Performance Verification Manual

for the CH2 Tester

CIRRIS®

Performance Verification Manual
For the CH2 Tester

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Introduction

The **CH2 Performance Verification Kit** allows the user to verify calibration and proper operation of the Cirris CH2 tester. Each kit includes a certificate of calibration that's valid for two years. At the end of two years, the kit should be replaced or recalibrated. The values of the components in the Performance Verification Kit have been verified with calibrated instruments traceable to the NIST.

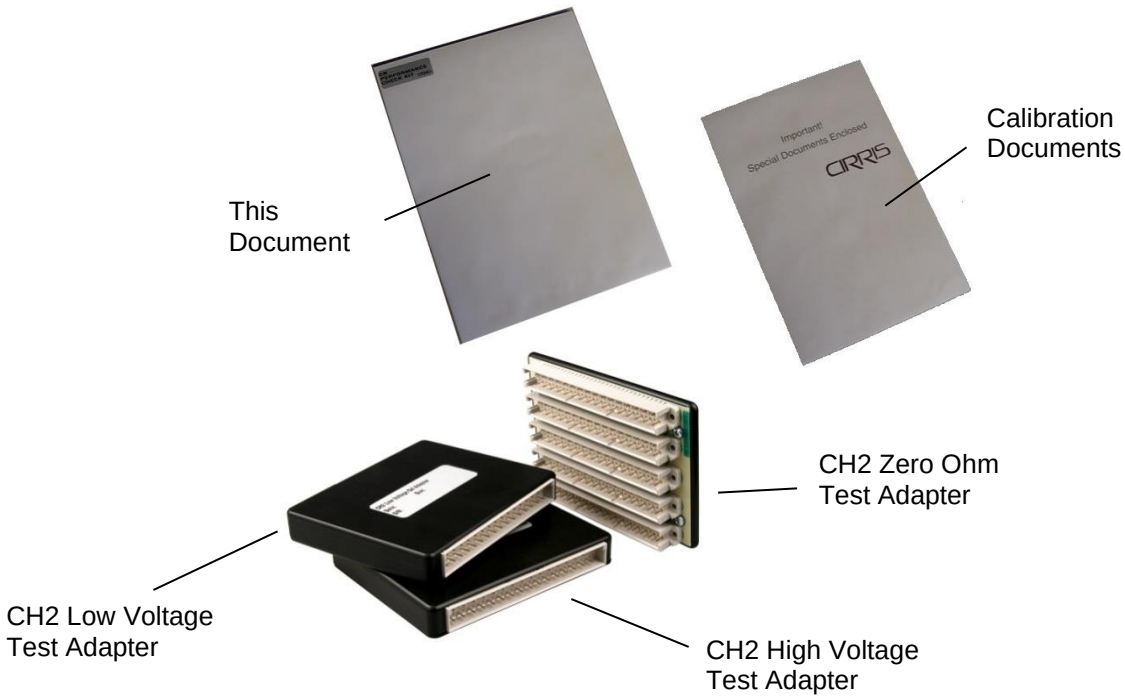
Cirris recommends that the Performance Verification described in this manual be performed annually, at a minimum, to verify the calibration of the CH2. The verification may also be used as part of a troubleshooting process whenever a problem with the CH2 is suspected.

Note: No adjustments are made to the CH2 tester during the performance verification. If the CH2 fails any step in the process, the tester requires service.

For helpful information on setting up a calibration system to meet national calibration standards such as ANSI/NCSL Z540-1, and ISO 10012-1, see **Setting up a Calibration System** in the appendix of this manual.

This verification procedure requires *Easy-Wire*™ software version 8.6 or higher.

You Should Have Received:



Note: *Before performing any of the tests in this manual, remove all adapters from the tester (including from the expansion enclosures) except for the adapters needed for verification.*

Required to Perform the Test:

Standard Pin Probe Test Leads for a multimeter.

A calibrated multimeter capable of measuring AC and DC voltages within a range of .1 to 1.5 volts with an accuracy of ±1%, such as a Fluke 80 Series meter or equivalent. The meter must have an input impedance of 10Mohm (±10%). Bench multimeters, such as Keysight units, typically do not meet this input impedance requirement.

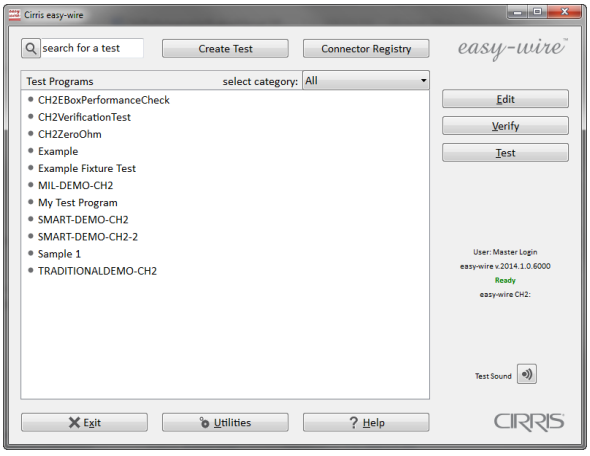
Import/Configure the Test Files

Before performing the calibration procedure, you must import the test files to the station(s) or network where the performance verification procedure is being performed. The following steps will create a category called **Calibration.** Import the test files into the Calibration category and configure the test files to run.

