Using GLCD JHD12864E

The graphical LCD JHD12864E is a 128x64 (8192) pixel dot matrix LCD. Each pixel on the display can be set or reset as per requirement. The LCD is divided into two halves of 64x64 pixels each of which is independently controlled by means of a KS0108 microcontroller. There are two chip select pins which enable the user to write to the two halves either individually or together.

The LCD is divided into 8 horizontal pages each of which has 128 columns of 8 bits each. The structure is shown in the following figure.

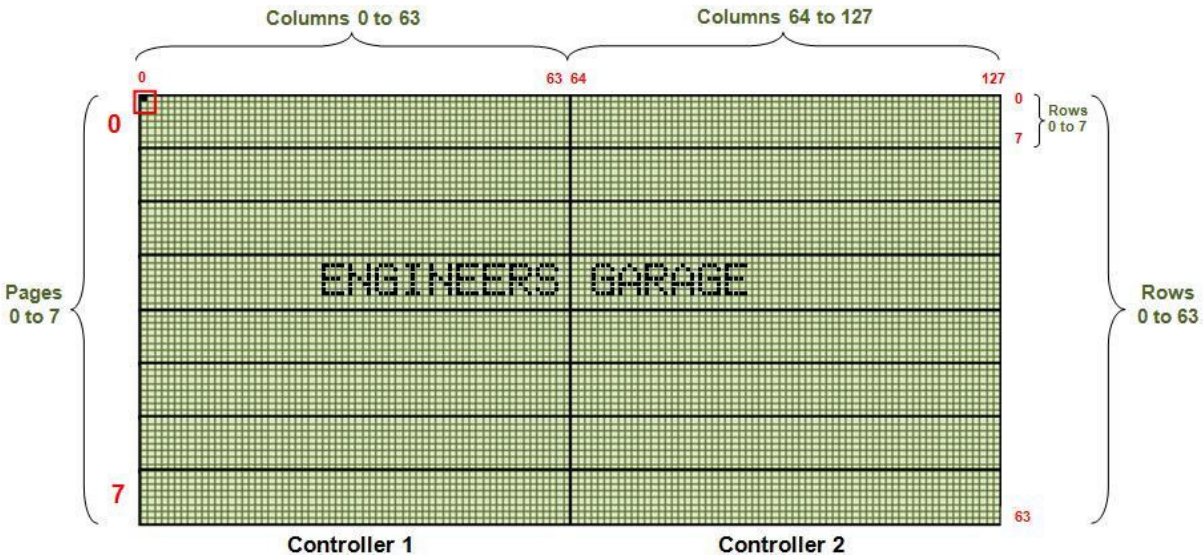

Fig. 1 GLCD structure [Courtesy: http://www.engineersgarage.com]

The GLCD has 20 pins, the functions of which are elaborated in the datasheet. A brief description of the pins is as follows:

RS: Send instruction (0) or data (1)

RW: Write (0) or Read (1)

EN: Enable LCD

CS1, CS2: Chip select pins for the respective halves

DB7-DB0: Data pins

To write something to the LCD involves the following 4 steps:

1. Initializing the LCD
2. Setting the Page Address
3. Setting the Y (column) Address
4. Writing the data to the selected address

For every step it is necessary that the following steps are followed:

- First set RS, RW, DB7-DB0 to the necessary values
- Assert EN, i.e., EN = 1
- Wait for some time (typically one clock cycle)
- De-assert EN, i.e., EN = 0

1. Initializing GLCD

RS = 0 [Instruction mode]
RW = 0 [Write Operation]
EN = 1 [LCD Enable]
CS1 = CS2 = 1 [Enable both halves]
DB7-DB0 = 0011111**x** [If x=1, Display ON, else Display OFF]

Wait for one clock cycle

EN = 0

2. Setting Page Address

RS = 0 [Instruction mode]
RW = 0 [Write Operation]
EN = 1 [LCD Enable]
CS1 = CS2 = 1 [Enable both halves]
DB7-DB0 = 10111**xxx** [xxx in the range of 0 to 7 to select a page]

Wait for one clock cycle

EN = 0

3. **Setting Y Address**

   RS = 0 [Instruction mode]
   RW = 0 [Write Operation]
   EN = 1 [LCD Enable]
   CS1 = CS2 = 1 [Enable both halves]
   DB7-DB0 = 01**xxxxxx** [xxxxxx in the range of 0 to 63 to select a cloumn]

   Wait for one clock cycle

   EN = 0

4. **Writing data**

   RS = 1 [Data mode]
   RW = 0 [Write Operation]
   EN = 1 [LCD Enable]
   CS1 = 1, CS2 = 0 for left half, CS1 = 0, CS2 = 1 for right half
   DB7-DB0 = Data to be written to that particular byte

   Wait for one clock cycle

   EN = 0

Some important info:

- Writing to a location doesn't erase the data at other locations.
- Resetting the display DOES NOT clear it. It only switches off the display. To clear a display you'll have to write zeroes to all the locations explicitly. The only other way is to turn off the power to the display. Even in this case, it takes some time for the data to be completely lost.

For any help or queries, please feel free to contact me at kamathar@gmail.com