PCIS-DASK ver. 3.25

for PC Compatibles

Function Reference Manual

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Trademarks

CONTENTS

How to Use This Manual

This manual is designed to help you use the PCIS-DASK software driver for NuDAQ PCI-bus data acquisition cards. The manual describes how to install and use the software library to meet your requirements and help you program your own software applications. It is organized as follows:

- Chapter 1, "Using PCIS-DASK Functions" gives the important information about how to apply the function descriptions in this manual to your programming language and environment.
- Chapter 2, "Function Description" gives the detailed description of each function call PCIS-DASK provided.
- Appendix A, "Status Codes" lists the status codes returned by PCIS-DASK functions, as well as their meanings.
- Appendix B, "AI Range Codes " lists all the valid AI range codes for each card.
- Appendix C, "AI Data Format" lists the AI data format for the cards performing analog input operation, as well as the calculation methods to retrieve the A/D converted data and the channel where the data read from.
- Appendix D, "Function Support" shows which data acquisition hardware each PCIS-DASK function supports.

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Using PCIS-DASK Functions

PCIS-DASK is a software driver for NuDAQ PCI-bus data acquisition cards. It is a high performance data acquisition driver for developing custom applications under Windows NT environment.

Using PCIS-DASK also lets you take advantage of the power and features of Microsoft Windows NT for your data acquisition applications. These include running multiple applications and using extended memory. Also, using PCIS-DASK under Visual Basic environment makes it easy to create custom user interfaces and graphics.

1.1 The Fundamentals of Building Windows 2000/NT/98 Application with PCIS-DASK

1.1.1 Creating a Windows 2000/NT/98 PCIS-DASK Application Using Microsoft Visual C/C++

To create a data acquisition application using PCIS-DASK and Microsoft Visual C/C++, follow these steps after entering Visual C/C++:

step 1. Open the project in which you want to use PCIS-DASK. This can be a new or existing project

step 2. Include header file DASK.H in the C/C++ source files that call PCIS-DASK functions. DASK.H contains all the function declarations and constants that you can use to develop your data acquisition application. Incorporate the following statement in your code to include the header file.

#include "DASK.H"

step 3. Build your application.

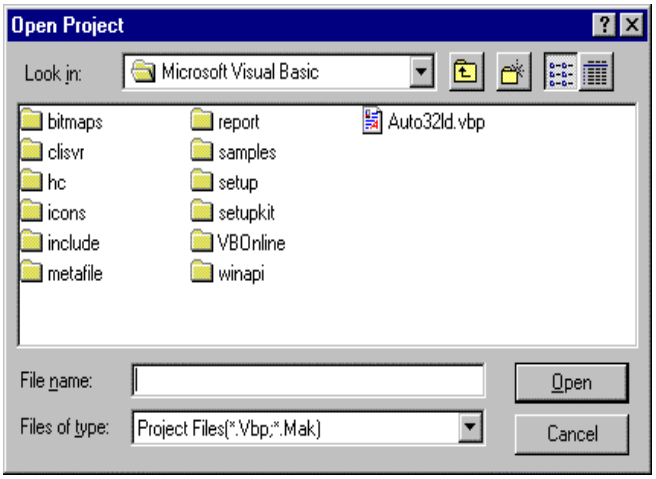
Setting the appropriate compile and link options, then build your application by selecting the Build command from Build menu (Visual C/C++ 4.0). Remember to link PCIS-DASK's import library PCI-DASK.LIB.

1.1.2 Creating a Windows 2000/NT/98 PCIS-DASK Application Using Microsoft Visual Basic

To create a data acquisition application using PCIS-DASK and Visual Basic, follow these steps after entering Visual Basic:

step 1. Open the project in which you want to use PCIS-DASK. This can be a new or existing project

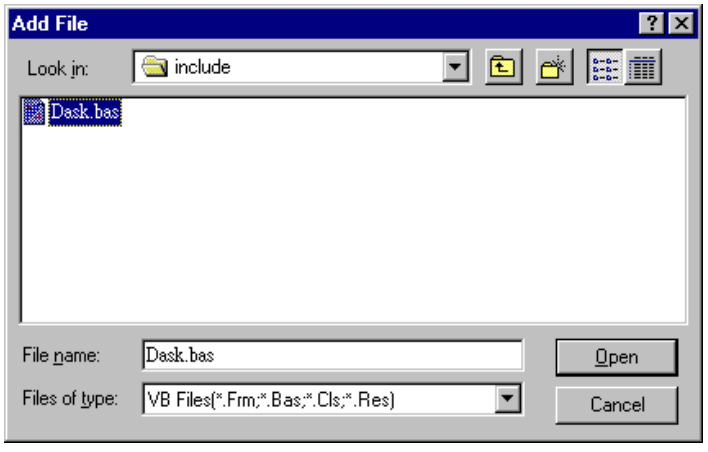
Open a new project by selecting the New Project command from the File menu. If it is an existing project, open it by selecting the Open Project command from the File menu. Then the Open Project dialog box appears.



Changed directory to the place the project file located. Double-click the project file name in the File Name list to load the project.

step 2. Add file DASK.BAS into the project if this file is not included in the project. This file contains all the procedure declarations and constants that you can use to develop your data acquisition application.

From the File menu, select the Add File command. The Add File window appears, displaying a list of files in the current directory.



Select DASK.BAS from the Files list by double-clicking on it. If you can't find this file in the list, make sure the list is displaying files from the correct directory. By default, DASK.BAS is installed in C:\ADLink\PCI-DASK\INCLUDE.

step 3. Design the interface for the application.

To design the interface, you place the desired elements, such as command button, list box, text box, etc., on the Visual Basic form. These are standard controls from the Visual Basic Toolbox. To place a control on a form, you just move pointer to Toolbox, select the desired control and draw it on the form. Or you can double-click the control icon in the Toolbox to place it on the form.

step 4. Set properties for the controls.

To view the property list, click the desired control and then choose the Properties command from the View menu or press F4, or you can also click the Properties button  on the toolbar.

step 5. Write the event code.

The event code defines the action you want to perform when an event occurs. To write the event code, double-click the desired control or form to view the code module and then add code you want. You can call the functions that declared in the file DASK.BAS to perform data acquisition operations.

step 6. Run your application.

To run the application, choose Start from the Run menu, or click the Start icon  on the toolbar (you can also press F5).

step 7. Distribute your application.

Once you have finished a project, you can save the application as an executable (.EXE) file by using the Make EXE File command on the File menu. And once you have saved your application as an executable file, you've ready to distribute it. When you distribute your application, remember also to include the PCIS-DASK' s DLL and driver files. These files should be copied to their appropriate directory as section 1.4.1 described.

1.2 PCIS-DASK Functions Overview

PCIS-DASK functions are grouped to the following classes:

- **General Configuration Function Group**
- **Actual Sampling Rate Function Group**
- **Analog Input Function Group**
  - Analog Input Configuration functions
  - One-Shot Analog Input functions
  - Continuous Analog Input functions
  - Asynchronous Analog Input Monitoring functions
- **Analog Output Function Group**

- **Digital Input Function Group**
  - Digital Input Configuration functions
  - One-Shot Digital Input functions
  - Continuous Digital Input functions
  - Asynchronous Digital Input Monitoring functions
- **Digital Output Function Group**
  - Digital Output Configuration functions
  - One-Shot Digital Output functions
  - Continuous Digital Output functions
  - Asynchronous Digital Output Monitoring functions
- **Timer/Counter Function Group**
  - Timer/Counter functions
  - The General-Purpose Timer/Counter functions
- **DIO Function Group**
  - Digital Input/Output Configuration function
  - Dual-Interrupt System Setting functions

2

Function Description

This chapter contains the detailed description of PCIS-DASK functions, including the PCIS-DASK data types and function reference. The functions are arranged alphabetically in *3.2 Function Reference*.

2.1 Data Types

We defined some data types in DASK.H. These data types are used by PCIS-DASK library. We suggest you to use these data types in your application programs. The following table shows the data type names, their ranges and the corresponding data types in C/C++, Visual Basic and Delphi (We didn't define these data types in DASK.BAS and DASK.PAS. Here they are just listed for reference)

Type Name	**Description**	**Range**	**Type**		
			C/C++ (for 32-bit compiler)	***Visual Basic***	***Pascal (Delphi)***
U8	8-bit ASCII character	0 to 255	unsigned char	Byte	Byte
I16	16-bit signed integer	-32768 to 32767	short	Integer	SmallInt
U16	16-bit unsigned integer	0 to 65535	unsigned short	Not supported by BASIC, use the signed integer (I16) instead	Word
I32	32-bit signed integer	-2147483648 to 2147483647	long	Long	LongInt
U32	32-bit unsigned integer	0 to 4294967295	unsigned long	Not supported by BASIC, use the signed long integer (I32) instead	Cardinal
F32	32-bit single-precision floating-point	-3.402823E38 to 3.402823E38	float	Single	Single
F64	64-bit double-precision floating-point	-1.797683134862315E308 to 1.797683134862315E309	double	Double	Double

2.2 Function Reference

2.2.1 AI_9111_Config

@ Description

Informs PCIS-DASK library of the trigger source and trigger mode selected for the PCI-9111 card with card ID *CardNumber*. You must call this function before calling function to perform continuous analog input operation.

@ Cards Support

9111

@ Syntax

Microsoft C/C++ and Borland C++

I16 AI_9111_Config (U16 CardNumber, U16 TrigSource, U16 PreTrgEn, U16 TraceCnt)

Visual Basic

AI_9111_Config (ByVal CardNumber As Integer, ByVal TrigSource As Integer, ByVal PreTrgEn As Integer, ByVal TraceCnt As Integer) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.

TrigSource : The continuous A/D conversion trigger source.
Valid values:
TRIG_INT_PACER: on-board Programmable pacer
TRIG_EXT_STROBE: external signal trigger

PreTrgEn: Enable or Disable Pre-Trigger mode.
TRUE: Enable Pre-Trigger mode
FALSE: Disable Pre-Trigger mode

TraceCnt: The number of data will be accessed after a specific trigger event.

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport

2.2.2 AI_9112_Config

@ Description

Informs PCIS-DASK library of the trigger source selected for the PCI-9112/cPCI-9112 with card ID *CardNumber*. You must call this function before calling function to perform continuous analog input operation.

@ Cards Support

9112

@ Syntax

Microsoft C/C++ and Borland C++

I16 AI_9112_Config (U16 CardNumber, U16 TrigSource)

Visual Basic

AI_9112_Config (ByVal CardNumber As Integer, ByVal TrigSource As Integer) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.
TrigSource : The continuous A/D conversion trigger source.
Valid values:
TRIG_INT_PACER: on-board Programmable pacer
TRIG_EXT_STROBE: external signal trigger

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport

2.2.3 AI_9113_Config

@ Description

Informs PCIS-DASK library of the trigger source selected for the PCI-9113 with card ID *CardNumber*. You must call this function before calling function to perform continuous analog input operation.

@ Cards Support

9113

@ Syntax

Microsoft C/C++ and Borland C++

I16 AI_9113_Config (U16 CardNumber, U16 TrigSource)

Visual Basic

AI_9113_Config (ByVal CardNumber As Integer, ByVal TrigSource As Integer) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.
TrigSource : The continuous A/D conversion trigger source.
Valid values:
TRIG_INT_PACER: on-board Programmable pacer

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport

2.2.4 AI_9114_Config

@ Description

Informs PCIS-DASK library of the trigger source selected for the PCI-9114 with card ID *CardNumber*. You must call this function before calling function to perform continuous analog input operation.

@ Cards Support

9114

@ Syntax

Microsoft C/C++ and Borland C++

I16 AI_9114_Config (U16 CardNumber, U16 TrigSource)

Visual Basic

AI_9114_Config (ByVal CardNumber As Integer, ByVal TrigSource As Integer) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.
TrigSource : The continuous A/D conversion trigger source.
Valid values:
TRIG_INT_PACER: on-board Programmable pacer
TRIG_EXT_STROBE: external signal trigger

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport

2.2.5 AI_9114_PreTrigConfig

@ Description

Informs PCIS-DASK library of the trigger source and trigger mode selected for the PCI-911 with card ID *CardNumber*. You must call this function before calling function to perform continuous analog input operation.

@ Cards Support

9114

@ Syntax

Microsoft C/C++ and Borland C++

I16 AI_9114_PreTrigConfig (U16 CardNumber, U16 PreTrgEn, U16 TraceCnt)

Visual Basic

AI_9114_PreTrigConfig (ByVal CardNumber As Integer, ByVal PreTrgEn As Integer, ByVal TraceCnt As Integer) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.
PreTrgEn: Enable or Disable Pre-Trigger mode.
TRUE: Enable Pre-Trigger mode
FALSE: Disable Pre-Trigger mode
TraceCnt: The number of data will be accessed after a specific trigger event.

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport

2.2.6 AI_9116_Config

@ Description

Informs PCIS-DASK library of the trigger source, trigger mode and trigger properties selected for the PCI-9116 with card ID *CardNumber*. You must call this function before calling function to perform continuous analog input operation.

@ Cards Support

9116

@ Syntax

Microsoft C/C++ and Borland C++

I16 AI_9116_Config (U16 CardNumber, U16 ConfigCtrl, U16 TrigCtrl, U16 PostCnt, U16 MCnt, U16 ReTrgCnt)

Visual Basic

AI_9116_Config (ByVal CardNumber As Integer, ByVal ConfigCtrl As Integer, ByVal TrigCtrl As Integer, ByVal PostCnt As Integer, ByVal MCnt As Integer, ByVal ReTrgCnt As Integer) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.

ConfigCtrl : The setting for A/D mode control. This argument is an integer expression formed from one or more of the manifest constants defined in DASK.H. There are three groups of constants:

(1) **A/D Polarity Control**
- P9116_AI_BiPolar
- P9116_AI_UniPolar

(2) **A/D Channel Input Mode**
- P9116_AI_SingEnded
- P9116_AI_Differential

(3) **Common Mode Selection**
- P9116_AI_LocalGND: Local Ground of cPCI-9116
- P9116_AI_UserCMMD: User defined Common Mode

When two or more constants are used to form the *ConfigCtrl* argument, the constants are combined with the bitwise-OR operator(|).

TrigCtrl : The setting for A/D Trigger control. This argument is an integer expression formed from one or more of the manifest constants defined in DASK.H. There are seven groups of constants:

(1) **Trigger Mode Selection**
- P9116_TRGMOD_SOFT : Software Trigger (no trigger)
- P9116_TRGMOD_POST : Post Trigger
- P9116_TRGMOD_DELAY: Delay Trigger
- P9116_TRGMOD_PRE : Pre-Trigger Mode
- P9116_TRGMOD_MIDL : Middle Trigger

(2) **Trigger Polarity**
- P9116_AI_TrgNegative: Trigger negative edge active
- P9116_AI_TrgPositive: Trigger positive edge active

(3) **Time Base Selection**
- P9116_AI_IntTimeBase: Internal time Base (24 MHz)
- P9116_AI_ExtTimeBase: External time base

(4) **Delay Source Selection**
- P9116_AI_DlyInSamples: delay in samples
- P9116_AI_DlyInTimebase: delay in time base

(5) **Re-Trigger Mode Enable**
- P9116_AI_ReTrigEn: Re-trigger in an acquisition is enabled

(6) **MCounter Enable**
- P9116_AI_MCounterEn: Mcounter is enabled and then the trigger signal is ignore before M terminal count is reached.

(7) **AD Conversion Mode Selection**
- P9116_AI_SoftPolling: Software Polling
- P9116_AI_INT: Interrupt mode of continuous AI
- P9116_AI_DMA: DMA mode of continuous AI

When two or more constants are used to form the *TrigCtrl* argument, the constants are combined with the bitwise-OR operator(|).

PostCnt : The number of data will be accessed after a specific trigger event. This argument is only valid for Middle trigger and Delay trigger mode.

MCnt : The counter value of MCounter . This argument is only valid for Pre-trigger and Middle trigger mode.

ReTrgCnt : The accepted trigger times in an acquisition. This argument is only valid for Delay trigger and Post trigger mode.

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport

2.2.7 AI_9116_CounterInterval

@ Description

Informs PCIS-DASK library of the scan interval value and sample interval value selected for the analog input operation of PCI9116. You must call this function before calling function to perform continuous analog input operation of PCI9116.

@ Cards Support

9116

@ Syntax

Microsoft C/C++ and Borland C++

```
I16  AI_9116_CounterInterval (U16 wCardNumber, U32 ScanIntrv, U32 SampIntrv)
```

Visual Basic

```
AI_9116_CounterInterval (ByVal CardNumber As Integer, ByVal ScanIntrv As Long,
        ByVal SampIntrv As Long) As Integer
```

@ Parameter

CardNumber : The card id of the card that want to perform this operation.

ScanIntrv : The length of the scan interval (that is, the counter value between the initiation of each scan sequence).
Range: 96 through 16777215

SampIntrv :The length of the sample interval (that is, the counter value between each A/D conversion within a scan sequence).
Range: 96 through 65535

Note: the value of *ScanIntrv* must be greater than or equal to the sum of the total sample interval (that is, *the number of channels in a scan sequence * SampIntrv*).

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport

2.2.8 AI_9118_Config

@ Description

Informs PCIS-DASK library of the trigger source, trigger mode and trigger properties selected for the PCI-9118 with card ID *CardNumber*. You must call this function before calling function to perform continuous analog input operation.

