





| | | |
|--------------|---|---|
| Part #: | TRV 1M Series |    |
| Description: | <ul style="list-style-type: none"> • 1 W DC/DC converters in a compact SIP-9 package • Reinforced isolation of 5000 V_{AC} • Medical and industrial safety approvals |  Download Datasheet |

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October 13, 2020, 02:12:28 pm

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Author

Topic: **Sencore LC102 & LC103 Capacitor & Inductor Analyzer** (Read 4792 times)

volvo_nut_v70 and 1 Guest are viewing this topic.

HighVoltage

Super Contributor



Posts: 4516

Country:



Sencore LC102 & LC103 Capacitor & Inductor Analyzer

[Say Thanks](#) [Reply](#) [Quote](#)

« on: July 18, 2019, 09:17:47 am »

This thread is about the Sencore LC102 and LC103 Capacitor & Inductor Analyzer

I am interested to buy a ~~Sencore LC102 Capacitor & Inductor Analyzer~~ in good working condition with accessories for a reasonable price.

Preferable from within the EU but if needed, it can be shipped from outside the EU as well.

« Last Edit: August 18, 2019, 04:31:12 pm by HighVoltage »

[Report to moderator](#)

There are 3 kinds of people in this world, those who can count and those who can not.

cahillsr

Newbie

Posts: 1

Country:



Re: WTB: Sencore LC102 Capacitor & Inductor Analyzer

[Say Thanks](#) [Reply](#) [Quote](#)

« Reply #1 on: July 20, 2019, 06:52:27 pm »

I have one needs repair. Everything seems to work except ESR and leads won't zero on open. I am in NH USA

[Report to moderator](#)

HighVoltage

Super Contributor

Re: Bought: Sencore LC102 Capacitor & Inductor Analyzer

[Say Thanks](#) [Reply](#) [Quote](#)

« Reply #2 on: July 31, 2019, 11:49:07 pm »



Posts: 4516

Country:

 **coromonadalix**

Super Contributor



Posts: 2813

Country:



I have found a broken Sencore LC103 instead and bought it.
Might be a good repair thread.

Report to moderator Logged

There are 3 kinds of people in this world, those who can count and those who can not.

Re: Bought: Sencore LC102 Capacitor & Inductor Analyzer

Say Thanks

Reply

Quote

« **Reply #3 on:** August 01, 2019, 02:27:00 am »

Just bought one too, for a very low price, (never tough it would be best offer accepted lol) clean casing, nothing broke, no xformer no test probes. Luckily i have a matcing xformer with the right plug who will fit nicely, and at my company we have very good Belden rf cables who could work.

The zeroing problems are known, you have a white relay who oxidize over time, some had suces with deoxit spray, but opening the relay is tricky, and you have to be careful not to contaminate the inside with debris.

You have the test plug with the integrated fuse who get loose some times

And some had problems with the small black reed relays, they get stuck or dont operate properly

And in the manual you have a section for the specs or failures when zeroing, impedances values etc.. and use an 93-96 ohm low capacitance cable ...

LINK : Sencore LC-102 Cable 'zeroing' issue and 'fix'
<https://www.antiqueradios.com/forums/viewtopic.php?f=8&t=286666>

Some link here :
<https://www.eevblog.com/forum/testgear/sencore-lc102-cap-analyzer/>
Replies #20 and 21 are interesting



sencore2.jpg (230.88 kB, 600x800 - viewed 304 times.)

« Last Edit: August 01, 2019, 02:45:07 am by coromonadlix »

Report to moderator Logged

HighVoltage

Super Contributor



Posts: 4516

Country:



Re: Bought: Sencore LC102 Capacitor & Inductor Analyzer

« Reply #4 on: August 01, 2019, 08:59:10 am »

Say Thanks Reply Quote

Nice, thanks for the info
I am looking forward to get my ReZolver !

Report to moderator Logged

There are 3 kinds of people in this world, those who can count and those who can not.

Sencoretech

Contributor

Posts: 18

Country:



Re: Bought: Sencore LC102 Capacitor & Inductor Analyzer

« Reply #5 on: August 01, 2019, 12:58:48 pm »

Say Thanks Reply Quote

Quote from: HighVoltage on August 01, 2019, 08:59:10 am

Nice, thanks for the info
I am looking forward to get my ReZolver !

Having worked on both the 102 and the 103 for a decade as my full time job I can tell you the 102

will be easier to fix in the field vs the 103. I'm hoping you find it with no major issues. If you need some help troubleshooting I'm more than willing to help, but PM me as I don't check these forums often.

[Report to moderator](#) [Logged](#)

The following users thanked this post: nikifena, Zucca, HighVoltage

HighVoltage

Super Contributor



HIGH VOLTAGE

Posts: 4516

Country:



Re: Bought: Sencore LC102 Capacitor & Inductor Analyzer

[Say Thanks](#) [Reply](#) [Quote](#)

« **Reply #6 on:** August 01, 2019, 01:59:39 pm »

Thank you,

The LC103 is on its way and I hope it has not too many issues. The seller claimed it needs calibration, so I am not sure if the label is expired or if it has an issue.

[Report to moderator](#) [Logged](#)

There are 3 kinds of people in this world, those who can count and those who can not.

coromonadalix

Super Contributor



Posts: 2813

Country:



Re: Bought: Sencore LC102 Capacitor & Inductor Analyzer

[Say Thanks](#) [Reply](#) [Quote](#)

« **Reply #7 on:** August 06, 2019, 02:55:05 pm »

Received my lc102, i think i've scored big, all zeroing / open test leads works, all coils and caps ive tested seems fine

The only thing i have to figure out is : the selected output voltage, is it a pulsed voltage to the selected value, or it is continuous when i push the test button ??

I have the right power supply plug, but an leader 12vac xformer instead of an dc one unless i hack a rectification in it ??

[Report to moderator](#) [Logged](#)

coromonadalix

Super Contributor



Posts: 2813

Country:



Re: Bought: Sencore LC102 Capacitor & Inductor Analyzer

[Say Thanks](#) [Reply](#) [Quote](#)

« **Reply #8 on:** August 06, 2019, 05:07:41 pm »

Tks mr.fabe

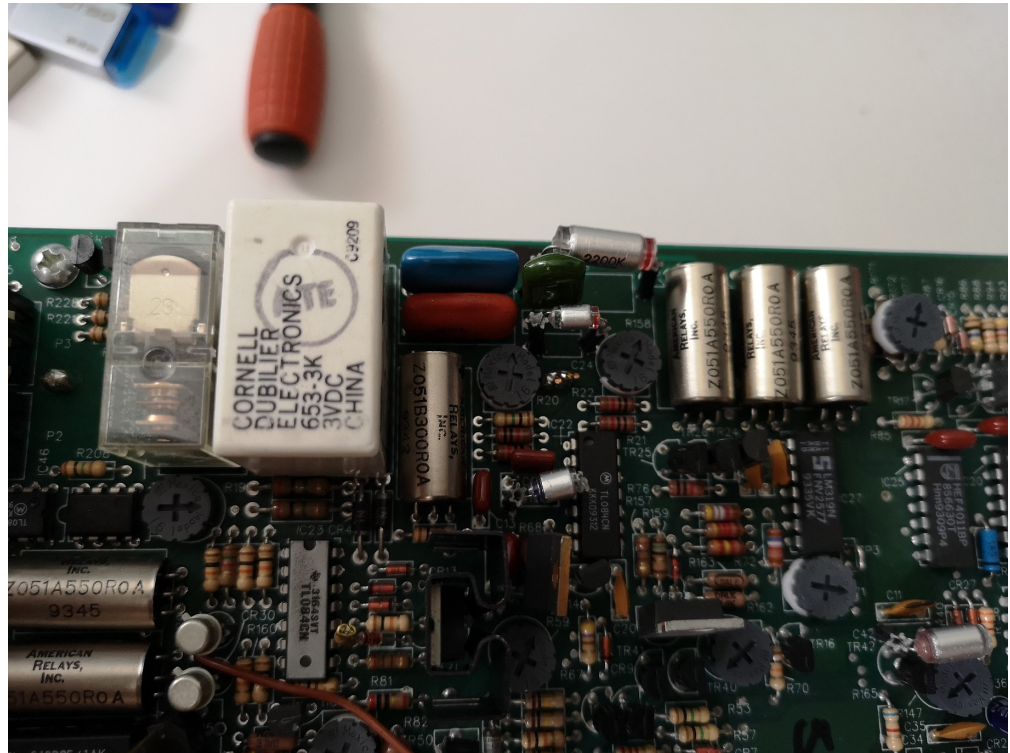
Checked the bnc fuse contacts just in case, i think it was never unscrewed ?

Opened the casing, never touched or repaired, all seems fine, managed to supply it thru an computer fan connector on the 3 pins psu dc in / battery in connector 12vdc simulated battery works fine but it wont start on the 3 pins dc plug, it need at least 15 - 18vdc to start.

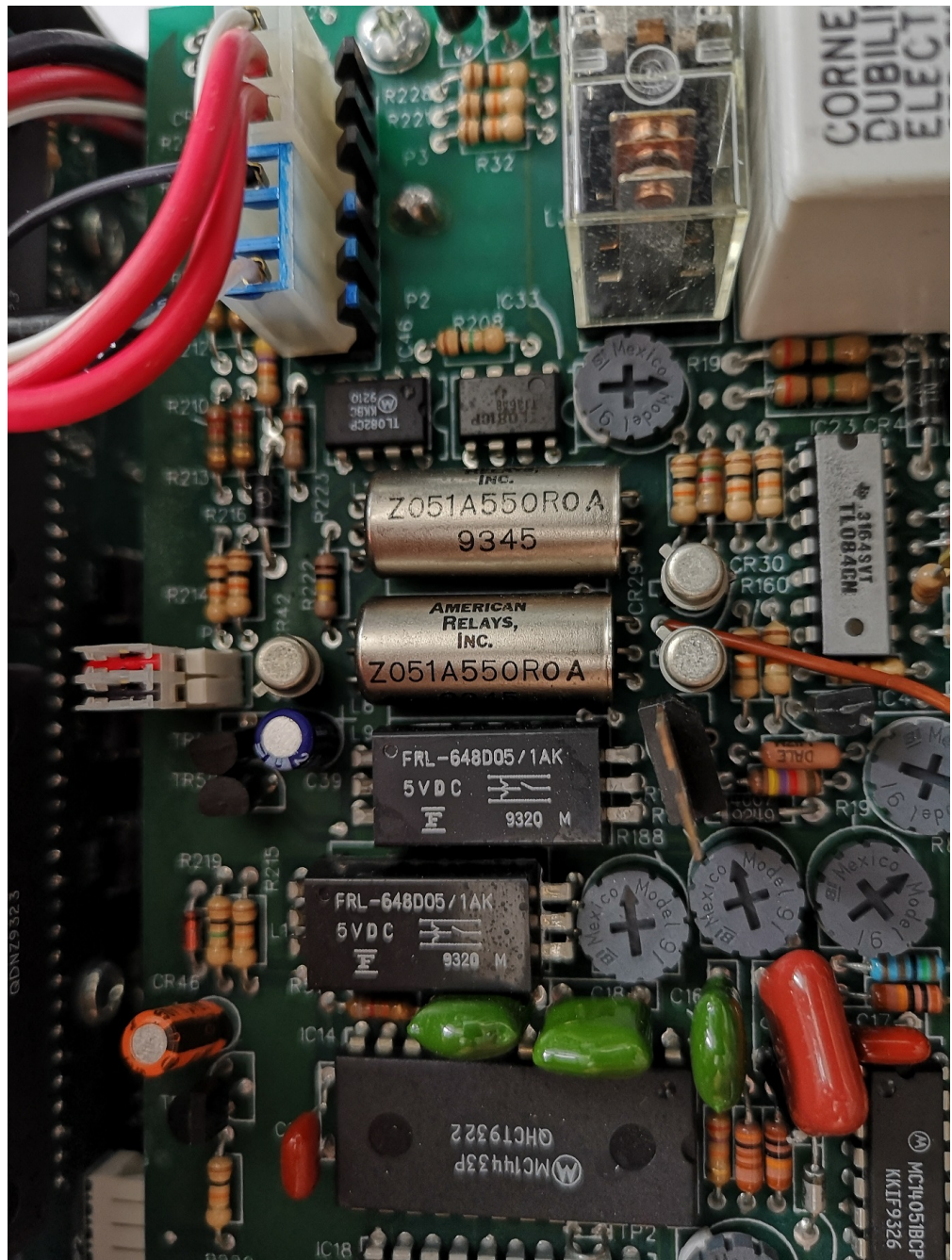
Found an 2 feet bnc to 3.5 mm already made cable (dont know its use or how i got it 10 years ago ??, it zero and open fine yepieee loll test at 6.5 pf ?? gonna add an 3.5mm female plug with 2 clip connectors, i'll sse if it accepts them

And find an 12vdc lead acid battery of the same size ??

