

Signature 1000H+ Cable Analyzer Performance Verification Manual

Version 4.1b

19 January 2004

(errata in version 4.0 dated 15 Sept. 1999 corrected this date)

CIRRIS
An ISO 9001 Certified Company

Signature 1000H+ Cable Analyzer Performance Verification Manual
Version 4.1b

19 January 2004

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Salt Lake City, Utah 84119-2026
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I Need Your Help!

As Senior Editor, it's my responsibility to constantly improve the manuals and other documentation we include with our equipment. We try hard, but we know we'll never please everyone. If you were in my chair, how would you change the documentation to make it better? Here's your chance to take gripes, suggestions and (we hope) praise directly to the guy who can change things. Please fax or mail this form to me, or contact me by e-mail.

Thanks!

Van Nielson
Senior Editor, Technical Documentation

1000H+ Performance Verification Manual

Attach more pages if needed

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Table of Contents

General Information	7
Firmware	7
Things to remember	7
Your packing list	7
Set Up the Analyzer, Perform the Calibration	9
Set up the hardware	9
Set the options for testing signal routing	9
What to do if you go past the value you want	10
Get your data sheets ready	10
Test the Signal Routing System	11
Test the Resistance Measurement System	12
Test the Resistance Threshold System	14
Safety Warnings!	16
Special voltmeter required!	16
Special equipment for testing above 1000 volts	16
Special procedures	16
Testing the Hipot System	16
Test the Insulation Resistance Detection System	21
Test the Capacitance Measurement System	25
Verify the 4-Wire Testing Capability	26
Calibration Masters (for photocopying)	29
Index	33

General Information

Firmware

Your analyzer may be equipped with any of several different versions of firmware. The firmware version your analyzer has is displayed as the analyzer powers up.

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VERSION A.10

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VERSION B.29

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VERSION B.32C

- If your analyzer is equipped with firmware version A.10 up to (but not including) B.29 you can complete a basic calibration, but you **cannot** calibrate for 4-wire testing or capacitance testing.
- If your analyzer is equipped with firmware version B.29 through B.32, you can complete a basic calibration, and calibrate for 4-wire testing. You **cannot** calibrate for capacitance testing.
- If your analyzer is equipped with firmware version B.32C or later, you can complete a basic calibration, and calibrate for 4-wire and capacitance testing. **Note:** Your analyzer **must** be equipped with the correct hardware to do capacitance testing. The C in the version number indicates that your analyzer is equipped for capacitance testing.

If you need to upgrade the firmware in your 1000H+, telephone Cirris at 801-973-4600 or 800-441-9910 for assistance.

Things to remember

- You should check the calibration of your 1000H+ at least once per year. Also check the calibration whenever you suspect the analyzer may not be operating properly. You **cannot** adjust the calibration yourself. If the analyzer does not pass the calibration tests, telephone Cirris at 801-973-4600 or 800-441-9910 for assistance.
- Keep the adapter receptacles and the area surrounding the analyzer free from dust, metal particles, and other debris. Keep all liquids away from your 1000H+. Liquid spills can pose a health hazard, can severely damage the analyzer, and will immediately void its warranty.
- **If you are wearing a cardiac pacemaker, an insulin pump, or any other electronically controlled medical device**, you should not do high voltage testing with the Cirris 1000H+ cable analyzer!

Your packing list

In addition to your analyzer (with its wall transformer power supply) and this manual, you will need a Zero Ohm Adapter, a Resistor Leak Adapter, and a Capacitance Adapter to complete calibration of your 1000H+.

Set Up the Analyzer, Perform the Calibration

Set up the hardware

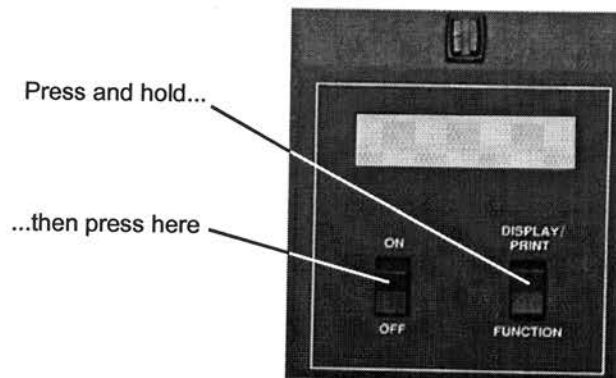
To prepare the analyzer's hardware for calibration, do these things:

- Install any expansion boxes you want to use. For information on how to do this, see your *1000H+ User's Guide*. **Note:** In our examples, we'll use a 1000H+ with no expansion boxes.
- Make sure the analyzer is turned off, then connect the power cord to the analyzer, and plug the wall transformer into a live, well-grounded wall outlet.

