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CaptivATE 3.3 Installation & Operation Manual

Part Number 150889 A2

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Preface

CaptivATE© is an application that runs under Windows XP. When loaded onto a PC, CaptivATE enhances the productivity of a business by automating the electrical safety testing and saving the results of those tests in a database.

CaptivATE communicates with the instrument(s) via the RS232 Com Port and the USB ports that have the appropriate serial communication adapters. For these adapters to work properly their software drivers must be installed on the testing computer.

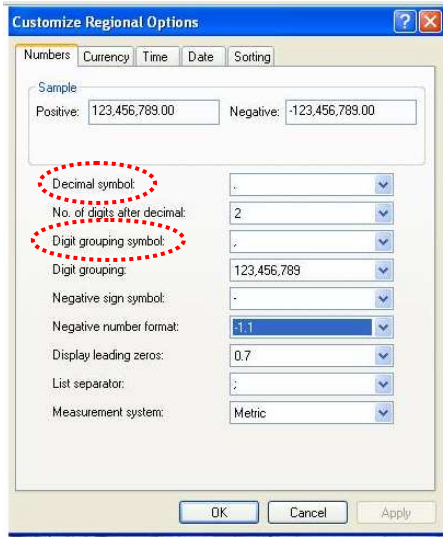
CaptivATE 3.3 Database is Compatible with 3.2

The database of Version 3.3 of CaptivATE is compatible with the database of Version 3.2.

Note to European Users

In order to change from commas to decimal points when entering decimal fractions, please follow the path to the Customize Regional Options pop-up.

1. Click the **Customize** button, and on the **Numbers** page, make the following changes:
2. In the **Decimal symbol** text box, enter a decimal point (**.**).
3. In the **Digit grouping symbol** text box, enter a comma (**,**) and click **OK**.



1 System Specifications

1.1 Hardware Minimum Requirements

- PC with 300MHz Pentium (or compatible) Processor
- 128MB RAM
- 2GB Hard Disk Space (Includes hard disk space required for program files only. Additional hard disk space is required for the database created by CaptivATE.
- One RS232 COM Port and one USB port for each installed instrument after the first. (USB ports require a USB to RS232 Converter capable of 9600 or 19200 Baud)
- Microsoft Compatible Keyboard
- Microsoft Compatible Mouse or other pointing device
- VGA Monitor capable of 800x600 Resolution or higher
- RS232 Communication Cable with 25 Pin D-sub (male) at Guardian 6000, 6100, 6200 side and required termination for customer-supplied PC RS232 port
- RS232 Communication Cable with 9 Pin D-sub (male) at Guardian 6000 Plus, 6100 Plus side and required termination for customer supplied PC RS232 port

1.2 Optional Hardware Requirements

- Programmable Barcode Scanner
- Microsoft Windows Compatible Network
- Microsoft Windows Compatible printer capable of 8.5” x 11” and 2” x 3” media

1.3 Operating System(s)

- Microsoft Windows XP

1.4 Software Minimum Requirements

- Microsoft Word 2000 or 2007 (To display Reports)
- Microsoft Excel 2000 or 2007 (To display Historical Searches)
- Localization: English (U.S.)

1.5 Optional Software Requirements

- Microsoft Access 2000 or greater

1.6 Instruments Supported

Guardian 6000	Firmware 1.08 (or higher) RS232 installed (G26) Three Scanners :(1 INT Scanner: 6000-01, -02 or -03, Optional; 2 EXT Scanners: 5000-01, -02, -03 or -04, Optional)
Guardian 6100	Firmware 1.08 (or higher) RS232 installed (G26) Three Scanners:(1 INT Scanner: 6000-05, Standard; 2 EXT Scanners: 5000-01, -02, -03 or -04, Optional)
Guardian 6000 Plus	Firmware 5.13 (or higher) Two Scanners:(1 INT Scanner: 6000-01, -02 or -03, Optional; 1 EXT Scanner: 5000-01, -02, -03 or -04, Optional) G45 40A GB Transformer (Optional)
Guardian 6100 Plus	Firmware 5.13 (or higher) Three Scanners:(1 INT Scanner: 6000-07, Standard; 2 EXT Scanners: 5000-01, -02, -03 or -04) G45 40A GB Transformer (Optional) AC Source (6408-1: 800VA AC Source W/Remote Option; 61603: 1500VA AC Source W/Remote Option)

Guardian 1010, 1030, 1030S Ground Bond Tester	Firmware 4.3 (or higher) RS232 installed (G36)
Guardian 1050 Ground Bond Tester	Firmware 1.0 (or higher) RS232 installed (G36)
Guardian 1730T	Firmware 2.0 (or higher) IEEE488 installed
Hybrid 2000 AC/DC/IR/DCR Safety Analyzer	Firmware 1.14 (or higher)
Matrix 8000 Scanning System - Medical	AC Line Module GBF-2 Module Earth Module AC Line 2 Module General Module
Matrix 8000 Scanning System - General	AC Line Module GBF-2 Module Earth Module General Module

AC Sources

6408-1	Firmware 2.20 (or higher)
61603	Firmware 1.10 (or higher)
61604	Firmware 1.20 (or higher)
61605	Firmware 1.20 (or higher)

2 How to Use This Manual

This manual is part task-oriented and part reference. Online users can click on any page number in the text to go to that page number.

2.1 What do you want to do with CaptivATE 3.3?

Displayed in Figure 1 on page 2 is a Use Case diagram for CaptivATE. This UCD shows the users of CaptivATE and what each user can do with the system. The three kinds of users are Administrators, Engineers, and Operators. Click on any page reference in Figure 1 to go to a specific functions. The manual is organized as follows:

Administrative Tasks

An Administrator is the only one who can assign users. Other administrative tasks are described in this section, starting in Section 3.

Software Switches to Automate and Simplify Testing

Software switches (also called checkboxes) can be checked-marked as appropriate for your needs, as described starting in Section 4.

Tutorials

The Tutorial Section 5 follows the creation and the running of two tests. Tutorial A includes an Instrument Setup with one test instrument (a QuadTech Hybrid 2000). Tutorial B includes an Instrument Setup with three test instruments (a QuadTech 6100 Plus, an AC Source, and a Matrix 8000).

Reports: Defining, Saving, and Printing

You can define the type of report you want to generate, the place online where you want to store it, and the optional printer to produce hard copies. The descriptions begin in Section 6.

Historical Search

An historical search is a way to produce a spreadsheet that includes several reports that can be assembled by date, operator, DUT, etc., as described starting in Section 8.

Reference Section

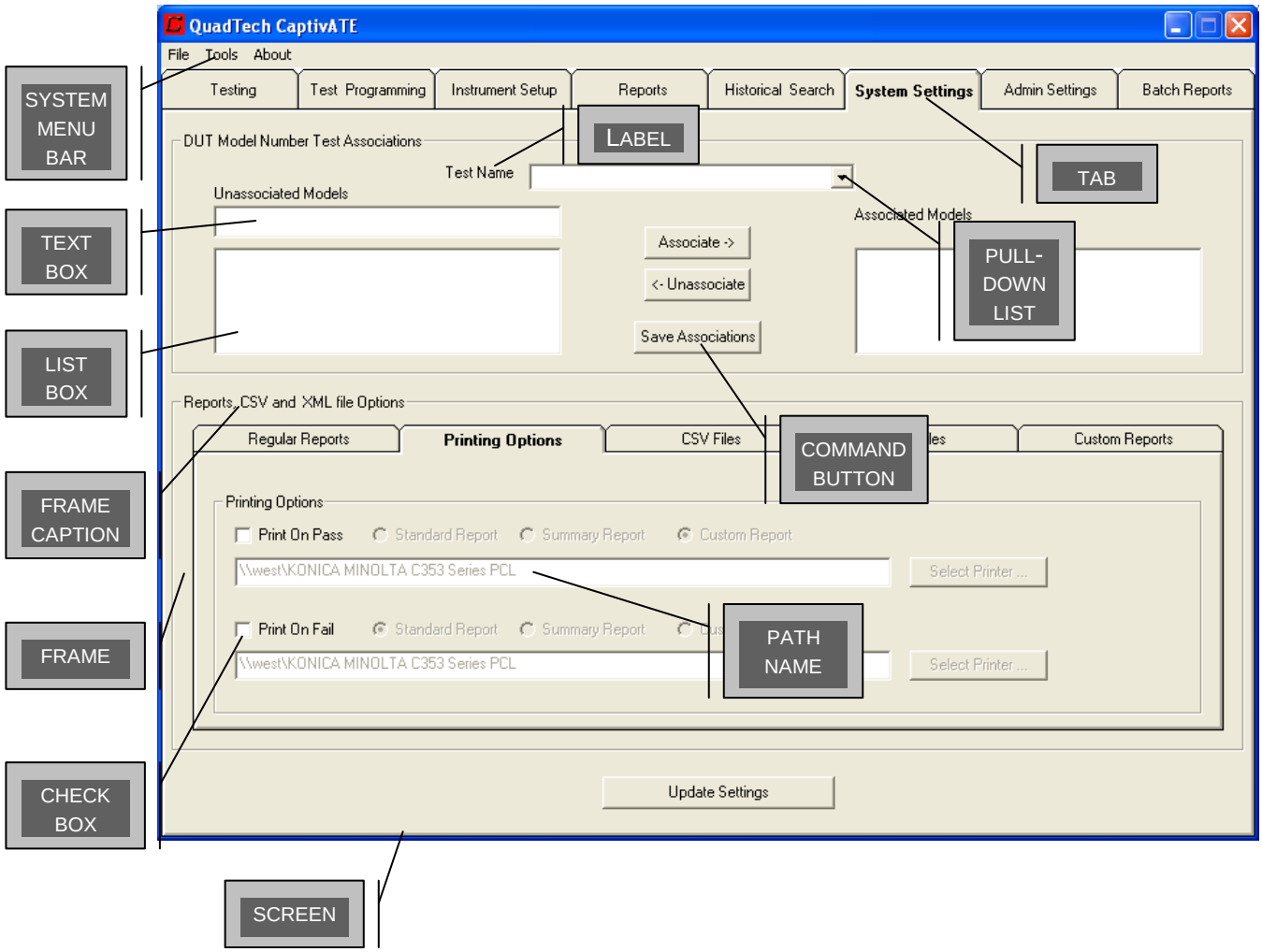
For a description of all tabs, screens, labels, and checkboxes, see the Reference Section 11.

2.2 Hardware Installation

While connecting test instruments to a personal computer, record the com port numbers as described in section 3.12. This will simplify the task of Instrument Setup if you want to program tests at a different PC from the one on which the tests are run.

2.3 Conventions Used in This Manual

Item	How it is represented in this manual
Command Buttons	**Button name in bold**
Tabs and Screens	Tab or screen name in *italics*; e.g. the *System Settings* screen
System messages	`System message in courier font`
Path names	`Path names in courier font`
Cropped screen captures	Where the screen capture has been cropped, cropped sides are represented by dotted lines.
Examples used	Tutorial A) Hybrid 2000, Tutorial B) Sentinel III (Guardian 6100 Plus, an AC Source, and the Matrix 8000).
Software Switches	Software switches are checkboxes that can be toggled on or off to affect a test or a test report.



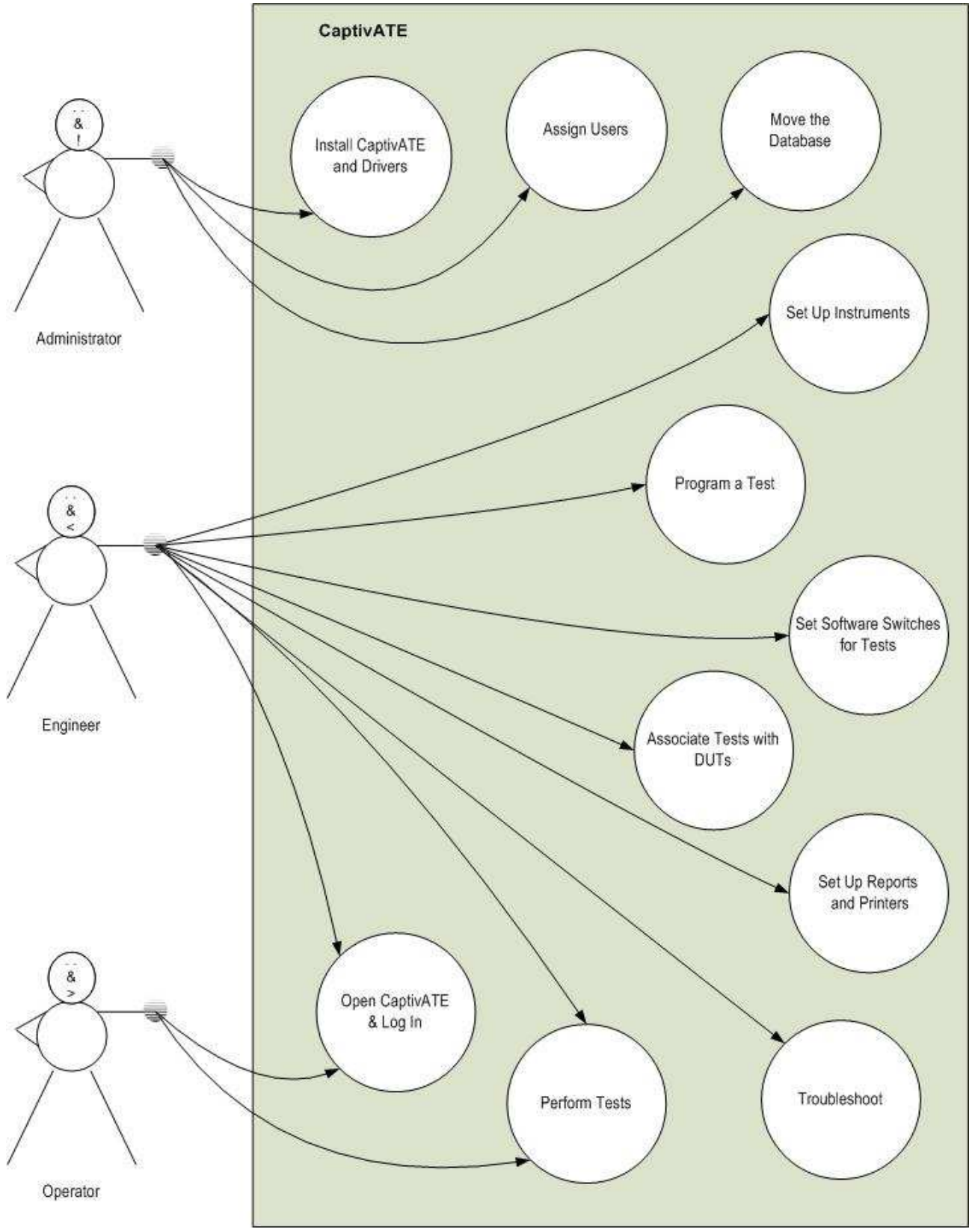


Figure 1 Use Case Diagram: What do you want to do with CaptivATE?

3 Administrative Tasks

The only purely administrative task is assigning user IDs, passwords, password effective date, number of days before expiration, and locking or unlocking the password. But one of the most important decisions for an administrator should be made in consultation with the Engineers and the Network Administrator; namely, where the database should go.

3.1 Where to Put the CaptivATE 3.3 Database?

There are two possible databases you can use: Microsoft Access and Microsoft SQL Server.

3.1.1 Microsoft Access Database

By default, when you install CaptivATE on a PC, the start-up CaptivATE Access database and associated files are placed in the PC's `C:\Program Files\CaptivATE 3.3` folder. That may be fine if CaptivATE is installed on only one PC. But what if you are installing CaptivATE on more than one PC? At each installation, a dialog box is going to ask where you want to put the database. In order to share all CaptivATE test programs, instrument setups, and associations, we recommend that at each installation you put the database **on a shared drive on a network**. By pointing to this location when you install CaptivATE on each PC, there will be one CaptivATE database that all users will share.

There are two possible databases you can use: Microsoft Access and Microsoft SQL Server.

3.1.2 Microsoft Access Database

Access is the default database.

3.1.3 Microsoft SQL Server Database (SQL Version of CaptivATE Only)

To select an SQL Server database, perform the following steps.

Make sure that you have purchased the SQL version of CaptivATE.

Request that the Database Administrator create a new database on Microsoft SQL Server, which includes running the scripts in tables.sql. (The tables.sql file is included in the CaptivATE files.)

Run the scripts

Then edit the 7th line of setting.txt, adding the name of the SQL Server as instructed by your DBA.

```
DBServerSQL=<name of server>
```

3.2 Install CaptivATE 3.3

If there is a previous version of CaptivATE on the PC, uninstall it before installing version 3.3.

Place the CaptivATE 3.3 CD in the CD drive. If the installation does not begin automatically, use Windows Explorer to locate the CD drive (usually Drive D) and display its contents. Click the CaptivATE 3.3 **setup.exe** file to begin the installation manually.

The following End-User License Agreement (Figure 2) is displayed.

Figure 2 End-User License Agreement

1. Click the **I accept** option button and click the **Continue** button. You then must select the location to which the files will be copied from the CD to the PC (Figure 3).

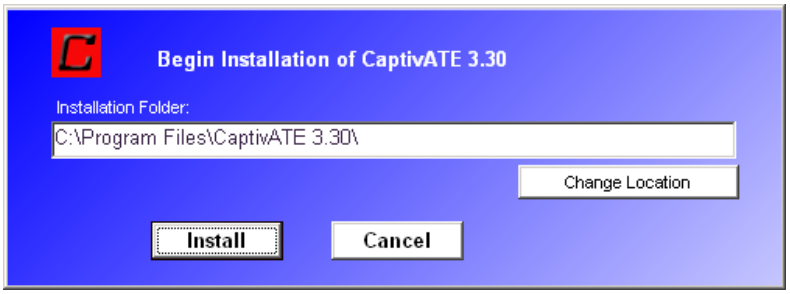


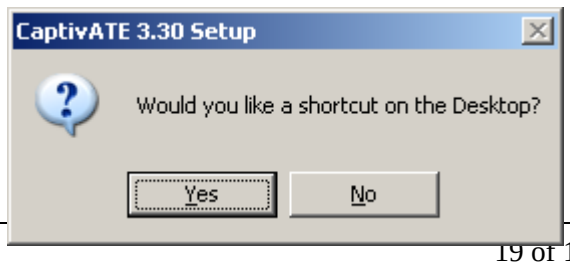
Figure 3 CaptivATE "Begin Installation" Pop-up

2. You can accept the default location (`C:\Program Files\CaptivATE 3.3`) or you can change the location by clicking **Change Location** and then browse to define a new path using Windows Explorer.

3. Click **Install**.

Installation should finish in a few seconds and display a pop-up (Figure 4) offering to create a CaptivATE 3.3 shortcut icon on the desktop.

Figure 4 "Would You Like a Shortcut?"



A pop-up then tells you that the installation of the CaptivATE 3.3 files is complete.

3.3 Install the Drivers

For any of the following optional drivers that you have ordered, follow the instructions in the accompanying manual.

USB-to-Serial Communication	For those who use more than one test instrument in a test program, the optional CD, titled `USB to Serial Converter`, converts USB ports on the PC to act like serial communication ports. A cable adapter is included.
IEEE-488	For using the QuadTech 1730T LCR Meter
NIUSB6525	For using National Instruments Digital I/O Card(Optional)

3.4 Open CaptivATE 3.3: Administrator

1. If a shortcut was created on the Desktop, click the shortcut icon to open CaptivATE 3.3. Otherwise, click Windows **Start**, click **All Programs**, and then find and click CaptivATE 3.3 from the list of programs.
2. Very briefly, a splash screen opens and closes, and a pop-up (Figure 5) asks you to click **OK** to define the location for the Access database.

Figure 5 "Next Step" Pop-Up

3. Click OK to display the Access Database Preferences pop-up. The choices are:

`Create a new Access database`.. For new users (i.e., users who are not upgrading)

`Use an existing Access database`...For users who want to upgrade and use the existing database

Figure 6 Access Database Preference Pop-Up

(CaptivATE Medical Option) If you selected "Use an existing Access database," the message in Figure 7 will be displayed. All of your existing users' passwords will expire in 90 days.

Figure 7 CaptivATE Password Security Pop-up

4. After either selection, use the Microsoft Explorer to browse for the correct folder in which to locate the CaptivATE database file. Only the database file will be here; all the other files installed from the installation CD will stay where they are.

Once the database file has been given its place, the login pop-up appears (Figure 8).

5. Log in with the Administrator's User Name and Password.

3.5 Open CaptivATE 3.3: Engineers and Operators

1. Operators and Engineers log in as determined by the Administrator. For all users, CaptivATE opens on the *Testing* screen.

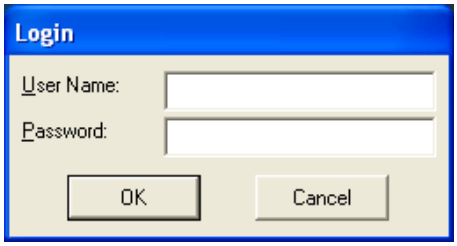


Figure 8 Login Pop-Up

2. To close CaptivATE at any time or from any screen, click **File** and then **Quit**, as shown in Figure 9

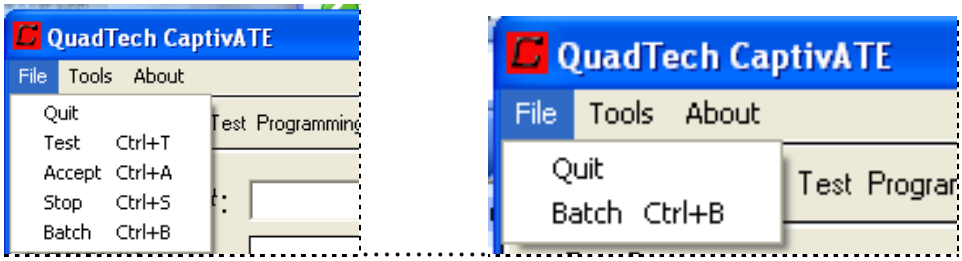


Figure 9 File Menu and Quit Command

In Figure 9, the **File** pull-down menu on the left is displayed when you are on the *Testing* screen. From any other screen, the File pull-down menu on the right is displayed.

3.6 Assign Users

Admin Settings screen

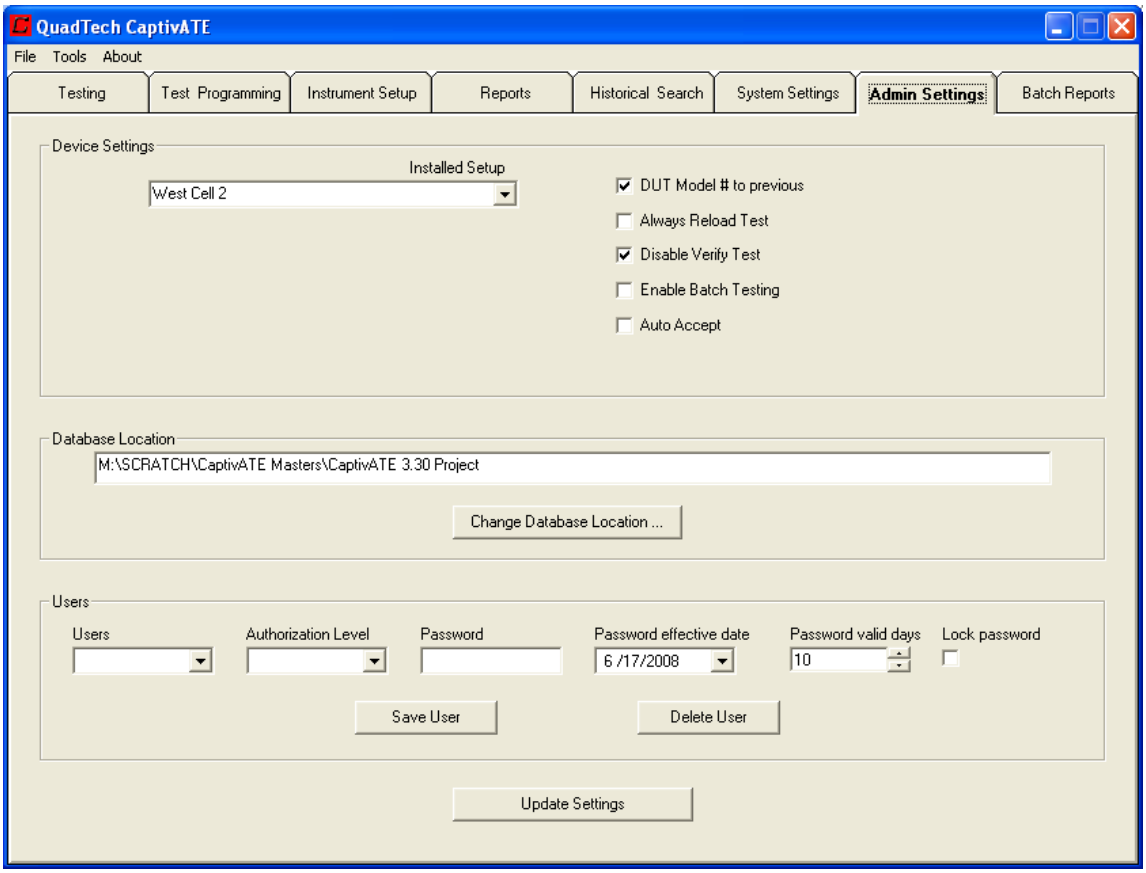


Figure 10 Admin Settings Screen

3.6.1 Add a User

Note: This example shows the screen for the Medical version of CaptivATE which has additional fields of Password Effective Date, Password Valid Days and Lock Password. General version functions exactly the same without password aging or lockout functions.

1. Click the *Admin Settings* tab.
2. Click the "Users" drop down box and click **New User.**
3. In the User Name pop-up box, enter the new user's login name (50 characters maximum), and then click **OK**.

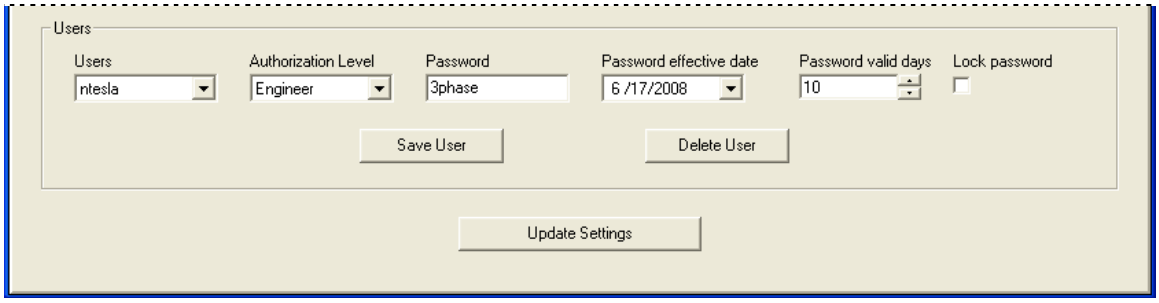


Figure 11 Admin Settings: Users

4. When you click **OK** in the User Name box, the "Authorization Level" defaults to **Operator**. Change the authorization as desired. In Figure 11 the Authorization Level for the new user is changed to **Engineer**.
5. Enter a user password in the **Password** text box.
6. Select the number of days for which this password is valid; 10 is the minimum, 370 the maximum.
7. If you click the Lock password checkbox, the user cannot log in.
8. DON'T FORGET! Click the **Save User** button.

3.6.2 Delete a User

Once you delete a user, the system will not allow you to re-use that user name.

CAUTION*: Before deleting the default administrator name ("admin"), create a user who has Administrative authority. Otherwise there will be no one with the Admin power.*

3.7 Move the Database

Admin Settings screen

The location of the CaptivATE database should be defined during the software installation process (Page 2). However, if the location of the database must be changed after installation, you can do that in the *Admin Setting* screen.

You can copy the database or you can move the database. Copying the database presents a problem. With more than one copy of the database, it can be difficult to know which database has which test programs.

On the other hand, if you *move* the database to, for instance, a shared folder on a network drive, that is fine because you still have only one database and all users can use it.

If you have more than one user of CaptivATE, be sure to change the location of the database on each PC so that **they all are using the same database**. See Database Location on the *Admin Settings* screen as shown in Figure 12.

1. Click the *Admin Settings* tab and note the current file path in the Database Location section.

2. With Windows Explorer, go to that folder.
3. Cut the `CaptivATE` database file from this location and paste it into another folder (for example, a shared directory).
4. Click on the **Change Database Location** button in the *Admin Settings* screen, and click the file path to the new location of the database. A pop-up appears, asking you to OK restart.
5. When you click **OK**, CaptivATE closes and restarts.
6. To verify the new location, log in and click the *Admin Settings* tab.
7. Check the file path in the Database Location section and verify it matches the file path of the newly moved CaptivATE database.

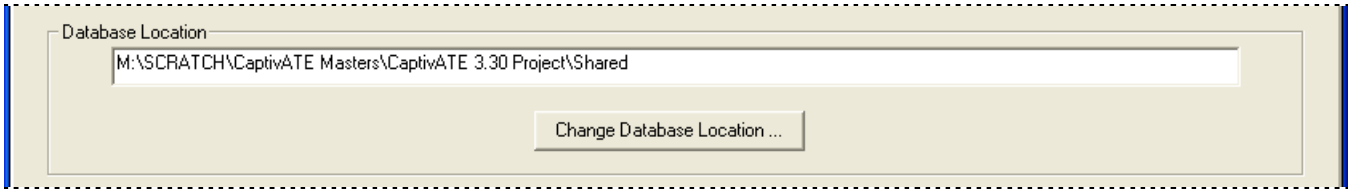


Figure 12 New Location of the CaptivATE Database on a Shared Network Drive

3.8 Idle Auto Log Off

Tools/Options/General screen.

To set the time limit for the CaptivATE application to be idle before any user is automatically logged off, perform the following steps.

Note: Idle Log Off does not close the CaptivATE program. A new user or the previous user may log back in and CaptivATE will continue from the exact point log off occurred. Idle log off only occurs in the Test Tab and will not occur during a test.

1. From the System Menu Bar, open the *Tools/Options/General* screen.
2. Click the “Idle auto log off…” checkbox.
3. Scroll up from the default of 1 minute and set the time. The maximum is 60 minutes.
4. Click the **Accept** button.

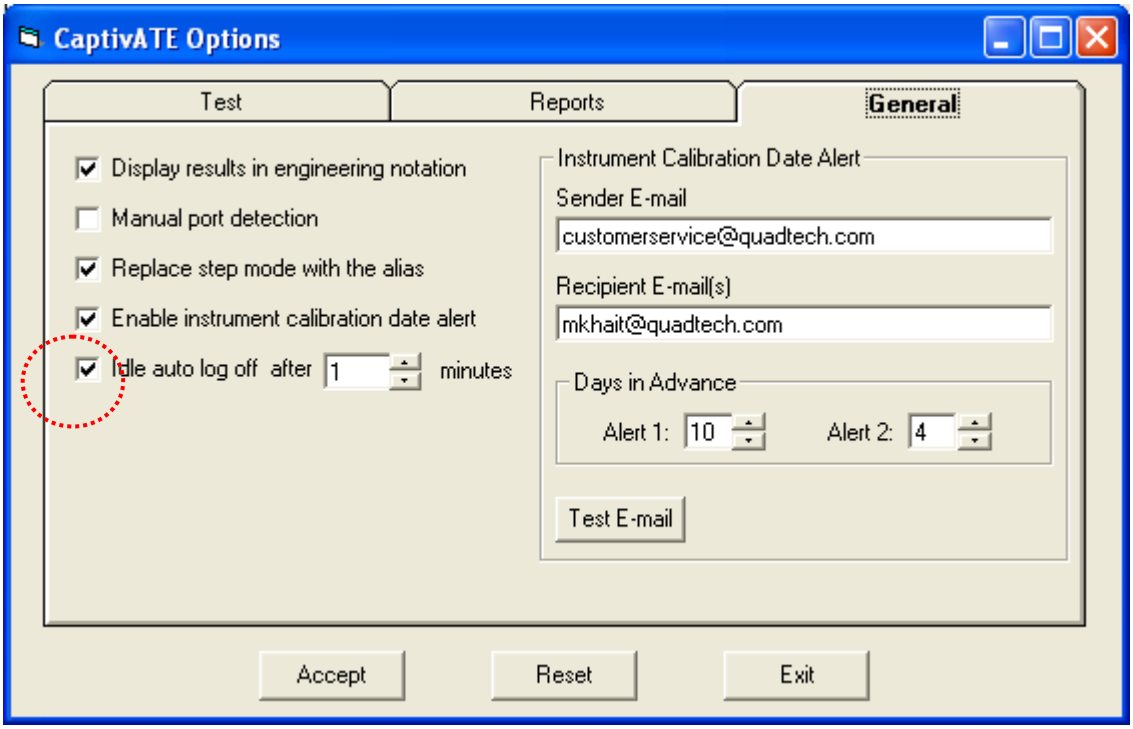


Figure 13 "Idle auto log off" Checkbox on Tools/Options/Test Screen

3.9 Edit the Settings.txt File

In the application path (the folder in which the CaptivATE system files have been installed) is the *settings.txt* file. You can edit the *settings.txt* file to do the following:

Debug while running a test

3.9.1 Debug: Activation

To tell the system software that you want to debug CaptivATE while running a test, edit the last line of the *settings.txt* file from

```
Debug=False
```

to

```
Debug=True
```

```
When CaptivATE is running a file debug.txt will be generated.
This file contains detailed information on commands being sent
to the various instruments and status of tests.
```

3.10 Enable Instrument Calibration-Due Date Alert

Tools/Options/General screen.

The Cal Due Date (Figure 14) is shown on the *Instrument Setup* screen..

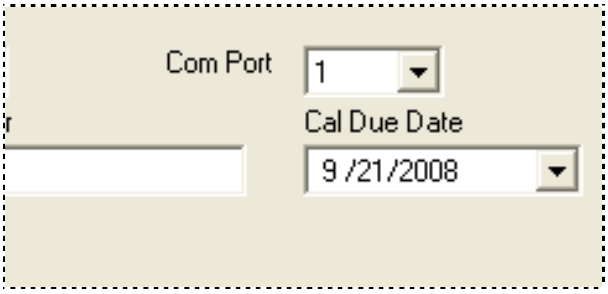


Figure 14 Calibration Due Date

The software can send an email, a set number of days in advance of the calibration due date, to a recipient(s) email address indicating that the calibration of the instruments will be due shortly.

Note: that the software only check this due date and sends an email on initial logon screen during startup. If CaptivATE is continuously running no email will be sent. If CaptivATE is not started during the day the email would be sent, no email will be sent.

To have an email sent perform the following steps:

1. Click *Tools/Options/General* to display the screen shown in Figure 15.
2. Click the "Enable instrument calibration day alert" checkbox.

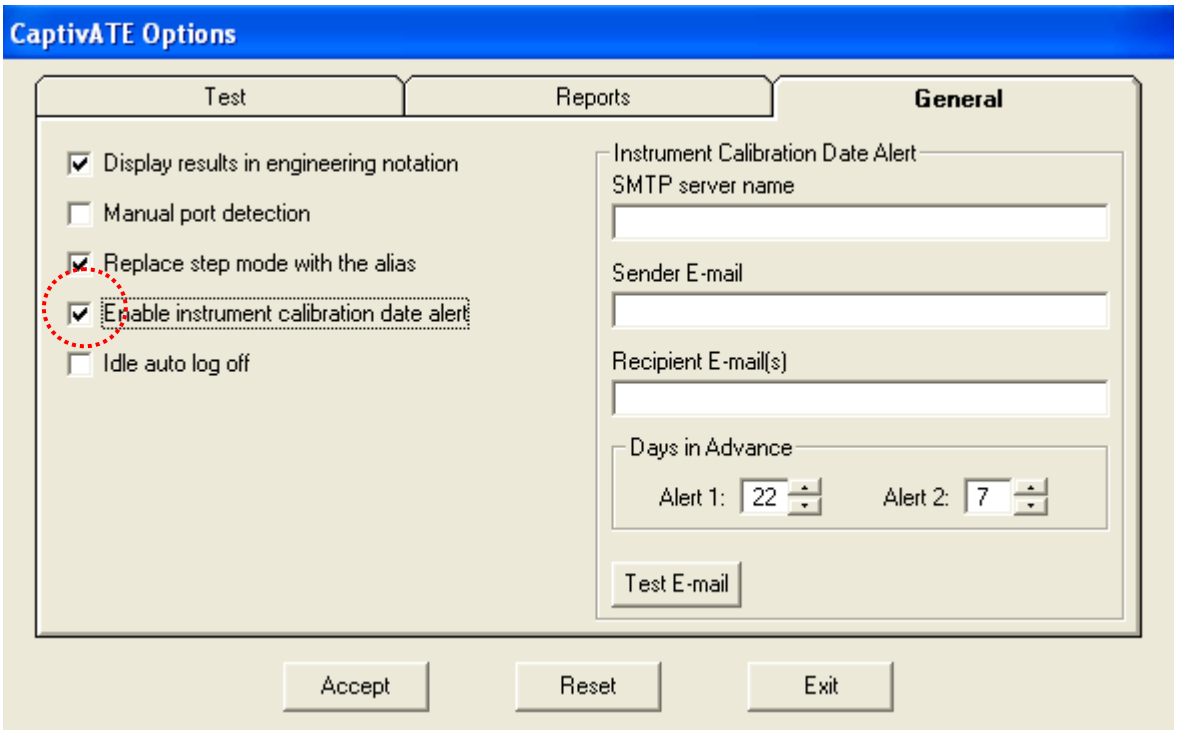


Figure 15 Enable Instrument Calibration Alert

3. Enter SMTP Server Name (provided by your network administrator)
4. Enter the Sender E-mail address
5. Enter email address of Recipient E-Mail(s) of the intended recipient(s) of the alert
6. Enter Days in Advance for Alert 1 and Alert 2

3.11 Change the Cal Due Date

CaptivATE's default Cal Due Date for a test instrument is one year from the date that you first introduce it in an Instrument Setup dialog.

Click on the carrot to the right of the Cal Due Date to pop up a calendar. Select appropriate calibration due date for the instrument. The calibration due date can also be enter manually by clicking on the month, day or year in the Cal Due Date box.

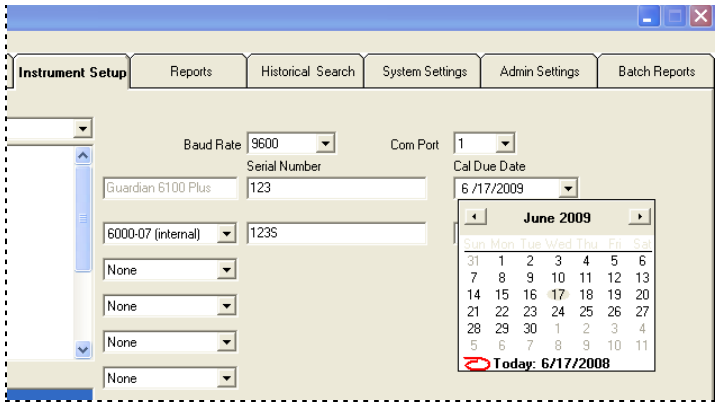


Figure 16 Changing the Cal Due Date

3.12 Com Port Numbers: Preparing for Instrument Setup from a Remote PC

This section is relevant in situations where you are connecting more than one test instrument to the PC.

Com Port numbers can be different from one PC to another. When you are setting up more than one instrument, and you are doing it on a remote PC—i.e., a different PC from the one that actually has the test instruments connected to it—what about the com port numbers? How can you be sure that the com port numbers in your Instrument Setups are the same ones that are on the PC that will be running the tests?

Figure 17 shows the problem graphically, using as an example a PC with three test instruments.

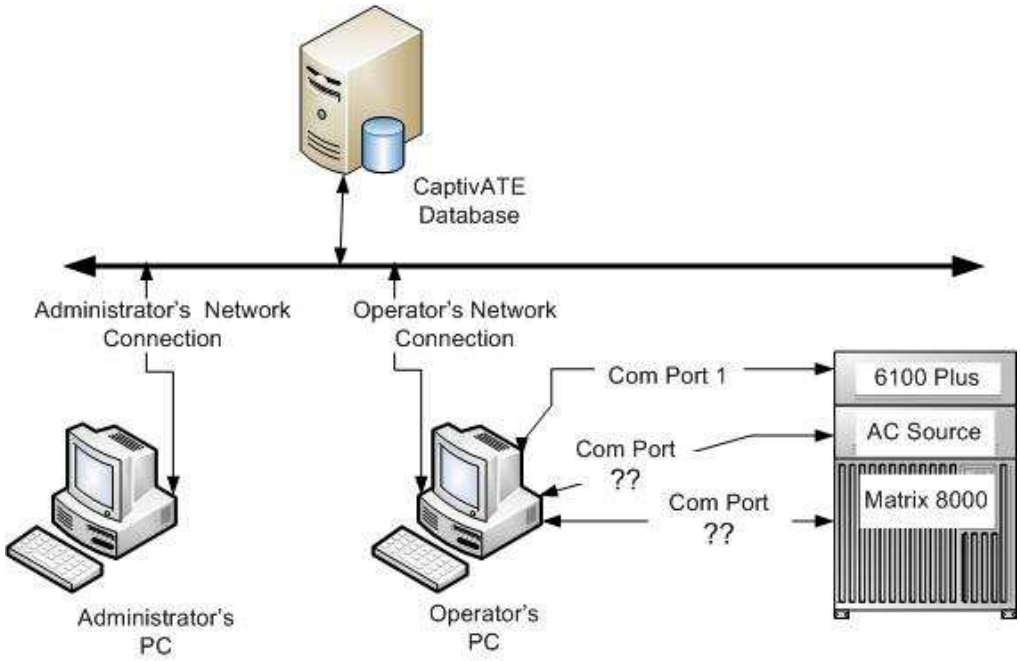
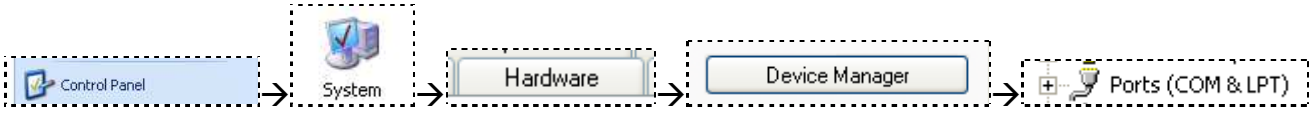


Figure 17 Com Port Confusion: Multiple Test Instruments

3.12.1 Finding Out What Com Ports are Being Used

The following procedure describes how to find out what Com Ports are being used by the PC that has the test instruments connected to it.

