**Listing 1. Odmierzanie czasu za pomocą przerwania Timera 0**

**void** **timer0Interrupt**(**void**\* context){

//Zadanie 2

**static** uint16\_t msCounter = 0;

**static** uint16\_t secCounter = 0;

**if**(msCounter < 999){

msCounter++;

}**else**{

msCounter = 0;

secCounter++;

intDisplayDec(secCounter);

}

IOWR\_ALTERA\_AVALON\_TIMER\_STATUS(TIMER0\_BASE, 0);

refreshDisplay();

}

**Listing 2. Funkcja generująca przerwanie po naciśnięciu przycisku**

**void** **timer0Interrupt**(**void**\* context){

IOWR\_ALTERA\_AVALON\_TIMER\_STATUS(TIMER0\_BASE, 0);

refreshDisplay();

}

**void** **SWInterrupt**(**void**\* context){

**static** uint16\_t counter = 0;

IOWR\_ALTERA\_AVALON\_PIO\_EDGE\_CAP(SW\_BASE, 0);

counter++;

intDisplayDec(counter);

}

**Listing 3. Funkcja eliminująca drgania styków**

**volatile** uint16\_t counter = 0;

**void** **timer0Interrupt**(**void**\* context){

IOWR\_ALTERA\_AVALON\_TIMER\_STATUS(TIMER0\_BASE, 0);

refreshDisplay();

**static** uint16\_t msCounter = 0;

uint16\_t state = IORD\_ALTERA\_AVALON\_PIO\_DATA(SW\_BASE);

**if**(state != 0b111){

**if**(msCounter < 50){

msCounter++;

}**else** **if**(msCounter == 50){

counter++;

intDisplayDec(counter);

msCounter++;

}

}**else**{

msCounter = 0;

}

}

**Listing 4. Pomiar czasu z użyciem funkcji dostarczanej przez producenta**

**volatile** uint16\_t counterMs = 0;

**void** **timer0Interrupt**(**void**\* context){

IOWR\_ALTERA\_AVALON\_TIMER\_STATUS(TIMER0\_BASE, 0);

refreshDisplay();

counterMs++;

}

// w pętli while

**if**(!(IORD\_ALTERA\_AVALON\_PIO\_DATA(SW\_BASE) & (1<<0))){

alt\_irq\_context context = alt\_irq\_disable\_all();

IOWR\_ALTERA\_AVALON\_TIMER\_SNAPH(TIMER0\_BASE, 0);

uint16\_t copyMs = counterMs;

// (\*)

alt\_irq\_enable\_all(context);

uint32\_t timerValue = IORD\_ALTERA\_AVALON\_TIMER\_SNAPH(TIMER0\_BASE);

timerValue <<= 16;

timerValue |= IORD\_ALTERA\_AVALON\_TIMER\_SNAPL(TIMER0\_BASE);

**printf**("T = %u.%03lu ms\r\n", copyMs, 999-timerValue/50);

intDisplayDec(copyMs);

**while**(!(IORD\_ALTERA\_AVALON\_PIO\_DATA(SW\_BASE) & (1<<0)));

}