

Version 2024.1.0



Easy-Touch Pro

Performance Verification Manual Version 2024.1.0 Copyright 2024 by Cirris, Inc. All Rights Reserved

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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.



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



Resistor Leak Adapter



Capacitance/Fourwire 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 2000volt scanners) with an accuracy of $\pm 1\%$, such as a Fluke 80 Series meter or equivalent. The meter must have an input impedance of 10 megohms ($\pm 10\%$). Bench multimeters, such as Keysight units, typically do not meet this input impedance requirement. **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 <u>all</u> voltage measurements.

□ High Voltage Probe



A high voltage probe with a 1000:1 voltage divider, accuracy of $\pm 1\%$ 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)

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.

 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'.

ſ	System Utilities
	Setup System Options <u>Export</u>
ļ	Database Maintenance Import
	Search Test Archives
	Change Login
	Category Maintenance
I	Wire Color Library
	D <u>o</u> ne ? <u>H</u> elp

- 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'.

(enter category n	ame here)	
Connector	r Type 🛛 🕑 🖉 🕇	Test Program
Master File Direc	ton	
Master The Direc		
<u>A</u> dd	<u>C</u> hange	Delete

6. Press 'Done' to return to the	<u>Category Maintenance</u>	
	Wire Color Library	
	Done	? Help

Importing the Test Files

- Cirris easy-wire - 0 **-** X 1. In the Easy-Wire main menu, easy-wire" Q search for a test select the category you created -Create Test Connector Registry select category: Verification • in the previous section Test Programs Edit and press 'Utilities'. <u>V</u>erify <u>T</u>est User: Master Login asy-wire v.2014.1.0.6000 Ready 1100/Easy Touch: bints, 2000 VDC, Scanne 2000 VDC Test Sound 🌒 CIRRIS 🗙 E<u>x</u>it °o <u>U</u>tilities ?<u>H</u>elp
 - 2. Press 'Import'.

3. Press 'Import .WIR File'.



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



 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.

1M Threshold.WIR	? ×
* CRC Signature: H9EKAR	*
(75698A-6L6J0	
J1 910693 * [A1KF-64]	
CONNECTION RESIS 500 K ohm LV INSULATION RESIS 1.00 M ohm HIPOT VOLTAGE OFF ** TEST METHOD SINGLE	E
1 J1A001 J1A002 2 J1B002 J1B004 3 J1B003 J1B005 5 J1B005 J1B008 5 J1B007 J1B010 6 J1B013 J1B015 7 J1B016 J1A016	
Save As	
1M Threshold	
Select Category	
a Verification	•
ⓑ ✓ Import ✗ Cancel ?	<u>H</u> elp

b. Press 'Import'.



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

Setup System Options	<u>E</u> xport
Database <u>M</u> aintenance	Import
Setup Security	Search Test <u>A</u> rchives
Change <u>L</u> ogin]
<u>Category</u> Maintenance]
Wire Color Library]

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'.**





- 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'.
- Learn Fourwire Store Error Details O Use Defaults For Adapters With Shared Signatures Learn Attached Device

Learn Attached Device

a Connection Resistance <=</p>

Components To Learn

Capacitor

b LV Insulation Resistance > 5.00 MOhm

Diode

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

Part Number	Mates To		
ACEF-64	64 POS1" EDGE FEM.		
AHED-64	64 POS1" FEM.		
AHEF-64	64 POS1" MALE		
AHR2-64	64 POS 32 EACH HEADER		
ALFH-60S	60 POS. HI-DENSITY		
AMDP-62	62 PIN MD-SUB MALE		
AMDS-62	62 POS. MD-SUB FEM.		
AMPG-62	62 POS MD-SUB MALE		
AMSG-62	62 POS.MICRO-D FEMALE		
	✓ OK	× Cancel	

0.1 Ohm - 100 kOhm

0.1 Ohm - 5.00 MOhm

+ +

+ +

Store Measured Values

× Cancel

Resistor

Twisted Pair

? Help

0.1 Ohm

C High Voltage Testing ON

Set High Voltage Parameters

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

1. Define Adapt	ers 2. Set Test Defaults	3. Define Instructions	4. View Nets	5. Label Point	s		
fest Parame	ters	1 1			1		
0	t Low Voltage	🔲 High Ve	High Voltage Testing ON			Set Fixture Tare Values	
		SetH	ligh Voltage		Select Test Ev	vent Script	
est Process							
tart Condition	Start Button is Presser	d	-] (First Article Veri	fication Required	
	Beare Baccon is Tressee						
Test Method	Signature Single Test		-	1	Configure Inputs	and Outputs	
Test Method	Signature Single Test		-		Configure Inputs	and Outputs	
Test Method Fest Window Upon loading this	Signature Single Test]	Configure Inputs	and Outputs	
Test Method Test Window Upon loading the	Signature Single Test				Configure Inputs	and Outputs	
Test Method Test Window Upon loading this	Signature Single Test Signature Single Test statistication the following file:	Set C	Operator Note		Configure Inputs Show Conne Detect Error Loca	and Outputs ctor Graphics ation (Which-End	
Test Method Test Window Upon loading this Shu Report Optio	Signature Single Test is test launch the following file: www.current Instruction ns	Set C	Operator Note		Configure Inputs Configure Inputs Show Conne	and Outputs ctor Graphics ation (Which-End	
Test Method Test Window Upon loading this Silve Report Optio	Signature Single Test Signature Single Test statianch the following file: w Current Instruction ns Operator Inputs	Set Configure F	Operator Note]C Seriel 1	Configure Inputs Show Conne Detect Error Loca Humbers Sed	and Outputs ctor Graphics ation (Which-End	