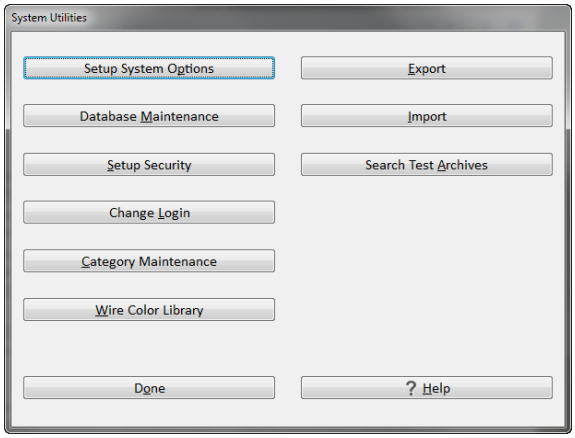
Important: To ensure use of the correct test files, re-import the files any time you update Easy-Wire or anytime you haven't run the test in a while. Re-importing test files guarantees they are the correct version.

1. Start the ***Easy-Wire*** software.

2. From the Main Menu, click **Utilities.**



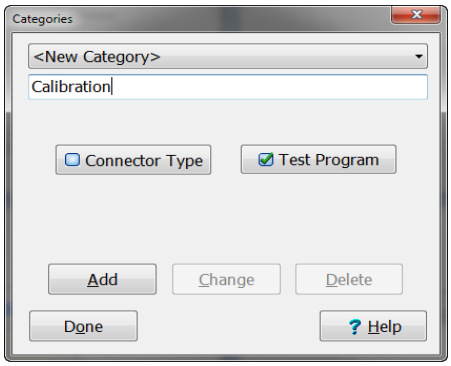
3. Click **Test Category Maintenance** (or Test Category Maintenance in version 8.6).



4. Make sure **Test Program** is checked. Click the down arrow and see if there is a category called **Calibration.**

   If there is no Category called **Calibration,** create one by entering the word **"Calibration"** in the text box and clicking **Add.**

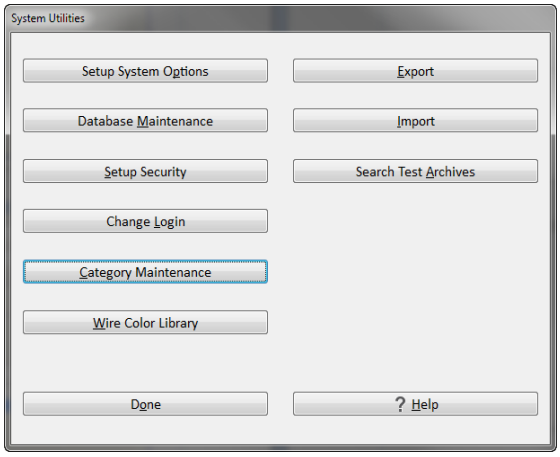
5. Click **Done.**



Click the down arrow to see the available categories.

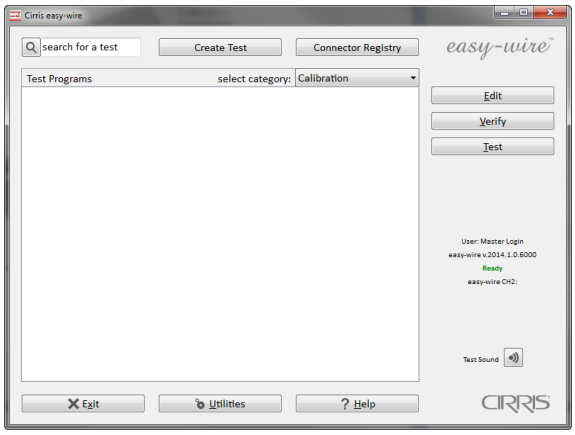
Make sure **Test Program** is checked.

