

Part #:	<b>Sentrius™ MG100</b>	 
Description:	<ul style="list-style-type: none"> <li>• LTE M / NB-IoT / Bluetooth 5 Micro-Gateway</li> <li>• Bridge Bluetooth sensors to the Cloud</li> </ul>	 <a href="#">Download Datasheet</a>

# 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.  
October 13, 2020, 03:32:10 pm

This topic

- Home
- Help
- Search
- Profile
- About us
- My Messages
- Calendar
- Links
- Members
- Logout

EEVblog Electronics Community Forum » Products » Test Equipment » Sencore LC102 lcr meter









« previous next »

Pages: [1] **Go Down**

- REPLY
- NOTIFY
- MARK UNREAD
- SEND THIS TOPIC
- PRINT
- SEARCH

Author

Topic: **Sencore LC102 lcr meter** (Read 1777 times)

volvo\_nut\_v70 and 0 Guests are viewing this topic.

**bubbatech**  
Contributor  
Posts: 5  
Country:

**Sencore LC102 lcr meter**  
« on: March 05, 2018, 07:26:47 pm »

Say Thanks Reply Quote

I bought a Sencore lc102 meter at a hamfest for an insane good price. I calibrated it and it worked flawlessly for month.  
Now, it says "error 7" when one attempts to zero it, or measure capacitance below 2uF (but not above). Inductance and ESR measurements are fine. The onset of the problem was sudden as if something folded. I have been working on this thing for about a month now, trying to diagnose the problem and it is absolutely kicking my ass. I have replaced the relays, the lm319 comparator, and for awhile suspected IC12, a flip-flop that addresses the current sources for capacitance measurements since only measurements below 2uf were affected (therefore, I suspect, screwing the ability to zero compensate). One theory was a power supply issue, but all the rails are nominal, except for the 12 volt unregulated rail which is at 13.8 volts, but I think that is normal. My most recent theory has been that there is a problem with one line in the control buss, but swapping the IC and checking all the components on that buss (F5) yielded nothing. 🙄  
In fact, though, I am still guessing. I still don't even know which section of the circuit is problematic. If someone who has some familiarity with this instrument could throw me a bone, it would be very grateful. I am running out of ideas.  
This is such a nice instrument. I refuse to give up. 🙄

Report to moderator Logged

**Johnny10**  
Frequent Contributor  
  
Posts: 714

**Re: Sencore LC102 lcr meter**  
« Reply #1 on: March 05, 2018, 08:23:37 pm »

Say Thanks Reply Quote

Yes I had 13 something on mine.  
I have to dig up my notes.  
  
I had the most problems with those "split the wire" connectors.  
And you have cleaned and measured the resistance through the Combination fuse/BNC input ?

Country: 



My favorite LC meter!

« Last Edit: March 05, 2018, 08:27:45 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

 **bubbatech**

Contributor

Posts: 5

Country: 



 **Re: Sencore LC102 lcr meter**

« Reply #2 on: March 06, 2018, 12:39:25 am »

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

Thanks for your reply. Yes, I checked the usual culprits. The input connections are clean and, prior to the failure, an error 4 indicating resistance out of spec did not occur. I have the full, original schematics for it, which are quite nice, but they do not specify nominal voltages and there is no discussion of the theory of operation, so it is not clear if some of the measured voltages are what they should be, since I never measured them before the unit failed.

[Report to moderator](#)  Logged

 **Johnny10**

Frequent Contributor



Posts: 714

Country: 



 **Re: Sencore LC102 lcr meter**

« Reply #3 on: March 06, 2018, 11:33:27 am »

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

Tell me which measurements you are looking for and I will check on mine. I have had a few of these units and repaired two.

Repairing the display on one of these was my first foray into electronics repair 4 years ago.