This one has different / newer reed relays, they are "metallic" enclosed ?? from American Relay



IMG_20190806_130416.jpg (639.65 kB, 1824x1368 - viewed 213 times.)



IMG_20190806_130429.jpg (777.41 kB, 1368x1824 - viewed 175 times.)

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HighVoltage

Super Contributor



Posts: 4516

Country:



Re: Bought: Sencore LC102 Capacitor & Inductor Analyzer

[Say Thanks](#) [Reply](#) [Quote](#)

« **Reply #9 on:** August 06, 2019, 06:16:40 pm »

Quote from: coromonadlix on August 06, 2019, 02:55:05 pm

Received my Lc102, i think i've scored big,

I got my LC103 today as well and it works like a charm. It is by far the best capacitor tester I have seen.

In leakage test mode, it applies up to 1000 Volts DC directly to the pins of the cap.

I had a DMM in parallel to the cap to watch the voltage and a good cap was detected as bad because of the 10 MOhm of the DMM.

Over the years I had collected lots of bad electrolytic and also bad film capacitors. And the LC103 detected all failure modes perfectly.

I will post pictures soon.

What a great instrument, highly recommended!
May be we should move this thread to the Test Equipment section.

Report to moderator Logged

There are 3 kinds of people in this world, those who can count and those who can not.

The following users thanked this post: Zucca, GEOelectronics

mr.fabe
Regular Contributor

Posts: 161
Country:

Re: Bought: Sencore LC102 Capacitor & Inductor Analyzer

Say Thanks Reply Quote

« Reply #10 on: August 06, 2019, 06:28:53 pm »

Quote from: coromonadalix on August 06, 2019, 05:07:41 pm

Tks mr.fabe

Checked the bnc fuse contacts just in case, i think it was never unscrewed ?

Opened the casing, never touched or repaired, all seems fine, managed to supply it thru an computer fan connector on the 3 pins psu dc in / battery in connector 12vdc simulated battery works fine but it wont start on the 3 pins dc plug, it need at least 15 - 18vdc to start.

Found an 2 feet bnc to 3.5 mm already made cable (dont know its use or how i got it 10 years ago ??, it zero and open fine yepeeee lol test at 6.5 pf ?? gonna add an 3.5mm female plug with 2 clip connectors, i'll sse if it accepts them

And find an 12vdc lead acid battery of the same size ??

This one has different / newer reed relays, they are "metallic" enclosed ?? from American Relay

BNC fuse connector causes a lot of issues with the Sencores that use them. Poor contact affects the lead zeroing.

The power plug requires at least 18 VDC. You can power the unit with lower voltage but it will shutdown on leakage tests depending on the test voltage used.

Cables used for test leads are the RG62 / 93 ohm stranded core similar to the Belkin 8255 but a little softer. Some LC units can zero out with RG58 but have issues with lower cap readings.

Powersonic batteries work with clip with adapter plug.

« Last Edit: August 06, 2019, 06:38:32 pm by mr.fabe »

Report to moderator Logged

HighVoltage
Super Contributor

Posts: 4516
Country:

Re: Bought: Sencore LC102 Capacitor & Inductor Analyzer

Say Thanks Reply Quote

« Reply #11 on: August 06, 2019, 07:12:38 pm »

Quote from: mr.fabe on August 06, 2019, 06:28:53 pm

Powersonic batteries work with clip with adapter plug.

Interesting,
Do you have a link to that battery?

I see some batteries on ebay for around 70 US\$
Are they worth it?

Report to moderator Logged

There are 3 kinds of people in this world, those who can count and those who can not.

GEOelectronics
Regular Contributor

Posts: 143
Country:

Re: Bought: Sencore LC102 Capacitor & Inductor Analyzer

Say Thanks Reply Quote

« Reply #12 on: August 06, 2019, 07:20:43 pm »

I've had the LC103 since it first came out, now they cost more used than new back then, wish I had bought a spare! L+C but not R specifically. Be careful at the HV settings, they mean business. Blew out one GR polyethylene decade cap during testing- egad, IET does not sell individual caps but glad to sell an individual decade switch- at a price.

This is my first capacitor meter that does a lead test first, shorted and open, then subtracts the

measured capacitance from the device under test measurements. Sencore was high end for the service technician's workbench, still have several of these scopes in service.

Still hanging on to the old bridges and meters out of nostalgia, but will probably start selling them to make space pretty soon, including some ESI universal impedance racks.

The 34470A does a lot of things better, but not everything. ACAL every day, sometimes several times, it does drift with temperature. Using 34470A to test 1G Ohm resistors overnight has given me renewed confidence in my ESI Precision Resistance Measurement system for high R values, it comes really close and it only takes 30 seconds. That rack is a keeper.

George Dowell

Report to moderator Logged

mr.fabe
 Regular Contributor

 Posts: 161
 Country:

Re: Bought: Sencore LC102 Capacitor & Inductor Analyzer

Say Thanks Reply Quote

« Reply #13 on: August 06, 2019, 07:22:52 pm »

Quote from: HighVoltage on August 06, 2019, 07:12:38 pm

Quote from: mr.fabe on August 06, 2019, 06:28:53 pm

Powersonic batteries work with clip with adapter plug.

Interesting,
Do you have a link to that battery?

I see some batteries on ebay for around 70 US\$
Are they worth it?

Not worth it.
Powersonic PS-1223 2.3 Amp Hr works for my LC103
I'll have to check for the links...

Report to moderator Logged

The following users thanked this post: HighVoltage, coromonadalix

coromonadalix
 Super Contributor

 Posts: 2813
 Country:

Re: Bought: Sencore LC102 Capacitor & Inductor Analyzer

Say Thanks Reply Quote

« Reply #14 on: August 06, 2019, 07:35:14 pm »

battery specs: 12vdc at 2.3 amps
https://cdn.shopify.com/s/files/1/2694/4298/files/PS-1223_SPEC_SHEET.pdf?16089243122879519379

Length:
7.17" (182mm)
Width:
0.94" (24mm)
Height:
2.40" (61mm)

They resemble old portable camera and camcorder pack ?? Around 55\$ CAD in my country

« Last Edit: August 06, 2019, 07:41:03 pm by coromonadalix »

Report to moderator Logged

mr.fabe
 Regular Contributor

 Posts: 161
 Country:

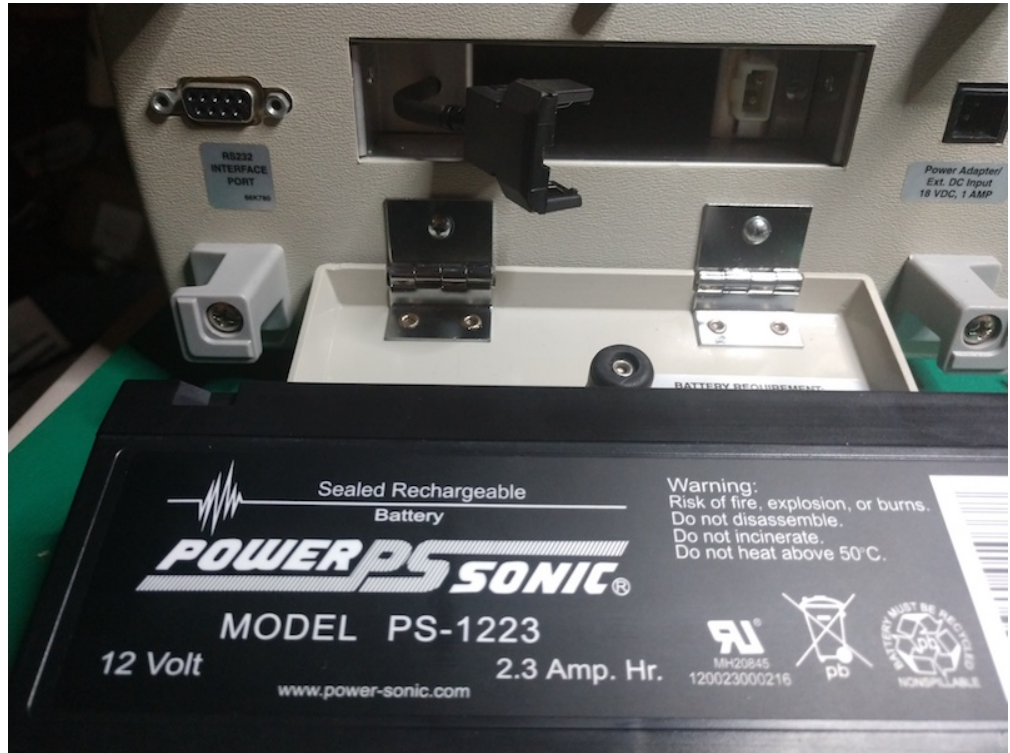
Re: Bought: Sencore LC102 Capacitor & Inductor Analyzer

Say Thanks Reply Quote

« Reply #15 on: August 06, 2019, 07:43:41 pm »

Here's a pic of the battery and clip.. I think I paid around \$24 USD for the battery and \$5 for the clip.

[attach=1]



IMG_20190806_121725525.jpg (153.41 kB, 800x600 - viewed 166 times.)

« Last Edit: August 06, 2019, 08:19:10 pm by mr.fabe »

Report to moderator Logged

HighVoltage

Super Contributor



Posts: 4516

Country:



Re: Bought: Sencore LC102 Capacitor & Inductor Analyzer

Say Thanks Reply Quote

« Reply #16 on: August 06, 2019, 09:16:29 pm »

Quote from: GEOelectronics on August 06, 2019, 07:20:43 pm

I've had the LC103 since it first came out, now they cost more used than new back then, wish I had bought a spare!

Good idea.

I think I will buy a second LC103, if I find another one for a good price.

One quote I got from a used equipment seller was US\$ 7200

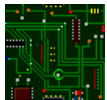
It is totally crazy, how much some instruments have increased in price over the years.

Report to moderator Logged

There are 3 kinds of people in this world, those who can count and those who can not.

Zucca

Supporter



Posts: 2828

Country:

EE meid in Itali



Re: Bought: Sencore LC102 Capacitor & Inductor Analyzer

Say Thanks Reply Quote

« Reply #17 on: August 07, 2019, 08:06:15 am »

I was thinking my Agilent 4263B was enough to test L or C components...

Why there is always a new toy to buy?

Report to moderator Logged

Can't know what you don't love. St. Augustine
Can't love what you don't know. Zucca

BU508A

Super Contributor





Re: Bought: Sencore LC102 Capacitor & Inductor Analyzer

Say Thanks Reply Quote

« Reply #18 on: August 07, 2019, 10:05:45 am »

Quote from: zucca on August 07, 2019, 08:06:15 am

I was thinking my Agilent 4263B was enough to test L or C components...
Why there is always a new toy to buy?

Posts: 2272
Country: 
Per aspera ad astra
  

This question will be answered here:
[https://www.eevblog.com/forum/testgear/test-equipment-anonymous-\(tea\)-group-therapy-thread/](https://www.eevblog.com/forum/testgear/test-equipment-anonymous-(tea)-group-therapy-thread/)



Report to moderator  Logged

"Chaos is found in greatest abundance wherever order is being sought. It always defeats order, because it is better organized."
- Terry Pratchett -

The following users thanked this post: Zucca, bitseeker

coromonadalix

Super Contributor



Posts: 2813

Country: 



 **Re: Bought: Sencore LC102 Capacitor & Inductor Analyzer**

Say Thanks Reply Quote

« Reply #19 on: August 08, 2019, 01:17:31 am »

I will upload to K04BB website the joint together multi part pages for the boards, took few hours to do

The 1000 board, already made by someone

Made by me
The block diagram
The 2000 and 3000 board

Around 17 megs each, had to patch ic16 ic17 and ic26 on the 2000 "Mcu" board, no manual around the web has this section correctly scanned ??

Hope it help

Copied in the test instruments, until someone complain or the admins remove it ?

