Easy-Touch Pro

Performance Verification Manual

Version 2024.1.0

CIRRIS®

A KOMAX COMPANY

Easy-Touch Pro

Performance Verification Manual

Version 2024.1.0

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Introduction

The Easy-Touch™ Pro Performance Verification Kit allows you to verify the calibration and proper operation of the Easy-Touch Pro tester. Each performance verification kit has a life cycle of two years from the time of purchase. At the end of two years, you can recalibrate or replace the kit. The components for this performance verification kit are tested with instruments traceable to the National Institute of Standards and Technology (NIST).

Easy-Touch Pro Performance verification should be done annually and any time the tester is not operating properly. If a step in the performance verification procedure fails, send the tester back to Cirris for repair. No external adjustments can be made to fix the tester.

For information on setting up a quality system that meets national quality standards such as ANSI/NCSL Z540-1, and ISO 10012-1, see the appendix of this manual.

Hipot Warning!

Possible electric shock! 

Cirris hipot testers are designed to be safe for operators. Injuries from hipot testing are rare; however, not every hipot test situation is safe. Hipot testing is not a danger to healthy individuals. At times an occasional mild electric shock may be experienced. Small shocks only occur during a hipot test when the operator touches an energized connection point. Any shock from the tester may result in a hipot test failure.

Medical Warning!

A child or individual wearing a cardiac pacemaker, an insulin pump, or an electronically controlled medical device should NOT perform Hipot testing.

For more information on improving hipot safety visit:
www.cirris.com/testing/guidelines/hipot_safety.html

Setting Up

Performance Verification Certificate and Data Sheet

You will find the Easy-Touch Pro Performance Verification Certificate and Verification Data Sheet at the end of this manual. You can record verification data on these documents for your records. If you use these documents, make photocopies to maintain master copies for future use.

Install Add-On Scanners

The examples in this manual use an Easy-Touch Pro with no expansion boxes.

Install add-on scanners if you have any. For instructions, see your Easy-Touch Pro User Manual.

Note: *Before performing any of the tests in this manual, remove all adapters from the tester (including from the add-on boxes) except for the adapters needed for verification. Failing to remove unnecessary adapters could result in the wrong signature and cause a failure even when the tester is functioning correctly.*

Plug in the Tester

Plug one end of the power cord into the tester. Plug the other end into a grounded outlet.

Parts List

Make sure you received the following parts:

- ❑ Zero Ohm Adapter

- ❑ Capacitance/Fourwire Adapter

- ❑ Resistor Leak Adapter

Required Tools (not provided by Cirris)

- ❑ Voltmeter

A calibrated multimeter capable of measuring DC voltages within a range of .05 to 1.5 volts (2 volts on testers equipped with optional 2000-volt scanners) with an accuracy of ±1%, such as a Fluke 80 Series meter or equivalent. The meter must have an input impedance of 10 megohms (±10%). Bench multimeters, such as Keysight units, typically do not meet this input impedance requirement.

- ❑ High Voltage Probe

A high voltage probe with a 1000:1 voltage divider, accuracy of ±1% or better and a nominal input impedance of 75 megohms, such as the Fluke 80K-6.

(use alligator clip test lead to connect probe tip to terminal on HV adapter)

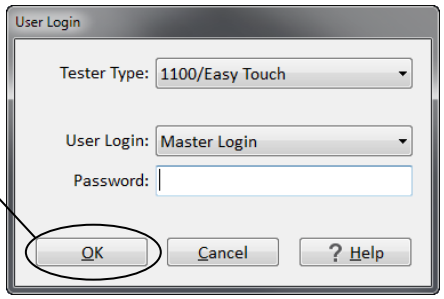
Caution! Your voltmeter may be damaged if a high voltage probe is not used as instructed in this manual. Voltages as high as 2000 VDC may be measured during the verification process and many multimeters have a measurement range that extends to only 1000 VDC. A high voltage probe is required for all voltage measurements.

Creating a Category

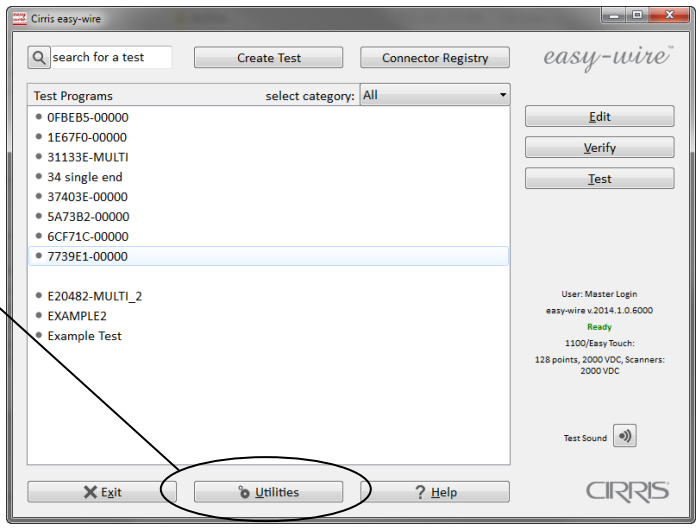
In the Easy-Wire® software, you can organize test programs into groups by assigning them to different categories. You can also create custom test program categories. The steps below illustrate how to create a category for your verification test files.

1. On the back of your Easy-Touch Pro tester, push in the power button for a few seconds to power on the tester.

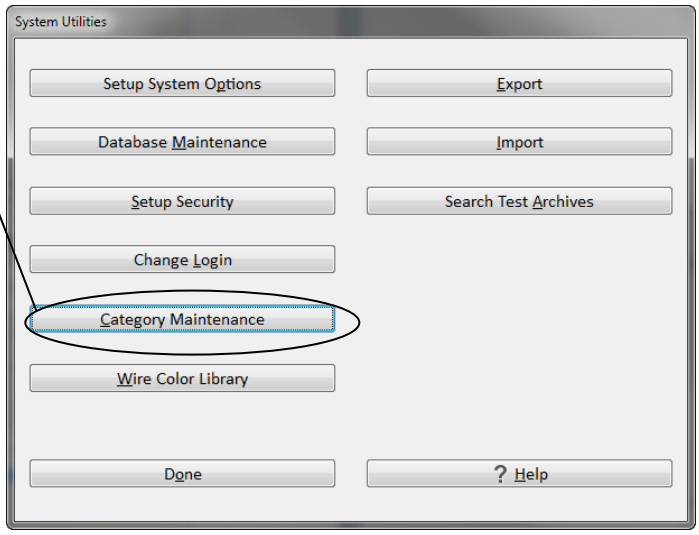
2. When the “User Login” window opens, log in to Easy-Wire.



3. In the Easy-Wire main menu, press **‘Utilities’.**



4. Press **'Category Maintenance'.**



5. In the "Categories" window, do the following:

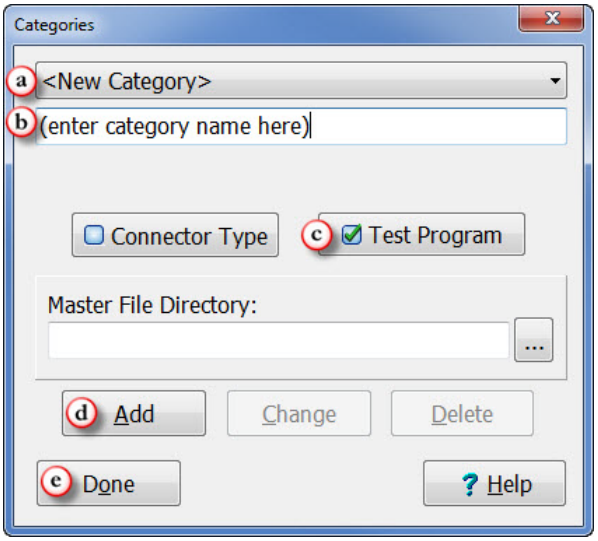
   a. Select <New Category> in the first text box.

   b. Enter a name, such as Verification, for the category in the second text box.