[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: 714

Country: 



 **Re: Sencore LC102 lcr meter**

« Reply #4 on: March 06, 2018, 04:31:06 pm »

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

Looking over the specs of the LC102 pg 7. There is range switching of Capacitor ESR :

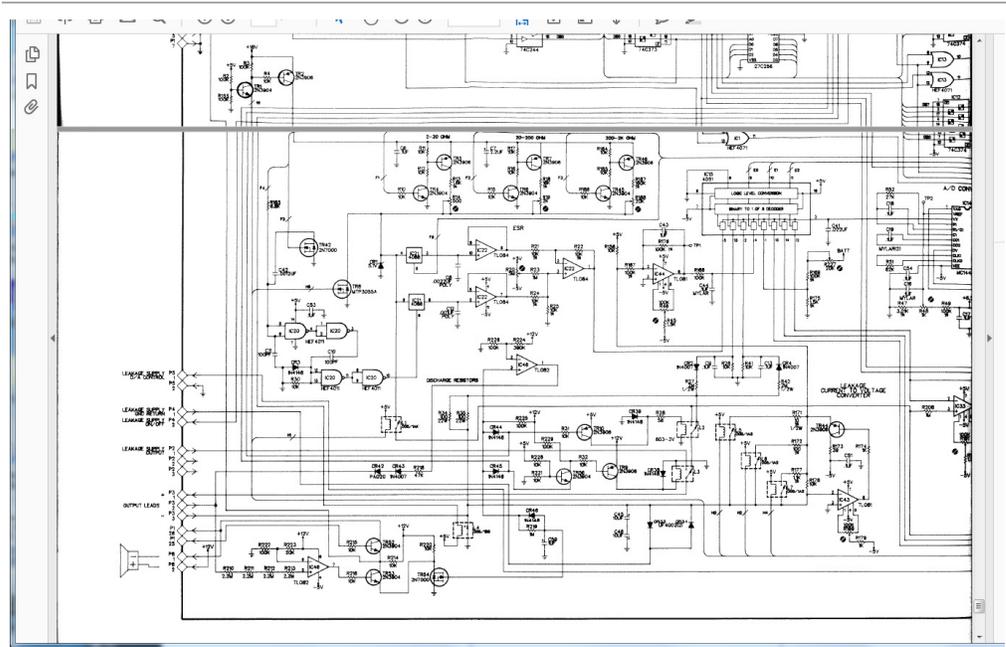
Your problem must be related to that circuit.

The patent is available 4795966

"the present invention a new and improved method for measuring the equivalent series resistance of a capacitor by charging the capacitor from a constant current source"

So problem must be in the ESR circuitry.

Schematic on left hand bottom of 2000 Board



LC102- ESR Schematic.jpg (346.66 kB, 1368x896 - viewed 305 times.)

6 / 111 25%

.01 uA	0.01 uA to	19.99 uA
.1 uA	20.0 uA to	199.9 uA
1 uA	200 uA to	1999 uA
0.1 mA	2.00 mA to	19.99 mA

**CAPACITOR ESR**  
(Test patented)

ACCURACY: +/-5% +/- 1 digit  
CAPACITOR RANGE: 1 uF to 19.99 F  
RESOLUTION AND RANGES: .10 ohm to 2000 ohms, fully autoranged

.01 ohm	0.10 ohms to	1.99 ohms
.1 ohm	2.0 ohms to	19.9 ohms
1 ohm	20 ohms to	1999 ohms

**CAPACITOR D/A**  
(U.S. Patent #4,267,503)

ACCURACY: +/- 5% of reading +/- 1 count  
RANGE: 1 to 100%  
CAPACITOR RANGE: .01 uF to 19.99 F

**INDUCTORS (In or out of circuit)**

**INDUCTANCE VALUE**  
(U.S. Patent #4,258,315)  
A dynamic test of value determined by measuring the EMF produced when a changing current is applied to the coil under test.

CURRENT RATES: automatically selected

50 mA/uSec	0 uH to	18 uH
5 mA/uSec	18 uH to	180 uH
.5 mA/uSec	180 uH to	1.8 mH
50 mA/mSec	1.8 mH to	18 mH
5 mA/mSec	18 mH to	180 mH
.5 mA/mSec	180 mH to	1.8 H
.05 mA/mSec	1.8 H to	19.99 H

ACCURACY: +/-2% +/- 1 digit  
RESOLUTION AND RANGES: .10 uH to 20 H, fully autoranged

.01 uH	0.10 uH to	19.99 uH
.1 uH	20.0 uH to	199.9 uH
1 uH	200 uH to	999 uH
0.01 mH	1.000 mH to	1.999 mH

**TEMPERATURE: operating range:** 32° to 104°F (0° to 40°C) **range for specified accuracy** (after 10 minute warmup): 50° to 86°F (10° to 30°C)

**POWER:** 105-130V AC, 60Hz, 24 watts with supplied PA251 power adapter. Battery operation with optional BY234 rechargeable battery. 210-230V AC operation with optional PA252 Power Adapter.