« Last Edit: August 08, 2019, 01:20:28 am by coromonadalix »

Report to moderator  Logged

coromonadalix

Super Contributor



Posts: 2813

Country: 



 **Re: Bought: Sencore LC102 Capacitor & Inductor Analyzer**

Say Thanks Reply Quote

« Reply #20 on: August 08, 2019, 09:49:38 pm »


Uploaded the LC102 calibration procedures at K04BB too

Report to moderator  Logged

philexile

Contributor

Posts: 6

Country: 



 **Re: Bought: Sencore LC102 Capacitor & Inductor Analyzer**

Say Thanks Reply Quote

« Reply #21 on: August 18, 2019, 01:14:18 pm »

Hello,

I recently purchased an Sencore LC103 and I'm waiting for it to be delivered. It will be arriving without a power supply and I'm having problems identifying the 3-prong power jack on the rear of the unit. Does anyone know the name of this connector? I don't think that it is proprietary to Sencore, but I could be wrong.

Should I instead ignore that and go through the 12v battery connector? If so, what sort of molex connector is that?

Also, I've attached the calibration procedure PDF for the LC103. It appears to require specific software and hardware. You'll see mention of Final Cal Test program, final test box, ringer test box, ringer cal box, final test box, large inductance box, and high cap box. There is also mention of a Standards book "on the bench."

Does anyone have access to the items noted above or performed a calibration?

Thank you

 LC103 CALIBRATION PROCEDURE.pdf (118.38 kB - downloaded 90 times.)

Report to moderator  Logged

The following users thanked this post: coromonadlix, mr.fabe

HighVoltage
Super Contributor



Posts: 4516
Country:



Re: Bought: Sencore LC102 Capacitor & Inductor Analyzer

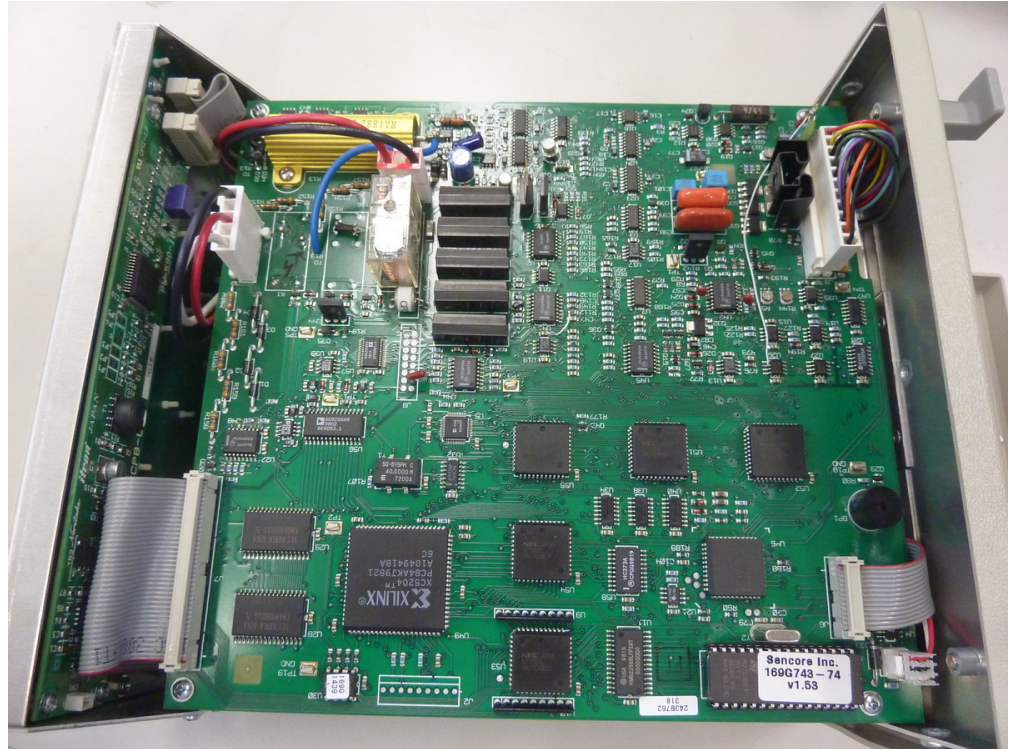
Say Thanks Reply Quote

« Reply #22 on: August 18, 2019, 01:32:07 pm »

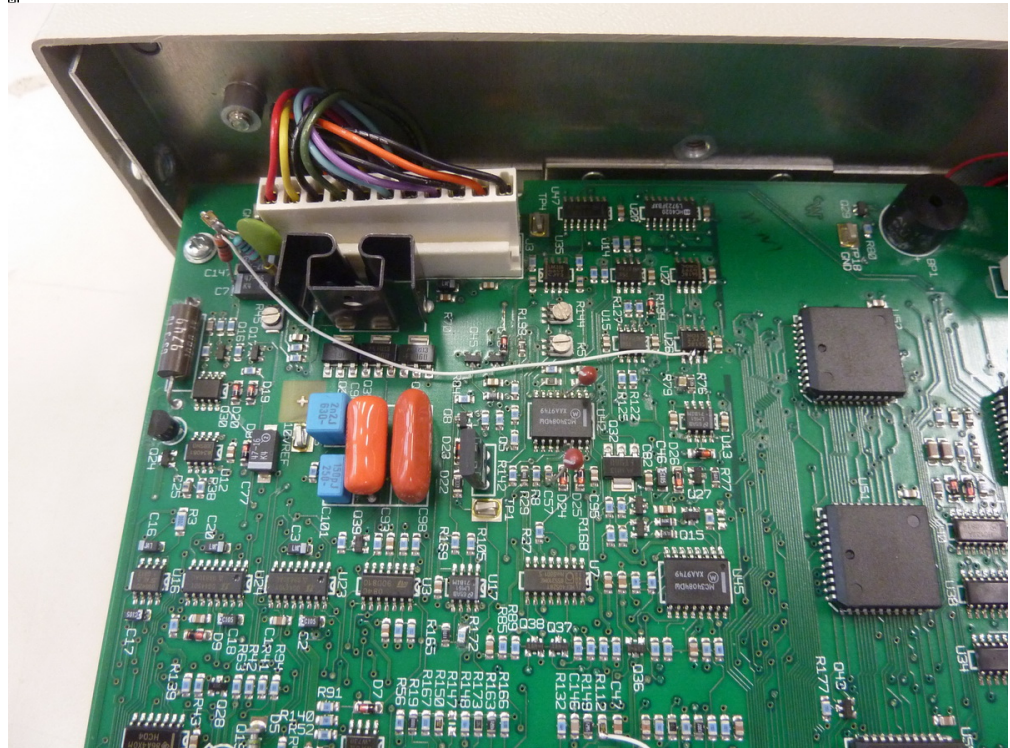
I just took my LC103 apart for the first time but it is difficult to get to the connector on the inside. It would require to remove the top or bottom PCB

Here are some tear down pictures.

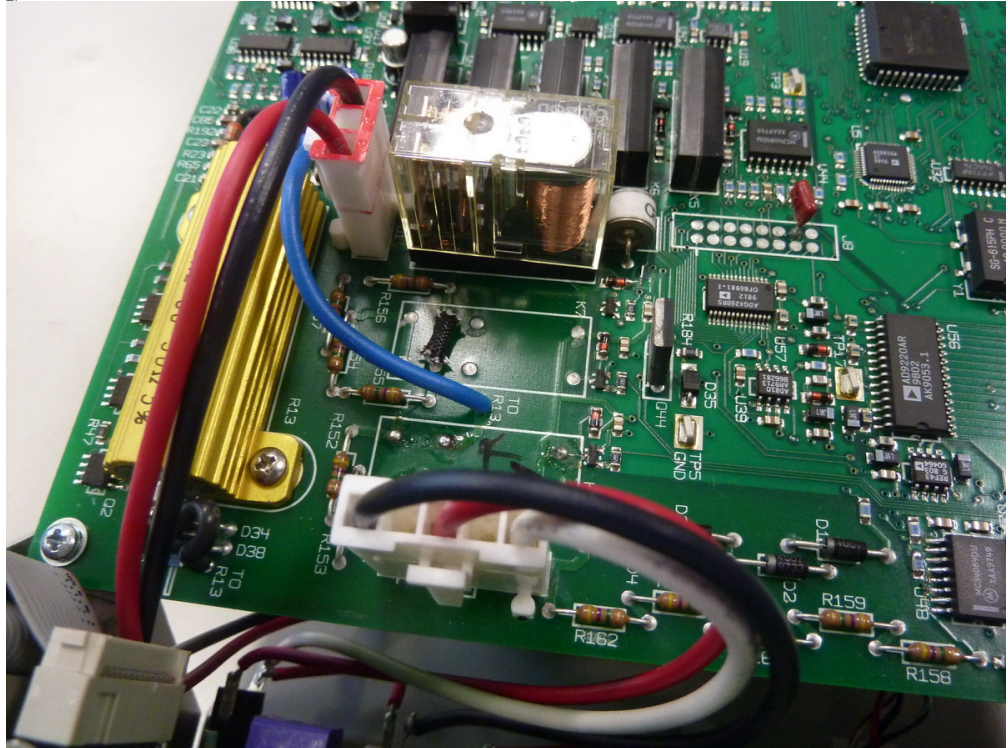
I do not know the manufacturer of that 3 pic connector



Sencore_LC103_2.JPG (481.63 kB, 1200x900 - viewed 185 times.)



Sencore_LC103_3.JPG (483.52 kB, 1200x900 - viewed 151 times.)



Sencore_LC103_4.JPG (443.77 kB, 1200x900 - viewed 143 times.)





Sencore_LC103_1.JPG (350.43 kB, 1200x900 - viewed 142 times.)

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There are 3 kinds of people in this world, those who can count and those who can not.

