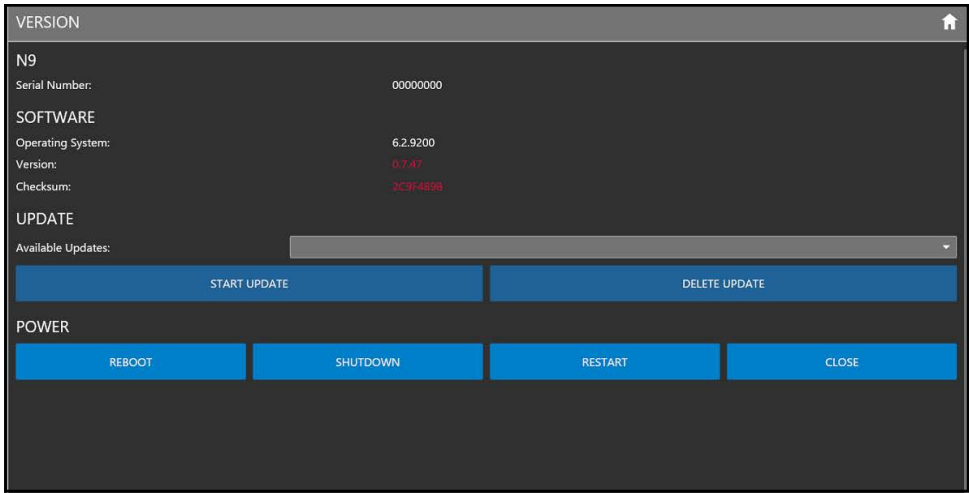


Figure 24
Version

Serial Number This field displays the serial number of the Cubiscan.

Software

Operating System This field displays the operating system currently used on the system.

Version The model and firmware version of the Cubiscan is displayed at the top of the Version screen.

Checksum This field displays the checksum for the software.

Version

Software Update To update system software, select the update software Available Update drop down and tap [Start Update].

Power

- | | |
|-----------------|--|
| Reboot | Click [REBOOT] to restart the Cubiscan N9 and boot the software again. |
| Shutdown | Click [SHUTDOWN] to close the Cubiscan N9 software and shutdown the system. |
| Restart | Click [RESTART] to restart the Cubiscan N9 software without shutting down the system. |
| Close | Click [CLOSE] to close the Cubiscan N9 software without shutting down the system. |

Measurement error

If the Cubiscan N9 reports a measurement error, complete the following steps.

1. Ensure the measurement area is free from objects not being measured, including hands that may be captured during the measurement. It may be helpful to use a different display mode to identify any unwanted measurements.
2. In some case a recalibration may be needed to ensure the Cubiscan is measuring properly.
3. If problem persists, cycle the power and remeasure.

If you are still receiving a sensor error, contact **Cubiscan Support** at **801.451.0500** for assistance.

Diagnostic

The following options can be used for diagnostic purposes of your Cubiscan N9. Two types of logs exist with diagnostic information about the system: the diagnostic log and the configuration log. Use these logs to troubleshoot possible issues with the Cubiscan N9.

To access the diagnostic information, perform the following steps:

1. From the menu side panel, select **DIAGNOSTICS**.

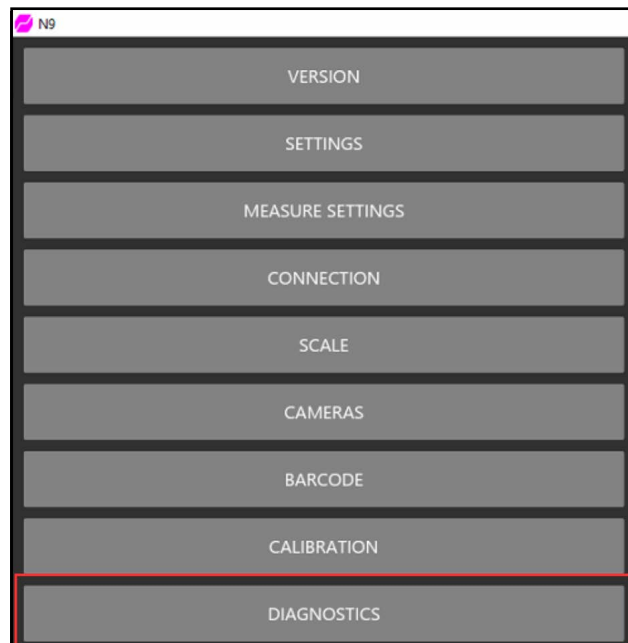


Figure 25
Menu: Diagnostic

A list of logs will display on the screen: diagnostic log, configuration log, calibration log, and update log. Select the diagnostic information you wish to view by tapping the respective button.

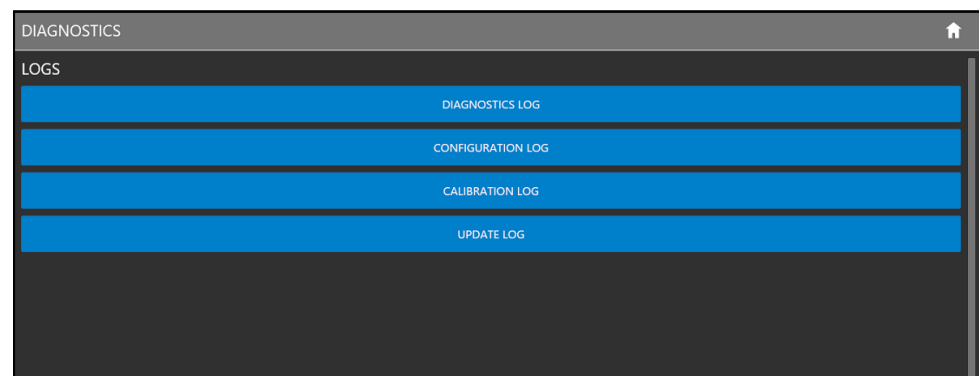


Figure 26
Logs

Diagnostics Log

The diagnostics log displays system messages, including error

messages. Each entry is stamped with the date and time that it occurred.

