MTI Part Number 7001-0040
Revision 3.1 – August 7, 2014

Note:
Performing a user calibration with the software package will result in an accuracy of 2% at best. A factory cal is required to achieve the original published MTI specifications.

1510A

Precision Signal Source with direct digital synthesis

Software Operation Manual

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MTI Instruments, Inc.
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Thank you for purchasing your copy of the 1500 Series Precision Signal Source Software Package

The 1500 Series Precision Signal Source Software Package has been designed to help you realize the full power of your 1500CS Precision Calibrator or 1510A Precision Signal Source. Once the software has been loaded on a standard PC computer and the communications link installed and connected to the 1500CS Calibrator, the software package will enable you to perform many useful maintenance and calibration tasks including:

- Setup of the 40 Memory Locations
- Manage the configuration of your 1500CS or 1510A
- Control of the 1500CS or 1510A output signals from your computer

MTI Part Number 7001-0040
Revision 3.1 August 7, 2014

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OVERVIEW OF THE 1500 SERIES SOFTWARE PACKAGE

The 1500 Series Precision Signal Source Software Package is a perfect companion to your 1500CS Precision Calibrator or 1510A Precision Signal Source. The package features an easy-to-use user interface, and offers a number of useful utilities for the control and maintenance of your 1500 Series Unit. With the Software Package, you will be able to:

Pre-Program Memory Locations – The 1500CS and 1510A have 40 memory locations that can hold pre-programmed signal settings. Each location can be pre-programmed and downloaded in the unit using this Software Package.

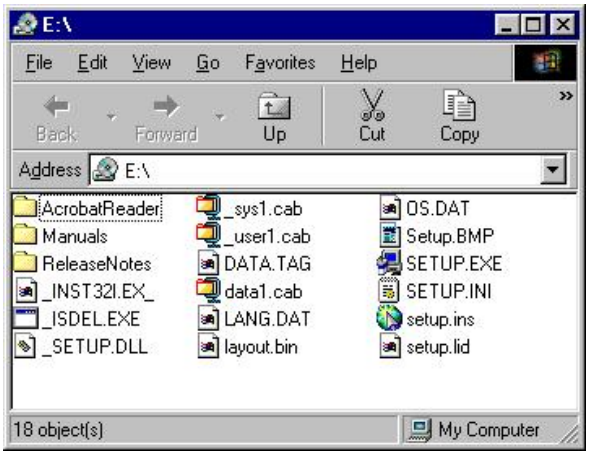
Review Memory Location Programs – The 1500CS and 1510A have 40 memory locations that can hold pre-programmed signal settings. Each or all of the 40 memory location settings can be up-loaded from the unit for review and editing. Changes can then be downloaded back into the unit.

Check Calibrator Configuration – The 1500CS and 1510A have several internal parameters such as software revision level, most recent calibration date, and unit serial numbers stored in its memory. All of these parameters may be viewed using this Software Package.

Remote Control Of signals – The 1500 Series Precision Signal Source Software Package also provides an easy to use interface for controlling the signals generated by the 1500CS via its RS-232 interface and the 1510A via its USB interface.

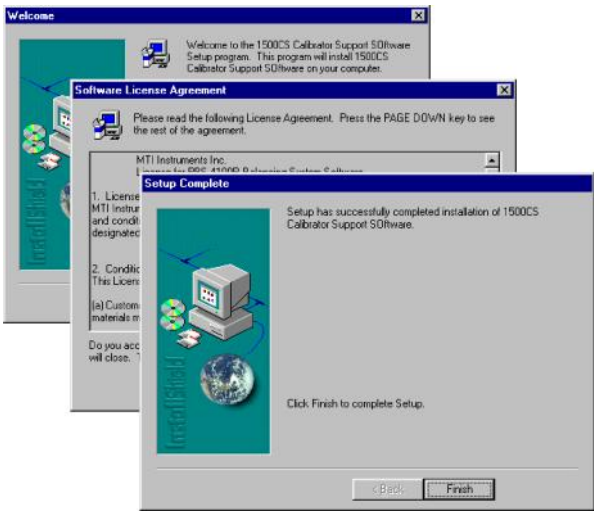
The 1500 Series Precision Signal Source Software Package is supplied on CD-ROM. This software must be installed before connecting the 1510A Precision Signal Source to your computer for the first time. Open a Windows Explorer window to view the contents of the CD.

Double Click on the SETUP.EXE program to begin the installation process as illustrated:



As the program installation continues, a welcome display will be produced, followed by the License acceptance display. At the conclusion of the installation process, the software loading completion display will appear as illustrated below.

Click on the FINISH button to complete the process.



At this time you may also wish to install a copy of the Acrobat Reader which is also included on the CD.

Note that the CD also includes a folder, which contains PDF versions of both the 1500 Series Users Manual and a copy of this manual.

If necessary, open the Adobe folder and install the Adobe Reader application.

When all software has been installed, remove the CD from the drive.

INSTALLING THE 1510A USB DRIVER

During Setup, the file mti1510A.INF was copied to the Windows\INF folder on your computer. This file contains instructions for loading the required USB drivers for the 1510A Precision Signal Source.

Verify that this file exists. If it does not, manually copy the file from the USB folder on the CDROM and placed it in your Windows\INF folder.

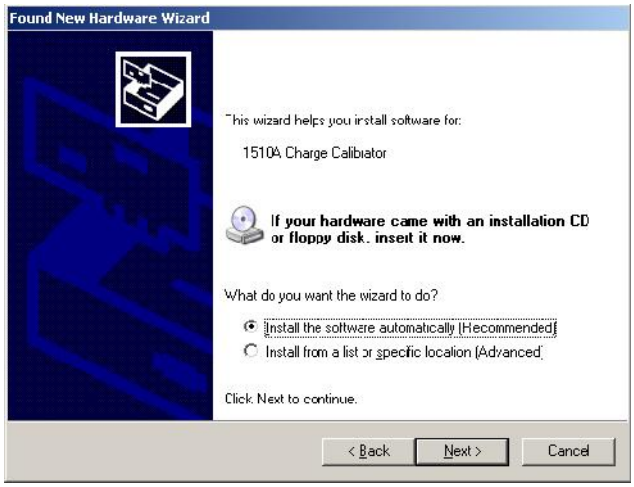
After verifying that the INF file exists, connect the USB cable to the 1510A and connect it to a free USB port on your computer.

The Windows Found New Hardware Wizard screen will display.

Select No, not this time and press Next.

Select Install the software automatically (Recommended) and press Next.

If warned that the driver has not passed Windows Logo Testing, press Continue Anyway.



When driver installation completes, press Finish.

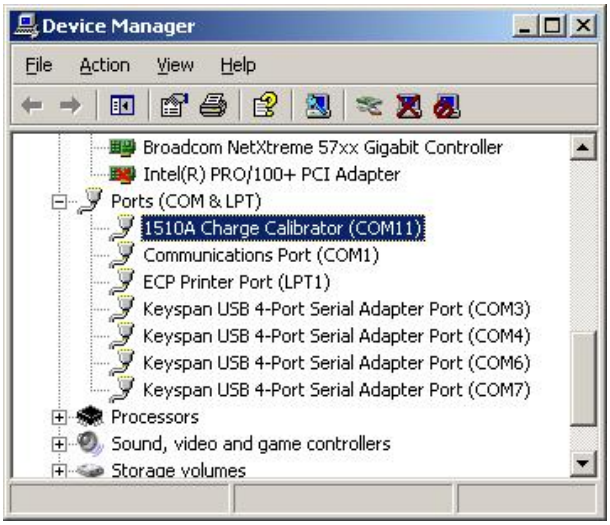
Your 1510A is ready for use.

Click Start-Settings-Control Panel and double click the System icon. When the System Properties dialog displays, click the Hardware tab.

Then click the Device Manger button.

In Device Manager, scroll down to the Ports category and open it. Locate the 1510A Charge Calibrator entry and note the assigned COM port. In the next step, the COM port value must be entered into the program INI file.

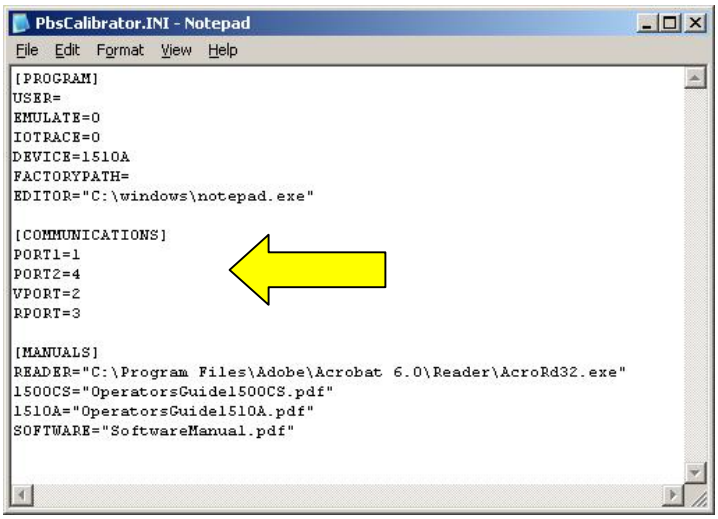
Close the Device Manager.



BEFORE YOU START THE SOFTWARE

After installation of the software you will need to check a few items to ensure efficient operation of all program features.

First, open the file: C:PBS\PbsCalibrator\Program\PbsCalibrator.INI



Verify that the path to the Adobe reader is correct for your system. If not, replace the correct path within the quotation marks in the INI file and SAVE. If you do not have Adobe reader installed, the 1500 Series Precision Signal Source Software Package CDROM contains a copy of the Adobe reader installation package.

Also verify that the Serial Port number listed in the INI file is correct for your system. 1=COM1, 2=COM2, etc.

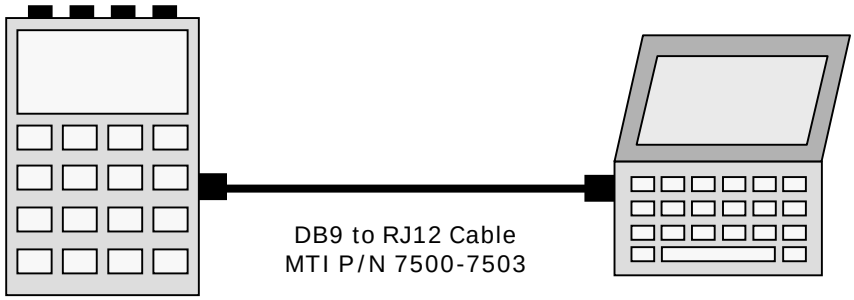
For the 1500CS, set PORT1 to the appropriate serial port number.

For the 1510A, set PORT2 to the port number previously determined from Device Manager.

Make the necessary changes, SAVE and close the INI file viewer. All other entries and setting in the file should be left unchanged.