The following users thanked this post: Xenawise

 **HighVoltage**
Super Contributor


 **Re: Bought: Sencore LC102 Capacitor & Inductor Analyzer**
« Reply #23 on: August 18, 2019, 01:32:58 pm »


Say Thanks Reply Quote

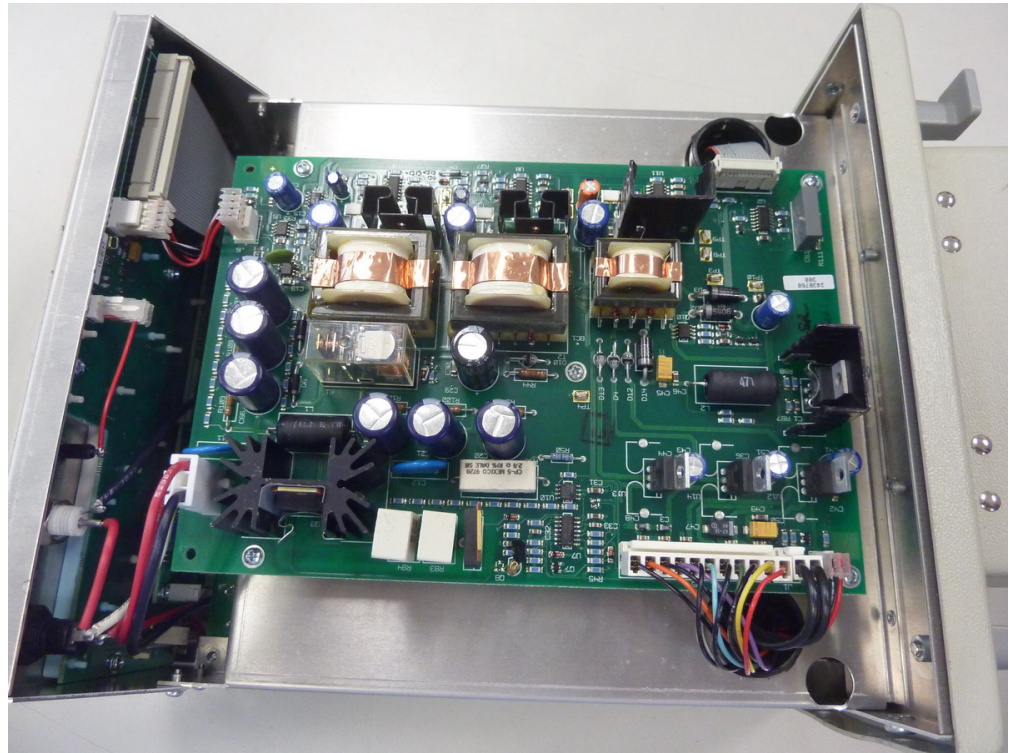
More pictures

DANGER

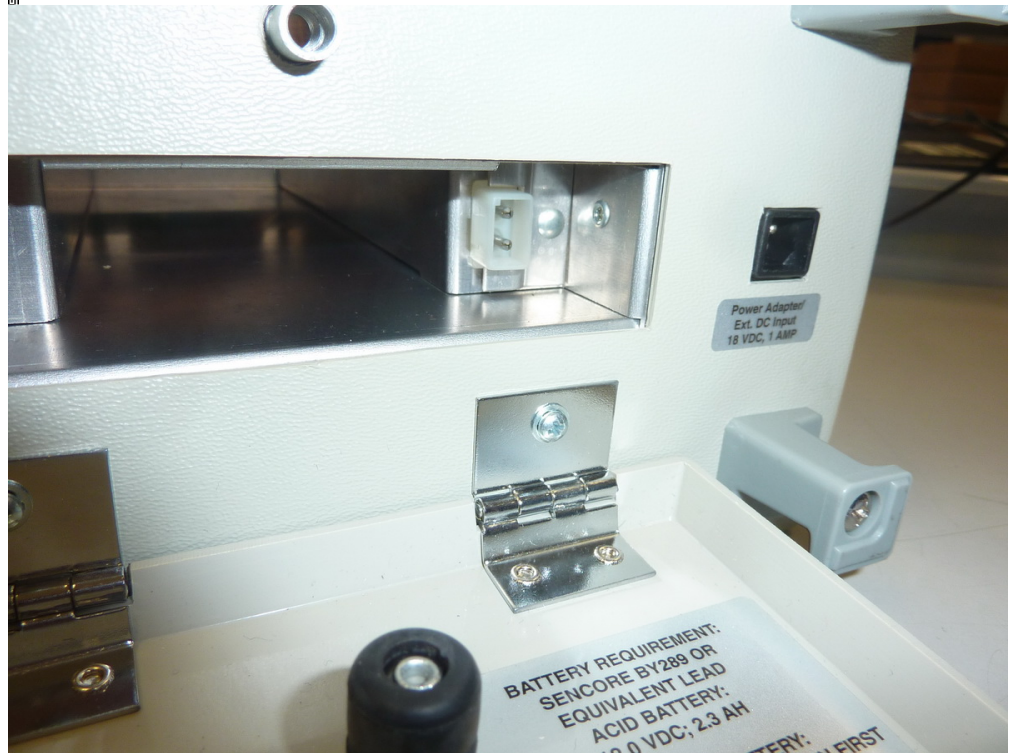
**HIGH
VOLTAGE**

Posts: 4516

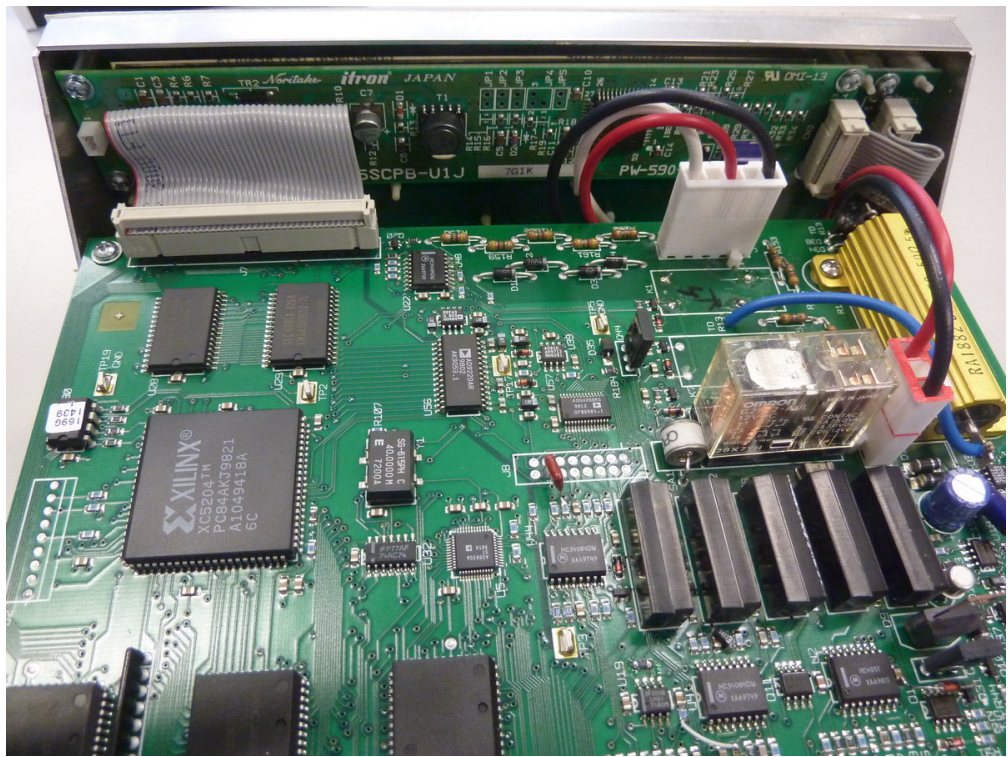
Country: 



Sencore_LC103_6.JPG (404.55 kB, 1200x900 - viewed 153 times.)



Sencore_LC103_7.JPG (279.95 kB, 1200x900 - viewed 135 times.)



Sencore_LC103_5.JPG (507.23 kB, 1200x900 - viewed 142 times.)

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There are 3 kinds of people in this world, those who can count and those who can not.

The following users thanked this post: coromonadalix, Xenawise

mr.fabe
 Regular Contributor

 Posts: 161
 Country:

Re: Bought: Sencore LC102 Capacitor & Inductor Analyzer

Say Thanks Reply Quote

« Reply #24 on: August 18, 2019, 02:11:28 pm »

Quote from: HighVoltage on August 18, 2019, 01:32:07 pm

I do not know the manufacturer of that 3 pic connector

I don't know the manufacturer but the connector type is a Mini-IEC (ACL117) that sells for \$7.95 AUS.

<https://www.wagneronline.com.au/mini-iec-to-bare-wire/ac-power-leads-iec/power-240vac/power-lighting/acl117-47410/969715/pd/>

You should probably ask the sysop move this topic to test equipment or start a fresh thread....



Mini-IEC to Bare Wire ACL117.jpg (5.36 kB, 278x181 - viewed 103 times.)

« Last Edit: August 18, 2019, 02:24:02 pm by mr.fabe »

Report to moderator Logged

The following users thanked this post: coromonadalix, Xenawise

coromonadalix
 Super Contributor

Re: Bought: Sencore LC102 Capacitor & Inductor Analyzer

Say Thanks Reply Quote

« Reply #25 on: August 18, 2019, 03:36:12 pm »



Posts: 2813

Country:



Managed to get the Sencore IB78 RS232 interface for a premium price

Gonna try to make a schematic for it, the eeproms dump now exists, will compare to mine when i'll have it ...

A member here pigrew is trying to simplify the design for his usage, dont know if it'll get public

I'll try to do the same on slightly older tech ?? 5v i/o fpga / cpld ... but i'm rusty

Tested my lc102 so far, i had the supply cord from an leader ac xformer, made a new dc supply for it, works fine, lc102 seems pretty spot on, cant find any calibration service near me to do a cal of this unit 😞



IMG_20190818_113825.jpg (224.21 kB, 1460x1095 - viewed 64 times.)

« Last Edit: August 18, 2019, 03:40:03 pm by coromonadalix »

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HighVoltage

Super Contributor



Posts: 4516

Country:



Re: Bought: Sencore LC102 Capacitor & Inductor Analyzer

Say Thanks Reply Quote

« Reply #26 on: August 18, 2019, 03:47:14 pm »

Quote from: mr.fabe on August 18, 2019, 02:11:28 pm

You should probably ask the sysop move this topic to test equipment or start a fresh thread....

Requested, may be an admin will notice.

Report to moderator Logged

There are 3 kinds of people in this world, those who can count and those who can not.

The following users thanked this post: mr.fabe

mr.fabe

Regular Contributor



Posts: 161

Country:



Re: Bought: Sencore LC102 Capacitor & Inductor Analyzer

Say Thanks Reply Quote

« Reply #27 on: August 18, 2019, 04:51:16 pm »

Quote from: coromonadalix on August 18, 2019, 03:36:12 pm

Tested my lc102 so far, i had the supply cord from an leader ac xformer, made a new dc supply for it, works fine, lc102 seems pretty spot on, cant find any calibration service near me to do a cal of this unit 😞

If the readings are pretty close, I wouldn't adjust it unless you absolutely have to. You have a LC102 and can perform the calibration yourself since the unit has variable pots. Much similar to the LC53, LC75, LC101 type units. I wish the LC103 had that option since calibration was quoted at \$500-\$600 USD. Pretty ridiculous pricing for a non-Lab type piece of equipment...

Report to moderator Logged

coromonadalix

Super Contributor



Posts: 2813

Country:



Re: Sencore LC102 & LC103 Capacitor & Inductor Analyzer

Say Thanks Reply Quote

« Reply #28 on: August 19, 2019, 01:43:39 am »

The lc102 need a few parts for calibrating it myself

I have a hard time to find 0.25% precision caps and some coils values in Canada

You need:

caps
1500pf
1.2uf
500uf

coils
20uh
80uh
800uh
8mh
60mh
80mh
800mh
2 henry
8 henry

res not wire wounded type not too difficult to find

1 ohm
15 ohms
20 ohms
150 ohms
250 ohms
1,5K ohms
50k ohms

Report to moderator Logged

mr.fabe

Regular Contributor



Posts: 161

Country:



Re: Bought: Sencore LC102 Capacitor & Inductor Analyzer

Say Thanks Reply Quote

« Reply #29 on: August 19, 2019, 02:15:31 am »

Quote from: mr.fabe on August 06, 2019, 07:43:41 pm

Here's a pic of the battery and clip.. I think I paid around \$24 USD for the battery and \$5 for the clip.

[attach=1]

Sorry about the delay on the battery clip information...

The battery clip I purchased was from DigiKey.

<https://www.digikey.com/product-detail/en/mpd-memory-protection-devices/ZA5350-B/ZA5350-B-ND/124921>

« Last Edit: August 19, 2019, 03:47:06 pm by mr.fabe »

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The following users thanked this post: Xenawise

HighVoltage

Super Contributor



Posts: 4516


Re: Sencore LC102 & LC103 Capacitor & Inductor Analyzer

Say Thanks Reply Quote

« Reply #30 on: August 19, 2019, 08:25:39 am »

Quote from: coromonadalix on August 19, 2019, 01:43:39 am

The lc102 need a few parts for calibrating it myself

Country: 

I have a hard time to find 0.25% precision caps and some coils values in Canada

The caps and inductors should also be easy to get.
Let me see what I can find in my bins.

I will use my Philips / Fluke PM6306 to select the values of caps and inductors.


[Report to moderator](#)  [Logged](#)

There are 3 kinds of people in this world, those who can count and those who can not.

Xenawise

Contributor

Posts: 7

Country: 

 **Re: Sencore LC102 & LC103 Capacitor & Inductor Analyzer**

[Say Thanks](#) [Reply](#) [Quote](#)

« **Reply #31 on:** August 19, 2019, 08:33:53 am »

@HighVoltage:

Hello, looks like you have a first production version of you PCB's (Version "B"). I recently repaired this version LC103 (it would fail the "OPEN" test but complete the "SHORT" test - turns out it was one of the SOT-23 2N3906 - Q13 - transistors in the low current source circuit. The transistor is completely open, all leads! Not sure what happened to it, there are no physical signs of failure either like too much current blew a chunk out of the case or something. It looks "normal" just like it's sister (it is connected in a darlington pair). Took quite a while to find this as well, I would say I have over a week into troubleshooting alone and since I have two LC103's now I could do some part swapping to help with the process.

In any case, I see that your EPROM is version 1.53! I have a Version "C" LC103 as well (I have two of them and actually three LC102's, one of them I need the LCD displays for as they got cracked during some shipping damage) and it has version 1.41 of firmware. Perhaps you could pull the EPROM and read it and post up the resulting BIN file? I would love to update to the latest firmware, although I wonder if the calibration of the unit is somehow tied the version of firmware (highly likely) so it might just be better to stick with whatever EPROM shipping in the unit to maintain the calibration. My Version "B" LC103 has firmware version 1.31. I have swapped the 1.41 firmware chip into the Version "B" and it does work, and your pictures show you have a Version "B" unit with version 1.53 firmware. Maybe it was sent in for repair or calibration and Sencore updated the firmware during the repair. As for Version "A" models, I don't think they were sold and were probably the last of the pre-production units. I believe Version "B" PCB's were the first production runs. My Version "C" unit does not have any of the bodesges that the Version "B" PCB's have, and the power supply unit has some significant changes as well.

