EEVblog Electronics Community Forum

A Free & Open Forum For Electronics Enthusiasts & Professionals

Hello volvo_nut_v70
Show unread posts since last visit.
Show new replies to your posts.
August 11, 2020, 03:52:59 pm

[Search box] This topic ▾ Search

🏠 Home   ❓ Help   🔍 Search   👤 Profile   About us   ✉ My Messages   📅 Calendar   Links   👥 Members   ➖ Logout

EEVblog Electronics Community Forum » Products » Test Equipment » Sencore LC102 Cap analyzer

« previous next »

Pages: 1 2 [**All**]   **Go Down**

REPLY   NOTIFY   MARK UNREAD   SEND THIS TOPIC   PRINT   SEARCH

📖 Author   Topic: Sencore LC102 Cap analyzer (Read 14106 times)

volvo_nut_v70 and 0 Guests are viewing this topic.

☐ **bfreemannh**
Newbie
Posts: 1
👤 💬

Sencore LC102 Cap analyzer
« **on:** January 18, 2014, 03:12:04 pm »

Say Thanks   **Reply**   **Quote**

Hi Folks,
Just purchased a used Sencore LC102 and it would appear that it is not happy....ummm...pissed-off might be a better term.
It boots fine and passes it's self test. I can zero the leads in 'open' but when I try to connect the leads together to zero 'short' it reads Error4.
When I test any size cap it reads in pF only and it is way way off. I have tested known good leads from another LC77, it is certainly the tester at fault. The lead fuse behind the BNC jack has continuity. The sencore lead that came with the LC102 worked fine on the LC77. I opened it and reseated connectors and did not see any anomalies.

I purchased on EB for a good sum of money, as it was described as 'working and just removed from a closed service center'. Spending more than $200 (usd) for a repair would exceed it's value. I am looking for options to repair it myself or for a service contact to have it repaired or should I just return it and keep looking?

I mostly work on vintage audio and I want a high performance cap tester with leakage,+600wv, ESR and DA, any suggestions?

Thank you for reading,

Brad

Report to moderator   🏁 Logged

☐ **nctnico**
Super Contributor
🟨🟨🟨

Re: Sencore LC102 Cap analyzer
« **Reply #1 on:** January 18, 2014, 03:56:31 pm »

Say Thanks   **Reply**   **Quote**

I'd return it if it has warranty.

<div align="right">Report to moderator   Logged</div>

There are small lies, big lies and then there is what is on the screen of your oscilloscope.

---

commongrounder
Frequent Contributor

Posts: 317
Country:

Re: Sencore LC102 Cap analyzer
« **Reply #2 on:** January 18, 2014, 04:56:46 pm »

<div align="right">Say Thanks   Reply   Quote</div>

From the Manual:
Error 4... Value Beyond Zeroing Limit
The amount of inductance or capacitance at the TEST LEAD INPUT is beyond the range of the zeroing circuits. An open (greater than 20kohms) or shorted (less than one ohm) test lead will cause the "OPEN" or "SHORT" annunciator to come on, rather than produce an "ERROR 4".
Possible causes:
1) The capacitance at the test lead input is greater than 1800pf
2) The inductance at the test lead input is greather than 18uH
3) The resistance at the test lead input is greater than 1 ohm.

Sounds like something wrong with your test lead that may work with the other unit but is not in range with the auto circuits in the LC102. Good Luck! 😊

<div align="right">Report to moderator   Logged</div>

---

commongrounder
Frequent Contributor

Posts: 317
Country:

Re: Sencore LC102 Cap analyzer
« **Reply #3 on:** January 18, 2014, 08:09:41 pm »

<div align="right">Say Thanks   Reply   Quote</div>

Also wanted to add that it could be one of the relays the LC102 uses to switch functions. They could get corroded if the unit has been stored or not used for a while, causing an increase in the test lead circuit resistance above the one ohm limit. The schematic/service manual would be of great help there. I own a Sencore PA81 I bought as "new old stock". I had to clean every relay in the thing before it would work properly.