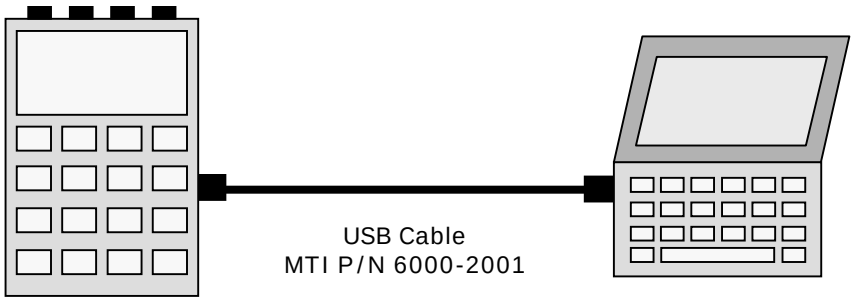
Finally, you may wish to place a shortcut to the program on your computer desktop. The 1500 Series Precision Signal Source Software Package program is located in:
C:\PBS\PbsCalibrator\Program\PbsCalibrator.exe

Your 1500CS accessory kit includes a communications cable that connects between the 1500CS Calibrator and your computer via an RS232 port. MTI Cable 7500-7503 has been designed specifically to connect between the 1500CS and your computer.



1500CS

Your 1510A accessory kit includes a communications cable that connects between the 1510A Precision Signal Source and your computer via a USB port. MTI Cable 6000-2001 has been designed specifically to connect between the 1510A and your computer.



1510A

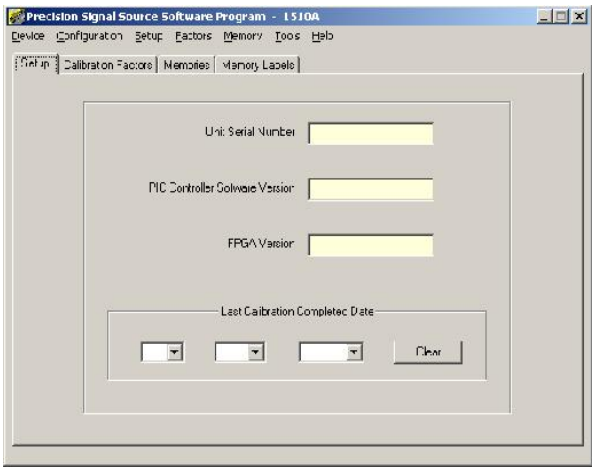
For successful communications ensure that your computer port is connected as illustrated above.

STARTING THE SOFTWARE

Double clicking on the program icon will launch the 1500 Series Precision Signal Source Software Program.

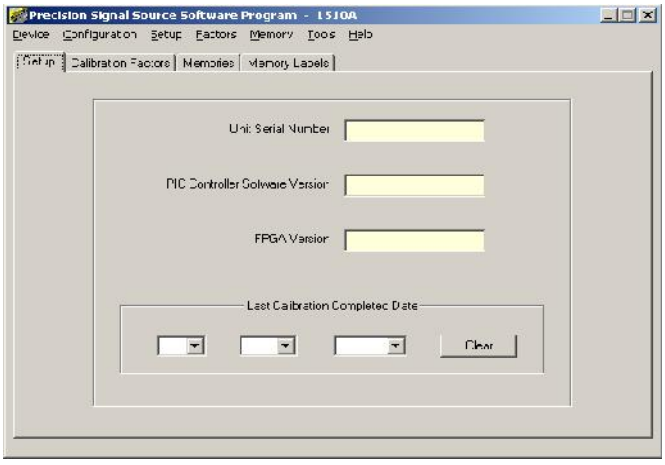
An introductory display will first be visible:

Followed by the user interface display:

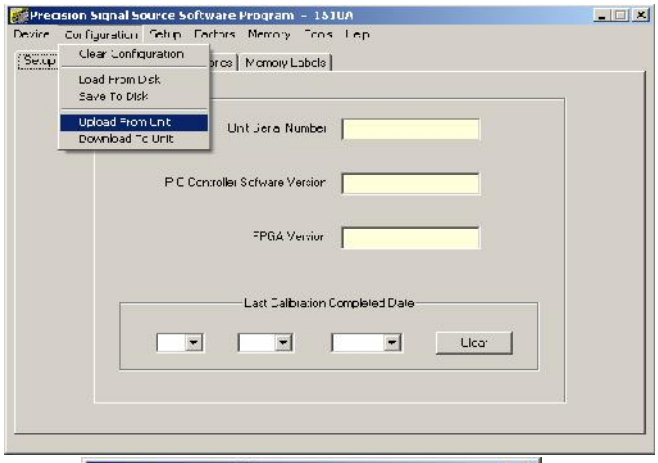


The following sections of this manual will explain the various features and functions of the software package.

The SETUP tab displays information concerning the internal software version number, unit serial number, and the calibration date of your 1500 Series unit. When the 1500 Series Precision Signal Source Software Package is first run, the data windows on this display will be blank as illustrated:



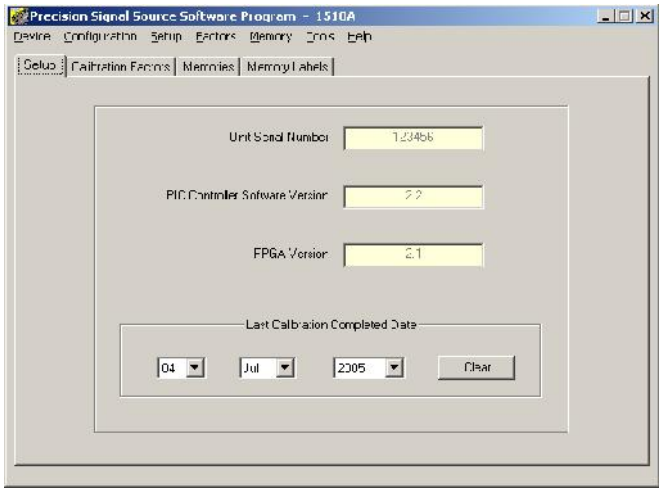
To refresh the data displayed in the windows, use the CONFIGURATION drop-down menu, and select the Upload From Unit option as illustrated.



After acknowledging the Upload success message, the display will be updated with the current 1500CS internal settings.

Although the serial number and software version numbers cannot be changed, it is useful information when talking to your MTI Instruments support representative.

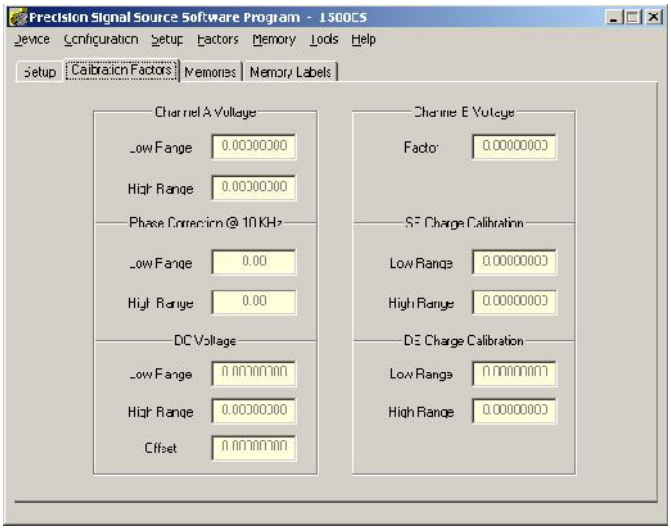
The “Last Calibration Date” information may be changed by the user of the calibrator.



CALIBRATION FACTORS Tab

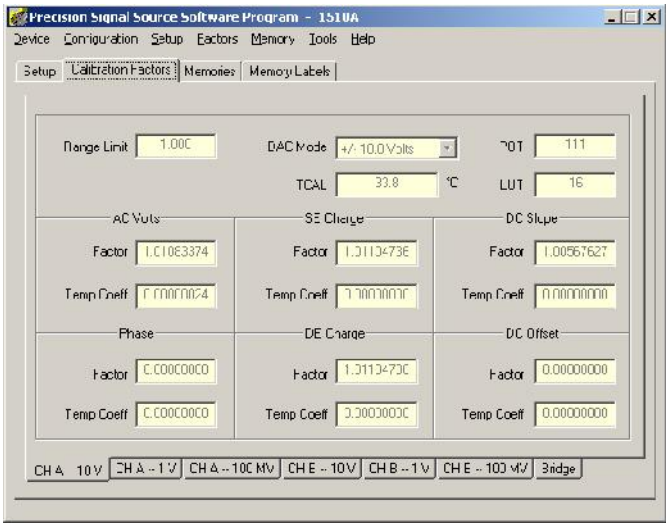
The CALIBRATION FACTORS tab at right reveals the internal calibration constants display for the 1500CS calibrator.

Note that there are several different calibration constants maintained for the different ranges of the 1500CS.



The CALIBRATION FACTORS tab at right reveals the internal calibration constants of the 1510A Precision Signal Source.

Note that there are several different tabs along the bottom of the display that are used to select the calibration constants maintained for the different ranges of the 1510A.



These calibration factors cannot be changed.

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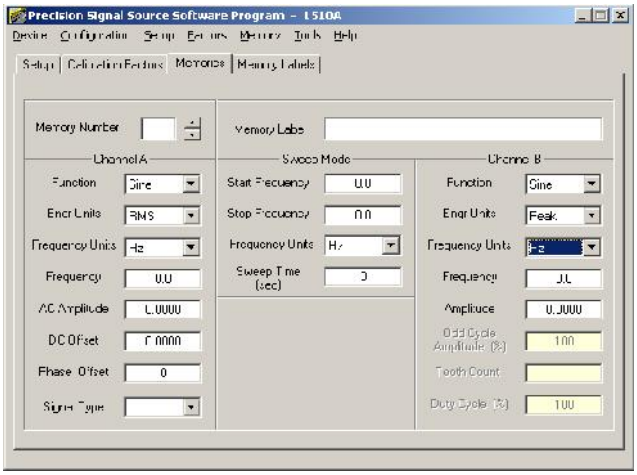
The MEMORIES Tab allows users to view and edit the settings saved in each of the 40 individual memory locations of the 1500CS and 1510A.



MEMORY NUMBER – Indicates the specific Memory Location and contents being displayed. Use the up and down pointers to index thru all of the 40 locations.

MEMORY LABEL – Use this area to enter a unique name for the signal being defined. The first 8 characters will be displayed on the 1500 Series unit display when the memory is selected. You may also name memory locations using the Memory Label tab.

CHANNEL A SETTINGS:

FUNCTION – This may be set to SINE, TRIANGLE, SAWTOOTH, or SQUARE wave signals using the drop down menu selector.

ENGINEERING UNITS – The amplitude units of the signal may be set to PEAK, PEAK to PEAK, or RMS using the drop down menu selector.

FREQUENCY UNITS – Use the drop down tool to select either Hz (hertz or cycles per second) or RPM (Revolutions per Minute).

FREQUENCY – Enter the desired frequency setting for the signal.

AC AMPLITUDE – Enter the desired amplitude value (see ENGINEERING UNITS Above) of the signal.

DC OFFSET – Enter the desired amount of DC voltage offset of the signal.

PHASE OFFSET – Enter the desired phase offset in degrees (relative to Channel B signal).

SIGNAL TYPE – Use the drop-down feature to select between VOLTS and Single Ended (SE) or Differential (DE) CHARGE type of signal.