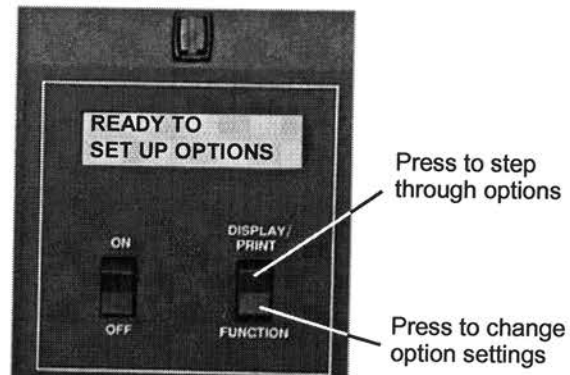
Set the options for testing signal routing

To set the test options for testing signal routing, do these things:

1. Press in and hold the Display/Print switch as you turn on the analyzer by pressing the On switch. Hold Display/Print until **Ready To Set Up Options** appears.



2. Once **Ready To Set Up Options** appears in the display, release Display/Print.



3. Select the **Create Test From** option by pressing Display/Print.

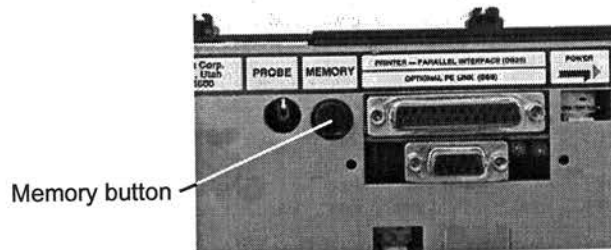
- If the setting is **SAMPLE CABLE**, go on to the next option by pressing Display/Print
 - To change the option setting, press Function until **SAMPLE CABLE** appears, then go on to the next option by pressing Display/Print.
4. Continue stepping through the options by pressing Display/Print, changing the settings as necessary by pressing Function, until all the options are set as shown in this table: When you are done, **Ready to Learn** will appear on the display.

First Option Settings for Calibration	
Option	Setting
Create Test From	SAMPLE CABLE
Connection Resistance	<.1 Ω
Hipot Voltage	OFF
Insulation Resistance	>5M Ω
Error Tones are	HIGH
Sorted Wire List is	OFF
Count All Cables is	OFF
Auto Print is	OFF

5. Turn the analyzer off.

What to do if you go past the value you want

If you want to go backward through either the options or settings, press in and hold the Memory button on the back of the analyzer, while pressing Display/Print or Function. **Note:** All options or settings will roll over to the beginning when you are going forward or backward.



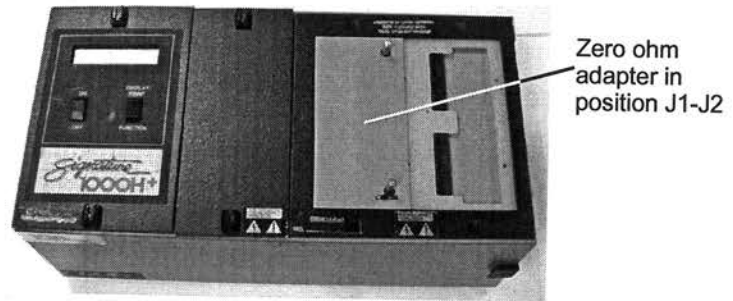
Get your data sheets ready

To make keeping track of your test results easy, we have provided a set of data sheets beginning on page 29. **PHOTOCOPY** these! That way, you will have clean sets of data sheets available whenever you need them. As you go through the calibration tests on your 1000H+, write your test results onto the photocopies.

Test the Signal Routing System

To test the signal routing system in your Cirris 1000H+, do these things:

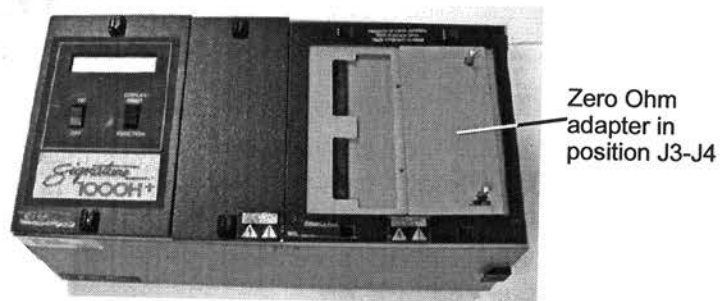
1. Install the Zero Ohm Adapter in position J1-J2 as shown here.



2. Turn on the analyzer. The analyzer will prompt **Learning Cable** for several seconds, then the prompt should change to **SIG:7F5527-6N030 Please Verify**. Write the signature you see into appropriate table on the data sheet, compare it with the Correct Signature shown in the table, and check off either Pass or Fail. Turn off the analyzer.



3. Install the Zero Ohm Adapter in position J3-J4 as shown here.



4. Turn on the analyzer. The analyzer will prompt **Learning Cable** for several seconds, then the prompt should change to **SIG:94C424-6N030 Please Verify**. Write the signature you see into appropriate table on the data sheet, compare it with the Correct Signature shown in the table, and check off either Pass or Fail. Turn off the analyzer.



