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code for graphical LCD? Font etc...

Author: [bschiett3 \(bert schiettecatte\)](#) (bert.schiettecatte@esat.kuleuven.ac.be)

Date: May 24 03, 00:21

hi all,

I've been thinking about using one of these nice 128x64 pixel graphical displays from Optrex (Epson LCD controller on board) in my new AVR project. I'd rather not write all the code to do graphics like plotting text, loading and converting fonts, etc etc... drawing widgets... I came across a library that offers all this functionality but I don't have 2500 \$ to spend on that. does anyone here have any suggestions?

thanks,
bert

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**If You could buy
One Universal
ICE/ISP/ISD
Tool**

Re: code for graphical LCD? Font etc...

Author: [John Sorensen](#) (noemail)

Date: May 24 03, 00:43

What compiler? What uC? What LCD controller?

j.

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Re: code for graphical LCD? Font etc...

Author: [bschiett3 \(bert schiettecatte\)](#) (bert.schiettecatte@esat.kuleuven.ac.be)

Date: May 24 03, 00:49

Hi,

GCC or IAR, Atmega32-16mc, the display is Optrex F-51320GNB-LW-AB which uses an Epson 15605D11B series controller according to the LCD module specs.

thanks,
bert

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Re: code for graphical LCD? Font etc...

Author: [bobgardner \(Bob Gardner\)](#) (bobgardner@aol.com)
Date: May 24 03, 01:18

>I'd rather not write all the code to do graphics like plotting text, loading and >converting fonts, etc etc... drawing widgets... I came across a library that offers >all this functionality but I don't have 2500 \$ to spend on that. does anyone here >have any suggestions?

Write the library and sell it for \$2000. Start a price war. We'll all wait till the price gets down to about \$100

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Re: code for graphical LCD? Font etc...

Author: [Dennis Welbourn](#) (dwelbourn@monacohr.com)
Date: May 24 03, 07:10

Hi Bert,

Recently on 8052.com the same subject was discussed and a freebie program was found to provide the font conversion for graphics. I tried to attach it and send it earlier today, but my computer hiccuped and I guess it didn't happen. You can go to 8052.com and search for it, or email me (I'll be back in the office maybe Wednesday) and I'll forward it to you.

Another good source of font and graphics software is in the Linux/Open Source world. LOTS of stuff available! Go to www.freshmeat.net and search. It's unlikely to be AVR code, but you ought to be able to find something to start from.

Dennis

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Re: code for graphical LCD? Font etc...

Author: [Mike Betz \(Mike Betz\)](#) (ams@iafrica.com)
Date: May 24 03, 07:32

Hi Bert.

If you are going to use a graphic lcd with a built-in controller, try and get one that uses a t6963c controller or compatible. I have found it quite easy to interface to these controllers. I have used an epson controller, think it was esd1330 or somethin like that and found it to be an absolute pain in the but.

The other option, would be to use one without a controller. Yes, you have to generate your own font, character positioning, cursor etc. but I have found these displays to be close to 1/2 the price of one with a controller. For AVRGCC there is a library AVRLIB which contains, amongst other things, routines which support a 128x64 non-built-in controller lcd. I have managed to get these working (+/-) in CVAVR. If you are interested, mail me and I will send you what I have.

TTFN
Mike

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Re: code for graphical LCD? Font etc...

Author: [vipwu](mailto:hw_viper@yahoo.com) (hw_viper@yahoo.com)
Date: May 24 03, 08:02

hello:
i have a problem with LCD display, i use AVR AT90S8535 to control LCD, but i do not know the LCD work. please give me some example of LCD!
best regards
thanks

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Re: code for graphical LCD? Font etc...

Author: [bschiett3 \(bert schiettecatte\)](mailto:bert.schiettecatte@esat.kuleuven.ac.be) (bert.schiettecatte@esat.kuleuven.ac.be)
Date: May 24 03, 11:58

hi,

maybe you can post the part number for the LCD here, so we can point you to the right direction. other than the manual and datasheet that come with the LCD, I wouldn't be able to help you ...

thanks
bert

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Re: code for graphical LCD? Font etc...

Author: [glitch](#) ()
Date: May 24 03, 20:06

The F51320 is a very easy LCD/controller to work with. You can buy an eval kit from Apollo Displays, and with that comes all the info you need to program for the display. I was able to port the manufacturers code directly to the AVR with no problem. As for font's etc, it is a bit of work, but I'm sure you can make use of some of the libraries posted here in the academy, you may even find one that has what you need.

