

Signature 1000H/2000H Cable Analyzer Performance Verification Manual

Version 4.5
Major Revision
10 December, 1999
(Errata corrected 9 January, 2001)

CIRRIIS
An ISO 9001 Certified Company

Signature 1000H/2000H Cable Analyzer Performance Verification Manual
Version 4.5

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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!

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1000H/2000H Performance Verification Manual

Attach more pages if needed

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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 2.36

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 analyzer 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 analyzer. 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 any Cirris 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, and a 1000H/2000H Resistance Adapter to complete calibration of your analyzer.

Set Up the Analyzer, Perform the Calibration

Set up the hardware

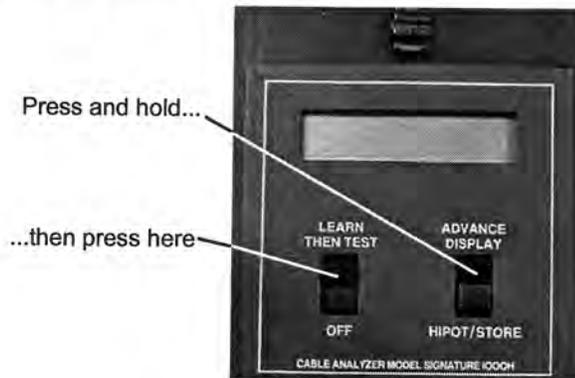
To prepare the analyzer's hardware for calibration, do these things:

- 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.

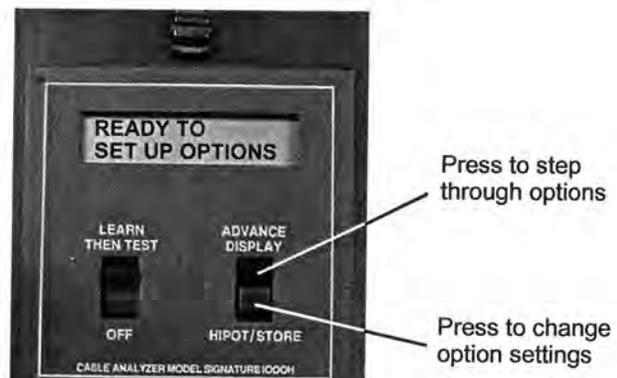
Set the options for testing signal routing

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

1. Press in and hold the Advance Display switch as you turn on the analyzer by pressing the Learn Then Test switch. Hold Advance Display until **Ready To Set Up Options** appears.



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



- Continue stepping through the options by pressing Advance Display, changing the settings as necessary by pressing Hipot/Store, 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
IGNORE UNUSED IS	OFF
RESIS THRESHOLD IS	.5Ω
HIPOT VOLTAGE	OFF
HIPOT DURATION	10 mS
INSULATION RESIS	>5MΩ
AUTO HIPOT	OFF
LOCK ON LEARN	OFF
ERROR TONES	ON
SORTED WIRE LIST	OFF
COUNT ALL CABLES	OFF
AUTO PRINT	OFF (2000H only)

- 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 Advance Display or Hipot/Store. **Note:** All options or settings will roll over to the beginning when you are going forward or backward.



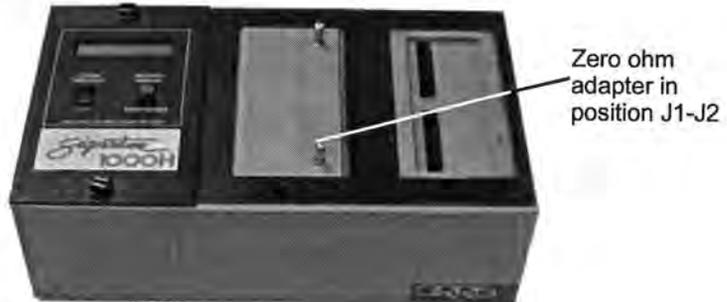
Get your data sheets ready

To make keeping track of your test results easy, we have provided a double-sided data sheet beginning on page 19. **PHOTOCOPY** this! That way, you will have clean data sheets available whenever you need them. As you go through the calibration tests on your analyzer, write your test results onto the photocopies.