@ Cards Support

9118

@ Syntax

Microsoft C/C++ and Borland C++

I16 AI_9118_Config (U16 CardNumber, U16 ModeCtrl, U16 FunCtrl, U16 BurstCnt, U16 PostCnt)

Visual Basic

AI_9118_Config (ByVal CardNumber As Integer, ByVal ModeCtrl As Integer, ByVal FunCtrl As Integer, ByVal BurstCnt As Integer, ByVal PostCnt As Integer) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.

ModeCtrl : The setting for A/D mode control. This argument is an integer expression formed from one or more of the manifest constants defined in DASK.H. There are four groups of constants:

(1) **A/D Polarity Control**
- P9118_AI_BiPolar
- P9118_AI_UniPolar

(2) **A/D Channel Input Mode**
- P9118_AI_SingEnded
- P9118_AI_Differential

(3) **External Gate Enable**
- P9118_AI_ExtG: 8254 counter is controlled by TGIN pin

(4) **External Trigger Enable**
- P9118_AI_ExtTrig: External Hardware Trigger Mode enabled

When two or more constants are used to form the *ModeCtrl* argument, the constants are combined with the bitwise-OR operator(|).

FunCtrl : The setting for A/D Function. This argument is an integer expression formed from one or more of the manifest constants defined in DASK.H. There are four groups of constants:

(1) **Digital Trigger Polarity**
- P9118_AI_DtrgNegative: Digital trigger negative active
- P9118_AI_DtrgPositive: Digital trigger positive active

(2) **External Trigger Polarity**
- P9118_AI_EtrgNegative: External trigger negative active
- P9118_AI_EtrgPositive: External trigger positive active

(3) **Burst Mode Enable**
- P9118_AI_BurstModeEn: Burst Mode is enabled

(4) **Burst Mode with Sample and Hold Mode Enable**
- P9118_AI_SampleHold: Burst mode with sample and hold is enabled

(5) **Trigger Mode Enable**
- P9118_AI_PostTrgEn: Post trigger mode is enabled
- P9118_AI_AboutTrgEn: About trigger mode or Pre-trigger mode is enabled

When two or more constants are used to form the *ModeCtrl* argument, the constants are combined with the bitwise-OR operator(|).

BurstCnt : The burst number

PostCnt : The number of data will be accessed after a specific trigger event

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport

2.2.9 AI_9812_Config

@ Description

Informs PCIS-DASK library of the trigger source, trigger mode, and trigger properties selected for the PCI-9812 card with card ID *CardNumber*. You must call this function before calling function to perform analog input operation.

@ Cards Support

9812/10

@ Syntax

Microsoft C/C++ and Borland C++

```
I16  AI_9812_Config (U16 CardNumber, U16 TrgMode, U16 TrgSrc, U16 TrgPol,
          U16 ClkSel, U16 TrgLevel, U16 PostCnt)
```

Visual Basic

```
AI_9812_Config (ByVal CardNumber As Integer, ByVal TrgMode As Integer, ByVal
        TrgSrc As Integer, ByVal TrgPol As Integer, ByVal ClkSel As Integer, ByVal
        TrgLevel As Integer, ByVal PostCnt As Integer) As Integer
```

@ Parameter

CardNumber : The card id of the card that want to perform this operation.

TrgMode : The setting for A/D trigger mode. The valid trigger modes are as follows:

- P9812_TRGMOD_SOFT : Software Trigger (no trigger)
- P9812_TRGMOD_POST : Post Trigger
- P9812_TRGMOD_PRE : Pre-Triger Mode
- P9812_TRGMOD_DELAY: Delay Trigger
- P9812_TRGMOD_MIDL : Middle Triger

TrgSrc : The setting for A/D Trigger Source. The valid trigger sources are as follows:

- P9812_TRGSRC_CH0 : Channel 0
- P9812_TRGSRC_CH1 : Channel 1
- P9812_TRGSRC_CH2 : Channel 2
- P9812_TRGSRC_CH3 : Channel 3
- P9812_TRGSRC_EXT_DIG : External Digital Trigger

TrgPol : The setting of Trigger polarity. The valid values are:

- P9812_TRGSLP_POS : Positive slope Trigger
- P9812_TRGSLP_NEG : Negative slope Trigger

ClkSel : The setting of A/D clock source. This argument is an integer expression formed from one or more of the manifest constants defined in DASK.H. There are two groups of constants:

(1) **A/D Clock Frequency**

P9812_AD2_GT_PCI : Freq. of A/D clock is higher than PCI clock freq.

P9812_AD2_LT_PCI : Freq. of A/D clock is lower than PCI clock freq.

(2) **The ADC clock source**

P9812_CLKSRC_INT : Internal clock

P9812_CLKSRC_EXT_SIN :External sin wave clock

P9812_CLKSRC_EXT_DIG :External square wave clock

When two constants are used to form the *ClkSel* argument, the constants are combined with the bitwise-OR operator(|).

Note: if the ADC clock source is P9812_CLKSRC_EXT_DIG or P9812_CLKSRC_EXT_SIN, the clock divider is a constant, *2*. Hence, the sampling rate is the half of the frequency of the source clock.

TrgLevel : The setting of Trigger level. The relationship between the value of *TrgLevel* and trigger voltage is listed in the following table:

TrgLevel	trigger	trigger
0xFF	0.992V	4.96V
0xFE	0.984V	4.92V
---	---	---
0x81	0.008V	0.04V
0x80	0.000V	0.00V
0x7F	-0.008V	-0.04V
---	---	---
0x01	-0.992V	-4.96V
0x00	-1.000V	-5.00V

PostCnt: The post count value setting for Middle Trigger mode or Delay Trigger mode. This argument is expressed as:

For Middle Trigger mode: the number of data accessed for each selected channel after a specific trigger event

For Delay Trigger mode: the counter value for deferring to access data after a specific trigger event

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport

2.2.10 AI_AsyncCheck

@ Description

Check the current status of the asynchronous analog input operation.

@ Cards Support

9111, 9112, 9113, 9114, 9116, 9118, 9812/10

@ Syntax

Microsoft C/C++ and Borland C++

I16 AI_AsyncCheck (U16 CardNumber, BOOLEAN *Stopped, U32 *AccessCnt)

Visual Basic

AI_AsyncCheck (ByVal CardNumber As Integer, Stopped As Byte, AccessCnt As Long) As Integer

@ Parameter

CardNumber : The card id of the card that performs the asynchronous operation.

Stopped : Whether the asynchronous analog input operation has completed. If *Stopped* = TRUE, the analog input operation has stopped. Either the number of A/D conversions indicated in the call that initiated the asynchronous analog input operation has completed or an error has occurred. If *Stopped* = FALSE, the operation is not yet complete. (constants TRUE and FALSE are defined in DASK.H)

AccessCnt : In the condition that the trigger acquisition mode is not used, *AccessCnt* returns the number of A/D data that has been transferred at the time calling **`AI_AsyncCheck().`**
If any trigger mode is enabled by calling **`AI_9111_Config(), AI_9812_Config(), or AI_9118_Config(),`** and double-buffered mode is enabled, *AccessCnt* returns the next position after the position the last A/D data is stored in the circular buffer at the time calling **`AI_AsyncCheck().`**

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered
ErrorFuncNotSupport

2.2.11 AI_AsyncClear

@ Description

Stop the asynchronous analog input operation.

@ Cards Support

9111, 9112, 9113, 9114, 9116, 9118, 9812/10

@ Syntax

Microsoft C/C++ and Borland C++

I16 AI_AsyncClear (U16 CardNumber, U32 *AccessCnt)

Visual Basic

AI_AsyncClear (ByVal CardNumber As Integer, AccessCnt As Long) As Integer

@ Parameter

CardNumber : The card id of the card that performs the asynchronous operation.

AccessCnt : In the condition that the trigger acquisition mode is not used,

AccessCnt returns the number of A/D data that has been transferred at the time calling **`AI_AsyncClear().`**
If double-buffered mode is enabled, *AccessCnt* returns the next position after the position the last A/D data is stored in the circular buffer. If the AccessCnt exeeeds the half size of circular buffer, call "AI_AsyncDblBufferTransfer " twice to get the data.

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport

2.2.12 AI_AsyncDblBufferHalfReady

@ Description

Checks whether the next half buffer of data in circular buffer is ready for transfer during an asynchronous double-buffered analog input operation.

@ Cards Support

9111, 9112, 9113, 9114, 9116, 9118, 9812/10

@ Syntax

Microsoft C/C++ and Borland C++

I16 AI_AsyncDblBufferHalfReady (U16 CardNumber, BOOLEAN *HalfReady, BOOLEAN *StopFlag)

Visual Basic

AI_AsyncDblBufferHalfReady(ByVal CardNumber As Integer, HalfReady As Byte, StopFlag As Byte) As Integer

@ Parameter

CardNumber : The card id of the card that performs the asynchronous double-buffered operation.

HalfReady : Whether the next half buffer of data is available. If *HalfReady* = TRUE, you can call **`AI_AsyncDblBufferTransfer()`** to copy the data to your user buffer. (constants TRUE and FALSE are defined in DASK.H)

StopFlag : Whether the asynchronous analog input operation has completed. If *StopFlag* = TRUE, the analog input operation has stopped. If *StopFlag* = FALSE, the operation is not yet complete. (constants TRUE and FALSE are defined in DASK.H)

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport

2.2.13 AI_AsyncDblBufferMode

@ Description

Enables or disables double-buffered data acquisition mode.

@ Cards Support

9111, 9112, 9113, 9114, 9116, 9118, 9812/10

@ Syntax

Microsoft C/C++ and Borland C++

I16 AI_AsyncDblBufferMode (U16 CardNumber, BOOLEAN Enable)

Visual Basic

AI_AsyncDblBufferMode (ByVal CardNumber As Integer, ByVal Enable As Byte) As Integer

@ Parameter

CardNumber : The card id of the card that double-buffered mode to be set.
Enable : Whether the double-buffered mode is enabled or not.
TRUE: double-buffered mode is enabled.
FALSE: double-buffered mode is disabled.
(constants TRUE and FALSE are defined in DASK.H)

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport

2.2.14 AI_AsyncDblBufferTransfer

@ Description

Depending on the continuous AI function selected, half of the data of the circular buffer will be logged into the user buffer (if continuous AI function is: *AI_ContReadChannel*, *AI_ContReadMultiChannels* and *AI_ContScanChannels*) or a disk file (if continuous AI function is: *AI_ContReadChannelToFile*, *AI_ContReadMultiChannelsToFile* and *AI_ContScanChannelsToFile*).
You can execute this function repeatedly to return sequential half buffers of the data.

@ Cards Support

9111, 9112, 9113, 9114, 9116, 9118, 9812/10

@ Syntax

Microsoft C/C++ and Borland C++

I16 AI_AsyncDblBufferTransfer (U16 CardNumber, U16 *Buffer)

Visual Basic

AI_AsyncDblBufferTransfer (ByVal CardNumber As Integer, Buffer As Integer) As Integer

@ Parameter

CardNumber : The card id of the card that performs the asynchronous double-buffered operation.
Buffer : The user buffer. An integer array to which the data is to be copied. If the data will be saved into a disk file, this argument is of no use.
Please refer to Appendix C, *AI Data Format* for the data format in *Buffer or the data file*.

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport, ErrorNotDoubleBufferMode, ErrorInvalidSampleRate

2.2.15 AI_ContReadChannel

@ Description

This function performs continuous A/D conversions on the specified analog input channel at a rate as close to the rate you specified.

@ Cards Support

9111, 9112, 9113, 9114, 9116, 9118, 9812/10

@ Syntax

Microsoft C/C++ and Borland C++

I16 AI_ContReadChannel (U16 CardNumber, U16 Channel, U16 AdRange, U16 *Buffer, U32 ReadCount, F32 SampleRate, U16 SyncMode)

Visual Basic

AI_ContReadChannel (ByVal CardNumber As Integer, ByVal Channel As Integer, ByVal AdRange As Integer, Buffer As Integer, ByVal ReadCount As Long, ByVal SampleRate As Single, ByVal SyncMode As Integer) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.

Channel : Analog input channel number
Range: 0 through 15 for PCI-9111
Range: 0 through 15 for PCI-9112/cPCI-9112
Range: 0 through 31 for PCI-9113
Range: 0 through 31 for PCI-9114
Range: 0 through 63 for cPCI-9116
Range: 0 through 15 for PCI-9118
Range: 0 for PCI-9812/10

AdRange : The analog input range the specified channel is setting. We define some constants to represent various A/D input ranges in DASK.H. Please refer to the Appendix B, ***AI Range Codes***, for the valid range values.

Buffer : An integer array to contain the acquired data. *Buffer* must has a length equal to or greater than the value of parameter *ReadCount*. If double-buffered mode is enabled, this buffer is of no use, you can ignore this argument. Please refer to Appendix C, *AI Data Format* for the data format in *Buffer*.

ReadCount : If double-buffered mode is disabled, *ReadCount* is the total number of A/D conversions (except cPCI9116) or the total number of scans (for cPCI9116) to be performed. For double-buffered acquisition, *ReadCount* is the size (in samples) of the circular buffer (except cPCI9116) or the size (in samples) allocated for each channel in the circular buffer (for cPCI9116) and its value must be a multiple of 4.

Note: if the card is PCI-9111, PCI-9113 or PCI-9114, this function uses FIFO-Half-Full interrupt transfer mode. So the value of *ReadCount* must be the multiple of 512 for non-double-buffer mode, or multiple of 1024 for double-buffer mode.

SampleRate : The sampling rate you want for analog input in hertz (samples per second). Your maximum rate depends on the card type and your computer system.
On cPCI9116, this parameter is ignored. Use **`AI_9116_CounterInterval()`** to set the scan rate.
If you set A/D trigger mode as external trigger by calling **`AI_9111_Config(), AI_9112_Config(), AI_9113_Config(),AI_9114_Config(), AI_9812_Config() or AI_9118_Config()`**, the sampling rate is determined by an external trigger source, you have to set this argument as CLKSRC_EXT_SampRate.

If you set A/D trigger mode as external trigger by calling **`AI_9812_Config(),`** the frequency divider is set as ***2*** by the driver. Hence, the sampling rate is:
Frequency of external clock source / 2

SyncMode : Whether this operation is performed synchronously or asynchronously. If any trigger mode is enabled by calling **`AI_9111_Config(), AI_9812_Config(), AI_9116_Config(), or AI_9118_Config()`**, this operation should be performed *asynchronously.*
Valid values:
SYNCH_OP: synchronous A/D conversion, that is, the function does not return until the A/D operation complete.
ASYNCH_OP: asynchronous A/D conversion

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport, ErrorInvalidIoChannel, ErrorInvalidAdRange, ErrorTransferCountTooLarge, ErrorContIoNotAllowed, ErrorInvalidSampleRate

2.2.16 AI_ContReadChannelToFile

@ Description

This function performs continuous A/D conversions on the specified analog input channel at a rate as close to the rate you specified and saves the acquired data in a disk file. The data is written to disk in binary format, with the lower byte first (little endian). Please refer to Appendix D, *Data File Format* for the data file structure and Appendix C, *AI Data Format* for the format of the data in the data file.

@ Cards Support

9111, 9112, 9113, 9114, 9116, 9118, 9812/10

@ Syntax

Microsoft C/C++ and Borland C++

```
I16 AI_ContReadChannelToFile (U16 CardNumber, U16 Channel, U16 AdRange,
        U8 *FileName, U32 ReadCount, F64 SampleRate, U16 SyncMode);
```

Visual Basic

```
AI_ContReadChannelToFile (ByVal CardNumber As Integer, ByVal Channel As
        Integer, ByVal AdRange As Integer, ByVal FileName As String, ByVal
        ReadCount As Long, ByVal SampleRate As Double, ByVal SyncMode As
        Integer) As Integer
```

@ Parameter

CardNumber : The card id of the card that want to perform this operation.
Channel : Analog input channel number
Range: 0 through 15 for PCI-9111
Range: 0 through 15 for PCI-9112/cPCI-9112
Range: 0 through 31 for PCI-9113
Range: 0 through 31 for PCI-9114
Range: 0 through 63 for cPCI-9116
Range: 0 through 15 for PCI-9118

Range: 0 for PCI-9812/10

AdRange : The analog input range the specified channel is setting. We define some constants to represent various A/D input ranges in DASK.H. Please refer to the Appendix B, ***AI Range Codes***, for the valid range values.

FileName : Name of data file which stores the acquired data

ReadCount : If double-buffered mode is disabled, *ReadCount* is the number of A/D conversions (except cPCI9116) or the total number of scans (for cPCI9116) to be performed. For double-buffered acquisition, *ReadCount* is the size (in samples) of the circular buffer (except cPCI9116) or the size (in samples) allocated for each channel in the circular buffer (for cPCI9116) and its value must be a multiple of 4.

Note: if the card is PCI-9111, PCI-9113 or PCI-9114, this function uses FIFO-Half-Full interrupt transfer mode. So the value of *ReadCount* must be the multiple of 512 for non-double-buffer mode, or multiple of 1024 for double-buffer mode.

