Manual of Operation and Instruction

Troxler
PlusLoader Software

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Troxler gauges are protected under U.S. and foreign patents.

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NOTE

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HOW TO USE THIS MANUAL

Congratulations on purchasing the **Troxler PlusLoader** software.

The **Troxler PlusLoader** *Manual of Operation and Instruction* explains how to install and register the software, and provides procedures for using the software to load calibration constants into Troxler Model 3430 Plus, 3440 Plus, and 3451 gauges.

GUIDE TO SYMBOLS

Throughout this manual symbols often reveal the purpose of the text. The symbols and their purpose are as follows:

NOTE
Indicates important information that must be read to ensure proper operation.

⟨KEY⟩ Angle brackets and a different typestyle indicate a key or character (number or letter) to press on the gauge keypad, PDA, or computer. For example, "Press ⟨**START/ENTER**⟩" means to press the key labeled *START/ENTER*.

DISPLAY A different typestyle is used in text to indicate information or messages displayed on the gauge or PDA.

```
DISPLAY - Typestyle
and shading used to
simulate the gauge
display
```

♦ Diamonds indicate a list of things needed (such as equipment) or things to know.

✓ Check marks indicate the performance of an action. With lists of check marks, follow the instructions in the order of the check marks.

► Triangles indicate that more than one option is available. Carefully select the option that applies.

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INTRODUCTION

The **Troxler PlusLoader** software enables gauge users to upload and download calibration constants to and from Troxler Model 3430 Plus, 3440 Plus, and 3451 gauges. This software is a useful tool for gauge users who choose to compute gauge calibration constants using a method other than the Troxler Plus Calibration Suite.

This manual provides instructions on installing and registering the PlusLoader software, as well as for using the software to load calibration constants into a gauge and to download the constants currently in the gauge.

COMPUTER REQUIREMENTS

The following sections list the hardware and software requirements for installing and using the Troxler PlusLoader software on personal computers equipped with the following operating systems.

NOTE

In addition to the hardware listed below, an RS-232 cable is required to connect the gauge to the computer's RS-232 connection.

- **To connect a Model 3451 gauge, the cable must be a standard RS-232 cable, with a DB9 female connector on one end and a DB9 male connector on the other (Troxler PN 110708).**
- **To connect a Model 3430 Plus or Model 3440 Plus gauge, the cable must be an RS-232 *null modem* cable (Troxler PN 113128), with a DB9 female connection on both ends.**

Windows XP Professional Edition

Minimum Hardware

Personal computer with a Pentium® 300 MHz processor or better and:

- 512 MB RAM
- Hard disk with 10 MB of free disk space
- CD-ROM drive
- VGA graphics adapter and monitor (default) with 256 colors or better
- Mouse
- Keyboard
- PCI serial card or an available USB port with an RS-232 serial-to-USB adapter

Recommended Hardware

- Pentium 1 GHz processor
- 1 Gigabyte RAM
- SVGA graphics adapter and monitor (default) with 1024 colors

Windows XP Home Edition

Minimum Hardware

Personal computer with a Pentium 300 MHz processor or better and:

- 256 MB RAM
- Hard disk with 10 MB of free disk space
- CD-ROM drive
- VGA graphics adapter and monitor (default) with 256 colors or better
- Mouse
- Keyboard
- PCI serial card or an available USB port with an RS-232 serial-to-USB adapter

Recommended Hardware

- Pentium 1 GHz processor
- 512 MB RAM
- SVGA graphics adapter and monitor (default) with 1024 colors

Windows XP Media Center Edition

Minimum Hardware

Personal computer with a Pentium 300 MHz processor or better and:

- 512 MB RAM
- Hard disk with 10 MB of free disk space
- CD-ROM drive
- VGA graphics adapter and monitor (default) with 256 colors or better
- Mouse
- Keyboard
- PCI serial card or an available USB port with an RS-232 serial-to-USB adapter

Recommended Hardware

- Pentium 1 GHz processor
- 1 Gigabyte RAM
- SVGA graphics adapter and monitor (default) with 1024 colors

Windows 2000 Edition

Minimum Hardware

Personal computer with a Pentium 300 MHz processor or better and:

- 128 MB RAM
- Hard disk with 10 MB of free disk space
- CD-ROM drive
- VGA graphics adapter and monitor (default) with 256 colors or better
- Mouse
- Keyboard
- PCI serial card or an available USB port with an RS-232 serial-to-USB adapter

Recommended Hardware

- Pentium 1 GHz processor
- 512 MB RAM
- SVGA graphics adapter and monitor (default) with 1024 colors

SECURITY FEATURES

The Model 3430 Plus, 3440 Plus, and 3451 gauges feature security functions that inhibit unauthorized users from accessing or tampering with gauge functions and data. This security extends to the manner in which calibrations are performed. Consequently, there are several points during a typical calibration when a *security check* is performed by the software. Most of these points occur when a menu-level function is begun.

The security check ensures that the gauge that is being calibrated should be communicating with the computer that is calibrating it, and vice versa. When a menu-level function that requires a security check is begun, the message box shown in Figure 1 is displayed.