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Re: code for graphical LCD? Font etc...

Author: [sk2209 \(steve k\)](#) (steve@snipersolutions.com.au)
Date: May 25 03, 04:57

I too use the same Optrex LCD and had no drama writing some assembly code to drive it.
It took some time but i wouldnt say it was hard to work with.
As glitch said there are many bits of code and existing font tables here already that u should be able to slightly modify to suit your needs.

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Re: code for graphical LCD? Font etc...

Author: [Michael](#) (mbruch@mbe-bielefeld.de)
Date: May 26 03, 11:47

I have a nice library written under imagecraft.

It runs on UC1606 KS07 controller supporting fonts, icons, listboxes

look at www.jukeboxmp3.de for a sample project.

for displays look at

<http://www.data-modul.de/de/presse/produkt/material/artikel/41>

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Re: code for graphical LCD? Font etc...

Author: [baso \(Knut Baardsen\)](#) (avr@baso.no)
Date: May 26 03, 19:19

Bert,

There is some code for both 6963c and SED1330/1335 based displays in the "Academy" section. I recently posted a lib for the SED's there. But first be very sure what graphic controller your display have. I have about 70 brand new displays without controller here, and they are really painfull.

BTW1:

Some small displays use a mini controller from Epson which they call SED, but it is not compatible with the SED1330/1335. You will in fact find some info about this display of yours at <http://www.mcselec.com> (Look under links).

BTW2:

The SED chips from Epson is just as easy / hard as the Toshiba 6963 chip - It's only a question of the right init and code. Most of the LCD code found is overcoded- it's really not that hard to do :-)

-Knut-

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Re: code for graphical LCD? Font etc...

Author: glitch ()
 Date: May 26 03, 20:31

The F51320 from Optrex uses the SED1565 Controller. This Tech-note from Optrex is what I used as the basis for my code.

http://www.optrex.com/SiteImages/PartList/APPNOTE/Technical_Note_r02.pdf

There should be enough there to get you writing to the display. You should be able to fill in the rest using the various routines that are in the academy.

The only changes I would suggest are for the following constants, this should give you fairly readable contrast at start-up.

```
V5_RESISTOR_RATIO = 0x24
ELECTRONIC_VOLUME_INIT = 0x36
```

Beyond that the C code in the app note ports pretty much directly to IAR. The only other trick is for the read sequencing. This is because of how the AVR sets/reads the pin states. Toggle the /RD line both on & off, then read the data pins. To illustrate, here is the LCD_READ routine I made based on the example code in the tech note above.

```
unsigned char read_LCD(unsigned char command) {
  unsigned char retVal;

  LCDCONTROL |= BUS_RELEASE;
  DDLRDD = BUS_READ;

  if(command==LCDCMD)
    LCDCONTROL &= ~LCD_A0;
  else
    LCDCONTROL |= LCD_A0;

  LCDCONTROL &= ~LCD_CS;
  LCDCONTROL &= ~LCD_RD;

  // sample on PINx occurs at the start of the cycle, so we need to
  // wait a cycle (setting occurs at the end
  // so we set & clear the read line & then read the bus
  LCDCONTROL |= LCD_RD;

  retVal = LCDIN;

  LCDCONTROL |= LCD_CS;

  LCDCONTROL |= BUS_RELEASE;
  return retVal;
}
```

As the code above was made to be easily ported to various devices & port connections all the port references are aliased. below are the descriptions for the ones referenced in the code above. The rest of the constants, should be consistent with those defined in the tech note.

LCDCONTROL is an alias for the port I tied the control lines to.

DDLCCDD is an alias for the data direction register for the port that the data lines are attached to.

LCDIN is an alias for the PINx register for the port the data lines are connected to.

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Re: code for graphical LCD? Font etc...

Author: [bschiett3 \(bert schiettecatte\)](#) (bert.schiettecatte@esat.kuleuven.ac.be)

Date: May 27 03, 02:48

Hi All,

I'd like to thank all of you for your help and for the tons of useful suggestions I've received. I'm sure I'll be able to get my project up and running now. I'll put up a website in a while with more details.

take care,
bert

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mega64	64	2048	4096	✓	53	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
mega103	128	4096	4096	✓	48	23	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
mega128	128	4096	4096	✓	48	23	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

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