SWEEP MODE SETTINGS - The 1500CS can generate a signal on channel B whose frequency constantly varies over a specified period of time. This feature is useful for simulating acceleration or deceleration runs of machinery.

START FREQUENCY – This value defines the frequency at which the SWEEP will begin.

STOP FREQUENCY – This value defines the frequency at which the SWEEP will stop.

FREQUENCY UNITS – Use the drop down tool to select either Hz (hertz or cycles per second) or RPM (Revolutions per Minute).

SWEEP TIME – Enter the period of time (in seconds) in which the sweep will be performed.

CHANNEL B SETTINGS

FUNCTION – This may be set to SINE, TRIANGLE, SAWTOOTH, SQUARE, PULSE, TACH or TTL signals using the drop down menu selector.

PULSE MODE – The 1500CS and 1510A produce a single pulse occurring at the same frequency or at a ratio of the Channel A frequency. The pulse duty cycle can be programmed from 3% to 100% of the period.

TACH MODE – The 1500CS and 1510A can produce a series of pulses simulating a multi-tooth gear speed signal.

ENGINEERING UNITS – The amplitude units of the signal may be set to PEAK, PEAK to PEAK, or RMS using the drop down menu selector.

FREQUENCY UNITS – Use the drop down tool to select either Hz (hertz or cycles per second), RPM (Revolutions per Minute), or RATIO.

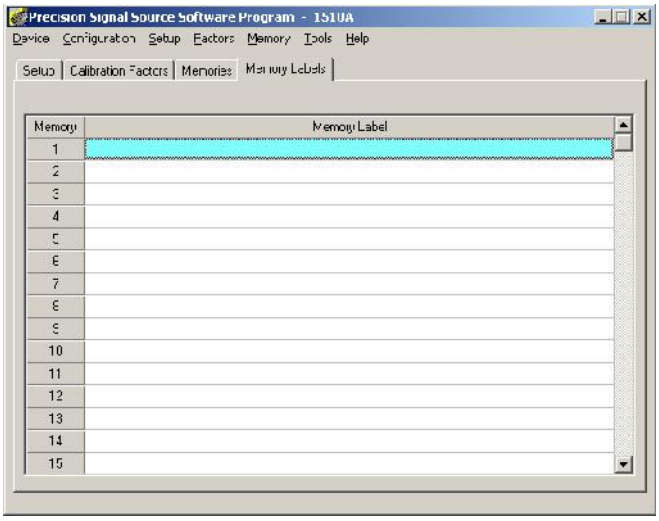
FREQUENCY – Enter the desired frequency setting for the signal. The frequency may be in Hertz (Hz) or a ratio of the Channel A frequency. When RATIO is selected, this window is used to designate the ratio value. A value greater than 1.000 will produce a signal frequency greater than Channel A, while a value of less than 1.0000 will produce a lower frequency.

AMPLITUDE – Enter the desired amplitude value (see ENGINEERING UNITS Above) of the signal.

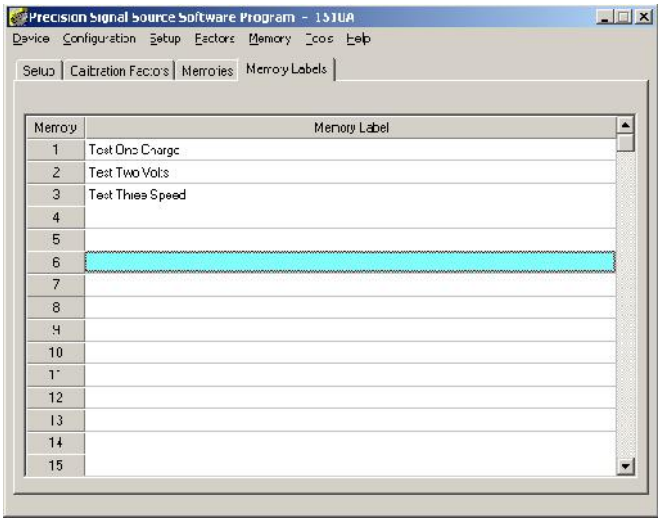
ODD CYCLE AMPLITUDE – When in TACH mode, the amplitude of the "odd" signal is expressed as a percentage of the other signals. Less than 100% for a "short" tooth and greater than 100% for "long" tooth signals.
TOOTH COUNT – When operating in TACH mode, multi-tooth speed signals may be simulated. This value represents the total number of teeth in the speed signal including the odd tooth.

MEMORY LABELS – Each of the 40 memory locations of the 1500CS and 1510A can be assigned a unique name or label, which will be shown on the 1500 Series unit display whenever the memory location is selected. Naming each of the memory locations can avoid confusion and eliminate mistakes.

Initially, the unit will not have any memory locations predefined, and consequently, the list of names will be empty as illustrated to the right.



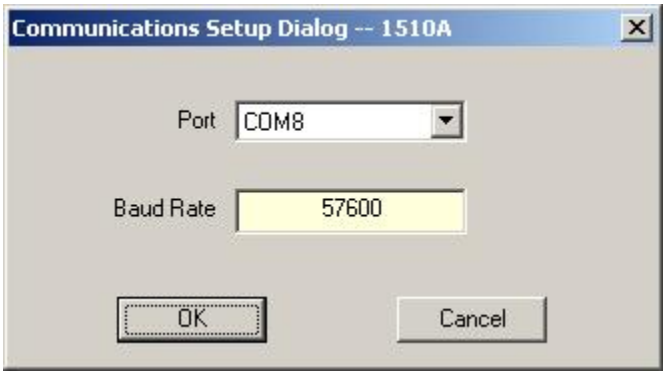
To enter names into each of the locations, click into the line of the desired location and type in the name. As illustrated, a few of the memory locations have been given unique names. These names will appear on the 1500 Series display when selected.



DEVICE OPTIONS Menu

1500CS / 1510A – This function is used to select the type of 1500 Series unit. A check mark appears in front of the current selected type of unit.

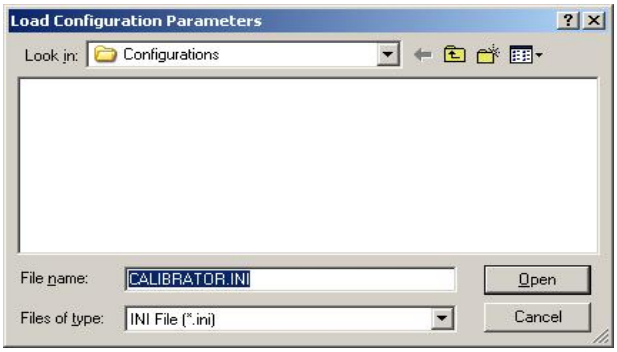
Setup Communications – Selecting this option enables the user to select the communications port that connects the computer the 1500CS or 1510A. After changing the communications port, exit the program and then restart it.



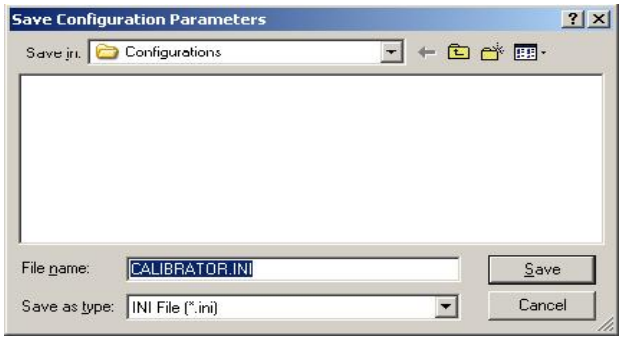
Verify Communications – Selecting this option causes the software to establish a communications link to the 1500 Series unit and to test communications.

CLEAR CONFIGURATION – This function clears all the information and settings on all of the "Tab-Displays." This command does not alter any settings within the 1500CS or 1510A.

LOAD from DISK – Selecting this option enables the user to select a configuration set-up from a file resident on the user's computer. As illustrated to the right, a file identification dialog is opened to allow selection of the desired file name and location.



SAVE to DISK – Selecting this option enables the user to save the current 1500 configuration to a file on the user's computer. As illustrated to the right, a file identification dialog is opened to allow definition of the desired file name and location.



UPLOAD from UNIT – Selecting this option establishes communications with the 1500 and updates the values displayed on all tab displays with those currently in the 1500.

At the conclusion of the "Upload," a success message will be displayed.

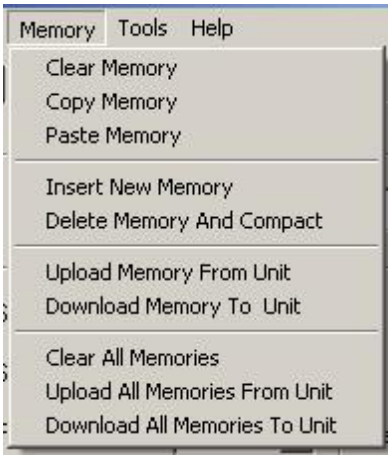
DOWNLOAD to UNIT – Selecting this option establishes communications with the 1500 and downloads the values displayed on all tab into the appropriate memories in the 1500.

At the conclusion of the “Download” a success message will be displayed.

CLEAR SETUP INFORMATION– This function clears all the calibration date information on the Setup Tab display. This command does not alter any settings within the 1500 Series unit.

There are no active functions for the FACTORS menu in this version of the software.

MEMORY Menu



The MEMORY menu provides a comprehensive set of utilities for managing the 40 memory locations in the 1500CS when used with the MEMORY Tab.

CLEAR MEMORY – Clears out all of the entry fields in the currently selected MEMORY editor page. All other locations remain unchanged.

COPY MEMORY – Copies the currently displayed set of memory settings to the clipboard.

PASTE MEMORY – Pastes the memory settings from the clipboard to the currently selected memory location.

INSERT NEW MEMORY – This command inserts a new memory AFTER the currently selected memory location. All subsequent locations are incremented by one (1) and the 40th location is lost.

DELETE MEMORY and COMPACT – This command deletes the currently displayed memory. All subsequent locations are decremented by one (1) and a new (and blank) 40th location is created.

UPLOAD MEMORY FROM UNIT – This command establishes communications with the 1500 and uploads a single memory location from the 1500 to the currently displayed location of the memory editing display.

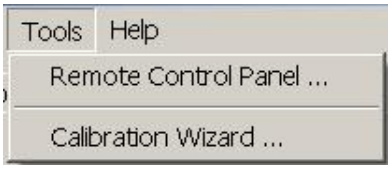
DOWNLOAD MEMORY TO UNIT – Selecting this option establishes communications with the 1500 and downloads the values of the currently displayed memory to the 1500.

CLEAR ALL MEMORIES – This command clears out all of the entry fields in all of the 40 MEMORIES of the editor.