1. To obtain the list of test instruments and their respective com ports, click the Windows **Start** button.
2. In order, click the following icons: Control Panel, System, Hardware, Device Manager, and Ports.



3. Click the "+" symbol in front of Ports. The displayed list includes the name of each test instrument and its corresponding Com Port number.

3.12.2 Adapting the Remote PC to Match the Com Port Numbers

The manual port detection selection check box controls which com ports are shown in the instrument setup screen. If checked all 10 com ports can be selected. If unchecked then only available com ports are shown.

On the remote PC, perform the following steps to make available all 10 com ports selections.

Tools/Options/General screen

1. Change the Manual port detection software switch, circled in Figure 18, to check-marked.

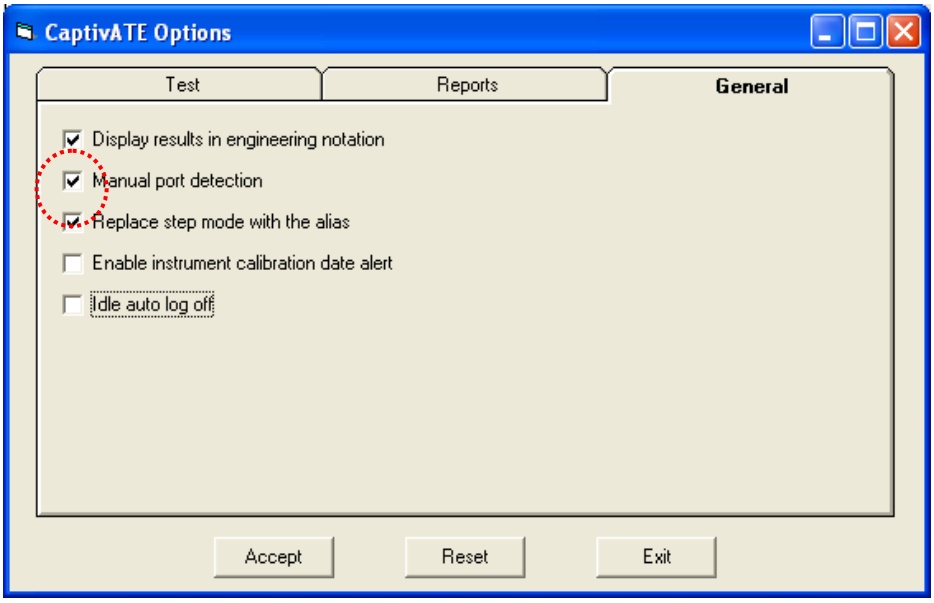


Figure 18 "Manual Port Detection" Pop-up

When you start assigning Com Port numbers, the pull-down list will display all the Com Ports that are available, as shown in Figure 19.

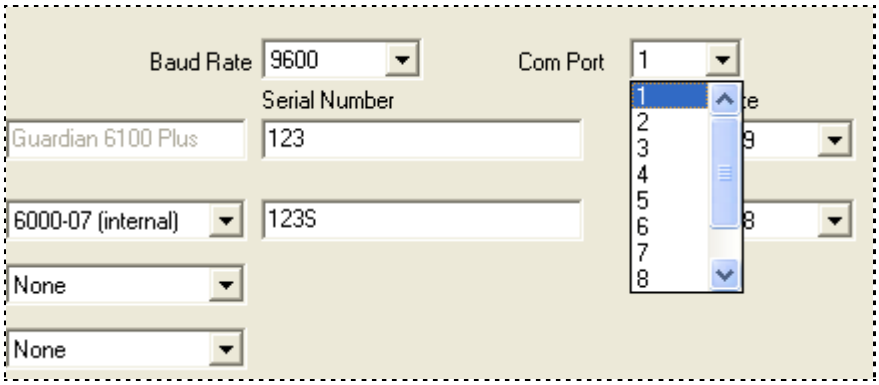


Figure 19 Instrument Setup on a Remote PC with Manual Port Detection

With the Manual port detection selected, therefore, the remote PC has the full range of Com Ports to choose from during Instrument Setup.

4 Software Switches to Automate and Simplify Testing

4.1 Associate DUT Model Numbers with Test Names

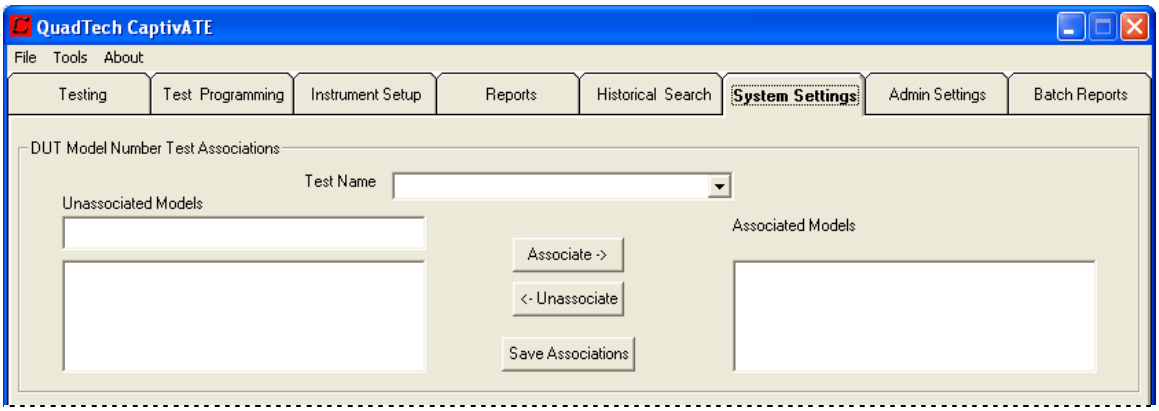
To help automate the test process, you can “associate” tests with DUTs. Once you associate a DUT Model with a Test Name and prepare to run a test, the following happens:

On the *Testing* screen, when you select an associated DUT Model Number, the Test Name box is automatically filled with the test name that is associated with that DUT Model. The cursor goes to the Serial Number text box.

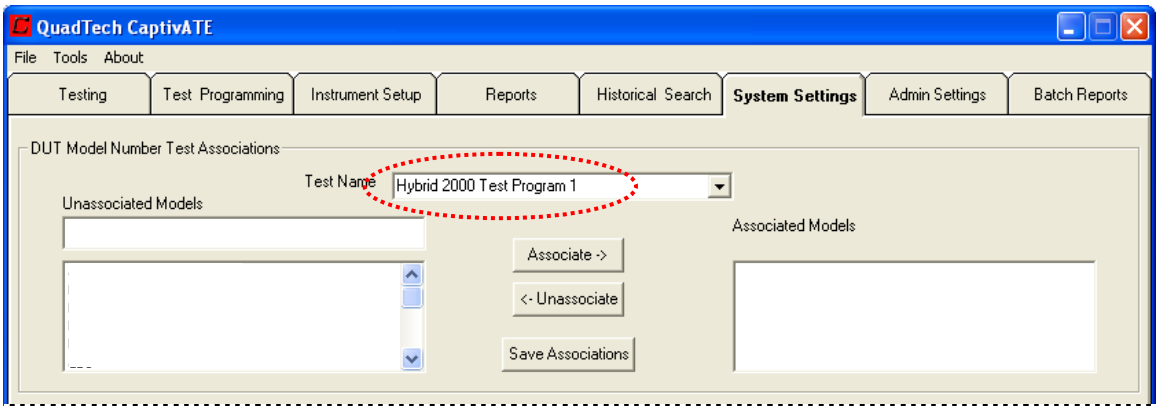
For a description of the Associations buttons and text boxes, see Table 19 on page 2.

System Settings screen

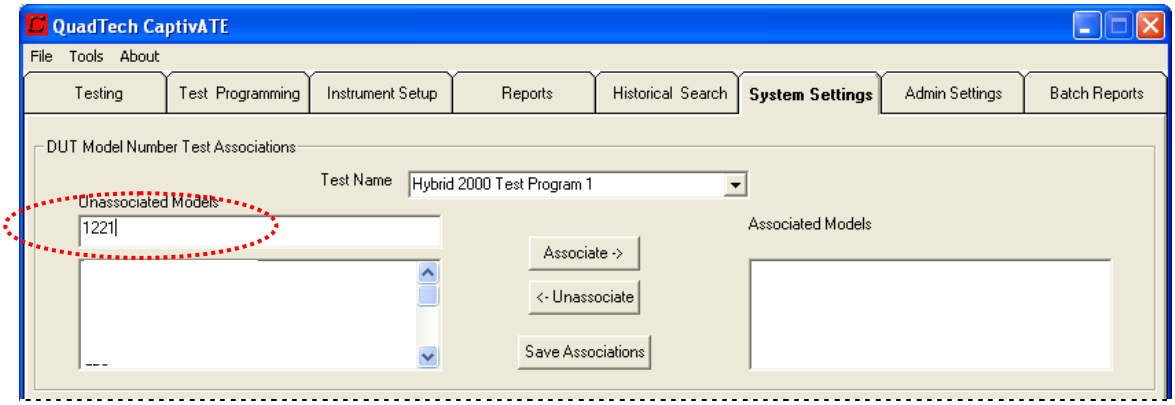
The following example associates a Hybrid 2000 test program with DUT “1221”.



1. Enter a Test Name.



2. Enter an Unassociated Model name or number.



3. Click the **Associate** button. The DUT Model # (in this example, 1221) moves to the Associated Models list box.

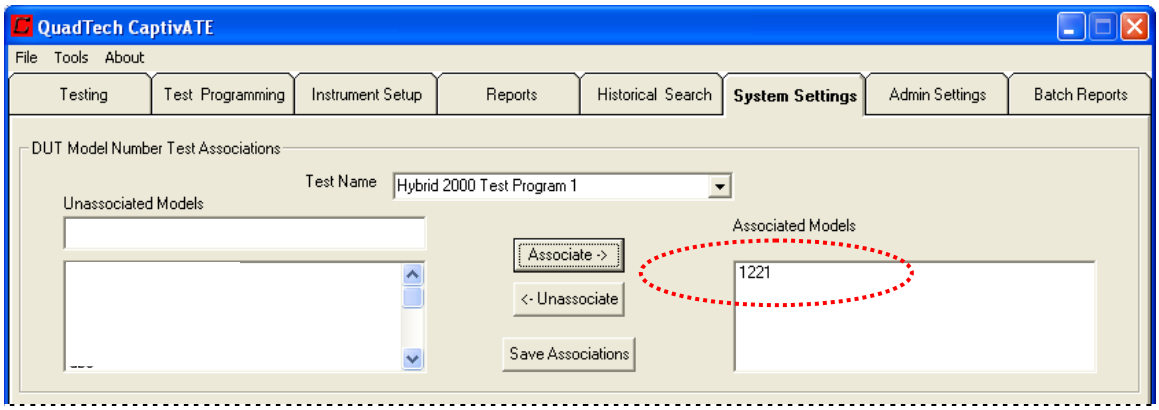


Figure 20 System Settings . . . DUT Model Number Test Associations

4. Click the **Save Associations** button. All text boxes and list boxes are cleared. When DUT Model 1221 is selected on the Testing screen, “Hybrid 2000 Test Program 1” automatically appears in the Test Name box.

4.1.1 Unassociate a DUT Model with a Test

To unassociate (dissociate) a DUT Model that has been associated with a Test Name,

1. Click a Test Name.
2. Highlight a Model in the list box labeled Associated Models and click the **Unassociate** button. The Model returns to the list box labeled Unassociated Models.
3. Click the **Save Associations** button.

4.1.2 Multiple Tests Associated with One DUT Model

Testing screen

When there is more than one test associated with a DUT Model, the system responds as shown in Figure 21. In this example, the DUT Model named “hipot” is associated with four tests. Highlight one of the test names and click **OK**.

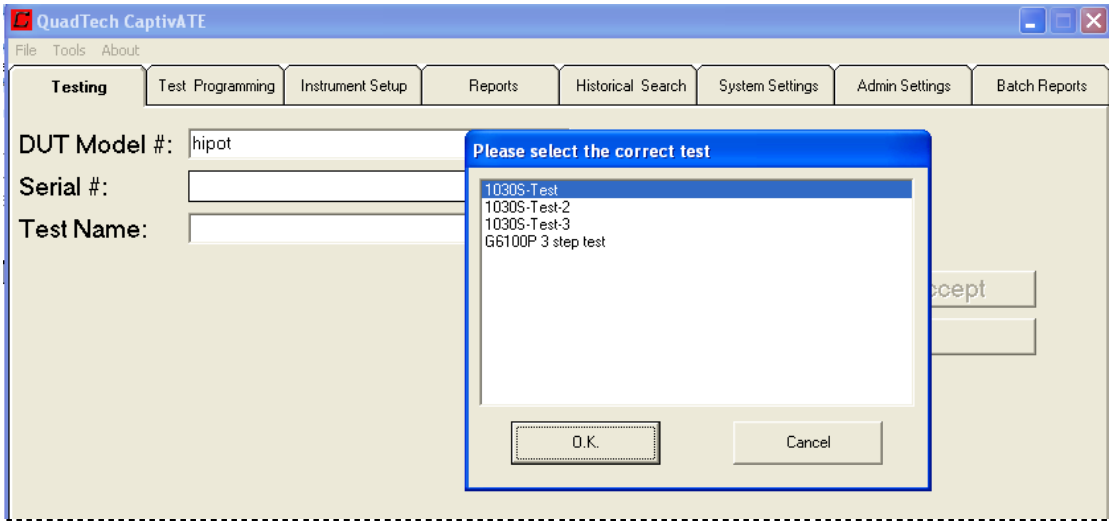


Figure 21 Multiple Tests Associated with the Same DUT Model #

4.1.3 Software Switches to Use with Associations

Tools/Options/Test screen

The following software switches are found on the *Test* tab of *Tools/Options*.

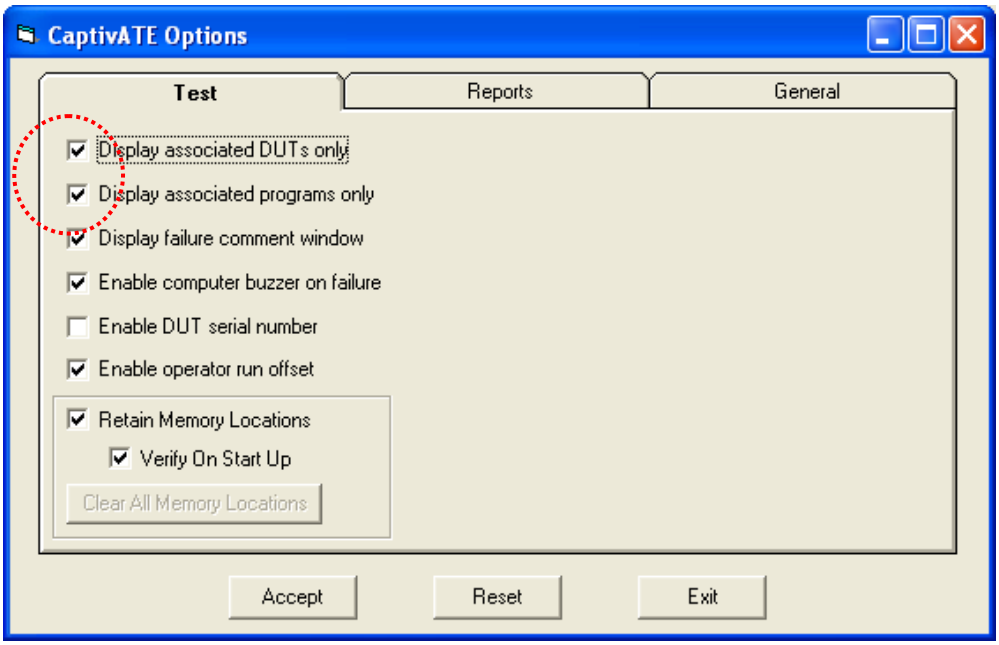


Figure 22 Tools/Options/Test: Software Switches for Associations

Display associated DUTs only	On the *Testing* screen, when a program is selected, only the DUT Model #'s that are associated with that program are displayed. Test Name Field is locked out.
Display associated programs only	On the *Testing* screen, when a DUT Model # is selected, only the test programs that are associated with a DUT are displayed.

4.2 Retain Memory Locations

To improve test time memory locations can be retained when CaptivATE is closed. On startup of CaptivATE memory locations are reloaded from a file eliminating the often time consuming operation of Loading Setups to each instrument. The offset values are also retained.

Note: If Retain Memory Locations is checked a Perform Offset button will appear on the Testing Tab. For operators the Perform Offset button can be disabled by unchecking Enable Operator Run Offset. Always Reload Tests on the Admin Tab will be disabled and greyed out as shown in Figure 24.

Tools/ Options/Test screen

There are two main reasons to retain the memory locations: To avoid reloading long tests, and to save offsets.

When a CaptivATE test program is loaded to a test instrument, it stores the relevant steps of the program in its volatile memory. The contents of these memory locations can be saved by checking the Retain Memory Locations checkbox. When CaptivATE is closed memory locations and offsets are saved to a file. By retaining memory locations, you can avoid the time taken to reload a test during the next CaptivATE session. When the test starts, CaptivATE will immediately display the Danger icon, indicating that the loading phase is skipped and the measurements are being performed right away. Note if when Retain Memory Locations is unchecked memory locations will be cleared and the current CaptivATE session will be closed.

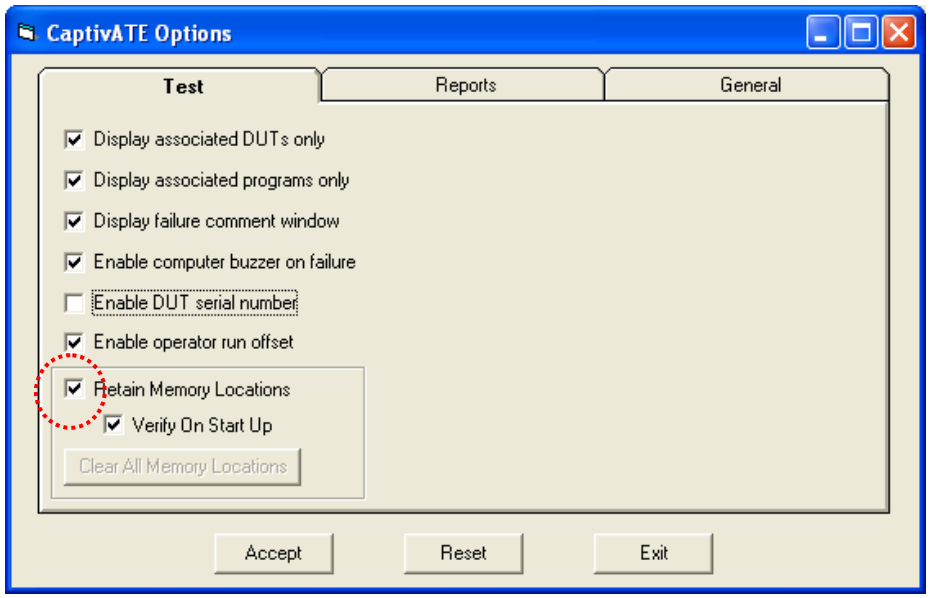


Figure 23 "Retain Memory Locations" Checkbox

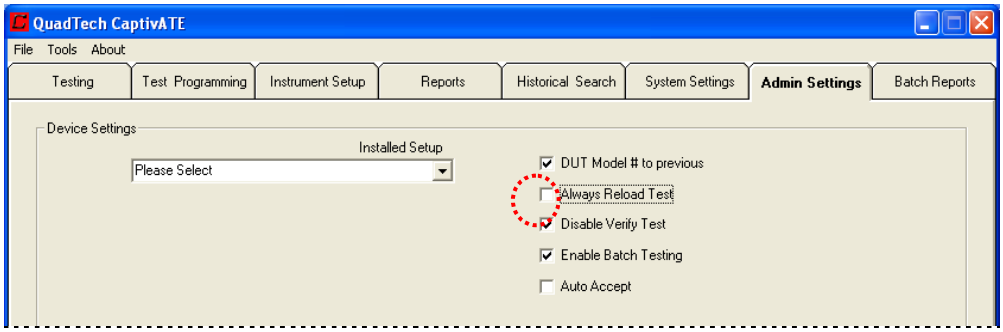


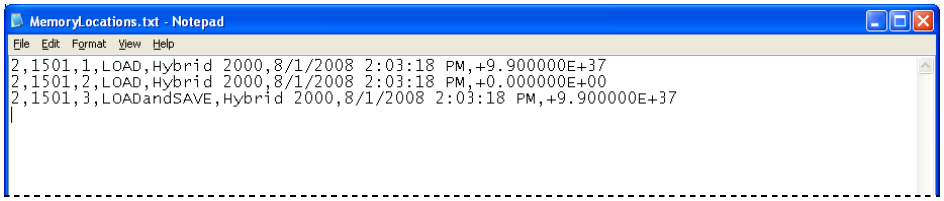
Figure 24 "Always Reload Test" Checkbox

It is not recommend to enable this feature during debugging test programs or modifying test programs. To empty the *MemoryLocation.txt* file, clear the Retain Memory Locations check box and turn off CaptivATE. This is recommended if instruments are changed or feature was used when programming new test programs.

4.2.1 Verify on Start-Up

If Verify on Start Up is checked the first time a test program is accessed during a new session the software will verify that the program in the instrument's memory matches the test program. If the program does not match a warning will be issued and all retained memory locations will be cleared. The next time the test program is run it will load the test program into instrument's memory.

Note: If Retain Memory Locations is checked a file memory locations.txt will be updated with information on instrument memory locations being used



The syntax of the first line of the file is as follows:

Table 1 Syntax of a Line in MemoryLocations.txt

Character String in the MemoryLocations.txt File	Meaning
2	Memory location in the Hybrid 2000
1501	ID number of this test program ("Hybrid 2000 Test Program 1")
1	Step number
Hybrid 2000	Test Instrument
8/1/2008 2:03:18 PM	Date and time
+9.900000E +37	Offset (for the insulation resistance, which is out of range)

4.3 Enable DUT Serial Numbers

Tools/ Options/Test screen

To require the Operator to enter a Serial Number for the DUT before running a test, you can click the Enable DUT serial number checkbox. Then you can choose whether to have the serial number entered manually or incremented automatically.

1. In the *Tools/ Options/Test* screen (Figure 25), click the **Enable DUT serial number** checkbox. The default is Manual.

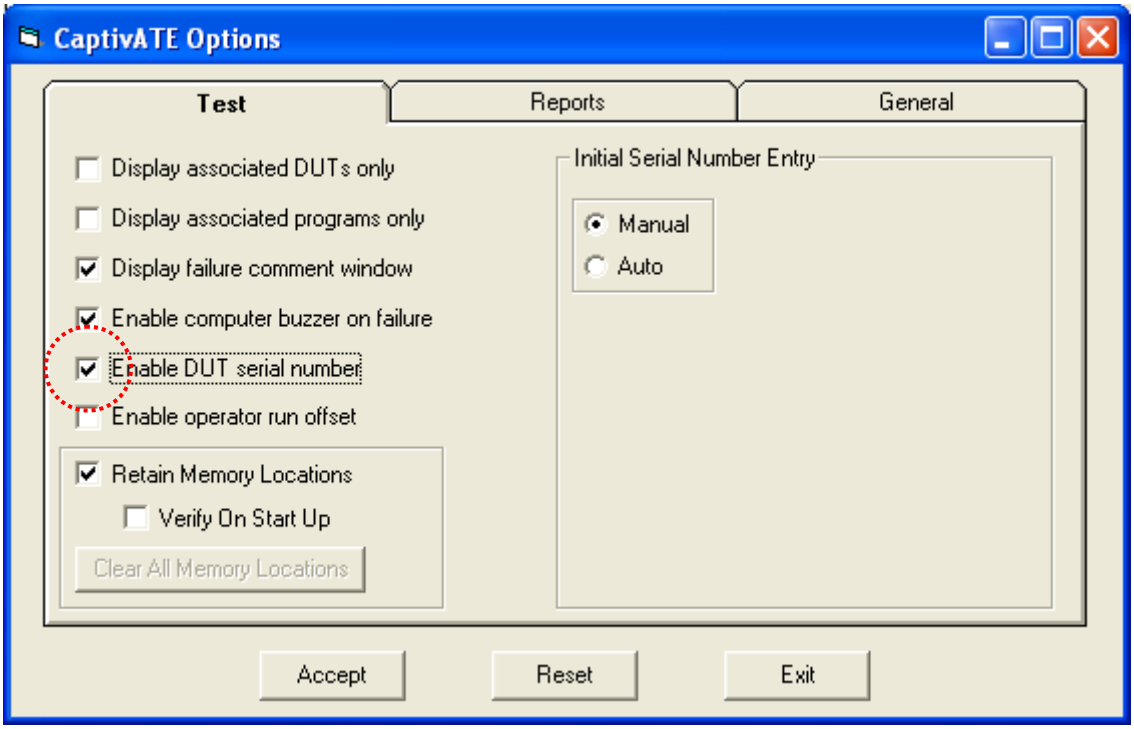


Figure 25 *Tools/Options/Test* Screen: Enable DUT Serial Number

2. To automate the entry of serial numbers, click the **Auto** button.

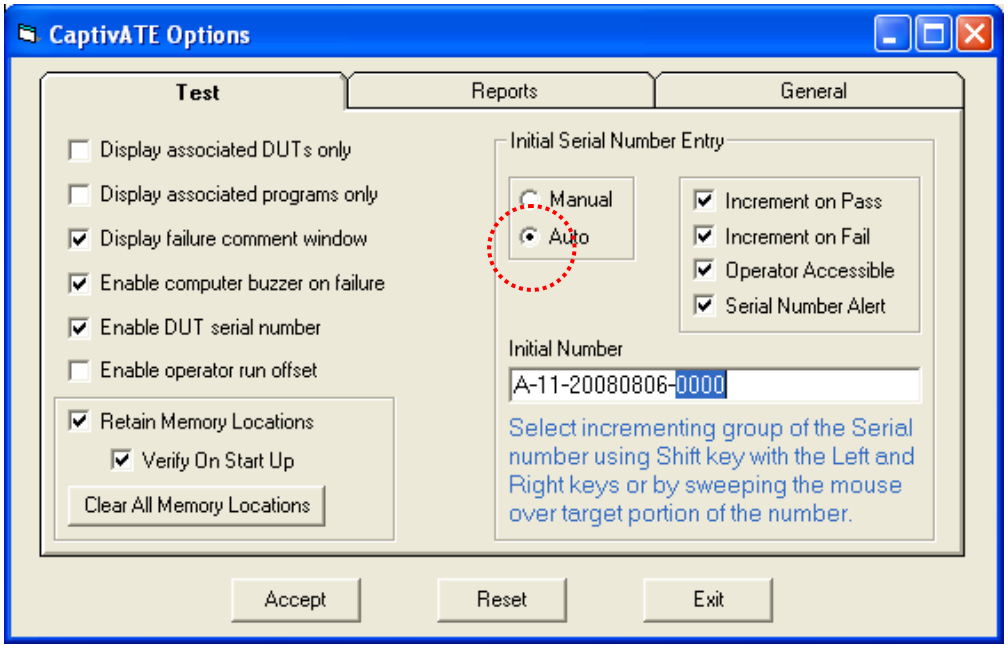


Figure 26 Tools/Options/Test Screen: Operator Accessible

Table 2 shows **Enable DUT serial number**, **Manual/Auto**, and the **Operator Accessible** checkboxes (Figure 26) in all of their combinations, with results in the right column.

Table 2 Checkboxes & Buttons Affecting the Automatic Increment of the Serial Number

Enable DUT serial number	Manual/ Auto	Operator Accessible	Is the **Edit** Button Displayed on the *Testing* Screen?
Checked	Manual	Not Displayed	**Edit** button is not displayed on the *Testing* screen. Operators must enter a serial number via the keyboard. For users with Admin or Engineer status, the *Tools/Options/Test* screen displays as in Figure 25.
Checked	Auto	Checked	**Edit** button is displayed on the *Testing* screen for all users as in Figure 27. When a user with Admin or Engineer status presses the **Edit** button, the *Test* screen displays as in Figure 26. When a user with Operator status presses the **Edit** button, the *Tools/Options/Test* screen displays as in Figure 28.
Checked	Auto	Unchecked	**Edit** button is displayed on the *Testing* screen for users with Admin status only. Users with Engineer status can open the *Tools/Options/Test* screen and then check the **Operator Accessible** box.
Unchecked	Not Displayed	Not Displayed	**Edit** button is not displayed on the *Testing* screen. Users with Admin or Engineer status can open the *Tools/Options/Test* screen and then check the **Enable DUT serial number** box.

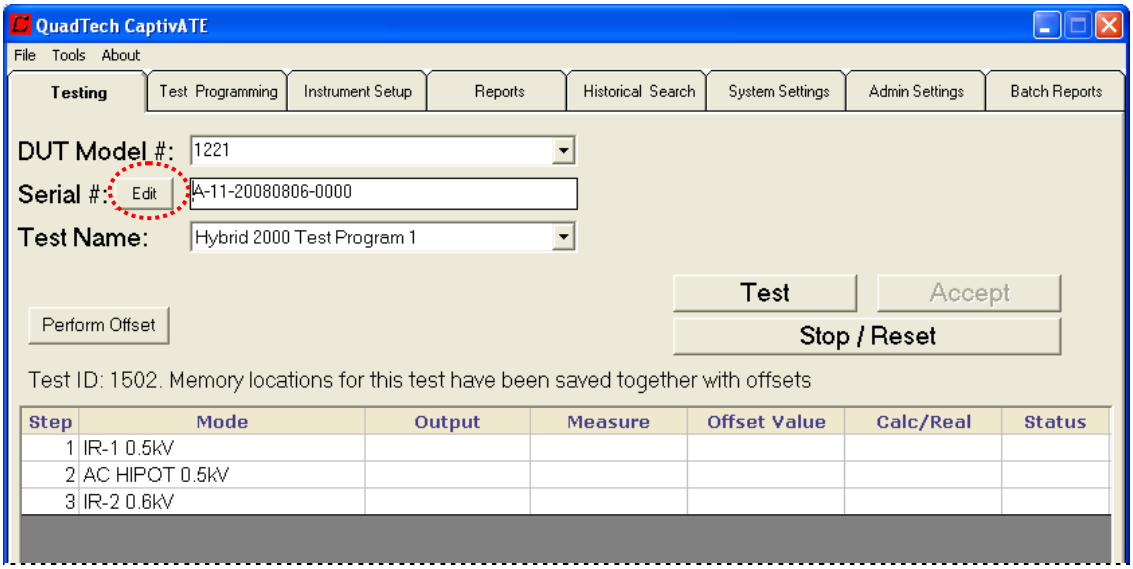


Figure 27 ***Testing*** **screen with Edit Button**

As shown in Figure 28, an Operator who has access to the **Edit** button can edit the serial number.

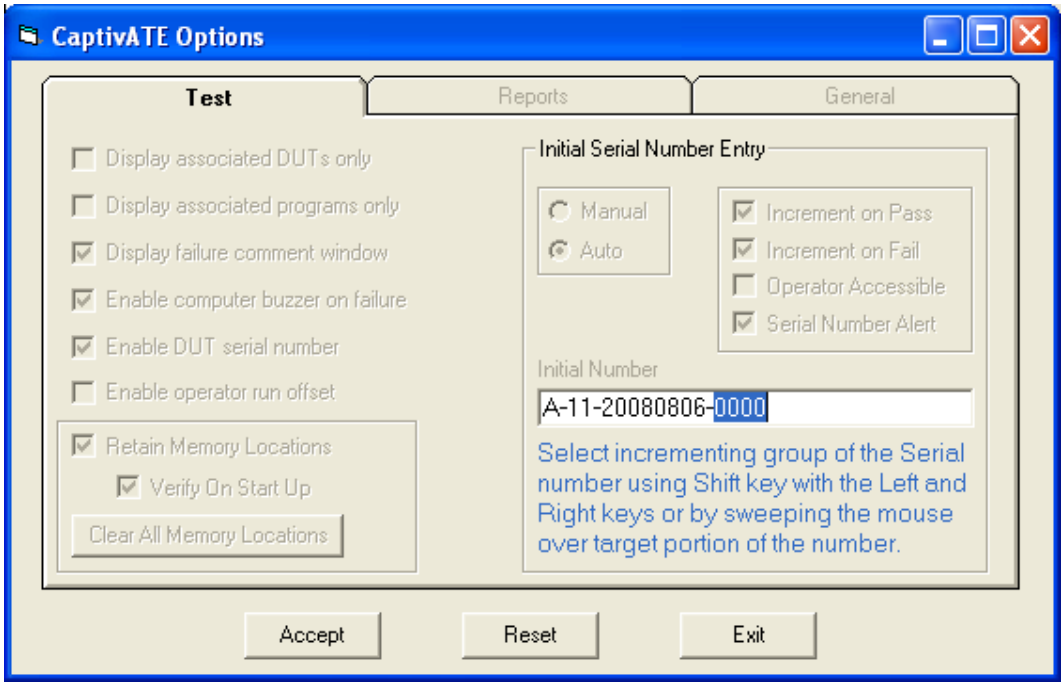
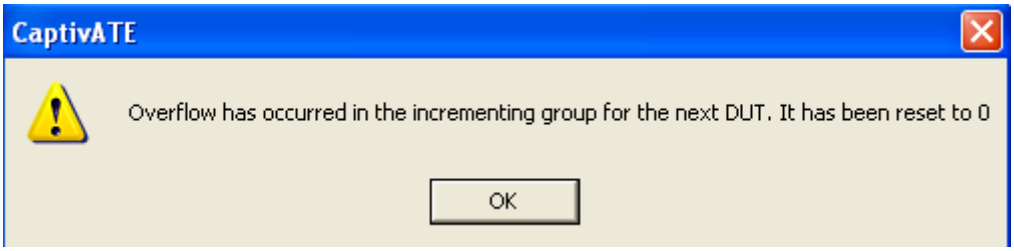


Figure 28 ***Tools/Options/Test*** **Screen as Displayed to a User with Operator Status**

4.3.1 Edit the Initial Serial Number

When the screen displays as in Figure 28, you can edit the serial number that is currently in the field and click **Accept,** or you can type a new string of characters and click **Accept**.

Note: Only the portion of serial number that is highlighted will be automatically incremented. Only alpha and/or numeric characters can be incremented. A message will be displayed to the operator if the serial number being incremented rolls over. Message is shown below.



The last serial number for the CaptivATE session will be saved and will be restored on start up.

Highlighting Hints:

- Hold the left key of the mouse and sweep the cursor over a portion of the serial number.
- Place the cursor to the left of the first character in the portion, and hold down a Shift key while pressing the → key. OR
- Place the cursor to the right of the first character in the portion, and hold down a Shift key while pressing the ← key.

Table 3 How to Edit the Serial Number

Do you want to edit the current serial number or enter a new string?	
If editing the current serial number.	If entering a new string.
The default serial number is 123. Highlight a portion of the serial number and click **Accept**. The characters in that portion of the serial number will be incremented. In the example shown in Figure 28, the edited serial number is A-11-20080806-0000. The portion of the serial number that is highlighted is *0000*. In subsequent tests, therefore, those four characters, starting with *0000*, will be incremented through *9999*, after 9999 the increment group will overflow and be restarted at 0000.	Delete the current serial number if there is one. Enter a new character string as the serial number. Click **Accept.**
Do you want to increment the whole serial number?	
If YES	If NO
To counteract a highlighted portion, click once in the serial number field. Click **Accept**. The serial number will increment from the right-most character to the left-most character.	Select a portion of the serial number as described above.

4.3.2 Serial Number Alert

When you check the Serial Number Alert check box shown Figure 26, the pop-up in Figure 29 is displayed the first time the Test Tab is accessed. This is designed to help an operator remember to check the serial number when automatic incrementing is being used.

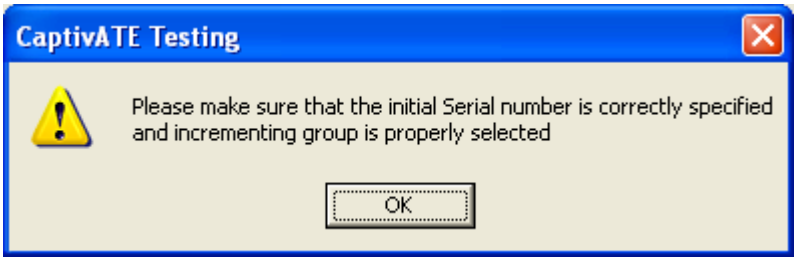


Figure 29 Serial Number Alert Pop-up

4.4 DUT Model # to Previous

Admin Settings screen

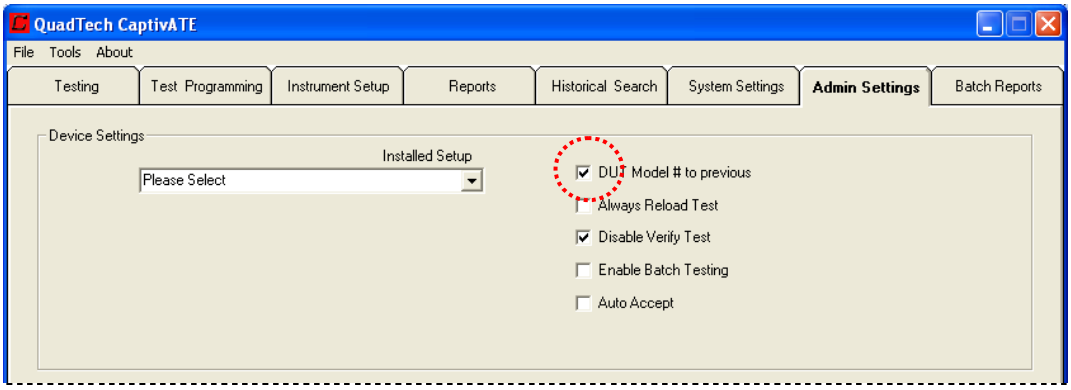


Figure 30 Set DUT Model # to Previous

Whatever DUT Model # was entered on the *Testing* screen in the previous test will be displayed automatically in that text box to begin the next test.

4.5 Auto Accept Test Results

Admin Settings screen

To automatically accept all test results (i.e., saving and/or printing all test results), click the checkbox shown in Figure 31.

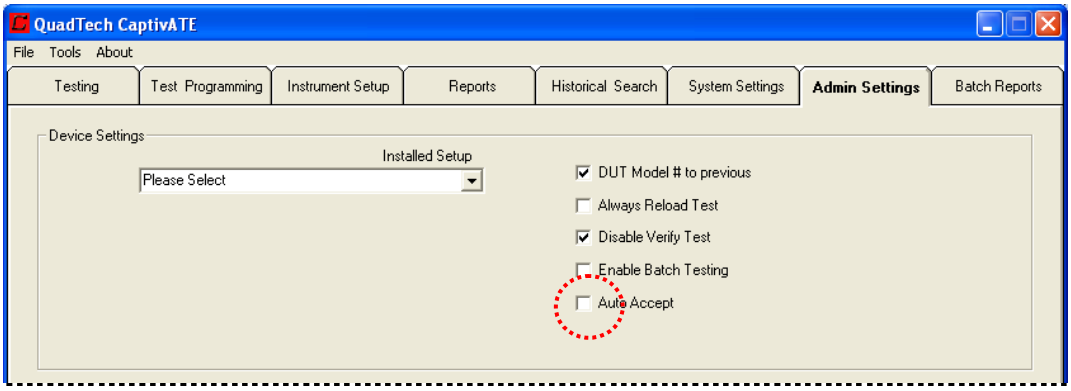


Figure 31 Auto Accept Test Results

Default is uncheck-marked. When checked, without the operator having to click the **Accept** button after a test, the results of the test are saved to the database and printed as defined in Section 6.

4.6 Enable Operator to Run Offsets

Tools/Options/Test Popup

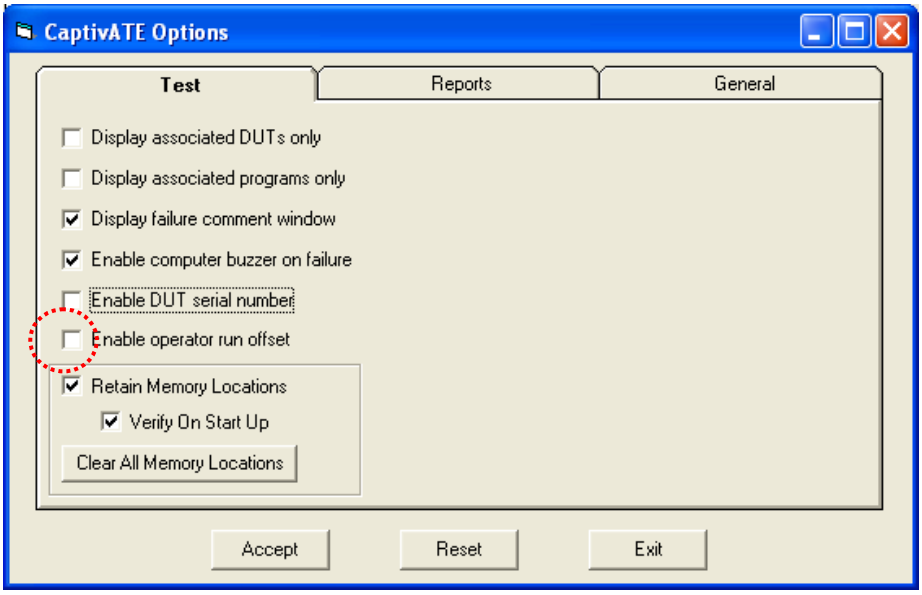


Figure 32 *Tools/Options/Test:* Enable Operator Run Offset

Default is uncheck-marked. When checked, the operator can perform an offset by clicking the **Perform Offset** button on the *Testing* screen.