**AUTO OFF:** Removes power during battery operation if unit sits idle longer than 15-20 minutes.

**BATTERY LIFE:** 8 hours typical inductor testing; 7 hours typical capacitor testing.

**SIZE:** 6" x 9" x 11.5" (15.2cm x 22.9cm x 29.1cm) **HWD**

**WEIGHT:** 6 lbs. (2.7kg) without battery, 7.6 lbs (3.4kg) with battery

**GOOD/BAD INDICATION:** Functions on all tests. Requires user input of component type and value, or input of desired limits.

**IEEE:** Requires the use of Sencore IB72 Bus Interface Accessory.

The following interface codes apply: SH1, AH1, TS, LA, SRO, RLO, PPO, DCO, DTC, CO. All readings are test accuracy +/- 1 count.

Specifications subject to change without notice

**ACCESSORIES**

**SUPPLIED:**

- 39G219 Test Leads
- 39G144 Test Lead Adapter
- 39G201 Test Button Hold Down Rod
- 64G37 Test Lead Mounting Clip
- PA251 AC Power Adapter/Recharger

**OPTIONAL:**

- 39G85 Touch Test Probe
- FC221 Field Calibrator
- BY234 Rechargeable Lead Acid Battery
- SCR250 SCR/Triac Test Accessory
- CC254 Carrying Case
- CH255 Component Holder
- CH256 Chip Component Test Lead
- IB72 Bus Interface Accessory
- PA252 220V AC Power Adapter/Recharger

LC102- ESR Spec.jpg (390.17 kB, 1209x932 - viewed 215 times.)

« Last Edit: March 06, 2018, 06:06:34 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

**Re: Sencore LC102 Icr meter**  
« Reply #5 on: March 06, 2018, 06:24:40 pm »

Say Thanks Reply Quote

Looking at the Error Code 7 description.

The error code describes a 1uF limit to ESR.

Posts: 714  
Country:



either an incorrect COMPONENT TYPE switch is selected for the test, or no COMPONENT TYPE switch is selected when required.

Possible causes:

1. Performing a capacitor test with an inductor COMPONENT TYPE switch selected.
2. Performing an inductor test with a capacitor COMPONENT TYPE switch selected.
3. Performing the INDUCTOR RINGER test without an inductor COMPONENT TYPE switch selected.
4. Performing any component test with the "Spare" capacitor COMPONENT TYPE button selected.

**Error 2 - Entered Value Beyond Range of Unit** - The component parameter entered via the keypad or IEEE is beyond the measuring range of the LC102.

Possible causes:

1. Entering a capacitance value greater than 19.9 Farads, or less than 1 picofarad.
2. Entering an inductance value greater than 19.9 Henrys, or less than .1 microhenrys.
3. Entering a leakage voltage greater than 999.9 volts.
4. Entering a tolerance percentage greater than +100%, or less than -99%.
5. Entering a tolerance percentage that includes a decimal.

*NOTE: Entering a leakage voltage less than 1 volt will set the leakage supply to 0 volts.*

**Error 6 - Invalid Computer Interface Command** - An improper command was sent to the LC102 via the computer interface.

Possible causes:

1. Sending a command that is not recognized by the LC102.
2. Wrong command syntax.

*NOTE: Refer to the COMPUTER INTERFACE section of this manual for information on using the AUTO-Z with computer control.*

**Error 7 - Component Out Of Test Range** - The component under test exceeds the limits of the test which was attempted.

Possible causes:

1. Measuring ESR of a capacitor having a value less than 1 uF.
2. Measuring capacitance value on an extremely leaky capacitor.
3. Attempting a capacitor value test with 1 ohm to 2 Megohms resistance connected across test leads.