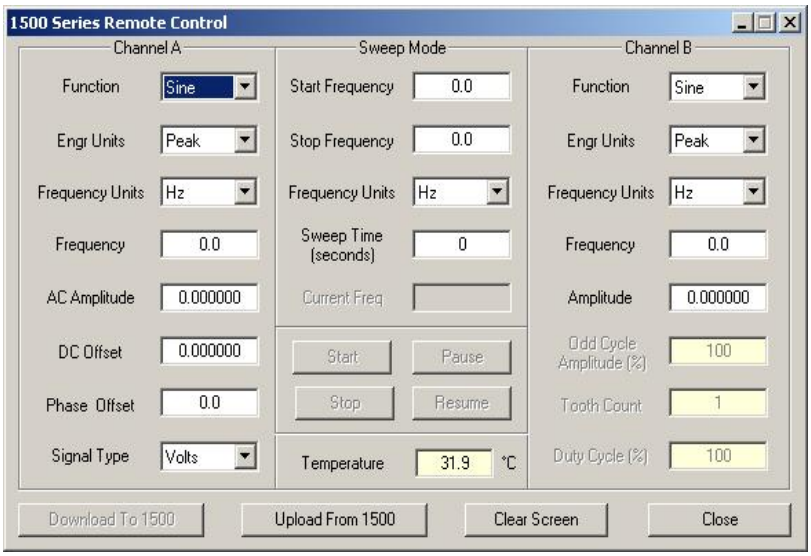
UPLOAD ALL MEMORIES FROM UNIT – Selecting this option establishes communications with the 1500 and uploads the stored values from all 40 memory locations into the 40 memory editor pages.

DOWNLOAD ALL MEMORIES TO UNIT – Selecting this option establishes communications with the 1500 and downloads the stored values from all 40 memory locations of the editor to the 1500 memory.

The TOOLS menu provides utilities for remotely operating the 1500CS or 1510A.



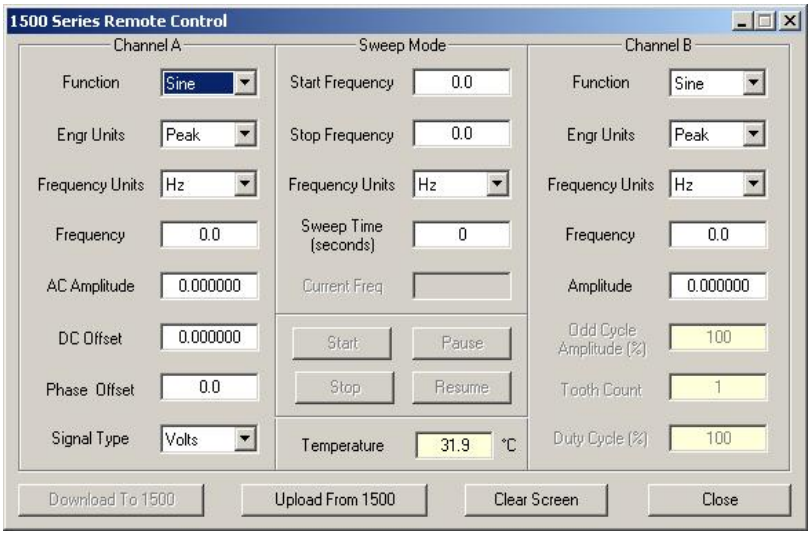
REMOTE CONTROL PANEL – This selection permits complete control of the outputs of the 1500CS or 1510A from the computer. Users may select any controllable parameter of the 1500 from the user interface, and when the set-up has been completed, a click of the DOWNLOAD to 1500 button will command the 1500 to generate the selected signal(s).



CALIBRATION WIZARD – This selection begins a fully sequenced set of measurements to re-calibrate the 1500CS or 1510A unit. The procedure results in the creation of a calibration factors table which is downloaded in to the unit.

TOOLS Menu – Remote Control Panel

The REMOTE CONTROL PANEL facilitates complete control of the outputs of the 1500CS and 1510A. Users may select any controllable parameter of the unit from the user interface, and when the set-up has been completed, a click of the DOWNLOAD to 1500 button will command the 1500 to generate the selected signal(s).



Clicking on the UPLOAD from 1500 button will establish communications with the unit and refresh all of the setting windows with the current settings from the unit.

NOTE that even under this mode of operation, the 1500 keyboard is active and keyboard entries can change settings.

CHANNEL A SETTINGS:

FUNCTION – This may be set to SINE, TRIANGLE, SAWTOOTH, or SQUARE wave signals using the drop down menu selector.

ENGINEERING UNITS – The amplitude units of the signal may be set to PEAK, PEAK to PEAK, or RMS using the drop down menu selector.

FREQUENCY UNITS – Use the drop down tool to select either Hz (hertz or cycles per second) or RPM (Revolutions per Minute).

FREQUENCY – Enter the desired frequency setting for the signal.

AC AMPLITUDE – Enter the desired amplitude value (see ENGINEERING UNITS Above) of the signal.

DC OFFSET – Enter the desired amount of DC voltage offset of the signal.

PHASE OFFSET – Enter the desired phase offset in degrees (relative to Channel B signal).

SIGNAL TYPE – Use the drop-down feature to select between VOLTS and Single Ended (SE) or Differential (DE) CHARGE type of signal.

SWEEP MODE SETTINGS - The 1500 can generate a signal on channel B whose frequency constantly varies over a specified period of time. This feature is useful for simulating acceleration or deceleration runs of machinery.

START FREQUENCY – This value defines the frequency at which the SWEEP will begin.

STOP FREQUENCY – This value defines the frequency at which the SWEEP will stop.

FREQUENCY UNITS – Use the drop down tool to select either Hz (hertz or cycles per second) or RPM (Revolutions per Minute).

SWEEP TIME – Enter the period of time (in seconds) in which the sweep will be performed.

CHANNEL B SETTINGS

FUNCTION – This may be set to SINE, TRIANGLE, SAWTOOTH, SQUARE, PULSE, TACH or TTL signals using the drop down menu selector.

PULSE MODE – The 1500 produces a single pulse occurring at the same frequency or at a ratio of the Channel A frequency. The pulse duty cycle can be programmed from 3% to 100% of the period.

TACH MODE – The 1500 can produce a series of pulses simulating a multi-tooth gear speed signal.

ENGINEERING UNITS – The amplitude units of the signal may be set to PEAK, PEAK to PEAK, or RMS using the drop down menu selector.

FREQUENCY UNITS – Use the drop down tool to select either Hz (hertz or cycles per second), RPM (Revolutions per Minute) or RATIO.

FREQUENCY – Enter the desired frequency setting for the signal. The frequency may be in Hertz (Hz) or a ratio of the Channel A frequency. When RATIO is selected, this window is used to designate the ratio value. A value greater than 1.000 will produce a signal frequency greater than Channel A, while a value of less than 1.0000 will produce a lower frequency.

AMPLITUDE – Enter the desired amplitude value (see ENGINEERING UNITS Above) of the signal.

ODD CYCLE AMPLITUDE – When in TACH mode, the amplitude of the "odd" signal is expressed as a percentage of the other signals. Less than 100% for a "short" tooth and greater than 100% for "long" tooth signals.

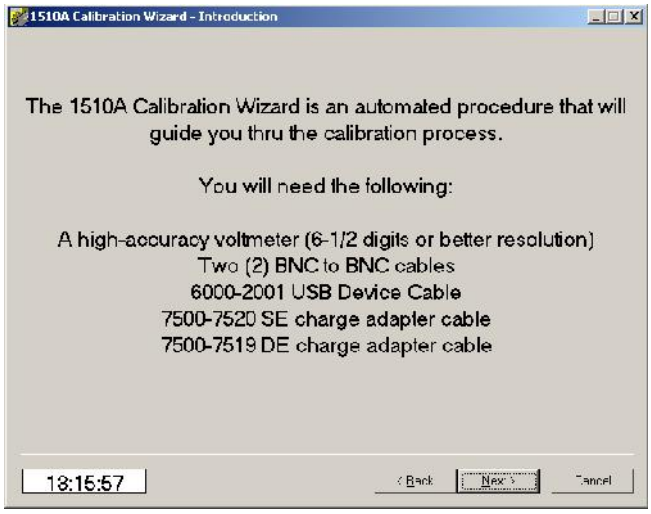
TOOTH COUNT – When operating in TACH mode, multi-tooth speed signals may be simulated. This value represents the total number of teeth in the speed signal including the odd tooth.

TOOLS Menu – Calibration Wizard

The Calibration Wizard is a semi-automated procedure for recalibration the 1500CS and 1510A. The Wizard guides users thru the process of measuring different outputs from the unit. Results of the measurements are used to recalibrate the 1500 Series device.

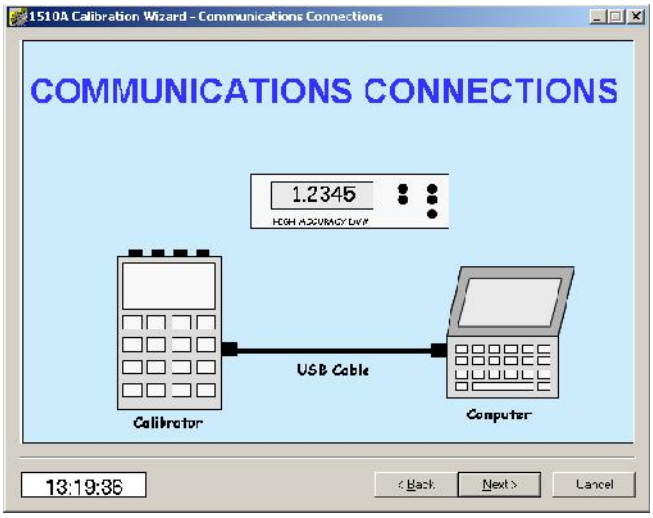
Users simply need to follow the instructions displayed on each page, and when completed, click the NEXT button.

To calibrate a 1500 Series unit you will need a high accuracy voltmeter and the cables listed.



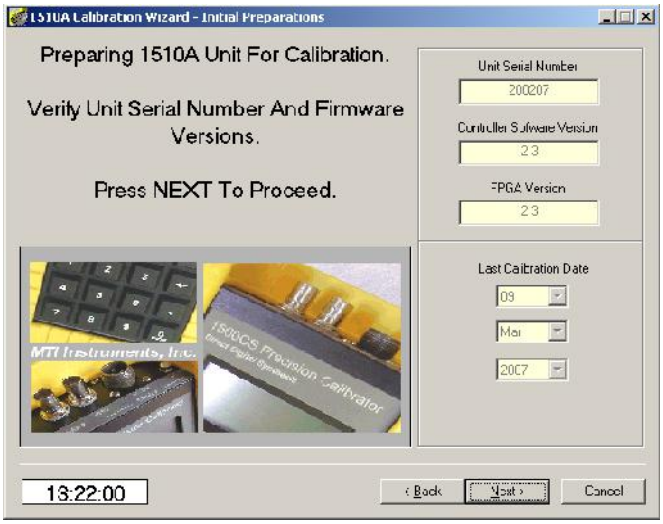
Connection to the 1500 Series unit

Before continuing, ensure that the communications cable has been connected between the 1500CS/1510A and the computer that is running the Calibration Wizard.