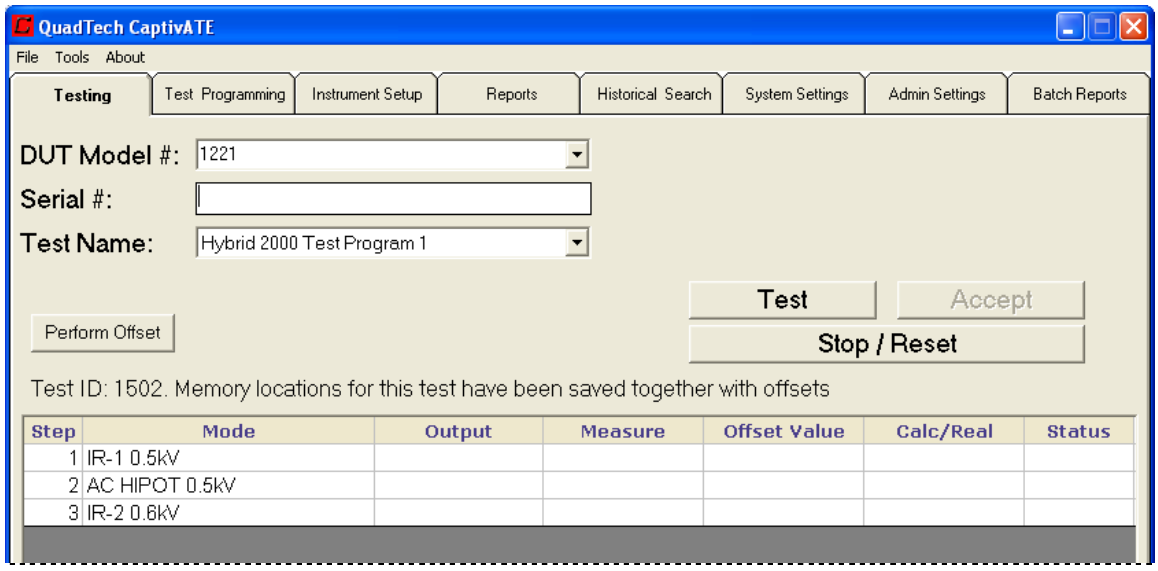


Figure 33 *Testing* Screen: Perform Offset

This offset is the same kind of offset that is performed when you click the Requires Offset checkbox on the *Test Programming* screen.

When you Retain Memory Locations is checked, the offset is also saved.

5 Tutorials

There are two tutorials, A and B. Each tutorial takes you from Instrument Setup through Testing, with branches to Reports, Admin Settings, System Settings, and the other screen and pop-ups that come into play.

Tutorial A has one test instrument, a Hybrid 2000. Tutorial B has the three test instruments that comprise the QuadTech Sentinel III: Guardian 6100 Plus, AC Source, and Matrix 8000,

Tutorial B is different in that it requites you to determine more than one Com Port. The test program created in Tutorial B also deals with steps that are unique to the Guardian 6100 Plus.

5.1 Tutorial A: One Test Instrument

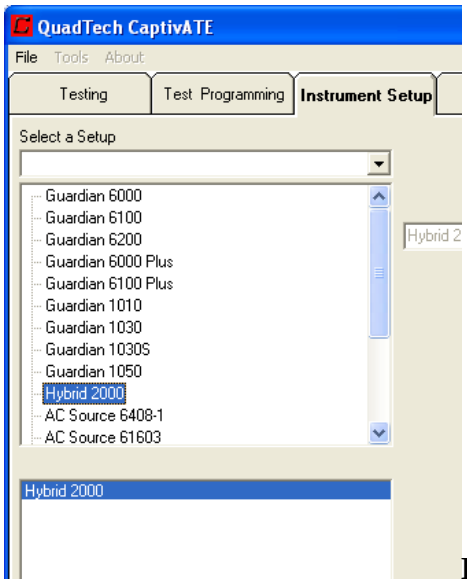
An Instrument Setup is a procedure for naming and specifying the settings of the instrument(s) with which you will be performing the tests. One setup can contain instructions for more than one instrument.

In the following example, the setup is for one test instrument, a QuadTech Hybrid 2000.

Note: Are you setting up more than one instrument? The Instrument Setup procedure is the same regardless of the number of instruments.

5.1.1 Instrument Setup

Instrument Setup screen

1. 

Error! Reference source not found. Click on Hybrid 2000, as shown in Figure 34.
2. Accept the default Baud rate
3. Accept the default com port 1.
4. Enter a serial number for the test instrument.
5. Save the setup by clicking the **Save** button and filling in a name, as in Figure 34.

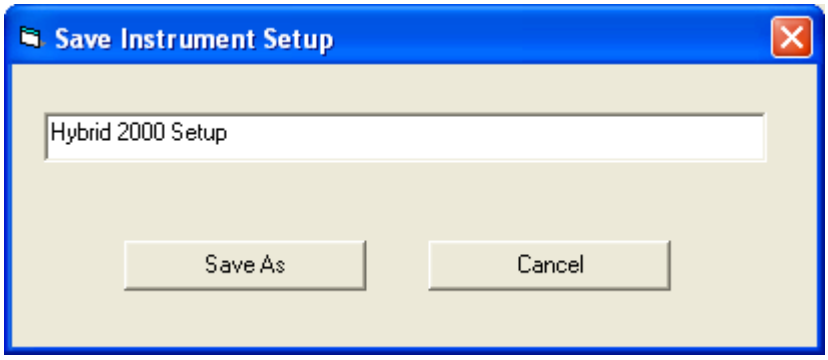


Figure 34 Save Instrument Setup Dialog Box

6. Click the **Save As** button.

5.1.2 Install the Setup

In order to program a test and run a test using an Instrument Setup, you have to "install" the Instrument Setup on the *Admin Settings* screen.

Admin Settings screen

1. In the Installed Setup text box, select the setup you just created, named "Hybrid 2000 Setup," as in Figure 35.

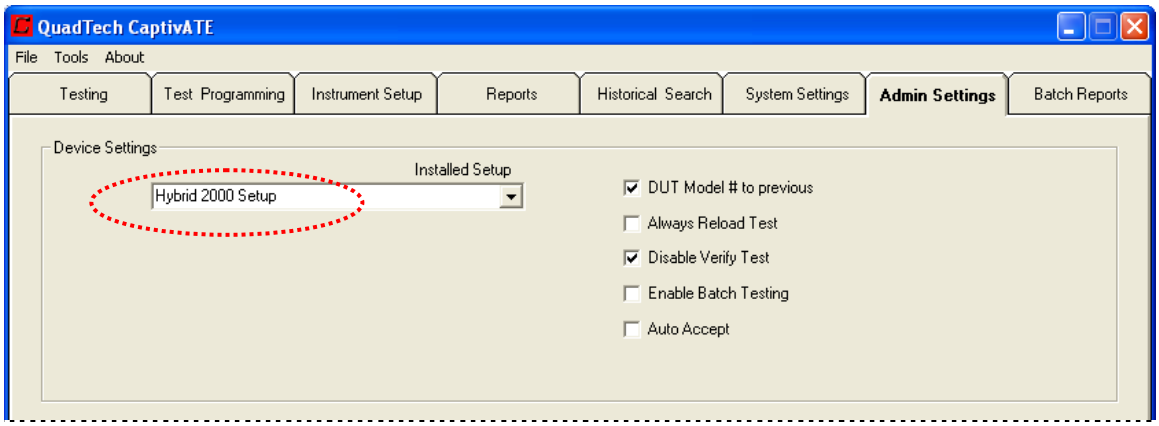


Figure 35 Install the Setup on the Admin Settings Screen

2. Click the **Update Settings** button and see the pop-up window as shown in Figure 36.

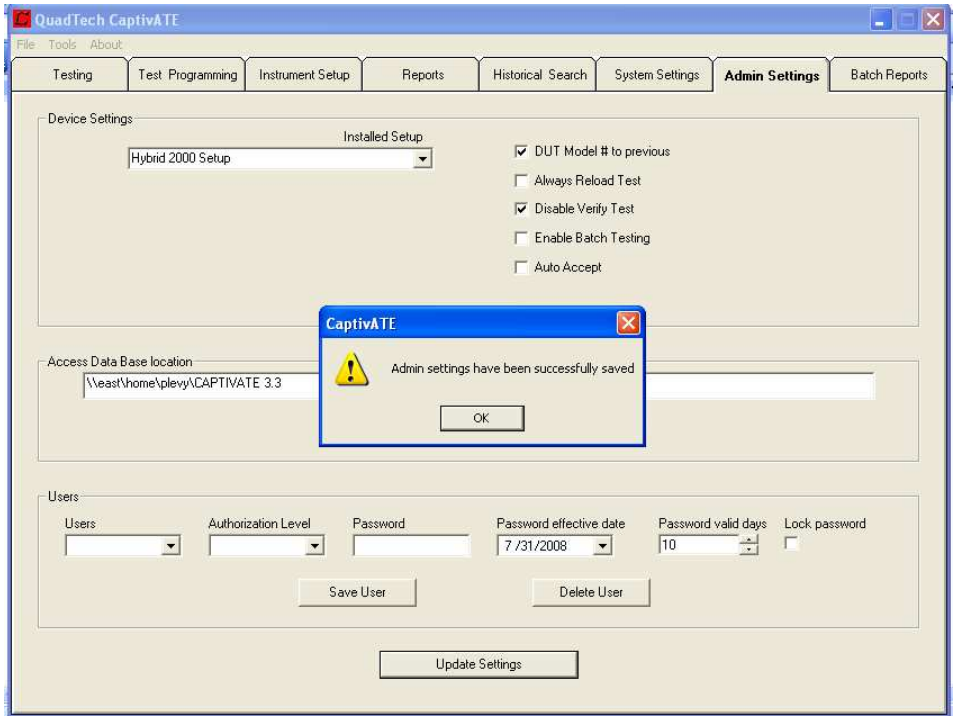


Figure 36 Admin Settings Pop-up

The setup that you just installed will appear on the Test Programming screen, as shown in Figure 37.

5.2 Program a Test

Test Programming screen

Rules of Test Programming

- When you enter a parameter value that is outside the limits, CaptivATE issues an error message.
- CaptivATE does not allow a comma (,) to be entered as a decimal point in a parameter text box. You must use a period (.) as a decimal point. (See Note to European Users on Page 2.)
- The equal sign (=) and the semi-colon (;) must **not** be entered in any text box.
- To remove a step, click on the step to highlight it, and click **Remove.**
- To clear the Test Sequence list box and start again, click **Cancel** instead of Save. All previously programmed steps of that sequence will be lost.
- Do not modify test programs while other CaptivATE users are running them.
- Setups manually programmed in an instrument's memory that conflict with the settings in CaptivATE are over-written by CaptivATE after terminating the test on the first try.
- If two Presets are programmed for the same instrument, they must be separated by a step (mode) from that instrument. Otherwise, when the Disable Verify Test software switch is uncheck-marked, a failure will occur.
- When programming a test in which there are more than one test instrument: Program the test sequence in the order in which you want CaptivATE to execute it.

See the message: "Hybrid 2000 Setup." The text box below, CaptivATE displays only the test instruments included in that particular Instrument Setup.

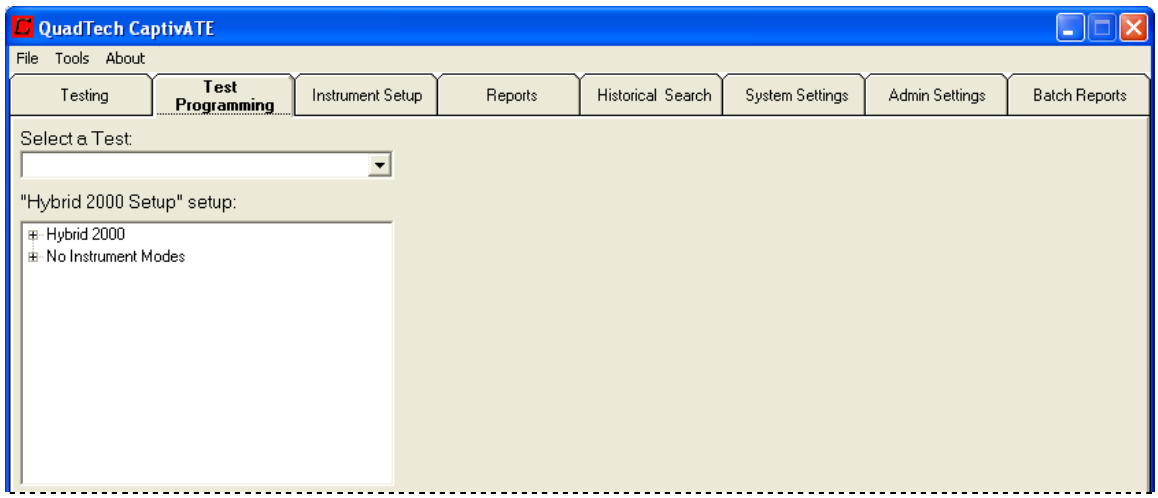


Figure 37 Test Programming Screen: Installed Setup Is Highlighted

1. Click the Hybrid 2000 "+" to show the modes, as in Figure 38.

In the Tutorial A Test Program, there are three modes or steps:

Insulation Resistance

AC Hipot

Insulation Resistance

2. Click the Insulation Resistance mode. The text boxes are displayed as in Figure 38.

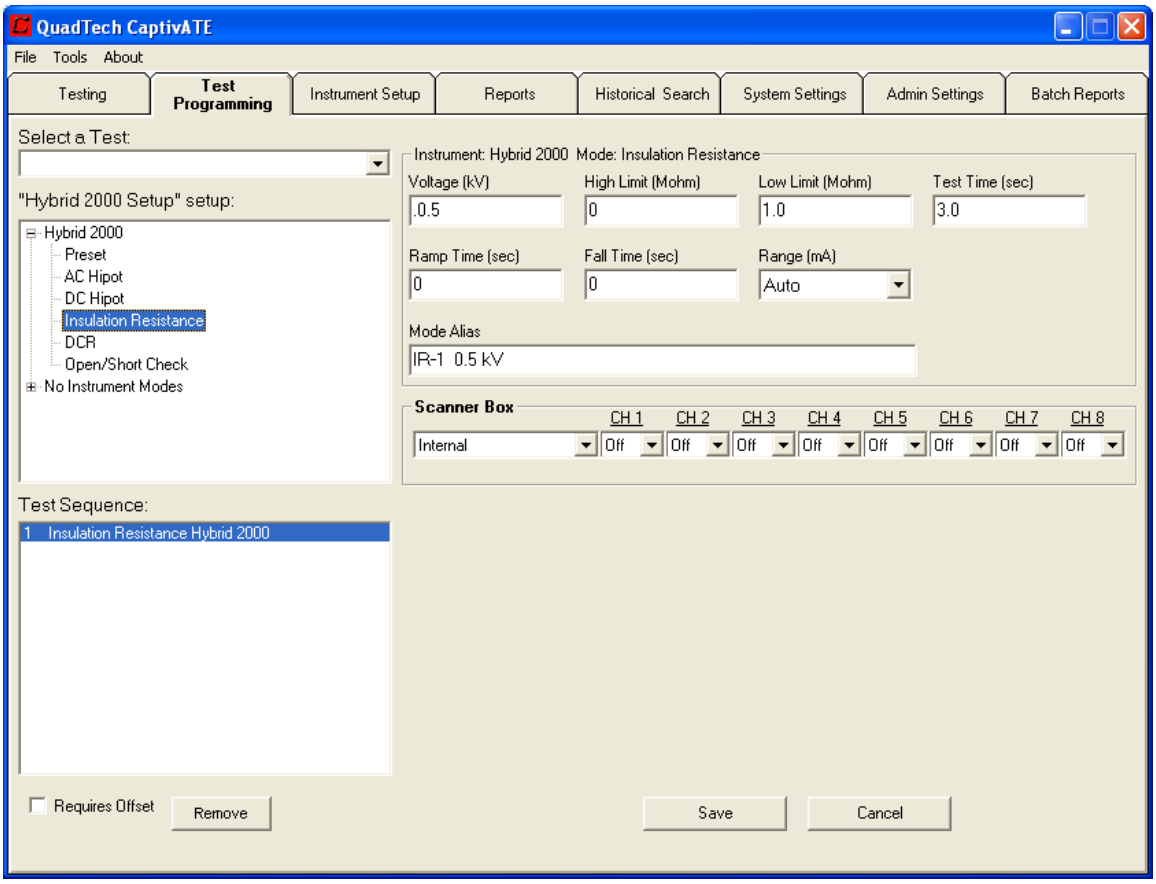


Figure 38 Test Programming: Insulation Resistance as First Step

3. Enter 0.5 kV in the Voltage text box, and enter an optional alias in the Mode Alias text box.
4. Enter AC Hipot. The Voltage text box (kV) is required. Mode Alias is optional.

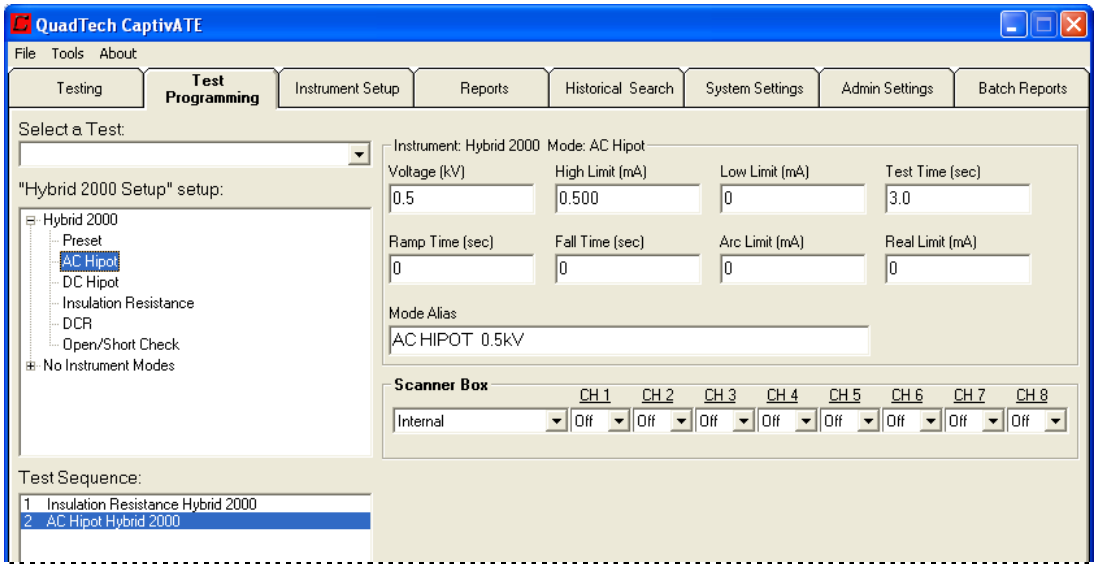


Figure 39 Test Programming: AC Hipot as the Second Step

5. Enter Insulation Resistance. The Voltage text box (kV) is required. Mode Alias is optional.

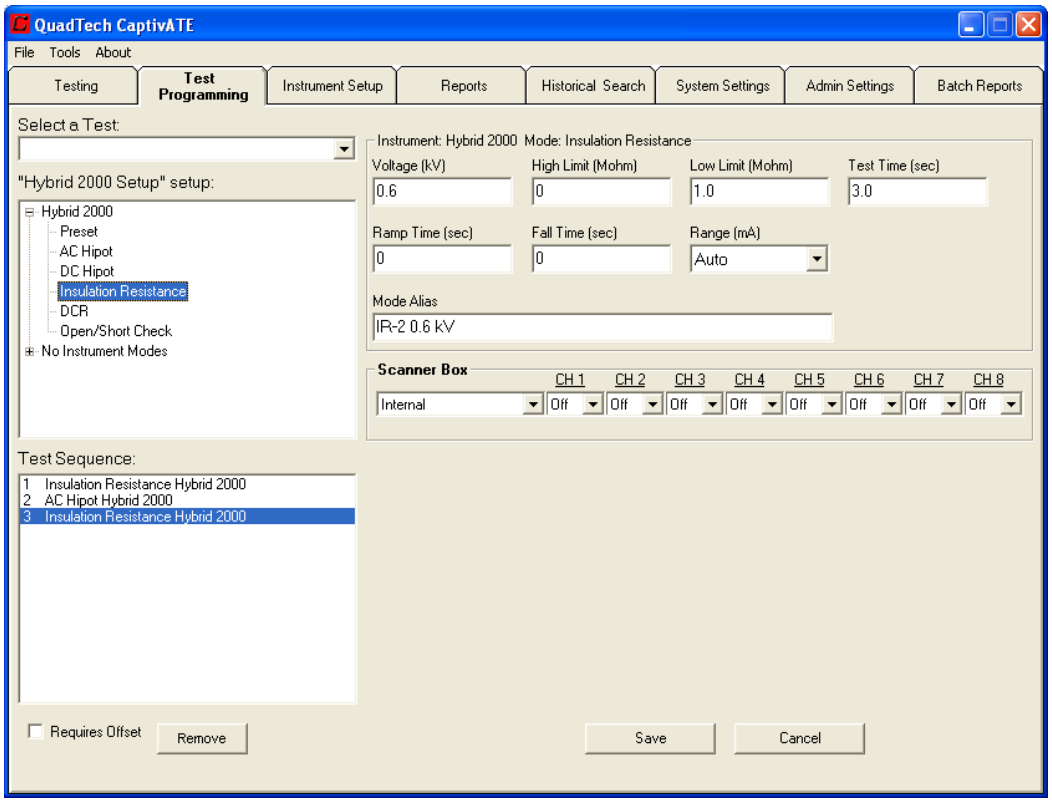


Figure 40 Test Programming: Insulation Resistance as Third Step

6. Click the **Save** button. A pop-up window appears as in Figure 41.

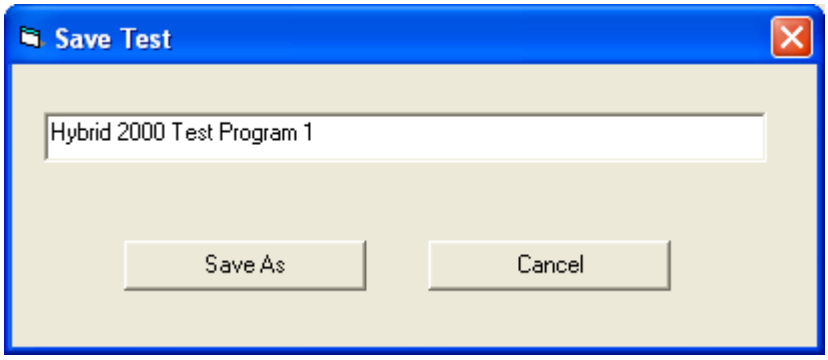


Figure 41 Save the Test Program

7. Enter a name for the test program, and click the **Save As** button,

5.3 "No Instrument" Modes

No Instrument Modes allows a variety of functions to be accessed during the test sequence such as creating a pause or displaying a work instruction. As shown in the sections below, these modes are Functional Check, Numeric Functional Check, Virtual Pause, Timed Virual Pause and Document Retrieval. The example shown below uses a Guardian 6100 Plus, all supported instruments listed in section 1.6 can be used.

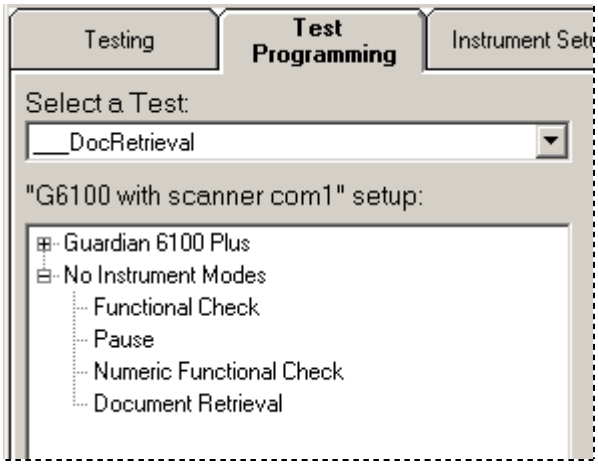


Figure 42 No Instrument Modes

5.3.1 Functional Check

Functional Check allows the programmer of the test to send instructions to the Operator. The same thing can be done with a Virtual Pause. But during a Functional Check, the Operator, depending upon the results after carrying out the instructions, clicks either the **Pass** button or the **Fail** button. The test will continue on a PASS. The test will be stopped on a Fail.

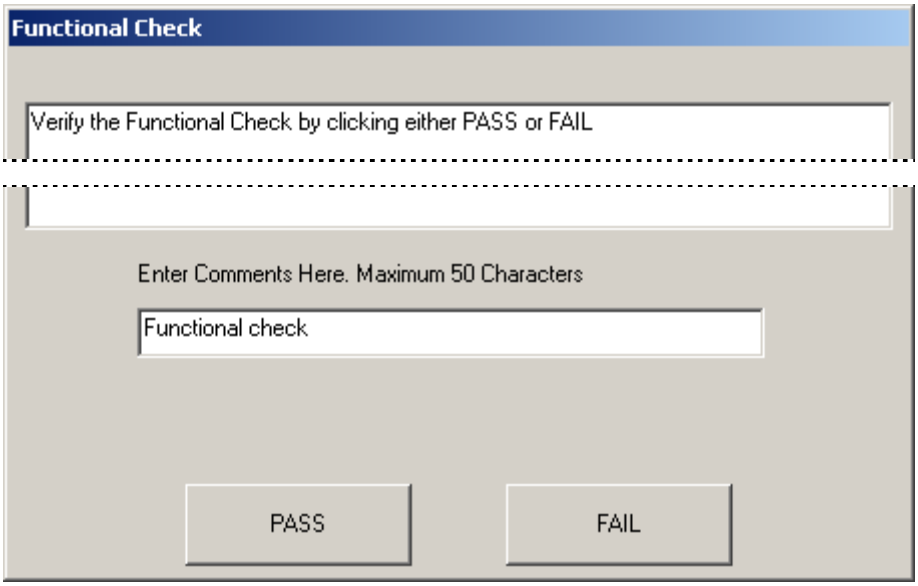


Figure 43 Functional Check Pop-Up during the *Testing* Phase

For instance, the instructions of a Functional Check might tell the Operator:

```
Please verify there is a serial number on the back of the DUT.
```

Or

```
Please press the ON button of the DUT and verify the message
‘ACME Patient Monitor’ is displayed on the LCD within three
seconds.
```

In the first example, if there is a serial number, the Operator clicks the **Pass** button and the test proceeds, if not he clicks **Fail**.

In the second example, if the message is displayed within the allotted time, the Operator clicks the **Pass** button and the test proceeds; if not, he clicks **Fail**.

The Operator can also enter a comment in the text box labeled “Enter Comment Here.” These responses are saved to the database.

5.3.2 Numeric Functional Check

Like a Functional Check, the programmer gives the Operator an instruction, and during the test the Operator responds. For example, if DUT is an oven, the instruction might be “Please read the thermometer and enter the temperature of the oven in the text box labeled ‘Enter Numeric Value Here’.”

The Operator’s input must be a number.

The CaptivATE software compares the numeric value entered by the Operator with the High and Low limits as defined by the programmer during the Numeric Functional Check step in the *Test Programming* phase.

5.3.3 Virtual Pause

Virtual Pause is a step that delays the test and/or passes messages to the Operator. During the test, when the message has been received, and the instructions carried out or the delay completed, the Operator clicks the **Continue** button to proceed to the next step.

5.3.4 Document Retrieval

Document Retrieval is a step that displays a document in a separate window. The document can be any document chosen by you in the Test Programming phase. The Document Type radio buttons should be used to select if the document is a Microsoft Office Document or other document such as pdf, jpg, txt etc.

Note that not all Office documents are supported by Microsoft Office Document Type, such as templates are not allowed.

Note that Ctrl-C, to continue a test, will not work when displaying pdf documents.

In Figure 44, the selected document is a .doc file, which when the step is reached, will open a window displaying the 150889 rev b.doc document.

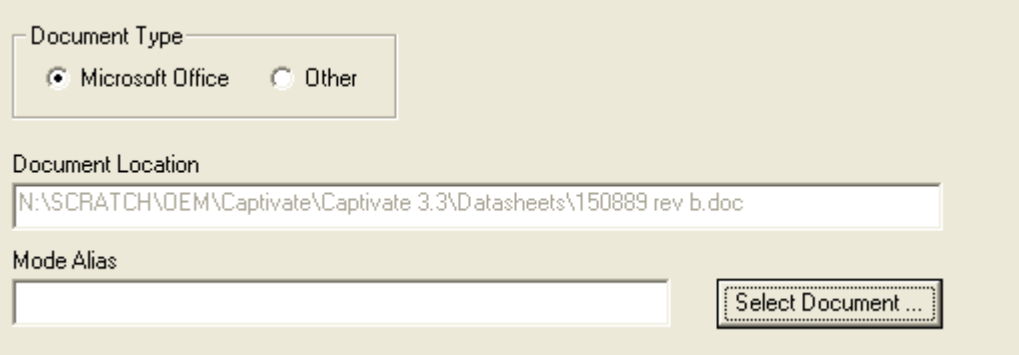


Figure 44 Document Retrieval Text Boxes

5.3.5 Timed Virtual Pause

Timed Virtual Pause is identical to Virtual Pause with an additional timer. Once the time out seconds has elapsed the next step will be executed. During the test, when the message has been received, and the instructions carried out or the delay completed, the Operator can also click the **Continue** button to proceed to the next step.

5.4 "Requires Offset" Check Box

An offset procedure is one in which the resistance or current carried by connectors and cables of the test instruments is calculated and "zeroed" to assure accurate measurements. When you check-mark this box (lower left of the *Test Programming* screen), it sets the stage for an offset procedure. An offset procedure is carried out just before the test is run. The system pop-up prompts the Operator to disconnect the DUT and connect the offset test cables.

When the "Requires Offset" check box on the *Test Programming* screen is check-marked. The following procedure is required while running that test:

1. As the test is loading, a pop-up message box instructs you to remove connections to the DUT and, if necessary, connect the offset test fixtures. Click **OK**.
2. At the end of performing an offset, a pop-up box tells the Operator to disconnect the offset fixture and connect the DUT.
3. Click **OK**. Allow the test to start. Results of the offset procedure are displayed in Figure 45.

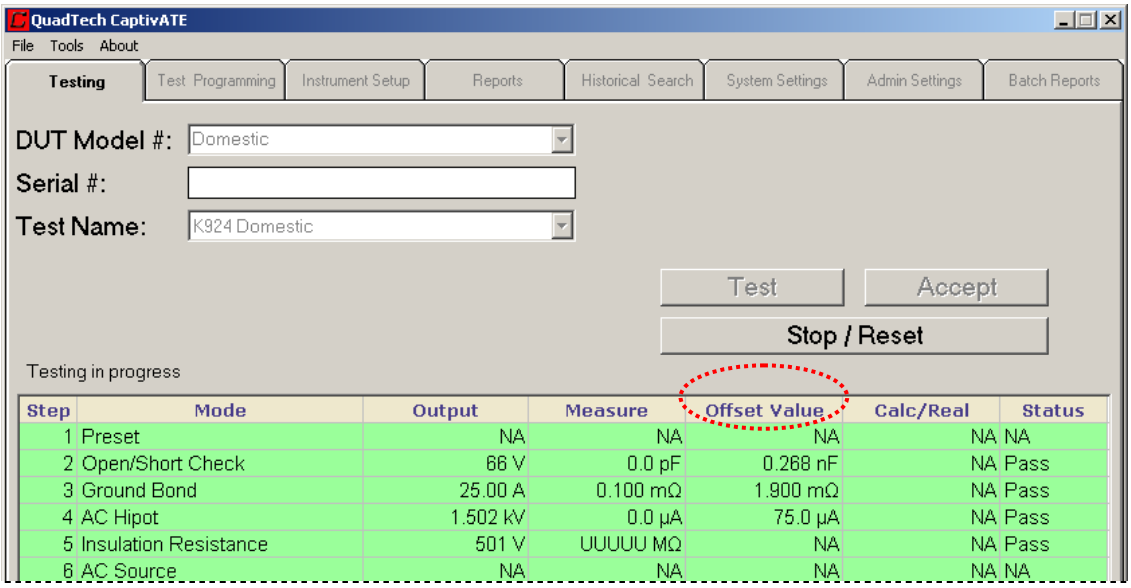


Figure 45 Testing screen Showing Offset Values

4. Enter DUT Model #, Serial #, and select a Test Name

*Note: When you enter a DUT Serial #, please avoid the following nine characters: \ / : * ? “ < > | In CSV, these characters will be replaced with underscores (_).*

5.5 Flags Seen During Tests

Table 4 Flags Seen During Tests

Flags display…	on backgrounds	. . .in these circumstances
	YELLOW	The first time this particular test is run OR When the software switch is ON (**Error! Reference source not found.**, Page **Error! Bookmark not defined.**)
	ORANGE	When the software switch is ON. (**Error! Reference source not found.**, Page **Error! Bookmark not defined.**)
	YELLOW	While a test is running.
	RED	When a specified limit has been breached at any step (mode).
	GREEN	When the DUT has remained within limits during all steps.

CaptivATE allows the instruments to receive the results of the tests; namely PASS or FAIL; the user can then press the **Accept** button to store the results in the CaptivATE database. As defined in the *System Settings* screen (Figure 74 on Page 2), an electronic test report will be created, saved, and printed.

5.6 Stop/Reset Button

You can stop the testing process at any point by clicking **Stop**/**Reset**.

One Click	Two Clicks
Stops test, issues message on *Testing* screen Turns off the buzzer and enables manual acceptance of failed test.	Resets test list boxes unless "DUT Model # to Previous" is check-marked on the *Admin Settings* screen.

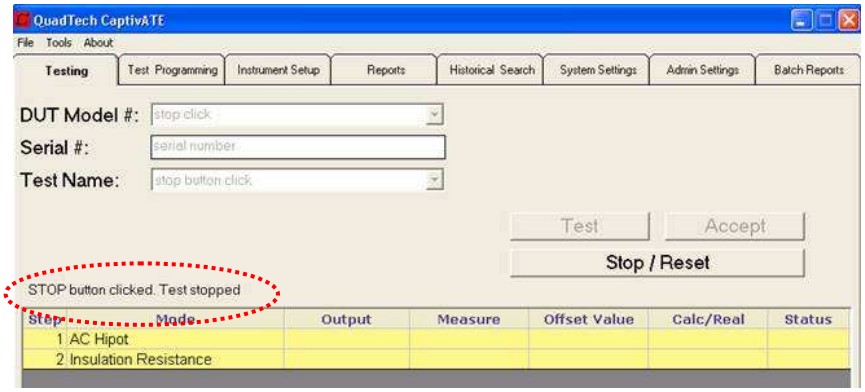


Figure 46 Test Stopped

5.7 Display Failure Comment Window

When a test fails and the Tools/Options/Test software switch is ON (Figure 47), the Failure Comment pop-up is displayed. The Operator must enter a comment of up to 50 characters.

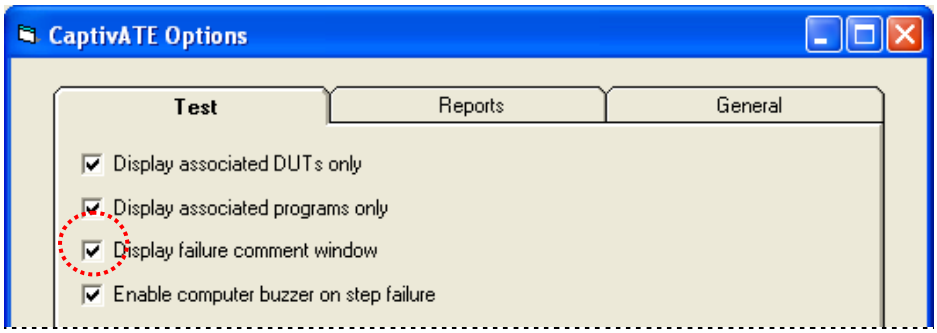


Figure 47 Tools: Software Switch, Failure Comment

Text box pops up when a test fails (Figure 48). A failure comment must be entered; a "Failure Comment" section is created in the Standard Report of this test.

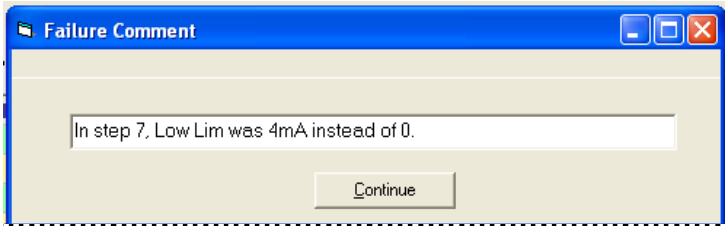


Figure 48 Failure Comment

5.7.1 Batch Testing

One other choice before starting a test is whether you want to run a batch of tests. See Batch Tests and Batch Reports in Section 7.

5.7.2 Test Procedure

Testing screen

1. Select or Enter a DUT Model #.
2. Verify that the Serial Number displays automatically.
3. Verify that the Test Name associated with the DUT Model# displays automatically.

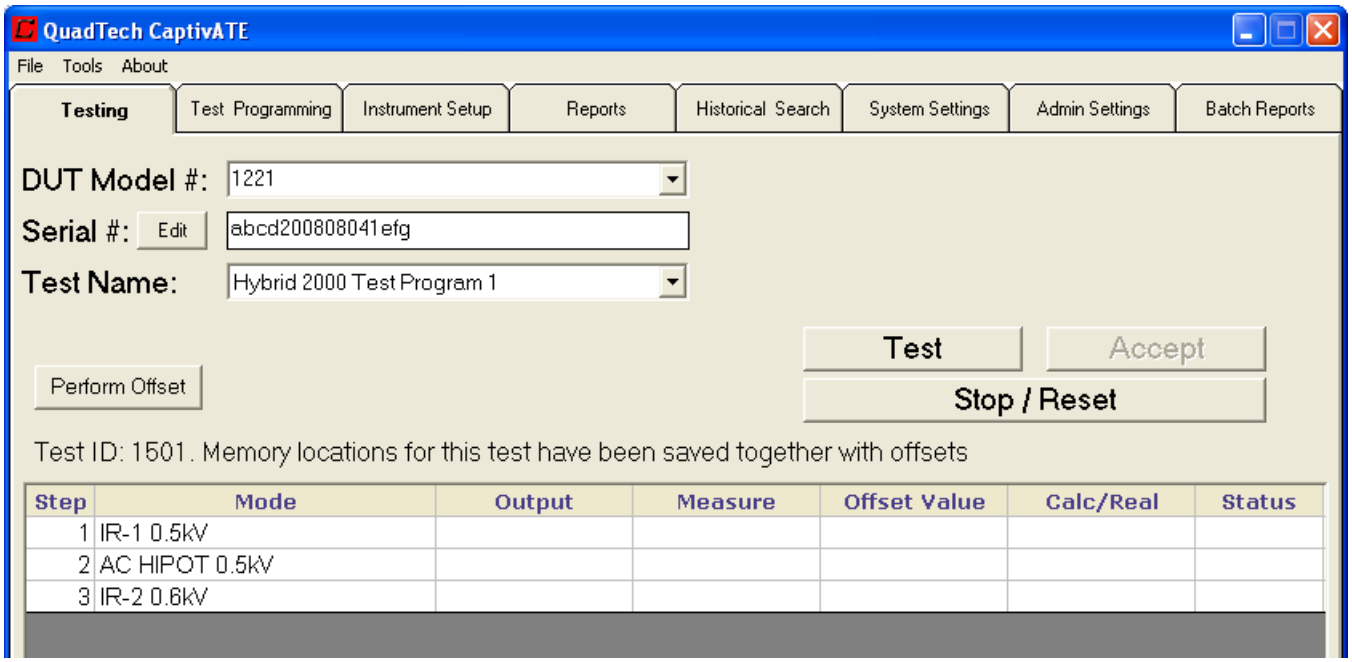


Figure 49 *Testing* Screen: All text boxes filled in

4. Click the **Perform Offset** button.

5. Click OK to begin the offset.

6. Start the test in one of the following ways:
   a. Click **OK** to continue.
   b. Press the **Test** button,
   c. Select Test from the File menu
   d. Press the Ctrl-T keys.
   e. Scan the “Test” bar code with a barcode scanner.

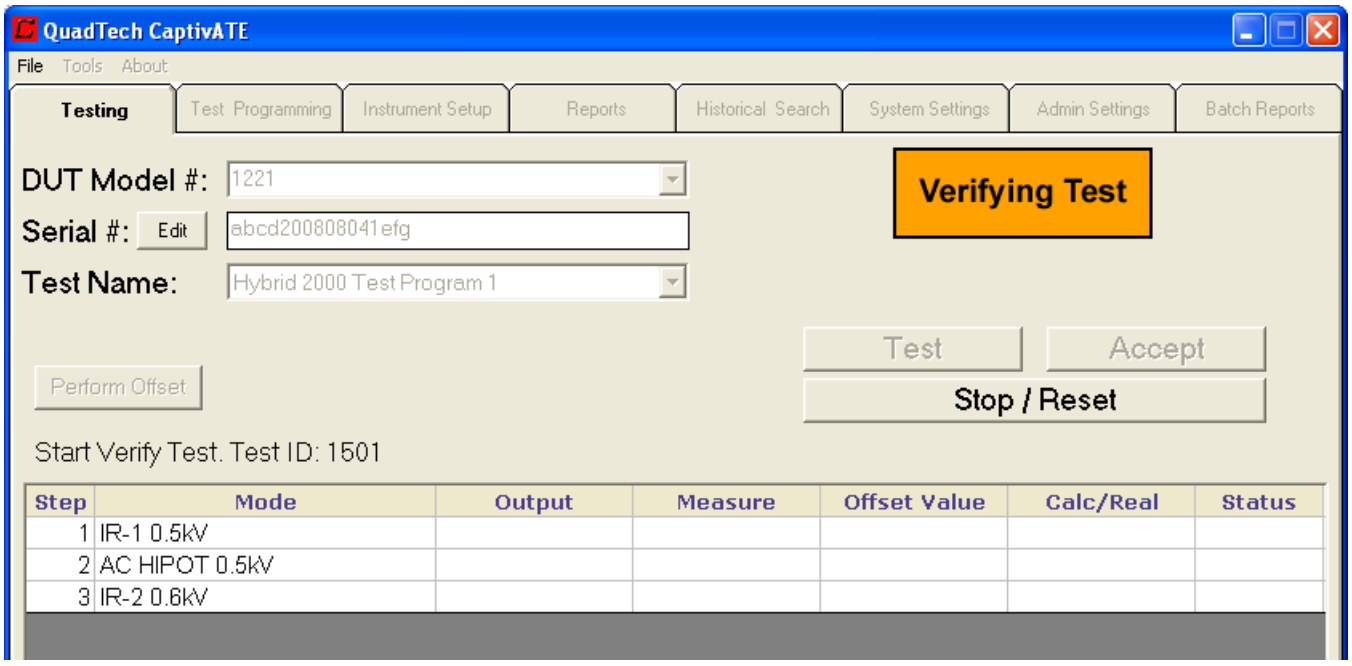


Figure 50 *Testing* screen: Verifying test

5.8 Tutorial B: Three Test Instruments

In the following example, the setup is for three test instruments: an AC Source, a Matrix 8000, and a Guardian 6100 Plus. This set of test instruments is the QuadTech Sentinel III product.