<div align="right">Report to moderator   Logged</div>

K1JOS
Regular Contributor

Posts: 137
Country:

Re: Sencore LC102 Cap analyzer
« **Reply #4 on:** January 18, 2014, 09:40:24 pm »

<div align="right">Say Thanks   Reply   Quote</div>

I had a NOS LC-102 and sent it to Sencore for calibration and they spontaneously told me that the three relays in the meter were notorious for getting corrosion on the contacts and these would inevitably cause zeroing problems. They replace all three with updated modern stock and I never had any problems. I would contact them to see if you could buy replacements or get the part numbers.

Jerry

<div align="right">Report to moderator   Logged</div>

---

ruairi
Frequent Contributor

Posts: 298
Country:

Re: Sencore LC102 Cap analyzer
« **Reply #5 on:** November 23, 2015, 06:59:08 pm »

<div align="right">Say Thanks   Reply   Quote</div>

Bumping this old topic. I have an LC77 (almost identical to LC102) that I bought used recently and it is a really nice machine but has the intermittent sticky relay / Error 4 issue. I'd like to replace all of the relays so I sent Sencore an email looking for replacements for the below.

Schematic Designation actual component	Part No.	Part type	Info on
L1, L9 648D05/1AK, 5VDC	41G13	Relay, SPST	MBZ, FRL-
L2, L3 Electronics, 603-3V	41G6	Relay, SPDT	Cornell Dubilier
L4 648D05/1BK, 5VDC	41G15	Relay, SPST	MBZ, FRL-
L5, L6, L7, L8, L10 648D05/1AS, 5VDC	41G12	Relay, SPST	MBZ, FRL-

Their reply;
41G13 – no longer available
41G6 - $27.00 each and in stock
41G15 - $14.50 each and in stock
41G12 – no longer available

Commongrounder mentioned cleaning relays but the relays on the LC102 are sealed. Any ideas on

alternative sources for the above parts?

Thanks!
Ruairi

Report to moderator   ᴸ Logged

ruairi
Frequent Contributor
🟨🟨
Posts: 298
Country: 🇺🇸
👤💬

Re: Sencore LC102 Cap analyzer
« **Reply #6 on:** November 24, 2015, 09:04:00 pm »

Say Thanks   Reply   Quote

Bumping one time

Report to moderator   ᴸ Logged

Sencoretech
Contributor
Posts: 18
Country: 🇺🇸
👤✉💬

Re: Sencore LC102 Cap analyzer
« **Reply #7 on:** December 04, 2015, 07:37:50 pm »

Say Thanks   Reply   Quote

I don't have another supplier for you but your best bet is to replace L2 or clean it if it's one you can open. They used a few different brands on it and if you have an older one you should be able to get the case off of it.

Also cleaning the contacts on the fuse holder, and P2 and P3 on the main board will help. These units can only zero about 3 ohms so it doesn't take much corrosion to cause issues. I'd also check the fuse to make sure it doesn't have any resistance on it as well, I've seen a few that have had more then they should and that causes issues.

Report to moderator   ᴸ Logged

ruairi
Frequent Contributor
🟨🟨
Posts: 298
Country: 🇺🇸
👤💬

Re: Sencore LC102 Cap analyzer
« **Reply #8 on:** December 05, 2015, 12:44:23 am »

Say Thanks   Reply   Quote

Superb info, thank you SencoreTech.

It's been working fine this last few weeks but I'll do as you suggest in the coming days.

Report to moderator   ᴸ Logged

Sencoretech
Contributor
Posts: 18
Country: 🇺🇸
👤✉💬

Re: Sencore LC102 Cap analyzer
« **Reply #9 on:** December 07, 2015, 08:36:30 pm »

Say Thanks   Reply   Quote

Quote from: ruairi on December 05, 2015, 12:44:23 am

> Superb info, thank you SencoreTech.
>
> It's been working fine this last few weeks but I'll do as you suggest in the coming days.

No problem, let me know if you have any other questions. I only check this site a few times a week so PMing me will get my attention quicker.