Set Up the Analyzer, Perform the Calibration / Test the Resistance Measurement System

5. If you have installed expansion boxes, continue moving the Zero Ohm Adapter from “J” position to “J” position. At each “J” position, turn on the analyzer.
 - Turn off the analyzer before you move the Zero Ohm Adapter to the next “J” position
 - Read the signature from the display, write it into the appropriate blank table on the data sheet, compare the signature you see with the Correct Signature shown in the table on the data sheet, then check off PASS or Fail.

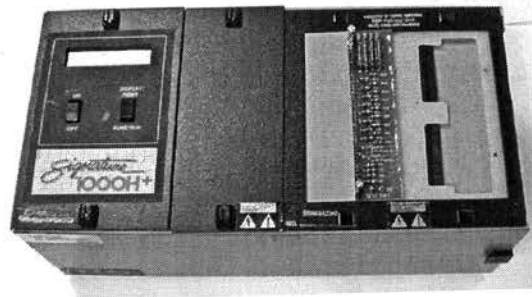
To make things easier, this table shows what the correct signatures should be for the “J” positions on the expansion boxes.

Zero Ohm Adapter in “J” Position	Correct Signature
J5-J6	5CC1A1-6N030
J7-J8	D3A34A-6N030
J9-J10	51A15E-6N030
J11-J12	C50EFB-6N030
J13-J14	E93078-6N030
J15-J16	719A99-6N030

Test the Resistance Measurement System

To test the Resistance Measurement system in your Cirris 1000H+, do these things:

1. Check the test option settings. They should **not** have changed. See page 9 for details on how to do this.
2. Install the Resistor Leak adapter in position J1-J2 as shown here.



3. Turn on the analyzer. The analyzer will prompt **Learning Cable** for several seconds. The prompt will then change to **Learned Cable Resistance Error**.

LEARNING CABLE

LEARNED CABLE
RESISTANCE ERROR

4. Press Display/Print. The analyzer will prompt with a "J" value and the first resistance value. Write the displayed resistance value into the Resistance Seen blank found within the table in the data sheet. Compare the resistance value prompted by the analyzer with the Correct Resistance shown in the table on the data sheet. This value is also shown in the table below.
 - If the displayed resistance falls either on the Correct Resistance or between the MAXimum and MINimum resistance limits shown in the table, check off Pass.
 - If the displayed resistance value falls outside the resistance limits shown in the table, check off Fail.
5. Continue pressing Display/Print, until you've checked all of the values shown below.

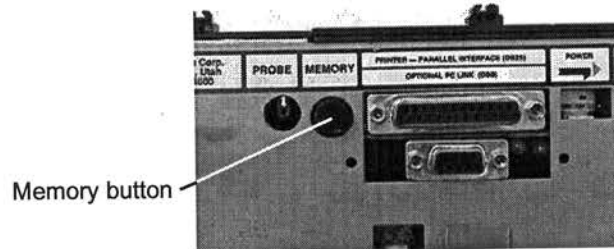
"J" Position	Correct Resis.	MINimum Limit	MAXimum Limit
J1B002-J1B004	10 ohms	9.4 ohms	10.5 ohms
J1B003-J1B005	100 ohms	95 ohms	104 ohms
J1B006-J1B008	1.00K ohms	960 ohms	1040 ohms
J1B007-J1B010	9.09K ohms	8.65K ohms	9.55K ohms
J1B013-J1B015	85.0K ohms	80.9K ohms	89.3K ohms

6. Press Display/Print a sixth time. The analyzer will prompt **Learned Cable Resistance Error**.
7. Turn off the analyzer.

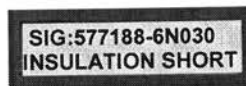
Test the Resistance Threshold System

To test the Resistance Threshold system within the Cirris 1000H+, do these things:

1. Press the Memory button on the back of the analyzer.



2. The analyzer should prompt **SIG:577188-6N030 Please Verify**. Write the displayed signature into the decision table found on the data sheet (Insulation Resistance set at 5M ohms).
 - If the Signature Seen matches the Correct Signature, check off Pass.
 - If the Signature Seen does not match the Correct Signature, check off Fail.
3. Press the Memory button again. The analyzer should prompt **SIG:577188-6N030 Insulation Short**.



4. Press Display/Print. Write the "NCJ" value seen into the NCJ Value Seen blank in the table on the data sheet. Compare the value seen with the Correct Value shown, then check off Pass or Fail.
5. Keep pressing Display/Print until you have checked six "NCJ" values. To make things easier, this table shows the six NCJ values you should see.

