

Classification	XPAC Development FAQ				No.	5-006-00	
Author	Sean	Version	1.0.1	Date	2012/8/21	Page	1/3

## Q: How to use microsecond timer with real-time performance?

*Applied to:*

<i>Platform</i>	<i>OS version</i>	<i>XPAC SDK version</i>	<i>XPAC Net version</i>
<i>XP-8000-CE6</i>	<b>V1.3.2.2 or later</b>	<b>V2.0.0.7 or later</b>	<b>V1.1.1.x or later</b>
<i>XP-8000-Atom-CE6</i>	<b>V1.0.0.2 or later</b>	<b>V2.0.0.7 or later</b>	<b>V1.1.1.x or later</b>

In X5-05 How-to document, we have discussed how to use Multimedia Timer to realize real-time operation. The Multimedia Timer can be adjusted the thread priority to meet the real-time requirement, but the timer unit is only in millisecond.

XPAC series controller provides the backplane timer that supports the high resolution timer in microsecond unit. In addition, the thread priority of this timer also can be adjusted for meeting the real-time requirement.

Backplane API functions:

- (1).pac\_SetBPTimerOut
- (2).pac\_SetBPTimer
- (3).pac\_KillBPTimer
- (4). pac\_SetBPTimerInterruptPriority

Refer to the XPAC Standard API manual at <ftp://ftp.icpdas.com/pub/cd/xp-8000-ce6/document/sdk/>  
Or <ftp://ftp.icpdas.com/pub/cd/xpac-atom-ce6/document/sdk/>

### What is the input range of the priority of backplane Timer?

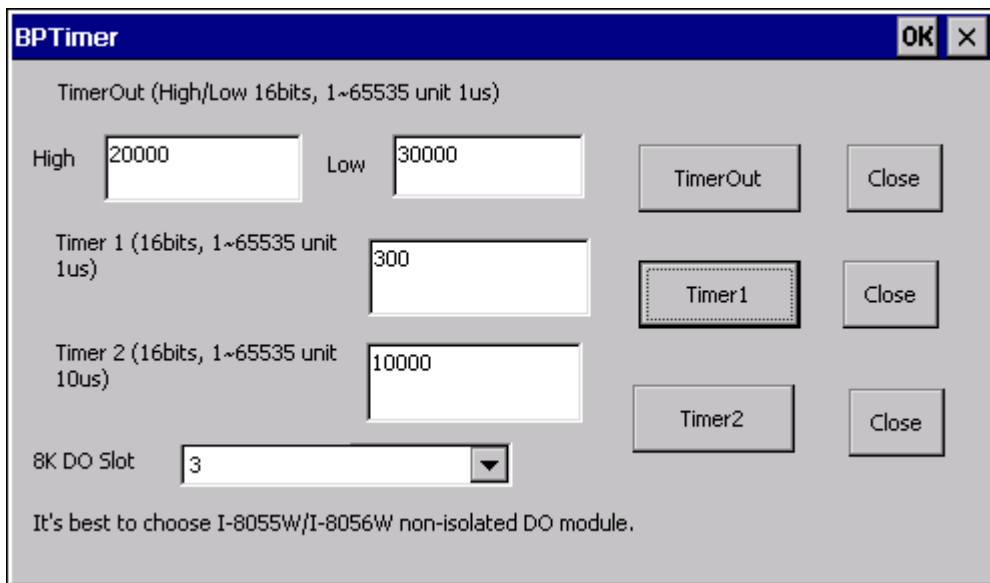
The range is 8 to 256.

### How to use backplane Timer?

#### 1. VC++ demo

Use any one 8K DO module to output square wave to test real time. Change the timer priority to enhance the real-time capability. Use the oscilloscope to monitor the square wave.

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## 2. C sharp/VB.net demo

It isn't recommended to write the managed code by C# or VB running in the .net compact framework for real-time work. **The feature of JIT compiler and garbage collector of .net compact framework will interfere with deterministic system behavior.**

But we provide the XPACNET.dll to use the P/Invoke functionality to enable managed code to call unmanaged native dynamic-link library entry points of XPACSDK.dll.

