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1: ' Program:Picbasic Pro 2.60
2: ' CPU:PIC16F1823
3: ' Peripheral:I2C-LCD PCF8574+SPLC780D+1602LCD
4:
5: ' _config _CONFIG1, _FOSC_INTOSC & _MCLRE_ON & _WDTE_ON & _PWRTE_ON &
6: ' _CP_OFF & _CPD_OFF & _BOREN_ON & _CLKOUTEN_OFF & _FCMEN_OFF & _IESO_OFF
7: ' _config _CONFIG2, _WRT_OFF & _P_LLEN_OFF & _STVREN_ON & _LVP_OFF &
8: ' _BORV_LO
9:
10: ' INCLUDE "modedefs.bas" ' module for use serial communication
11: ' DEFINE ONINT_USED 1 ' use boot-up module for write program
12:
13: TRISA=%00000000 ' 0:OUTPUT, 1:INPUT
14: TRISC=%00000000 ' 0:OUTPUT, 1:INPUT
15: ADCON1=7 ' NO A/D CONVERTER
16: ANSELA=%00000000 ' 0:DIGITAL, 1:A/D
17: ANSELB=%00000000 ' 0:DIGITAL, 1:A/D
18: ANSELC=%00000000 ' 0:DIGITAL, 1:A/D
19: OSCCON=%01101010 ' bit7:NO PLL,bit6-3:4MHz,bit1-0:INTERNAL OSC
20:
21: VARS:
22: ASC VAR BYTE ' ASCII CODE
23: ASH VAR BYTE ' HIGH SIDE 4BIT OF ASCII CODE
24: ASL VAR BYTE ' LOW SIDE 4BIT OF ASCII CODE
25: CH1 VAR BYTE ' I2C CODE OF HIGH SIDE 4BIT
26: CH2 VAR BYTE ' WRITE I2C CODE
27: CH3 VAR BYTE ' I2C CODE OF LOW SIDE 4BIT
28: CH4 VAR BYTE ' WRITE I2C CODE
29: N VAR BYTE ' COUNT NUMBER
30: K VAR WORD ' NUMBER FOR DISPLAY
31: DGTS VAR BYTE ' VALUE FOR CODES
32: CODE VAR BYTE[2] ' CODE OF EACH DIGIT
33: CODS VAR BYTE ' CODE OF NUMBERS
34:
35: ' DEFINE VALUES FOR I2C COM-----
36: SDA VAR PORTC.0 ' DEFINE DATA FOR I2C
37: SCL VAR PORTC.1 ' DEFINE CLOCK FOR I2C
38: ADDRESS VAR BYTE ' ADDRESS OF PCF8574
39: ADDRESS = $4E ' SLAVE ADDRESS"0100111"+WRITE"0" A2-A0:open
40:
41: ' SET OPERATIONAL CONDITION OF I2C COM-----
42: I2CWRITE SDA, SCL, ADDRESS, [$2C, $28] ' set 4bit pararel
43: PAUSE 10
44: I2CWRITE SDA, SCL, ADDRESS, [$2C, $28, $8C, $88] ' set 4bit pararel and 2 line
45: display
46: pause 1
47: I2CWRITE SDA, SCL, ADDRESS, [$0C, $08, $CC, $C8] ' display on and cursor
48: disappears
49: pause 1
50: I2CWRITE SDA, SCL, ADDRESS, [$0C, $08, $6C, $68] ' set increase by one. display
51: has no
52: shift
53: pause 10
54:
55: ' DISPLAY CHARACTERS ON LCD-----
56: K = 0 ' CLEAR NUMBER FOR DISPLAY
57: MAIN1:
58: I2CWRITE SDA, SCL, ADDRESS, [$0C, $08, $1C, $18] ' CLEAR DISPLAY

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52: pause 500
53: ASC="P" : GOSUB DISPCHAR ' disp P
54: ASC="I" : GOSUB DISPCHAR ' disp I
55: ASC="C" : GOSUB DISPCHAR ' disp C
56: ASC="B" : GOSUB DISPCHAR ' disp B
57: ASC="a" : GOSUB DISPCHAR ' disp a
58: ASC="s" : GOSUB DISPCHAR ' disp s
59: ASC="i" : GOSUB DISPCHAR ' disp i
60: ASC="c" : GOSUB DISPCHAR ' disp c
61: ASC=" " : GOSUB DISPCHAR ' disp space
62: ASC="2" : GOSUB DISPCHAR ' disp 2
63: ASC="0" : GOSUB DISPCHAR ' disp 0
64: ASC="2" : GOSUB DISPCHAR ' disp 2
65: ASC="0" : GOSUB DISPCHAR ' disp 0
66: ASC="." : GOSUB DISPCHAR ' disp .