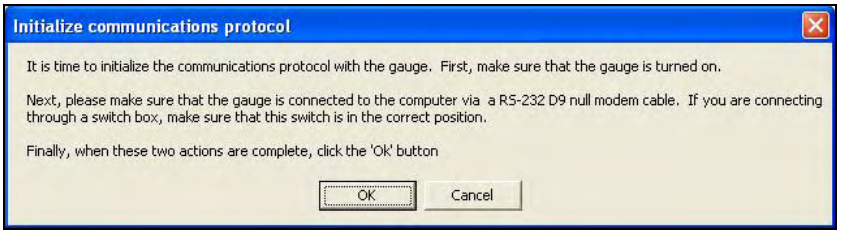

Figure 1. Initialize Communications Protocol Message Box

As directed, confirm that the gauge is on and that the RS-232 cable is properly plugged in and configured, then click the ⟨**OK**⟩ button.

The program then looks for a "security key" that the gauge and computer share if they are authorized to communicate with each another. One of three scenarios could take place:

- If there is currently no key, the software will ask the gauge for the key, and the gauge will pass the key to the computer.
- If there is a valid key, the software tries the key in the gauge to confirm that it works.
- If there is a key but it is not valid, the key will fail when the software tries it in the gauge.

The first two scenarios are the most common.

If the security key is confirmed, the software displays a message box that states **The key is obtained**. A number, which varies from gauge to gauge, is displayed in the left side of the message box. To complete the security check and continue with the calibration, click ⟨**OK**⟩.

If the security key cannot be confirmed, a **Communications error** message box similar to the one shown in Figure 2 is displayed. Follow the instructions in the message box, and resume the calibration.

Figure 2. Communications Error Message Box

INSTALLING, REGISTERING, AND UNLOCKING THE SOFTWARE

Before the Troxler PlusLoader software can be used to load calibration constants into a Troxler Model 3430 Plus, 3440 Plus, or 3451 gauge, the software must be installed, registered with Troxler, and unlocked as described in the following sections.

NOTE

The following procedures apply to any of the Windows operating systems supported by the Troxler PlusLoader software.

SOFTWARE INSTALLATION

To install the Troxler PlusLoader software:

Insert the Calibration CD-ROM into the computer's CD-ROM drive.

The CD-ROM is AutoPlay (or AutoRun) enabled. Wait for the AutoPlay screen for this CD-ROM to be displayed. Follow the onscreen instructions for installing the software application.

NOTE

If the AutoPlay function is disabled on this computer, follow your operating system's instructions for running the AutoPlay program on a CD-ROM.

The installation of the software adds a **Troxler PlusLoader** program group to the computer's **Programs** menu. The program subgroup will have four menu items:

- The PlusLoader software application itself
- An **Uninstall** item for the software application
- A **Register Software** item
- A **Help and Support** item

REGISTERING THE SOFTWARE

Once the software installation is complete, the software will need to be registered with Troxler to be functional. To start the Calibration Registration program:

1.1 Click the Windows ⟨**Start**⟩ button, then select the **All Programs** menu and the **Troxler PlusLoader** program group.

1.2 From the **Troxler PlusLoader** program group, select the **Register Software** menu item.

1.3 After the software has been loaded, the **License Information** main menu shown in Figure 3 is displayed.

1.4 Enter the requested information, Press the ⟨**Register**⟩ button. The Calibration Registration program creates a file on the desktop named *TroxlerRegistrationInfo.txt* and displays a **Register Software** prompt.

1.5 As directed, e-mail the *TroxlerRegistrationInfo.txt* file to **softwaresupport@troxlerlabs.com** using the subject line "Calibration Software Registration Request."

