
TO: Dr. Winikus

FROM: Misha Nelyubov

Subject: Progress Update on the timer/alarm embedded system project

Date: October 14, 2021

PURPOSE:

This memo overviews the progress made and the next steps to be taken in the development of the timer/alarm system.

SUMMARY:

The timer that is under development is an embedded system operated by a microcontroller. The microcontroller uses an external 4x4 matrix keypad and LCD as its input and output peripherals. The timer can be started, stopped, and programmed using the appropriate buttons on the matrix keypad.

The LCD informs the system's user of the current state of the system: whether the system is awaiting for a time to be configured, counting down, stopped, or signaling the end of time alarm.

UPDATE ON PROGRESS:

The design document for creating the system has been completed and is provided for your review alongside this document.

The initial stage of configuring inputs from a 4x4 matrix keypad has been completed so that a single press of a button on the keypad causes a single function call to be sent to the core mode handler of the system. The input polling of the system has been configured to avoid the creation of duplicate events due to a single button press lasting longer than the keypad polling rate.

Once at the core mode handler, the input button press is handled based on the mode of the system at the time that the button press was registered.

CONCERNS:

Despite receiving the provided code to interface with the LCD using the I²C protocol, there has yet to be any testing of the interaction with the SDA or SCL channels, and thus no certainty on if the LCD is operational. The provided code includes the default pin values to use PB_9 and PB_8, which will be sufficient to begin testing during the next development session.

RECOMMENDATION:

The next stages of development are as follows:

1. Program of the mode-specific timer control system responses for each valid button input.
2. Verify the operating status of the LCD and its API.
3. Integrate the LCD as the output for the timer system.

4. Test the complete system to verify the expected system behavior is performed in response to inputs to the system.
5. Write the final report describing the system.