In any case, have fun with your LC103! They will only rise in value as time goes on I predict, unless some manufacturer comes up with something that can replace it which I doubt will ever happen.

Regards,

Xenawise

[Report to moderator](#)  [Logged](#)


The following users thanked this post: mr.fabe

coromonadalix

Super Contributor



Posts: 2813

Country: 

 **Re: Sencore LC102 & LC103 Capacitor & Inductor Analyzer**

[Say Thanks](#) [Reply](#) [Quote](#)

« **Reply #32 on:** August 19, 2019, 02:24:25 pm »

A 20 farad or 20 henry lcr seems improbable, with an 1kv leak test ?? more improbable ? seen tons of models up to 100,000uf seen nothing in recent models higher or equal to the lc102, lc103 can offer ??

I can be wrong

« *Last Edit:* August 19, 2019, 02:26:09 pm by coromonadalix »

[Report to moderator](#)  [Logged](#)

HighVoltage

Super Contributor



Posts: 4516

Country: 

 **Re: Sencore LC102 & LC103 Capacitor & Inductor Analyzer**

[Say Thanks](#) [Reply](#) [Quote](#)

« **Reply #33 on:** August 19, 2019, 06:22:00 pm »

@Xenawise
Very interesting, thanks.

OK, I will get the EPROM version 1.53 read out.

Based on your facts, it really seems that my unit was repaired at a later time and the new FW installed.

Report to moderator  Logged

There are 3 kinds of people in this world, those who can count and those who can not.

 **syau**

Regular Contributor



Posts: 216

Country: 



 **Re: Sencore LC102 & LC103 Capacitor & Inductor Analyzer**

Say Thanks

Reply

Quote

« **Reply #34 on:** August 19, 2019, 11:12:08 pm »

Scored a LC102, unable to zero on short, other capacitor measurement work except the ESR which give -ve 🤔

Managed to open up the cover on the big white relay, cleaned the contact with deoxit, also did so with the adjacent one. Still fail when I do zero on short. Surprising, it show short when I shorted the lead during capacitor measurement.

Need to do some trouble shooting on the ESR circuit.


Report to moderator  Logged

coromonadalix

Super Contributor



Posts: 2813

Country: 



 **Re: Sencore LC102 & LC103 Capacitor & Inductor Analyzer**

Say Thanks

Reply

Quote

« **Reply #35 on:** August 19, 2019, 11:34:46 pm »

@syau does it says error 7 ?? do you have an original test cable ?

With a cable i had for years : i've made the open short tests, they are okay, but if i add some tests clips to complete the cable it doesn't pass the open test, but pass the short test ... i have to get the correct impedance vs the cable capacitance ...

You have explications in the user manual for the errors test(s)

Report to moderator  Logged

 **syau**

Regular Contributor



Posts: 216

Country: 



 **Re: Sencore LC102 & LC103 Capacitor & Inductor Analyzer**

Say Thanks

Reply

Quote

« **Reply #36 on:** August 19, 2019, 11:47:31 pm »

It show error 4 during short cal. I did bypassed the input coax and directly shorting the input to the pcb (the one has 1 thin white wire and 3 thick red) with the same result. (the white go to the shield, center red go the the coaxial center, the right red go to the coaxial center after the fuse)

Tried to remove the fuse (by turning bnc anti-clockwise) but unable to do so, looks like the previous owner turn it too hard in order the secure a good contact 🤔

No error 7 during esr measurement, only give -ve which keep changing

Note: The test lead I am using is not original.


Report to moderator  Logged

 **Johnny10**

Frequent Contributor



Posts: 714

Country: 



 **Re: Sencore LC102 & LC103 Capacitor & Inductor Analyzer**

Say Thanks

Reply

Quote

« **Reply #37 on:** August 20, 2019, 12:49:17 am »

Since we started repairing these Sencore units on the EEV Blog Forum the price has gone way up!

I repaired a number of these units a few years back. I did buy parted out units etc. from this eBay seller.

<https://www.ebay.com/itm/SENCORE-LC103-LC102-LC101-LC77-LC76-LC75-LC53-TEST-LEADS-SET-OF-THREE-NEW/113767939522?hash=item1a7d18fdc2:g:69QAAOSwhURZgj8w>

All my units Zero, open and short, with a BNC adapter and regular clip cables. When they don't zero it takes a while to track down the exact cause, i.e. BNC Fuse Holder, Relays... The relays were available on eBay also. I bought a few of the black ones from someone mismatching manufacturer name. They had 50 or so but that was a few years ago.

I should look that up again.



IMG_0773.JPG (339.3 kB, 1632x1224 - viewed 43 times.)

Report to moderator  Logged


Tektronix TDS7104, DMM4050, HP 3561A, HP 35665, Tek 2465A, HP8903B, DSA602A, Tek 7854, 7834, HP3457A, Tek 575, 576, 577 Curve Tracers, Datron 4000, Datron 4000A, uTracer, HP5335A, EIP534B 20GHz Frequency Counter, TrueTime Rubidium, Sencore LC102, Tek TG506, TG501, SG503, HP 8568B

 **coromonadalix**

Super Contributor



Posts: 2813

Country: 



 **Re: Sencore LC102 & LC103 Capacitor & Inductor Analyzer**

« Reply #38 on: August 20, 2019, 02:04:44 am »

Say Thanks

Reply

Quote

As Johnny10 wrote

I did all the checkups for the mta crimp connectors, some claimed the wire cut in the connector, unscrewed the bnc fuse, it was tighten very well, i put an bnc connector and turned slowly counterclockwise with a pair of pliers, done every checkups i could do for oxydation on the 2 big relays and the bnc test plug.

With the calibration procedures i re-checked every voltages in the lc102, they were almost perfect for its age ? touched nothing else.

Tested the open and short tests, everything went fine.

Sencore LC-102 Cable 'zeroing' issue and 'fix' mostly the error 7
<https://www.antiqueradios.com/forums/viewtopic.php?f=8&t=286666>

Normally the test leads are made with an low capacitance cable rg-62u

@syau Your error4 Value beyond zeroing limits, see page 18 of the user manual

It simply could be your tests leads are not accepted by the lc102

Just checked my tests leads, they are slightly over 1800 pf, damn lol short pass, open fail
They are coaxial, but no specs written 😞

Report to moderator Logged

syau
Regular Contributor

Posts: 216
Country:

Re: Sencore LC102 & LC103 Capacitor & Inductor Analyzer

Say Thanks Reply Quote

« Reply #39 on: August 20, 2019, 04:02:23 am »

I suspect that the relay L1 failed to close during ESR and Short Zero measurement and will test it out later today. In the mean time, I ordered several 5VDC reed relay from RS (diff pin out) but better spec, which should be delivered within 3 days.

Testing has been done on the P3 connector so it ruled out the test lead issue.

By the way, any one know the source of the fused bnc jack ?

Report to moderator Logged

HighVoltage
Super Contributor

Posts: 4516
Country:

Re: Sencore LC102 & LC103 Capacitor & Inductor Analyzer

Say Thanks Reply Quote

« Reply #40 on: August 20, 2019, 09:17:50 am »

Quote from: Johnny10 on August 20, 2019, 12:49:17 am

Since we started repairing these Sencore units on the EEV Blog Forum the price has gone way up!

It is really crazy, how much they have increase since this thread is open!
For LC102 and LC103

I just got a quote from a company for a LC103 in good condition for US\$ 4800 !

Report to moderator Logged

There are 3 kinds of people in this world, those who can count and those who can not.

Mr. Scram
Super Contributor

Posts: 9626
Country:
Display aficionado

Re: Sencore LC102 & LC103 Capacitor & Inductor Analyzer

Say Thanks Reply Quote

« Reply #41 on: August 20, 2019, 09:36:17 am »

Quote from: HighVoltage on August 20, 2019, 09:17:50 am

It is really crazy, how much they have increase since this thread is open!
For LC102 and LC103

I just got a quote from a company for a LC103 in good condition for US\$ 4800 !

Such is the Eevblog. The prices will come down again when the initial hype blows over though.

« Last Edit: August 20, 2019, 09:38:20 am by Mr. Scram »

Report to moderator Logged

BU508A
Super Contributor

Re: Sencore LC102 & LC103 Capacitor & Inductor Analyzer


Say Thanks Reply Quote

« Reply #42 on: August 20, 2019, 09:50:07 am »

Quote from: HighVoltage on August 20, 2019, 09:17:50 am

I just got a quote from a company for a LC103 in good condition for US\$ 4800 !

Posts: 2272

Country: 

Per aspera ad astra



I hope, you've showed them this:

[Report to moderator](#)  [Logged](#)


"Chaos is found in greatest abundance wherever order is being sought. It always defeats order, because it is better organized."
- Terry Pratchett -

HighVoltage

Super Contributor

**HIGH VOLTAGE**


Posts: 4516

Country: **Re: Sencore LC102 & LC103 Capacitor & Inductor Analyzer**[Say Thanks](#)[Reply](#)[Quote](#)« **Reply #43 on:** August 20, 2019, 10:54:22 am »**Quote from: BU508A on August 20, 2019, 09:50:07 am**

I hope, you've showed them this:

Yup!

I am glad I have a good working LC103, that I got for a good price. I might buy a LC102, once the prices have come down again.

No hurry! 

In regards to open and short compensation, I have tried a normal 50 Ohm BNC cable and it would not confirm the open compensation. So it seems Sencore has limited this to special cables. I will try a few other cables soon.

[Report to moderator](#)  [Logged](#)


There are 3 kinds of people in this world, those who can count and those who can not.

syau

Regular Contributor




Posts: 216

Country: **Re: Sencore LC102 & LC103 Capacitor & Inductor Analyzer**[Say Thanks](#)[Reply](#)[Quote](#)« **Reply #44 on:** August 20, 2019, 01:56:30 pm »**Quote from: syau on August 20, 2019, 04:02:23 am**

I suspect that the relay L1 failed to close during ESR and Short Zero measurement and will test it out later today. In the mean time, I ordered several 5VDC reed relay from RS (diff pin out) but better spec, which should be delivered within 3 days.

Testing has been done on the P3 connector so it ruled out the test lead issue.

By the way, any one know the source of the fused bnc jack ?

Did an in circuit testing of L1, it works but still can't cal short nor ESR (start with -1990 displayed on the LCD and the value slowly increase up to -9.0 ohm) 


Anybody has an idea how the ESR circuit works ? One member did mentioned that it use the ESR circuit to do a cal short.

[Report to moderator](#)  [Logged](#)**Johnny10**

Frequent Contributor



Posts: 714

Country: **Re: Sencore LC102 & LC103 Capacitor & Inductor Analyzer**[Say Thanks](#)[Reply](#)[Quote](#)« **Reply #45 on:** August 20, 2019, 02:19:36 pm »

That zero issue fix on Antique Radio was a bit off in technique.


I first cut into the top of relay cover as shown in pics.

Yet afterwards, I found I could simply squeeze rectangular cover and it unlocked and whole cover came off without having cut on top that then needed to be fixed.

« *Last Edit: August 23, 2019, 12:59:58 pm by Johnny10* »

[Report to moderator](#)  [Logged](#)

Tektronix TDS7104, DMM4050, HP 3561A, HP 35665, Tek 2465A, HP8903B, DSA602A, Tek 7854, 7834, HP3457A, Tek 575, 576, 577 Curve Tracers, Datron 4000, Datron 4000A, uTracer, HP5335A, EIP534B 20GHz Frequency Counter, TrueTime Rubidium, Sencore LC102, Tek TG506, TG501, SG503, HP 8568B

 **mr.fabe**
 Regular Contributor

 Posts: 161
 Country: 


 **Re: Sencore LC102 & LC103 Capacitor & Inductor Analyzer**

Say Thanks Reply Quote

« Reply #46 on: August 20, 2019, 03:33:06 pm »

Quote from: HighVoltage on August 20, 2019, 10:54:22 am

In regards to open and short compensation, I have tried a normal 50 Ohm BNC cable and it would not confirm the open compensation. So it seems Sencore has limited this to special cables. I will try a few other cables soon.

With the LC53, LC75, LC101 (units that I've owned), RG62 cables were needed to be able to zero out the meter.

With my LC103, I have no trouble with open and close compensation with any of the cables I normally use. I use the Sencore 39G219, Fluke tweezers, mini 7" BNC to clip hook leads, and sometimes a set of needle probes for in-circuit tests.

Per the LC103 Manual for Value Beyond Zeroing Limit...