SampleRate : The sampling rate you want for analog input in hertz (samples per second). Your maximum rate depends on the card type and your computer system.
On cPCI9116, this parameter is ignored. Use **`AI_9116_CounterInterval()`** to set the scan rate.
If you set A/D trigger mode as external trigger by calling **`AI_9111_Config(), AI_9112_Config(), AI_9113_Config(),AI_9114_Config(), AI_9812_Config() or AI_9118_Config()`**, the sampling rate is determined by an external trigger source, you have to set this argument as CLKSRC_EXT_SampRate.
If you set A/D trigger mode as external trigger by calling **`AI_9812_Config(),`** the frequency divider is set as ***2*** by the driver. Hence, the sampling rate is:
Frequency of external clock source / 2

SyncMode : Whether this operation is performed synchronously or asynchronously. If any trigger mode is enabled by calling **`AI_9111_Config(), AI_9116_Config(), AI_9812_Config(), or AI_9118_Config()`**, this operation should be performed *asynchronously*.
Valid values:
SYNCH_OP: synchronous A/D conversion, that is, the function does not return until the A/D operation complete.
ASYNCH_OP: asynchronous A/D conversion

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport, ErrorInvalidIoChannel, ErrorInvalidAdRange, ErrorTransferCountTooLarge, ErrorContIoNotAllowed, ErrorInvalidSampleRate, ErrorOpenFile

2.2.17 AI_ContReadMultiChannels

@ Description

This function performs continuous A/D conversions on the specified analog input channels at a rate as close to the rate you specified. This function takes advantage of the PCI-9118 and PCI-9116 auto-scan and channel-gain queue functionality to perform multi-channel analog input.

@ Cards Support

9116, 9118

@ Syntax

Microsoft C/C++ and Borland C++

I16 AI_ContReadMultiChannels (U16 CardNumber, U16 numChans, U16 *Chans, U16 *AdRanges, U16 *Buffer, U32 ReadCount, F32 SampleRate, U16 SyncMode)

Visual Basic

AI_ContReadMultiChannels (ByVal CardNumber As Integer, ByVal numChans As Integer, Chans As Integer, AdRanges As Integer, Buffer As Integer, ByVal ReadCount As Long, ByVal SampleRate As Single, ByVal SyncMode As Integer) As Integer

@ Parameter

CardNumber : The card ID of the card that want to perform this operation.

numChans : The number of analog input channels in the array *Chans*. The valid value:
cPCI-9116: 1 through 511
PCI-9118: 1 through 255

Chans : Array of analog input channel numbers. The channel order for acquiring data is the same as the order you set in Chans.
cPCI-9116: numbers in *Chans* must be within 0 and 63. Since there is no restriction of channel order setting, you can set the channel order as you wish.
PCI-9118: numbers in *Chans* must be within 0 and 15. Since there is no restriction of channel order setting, you can set the channel order as you wish.

AdRanges : An integer array of length *numChans* that contains the analog input range for every channel in array *Chans*.
PCI-9118/cPCI9116:
Please refer to the Appendix B for the valid range values. Since PCI-9118/cPCI-9116 supports different ranges, the range values in *AdRanges* can be any of the valid range values of PCI-9118/cPCI-9116.

Buffer : An integer array to contain the acquired data. The length of *Buffer* must be equal to or greater than the value of parameter *ReadCount*. The acquired data is stored in interleaved sequence. For example, if the value of *numChans* is 3, and the numbers in *Chans* are 3, 8, and 0. Then this function input data from channel 3, then channel 8, then channel 0, then channel 3, then channel 8, ... The data acquired is put to *Buffer* by order. So the data read from channel 3 is stored in *Buffer*[0], *Buffer*[3], *Buffer*[6], ... The data from channel 8 is stored in *Buffer*[1], *Buffer*[4], *Buffer*[7], ... The data from channel 0 is stored in

Buffer[2], *Buffer*[5], *Buffer*[8], ... If double-buffered mode is enabled, this buffer is of no use, you can ignore this argument. Please refer to Appendix C, *AI Data Format* for the data format in *Buffer*.

ReadCount : If double-buffered mode is disabled, *ReadCount* is the number of A/D conversions (for PCI9118) or the total number of scans (for cPCI9116) to be performed. For double-buffered acquisition, *ReadCount* is the size (in samples) of the circular buffer (for PCI9118) or the size (in samples) allocated for each channel in the circular buffer (for cPCI9116) and its value must be a multiple of 4.

SampleRate : The sampling rate you want for analog input in hertz (samples per second). The maximum rate depends on the card type and your computer system.

On cPCI9116, this parameter is ignored. Use **`AI_9116_CounterInterval()`** to set the scan rate.

If you set A/D trigger source as external trigger by calling **`AI_9118_Config()`**, the sampling rate is determined by an external trigger source, you have to set this argument as CLKSRC_EXT_SampRate.

SyncMode : Whether this operation is performed synchronously or asynchronously. If any trigger mode is enabled by calling **`AI_9118_Config()`** or **`AI_9116_Config()`**,this operation should be performed **asynchronously**.

Valid values:

SYNCH_OP: synchronous A/D conversion, that is, the function does not return until the A/D operation complete.

ASYNCH_OP: asynchronous A/D conversion

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport, ErrorInvalidIoChannel, ErrorInvalidSampleRate, ErrorInvalidAdRange, ErrorTransferCountTooLarge, ErrorContIoNotAllowed

2.2.18 AI_ContReadMultiChannelsToFile

@ Description

This function performs continuous A/D conversions on the specified analog input channels at a rate as close to the rate you specified and saves the acquired data in a disk file. The data is written to disk in binary format, with the lower byte first (little endian). Please refer to Appendix D, *Data File Format* for the data file structure and Appendix C, *AI Data Format* for the format of the data in the data file. This function takes advantage of the PCI-9118 auto-scan and channel-gain queue functionality to perform multi-channel analog input.

@ Cards Support

9116, 9118

@ Syntax

Microsoft C/C++ and Borland C++

```
I16 AI_ContReadMultiChannelsToFile (U16 CardNumber, U16 NumChans, U16
        *Chans, U16 *AdRanges, U8 *FileName, U32 ReadCount, F64
        SampleRate, U16 SyncMode)
```

Visual Basic

AI_ContReadMultiChannelsToFile (ByVal CardNumber As Integer, ByVal numChans As Integer, Chans As Integer, AdRanges As Integer, ByVal FileName As String, ByVal ReadCount As Long, ByVal SampleRate As Double, ByVal SyncMode As Integer) As Integer

@ Parameter

CardNumber : The card ID of the card that want to perform this operation.

numChans : The number of analog input channels in the array *Chans*. The valid value:
cPCI-9116: 1 through 511
PCI-9118: 1 through 255

Chans : Array of analog input channel numbers. The channel order for acquiring data is the same as the order you set in Chans.
cPCI-9116: numbers in *Chans* must be within 0 and 63. Since there is no restriction of channel order setting, you can set the channel order as you wish.
PCI-9118: numbers in *Chans* must be within 0 and 15. Since there is no restriction of channel order setting, you can set the channel order as you wish.

AdRanges : An integer array of length *numChans* that contains the analog input range for every channel in array *Chans*.
CPCI-9116/PCI-9118:
Please refer to the Appendix B for the valid range values. Since PCI-9118 supports different ranges, the range values in *AdRanges* can be any of the valid range values of PCI-9118/cPCI-9116.

FileName : Name of data file which stores the acquired data

ReadCount : If double-buffered mode is disabled, *ReadCount* is the number of A/D conversions (for PCI9118) or the total number of scans (for cPCI9116) to be performed. For double-buffered acquisition, *ReadCount* is the size (in samples) of the circular buffer (for PCI9118) or the size (in samples) allocated for each channel in the circular buffer (for cPCI9116) and its value must be a multiple of 4.

SampleRate : The sampling rate you want for analog input in hertz (samples per second). The maximum rate depends on the card type and your computer system.
On cPCI9116, this parameter is ignored. Use **`AI_9116_CounterInterval()`** to set the scan rate.
If you set A/D trigger source as external trigger by calling **`AI_9118_Config()`**, the sampling rate is determined by an external trigger source, you have to set this argument as CLKSRC_EXT_SampRate.

SyncMode : Whether this operation is performed synchronously or asynchronously. If any trigger mode is enabled by calling **`AI_9118_Config()`**,this operation should be performed **asynchronously**.
Valid values:
SYNCH_OP: synchronous A/D conversion, that is, the function does not return until the A/D operation complete.
ASYNCH_OP: asynchronous A/D conversion

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport, ErrorInvalidIoChannel, ErrorInvalidSampleRate, ErrorInvalidAdRange, ErrorTransferCountTooLarge, ErrorContIoNotAllowed, ErrorOpenFile

2.2.19 AI_ContScanChannels

@ Description

This function performs continuous A/D conversions on the specified continuous analog input channels at a rate as close to the rate you specified. This function takes advantage of the hardware auto-scan functionality to perform multi-channel analog input.

@ Cards Support

9111, 9112, 9113, 9114, 9116, 9118, 9812/10

@ Syntax

Microsoft C/C++ and Borland C++

I16 AI_ContScanChannels (U16 CardNumber, U16 Channel, U16 AdRange, U16 *Buffer, U32 ReadCount, F64 SampleRate, U16 SyncMode)

Visual Basic

AI_ContScanChannels (ByVal CardNumber As Integer, ByVal Channel As Integer, ByVal AdRange As Integer, Buffer As Integer, ByVal ReadCount As Long, ByVal SampleRate As Double, ByVal SyncMode As Integer) As Integer

@ Parameter

CardNumber : The card ID of the card that want to perform this operation.

Channel : The largest channel number of specified continuous analog input channel. The channel order for acquiring data is as follows:

PCI-9111: number of *Channel* must be within 0 and 15. The continuous scan sequence is ascending and the first one must be zero. For example, 0, 1, 2, 3.

PCI-9112/cPCI-9112: number of *Channel* must be within 0 and 15. The continuous scan sequence is descending, and the first one must be zero. For example, 3, 2, 1, 0.

PCI-9113: number of *Channel* must be within 0 and 31. The continuous scan sequence is ascending and the first one must be zero. For example, 0, 1, 2, 3.

PCI-9114: number of *Channel* must be within 0 and 31. The continuous scan sequence is ascending and the first one must be zero. For example, 0, 1, 2, 3.

cPCI-9116: number of *Channel* must be within 0 and 63. The continuous scan sequence is ascending and the first one must be zero. For example, 0, 1, 2, 3.

PCI-9118: number of *Channel* must be within 0 and 15. The continuous scan sequence is ascending and the first one must be zero. For example, 0, 1, 2, 3.

PCI-9812/10: number of *Channel* must be 0, 1 or 3. The continuous scan sequence is ascending and the first one must be zero. For example, 0, 1, 2, 3.

AdRange : The analog input range the continuous specified channel is setting. Please refer to the Appendix B for the valid range values.

Buffer : An integer array to contain the acquired data. The length of *Buffer* must be equal to or greater than the value of parameter *ReadCount*. The acquired data is stored in interleaved sequence. For example, if the value of *Channel* is 3, and the scanned channel numbers is descending (e.g. PCI-9112/cPCI-9112), then this function input data from channel 2, then channel 1, then channel 0, then channel 2, then channel 1, ... The data acquired is put to *Buffer* by order. So the data read from channel 2 is stored in *Buffer*[0], *Buffer*[3], *Buffer*[6], ... The data from channel 1 is stored in *Buffer*[1], *Buffer*[4], *Buffer*[7], ... The data from channel 0 is stored in *Buffer*[2], *Buffer*[5], *Buffer*[8], ... If double-buffered mode is enabled, this buffer is of no use, you can ignore this argument. Please refer to Appendix C, *AI Data Format* for the data format in *Buffer*.

ReadCount : If double-buffered mode is disabled, *ReadCount* is the number of A/D conversions (except cPCI9116) or the total number of scans (for cPCI9116) to be performed. For double-buffered acquisition, *ReadCount* is the size (in samples) of the circular buffer (except cPCI9116) or the size (in samples) allocated for each channel in the circular buffer (for cPCI9116) and its value must be a multiple of 4.

Note: if the card is PCI-9111, PCI-9113 or PCI-9114, this function uses FIFO-Half-Full interrupt transfer mode. So the value of *ReadCount* must be the multiple of 512 for non-double-buffer mode, or multiple of 1024 for double-buffer mode.

SampleRate : The sampling rate you want for analog input in hertz (samples per second). The maximum rate depends on the card type and your computer system.

On cPCI9116, this parameter is ignored. Use **`AI_9116_CounterInterval()`** to set the scan rate.

If you set A/D trigger mode as external trigger by calling **`AI_9111_Config(), AI_9112_Config(), AI_9113_Config(),AI_9114_Config(), AI_9812_Config() or AI_9118_Config()`**, the sampling rate is determined by an external trigger source, you have to set this argument as CLKSRC_EXT_SampRate.

If you set A/D trigger mode as external trigger by calling **`AI_9812_Config(),`** the frequency divider is set as ***2*** by the driver. Hence, the sampling rate is:

Frequency of external clock source / 2

SyncMode : Whether this operation is performed synchronously or asynchronously. If any trigger mode is enabled by calling **`AI_9111_Config(), AI_9116_Config(), AI_9812_Config() or AI_9118_Config()`**, this operation should be performed **asynchronously**.

Valid values:

SYNCH_OP: synchronous A/D conversion, that is, the function does not return until the A/D operation complete.

ASYNCH_OP: asynchronous A/D conversion

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport, ErrorInvalidIoChannel, ErrorInvalidSampleRate, ErrorInvalidAdRange, ErrorTransferCountTooLarge, ErrorContIoNotAllowed, ErrorLastChannelNotZero, ErrorDiffRangeNotSupport, ErrorChannelNotDescending, ErrorChannelNotAscending

2.2.20 AI_ContScanChannelsToFile

@ Description

This function performs continuous A/D conversions on the specified continuous analog input channels at a rate as close to the rate you specified and saves the acquired data in a disk file. The data is written to disk in binary format, with the lower byte first (little endian). Please refer to Appendix D, *Data File Format* for the data file structure and Appendix C, *AI Data Format* for the format of the data in the data file. This function takes advantage of the hardware auto-scan functionality to perform multi-channel analog input.

@ Cards Support

9111, 9112, 9113, 9114, 9116, 9118, 9812/10

@ Syntax

Microsoft C/C++ and Borland C++

I16 AI_ContScanChannelsToFile (U16 CardNumber, U16 Channel, U16 AdRange, U8 *FileName, U32 ReadCount, F64 SampleRate, U16 SyncMode)

Visual Basic

AI_ContScanChannelsToFile (ByVal CardNumber As Integer, ByVal Channel As Integer, ByVal AdRange As Integer, ByVal FileName As String, ByVal ReadCount As Long, ByVal SampleRate As Double, ByVal SyncMode As Integer) As Integer

@ Parameter

CardNumber : The card ID of the card that want to perform this operation.

Channel : The largest channel number of specified continuous analog input channel. The channel order for acquiring data is as follows:

PCI-9111: number of *Channel* must be within 0 and 15. The continuous scan sequence is ascending and the first one must be zero. For example, 0, 1, 2, 3.

PCI-9112/cPCI-9112: number of *Channel* must be within 0 and 15. The continuous scan sequence is descending, and the first one must be zero. For example, 3, 2, 1, 0.

PCI-9113: number of *Channel* must be within 0 and 31. The continuous scan sequence is ascending and the first one must be zero. For example, 0, 1, 2, 3.

PCI-9114: number of *Channel* must be within 0 and 31. The continuous scan sequence is ascending and the first one must be zero. For example, 0, 1, 2, 3.

cPCI-9116: number of *Channel* must be within 0 and 63. The continuous scan sequence is ascending and the first one must be zero. For example, 0, 1, 2, 3.
PCI-9118: number of *Channel* must be within 0 and 15. The continuous scan sequence is ascending and the first one must be zero. For example, 0, 1, 2, 3.
PCI-9812/10: number of *Channel* must be 0, 1 or 3. The continuous scan sequence is ascending and the first one must be zero. For example, 0, 1, 2, 3.

AdRange : The analog input range the continuous specified channel is setting. Please refer to the Appendix B for the valid range values.

FileName : Name of data file which stores the acquired data

ReadCount : If double-buffered mode is disabled, *ReadCount* is the number of A/D conversions (except cPCI9116) or the total number of scans (for cPCI9116) to be performed. For double-buffered acquisition, *ReadCount* is the size (in samples) of the circular buffer (except cPCI9116) or the size (in samples) allocated for each channel in the circular buffer (for cPCI9116) and its value must be a multiple of 4.

Note: if the card is PCI-9111, PCI-9113 or PCI-9114, this function uses FIFO-Half-Full interrupt transfer mode. So the value of *ReadCount* must be the multiple of 512 for non-double-buffer mode, or multiple of 1024 for double-buffer mode.