Row	Correct Value
1	NC J1B016
2	NC J1A016
3	NC J1A020
4	JC J1A021
5	JC J1A022
6	NC J1A023

6. Press Display/Print again. The analyzer should prompt **SIG:577188-6N030 Insulation Short**. Turn the analyzer off.

SIG:577188-6N030
INSULATION SHORT

7. Reset the test options to the settings shown in this table (see page 9 for instructions on how to set the options).

Second Option Settings for Calibration	
Option	Setting
Create Test From	SAMPLE CABLE
Connection Resistance	<.1 Ω
Hipot Voltage	OFF
Insulation Resistance	>500K Ω .
Error Tones are	HIGH
Sorted Wire List is	OFF
Count All Cables is	OFF
Auto Print is	OFF

8. Turn on the analyzer. The analyzer will prompt **Learning Cable** for several seconds. The prompt will then change to **Learned Cable Resistance Error**.

LEARNING CABLE

LEARNED CABLE
RESISTANCE ERROR

9. Press the Memory button on the back of the analyzer. The analyzer should prompt **SIG:577188-6J030 Please Verify**.

SIG:577188-6J030
PLEASE VERIFY

10. Write the displayed signature into the blank on the data sheet (Insulation Resistance set at 500 ohms), compare it with the Correct Signature, and check off Pass or Fail.
11. Press the Memory button again. The analyzer should prompt **SIG:577188-6J030 Insulation Short**.

12. Press Display/Print. The analyzer should prompt with the first of two NCJ Insulation Short values, and **Insulation Short**. Write it into the table on the data sheet, compare it with the correct value shown, then check off Pass or Fail.
13. Press Display/Print again. The analyzer should prompt with the second and last of two NCJ Insulation Short values. Write it into the table as before, compare it with the correct value shown, and check off Pass or Fail. To make things easier, this table shows the correct NCJ values that should be displayed.

Row	Correct Value
1	NC J1B016
2	NC J1A016

Safety Warnings!

The following portions of the calibration procedure involve working with high voltages.

- Only someone experienced in working with high voltages should perform these tests.
- **No one** who is wearing a cardiac pacemaker, an insulin pump, or any other electronically controlled medical device should do hipot testing using the Cirris 1000H+ cable analyzer.

Special voltmeter required!

For hipot testing at 630 volts, a special voltmeter will be required. This voltmeter must be capable of measuring at least 700 volts DC. This is beyond the safe range for most ordinary voltmeters.

Special equipment for testing above 1000 volts

For testing above 1000 volts DC, your voltmeter must be equipped with a high voltage probe, which must have at least 50 Megohms of input resistance, and be able to safely withstand over 1500 volts DC.

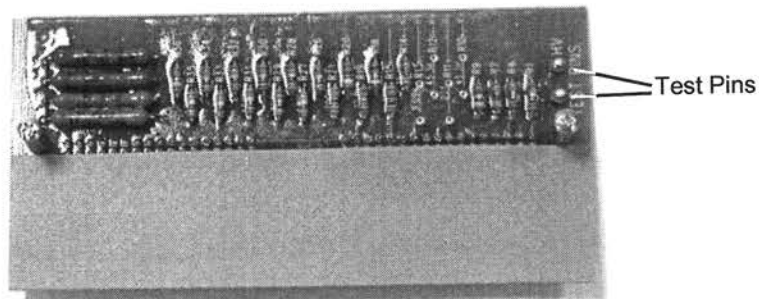
Special procedures

When you're measuring hipot voltages, begin the hipot test, measure the voltage, then turn the analyzer off **immediately**. High voltage may still be applied to the test points even when it is not showing on your voltmeter.

Testing the Hipot System

To test the hipot system inside the Cirris 1000H+, do these things:

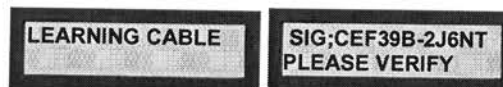
1. Connect your voltmeter's probes to the test points on the Resistor Leak adapter as shown. Be sure to check the polarity carefully.



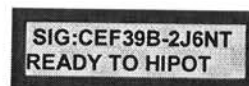
- Reset the test options to those settings shown here (see page 9 for instructions on how to set the options).

Third Option Settings for Calibration	
Option	Setting
Create Test From	SAMPLE CABLE
Connection Resistance	<5MΩ
Hipot Voltage	50 V
Insulation Resistance	>5MΩ.
Hipot Duration	10 SEC
Apply Hipot To	ALL ADAPTER PINS
Single Net Error	FAILS HIPOT
Auto Hipot	OFF
Error Tones are	HIGH
Sorted Wire List is	OFF
Count All Cables is	OFF
Auto Print is	OFF

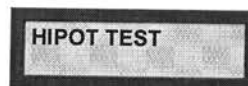
- Turn the analyzer off.
- Turn the analyzer on. The analyzer will prompt **Learning Cable** for several seconds. The prompt will then change to **SIG:CEF39B-2J6NT Please Verify**. Write the displayed signature into the table on the data sheet (50 volt test), then complete the usual compare and check-off steps.