1.6 Press the ⟨**OK**⟩ button to exit.

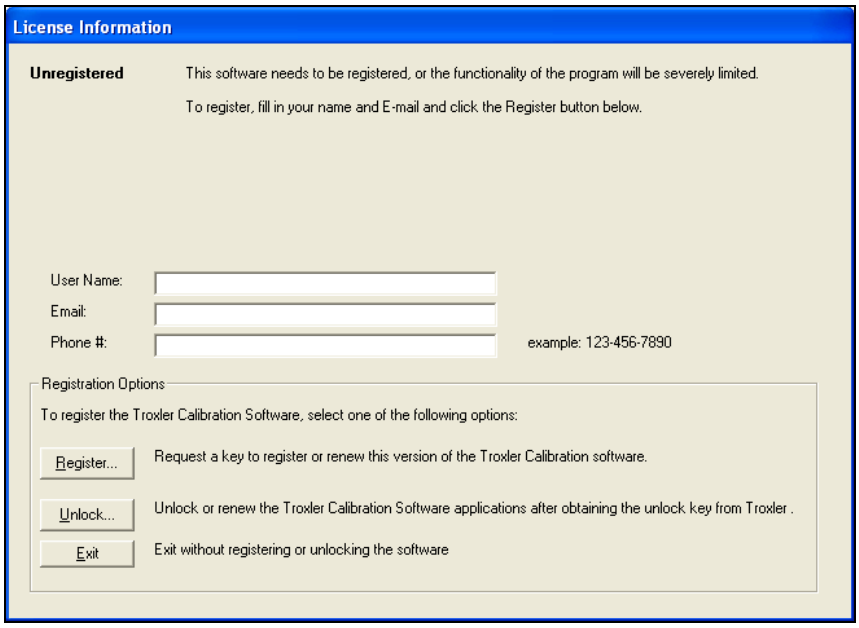

Figure 3. License Information Main Menu

UNLOCKING THE SOFTWARE

After registering the software as described in the previous section, you will receive an e-mail response from Troxler that has a *Registration Key File* attached. The file will be named *TroxlerUnlockInfo.txt.* When you receive this e-mail, save the file to the computer on which the software has been installed.

To unlock the software:

1.7 Repeat steps 1.1 and 1.2 on page 5 to display the **License Information** main menu (see Figure 3).

1.8 On the **License Information** main menu, press the ⟨**Unlock**⟩ button. The **Open key file** message box shown in Figure 4 is displayed. Click the ⟨**OK**⟩ button.

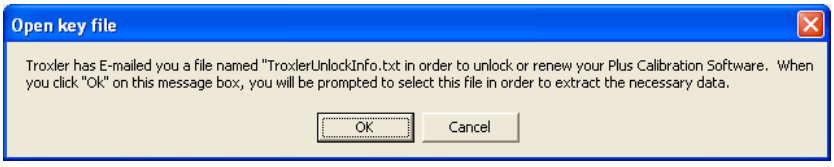

Figure 4. Open Key File Message Box

1.9 A **File Open** dialog box is now displayed. Use this dialog box to open the file *TroxlerUnlockInfo.txt* that was e-mailed to you from Troxler. Once this file has been opened, the software will be unlocked and the Calibration Registration program will display a message box that states **Registration Successful**.

1.10 Click the ⟨**OK**⟩ button to return to the **License Information** main menu, then click ⟨**Exit**⟩.

NOTE

The status of your registration can be viewed at any time by clicking the ⟨License Status⟩ button on the PlusLoader main menu (see Figure 5 on page 8).

PREPARING THE GAUGE TO ENTER THE CALIBRATION CONSTANTS

After the software has been installed, registered, and unlocked, it can be used to load calibration constants into the gauge.

As described in the *Computer Requirements* section on page 1, the computer must be equipped with a PCI serial card or an available USB port with an RS-232 serial-to-USB adapter. In addition, an RS-232 cable is required to connect the gauge to the computer's RS-232 connection:

- To connect a Model 3451 gauge, the cable must be a standard RS-232 cable, with a DB9 female connector on one end and a DB9 male connector on the other (Troxler PN 110708).
- To connect a Model 3430 Plus or Model 3440 Plus gauge, the cable must be an RS-232 *null modem* cable (Troxler PN 113128), with a DB9 female connection on both ends.

Before using the PlusLoader software to load the calibration constants into the gauge, connect the gauge to the computer and prepare the gauge to communicate with the computer as follows:

2.1 Turn on the gauge. If the gauge is a Model 3430 Plus or 3440 Plus, allow the gauge to complete the self-check, but you can skip the 300 second warmup period.

2.2 Connect the proper RS-232 cable between the gauge and the computer. Take note of the number assigned to the computer communications port that you are using (if you have more than one port).

- If the gauge is a Model 3451, no further preparation is required. Proceed to the *Loading the Calibration Constants into the Gauge* section on page 8.
- If the gauge is a Model 3430 Plus or 3440 Plus, however, the gauge must be in *Command Line Interface (CLI)* mode in order to communicate with the computer. Proceed to step 2.3.

2.3 On the gauge keypad, press ⟨**SETUP**⟩ to access the **Setup** menu.

2.4 From the **Setup** menu, press ⟨**.**⟩ ⟨**9**⟩ to access the gauge's **Extended** menu.

2.5 The gauge requests an access code. Press ⟨**4**⟩ ⟨**7**⟩ ⟨**0**⟩ ⟨**8**⟩, then press the ⟨**ENTER/START**⟩ key. The **Extended** menu is displayed.

2.6 From the **Extended** menu, press ⟨**.**⟩ ⟨**9**⟩ to access the gauge's **Factory** menu.

2.7 The gauge again requests an access code. Press ⟨**3**⟩ ⟨**7**⟩ ⟨**6**⟩ ⟨**7**⟩, then press the ⟨**ENTER/START**⟩ key. The **Factory** menu is displayed.

2.8 From the **Factory** menu, press ⟨**1**⟩. The gauge enables the CLI mode and returns to the **Factory** menu. **The gauge is now ready to communicate with the computer.**

LOADING THE CALIBRATION CONSTANTS INTO THE GAUGE

The calibration constants can now be loaded into the gauge. If the user wishes to re-use some of the calibration constant that are currently in the gauge from a previous calibration, this step in the process will allow them to do this task automatically. However, if there are calibration constants that the user wishes to enter into the gauge that are not already in the gauge from a previous calibration, the user must have these new values available at this point.