- 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.

ect Test Method			
Select test criteria	- OR ·	Select test method	
est Completed Assemblies	Single	Test	
Test each instruction once	Single	Test Repeat	
Penest Single Tests 2	Contin	nuous Test	
_ Repeat Jingle Test,	Signal	ure Single Test	
Continuously test all instructions checking for	Seque	ntial Build Test	
intermittents	Single	Pass Build Test ntial Build I oose Wires]	
1	Rando	m Build Test	
🧭 Use Signature Test Mode	Rando	m Build [Loose Wires]	
arning: Instructions will be reordered for optimal test speed when saved.			
est While Building or Troubleshoot Assemblie	25		
Instructions must be completed in order			
🔲 Wires can be disconnected after initial good test			
User can select instructions in any order			
Ignore shorts caused by loose wires until all			
connection in the been made			
-Box			
Energize Test (CH2 only)			
✓ <u>o</u> k	🗙 <u>C</u> ancel		? Help



 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.

Save Test Program	x
Enter test program name:	
7F5527-6N030	
✓ <u>O</u> K X Cancel	? <u>H</u> elp

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'.**

1. Define Adapte	rs 2. Set Test De	faults 3. Def	fine Instructio	ons 4. View N	lets 5. Lab	vel Points
		Search Inst	ruction List	Reorder Ins	truction List	Import Instruction
Туре	From	То	Pa	rameters		L
-WIRE	J1-001	J1-005				
-WIRE	J1-005	J1-009				
-WIRE	J1-009	J1-013				
-WIRE	J1-013	J1-017				
-WIRE	J1-017	J1-021				
-WIRE	J1-021	J1-025				
-WIRE	J1-025	J1-029				
-WIRE	J1-002	J1-006				
-WIRE	J1-006	J1-010				
-WIRE	J1-010	J1-014				
WIRE	J1-014	J1-018				
WIRE	J1-018	J1-022				
-WIRE	J1-022	J1-026				
WIRE	J1-026	J1-030				
WIRE	J1-003	J1-007				
-WIRE	J1-007	J1-011				
WIRE	J1-011	J1-015				
WIRE	J1-015	J1-019				
-WIRE	J1-019	J1-023				
-WIRE	J1-023	J1-027				
•				m		
WIRE		•	Edit Ins	truction	Chan	ge Instruction Type
Add Instruction	Add Multiple		Delete In	struction	Swap	Instruction Pin Orde



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				
			001.002	02,1101 011000				

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'.





- 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**.

		Connection Resistance <=		100 kOhm			
	Connection Resistance			m	+	÷	
		ation Resistance >	0.1 Ohm -	5.00 MOhm			
	LV Insulation Resistan		5.00 M	Ohm	+	÷	
	C	O Hi	igh Voltag	e Testing ON	I		
		Set H	ligh Volta	je Parameter	s		
C	Components To Learn						
	Capacitor	Dioo	de	C Resi	stor		Twisted Pair
	Learn Fourwire						
	Store Error Details				o Moas	ured Values	
	Store Error Detai	ils) Stor	e meas	
	Store Error Detai	ils aults F	or Adapte	rs With Shar) Stor	gnature	25

Part Number	Mates To		
ACEF-64	64 POS1" EDGE FEM.		
AHED-64	64 POS1" FEM.		
AHEF-64	64 POS1" MALE		
AHR2-64	64 POS 32 EACH HEADER		1
ALFH-60S	60 POS. HI-DENSITY		
AMDP-62	62 PIN MD-SUB MALE		
AMDS-62	62 POS. MD-SUB FEM.		
AMPG-62	62 POS MD-SUB MALE		
AMSG-62	62 POS.MICRO-D FEMALE		
		Con cel	

 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.

Hardware Status Update						
Status Update Type:						
System Warning						
HIGH RESISTANCE ERROR: Measured 10.1 Ohm from J1B002 to J1B004 HIGH RESISTANCE ERROR: Measured 100 Ohm from J1B003 to J1B005 HIGH RESISTANCE ERROR: Measured 1.00 kOhm from J1B006 to J1B008 HIGH RESISTANCE ERROR: Measured 9.09 kOhm from J1B007 to J1B010 HIGH RESISTANCE ERROR: Measured 85.1 kOhm from J1B013 to						
✓ <u>O</u> K Print ? <u>H</u> elp						

Resistance Measurement					
Resistor	Correct	Minimum	Maximum		
Positions	Resistance	Limit	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'.**