6. Click **Done.**

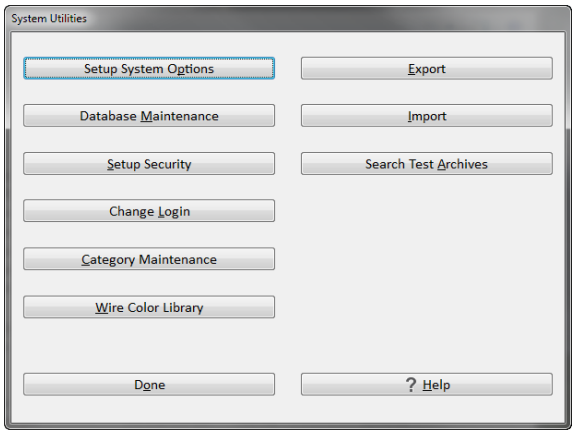


7. Select **Calibration** as the category.

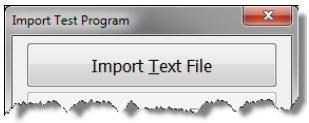
8. Click **Utilities.**



9. In **System Utilities,** click **Import.**



10. Click **Import Text File.**



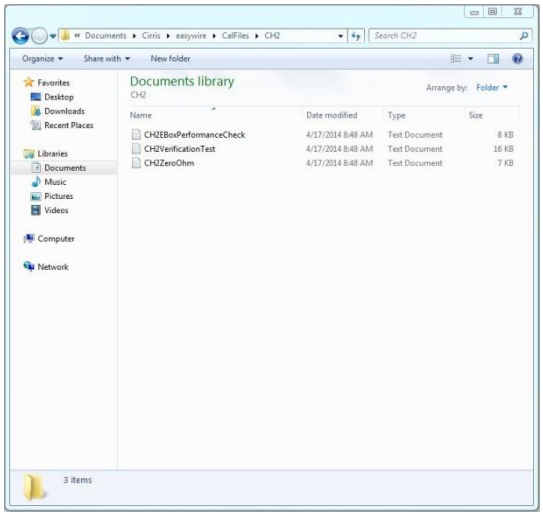
11. Browse to the path where the calibration files are located.

    Windows 7 – Windows 10:
    `C:\Users\Public\Documents\Cirris\easywire\CalFiles\CH2`

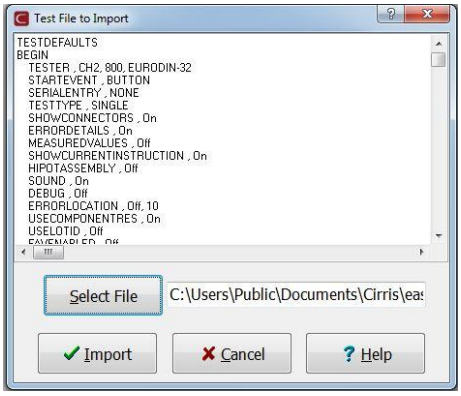
    XP:
    `c:\Documents and Settings\All Users\Shared Documents\Cirris\easywire\calfiles\CH2`

    Vista:
    `c:\Users\Public\Public Documents\Cirris\easywire\calfiles\CH2`

12. Click **CH2VerificationTest.txt,** and click **Open.**

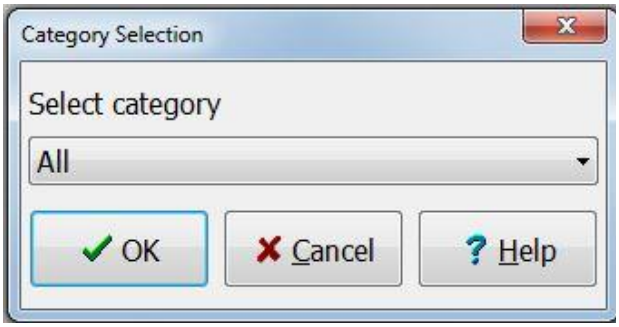


13. Click **Import.**

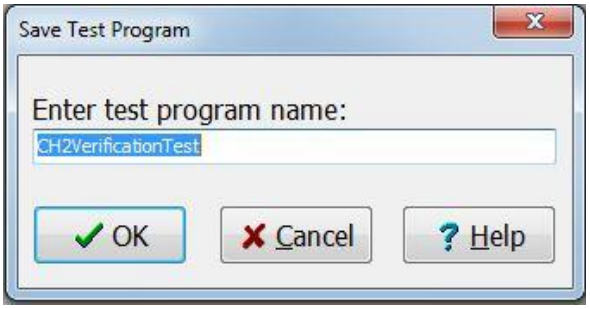


14. You may be asked to choose an existing category for storing connector types. If so, choose any category and click **OK.**

    (This window will only appear the first time calibration files are imported.)



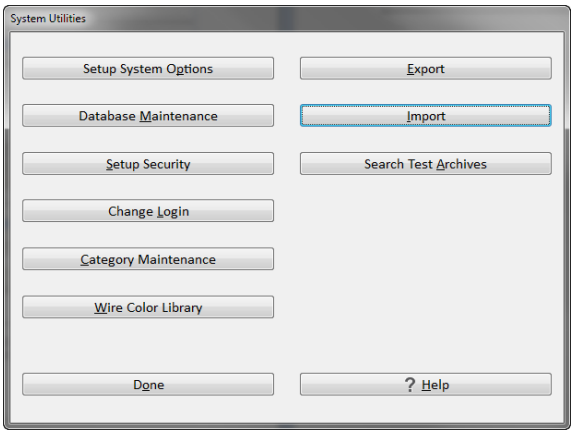
15. When asked for a test program name, click **OK.**



16. Follow the same process to import the test file to test your Energization (E-Box) scanner modules if applicable.

Import: CH2ZeroOhm.txt

17. When you have imported all the files, click **Done** until you reach the main menu.



Making Calibration Records

Your calibration system requirements may require the preparation of forms to record the performance verification results. The **CH2 Certificate of Calibration Verification** and **CH2 Calibration Verification Data Report** found in the appendix can be used for this purpose. If viewing this manual as a printed document, before using these forms make a photocopy of each to preserve clean masters for future use.