- Press the Memory button. The analyzer will prompt **SIG:CEF39B-2J6NT Ready to Hipot**.



- Press Function. The analyzer will prompt **Hipot Test**.



7. Read the hipot voltage displayed on your voltmeter. Write this voltage into the table on the data sheet (50 volt test). Compare your measured voltage with the Correct Voltage and the MINimum and MAXimum limits shown in the table. Complete the usual check-off step. **Note:** *The analyzer will continue to apply high voltage to each pin or net on the high voltage adapter if it is allowed to continue running. It will take a long time to finish the test.*
 - To shut off the hipot voltage, **turn the analyzer off** to abort the test once you've read and recorded the voltage. This will happen on all high voltage tests.

To make things easier, this table shows the Correct Voltage and the MINimum and MAXimum voltage limits for this part of the test.

Correct Voltage	MINimum Limit	MAXimum Limit
50 Volts	45 Volts	55 Volts

8. Reset the test options to the settings shown here. **Careful!** You are now setting the hipot voltage to a level that can be dangerous to you and your voltmeter.

Fourth Option Settings for Calibration	
Option	Setting
Create Test From	SAMPLE CABLE
Connection Resistance	AUTO
Hipot Voltage	630 V
Insulation Resistance	>5MΩ.
Hipot Duration	10 SEC
Apply Hipot To	ALL ADAPTER PINS
Single Net Error	FAILS HIPOT
Auto Hipot	OFF
Error Tones are	HIGH
Sorted Wire List is	OFF
Count All Cables is	OFF

9. Turn the analyzer off.
10. Turn the analyzer on. The analyzer will prompt **Learning Cable** for several seconds. The prompt will change to **SIG:577188-EJ67V Please Verify.**



Set Up the Analyzer, Perform the Calibration / Testing the Hipot System

11. Write the displayed value into the table on the data sheet (630 volt test), then complete the usual compare and check-off steps.
12. Press the **Memory** button. The analyzer will prompt **SIG:577188-EJ67V Ready to Hipot.**

SIG:577188-EJ67V
READY TO HIPOT

13. Press **Function**. The analyzer will prompt **Hipot Test.**

HIPOT TEST

14. Measure the hipot voltage using your voltmeter. Write the voltage (read from your voltmeter) into the Voltage Seen blank (630 volt test) in the table on the data sheet. Compare the voltage you've measured with the Correct Voltage and the MINimum and MAXimum limits shown in the table, and complete the usual check-off step.

- To shut off the hipot voltage, **turn the analyzer off** to abort the test once you've read and recorded the voltage.

To make things easier, this table shows the Correct Voltage and the MINimum and MAXimum voltage limits for this part of the test

Correct Voltage	MINimum Limit	MAXimum Limit
630 Volts	567 Volts	693 Volts

Important Note!: The 1000 volt test is *optional*. If you do not intend to use the analyzer at 1000 volts, go directly to the next section (testing the Insulation Resistance Detection System).

Please see next page...

15. Change the option settings to those shown in this table (see page 9 for instructions on how to do this). **Caution!** You are setting the analyzer to place 1000 volts across the test points. *This is a dangerous voltage to you and to your equipment if you do not treat it with respect. Double-check everything before you apply the test voltage. Be certain that your voltmeter is equipped with a special high voltage probe. This probe must have at least 50 Megohms of input resistance, and must be able to withstand at least 1500 volts DC. Set the meter's controls properly for this measurement. The meter will be destroyed if you do not take these precautions!*

Fifth Option Settings for Calibration	
Option	Setting
Create Test From	SAMPLE CABLE
Connection Resistance	AUTO
Hipot Voltage	1000 V
Insulation Resistance	>10MΩ.
Hipot Duration	10 SEC
Apply Hipot To	ALL ADAPTER PINS
Single Net Error	FAILS HIPOT
Auto Hipot	OFF
Error Tones are	HIGH
Sorted Wire List is	OFF
Count All Cables is	OFF
Auto Print	OFF

16. Turn the analyzer off.
17. Turn the analyzer on. The analyzer will prompt **Learning Cable** for several seconds. The prompt will then change to **SIG:577188-KJXXV Please Verify**.
Note: Since the Connection Resistance is set to Auto, the two digits represented by X's may not be the same as those that appear in your analyzer's display.



18. Write the displayed signature into the table on the data sheet (1000 volt test), then complete the usual compare and check-off steps.

19. Press the Memory button. The analyzer should prompt **SIG:577188-KJXXV Ready to Hipot.**

SIG:577188-KJXXV
READY TO HIPOT

20. Press Function. The analyzer will prompt **Hipot Test.**

HIPOT TEST

21. Measure the voltage using your voltmeter. Write the voltage (read from your voltmeter) into the Voltage Seen blank (1000 volt test) in the table on the data sheet. Compare the voltage you've measured with the Correct Voltage and the MINimum and MAXimum limits shown in the table, and complete the usual check-off step.