SampleRate : The sampling rate you want for analog input in hertz (samples per second). The maximum rate depends on the card type and your computer system.
On cPCI9116, this parameter is ignored. Use **`AI_9116_CounterInterval()`** to set the scan rate.
If you set A/D trigger mode as external trigger by calling **`AI_9111_Config(), AI_9112_Config(), AI_9113_Config(),AI_9114_Config(), AI_9812_Config() or AI_9118_Config()`**, the sampling rate is determined by an external trigger source, you have to set this argument as CLKSRC_EXT_SampRate.
If you set A/D trigger mode as external trigger by calling **`AI_9812_Config(),`** the frequency divider is set as ***2*** by the driver. Hence, the sampling rate is:
Frequency of external clock source / 2

SyncMode : Whether this operation is performed synchronously or asynchronously. If any trigger mode is enabled by calling **`AI_9111_Config(), AI_9116_Config(), AI_9812_Config() or AI_9118_Config()`**, this operation should be performed **asynchronously**.
Valid values:
SYNCH_OP: synchronous A/D conversion, that is, the function does not return until the A/D operation complete.
ASYNCH_OP: asynchronous A/D conversion

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport, ErrorInvalidIoChannel, ErrorInvalidSampleRate, ErrorInvalidAdRange, ErrorTransferCountTooLarge, ErrorContIoNotAllowed, ErrorLastChannelNotZero, ErrorDiffRangeNotSupport, ErrorChannelNotDescending, ErrorChannelNotAscending

2.2.21 AI_ContStatus

@ Description

While performing continuous A/D conversions, this function is called to get the A/D status. Please refer to the manual for your device for the AI status the device might meet.

@ Cards Support

9111, 9112, 9113, 9114, 9116, 9118, 9812/10

@ Syntax

Microsoft C/C++ and Borland C++

```
I16 AI_ContStatus (U16 CardNumber, U16 *Status)
```

Visual Basic

```
AI_ContStatus (ByVal CardNumber As Integer, Status Integer) As Integer
```

@ Parameter

CardNumber : The card id of the card that want to perform this operation.

Status : The continuous AI status returned. The description of the parameter *Status* for various card types is the following:

PCI9111/PCI9113/PCI9114 :

bit 0 : '0' indicates FIFO is empty
bit 1 : '0' indicates FIFO is Half Full
bit 2 : '0' indicates FIFO is Full, the data might have been lost
bit 3 : '0' indicates AD is busy, the A/D data hasn't been latched into FIFO yet
bit 4 ~ 15 : not used

PCI9112:

bit 0 : '1' indicates A/D conversion is Completed (Ready)
bit 1 : '1' indicates A/D conversion is Over-Run
bit 2 ~ 15 : not used

cPCI9116:

bit 0 : '1' indicates A/D conversion is Over Speed
bit 1 : '1' indicates A/D conversion is Over-Run
bit 2 : '1' indicates Scan Counter Counts to zero
bit 3 : '1' indicates External Digital Trigger ever happened
bit 4 : '1' indicates A/D FIFO is empty
bit 5 : '1' indicates A/D FIFO is Half Full
bit 6 : '0' indicates A/D FIFO is Full
bit 7 ~ 15 : not used

PCI9118:

bit 0 : '1' indicates A/D conversion is Completed (Ready)
bit 1 : '1' indicates A/D conversion is Over-Run

bit 2 : '1' indicates A/D conversion is Over-Speed
bit 3 : '1' indicates Burst Mode of A/D conversion is Over-Run
bit 4 : '1' indicates External Digital Trigger ever happened
bit 5 : '1' indicates About Trigger of A/D conversion is Completed
bit 6 : '1' indicates A/D FIFO is empty
bit 7 : '1' indicates FIFO is Half Full
bit 8 : '1' indicates FIFO is Full
bit 9 ~ 15 : not used

PCI9812:

bit 0 : '1' indicates FIFO is ready for Input (Not Full)
bit 1 : '1' indicates FIFO is at least Half-Full
bit 2 : '1' indicates FIFO is ready for Output (Not Empty)
bit 3 : '3' indicates the post trigger counter reaches zero
bit 4 ~ 15 : not used

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered

2.2.22 AI_ContVScale

@ Description

This function converts the values of an array of acquired binary data from an continuous A/D conversion call to the actual input voltages. The acquires binary data in the reading array might include the channel information (please refer to continuous functions, AI_ContReadChannel or AI_ContScanChannels, for the detailed data format); however, The calculated voltage values in the voltage array returned will not include the channel message.

@ Cards Support

9111, 9112, 9113, 9114, 9116, 9118, 9812/10

@ Syntax

Microsoft C/C++ and Borland C++

```
I16 AI_ContVScale (U16 CardNumber, U16 AdRange, U16 *readingArray, F64
        *voltageArray, I32 count)
```

Visual Basic

```
AI_ContVScale (ByVal CardNumber As Integer, ByVal AdRange As Integer,
        readingArray As Integer, voltageArray As Double, ByVal count As Long) As
        Integer
```

@ Parameter

CardNumber : The card id of the card that want to perform this operation.
AdRange : The analog input range the continuous specified channel is setting. Please refer to the Appendix B for the valid range values.
readingArray : Acquired continuous analog input data array
voltageArray : computed voltages array returned

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport, ErrorInvalidAdRange

2.2.23 AI_InitialMemoryAllocated

@ Description

This function returns the available memory size for analog input in the device driver in argument *MemSize*. The continuous analog input transfer size can not exceed this size.

@ Cards Support

9111, 9112, 9113, 9114, 9116, 9118, 9812/10

@ Syntax

Microsoft C/C++ and Borland C++

I16 AI_InitialMemoryAllocated (U16 CardNumber, U32 *MemSize)

Visual Basic

AI_InitialMemoryAllocated (ByVal CardNumber As Integer, MemSize As Long) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.
MemSize : The available memory size for continuous AI in device driver of this card. The unit is KB (1024 bytes).

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered

2.2.24 AI_ReadChannel

@ Description

This function performs a software triggered A/D conversion (analog input) on an analog input channel and returns the value converted.

@ Cards Support

9111, 9112, 9113, 9114, 9116, 9118

@ Syntax

Microsoft C/C++ and Borland C++

I16 AI_ReadChannel (U16 CardNumber, U16 Channel, U16 AdRange, U16 *Value)

Visual Basic

AI_ReadChannel (ByVal CardNumber As Integer, ByVal Channel As Integer, ByVal AdRange As Integer, Value As Integer) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.
Channel : Analog input channel number.
Range: 0 through 15 for PCI-9112/cPCI-9112, PCI-9111, PCI-9118
Range: 0 through 31 for PCI-9113, PCI-9114
Range: 0 through 63 for cPCI-9116
AdRange : The analog input range the specified channel is setting. Please refer to the Appendix B for the valid range values.

Value : The A/D converted value. The data format in *value* is described as below:

PCI-9113

16-bit unsigned data:

B15 …B12 D11 D10 …. D1 D0

where D11, D10, ... , D0 : A/D converted data

B15 ~ B12: don't care

PCI-9114

16-bit signed data:

D15 D14 ……. D1 D0

where D15, D14, ... , D0 : A/D converted data

For PCI-9111, PCI-9112/cPCI-9112, cPCI-9116, and PCI-9118, please refer to the description of *Buffer* argument of **`AI_ContReadChannel()`** for the correct data format.

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport, ErrorInvalidIoChannel, ErrorInvalidAdRange

2.2.25 AI_VReadChannel

@ Description

This function performs a software triggered A/D conversion (analog input) on an analog input channel and returns the value scaled to a voltage in units of volts.

@ Cards Support

9111, 9112, 9113, 9114, 9116, 9118

@ Syntax

Microsoft C/C++ and Borland C++

I16 AI_VReadChannel (U16 CardNumber, U16 Channel, U16 AdRange, F64 *voltage)

Visual Basic

AI_ReadChannel (ByVal CardNumber As Integer, ByVal Channel As Integer, ByVal AdRange As Integer, voltage As Double) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.

Channel : Analog input channel number.
Range: 0 through 15 for PCI-9112/cPCI-9112, PCI-9111, PCI-9118
Range: 0 through 31 for PCI-9113, PCI-9114
Range: 0 through 63 for cPCI-9116

AdRange : The analog input range the specified channel is setting. Please refer to the Appendix B for the valid range values.

voltage : The measured voltage value returned and scaled to units of voltage.

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport, ErrorInvalidIoChannel, ErrorInvalidAdRange

2.2.26 AI_VoltScale

@ Description

This function converts the result from an AI_ReadChannel call to the actual input voltage.

@ Cards Support

9111, 9112, 9113, 9114, 9116, 9118

@ Syntax

Microsoft C/C++ and Borland C++

I16 AI_VoltScale (U16 CardNumber, U16 AdRange, I16 reading, F64 *voltage)

Visual Basic

AI_VoltScale (ByVal CardNumber As Integer, ByVal AdRange As Integer, ByVal reading As Integer, voltage As Double) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.
AdRange : The analog input range the specified channel is setting. Please refer to the Appendix B for the valid range values.
reading : The result of the AD Conversion.
voltage : Computed voltage value.

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport, ErrorInvalidAdRange

2.2.27 AO_6208A_Config

@ Description

Sets the *Voltage to Current* Mode of PCI-6208A.

@ Cards Support

6208A

@ Syntax

Microsoft C/C++ and Borland C++

I16 AO_6208A_Config (U16 CardNumber, U16 V2AMode)

Visual Basic

AO_6208A_Config (ByVal CardNumber As Integer, ByVal V2AMode As Integer) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.
V2AMode : The voltage to current mode. The valid V2Amode are:
P6208_CURRENT_0_20MA
P6208_CURRENT_5_25MA
P6208_CURRENT_4_20MA

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport, ErrorInvalidIoChannel

2.2.28 AO_6308A_Config

@ Description

Sets the *Voltage to Current* Mode of PCI-6308A.

@ Cards Support

6308A

@ Syntax

Microsoft C/C++ and Borland C++

I16 AO_6308A_Config (U16 CardNumber, U16 V2AMode)

Visual Basic

AO_6308A_Config (ByVal CardNumber As Integer, ByVal V2AMode As Integer) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.
V2AMode : The voltage to current mode. The valid V2Amode are:
P6308_CURRENT_0_20MA
P6308_CURRENT_5_25MA
P6308_CURRENT_4_20MA

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport, ErrorInvalidIoChannel

2.2.29 AO_6308V_Config

@ Description

Informs PCIS-DASK library of the polarity (unipolar or bipolar) that the output channel is configured for the analog output and the reference voltage value selected for an analog output channel of PCI-6308V. You can configure each channel to use an internal reference of 10V or an external reference (0V ~ +10V) by setting related jumpers. You must call this function before calling function to perform voltage output operation.

@ Cards Support

6308V

@ Syntax

Microsoft C/C++ and Borland C++

I16 AO_6308V_Config (U16 wCardNumber, U16 Channel, U16 wOutputPolarity, F64 refVoltage)

Visual Basic

AO_6308V_Config (ByVal CardNumber As Integer, ByVal Channel As Integer, ByVal OutputPolarity As Integer, ByVal refVoltage As Double) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.

Channel : The AO channel number configured. The valid values are:
P6308V_AO_CH0_3
P6308V_AO_CH4_7

OutputPolarity : The polarity (unipolar or bipolar) of the output channel. The valid values are:
P6308V_AO_UNIPOLAR
P6308V_AO_BIPOLAR

refVoltage : Voltage reference value.
If the D/A reference voltage source your device use is internal reference, the valid values for *refVoltage* is 10.
If the D/A reference voltage source your device use is external reference, the valid range for *refVoltage* is 0 to +10.

Note : If the 10V D/A reference voltage is selected, the D/A output range is 0V~10V.

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport, ErrorInvalidDaRefVoltage

2.2.30 AO_9111_Config

@ Description

Informs PCIS-DASK library of the polarity (unipolar or bipolar) that the output channel is configured for the analog output of PCI9111. You must call this function before calling function to perform voltage output operation.

@ Cards Support

9111

@ Syntax

Microsoft C/C++ and Borland C++

I16 AO_9111_Config (U16 CardNumber, U16 OutputPolarity)

Visual Basic

AO_9111_Config (ByVal CardNumber As Integer, ByVal OutputPolarity As Integer) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.

OutputPolarity : The polarity (unipolar or bipolar) of the output channel. The valid values are:
P9111_AO_UNIPOLAR
P9111_AO_BIPOLAR

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport

2.2.31 AO_9112_Config

@ Description

Informs PCIS-DASK library of the reference voltage value selected for an analog output channel of PCI9112. You can configure each channel to use an internal reference of –5V (default) or –10V or an external reference (-10V ~ +10V) by setting related jumpers. You must call this function before calling function to perform voltage output operation.

@ Cards Support

9112

@ Syntax

Microsoft C/C++ and Borland C++

I16 AO_9112_Config (U16 CardNumber, U16 Channel, F64 refVoltage)

Visual Basic

AO_9112_Config (ByVal CardNumber As Integer, ByVal Channel As Integer, ByVal refVoltage As Double) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.
Channel : The AO channel number configured.
refVoltage : Voltage reference value.
If the D/A reference voltage source your device use is internal reference, the valid values for *refVoltage* is –5 and –10.
If the D/A reference voltage source your device use is external reference, the valid range for *refVoltage* is –10 to +10.

Note : If the -10V D/A reference voltage is selected, the D/A output range is 0V~10V. On the other hand, if the +10V is selected, the D/A output range is -10V~0V.

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport, ErrorInvalidDaRefVoltage

2.2.32 AO_SimuVWriteChannel

@ Description

Writes voltage values, scales them to the proper binary values and writes binary values to the specified analog output channels simultaneously.

@ Cards Support

6308V/08A

@ Syntax

Microsoft C/C++ and Borland C++

I16 AO_SimuVWriteChannel (U16 wCardNumber, U16 wGroup, F64 *VBuffer)

Visual Basic

AO_SimuVWriteChannel (ByVal CardNumber As Integer, ByVal wGroup As Integer, voltageArray As Double) As Intege

@ Parameter

CardNumber : The card id of the card that want to perform this operation.

Group : The group number of the analog output channels. The valid value:

P6308V_AO_CH0_3
P6308V_AO_CH4_7

VBuffer : An voltage array to contain the update data. The length (in samples) of *VBuffer* must be equal to or greater the number of channels in the specified group. The range of voltages depends on the type of device, on the output polarity, and on the voltage reference (external or internal)

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport, ErrorInvalidIoChannel

2.2.33 AO_SimuWriteChannel

@ Description

Writes binary values to the specified analog output channels simultaneously.

@ Cards Support

6308V/08A

@ Syntax

Microsoft C/C++ and Borland C++

I16 AO_SimuWriteChannel (U16 wCardNumber, U16 wGroup, I16 *Buffer)

Visual Basic

AO_SimuWriteChannel (ByVal CardNumber As Integer, ByVal wGroup As Integer, valueArray As Integer) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.

Group : The group number of the analog output channels. The valid value:

P6308V_AO_CH0_3
P6308V_AO_CH4_7

Value : An integer array to contain the update data. The length (in samples) of *Buffer* must be equal to or greater the number of channels in the specified group. The range of value to be written to the analog output channels:

Range: 0 through 4095 for PCI-6308

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport, ErrorInvalidIoChannel

2.2.34 AO_VoltScale

@ Description

Scales a voltage (or a current value) to a binary value.

@ Cards Support

9111, 9112, 9118, 6208V/16V/08A, 6308V/08A

@ Syntax

Microsoft C/C++ and Borland C++

I16 AO_VoltScale (U16 CardNumber, U16 Channel, F64 Voltage, I16 *binValue)

Visual Basic

AO_VoltScale (ByVal CardNumber As Integer, ByVal Channel As Integer, ByVal Voltage As Double, binValue As Integer) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.
Channel : The analog output channel number.
Range: 0 or 1 for PCI-9112/cPCI-9112
Range: 0 for PCI-9111
Range: 0 or 1 for PCI-9118
Range: 0 through 7 for PCI-6208V/08A and PCI-6308V/08A
Range: 0 through 15 for PCI-6216V
Voltage : Voltage, in volts, to be converted to a binary value
binValue : the converted binary value returned

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport, ErrorInvalidIoChannel. ErrorDaVoltageOutOfRange

2.2.35 AO_VWriteChannel

@ Description

Accepts a voltage value (or a current value), scales it to the proper binary value and writes a binary value to the specified analog output channel.

@ Cards Support

9111, 9112, 9118, 6208V/16V/08A, 6308V/08A

@ Syntax

Microsoft C/C++ and Borland C++

I16 AO_VWriteChannel (U16 CardNumber, U16 Channel, F64 Voltage)

Visual Basic

AO_VWriteChannel (ByVal CardNumber As Integer, ByVal Channel As Integer, ByVal Voltage As Double) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.
Channel : The analog output channel number.
Range: 0 or 1 for PCI-9112/cPCI-9112
Range: 0 for PCI-9111
Range: 0 or 1 for PCI-9118
Range: 0 through 7 for PCI-6208V/08A and PCI-6308V/08A
Range: 0 through 15 for PCI-6216V
Voltage : The value to be scaled and written to the analog output channel. The range of voltages depends on the type of device, on the output polarity, and on the voltage reference (external or internal).

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport, ErrorInvalidIoChannel, ErrorDaVoltageOutOfRange

2.2.36 AO_WriteChannel

@ Description

Writes a binary value to the specified analog output channel.

