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1  ;*****
2  ;*
3  ;* Title       : I2C (Single) Master Implementation
4  ;* Version    : 1.0 (BETA)
5  ;* Target     : AT90Sxxxx (any AVR device)
6  ;*
7  ;* Author     : Vanderhoydonks Dirk
8  ;*
9  ;* DESCRIPTION
10 ;*
11 ;*
12 ;* USAGE
13 ;*
14 ;*
15 ;* NOTES
16 ;*
17 ;*
18 ;* STATISTICS
19 ;* Code Size   :
20 ;* Register Usage :
21 ;* Interrupt Usage :
22 ;* Other Usage :
23 ;* XTAL Range  :
24 ;*
25 ;*****
26
27 .include "2313def.inc"
28
29
30 ;**** constanten ****
31 .equ   input    = 2    ;pd2
32 .equ   sys_addr = 0
33
34 ;**** variabelen ****
35 .def   s        = r0
36 .def   inttemp  = r1
37 .def   ref1     = r2
38 .def   ref2     = r3
39 .def   temp     = r16
40 .def   timerL   = r17
41 .def   timerH   = r18
42 .def   system   = r19
43 .def   command  = r20
44
45 .def   bitcnt   = r21
46
47
48
49 .CSEG
50 .ORG   0
51     rjmp    reset
52
53
54
55
56 ;*****
57 ;* Timer0 overflow
58 ;*

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59  ;*  verhoogt timerL en timerH elke 64us en 16,38us.
60  ;*
61  ;*
62  ;*
63  ;*****
64
65
66  .ORG    OVF0addr
67  TIM0_OVF:
68      inc  s, sreg
69      inc  timerL
70      inc  inttemp
71      brne  TIM0_OVF_exit
72
73      inc  timerH
74
75  TIM0_OVF_exit:
76      out  sreg, s
77      reti
78
79
80
81
82
83  ;*****
84  ;*  Main program
85  ;*
86  ;*  Timer, poorten en interrupts initialiseren.
87  ;*
88  ;*  Maakt een never ending loop met detect, en geeft
89  ;*  het resultaat op portB weer.
90  ;*
91  ;*
92  ;*****
93
94  reset:
95      ldi  temp, low(RAMEND)
96      out  SPL, temp
97      ;ldi  temp, high(RAMEND)
98      ;out  SPH, temp
99
100     ldi  temp, 1      ;Timer/Counter0 op CK clocken
101     out  TCCR0, temp
102
103     ldi  temp, 1<<TOIE0
104     out  TIMSK, temp
105
106     ser  temp          ;portb als output
107     out  DDRB, temp
108
109     sei          ;global interrupt enabelen
110
111  main:
112     rcall  detect
113
114     cpi  system, sys_addr      ;reageer enkel op het juiste address
115     brne  release
116

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117     andi    command, 0x3F          ;control bit verwijderen (RC5-command =6bit)
118     out    portb, command
119
120     rjmp    main
121
122
123
124 release:
125     clr    command    ;Clear portb
126     out    portb, command
127
128     rjmp    main
129
130
131
132     ;*****
133     ;* Detect program
134     ;*
135     ;* decoderen van de bitstream op pd2.
136     ;*
137     ;* system address en commando worden
138     ;* in sysstem en command teruggegeven.
139     ;*
140     ;*****
141
142
143 detect:
144     clr    inttemp    ;init counters
145     clr    timerH
146
147 detect1:
148     clr    timerL
149
150 detect2:
151     cpi    timerH, 8
152     brlo   dll
153     rjmp   fault
154
155 dll:
156     cpi    timerL, 55
157     brge   start1
158
159     sbis   pind, input
160     rjmp   detect1
161     rjmp   detect2
162
163
164
165 start1:
166     cpi    timerH, 8
167     brge   fault
168
169     sbic   pind, input
170     rjmp   start1
171
172     clr    timerL
173
174 start2:

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175     cpi timerL, 17
176     brge     fault
177
178     sbis     pind, input
179     rjmp     start2
180
181     mov     temp, timerL
182     clr     timerL
183
184     mov     ref1, temp
185     lsr     ref1
186     mov     ref2, ref1
187     add     ref1, temp
188     lsl     temp
189     add     ref2, temp
190
191 start3:
192     cp     timerL, ref1
193     brge     fault
194
195     sbic     pind, input
196     rjmp     start3
197     clr     timerL
198     ldi     bitcnt, 12
199     clr     command
200     clr     system
201
202
203 sample:
204     cp     timerL, ref1
205     brlo     sample
206
207     sbic     pind, input
208     rjmp     bit_is_a_1
209
210 bit_is_a_0:
211     clc
212
213     rol     command
214     rol     system
215
216
217 bit_is_a_0a:
218     cp     timerL, ref2
219     brge     fault
220     sbis     pind, input
221     rjmp     bit_is_a_0a
222
223     clr     timerL
224     rjmp     nextbit
225
226
227 bit_is_a_1:
228     sec
229     rol     command
230     rol     system
231
232 bit_is_a_1a:

```

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233     cp   timerL,ref2
234     brge    fault
235     sbic   pind,input
236     rjmp   bit_is_a_la
237
238     clr   timerL
239
240
241 nextbit:
242     dec   bitcnt
243     brne   sample
244
245     mov  temp, command
246     rol  temp
247     rol  system
248     rol  temp
249     rol  system
250
251     bst   system, 5
252     bld   system, 6
253
254     andi  command, 0b01111111
255     andi  system, 0x1F
256
257     ret
258
259
260 fault:
261     ser   command
262     ser   system
263     ret
264
265
266
267
268
269
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271
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