- To shut off the hipot voltage, **turn the analyzer off** to abort the test once you've read and recorded the voltage.

To make things easier, this table shows the Correct Voltage and the MINimum and MAXimum voltage limits for this part of the test

Correct Voltage	MINimum Limit	MAXimum Limit
1000 Volts	900 Volts	1100 Volts

Test the Insulation Resistance Detection System

To test the Insulation Resistance Detection System inside the Cirris 1000H+, do these things:

- Change the option settings to the ones shown below (see page 9 for instructions on how to do this).

Sixth Option Settings for Calibration	
Option	Setting
Create Test From	SAMPLE CABLE
Connection Resistance	AUTO
Hipot Voltage	50 V
Insulation Resistance	>5MΩ.
Hipot Duration	100mS
Apply Hipot To	ALL ADAPTER PINS
Single Net Error	FAILS HIPOT
Auto Hipot	OFF

Sixth Option Settings for Calibration	
Option	Setting
Error Tones are	HIGH
Sorted Wire List is	OFF
Count All Cables is	OFF
Auto Print	OFF

- Turn the analyzer off.
- Turn the analyzer on. The analyzer will prompt Learning Cable for several seconds. The prompt will then change to **SIG:577188-2JXXL**. **Note:** Because the Connection Resistance is set to Auto, the two digits represented here by X's may not be the same as those shown in your analyzer's display.



- Write the displayed signature into the table on the data sheet (50 volt test), then complete the usual compare and check-off procedure.
- Press the Memory button. The analyzer will prompt **Ready to Hipot**.



- Press Function. The analyzer will prompt **Hipot Test**. The test will proceed, then the analyzer will prompt **Failed Hipot Test**.



- Press Display/Print. The analyzer will prompt with the first of six NCJ values, and **Has Leakage**. Write the displayed NCJ value into the first row blank in the table on the data sheet, and complete the usual compare and check-off procedure. Continue pressing Display/Print, then recording NCJ values in the table until you've completed all six tests. To make things easier, this table (continued on next page) shows the NCJ values you should see.

Row	Correct Value
1	NC J1B016
2	NC J1A016

Row	Correct Value
3	NC J1A020
4	JC J1A021
5	JC J1A022
6	NC J1A023

8. Press Display/Print a seventh time. The analyzer should prompt **SIG:577188-2JXXL Ready to Hipot.**

**SIG:577188-2JXXL
READY TO HIPOT**

9. Change the options to the settings shown in this table (see page 9 for details on how to do this). **Caution!** You are setting the analyzer to hipot test at 1000 volts.

Seventh Option Settings for Calibration	
Option	Setting
Create Test From	SAMPLE CABLE
Connection Resistance	<5M Ω
Hipot Voltage	1000 V
Insulation Resistance	>500M Ω .
Hipot Duration	100mS
Apply Hipot To	ALL ADAPTER PINS
Single Net Error	FAILS HIPOT
Auto Hipot	OFF
Error Tones are	HIGH
Sorted Wire List is	OFF
Count All Cables is	OFF
Auto Print	OFF

10. Turn the analyzer off.
11. Turn the analyzer on. The analyzer will prompt **Learning Cable** for several seconds. The prompt should then change to **SIG:CEF39B-KX6NJ Please**

Verify. Write the displayed signature into the table on the data sheet (1000 volt test), then complete the usual compare and check-off step.

LEARNING CABLE

SIG:CEF39B-KX6NJ
PLEASE VERIFY

12. If you haven't already done so, **disconnect your voltmeter** from the analyzer.
13. Press the Memory button. The analyzer will prompt **SIG:CEF39B-KX6NJ Ready to Hipot.**

SIG:CEF39B-KX6NJ
READY TO HIPOT

14. Press Function. The analyzer should prompt **Failed Hipot Test.**

FAILED HIPOT TEST

15. Press Display/Print. The analyzer should prompt with the first of four NCJ values, and **Has Leakage**. Write the value into the first row of the table shown in the data sheet, then complete the usual compare and check-off step. Continue pressing Display/Print, then writing down the NCJ values in the table. Only four NCJ values should be shown. Check for any extra or missing values. The values you see, and the Correct Values shown in the table must match exactly for the analyzer to pass the test.

To make things easier, this table shows the values you should see:

Row	Correct Value
1	NC J1A019
2	NC J1B020
3	NC J1B023
4	JC J1B026

16. Turn the analyzer off.

Test the Capacitance Measurement System

To test the Capacitance Measurement system in your Cirris 1000H+, do these things:

1. Find out what firmware version your analyzer is equipped with (see page 7 for instructions on how to do this). To calibrate the system for capacitance, your analyzer must be equipped with version B.32C or later.
2. Install the Capacitance/4-Wire adapter in position J1-J2 as shown here. (The adapter must be installed to be able to set these options.)