@ Cards Support

9111, 9112, 9118, 6208V/16V/08A, 6308V/08A

@ Syntax

Microsoft C/C++ and Borland C++

I16 AO_WriteChannel (U16 CardNumber, U16 Channel, U16 Value)

Visual Basic

AO_WriteChannel (ByVal CardNumber As Integer, ByVal Channel As Integer, ByVal Value As Integer) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.
Channel : The analog output channel number.
Range: 0 or 1 for PCI-9112/cPCI-9112
Range: 0 for PCI-9111
Range: 0 or 1 for PCI-9118
Range: 0 through 7 for PCI-6208V/08A and PCI-6308V/08A
Range: 0 through 15 for PCI-6216V
Value : The value to be written to the analog output channel.
Range: 0 through 4095 for PCI-9111, PCI-9112/cPCI-9112, PCI-9118
0 though 32767 for PCI-6208A and PCI-6308A
-32768 through 32767 for PCI-6208V/16V and PCI-6308V

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport, ErrorInvalidIoChannel

2.2.37 CTR_8554_CK1_Config

@ Description

Selects the source of CK1.

@ Cards Support

8554

@ Syntax

Microsoft C/C++ and Borland C++

I16 CTR_8554_CK1_Config (U16 CardNumber, U16 ClockSource)

Visual Basic

CTR_8554_CK1_Config (ByVal CardNumber As Integer, ByVal ClockSource As Integer) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.
ClockSource : The source of CK1. CK1_C8M or CK1_COUT11.

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport, InvalidCtrSource

2.2.38 CTR_8554_ClkSrc_Config

@ Description

Selects PCI-8554 counter #1 ~ #10 clock source. (Clock source of counter #11 is 8MHz and clock source of counter #12 is from COUT11**,** both are fixed.)

@ Cards Support

8554

@ Syntax

Microsoft C/C++ and Borland C++

I16 CTR_8554_ClkSrc_Config (U16 CardNumber, U16 Ctr, U16 ClockSource)

Visual Basic

CTR_8554_ClkSrc_Config (ByVal CardNumber As Integer, ByVal Ctr As Integer, ByVal ClockSource As Integer) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.
Ctr : The counter number.
Range: 1~10
ClockSource : The clock source of the specified counter.
ECKN: external clock source
COUTN_1: the cascaded counter output (COUT n-1)
CK1: internal clock source CK1
COUT10: output of the counter 10

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport, InvalidCounter

2.2.39 CTR_8554_Debounce_Config

@ Description

Selects debounce clock.

@ Cards Support

8554

@ Syntax

Microsoft C/C++ and Borland C++

I16 CTR_8554_Debounce_Config (U16 CardNumber, U16 DebounceClock)

Visual Basic

CTR_8554_CK1_Config (ByVal CardNumber As Integer, ByVal DebounceClock As Integer) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.
DebounceClock : DBCLK_COUT11: output of counter 11 DBCLK_2MHZ: 2MHz

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport, InvalidCtrSource

2.2.40 CTR_Clear

@ Description

Turns off the specified counter operation and sets the output of the selected counter to the specified state.

@ Cards Support

9111, 9112, 9113, 9114, 9118, 7248, 7249, 7296, 7396, 8554

@ Syntax

Microsoft C/C++ and Borland C++

I16 CTR_Clear (U16 CardNumber, U16 Ctr, U16 State)

Visual Basic

CTR_Clear (ByVal CardNumber As Integer, ByVal Ctr As Integer, ByVal State As Integer) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.

Ctr : The counter number.
Range: 0 for PCI-9111, PCI-9112/cPCI-9112, PCI-9113, PCI-9114, PCI-9118.
0, 1, 2 for PCI-7248/cPCI-7248, cPCI-7249R, PCI-7296, PCI-7396.
1~12 for PCI-8554

state : The logic state to which the counter is to be reset.
Range: 0 or 1.

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport, InvalidCounter

2.2.41 CTR_Read

@ Description

Reads the current contents of the selected counter without disturbing the counting process.

@ Cards Support

9111, 9112, 9113, 9114, 9118, 7248, 7249, 7296, 7396, 8554

@ Syntax

Microsoft C/C++ and Borland C++

I16 CTR_Read (U16 CardNumber, U16 Ctr, U32 *Value)

Visual Basic

CTR_Read (ByVal CardNumber As Integer, ByVal Ctr As Integer, Value As Long) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.
Ctr : The counter number.
Range: 0 for PCI-9111, PCI-9112/cPCI-9112, PCI-9113, PCI-9114, PCI-9118.
0, 1, 2 for PCI-7248/cPCI-7248, cPCI-7249R, PCI-7296, PCI-7396.
1~12 for PCI-8554.
Value : Returns the current count of the specified counter.
Range: 0 through 65536 for binary mode (default).
0 through 9999 for BCD counting mode.

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport, InvalidCounter

2.2.42 CTR_Setup

@ Description

Configures the selected counter to operate in the specified mode.

@ Cards Support

9111, 9112, 9113, 9114, 9118, 7248, 7249, 7296, 7396, 8554

@ Syntax

Microsoft C/C++ and Borland C++

I16 CTR_Setup (U16 CardNumber, U16 Ctr, U16 Mode, U32 Count, U16 BinBcd)

Visual Basic

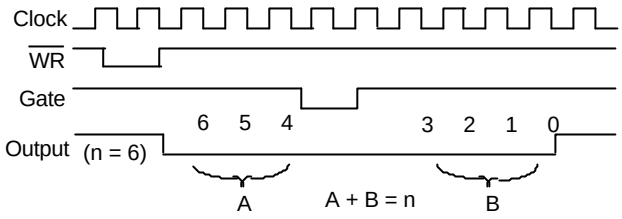
CTR_Setup (ByVal CardNumber As Integer, ByVal Ctr As Integer, ByVal Mode As Integer, ByVal Count As Long, ByVal BinBcd As Integer) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.
Ctr : The counter number.
Range: 0 for PCI-9111, PCI-9112/cPCI-9112, PCI-9113, PCI-9114, PCI-9118.
0, 1, 2 for PCI-7248/cPCI-7248, cPCI-7249R, PCI-7296, PCI-7396.
1~12 for PCI-8554
Mode : The mode in which the counter is to operate.
Valid value:
TOGGLE_OUTPUT
PROG_ONE_SHOT
RATE_GENERATOR
SQ_WAVE_RATE_GENERATOR
SOFT_TRIG
HARD_TRIG

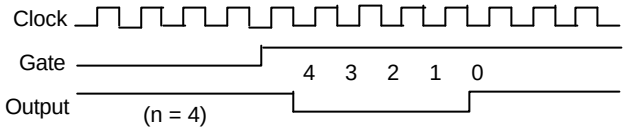
TOGGLE_OUTPUT: Toggle output from low to high on terminal count

In this mode, the output goes low after the mode set operation, and the counter begins to count down while the gate input is high. When terminal count is reached, the output goes high and remains high until the selected counter is set to a different mode. The following diagram shows the TOGGLE_OUTPUT mode timing diagram.



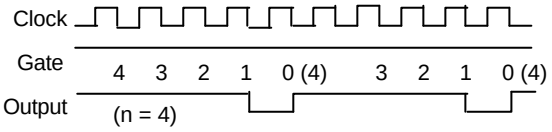
PROG_ONE_SHOT: Programmable one-shot

In this mode, the output goes low on the cofollowing the rising edge of the gate input and goes high on terminal count. The following diagram shows the PROG_ONE_SHOT mode timing diagram.



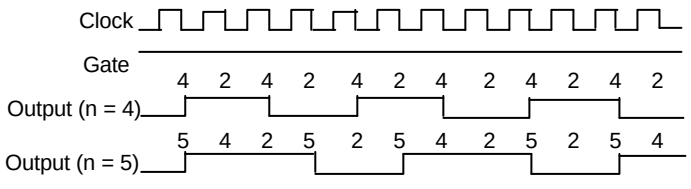
RATE_GENERATOR: Rate generator

In this mode, the output goes low for one period of the clock input. *count* indicates the period from one output pulse to the next. The following diagram shows the RATE_GENERATOR mode timing diagram.



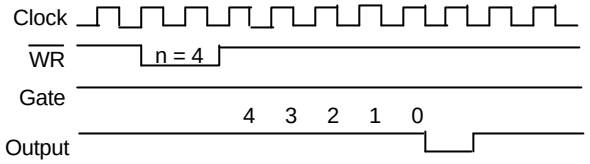
SQ_WAVE_RATE_GENERATOR: Square wave rate generator

In this mode, the output stays high for one half of the *count* clock pulses and stays low for the other half. The following diagram shows the SQ_WAVE_RATE_GENERATOR mode timing diagram.



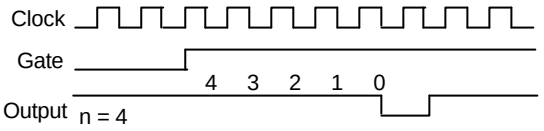
SOFT_TRIG: Software-triggered strobe

In this mode, the output is initially high, and the counter begins to count down while the gate input is high. On terminal count, the output goes low for one clock pulse, then goes high again. The following diagram shows the SOFT_TRIG mode timing diagram.



HARD_TRIG: Hardware-triggered strobe

This mode is similar to SOFT_TRIG mode except that the gate input is used as a trigger to start counting. The following diagram shows the HARD_TRIG mode timing diagram.



Count : The period from one output pulse to the next.

BinBcd : Whether the counter operates as a 16-bit binary counter or as a 4-decade binary-coded decimal (BCD) counter.

Valid value:

BIN: 16-bit binary counter.

BCD: 4-decade BCD counter.

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport, InvalidCounter

2.2.43 DI_7200_Config

@ Description

Informs PCIS-DASK library of the trigger source, and input mode selected for PCI7200/cPCI7200 with card ID *CardNumber*. You must call this function before calling function to perform continuous digital input operation.

@ Cards Support

7200

@ Syntax

Microsoft C/C++ and Borland C++

I16 DI_7200_Config (U16 CardNumber, U16 TrigSource, U16 ExtTrigEn, U16 TrigPol, U16 I_REQ_Pol)

Visual Basic

DI_7200_Config (ByVal CardNumber As Integer, ByVal TrigSource As Integer, ByVal ExtTrigEn As Integer, ByVal TrigPol As Integer, ByVal I_REQ_PolAs Integer) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.

TrigSource : The trigger mode for continuous digital input.
Valid values:
TRIG_INT_PACER: on-board Programmable pacer
TRIG_EXT_STROBE: external signal trigger
TRIG_HANDSHAKE: handshaking

ExtTrigEn : External Trigger Enable, the valid values are:
DI_WAITING: digital input sampling waits rising or falling edge of I_TRG to start DI
DI_NOWAITING: input sampling starts immediately

TrigPol : Trigger Polarity, the valid values are:
DI_TRIG_RISING: I_TRG is rising edge active
DI_TRIG_FALLING: I_TRG is falling edge active

I_REQ_Pol : I_REQ Polarity, the valid values are:
IREQ_RISING: I_REQ is rising edge active
IREQ_FALLING: I_REQ is falling edge active

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport

2.2.44 DI_7300A_Config

@ Description

Informs PCIS-DASK library of the trigger source, port width, etc. selected for PCI7300A Rev.A/cPCI7300A Rev.A card with card ID *CardNumber*. You must call this function before calling function to perform continuous digital input operation.

@ Cards Support

7300A Rev.A

@ Syntax

Microsoft C/C++ and Borland C++

I16 DI_7300A_Config (U16 CardNumber, U16 PortWidth, U16 TrigSource, U16 WaitStatus, U16 Terminator, U16 I_REQ_Pol, BOOLEAN ClearFifo, BOOLEAN DisableDI)

Visual Basic

DI_7300A_Config (ByVal CardNumber As Integer, ByVal PortWidth As Integer, ByVal TrigSource As Integer, ByVal WaitStatus As Integer, ByVal Terminator As Integer, ByVal I_REQ_Pol As Integer, ByVal ClearFifo As Byte, ByVal DisableDI As Byte) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.

PortWidth : The width of digital input port (PORT A). The valid value is 0, 8, 16, or 32.

TrigSource : The trigger mode for continuous digital input.
Valid values:

TRIG_INT_PACER: on-board programmable pacer timer0
TRIG_EXT_STROBE: external signal trigger
TRIG_HANDSHAKE: handshaking
TRIG_CLK_10MHz: 10MHz clock
TRIG_CLK_20MHz: 20MHz clock

WaitStatus : DI Wait Trigger Status, the valid values are:
P7300_WAIT_NO: input sampling starts immediately
P7300_WAIT_TRG: digital input sampling waits rising or falling edge of I_TRG to start DI

Terminator : PortA Terminator On/Off, the valid values are:
P7300_TERM_ON: terminator on
P7300_TERM_OFF: terminator off

I_REQ_Pol : I_REQ Polarity. This function is not implemented on PCI-7300A Rev.A/cPCI-7300A Rev.A card. You can ignore this argument.

ClearFifo : FALSE: retain the FIFO data
TRUE: clear FIFO data before perform digital input

DisableDI : FALSE: digital input operation still active after DMA transfer complete. The input data still put into FIFO
TRUE: disable digital input operation immediately when DMA transfer complete

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport

2.2.45 DI_7300B_Config

@ Description

Informs PCIS-DASK library of the trigger source, port width, etc. selected for PCI7300A Rev.B/cPCI7300A Rev.B card with card ID *CardNumber*. You must call this function before calling function to perform continuous digital input operation.

@ Cards Support

7300A Rev.B

@ Syntax

Microsoft C/C++ and Borland C++

```
I16 DI_7300B_Config (U16 CardNumber, U16 PortWidth, U16 TrigSource, U16
        WaitStatus, U16 Terminator, U16 I_Cntrl_Pol, BOOLEAN ClearFifo,
        BOOLEAN DisableDI)
```

Visual Basic

```
DI_7300B_Config (ByVal CardNumber As Integer, ByVal PortWidth As Integer,
        ByVal TrigSource As Integer, ByVal WaitStatus As Integer, ByVal
        Terminator As Integer, ByVal I_Cntrl_Pol As Integer, ByVal ClearFifo As
        Byte, ByVal DisableDI As Byte) As Integer
```

@ Parameter

CardNumber : The card id of the card that want to perform this operation.

PortWidth : The width of digital input port (PORT A). The valid value is 0, 8, 16, or 32.

TrigSource : The trigger mode for continuous digital input.
Valid values:

TRIG_INT_PACER: on-board programmable pacer timer0
TRIG_EXT_STROBE: external signal trigger
TRIG_HANDSHAKE: handshaking
TRIG_CLK_10MHz: 10MHz clock
TRIG_CLK_20MHz: 20MHz clock

WaitStatus : DI Wait Trigger Status, the valid values are:
P7300_WAIT_NO: input sampling starts immediately
P7300_WAIT_TRG: digital input sampling waits rising or falling edge of I_TRG to start DI

Terminator : PortA Terminator On/Off, the valid values are:
P7300_TERM_ON: terminator on
P7300_TERM_OFF: terminator off

I_Cntrl_Pol : The polarity configuration. This argument is an integer expression formed from one or more of the manifest constants defined in DASK.H. There are three groups of constants:

(1) DIREQ
P7300_DIREQ_POS: DIREQ signal is rising edge active
P7300_DIREQ_NEG: DIREQ signal is falling edge active

(2) DIACK
P7300_DIACK_POS: DIACK signal is rising edge active
P7300_DIACK_NEG: DIACK signal is falling edge active

(3) DITRIG
P7300_DITRIG_POS: DITRIG signal is rising edge active
P7300_DITRIG_NEG: DITRIG signal is falling edge active

ClearFifo : FALSE: retain the FIFO data
TRUE: clear FIFO data before perform digital input

DisableDI : FALSE: digital input operation still active after DMA transfer complete. The input data still put into FIFO
TRUE: disable digital input operation immediately when DMA transfer complete

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport

2.2.46 DI_AsyncCheck

@ Description

Check the current status of the asynchronous digital input operation.

@ Cards Support

7200, 7300A

@ Syntax

Microsoft C/C++ and Borland C++

```
I16 DI_AsyncCheck (U16 CardNumber, BOOLEAN *Stopped, U32 *AccessCnt)
```

Visual Basic

```
DI_AsyncCheck (ByVal CardNumber As Integer, Stopped As Byte, AccessCnt As
        Long) As Integer
```

@ Parameter

CardNumber : The card id of the card that performs the asynchronous operation.

Stopped : Whether the asynchronous analog input operation has completed. If *Stopped* = TRUE, the digital input operation has stopped. Either the number of digital input indicated in the call that initiated the asynchronous digital input operation has completed or an error has occurred. If *Stopped* = FALSE, the operation is not yet complete. (constants TRUE and FALSE are defined in DASK.H)

AccessCnt : The number of digital input data that has been transferred at the time the call to **`DI_AsyncCheck()`**.
AccessCnt is of no use (always returns 0) in DI_AsyncCheck() and DI_AsyncClear() with ***PCI-7300A*** board because PLX9080 has no function or register to get the current amount of DMA transfer.

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport

2.2.47 DI_AsyncClear

@ Description

Stop the asynchronous digital input operation.

@ Cards Support

7200, 7300A

@ Syntax

Microsoft C/C++ and Borland C++

I16 DI_AsyncClear (U16 CardNumber, U32 *AccessCnt)

Visual Basic

DI_AsyncClear (ByVal CardNumber As Integer, AccessCnt As Long) As Integer

@ Parameter

CardNumber : The card id of the card that performs the asynchronous operation.