Test the Signal Routing System

To test the signal routing system in your Cirris analyzer, 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:7F5527-0002 Please Verify**. Write the signature you see into Table 1 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:94C424-0002 Please Verify**. Write the signature you see into Table 2 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.

LEARNING CABLE

SIG:94C424-0002
PLEASE VERIFY

Note: If you are working on a 1000H analyzer, go directly to page 12, "Test the Resistance Measurement System."

5. If you are working on a 2000H analyzer, install the Zero Ohm adapter in position J5-J6.
6. Turn on the analyzer. The analyzer will prompt **Learning Cable** for several seconds, then the prompt should change to **SIG:5CC1A1-0002 Please Verify**.

LEARNING CABLE

SIG:5CC1A1
PLEASE VERIFY

7. Record the prompted signature as usual in Table 3 on the data sheet, then compare the signature with the correct signature shown on the data sheet. Check off "Pass" or "Fail" as usual. Turn off the analyzer.
8. Install the Zero Ohm Adapter in position J7-J8.
9. Turn on the analyzer. The analyzer will prompt Learning Cable for several seconds. The prompt will then change to **SIG: D3A34A-0002 Please Verify**.

LEARNING CABLE

SIG:D3A34A-0002
PLEASE VERIFY

10. Record the displayed signature in Table 4 on the data sheet as usual, compare it with the correct signature, then check off "Pass" or "Fail" as usual.

Test the Resistance Measurement System

To test the Resistance Measurement system in your Cirris analyzer, 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. Remove the Zero Ohm Adapter and set it aside.

3. Install the 1000H/2000H Resistance Adapter in position J1-J2 as shown here..



4. Turn on the analyzer. The analyzer will prompt **Learning Cable** for several seconds. The prompt will then change to **SIG:F02D99-0002 Please Verify**..

LEARNING CABLE

SIG: F02D99-0002
PLEASE VERIFY

5. Press the **Memory** button on the back of the analyzer. The analyzer should prompt **SIG:F02299-0002 BAD R>.5Ω**.
6. Press **Advance Display**. The analyzer will prompt with the first of seven “J” values, and the first of seven resistance values.
7. Record the values displayed in Row 1 of Table 5 on the data sheet. Compare these with the correct values shown in the data sheet, then check off “Pass” or “Fail” as usual.
8. Continue pressing **Advance Display** to work your way through all 7 resistance values that should display. As you write the values you see into Table 5 on the data sheet, check each displayed resistance value carefully against the correct values (and allowable ranges) shown. Check off **PASS** or **Fail** as you go.
9. Press **Advance Display** an eighth time. Only seven values should display. The eighth button press should change the prompt to **SIG:F02D99-0002 BAD R>.5Ω**.

Important Warnings! The remaining sections of this performance verification involve working with high voltages.

- These tests should be performed by someone experienced in working with such voltages.

- **No one** who is wearing a cardiac pacemaker, an insulin pump, or any electronically controlled medical device should do hipot testing using a Cirris Cable Analyzer.
- For hipot testing at 630 volts DC, a **special** voltmeter will be needed. This voltmeter must be capable of measuring at least 700 volts DC. Many common voltmeters cannot measure this much voltage. Subjecting a voltmeter to voltages it is not designed to handle will destroy the meter!
- When you are measuring hipot voltages, begin the hipot test, measure and record the voltage, and turn the analyzer off *immediately*. High voltage may still be applied to the test points even when it is not showing on your voltmeter.

Test the Hipot System

To test the hipot system within your analyzer, do these things:

1. With the 1000H/2000H Resistance Adapter still installed in position J1-J2, connect your voltmeter's probes to the test points on the adapter.