67: ASC="8" : GOSUB DISPCHAR ' disp 8
68: pause 500
69:
70: I2CWRITE SDA, SCL, ADDRESS, [$CC, $C8, $0C, $08] ' set cursor to 2nd line
71: ASC="I" : GOSUB DISPCHAR ' disp I
72: ASC="2" : GOSUB DISPCHAR ' disp 2
73: ASC="C" : GOSUB DISPCHAR ' disp C
74: ASC="." : GOSUB DISPCHAR ' disp .
75: ASC="P" : GOSUB DISPCHAR ' disp P
76: ASC="F" : GOSUB DISPCHAR ' disp F
77: ASC="C" : GOSUB DISPCHAR ' disp C
78: ASC="8" : GOSUB DISPCHAR ' disp 8
79: ASC="5" : GOSUB DISPCHAR ' disp 5
80: ASC="7" : GOSUB DISPCHAR ' disp 7
81: ASC="4" : GOSUB DISPCHAR ' disp 4
82: ASC=" " : GOSUB DISPCHAR ' disp space
83: ASC="K" : GOSUB DISPCHAR ' disp N
84: ASC="=" : GOSUB DISPCHAR ' disp =
85:
86: ' NUMBER DISPLAY-----
87: IF K > 99 THEN K = 0 ' RETURN TO 0 WHEN OVER 99
88: GOSUB CONVTC ' CONVERT VALUE TO CODE
89: FOR N = 1 TO 0 STEP - 1 ' ORDER TO DISPLAY 2DIGIT
90: ASC = CODE[N] : GOSUB DISPCHAR ' DISPLAY NUMBERS
91: NEXT N
92: K = K + 1
93: PAUSE 1500
94: GOTO MAIN1
95:
96: ' DISPLAY CHARACTERS-----
97: DISPCHAR:
98: ASH=ASC & $F0 ' "0"clear low side 4bit
99: CH1=ASH+$D ' add code of PCF8574 output of low side 4bit
100: CH2=CH1-$4 ' fall down E(bit3) to write into SPLC780D
101: ASL=ASC * $10 ' move low side 4bit to high side and "0"clear low side 4bit
102: CH3=ASL+$D ' add code of PCF8574 output of low side 4bit
103: CH4=CH3-$4 ' fall down E(bit3) to write into SPLC780D
104: PAUSE 1
105: I2CWRITE SDA, SCL, ADDRESS, [CH1, CH2, CH3, CH4] ' display characters on LCD
106: pause 100
107: RETURN
108: ' END DISPLAY CHARACTERS-----

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109:
110: ' CONVERT VALUE TO CODE-----
111: CONVTVC:
112: FOR N= 0 TO 1
113:   DGTS = K DIG N : GOSUB DISP_CODE : CODE[N]=CODS
114: NEXT N
115:   IF CODE[1]=$30 THEN
116:     CODE[1]=$20 : ENDIF
117: RETURN
118: ' END CALCULATION-----
119:
120: DISP_CODE: ' DISPLAY ONE DIGIT-----
121:   SELECT CASE DGTS
122:     CASE 0 : CODS=$30 ' DISPLAY "0"
123:     CASE 1 : CODS=$31 ' DISPLAY "1"
124:     CASE 2 : CODS=$32 ' DISPLAY "2"
125:     CASE 3 : CODS=$33 ' DISPLAY "3"
126:     CASE 4 : CODS=$34 ' DISPLAY "4"
127:     CASE 5 : CODS=$35 ' DISPLAY "5"
128:     CASE 6 : CODS=$36 ' DISPLAY "6"
129:     CASE 7 : CODS=$37 ' DISPLAY "7"
130:     CASE 8 : CODS=$38 ' DISPLAY "8"
131:     CASE 9 : CODS=$39 ' DISPLAY "9"
132:   END SELECT
133:   PAUSE 6      ' DELAY
134: RETURN
135:
136: END
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