Report to moderator   ᴸ Logged

Johnny10
Frequent Contributor
🟨🟨
Posts: 697
Country: 🇺🇸
👤💬

Re: Sencore LC102 Cap analyzer
« **Reply #10 on:** January 19, 2016, 06:36:17 pm »

Say Thanks   Reply   Quote

How did this repair progress?

I have the LC102 and I find I get "short" displayed while trying to zero probe on the OPEN switch. Looking for a solution.

Report to moderator   ᴸ 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

glicos

Regular Contributor

Posts: 66

Re: Sencore LC102 Cap analyzer
« **Reply #11 on:** January 20, 2016, 01:51:51 am »

Say Thanks   Reply   Quote

Quote from: bfreemannh on January 18, 2014, 03:12:04 pm

> Hi Folks,
> Just purchased a used Sencore LC102 and it would appear that it is not happy....ummm...pissed-off might be a better term.
> It boots fine and passes it's self test. I can zero the leads in 'open' but when I try to connect the leads together to zero 'short' it reads Error4.
> When I test any size cap it reads in pF only and it is way way off. I have tested known good leads from another LC77, it is certainly the tester at fault. The lead fuse behind the BNC jack has continuity. The sencore lead that came with the LC102 worked fine on the LC77. I opened it and reseated connectors and did not see any anomalies.
>
> I purchased on EB for a good sum of money, as it was described as 'working and just removed from a closed service center'. Spending more than $200 (usd) for a repair would exceed it's value. I am looking for options to repair it myself or for a service contact to have it repaired or should I just return it and keep looking?
>
> I mostly work on vintage audio and I want a high performance cap tester with leakage,+600wv, ESR and DA, any suggestions?
>
> Thank you for reading,
>
> Brad

Try to manually short the output terminal together and check if ok. If yes, you have a problem on your cable otherwise there's a problem with your input section. I have a good working one and will change notes together to repair the problem..

Report to moderator   Logged

commongrounder

Frequent Contributor

Posts: 317
Country: 🇺🇸

Re: Sencore LC102 Cap analyzer
« **Reply #12 on:** January 21, 2016, 06:23:32 pm »

Say Thanks   Reply   Quote

Quote from: Johnny10 on January 19, 2016, 06:36:17 pm

> How did this repair progress?
>
> I have the LC102 and I find I get "short" displayed while trying to zero probe on the OPEN switch.
> Looking for a solution.

Have you done an OPEN zero with no test lead attached? If it completes with no error message, then check your test lead with an ohmmeter for a short between the shield and center conductor (or just the red and black mini-grabbers). If the tester still reads "short" then there is a fault inside the unit that will need to be traced down.

Report to moderator   Logged

Johnny10

Frequent Contributor

Posts: 697
Country: 🇺🇸

Re: Sencore LC102 Cap analyzer
« **Reply #13 on:** January 24, 2016, 05:26:50 am »

Say Thanks   Reply   Quote

OK
My unit shows the "SHORT" designator during the Zero Calibration "OPEN" switch.
When the probe is disconnected.
Where would I find the probe calibration circuit in the Sencore LC102?

I am not at all familiar with this type circuit.
« *Last Edit: January 26, 2016, 08:53:24 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

Johnny10

Frequent Contributor

Posts: 697
Country: 🇺🇸

Re: Sencore LC102 Cap analyzer
« **Reply #14 on:** January 24, 2016, 06:35:45 am »

Say Thanks   Reply   Quote

Mucking around the mainboard now the unit just shuts down whenever I press either "Short" or "Open"
And I don't hear the relay ! Maybe one of the relays malfunctioning ?
« *Last Edit: January 26, 2016, 08:53:43 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

commongrounder

Re: Sencore LC102 Cap analyzer

« Reply #15 on: January 24, 2016, 06:44:54 pm »   **Say Thanks**   **Reply**   **Quote**

Posts: 317
Country: 🇺🇸

The LC-102 uses the ESR and capacitance measurement circuits to determine the residual lead capacitance and resistance, then digitally subtracts the result from actual component readings. There is no "calibration circuit", just a microprocessor routine. The shutdown issue may be a clue to the real problem you are having. The main board has +12, +18 (with a +15 volt on board regulator), +5 and -5 volts, all of which come across from the power supply board to P6. You should be able to probe that connector and check that those voltages are stable. If any of those are out by a significant amount, or collapse when you use the cal switch, you need to go over to the power supply board and check things, especially capacitors. There are switching circuits there. If you have an oscilloscope you can also check for pulse noise on the DC rails that might point to capacitor degradation, or other issues. Do you have the schematics? You should get your hands on a set if you plan to keep this unit for a while.