2. Set the meter's controls to measure at least 75 volts DC.
3. Reset the options to these settings:

Second Option Settings for Calibration	
Option	Setting
IGNORE UNUSED IS	OFF
RESIS THRESHOLD IS	.5Ω
HIPOT VOLTAGE	50 V
HIPOT DURATION	10 SEC
INSULATION RESIS	>5MΩ
AUTO HIPOT	OFF

Second Option Settings for Calibration	
Option	Setting
LOCK ON LEARN	OFF
ERROR TONES	ON
SORTED WIRE LIST	OFF
COUNT ALL CABLES	OFF
AUTO PRINT	OFF (2000H only)

4. Turn off the analyzer.
5. Turn on the analyzer. The analyzer will prompt **Learning Cable** for several seconds. The prompt will then change to **SIG: F02D99-2C02 Please Verify**.
6. Write the displayed signature into the Signature Seen blank in Table 6 on the data sheet. Compare it with the Correct Signature in the table, then check off "Pass" or "Fail" as usual.
7. Press the Memory button. The analyzer will prompt **SIG: F02D99-2C02 R>.5Ω**.
8. Press Hipot/Store. The analyzer will prompt **High Voltage Do Not Touch**.
9. Write the voltage you measure with your voltmeter into the Voltage Seen blank in Table 7 on the data sheet, then **turn off the analyzer immediately**. You don't need to wait for the hipot test to finish.
10. Compare the voltage you measured with the Correct Voltage shown in the table on the data sheet. Check off "Pass" or "Fail" as usual.
11. Set the options to the settings shown in this table:

Third Option Settings for Calibration	
Option	Setting
IGNORE UNUSED IS	OFF
RESIS THRESHOLD IS	.5Ω
HIPOT VOLTAGE	630 V
HIPOT DURATION	10 SEC
INSULATION RESIS	>5MΩ
AUTO HIPOT	OFF

Third Option Settings for Calibration	
Option	Setting
LOCK ON LEARN	OFF
ERROR TONES	ON
SORTED WIRE LIST	OFF
COUNT ALL CABLES	OFF
AUTO PRINT	OFF (2000H only)

12. Turn the analyzer off. You have now set the hipot voltage to 630 volts. This can be a dangerous voltage to you and to your equipment. Be **careful!** Set your voltmeter's controls to measure at least 700 volts DC.
 13. With the 1000H/2000H Resistance Adapter still installed at position J1-J2, turn on the analyzer. It should prompt **SIG: F02D99-EC02**.
 14. Write the displayed signature into the blank in Table 8 on the data sheet. Compare it with the correct value shown, then check off "Pass" or "Fail" as usual.
 15. Press the **Memory** button on the back of the analyzer. The analyzer will prompt **SIG:F02D99-EC02 BAD R>.5Ω**.
 16. Press **Hipot/Store**. The analyzer will prompt **High Voltage Do Not Touch**.
 17. Measure the hipot voltage with your voltmeter, and record the measured voltage in the Voltage Seen blank in Table 9 on the data sheet. **Turn off the analyzer immediately.**
 18. Compare the voltage you measured with the correct voltage shown in the table on the data sheet, then check off "Pass" or "Fail" as usual.
 19. Disconnect your voltmeter's test leads from the analyzer.
1. Change the option settings to these settings:

**Test the
Insulation
Resistance
Detection
System**

Fourth Option Settings for Calibration	
Option	Setting
IGNORE UNUSED IS	OFF
RESIS THRESHOLD IS	.5Ω
HIPOT VOLTAGE	630 V
HIPOT DURATION	100mS

Fourth Option Settings for Calibration	
Option	Setting
INSULATION RESIS	>500M Ω
AUTO HIPOT	OFF
LOCK ON LEARN	OFF
ERROR TONES	ON
SORTED WIRE LIST	OFF
COUNT ALL CABLES	OFF
AUTO PRINT	OFF (2000H only)

2. With the 1000H/2000H Resistance Adapter still installed at position J1-J2, turn on the analyzer.
3. The analyzer will prompt **Learning Cable** for several seconds. The prompt will then change to **SIG: F02D99-E462 Please Verify**.
4. Write the displayed signature into the Signature Seen blank in Table 10 on the data sheet. Compare it with the Correct Signature in the table, then check off "Pass" or "Fail" as usual.
5. Press the **Memory** button on the back of the analyzer. The analyzer will prompt **SIG:F02D299-E462 BAD R> .5 Ω** .
6. Press **Hipot/Store**. The analyzer will prompt **High Voltage Do Not Touch**, then **Failed Hipot Test**.
7. Press **Advance Display** to view the first of two "NCJ" values. Write the value into the appropriate blank on Table 11 in the data sheet. Compare it with the correct value shown in the table, and check off "Pass" or "Fail" as usual.
8. Press **Advance Display** again to view the second of two "NCJ" values. As before, write the value you see into the appropriate blank in Table 11 on the data sheet, compare it with the correct value from the table, and check off "Pass" or "Fail" as usual.