To fulfill more detailed test reporting requirements, you can use the test reporting capabilities of the CH2 system. To setup this capability, see **Creating Test Reports** in the appendix.

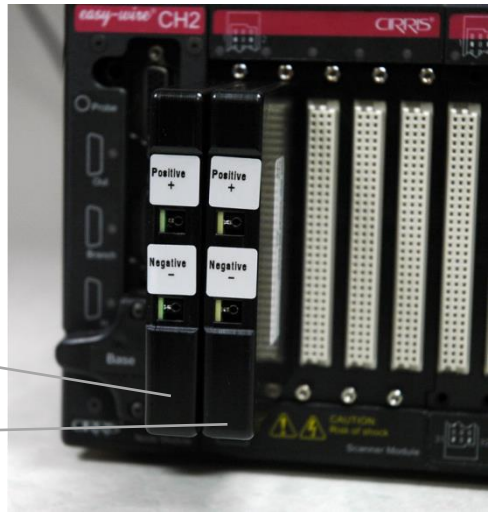
Test Procedure

To verify the calibration of the CH2 analyzer, you will test the operation of the measurement system as well as the operation of each of the 160 point scanner modules.

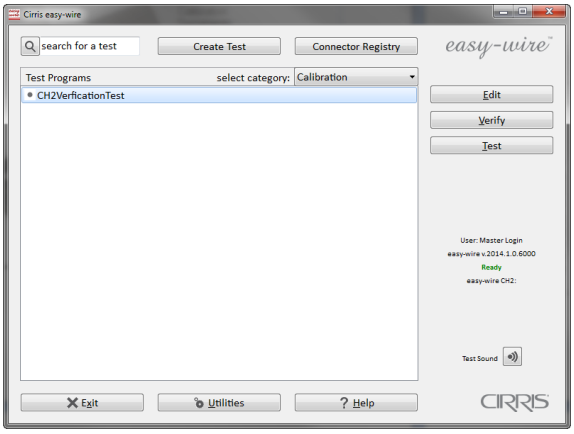
To test the measurement system:

1. Install the CH2 Low Voltage Calibration Adapter on the first connector of the **CH2 Test Point Scanner.**

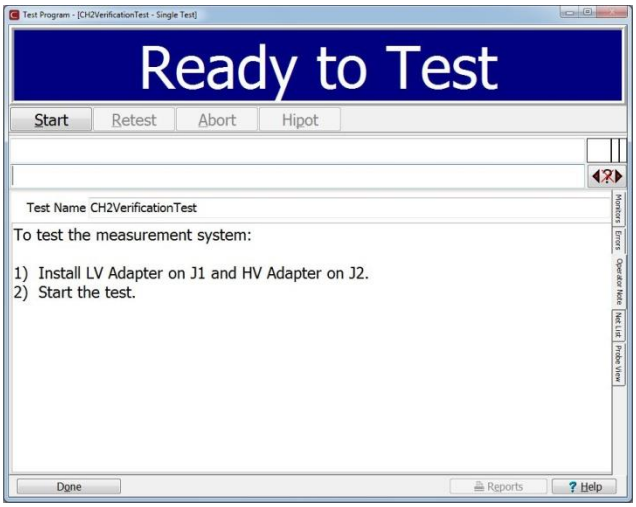
   Install the CH2 High Voltage Calibration Adapter on the second connector on the **CH2 Test Point Scanner.**



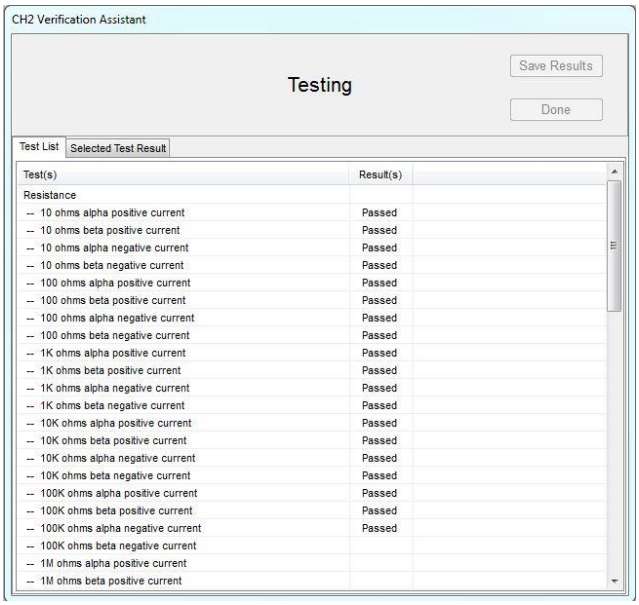
2. From the Main Menu, click the test program **CH2VerificationTest** and click **Test.**



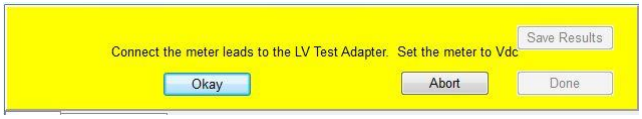
3. Click **Start.**



4. The **CH2 Verification Assistant** window will open. Once the test starts, this window will give you prompts to complete the test.

