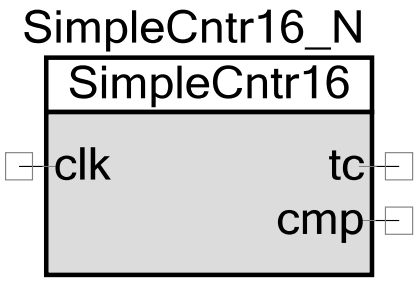
16-Bit Simple Down Counter (SimpleCntr16)

1.0

Features

- 16-Bit Counter
- Terminal Count Output
- Compare (PWM) Output.



General Description

The SimpleCNTR16 is a simple 16-bit down counter. It can also be used as a single output PWM. This component was created to help new users understand how to develop simple components using two parallel UDB Datapaths.

Input/Output Connections

This section describes the various input and output connections.

clk – Input

Clock input to run the counter.

tc – Output

This signal goes high when the internal counter equals zero.

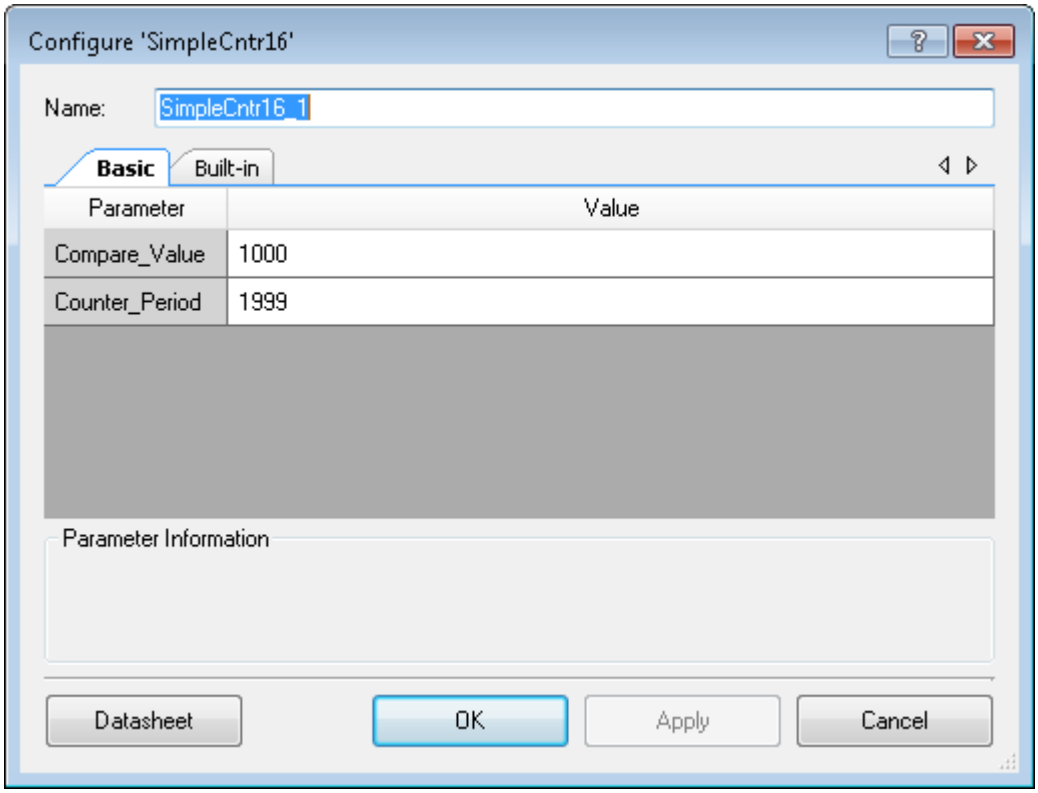
cmp – Output

The Compare (cmp) goes high when the counter is less than the compare value. This output is used as a PWM output.

Parameters and Setup

Drag a SimpleCNTR16 component onto your design and double-click it to open the Configure dialog.

Figure 1 Configure SimpleCNTR16 Dialog



The SimpleCNTR16 component provides the following parameters.

Compare_Value

This parameter determines what value will be used to compare to the internal counter, to generate the PWM output “cmp”. The valid range for this parameter is 1 to 65535.

Counter_Period

This parameter determines the length of the counter period as a number of clocks+1. If a period of 120 clocks is desired, enter 119. The valid range for this parameter is 1 to 65535.

Resources

PSoC UDB resources used.

Resource	Amount Used	Percent PSoC Resource Used
Macrocells	0	0%
Unique Product Terms	0	0%
Datapaths	2	8.33%
Control Register	0	0%
Status Register	0	0%

Application Programming Interface

This component does not include APIs for programming but instead provides register definitions so that the user can easily set parameters during program execution time.

Sample Firmware Source Code

The following is a C language example demonstrating the basic functionality of the SimpleCNTR16 component. This example assumes the component has been placed in a design with the default name " SimpleCNTR16 _1."

Note If you rename your component you must also edit the example code as appropriate to match the component name you specify.

```
#include <device.h>

void main()
{
    /* Set Period to 5000 clocks and compare to 1250 for a 25% duty cycle */
    CY_SET_REG16(SimpleCNTR16_1_Period_Reg_Ptr, 4999);
    CY_SET_REG16(SimpleCNTR16_1_Compare_Reg_Ptr, 1250);

    for(;;)
    {
        /* Place your application code here. */
    }
   }
```

Registers

The functions provided support most of the common runtime functions required for most applications. The following register references provide brief descriptions for the advanced user.

SimpleCNTR16 _Period_Reg

Bits	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Value	Data[15:0]															

- Data[15:0]: Counter Period Register.

SimpleCNTR16 _Compare_Reg

Bits	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Value	Data[15:0]															

- Data[15:0]: Counter Compare Register.

DC and AC Electrical Characteristics

AC Characteristics

Parameter	Description	Min	Typ	Max	Units
F_{max}	Operating frequency	-	-	62	MHz

Component Changes

This section lists the major changes in the component from the previous version.

Version	Description of Changes	Reason for Changes / Impact
1.00		Initial document

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