Conclusion

You have completed the performance verification tests on your Cirris analyzer. If the analyzer passed all of these tests, it is working properly.

If your analyzer did not pass all of these tests, please call our customer support team at 801-973-4600 or 800-441-9910. Please have the tables that you filled out during the testing process available when you call. Be prepared to give our customer service person as complete a description as you can of the failure(s) or other problems that you encountered while verifying the analyzer's performance.

Data Sheet Master

PHOTOCOPY THIS!

This data sheet gives you an easy way to record your calibration testing results as you work through the procedure. Photocopy this double-sided sheet, then write your results onto the copies instead of onto this original. That way you will have a supply of data sheets ready whenever you need them.

File copies?

A good way to keep track of the calibrations you do on your Cirris analyzer is to simply file the completed data sheets away for permanent reference. We recommend this as a good way to start a “calibration trail” on your analyzer.

Calibration Data Sheet

Cirris 1000H/2000H Cable Analyzer

Test Date: ___ / ___ / ___
 Operator: _____
 Analyzer Serial Number: _____

Test the Signal Routing System

Table 1

Signature Seen	Correct Signature	Pass	Fail
	7F5527-0002		

Zero Ohm adapter at position J1-J2

Table 2

Signature Seen	Correct Signature	Pass	Fail
	94C424-0002		

Zero Ohm adapter at position J3-J4

Table 3

Signature Seen	Correct Signature	Pass	Fail
	5CC1A1-0002		

Zero Ohm adapter at position J5-J6
(2000H only)

Table 4

Signature Seen	Correct Signature	Pass	Fail
	D3A34A-0002		

Zero Ohm adapter at position J7-J8
(2000H only)

Test the Resistance Measurement System

Table 5

Row	"J" Posit.	Resis. Seen	Correct Resis.	MIN Limit	MAX Limit	Pass	Fail
1	J1A02 J1A03		22.1Ω	21.0Ω	23.2Ω		
2	J1B02 J1B04		10.0Ω	9.5Ω	10.5Ω		
3	J1B03 J1B05		100Ω	95Ω	105Ω		
4	J1A04 J1A05		44.2Ω	42.0Ω	46.4Ω		
5	J1B06 J1B08		1000Ω	950Ω	1050Ω		
6	J1A06 J1A07		221Ω	210Ω	232Ω		
7	J1A08 J1A09		510Ω	485Ω	536Ω		

Only 7 "J" positions should display. The analyzer's prompt returns to "SIG:F02D99-0002 BAD R> .5Ω." All of the "J" information displayed must match that shown here.

Test the Hipot System

Table 6

Signature Seen	Correct Signature	Pass	Fail
	F02D99-2C02		

Table 7

Voltage Seen	Correct Voltage	MIN Limit	MAX Limit	Pass	Fail
	50 VOLTS	45 VOLTS	55 VOLTS		

Table 8

Signature Seen	Correct Signature	Pass	Fail
	F02D99-EC02		

Table 9

Voltage Seen	Correct Voltage	MIN Limit	MAX Limit	Pass	Fail
	630 VOLTS	567 VOLTS	693 VOLTS		

Test the Insulation Resistance Detection System

Table 10

Signature Seen	Correct Signature	Pass	Fail
	F02D99-E462		

Table 11

Row	"NCJ" Value Seen	Correct "NCJ"	Pass	Fail
1		NCJ1B23		
2		NCJ1B26		

Only two values should display. Check for extra or missing values. The "NCJ" Value Seen and the Correct "NCJ" must match exactly for the analyzer to pass this test.

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