Report to moderator   Logged

☐ **Johnny10**
Frequent Contributor

🟨🟨

Posts: 697
Country: 🇺🇸

Re: Sencore LC102 Cap analyzer
« **Reply #16 on:** January 24, 2016, 07:38:28 pm »   **Say Thanks**   **Reply**   **Quote**

Thanks,

Oops, you caught the shut down problem very quickly for me!
If you have seen my other post about display problems with this unit I am getting quite good at working on the power supply.

I was using too low a power supply voltage and as soon as I brought it back up .. no more shutdown. Forgot the voltage setting from the last time on the bench!

Still getting the SHORT on Open result .

I do have a set of schematics that I printed out from the online manual.
Problem is the mainboard schematic is quite hard to read unlike the power supply and display board schematics.

I will have to enlarge it and then print again.

« *Last Edit: February 07, 2016, 11:02:36 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

🟩 **commongrounder**
Frequent Contributor

🟨🟨

Posts: 317
Country: 🇺🇸

Re: Sencore LC102 Cap analyzer
« **Reply #17 on:** January 26, 2016, 07:55:07 pm »   **Say Thanks**   **Reply**   **Quote**

Ah. Good that the shutdown problem had a simple solution. Too bad it still leaves you with the short issue.
When the unit is at rest, the relays have the 50 ohm (two 100 ohm 22 watt resistors in parallel) discharge load across the leads. If the relay switching is faulty, this load might possibly remain in circuit and cause the short reading when running the cal. Do you read around 50 ohms across the test jack (If it is lower, then there is an additional short on the circuit)? You should hear some relay clicking when running cal. Do you have solid supply voltage (either +5 or +12v) at all of the relay coils? L2 and L3 have high side switching through their transistors, TR10 and TR9, so their coils have no voltage unless energized. The others have low side switching and have +5v on the coil high side. Finally, there is always the possibility of a welded relay contact if the unit was abused by a previous user (like hooking onto a capacitor charged to 5kv or something).
By the way, do you get an error code when you run a capacitance test?
Sorry I can't check the forum very often right now due to being so busy, but will try to check in on your progress. 😊

Report to moderator   Logged

☐ **Johnny10**
Frequent Contributor

🟨🟨

Posts: 697
Country: 🇺🇸

Re: Sencore LC102 Cap analyzer
« **Reply #18 on:** January 27, 2016, 04:29:38 pm »   **Say Thanks**   **Reply**   **Quote**

Thanks! commongrounder for taking time to go over this problem with me.
Output jack reads 51.9 ohms.
Open switch reads Short
Short switch starts the blinking dash for probe cal without leads attached.
Voltages are at 12V, 5V at relays.
When running Cap Value Test display reads Short
Relays are clicking at Cap Value Test but displays Short with no lead attached.

Leakage test sends entered voltage spike to BNC .

« Last Edit: February 01, 2016, 05:18:23 am 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

Johnny10

Frequent Contributor

🟡🟡

Posts: 697
Country: 🇺🇸

📇💬

📎 **Re: Sencore LC102 Cap analyzer**　　　　　**Say Thanks**　　**Reply**　　**Quote**
« **Reply #19 on:** February 02, 2016, 03:51:00 pm »

Re-reading this thread I see commongrounder cleaned all the relays in his unit.

 Fujitsu FRL-648D05/1AK relays

I cleaned the contacts in the Cornell Dubilier 603-3v relay.
Found a Fujitsu relay L8 that is always open and wouldn't close.

After disconnecting this relay I can get the ESR to work (shows accurate result of resistor in test port but still comes up "Short" on Cap Value Test and Zero Cal.

Maybe I am getting closer to solving this problem?