Note: Are you setting up only one instrument? The Instrument Setup procedure is the same regardless of the number of instruments.

An Instrument Setup is a procedure for naming and specifying the settings of the instrument(s) with which you will be performing the tests. One setup can contain instructions for more than one instrument.

5.8.1 Instrument Setup

Instrument Setup screen

1. Click the *Instrument Setup* tab. The *Instrument Setup* screen is displayed. A list of QuadTech test instruments is displayed in the list box.
2. Select as an instrument the 6100 Plus by double-clicking on its name, as shown in Figure 51. The instrument name then appears in the lower list box window.

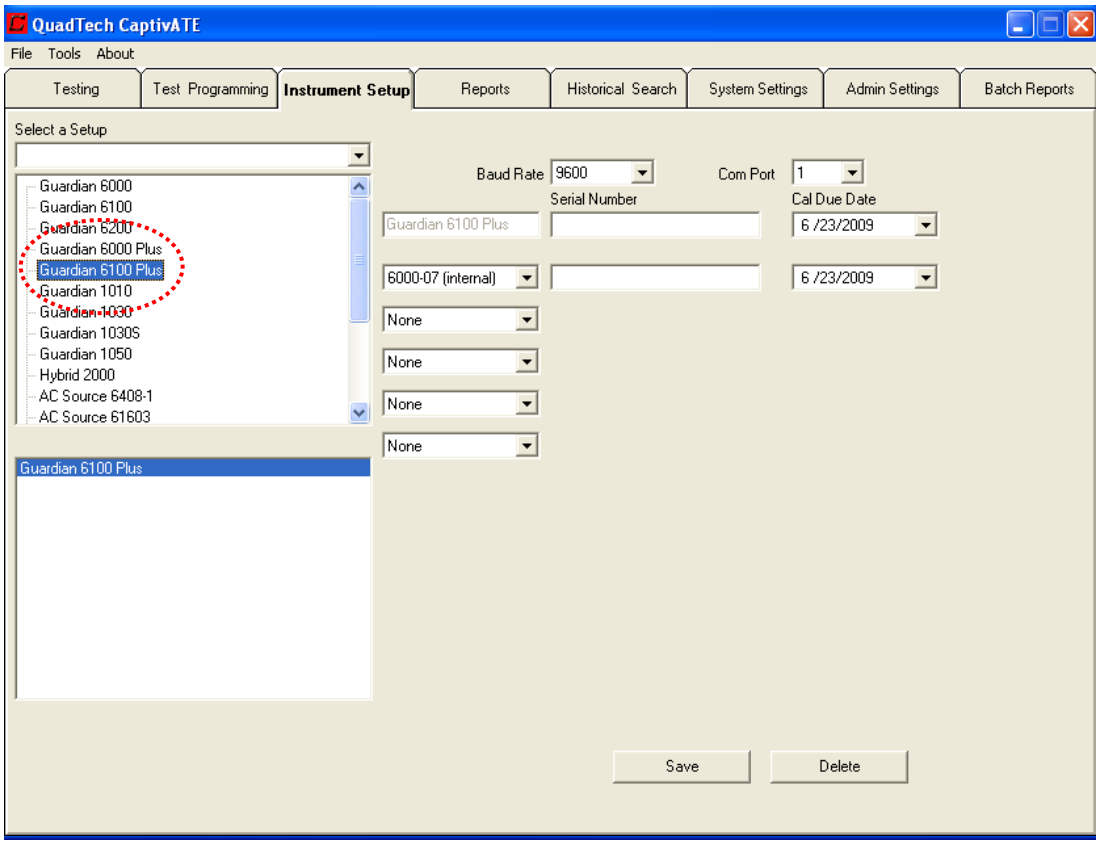


Figure 51 *Instrument Setup* screen

3. Accept the default baud rate, which is set by the software to either 9600 or 19200.
4. The PC com port that accepts the 9-pin D-connector is always Port 1.

5. Enter a Serial Number for the 6100 Plus.
6. The Calibration Due Date (Figure 52) is defaulted to one year from the date on which the instrument was set up. To change the Cal Due Date, see or to request an email alert when the Cal Due Date is imminent, see section 3.9.

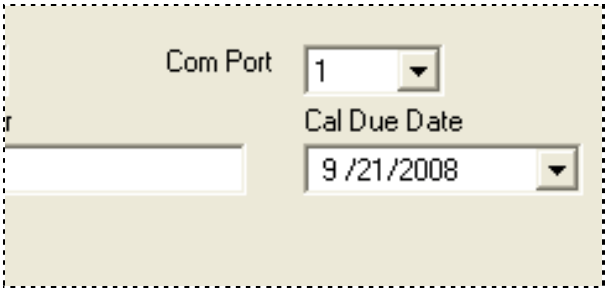


Figure 52 Calibration Due Date

7. In the list box, double-click on the name of the AC Source, 6408.
8. Connect a USB cable from the PC through a serial converter adapter to the AC Source.
9. Open the Com Port pull-down list. Now what com ports are shown to be connected? COM PORTS 1 and 4. Therefore, when you assign a Com Port to the AC Source during Instrument Setup, assign it Com Port 4.
10. Select 4 from the Com Port pull-down list and enter a Serial Number for the AC Source.
11. In the list box, double-click on Matrix 8000.
12. Connect a USB cable from the PC through a cable adapter to the Matrix 8000.
13. Open the Com Port pull-down menu.

Com Ports 1, 4, and 6 are being used, which tells us that the USB connection made to the Matrix 8000 was from Com Port 6.

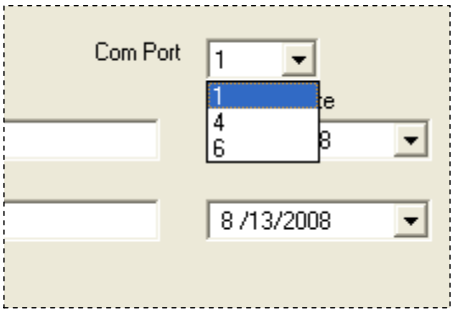


Figure 53 Com Port Pull-down with Three Instruments Connected

5.8.2 Finish the Setup

1. Select 6 from the Com Port pull-down list and enter the serial number of the Matrix 8000.
2. When the instruments have each been included, click on **Save** at the bottom of the *Instrument Setup* screen. A “Save Instrument Setup” pop-up box appears.

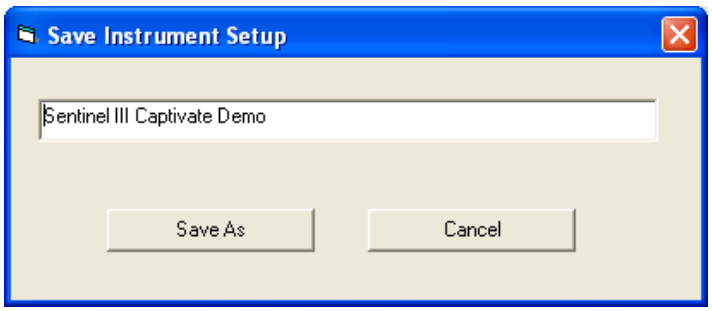


Figure 54 Save Instrument Setup Pop-Up

3. When the instruments have each been included, click on **Save** at the bottom of the *Instrument Setup* screen. A “Save Instrument Setup” pop-up box appears.

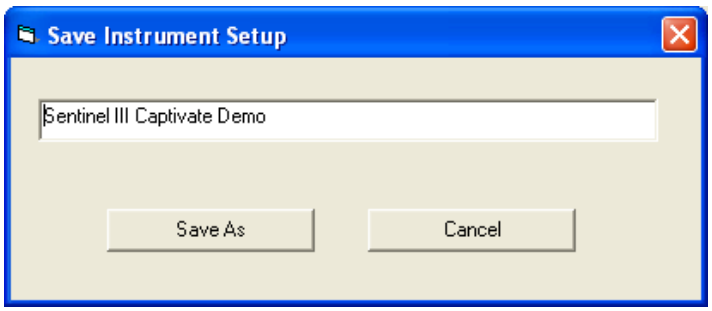


Figure 55 Save Instrument Setup Pop-Up

4. Click **Save As**.

5.8.3 Install the Setup

Admin Settings Screen

You must specify one Instrument Setup per test. Once you have saved an Instrument Setup, you must “install” it as follows before using it to run a test.

1. Click the *Admin Settings* tab.
2. From the Installed Setup drop down box, click an instrument setup as in Figure 56.

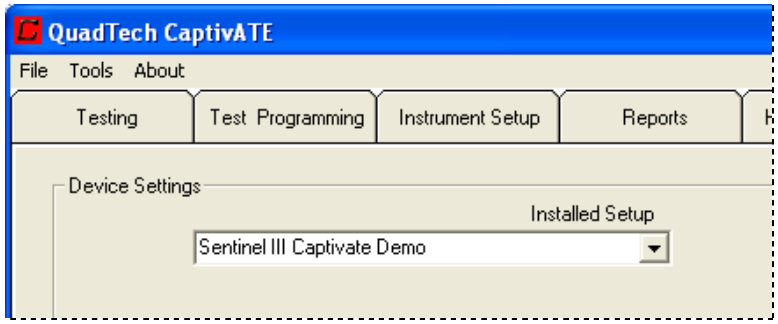


Figure 56 Admin Settings: Selecting an Installed Setup

NOTE: Changes to any of the Device Settings must be followed by clicking the **Update Settings** *button at the bottom of the Admin Settings screen. Once you update ant setting, the message shown Figure 57 appears.*

Figure 57 Updated System Settings Pop-up

5.8.4 Program a Test

The sample program that will be created here is for a Sentinel III, which contains three instruments

Note: Are you programming only one instrument? The Instrument Setup and the Test Programming are the same, regardless of the number of instruments.

Test Programming screen

The Test Programming screen displays the instruments that are in the setup selected on the Installed Setup box on the *Admin Settings* screen.

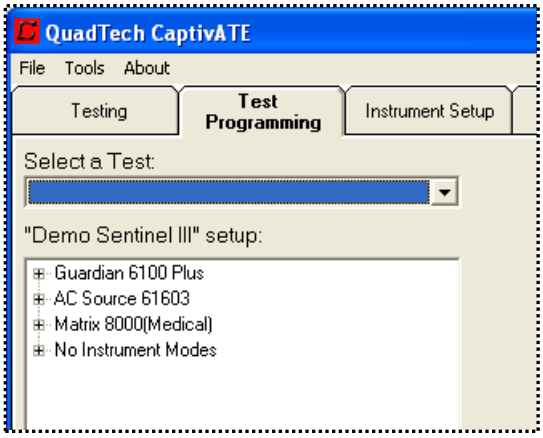


Figure 58 Test Programming: Included Instruments

AC SOURCE 61603

The AC Source maintains a stable voltage, which in our example is 120V. An AC Source is programmed into Step 1

1. Start building a test sequence by clicking the AC source, and expand the command tree by clicking the "+" next to the respective instrument as shown in Figure 58.
2. Double click on a test step command. The command will be added to the Test Sequence window. The right side of the *Test Programming* screen will display the test parameters for the selected step.

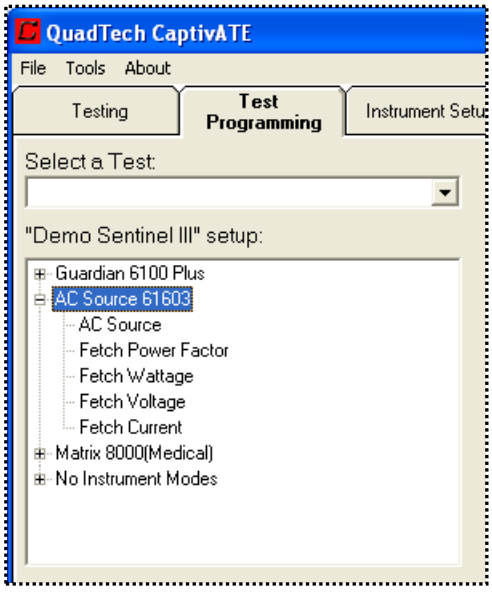


Figure 59 Step 1: AC Source

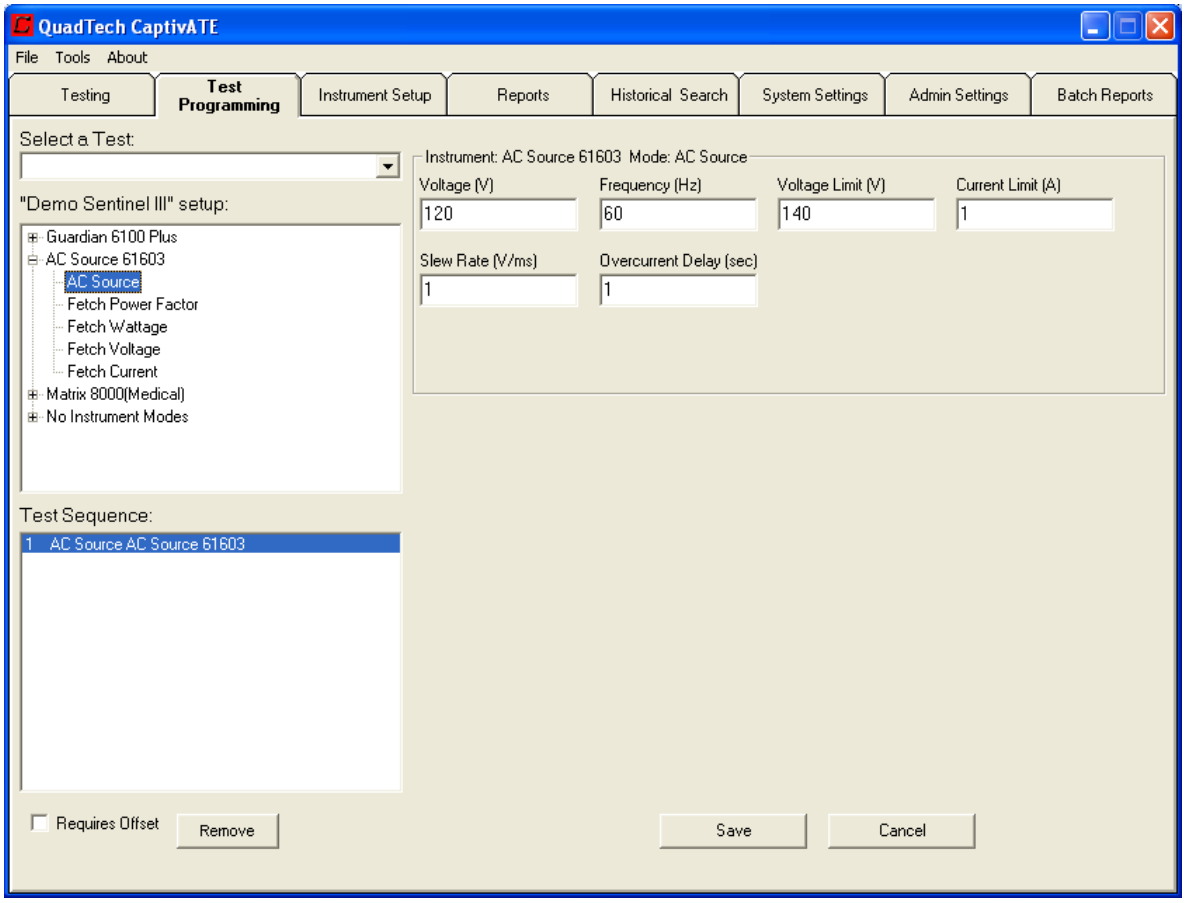


Figure 60 AC Source: Test Programming Boxes

Guardian 6100 Plus

The Guardian 6100 Plus is the main instrument in the test, driving voltage and current into Steps 3 (Figure 63), 5 (Figure 65), 7 (Figure 67), and 9 (Figure 69).

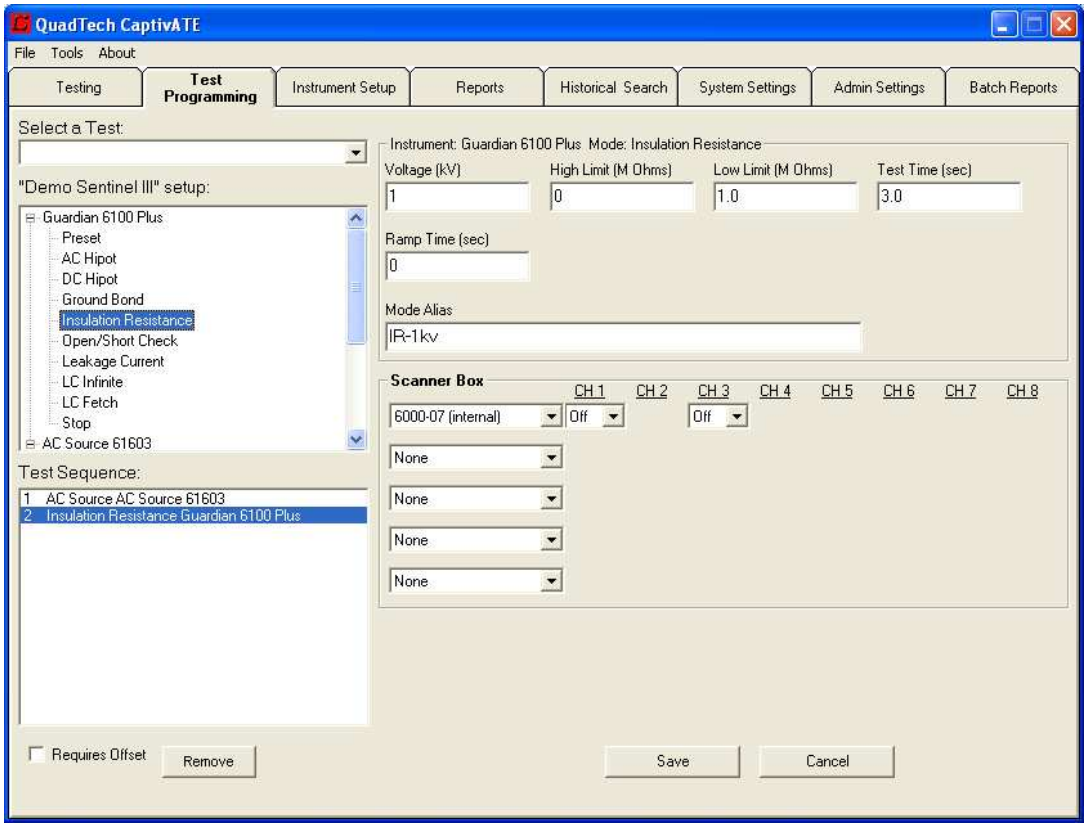


Figure 61 Insulation Resistance: Step 2

MATRIX 8000

The Matrix 8000 is a modular mainframe with up to eight modules which can be configured to automate testing of device with multiple connections.

There are two versions of the QuadTech Matrix 8000: General and Medical. The one used in this example is the Medical. It is programmed into Steps 2 (Figure 62), 4 (Figure 64), 6 (Figure 65), and 8 (Figure 68). When programming the Matrix 8000, the modules must match those programmed in the Instrument Setup.

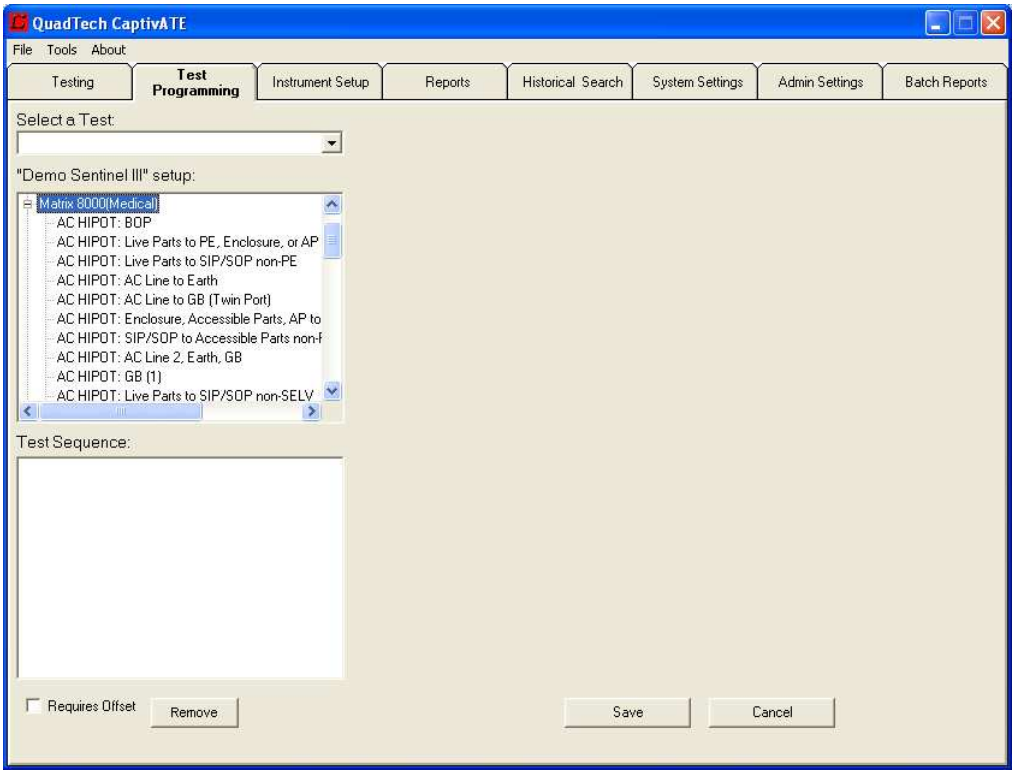


Figure 62 Step2: Matrix 8000 Ground Bond

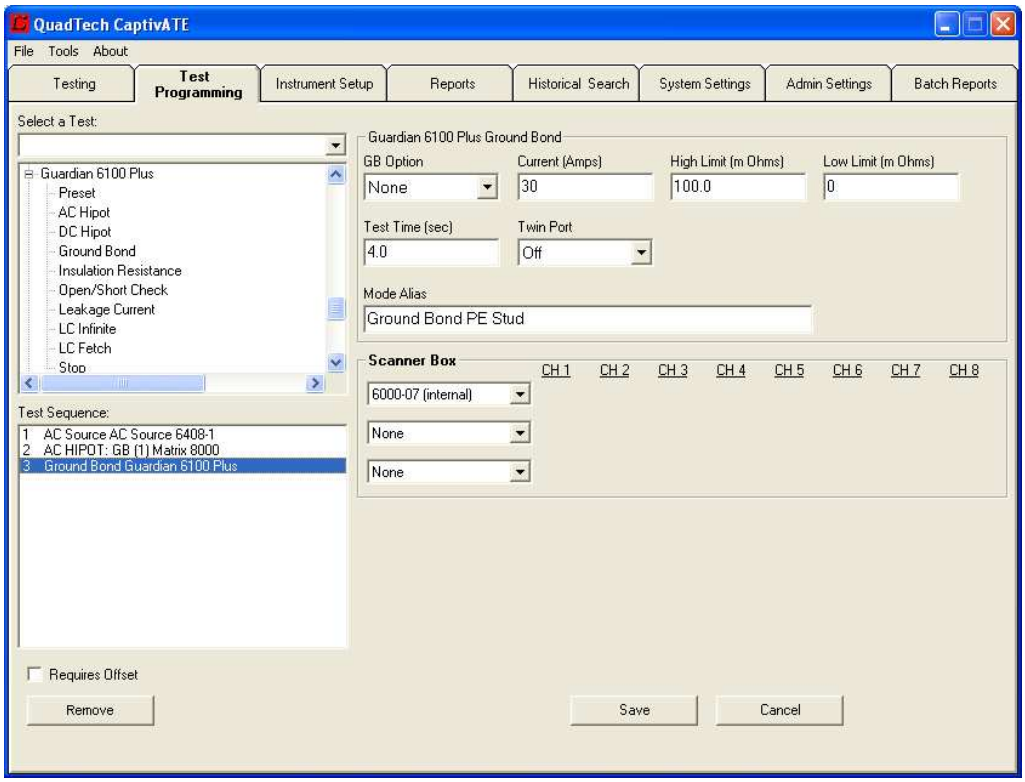


Figure 63 Step 3 Guardian 6100 Plus: Ground Bond (with Alias)

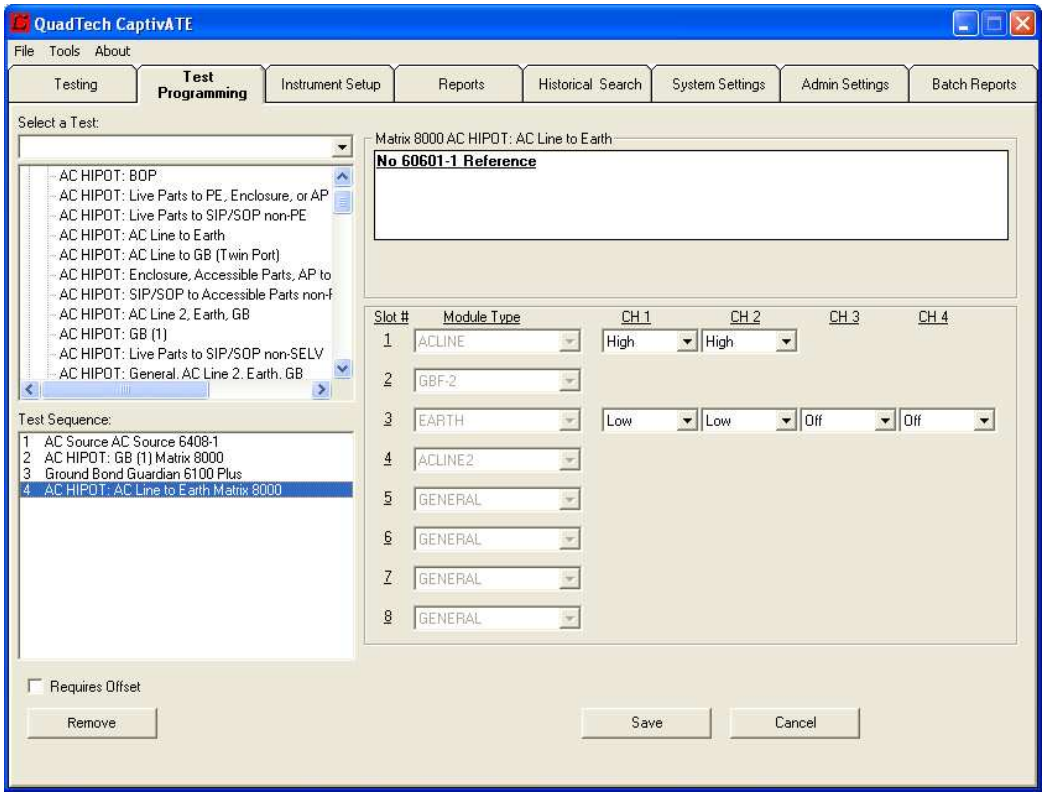
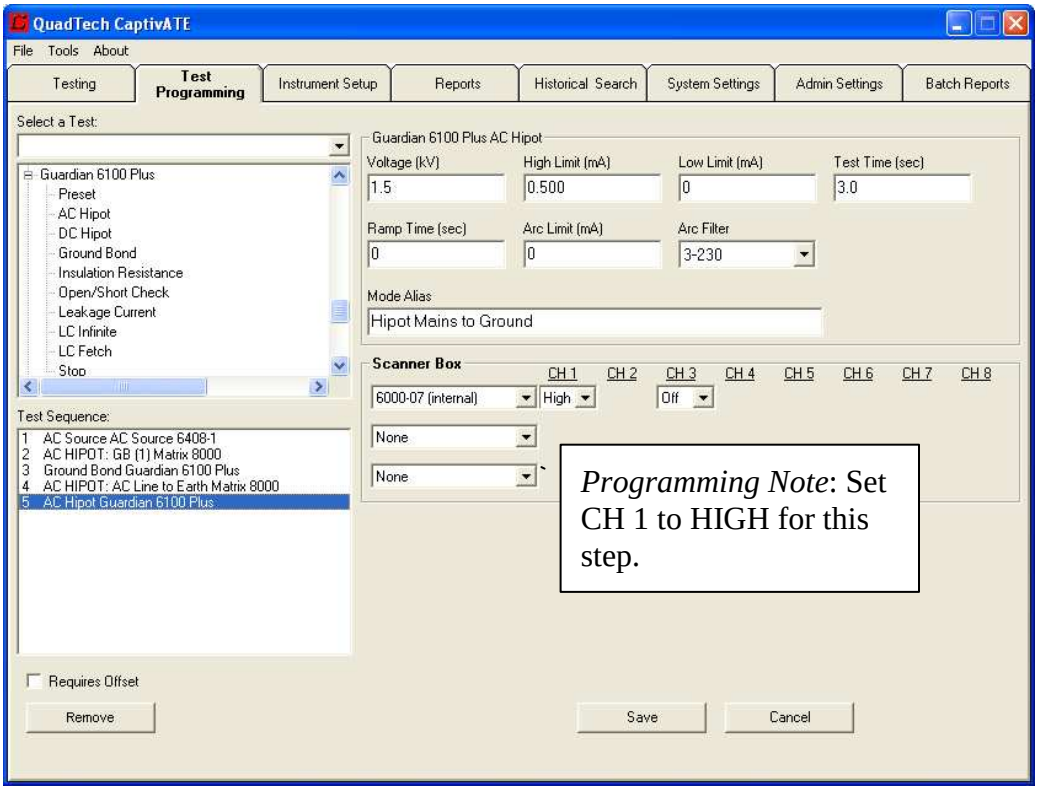


Figure 64 Step 4: Matrix 8000 AC HIPOT AC Line to Ground



Programming Note: Set CH 1 to HIGH for this step.

Figure 65 Step 5: Guardian 6100 Plus AC Hipot (with Alias)

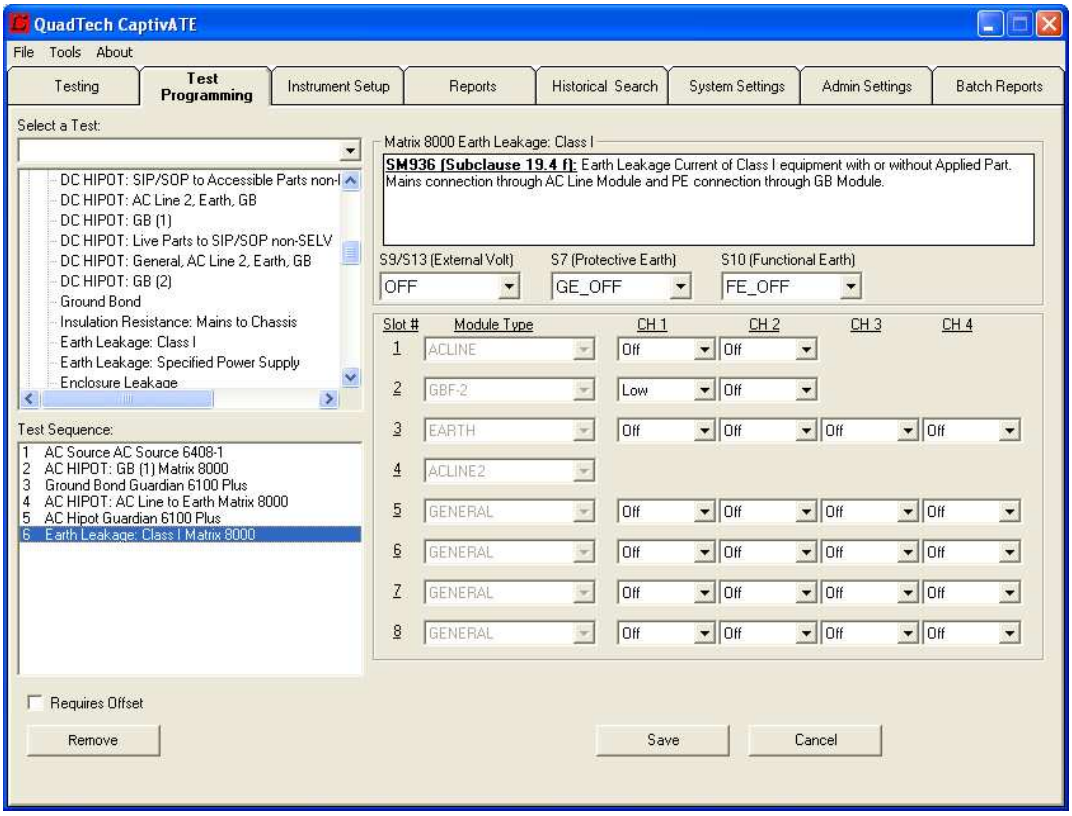


Figure 66 Step 6 Matrix 8000 Earth Leakage Class I

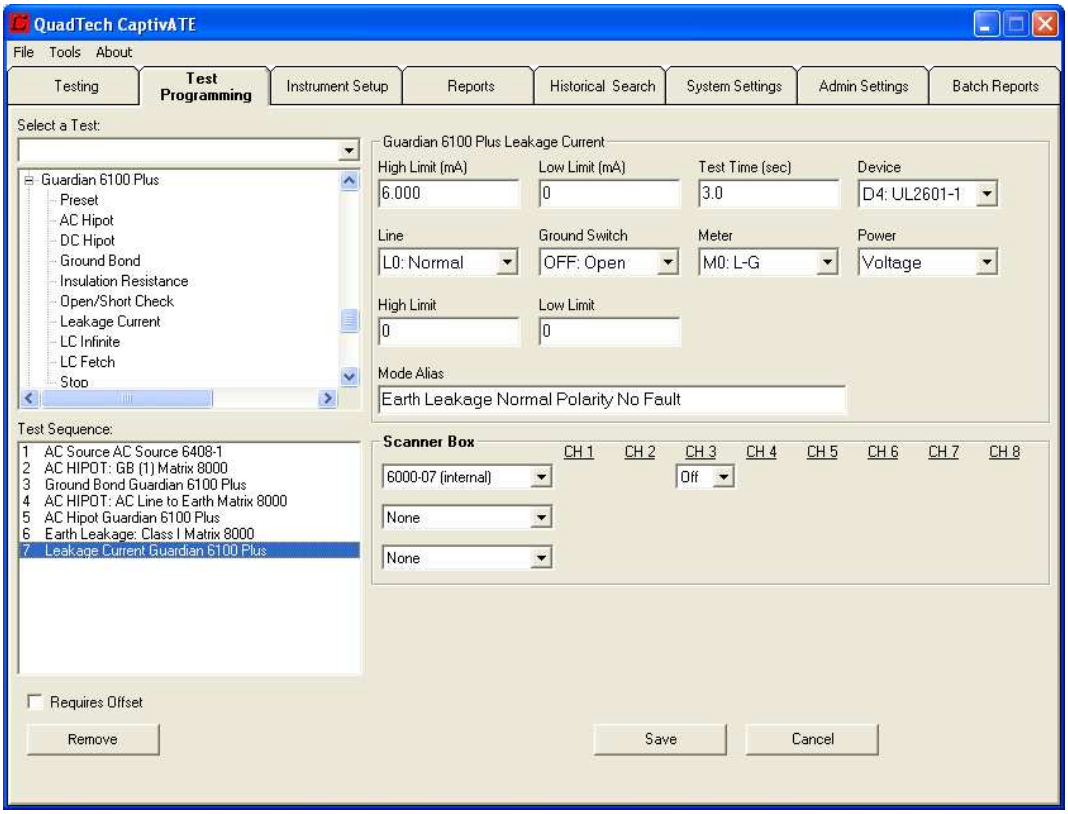


Figure 67 Step 7 Guardian 6100 Plus Leakage Current (with Alias)

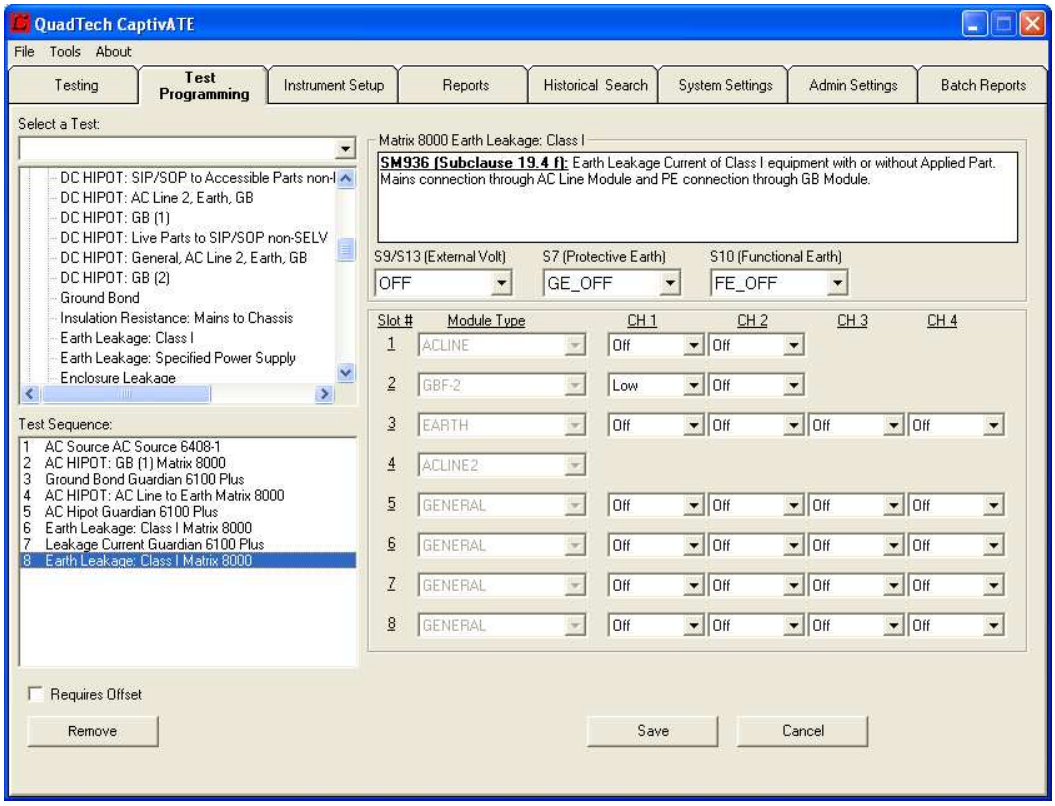


Figure 68 Step 8 Matrix 8000 Earth Leakage Class I

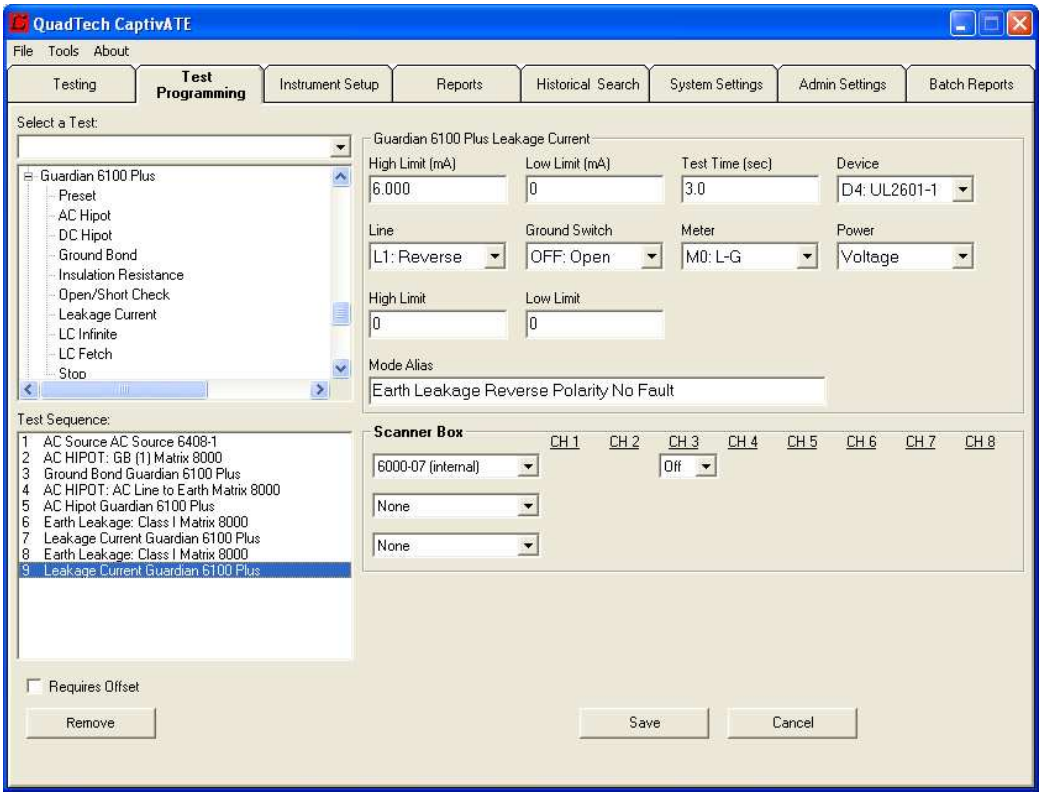


Figure 69 Step 9 Guardian 6100 Plus Leakage Current (with Alias)

5.8.5 Save the Program

When all the steps have been defined, click the **Save** button and enter a name for the test in the pop-up text box. Then click **Save As**.

5.8.6 Run a Test

Follow the Test Procedure Section 5.7.2.

5.9 Modes and Aliases

You can substitute aliases for the default node names. You can define these aliases with names that are more meaningful than the default mode names. Mode Aliases can be added or changed in the Test Programming Tab. When the software switch shown in Figure 70 is check-marked, the alias name will replace all default step mode names in reports for that test.

