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1 ; *****
2 ; ** PROGRAMME MAKED BY FADISHOP Card: FADICLOCK http://www.fadishop.eu FADITECO, S.L.U. Lleonard G. **
3 ; ** This program reads date-time. Is modified to apply every 2 seconds a temperature reading **
4 ; ** **
5 ; ** SLAVE ADDRESS IS STILL DS3232 I2C $ D0. **
6 ; ** SQW INTERRUPT ROUTING JP6 (BLUE JUMPER) (I0 = 1 I1 = 0, I2 = 0, portC.7 = 1; Rpullup = 1) **
7 ; *****
8 ; SETTINGS
9 #picaxe 28x2
10 let dirsB=%00000000 ; 1=output 0=input
11 let dirsC=%00000000 ; 1=output 0=input
12 ; C.3 I2C_SCL
13 ; C.4 I2C_SDA
14 ;adcsetup = %00000000 ; SETTING ANALOG
15 ;setfreq em16 ; Oscillator / external oscillator to 16Mhz.
16 device_DS3232SN:
17 symbol adress_slave_A =$D0 ; Address 0xD0 DS3232 I2C only.
18 symbol @now=$00 ; Internal address register of seconds, minutes and hours.
19 symbol @today=$03 ; Internal address register of day, month and year-century.
20 symbol @alm1=$07 ; Internal address register alarm_1 (sec, min, hour and day / day).
21 symbol @alm2=$0B ; Internal address register alarma2 (min, hour and day / day).
22 symbol @control=$0E ; (7)/EOSC (6)BBSQW (5)CONV (4-3)RS2-1 (2)INTCN (1)A2IE (0)A1IE
23 symbol @status=$0F ; (7)OSF (6)BB32KHZ (5-4)CRATE (3)EN32KHZ (2)BSY (1)A2F (0)A1F
24 symbol @offset=$10 ; temperature offset. (adds / subtracts capacitance)
25 symbol @temp=$11 ; Internal word temperature address($11-MSB_temperature and $12-LSB_temperature) .
26 symbol @test=$13 ; Reserved for test.
27 symbol @sram=$14 ; Internal address of the start of the block of 236 bytes SRAM.
28 symbol control=b16 ; Register/shadow control DS3232.
29 symbol status=b18 ; Register/shadow control/status DS3232.
30 ; Program Definitions and Initialization
31 symbol seconds=b0
32 symbol minutes=b1
33 symbol hour=b2
34 symbol day=b3
35 symbol date=b4
36 symbol mounth=b5
37 symbol year=b6
38 symbol T_msb=b7
39 symbol T_lsb=b8
40
41 ; INITIALIZATIONS:
42 let control=%00011100 ; Matches defecto.POR initialization (power on reset).
43 let control=control and %11111011 ; bit (2) INTCN = 0. The output INT / SQW is output wave form.
44 let control=control and %11110011 ; bits (3-4) RS1 = 0, RS2 = 0.Frecuencia SQUARE-WAVE: 1HZ.
45 ;let control=control or %01000000 ; bit (6) = 1 -> INT / SQW ranges when Vbat feed DS3232.
46 let status=%11001000 ; Matches defecto.POR initialization (power on reset).
47 let status=status and %11110111 ; bit (3) = 0 -> output is inhibited (32 kHz) when Vcc feed DS3232.
48 let status=status and %10111111 ; Bit (6) = 0 -> output is inhibited (32 kHz) when Vbat feed DS3232.
49 i2cslave adress_slave_A, i2cslow, i2cbyte ; DS3232 I2C Address (0xD0-0xD1).
50 writei2c @control,(control,status) ; Settings are sent and ratings.
51 ;call set_time_date ; change the date-time DS3232 RTC.

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52 ;call set_alarm1 ; alarm_1 sets the DS3232 RTC.
53 configuracio_interrupcions:
54 setint %10000000,%10000000 ; are enabled by high pinC.7 interruptions.
