

MICROPROCESSORS AND MICROCONTROLLERS REPORT

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Overview

Materials used:

Microcontroller – PIC18F452 – 1nos

Resistor - 10k – 1nos

Resistor – 220 – 2 nos

Red LED – 2 nos

Digital-out audio sensor – W104 – 1nos

Jumper wires – male to male

Capacitors – 18uF – 2nos

Crystal oscillator – 16MHz – 1 nos

Battery – 9V – 1 nos

Voltage regulator – 5V – 1nos

Explanation

Our project is based on the working principle of a lift using a clap switch. Consider the LED connected to RB5 as the closed state of the lift and the LED connected to RD0 as the open state of the lift.

Whenever a clap is heard, the closed state LED turns off and the open state LED turns on thereby opening the lift. This then persists for 5 seconds before switching showing the automatic closing closing of the lift. Now, this can be interrupted by clapping again which cause the lift to start closing showing the manual closing function for the lift. Thus, our circuit is able to produce the opening and closing action of a lift using the PIC microcontroller.

Code

```
#include <p18f452.inc>

CONFIG OSC = HS      ; High-Speed Oscillator (20 MHz crystal)
CONFIG BOR = OFF     ; Brown-Out Reset voltage set to 4.5V
CONFIG PWRT = ON      ; Power-Up Timer enabled
CONFIG WDT = OFF      ; Watchdog Timer disabled
CONFIG LVP = OFF      ; Low-Voltage Programming disabled

ORG 0H
GOTO MAIN

ORG 8H
BTFSC INTCON,INT0IF
CALL LED1_ISR
GOTO HERE

ORG 50H
MAIN BSF TRISB,0
BCF TRISB,5
BCF TRISD,0
BSF PORTB,5
BCF PORTD,0
BSF INTCON,INT0IE
BSF INTCON,GIE
HERE BRA HERE

ORG 150H
LED1_ISR
BCF INTCON,INT0IF
BTG PORTB,5
BTG PORTD,0
BSF INTCON,GIE
BTFSS PORTB,5
CALL TIMER
RETURN

ORG 200H
TIMER BCF INTCON,TMR0IF
MOVLW 0X07
MOVWF T0CON
MOVLW 0H
MOVWF TMR0H
MOVLW 0H
MOVWF TMR0L
BSF T0CON,TMR0ON
AGAIN BTFSS INTCON,TMR0IF
BRA AGAIN
BTG PORTB,5
BTG PORTD,0
```

BTG TOCON,TMR0ON

BCF INTCON,TMR0IF

RETURN

END

#include <pl8f452.inc>

```
CONFIG OSC = HS      ; High-Speed Oscillator (20 MHz crystal)
CONFIG BOR = OFF      ; Brown-Out Reset voltage set to 4.5V
CONFIG PWRT = ON      ; Power-Up Timer enabled
CONFIG WDT = OFF      ; Watchdog Timer disabled
CONFIG LVP = OFF      ; Low-Voltage Programming disabled
```

ORG 0H

GOTO MAIN

ORG 8H

BTFSC INTCON,INT0IF

CALL LED1_ISR

GOTO HERE

ORG 50H

MAIN BSF TRISB,0

BCF TRISB,5

BCF TRISD,0

BSF PORTB,5

BCF PORTD,0

BSF INTCON,INT0IE

BSF INTCON,GIE

HERE BRA HERE

ORG 150H

LED1_ISR

BCF INTCON,INT0IF

BTG PORTB,5

BTG PORTD,0

BSF INTCON,GIE

BTFSS PORTB,5

CALL TIMER

RETURN

ORG 200H

TIMER BCF INTCON,TMR0IF

MOVLW 0X07

```
MOVWF TOCON
MOVLW 0H
MOVWF TMROH
MOVLW 0H
MOVWF TMROL
BSF TOCON, TMROON
AGAIN BTFSS INTCON, TMROIF
BRA AGAIN
BTG PORTB, 5
BTG PORTD, 0
BTG TOCON, TMROON
BCF INTCON, TMROIF
RETURN
END`
```

Circuit