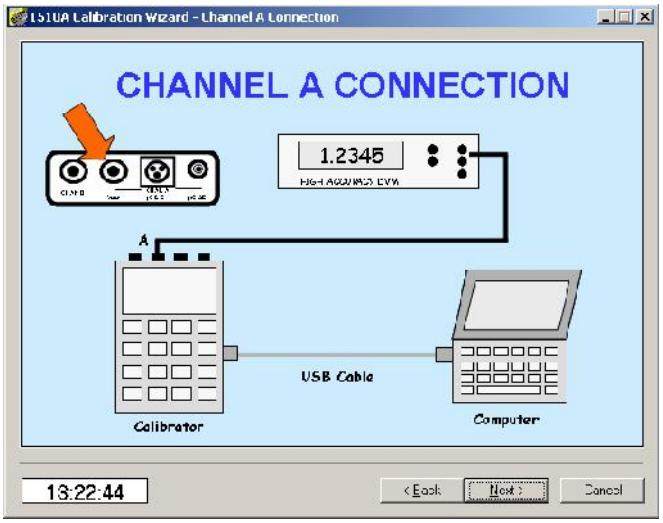
TOOLS Menu – Calibration Wizard Continued

The next step in the Calibration Wizard uploads the units' serial number and software version information. Verify these numbers with those found on the label affixed to the back of the unit.



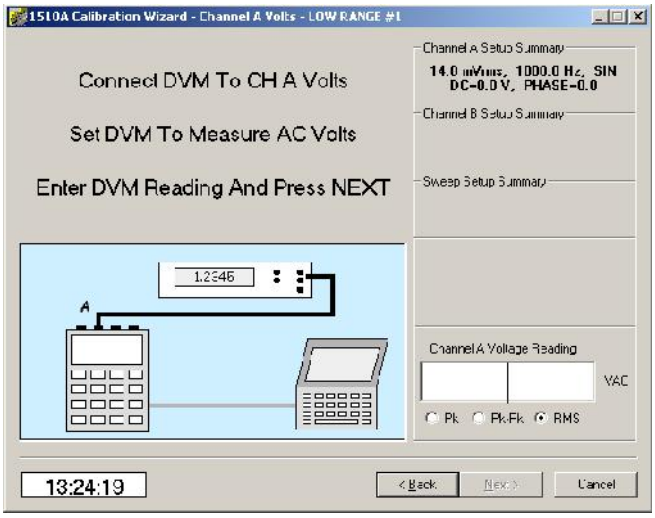
Connect to Channel A –
Connect a BNC cable between the 1500CS/1510A Channel A output connector and the input to the voltmeter.

Set the voltmeter for AC RMS readings.



Channel A Low range AC calibration
Click in the Voltage Reading window and enter the reading of the voltmeter. Verify that the correct units (Pk, Pk-Pk, or RMS) are selected for the type of voltmeter you are using.

This screen is repeated for the three low range voltages (14 mv, 35 mv, and 56 mv) used.

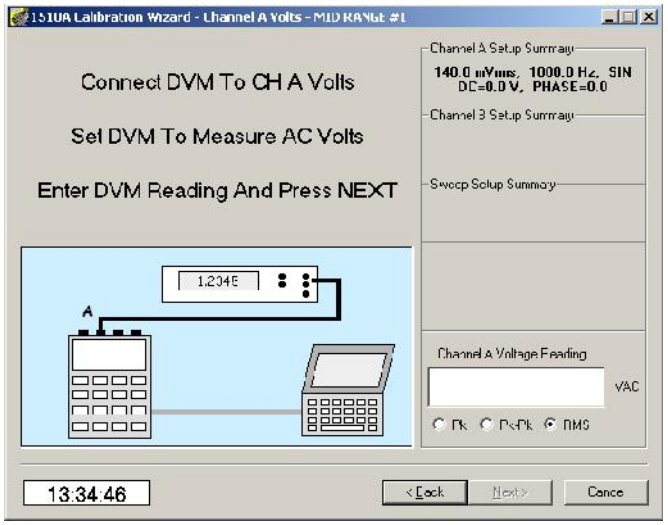


TOOLS Menu – Calibration Wizard Continued

Channel A mid range AC calibration

Next, click in the Voltage Reading window and enter the reading of the voltmeter. Verify that the correct units (Pk, Pk-Pk, or RMS) are selected for the type of voltmeter you are using.

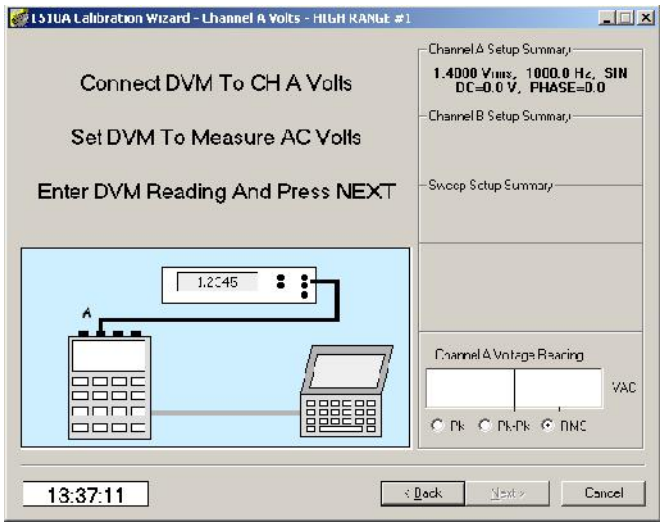
This screen is repeated for the three low range voltages (140 mv, 350 mv, and 560 mv) used.



Channel A high range AC calibration

Next, click in the Voltage Reading window and enter the reading of the voltmeter. Verify that the correct units (Pk, Pk-Pk, or RMS) are selected for the type of voltmeter you are using.

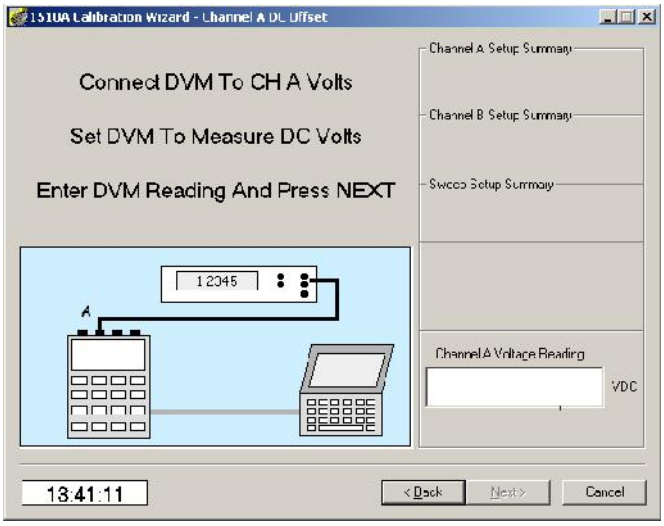
This screen is repeated for the three low range voltages (1.4 v, 3.5 v, and 5.6 mv) used.



Channel A DC offset calibration

Next, click in the Voltage Reading window and enter the reading of the voltmeter.

Set the voltmeter for DC volts readings.

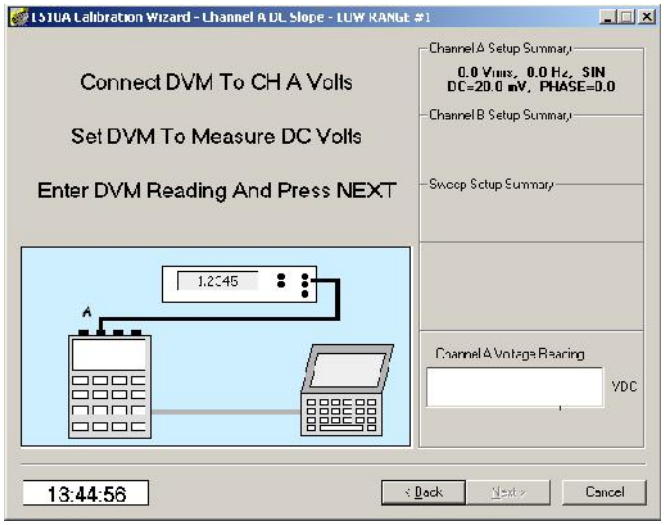


Channel A DC low range calibration

Next, click in the Voltage Reading window and enter the reading of the voltmeter.

Set the voltmeter for DC readings.

This screen is repeated for the three low range voltages (20, 50, and 80 mvdc) used.

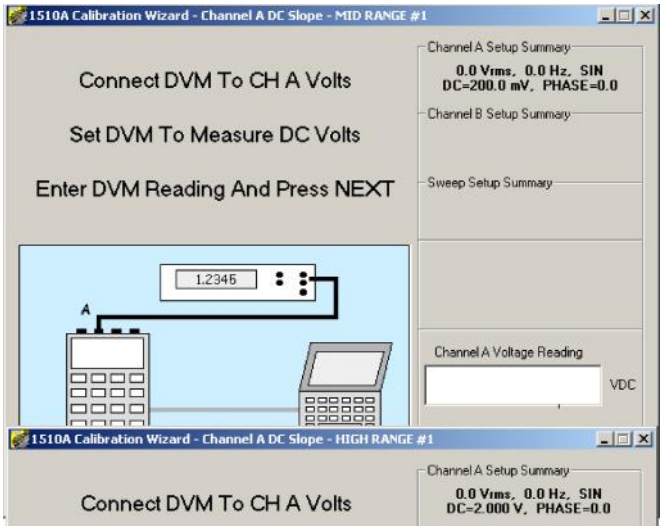


Channel A mid range DC calibration

Next, click in the Voltage Reading window and enter the reading of the voltmeter. Verify that the correct units (Pk, Pk-Pk, or RMS) are selected for the type of voltmeter you are using.

Set the voltmeter for DC readings.

This screen is repeated for the three low range voltages (200, 500, and 800 mvdc) used.

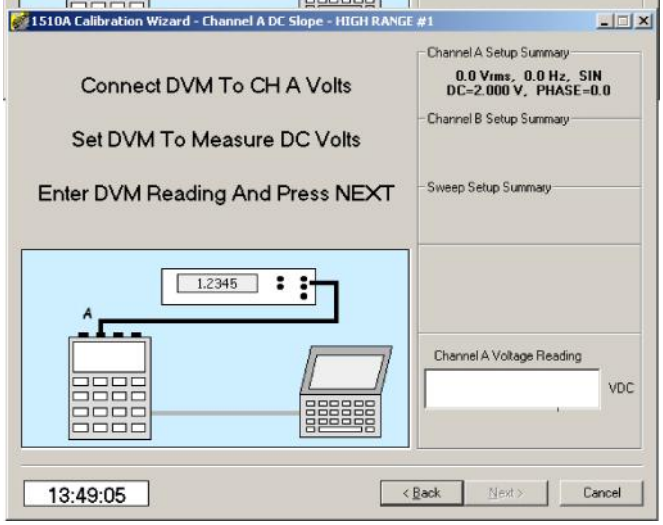


Channel A high range DC calibration

Next, click in the Voltage Reading window and enter the reading of the voltmeter.

Set the voltmeter for DC readings.

This screen is repeated for the three low range voltages (2, 5, and 8 vdc) used.

