

LA100 Application Note 24: Fitting the Lithium-Ion Battery Upgrade (Switching PSU)

Note: Only fit this modification to LA101 or LA102 with a black switch-mode power module (NOT a blue or grey transformer type).

This kit is to be fitted by competent engineering personnel. If you have any queries, contact Lindos for advice.

All memory contents of LA102 will be lost. It is best to print out any relevant information before starting this upgrade.

While fitting the kit, static electricity precautions must be observed.

Check Kit contents:-

- 1 x Lithium-Ion battery pack assembly.
- 1 x 3K9 1% ¼W resistor.
- 1 x 220R 1% ¼W resistor.
- 1 x 1K5 1% ¼W resistor.
- 1 x 10K 1% ¼W resistor.
- 1 x 18R 1% 1W resistor.
- 1 x 470K 1% surface mount resistor.
- 1 x 10nF 63V ceramic capacitor.
- 1 x MF-R020 polyfuse.
- 1 x BC639 transistor.
- 1 x KA431AZ I.C.
- 1 x Shorting Link.
- 10cm Kynar wire.
- 1 x Test load.

Fitting the upgrade:-

- Disconnect the instrument (LA101 or LA102) from the mains supply and remove the top cover.
- Unplug and remove the Ni-Cad battery pack. Dispose of this in an environmentally responsible manner or return it to Lindos for disposal.
- The upgrade is fitted to the processor/power supply (top) board. Carefully remove this board from the chassis by disconnecting the ribbon cables, remove the screws, remove the mains shield and unsolder the mains wiring.

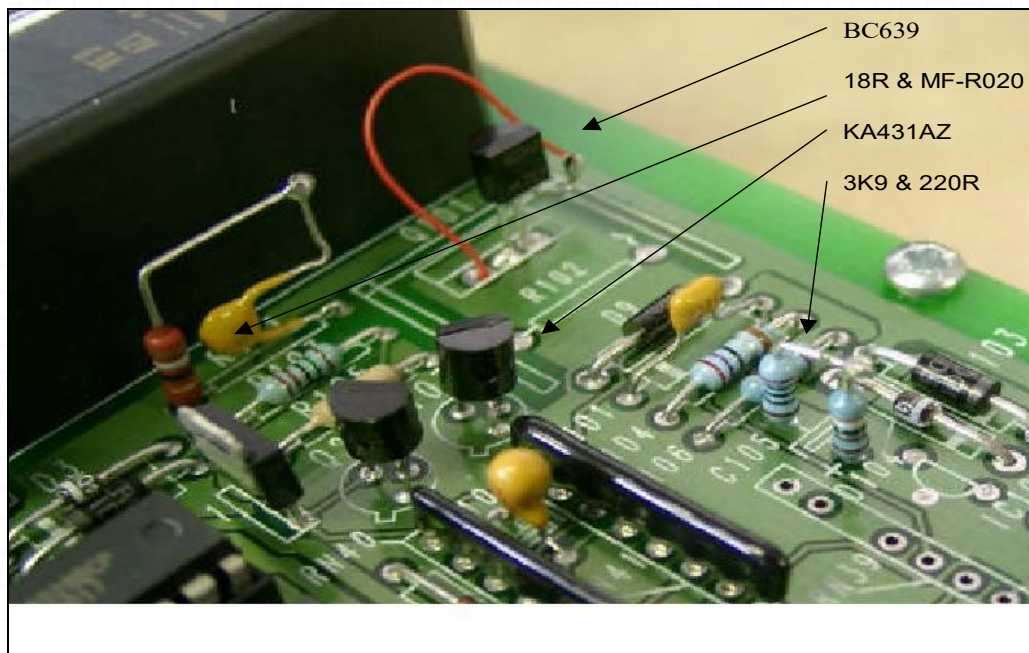
- Remove the components listed by cutting their leads and unsoldering the remaining wire ends in turn. Carefully clean out the holes with a solder sucker.

Reference No.	Component
C105	22 μ F tantalum
D101	1N4148
IC101	LM2931
IC102	MAX2003
Q101	2SA968
Q103	BC107
R101	1R8
R102	47R
R103	68R
R105	510R
R106	4K7
RN39	Lindos resistor pack

- Fit the components listed, referring to the illustrations where indicated *.