To enter the calibration constants into the gauge:

3.1 Click the Windows ⟨**Start**⟩ button, then select the **All Programs** menu and the **Troxler PlusLoader** program group.

3.2 From the **Troxler PlusLoader** program group, select the **PlusLoader** program.

3.3 The *PlusLoader* main menu (see Figure 5) is displayed. Select the **Upload Calibration constants to a Troxler Model 3430 Plus, 3440 Plus, or 3451** option button, then click ⟨**Proceed**⟩.

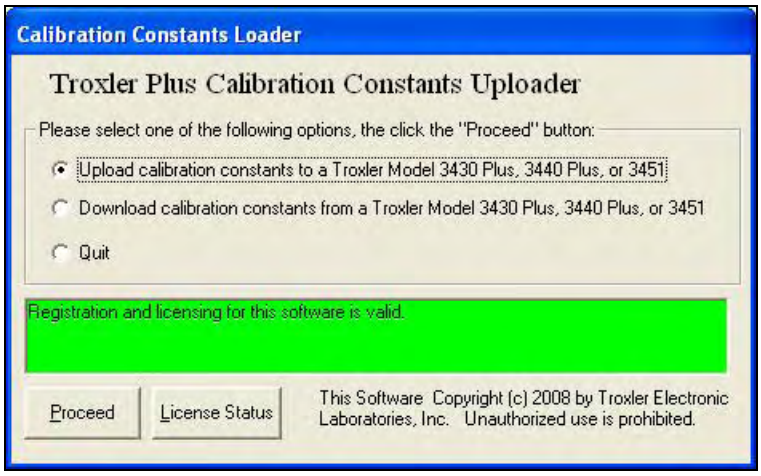

Figure 5. PlusLoader Main Menu

3.4 As shown in Figure 6, the program now prompts the user to select the RS-232 communications port through which the computer is connected to the gauge (see step 2.2 on page 7). Select the appropriate port number, then click ⟨**Proceed**⟩.

Figure 6. Communications Port Selection Screen

3.5 After the communications port is selected, the **Gauge Model** selection screen (see Figure 7) is displayed. Select the gauge model, then click ⟨**Proceed**⟩.

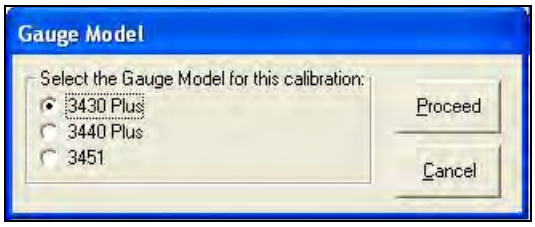

Figure 7. Gauge Model Selection Screen

3.6 As shown in Figure 8, the software now asks if the user would like to read (upload) the calibration constants currently stored in the gauge or not. This option is useful if you plan to re-use some of the current calibration constants. The software will read the values from the gauge and pre-load them into the data entry fields used to enter calibration constants into the gauge. If you do not plan to re-use any calibration constants, this option only creates more work.

- To read the calibration constants currently stored in the gauge, click ⟨**Yes**⟩ and proceed to step 3.7.
- To continue without reading the calibration constants currently stored in the gauge, click ⟨**No**⟩ and proceed to step 3.8.

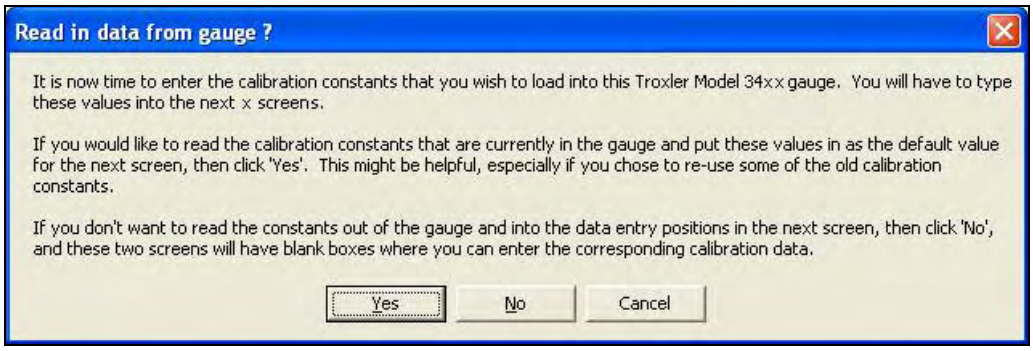

Figure 8. Query Regarding Whether to Read Calibration Constants from the Gauge

3.7 The program now reads the calibration constants from the gauge and prepares them for display. When the constants have all been read, the software displays a message box stating **Calibration Constants Complete**. Click ⟨**OK**⟩ on that message box and proceed to step 3.8.

3.8 The software now displays the **Enter Calibration and Gauge Data** screen for the gauge. For a Model 3451 gauge, the screen is structured as shown in Figure 9. For a Model 3430 Plus or 3440 Plus gauge, the screen is structured as shown in Figure 10.