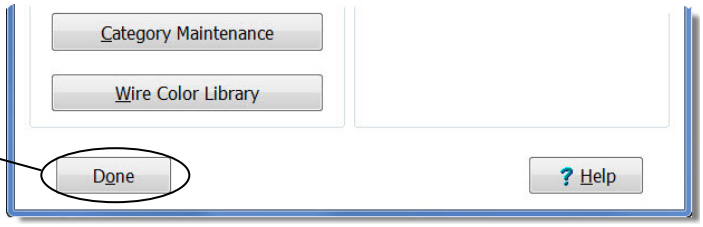
   c. Check the "Test Program" box.

   d. Press **'Add'.**

   e. Press **'Done'.**

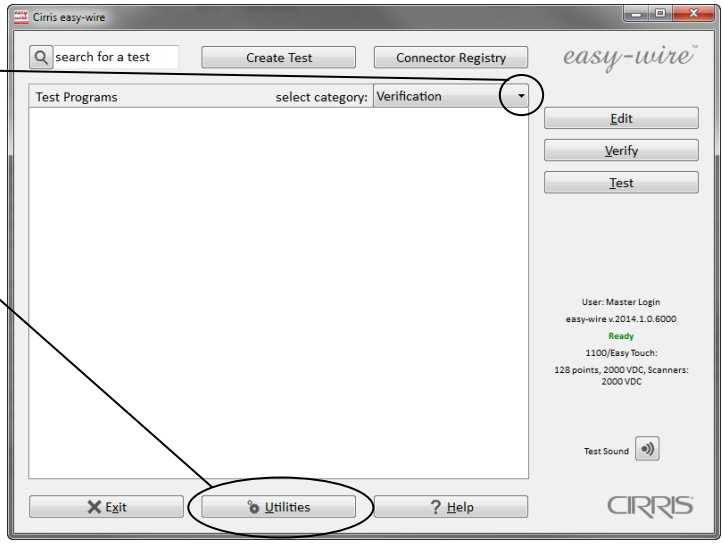


6. Press **'Done'** to return to the main menu**.**

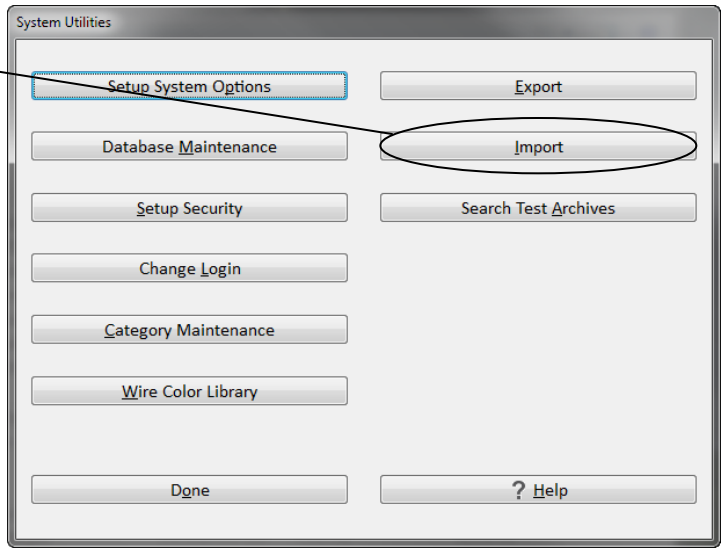


Importing the Test Files

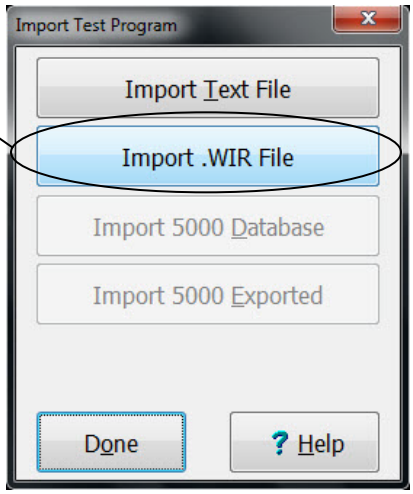
1. In the Easy-Wire main menu, select the category you created in the previous section and press **'Utilities'**.



2. Press **'Import'.**

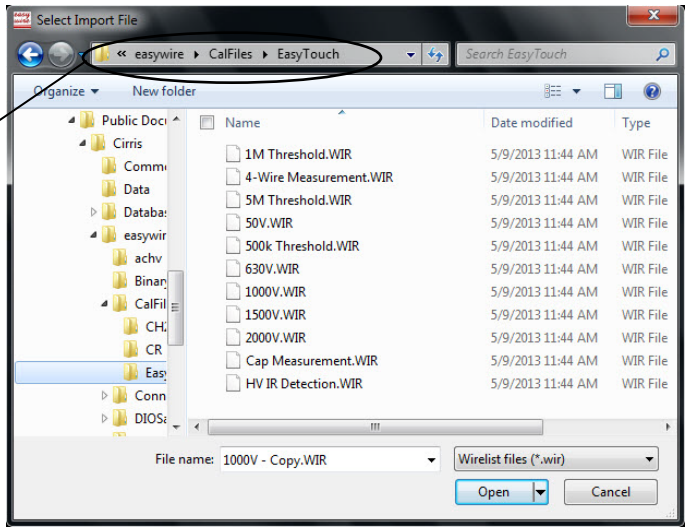


3. Press **'Import .WIR File'.**

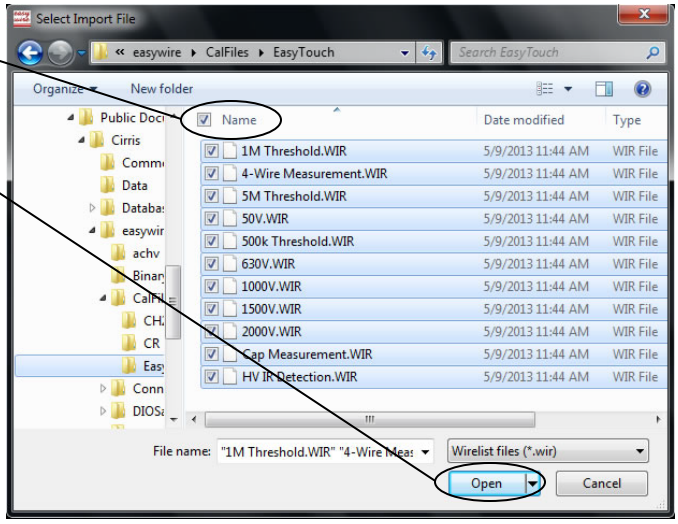


4. Navigate to the file path below:

   C:\Users\Public\
   Public Documents\
   Cirris\easywire
   \CalFiles\EasyTouch



5. Press the "Name" check box to select all of the verification files as shown, and press **'Open'.**

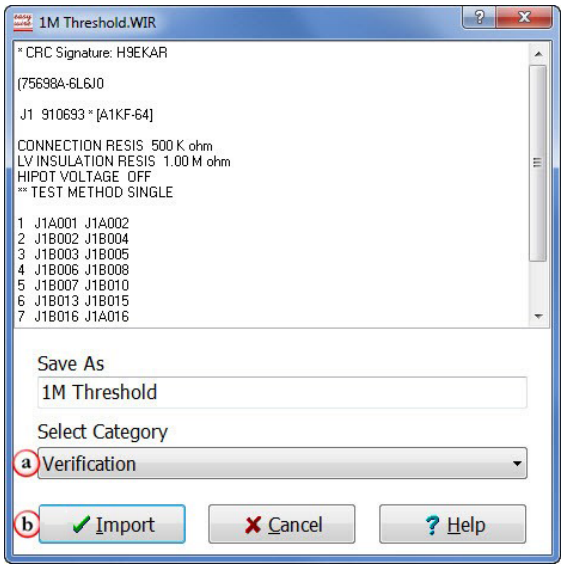


6. In version 2019.1.0 and later, multiple selected files are imported as a group and it won't be possible to select a destination category (one can be assigned later by right-clicking a program name in the Main Menu).

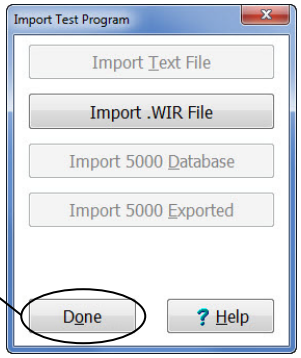
   In earlier versions, or when files are imported individually, the test will be displayed. Do the following:

   a. From the drop down menu, select the verification file category you created.

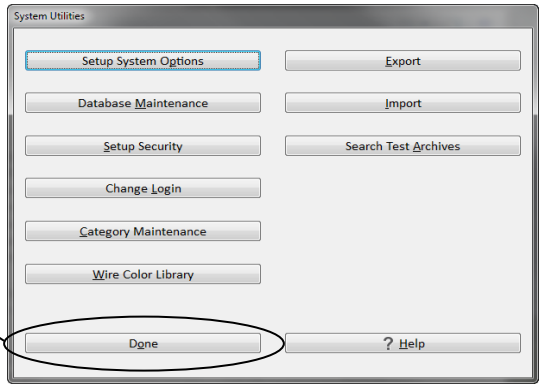
   b. Press **'Import'.**



7. Press **'Done'.**



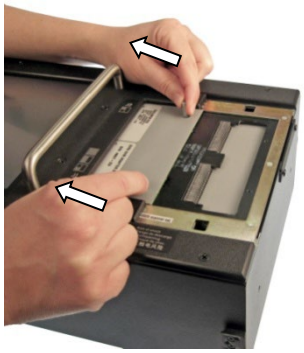
8. Press **'Done'** to return to the main menu.



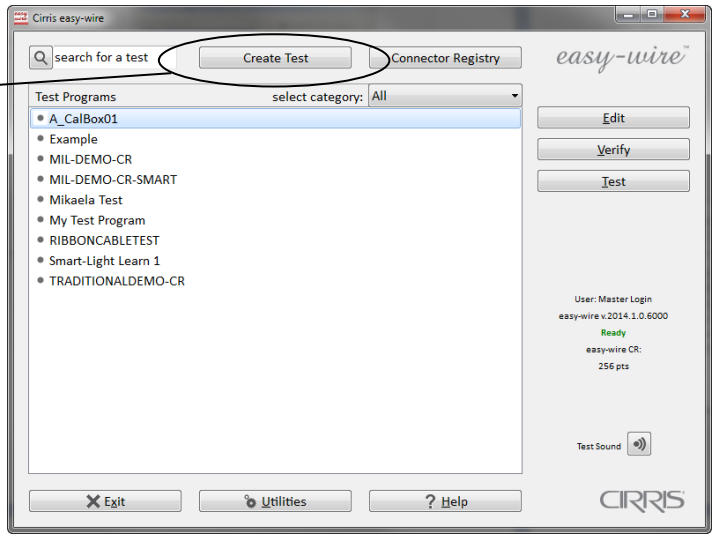
Note: To ensure that you always have the correct test files, re-import the files any time you update Easy-Wire or if you have not run the test in a while. Re-importing test files guarantees version control.