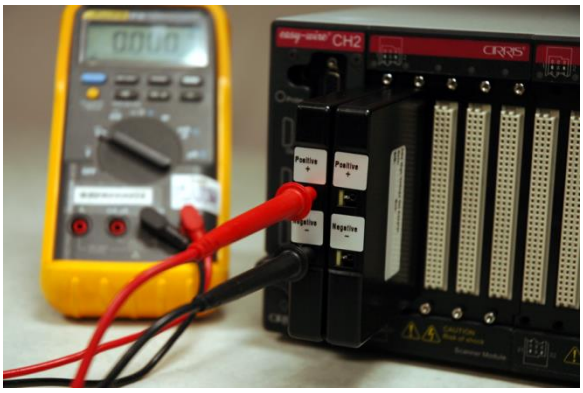


5. When the **CH2 Verification Assistant** prompts you to attach the meter leads to the **CH2 Low Voltage Test Adapter,** insert the positive lead into the top jack and the negative lead into the bottom jack.



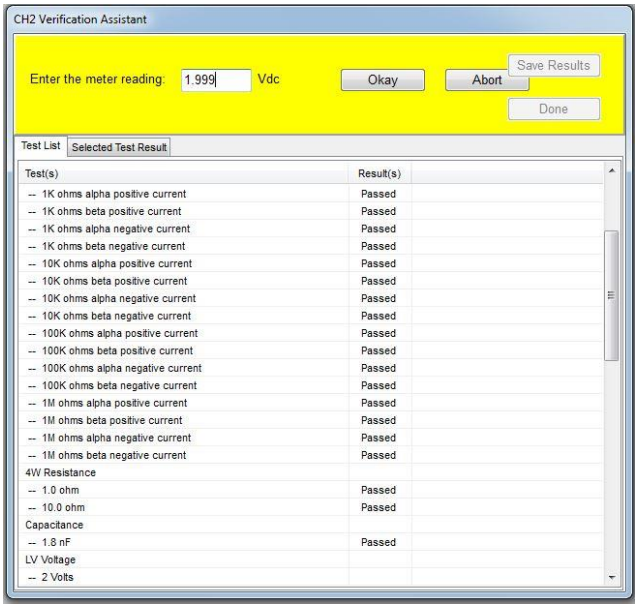
6. Set the meter to the range shown in the prompt ("Vdc" for example).

   Be ready to read the meter! Once you click **Okay,** a voltage will appear on the meter. The value will only be shown for several seconds so be ready to read it.



7. Read the meter and enter the value (in volts) into the box on the Verification Assistant and click **Okay.**

Note: Some meters auto-scale the measured results differently. The CH2 test is written to accept values as volts. For example, if the prompt is asking for an **DC Voltage Measurement** and the meter shows a value of 100 mV, the value entered should be 0.100.



8. When the Verification Assistant prompts you to attach the meter leads to the **CH2 High Voltage Test Adapter.** Move the positive lead into the top jack and the negative lead into the bottom jack of the **HV Test Adapter.**

9. Each time you are prompted to read the meter make sure you set the meter to the range shown in the prompt (“Vdc” or “Vac” for example).

   Be ready to read the meter! Once you click **Okay,** a voltage will appear on the meter. The value will only be shown for several seconds so you need to be ready to read it.

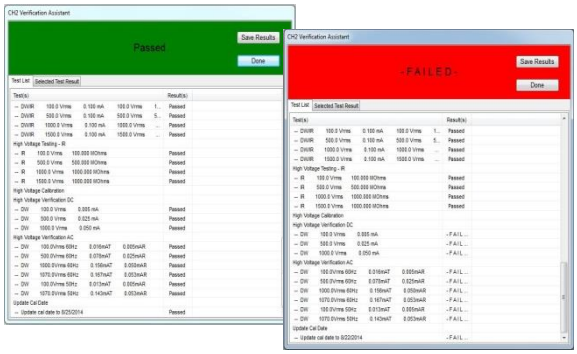
10. When you are ready to read the meter, click **Okay.**

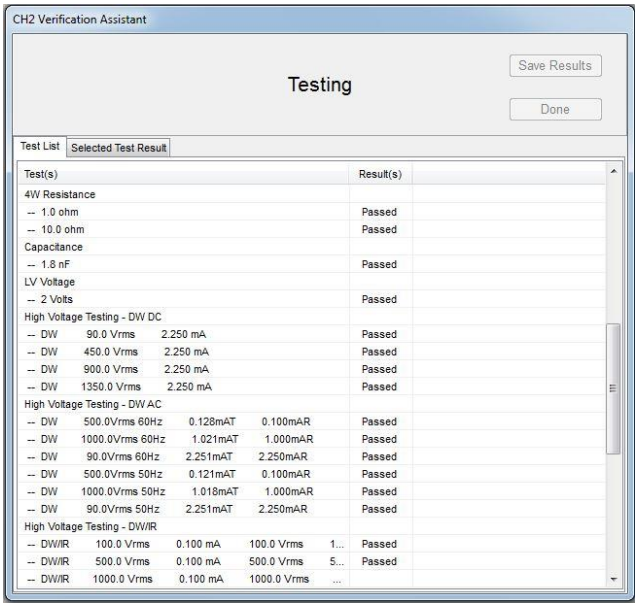
11. Read the meter and enter the value (in volts) into the box on the Verification Assistant and click **Okay.**

Note: The **HV Cal Adapter** contains a voltage divider circuit that reduces the high voltage down to safe levels. This should work for any type of meter and will be harmless if you come in contact with the meter leads during the test.