NOTE

In the examples shown in Figure 9, Figure 10, and Figure 11, the user has chosen to read the calibration constants from the gauge. Therefore, all of the data entry boxes are populated with values from the previous calibration. If the user had chosen *not* to read the constants from the gauge, all data entry boxes on these forms would be initially blank, except for the Date of Calibration field, which would contain the current date as the default.

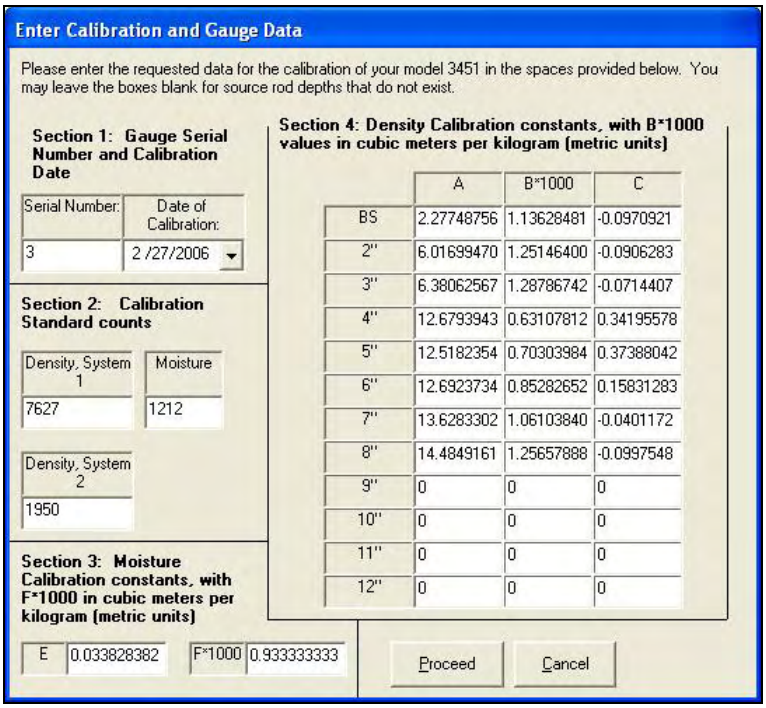

Figure 9. Enter Calibration and Gauge Data Screen for a Model 3451 Gauge

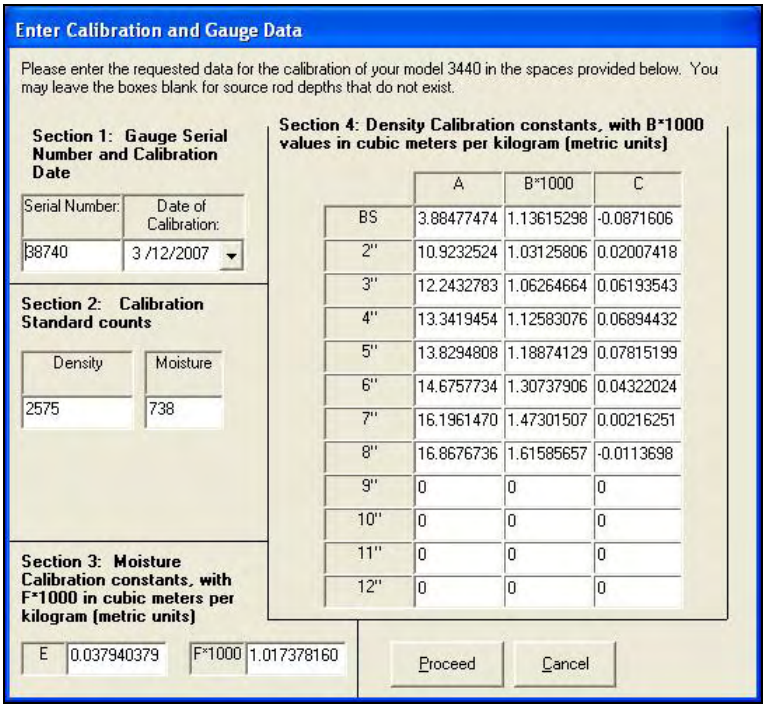

Figure 10. Enter Calibration and Gauge Data Screen for a Model 3430 Plus or 3440 Plus Gauge

3.9 Enter (or edit) the required data on this form, making sure that the correct metric units are used, then click ⟨**Proceed**⟩.

- If the gauge for which the calibration constants are being entered is a Model 3430 Plus or 3440 Plus, proceed to step 3.10.
- If the gauge for which calibration constants are being entered is a Model 3451, the software displays the **Enter the Thin Layer Calibration Constants** screen shown in Figure 11. Enter (or edit) the required data on this form, making sure that the correct English units are used, then click ⟨**Proceed**⟩ to continue to step 3.10.

