Segment LCD example project

4.0

Features

- 14 Segment helper
- Low Power (ILO) mode operation
- Refresh rate – 62 Hz
- Type B waveforms

General Description

This example project demonstrates the Segment LCD component operation in Low Power mode.
In this mode the component will put the PSoC3/5 device into sleep between the LCD refresh sequences. As a wakeup source, the SegLCD uses the 1KHz Internal Low Oscillator. In this mode the component has limited refresh rate selections which is dependent on the Waveform Type and Number of commons and can vary from design to design. Based on the glass size the customizer's input in the Driver Power settings will select proper power settings for our design. The 14 Segment helper handles data processing and proper pixel reflection output on 14 Segment digits. You will need a PSoC3/5 DVK CY8CKIT-001 and PSoC® LCD Segment Drive Expansion Board Kit CY8CKIT-029. The LCD expansion board has to be connected to port A of CY8CKIT001.

Development kit configuration

You will need a PSoC3/5 DVK CY8CKIT-001 and PSoC® LCD Segment Drive Expansion Board Kit CY8CKIT-029. The LCD expansion board has to be connected to port A as shown in Figure 1. Build the project and program the hex file on to CY8C3866AXI-040 using MiniProg3



Figure 1. LCD Expansion Board Connection to PSoC3/5 DVK

Project configuration

There are no other components required so the design is pretty simple. The Segment LCD configuration should be set as on the following diagrams.

First diagram shows how System Clocks are set in this example project. This is important as a default System Clocks settings are slightly different from those that in this project.

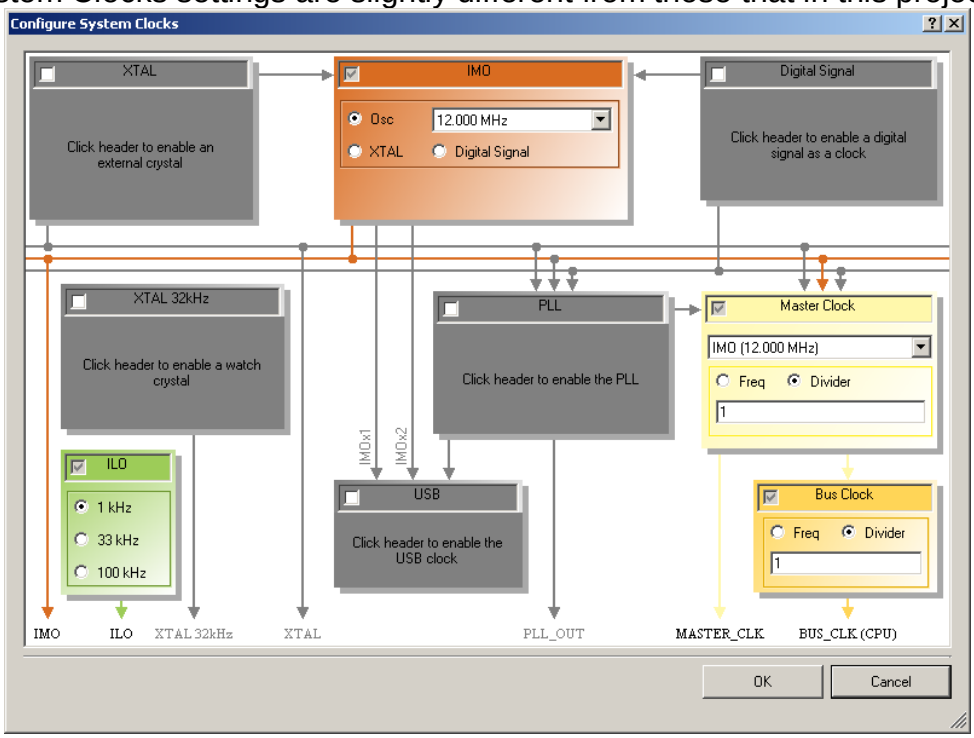

Figure 2. Configure System Clocks window.