55
56 main:
57 i2cslave adress_slave_A, i2cslow, i2cbyte ; DS3232 I2C Address (0xD0-0xD1)
58 readi2c @now,(seconds,minutes,hour,day) ; Read now (seconds minutes, hour and day)
59 readi2c @today,(date,mounth,year) ; Read today (date, mounth and year)
60 readi2c @temp,(T_msb,T_lsb) ; Read 2 bytes temperature
61 readi2c @alm1,(b10,b11,b12,b13) ; Read alarma_1.
62 readi2c @control,(b17,b19) ; Read control registers.
63 debug ; Output data to display PC
64 PAUSE 5000 ; Pause 5 seconds
65 goto main ; Reboot
66
67 ; INTERRUPT SEQUENCE
68 interrupt: ; It has previously been low? MSB: b21, LSB: b22.
69 if b20=0 then inc w11 ; (YES) Increase word register.
70 ; let b20=255 ; (YES) Note that is high.
71 ; setint %00000000,%10000000 ; (YES) Are enabled by low pinC.7 interruptions?
72 else let b20=0 ; (NO) Records that is low.
73 ; setint %10000000,%10000000 ; (NO) are enabled by high pinC.7 interruptions.
74 endif
75 return ;
76
77 ; SUBROUTINE
78 set_time_date:
79 symbol xseg=$25 ; @_intern DS3232: $00
80 symbol xminu=$00 ; @_intern DS3232: $01
81 symbol xhora=$13 ; @_intern DS3232: $02
82 symbol xsemdia=$00 ; @_intern DS3232: $03
83 symbol xdia=$03 ; @_intern DS3232: $04
84 symbol xmes=$03 ; @_intern DS3232: $05
85 symbol xanno=$12 ; @_intern DS3232: $06
86 i2cslave adress_slave_A, i2cslow, i2cbyte ; Adress I2C of DS3232 (0XD0-0XD1)
87 writei2c @now,(xseg,xminu,xhora,xsemdia,xdia,xmes,xanno); It send current date-time to the RTC DS3232.
88 return
89
90 set_alarm1:
91 symbol al_seg=$00
92 symbol al_min=$01
93 symbol al_hor=$13 ; Time format->bit(6)=0:24h, bit(6)=1:AM/PM 12h.
94 symbol al_dia_sem=$03 ; Day format-> bit(6)=0:dia del mes, bit(6)=1:dia de la semana.
95 i2cslave adress_slave_A, i2cslow, i2cbyte ; Adress I2C of DS3232 (0XD0-0XD1)
96 writei2c @alm1,(al_seg,al_min,al_hor,al_dia_sem) ; It sends the settings of the alarma_1.
97 let control=control or %00000001 ; Interruption is enabled alarma_1 AlE.
98 let control=control or %00000100 ; Alarm interrupt is enabled INTCN in DS3232.
99 let status=status and %11111110 ; Flag is cleared alarma_1 in DS3232.
100 writei2c @control,(control,status) ; It sends and delete flag clearance AlF.
101 return
102
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103 set_alarm2:
104 symbol a2_min=$01
105 symbol a2_hor=$13
106 symbol a2_dia_sem=$03
107 i2cslave adress_slave_A, i2cslow, i2cbyte
108 writei2c @alm2,(a2_min,a2_hor,a2_dia_sem)
109 let control=control or %00000010
110 let control=control or %00000100
111 let status=status and %11111101
112 writei2c @control,(control,status)
113 return
; Time Format-> bit (6) h = 0:24, bit (6) = 1: AM / PM 12h.
; Day format-> bits (6) = 0: day of the month, bit (6) = 1: day of the week.
; Dirección I2C del DS3232 (0XD0-0XD1)
; It sends the settings of the alarma_2.
; Interruption is enabled alarma_1 A2E.
; Alarm interrupt is enabled INTCN in DS3232.
; Flag is cleared alarma_2 in DS3232.
; It sends and delete flag clearance A2F.
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