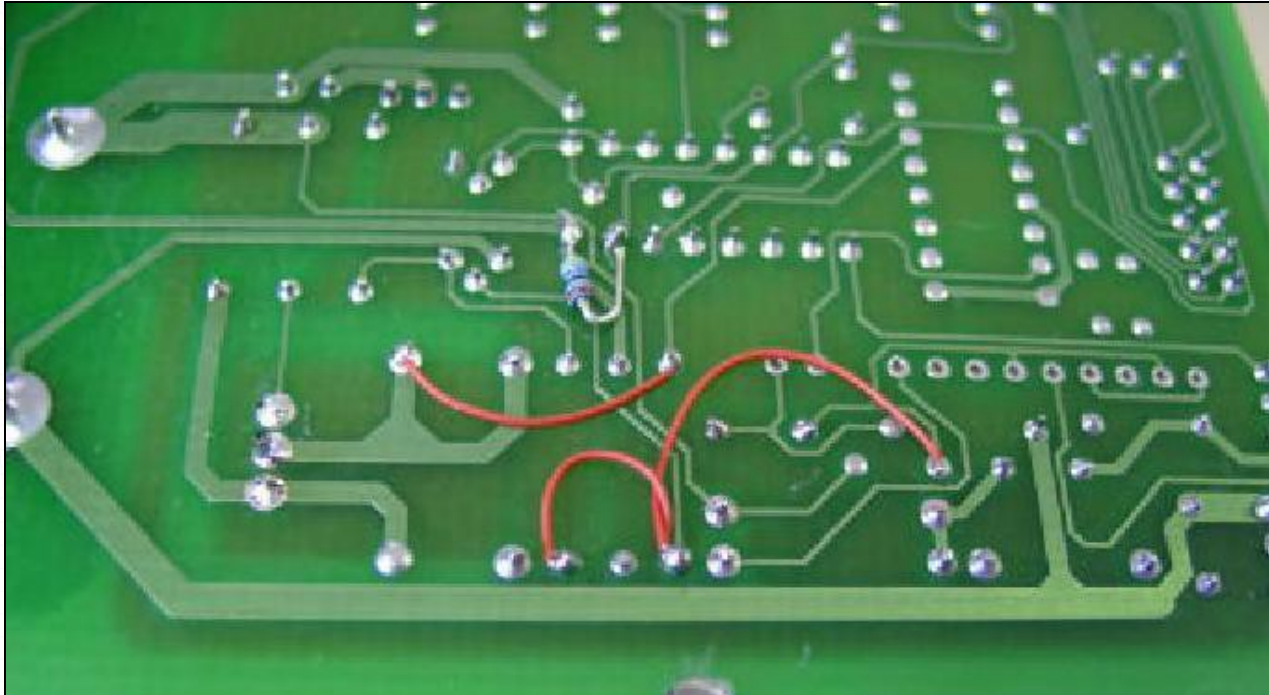
Reference	New Component
C105	3K9 & 220R *
D101	10nF 63V
Q101	BC639 *
Q103	KA431AZ *
R101	18R & MF-R020 *
R103	1K5
R105	Shorting Link
R106	10K

Please note that several component positions will be left vacant.



Please pay particular attention to the orientation of the KA431AZ in position Q103.

- Take the remaining 9cm of Kynar wire and place the links on the under (track) side of the PCB, using the illustration as guide.



- Identify resistor network RN41 and carefully fit the supplied $220\text{K}\Omega$ surface mount resistor between pads for pins 7 & 8 on the non-component side of the PCB. For reference, pin 1 is identified by a dot in the screen-printed legend on the component side of the board.
- Refit the processor board back in the unit. Be careful that the mains voltage wiring is not trapped when refitting the board. Check very carefully that all cables/wires are fitted to their original locations and that there are no loose wires.
- Apply mains power. The unit should work normally.
- Take the test load in the kit (8K2 resistor on a 3-way header) and plug it on to the battery connector on the processor board. Using a Digital Voltmeter, check the voltage on the outer pins of the battery connector. This voltage must be $8.35\text{V} \pm 0.05\text{V}$. If the voltage is above 8.40V, do not connect the battery pack and contact Lindos for advice.
- If within these limits, fit and connect the new battery pack, noting that the battery connector will only fit one way round. Check battery operation. Batteries are normally supplied about 75% charged.
- Leave unit powered from the mains at least overnight to charge the new battery.
- Re-fit the top cover.

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