Stepper Motor Control System Report

Nmae: Motaz Ahmed Elsaman ID: 120210316

May 20, 2024
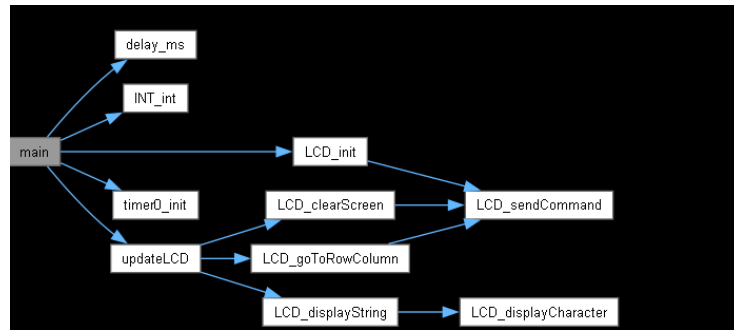
1   Block Diagram of the System

Figure 1: Block Diagram of the Stepper Motor Control System

The block diagram in Figure 1 illustrates the main components of the stepper motor control system. It includes:

- AVR ATmega32 microcontroller

- Stepper motor

- LCD display

- Push buttons for direction and mode control

The interactions between these components are managed through GPIO pins, external interrupts, and a timer for controlling motor speed.

2   Summary of C Program Functionality

The C program controls the stepper motor's direction and stepping mode based on user input from push buttons. Here are the key functions and their purposes:

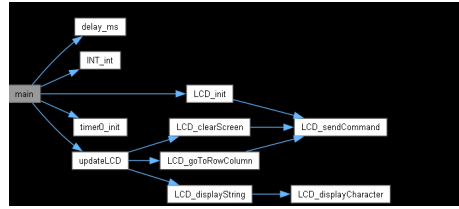- `timer0_init()`: Initializes Timer0 for delay generation.

Figure 2: Graph for main function

- **delay_ms(uint16_t milliseconds)**: Provides millisecond-level delay using Timer0.

- **INT_int()**: Initializes external interrupts for button control.

- **updateLCD(uint8_t direction, uint8_t mode)**: Updates the LCD display with motor direction and mode.

- **main()**: The main function initializes hardware components, sets up interrupts, and enters a loop to control the motor based on user input.