Signal Routing System Test

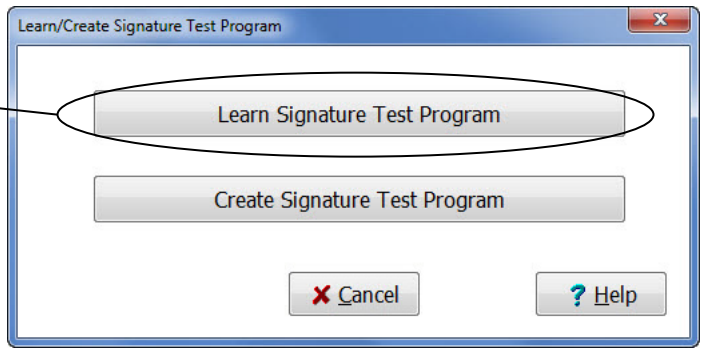
1. Install the Zero Ohm Adapter in the J1-J2 position as shown.



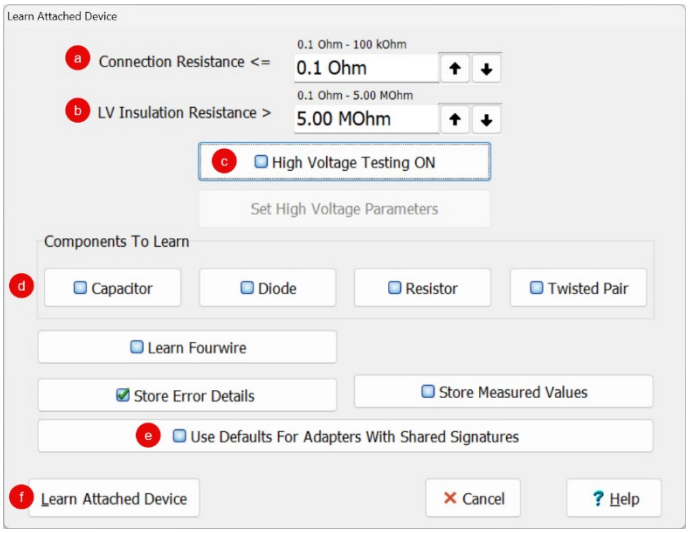
2. In the Easy-Wire main menu, press **‘Create Test’.**



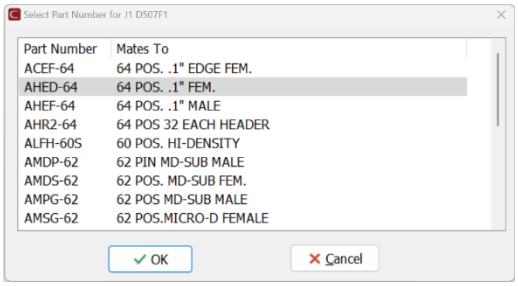
3. Press **‘Learn Signature Test Program’.**



4. In the “Learn Attached Device” window, do the following:
   a. Set the “Connection Resistance” to **0.1 Ohm.**
   b. Set the “LV Insulation Resistance” to **5.00 MOhm.**
   c. **Clear** the “High Voltage Testing ON” checkbox.
   d. **Clear** all component boxes.
   e. If your software contains the **“Use Defaults For Adapters With Shared Signatures”** box, make sure it is NOT checked.
   f. Click **‘Learn Attached Device’.**



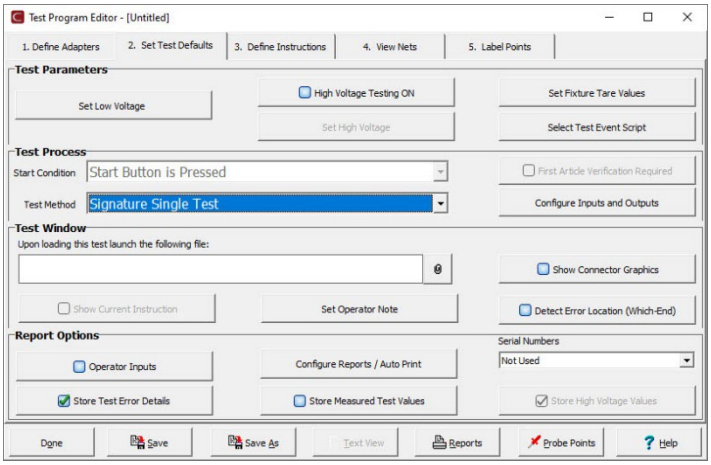
5. In the window that opens, select **AHED-64** as the adapter type and click **OK**.



6. In order to view the signature of the adapter, you must be in a Signature Mode test.

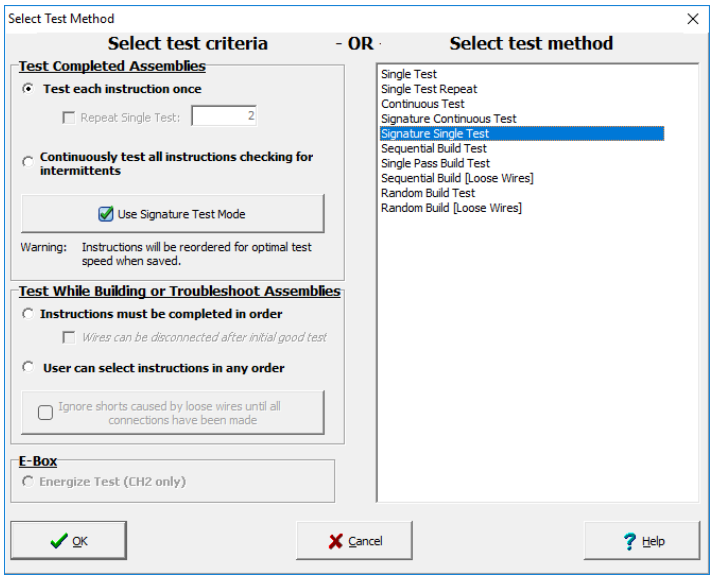
   Go to Tab 2 Set Test Defaults to verify that the Test Method is set to **Signature Single Test** or **Signature Continuous Test.**

   If you are not in a Signature Test method, click on the drop-down box next to Test Method

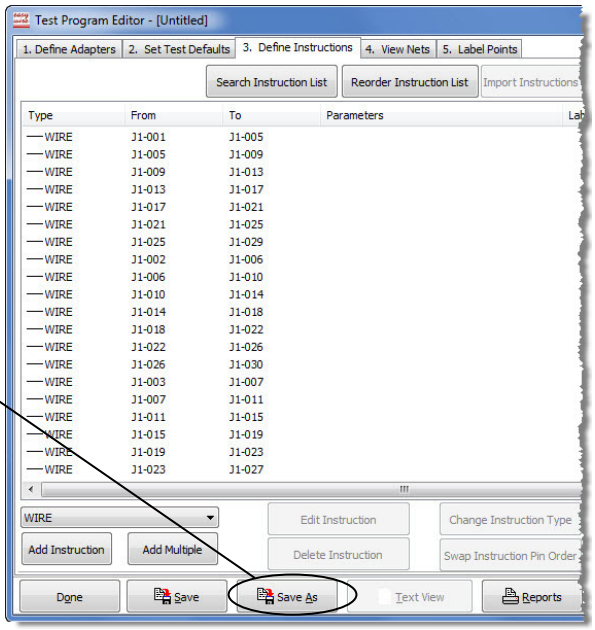


7. A separate window will open and display multiple test options. In the “Select Test Method” column, select a Signature test.

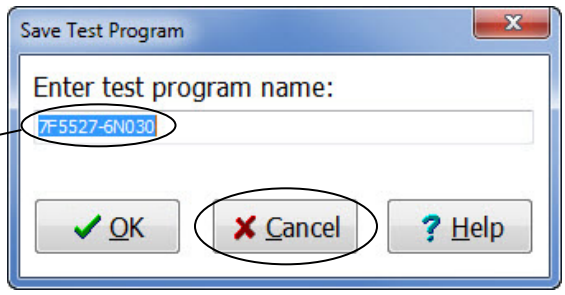
   - **Continuous Test:** Similar to a Single Test but continues repeating until all errors are solved. A Continuous Test allows the operator to move the cable around in an effort to catch intermittent failures such as loose connections. Test will continue to run until the Stop button is pressed.
   - **Signature Single Test:** The tester will perform the specified low voltage tests once. This method is fastest.