To access the diagnostics log, tap **[DIAGNOSTICS LOG]** from the Diagnostics menu. The diagnostics log will display on the screen.

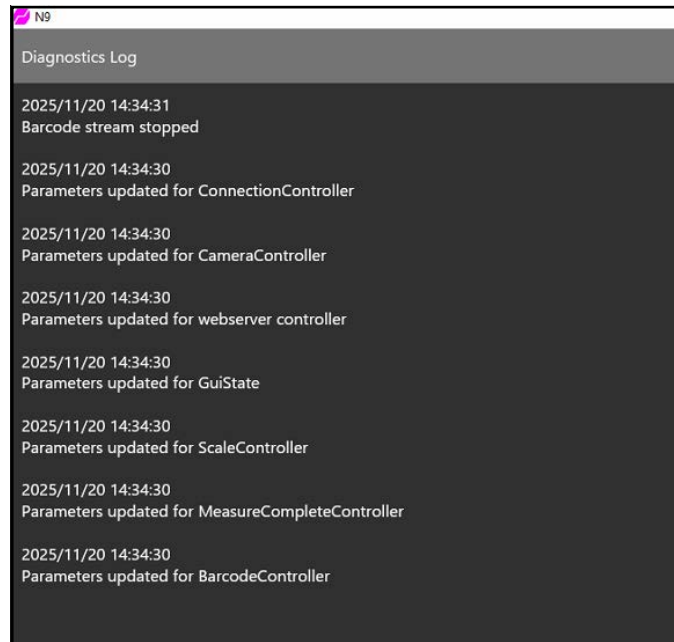


Figure 27
Diagnostic log

Configuration Log

The configuration log displays the configuration audit trail. When configuration changes are made to the Cubiscan N9, the changes are recorded here. Changing dimension units, weight units, and dim factors are examples of the changes that are stored here.

To access the configuration audit log, tap **[CONFIGURATION LOG]** from the Diagnostics menu. The configuration log will display on the

screen.

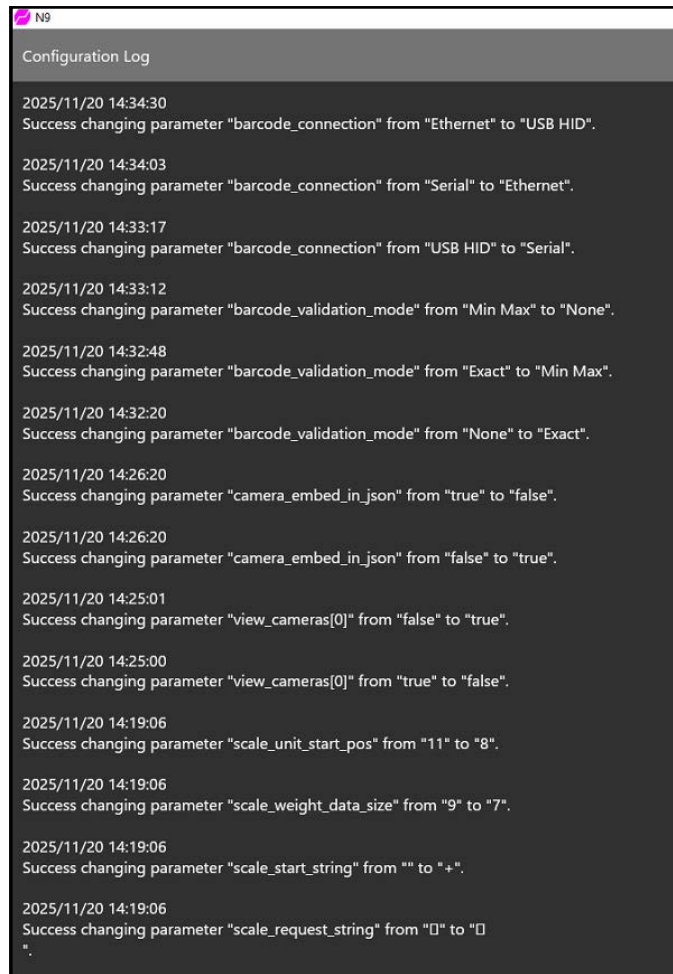


Figure 28
Configuration log

Calibration Log

The calibration log displays the results of calibration. When a calibration is performed on the Cubiscan N9, any errors are recorded here. If the calibration is successful, it will be logged as well.

To access the calibration log, tap **[CALIBRATION LOG]** from the Diagnostics menu. The calibration log will display on the screen.

Update Log

The update log displays a timestamp of the updates to the system software. The update log provides a list of each update to the Cubiscan N9 and when it was performed. This may be helpful to determine if a update is required.

To access the update log, tap **[UPDATE LOG]** from the Diagnostics menu. The update log will display on the screen.