📎 Sencore Relays.jpg (185.95 kB, 772x513 - viewed 675 times.)

« Last Edit: February 09, 2016, 02:44:09 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

JDM

Newbie

Posts: 1
Country: 🇨🇦

📇💬

📎 **Re: Sencore LC102 Cap analyzer**　　　　　**Say Thanks**　　**Reply**　　**Quote**
« **Reply #20 on:** October 27, 2016, 08:31:38 pm »

Quote from: ruairi on November 23, 2015, 06:59:08 pm

> Bumping this old topic. I have an LC77 (almost identical to LC102) that I bought used recently and it is a really nice machine but has the intermittent sticky relay / Error 4 issue. I'd like to replace all of the relays so I sent Sencore an email looking for replacements for the below.
>
> | Schematic Designation | Part No. | Part type | Info on actual component |
> |---|---|---|---|
> | L1, L9 | 41G13 | Relay, SPST | MBZ, FRL-648D05/1AK, 5VDC |
> | L2, L3 | 41G6 | Relay, SPDT | Cornell Dubilier Electronics, 603-3V |
> | L4 | 41G15 | Relay, SPST | MBZ, FRL-648D05/1BK, 5VDC |
> | L5, L6, L7, L8, L10 | 41G12 | Relay, SPST | MBZ, FRL-648D05/1AS, 5VDC |

Also bumping this old topic... working on my LC102 with same intermittent issue when zeroing the cable.

603-3V is still available; it has a contact rating of 2A. It is in series with L3, which in my unit is an Omron G2R-1-E-DC12: this E part has a 16A contact rating, so I'm wondering if L2 might also benefit from a higher contact rating (now that 3V relays are much more commonly used, there are many more options).

I searched for data on the FRL-648 relays and came up with nothing, so I wrote to Fujitsu who kindly and quickly replied with the attached (which they say is all they have on these relays discontinued 20 years ago).

My summary of the FRL-648 parts:
D05 is 5VDC coil, 550 ohms, 45 mw (ie. 9mA), 3.8V pickup
and for /1AK, /1AS, /1BK
1 = SPST
A = form A (normally open)
B = form B (normally closed)
S = 10VA, 500mA, 100V contact rating
K = 50VA, 1A, 100V contact rating

There is a note about magnetic shield inside the mold, but I'm guessing that isn't relevant in this application.

Summarizing the various recommendations from Sencoretech et al, my plan is to replace L1,L2,L9 (possibly with higher contact rating parts), as well as clean the fuse holder and P2&P3 connectors on the main board.

📎 frl-640.pdf (220.72 kB - downloaded 865 times.)

Report to moderator　📶L Logged

Johnny10

Frequent Contributor

Posts: 697
Country: 🇺🇸

Re: Sencore LC102 Cap analyzer
« Reply #21 on: October 27, 2016, 10:26:56 pm »

Say Thanks　　Reply　　Quote

I don't know if I would change all the relays.
That seems to be the consensus but I found it wasn't a cure all for the problem.
I have a lot of experience with the LC102.

You could say I cut my teeth on this baby.

I took the Omron relays apart, don't and I mean don't cut the top off the relay.
It actually comes apart very easily. Small hidden tab at bottom and lifts off in one piece. No need to cut or slice top. (Sencoretech noted changes in BOM at different serial numbers.
I followed an old thread on different site and they were very wrong for my unit.
Actually there was a lot of incomplete information available.
Really think before you go messing around with the main board as it is very easy to damage.

Most of my problem with error 4 was in the BNC/inline fuse connector, It is very sensitive to movement. (tightening the fuse holder had an effect on my error 4 issue) I cleaned it and still didn't work. It took the intermittent behavior to suggest the Fuse Holder was partial to blame.
The LC77 and LC102 are very similar I believe it is just the Leakage voltage that is different.
I purchased a LCD Screen from the LC77 and it was identical except for one indicator lamp. Never used it! I did test it in the LC102 and worked fine.