An open (greater than 20kohms) or shorted (less than 1 ohm) test lead will cause the display to show "OPEN" or "SHORT"

Possible Causes:

1. The capacitance at the TEST LEAD input is greater than 1800pF
2. The inductance at the TEST LEAD input is greater than 18uH
3. The resistance at the TEST LEAD input is greater than 5 ohms

« Last Edit: August 20, 2019, 08:47:01 pm by mr.fabe »

Report to moderator  Logged


 **syau**
 Regular Contributor

 Posts: 216
 Country: 


 **Re: Sencore LC102 & LC103 Capacitor & Inductor Analyzer**





Say Thanks Reply Quote

« Reply #47 on: August 23, 2019, 12:37:11 pm »

Replaced L1 & L9, no improvement 

Will try to replaced the 4011 & 4066 in the ESR circuitry.

Report to moderator  Logged

 **volvo_nut_v70**
 Regular Contributor

 Posts: 89
 Country: 


 **Re: Sencore LC102 & LC103 Capacitor & Inductor Analyzer LC102 Keyboard**

Reply Quote Modify Remove






« Reply #48 on: August 23, 2019, 03:26:33 pm »

Hello;

I am looking for a new or used LC102 membrane keyboard to repair the one I have. One of the "button" is worn straight through....

Thanks!

Report to moderator  216.13.179.106

 **HighVoltage**
 Super Contributor


 Posts: 4516
 Country: 


 **Re: Sencore LC102 & LC103 Capacitor & Inductor Analyzer LC102 Keyboard**

Withdraw Thanks Reply Quote

« Reply #49 on: August 23, 2019, 03:39:25 pm »

Quote from: volvo_nut_v70 on August 23, 2019, 03:26:33 pm

Hello;

I am looking for a new or used LC102 membrane keyboard to repair the one I have. One of the "button" is worn straight through....

Thanks!

Every once in a while, they show up on ebay USA but right now I do not see one. You probably have to have some patience.

Report to moderator  Logged

There are 3 kinds of people in this world, those who can count and those who can not.

The following users thanked this post: [volvo_nut_v70](#)

mr.fabe
Regular Contributor



Posts: 161
Country: 



 **Re: Sencore LC102 & LC103 Capacitor & Inductor Analyzer**

Say Thanks Reply Quote

« **Reply #50 on:** August 26, 2019, 10:46:32 pm »

Quote from: coromonadalix on August 19, 2019, 01:43:39 am

The lc102 need a few parts for calibrating it myself

I have a hard time to find 0.25% precision caps and some coils values in Canada

You really can get by with using higher (>0.25%) components for calibrating the unit. Verify the component values on a calibrated LCR and use those values to adjust the trimmers for each of the respective ranges. Just make sure you use the original 39G219 or low capacitance cable and perform the lead zero operation before making your adjustments.

Report to moderator  Logged

Xenawise
Contributor

Posts: 7
Country: 



 **Re: Sencore LC102 & LC103 Capacitor & Inductor Analyzer**

Say Thanks Reply Quote

« **Reply #51 on:** August 27, 2019, 06:08:40 pm »

Quote from: HighVoltage on August 19, 2019, 06:22:00 pm

@Xenawise
Very interesting, thanks.

OK, I will get the EPROM version 1.53 read out.

Based on your facts, it really seems that my unit was repaired at a later time and the new FW installed.


Any progress on getting that EPROM read and posted? Thanks! 

Regards,

Xenawise

Report to moderator  Logged

mr.fabe
Regular Contributor



Posts: 161
Country: 



 **Re: Sencore LC102 & LC103 Capacitor & Inductor Analyzer**

Say Thanks Reply Quote

« **Reply #52 on:** August 27, 2019, 06:37:32 pm »

Quote from: Xenawise on August 27, 2019, 06:08:40 pm

Quote from: HighVoltage on August 19, 2019, 06:22:00 pm

@Xenawise
Very interesting, thanks.

OK, I will get the EPROM version 1.53 read out.

Based on your facts, it really seems that my unit was repaired at a later time and the new FW installed.

Any progress on getting that EPROM read and posted? Thanks! 

Regards,

Xenawise

Would you be able to read the memory chip at U21 (24LC16B) off one of your boards and post it? I believe this chip may hold the calibration settings for the LC103 and hope to get it decoded. Thanks!

Report to moderator  Logged

coromonadalix
Super Contributor




 **Re: Sencore LC102 & LC103 Capacitor & Inductor Analyzer**

Say Thanks Reply Quote

« **Reply #53 on:** August 28, 2019, 12:41:48 am »

Bought two already hand made cables on Ebay, i can zero my test cable but do an open test, found many coils and capacitors parts to do some tests, the lc102 seems to be on par with them, my job ordered an DE-5000, ill do more cross checks between the two.

Posts: 2813

Country: 

EDIT August 30


Received the cables, they are worth the price, perfect open and zero calibration

« Last Edit: August 31, 2019, 03:40:43 am by coromonadalix »

Report to moderator  Logged **Xenawise**

Contributor

Posts: 7

Country:  **Re: Sencore LC102 & LC103 Capacitor & Inductor Analyzer**

Withdraw Thanks

Reply

Quote

« Reply #54 on: August 28, 2019, 10:27:42 pm »

Quote from: mr.fabe on August 27, 2019, 06:37:32 pm

Would you be able to read the memory chip at U21 (24LC16B) off one of your boards and post it? I believe this chip may hold the calibration settings for the LC103 and hope to get it decoded. Thanks!

I will see about desoldering that chip and reading it out and posting it.

Speaking of posting, here are my BIN files (rename to .BIN from .TXT)

Regards,

Xenawise

 Sencore LC102 EPROM 169G266-17 IC9.txt (32 kB - downloaded 31 times.)

 Sencore LC103 EPROM 169G1114-45 v1.31.txt (128 kB - downloaded 31 times.)

 Sencore LC103 EPROM 169G1114-47 v1.41.txt (128 kB - downloaded 29 times.)

Report to moderator  Logged

The following users thanked this post: HighVoltage, coromonadalix, **volvo_nut_v70**, mr.fabe

 **volvo_nut_v70**

Regular Contributor



Posts: 89

Country:  **Re: Sencore LC102 & LC103 Capacitor & Inductor Analyzer**

Reply

Quote

Modify

Remove

« Reply #55 on: September 12, 2019, 02:26:17 pm »

Hello;

Would any one have a new or used membrane keyboard for a LC102?

Report to moderator  216.13.179.106 **philexile**

Contributor

Posts: 6

Country:  **Re: Sencore LC102 & LC103 Capacitor & Inductor Analyzer**

Say Thanks

Reply

Quote

« Reply #56 on: February 02, 2020, 04:47:22 pm »

Hello,

I acquired a Sencore LC103 from an auction this past summer. Luckily, it seems to work well. At the time, I did some digging for any information I could about the unit and, over time, came up with some interesting materials....

1. Complete BOM files for the LC77, LC102, and LC103
2. Calibration procedures for LC77, LC102, and LC103
3. Schematics and parts lists for the LC77, LC102, and LC103
4. Common fix list for the LC103

5. Sencore's "FinalCal" calibration software for the LC103

I'm assuming that item 5 will interest most people here. 🤔

The FinalCal software is complete (please see the attached pictures of the software up and running on my old XP laptop) and even includes the source code in a separate folder. There are some things to figure out though, see below:

- You will see in the calibration procedure instructions, included with the images, that there are a few separate items called for: final test box, cal disk (more on this in the next point), ringer test box, and

ringer cal box. There is also a note towards the end instructing the operator to bring the unit to the z-meter bench in "Service."

- When opening the software, there is a prompt to insert the floppy disk NOW. This is also noted in step 4 of the calibration procedure document – but there it is called "cal disk" and not floppy. I believe this floppy would have included the two "cal" files called for in step 6: "P071_03.cal" and "P72_10.cal" – thankfully, I have these files as well. I haven't been able to try to include them on a floppy disk however as I don't have any floppies currently!

- There is an error shown in the pictures, related to LabVIEW. I'm not sure what this means. It is possible that even though my LC103 was hooked up via the RS232 port, it wasn't communicating properly. I didn't troubleshoot this.

- I am able to navigate to the two cal files, but I haven't run any of the tests or calibrations, since I'm still trying to figure this out – and I'm still missing essential parts of the calibration – the external "boxes."

So where do I go from here? I'm hoping that some of you can help! I think the biggest obstacles will be finding or reproducing the external "boxes" as I assume they were Sencore's proprietary units: final test box, ringer test box, and ringer cal box. That said –

- Maybe a former Sencore tech can help out here?
- Perhaps some information can be gleamed from the source code?

In any case, with this software, I think we are much closer to having these units be serviceable by their owners -- as it should be in 2020!

Looking forward to your thoughts.

Best Regards

LC103 CALIBRATION PROCEDURE

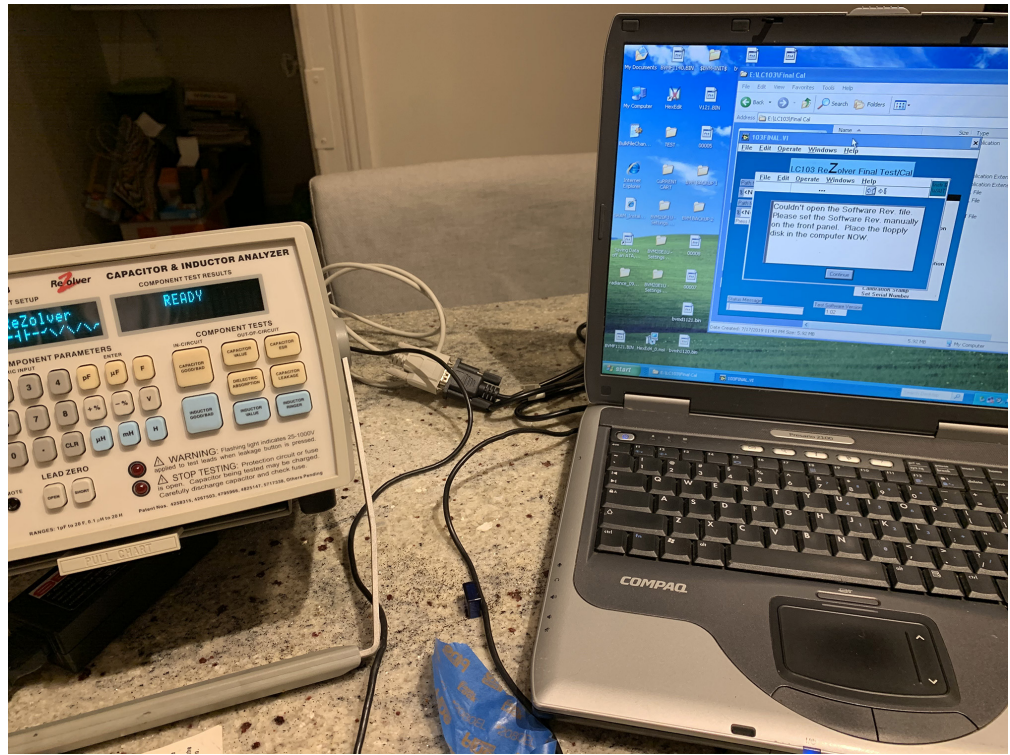
(This unit is mainly calibrated using an automated test.)

