**Data Dictionary**

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Location** | **Description** |
| current\_floor | 8-bit integer | R16 | Used to store the lift's current floor level |
| col | 8-bit integer | R21 | Used to store the current column number. Used in keypad scanning |
| colmask | 8-bit integer | R23 | Mask for current column during keypad scan |
| door\_state | 8-bit integer | R19 | Used to indicate the state of the doors. Takes on 4 values:  0 (closed), 1 (opening), 2 (opened), 3 (closed) |
| eighthTimeCounter | 16-bit integer | dseg | Determines whether 1/8th of a second has passed. Used in Timer2 |
| final\_dest | 8-bit integer | R17 | Used to store the destination floor that the lift is moving towards |
| floor\_changed | flag | dseg | Used to indicate whether the floor level has changed |
| LED\_door\_state\_output | 8-bit integer | dseg | LED pattern for the door state component |
| LED\_lift\_direction\_output | 8-bit integer | dseg | LED pattern for the lift direction component |
| lift\_direction | 8-bit integer | R18 | Used to indicate the direction lift is moving. Takes on 3 values: -1 (down), 0 (stationary), 1 (up) |
| oldCol | 8-bit integer | dseg | Used for keypad debouncing |
| oldRow | 8-bit integer | dseg | Used for keypad debouncing |
| row | 8-bit integer | R20 | Used to store the current row number. Used in keypad scanning |
| rowmask | 8-bit integer | R22 | Mask for current row during keypad scan |
| stop\_at\_floor | flag | dseg | Used to indicate a "stop at current floor" request |
| stop\_at\_floor\_progress | 8-bit integer | dseg | Used to keep track of the different stages within the "stop at current floor" procedure |
| temp1 | 8-bit integer | R24 | Temporary register used for general processing. Sometimes used with temp2 for 16-bit processing. |
| temp2 | 8-bit integer | R25 | Temporary register used for general processing. Sometimes used with temp1 for 16-bit processing. |
| timer0\_TimeCounter | 8-bit integer | dseg | Used to count number of timer 0 overflows |
| timer4\_TimeCounter | 8-bit integer | dseg | Used to count number of timer 4 overflows |

Notes:

* For some reason, making "poll\_keypresses" a function will bug the entire system. Currently it is being called by "rjmp" in MAIN, which is a temporary fix. However it would be ideal to make this a function for cleaner and more consistent code.

**MODULE SPECIFICATION**

**Main and Keypad**

‘Main’ is responsible for the processing of data, and preparing variables prior to appropriate procedures being carried out by other components (essentially the brain of the system). The keypad is responsible for acknowledging the request to visit a floor, or request for emergency.

**Timer 0**

[Diagram]

‘Timer0’ is responsible for moving the lift through the floors, by keeping track of time.Once the duration to reach a floor has been elapsed, it will set a flag indicating the floor has changed (which is to be acknowledged and reset by ‘Main’).  It uses “timer0\_TimeCounter” as a local variable to keep track of the time progressed. It will only start timing when the lift is in motion AND if a floor change hasn’t been requested, so it must check both conditions prior to carrying out its procedure.

**Timer 1**

[Diagram]

‘Timer1’ is responsible for displaying the emergency alarm signal through the LED’s. It does so by reading in

**Timer 2**

**Timers 3, 4, and 5**

**Push buttons**