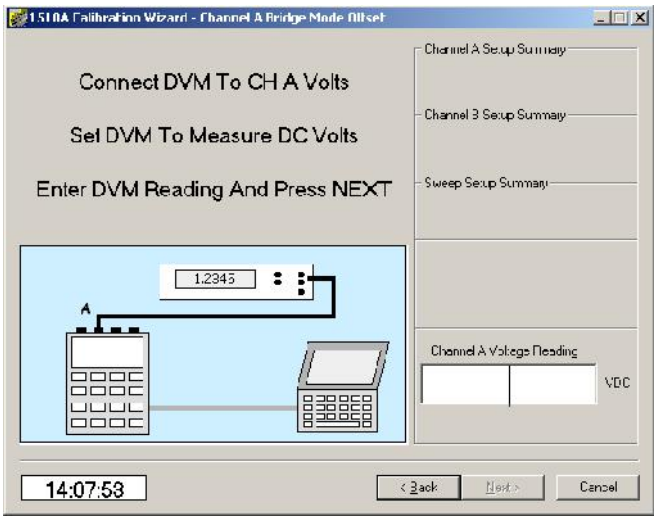


Bridge Mode offset calibration

Next, click in the Voltage Reading window and enter the reading of the voltmeter.

Set the voltmeter for DC volts readings.

Be sure to wait for the bridge output voltage to stabilize.



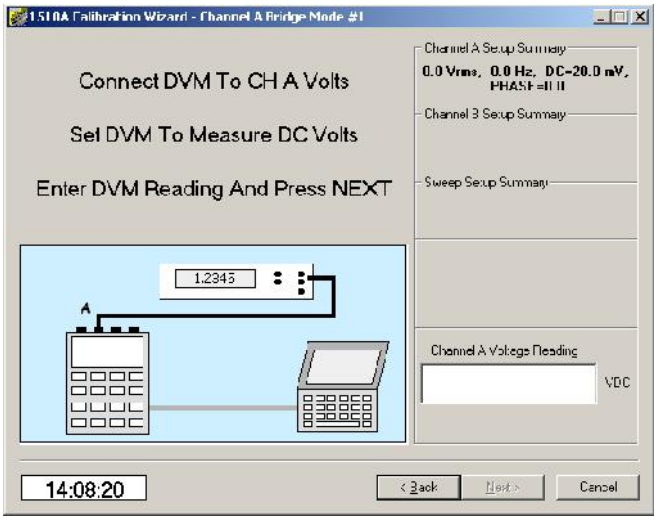
Bridge Mode span calibration

Next, click in the Voltage Reading window and enter the reading of the voltmeter.

Set the voltmeter for DC volts readings.

Be sure to wait for the bridge output voltage to stabilize.

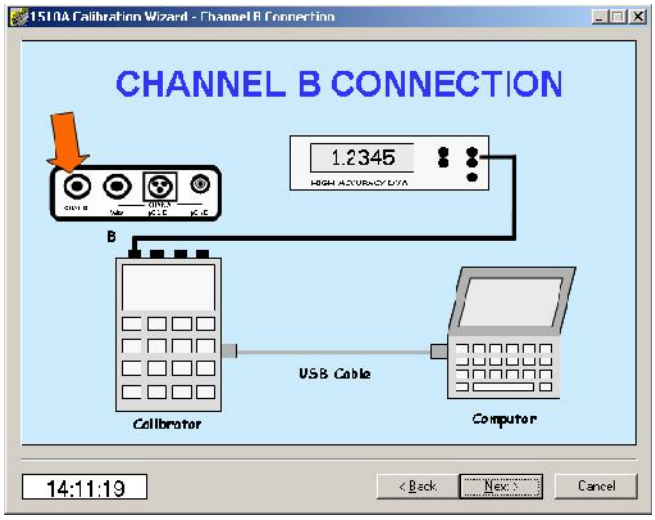
This screen is repeated for the three bridge mode voltages (20, 50, and 80 mvdc) used.



Channel B calibration

Next, connect the BNC cable to the 1500CS/1510A Channel B output connector and the input to the voltmeter.

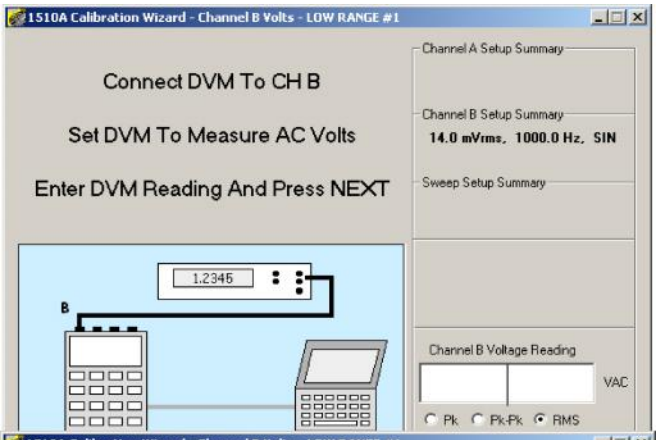
Set the voltmeter for AC RMS readings.



Channel B Low range AC calibration

Next, click in the Voltage Reading window and enter the reading of the voltmeter. Verify that the correct units (Pk, Pk-Pk, or RMS) are selected for the type of voltmeter you are using.

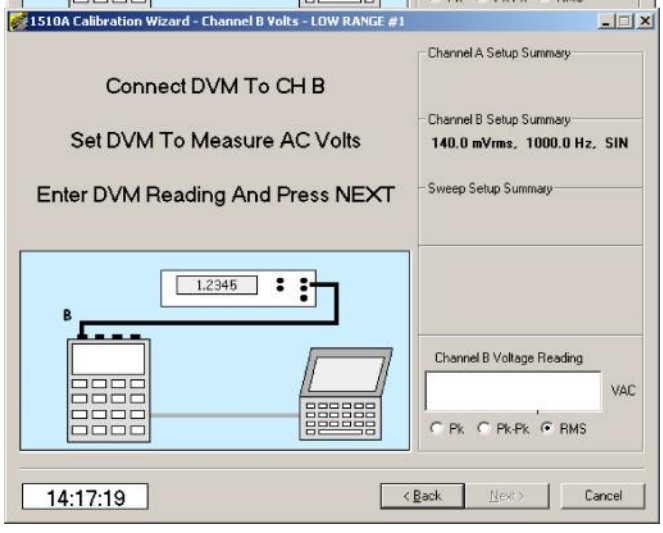
This screen is repeated for the three low range voltages (14 mv, 35 mv, and 56 mv) used.



Channel B Mid range AC calibration

Next, click in the Voltage Reading window and enter the reading of the voltmeter. Verify that the correct units (Pk, Pk-Pk, or RMS) are selected for the type of voltmeter you are using.

This screen is repeated for the three mid range voltages (140 mv, 350 mv, and 560 mv) used.

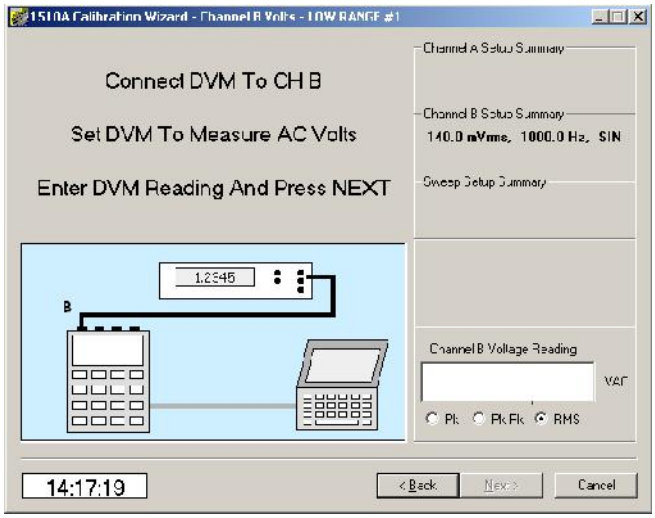


TOOLS Menu – Calibration Wizard Continued

Channel B High range AC calibration

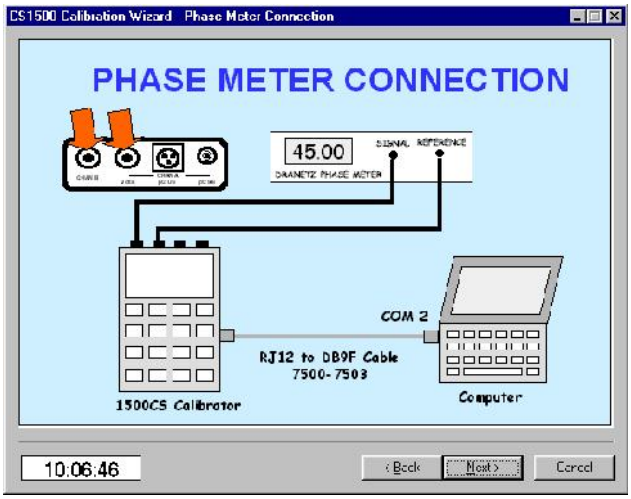
Next, click in the Voltage Reading window and enter the reading of the voltmeter. Verify that the correct units (Pk, Pk-Pk, or RMS) are selected for the type of voltmeter you are using.

This screen is repeated for the three mid range voltages (1.4 v, 3.5 v, and 5.6 v) used.



1500CS Phase calibration

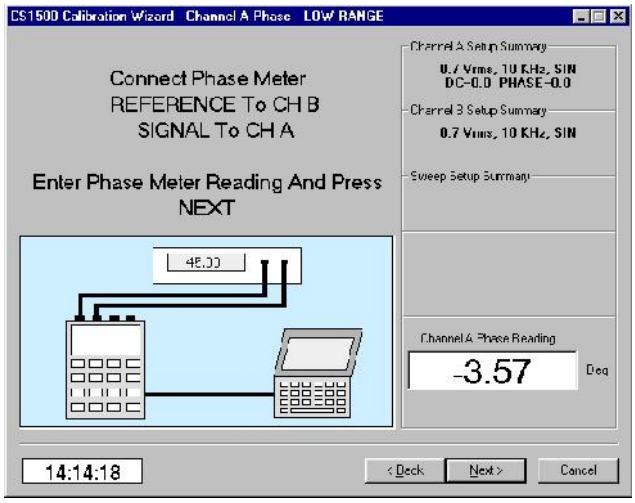
Next, disconnect the voltmeter, and connect the 1500CS to the Phase meter using two (2) BNC cables as illustrated.



NOTE

The 1510A does not require phase calibration. Skip this step for a 1510A.

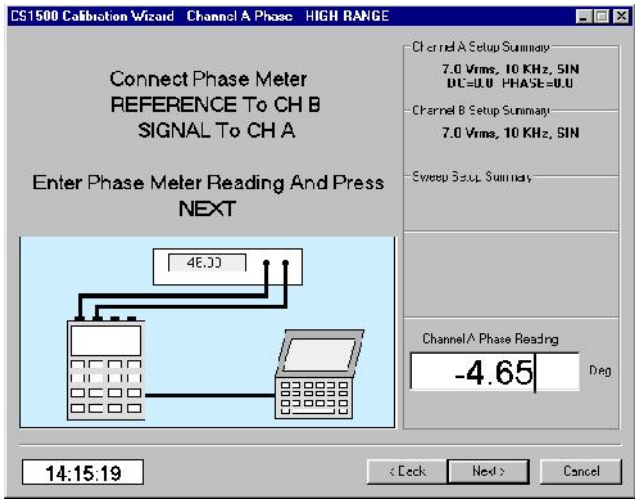
Next, click in the Phase Reading window and enter the reading of the phase meter.