3. Set the test options as shown below (see page 9 for instructions on how to do this).

Eighth Option Settings for Calibration	
Option	Setting
Create Test From	COMPLEX ASSEMBLY
Connection Resistance	<.001Ω
Hipot Voltage	OFF
Insulation Resistance	>5MΩ.
Error Tones are	HIGH
Sorted Wire List is	OFF
Count All Cables is	OFF
Auto Print	OFF

4. Turn the analyzer off.
5. Turn the analyzer on. The analyzer will prompt **Learning Cable** for several seconds. The analyzer will display three different screens during the learning process, then the prompt will change to **SIG:388ECB-MULTI Please Verify**.

LEARNING CABLE

SIG:388ECB-MULTI
PLEASE VERIFY

6. Write the displayed signature into the table on the data sheet (first of two tables for the capacitance test), then complete the usual compare and check-off step.
7. Do one of these things:
 - If you have a printer connected to your 1000H+, press Display/Print. Verify the printout the analyzer makes against the printout shown below.
 - If you do not have a printer connected to your 1000H+, press Display/Print nine (9) times. As you step through, the display should show the same information contained in this printout.

SIGNATURE 1000H+ CABLE DOCUMENTATION

CABLE SIGNATURE 388ECB CABLE PART NO.: _____
PARAMETER SIGNATURE MULTI
J1 ADAPTER SIGNATURE: FBEA7D CONNECTOR DESCRIPTION _____
CABLE DESCRIPTION: _____

PARAMETER SETTINGS:
INSULATION TEST PARAMETER SIGNATURE: 6N6N0
HIPOT VOLTAGE OFF
INSULATION RESISTANCE >5M ohm

WIRE LIST SIGNATURE: 444A85-5Z031
WIRE RESISTANCE <.001 ohm
COMPONENT RESISTANCE >95K ohm

WIRE LIST:
NO. COMMON CONNECTIONS
1 J-001 J-002

CHECK COMPONENTS:
NO. DESCRIPTION
1 CAP J-003 J-006 1.38 uF 10%

NOTES:

8. Turn the analyzer off.

Verify the 4-Wire Testing Capability

To verify the 4-wire testing capability in your Cirris 1000H+, do these things:

1. Check what firmware version your analyzer is equipped with (see page 7 for instructions on how to do this). **If the firmware version is not B.29 or later**, skip this test. Earlier firmware versions do not allow 4-wire testing.
2. Be sure the Capacitance/4-Wire adapter is still installed in position J1-J2.

Set Up the Analyzer, Perform the Calibration / Performance Verification complete

3. Turn on the analyzer. The analyzer will move rapidly through several prompts, then will display **SIG:388ECB-MULTI Please Verify**.

**SIG:388ECB-MULTI
PLEASE VERIFY**

4. Write the displayed signature into the table shown in the data sheet (first table for the 4-Wire test), then complete the usual compare and check-off step.
5. Press the **Memory** button, then release it. The analyzer will perform a continuity test and an insulation check.
6. Press the **Function** switch, and hold it down. The analyzer will perform a 4-wire test while it prompts **Performing Four Wire Test**.
7. Release the **Function** switch. The analyzer should prompt **SIG:444A85-MULTI Bad R>.001Ω**. This is the correct response. The 1000H+ has correctly distinguished between 0.1Ω on the traces, and 0.2 Ω on the resistor.
8. Press **Display/Print**. The analyzer should prompt J-001 J-002 0.200Ω. The value should be between 0.180Ω and 0.200Ω.
9. Do the final check:
 - If you do not have a printer connected to your 1000H+, the displayed value should be between 0.180Ω and 0.220Ω.
 - If you do have a printer connected to your 1000H+, press **Display/Print**. Verify it against the printout shown below.

CABLE SIGNATURE: 444A85

1 J-001 J-002
HIGH RESISTANCE .202 ohm

10. Turn the analyzer off

**Performance
Verification complete**

This completes the performance verification of your Cirris 1000H+ cable analyzer. If the analyzer did not pass all tests as given in this manual, telephone Cirris at 801-973-4600 or 800-441-9910 for assistance. There are no internal adjustments you can make yourself to bring the analyzer into compliance.