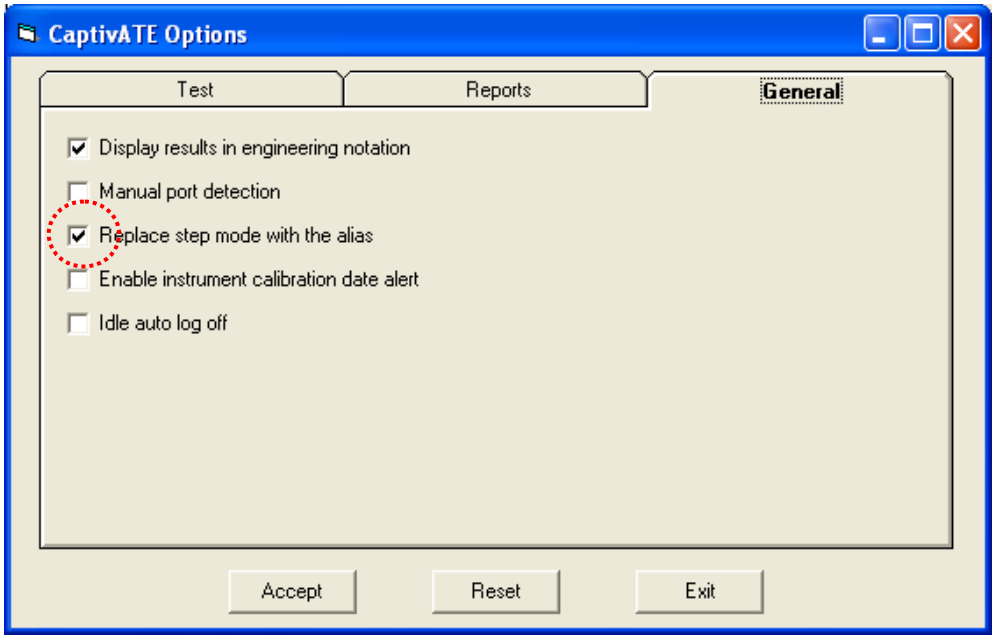


Figure 70 Software Switch for Aliases

In Table 5, the left-hand column shows the default mode names in Tutorial B, while the user-defined aliases are shown in the right-hand column.

Table 5 Default Step (Mode) Names and Their Possible Aliases

Default Step (Mode) Name	Alias
Ground Bond	Ground Bond PE Stud
AC Hipot	Hipot Mains to Ground
Leakage Current	Earth Leakage Normal Polarity No Fault
Leakage Current	Earth Leakage Reverse Polarity No Fault

Note: To enable the alias to be included in a test report, set the software switch in Tools/Options/General, shown in Figure 82.

5.10 Stop Mode (6100 Plus)

The Stop mode is unique to the 6100 Plus. When the Stop mode is executed in a test program, it will immediately shut down the output of the Guardian 6100 Plus.

WARNING No Instrument Modes such as Virtual Pause **will not shut down** the Guardian 6100 Plus. You must use the **Stop mode** to shut down the G6100 Plus.

5.11 LC Infinite and LC Fetch Modes

LC Infinite and LC Fetch are relevant to the Guardian 6100 Plus, They are another way to measure leakage current and can significantly reduce test time especially when used with the Matrix 8000. LC Infinite instructs the Guardian 6100 to perform an LC measurement continuously. LC Fetch is then used to make a measurement of the LC value.

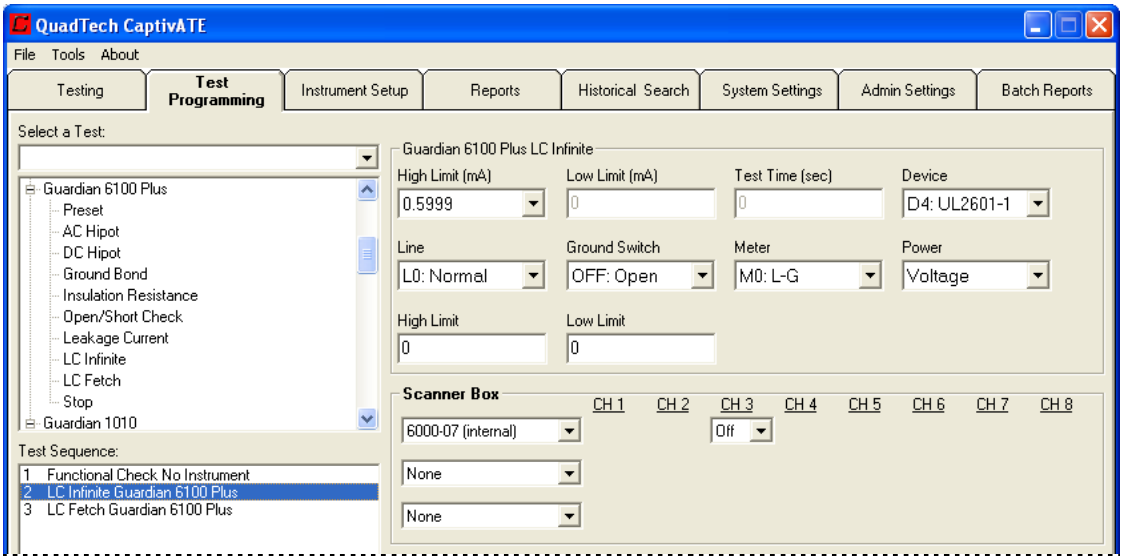


Figure 71 LC Infinite Text Boxes

The LC Infinite will remain on until the End of Test, a Stop Command or another step is encountered in the test sequence that uses the G6100 Plus.

Table 6 Text Boxes for LC Infinite

Text Boxes	Function
High Limit	Selected from pull-down: 0.5999mA, 6.000mA, 0.9999mA, or 10.000. The limit of the value captured in the Fetch mode, it should be ≥ than the High Limit of LC Fetch.
Low Limit	N/A
Test Time	N/A
Device	Selected from pull-down
Line	Selected from pull-down
Ground Switch	Selected from pull-down
Meter	Selected from pull-down
Power	Voltage, current, or VA
High limit	Voltage, AC Source
Low limit	Voltage, AC Source

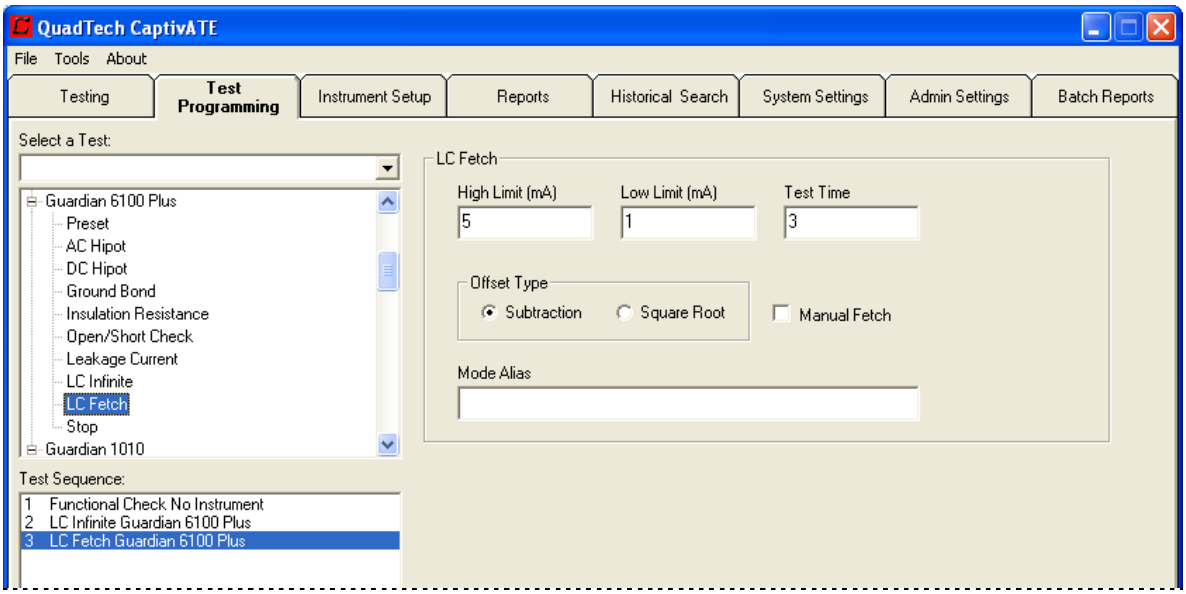


Figure 72 LC Fetch Text Boxes

In combination with the LC Infinite command, use the LC Fetch command to tell CaptivATE to fetch the leakage current measurement data. CaptivATE takes the measurement and compares it to the set High and Low Limits.

Table 7 Text Boxes for LC Fetch

Text Boxes	Function
High Limit	High limit for the value captured in the fetch mode
Low Limit	Low limit for the value captured in the fetch mode
Test Time	Duration from the start of LC Infinite to the capture of the data
Subtraction	The method of displaying leakage current by subtracting the difference between the value captured during the fetch and the value measured during the test. This method should be used for testing LC on most DUTs. $LC_{display} = LC_{meas} - LC_{offset}$
Square Root	Value is determined by the square root of the difference. This method is normally used for devices that are resistive. $LC_{display} = \sqrt{LC_{meas}^{2} - LC_{offset}^{2}}$
Manual Fetch	Fetch is prompted by a system message and made when the Operator chooses
Mode Alias	User-defined alternate name for this step

As shown in Figure 73, the data captured by LC Fetch is in the Measure column.

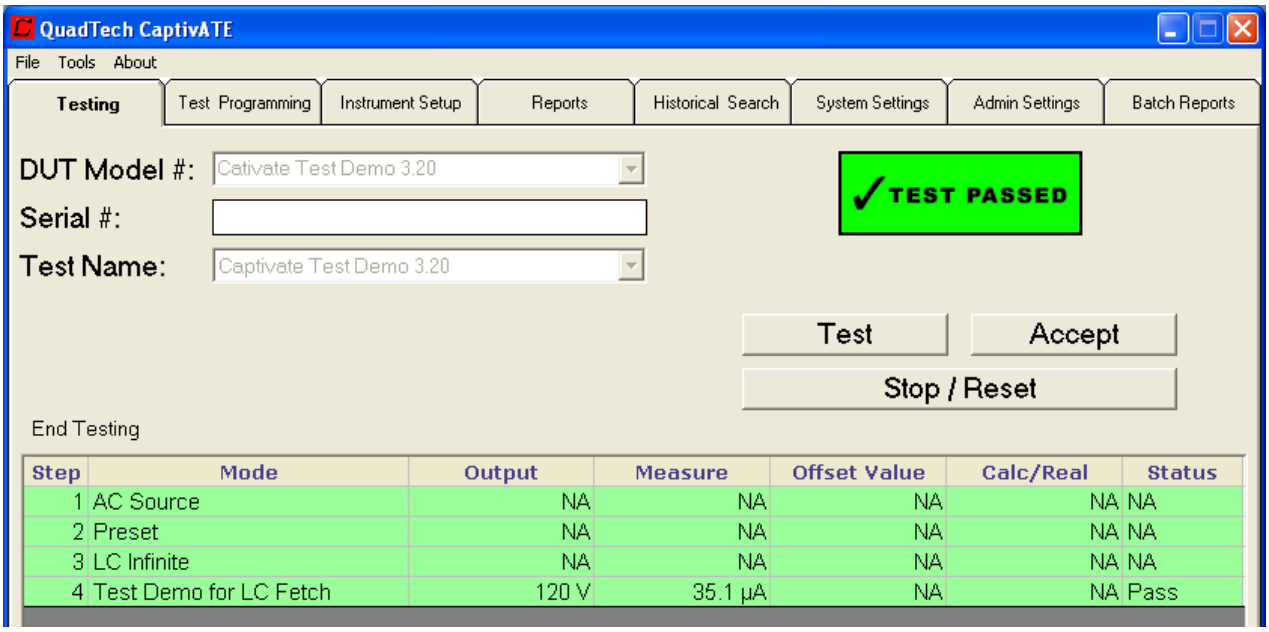


Figure 73 Results of an LC Fetch

6 Reports: Defining, Saving, and Printing

A Report Search differs from an Historical Search as follows:

Report Search	A search for one MS Word document
Historical Search	A search for results of many tests, arrayed on a spreadsheet

Data from all tests is stored in the CaptivATE database. A report is a set of data on one test, formatted as a Word document, and stored in a directory defined by the user. Figure 74 shows the settings on a sample *Reports* screen. The Administrator or Engineer can set the same destination for the reports from all Operators.

6.1 Regular Reports

System Settings screen

Figure 74 specifies that for each test that passes and is accepted, a Summary Report (a Word document) will be saved to the PASS directory; and that for each test that fails and is accepted, a Standard Report (a Word document) will be saved to the FAIL directory.

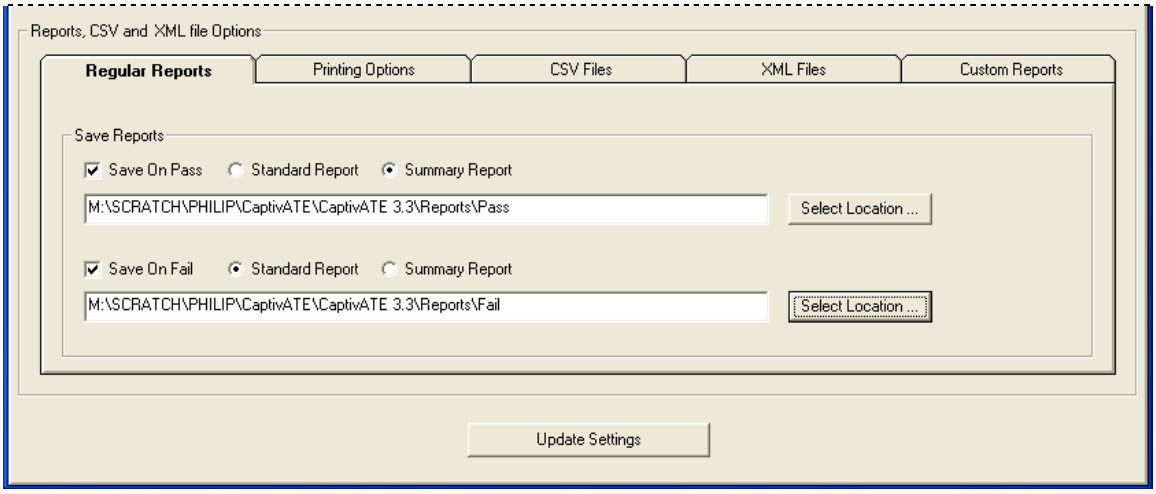


Figure 74 Regular Reports: Setting the Location

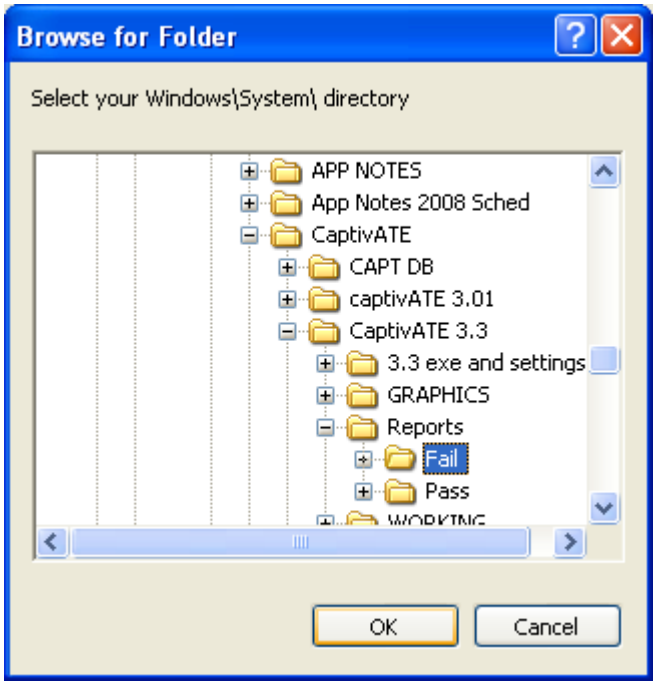


Figure 75 Using Windows Explorer to Define Reports Folders

6.2 Printing Options

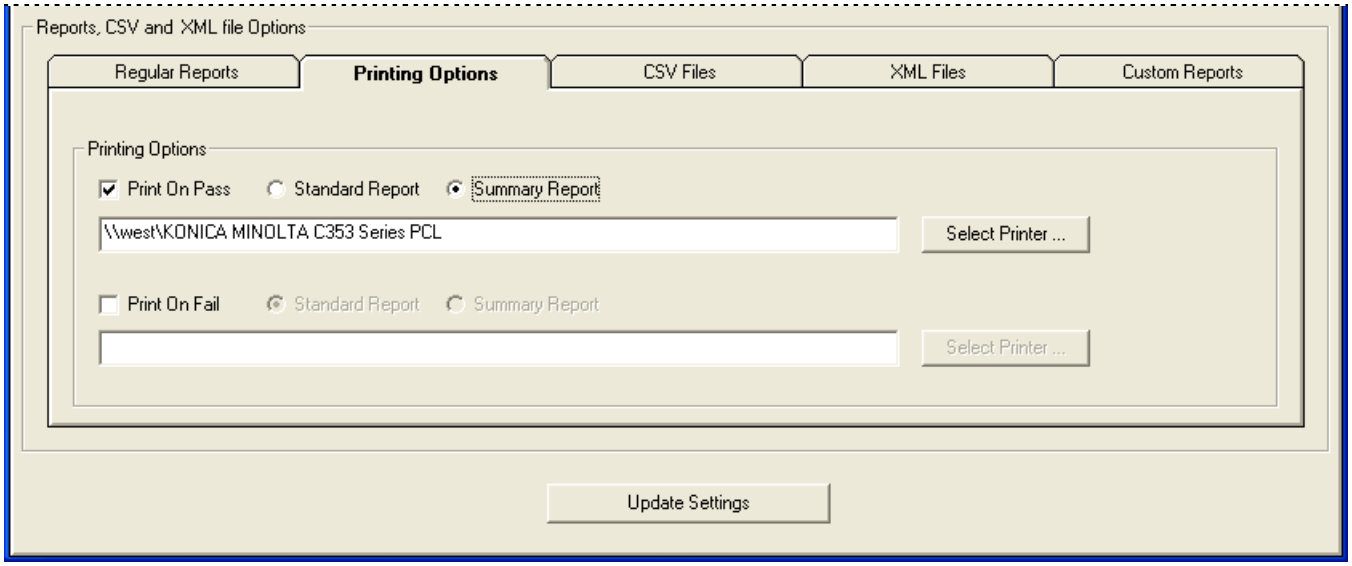


Figure 76 *Printing Options* Tab on the *Reports* Screen

6.3 CSV Files

CSV stands for comma-separated values. CSV files are ASCII text files, which commas separate each column heading and each discreet piece of data.

To save test data to a MES (Manufacturing Enterprise System) CSV files are a convenient transition. The CSV file is written as a text file with the extension .csv. This extension causes the Windows OS to mark it as a MS Excel CSV file, with the corresponding icon in the Windows Explorer.

When Save On Pass and Save on Fail are each checked, as shown in Figure 77, a CSV file will be created after each test. The file name will be as follows:

```
<serial#>_mm_dd_yyyy_hh_mm_ss.csv
```

The file is one line unbroken by line feeds or carriage returns. For the example that follows, the file has been broken to show a typical header for a CSV version of a standard report.

The header always contains eight pieces of information, each one bounded by a pair of commas. The field captions, e.g., “DUT Model #:” are hard coded in the program and, therefore will remain constant.

```
DUT Model #: System Test_Case_64,DUT Serial #: System
Test_Case_64,TestName: System Test_Case_64 OSC and offset,TestResult:
Pass,Test Date: 9/18/2007,Test Time:  7:11:06 AM,Operator: admin,Setup
Name: G6000P Com1
```

The standard report version of that same file header is as follows:

DUT Model #: System Test_Case_64 DUT Serial #: System Test_Case_64 Test Name: System Test_Case_64 OSC and offset	Test Result Pass	Test Date: 9/18/2007 Test Time: 7:11:06 AM Operator: admin Setup Name: G6000P Com1

In the next portion of the file, the first comma (the eighth comma in the whole file) marks the beginning of the test results. The <TEST RESULTS> tag as well as the column headings (Step#, Mode, Output, etc) are hard-coded

```
,1,Preset,NA,NA,NA,NA,NA
```

The standard report version of the same portion of the report is as follows:

********** TEST RESULTS **********

Step #	Mode	Output	Measure	Offset	Calc/Real	Result
1	Preset	NA	NA	NA	NA	NA

Test results rows, themselves separated by commas, will be repeated until the end of file if no other reporting options are selected or until a tag <TEST DETAIL>, <INSTRUMENTS USED>, etc is encountered.

```
<TEST DETAIL>,Step #1 Guardian 6000 Plus Preset~Pass Hold (sec)=0.5~
Step Hold (sec)=0.2~ AC Voltage Freq. (Hz)=60~ Ground Bond Freq.
```

```
(Hz)=60~ IEC-601=Off~ Ground Bond (V)=15.0~ Auto Range=Off~ Soft Gain
Control=On~ Scanner #1 HV Channel 3 N/A~N/A~N/A~N/A~N/A~N/A~N/A~N/A
```

Multiple tilde (~) characters in the CSV file represent commas which are part of the data itself in the CaptivATE.mdb database. These commas were temporarily replaced by tildes in order to preserve the data structure of the file. The application parsing program developed by an individual client will have to replace tildes with the commas after the parsing process is complete. A portion of the CSV file we've been using includes some tildes.

```
,Step #2 Guardian 6000 Plus Ground Bond~GB Option=None~ Current
(Amps)=25~ High Limit (m Ohms)=100.0~ Low Limit (m Ohms)=0~ Test Time
(sec)=3.0~ Twin Port=On~ Scanner #1 HV Channel 3
N/A~N/A~N/A~N/A~N/A~N/A~N/A~N/A~N/A
```

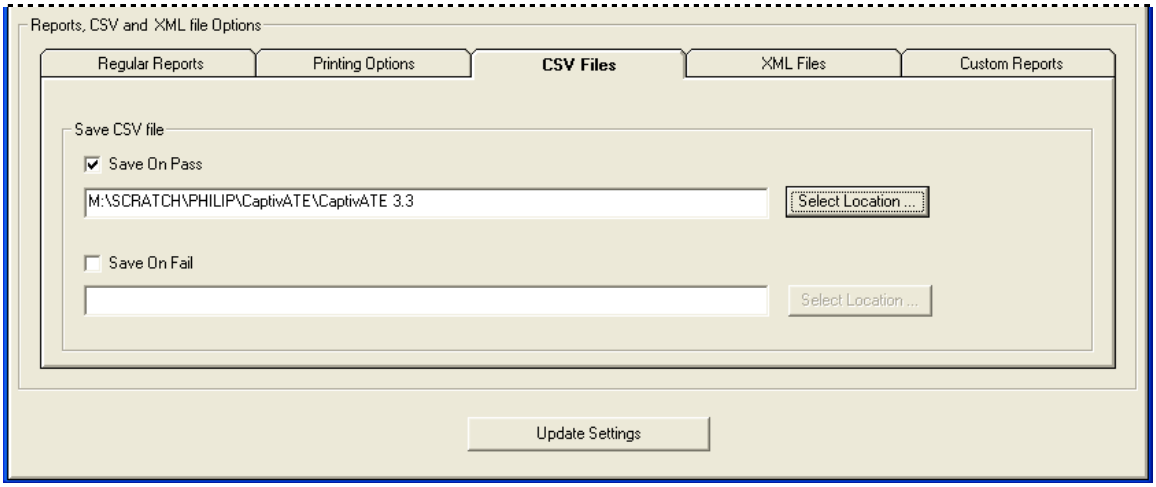


Figure 77 *CSVFiles* Tab on the *Reports* Screen

6.4 XML Files

XML stands for Extensible Markup Language. XML files are ASCII text files in which each discreet piece of data is tagged.

When Save On Pass or Save on Fail are checked, as shown in Figure 78, an XML file will be created after each test. The file name will be as follows:
`<serial#>_mm_dd_yyyy_hh_mm_ss.xml`

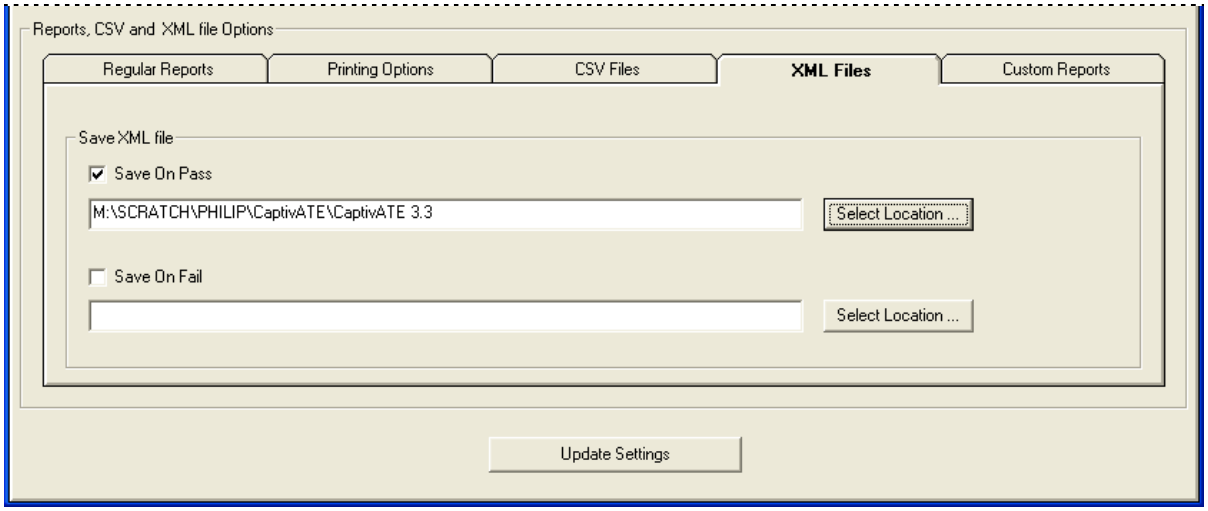


Figure 78 *XML Files* Tab on the *Reports* Screen

A portion of an example XML file follows:

<?xml version="1.0" ?>
- <test>
- <header>
<dutmodelnumber>**system_test_case_#13**</dutmodelnumber>
<dutserialnumber>**system_test_case_#13 61603**</dutserialnumber>
<testname>**System Test_Case_13 61603**</testname>
<testresult>**Pass**</testresult>
<testdate>**9/14/2007**</testdate>
<testtime>**10:29:57 AM**</testtime>
<username>**admin**</username>
<setupname>**g6100p g6100 61603**</setupname>
</header>
- <teststeps>
- <step>
<stepnumber>**1**</stepnumber>
<modedisplay>**AC Source**</modedisplay>
<output>**NA**</output>
<measure>**NA**</measure>
<offsetvalue>**NA**</offsetvalue>
<realorcalculated>**NA**</realorcalculated>
<stepstatus>**NA**</stepstatus>
</step>
~~~~
~~~~

```
    </teststeps>
- <instruments>
- <instrument>
  <name>AC Source 61603</name>
  <instrcaldate>9/13/2008</instrcaldate>
  <instrserialnmbr>ac source</instrserialnmbr>
  <scanners />
    </instrument>
    </instruments>
    </test>
```

6.5 Custom Reports

Access to the *Custom Reports* tab must be set by QuadTech in the *Settings.txt* file.

Please contact QuadTech for prices and options.

6.6 Print Step with No Returned (i.e., Null) Values

Tools Options pop-up (*Reports* tab and *General* tab)

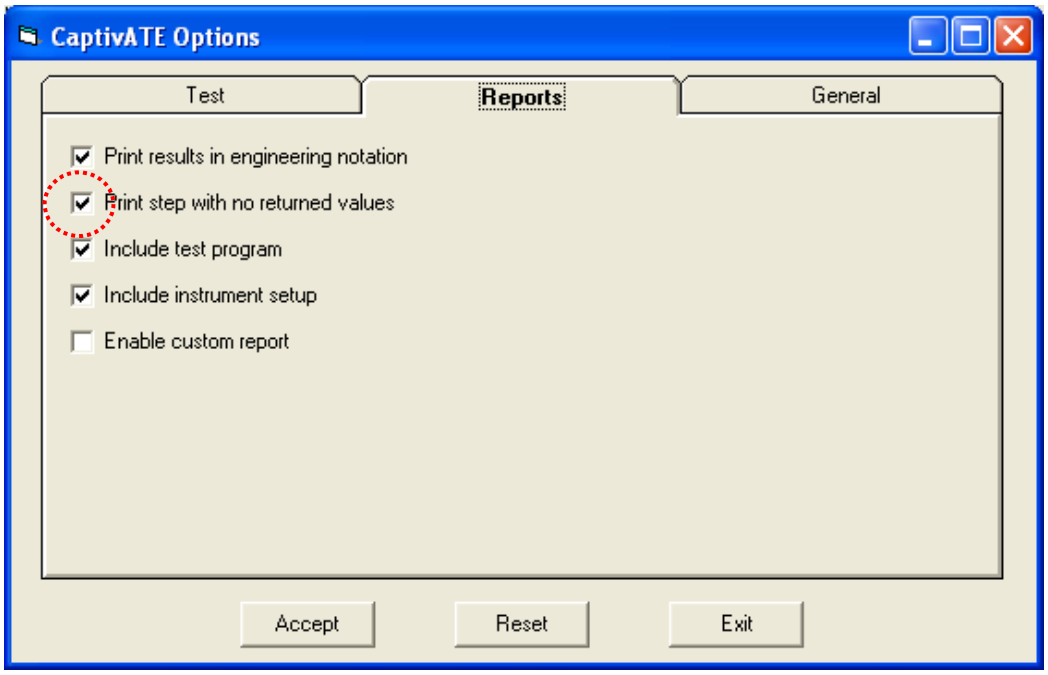


Figure 79 Software Switches for *Reports*

In Figure 79, when the “Print step with no returned values” software switch is check-marked, null lines(the ones with N/A in most columns) are printed, as in Figure 80.

DUT Model #: Sentinel III Captivate Demo DUT Serial #: No Serial Number Test Name: Sentinel III test captivate	Test Result Pass	Test Date: 8/17/2007 Test Time: 9:52:10 AM Operator: admin Setup Name: Sentinel III-capivate setup

********** TEST RESULTS **********

Step #	Mode	Output	Measure	Offset	Calc/Real	Result
1	AC Source	NA	NA	NA	NA	NA
2	Ground Bond	NA	NA	NA	NA	NA
3	Ground Bond PE Stud	30.01 A	1.800 mΩ	NA	NA	Pass
4	AC HIPOT: AC Line to Earth	NA	NA	NA	NA	NA
5	Hipot Mains to Ground	1.500 kV	13.000 µA	NA	NA	Pass
6	Earth Leakage: Class I	NA	NA	NA	NA	NA
7	Earth leakage Normal Polarity No Fault	120. V	40.013 µA	NA	NA	Pass
8	Earth Leakage: Class I	NA	NA	NA	NA	NA
9	Earth Leakage Reverse Polarity No	120. V	40.013 µA	NA	NA	Pass

Figure 80 Standard Report with Null Lines

When the “Print step with no returned values” checkbox is unchecked, null lines are not displayed. These null lines exist as a number in parentheses, as seen in the Step # column in Figure 81.The Step # for Ground Bond PE Stud is “1(3)”. This simply means that this is the first step that returns value, and there were two null lines in front of it, which made this step 3 of the total.

DUT Model #: Sentinel III Captivate Demo DUT Serial #: No Serial Number Test Name: Sentinel III test captivate	Test Result Pass	Test Date: 8/16/2007 Test Time: 4:54:33 PM Operator: admin Setup Name: Sentinel III-setup

********** TEST RESULTS **********

Step #	Mode	Output	Measure	Offset	Calc/Real	Result
1(3)	Ground Bond PE Stud	30.01 A	1.800 mΩ	NA	NA	Pass
2(5)	Hipot Mains to Ground	1.500 kV	13.000 µA	NA	NA	Pass
3(7)	Earth leakage Normal Polarity No Fault	120 V	37.576 µA	NA	NA	Pass
4(9)	Earth Leakage Reverse Polarity No Fault	120 V	40.013 µA	NA	NA	Pass

Figure 81 Standard Report without Null Lines

In the Mode columns of Figure 80 and Figure 81, the user-defined alias names are displayed because of the “Replace step mode with the alias” checkbox. This, along with “Display results in engineering notation” is a default.

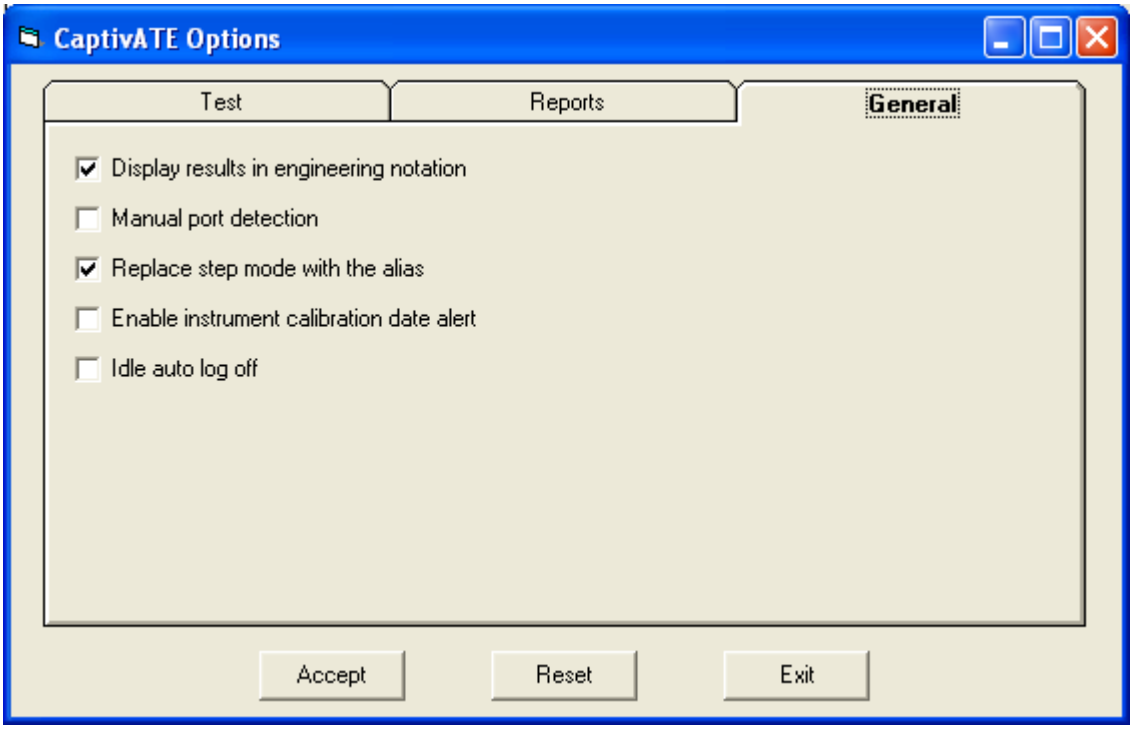


Figure 82 ***Tools/Options/General*** **Screen Software Switches**

6.7 Run a Report

The *Reports* screen has four filters. Click a date from the Test Date pull-down and click **Search**. Each row represents a test.

1. Click the **Create Summary Report** button. An example of a Summary Report is as follows:

DUT Model #:

Sentinel III Captivate Demo

DUT Serial #:

No Serial Number

Test Name:

Sentinel III test captivate

Test Date, Time:

7/14/2008 2:57:41 PM

Operator:

admin

Test Result:

Pass

2. To generate a regular report that includes the maximum amount of data, see Figure 83. On the Tools/Options/Reports pop-up, check the two “Include . . .” checkboxes. (The two “Print. . .” checkboxes are checked by default.

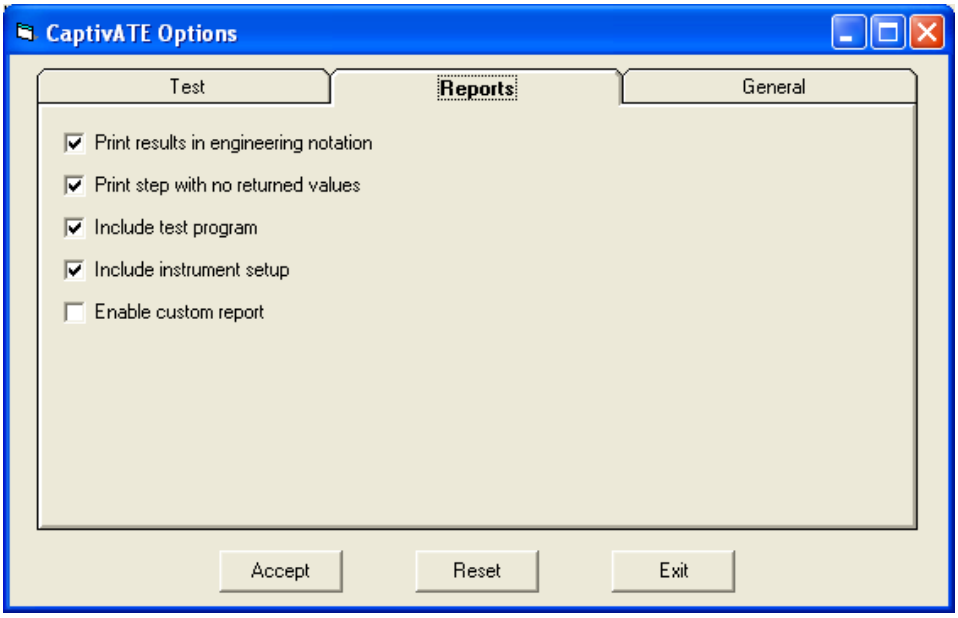


Figure 83 Tools Options: Software Switches to Display Test Results

3. Back on the *Reports* screen, click the **Create Standard Report** button.

6.8 Sample of Sentinel III Standard Report

The following sample is run with all *Tools/Options/Reports* checkboxes checked (except Enable custom report) and all relevant *System Settings* checkboxes checked.

DUT Model #: Sentinel III Captivate Demo DUT Serial #: No Serial Number Test Name: Sentinel III test captivate	Test Result Pass	Test Date: 8/13/2007 Test Time: 2:57:41 PM Operator: admin Setup Name: Sentinel III Captivate Demo

********** TEST RESULTS **********

Step #	Mode	Output	Measure	Offset	Calc/Real	Result
1(3)	Ground Bond PE Stud	30.01 A	1.800 mΩ	NA	NA	Pass
2(5)	Hipot Mains to Ground	1.500 kV	13.000 µA	NA	NA	Pass
3(7)	Earth leakage Normal Polarity No Fault	120. V	40.013 µA	NA	NA	Pass
4(9)	Earth Leakage Reverse Polarity No Fault	120. V	40.013 µA	NA	NA	Pass

**********TEST DETAIL**********

Step #1 AC Source 6408-1 AC Source

Voltage (V)=120, Frequency (Hz)=60, Voltage Limit (V)=130, Current Limit (A)=10

Step #2 Matrix 8000 Ground Bond

label=(Subclause 18 f): GB Modules can only be located in Frame 0 (Master)., Module #1 ACLINE N/A,N/A,N/A,N/A, Module #1 GBF-2 High/Low,Off,N/A,N/A, Module #1 EARTH Off,Off,Off,Off, Module #1 ACLINE2 N/A,N/A,N/A,N/A, Module #1 GENERAL N/A,N/A,N/A,N/A, Module #1 GENERAL N/A,N/A,N/A,N/A, Module #1 GENERAL N/A,N/A,N/A,N/A, Module #1 GENERAL N/A,N/A,N/A,N/A

Step #3 Guardian 6100 Plus Ground Bond

GB Option=None, Current (Amps)=30, High Limit (m Ohms)=100.0, Low Limit (m Ohms)=0, Test Time (sec)=4.0, Twin Port=Off, Scanner #1 6000-07 (internal) N/A,N/A,N/A,N/A,N/A,N/A,N/A,N/A

Step #4 Matrix 8000 AC HIPOT: AC Line to Earth

description=No 60601-1 Reference, Module #1 ACLINE High,High,N/A,N/A, Module #1 GBF-2 N/A,N/A,N/A,N/A, Module #1 EARTH Low,Low,Off,Off, Module #1 ACLINE2 N/A,N/A,N/A,N/A, Module #1 GENERAL N/A,N/A,N/A,N/A, Module #1 GENERAL N/A,N/A,N/A,N/A, Module #1 GENERAL N/A,N/A,N/A,N/A, Module #1 GENERAL N/A,N/A,N/A,N/A

Step #5 Guardian 6100 Plus AC Hipot

Voltage (kV)=1.5, High Limit (mA)=0.500, Low Limit (mA)=0, Test Time (sec)=3.0, Ramp Time (sec)=0, Arc Limit (mA)=0, Arc Filter=3-230, Scanner #1 6000-07 (internal) Off,N/A,Off,N/A,N/A,N/A,N/A,N/A

Step #6 Matrix 8000 Earth Leakage: Class I

S9/S13 (External Volt)=OFF, S7 (Protective Earth)=GE_OFF, S10 (Functional Earth)=FE_OFF, Module #1 ACLINE Off,Off,N/A,N/A, Module #1 GBF-2 Low,Off,N/A,N/A, Module #1 EARTH Off,Off,Off,Off, Module #1 ACLINE2 N/A,N/A,N/A,N/A, Module #1 GENERAL Off,Off,Off,Off, Module #1 GENERAL Off,Off,Off,Off, Module #1 GENERAL Off,Off,Off,Off, Module #1 GENERAL Off,Off,Off,Off

Step #7 Guardian 6100 Plus Leakage Current

High Limit (mA)=6.000, Low Limit (mA)=0, Test Time (sec)=3.0, Device=D4: UL2601-1, Line=L0: Normal, Ground Switch=OFF: Open, Meter=M0: L-G, Power=Voltage, Power High Limit (mA)=0, Power Low Limit (mA)=0, Scanner #1 6000-07 (internal) N/A,N/A,Off,N/A,N/A,N/A,N/A,N/A

Step #8 Matrix 8000 Earth Leakage: Class I

S9/S13 (External Volt)=OFF, S7 (Protective Earth)=GE_OFF, S10 (Functional Earth)=FE_OFF, Module #1 ACLINE Off,Off,N/A,N/A, Module #1 GBF-2 Low,Off,N/A,N/A, Module #1 EARTH Off,Off,Off,Off, Module #1 ACLINE2 N/A,N/A,N/A,N/A, Module #1 GENERAL Off,Off,Off,Off, Module #1 GENERAL Off,Off,Off,Off, Module #1 GENERAL Off,Off,Off,Off, Module #1 GENERAL Off,Off,Off,Off

Step #9 Guardian 6100 Plus Leakage Current

High Limit (mA)=6.000, Low Limit (mA)=0, Test Time (sec)=3.0, Device=D4: UL2601-1, Line=L1: Reverse, Ground Switch=OFF: Open, Meter=M0: L-G, Power=Voltage, Power High Limit (mA)=0, Power Low Limit (mA)=0, Scanner #1 6000-07 (internal) N/A,N/A,Off,N/A,N/A,N/A,N/A,N/A

*******INSTRUMENTS USED********

Instrument	Cal Due Date	Serial Number
AC Source 6408-1	8/13/2008	demo
Matrix 8000	8/13/2008	Demo
ACLINE	8/13/2008	Demo
GBF-2	8/13/2008	Demo
EARTH	8/13/2008	Demo
ACLINE2	8/13/2008	Demo
GENERAL	8/13/2008	Demo
GENERAL	8/13/2008	Demo
GENERAL	8/13/2008	Demo
GENERAL	8/13/2008	Demo
Guardian 6100 Plus	8/13/2008	Demo
6000-07 (internal)	8/13/2008	

6.9 CSV (Comma-Separated Value) File: Mapping CSV file to Standard Report

To save test data to a MES (Manufacturing Enterprise System), CSV files are a convenient transition. The CSV file is written as a text file with the extension .`csv`. This extension causes the Windows OS to mark it as a MS Excel CSV file, with the corresponding icon in the Windows Explorer. One must use MS Notepad to open this file.

