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ENEL 452 : Embedded and Real-Time Software Systems

Elevator Controller Project

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My application is an elevator control system with 8 floors. The elevator algorithm used is optimized to have the least amount of travel time. The requests from the user are parsed through the command line interface and then sent to the control logic which then gets executed one by one through the queue. Upon completion the elevator car will return to its original position.

The elevator control system this project will emulate is called: Selective collective operation.

Selective collective operation remembers, and answers calls in one direction then reverses. When the trip completes, it is programmed to return to a home landing.

<http://www.electrical-knowhow.com/2012/04/elevator-control-system.html>

Tasks

Task	Explanation
CLI	Responsible for accepting commands from the user. Then the commands are parsed and then the information over a queue to the Processing task. Sends the floor that a button was pressed to processing task
LCD	Responsible for displaying which floor the elevator car is currently in. As well as the direction/state that the elevator is in. Receives the current floor position, elevator direction/state from the processing task.
Demux	Responsible for turning on 1 of 8 LEDs which represent the elevator's floor position. Receives the 3 input binary digits from the processing task.
Processing Task	This task is responsible for executing the

	<p>control logic for the elevator car.</p> <p>Will process inputs from the CLI Task (USART2 interrupt) as well as the external Interrupt for the emergency button.</p> <p>Will sends updated parameters to the output tasks (LCD, Demuxer Task)</p>
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ISR	Explanation
USART2IRQ	Responsible for the CLI functionality for this project. Each time a character is received from a terminal emulator (Tera term, Putty, etc.) this external interrupt relays said character over to the CLI task.
EXTI0	This external interruption is responsible for simulating an emergency button for an elevator car. When this interrupt is pressed it makes sure to stop the elevator and let the user know through the CLI window status that the emergency

Elevator System State Diagram - Model - View - Controller Diagram