Error 7.jpg (282.48 kB, 1335x747 - viewed 217 times.)

Report to moderator

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

**bubbatech**

Contributor

Posts: 5

Country:



**Re: Sencore LC102 lcr meter**

« Reply #6 on: March 07, 2018, 03:35:19 am »

Say Thanks Reply Quote

Thank you very much for your time. I have checked esr measurements by connecting resistors across the leads and it appears to read ok, so that idea is not intuitively obvious to me (which could be why I have so far failed!) However, if the ESR section is involved in capacitance measurements, then it becomes much more plausible. I have looked at ic21 some, but nothing else. Tomorrow evening, I'll try to make some measurements, paying attention to CR1 and some of the lines leading from IC21 to those op-amps to see if any of the capacitors have shorted to ground. Thank you!

Report to moderator

**bubbatech**

Contributor

Posts: 5

Country:



**Re: Sencore LC102 lcr meter**

« Reply #7 on: March 13, 2018, 09:11:09 pm »

Say Thanks Reply Quote

It has been awhile since I worked on the instrument because I have been out of town. I am getting back to it, but there is one critical question. There is a 12V unregulated power rail. On that rail, I find 13.8V. If this is abnormal, it would explain why the current sources for low capacitance measurements never turn on because the base would always remain relative negative. On the other hand, 12V rails in battery powered devices can be as high as 13.8V normally. Do you see this in your working device? Thanks!

Report to moderator

**Johnny10**

Frequent Contributor



Posts: 714

Country:



**Re: Sencore LC102 lcr meter**

« Reply #8 on: March 14, 2018, 02:00:02 am »

Say Thanks Reply Quote

Where are you measuring the 12v unregulated line? I just opened my unit and have it sitting on bench.

« Last Edit: March 14, 2018, 02:46:38 am by Johnny10 »

Report to moderator

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

**bubbatech**

Contributor

Posts: 5

Country:



**Re: Sencore LC102 lcr meter**

« Reply #9 on: March 14, 2018, 02:03:22 pm »

Say Thanks Reply Quote

Damn. I wish I had seen this sooner. Sorry. You could measure it on pin 6 of P4 on the power supply board, or Pin 5 of P6 on the main board. These are connected to the output of the unregulated 12 V supply. It is plausible that this would be higher than 12V because I think it is used to charge the battery, but I need to make sure so I can rule

it out.

In any event, I think the primary problem is that the line that should enable the relevant current sources, which are the cathode side of CR6 and CR7 on the main board should go logical low for at least a short period (I think) when capacitance measurements are made or the instrument is zeroed. When that line goes more negative, it should drive current across R53 and R54, pulling the base of Tr11 more negative, turning it on. I have never seen these lines go low - ever. They stay rock solid at 4.8V. It is my feeling that this can't be right. If it is convenient, can you measure these lines when the capacitance button is pressed (or the zero switch) and tell me if they go low as well? That would be extremely helpful. If they never go low on your instrument, then I am chasing the proverbial wild goose.

Thanks!

[Report to moderator](#) Logged

**Johnny10**

Frequent Contributor



Posts: 714

Country:



**Re: Sencore LC102 lcr meter**

« **Reply #10 on:** March 14, 2018, 02:46:33 pm »

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

No Problems I cleared the bench for another project.

Pin 6 P4 on 3000 Board

14.77 Volts

[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

Pages: [1] [Go Up](#)

[REPLY](#) [NOTIFY](#) [MARK UNREAD](#) [SEND THIS TOPIC](#) [PRINT](#) [SEARCH](#)  
« previous next »

Share me



[EEVblog Electronics Community Forum](#) » [Products](#) » [Test Equipment](#) » [Sencore LC102 lcr meter](#)

[LINK TO CALENDAR](#)

Jump to:

Quick Reply

**RIGOL**  
Possibilities and More

Check Out the Latest Promotion Now

- Free Options
- Free Upgrade
- Price Discount

**BUDGET MULTIMETERS !!**  
ANENG, UNI-T and more...

[EEVblog Main Site](#)

[EEVblog on Youtube](#)

[EEVblog on Twitter](#)

[EEVblog on Facebook](#)

[EEVblog on Library](#)