Jim Henry wrote a superb guide about LCD soldering which is not only interesting for beginners - thanks Jim!

http://www.midibox.org/users/jim_henry/building_a_midibox_lcd_cable.pdf

The soldered connections to the LCD are somewhat fragile. The one pictured in my guide broke after a few weeks of use. (I just have all the boards loose as I try different configurations so I am hard on the connections.) I suggest folding the ribbon cable back onto itself about 1/2“ from the soldered connections and securing the ribbon cable to the LCD's PCB to provide some mechanical support for the soldered points. I just taped the ribbon cable to the opposite edge of the PCB. I'll update the guide once I get some hours accumulated on this additional step to verify that it protects the soldered connections. _Jim Henry_

Additional hints: So long as the operating system (MIOS) hasn't been uploaded via MIDI, the LCD won't be initialized and shows black bars at the upper line. If you don't see these bars, adjust the contrast pot. The highest contrast can be achieved with V0=0V (you can adjust this voltage with the trimpot P2).

A message should appear on screen once MIOS is up and running.

Note: if you've connected a second LCD (e.g. for MIDIboxSEQ or MIDIboxLC) to the core, it won't be initialized so long the appr. application (which supports this option) hasn't been uploaded

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Blank display?:

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"The main problem tends to be that the display contrast is not set
correctly, or that they have used an extended temperature range display
without realising that it needs a negative contrast voltage." _Steve Lawther
from [this
page|http://ourworld.compuserve.com/homepages/steve_lawther/charlcd.htm]_
```

Contrast:

```
If you can sweep the contrast control pot from one end to the other and you
don't see any change, (even if there is no text on the display, you should
be able to see the pattern of pixels with the contrast full up or full down)
And you are sure the wiring is correct, Then you -probably- have a display
that needs a negative contrast voltage (between 0 and -5 volts, not 0 and +5
like the CORE gives). _SmashTV_
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BG Micro displays:

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"I purchased a 40x2 LCD with LED backlight from BG Micro and built the
display according to the diagram above. When I plugged the display into the
computer and powered it up it displayed nothing. Most displays, when
powered, will display all block characters across the first line until they
receive some sort of signal. I saw no blocks, no smoke, and had no funny
smells. The LED backlight was working which made me feel a little better. I
checked and re-checked my connections a dozen times before I caught a slight
```

glimpse of characters. When I held the display at an angle I could see faint characters on the display. I was relieved that it was working but confused why the characters were so dim. BG Micro supplied a technical sheet with the LCD which identified the LCD as being manufactured by Tianma. After searching through their website I discovered they offered their LCD's in both standard and extended temperature models. I don't really know what the extended temperature means but the documentation stated that the contrast controls require negative voltage for control rather than the simple ground used in the diagram above."_Jonathan Hamilton from [this page|http://www.modthebox.com/lcdhowto.shtml]_

How do I generate a negative voltage for the contrast?:

[This site|http://www.modthebox.com/lcdhowto.shtml] shows a decent example of the easiest way to create a negative contrast voltage without a negative rail on your power supply. This works because the current draw/power requirement of the contrast supply is very very small, and there is a wide range of easy to use IC's besides the example given on the site for this. _SmashTV_

LED Backlights:

Does your LCD backlight flash once then go dark when you apply power to the core? If yes you probably have the "A" and "K" connections reversed, And this condition might be pulling several times the usual power requirement from the power supply. (IE regulator hot enough to burn it's number into your fingertip!) _SmashTV_

If you have connected A and K right and your backlight is still flashing AND your regulator is very hot....then you can be sure that your power supply isn't strong enough for the whole box (especially if you have more than one display). Solution: Build a seperate power supply for the backlight(s). _Doc_

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