1. Check the resistance through the fuse holder first, try tightening while calibrating leads. Check Short Open test while fiddling with BNC connection.
2. Be very careful of all wire connectors.... just moving the inter-board connectors will sever the connection on those old thin wires and you won't even see the break. These connectors worked by slicing the insulation during insertion.
3. Change all the caps in the power supply. They did not hold up well. Mine leaked under can.
4. These are fantastic easy to use Capacitor checkers with lots of great functions.

I also bought 5- 5V Fujitsu relays. NOS FRP645
I will look up the seller. Fairly Expensive.

These old boards are quite easy to damage. ie. lift pads. I lifted a pad removing one of the smoothing caps. Easy to Short them out! Blow them up! Yikes !
Mucking around with those old reed relays may not a good idea.
Maybe that is where all the information came about relay problems?
I shorted one on my board just checking voltages and it was a pain to get it out and find another.

My unit works great now no complaints.

Great addition to the bench.

« Last Edit: October 30, 2016, 08:57:09 pm by Johnny10 »   Report to moderator   Logged
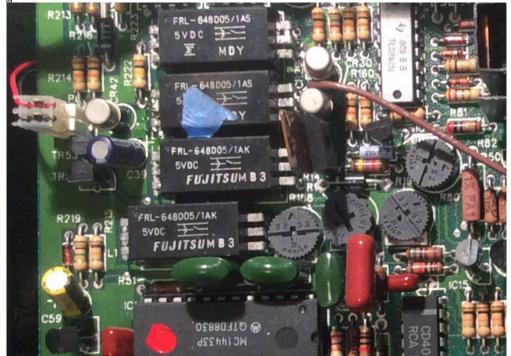
Tektronix TDS7104, DMM4050, HP 3561A, HP 35665, Tek 2465A, HP8903B, DSA602A, Tek 7854, 7834, HP3457A, Tek 575, 576, 577 Curve Tracers, Datron 4000, Datron 4000A, uTracer, HP5335, EIP534B 20GHz Frequency Counter, TrueTime Rubidium, Sencore LC102, Tek TG506, TG501, SG503, HP 8568B

Johnny10
Frequent Contributor

Posts: 697
Country: 🇺🇸

Re: Sencore LC102 Cap analyzer
« **Reply #22 on:** October 28, 2016, 12:48:05 pm »   Say Thanks   Reply   Quote

Found the supplier of those relays.

http://www.ebay.com/itm/FUJITSU-FRL-648D05-1AS-1-FORM-A-Relay-New-Lot-Quantity-5-/161929708311?hash=item25b3c34317:g:IDkAAOSwnLdWs5uy

As I said I bought 5 of these.
Not as expensive as I remembered.

« Last Edit: October 28, 2016, 01:15:20 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

zaoka
Frequent Contributor

Posts: 373
Country: 🇺🇸

Re: Sencore LC102 Cap analyzer
« **Reply #23 on:** October 31, 2016, 12:43:15 am »   Say Thanks   Reply   Quote

Replacing relays, test leads, BNC and fuse holder fix most of the problems. I used different relays, glued them and used wires to connect to PCB. Those two are NLA from Sencore for a long time.

Once fixed its the best to send it to Sencore for calibration...

Report to moderator   Logged

Johnny10
Frequent Contributor

Posts: 697
Country: 🇺🇸

Re: Sencore LC102 Cap analyzer
« **Reply #24 on:** October 31, 2016, 01:25:03 am »   Say Thanks   Reply   Quote

Did you see the calibration instructions given by Sencoretech?

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

Johnny10
Frequent Contributor

Posts: 697
Country: 🇺🇸

Re: Sencore LC102 Cap analyzer
« **Reply #25 on:** October 31, 2016, 01:51:25 am »   Say Thanks   Reply   Quote

Found the 1AK on eBay marked incorrectly!
Fujitsu not Fairchild

http://www.ebay.com/itm/LOT-OF-4-FRL-648D05-1AK-by-Fairchild-relay-/141971378792?hash=item210e275268:g:UNgAAOSwiYFXHi8T

The blue tape is on bad L8
Below that actual 1AK relays.

Fujitsu 1AK.jpg (19.02 kB, 500x401 - viewed 227 times.)