AccessCnt : The number of digital input data that has been transferred at the time the call to **`DI_AsyncClear()`**.
If double-buffered mode is enabled, *AccessCnt* returns the next position after the position the last data is stored in the circular buffer. If the AccessCnt exeeceds the half size of circular buffer, call "DI_AsyncDblBufferTransfer " twice to get the data.
AccessCnt is of no use (always returns 0) in DI_AsyncCheck() and DI_AsyncClear() with ***PCI-7300A*** board because PLX9080 has no function or register to get the current amount of DMA transfer.

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport

2.2.48 DI_AsyncDblBufferHalfReady

@ Description

Checks whether the next half buffer of data in circular buffer is ready for transfer during an asynchronous double-buffered digital input operation.

@ Cards Support

7200

@ Syntax

Microsoft C/C++ and Borland C++

I16 DI_AsyncDblBufferHalfReady (U16 CardNumber, BOOLEAN *HalfReady)

Visual Basic

DI_AsyncDblBufferHalfReady(ByVal CardNumber As Integer, HalfReady As Byte) As Integer

@ Parameter

CardNumber : The card id of the card that performs the asynchronous double-buffered operation.

HalfReady : Whether the next half buffer of data is available. If HalfReady = TRUE, you can call **`DI_AsyncDblBufferTransfer()`** to copy the data to your user buffer. (constants TRUE and FALSE are defined in DASK.H)

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport

2.2.49 DI_AsyncDblBufferMode

@ Description

Enables or disables double-buffered data acquisition mode.

@ Cards Support

7200

@ Syntax

Microsoft C/C++ and Borland C++

I16 DI_AsyncDblBufferMode (U16 CardNumber, BOOLEAN Enable)

Visual Basic

DI_AsyncDblBufferMode (ByVal CardNumber As Integer, ByVal Enable As Byte) As Integer

@ Parameter

CardNumber : The card id of the card that double-buffered mode to be set.

Enable : Whether the double-buffered mode is enabled or not.
TRUE: double-buffered mode is enabled.
FALSE: double-buffered mode is disabled.
(constants TRUE and FALSE are defined in DASK.H)

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport

2.2.50 DI_AsyncDblBufferTransfer

@ Description

Depending on the continuous DI function selected, half of the data of the circular buffer will be logged into the user buffer (if continuous DI function is: *DI_ContReadPort*) or a disk file (if continuous DI function is: *DI_ContReadPortToFile*).

If the data will be saved in a file, the data is written to disk in binary format, with the lower byte first (little endian).
You can execute this function repeatedly to return sequential half buffers of the data.

@ Cards Support

7200

@ Syntax

Microsoft C/C++ and Borland C++

```
I16 DI_AsyncDblBufferTransfer (U16 CardNumber, void *Buffer)
```

Visual Basic

```
DI_AsyncDblBufferTransfer (ByVal CardNumber As Integer, Buffer As Any) As
        Integer
```

@ Parameter

CardNumber : The card id of the card that performs the asynchronous double-buffered operation.

Buffer : The user buffer to which the data is to be copied. If the data will be saved into a disk file, this argument is of no use.

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport, ErrorNotDoubleBufferMode

2.2.51 DI_AsyncMultiBufferNextReady

@ Description

Checks whether the next buffer of data in circular buffer is ready for transfer during an asynchronous multi-buffered digital input operation. The returned *BufferId* is the index of the most recently available (newest available) buffer.

@ Cards Support

7300A

@ Syntax

Microsoft C/C++ and Borland C++

```
I16 DI_AsyncMultiBufferNextReady (U16 CardNumber, BOOLEAN *NextReady, U16
        *BufferId)
```

Visual Basic

```
DI_AsyncMultiBufferNextReady (ByVal CardNumber As Integer, NextReady As
        Byte, BufferId As Integer) As Integer
```

@ Parameter

CardNumber : The card id of the card that performs the asynchronous multi-buffered operation.

NextReady : Whether the next buffer of data is available. If NextReady = TRUE, you can handle the data in the buffer. (constants TRUE and FALSE are defined in DASK.H)

BufferId : Returns the index of the ready buffer.

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport

2.2.52 DI_ContMultiBufferSetup

@ Description

This function set up the buffer for multi-buffered digital input. The function has to be called repeatedly to setup all of the data buffers (at most 8 buffers).

@ Cards Support

7300A

@ Syntax

Microsoft C/C++ and Borland C++

```
I16 DI_ContMultiBufferSetup (U16 CardNumber, void *Buffer, U32 ReadCount, U16
    *BufferId)
```

Visual Basic

```
DI_ContMultiBufferSetup (ByVal CardNumber As Integer, Buffer As Any, ByVal
    ReadCount As Long, BufferId As Integer) As Integer
```

@ Parameter

CardNumber : The card id of the card that want to perform this operation.
Buffer : The starting address of the memory to contain the input data.
ReadCount : The size (in samples) of the buffer and its value must be even.
BufferId : Returns the index of the buffer currently set up.

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport, ErrorTransferCountTooLarge , ErrorContIoNotAllowed

2.2.53 DI_ContMultiBufferStart

@ Description

This function starts multi-buffered continuous digital input on the specified digital input port at a rate as close to the rate you specified.

@ Cards Support

7300A

@ Syntax

Microsoft C/C++ and Borland C++

```
I16 DI_ContMultiBufferStart (U16 CardNumber, U16 Port, F64 SampleRate)
```

Visual Basic

```
DI_ContMultiBufferStart (ByVal CardNumber As Integer, ByVal Port As Integer,
    ByVal SampleRate As Double) As Integer
```

@ Parameter

CardNumber : The card id of the card that want to perform this operation.
Port : Digital input port number. For PCI-7300A/cPCI-7300A, this argument must be set to 0.
SampleRate : The sampling rate you want for digital input in hertz (samples per second). Your maximum rate depends on the card type and your computer system. This argument is only useful if the DI trigger mode

was set as internal programmable pacer (TRIG_INT_PACER) by calling **DI_7300A_Config()** or **DI_7300B_Config()**.

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport, ErrorInvalidIoChannel, ErrorContIoNotAllowed

2.2.54 DI_ContReadPort

@ Description

This function performs continuous digital input on the specified digital input port at a rate as close to the rate you specified.

@ Cards Support

7200, 7300A

@ Syntax

Microsoft C/C++ and Borland C++

```
I16 DI_ContReadPort (U16 CardNumber, U16 Port, void *Buffer, U32 ReadCount,
        F64 SampleRate, U16 SyncMode)
```

Visual Basic

```
DI_ContReadPort (ByVal CardNumber As Integer, ByVal Port As Integer, Buffer As
        Any, ByVal ReadCount As Long, ByVal SampleRate As Double, ByVal
        SyncMode As Integer) As Integer
```

@ Parameter

CardNumber : The card id of the card that want to perform this operation.

Port : Digital input port number. For PCI-7200/cPCI-7200 and PCI-7300A/cPCI-7300A, this argument must be set to 0.

Buffer : The starting address of the memory to contain the input data. This memory must have been allocated for enough space to store input data. If double-buffered mode is enabled, this buffer is of no use, you can ignore this argument.

ReadCount : If double-buffered mode is disabled, *ReadCount* is the number of input operation to be performed. For double-buffered acquisition, *ReadCount* is the size (in samples) of the circular buffer and its value must be even.

SampleRate : The sampling rate you want for digital input in hertz (samples per second). Your maximum rate depends on the card type and your computer system. This argument is only useful if the DI trigger mode was set as internal programmable pacer (TRIG_INT_PACER) by calling **DI_7200_Config()** or **DI_7300_Config()**. For the other settings, you have to set this argument as CLKSRC_EXT_SampRate.

SyncMode : Whether this operation is performed synchronously or asynchronously.

Valid values:

- SYNCH_OP: synchronous digital input, that is, the function does not return until the digital input operation complete.
- ASYNCH_OP: asynchronous digital input operation

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport, ErrorInvalidIoChannel, ErrorTransferCountTooLarge , ErrorContIoNotAllowed

2.2.55 DI_ContReadPortToFile

@ Description

This function performs continuous digital input on the specified digital input port at a rate as close to the rate you specified and saves the acquired data in a disk file. The data is written to disk in binary format, with the lower byte first (little endian). Please refer to Appendix D, *Data File Format* for the data file structure.

@ Cards Support

7200, 7300A

@ Syntax

Microsoft C/C++ and Borland C++

```
I16 DI_ContReadPortToFile (U16 CardNumber, U16 Port, U8 *FileName, U32
        ReadCount, F64 SampleRate, U16 SyncMode)
```

Visual Basic

```
DI_ContReadPortToFile (ByVal CardNumber As Integer, ByVal Port As Integer,
        ByVal FileName As String, ByVal ReadCount As Long, ByVal SampleRate
        As Double, ByVal SyncMode As Integer) As Integer
```

@ Parameter

CardNumber : The card id of the card that want to perform this operation.

Port : Digital input port number. For PCI-7200/cPCI-7200 and PCI-7300A/cPCI-7300A, this argument must be set to 0.

FileName : Name of data file which stores the acquired data

ReadCount : If double-buffered mode is disabled, *ReadCount* is the number of input operation to be performed. For double-buffered acquisition, *ReadCount* is the size (in samples) of the circular buffer and its value must be even.

SampleRate : The sampling rate you want for digital input in hertz (samples per second). Your maximum rate depends on the card type and your computer system. This argument is only useful if the DI trigger mode was set as internal programmable pacer (TRIG_INT_PACER) by calling **`DI_7200_Config()`** or **`DI_7300_Config()`**. For the other settings, you have to set this argument as CLKSRC_EXT_SampRate.

SyncMode : Whether this operation is performed synchronously or asynchronously.

Valid values:

- SYNCH_OP: synchronous digital input, that is, the function does not return until the digital input operation complete.
- ASYNCH_OP: asynchronous digital input operation

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport, ErrorInvalidIoChannel, ErrorInvalidSampleRate, ErrorTransferCountTooLarge , ErrorContIoNotAllowed

2.2.56 DI_ContStatus

@ Description

While performing continuous DI conversions, this function is called to get the DI status. Please refer to the manual for your device for the DI status the device might meet.

@ Cards Support

7200, 7300A

@ Syntax

Microsoft C/C++ and Borland C++

I16 DI_ContStatus (U16 CardNumber, U16 *Status)

Visual Basic

DI_ContStatus (ByVal CardNumber As Integer, Status Integer) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.

Status : The continuous DI status returned. The description of the parameter *Status* for various card types is the following:

PCI7200 :

bit 0 : '1' indicates D/I FIFO is Full (Over-Run)
bit 1 : '1' indicates D/O FIFO is Empty (Under-Run)
bit 2 ~ 15 : not used

PCI7300A_RevA:

bit 0 : '1' indicates DI FIFO is full during input sampling and some data were lost. Writes' 1' to clear this bit
bit 1 : '1' indicates DI FIFO is full
bit 2 : '1' indicates DI FIFO is empty
bit 3 ~ 15 : not used

PCI7300A_RevB:

bit 0 : '1' indicates DI FIFO is full during input sampling and some data were lost. Writes' 1' to clear this bit
bit 1 : '1' indicates DI FIFO is full
bit 2 : '1' indicates DI FIFO is empty
bit 3 ~ 15 : not used

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered

2.2.57 DI_InitialMemoryAllocated

@ Description

This function returns the available memory size for digital input in the device driver of this card. The continuous digital input transfer size can not exceed this size.

@ Cards Support

7200, 7300A

@ Syntax

Microsoft C/C++ and Borland C++

I16 DI_InitialMemoryAllocated (U16 CardNumber, U32 *MemSize)

Visual Basic

DI_InitialMemoryAllocated (ByVal CardNumber As Integer, MemSize As Long) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.

MemSize : The available memory size for continuous DI in device driver of this card.
The unit is KB (1024 bytes).

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered

2.2.58 DI_ReadLine

@ Description

Read the digital logic state of the specified digital line in the specified port.

@ Cards Support

6208V/16V/08A, 6308V/08A, 7200, 7230, 7233, 7248, 7249, 7250/51, 7252, 7256, 7258, 7296, 7300A, 7396, 7432, 7433, 8554, 9111, 9112, 9114, 9116, 9118

@ Syntax

Microsoft C/C++ and Borland C++

I16 DI_ReadLine (U16 CardNumber, U16 Port, U16 Line, U16 *State)

Visual Basic

DI_ReadLine (ByVal CardNumber As Integer, ByVal Port As Integer, ByVal Line As Integer, State As Integer) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.

Port : Digital input port number. The valid value:
PCI-6208V/16V/08A: 0
PCI-6308V/08A: 0
PCI-7200 : 0
cPCI-7200: 0, 1 (auxiliary input port)
PCI-7230/cPCI-7230: 0
PCI-7233: 0
PCI-7248/cPCI-7248:
Channel_P1A, Channel_P1B,
Channel_P1C, Channel_P1CL,
Channel_P1CH, Channel_P2A,
Channel_P2B, Channel_P2C,
Channel_P2CL, Channel_P2CH
cPCI-7249R:
Channel_P1A, Channel_P1B,
Channel_P1C, Channel_P1CL,
Channel_P1CH, Channel_P1AE,
Channel_P1BE, Channel_P1CE,
Channel_P2A, Channel_P2B,
Channel_P2C, Channel_P2CL,
Channel_P2CH, Channel_P2AE,

Channel_P2BE, Channel_P2CE,
PCI-7250/51: 0 through 3
cPCI-7252: 0
PCI-7256: 0
PCI-7258: 0
PCI-7296:
Channel_P1A, Channel_P1B,
Channel_P1C, Channel_P1CL,
Channel_P1CH, Channel_P2A,
Channel_P2B, Channel_P2C,
Channel_P2CL, Channel_P2CH,
Channel_P3A, Channel_P3B,
Channel_P3C, Channel_P3CL,
Channel_P3CH, Channel_P4A,
Channel_P4B, Channel_P4C,
Channel_P4CL, Channel_P4CH
PCI-7396:
Channel_P1A, Channel_P1B,
Channel_P1C,
Channel_P2A, Channel_P2B,
Channel_P2C,
Channel_P3A, Channel_P3B,
Channel_P3C,
Channel_P4A, Channel_P4B,
Channel_P4C
PCI-7300A/cPCI-7300A: 1 (auxiliary input port)
PCI-7432/cPCI-7432: 0
cPCI-7432R: 0
PCI-7433/cPCI-7433: PORT_DI_LOW, PORT_DI_HIGH
cPCI-7433R: PORT_DI_LOW, PORT_DI_HIGH
PCI-8554: 0
PCI-9111: P9111_CHANNEL_DI, P9111_CHANNEL_EDI
PCI-9112/cPCI-9112: 0
PCI-9114: 0
cPCI-9116: 0
PCI-9118: 0

Line : The digital line to be read. The valid value:
PCI-6208V/16V/08A: 0 through 3
PCI-6308V/08A: 0 through 3
PCI-7200/cPCI-7200: 0 through 31 (for port 0)
0 through 3 (for auxiliary input port of cPCI7200)
PCI-7230/cPCI-7230: 0 through 15
PCI-7233: 0 through 31
PCI-7248/cPCI-7248: 0 through 7
cPCI-7249R: 0 through 7
PCI-7250/51: 0 through 7
cPCI-7252: 0 through 15
PCI-7256: 0 through 15
PCI-7258: 0 through 1
PCI-7296: 0 through 7
PCI-7300A/cPCI-7300A: 0 through 3

PCI-7396: 0 through 7
PCI-7432/cPCI-7432/cPCI-7432R: 0 through 31
PCI-7433/cPCI-7433/cPCI-7433R: 0 through 31
PCI-8554: 0 through 7
PCI-9111: 0 through 15
PCI-9112/cPCI-9112: 0 through 15
PCI-9114: 0 through 15
cPCI-9116: 0 through 7
PCI-9118: 0 through 3

State : Returns the digital logic state, 0 or 1, of the specified line.

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport, ErrorInvalidIoChannel

2.2.59 DI_ReadPort

@ Description

Read digital data from the specified digital input port.

@ Cards Support

6208V/16V/08A, 6308V/08A, 7200, 7230, 7233, 7248, 7249, 7250/51, 7252, 7256, 7258, 7296, 7300A, 7396, 7432, 7433, 7434, 8554, 9111, 9112, 9114, 9116, 9118

@ Syntax

Microsoft C/C++ and Borland C++

```
I16 DI_ReadPort (I16 CardNumber, U16 Port, U32 *Value)
```

Visual Basic

```
DI_ReadPort (ByVal CardNumber As Integer, ByVal Port As Integer, Value As Long)
        As Integer
```

@ Parameter

CardNumber : The card id of the card that want to perform this operation.