The file is one line unbroken by line feeds or carriage returns. For the example that follows, the file has been broken to show a typical header for a CSV version of a standard report.

The header always contains eight pieces of information, each one bounded by a pair of commas. The field captions, e.g., “DUT Model #:” are hard coded in the program and, therefore will remain constant.

```
DUT Model #: System Test_Case_64,DUT Serial #: System
Test_Case_64,TestName: System Test_Case_64 OSC and offset,TestResult:
Pass,Test Date: 9/18/2007,Test Time:  7:11:06 AM,Operator: admin,Setup
Name: G6000P Com1
```

The standard report version of that same file header is as follows:

DUT Model #: System Test_Case_64 DUT Serial #: System Test_Case_64 Test Name: System Test_Case_64 OSC and offset	Test Result Pass	Test Date: 9/18/2007 Test Time: 7:11:06 AM Operator: admin Setup Name: G6000P Com1

In the next portion of the file, the first comma (the eighth comma in the whole file) marks the beginning of the test results. The <TEST RESULTS> tag as well as the column headings (Step#, Mode, Output, etc) are hard-coded

```
,1,Preset,NA,NA,NA,NA,NA
```

The standard report version of the same portion of the report is as follows:

********** TEST RESULTS **********

Step #	Mode	Output	Measure	Offset	Calc/Real	Result
1	Preset	NA	NA	NA	NA	NA

Test results rows, themselves separated by commas, will be repeated until the end of file if no other reporting options are selected or until a tag <TEST DETAIL>, <INSTRUMENTS USED>, etc is encountered.

```
<TEST DETAIL>,Step #1 Guardian 6000 Plus Preset~Pass Hold (sec)=0.5~
Step Hold (sec)=0.2~ AC Voltage Freq. (Hz)=60~ Ground Bond Freq.
(Hz)=60~ IEC-601=Off~ Ground Bond (V)=15.0~ Auto Range=Off~ Soft Gain
Control=On~ Scanner #1 HV Channel 3 N/A~N/A~N/A~N/A~N/A~N/A~N/A~N/A
```

Multiple tilde (~) characters in the CSV file represent commas which are part of the data itself in the CaptivATE. database. These commas were temporarily replaced by tildes in order to preserve the data structure of the file. The application parsing program developed by an individual client will have to replace tildes with the commas after the parsing process is complete. A portion of the CSV file we've been using includes some tildes.

```
,Step #2 Guardian 6000 Plus Ground Bond~GB Option=None~ Current
(Amps)=25~ High Limit (m Ohms)=100.0~ Low Limit (m Ohms)=0~ Test Time
(sec)=3.0~ Twin Port=On~ Scanner #1 HV Channel 3
N/A~N/A~N/A~N/A~N/A~N/A~N/A~N/A
```

Reports screen

1. Click on Create CSV File.

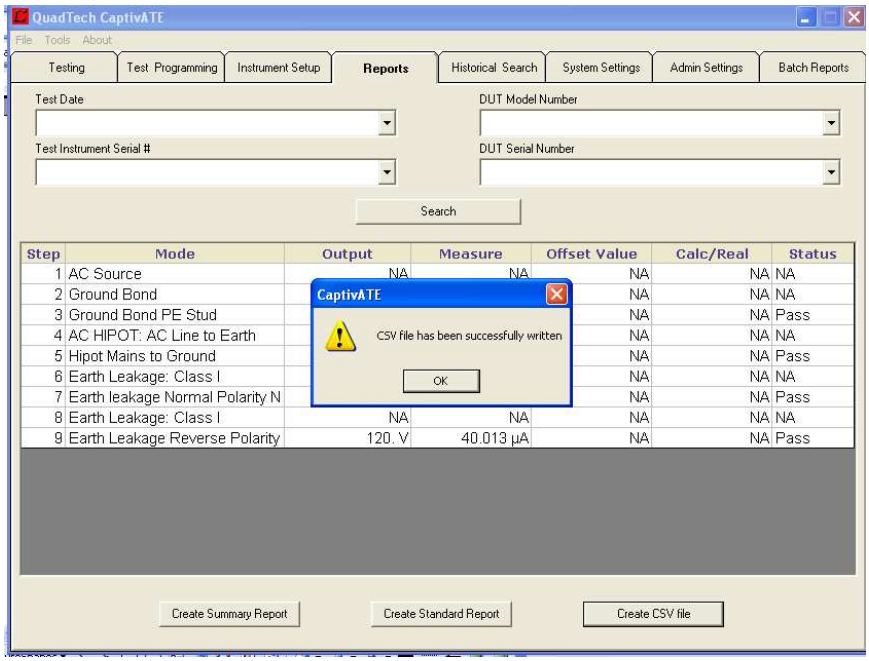


Figure 84 System Message: CSV File Successfully Written

System Settings screen

2. Note the location of the CSV reports and use Windows Explorer to find the file, an example of which is shown in Figure 85.

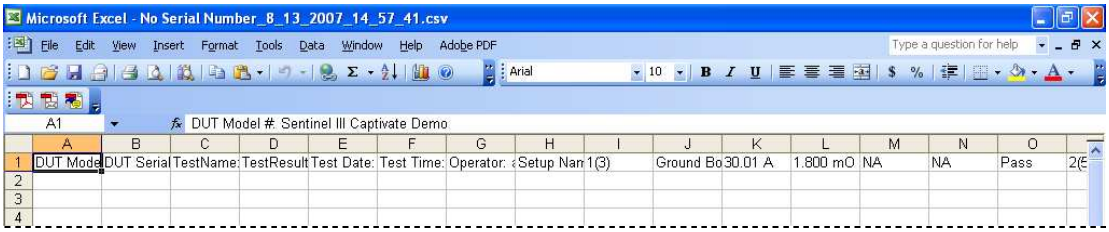


Figure 85 CSV Data in Excel File

3. Right-click on the Excel file and open it with Notepad.

7 Batch Tests and Batch Reports

7.1 Batch Testing

Batch testing is a means of collecting the results of an uninterrupted series of tests. A batch includes only the tests in that series that have passed.

When the software switch (Figure 86) is set to enable batch testing, you can run *only* batch testing.

Admin Settings screen

1. To enable batch testing, click the Enable Batch Testing check box.
2. Click **Update Settings**.

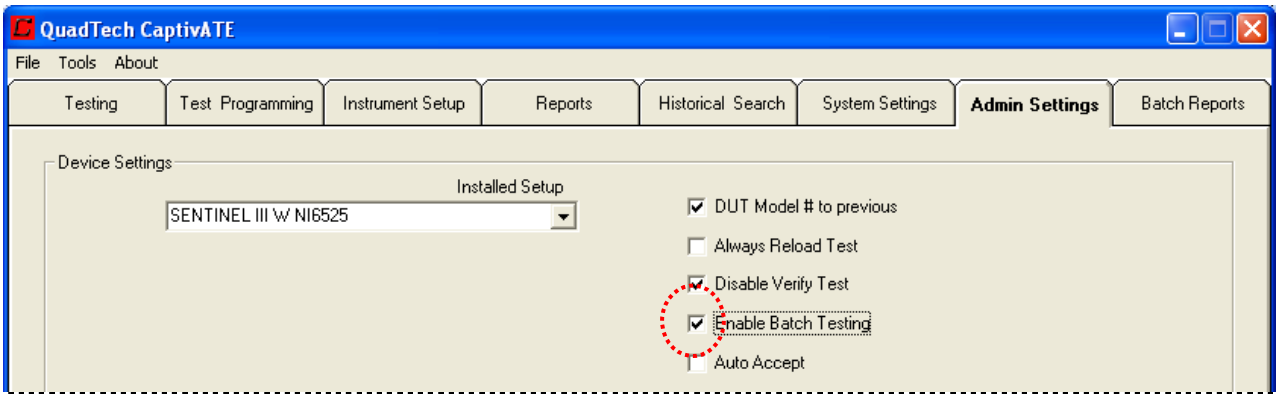


Figure 86 Admin Settings: Batch Testing Enabled

3. Click the *Testing* tab.
4. To start a batch on the *Testing* screen, enter a number or name in the Batch # text box. In the unlabeled text box pointed to in Figure 87, enter a name for the batch test.

Note: When you enter a batch number that exists already, the results of the test is appended to the existing batch file.

5. Click **Start Batch** and begin running tests. Each test that passes and that you accept is added to the batch. (Failed tests are added to the database but not to the batch report.) When the batch is complete, click **End Batch**.

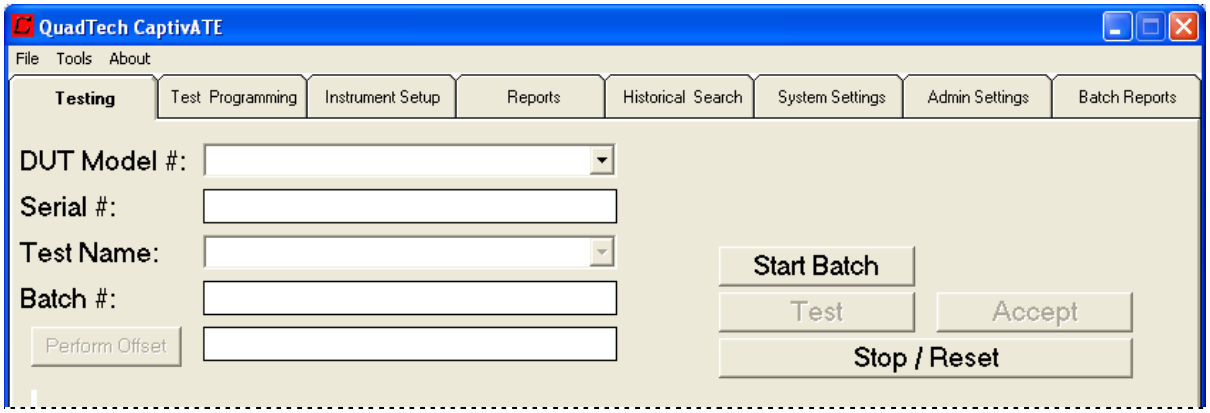


Figure 87 Testing Screen with Batch Buttons

7.2 Batch Reports

Batch Reports screen

1. Click on the drop down arrow and click a batch report. The selected batch report is arrayed across the grid on the *Batch Reports* screen as shown in Figure 88:

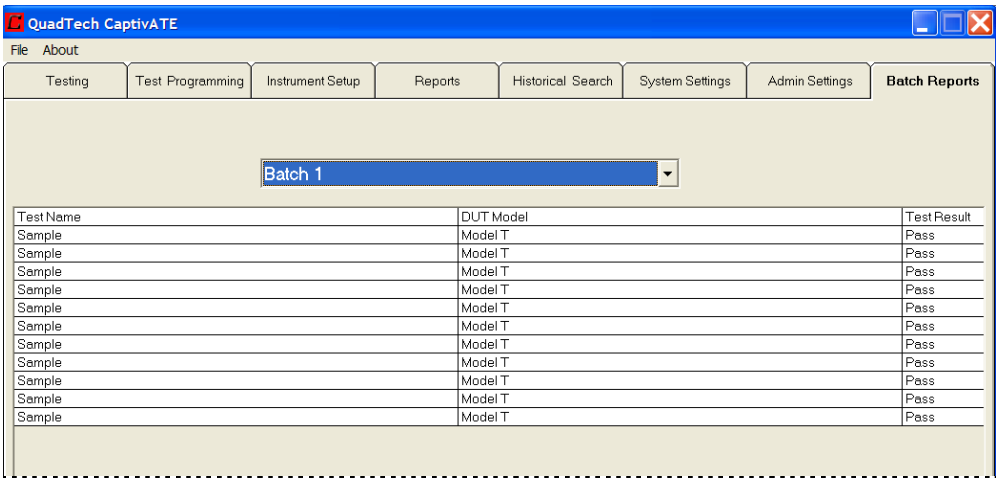
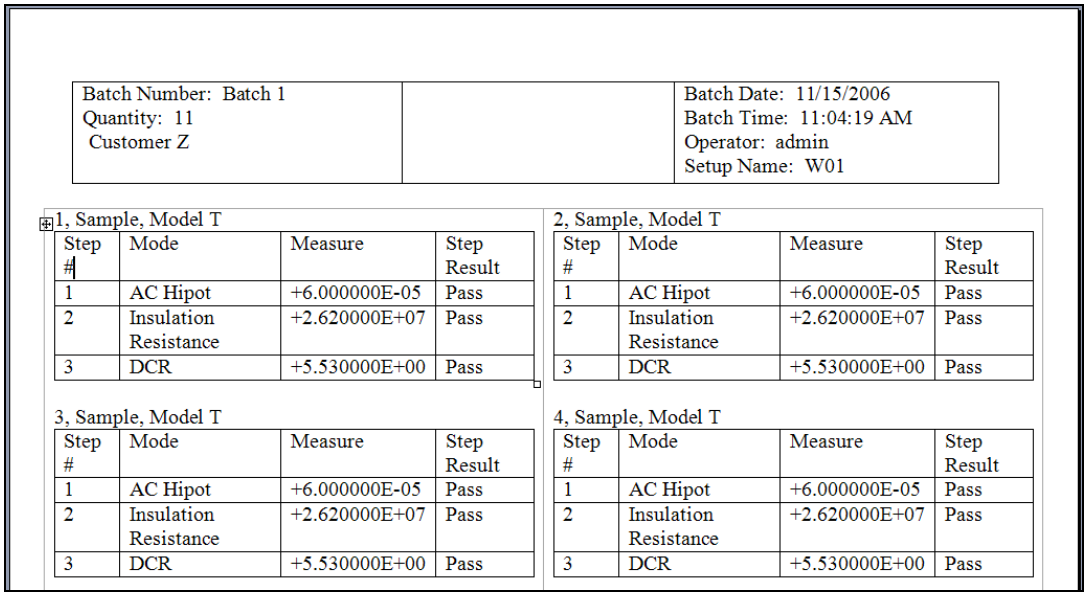


Figure 88 List of All Batch Reports

2. Click the **Display Batch Report** button at the bottom of the screen. CaptivATE© opens Microsoft Word and generates a batch report such as the one in Figure 89: (Only PASS results are included in a Batch Report.)



Batch Number: Batch 1 Quantity: 11 Customer Z		Batch Date: 11/15/2006 Batch Time: 11:04:19 AM Operator: admin Setup Name: W01

1, Sample, Model T

Step #	Mode	Measure	Step Result
1	AC Hipot	+6.000000E-05	Pass
2	Insulation Resistance	+2.620000E+07	Pass
3	DCR	+5.530000E+00	Pass

2, Sample, Model T

Step #	Mode	Measure	Step Result
1	AC Hipot	+6.000000E-05	Pass
2	Insulation Resistance	+2.620000E+07	Pass
3	DCR	+5.530000E+00	Pass

3, Sample, Model T

Step #	Mode	Measure	Step Result
1	AC Hipot	+6.000000E-05	Pass
2	Insulation Resistance	+2.620000E+07	Pass
3	DCR	+5.530000E+00	Pass

4, Sample, Model T

Step #	Mode	Measure	Step Result
1	AC Hipot	+6.000000E-05	Pass
2	Insulation Resistance	+2.620000E+07	Pass
3	DCR	+5.530000E+00	Pass

Figure 89 Sample of One Batch Report

8 Historical Search

Historical Search screen

An historical search is a search for the results of several tests, to be arrayed in a spreadsheet.

An Historical Search differs from a Report Search as follows:

Report Search	A search for one MS Word document
Historical Search	A search for results of many tests, arrayed on a spreadsheet

There are four search “filters” you can use. The pull-down lists of the four filters each offer the same categories:

No Filter

Date

Test Instrument Serial Number

Test Instrument Model

DUT Serial Number

DUT Model

Test Result (PASS or FAIL)

Step Result (PASS or FAIL)

User (Operator)

1. Click the drop down arrow from **Filter # 1** and choose **Date**; and from the start and end pop-ups choose a range of dates.
2. Start the search.

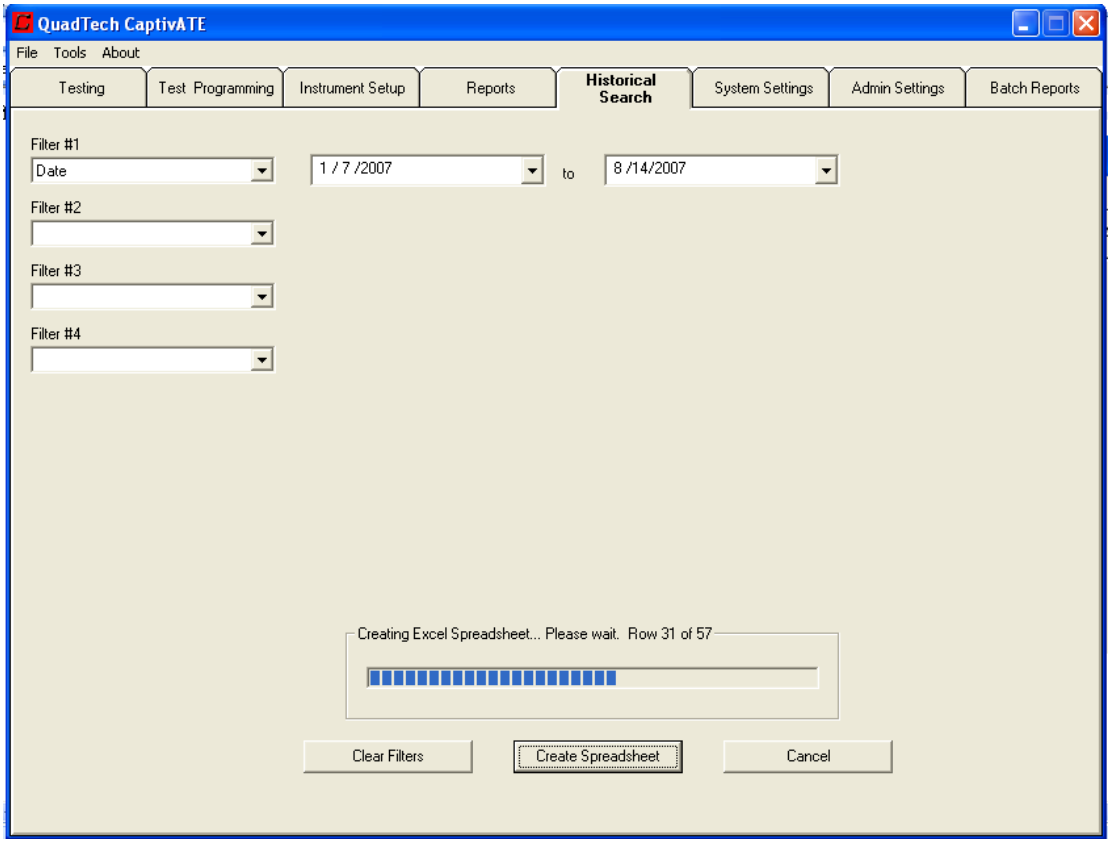


Figure 90 Historical Search in Progress

3. To terminate a search at any time, click the **Cancel** button.

The spreadsheet will have 35 columns (“A” through “AI”) of data on the tests that have been selected, with each row containing the data for one step. An example is shown in Figure 91. In the **Mode** column (column J) the steps for the 6100 Plus are called by their aliases.

Microsoft Excel - Historic data - New Document1

	DUT Model #	DUT Serial #	Test Date	Test Time	Operator	Test Instrument Model #	Test Instrument Serial #	Test Name	Step #	Mode	
2	Sentinel III Ca	No Serial Nur	8/13/2007	13:42	admin	Matrix 8000	Demo	Sentinel III t	1	Ground Bond	NA
3	Sentinel III Ca	No Serial Nur	8/13/2007	13:42	admin	Guardian 6100 Plus	Demo	Sentinel III t	2	Ground Bond PE Stud	30.01
4	Sentinel III Ca	No Serial Nur	8/13/2007	13:42	admin	Matrix 8000	Demo	Sentinel III t	3	AC HIPOT: AC Line to Earth	NA
5	Sentinel III Ca	No Serial Nur	8/13/2007	13:42	admin	Guardian 6100 Plus	Demo	Sentinel III t	4	Hipot Mains to Ground	1.502
6	Sentinel III Ca	No Serial Nur	8/13/2007	13:42	admin	Matrix 8000	Demo	Sentinel III t	5	Earth Leakage: Class I	NA
7	Sentinel III Ca	No Serial Nur	8/13/2007	13:42	admin	Guardian 6100 Plus	Demo	Sentinel III t	6	Earth leakage Normal Polarity	272.62
8	Sentinel III Ca	No Serial Nur	8/13/2007	13:42	admin	Matrix 8000	Demo	Sentinel III t	7	Earth Leakage: Class I	NA
9	Sentinel III Ca	No Serial Nur	8/13/2007	13:42	admin	Guardian 6100 Plus	Demo	Sentinel III t	8	Earth Leakage Reverse Polarit	272.62
10	Sentinel III Ca	No Serial Nur	8/13/2007	13:48	admin	Matrix 8000	Demo	Sentinel III t	1	Ground Bond	NA
11	Sentinel III Ca	No Serial Nur	8/13/2007	13:48	admin	Guardian 6100 Plus	Demo	Sentinel III t	2	Ground Bond PE Stud	30.01
12	Sentinel III Ca	No Serial Nur	8/13/2007	13:48	admin	Matrix 8000	Demo	Sentinel III t	3	AC HIPOT: AC Line to Earth	NA
13	Sentinel III Ca	No Serial Nur	8/13/2007	13:48	admin	Guardian 6100 Plus	Demo	Sentinel III t	4	Hipot Mains to Ground	1.502
14	Sentinel III Ca	No Serial Nur	8/13/2007	13:48	admin	Matrix 8000	Demo	Sentinel III t	5	Earth Leakage: Class I	NA
15	Sentinel III Ca	No Serial Nur	8/13/2007	13:48	admin	Guardian 6100 Plus	Demo	Sentinel III t	6	Earth leakage Normal Polarity	272.62

Figure 91 Historical Search Spreadsheet

9 NI USB 6525 Digital I/O

Note: This process requires a NI USB 6525 to be installed in the system and the National Instruments software be installed for the NI USB 6525. The settings.txt file in the CaptivATE directory must have NI USB 6525 Is Used = True for operation.

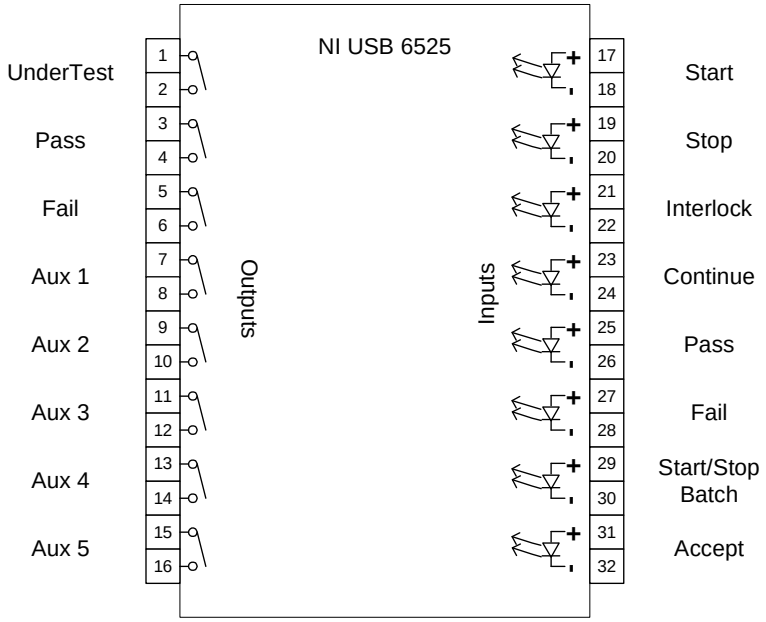


Figure 92 Diagram of Ni USB 6525

Inputs are limited to +/- 60VDC and draw 3mA. Interlock is level sensitive and based upon the settings in Tools Options General Tab. All other inputs are active on a transition from one level to another. Polling of inputs are based upon a polling setting in Tools Options General Tab. Inputs consist of the following: Start, Stop, Interlock, Continue, Pass, Fail, Start/Stop Batch, and Accept. These inputs correspond with all buttons used on the CaptivATE Testing Tab.

Outputs are limited to +/-60VDC and 500mA. Outputs are closed when True. Aux Outputs and Interlock are controlled via NI USB 6525 “Aux Channels” mode in Test Programming. The Undertest, Pass and Fail function exactly the same as the Danger, Pass and Fail indicator on the Testing Tab. For example, if the Danger indicator is flashing then the Undertest output on the Ni USB 6525 will be closed. There are eight outputs designated: Undertest, Pass, Fail, Aux 1, Aux 2, Aux 3, Aux 4, and Aux 5. Shown in Figure 95.

9.1 CaptivATE Tools Options General Tab NI USB 6525 Controls

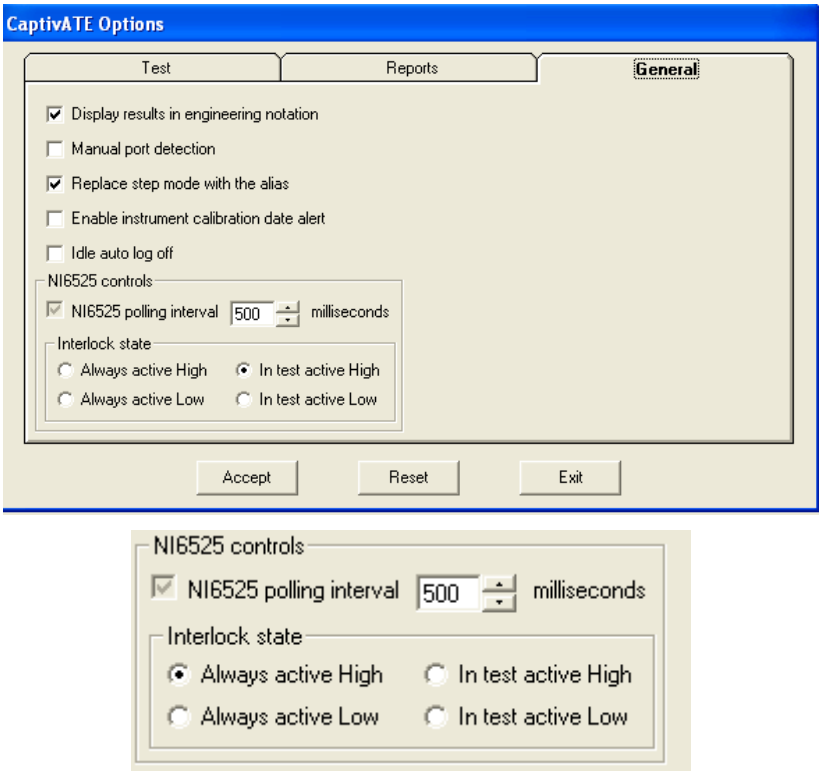


Figure 93 Shows Tools Options General Tab Ni6525 controls

Polling interval can be set between 100 and 5000 msec. This is the interval at which the software interrogates the NI USB 6525 and responds to the inputs. The polling interval is approximate and cannot be verified or calibrated.

9.1.1 Always Active High Condition

When in the Testing Tab, if the interlock signal going to the NI USB 6525 is low, then testing is allowed. All fields are available to the operator. If the interlock input is high (voltage applied) the message will read, “Testing is not allowed! Interlock is ON!” A test cannot be started via Ctrl-T, button or NI USB 6525. If the interlock signal goes low during testing, the test is stopped and a message is issued.

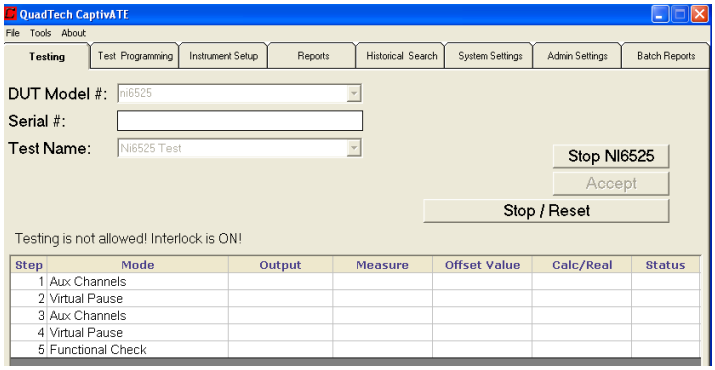


Figure 94 Depicts a test that cannot be started.

9.1.2 Always Active Low Condition

When in the Testing Tab, if the interlock signal going to the NI USB 6525 is high, then testing is allowed. All fields are available to the operator. If the interlock input is high (voltage applied), the message will read, “Testing is not allowed! Interlock is ON!” A test cannot be started via Ctrl-T, button or NI USB 6525. If the interlock signal goes high during testing, the test is stopped and a message is issued.

9.1.3 In Test Active High

The interlock signal from NI USB 6525 is ignored in the Testing Tab. Once a test is started, the interlock signal is polled. If the interlock input goes high, the test is stopped, and a message is issued “Test Aborted due to Instrument Stop or Interlock Activation.” Note: Interlock can still be turned off in the testing sequence using NI USB 6525 “Aux Channels” mode.

9.1.4 In Test Active Low

The interlock signal from NI USB 6525 is ignored in Testing Tab. Once the test is started, the interlock signal is polled. If the interlock input goes low, the test is stopped, and a message is issued “Test Aborted due to Instrument Stop or Interlock Activation.” Note: Interlock can still be turned off in the testing sequence using NI USB 6525 “Aux Channels” mode.

9.2 Programming Outputs and Interlock during a test sequence

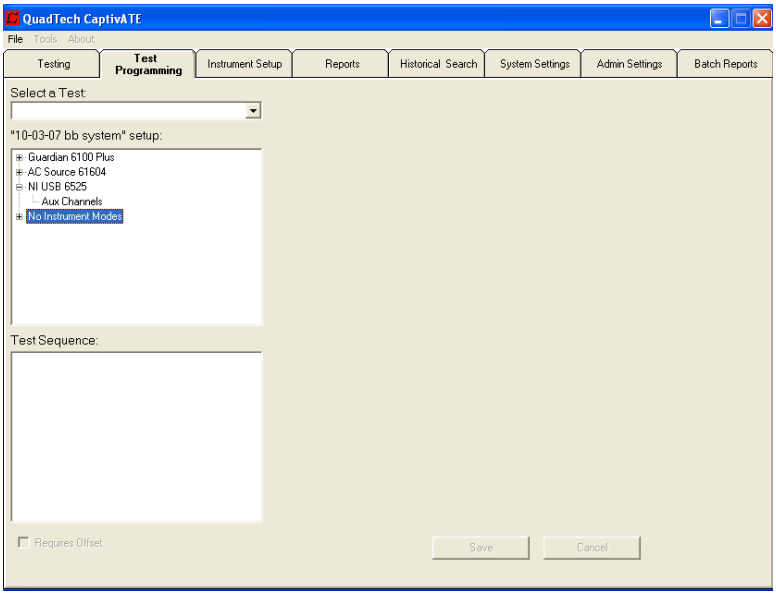


Figure 95 Shows the Test Programming tab where Aux Channels can be selected.

When creating a test sequence in the Test Programming Tab under the NI USB 6525 Aux Channels can be selected. (See Figure 98) When channels are selected, the screen in Figure 99 is shown.

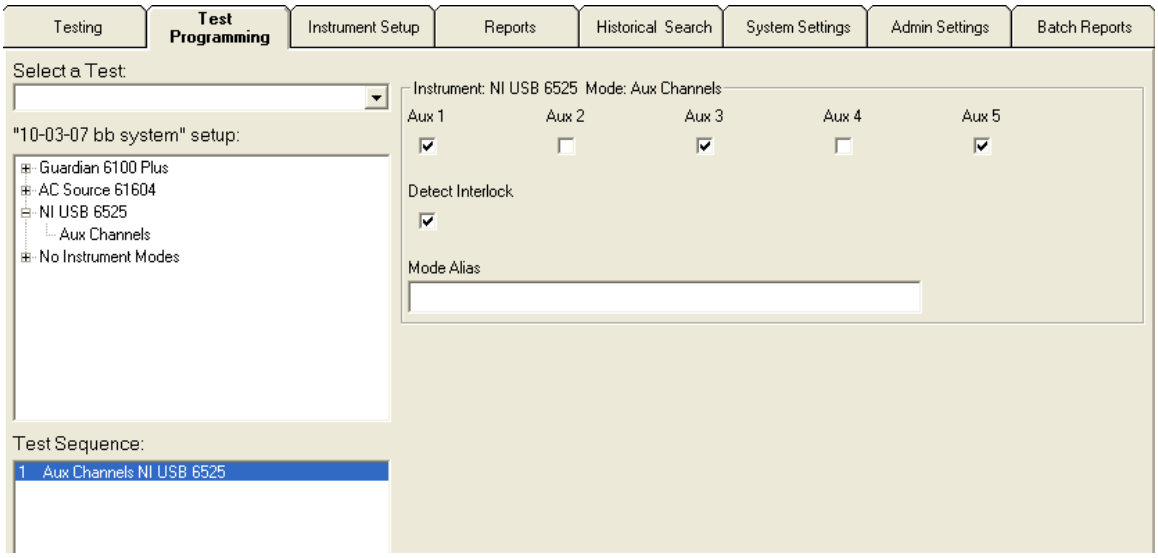


Figure 96 Shows Auxillary Channel selections

Checking Aux 1 through 5 will enable or disable the outputs of the NI USB 6525 when that step is reached in the sequence. In figure 99, Aux 1, 3 and 5 outputs will be closed in the first step of the sequence. At the end of the test sequence all AUX outputs will be opened.

9.3 Testing Tab and NI USB 6525

The NI USB 6525 will not work unless it is recognized by the software. The message box on the Testing Tab will indicate if the NI USB 6525 is plugged in and active. See figure 100.

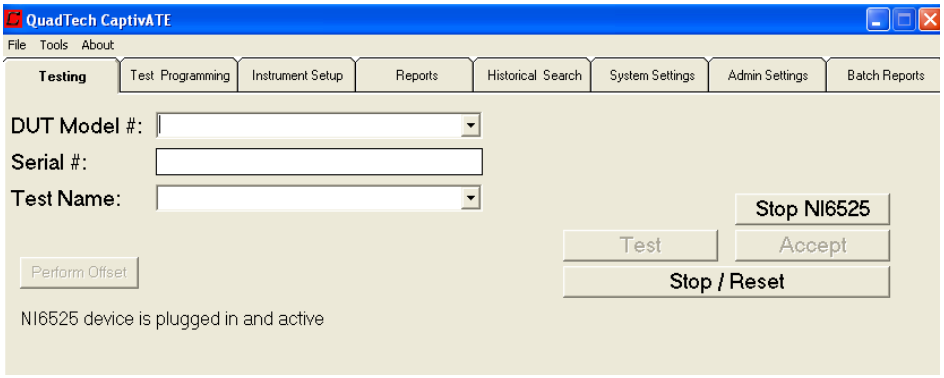


Figure 97 Shows a device that is plugged in and active.

The Stop NI USB 6525 button causes CaptivATE to ignore all inputs from the NI USB 6525 and not set any outputs. When the button is pressed, a message box will appear as shown in figure 101. This feature is particularly useful if the software is being controlled via a PLC. Testing can then be safely stopped without any possibility of a testing being started via an input from the PLC.

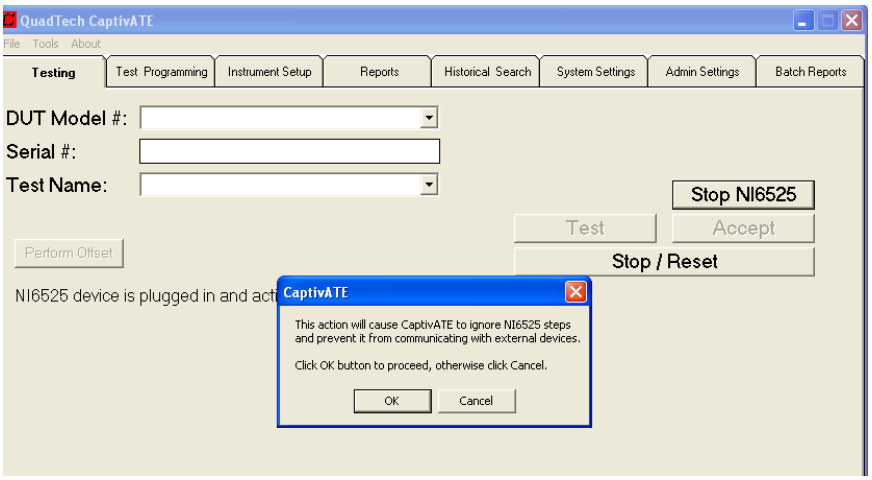


Figure 98 Shows the "stop" Ni6525 button and action message.

Once Okay is clicked, the Stop NI USB 6525 button will change to Start NI USB 6525. Clicking on the Start NI USB 6525 will enable all NI USB 6525 inputs and outputs.

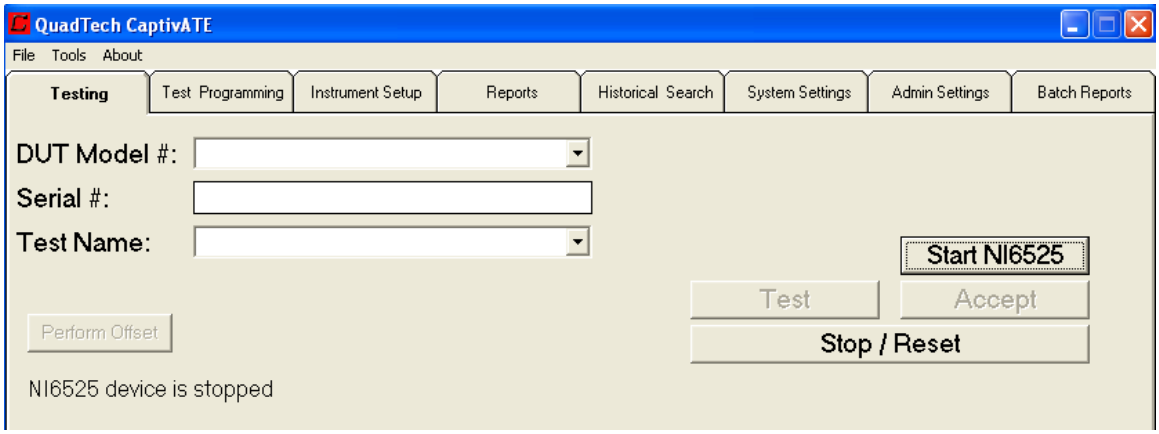


Figure 99 Shows the Start NI USB 6525 button.

When the Danger indicator is flashing, (see figure 103) the NI USB 6525 undertest output will be closed. During all steps, with the exception of the No Instrument modes, (Virtual Pause, Timed Pause, etc.) where the undertest output will be opened.

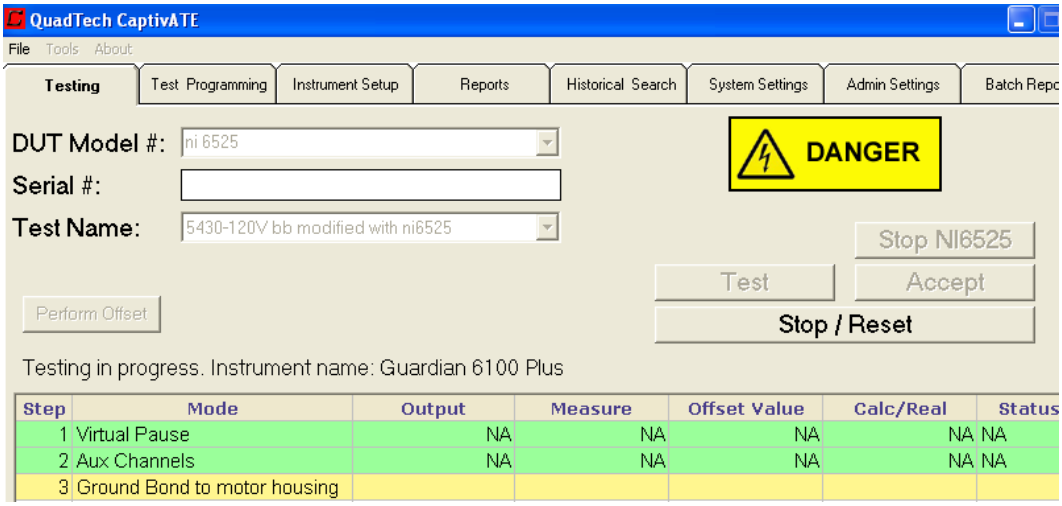


Figure 100 Shows the Danger signal.