Basic Configuration tab is set up as below:

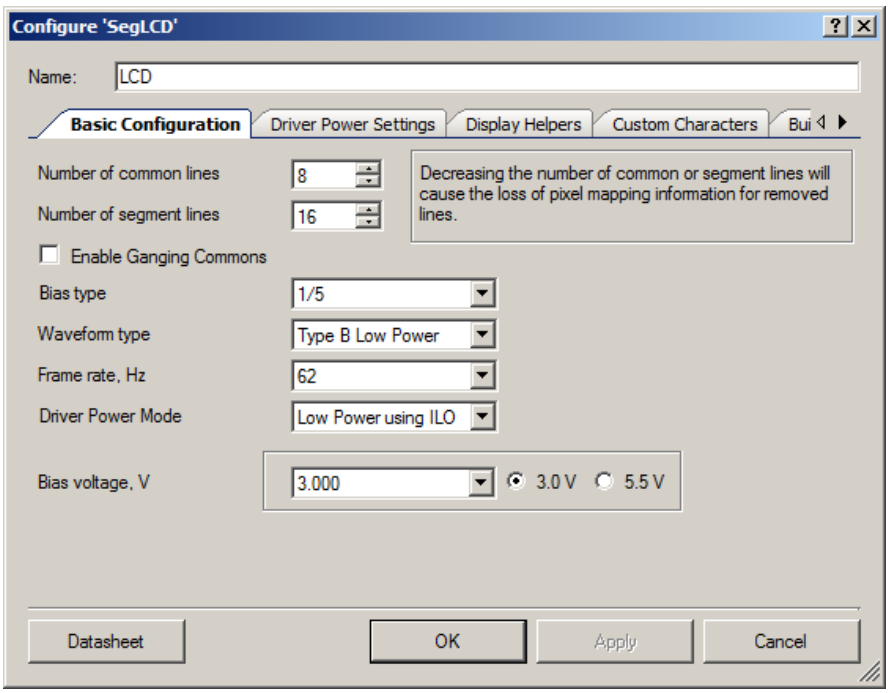

Figure 3. Basic Configuration window.

Driver Power Settings tab is configured as below:

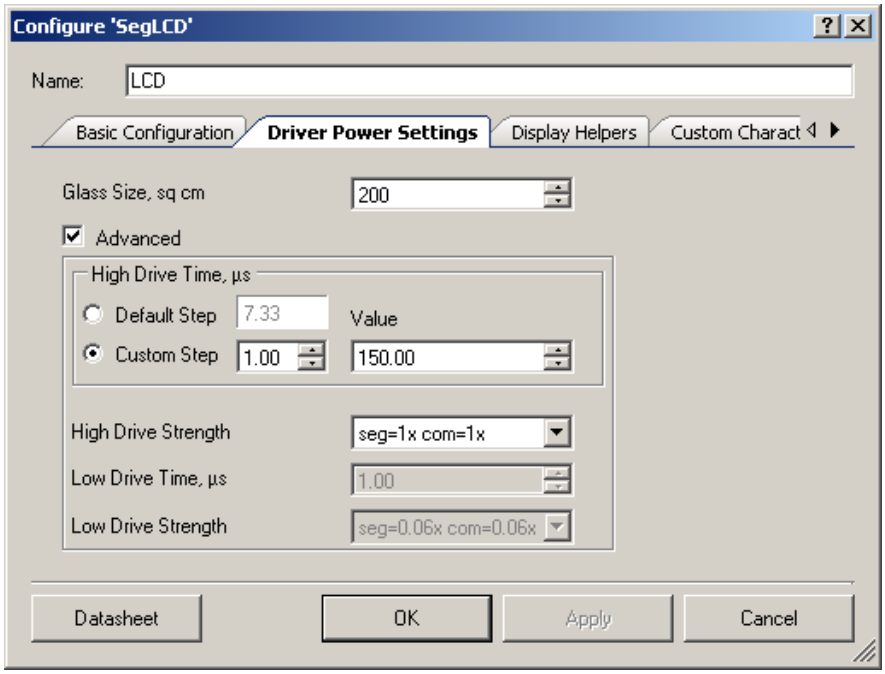

Figure 4. Driver Power settings window.

The Driver Power Settings are set with respect to a power efficiency and because of that the LCD contrast may not be good enough. In this case the contrast can be refined by increasing High Drive Time or High Drive Strength or both of them. In case when the High Drive Time is

reach its maximum value and the contrast is still not good enough the Custom Step can be increased and this will increase High Drive Time.