Port : Digital input port number. The valid value:
PCI-6208V/16V/08A: 0
PCI-6308V/08A: 0
PCI-7200/cPCI-7200: 0
cPCI-7200: 0 , 1 (auxiliary digital input port)
PCI-7230/cPCI-7230: 0
PCI-7233: 0
PCI-7248/cPCI-7248:
Channel_P1A, Channel_P1B,
Channel_P1C, Channel_P1CL,
Channel_P1CH, Channel_P2A,
Channel_P2B, Channel_P2C,
Channel_P2CL, Channel_P2CH
cPCI-7249R:
Channel_P1A, Channel_P1B,
Channel_P1C, Channel_P1CL,
Channel_P1CH, Channel_P1AE,
Channel_P1BE, Channel_P1CE,

Channel_P2A, Channel_P2B,
Channel_P2C, Channel_P2CL,
Channel_P2CH, Channel_P2AE,
Channel_P2BE, Channel_P2CE

PCI-7250/51: 0 through 3
cPCI-7252: 0
PCI-7256: 0
PCI-7258: 0
PCI-7296:
Channel_P1A, Channel_P1B,
Channel_P1C, Channel_P1CL,
Channel_P1CH, Channel_P2A,
Channel_P2B, Channel_P2C,
Channel_P2CL, Channel_P2CH,
Channel_P3A, Channel_P3B,
Channel_P3C, Channel_P3CL,
Channel_P3CH, Channel_P4A,
Channel_P4B, Channel_P4C,
Channel_P4CL, Channel_P4CH
PCI-7300A/cPCI-7300A: 1 (auxiliary digital input port)
PCI-7396:
Channel_P1A, Channel_P1B,
Channel_P1C, Channel_P1,
Channel_P2A, Channel_P2B,
Channel_P2C, Channel_P2
Channel_P3A, Channel_P3B,
Channel_P3C, Channel_P3,
Channel_P4A, Channel_P4B,
Channel_P4C, Channel_P4
PCI-7432/cPCI-7432: 0
cPCI-7432R: 0, P7432R_DI_SLOT
PCI-7433/cPCI-7433: PORT_DI_LOW, PORT_DI_HIGH
cPCI-7433R: PORT_DI_LOW, PORT_DI_HIGH, P7433R_DI_SLOT
cPCI-7434R: P7434R_DI_SLOT
PCI-8554: 0
PCI-9111: P9111_CHANNEL_DI, P9111_CHANNEL_EDI
PCI-9112/cPCI-9112: 0
PCI-9114: 0
cPCI-9116: 0
PCI-9118: 0

Note: The value, Channel_P*n*, for argument *Port* is defined as all of the ports (Port A, B and C) in channel *n*.

Value : Returns the digital data read from the specified port.
PCI-6208V/16V/08A: 4-bit data
PCI-6308V/08A: 4-bit data
PCI-7200/cPCI-7200: 32-bit data
4-bit data (for auxiliary input port of cPCI-7200)
PCI-7230/cPCI-7230: 16-bit data
PCI-7233: 32-bit data

PCI-7248/cPCI-7248: 8-bit data
cPCI-7249R: 8-bit data
PCI-7250/51: 8-bit data
cPCI-7252: 16-bit data
PCI-7256: 16-bit data
PCI-7258: 2-bit data
PCI-7296: 8-bit data
PCI-7300A/cPCI-7300A: 4-bit data
PCI-7396: 24-bit data (for Channel_P*n*, where *n* is the channel number) or
8-bit data (for Channel_P*n*A, Channel_P*n*B, Channel_P*n*C , where *n* is the channel number)
PCI-7432/cPCI-7432/cPCI-7433R: 32-bit data
PCI-7433/cPCI-7433/cPCI-7434: 32-bit data
PCI-8554: 8-bit data
PCI-9111: 16-bit data (for P9111_CHANNEL_DI) or
8-bit data (for P9111_CHANNEL_EDI)
PCI-9112/cPCI-9112: 16-bit data
PCI-9114: 16-bit data
cPCI-9116: 8-bit data
PCI-9118: 4-bit data

Note: The data format for Channel_P*n* is as follows:

	Don't care	PORT C	PORT B	PORT A
Bit	31 - 24	23 - 16	15 – 8	7 - 0

@ Return Code

NoError, CardNotRegistered, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport

2.2.60 DIO_7300SetInterrupt

@ Description

This function controls the interrupt sources (AuxDI0 and Timer 2) of local interrupt system of PCI-7300A/cPCI7300A and returns the two interrupt events. If an interrupt is generated, the corresponding interrupt event will be signaled. The application can use Win32 wait functions, such as WaitForSingleObject or WaitForMultipleObjects to check the interrupt event status.

@ Cards Support

7300A

@ Syntax

Microsoft C/C++ and Borland C++

I16 DIO_7300SetInterrupt (U16 CardNumber, I16 AuxDIEn, I16 T2En, HANDLE *hEvent)

Visual Basic

DIO_7300SetInterrupt (ByVal CardNumber As Integer, ByVal AuxDIEn As Integer, ByVal T2En As Integer, hEvent As Long) As Integer

@ Parameter

CardNumber : The card id of the card that want to be performed this operation.

AuxDIEn : The control value for AUXDI interrupt.
The valid values:
0: disabled
1: enabled

T2En : The control value for Timer2 interrupt.
The valid values:
0: disabled
1: enabled

hEvent : The local interrupt event handles returned. The status of the interrupt event indicates that an interrupt is generated or not.

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered
ErrorFuncNotSupport

2.2.61 DIO_AUXDI_EventMessage

@ Description

Controls the AUXDI interrupt and notifies the user' s application when an interrupt event occurs. The notification is performed through a user-specified callback function or the Windows PostMessage API.

@ Cards Support

7300A

@ Syntax

Microsoft C/C++ and Borland C++

I16 DIO_AUXDI_EventMessage (U16 CardNumber, I16 AuxDIEn, HANDLE windowHandle, U32 message, void *callbackAddr())

Visual Basic 5

DIO_ AUXDI _EventMessage (ByVal CardNumber As Integer, ByVal AuxDIEn As Integer, ByVal windowHandle As Long, ByVal message As Long, ByVal callbackAddr As Long) As Integer

@ Parameter

CardNumber : The card id of the card that want to be performed this operation.

AuxDIEn : The control value for AUXDI interrupt.
The valid values:
0: disabled
1: enabled

windowHandle : The handle to the window you want to receive a Windows message in when the specified AUXDI event happens. If *windowHandle* is 0, no Windows messages are sent.

message : a message you define. When the specified AUXDI event happens, PCIS-DASK passes *message* back to you. *message* can be any value.
In Windows, you can set *message* to a value including any Windows predefined messages (such as WM_PAINT). However, to define your own message, you can use any value ranging from WM_USER (0x400) to 0x7fff. This range is reserved by Microsoft

for messages you define.

callbackAddr : address of the user callback function. PCIS-DASK calls this function when the specified AUXDI event occurs. If you do not want to use a callback function, set *callbackAddr* to 0.

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered
ErrorFuncNotSupport

2.2.62 DIO_GetCOSLatchData

@ Description

Gets the DI data that latched in the the COS Latch register while the Change-of-State(COS) interrupt occurred.

@ Cards Support

7256

@ Syntax

Microsoft C/C++ and Borland C++

I16 DIO_GetCOSLatchData(U16 wCardNumber, U16 *CosLData)

Visual Basic

DIO_GetCOSLatchData (ByVal CardNumber As Integer, Value As Long) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.

Value : Returns the DI data that latched in the the COS Latch register while the Change-of-State(COS) interrupt occurred.
PCI-7256: 16-bit data

@ Return Code

NoError, CardNotRegistered, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport

2.2.63 DIO_INT1_EventMessage

@ Description

Controls the interrupt sources of INT1 of Dual Interrupt system and notifies the user's application when an interrupt event occurs. The notification is performed through a user-specified callback function or the Windows PostMessage API.

@ Cards Support

7230, 7233, 7248, 7249, 7256, 7258, 7296, 7396, 7432, 7433, 8554

@ Syntax

Microsoft C/C++ and Borland C++

I16 DIO_INT1_EventMessage (U16 CardNumber, I16 Int1Mode, HANDLE windowHandle, U32 message, void *callbackAddr())

Visual Basic 5

DIO_INT1_EventMessage (ByVal CardNumber As Integer, ByVal Int1Mode As Integer, ByVal windowHandle As Long, ByVal message As Long, ByVal callbackAddr As Long) As Integer

@ Parameter

CardNumber : The card id of the card that want to be performed this operation.

Int1Mode : The interrupt mode of INT1. The valid values:

PCI-7248/cPCI-7248/cPCI-7249R/7296:
- INT1_DISABLE : INT1 Disabled
- INT1_FP1C0 : INT1 by Falling edge of P1C0
- INT1_RP1C0_FP1C3 : INT1 by P1C0 Rising or P1C3 Falling
- INT1_EVENT_COUNTER: INT1 by Event Counter down to zero
- INT1_ EXT_SIGNAL: INT1 by External Signal

PCI-7230/cPCI-7230/7233/7432/7433:
- INT1_DISABLE : INT1 Disabled
- INT1_ EXT_SIGNAL: INT1 by External Signal

PCI-7256:
- INT1_DISABLE : INT1 Disabled
- INT1_COS : INT1 by COS
- INT1_CH0 : INT1 by CH0

PCI-7258:
- INT1_DISABLE : INT1 Disabled
- INT1_ EXT_SIGNAL: INT1 by External Signal

PCI-8554:
- INT1_DISABLE : INT1 Disabled
- INT1_COUT12 : INT1 by Counter #12
- INT1_ EXT_SIGNAL: INT1 by External Signal

PCI-7396:
- INT1_DISABLE : INT1 Disabled
- INT1_COS : INT1 by COS
- INT1_FP1C0 : INT1 by Falling edge of P1C0
- INT1_RP1C0_FP1C3 : INT1 by P1C0 Rising or P1C3 Falling
- INT1_EVENT_COUNTER: INT1 by Event Counter down to zero
- INT1_ EXT_SIGNAL: INT1 by External Signal

windowHandle : The handle to the window you want to receive a Windows message in when the specified INT1 event happens. If *windowHandle* is 0, no Windows messages are sent.

message : a message you define. When the specified INT1 event happens, PCIS-DASK passes *message* back to you. *message* can be any value.

In Windows, you can set *message* to a value including any Windows predefined messages (such as WM_PAINT). However, to define your own message, you can use any value ranging from WM_USER (0x400) to 0x7fff. This range is reserved by Microsoft for messages you define.

callbackAddr : address of the user callback function. PCIS-DASK calls this function when the specified INT1 event occurs. If you do not want to use a callback function, set *callbackAddr* to 0.

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered
ErrorFuncNotSupport

2.2.64 DIO_INT2_EventMessage

@ Description

Controls the interrupt sources of INT2 of Dual Interrupt system and notifies the user's application when an interrupt event occurs. The notification is performed through a user-specified callback function or the Windows PostMessage API.

@ Cards Support

7230, 7233, 7248, 7249, 7256, 7258, 7296, 7396, 7432, 7433, 8554

@ Syntax

Microsoft C/C++ and Borland C++

I16 DIO_INT2_EventMessage (U16 CardNumber, I16 Int2Mode, HANDLE windowHandle, U32 message, void *callbackAddr())

Visual Basic 5

DIO_INT2_EventMessage (ByVal CardNumber As Integer, ByVal Int2Mode As Integer, ByVal windowHandle As Long, ByVal message As Long, ByVal callbackAddr As Long) As Integer

@ Parameter

CardNumber : The card id of the card that want to be performed this operation.

Int2Mode : The interrupt mode of INT2.The valid values:

PCI-7248/cPCI-7248/cPCI-7249R/7296:
- INT2_DISABLE : INT2 Disabled
- INT2_FP2C0 : INT2 by Falling edge of P2C0
- INT2_RP2C0_FP2C3 : INT2 by P2C0 Rising or P2C3 Falling
- INT2_TIMER_COUNTER: INT2 by Timer Counter down to zero
- INT2_ EXT_SIGNAL: INT2 by External Signal

PCI-7230/cPCI-7230/7233/7432/7433/8554:
- INT2_DISABLE : INT2 Disabled
- INT2_ EXT_SIGNAL: INT2 by External Signal

PCI-7256:
- INT2_DISABLE : INT2 Disabled
- INT2_CH1 : INT2 by CH1

PCI-7258:
- INT2_DISABLE : INT2 Disabled
- INT2_ EXT_SIGNAL: INT2 by External Signal

PCI-7396:
- INT2_DISABLE : INT2 Disabled
- INT2_COS : INT2 by COS
- INT2_FP2C0 : INT2 by Falling edge of P2C0
- INT2_RP2C0_FP2C3 : INT2 by P2C0 Rising or P2C3 Falling
- INT2_TIMER_COUNTER: INT2 by Timer Counter down to zero
- INT2_ EXT_SIGNAL: INT2 by External Signal

windowHandle : The handle to the window you want to receive a Windows message in when the specified INT2 event happens. If *windowHandle* is 0, no Windows messages are sent.

message : a message you define. When the specified INT2 event happens, PCIS-DASK passes *message* back to you. *message* can be any value.

In Windows, you can set *message* to a value including any Windows predefined messages (such as WM_PAINT). However, to define your own message, you can use any value ranging from WM_USER (0x400) to 0x7fff. This range is reserved by Microsoft for messages you define.

callbackAddr : address of the user callback function. PCIS-DASK calls this function when the specified INT2 event occurs. If you do not want to use a callback function, set *callbackAddr* to 0..

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered
ErrorFuncNotSupport

2.2.65 DIO_PortConfig

@ Description

Informs PCIS-DASK library of the port selected and the direction (Input or output) setting of the selected port.

@ Cards Support

7248, 7249, 7296, 7396

@ Syntax

Microsoft C/C++ and Borland C++

I16 DIO_PortConfig (U16 CardNumber, U16 Port, U16 Direction)

Visual Basic

DIO_PortConfig (ByVal CardNumber As Integer, ByVal Port As Integer, ByVal Direction As Integer) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.

Port : The port selected. The valid value:

PCI-7248/cPCI-7248:
Channel_P1A, Channel_P1B,
Channel_P1C, Channel_P1CL
Channel_P1CH, Channel_P2A,
Channel_P2B, Channel_P2C,
Channel_P2CL, Channel_P2CH

cPCI-7249R:
Channel_P1A, Channel_P1B,
Channel_P1C, Channel_P1CL
Channel_P1CH, Channel_P2A,
Channel_P2B, Channel_P2C,
Channel_P2CL, Channel_P2CH

PCI-7296:
Channel_P1A, Channel_P1B,
Channel_P1C, Channel_P1CL,
Channel_P1CH, Channel_P2A,
Channel_P2B, Channel_P2C,
Channel_P2CL, Channel_P2CH,
Channel_P3A, Channel_P3B,
Channel_P3C, Channel_P3CL,
Channel_P3CH, Channel_P4A,
Channel_P4B, Channel_P4C,
Channel_P4CL, Channel_P4CH

PCI-7396:
Channel_P1A, Channel_P1B,
Channel_P1C, Channel_P1,

Channel_P1E,
Channel_P2A, Channel_P2B,
Channel_P2C, Channel_P2,
Channel_P2E,
Channel_P3A, Channel_P3B,
Channel_P3C, Channel_P3,
Channel_P3E,
Channel_P4A, Channel_P4B,
Channel_P4C, Channel_P4,
Channel_P4E

Note: 1. The value, Channel_P*n*, for argument *Port* is defined as all of the ports (Port A, B and C) in channel *n*.

2. If the *port* argument of DIO_PortConfig is set to Channel_P*n*E, the channel *n* will be configured as INPUT_PORT (the argument *Direction* is of no use here) and the digital input of channel *n* is controlled by external clock.

Direction : The port direction of PIO port. The valid value:
INPUT_PORT
OUTPUT_PORT

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport, ErrorInvalidIoChannel

2.2.66 DIO_SetCOSInterrupt

@ Description

This functions enable/disables the COS (Change Of State) interrupt detection capability of the specified ports.

@ Cards Support

7396, 7256

@ Syntax

Microsoft C/C++ and Borland C++

I16 DIO_SetCOSInterrupt (U16 CardNumber, U16 Channel_no, U16 ctlA, U16 ctlB, U16 ctlC)

Visual Basic

DIO_SetCOSInterrupt (ByVal wCardNumber As Integer, ByVal Channel_no As Integer, ByVal ctlA As Integer, ByVal ctlB As Integer, ByVal ctlC As Integer) As Integer

@ Parameter

CardNumber : The card id of the card that want to be performed this operation.

Channel_no : The channel number to be enabled or disabled COS detection capability. The valid port numbers are:

PCI-7396:
Channel_P1 : Port 1
Channel_P2 : Port 2
Channel_P3 : Port 3
Channel_P4 : Port 4

PCI-7256: 0

ctlA : The control value for Port A of the channel defined by argument *Channel_no* or the control value for the port defined by *Channel_no*.
The valid values:
PCI-7396:
0: disabled
1: enabled
PCI-7256:
Each bit of the value of *ctrlA* controls one DI channel. The '0' value of the bit value enable the COS function of the corresponding channel, and the '1' value of the bit value disable the COS function of the corresponding channel. The valid values for *ctrlA* :
0 through 65535

ctlB : The control value for Port B of the channel defined by argument *Channel_no*.
The valid values:
PCI-7396:
0: disabled
1: enabled
PCI-7256: Not Needed

ctlC : The control value for Port C of the channel defined by argument *Channel_no*.
The valid values:
PCI-7396:
0: disabled
1: enabled
PCI-7256: Not Needed

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered
ErrorFuncNotSupport

2.2.67 DIO_SetDualInterrupt

@ Description

This function informs PCIS-DASK library of the interrupt mode of two interrupt sources of dual-interrupt system and returns dual interrupt events. If an interrupt is generated, the corresponding interrupt event will be signaled. The application can use Win32 wait functions, such as WaitForSingleObject or WaitForMultipleObjects to check the interrupt event status.