If the result of the test is Pass, the Pass output will be closed on the NI USB 6525 until the next test or the stop/reset button is pressed. If the result of the test is Fail, the Fail output will be closed on the NI USB 6525 until the next test or the stop/reset button is pressed.

10 Reference Section

10.1 System Menu Bar: File

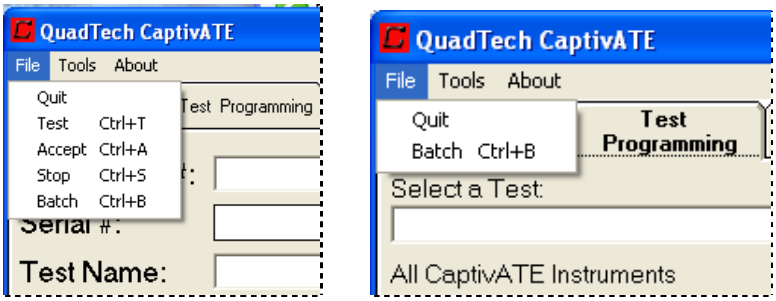


Figure 101 System Menu Bar . . . File

Table 8 System Menu Bar . . . File

Quit	Close the CaptivATE program.
Test	Run the selected test.
Accept	Save and/or print the test result.
Stop	Stop the test.
Batch	Start the batch test

10.2 System Menu Bar: Tools/Options

10.3 Tools/Options/Test

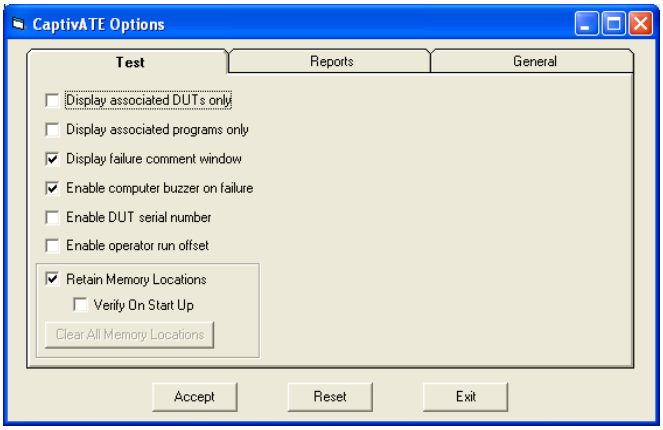


Figure 102 Tools/Options/Test Screen

Table 9 Tools/Options/Test Screen

Test Check Box	Check-marked	Uncheck-marked
Display associated DUTs only	**Default** On the *Testing* screen in the DUT Model # field, display in the pull-down list only the DUT Model #'s that are associated with one or more Test Names. Test name cannot be entered manually.	
Display associated programs only	**Default** On the *Testing* screen in the Test Name field, display in the pull-down list only the programs (the Test Names) that are associated with one or more DUT Model #s.	
Display failure comment window	Text box pops up when a test fails, requiring the operator to enter up to 50 characters. A "Failure Comment" section is created in the Standard Report of this test.	
Enable computer buzzer on step failure	On a step (mode's) failure, enables the buzzer in the PC to buzz. (To silence the buzzer, press the **Stop/Reset** button on the *Testing* screen.)	
Enable DUT serial number	Before a test can be run, a DUT serial number must be entered, either manually or automatically.	
Enable operator run offset	Allows an operator to run an offset while in the *Testing* screen.	
Retain Memory Locations {XE "Retain Memory Locations"}	**Default** When a CaptivATE test program is running on a test instrument, the test instrument stores the relevant parts of the program in locations in its own memory. The contents of these memory locations can be saved by checking the Retain Memory Locations box. By doing this, you can avoid the time taken to reload a long test. CaptivATE will immediately display the Danger icon, indicating that the test is running. The MemoryLocation.txt file contains a record of all programs that have been run since the Retain Memory Locations box was checked. To empty the MemoryLocation.txt file, clear the check box and turn off CaptivATE.	
Verify on Start Up	At the start of the test, the test will be verified to check that program in the instrument's memory matches the test program.	

10.3.1 Tools/Options/Test . . . Enable DUT serial number

This check box determines whether any serial number must be entered during a test for a DUT, and whether the serial number is to be entered manually or automatically.

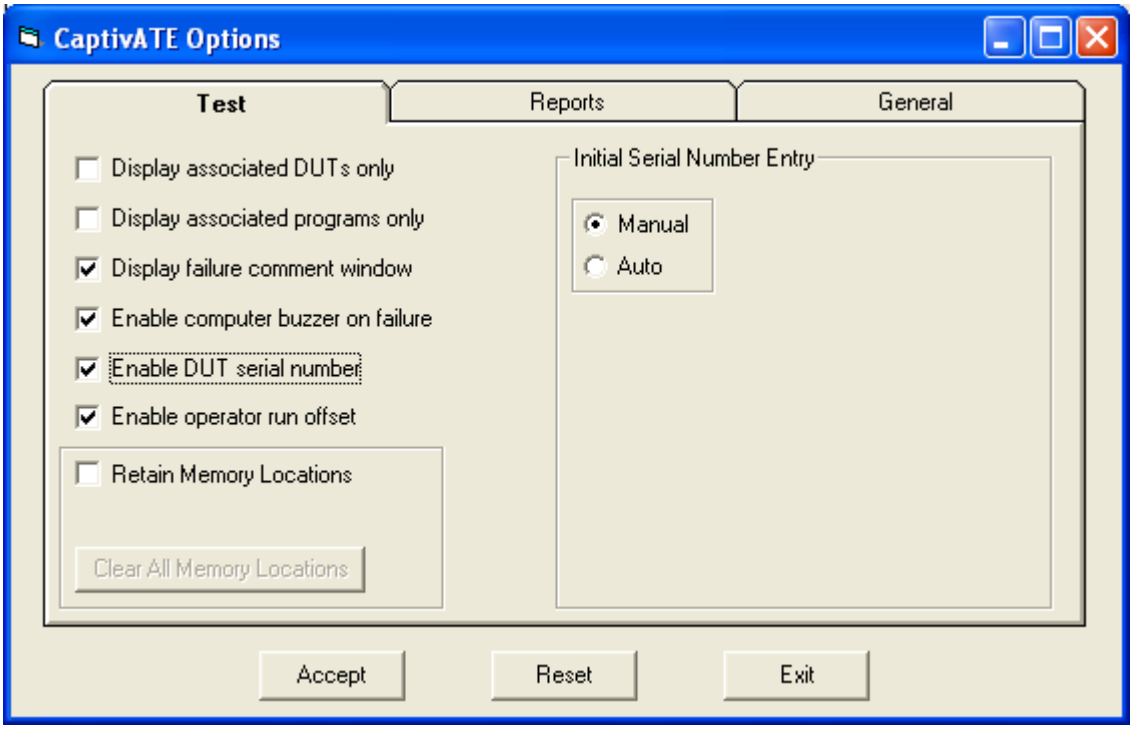


Figure 103 Tools/Options/Test … Enable DUT serial number

Table 10 Tools/Options/Test … Enable DUT serial number

Initial Serial Number Entry	Selected
Manual	**Default** Before a test can be run, a DUT serial number must be entered manually.
Auto	Opens more checkboxes with which to define the automatic incrementing of the DUT serial numbers. See Table 11.

10.3.2 Tools/Options/Test. . .Enable DUT serial number. . .Auto

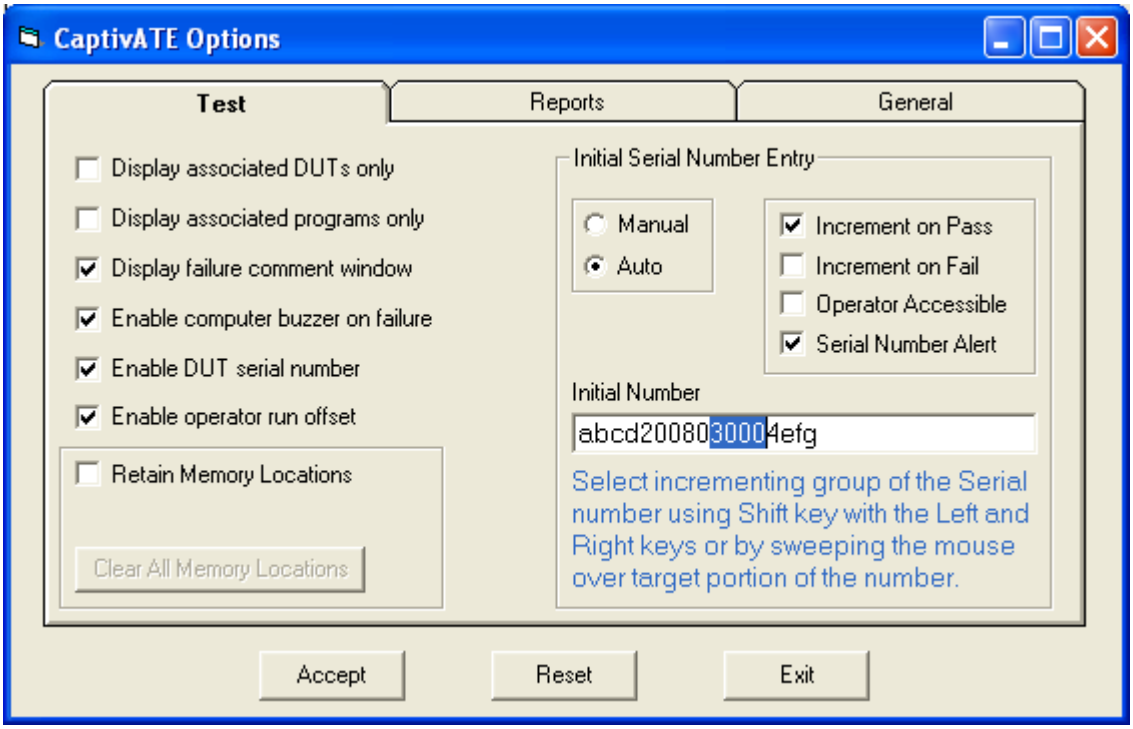


Figure 104 Tools/Options/Test….Enable DUT serial number…Auto

Table 11 Tools/Options/Test….Enable DUT serial number…Auto

Increment on Pass	Increment the serial number when the previous test passes.
Increment on Fail	Increment the serial number when the previous test fails.
Operator Accessible	Allow the operator to click the **Edit** button on the Testing screen in order to edit the serial number or the part of the serial number to be incremented.
Serial Number Alert	A pop-up that asks the operator to verify the initial serial number.
Initial Number	A frame containing the text box that displays the initial serial number.
Accept	Tells the system to accept changes you have made to these software switches.
Reset	As long as you have not clicked Accept, recovers the switch settings as they were before you changed them, and keeps the Tools/Options/Test open.
Exit	Closes the Tools/Options/Test without saving changes.

Table 12 Tools/Options/Test . . . Retain Memory Locations

Check Box	Check-marked
Retain Memory Locations {XE “Retain Memory Locations”}	When a CaptivATE test program is running on a test instrument, the test instrument stores the relevant parts of the program in locations in its own memory. The contents of these memory locations can be saved by checking the Retain Memory Locations box. By doing this, you can avoid the time taken to reload a long test. CaptivATE will immediately display the Danger icon, indicating that the test is running. The MemoryLocation.txt file contains a record of all programs that have been run since the Retain Memory Locations box was checked. An example is in **Error! Reference source not found.**. To empty the MemoryLocation.txt file, clear the check box and turn off CaptivATE.

10.4 Tools/Options/Reports

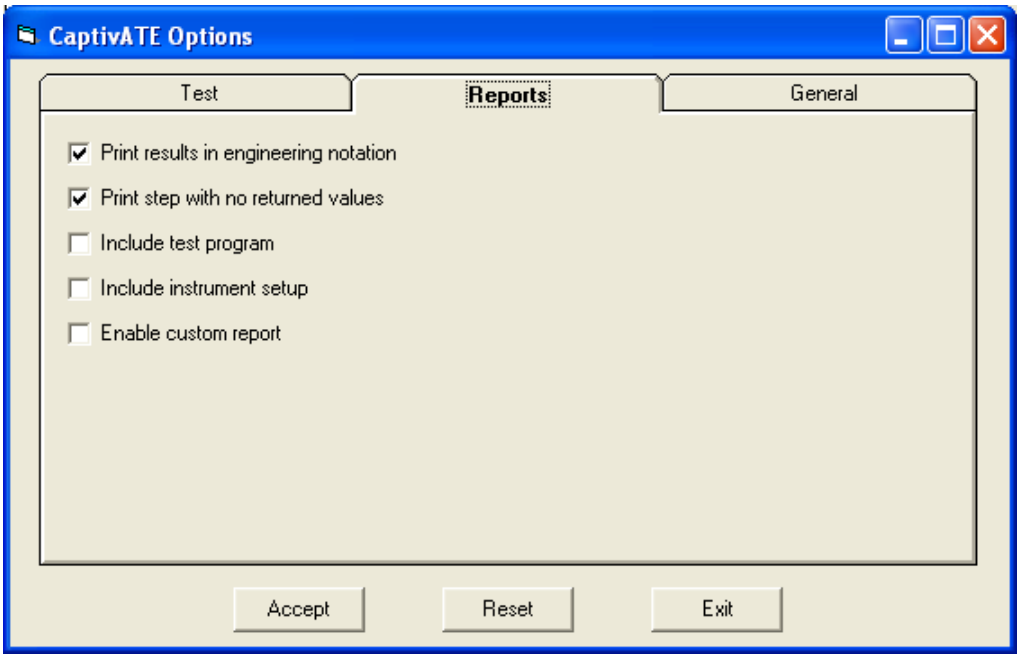


Figure 105 Tools/Options/Reports Screen

Table 13 Tools/Options/Reports Software Switches

Checkbox	Function
Print results in engineering notation	**Default** Prints and reports a value such as 8.0 microAmps as “8.0 µA” instead of in scientific notation as “+8.000000E-06“
Print step with no returned values	**Default** Prints and reports a null step, one that carries out part of a test program, such as Preset, without returning value. (See **Figure 80** for a report with null lines. See **Figure 81** for a report without null lines.)
Include test program	Include details of each step (mode) in the test in the “Test Detail” part of a Standard Report.
Include instrument setup	To include details of each step (mode) in the test, the report provides an “Instruments Used” section
Enable custom report	This function available only through arrangement with QuadTech.
Accept	Tells the system to accept changes you have made to these software switches.
Reset	As long as you have not clicked **Accept, r**ecovers the switch settings as they were before you changed them, and keeps the window open.
Exit	Closes the window without saving changes.

10.5 Tools/Options/General

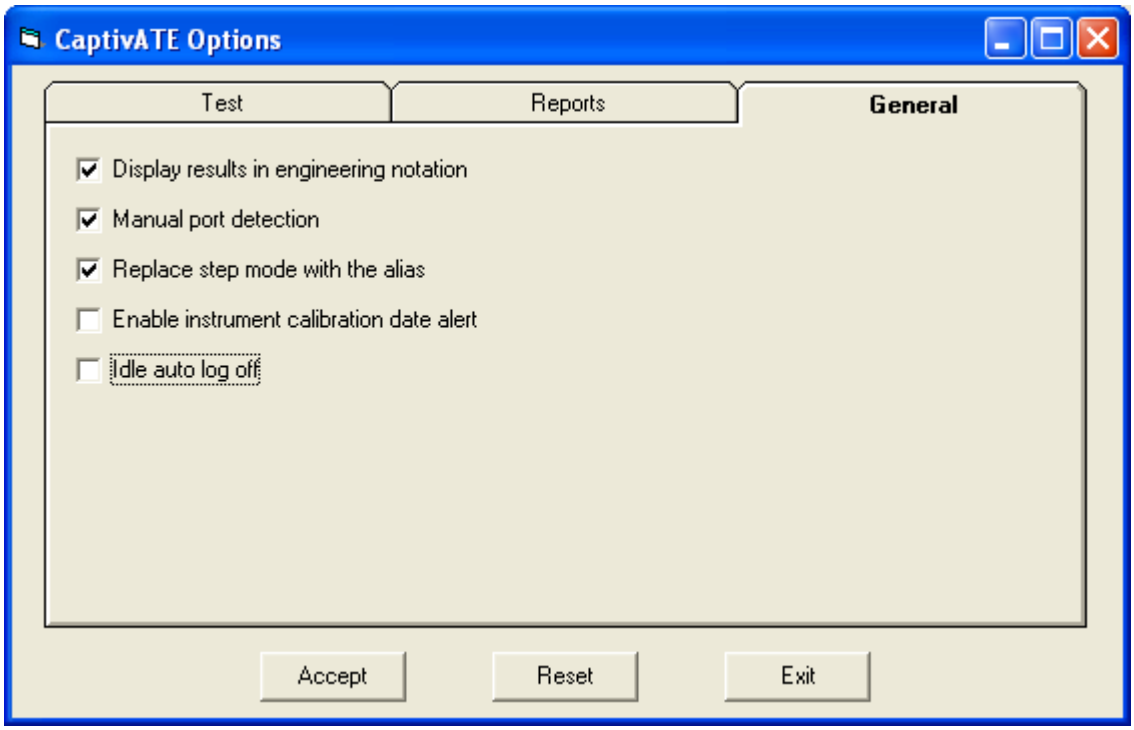


Figure 106 Tools/Options/General Screen

Table 14 Tools/Options/General Software Switches

Switch	Function
Display results in engineering notation	**Default.** Display in a report all results as shown in the Output and the Measure columns in Figure 81 (this switch check-marked).
Manual port detection	With manual port detection checked, the Com Port pull-down on the *Instrument Setup* screen displays all com port numbers, as shown in Figure 107.
Replace step mode with the alias	**Default.** Allows the alias(es) you have entered on the *Test Programming* screen to be displayed and included in subsequent test reports.
Accept	Tells the system to accept changes made to these software switches.
Reset	As long as you have not clicked **Accept, r**ecovers the switch settings as they were before you changed them, and keeps the *Tools Options* open.
Exit	Closes the Tools Options without saving changes.

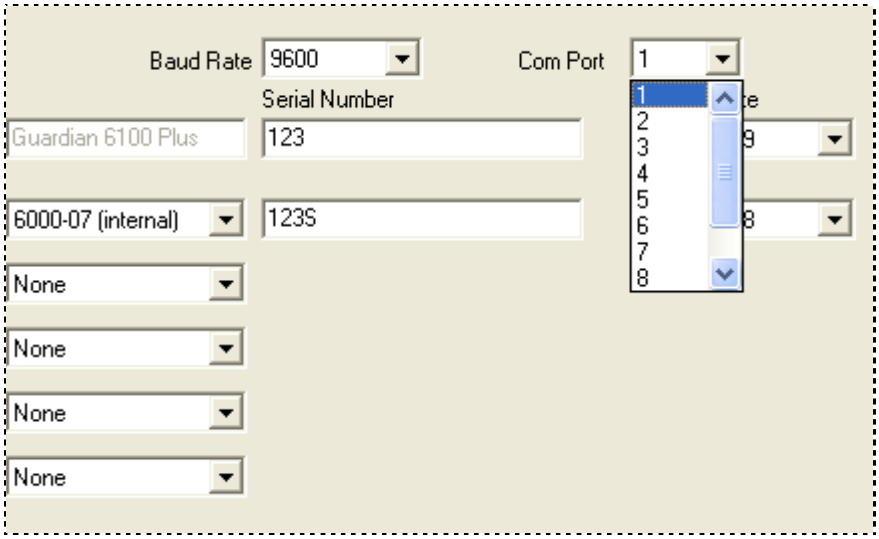


Figure 107 Pull-down List of Com Ports with Manual port detection checked

10.5.1 Tools/Options/General. . .Enable instrument calibration date alert

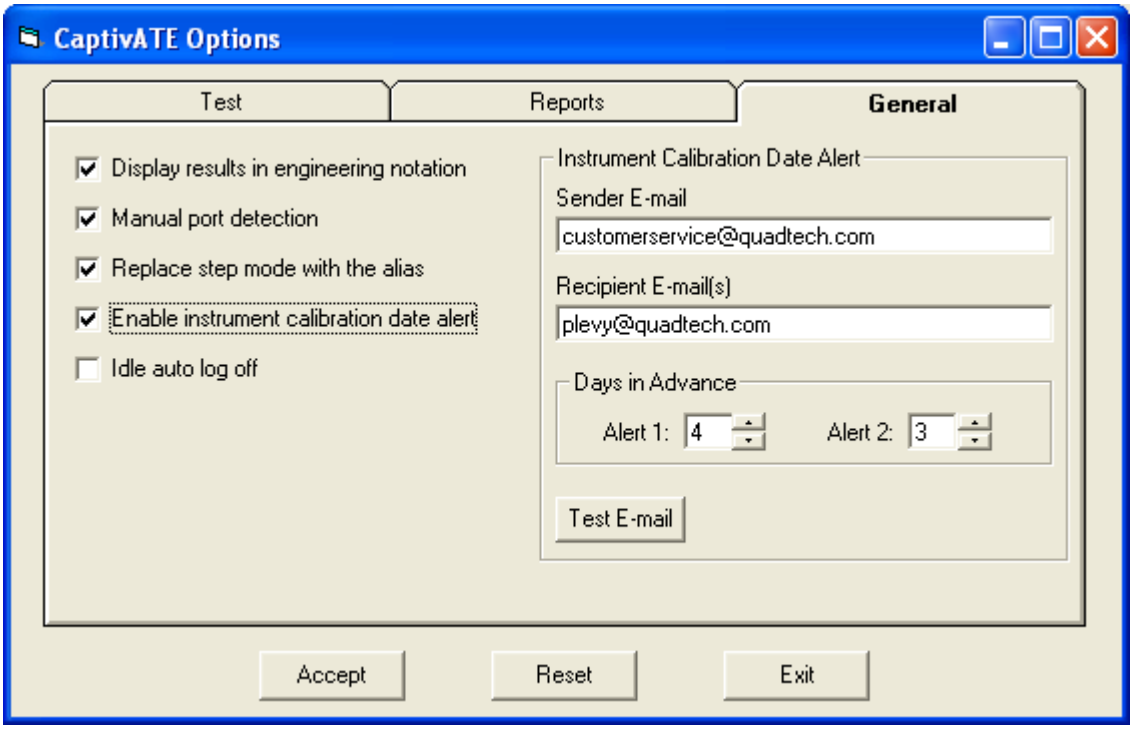


Figure 108 Tools/Options/General . . . Enable instrument calibration date alert

Table 15 Tools/Options/General . . . Enable instrument calibration date alert Software Switches

Enable instrument calibration date alert	In the Recipient E-mail(s) text box, enter one or more email address to which to send the two alerts
Sender E-Mail	E-mail address from which to send the alerts.
Recipient E-Mail	E-mail address(es) to which to send the alerts.
Alert 1	Days before calibration is due that you want to receive the first alert.
Alert 2	Days before calibration is due that you want to receive the second alert.
Test E-mail	Tells the system to send an email immediately.

10.5.2 Tools/Options/General. . .Idle auto log off. . .After nn minutes

Idle log off will log the existing user off CaptivATE. It does not close the CaptivATE program. A new user or the previous user may log back in and CaptivATE will continue from the exact point log off occurred. Idle log off only occurs in the Test Tab and will not occur during a test.

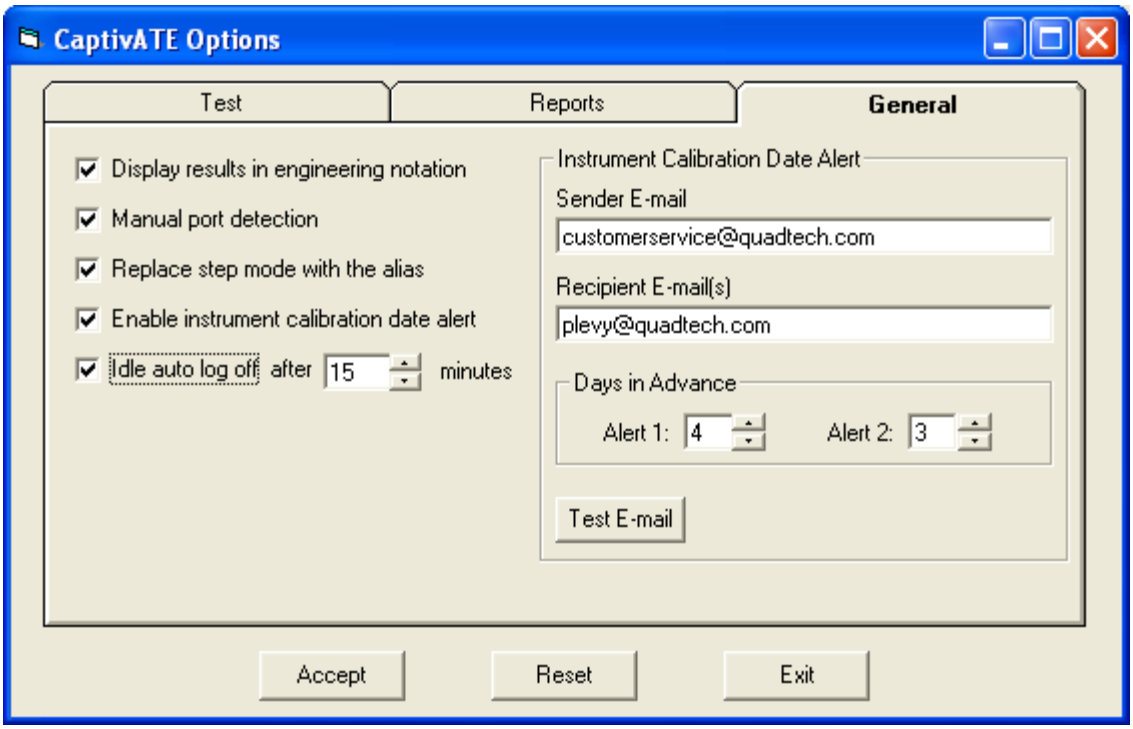


Figure 109 Tools/Options/General . . . Idle auto log off . . . After nn minutes

Table 16 Tools/Options/General . . . Idle auto log off . . . After nn minutes Software Switches

Idle auto log off	Enable the automatic log off.
After nn minutes	The idle time allowed for a CaptivATE system before a pop-up appears that warns the user 30 seconds before log off.

10.6 Admin Settings

This screen is divided into three frames:

Device Settings, Database Location, and Users.

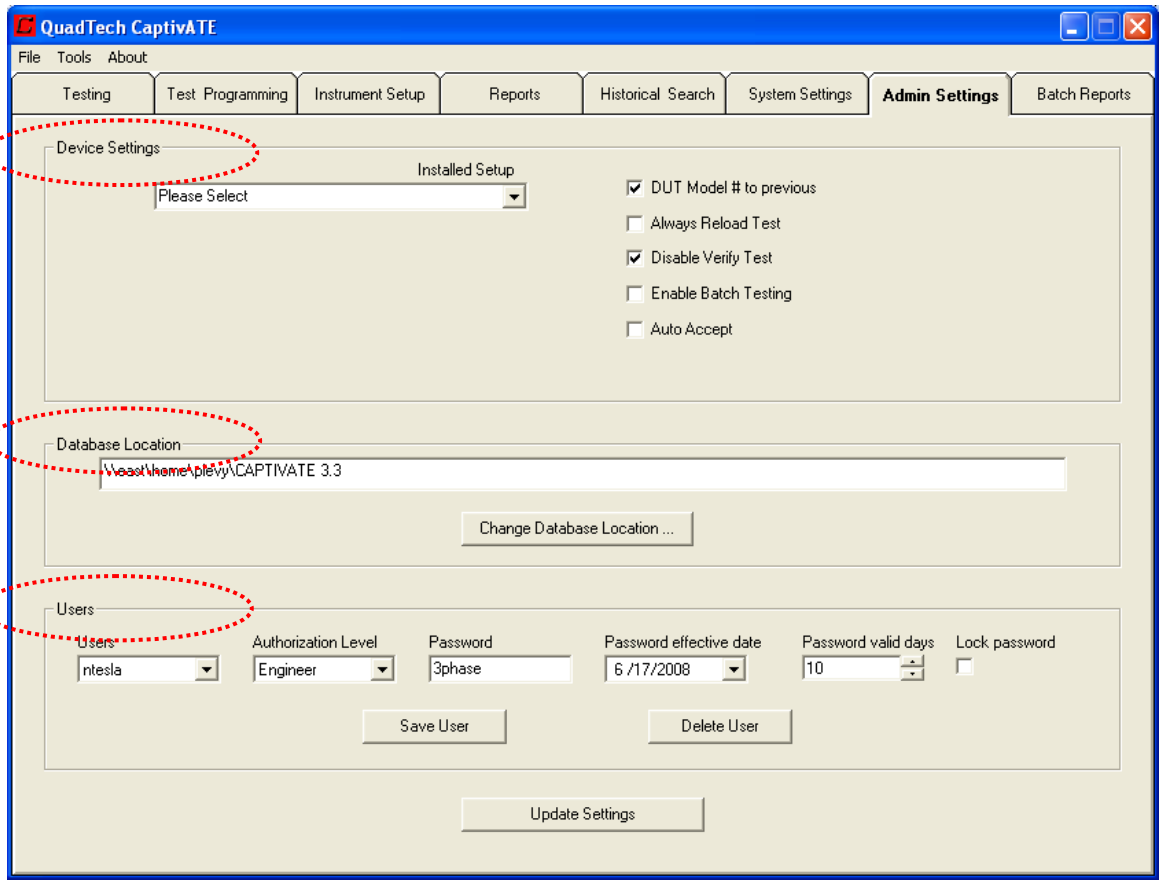


Figure 110 Admin Settings Screen

10.6.1 Admin Settings. . .Device Settings

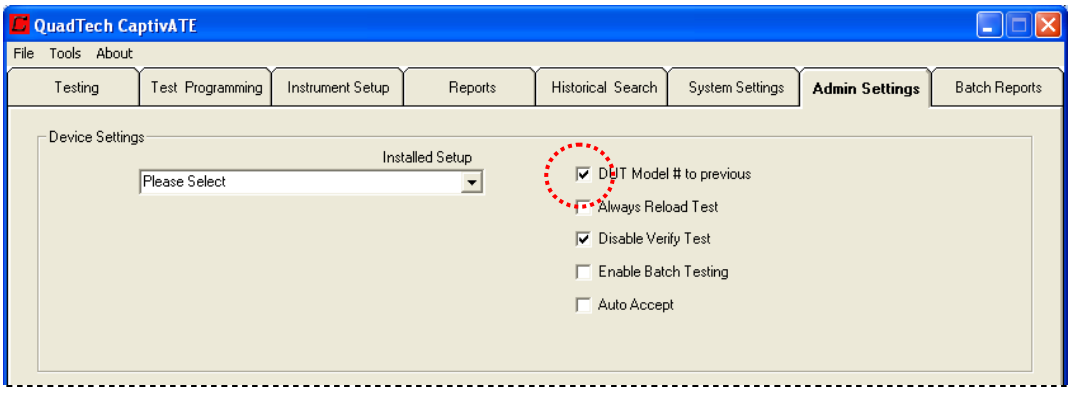


Figure 111 Admin Settings . . . Device Settings

Table 17 Admin Settings . . . Device Settings

Installed Setup	The name of the active Instrument Setup. Only the test instruments included in the setup entered here will appear in the list box on the *Test Programming* screen.	
Setting	Check-marked	Uncheck-marked
DUT Model # to previous	**Default.** Whatever DUT Model # was entered on the *Testing* screen in the previous test will be displayed automatically in that text box to begin the next test.	Operator must manually do one of the following Enter the DUT Model # via the keyboard Click it from the pull-down menu Scan it with a bar-code scanner
Always Reload Test	For each iteration, the test will load into the installed instrument(s). The yellow "Loading Test, please wait…" flag will be displayed in the upper right corner of the *Testing* screen.	**Default.** The test is loaded only on the first iteration.
Disable Verify Test	**Default**. The loaded test will not be verified. Not verified means that the settings on the instrument will not be compared with the settings of the particular test program that is loaded. NOTE: CaptivATE will still check that there are no errors after each step is loaded.	The loaded test will be verified, which means that the settings on the instrument are compared with the settings of the particular test that is loaded. The orange "Verifying Test" flag is displayed.
Enable Batch Testing	Adds two fields to the *Testing* screen: Start Batch and Batch#. For detail, see **Batch Tests and Batch Reports**.	**Default.** No batch testing can be done.
Auto Accept	Without the operator having to click the **Accept** button, the results of the test are saved to the database and printed as defined in Section 6.	**Default.** To accept the results of a test, you must manually click the **Accept** button.

10.6.2 Admin Settings. . .Database Location

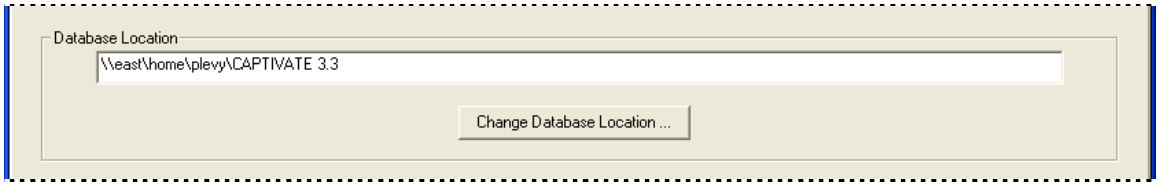


Figure 112 Admin Settings . . . Database Location

Setting	
Database Location	The folder that contains the CaptivATE database. For customers who have more than one user, this folder should be on a shared drive.

10.6.3 Admin Settings. . .Users

Available only to those who have Administrative-level authority.

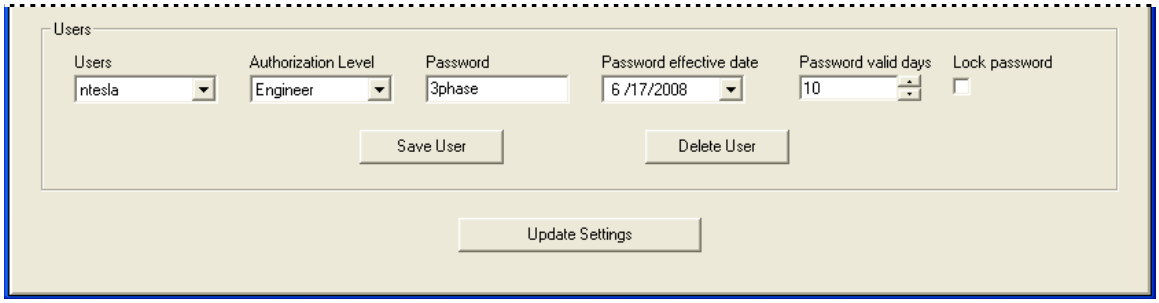


Figure 113 Admin Settings . . . Users

Table 18 Admin Settings . . . Users

Setting	
Users	Pull-down menu displays all defined users as well as “New User.” Selection of New User opens a pop-up text box into which the Administrator enters the new user’s name.
Authorization Level	Pull-down menu displays the three levels: Administrator, Engineer, and Operator.
Password	User Password Entered by the Administrator.
Password effective date	Start date for password aging. Default is the current date. Only available in Medical version of CaptivATE
Password valid date	Number of days during which this password is valid from effective date. After which user will be locked out. Minimum 10, maximum 370. Only available in Medical version of CaptivATE
Lock password	Unlocks a user that has been locked out due to more than 3 login attempts or can be used to prevent this user from logging in. Only available in Medical version of CaptivATE
Save User	Required in order to save a user’s settings.
Delete User	Deletes the selected user. This user’s name cannot be used again. CAUTION: For this reason, do not delete the admin user name until you have defined another user with administrative level authority.

Update Settings	Not necessary to save a user setting.

10.7 System Settings

The System Settings screen has two frames: “DUT Model Number Test Associations” and “Reports, CSV and XML File Options.”

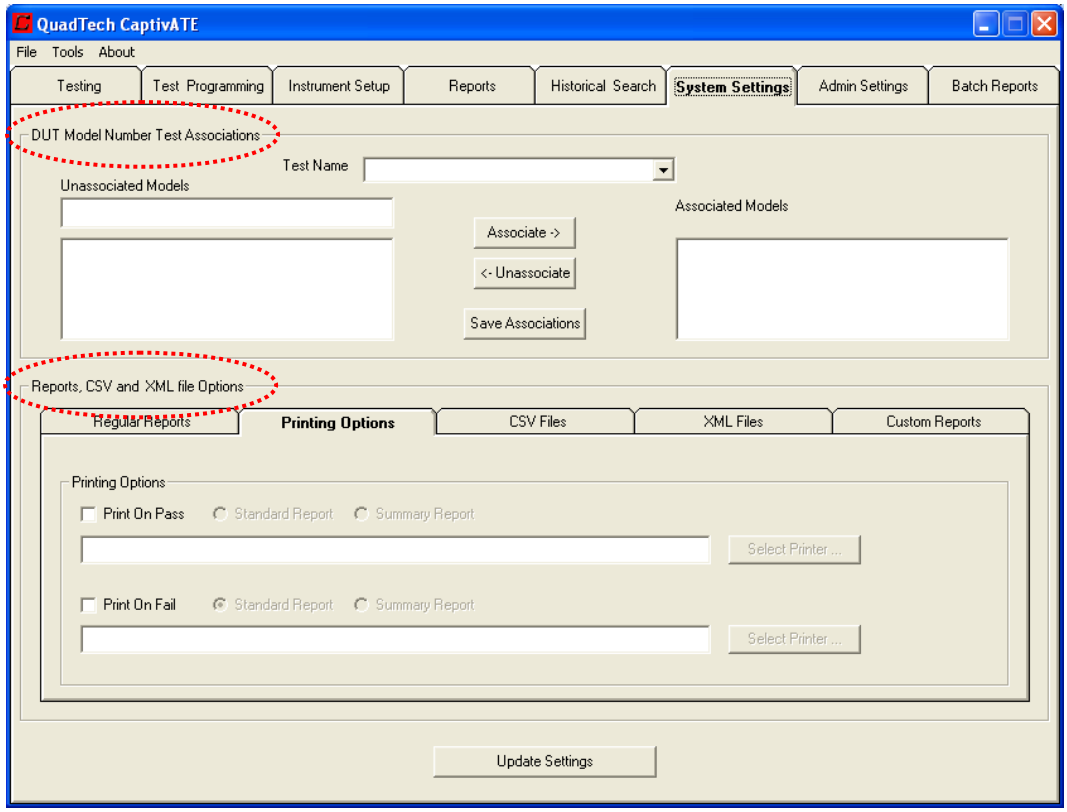


Figure 114 System Settings

10.7.1 System Settings . . . DUT Model Number Test Associations

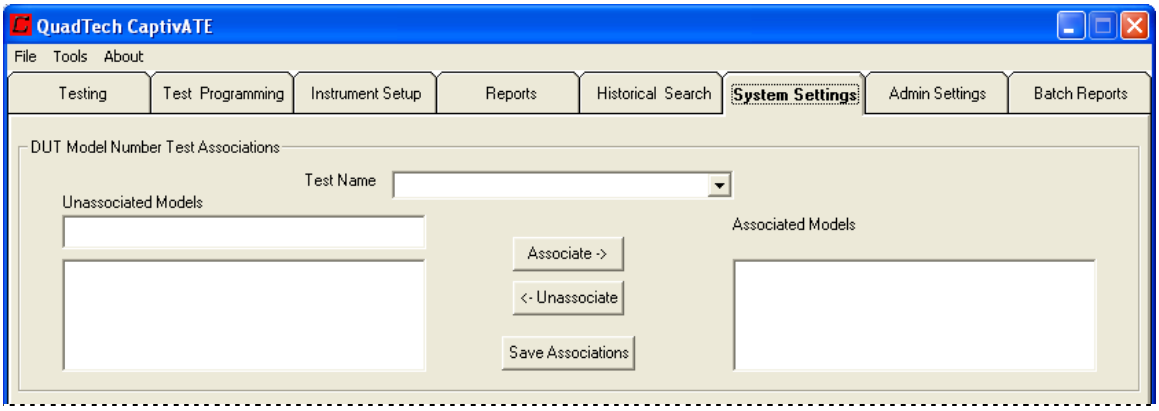


Figure 115 System Settings . . . DUT Model Number Test Associations

Table 19 System Settings . . . DUT Model Number Test Associations

Labels	Box or Button Function
Test Name	All the tests that you have created are listed in the pull-down menu in the Test Name list box.
Unassociated Models	If you have not yet entered any DUT Model numbers, this is the place for it. When a test is selected from the list of Test Names, a list of all DUT Model Numbers is automatically displayed in the list box below the Unassociated Models text box. This list of DUT Model Numbers is composed of the model numbers (or names) that you have entered in the Unassociated Models text box prior to associating them one-by-one.
Associate→	Moves a selected model from the Unassociated Models text box to the Associated Models list box.
←Unassociate	Selecting a model in the Associated Model list box and clicking **Unassociate** will move the model back to the list of Unassociated Models.
Save Associations	In order to save any association or unassociation, you must click Save Associations. Clicking the **Save Associations** button clears all fields. To save an association, it is **not** necessary to click **Update Settings**.