Set Up the Analyzer, Perform the Calibration / Performance Verification complete

Calibration Sheet for 1000H+

Date _____ Serial # _____

1- Test Signal Routing System

Performed By _____

Zero Ohm Adapter at Position J1-J2

Signature Seen	Correct Signature	Pass	Fail
	7F5527-6N030		

Zero Ohm Adapter at Position J3-J4

Signature Seen	Correct Signature	Pass	Fail
	94C424-6N030		

Zero Ohm Adapter at Position J5-J6

Signature Seen	Correct Signature	Pass	Fail
	5CC1A1-6N030		

Zero Ohm Adapter at Position J7-J8

Signature Seen	Correct Signature	Pass	Fail
	D3A34A-6N030		

Zero Ohm Adapter at Position J9-J10

Signature Seen	Correct Signature	Pass	Fail
	51A15E-6N030		

Zero Ohm Adapter at Position J11-J12

Signature Seen	Correct Signature	Pass	Fail
	C50EFB-6N030		

Zero Ohm Adapter at Position J13-J14

Signature Seen	Correct Signature	Pass	Fail
	E93078-6N030		

Zero Ohm Adapter at Position J15-J16

Signature Seen	Correct Signature	Pass	Fail
	719A99-6N030		

2- Test Resistance Measurement System

ROW	J Position	Resis. Seen	Correct Resis.	Min. Limit	Max. Limit	Pass	Fail
1	J1B002-J1B004		10 ohms	9.4 ohms	10.5 ohms		
2	J1B003-J1B005		100 ohms	95 ohms	104 ohms		
3	J1B006-J1B008		1000 ohms	960 ohms	1040 ohms		
4	J1B007-J1B010		9.09K ohms	8.65K ohms	9.55K ohms		
5	J1B013-J1B015		85.0K ohms	80.9K ohms	89.3K ohms		

3- Test Resistance Threshold System

Insulation Resistance set at 5M ohms

Signature Seen	Correct Signature	Pass	Fail
	577188-6N030		

ROW	NC J Value Seen	Correct Value	Pass	Fail
1		NC J1B016		
2		NC J1A016		
3		NC J1A020		
4		NC J1A021		
5		NC J1A022		
6		NC J1A023		

Insulation Resistance set at 500 ohms

Signature Seen	Correct Signature	Pass	Fail
	577188-6J030		

ROW	NC J Value Seen	Correct Value	Pass	Fail
1		NC J1B016		
2		NC J1A016		

4- Test Hipot System

50 Volt Test

Signature Seen	Correct Signature	Pass	Fail
	CEF39B-2J6NT		

Voltage Seen	Correct Voltage	Min. Limit	Max. Limit	Pass	Fail
	50 Volts	45 Volts	55 Volts		

630 Volt Test

Signature Seen	Correct Signature	Pass	Fail
	577188-EJ67V		

Voltage Seen	Correct Voltage	Min. Limit	Max. Limit	Pass	Fail
	630 Volts	567 Volts	693 Volts		

1000 Volt Test

Signature Seen	Correct Signature	Pass	Fail
	577188-KJ(XX)V		

Voltage Seen	Correct Voltage	Min. Limit	Max. Limit	Pass	Fail
	1000 Volts	900 Volts	1100 Volts		

Note: Since the connection resistance is set to 'AUTO', the two digits "XX" may not be the same as those that appear in your analyzer's display.

5- Test Insulation Resistance Detection System

50 Volt Test

Signature Seen	Correct Signature	Pass	Fail
	577188-2J(XX)L		

Note: Since the connection resistance is set to 'AUTO', the two digits "XX" may not be the same as those that appear in your analyzer's display.

ROW	NC J Value Seen	Correct Value	Pass	Fail
1		NC J1B016		
2		NC J1A016		
3		NC J1A020		
4		NC J1A021		
5		NC J1A022		
6		NC J1A023		

1000 Volt Test

Signature Seen	Correct Signature	Pass	Fail
	CEF39B-KX6NJ		

ROW	NC J Value Seen	Correct Value	Pass	Fail
1		NC J1A019		
2		NC J1B020		
3		NC J1B023		
4		NC J1B026		

6- Test Capacitance Measurement System

Signature Seen	Correct Signature	Pass	Fail
	388ECB-MULTI		

Display	Min. Limit	Max. Limit	Pass	Fail
Check 1 cap 1.41 uF 10%	1.27 uF	1.55 uF		

7- Test 4-Wire Test Function

Signature Seen	Correct Signature	Pass	Fail
	388ECB-MULTI		

Display	Min. Limit	Max. Limit	Pass	Fail
J1-001 J-002. (XXX) ohms	0.18 ohms	0.22 ohms		

Note: Capacitance (XXX) May not be the same as those that appear on all testers, but should fall within the limits above.

This is the end of the Data Sheet

Index

Numerics

4-Wire Testing capability

How to verify it 26

C

Calibration

How often to calibrate 7

Capacitance Measurement system

How to test it 25

D

Data Sheets

Master copies for photocopying 29

Recommend you copy them 10

F

Firmware

How to find out what version you have 7

H

Hardware

Set up for calibration 9

Hipot system

How to test it 16

I

Insulation Resistance Detection system

How to test it 21

O

Options

Eighth settings for calibration 25

Fifth settings for calibration 20

First settings for calibration 10

Fourth settings for calibration 18

How to set 9

Second set for calibration 15

Seventh settings for calibration 23

Sixth settings for calibration 21

Third settings for calibration 17

What to do if you go past the value you want 10

P

Packing list

What your order should contain 7

R

Resistance Measurement system

How to test it 12

Resistance Threshold system

How to test it 14

S

Safety Warnings 16

Signal Routing system

How to test it 11

W

What to do if you go past the value you want 10