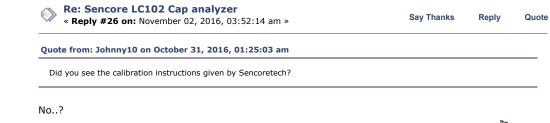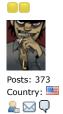

IMG_1261.JPG (224.08 kB, 764x545 - viewed 279 times.)

« Last Edit: October 31, 2016, 02:06:08 am 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

---

zaoka

Frequent Contributor

Posts: 373
Country:

Re: Sencore LC102 Cap analyzer
« **Reply #26 on:** November 02, 2016, 03:52:14 am »

Say Thanks   Reply   Quote

Quote from: Johnny10 on October 31, 2016, 01:25:03 am

Did you see the calibration instructions given by Sencoretech?

No..?

Report to moderator   Logged

Johnny10

Frequent Contributor

Posts: 697
Country: 🇺🇸

Re: Sencore LC102 Cap analyzer
« **Reply #27 on:** November 02, 2016, 09:23:03 am »

Say Thanks   Reply   Quote

Just meant... calibration instructions for LC102 are available on the forum.

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

The following users thanked this post: zaoka

---

pigrew

Frequent Contributor

Posts: 568
Country: 🇺🇸

Re: Sencore LC102 Cap analyzer
« **Reply #28 on:** June 02, 2018, 02:16:27 am »

Say Thanks   Reply   Quote

The manual had a hint that they would eventually do something with the "SPARE" button on the front panel, and talked about replacement EPROMS.

To that end, I just read out the EPROM of a LC102. I think it's revision 17 of the EPROM. There are a number of bodge wires on the board; I don't know if they are required or not for this firmware revision. Perhaps the hardware revision is run "58A"?

I've also uploaded the firmware to KO4BB.

I'm interested it getting the computer interface up and running, but can't find any details on the interface box.... Does anyone have photos inside the IB72? It should contain an I/O extender for the TMP80C39AP-6 processor (the TMP82C43P).

📎 Sencore_LC102_TMS27C256_169G266-17.zip (10.68 kB - downloaded 72 times.)

📎 SencoreLC102_EPROM_sm.jpg (661.82 kB, 4000x3000 - viewed 151 times.)

Report to moderator   Logged

---

pigrew

Frequent Contributor

Posts: 568
Country: 🇺🇸

Re: Sencore LC102 Cap analyzer
« **Reply #29 on:** June 03, 2018, 06:49:47 pm »

Say Thanks   Reply   Quote

Quote from: pigrew on June 02, 2018, 02:16:27 am

> I'm interested it getting the computer interface up and running, but can't find any details on the interface box.... Does anyone have photos inside the IB72? It should contain an I/O extender for the TMP80C39AP-6 processor (the TMP82C43P).

I spent yesterday trying to decode the firmware (and stitch together the schematics in the PDF of the

manual). I'm 99% sure it does use the TMP82C43P I/O expander. I'm not sure which GPIB controller it uses, perhaps the Intel 8291 or similar. I've put my progress with disassembly on Github.

I don't have the parts on hand to (easily) emulate the TMP82C43P, so I can't do any hardware testing at the moment. I think I'll order one from eBay (and a DIN 7 connector). Don't expect to hear more until a few weeks from now (I'll be at IMS in a week).

Report to moderator   Logged

□ **pigrew**

Frequent Contributor

🟡🟡

Posts: 568
Country: 🇺🇸

👤💬

📎 **Re: Sencore LC102 Cap analyzer**   **Say Thanks**   **Reply**   **Quote**
« **Reply #30 on:** July 11, 2018, 10:51:58 pm »

I got the IO expander chip (It was stuck in Chicago customs for two weeks), and have successfully received data from a LC102.

The protocol doesn't seem to match any particular GPIB controller, so my guess is that Sencore had a microcontroller as the interface.