8. To view the signature, press **‘Save As’,** but <u>do not save the test!</u>



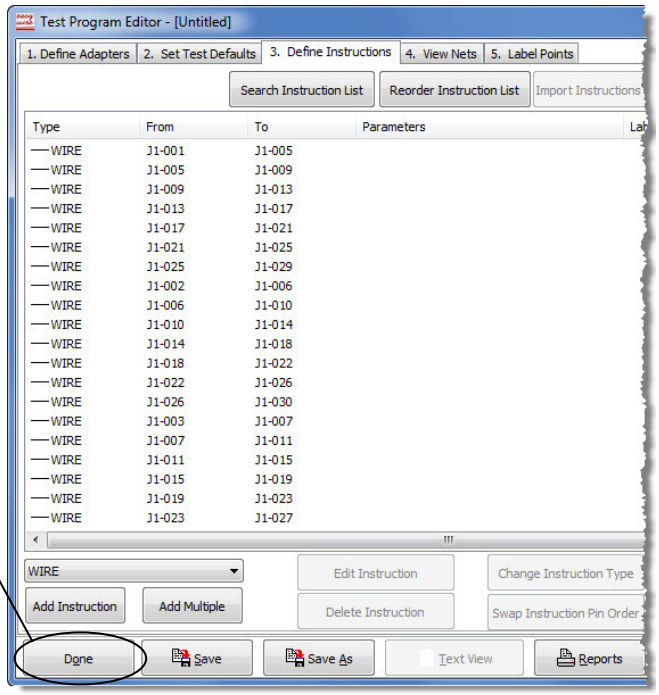
9. If the displayed signature matches the correct signature on the verification data sheet under “Signal Routing System Test”, check off Pass; otherwise, check off Fail.



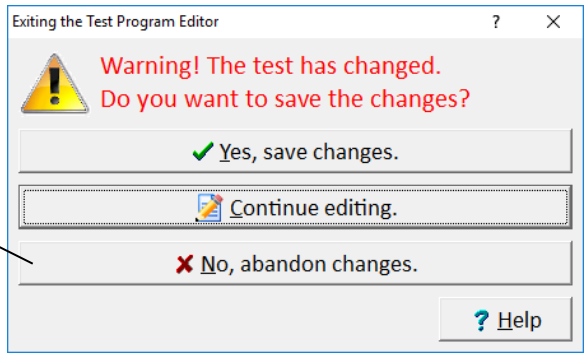
Note: If you do not see the signature displayed and the box reads “untitled”, change the test method to Signature Single Test by canceling, selecting Tab 2, and changing the test method to Signature Single Test. Click Save again to see the signature appear in the box.

10. When you are finished viewing the signature, press **‘Cancel’.**

11. In the Test Program Editor, press **‘Done’.**



12. Select “Abandon changes and return to the main menu” and press **‘OK’.**



13. Install the Zero Ohm Adapter in the J3-J4 position, and repeat steps 2-11. In step 8, you can compare the signature with correct signature in Table 1 on the next page.

14. If you installed add-on scanners, move the Zero Ohm Adapter to each subsequent “J” position and repeat steps 2-9 for each test.

    Table 1 lists the correct signatures for the adapter “J” positions.

Zero Ohm “J” Position Signatures				
“J” Position	**Correct Signature**		**“J” Position**	**Correct Signature**
J1-J2	7F5527-6N030		J17-J18	8CE799-6N030
J3-J4	94C424-6N030		J19-J20	18483C-6N030
J5-J6	5CC1A1-6N030		J21-J22	3476BF-6N030
J7-J8	D3A34A-6N030		J23-J24	B5D5D5-6N030
J9-J10	51A15E-6N030		J25-J26	1E83A5-6N030
J11-J12	C50EFB-6N030		J27-J28	8A2C00-6N030
J13-J14	E93078-6N030		J29-J30	A61283-6N030
J15-J16	719A99-6N030		J31-J32	3BA461-6N030

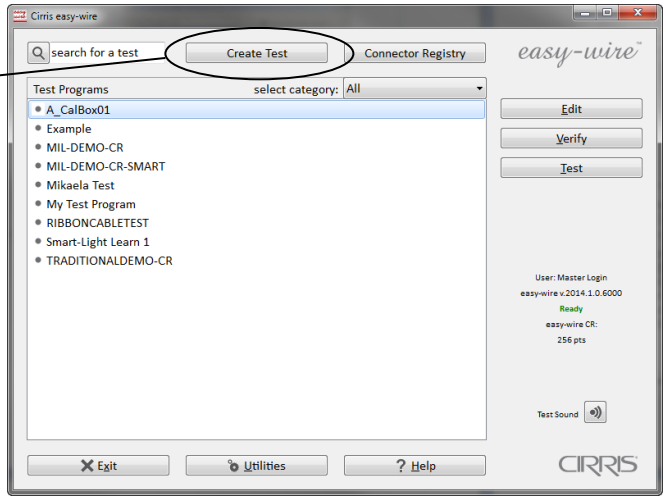
Table 1

15. Remove the Zero Ohm Adapter.

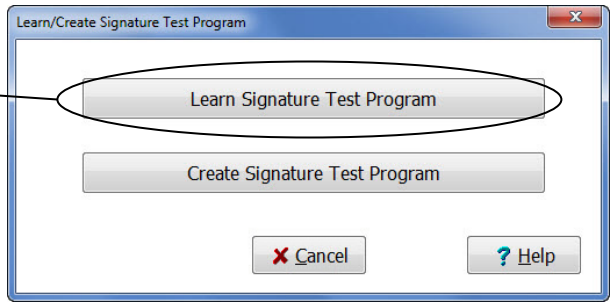
Resistance Measurement System Test

1. Install the Resistor Leak Adapter in the J1-J2 position as shown.

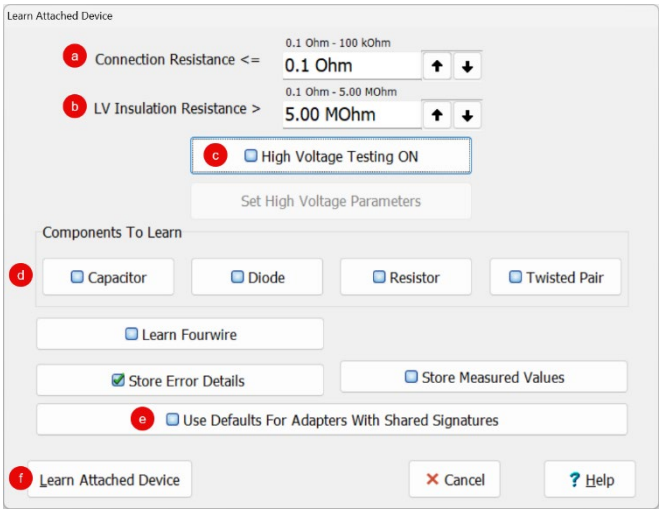
2. In the Easy-Wire main menu, press **‘Create Test’.**



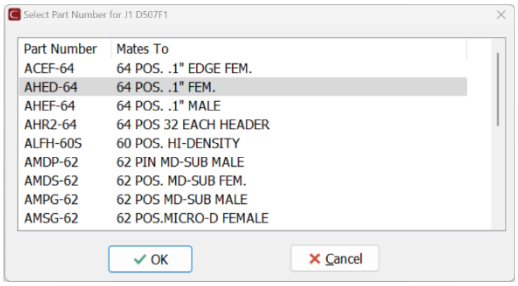
3. Press **‘Learn Signature Test Program’.**



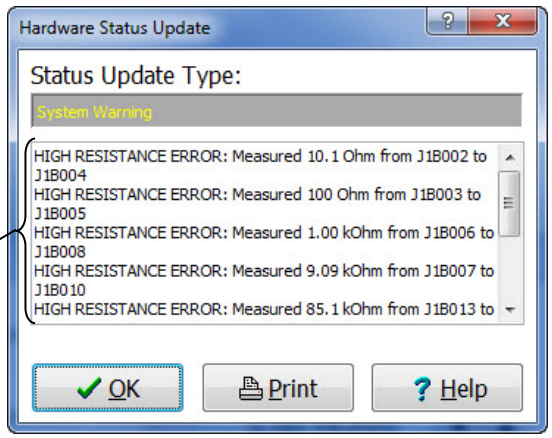
4. In the “Learn Attached Device” window, do the following:
   a. Set the “Connection Resistance” to **0.1 Ohm.**
   b. Set the “LV Insulation Resistance” to **5.00 MOhm.**
   c. **Clear** the “High Voltage Testing ON” checkbox.
   d. **Clear** all component boxes.
   e. If your software contains the **“Use Defaults For Adapters With Shared Signatures”** box, make sure it is NOT checked.
   f. Click **‘Learn Attached Device’.**



5 In the window that opens, select **AHED-64** as the adapter type and click **OK**.



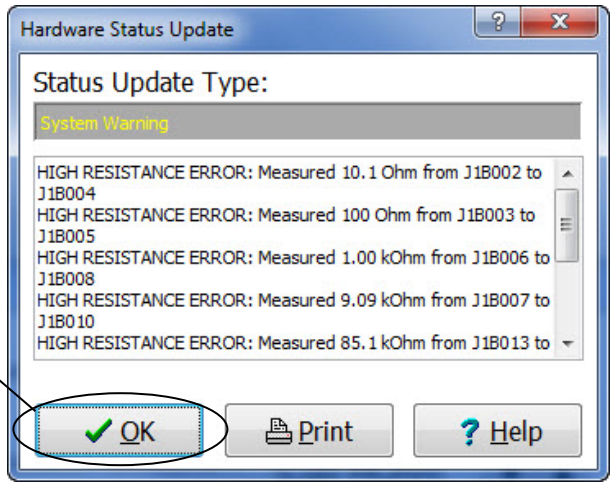
6. Record each Measured value in the “Hardware Status Update” window on the verification data sheet under “Resistence Measurement System Test”. If the value is between the minimum and maximum limits shown in Table 2 below, check off Pass; otherwise, check off Fail.



