lcd Drivers

Nti Team

Software Requirement Specification Document

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Version: 1st

1. Scope of Document

This document covers the functional and non-functional requirements of the LCD software system..

1.1 Constraints

a.Response Time: LCDs have a response time, which refers to the speed at which the liquid crystals can change their orientation in response to voltage changes.

b.Contrast Ratio: The contrast ratio represents the difference in brightness between the darkest and brightest parts of an LCD display.

c.Power Consumption: LCD displays require a backlight to be illuminated, which contributes to power consumption.

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2. Requirements Structure

2.1 non Functional requirments

2.2 functional requirments

2.1 Functional Requirements: -

- Display Control: Specify the ability to control the display, including turning it on/off, adjusting brightness, and setting the contrast.
- Text Display: Define the capability to display text on the LCD, including support for different fonts, sizes, and character sets.
- Character Display: Define the capability to display text on the LCD, including support for different fonts and sizes.
- Screen Navigation: Define the capability to navigate between different cells and
- characters on the LCD display.
- Error Handling: Define how errors or exceptional conditions are handled by the LCD software system.
- Screen Clear: Define the capability to clear different cells and characters on the LCD display.
- Configurability: LCD must be supported in different modes 4bit mode and 8bit mode.
- Send specific command to LCD.
- Initialize LCD.

2.2 Non-Functional Requirements:-

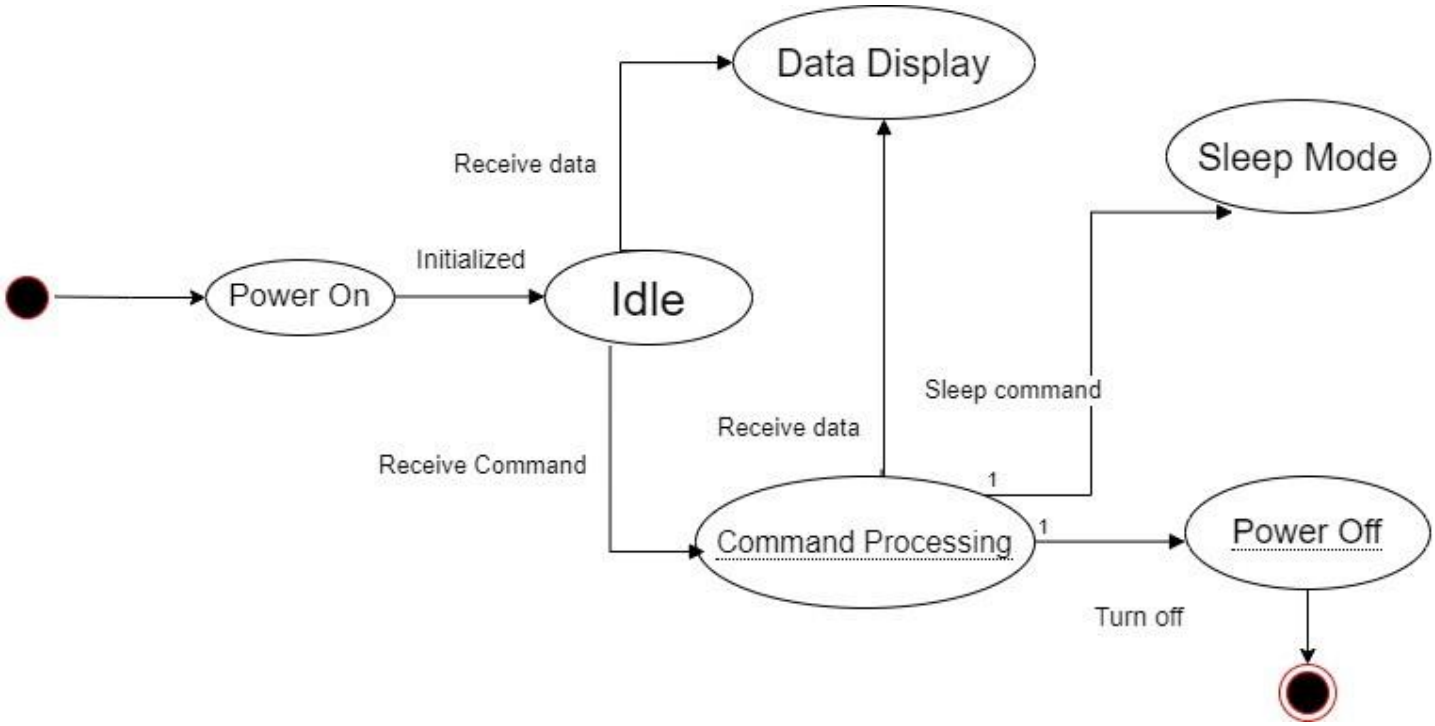
- a.Performance: Define the performance requirements, such as screen refresh rate, response time, and rendering speed.
- b.Usability: Define the usability requirements, including user interface guidelines, intuitive navigation, and clear readability
- Compatibility: Specify any compatibility requirements, such as compatibility with different LCD models, display resolutions, or communication protocols.