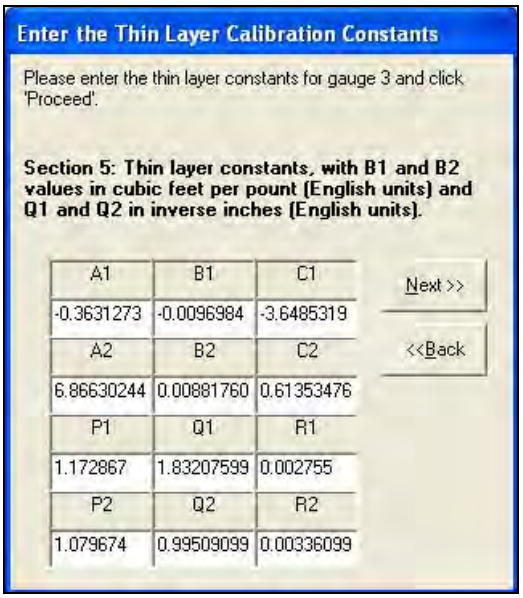

Figure 11. Enter the Thin Layer Calibration Constants Screen for a Model 3451 Gauge

3.10 After all of the calibration constants and related data have been entered and/or edited, the program will prepare to load the data into the gauge. The two security-related message boxes described in the *Security Features* section on page 4 will be displayed. Click ⟨**OK**⟩ on both of these message boxes.

3.11 After the security checks have passed, the data is transferred to the gauge. When the data transfer is complete, a message box stating **Calibration Storage Complete!** is displayed. Click ⟨**OK**⟩ on this message box.

3.12 A message box informing the user that the calibration constants have been successfully passed to the gauge is displayed. Click ⟨**OK**⟩ on this message box. The program returns to the PlusLoader main menu (see Figure 5).

3.13 At this point the calibration constants are in the gauge. If you wish to double-check the values that are in the gauge, or if you wish to generate a printout of these values, proceed to Chapter 4.

NOTE

For a Model 3430 Plus or 3440 Plus gauge, the process of loading the calibration constants into the gauge is now complete. However, if the gauge is a Model 3451, the new calibration constants must be uploaded from the gauge to the PDA. For instructions on uploading calibration constants from the Model 3451 gauge to the PDA, proceed to Appendix A on page 14.

READING THE CALIBRATION CONSTANTS FROM THE GAUGE

In addition to the functions described thus far, the PlusLoader software enables the user to read the calibration constants from a Model 3451, 3430 Plus, or 3440 Plus gauge, display the constants on the computer screen, and print them to a printer. To perform these tasks:

4.1 Ensure that the gauge is prepared to communicate with the computer, as described in the section that begins on page 7.

4.2 From the PlusLoader main menu (see Figure 5 on page 8), select the **Download calibration constants from a Troxler Model 3430 Plus, 3440 Plus, or 3451** option button, then click ⟨**Proceed**⟩.

4.3 As shown in Figure 6 on page 8, the program now prompts the user to select the RS-232 communications port through which the computer is connected to the gauge (see step 2.2 on page 7). Select the appropriate port number, then click ⟨**Proceed**⟩.

4.4 The software displays a message box that asks if the gauge being read is a Model 3451. Click ⟨**Yes**⟩ if the gauge is a Model 3451, or ⟨**No**⟩ if it is not.

4.5 The two security-related message boxes described in the *Security Features* section on page 4 are displayed. Click ⟨**OK**⟩ on both of these message boxes.

4.6 The program now reads the calibration constants from the gauge. When the constants have all been read, the software displays a message box stating **Calibration Constants Complete**. Click ⟨**OK**⟩ on the message box.

4.7 The program now displays the calibration constants that were downloaded from the gauge, as shown in Figure 12. To view all of the constants, use the scroll bar along the right side of the text box where the constants are displayed. To print a copy of the data, clicking ⟨**Print**⟩. To return to the PlusLoader main menu, click ⟨**Quit**⟩.

NOTE

The example shown in Figure 12 is for a Model 3451 gauge. The screen for a Model 3430 Plus or 3440 Plus gauge will have a slightly different format, as these gauge models have only one density standard count and no thin-layer constants.

Figure 12. Calibration Constants Downloaded from Gauge Screen

APPENDIX A. UPLOADING CALIBRATION CONSTANTS FROM THE GAUGE TO THE PDA (MODEL 3451 ONLY)

For a Model 3451 gauge, after the new calibration constants are loaded into the gauge, they must also be loaded into the PDA to be used when taking gauge measurements. To upload calibration constants from the gauge to the PDA:

A.1 Disconnect the RS-232 cable that is currently connected from the gauge to the computer.

A.2 Plug the Bluetooth® cordless serial adapter (see Figure 13) into the RS-232 port on the gauge and screw it snugly into place, as shown in Figure 14.

A.3 Locate the Intermec® 700 Series Color Mobile Computer (hereafter referred to as the *PDA*) that will be used with this gauge. A picture of the PDA is shown in Figure 15.

Front View *Back View*

Figure 13. Bluetooth Cordless Serial Adapter

Figure 14. Bluetooth Cordless Serial Adapter Installed in the Gauge

Figure 15. Intermec 700 Series Color Mobile Computer

A.4 Press the power switch (labeled **I/O**) located in the upper left corner of the PDA keypad. The PDA powers up, then displays the **Troxler** menu shown in Figure 16.