NOTE

If you do not have access to a phase meter, verify that the value –3.57 degrees is in the reading window, and click the NEXT button.

Next, click in the Phase Reading window and enter the reading of the phase meter.

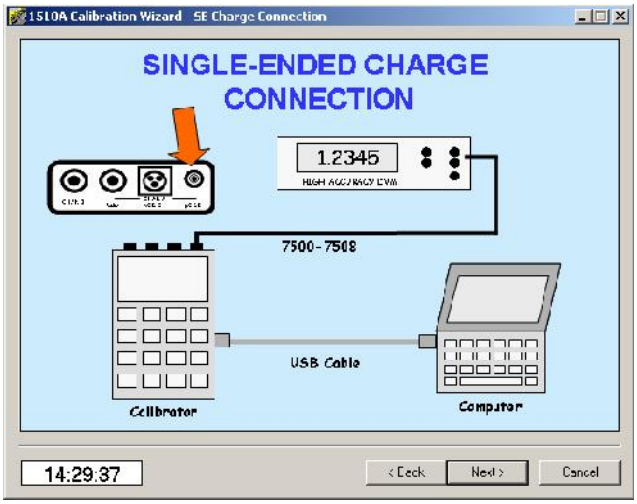


NOTE

If you do not have access to a phase meter, verify that the value –4.65 degrees is in the reading window, and click the NEXT button.

Single Ended charge calibration –

Next, connect the 1500CS/1510A to the voltmeter as illustrated using the special SE charge calibration cable.



Set the voltmeter for AC RMS readings.

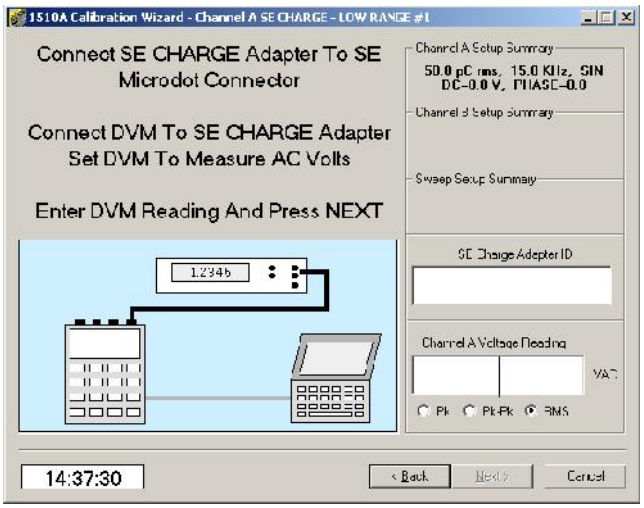
Be sure to note the cable ID number.

NOTE

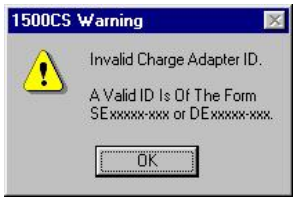
To ensure accuracy, do not allow the cable to move during this series of tests. Even small motion of the cable can induce measurement errors.

Low Range Single Ended charge calibration

Next, click in the SE Charge Adapter ID window and enter the ID number of the cable. Use caution to enter the ID number in the correct format.



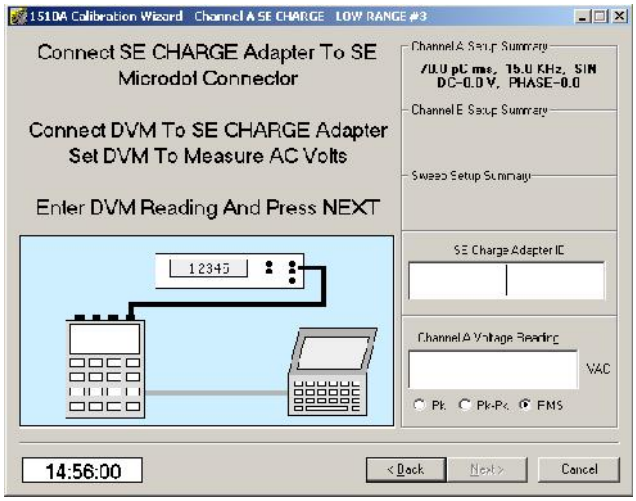
If the ID is entered incorrectly, the following message will be displayed.



Next, click in the Voltage Reading window and enter the reading of the voltmeter. Verify that the correct units (Pk, Pk-Pk, or RMS) are selected for the type of voltmeter you are using.

This screen is repeated for the three low range charge outputs (50, 60, 70 pC rms) used.

Mid Range Single Ended charge calibration

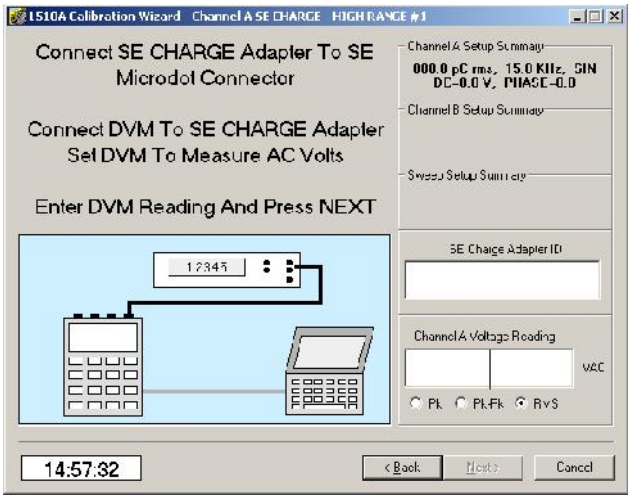


Click in the SE Charge Adapter ID window and enter the ID number of the cable. Use caution to enter the ID number in the correct format.

Now, click in the Voltage Reading window and enter the reading of the voltmeter. Verify that the correct units (Pk, Pk-Pk, or RMS) are selected for the type of voltmeter you are using.

This screen is repeated for the three low range charge outputs (80, 350, 700 pC rms) used.

High Range Single Ended charge calibration



Next, click in the SE Charge Adapter ID window and enter the ID number of the cable. Use caution to enter the ID number in the correct format.

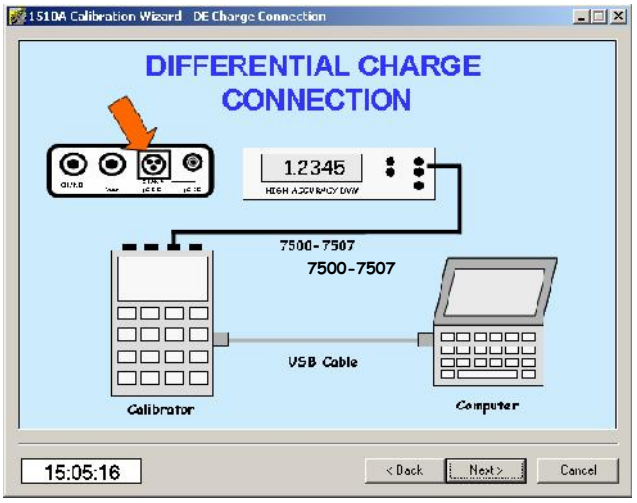
Now, click in the Voltage Reading window and enter the reading of the voltmeter. Verify that the correct units (Pk, Pk-Pk, or RMS) are selected for the type of voltmeter you are using.

This screen is repeated for the three low range charge outputs (800, 35000, 7000 pC rms) used.

TOOLS Menu – Calibration Wizard Continued

Differential charge calibration –

Connect the 1500CS/1510A to the voltmeter as illustrated using the DE Charge calibration cable.



Be sure to note the cable ID number.

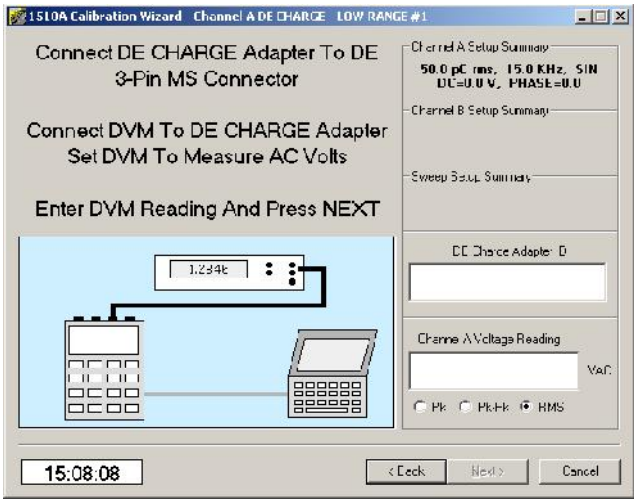
Set the voltmeter for AC RMS readings.

NOTE

To ensure accuracy, do not allow the cable to move during this series of tests. Even small motion of the cable can induce measurement errors.

Low Range Differential charge calibration

Next, click in the DE Charge Adapter ID window and enter the ID number of the cable. Use caution to enter the ID number in the correct format.

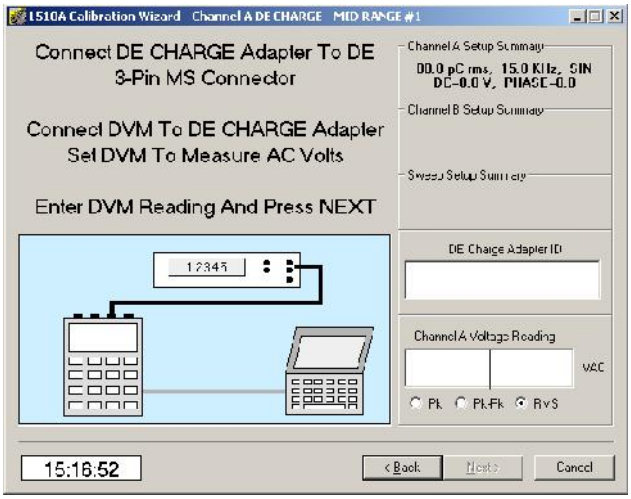


If the ID is entered incorrectly, the following message will be displayed.

Next, click in the Voltage Reading window and enter the reading of the voltmeter. Verify that the correct units (Pk, Pk-Pk, or RMS) are selected for the type of voltmeter you are using.

This screen is repeated for the three low range charge outputs (50, 60, 70 pC rms) used.

Mid Range Differential charge calibration

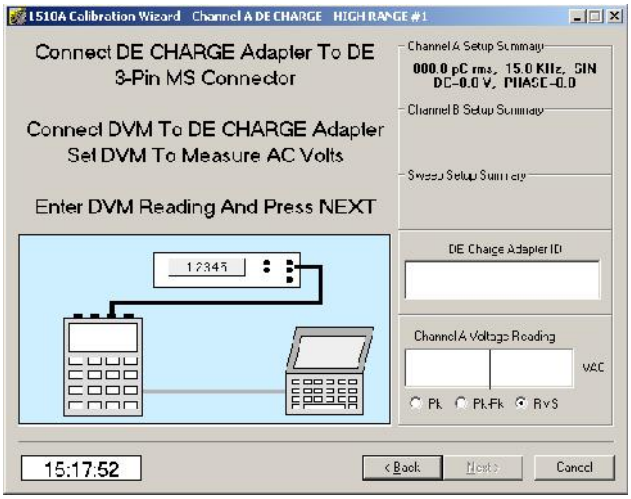


Click in the DE Charge Adapter ID window and enter the ID number of the cable. Use caution to enter the ID number in the correct format.