10.8 System Settings. . .Reports, CSV and XML file Options

This frame also includes *Printing Options* and *Regular Reports.*

10.8.1 System Settings . . . Regular Reports

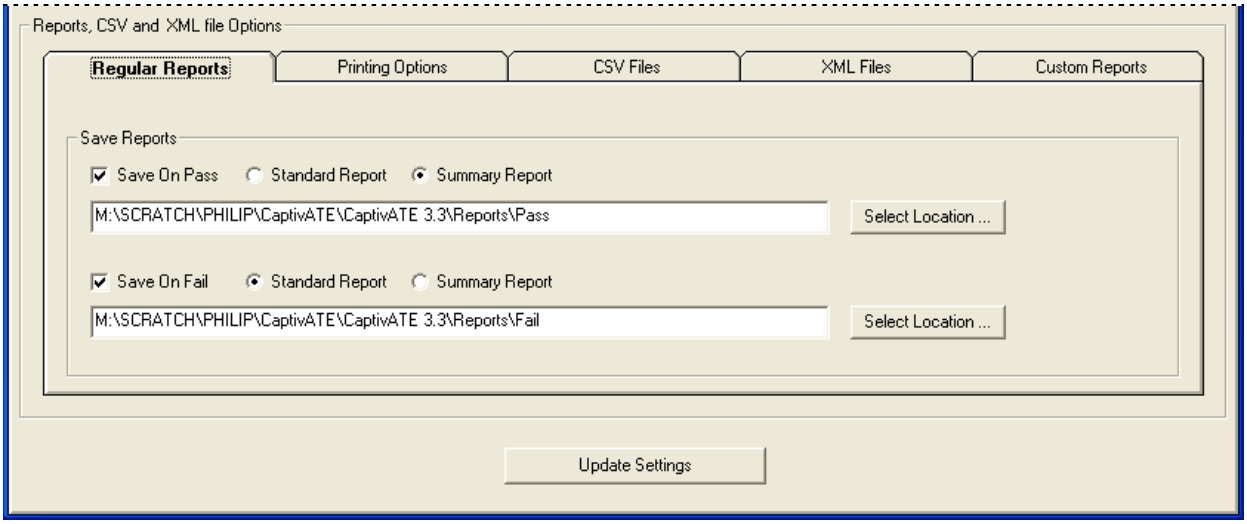


Figure 116 System Settings . . . Regular Reports

Table 20 System Settings . . . Regular Reports

Save Reports	Function
Save On Pass	A test that has passed and been accepted is saved to the specified location.
Standard Report	Includes at minimum a header (which contains the same information as an entire Summary Report) and the Test Results step-by-step. Check-marks on two software switches shown in Figure 79 (“Include test program” and “Include instrument setup”) will include in the report a detailed description of each step in the test program as well as the instruments used.
Summary Report	Includes the following data: DUT Model Number, Serial Number, Test Name, Date & Time, Operator, and Test Result.
Select Location	Using Windows Explorer, select the directory in which to save test results.
Save On Fail	A test that has passed and been accepted is saved to the specified location.
Update Settings	Must be clicked to have the system recognize the changes,

10.8.2 System Settings . . . Printing Options

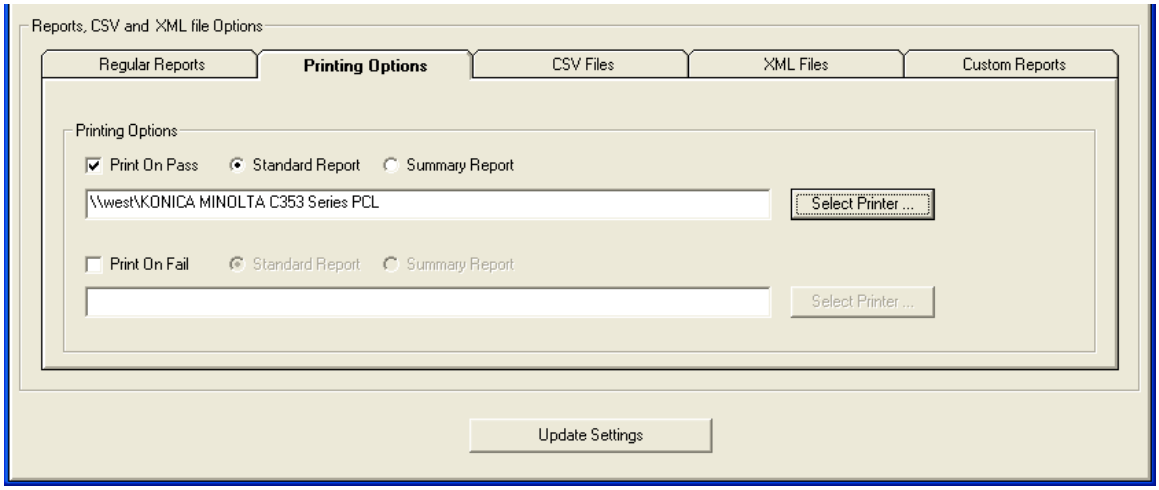


Figure 117 System Settings . . . Printing Options

Table 21 System Settings . . . Printing Options

Printing Options	Function
Print On Pass	When a test passes and is accepted, it will be printed.
Standard Report	
Summary Report	Includes the following: DUT Model Number, Serial Number, Test Name, Date & Time, Operator, Test Result.
Select Printer	Using the Windows Explorer, you can select a printer.
Print On Fail	When a test fails and is accepted, it will be printed.
Select Printer	Using the Windows Explorer, you can select a printer.
Update Settings	Click this button to save specifications.

10.8.3 System Settings. . .CSV Files

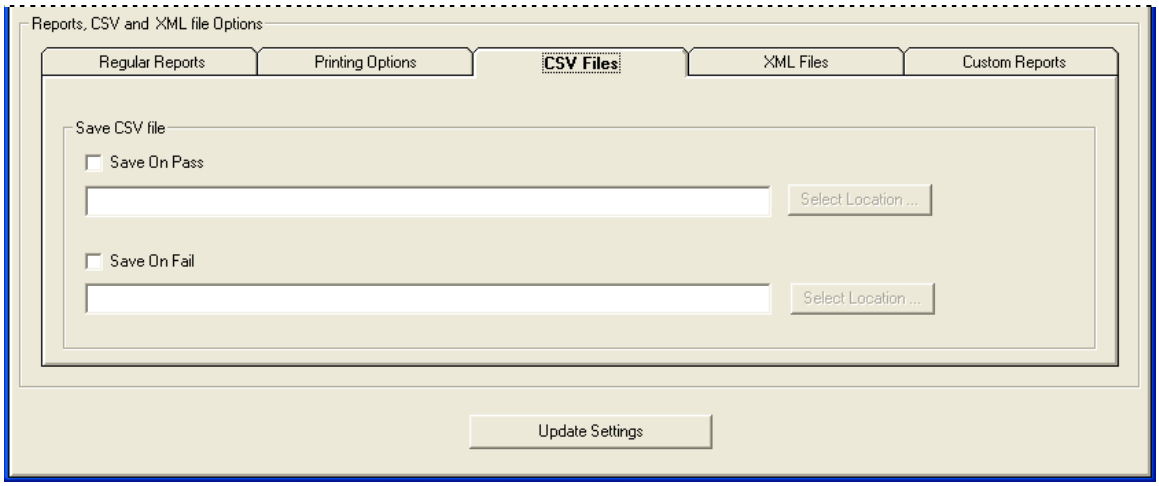


Figure 118 System Settings . . . CSV Files

Table 22 System Settings . . . CSV Files

Save CSV File	Box Function
Save On Pass	A test that passes and for which the **Accept** button is clicked, is saved to the specified location.
Select Location	Using Windows Explorer, select the directory in which to save Pass results.
Save On Fail	A test that fails and for which the **Accept** button is clicked, is saved to the specified location.
Select Location	Using Windows Explorer, select the directory in which to save Fail results.

10.8.4 System Settings. . .XML Files

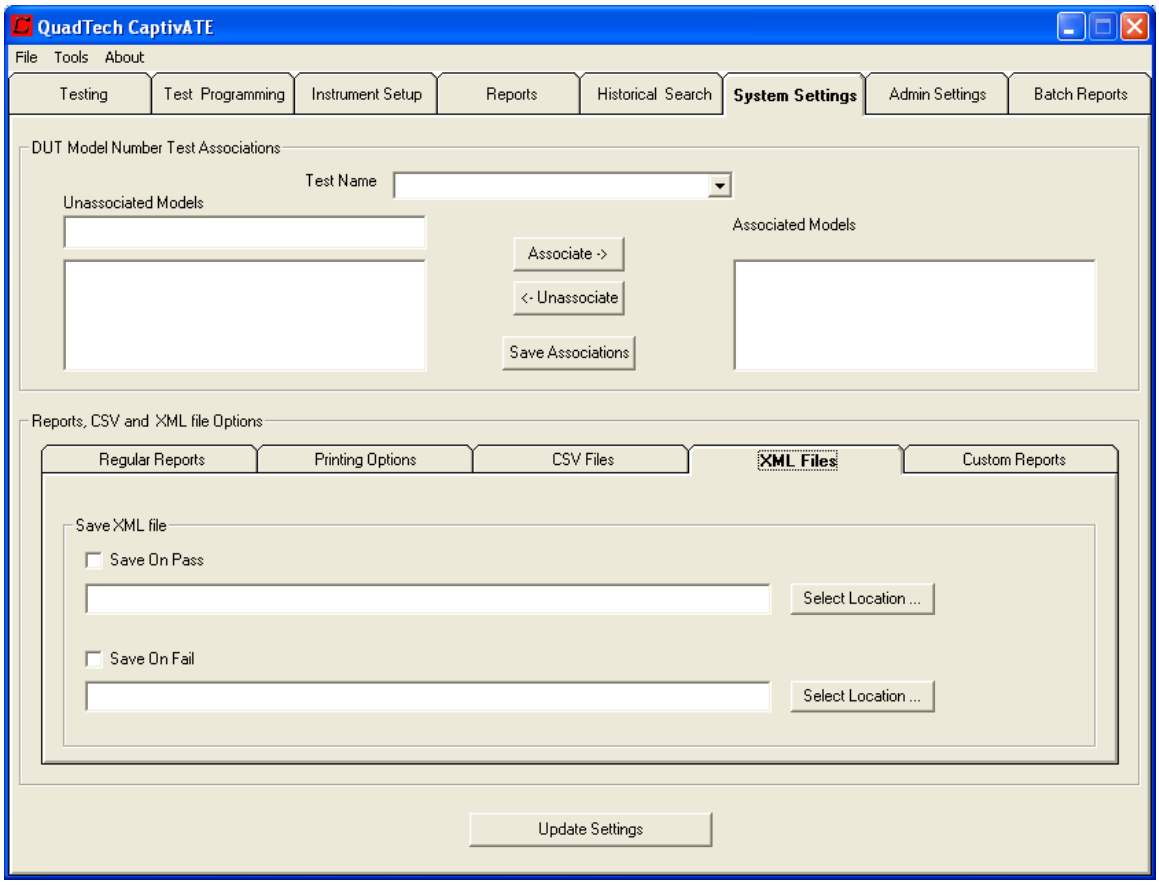


Figure 119 System Settings . . . XML Files

Table 23 System Settings . . . XML Files

Save XML File	Box Function
Save On Pass	A test that passes and for which the **Accept** button is clicked, is saved to the specified location.
Select Location	Using Windows Explorer, select the directory in which to save PASS results.
Save On Fail	A test that fails and for which the **Accept** button is clicked, is saved to the specified location.
Select Location	Using Windows Explorer, select the directory in which to save FAIL results.

10.8.5 Custom Reports

Must be factory-set.

10.9 Instrument Setup

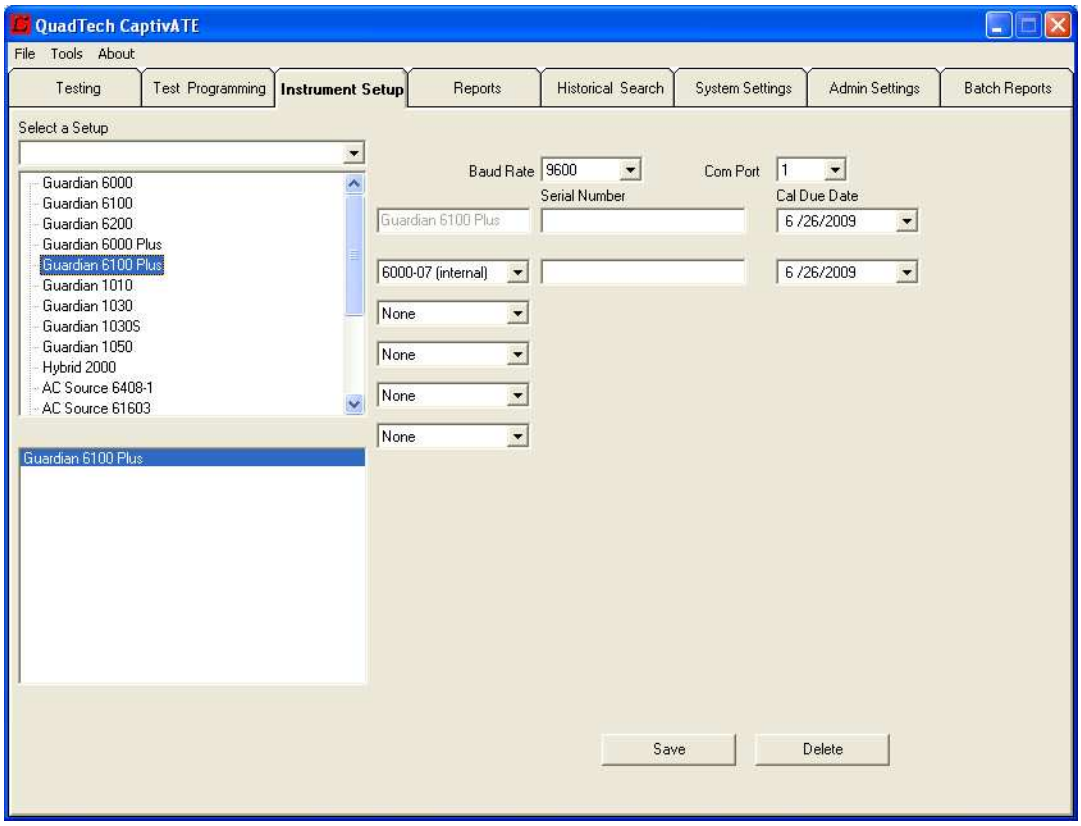


Figure 120 Instrument Setup

Table 24 Instrument Setup

Select a Setup	Unless you are editing a setup, you don't have to enter a name
Baud Rate	Selected by the CaptivATE software.
Com Port	For a setup that has one test instrument, this is always Com Port 1. For a setup that has more than one test instrument, see section 3.12.
Serial Number	Required.
Cal Due Date	Default is one year from the current date. To change this date, see section 3.11.
Save	Tells the system that you want to save the Instrument Setup.
Delete	Tells the system that you want to delete the line that is currently highlighted in the setup list box.

10.10 Test Programming

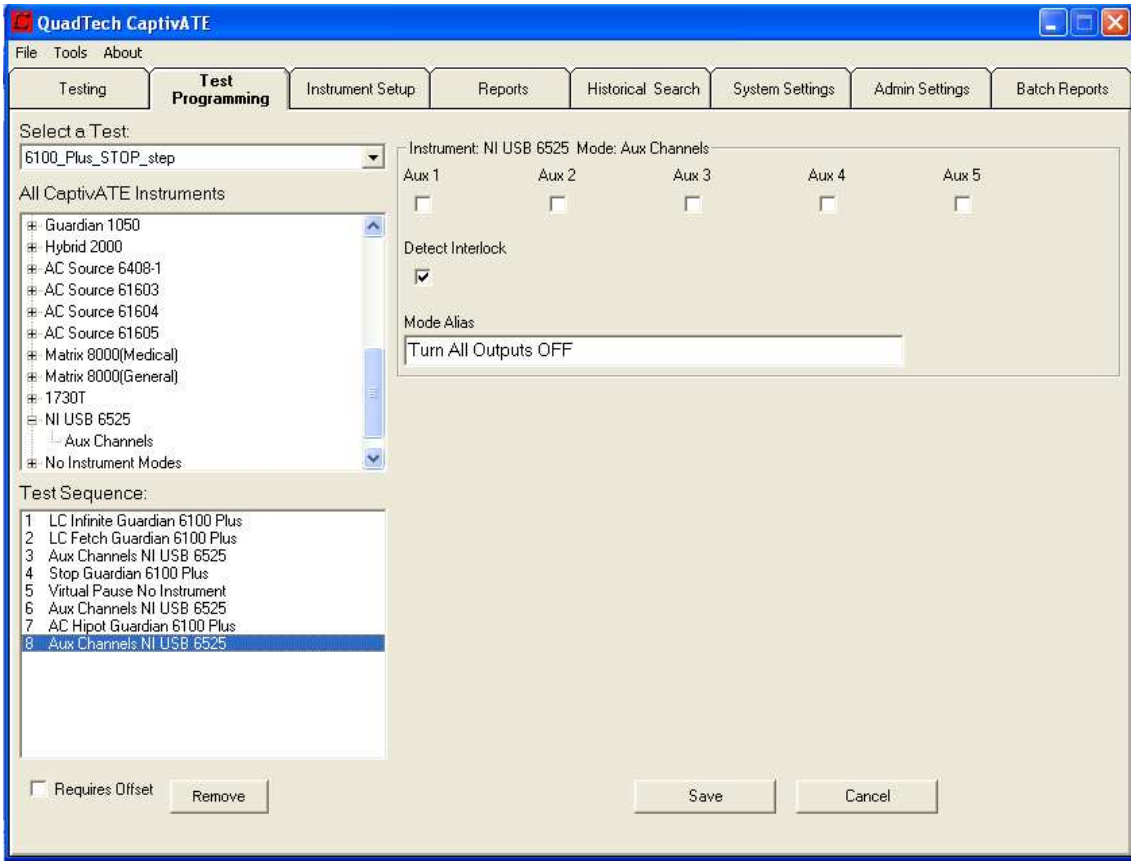


Figure 121 Test Programming

Table 25 Test Programming

Select a Test	Select an existing test program to edit, delete, or rename.
Test Sequence	The chronological order of the test steps.
Requires Offset	Tells the system to require the operator to perform an offset. This is similar to Enable Operator to Run Offsets.
Remove	Tells the system that you want to delete the line that is currently highlighted in the Test Sequence box.
Save	Tells the system to open the pop-up on which you enter the test program's name.
Cancel	Clears the Select a Test and the Test Sequence text boxes/

10.10.1 Testing

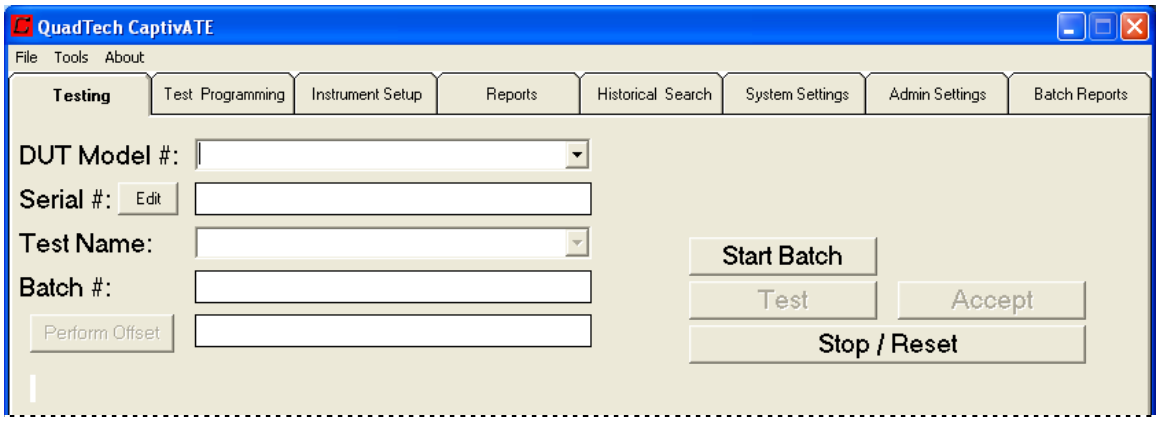


Figure 122 Testing

Table 26 Testing

DUT Model #	User-defined
Serial #	Can be manually or automatically entered, or not entered.
Edit	If Operator is given access and automatic increment is selected, this button is displayed.
Test Name	Name of test program to be run.
Perform Offset	Offset can be run during a test, or before or after.
Batch #	User-defined.
Start Batch	To begin a batch.
Test	To begin a test.
Accept	Accepts a test result.
Stop/Reset	One click=Stop. Stops test, issues message on *Testing* screen, turns off the Fail buzzer, or enables manual acceptance of failed test. Two clicks=Reset. Resets test list boxes unless “DUT Model # to Previous” is check-marked on the *Admin Settings* screen.

10.11 Reports

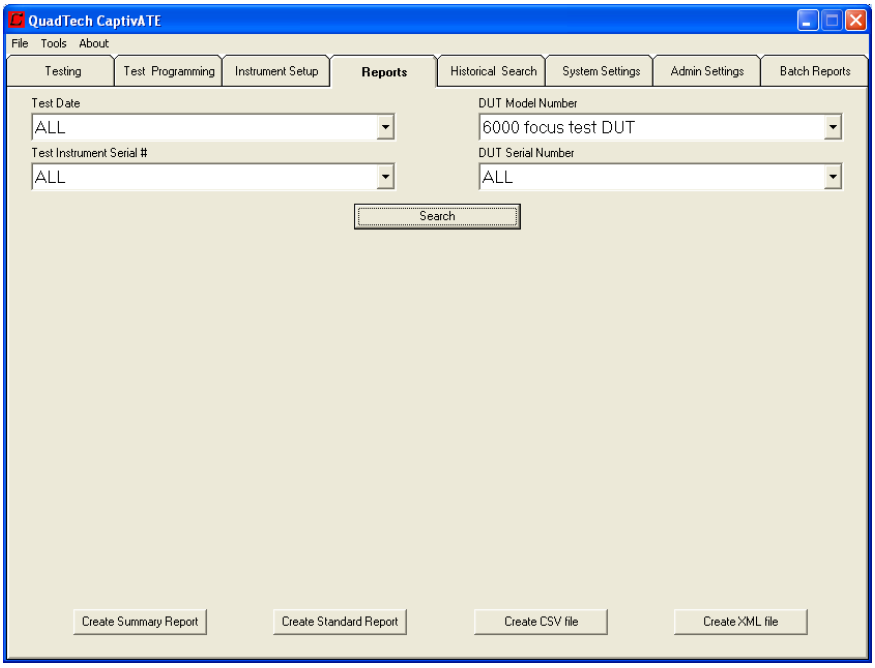
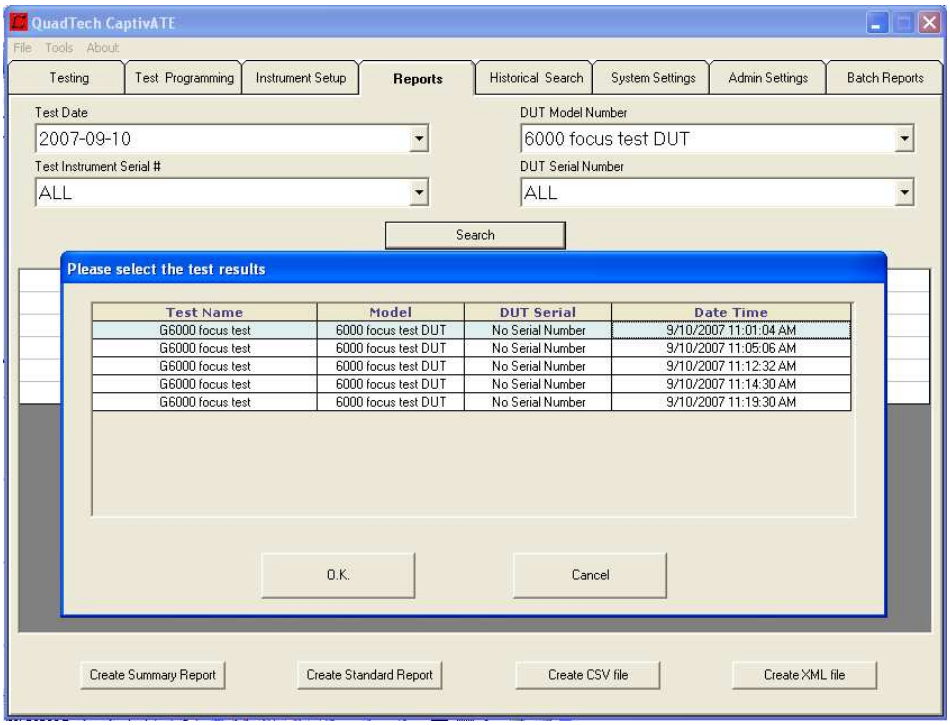


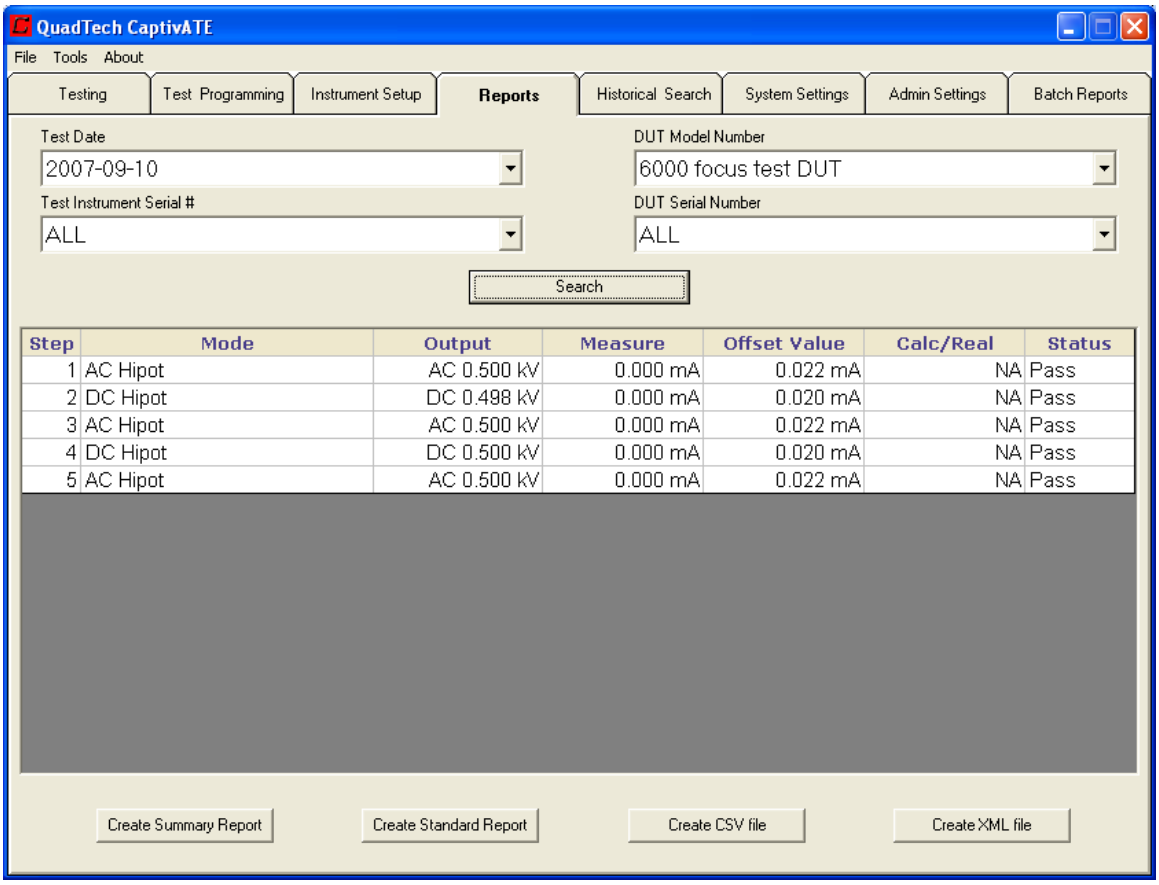
Table 27 Report Screen

Report Search Filters	Function
Test Date	Pull-down menu displays all individual dates on which tests have been run and accepted.
Test Instrument Serial #	Pull-down menu displays all Test Instrument Serial #'s with which tests have been run and accepted.
DUT Model Number	Pull-down menu displays all DUT Model Numbers on which tests have been run and accepted.
DUT Serial Number	Pull-down menu displays all DUT Serial Numbers on which tests have been run and accepted.
Search	Shows the results of a search filtered by Test Date. Displayed in columns are Test Name, Model, DUT Serial, and Date Time. If clicked without a filter being used, Search displays a list of all accepted tests in order of Date Time.
Create Summary Report	Includes the following: DUT Model Number, Serial Number, Test Name, Date & Time, Operator, and Test Result. (See Page 2.)
Create Standard Report	See Page 2 for an example of a Standard Report.
Create CSV file	Create a comma-separated value file. For an example of mapping a CSV file.
Create XML file	Create an XML file.

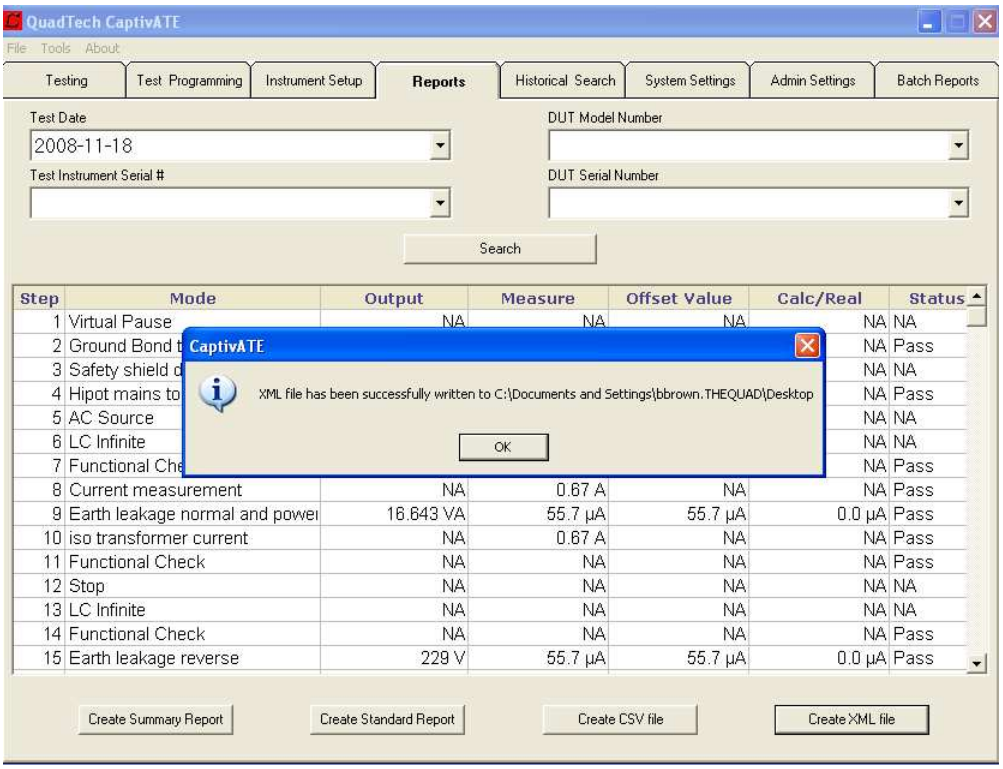
10.11.1 Reports. . .Search



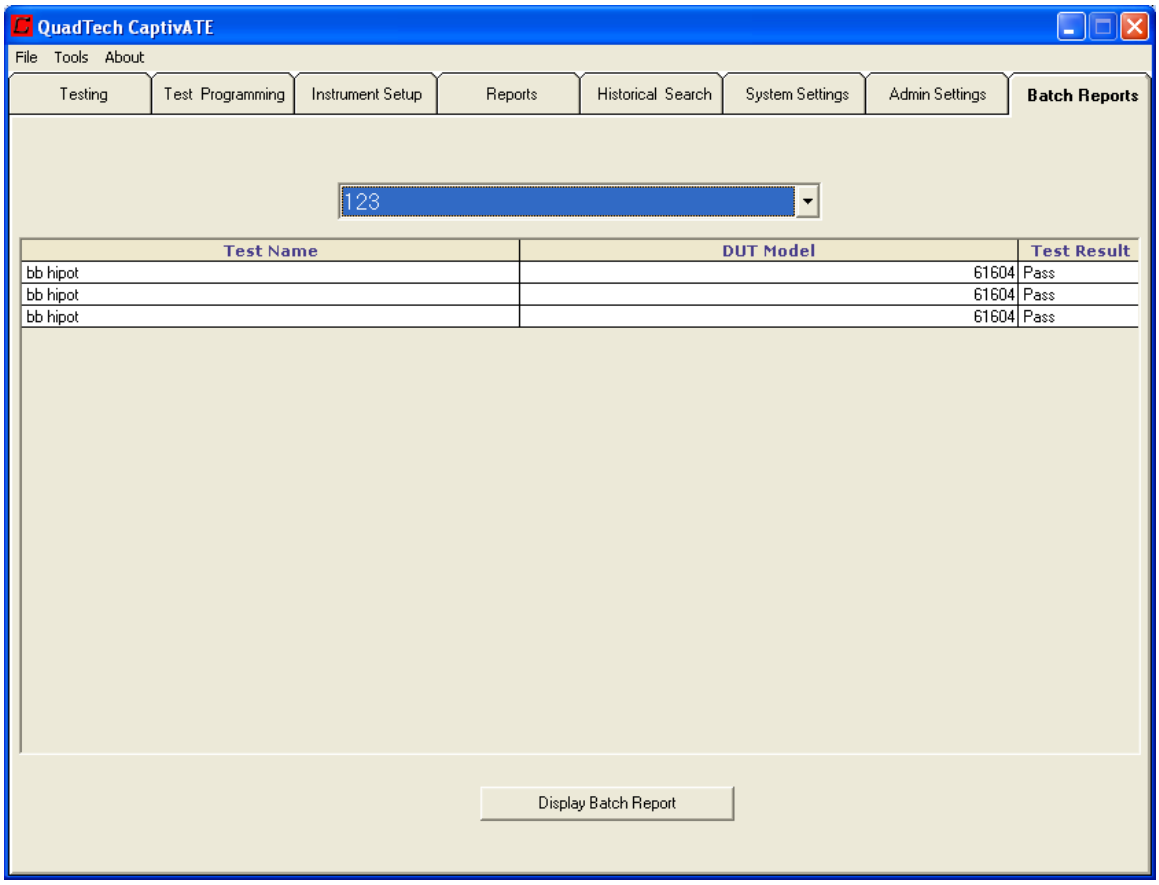
10.11.2 Reports. . .Search. . .OK



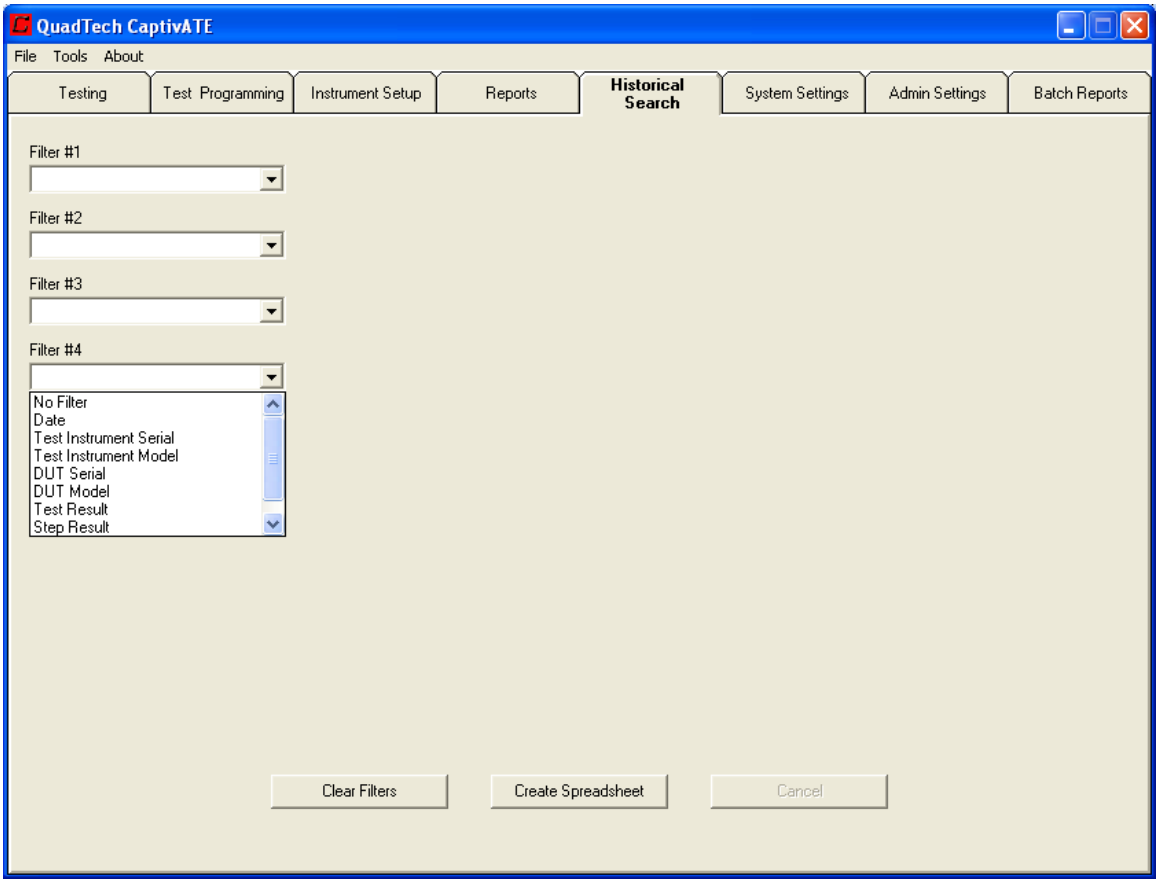
10.11.3 Create XML File



10.12 Batch Reports



10.13 Historical Search



11 Troubleshooting Error and Status Messages

Error and status messages appear in two forms: On the *Testing* screen during and after tests (an example in Figure 123), or as pop-ups on all other screens. An example is in Figure 124, which tells you during a session on the *Instrument Setup* screen that you are trying to assign the same com port number to two different instruments.

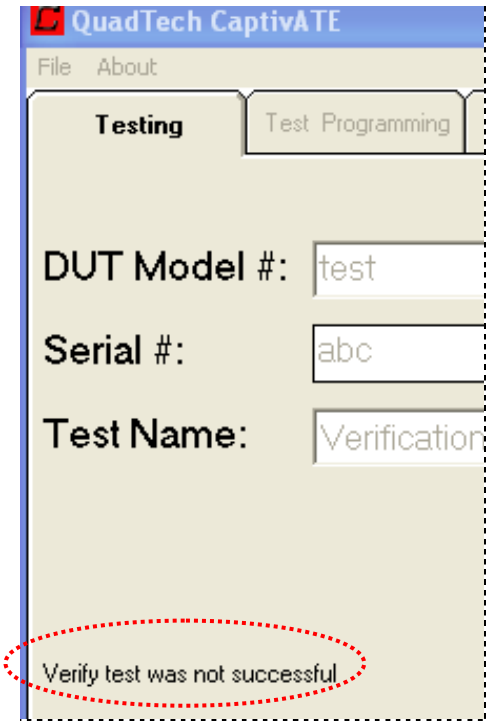


Figure 123 Error Message During a Test

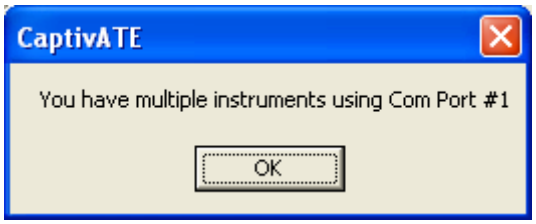


Figure 124 Pop-Up Error Message

The error and status messages in Table 28 are presented alphabetically.

Table 28 Error and Status Messages

Message	Remedy
A database already exists in this location.	You tried to *create* a CaptivATE database in a folder that already has a copy. You probably want to use an *existing* database.
Attach known good DUT to get Cs.	When OSC is part of the test, a GET Cs command is executed at the start.
Cannot enable custom reporting since the "InstalledAt" parameter value is not set to the company name in the Settings.txt file.	The InstalledAt parameter must be factory set. Contact QuadTech if you think you should have a Custom report.
Could not open the database dialogue	Database location was changed incorrectly in. Refer to section 3.7.
Excel template 'New Document.xlt' could not be found in the application path	This file must be in the same directory as the Captivate.exe file.
Database error occurred while saving test results.	Verify that the database is accessible and is not write-protected.
Equal sign and semicolon are not allowed in the <Mode Alias/ Functional Check/Numeric Functional Check/Virtual Pause> text box.	Delete the "=" and ";" characters from the text and click **OK**.
Failed to communicate with <instrument name>.	Verify that the instrument is connected via RS232 or USB, and has power and is turned on. Verify that the Installed Setup list box displays the correct setup name. See Figure 56 on Page 2.
<Instrument> is not an installed instrument.	The instrument(s) in the Installed Setup list box does not match the instruments set up for the test. See Figure 56.
<Instrument> has passed its calibration date of <due date.>	Calibrate the instrument ASAP; when it has been calibrated, reset the Cal Due Date on the *Instrument Setup* screen
Number of commands for this step exceeds the allowed limit	CaptivATE could not read the entered text in a Virtual Pause, Functional Check, or a Numeric Functional Check. Remove any equal signs (=) and semi colons (;).
OFFSET is required. Please connect all offset fixtures.	The Requires Offset check box (shown in Figure 69 et al) was check-marked. Test cannot proceed until this procedure is performed.
OFFSET process complete, Attach known good DUT to get Cs. Press OK to continue.	When OSC is part of the test, a GET Cs command is executed after the offset.

`Please stop the current test before closing the application.`	Press the **Stop/Reset** button, and then close the program (Alt+F, +Q).
`Remove known good DUT. Please connect the product. Press OK to continue.`	GET Cs command has been executed. Connect the DUT.
`The database that you have selected is not the correct version. Please use another database.`	The database is either incompatible (CaptivATE 1.0 or 2.0) or is corrupt.
`There was an error saving test results.`	Change the location of saved test results and retry. Refer to Figure 74.
`Type Mismatch`	Either the word string should be a number or the number should be a word string.
`There was an error with the database path.`	Change the location of the database and retry. Refer to section 3.7.
`Verify test was not successful.`	During a test for which the software switch “Disable verify test” is OFF (see **Error! Reference source not found.**, Page **Error! Bookmark not defined.**), the system detected a difference between the settings on the test instrument and the settings on the test program stored in the CaptivATE database. When you run the test a second time, the settings on the test instrument will be overwritten by the test program in the CaptivATE database.
`Word template 'RptBatch.dot' could not be found in the application path`	This file must be in the same directory as the Captivate.exe file.
`You must choose an Installed Instrument Setup before testing`	Select an Installed Setup on the Admin Settings screen as shown in Figure 56.

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