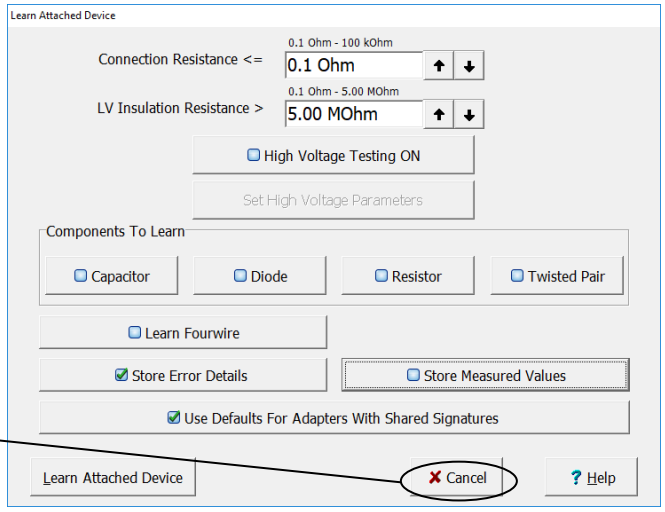
Resistance Measurement			
Resistor Positions	**Correct Resistance**	**Minimum Limit**	**Maximum Limit**
J1B002-J1B004	10.00 Ω	9.80 Ω	10.20 Ω
J1B003-J1B005	100.0 Ω	98.9 Ω	101.1 Ω
J1B006-J1B008	1,000 Ω	989.9 Ω	1,010.1 Ω
J1B007-J1B010	9,090 Ω	8,999 Ω	9,181 Ω
J1B013-J1B015	85.00K Ω	84.15K Ω	85.85K Ω
J1B016-J1A016	404.1K Ω	363.69K Ω	444.51K Ω
J1A020-J1A021	3.806M Ω	3.4254M Ω	4.1866M Ω
J1A022-J1A023	592.0K Ω	532.8K Ω	651.2K Ω

Table 2

7. When you are done recording the measured values, press **‘OK’.**



8. Press **‘Cancel’** to return to the main menu.



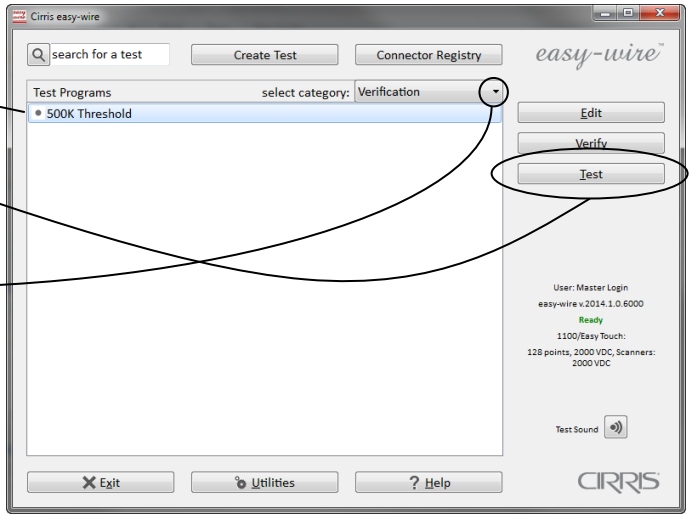
Resistance Threshold System Test

500k Ω

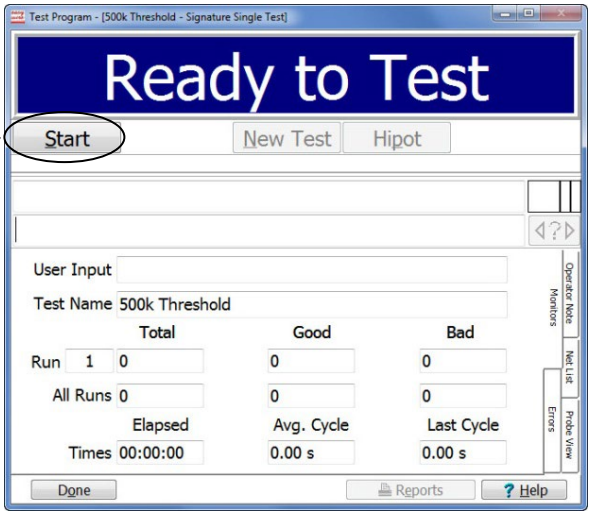
1. Ensure that the Resistor Leak Adapter is in the J1-J2 position as shown.

2. In the Easy-Wire main menu, select “500k Threshold” from the list, and press **‘Test’.**

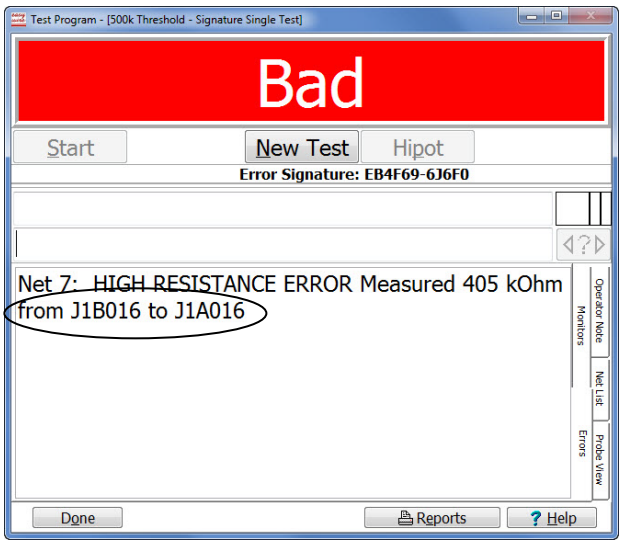
   Note: The proper category must be selected to view the verification files as a group.



3. When the information bar at the top displays “Ready to Test”, press **‘Start’.**

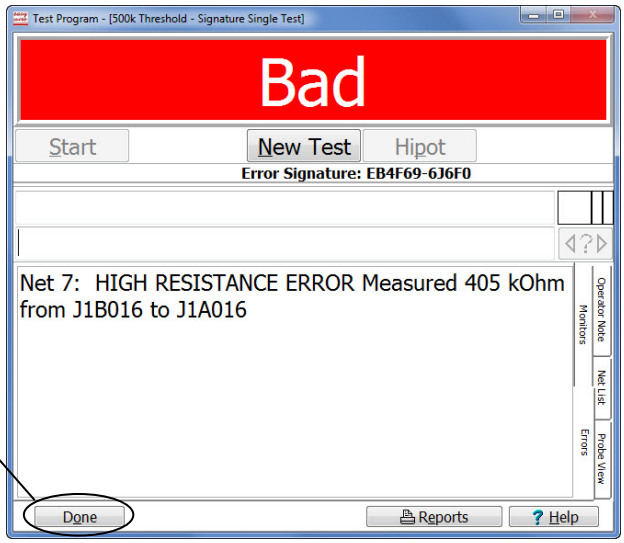


4. The test window should display “HIGH RESISTENCE ERROR”. If the failed points are from J1B016 to J1A016, check off Pass on the verification sheet under “Resistance Threshold System Test, 500k Ω”; otherwise check off Fail.



Note: The actual measured value for this part of the test is irrelevant and does not need to be recorded.

5. Press **‘Done’** to return to the main menu.



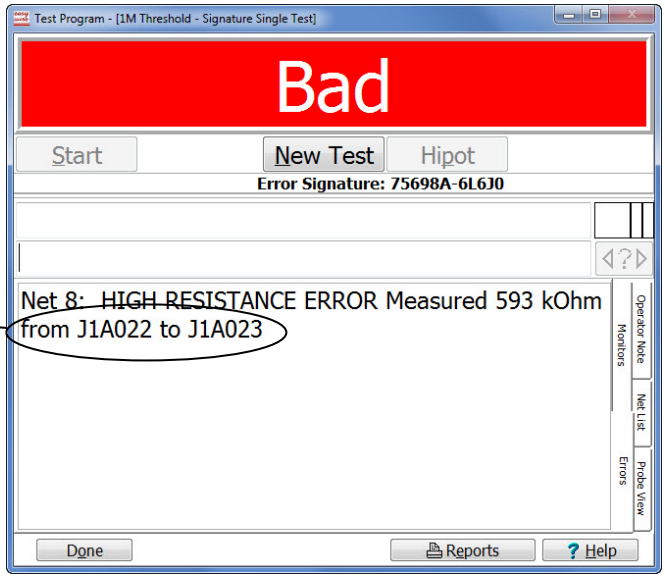
1M Ω

1. Ensure that the Resistor Leak Adapter is in the J1-J2 position as shown.

2. In the Easy-Wire main menu, select “1M Threshold” and press **‘Test’.**

3. When the information bar at the top displays “Ready to Test”, press **‘Start’.**

4. The test window should display “HIGH RESISTENCE ERROR”. If the failed points are from J1A022 to J1A023, check off Pass on the verification sheet under “Resistance Threshold System Test, 1M Ω”; otherwise check off Fail.