Hardware Status Update	? ×					
Status Update Type:						
System Warning						
HIGH RESISTANCE ERROR: Measured 10.1 Ohm f J1B004 HIGH RESISTANCE ERROR: Measured 100 Ohm fr J1B005 HIGH RESISTANCE ERROR: Measured 1.00 kOhm J1B008 HIGH RESISTANCE ERROR: Measured 9.09 kOhm J1B010 HIGH RESISTANCE ERROR: Measured 85.1 kOhm	from J1B002 to rom J1B003 to from J1B006 to from J1B007 to from J1B013 to +					
✓ <u>Q</u> K Print	? <u>H</u> elp					

	Learn Attached Device
	Connection Resistance <= 0.1 Ohm - 100 kOhm 0.1 Ohm LV Insulation Resistance > 0.1 Ohm 5.00 MOhm
	High Voltage Testing ON
	Set High Voltage Parameters
	Components To Learn
	Capacitor Diode Resistor Twisted Pair
	Learn Fourwire
8. Press Cancel' to return to the	Store Error Details
	Use Defaults For Adapters With Shared Signatures
	Learn Attached Device Cancel ? Help

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. _



 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.

Test Program - [500	Jk Threshold - Signature Single Test]	x				
	Bad					
<u>S</u> tart	New Test Hipot Error Signature: EB4F69-636F0					
		∏ ?Þ				
Net 7: HIG from J1B01	Net 7: HIGH RESISTANCE ERROR Measured 405 kOhm from J1B016 to J1A016					
		Net List				
		Probe View Errors				
D <u>o</u> ne	Areports ? Help					

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.	Test Program - [500k Threshold - Signature Single Test]
		Start New Test Hipot Error Signature: EB4F69-6J6F0
		Net 7: HIGH RESISTANCE ERROR Measured 405 kOhm from J1B016 to J1A016
		Done Breports ? Help

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'.**
- 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.



- 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'.**
- 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 Cirris easy-wire - - × Q search for a test easy-wire" Create Test Connector Registry Test Programs select category: Verification • 50V <u>E</u>dit Verify 1. In the Easy-Wire main menu, Test select "50V" and press 'Test'.~ User: Master Login asy-wire v.2014.1.0.6000 Ready 1100/Easy Touch 2000 VDC, S 2000 VDC Test Sound CIRRIS 🗙 E<u>x</u>it °o ∐tilities ? Help

2.	When the information bar at the top displays "Ready toTest", press 'Start'.	Test Program - [50V - Signature Single Test]					
		User Input Test Name		50V			Operator Not
				Total	Good	Bad	s e
		Run	3	0	0	0	Net
		All Run	Runs	2	0	2	1. St
				Elapsed	Avg. Cycle	Last Cycle	Probe
		1	Times	00:00:00	0.00 s	0.00 s	View
		Dg	ine			🖺 Reports 📄 🦳 📬	<u>H</u> elp

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.

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

🚟 Test Program - (50V - Signature Single Test)						
R	leac	ly to I	Hipot			
<u>S</u> tart	Start Abort Hipot					
Click the H	ipot Button	to start high vo	ltage testing			
				$\triangleleft ? \triangleright$		
User Input				Opera		
Test Name	50V			Monito		
	Total	Good	Bad	IS IC		
Run 3	0	0	0	Net		
All Runs	2	0	2	\$		
	Elapsed	Avg. Cycle	Last Cycle	Probe		
Times	00:00:10	0.00 s	0.00 s	View		
Done			🖹 Reports 🛛 🦳	Help		

 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.

Test Program - [50	Test Program - [50V - Signature Single Test]					
<u>S</u> tart	Si	New Test	Hipot			
User Input Test Name	50V			Operator No Monit		
Rup 9	Total	Good	Bad	ors Net		
All Runs	9	2	7	Err		
Times	Elapsed 00:01:24	Avg. Cycle 65.7 s	Last Cycle 65.7 s	ors		
Done			🖹 Reports 🛛 💙 ? L	<u>H</u> elp		

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.

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

- When the information bar displays "Ready to Hipot", press 'Hipot' and read the meter.
- 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			
Minimum Limit	Maximum Limit		
950 V	1050 V		
	000 Volt Te Minimum Limit 950 ∨		

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.

- 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.

- 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.

	Test Program - [HV IR Detection - Signature Single Test]
	Bad
	Start New Test Hipot Signature: 166514-MULTI
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.	Net NC: DIELECTRIC FAILURE J1A019 Net NC: DIELECTRIC FAILURE J1B020 Net NC: HV LEAKAGE J1B023 Measured: 400 MOhm Net NC: HV LEAKAGE J1B026 Measured: 400 MOhm
	Done Areports ? Help

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.



Test Program - [4W_TEST - Signature Single Test]

- 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.
- 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.



D<u>o</u>ne

Reports ? Help



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 <u>www.ncsli.org</u>. You can also review the ISO standards from the International Standards Organization (ISO) at their web site <u>www.iso.org</u>.

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 Pr Verification-Ve	o Performance	
Temperature:		Relative Humi	dity:	
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	4.1866Μ 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		

• $5 M\Omega$ 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: F		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		