SynchroChron LCD Schematic

10 messages

Kendrick Wiersma <kgw3@students.calvin.edu> **Wed, Mar 30, 2011 at 9:30 AM**
To: info@synchro.com

Dear SyncroSystems,

We are a team of senior electrical engineering students working with a TI MSP430 and have chosen to use your 160-segment display for our project. We are working on doing some layout in EAGLE for our PCBs and are wondering if you happen to have, or be able to provide, a pre-made part library that we could use?

Thanks.
Kendrick Wiersma
kgw3@students.calvin.edu

Chuck Cox <chuck@synchro.com> **Wed, Mar 30, 2011 at 10:01 AM**
To: Kendrick Wiersma <kgw3@students.calvin.edu>
Cc: John Lupien <john@synchro.com>

The attached is from an in-house project. We haven't tried using it outside our project environment, but hopefully it will be helpful. Let me know how it goes because we'd like to add it to our public downloads if it is useful.

The common and segment pins can be connected to the MCU common and segment pins in any order, commons have to connect to commons and segments have to connect to segments, but the numbers don't have to match, however you will need to update the driver configuration to match your pinout.

Also: The thin piece of plastic in the backlight package is a spacer to help maintain the correct spacing while soldering in the LCD, but don't expose it to too much heat, just quickly tack the corners then remove the spacer.

Good luck and let us know how your project goes.

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> kgw3@students.calvin.edu <mailto:kgw3@students.calvin.edu>

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sclcd.lbr
5K

Kendrick Wiersma <kgw3@students.calvin.edu> **Wed, Mar 30, 2011 at 10:13 AM**
To: Chuck Cox <chuck@synchro.com>

Chuck,

Thanks for your prompt reply, really do appreciate it!

Simply loading the library into our project appears to work; I will probably be making a demo PCB in the next few days using the part library and I'll report back to you then how it went.

Thanks again.

Kendrick Wiersma
kgw3@students.calvin.edu

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Kendrick Wiersma <kgw3@students.calvin.edu> **Wed, Apr 6, 2011 at 9:09 PM**
To: Chuck Cox <chuck@synchro.com>
Cc: John Lupien <john@synchro.com>

Chuck,

Thanks again for the part library, it was quite useful for making our small breakout board. One of our other team-mates routed the board and it turned out just fine.

However, now that we can attach the LCD to our microprocessor, an MSP430F47197, I have a few more questions. We have been trying to use your provided driver firmware and are having a bit of difficulty mapping our pinout into the lcd_wiring.h. Allow me to explain our setup: Our dev-board an MSP-TS430PZ100A from TI has pins for S0-S39 spaced around the edges (not all Sx pins are spatially close to each other) and a 4 COM pins. We have attached the segment pins from the LCD to the Sx pins on the board LCD0->S0, LCD1->S1, et c. and rearranged the header to show all pins in order. We then setup the 1/3 bias resistor ladder as shown in your user manual, and configured our device (we believe) to power everything as necessary. In spite of this we do not seem to be able to get anything appearing on the LCD. Can you suggest anything else that we should be looking into?

If I need to provide some more info to better allow you to answer this please let me know. This is the first time I've tried to interface an LCD to a microprocessor so please excuse any questions that might be slightly naive/

Thanks again.

Kendrick Wiersma
kgw3@students.calvin.edu

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> <sclcd.lbr>

Chuck Cox <chuck@synchro.com> **Thu, Apr 7, 2011 at 9:27 PM**

To: Kendrick Wiersma <kgw3@students.calvin.edu>
Cc: John Lupien <john@synchro.com>

It sounds like lcd_wiring.h should look like:

```
// MCU S0 (pin 12)
S00 = 0,                        // LCD S0  (pin  1)
S01,                           // LCD S1  (pin  2)
S02,                           // LCD S2  (pin  3)
...
```

If you are seeing segments but they are not in the right place, then lcd_wiring.h is the problem. If you aren't getting any display, then make sure you have initialized the clocks and LCD controller correctly. See the demo firmware on our website for an example. We don't have code specific to the MSP430F47197, so you'll need to work through the details for your chip. You should also verify that the voltage divider is generating the correct voltages. If the LCD controller is running correctly, you should see waveforms similar to those in the MCU data sheet at the COM and SEG pins. If you haven't worked with the MSP430 before, it can be difficult to get configured correctly. Read the data sheet carefully, paying particular attention to your clock configuration since that is vital to driving the LCD controller. We like the Imagecraft toolchain because it includes a handy "Application Builder" that simplifies the peripheral configuration process. If you get stuck, you might try downloading an evaluation copy and examine the initialization code it generates for your chip.

