| 分類/Classification | ☐ tDS ☐ tGW ☐ PETL/tET/tPET ☐ DS/PDS/PPDS ☐ tM-752N<br>☑ I/O Card ☐ VXC Card ☐ VxComm ☐ Other | | | | |
|---|---|---|---|---|---|
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## Q: How do I use a PCI-TMC12A module to measure external frequencies?

**A:** The following describes the Measurement Principles and Jumper Settings for measuring external frequencies, together with an example.

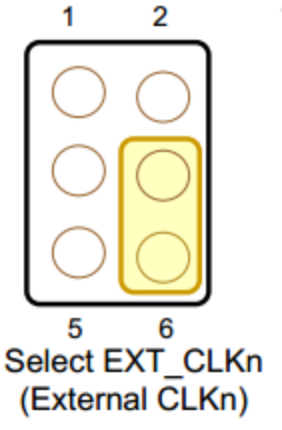
- **Measurement Principles**: Measure the number of external pulses within a defined period of time, and then calculate the frequency.

- **Jumper Settings**: Select the external clock via the Jumper.

  For more detailed information related to jumper selection, refer to section 2.4.3 in the PCI-TMC12A User Manual, which can be downloaded from:
  http://ftp.icpdas.com/pub/cd/iocard/pci/napdos/pci/pci-tmc12a/manual/pci-tmc12_user_manual.pdf

- **Example**: The following example demonstrates how to use Counter 1 on the PCI-TMC12A to measure an unknown signal frequency.

Step1: Use jumper J22 to set the clock source to the external clock, as illustrated below.




Step2:

Connect the **External CLK** pin to **CON1.ECLK1 (Pin 1)**.
Connect the **External GND** pin to **CON1.GND (Pin 19).**

Refer to the sample code below for an illustration of the implementation.

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**Example: Using the UniDAQ Driver**

```
wRtn=Ixud_DriverInit(&wTotalBoards);
wRtn=Ixud_GetCardInfo(i,&DevInfo,&CardInfo,szModelName);

wBoardNo = 0;
wChannel = 1; //Set the timer counter to counter 1
wMode = 0; //Set the timer counter to mode 0
dwValue = 0xFFFF; //Set the countdown value

wRtn = Ixud_SetCounter(wBoardNo,wChannel,wMode,  dwValue);

 //Initialize the timer counter
wRtn = Ixud_WritePort(DevInfo.dwBAR[2]+0x18,16,0<<wChannel);
wRtn = Ixud_WritePort(DevInfo.dwBAR[2]+0x18,16,1<<wChannel);
wRtn = Ixud_WritePort(DevInfo.dwBAR[2]+0x18,16,0<<wChannel);
wRtn = Ixud_WritePort(DevInfo.dwBAR[2]+0x18,16,1<<wChannel);
wRtn = Ixud_WritePort(DevInfo.dwBAR[2]+0x18,16,0<<wChannel);

//Measure the external frequency
wRtn = Ixud_ReadCounter(wBoardNo,wChannel,  &CounterInit); //Read the initial value of Counter 1

QueryPerformanceFrequency  (&liFrequency); //Read the frequency of the hardware
QueryPerformanceCounter  (&liStart); //Read the starting time

Sleep (500);

QueryPerformanceCounter  (&liStop); //Read the ending time

wRtn = Ixud_ReadCounter(wBoardNo,wChannel,  &CounterFinal); //Read the termination value for
Counter 1

Time = (liStop-liStart)/liFrequency;  //Calculate the elapsed time
UnknownFre=(CounterInit  - CounterFinal)/Time; //Calculate the External frequency

wRtne=Ixud_DriverClose();
```

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**Example: Using the Classic Driver**

```
wRtn=PTMC12_DriverInit();
wTotalBoards=PTMC12_DetectBoards();

 wBoardNo = 0;
 wChannel = 1; //Set the timer counter to counter 1
 wMode = 0; //Set the timer counter to mode 0
 dwValue = 0xFFFF; //Set the countdown value

wRtn=PTMC12_OpenBoard(wBoardNo,0);

wRtn=PTMC12_WriteCounter(wBoardNo,wChannel,wMode,dwValue);

 //Initialize the timer counter
 wRtn = PTMC12_WriteWord(wBoard,0x18,0<<wChannel);
 wRtn = PTMC12_WriteWord(wBoard,0x18,1<<wChannel);
 wRtn = PTMC12_WriteWord(wBoard,0x18,0<<wChannel);
 wRtn = PTMC12_WriteWord(wBoard,0x18,1<<wChannel);
 wRtn = PTMC12_WriteWord(wBoard,0x18,0<<wChannel);

//Measure the external frequency
wRtn = PTMC12_ReadCounter(wBoard,wChannel,CounterInit);  //Read the initial value of Counter 1

QueryPerformanceFrequency  (&liFrequency); //Read the frequency of the hardware
QueryPerformanceCounter  (&liStart); //Read the starting time

Sleep (500);

QueryPerformanceCounter  (&liStop); //Read the ending time

wRtn = PTMC12_ReadCounter(wBoard,wChannel,CounterFinal);  //Read the termination value for Counter
1

Time = (liStop-liStart)/liFrequency;  //Calculated the elapsed time
UnknownFre=(CounterInit  - CounterFinal)/Time; //Calculate the external frequency

wRtn=PTMC12_CloseBoard(wBoardNo);
```

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