Note: The actual measured value for this part of the test is irrelevant and does not need to be recorded.

5. In the test window, press **‘Done’** to return to the main menu.

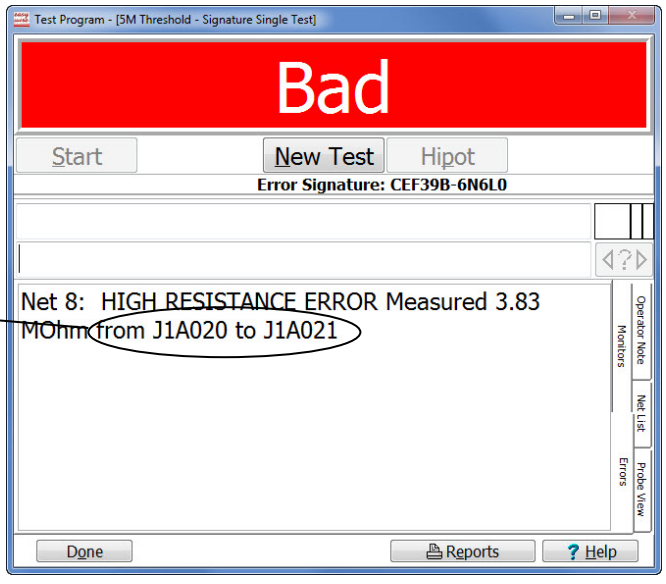
5M Ω

1. Ensure that the Resistor Leak Adapter is in the J1-J2 position as shown.

2. In the Easy-Wire main menu, select “5M Threshold” and press **‘Test’.**

3. When the information bar at the top reads “Ready to Test”, press **‘Start’.**

4. The test window should display “HIGH RESISTENCE ERROR”. If the failed points are from J1A020 to J1A021, check off Pass on the verification sheet under “Resistance Threshold System Test, 5M Ω”; otherwise check off Fail.



Note: The actual measured value for this part of the test is irrelevant and does not need to be recorded.

5. In the test window, press **‘Done’** to return to the main menu.

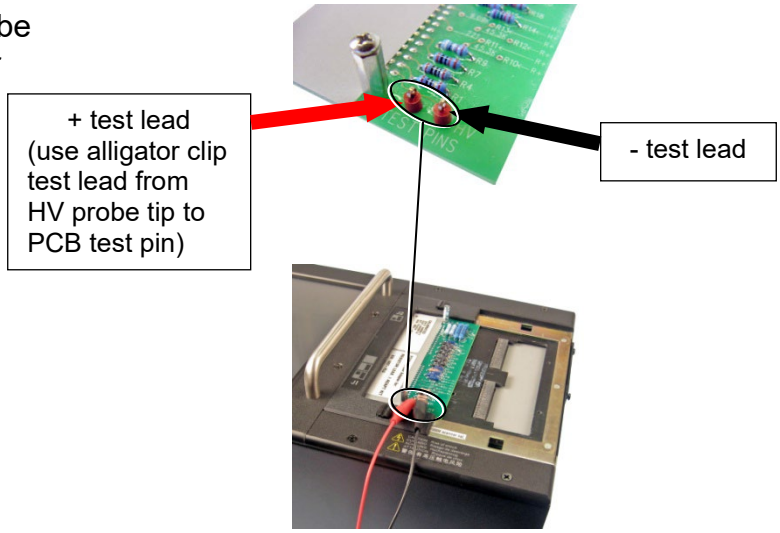
HV System Test

Before you Begin Testing

1. Ensure that the Resistor Leak Adapter is in the J1-J2 position as shown.

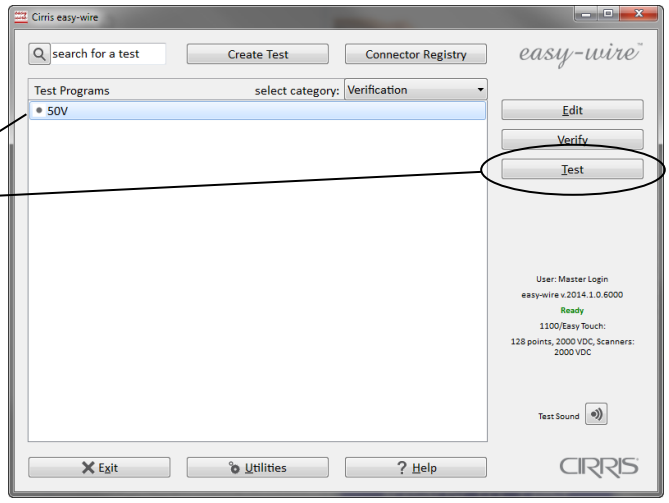
2. Plug the high voltage probe into the Voltmeter.

3. Connect your high voltage probe to the test pins on the Resistor Leak adapter as shown.

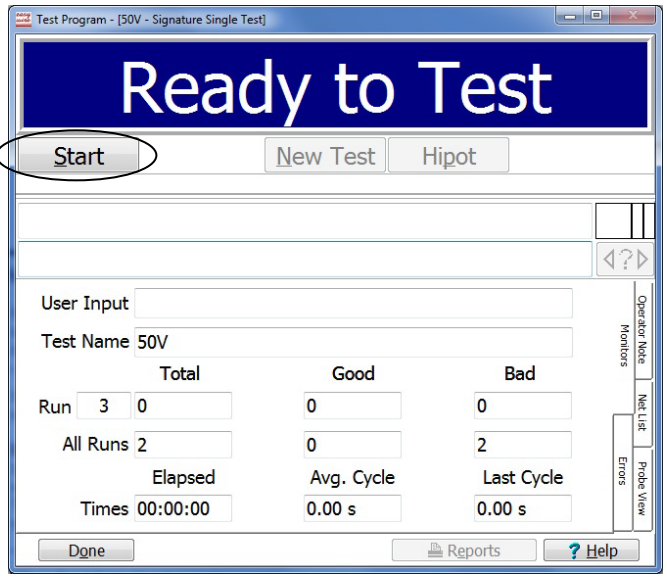


50 Volt

1. In the Easy-Wire main menu, select “50V” and press **‘Test’.**

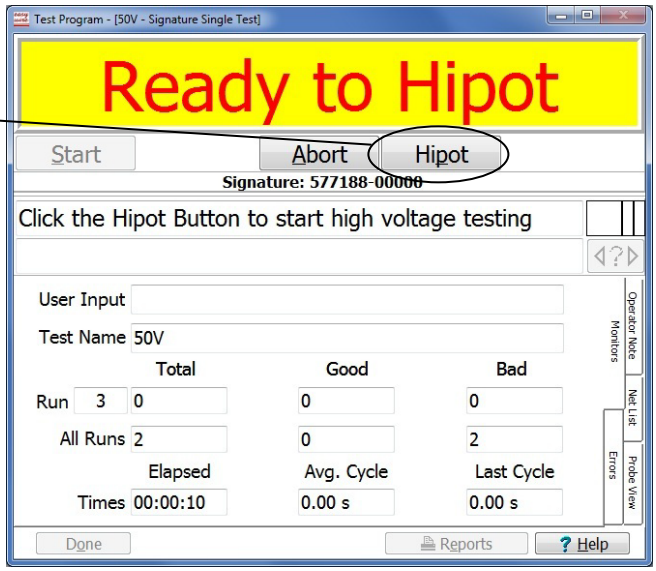


2. When the information bar at the top displays “Ready toTest”, press **‘Start’.**



Be ready to read the meter!
When you do the next step, a voltage will appear on the meter. The value will only display for a few seconds.

3. When the information bar displays "Ready to Hipot", press **'Hipot'** and read the meter.



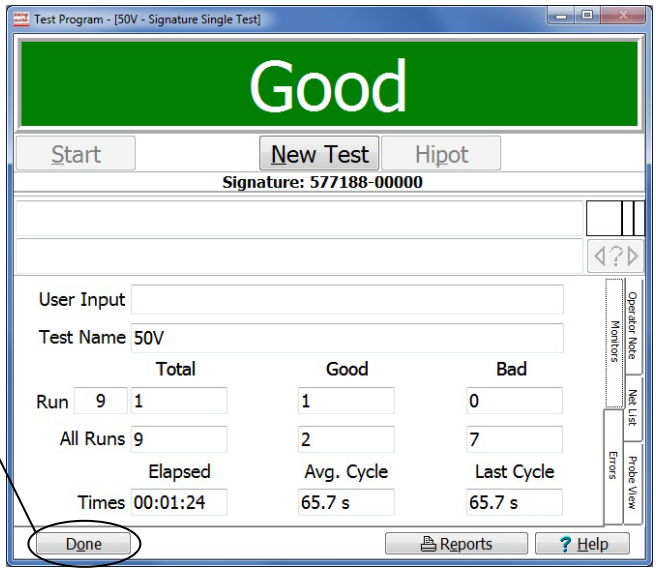
4. Record the voltmeter value on the verification data sheet under "HV System Test, 50 Volt."
   If the voltmeter value is between the minimum and maximum limits shown in Table 3, check off Pass; otherwise, check off Fail.

