Smart Home project

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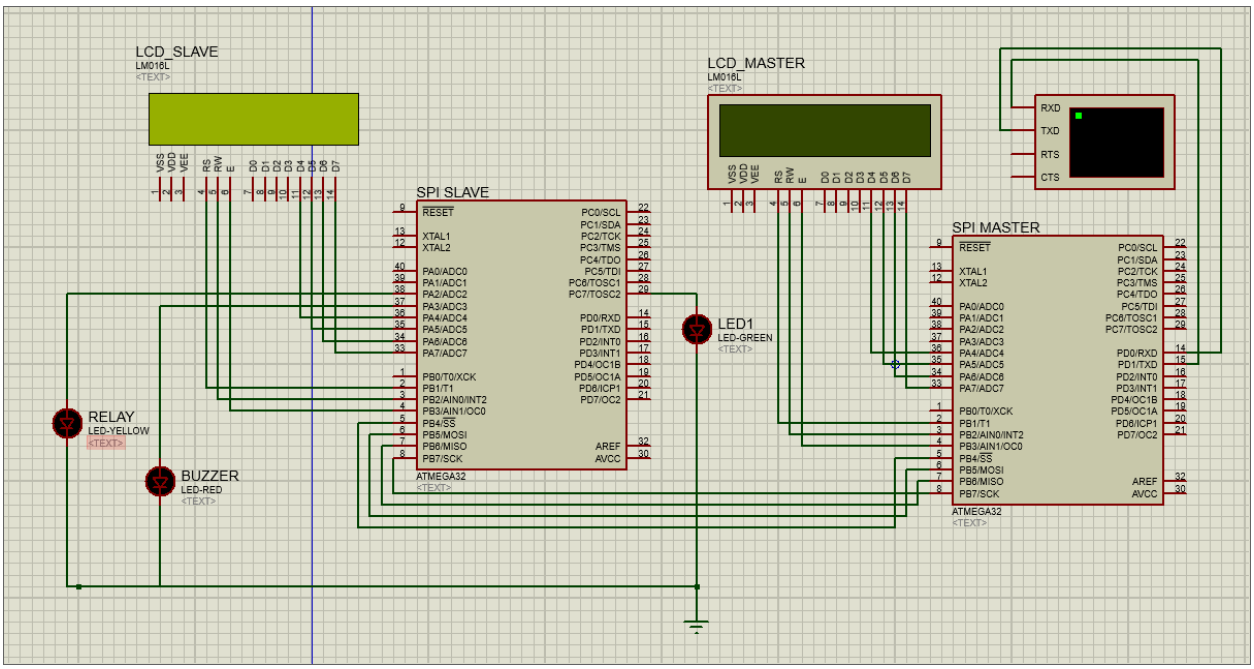
The project is comprised of 2 ATMEL Atmega32 microcontrollers working in a master-slave scheme. The 2 controllers communicate data by using the SPI protocol.

The Master microcontroller is connected to a Bluetooth module (HC-05) via USART protocol.

We used a virtual terminal in the Proteus simulation design in place of the BT hardware module to simulate its operation.

The slave microcontroller will be tested for activating selected hardware modules upon data reception from the master microcontroller to verify the integrity of received data.

The following figure shows the proteus simulation of the project.



We've replaced the buzzer the relay by LEDs on the pins PA2 and PA3.

The system offers a menu for the user offering him options to select the hardware module he/she wishes to operate as follows:

1 for activating LED1.

2 for activating the Buzzer.

3 for activating the relay.

On the Master microcontroller, we've used ISR instead of polling technique to receiving the data from the BT module (USART). The master also uses ISR for SPI data transmission. However, the slave microcontroller uses polling techniques for SPI module to receive data.

Every microcontroller is connected to an LCD unit.

The menu will be shown on the master LCD and the slave LCD displays the operation under execution.

We used Eclipse IDE to generate the drivers for the project in a layered architecture.

Two short videos have been recorded showing the software and hardware simulation and will be uploaded on an external link.

Finally, the code is uploaded on the following GitHub link:

Smart Home GitHub link

Link to software and hardware simulation:

Smart Home Project videos

Thanks