3. Functional Overview

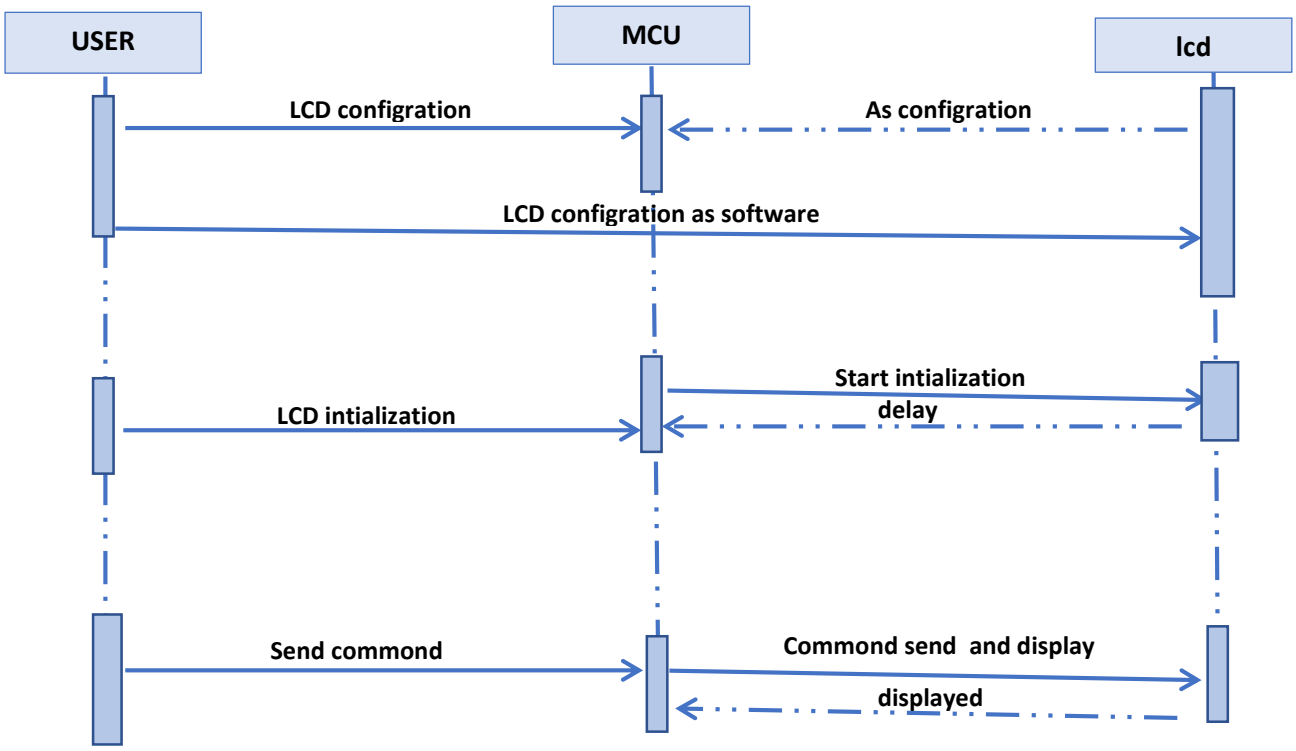
LCD display is very basic module and is very commonly used in various devices and circuits. These modules are preferred over seven segments and other multi segment LEDs. The reasons being: LCDs are economical; easily programmable; have no limitation of displaying special & even custom characters (unlike in seven segments), animations and so on.

A 20x4 LCD means it can display 20 characters per line and there are 4 such lines. In this LCD each character is displayed in 5x7 pixel matrix. This LCD has two registers, namely, Command and Data. This is standard HD44780 controller LCD.

4. State Machine



5. Sequence diagram



6. References

1. lcd Datasheets.
2. AVR Microcontroller Datasheets.