1. Connect the PA251 power adapter to the back of the UUT.
2. Connect the RS232 cable from the back of the computer to the RS232 port on back of the UUT.
3. Connect the 39G219-test lead cable from the front of the UUT to the **final test box**. Hook up the IEEE cable to the RS232 Interface Port located on the back left side of the UUT.
4. Power UUT on. Watch for the software rev. number. (It will read 1.47 or 1.50). Double click on "Sencore Tests". **Insert the cal disk**.
5. Boot up the LC103 Final Cal Test program on the computer by double clicking on the "LC103 F_Cal" icon.
6. Use the "F1" key to apply the correct file information for the inductance and capacitance calibrations. Click on "P071_03.Cal" to set the capacitance cal data. Click on "OK". Click on "P072_10.Cal" to set the inductance cal data. Click on "OK".
7. Make sure the "Software Rev." matches what the unit displays (may have to power off/on again to recheck).
8. Highlight "ALL (NOT RINGERS)" by using the left side click button on the mouse.
9. Highlight "PRESS TO START" by using the left side click button on the mouse.
10. Follow the prompt on the computer for calibration instructions, making sure to use either the "ENTER" or left side click of the mouse for advancing through the program.
11. When the program is done, disconnect the RS232 port cable from the back of the unit and power the unit off/on again.
12. Remove the 39G219 test lead from the final test box to the **ringer test box** and connect to the **ringer cal box**.
13. Set the switch for "YOLKS AND FLYBACKS".
14. Press the "YOLKS AND FLYBACKS" button on the UUT. Press and hold the "Inductor Ringer Button". Watch for the same number that is noted on the ringer test box. If not the same, adjust **R1144** for the same number.
15. Set the ringer test box to the "SWITCHING TRANSFORMERS" position.
16. Press the "SWITCHING TRANSFORMERS" button on the UUT. Press and hold the "Inductor Ringer Button". Watch for the same number. If not the same, adjust **R1005** for the same number. Disconnect the test lead from the ringer box and reconnect to the final test box.
17. Power UUT off.
18. Disconnect the PA251 power adapter from the back of the UUT.
19. Disconnect the 39G219-test lead from the front of the UUT.
20. **Carry the unit over to the z-meter bench in Service**. Open up the back of the unit. Check the battery supply by hooking up to the DC Regulated Power Supply using the lead hanging on the bench under the supply. Make sure the power supply is set to approximately 12.65V. (Use the voltage coarse knob on the power supply to set.) Check and make sure that the unit reads 90% - 100%.

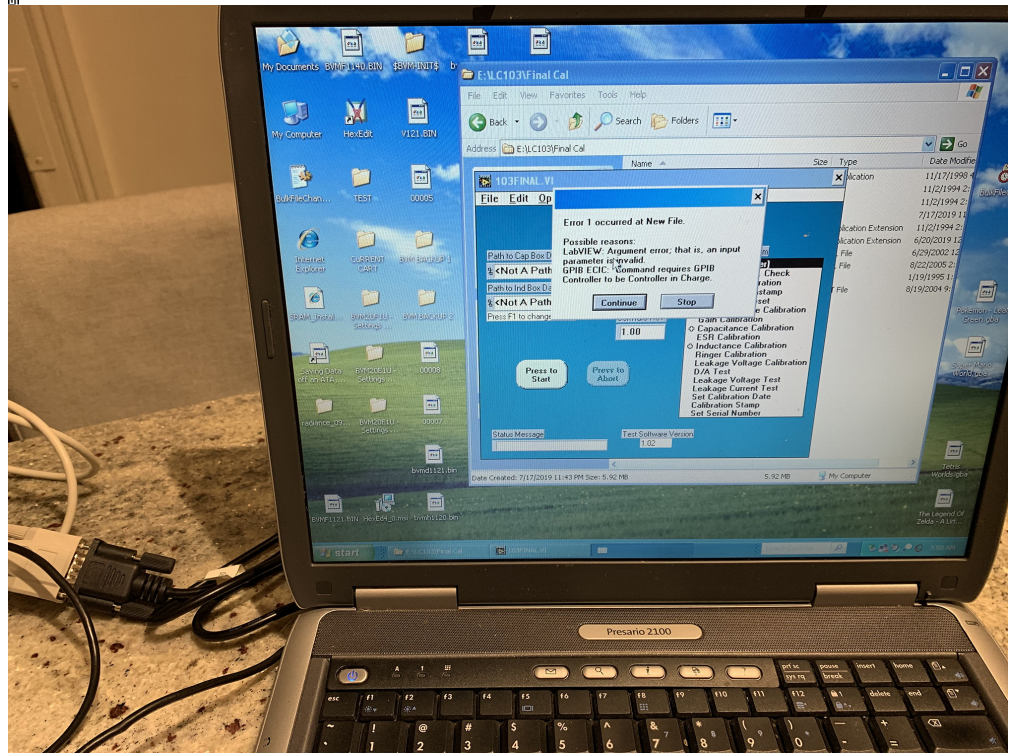
 LC103 CALIBRATION PROCEDURE_Page_1.jpg (790.34 kB, 1700x2200 - viewed 45 times.)

21. Turn the voltage fine tune knob all the way CCW (counter clock wise) to approximately 11V. Make sure unit reads 0% - 10%. Disconnect the DC power supply and close the back of the unit and connect the power adapter. Turn unit on by pressing POWER.
22. Connect the test leads to the unit and short them together. Apply 25Volts leakage by pressing "2,5,V". Push and hold the CAPACITOR LEAKAGE button. The right display on the unit should show ">20mA" flashing.
23. Press the "CLEAR" button 3 times. Short the leads to the Large Inductance box. Press "SHORT". Press inductance and make sure unit reads 0.00. Check the inductance readings.
24. Connect the test leads to the high cap box and "open " them. Check the high cap box readings. Specs are in the Standards book on the bench.
25. Case the UUT and send to age.

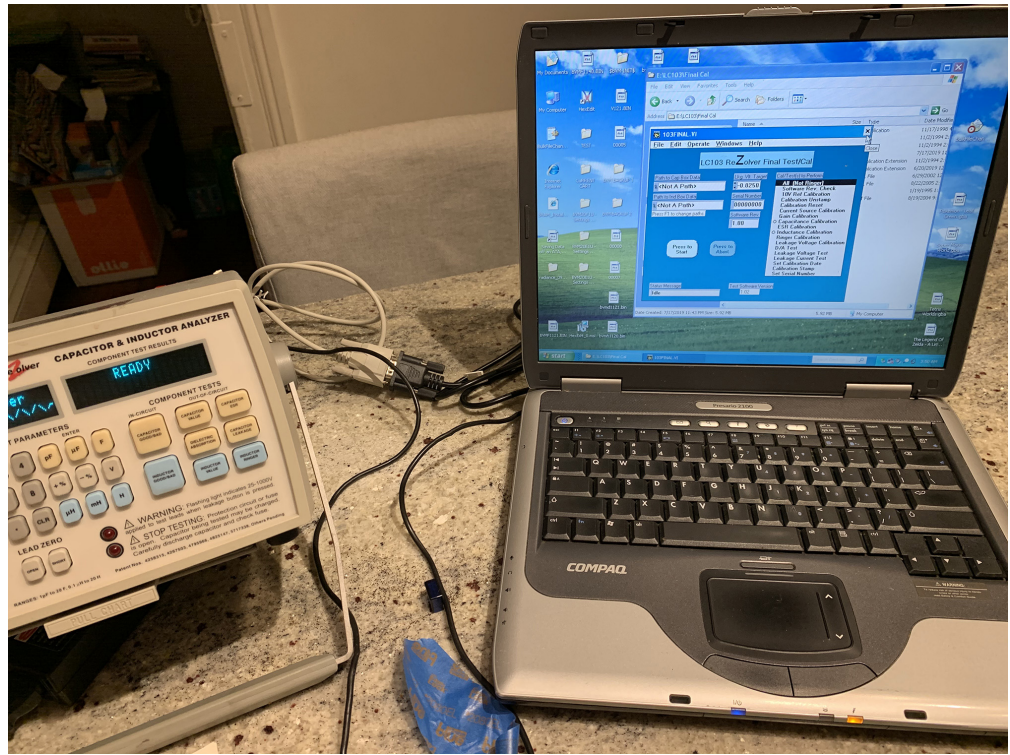
 LC103 CALIBRATION PROCEDURE_Page_2.jpg (408.48 kB, 1700x2200 - viewed 38 times.)



IMG_0297.jpeg (891.32 kB, 2016x1512 - viewed 69 times.)



IMG_0298.jpeg (1135.61 kB, 2016x1512 - viewed 49 times.)



IMG_0299.jpeg (947.51 kB, 2016x1512 - viewed 40 times.)

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HighVoltage

Super Contributor



Posts: 4516

Country:



Re: Sencore LC102 & LC103 Capacitor & Inductor Analyzer

[Say Thanks](#) [Reply](#) [Quote](#)

« **Reply #57 on:** February 02, 2020, 05:35:08 pm »

Very interesting, thanks for sharing.

How can I get a copy of all your files.
I always have a old XP laptop in the lab for such old software.
Will be very interesting to try.

[Report to moderator](#) [Logged](#)

There are 3 kinds of people in this world, those who can count and those who can not.

coromonadalix

Super Contributor



Posts: 2813

Country:



Re: Sencore LC102 & LC103 Capacitor & Inductor Analyzer

[Say Thanks](#) [Reply](#) [Quote](#)

« **Reply #58 on:** February 03, 2020, 04:07:01 am »

Same here 😊 i would like the files

[Report to moderator](#) [Logged](#)

mr.fabe

Regular Contributor



Posts: 161

Country:



Re: Sencore LC102 & LC103 Capacitor & Inductor Analyzer

[Say Thanks](#) [Reply](#) [Quote](#)

« **Reply #59 on:** February 03, 2020, 04:21:14 am »

I would appreciate all the files as well.

My LC103 is the only one that I have not been able to do a calibration on. I was going to try a backdoor method by comparing chips and tweaking the differences but having the software will definitely be useful.

Has the latest LC103 ROM been posted yet? I think it is 1.53...

[Report to moderator](#) [Logged](#)

NY2KW

Regular Contributor



Posts: 113

Country:

 **Re: Sencore LC102 & LC103 Capacitor & Inductor Analyzer**[Say Thanks](#)[Reply](#)[Quote](#)« **Reply #60 on:** February 03, 2020, 04:42:36 am »

You can run a 32b Win XP as a virtual machine in any Windows 10 environment. Just need to download a copy of XP with SP3 and easy to find product keys by Google.

Jerry

[Report to moderator](#)

Logged

 HighVoltage

Super Contributor



Posts: 4516

Country:

 **Re: Sencore LC102 & LC103 Capacitor & Inductor Analyzer**[Say Thanks](#)[Reply](#)[Quote](#)« **Reply #61 on:** February 03, 2020, 09:31:41 am »**Quote from: NY2KW on February 03, 2020, 04:42:36 am**

You can run a 32b Win XP as a virtual machine in any Windows 10 environment. Just need to download a copy of XP with SP3 and easy to find product keys by Google.

Jerry

This does work for a few applications.

... I have an old Fluke Software that was made for Win98 and works perfectly within XP, but I can not get it to run on a virtual XP machine. Therefore I am keeping a few pure XP machines around in the lab.

So, I am looking forward testing this LC103 software on XP.

[Report to moderator](#)

Logged

There are 3 kinds of people in this world, those who can count and those who can not.

 Sencoretech

Contributor

Posts: 18

Country:

 **Re: Sencore LC102 & LC103 Capacitor & Inductor Analyzer**[Say Thanks](#)[Reply](#)[Quote](#)« **Reply #62 on:** February 03, 2020, 02:20:25 pm »

As the last Sencore Tech to officially service these let me answer these questions:

First of the error you are getting is because you are missing the cal text file as you stated. This contains your expected software revisions as well as the expected vs actual values of your test fixtures. With out this file the calibration will not be accurate. I do think it'll run but it'll go to the default values and whatever it pushes to your LC103 might be in the ball park but probably out of the tolerance you'll want.

What you need for cal it a cap decade box, inductance decade box, some coils for calibrating the ringer(this is manual and rarely is ever out of spec) and a 20 ohm resistor for the ESR calibration. What you can't get is the proprietary current source and leakage current box. I know sencore had two of them made and I've only briefly looked at them, they are a series of relays/caps/resistors with an IEEE port to talk to the PC to make calibration partially automated.

All the data is sent to the LC103 via the RS232 port on the back, if you look at the menu you will notice it erases all the cal data as one of the first sets so I would not run this since you'll never be able calibrate the current source.

I haven't worked at Sencore in 3+ years so I don't know if any of the old set up still exists, I'm guessing not but it was there when I was walked out the door so maybe they still have it stuff in storage somewhere.

Sorry for not having better info for you.

Quote from: philexile on February 02, 2020, 04:47:22 pm

Hello,

I acquired a Sencore LC103 from an auction this past summer. Luckily, it seems to work well. At the time, I did some digging for any information I could about the unit and, over time, came up with some interesting materials...