Tests show their status as they are being performed.

When complete, the test will show its final status of PASSED or FAILED.



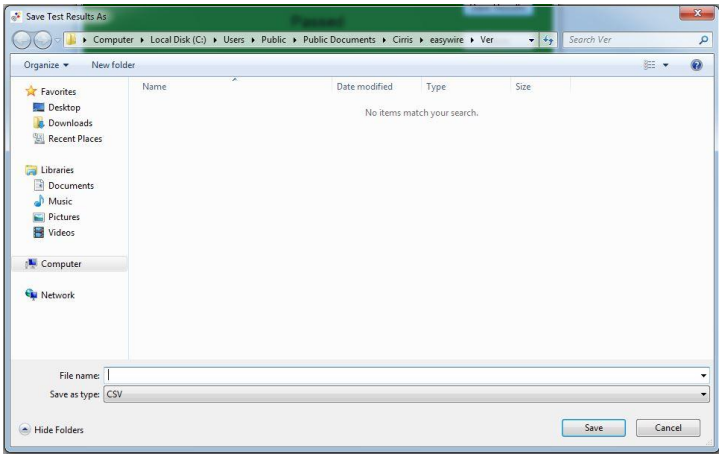


Once the test is complete, the Verification Assistant will ask you where you would like to save the test results.

12. Choose a path and file name for the test results.

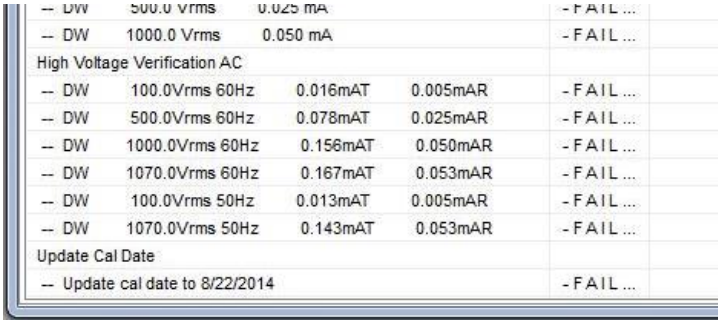
13. Click **Save.**

The text file (.csv) that will be saved can be loaded into any spreadsheet program.

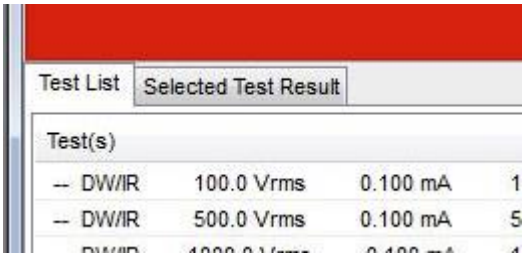


Note: There are no adjustments made to the CH2 tester during the performance verification process. If the CH2 fails any step in the performance verification procedure, it indicates the tester requires service.

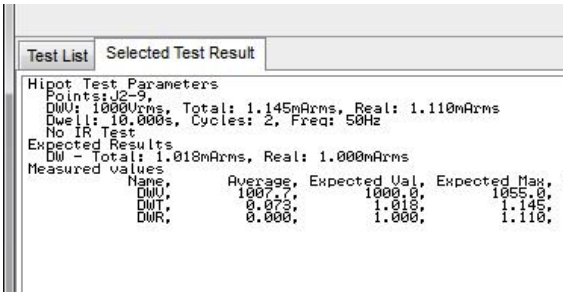
Test results can be viewed for each individual test by selecting the test you want to view:



and clicking the **Selected Test Result** tab.



The details of the specific test as well as the measured values will be displayed.



Note: The test group, Hipot Charge Verification, may show that sections of the test failed while the overall test group passed. Failures shown within this section of the report do not mean something is wrong with your tester. As long as all the test groups in the report pass, your tester does not need to be sent in for calibration.