Good luck.

On 4/6/2011 9:09 PM, Kendrick Wiersma wrote:

> Chuck,
>
> Thanks again for the part library, it was quite useful for making our small breakout board. One of our other team-mates routed the board and it turned out just fine.
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> Thanks again.
>
> Kendrick Wiersma

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John Lupien <john@synchro.tuffmail.com> **Fri, Apr 8, 2011 at 9:40 PM**
Reply-To: john@synchro.com
To: Kendrick Wiersma <kgw3@students.calvin.edu>
Cc: Chuck Cox <chuck@synchro.com>, John Lupien <john@synchro.com>

Hi Kendrick,
It sounds to me as if your setup should be able to work.
If there are no electrical continuity/resistance issues between
the CPU and the display, it should be able to run. The description
you give sounds like it may have more wiring/cable/interface than
I usually work with, I like to have the LCD soldered directly to the
PCB. Capacitance in the hookup would be a big concern since
an LCD segment is similar to a capacitor in its circuit role.
Do you have any kind of contrast control? I don't have a reference
ready to hand, but the board I did most recently has a potentiometer
you have to adjust for contrast.
My first couple of tries to get a display working came up blank
One was thermal damage, the other was because the contrast was
too low.
-John

On 4/6/2011 9:09 PM, Kendrick Wiersma wrote:

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Kendrick Wiersma <kgw3@students.calvin.edu> **Tue, Apr 12, 2011 at 12:03 PM**
To: john@synchro.com
Cc: Chuck Cox <chuck@synchro.com>

Chuck and John:

Thanks to both of you for your responses. I actually got the display working the same day you emailed back but just haven't got around to writing back because we've been drafting our final report.

Our problem was the configuration of the LCD controller, or more specifically our development board, which required an additional clocking circuit to be attached before any of the peripherals would function (of course, this was conveniently omitted in the documentation).

John: we don't specifically have a contrast control, but may try to add one before the end of the project. However, we're using the MSP430's internal resistor ladder to generate the reference voltages, and I'm not entirely sure how that would work. Can you offer any insight here?

If you'd like to see our implementation in action you can pull up a quick video from Youtube.

Thanks again
Kendrick Wiersma
kgw3@students.calvin.edu

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Chuck Cox <chuck@synchro.com> **Tue, Apr 12, 2011 at 12:15 PM**
To: Kendrick Wiersma <kgw3@students.calvin.edu>
Cc: john@synchro.com

Thanks for the YouTube link, very cool. Keep us up-to-date on your project.

On 4/12/2011 12:03 PM, Kendrick Wiersma wrote:

> Chuck and John:
>
> Thanks to both of you for your responses. I actually got the display working the same day you emailed back but just haven't got around to writing back because we've been drafting our final report.
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> Kendrick Wiersma
> kgw3@students.calvin.edu <mailto:kgw3@students.calvin.edu>
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> > > <http://focus.ti.com/docs/toolsw/folders/print/msp-ts430pz100a.html> from TI has pins for S0-S39 spaced around the edges (not all Sx pins are spatially close to each other) and a 4 COM pins. We have attached the segment pins from the LCD to the Sx pins on the board LCD0->S0, LCD1->S1, et c. and rearranged the header to show all pins in order. We then setup the 1/3 bias resistor ladder as shown in your user manual, and configured our device (we

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> >
> > Kendrick Wiersma
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Kendrick Wiersma <kgw3@students.calvin.edu> **Mon, Apr 25, 2011 at 9:24 AM**
To: Chuck Cox <chuck@synchro.com>
Cc: john@synchro.com

As a token of our team's appreciation for your help, both of should be receiving (or may have already received) invites to our senior design presentations and following banquet.

If you happen to be in the Michigan area around May 7, we hope you will come and join us. Otherwise thanks again :)

Kendrick

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Chuck Cox <chuck@synchro.com> **Mon, Apr 25, 2011 at 11:25 AM**
To: Kendrick Wiersma <kgw3@students.calvin.edu>
Cc: john@synchro.com

Hi Kendrick,

Yes, we did receive your invitations, thank you for inviting us. If either of us were closer we would definitely attend, but neither of us has plans to be in the midwest, so we must decline. Good luck with your presentation and thanks again for inviting us.

On 4/25/2011 9:24 AM, Kendrick Wiersma wrote:

> As a token of our team's appreciation for your help, both of should be receiving (or may have already received) invites to our senior design presentations and following banquet.
>
> If you happen to be in the Michigan area around May 7, we hope you will come and join us. Otherwise thanks again :)
>
> Kendrick

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