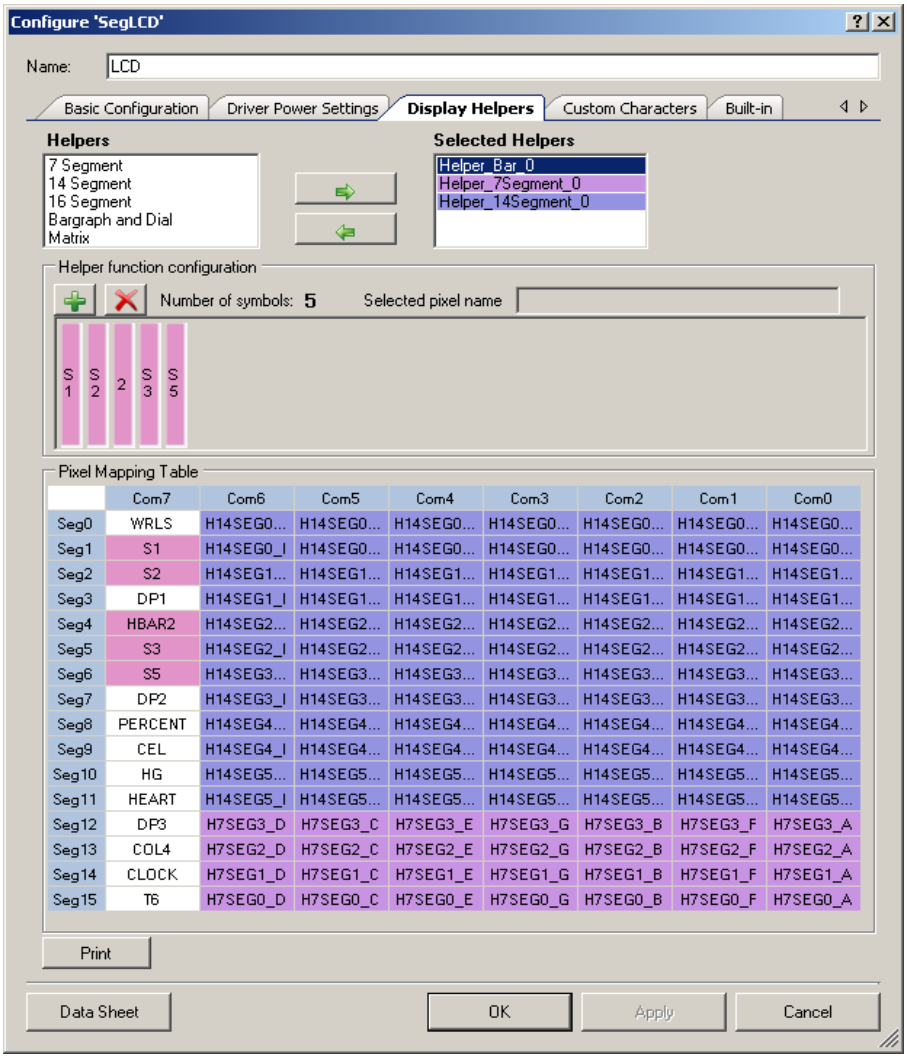

Figure 5. Display Helpers window.

Display helpers tab contains pixel mapping configuration an it should match pixel mapping configuration LCD glass.

PIN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
COM8	COM8								T7	S1	S2	COL1	S3	S4	S5	COL2	T1	T4	T2	T3	COL3	COL4	T5	T6
COM7		COM7							1A	1J	2A	2J	3A	3J	4A	4J	5A	5J	6A	6J	10D	9D	8D	7D
COM6			COM6						1P	1K	2P	2K	3P	3K	4P	4K	5P	5K	6P	6K	10C	9C	8C	7C
COM5				COM5					1F	1B	2F	2B	3F	3B	4F	4B	5F	5B	6F	6B	10E	9E	8E	7E
COM4					COM4				1G	1L	2G	2L	3G	3L	4G	4L	5G	5L	6G	6L	10G	9G	8G	7G
COM3						COM3			1E	1C	2E	2C	3E	3C	4E	4C	5E	5C	6E	6C	10B	9B	8B	7B
COM2							COM2		1M	1R	2M	2R	3M	3R	4M	4R	5M	5R	6M	6R	10F	9F	8F	7F
COM1								COM1	1N	1D	2N	2D	3N	3D	4N	4D	5N	5D	6N	6D	10A	9A	8A	7A

Figure 6. LCD Glass pixel mapping table.