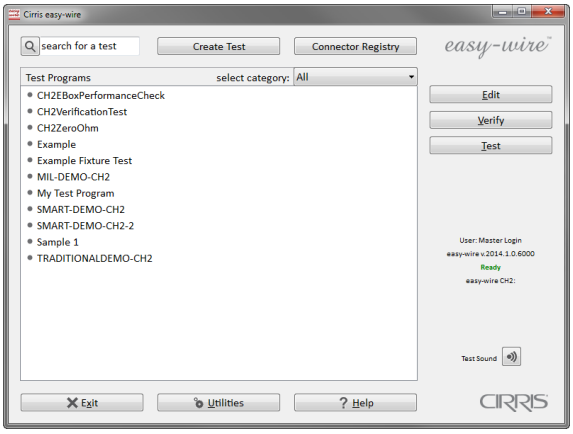
You can save additional copies of the test results to a .csv file by clicking **Save Results.**

To test the scanner modules:

1. Remove the **CH2 Low Voltage Test Adapter** and the **CH2 High Voltage Test Adapter** from the CH2 analyzer.

2. Locate the **CH2 Zero Ohm Cal Adapter.**

3. From the Main Menu, select the **CH2ZeroOhm** test from the list.

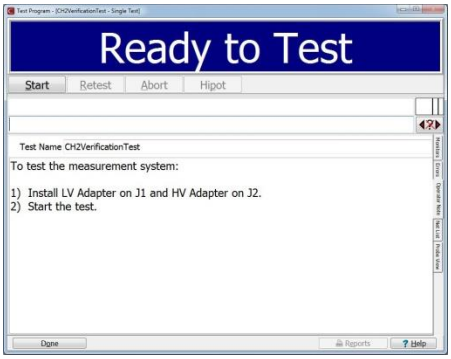


4. Click **Test.**

5. Attach the **CH2 Zero Ohm Cal Adapter** to the first Scanner Module.

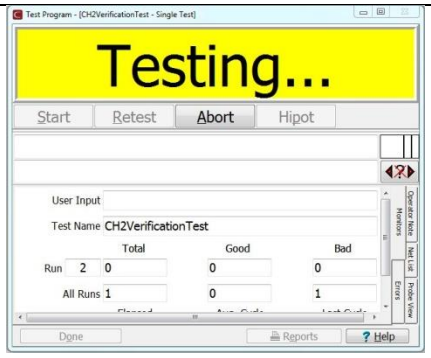
Note: The adapter is keyed to only fit one way on the Scanner Module.

6. When the test shows **Ready to Test,** click **Start.**



7. Press the zero ohm adapter firmly on the front of the scanner module 1 and press **OK.**

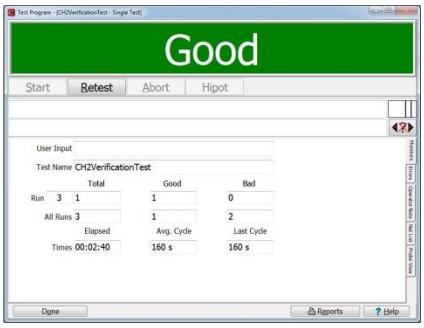
8. The test will run automatically.



9. The final status of the test will be displayed. All of the module tests should pass.

The results can be marked on the **Test Results** form at the end of these instructions.

10. Click **Done.**



11. Move the **CH2 Zero Ohm Cal Adapter** to the corresponding scanner module, and press ok to continue the tests, until all the Scanner Modules have been tested.

Testing is now complete.

Setting Up a Calibration System

The information below is meant as an introduction to setting up a formal calibration system in your organization.

Calibration Standards

Calibration standards refer to written quality system requirements for organizations that perform calibrations and use calibrated equipment. Establishing a quality system according to calibration standards helps ensure calibrations are done competently and lends credibility to the calibration organization. In the United States, common calibration standards include ANSI/NCSL Z540-1, ISO/IEC Guide 25, ISO 10012-1, and the former MIL-STD 45662A.

The ANSI/NCSL Z540 standard referred to above, as well as other helpful metrology information, can be obtained from the **National Conference of Standards Laboratories International (NCSL)** at 1-303-440-3339 or www.ncslinternational.org. You can obtain the ISO standards from the **International Standards Organization (ISO)** at their web site www.iso.net/.

Good Calibration Practices

The calibration standards, such as ANSI/NCSL Z540-1 and ISO 10012-1 require several good practices for the calibration industry including the following areas:

Establish a recall system

How do you ensure that you don't forget to send an instrument in for calibration? A recall system can be a card file or a computerized database which includes calibration dates, due dates, calibration sources, and other instrument records. The recall system ensures calibrated instruments are recalibrated in a timely manner.

Calibration Labels

How does someone know if an instrument has been calibrated without looking for the paperwork in a filing cabinet drawer? When an instrument is calibrated, the calibration standards require the instrument to be labeled as such. The calibration labels, which are applied to instruments, have fields for the instrument serial number, calibration date, calibration due date, and by whom.

Test Accuracy Ratios

Wherever possible, calibration standards require an accuracy ratio of at least four to one. In other words, the insturment being used to measure the calibrated instrument should be at least four times as accurate as the calibrated instrument.

Certificate of Calibration

How does everyone *know* you had an instrument calibrated? The calibration certificate is the record of who, when, and by what equipment the instrument was calibrated.
A **CH2 Certificate of Calibration,** which you can photocopy for your calibration, is provided following this section.