A.5 To start the RoadReader Plus software, press the ⟨**Troxler 3451**⟩ button on the **Troxler** menu. The software displays a splash screen that includes the software version and gauge serial number. The software then establishes Bluetooth wireless communications between the PDA and gauge. Once the PDA establishes communications with the gauge, the software displays the status of the gauge's nickel-metal hydride (NiMH) batteries, as shown in Figure 17.

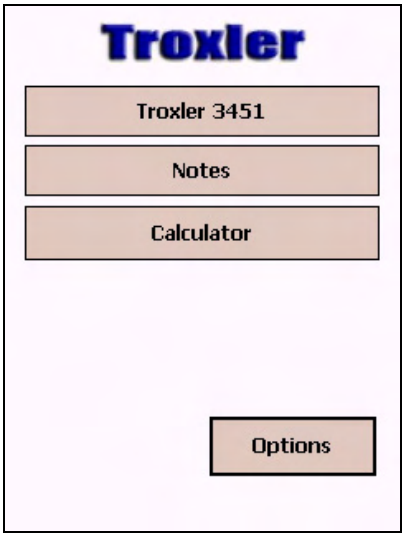

Figure 16. Troxler Menu

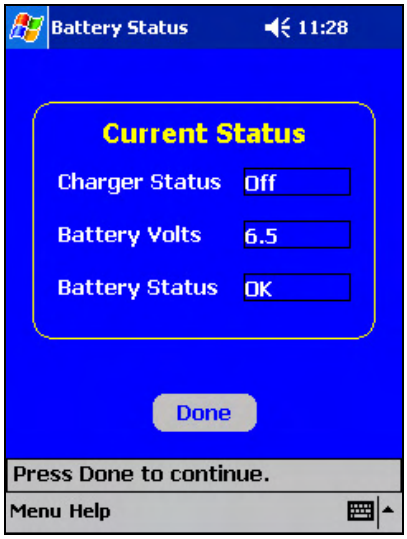

Figure 17. Battery Status Display

A.6 Press the ⟨**Done**⟩ button to continue. The gauge enters a 5-minute warmup period and the PDA displays the **Gauge Warm Up** display shown in Figure 18. Press the ⟨**Abort**⟩ button.

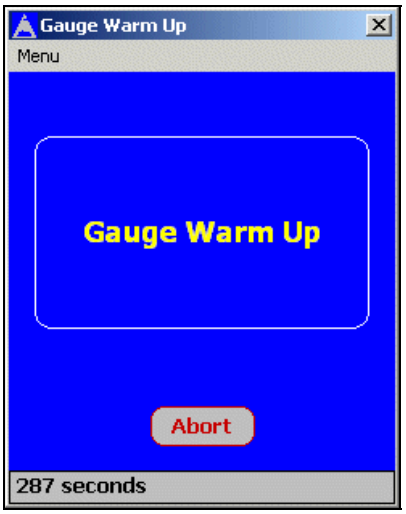

Figure 18. Gauge Warm Up Screen

A.7 The PDA displays the RoadReader Plus main menu, as shown in Figure 19. Press the ⟨**Gauge Tools**⟩. The **Gauge Tools** menu shown in Figure 20 is displayed.

A.8 From the **Gauge Tools** menu, press the ⟨**Diagnostics**⟩ button. The **Diagnostics Menu** shown in Figure 21 is displayed.

A.9 From the **Diagnostics Menu**, click the word **Menu** in the lower left corner of the screen. A dropdown menu will appear in the lower left side of the screen, as shown in Figure 22.