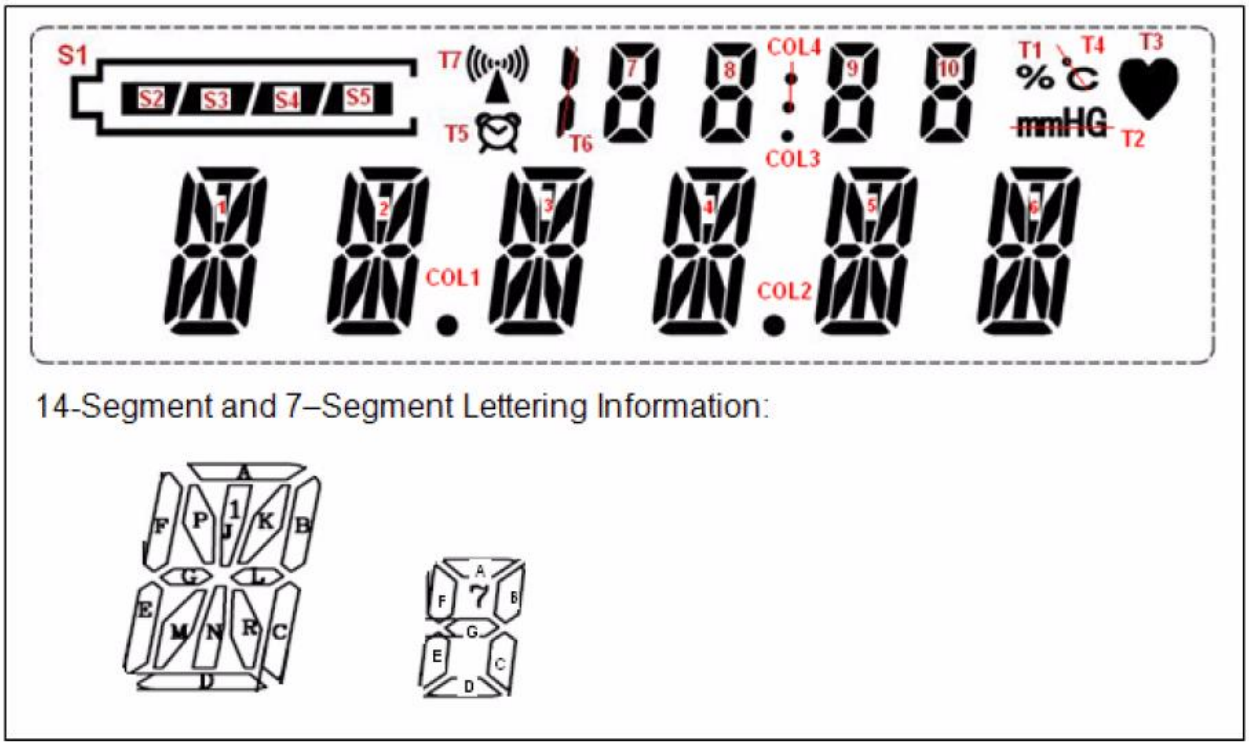

Figure 7. LCD Glass lettering information.

Note that lettering information and pixel names in the Display Helpers customizer's window may differ.

Project description

The main purpose of this Example project is to show component ability to enter to a Sleep and then wakeup and resume its normal work. In the example project Segment LCD will perform normal work for a short period of time an then will Enter to a Sleep mode. On the internal LCD's timer TC signal assertion the wakeup process will be initiated and component resume its normal work for a short period of time and enter to a Sleep mode later. As a source for the LCD timer the 1KHz ILO Crystal is selected. The Example project show a method of output of a "running" string on the 14 Segment display.

Expected results.

As an expected result you will see the running string: *LCD LOW POWER UPDATE SEQUENCE WORKING* on the LCD 14 Segment digits.



Figure 8. Expected result.

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