Refer to <http://msdn.microsoft.com/en-us/library/ms836789.aspx> for more detail regarding of Read-time behavior of the .NET Compact Framework.

XPACNET.dll must be put with the executable file in the same folder.

### Location of demo download

C sharp:

<http://ftp.icpdas.com/pub/cd/xp-8000-ce6/demo/xpac/c%23/standard/bptimer/>

or

<http://ftp.icpdas.com/pub/cd/xpac-atom-ce6/demo/xpac/c%23/standard/bptimer/>

VC++:

<http://ftp.icpdas.com/pub/cd/xp-8000-ce6/demo/xpac/vc2008/standard/bptimer/>

or

<http://ftp.icpdas.com/pub/cd/xpac-atom-ce6/demo/xpac/vc2008/standard/bptimer/>

VB.net:

<http://ftp.icpdas.com/pub/cd/xp-8000-ce6/demo/xpac/vb.net/standard/bptimer/>

or

<http://ftp.icpdas.com/pub/cd/xpac-atom-ce6/demo/xpac/vb.net/standard/bptimer/>

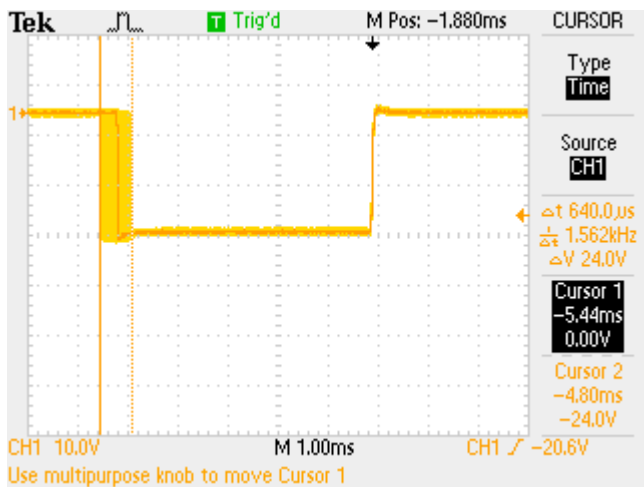
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### The Actual Test

1. Test using Backplane Timer1 calling pac\_SetBPTimer(1,...) function.
2. Run the following programs to make CPU loading 100% and use the persistence feature of the scope, which records and overwrites ALL traces for a total of many thousands of traces for 12 hours.
  - tcpmp 0.72 to play a mp4 file
  - FTP data upload and download between PC and XPAC
  - Do endless loop to write 100KB data to a file on \Temp and then delete it.

#### C# BP Timer1

pac\_SetBPTimer(1, 5000, ..) The period of timer is 2ms (50% duty cycle)

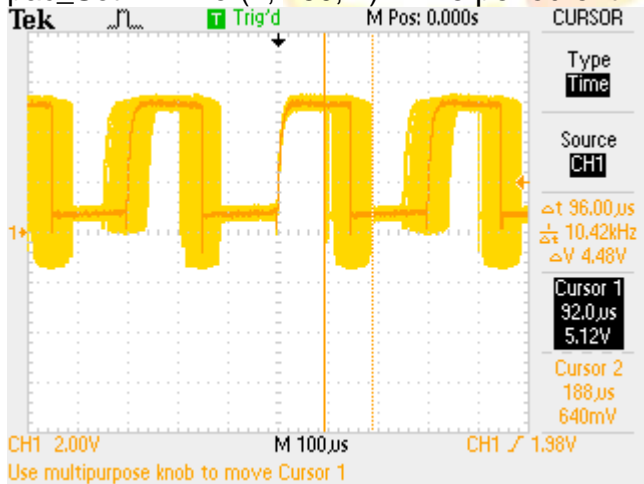


Jitter is about 640μs.

According to the actual test, the time interval must be large than or equal to 5ms for development using C# language.

#### VC BP Timer1

pac\_SetBPTimer(1, 150, ..) The period of timer is 300μs (50% duty cycle)



Jitter is about 96μs.

According to the actual test, the time interval must be large than or equal to 150μs for development using VC language.