```
1  #ifndef TIMER_H
2  #define TIMER_H
3
4  /***********************************************************************
5   *
6   * Timer library for AVR-GCC.
7   * ATmega328P (Arduino Uno), 16 MHz, AVR 8-bit Toolchain 3.6.2
8   *
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10  * Dept. of Radio Electronics, Brno University of Technology, Czechia
11  * This work is licensed under the terms of the MIT license.
12  *
13  **********************************************************************/
14
15 /**
16  * @file  timer.h
17  * @brief Timer library for AVR-GCC.
18  *
19  * @details
20  * The library contains macros for controlling the timer modules.
21  *
22  * @note
23  * Based on Microchip Atmel ATmega328P manual and no source file is
24  * needed for the library.
25  *
26  * @copyright (c) 2019-2020 Tomas Fryza
27  * Dept. of Radio Electronics, Brno University of Technology, Czechia
28  * This work is licensed under the terms of the MIT license.
29  */
30
31 /* Includes ----------------------------------------------------------*/
32 #include <avr/io.h>
33
34 /* Defines -----------------------------------------------------------*/
35 /**
36  * @brief Defines prescaler CPU frequency values for Timer/Counter0.
37  * @note  F_CPU = 16 MHz
38  */
39 #define TIM0_stop()             TCCR0B &= ~((1<<CS02) | (1<<CS01) |
      (1<<CS00));
40 #define TIM0_overflow_16us()        TCCR0B &= ~((1<<CS02) | (1<<CS01));
      TCCR0B |= (1<<CS00);
41 #define TIM0_overflow_128us()    TCCR0B &= ~((1<<CS02) | (1<<CS00)); TCCR0B |
      = (1<<CS01);
42 #define TIM0_overflow_1ms()   TCCR0B &= ~(1<<CS02); TCCR0B |= (1<<CS01) |
      (1<<CS00);
43 #define TIM0_overflow_4ms()      TCCR0B &= ~((1<<CS01) | (1<<CS00)); TCCR0B |
      = (1<<CS02);
44 #define TIM0_overflow_16ms()      TCCR1B &= ~(1<<CS01); TCCR0B |= (1<<CS02) |
       (1<<CS00);
45
46 /**
47  * @brief Defines interrupt enable/disable modes for Timer/Counter0.
```

```
48   */
49  #define TIM0_overflow_interrupt_enable()    TIMSK0 |= (1<<TOIE0);
50  #define TIM0_overflow_interrupt_disable()   TIMSK1 &= ~(1<<TOIE0);
51
52
53  /**
54   * @brief Defines prescaler CPU frequency values for Timer/Counter1.
55   * @note  F_CPU = 16 MHz
56   */
57  #define TIM1_stop()             TCCR1B &= ~((1<<CS12) | (1<<CS11) |
      (1<<CS10));
58  #define TIM1_overflow_4ms()     TCCR1B &= ~((1<<CS12) | (1<<CS11)); TCCR1B |=
      (1<<CS10);
59  #define TIM1_overflow_33ms()    TCCR1B &= ~((1<<CS12) | (1<<CS10)); TCCR1B |=
      (1<<CS11);
60  #define TIM1_overflow_262ms()   TCCR1B &= ~(1<<CS12); TCCR1B |= (1<<CS11) |
      (1<<CS10);
61  #define TIM1_overflow_1s()      TCCR1B &= ~((1<<CS11) | (1<<CS10)); TCCR1B |=
      (1<<CS12);
62  #define TIM1_overflow_4s()      TCCR1B &= ~(1<<CS11); TCCR1B |= (1<<CS12) |
      (1<<CS10);
63
64  /**
65   * @brief Defines interrupt enable/disable modes for Timer/Counter1.
66   */
67  #define TIM1_overflow_interrupt_enable()    TIMSK1 |= (1<<TOIE1);
68  #define TIM1_overflow_interrupt_disable()   TIMSK1 &= ~(1<<TOIE1);
69
70
71  /**
72   * @brief Defines prescaler CPU frequency values for Timer/Counter2.
73   * @note  F_CPU = 16 MHz
74   */
75  #define TIM2_stop()               TCCR1B &= ~((1<<CS22) | (1<<CS21) |
      (1<<CS20));
76  #define TIM2_overflow_16us()      TCCR1B &= ~((1<<CS22) | (1<<CS21));
      TCCR2B |= (1<<CS20);
77  #define TIM2_overflow_128us()     TCCR1B &= ~((1<<CS22) | (1<<CS20));
      TCCR1B |= (1<<CS21);
78  #define TIM2_overflow_512us()     TCCR1B &= ~(1<<CS22); TCCR2B |= (1<<CS21)
      | (1<<CS20);
79  #define TIM2_overflow_1ms()       TCCR1B &= ~((1<<CS21) | (1<<CS20));
      TCCR2B |= (1<<CS22);
80  #define TIM2_overflow_2ms()       TCCR1B &= ~(1<<CS21); TCCR2B |= (1<<CS22)
      | (1<<CS20);
81  #define TIM2_overflow_4ms()       TCCR1B &= ~(1<<CS20); TCCR2B |= (1<<CS22)
      | (1<<CS21);
82  #define TIM2_overflow_16ms()      TCCR1B |= (1<<CS21) | (1<<CS22) |
      (1<<CS20);
83
84  /**
85   * @brief Defines interrupt enable/disable modes for Timer/Counter2.
86   */
```

```
87  #define TIM2_overflow_interrupt_enable()    TIMSK2 |= (1<<TOIE2);
88  #define TIM2_overflow_interrupt_disable()   TIMSK2 &= ~(1<<TOIE2);
89
90  #endif
```