

'-----Title-----

' File.....mpx4250.pbp
' Started....7/20/12
' Microcontroller used: Microchip Technology PIC16F88
' microchip.com
' PicBasic Pro Code: micro-Engineering Labs, Inc.
' melabs.com

'-----Program Description-----

' The program uses one of the analog-to-digital
' converters,(AN4), to measure the output of thh
' MPX4250AP pressure sensor (an analog signal).
' It then converts the analog voltage into an 8-bit
' digital value (0 to 255) and displays it on an LCD.
' The program also converts the raw output reading of
' the MPX4250AP to a depth measurement.

'-----Schematic-----

' See schematic at:
' http://www.cornerstonerobotics.org/schematics/control4_mpx4250ap.pdf

'-----PIC Connections-----

16F88 Pin	Wiring
RA0	LCD pin 11(DB4)
RA1	LCD pin 12(DB5)
RA2	LCD pin 13(DB6)
RA3	LCD pin 14(DB7)
RA4	Pin 1 MPX4250AP
RB4	LCD Register Select(RS)
RB3	LCD Enable(E)

' See schematic for the other usual PIC connections

'-----LCD Connections-----

LCD Pin	Wiring
1	Ground(Vss)
2	+ 5v(Vdd)
3	Center of 20K Pot(Contrast)
4	RB4(Register Select,RS)
5	Ground(Read/Write,R/W)
6	RB3(Enable)
7	No Connection(DB0)
8	No Connection(DB1)
9	No Connection(DB2)
10	No Connection(DB3)
11	RA0(DB4)
12	RA1(DB5)
13	RA2(DB6)
14	RA3(DB7)

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'-----Constants/Defines-----

' To free up AN4 (Pin RA4) for an analog input, the
' default LCD Register Select (RS) function must be
' removed from RA4. This is relocated to PORTB.4
' using the LCD DEFINE statements below. All other
' default LCD pins and functions are left unchanged.
' For details see:
' http://www.cornerstonerobotics.
org/curriculum/lessons_year2/erii16_lcd3_pot_command_and_lcd_defines.pdf
' or
' Look around page 97 in the PicBasic Pro Compiler Manual.
' The PicBasic Pro Compiler Manual is on line at:
' http://www.microengineeringlabs.com/resources/index.htm#Manuals

DEFINE LCD_RSREG    PORTB    ' PORTB - RS port
DEFINE LCD_RSBIT    4        ' Bit 4 - RS bit

'-----Variables-----

    x VAR BYTE      ' BYTE for MPX4250AP output
    y VAR BYTE      ' BYTE for depth variable
'-----Initialization-----

ANSEL = %00010000    ' Leaves AN4 in analog mode, but
                    ' changes other analog bits to digital.
                    ' See table below.

'
'   Analog Bit      Analog or Digital      PIC16F88 Pin
'   -----
'   AN0             Digital                RA0
'   AN1             Digital                RA1
'   AN2             Digital                RA2
'   AN3             Digital                RA3
'   AN4             Analog                RA4
'   AN5             Digital                RB6
'   AN6             Digital                RB7

' For the ANSEL Register table, look at the
' PIC16F88 datasheet. For Microchip PIC datasheets, see:
' http://www.microchip.
com/stellent/idcplg?IdcService=SS_GET_PAGE&nodeId=2046
' Select 8-bit PIC Microcontrollers, then the device from the
' drop down menu. Now download the 16F88 Datasheet.
' The ANSEL Register is Register 12-1: ANSEL Register,
' look around page 113 in the 16F88 datasheet.

OSCCON = $60        ' Sets the internal oscillator in the
                    ' 16F88 to 4 MHz

'-----Main Code-----

PAUSE 1000        ' Pause to allow LCD to setup
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start:

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ADCIN 4, x           ' Read analog voltage on AN4 and
                    ' convert to 8-bit digital value
                    ' and store as x.

LCDOUT $FE,1,"RAW READING = ",#x  ' Clears LCD screen, displays
                    ' "RAW READING = " and the 8-bit
                    ' value of x.

y = x/3 - 30        ' Equation converts raw reading
                    ' to depth(y)

LCDOUT $FE,$C0,"Depth = ",#y     ' Prints depth

PAUSE 1000          ' Pause 1 second between readings

GOTO start          ' Go to start label

END
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