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2 ; ** PROGRAMME MAKED BY FADISHOP Card: FADICLOCK http://www.fadishop.eu FADITECO, S.L.U. Lleonard G. **
3 ; ** Program function test 32kHz. It performs time-date readings and temperature **
4 ; ** Although 32kHz is very fast interrupts are enabled PORTC (C.5). **
5 ; ** SLAVE ADDRESS IS STILL DS3232 I2C $ D0. **
6 ; ** INTERRUPT ROUTING 32KHZ (HIGH OR LOW) JP6 (BLUE JUMPER) (C.6 = 0, C.4 C.5 = 1 = 0) **
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 ;INITIALIZATIONS:
41 let control=%00011100 ; Matches defecto.POR initialization (power on reset).
42 ;let control=control and %11111011 ; bit (2) INTCN = 0. The output INT / SQW is output wave form.
43 control=control and %11100111 ; Bits (3-4) RS1 = 0, RS2 = 0.Frequency SQUARE-WAVE: 1HZ.
44 ;let control=control or %01000000 ; bit (6) = 1 -> INT / SQW ranges when Vbat feed DS3232.
45 let status=%11001000 ; Matches defecto.POR initialization (power on reset).
46 ;let status=status and %11110111 ; bit (3) = 0 -> output is inhibited (32 kHz) when Vcc feed DS3232.
47 ;let status=status and %10111111 ; bit (6) = 0 -> output is inhibited (32 kHz) when Vbat feed DS3232.
48 i2cslave adress_slave_A, i2cslow, i2cbyte ; DS3232 I2C Address (0xD0-0xD1).
49 writei2c @control,(control,status) ; Settings are sent and ratings.
50 ;call set_time_date ; change the date-time DS3232 RTC.
51 ;call set_alarm1 ; alarm_1 sets the DS3232 RTC.

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52 configuracio_interrupcions:
53 setint %00100000,%00100000 ; are enabled by high pinC.5 interruptions.
54
55 main:
56 ;i2cslave adress_slave_A, i2cslow, i2cbyte ; DS3232 I2C Address (0xD0-0xD1)
57 ;readi2c @now,(seconds,minutes,hour,day) ; Read now (seconds minutes, hour and day)
58 ;readi2c @today,(date,mounth,year) ; Read today (date, mounth and year)
59 ;readi2c @temp,(T_msb,T_lsb) ; Read 2 bytes temperature
60 ;readi2c @alm1,(b10,b11,b12,b13) ; Read alarma_1.
61 ;readi2c @control,(b17,b19) ; Read control registers.
62 debug ; Output data to display PC
63 PAUSE 5000 ; Pause 5 seconds
64 goto main ; Reboot
65
66 ; INTERRUPT SEQUENCE
67 interrupt: ; It has previously been low? MSB: b21, LSB: b22.
68 if b21=0 then inc w12 ; (YES) Increase word register.
69 let b21=255 ; (YES) Note that is high.
70 setint %00000000,%00100000 ; (YES) Are enabled by low pinC.5 interruptions?
71 else let b21=0 ; (NO) Records that is low.
72 setint %00100000,%00100000 ; (NO) are enabled by high pinC.5 interruptions.
73 endif
74 return
75
76 ; SUBROUTINE
77 set_time_date:
78 symbol xseg=$25 ; @_intern DS3232: $00
79 symbol xminu=$00 ; @_intern DS3232: $01
80 symbol xhora=$13 ; @_intern DS3232: $02
81 symbol xsemdia=$00 ; @_intern DS3232: $03
82 symbol xdia=$03 ; @_intern DS3232: $04
83 symbol xmes=$03 ; @_intern DS3232: $05
84 symbol xanno=$12 ; @_intern DS3232: $06
85 i2cslave adress_slave_A, i2cslow, i2cbyte ; Adress I2C of DS3232 (0XD0-0XD1)
86 writei2c @now,(xseg,xminu,xhora,xsemdia,xdia,xmes,xanno); It send current date-time to the RTC DS3232.
87 return
88
89 set_alarm1:
90 symbol al_seg=$00
91 symbol al_min=$01
92 symbol al_hor=$13 ; Time format->bit(6)=0:24h, bit(6)=1:AM/PM 12h.
93 symbol al_dia_sem=$03 ; Day format-> bit(6)=0:dia del mes, bit(6)=1:dia de la semana.
94 i2cslave adress_slave_A, i2cslow, i2cbyte ; Adress I2C of DS3232 (0XD0-0XD1)
95 writei2c @alm1,(al_seg,al_min,al_hor,al_dia_sem) ; It sends the settings of the alarma_1.
96 let control=control or %00000001 ; Interruption is enabled alarma_1 A1E.
97 let control=control or %00000100 ; Alarm interrupt is enabled INTCN in DS3232.
98 let status=status and %11111110 ; Flag is cleared alarma_1 in DS3232.
99 writei2c @control,(control,status) ; It sends and delete flag clearance A1F.
100 return
101
102 set_alarm2:

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C:\Users\BREAKOUT\web\_faditeco\data\fclock\_ang\6a\_fclock\_32khz\_c.bas

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103 symbol a2_min=$01
104 symbol a2_hor=$13
105 symbol a2_dia_sem=$03
106 i2cslave address_slave_A, i2cslow, i2cbyte
107 writei2c @alm2,(a2_min,a2_hor,a2_dia_sem)
108 let control=control or %00000010
109 let control=control or %00000100
110 let status=status and %11111101
111 writei2c @control,(control,status)
112 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.