One difficulty is that I don't know how to do galvanic isolation due to the bidirectional nature of the I/O pins. The connector on the LC102 contains earth, common, \PROG, and four I/O lines. For the moment, my cable connects common to the microcontroller's ground/USB ground/earth. I'm leaving the LC102's earth floating. The LC102's common is floating with respect to earth, and is connected to the DUT's negative (BNC shield).
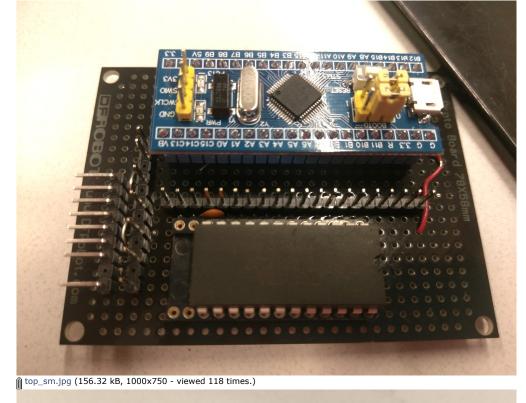
Because of the ESD diodes in the I/O expander, bad things would happen if the I/O expander was not powered while the LC102 is turned on. I added some isolation between the busses with BS138 nFETs. The gates are tied to the expander's VDD, so the bus is isolated when power is off (there's a 100k resistor between VDD and GND). The drain is connected to the LC102. I'm very curious how Sencore had solved this circuit problem. Or did they just add some series resistors to reduce the fault-current?
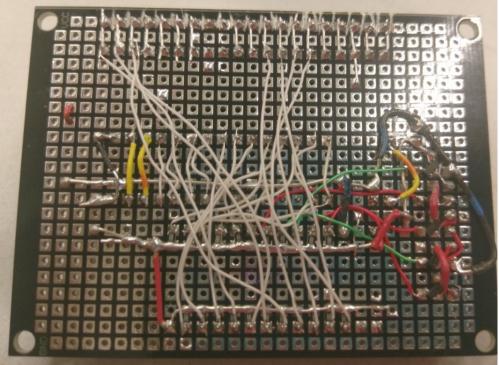
The I/O expander protocol uses 8 lines for data I/O, four input signals, and four output signals. For now, I've implemented a "reset", and a "write" signal from the LC102. Feedback to the LC102 is through "Ready" and "data received" signals. I wanted there to be some sort of four-way handshake (write-enable, write received, wait for write received, de-assert write-enable, wait for NOT write received), but the Sencore firmware doesn't seem to wait for "NOT write received" before sending the next character. Even though, the STM32 code seems to receive data properly.

(PS: I now truly hate proto-boards. Next time I'm going to go straight to PCB)

```
🖥 Console    🗄 Memory    ▦ SWV Trace Log    ▦ SWV Exception Trace Log    🔍 Problems  ▶

Port 0  ✖

Received 'CPO   0000.      \0d\0a'
Received 'CPOReceived 'CPO   0000.      \0d\0a'
Received 'CPO   0000.      \0d\0a'
Received 'CPO   0000.      \0d\0a'
Received 'CPO   0000.      \0d\0a'
Received 'CPO   0000.      \0d\0a'
Received 'CPO   0000.      \0d\0a'
Received 'CPO   0000.      \0d\0a'
Received 'CPO   0000.      \0d\0a'
Received 'CAP00115.2E-12 \0d\0a'
Received 'CAP00115.6E-12 \0d\0a'
Received 'CAP00115.1E-12 \0d\0a'
```

📎 DataLog.png (39.67 kB, 963x573 - viewed 108 times.)

top_sm.jpg (156.32 kB, 1000x750 - viewed 118 times.)

bottom_sm.jpg (158.35 kB, 794x600 - viewed 110 times.)

Report to moderator   Logged

Pages: 1 2 [**All**]   **Go Up**   REPLY   NOTIFY   MARK UNREAD   SEND THIS TOPIC   PRINT   SEARCH

« previous next »

Share me

LINK TO CALENDAR

Jump to: => Test Equipment ▾ go

➕ **Quick Reply**

| EEVblog Main Site | EEVblog on Youtube | EEVblog on Twitter | EEVblog on Facebook | EEVblog on Library |

SMF 2.0.15 | SMF © 2017, Simple Machines
Simple Audio Video Embedder
SMFAds for Free Forums
XHTML RSS Mobile WAP2