50 Volt Test		
Correct Voltage	**Minimum Limit**	**Maximum Limit**
50 V	45 V	55 V

Table 3

Note: The hipot test takes up to 120 seconds to complete. If the hipot test is still running after this time frame, press **'Abort'** to stop the test.

5. When the information bar displays "Good" or "Bad, press **'Done'** to return to the main menu.



630 Volt

1. In the Easy-Wire main menu, select “630V”and press **‘Test’.**

2. When the information bar displays “Ready to Test”, press **‘Start’.**

Be ready to read the meter!
When you do the next step, a voltage will appear on the meter. The value will only display for a few seconds.

3. When the information bar displays “Ready to Hipot”, press **‘Hipot’** and read the meter.

4. Record the voltmeter value on the verification data sheet under “HV System Test, 630 Volt”. If the voltmeter value is between the minimum and maximum limits shown in Table 4, check off Pass; otherwise, check off Fail.

630 Volt Test		
Correct Voltage	**Minimum Limit**	**Maximum Limit**
630 V	599 V	662 V

Table 4

Note: The hipot test takes up to 120 seconds to complete. If the hipot test is still running after this time frame, press **‘Abort’** to stop the test.

5. When the information bar displays “Good” or “Bad”, press **‘Done’** to return to the main menu.

1000 Volt

Caution! Be certain a high voltage probe as specified in the *Setting Up* section of this manual is connected as described above. Your voltmeter may be damaged if you do not take this precaution!

1. In the Easy-Wire main menu, select “1000V” and press **‘Test’.**

2. When the information bar displays “Ready to Test”, press **‘Start’.**

Be ready to read the meter!
When you do the next step, a voltage will appear on the meter. The value will only display for a few seconds.

3. When the information bar displays “Ready to Hipot”, press **‘Hipot’** and read the meter.

4. Record the voltmeter value on the verification sheet under “HV System Test, 1000 Volt.” If the voltmeter value is between the minimum and maximum limits shown in Table 5, check off Pass; otherwise check off Fail.

1000 Volt Test		
Correct Voltage	**Minimum Limit**	**Maximum Limit**
1000 V	950 V	1050 V

Table 5

Note: The hipot test takes up to 120 seconds to complete. If the hipot test is still running after this time frame, press **‘Abort’** to stop the test.

5. When the information bar displays “Good” or “Bad”, press **‘Done’** to return to the main menu.

6. Disconnect the clip leads from the Resistance Leak Adapter.

1500 Volt

Caution! Be certain a high voltage probe as specified in the *Setting Up* section of this manual is connected as described above. Your voltmeter may be damaged if you do not take this precaution!

7. In the Easy-Wire main menu, select “1500V” and press **‘Test’.**

8. When the information bar displays “Ready to Test”, press **‘Start’.**

Be ready to read the meter!
When you do the next step, a voltage will appear on the meter. The value will only display for a few seconds.

9. When the information bar displays “Ready to Hipot”, press **‘Hipot’** and read the meter.

10. Record the voltmeter value on the verification sheet under “HV System Test, 1500 Volt.” If the voltmeter value is between the minimum and maximum limits shown in Table 6, check off Pass; otherwise check off Fail.

1500 Volt Test		
Correct Voltage	**Minimum Limit**	**Maximum Limit**
1500 V	1425 V	1575 V

Table 6

Note: The hipot test takes up to 120 seconds to complete. If the hipot test is still running after this time frame, press **‘Abort’** to stop the test.

11. When the information bar displays “Good” or “Bad”, press **‘Done’** to return to the main menu.

12. Disconnect the clip leads from the Resistance Leak Adapter.

2000 Volt (only for testers equipped with optional 2000VDC scanners)

Caution! Be certain a high voltage probe as specified in the *Setting Up* section of this manual is connected as described above. Your voltmeter may be damaged if you do not take this precaution!

13. In the Easy-Wire main menu, select “2000V” and press **‘Test’.**

14. When the information bar displays “Ready to Test”, press **‘Start’.**

Be ready to read the meter!
When you do the next step, a voltage will appear on the meter. The value will only display for a few seconds.

15. When the information bar displays “Ready to Hipot”, press **‘Hipot’** and read the meter.

16. Record the voltmeter value on the verification sheet under “HV System Test, 2000 Volt.” If the voltmeter value is between the minimum and maximum limits shown in Table 7, check off Pass; otherwise check off Fail.

2000 Volt Test		
Correct Voltage	**Minimum Limit**	**Maximum Limit**
2000 V	1900 V	2100 V

Table 7

Note: These measurements only apply if you have a 2000 V Easy-Touch Pro Unit with 2000 V scanners.

Note: The hipot test takes up to 120 seconds to complete. If the hipot test is still running after this time frame, press **‘Abort’** to stop the test.

17. When the information bar displays “Good” or “Bad”, press **‘Done’** to return to the main menu.

18. Disconnect the clip leads from the Resistance Leak Adapter.

HV Insulation Resistance Detection System Test

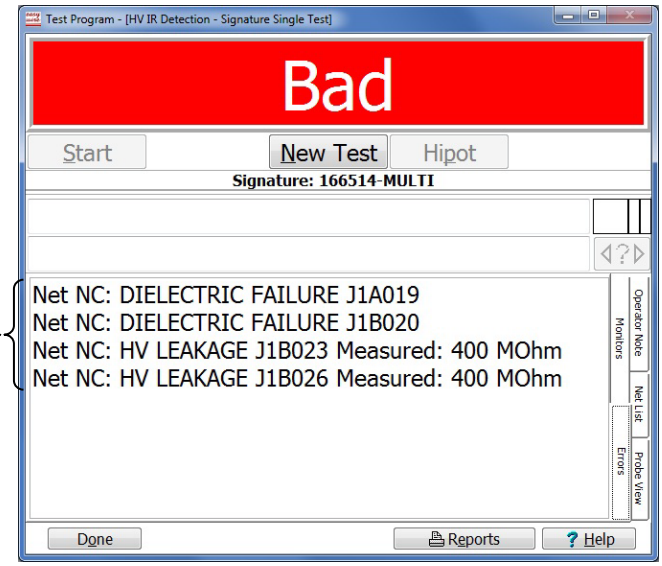
1. Ensure that the Resistor Leak Adapter is in the J1-J2 position as shown.

2. In the Easy-Wire main menu, select “HV IR Detection”and press **‘Test’.**

3. When the information bar displays “Ready to Test”, press **‘Start’.**

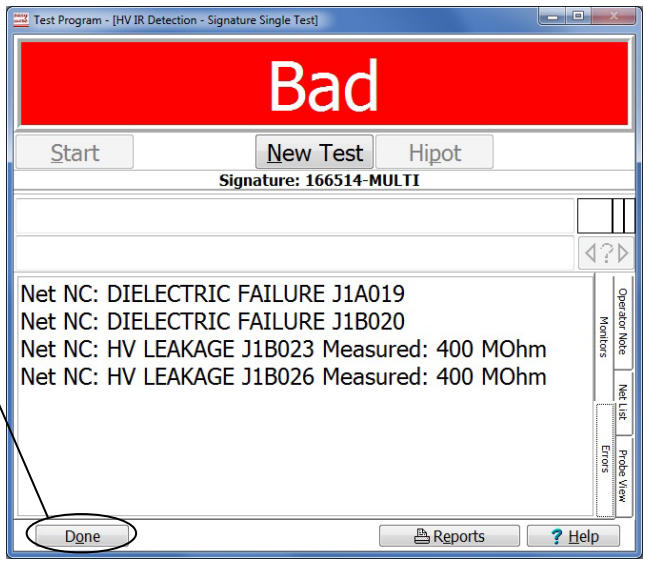
4. When the information bar displays “Ready to Hipot”, press **‘Hipot’.**

5. If the test window only reports the four high voltage errors shown, check of Pass on the verification sheet under “HV Insulation Resistance Detection System Test; otherwise, check off Fail.

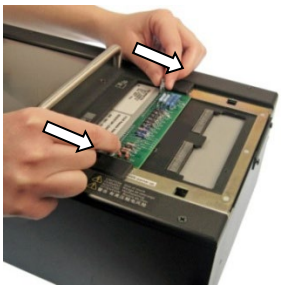


Note: The actual measured value for the error will vary on each tester.

6. In the test window, press **'Done'** to return to the main menu.

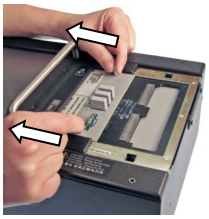


7. Remove the Resistant Leak Adapter from the tester.



Capacitance Measurement System Test

1. Install the Capacitance/4-Wire Adapter in the J1-J2 position as shown.

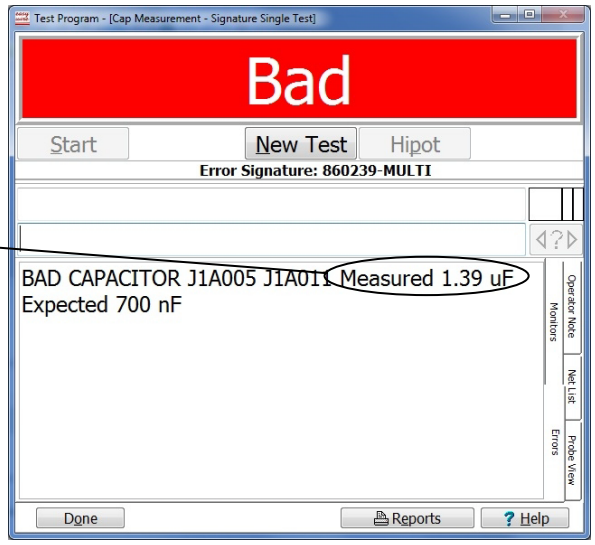


2. In the Easy-Wire main menu, select “Cap Measurement” and press **‘Test’.**

3. When the information bar displays “Ready to Test”, press **‘Start’.**

4. The information bar will display “Bad.” Record the Measured Value on the verification data sheet under “Capacitance Measurement System.”