Calibration Data Report
So how accurate is the calibrated test instrument in relation to its published specifications? Some organizations require the measured values of a calibrated instrument are written down when an instrument is calibrated. Calibration laboratories typically charge extra to create a calibration data report. However, when a calibrated instrument is found to be out-of-tolerance, the calibration standards require the out-of- tolerance data be recorded in relation to the instruments specifications. A calibration data report can fill this requirement. A calibration data report, you can photocopy to use for your CH2 calibration, is provided following this section.

Traceability
Did qualified personnel perform the calibration procedure under controlled conditions, using correctly calibrated instruments with the correct test accuracy ratios? To maintain traceability, the answer to all these questions must be *yes*. Traceability refers to each unbroken link of valid calibrations going back to national standards such as those maintained by the NIST in the United States.

Several years ago NIST numbers (ie. reference numbers issued on NIST reports) were commonly copied on successive calibration certificates as a means of showing traceability. This practice has been discontinued. Therefore, if you are writing a calibration procedure, do not require NIST numbers be copied on reports to show traceability. NIST numbers are sometimes confused with other numbers that calibration laboratories create for reference such as “asset numbers”, “NIST trace numbers”, “ID numbers”, and “report numbers.” For more information regarding the discontinued use of NIST numbers, Cirris can provide a copy of the position paper from the **National Conference of Standards Laboratories.**

Creating Test Reports

The results of the performance verification are stored two of the following ways.

1. The **CH2VerificationTest** allows you to save a **.csv** file that contains the results of each test performed on the measurement system of the CH2. The **.csv** file can be examined, printed, and loaded into any spreadsheet program; it's intended to be a key part of your test results.

2. The results for all test runs (both the **CH2VerificationTest** and each of the **C_CalModule** tests) are stored in the Easy-Wire database and are accessible from the **Test Archive Report** or from the **In Process Report,** features of the Easy-Wire software. Those reports save the summary of the testing that was done. If required, you can have the CH2 save more information about the tests. To save more information for each test, do the following steps:

Before running the test:

1. From the Easy-Wire Main Menu, click on the test program you wish to use to turn on the test data storage options.
2. Click **Edit**.
3. At the top of the **Test Program Editor** screen, click the **Set Test Defaults** tab.
4. Check the **Store measured test value** box.
5. Check the **Store High Voltage IR Values** box (if the box is enabled).
6. Click **Done** at the bottom of the screen.
7. Select **Yes, save changes and return to the main menu.**

After the test program completes, while still in the test:

1. Click **Reports** at the bottom of the test program screen.
2. Click **In Process Report** and a test report will open.
3. Use the report's **Print Menu** to print or create a .pdf of the report.

Customer Service

Please contact Cirris technical support at techsupport@cirris.com, or your local Cirris representative, for additional assistance.

CH2 Certificate of Calibration Verification

Organization performing the verification:	**Organization Address:**
Certificate Number:	**Verified by:**
Calibrated:	**Due:**
Applicable Calibration Standard(s):	**Procedure:** CH2 Performance Verification
Temperature:	**Relative Humidity:**

Serial Numbers:

Instruments used:	Serial Number	Cal Date	Due
CH2 Low Voltage Calibration Adapter			
CH2 High Voltage Calibration Adapter			
CH2 Zero Ohm Calibration Adapter			
Multimeter			

Statement of Traceablility:

Certified by:

CH2 Calibration Verification Data Report

Report Number:	**Verified by:**
Tester Serial Number:	**Verification date:**

Test / Serial Number		**Recorded Value**	**Test / Serial Number**		**Recorded Value**
Scanner Module 1		Pass / Fail	Scanner Module 21		Pass / Fail
Scanner Module 2		Pass / Fail	Scanner Module 22		Pass / Fail
Scanner Module 3		Pass / Fail	Scanner Module 23		Pass / Fail
Scanner Module 4		Pass / Fail	Scanner Module 24		Pass / Fail
Scanner Module 5		Pass / Fail	Scanner Module 25		Pass / Fail
Scanner Module 6		Pass / Fail	Scanner Module 26		Pass / Fail
Scanner Module 7		Pass / Fail	Scanner Module 27		Pass / Fail
Scanner Module 8		Pass / Fail	Scanner Module 28		Pass / Fail
Scanner Module 9		Pass / Fail	Scanner Module 29		Pass / Fail
Scanner Module 10		Pass / Fail	Scanner Module 30		Pass / Fail
Scanner Module 11		Pass / Fail	Scanner Module 31		Pass / Fail
Scanner Module 12		Pass / Fail	Scanner Module 32		Pass / Fail
Scanner Module 13		Pass / Fail	Scanner Module 33		Pass / Fail
Scanner Module 14		Pass / Fail	Scanner Module 34		Pass / Fail
Scanner Module 15		Pass / Fail	Scanner Module 35		Pass / Fail
Scanner Module 16		Pass / Fail	Scanner Module 36		Pass / Fail
Scanner Module 17		Pass / Fail	Scanner Module 37		Pass / Fail
Scanner Module 18		Pass / Fail	Scanner Module 38		Pass / Fail
Scanner Module 19		Pass / Fail	Scanner Module 39		Pass / Fail
Scanner Module 20		Pass / Fail	Scanner Module 40		Pass / Fail