Figure 19. RoadReader Plus Main Menu

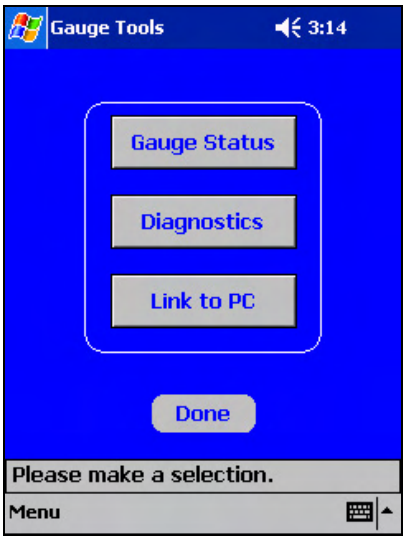

Figure 20. Gauge Tools Menu

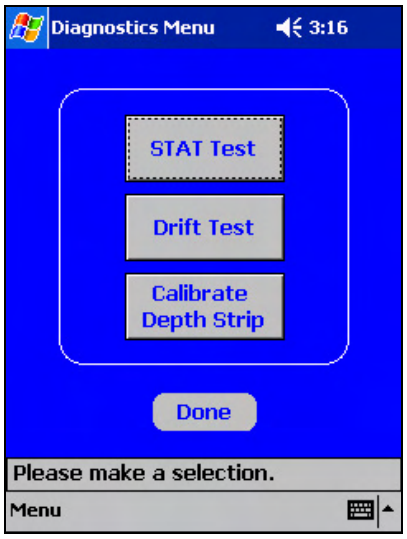

Figure 21. Diagnostics Menu

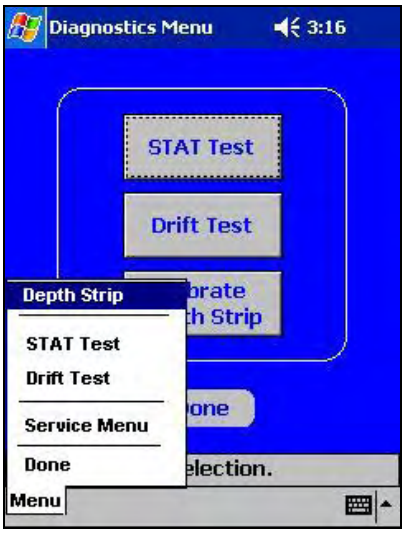

Figure 22. Diagnostics Menu, with Dropdown Menu Activated

A.10 From the dropdown menu shown in Figure 22, click on the **Service Menu** option. The software requests a service code, as shown in Figure 23.

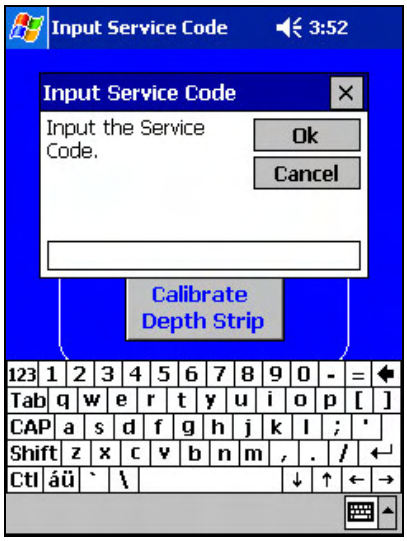

Figure 23. Service Code Prompt

A.11 Using the keypad in the lower half of the screen or the keypad on the PDA itself, Enter the code *1961* and press ⟨**Ok**⟩.

A.12 The PDA displays the **Service Menu** shown in Figure 24. Press the ⟨**Calib Const**⟩ button.

A.13 The PDA displays the **Calibration Constants** menu shown in Figure 25. To retrieve the calibration constants stored in the gauge, press the ⟨**Automatic**⟩ button.

Figure 24. Service Menu

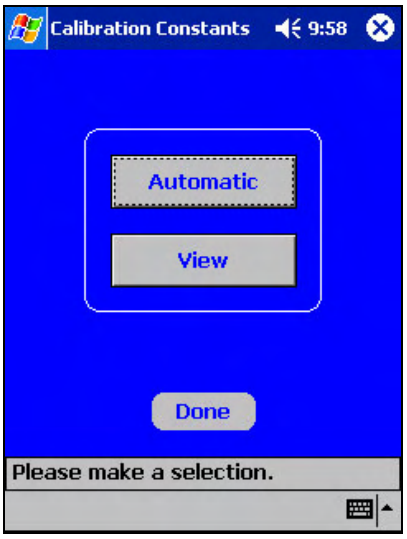

Figure 25. Calibration Constants Menu

A.14 The RoadReader Plus software collects the constants from the gauge and stores them in the PDA memory. During this process, the PDA displays the message **Collecting Data from the gauge**. Note that this data transfer takes only a second or two.

A.15 After the gauge has finished sending the calibration constants to the PDA, the PDA returns to the **Calibration Constants** menu, with a message box that states **Calibration Constants Complete** superimposed over it. This message indicates that the calibration constants were transferred from the gauge to the PDA without any problems. Click the ⟨**Ok**⟩ button to close the message box and return to the unobstructed **Calibration Constants** menu.

A.16 Click the ⟨**View**⟩ button.

A.17 The *E* and *F*1000* calibration constants in the PDA are now displayed on the screen. Check these values to make sure that they are correct, then click the ⟨**Next**⟩ button.

A.18 The next set of calibration constants are now displayed on the screen. Note that density *B* values are displayed as their metric *B*1000* values and thin layer values will be displayed as their English unit values. Check the values to make sure that they are correct, then click the ⟨**Next**⟩ button.

A.19 Repeat step A.18 until all calibration constants in the PDA have been reviewed.

A.20 When all calibration constants have been reviewed, click ⟨**Done**⟩ to return to the **Service Menu**.

A.21 On the **Service Menu**, click the ⟨**Done**⟩ button to return to the **Diagnostics Menu**.

A.22 On the **Diagnostics Menu**, click the ⟨**Done**⟩ button to return to the **Gauge Tools** menu.

A.23 On the **Gauge Tools** menu, click the ⟨**Done**⟩ button to return to the RoadReader Plus main menu.

The process of loading the new calibration constants from the gauge into the PDA is now complete. The gauge is now fully ready to use with the new calibration constants.