Now, click in the Voltage Reading window and enter the reading of the voltmeter. Verify that the correct units (Pk, Pk-Pk, or RMS) are selected for the type of voltmeter you are using.

This screen is repeated for the three low range charge outputs (80, 350, 700 pC rms) used.

High Range Differential charge calibration



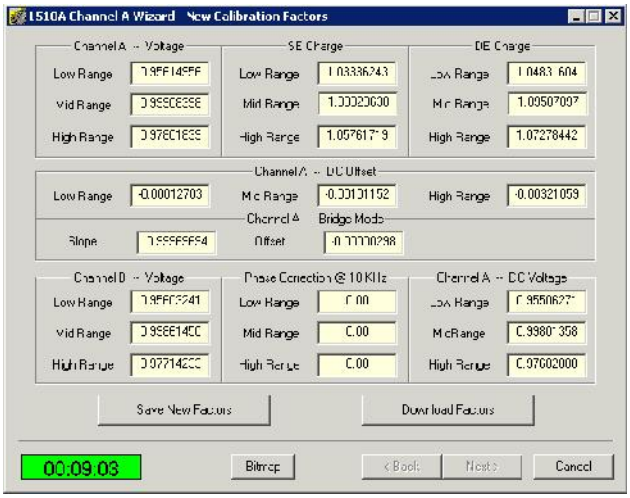
Next, click in the DE Charge Adapter ID window and enter the ID number of the cable. Use caution to enter the ID number in the correct format.

Now, click in the Voltage Reading window and enter the reading of the voltmeter. Verify that the correct units (Pk, Pk-Pk, or RMS) are selected for the type of voltmeter you are using.

This screen is repeated for the three low range charge outputs (800, 35000, 7000 pC rms) used.

Click the NEXT button.

Downloading calibration factors



The calibration procedure is nearly complete. Review each of the calibration constants to ensure that the Low range, Mid range and High range numbers are near 1.000 and that the offset factors are near 0.0000. For the 1500CS, verify that the Phase constants are approximately 3 or 4 degrees. For the 1510A, the phase constants should be zero.

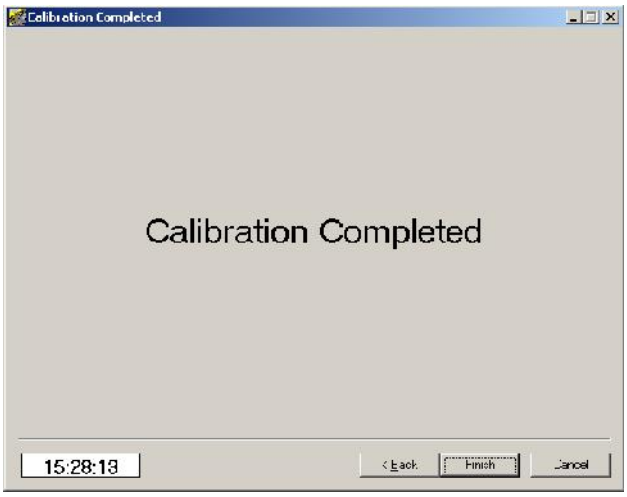
If all factors are “reasonable” click the DOWNLOAD FACTORS button to update the 1500 Series unit memory. Otherwise, click CANCEL.

If factors were downloaded, verify that the Download button has grayed-out.

Click the NEXT button.

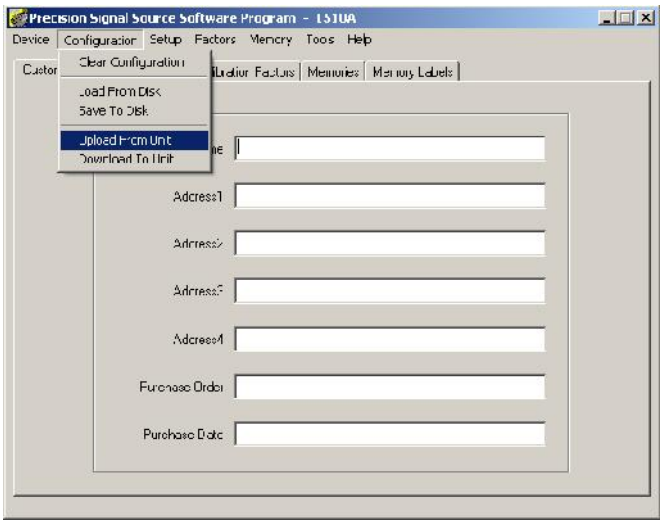
Calibration has been completed

Click the FINISH button.



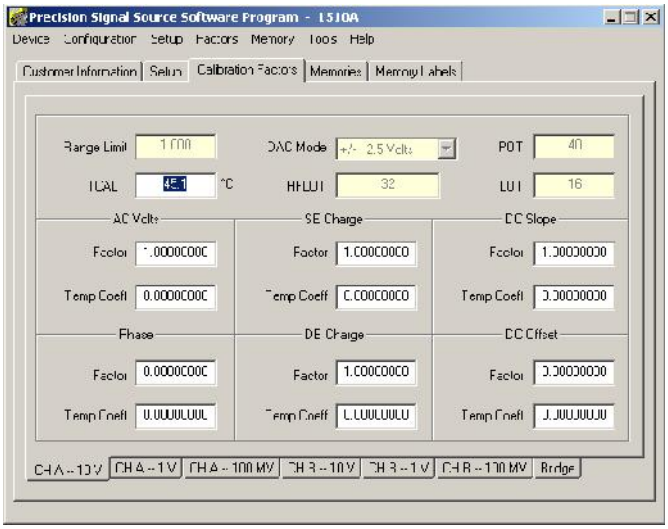
Verify Calibration Factors

Upload the current factors by selecting the Configuration-UploadFromUnit menu function.



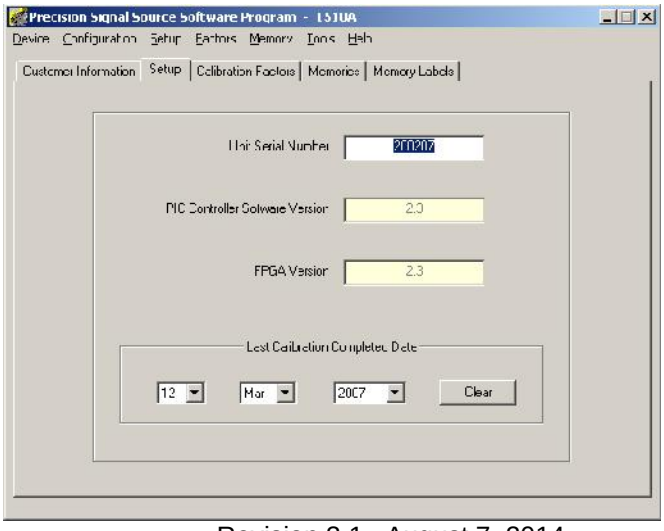
After the upload completes, the following message will be displayed.

Select the Calibration Factors tab and examine the current factors for each voltage range.



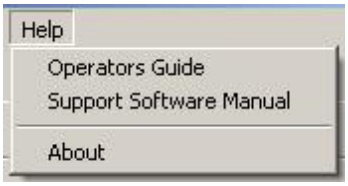
To verify that the calibration date has been updated in the 1500CS, click on the Setup tab.

It is also recommended that at the conclusion of calibration, the configuration be saved on the computer. To do this, use the Configuration – Upload from Unit function, and then the Configuration - Save to Disk function.



HELP Menu

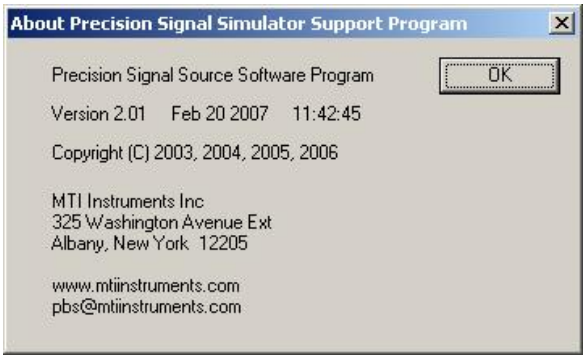
The Help menu provides general information concerning the 1500 Support Software package. The drop down menu provides links to the following services:



1500CS Operators Guide – This provides a link to the complete 1500 Users Manual in PDF format. This link will only work if the instructions found on page 4 (Before you start the Software) have been performed.

Software Guide – This provides a link to the complete 1500 Calibrator Software Support Manual in PDF format. This link will only work if the instructions found on page 4 (Before you start the Software) have been performed.

About produces a summary display of the current software revision level as illustrated:



OPTIONAL ACCESSORIES

There are a number of accessories available to compliment your 1500CS or 1510A, and to ease the challenges associated with connecting your calibrator to different cables and connectors. Contact your MTI Instruments representative for more information.

1500CS Replacement AC Power Adapter – 4000-0013

Replacement NiMH batteries – 4000-0012

Differential Charge Output Adapter cable – 7500-7509

PBS-4100 4 Channel Charge Amplifier Adapter Cable Set – 8103-6589

Single Ended Charge Output Adapter Cable Set – 7500-7508

RS232 Control Cable and Software Set – 7000-7503

Replacement USB Control Cable – 6000-2001

Replacement Protective Booty for 1500CS – 7000-7002

Differential Charge Output Calibration Cable – 7500-7507

Single Ended Charge Output Calibration Cable – 7500-7508

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OTHER FINE PRODUCTS FROM MTI INSTRUMENTS

Portable Vibration and Balancing System –

The PBS-4100^{+} is a powerful and full function vibration analysis system designed for flightline analysis of gas turbine engines. Trim balancing is fast and easy with the Balancing Wizard. Accessories are available for civilian and military engines and aircraft

Test Cell Vibration and Balancing Systems –

The PBS-4100R^{+} is a vibration analysis system designed for vibration analysis of gas turbine engines in a test cell environment. High-speed digital data interfaces allow computer control and data exchange. Accessories are available for all civilian and military engines.

Vibration Analysis for APUs –

The PBS-4100R^{+} LTE is a vibration analysis system designed specifically testing Auxiliary Power Units and gas turbine engines that cannot be balanced. Windows based software allows easy control and analysis of the data. Cable sets and accessories are available to service a wide selection of engine applications.

Tachometer Signal Conditioner –

The TSC-4800A is a complete speed signal conditioning unit capable of working with all types of engine speed signals. Whether testing engines with a long tooth or short tooth embedded N1 signal, engines with older high-voltage tachometer generators, or if testing involves the new offset tooth design, the TSC-4800A will condition all of these types of signals, up to 3 channels (N1, N2, N3).

Charge Amplifiers–

Available in rack mount or rugged NEMA configurations, these units are ideal for amplifying the signals from up to 8 accelerometers

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