   Check off Pass if the measured value is between the minimum and maximum limits shown in Table 8. Otherwise check off Fail.



Capacitance Measurement		
Correct Capacitance	**Minimum Capacitance**	**Maximum Capacitance**
1.41 µF	1.27 µF	1.55 µF

Table 8

5. In the test window, press **‘Done’** to return to the main menu.

4-Wire Measurement System Test

1. Ensure that the Capacitance/4-Wire Adapter is in the J1-J2 position as shown.

2. In the Easy-Wire main menu, select “4-Wire Measurement”, and press **‘Test’.**

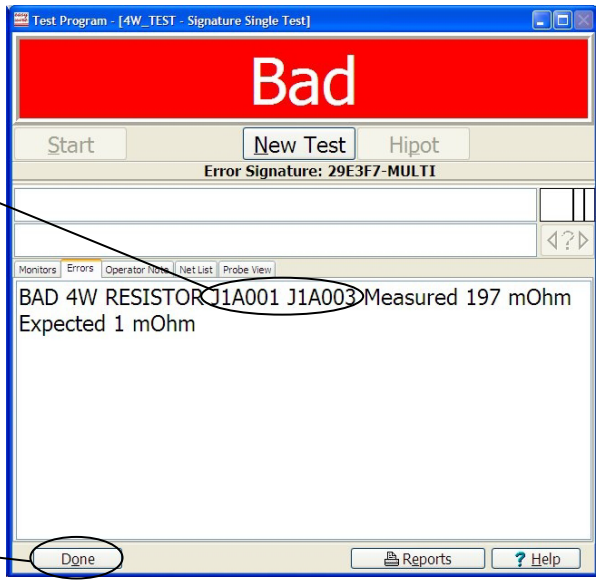
3. When the information bar reads “Ready to Test”, press **‘Start’.**

4. The information bar will read “Bad”.

5. Verify that the “Bad 4W Resistor” reads J1A001 and J1A003.

6. On the verification data sheet under “4-Wire Measurement System”, check off Pass if the measured value is between 195 and 205 mOhm. Otherwise check off Fail.

7. Press **‘Done’.**



8. Remove the Capacitance/4-Wire Adapter from the tester.

Appendix

The following information can be used as a guide for setting up a formal quality system in your organization.

Quality Standards

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

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

In the metrology industry, the word “standards” often refers to a centralized, most accurate unit of measurement regulated by countries. The National Institute of Standards and Technology (NIST) maintains the *national standards* for measurements in the United States.

Good Quality Practices

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

Recall System

How do you ensure that your company will remember to send an instrument in for calibration? Use a card file or computerized database recall system. This system includes calibration dates, due dates, calibration sources, and other instrument records. The recall system ensures that instruments are recalibrated in a timely manner.

Verification Labels

How do you know if calibration has been verified without looking for the paperwork? When an instrument’s calibration is verified, the quality standards require the instrument to be labeled as such. These labels, which are applied to instruments, have fields for the instrument serial number, verification date, verification due date, and by whom. A good source of inexpensive labels is United Ad Label at 1-800-992-5755.

Accuracy Ratios
Can you use a ruler to calibrate your digital calipers? The answer is no. Wherever possible, quality standards require an accuracy ratio of at least four to one. In other words, the instrument being used to measure the calibrated instrument should be at least four times as accurate as the calibrated instrument.

Performance Verification Certificate
How do you know that an instrument has been verified? The Performance Verification Certificate is a record of who, when, and by what equipment the instrument was verified. The Easy-Touch Pro Performance Verification Certificate is provided on the next page.

Verification Data Report
How accurate is the calibrated test instrument in relation to its published specifications? Some organizations require the measured values of a calibrated instrument to be written down when that instrument is calibrated. Calibration laboratories typically charge extra to create a data report. However, when an instrument is found to be out-of-tolerance, the quality standards require the out-of-tolerance data be recorded in relation to the instrument specifications. A verification data report can fill this requirement. You can photocopy the Easy-Touch Pro Verification Data Report from the Appendix and fill it out.

Traceability
Traceability refers to each unbroken link of valid verifications going back to national standards such as those maintained by the NIST in the United States. To maintain traceablity, qualified personnel must perform the performance verification under controlled conditions, using correctly calibrated instruments with correct test accuracy ratios.

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 performance verification 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.

Easy-Touch Pro Performance Verification Certificate

Name and Address of Organization:	
Certificate Number:	**Performed by:**
Date:	**Due Date:**
Applicable Quality Standard(s):	**Procedure:** Easy-Touch Pro Performance Verification-Version _____
Temperature:	**Relative Humidity:**
Tester Serial Number:	

Instruments used:	**Serial Number**	**Cal. Date**	**Due Date**
Zero Ohm Adapter			
Resistor Leak Adapter			
Capacitance/Fourwire Adapter			
Voltmeter			

Statement of Traceablility:

Certified by:

Easy-Touch Pro Verification Data Sheet

Date: _____
Tester Serial Number: _____
Tests Performed By: _____

Signal Routing System

J Position for Adapter	Correct Signature	Displayed Signature	Pass	Fail
J1-J2	7F5527-6N030			
J3-J4	94C424-6N030			
J5-J6	5CC1A1-6N030			
J7-J8	D3A34A-6N030			
J9-J10	51A15E-6N030			
J11-J12	C50EFB-6N030			
J13-J14	E93078-6N030			
J15-J16	719A99-6N030			
J17-J18	8CE799-6N030			
J19-J20	18483C-6N030			
J21-J22	3476BF-6N030			
J23-J24	B5D5D5-6N030			
J25-J26	1E83A5-6N030			
J27-J28	8A2C00-6N030			
J29-J30	A61283-6N030			
J31-J32	3BA461-6N030			

Resistance Measurement System

Resistor Positions	Correct Resistance	Minimum Limit	Maximum Limit	Displayed Value	Pass	Fail
J1B002-J1B004	10.00 Ω	9.80 Ω	10.20 Ω			
J1B003-J1B005	100.0 Ω	98.9 Ω	101.1 Ω			
J1B006-J1B008	1,000 Ω	989.9 Ω	1,010.1 Ω			
J1B007-J1B010	9,090 Ω	8,999 Ω	9,181 Ω			
J1B013-J1B015	85.00K Ω	84.15K Ω	85.85K Ω			
J1B016-J1A016	404.1K Ω	363.69K Ω	444.51K Ω			
J1A020-J1A021	3.806M Ω	3.4254M Ω	4.1866M Ω			
J1A022-J1A023	592.0K Ω	532.8K Ω	651.2K Ω			

Resistance Threshold System

- **500 kΩ Test**

High Resistance Error between:	Pass	Fail
J1B016 and J1A016		

- **1 MΩ Test**

High Resistance Error between:	Pass	Fail
J1A022 and J1A023		

- **5 MΩ Test**

High Resistance Error between:	Pass	Fail
J1A020 and J1A021		

HV System Test

- **50 Volt Test**

Correct Voltage	Minimum Voltage	Maximum Voltage	Displayed Value	Pass	Fail
50 V	45 V	55 V			

- **630 Volt Test**

Correct Voltage	Minimum Voltage	Maximum Voltage	Displayed Value	Pass	Fail
630 V	599 V	662 V			

- **1000 Volt Test**

Correct Voltage	Minimum Voltage	Maximum Voltage	Displayed Value	Pass	Fail
1000 V	950 V	1050 V			

- **1500 Volt Test**

Correct Voltage	Minimum Voltage	Maximum Voltage	Displayed Value	Pass	Fail
1500 V	1425 V	1575 V			

- **2000 Volt Test (Optional)**

Correct Voltage	Minimum Voltage	Maximum Voltage	Displayed Value	Pass	Fail
2000 V	1900 V	2100 V			

HV Insulation Resistance Detection System

Dielectric Failure at:	Pass	Fail
J1A019		

Dielectric Failure at:	Pass	Fail
J1B020		

HV Leakage at:	Pass	Fail
J1B023 (measured value: 360-440M Ω)		

HV Leakage at:	Pass	Fail
J1B026 (measured value: 360-440M Ω)		

Capacitance Measurement System

Correct Capacitance	Minimum Capacitance	Maximum Capacitance	Displayed Measured Value	Pass	Fail
1.41 µF	1.27 µF	1.55 µF			

4-Wire Measurement System

Bad 4W Resistor Error between J1A001 and J1A003	Minimum Value	Maximum Value	Pass	Fail
0.2 Ω ± 2% ± 0.001 Ω	0.195 Ω	0.205 Ω		