1. Complete BOM files for the LC77, LC102, and LC103
2. Calibration procedures for LC77, LC102, and LC103
3. Schematics and parts lists for the LC77, LC102, and LC103

4. Common fix list for the LC103

5. Sencore's "FinalCal" calibration software for the LC103

I'm assuming that item 5 will interest most people here. 🤔

The FinalCal software is complete (please see the attached pictures of the software up and running on my old XP laptop) and even includes the source code in a separate folder. There are some things to figure out though, see below:

- You will see in the calibration procedure instructions, included with the images, that there are a few separate items called for: final test box, cal disk (more on this in the next point), ringer test box, and ringer cal box. There is also a note towards the end instructing the operator to bring the unit to the z-meter bench in "Service."
- When opening the software, there is a prompt to insert the floppy disk NOW. This is also noted in step 4 of the calibration procedure document – but there it is called "cal disk" and not floppy. I believe this floppy would have included the two "cal" files called for in step 6: "P071_03.cal" and "P72_10.cal" – thankfully, I have these files as well. I haven't been able to try to include them on a floppy disk however as I don't have any floppies currently!
- There is an error shown in the pictures, related to LabVIEW. I'm not sure what this means. It is possible that even though my LC103 was hooked up via the RS232 port, it wasn't communicating properly. I didn't troubleshoot this.
- I am able to navigate to the two cal files, but I haven't run any of the tests or calibrations, since I'm still trying to figure this out – and I'm still missing essential parts of the calibration – the external "boxes."

So where do I go from here? I'm hoping that some of you can help! I think the biggest obstacles will be finding or reproducing the external "boxes" as I assume they were Sencore's proprietary units: final test box, ringer test box, and ringer cal box. That said –

- Maybe a former Sencore tech can help out here?
- Perhaps some information can be gleamed from the source code?

In any case, with this software, I think we are much closer to having these units be serviceable by their owners -- as it should be in 2020!

Looking forward to your thoughts.


Best Regards

Report to moderator  Logged

 **philexile**

Contributor

Posts: 6

Country: 



Re: Sencore LC102 & LC103 Capacitor & Inductor Analyzer

« **Reply #63 on:** February 03, 2020, 06:33:18 pm »

Say Thanks

Reply

Quote

Hi Sencoretech,

Thank you for getting back to me! I have a few followup questions, please see below –

Quote

First of the error you are getting is because you are missing the cal text file as you stated. This contains your expected software revisions as well as the expected vs actual values of your test fixtures. Without this file the calibration will not be accurate.

Sorry, I probably wasn't clear: I actually do have the two cal text files available – **P071_03.cal** and **P72_10.cal** – I assume that I just have to put these on a floppy, and have it inserted to avoid the error? These two files were included with the software.

Quote

What you need for cal is a cap decade box, inductance decade box, some coils for calibrating the ringer (this is manual and rarely is ever out of spec) and a 20-ohm resistor for the ESR calibration.

So the various items you've noted here would be able to be substituted for the "final test box" called for in the LC103 calibration procedure?

Also, would these boxes be okay to use:

cap decade box: Exttech 380405

inductance decade box: Electronix Express Inductance Decade Box

Quote

What you can't get is the proprietary current source and leakage current box. I know Sencore had two of them made and I've only briefly looked at them, they are a series of relays/caps/resistors with an IEEE port to talk to the PC to make calibration partially automated.

Do you know what the proprietary current source and leakage current box was called? If a schematic exists, maybe it can be recreated – unless that would be cost-prohibitive.

Quote

All the data is sent to the LC103 via the RS232 port on the back, if you look at the menu you will notice it erases all the cal data as one of the first sets so I would not run this since you'll never be able to calibrate the current source.

I assume you mean the "calibration reset" menu item? Currently, my unit works well, and I don't plan on running this before being sure I have all the information to safely do so.

From what you've said here, I'm hoping that we can use this software to run some of the calibrations, such as capacitance and inductance, with the right substitute equipment.

Quote

I haven't worked at Sencore in 3+ years so I don't know if any of the old set up still exists, I'm guessing not but it was there when I was walked out the door so maybe they still have it stuff in storage somewhere.

Do you have any contacts that are still with the company who'd be willing to share? From what I understand, Sencore has moved on completely from the test equipment field – so this information would be of little value to them I assume.


Thanks again!

Report to moderator  Logged

Sencoretech

Contributor

Posts: 18

Country: 



 **Re: Sencore LC102 & LC103 Capacitor & Inductor Analyzer**

« **Reply #64 on:** February 03, 2020, 07:40:22 pm »

Say Thanks Reply Quote

Quote

Sorry, I probably wasn't clear: I actually do have the two cal text files available – **P071_03.cal** and **P72_10.cal** – I assume that I just have to put these on a floppy, and have it inserted to avoid the error? These two files were included with the software.

Yeah as long as you can get the files on a floppy you should be fine, you probably want to edit them with the values of your test fixtures.

Quote

So the various items you've noted here would be able to be substituted for the "final test box" called for in the LC103 calibration procedure?

Also, would these boxes be okay to use:

cap decade box: Exttech 380405

inductance decade box: Electronix Express Inductance Decade Box

No the final test box is just the current source/leakage test box, you'll still need it to do those calibrations, you can do the all the others and write the cal stamp w/o it. What you have should work fine as long as you know it's accurate. Sencore had some pretty strict standards and we had all out equipment certified by a lab.

Quote

Do you know what the proprietary current source and leakage current box was called? If a schematic exists, maybe it can be recreated – unless that would be cost-prohibitive.

Yeah there was a schematic for it, I remember looking at it but it was only a paper one. Chances are it's toast by now.

Quote

Do you have any contacts that are still with the company who'd be willing to share? From what I understand, Sencore has moved on completely from the test equipment field – so this information would be of little value to them I assume.

Thanks again!

There are two people I would talk to, if they are still there Tory Hoteling, I believe he's still in customer support but he use to be the service manager when they still had the service department,

the other would be Ralph Belding, he is/was the Quality Assurance manager and might know where the equipment is. I would just call the general number and ask for them, I haven't talked to either of these guys in years but hopefully they'll help you out, but no guarantees.

Report to moderator  Logged

 **philexile**

Contributor

Posts: 6

Country: 



 **Re: Sencore LC102 & LC103 Capacitor & Inductor Analyzer**

« **Reply #65 on:** February 03, 2020, 10:29:21 pm »

Say Thanks

Reply

Quote

Hi again,

Quote

Yeah as long as you can get the files on a floppy you should be fine, you probably want to edit them with the values of your test fixtures.

Good to know, just for reference, below are the values from my two cal docs -

P071_03.CAL

201.1E-12
 1701.1E-12
 0.004E-6
 0.018E-6
 0.04E-6
 0.18E-6
 0.4E-6
 1.764E-6
 3.848E-6
 19.610E-6
 38.37E-6
 172.04E-6
 383.0E-6
 1715.25E-6

P072_1.cal

8.1288
 1.9915
 1.49601
 0.19871
 149.22E-3
 19.944E-3
 14.951E-3
 1.9971E-3
 1.4937E-3
 198.05E-6
 10.31E-6
 2.35E-6
 78.98E-6
 37.15E-6

There are 7 cal ranges. The values listed above are grouped in two's; the first one is the high cal point and the second is the low cal point.

Actually . . . I wonder if those two documents are what was intended for the floppy disk. Looking at the instructions again, you'll see point #5 says to double click on "LC103 Final Cal" icon. I have a folder here with the following items:

LC103 Cal Data.ini
 LC103 configData.nce
 LC103 Final Cal.aliases
 LC103 Final Cal.ini

I'm going to hazard a guess and say that THIS directory is what should go on the floppy disk, right?

Here are the contents of each of the files:

LC103 Cal Data.ini

[LC103 SW]
 ver=1.53

;Capacitors
[C Range0]
200pF (73P71)
low_actual=202.7E-12
1700pF (73P71)
high_actual=1704.0E-12

[C Range1]
0.004uF (73P71)
low_actual=0.004E-6
0.018uF (73P71)
high_actual=0.018E-6

[C Range2]
0.04uF (73P71)
low_actual=0.04E-6
0.18uF (73P71)
high_actual=0.18E-6

[C Range3]
0.4uF (73P71)
low_actual=0.4E-6
1.80uF (74B211)
high_actual=1.765E-6

[C Range4]
4.0uF (74B211)
low_actual=3.849E-6
18.0uF (74B211)
high_actual=19.580E-6

[C Range5]
40.0uF (74B211)
low_actual=38.20E-6
180uF (74B211)
high_actual=171.21E-6

[C Range6]
400uF (74B211)
low_actual=381.04E-6
1800uF (74B211)
high_actual=1709.20E-6

;Inductors
[L Range0]
2.00uH (74A144)
low_actual=2.36E-6
10.0uH (74A144)
high_actual=10.32E-6

[L Range1]
40.0uH (74A144)
low_actual=37.14E-6
80.0uH (74A144)
high_actual=79.00E-6

[L Range2]
200uH (73P72)
low_actual=198.08E-6
1.50mH (73P72)
high_actual=1.4950E-3

[L Range3]
2.00mH (73P72)
low_actual=1.9983E-3
15.0mH (73P72)
high_actual=14.964E-3

[L Range4]
20.0mH (73P72)
low_actual=19.952E-3
150mH (73P72)
high_actual=149.42E-3

```
[L Range5]
200mH (73P72)
low_actual=0.19894
1.50H (73P72)
high_actual=1.49680
```

```
[L Range6]
2.00H (73P72)
low_actual=1.9948
8.00H (73P72)
high_actual=8.1361
```

LC103 Final Cal.ini

```
[LC103 Final Cal]
server.app.propertiesEnabled=True
server.ole.enabled=True
server.tcp.serviceName="My Computer/VI Server"
server.vi.propertiesEnabled=True
WebServer.TcpAccess="c+*"
WebServer.ViAccess="+*"
DebugServerEnabled=False
DebugServerWaitOnLaunch=False
```

Quote

No the final test box is just the current source/leakage test box, you'll still need it to do those calibrations, you can do all the others and write the cal stamp w/o it. What you have should work fine as long as you know it's accurate. Sencore had some pretty strict standards and we had all out equipment certified by a lab.

Okay, so without the "final test box" is the source/leakage box and didn't have anything to do with calibrating the capacitance and inductance? Sorry if I'm being dense – but there were so many "boxes" referenced in the calibration procedure! (final test box, ringer test box, large inductance box, ringer cal box)

Quote

Yeah there was a schematic for it, I remember looking at it but it was only a paper one. Chances are it's toast by now.

I'll dig. 😊

Quote

There are two people I would talk to, if they are still there Tory Hoteling, I believe he's still in customer support but he use to be the service manager when they still had the service department, the other would be Ralph Belding, he is/was the Quality Assurance manager and might know where the equipment is. I would just call the general number and ask for them, I haven't talked to either of these guys in years but hopefully they'll help you out, but no guarantees.

Great, thank you again for all the help!

[Report to moderator](#) [Logged](#)

philexile

Contributor

Posts: 6

Country:



Re: Sencore LC102 & LC103 Capacitor & Inductor Analyzer

« **Reply #66 on:** February 05, 2020, 02:46:29 pm »

[Say Thanks](#) [Reply](#) [Quote](#)

Hello,

Just a quick update — I spoke to a rep at Sencore and they confirmed that the cap and inductance boxes weren't exclusive to Sencore. They're trying to dig up exactly what was used — and additional info on the final cal box.

In the meantime, does anyone have LabView version 3.1 or 5.1 available?

Thanks

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The following users thanked this post: HighVoltage, coromonadalix


globe_02

Re: Sencore LC102 & LC103 Capacitor & Inductor Analyzer

[Say Thanks](#) [Reply](#) [Quote](#)

Newbie

Posts: 3

Country: 



« Reply #67 on: April 03, 2020, 11:13:08 pm »

Hi, is this <https://www.freewarefiles.com/development/labview-nxg-3-1-free-download/> what you are looking for?
Very large file. 3Gb.

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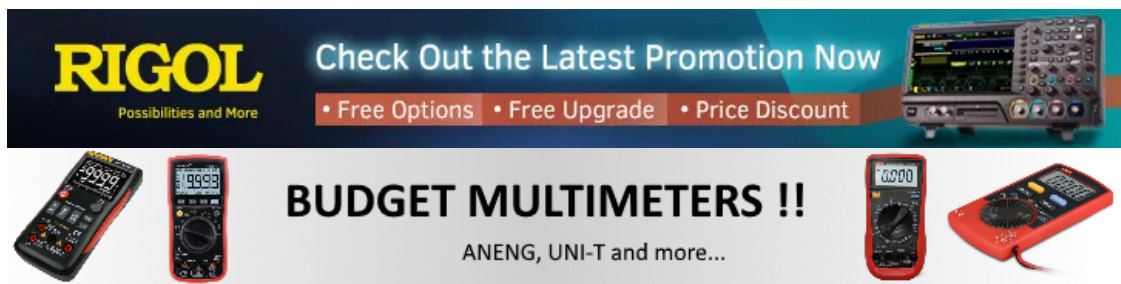


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