@ Cards Support

7230, 7233, 7248, 7249, 7256, 7258, 7296, 7396, 7432, 7433, 8554

@ Syntax

Microsoft C/C++ and Borland C++

```
I16 DIO_SetDualInterrupt (U16 CardNumber, I16 Int1Mode, I16 Int2Mode, HANDLE
        *hEvent)
```

Visual Basic

```
DIO_SetDualInterrupt (ByVal CardNumber As Integer, ByVal Int1Mode As Integer,
        ByVal Int2Mode As Integer, hEvent As Long) As Integer
```

@ Parameter

CardNumber : The card id of the card that want to be performed this operation.

Int1Mode : The interrupt mode of INT1. The valid values:

PCI-7248/cPCI-7248/cPCI7249R//7296:
- INT1_DISABLE : INT1 Disabled
- INT1_FP1C0 : INT1 by Falling edge of P1C0
- INT1_RP1C0_FP1C3 : INT1 by P1C0 Rising or P1C3 Falling
- INT1_EVENT_COUNTER: INT1 by Event Counter down to zero

PCI-7230/cPCI-7230/7233/7432/7433:
- INT1_DISABLE : INT1 Disabled
- INT1_ EXT_SIGNAL: INT1 by External Signal

PCI-7256:
- INT1_DISABLE : INT1 Disabled
- INT1_COS : INT1 by COS
- INT1_CH0 : INT1 by CH0

PCI-7258:
- INT1_DISABLE : INT1 Disabled
- INT1_ EXT_SIGNAL: INT1 by External Signal

PCI-8554:
- INT1_DISABLE : INT1 Disabled
- INT1_ EXT_SIGNAL: INT1 by External Signal
- INT1_COUT12 : INT1 by Counter #12

PCI-7396:
- INT1_DISABLE : INT1 Disabled
- INT1_COS : INT1 by COS
- INT1_FP1C0 : INT1 by Falling edge of P1C0
- INT1_RP1C0_FP1C3 : INT1 by P1C0 Rising or P1C3 Falling
- INT1_EVENT_COUNTER: INT1 by Event Counter down to zero

Int2Mode : The interrupt mode of INT2.The valid values:

PCI-7248/cPCI-7248/cPCI-7249R/7296:
- INT2_DISABLE : INT2 Disabled
- INT2_FP2C0 : INT2 by Falling edge of P2C0
- INT2_RP2C0_FP2C3 : INT2 by P2C0 Rising or P2C3 Falling
- INT2_TIMER_COUNTER: INT2 by Timer Counter down to zero

PCI-7230/cPCI-7230/7233/7432/7433/8554:
- INT2_DISABLE : INT2 Disabled
- INT2_ EXT_SIGNAL: INT2 by External Signal

PCI-7256:
- INT2_DISABLE : INT2 Disabled
- INT2_CH1 : INT2 by CH1

PCI-7258:
- INT2_DISABLE : INT2 Disabled
- INT2_ EXT_SIGNAL: INT2 by External Signal

PCI-7396:
- INT2_DISABLE : INT2 Disabled
- INT2_COS : INT2 by COS
- INT2_FP2C0 : INT2 by Falling edge of P2C0
- INT2_RP2C0_FP2C3 : INT2 by P2C0 Rising or P2C3 Falling
- INT2_TIMER_COUNTER: INT2 by Timer Counter down to zero

hEvent : dual interrupt event handles returned. The status of a dual interrupt event indicates that an interrupt is generated or not for the cards

comprising dual interrupts system (PCI-7230/cPCI-7230, PCI-7233, PCI-7248/cPCI-7248, cPCI-7249R, PCI-7256, PCI-7258, PCI-7296, PCI-7396, PCI-7432/cPCI-7432/cPCI7432R, and PCI-7433/cPCI-7433/cPCI7433R).

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered
ErrorFuncNotSupport

2.2.68 DIO_T2_EventMessage

@ Description

Controls the Timer2 interrupt and notifies the user' s application when an interrupt event occurs. The notification is performed through a user-specified callback function or the Windows PostMessage API.

@ Cards Support

7300A

@ Syntax

Microsoft C/C++ and Borland C++

I16 DIO_T2_EventMessage (U16 CardNumber, I16 T2En, HANDLE windowHandle, U32 message, void *callbackAddr())

Visual Basic 5

DIO_ AUXDI _EventMessage (ByVal CardNumber As Integer, ByVal T2En As Integer, ByVal windowHandle As Long, ByVal message As Long, ByVal callbackAddr As Long) As Integer

@ Parameter

CardNumber : The card id of the card that want to be performed this operation.

T2En : The control value for Timer2 interrupt.
The valid values:
0: disabled
1: enabled

windowHandle : The handle to the window you want to receive a Windows message in when the specified Timer2 event happens. If *windowHandle* is 0, no Windows messages are sent.

message : a message you define. When the specified Timer2 event happens, PCIS-DASK passes *message* back to you. *message* can be any value.
In Windows, you can set *message* to a value including any Windows predefined messages (such as WM_PAINT). However, to define your own message, you can use any value ranging from WM_USER (0x400) to 0x7fff. This range is reserved by Microsoft for messages you define.

callbackAddr : address of the user callback function. PCIS-DASK calls this function when the specified Timer2 event occurs. If you do not want to use a callback function, set *callbackAddr* to 0.

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered

ErrorFuncNotSupport

2.2.69 DO_7200_Config

@ Description

Informs PCIS-DASK library of the trigger source and output mode selected for PCI7200/cPCI7200 with card ID *CardNumber*. You must call this function before calling function to perform continuous digital output operation.

@ Cards Support

7200

@ Syntax

Microsoft C/C++ and Borland C++

I16 DO_7200_Config (U16 CardNumber, U16 TrigSource, U16 OutReqEn, U16 OutTrigSig)

Visual Basic

DO_7200_Config (ByVal CardNumber As Integer, ByVal TrigSource As Integer, ByVal OutReqEn As Integer, ByVal OutTrigSig As Integer) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.

TrigSource : The trigger source for continuous digital input.
Valid values:
TRIG_INT_PACER: on-board Programmable pacer
TRIG_HANDSHAKE: handshaking

Output REQ Enable :
OREQ_ENABLE: output REQ is enabled, an O_REQ strobe is generated after output data is strobe
OREQ_DISABLE: output REQ is disable

Output Trigger Signal :
OTRIG_HIGH: O_TRIG signal goes high
OTRIG_LOW: O_TRIG signal goes low

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport

2.2.70 DO_7300A_Config

@ Description

Informs PCIS-DASK library of the trigger source, port width, etc. selected for PCI7300A Rev.A/cPCI7300A Rev.A card with card ID *CardNumber*. You must call this function before calling function to perform continuous digital output operation.

@ Cards Support

7300A Rev.A

@ Syntax

Microsoft C/C++ and Borland C++

I16 DO_7300A_Config (U16 CardNumber, U16 PortWidth, U16 TrigSource, U16 WaitStatus, U16 Terminator, U16 O_REQ_Pol)

Visual Basic

DO_7300A_Config (ByVal CardNumber As Integer, ByVal PortWidth As Integer, ByVal TrigSource As Integer, ByVal WaitStatus As Integer, ByVal Terminator As Integer, ByVal O_REQ_Pol As Integer) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.

PortWidth : The width of digital output port (PORT B). The valid value is 0, 8, 16, or 32.

TrigSource : The trigger mode for continuous digital output.
Valid values:
TRIG_INT_PACER: on-board programmable pacer timer1
TRIG_CLK_10MHz: 10MHz clock
TRIG_CLK_20MHz: 20MHz clock
TRIG_HANDSHAKE: handshaking mode

WaitStatus : DO Wait Status, the valid values are:
P7300_WAIT_NO:digital output starts immediately
P7300_WAIT_TRG:digital output waits rising or falling edge of O_TRG to start
P7300_WAIT_FIFO:delay output data until FIFO is not almost empty
P7300_WAIT_BOTH:delay output data until O_TRG active and FIFO is not almost empty

Terminator : PortB Terminator On/Off, the valid values are:
P7300_TERM_ON: terminator on
P7300_TERM_OFF:terminator off

O_REQ_Pol : O_REQ Polarity. This function is not implemented on PCI-7300A Rev.A/cPCI-7300A Rev.A card. You can ignore this argument.

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport

2.2.71 DO_7300B_Config

@ Description

Informs PCIS-DASK library of the trigger source, port width, etc. selected for PCI7300A Rev.B/cPCI7300A Rev.B card with card ID *CardNumber*. You must call this function before calling function to perform continuous digital output operation.

@ Cards Support

7300A Rev.B

@ Syntax

Microsoft C/C++ and Borland C++

I16 DO_7300B_Config (U16 CardNumber, U16 PortWidth, U16 TrigSource, U16 WaitStatus, U16 Terminator, U16 O_Cntrl_Pol, U32 FifoThreshold)

Visual Basic

DO_7300B_Config (ByVal CardNumber As Integer, ByVal PortWidth As Integer, ByVal TrigSource As Integer, ByVal WaitStatus As Integer, ByVal Terminator As Integer, ByVal O_Cntrl_Pol As Integer, ByVal FifoThreshold As Long) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.

PortWidth : The width of digital output port (PORT B). The valid value is 0, 8, 16, or 32.

TrigSource : The trigger mode for continuous digital output.
Valid values:
TRIG_INT_PACER: on-board programmable pacer timer1
TRIG_CLK_10MHz: 10MHz clock
TRIG_CLK_20MHz: 20MHz clock
TRIG_HANDSHAKE: handshaking mode
TRIG_DO_CLK_TIMER_ACK: burst handshaking mode by using timer1 output as output clock
TRIG_DO_CLK_10M_ACK: burst handshaking mode by using 10MHz clock as output clock
TRIG_DO_CLK_20M_ACK: burst handshaking mode by using 20MHz clock as output clock

WaitStatus : DO Wait Status, the valid values are:
P7300_WAIT_NO:digital output starts immediately
P7300_WAIT_TRG: digital output waits rising or falling edge of O_TRG to start
P7300_WAIT_FIFO: delay output data until FIFO is not almost empty
P7300_WAIT_BOTH: delay output data until O_TRG active and FIFO is not almost empty

Terminator : PortB Terminator On/Off, the valid values are:
P7300_TERM_ON: terminator on
P7300_TERM_OFF:terminator off

O_Cntrl_Pol : The polarity configuration. This argument is an integer expression formed from one or more of the manifest constants defined in DASK.H. There are three groups of constants:

(1) DOREQ
P7300_DOREQ_POS: DOREQ signal is rising edge active
P7300_DOREQ_NEG: DOREQ signal is falling edge active

(2) DOACK
P7300_DOACK_POS: DOACK signal is rising edge active
P7300_DOACK_NEG: DOACK signal is falling edge active

(3) DOTRIG
P7300_DOTRIG_POS: DOTRIG signal is rising edge active
P7300_DOTRIG_NEG: DOTRIG signal is falling edge active

FifoThreshold :programmable almost empty threshold of both PORTB FIFO and PORTA FIFO (if output port width is 32).

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport

2.2.72 DO_AsyncCheck

@ Description

Check the current status of the asynchronous digital output operation.

@ Cards Support

7200, 7300A

@ Syntax

Microsoft C/C++ and Borland C++

I16 DO_AsyncCheck (U16 CardNumber, BOOLEAN *Stopped, U32 *AccessCnt)

Visual Basic

DO_AsyncCheck (ByVal CardNumber As Integer, Stopped As Byte, AccessCnt As Long) As Integer

@ Parameter

CardNumber : The card id of the card that performs the asynchronous operation.

Stopped : Whether the asynchronous digital output operation has completed. If *Stopped* = TRUE, the digital output operation has stopped. Either the number of digital output indicated in the call that initiated the asynchronous digital output operation has completed or an error has occurred. If *Stopped* = FALSE, the operation is not yet complete. (constants TRUE and FALSE are defined in DASK.H)

AccessCnt : The number of digital output data that has been written at the time the call to **`DO_AsyncCheck()`**.

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport

2.2.73 DO_AsyncClear

@ Description

Stop the asynchronous digital output operation.

@ Cards Support

7200, 7300A

@ Syntax

Microsoft C/C++ and Borland C++

I16 DO_AsyncClear (U16 CardNumber, U32 *AccessCnt)

Visual Basic

DO_AsyncClear (ByVal CardNumber As Integer, AccessCnt As Long) As Integer

@ Parameter

CardNumber : The card id of the card that performs the asynchronous operation.

AccessCnt : The number of digital output data that has been transferred at the time the call to **`DO_AsyncClear()`**.

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport

2.2.74 DO_AsyncMultiBufferNextReady

@ Description

Checks whether the next buffer is ready for new data during an asynchronous multi-buffered digital output operation. The returned *BufferId* is the index of the most recently available (newest available) buffer.

@ Cards Support

7300A

@ Syntax

Microsoft C/C++ and Borland C++

```
I16 DO_AsyncMultiBufferNextReady (U16 CardNumber, BOOLEAN *bNextReady,
        U16 *wBufferId)
```

Visual Basic

```
DO_AsyncMultiBufferNextReady (ByVal CardNumber As Integer, NextReady As
        Byte, BufferId As Integer) As Integer
```

@ Parameter

CardNumber : The card id of the card that performs the asynchronous multi-buffered operation.
NextReady : Whether the next buffer is ready for new data.
BufferId : Returns the index of the ready buffer.

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport

2.2.75 DO_ContMultiBufferSetup

@ Description

This function set up the buffer for multi-buffered digital output. The function has to be called repeatedly to setup all of the data buffers (at most 8 buffers).

@ Cards Support

7300A

@ Syntax

Microsoft C/C++ and Borland C++

```
I16 DO_ContMultiBufferSetup (U16 CardNumber, void *pwBuffer, U32
        dwWriteCount, U16 *BufferId)
```

Visual Basic

```
DO_ContMultiBufferSetup (ByVal CardNumber As Integer, Buffer As Any, ByVal
        WriteCount As Long, BufferId As Integer) As Integer
```

@ Parameter

CardNumber : The card id of the card that want to perform this operation.
Buffer : The starting address of the memory to contain the output data.
WriteCount : The size (in samples) of the buffer and its value must be even.
BufferId : Returns the index of the buffer currently set up.

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport, ErrorTransferCountTooLarge , ErrorContIoNotAllowed

2.2.76 DO_ContMultiBufferStart

@ Description

This function starts multi-buffered continuous digital output on the specified digital output port at a rate as close to the rate you specified.

@ Cards Support

7300A Rev.B

@ Syntax

Microsoft C/C++ and Borland C++

I16 DO_ContMultiBufferStart (U16 CardNumber, U16 Port, F64 SampleRate)

Visual Basic

DO_ContMultiBufferStart (ByVal CardNumber As Integer, ByVal Port As Integer, ByVal SampleRate As Double) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.

Port : Digital output port number. For PCI-7300A/cPCI-7300A, this argument must be set to 0.

SampleRate : The sampling rate you want for digital output in hertz (samples per second). Your maximum rate depends on the card type and your computer system. This argument is only useful if the DO trigger mode was set as internal programmable pacer (TRIG_INT_PACER) by calling **`DO_7300B_Config()`**.

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport, ErrorInvalidIoChannel, ErrorContIoNotAllowed

2.2.77 DO_ContStatus

@ Description

While performing continuous DO conversions, this function is called to get the DO status. Please refer to the manual for your device for the DO status the device might meet.

@ Cards Support

7200, 7300A

@ Syntax

Microsoft C/C++ and Borland C++

I16 DO_ContStatus (U16 CardNumber, U16 *Status)

Visual Basic

DO_ContStatus (ByVal CardNumber As Integer, Status Integer) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.

Status : The continuous DO status returned. The description of the parameter *Status* for various card types is the following:

PCI7200 :

bit 0 : '1' indicates D/I FIFO is Full (Over-Run)
bit 1 : '1' indicates D/O FIFO is Empty (Under-Run)
bit 2 ~ 15 : not used

PCI7300A_RevA:

bit 0 : '1' indicates DO FIFO is empty during data output and some output data were written twice. Writes' 1' to clear this bit
bit 1 : '1' indicates DO FIFO is full
bit 2 : '1' indicates DO FIFO is empty
bit 3 ~ 15 : not used

PCI7300A_RevB:
bit 0 : '1' indicates DO FIFO is empty during data output and some output data were written twice. Writes' 1' to clear this bit
bit 1 : '1' indicates DO FIFO is full
bit 2 : '1' indicates DO FIFO is empty
bit 3 ~ 15 : not used

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered

2.2.78 DO_ContWritePort

@ Description

This function performs continuous digital output on the specified digital output port at a rate as close to the rate you specified.

@ Cards Support

7200, 7300A

@ Syntax

Microsoft C/C++ and Borland C++

I16 DO_ContWritePort (U16 CardNumber, U16 Port, void *Buffer, U32 WriteCount, U16 Iterations, F32 SampleRate, U16 SyncMode)

Visual Basic

DO_ContWritePort (ByVal CardNumber As Integer, ByVal Port As Integer, Buffer As Any, ByVal WriteCount As Long, ByVal Iterations As Integer, ByVal SampleRate As Single, ByVal SyncMode As Integer) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.
Port : Digital output port number. For PCI-7200/cPCI-7200 and PCI-7300A/cPCI-7300A, this argument must be set to 0.
Buffer : The starting address of the memory containing the output data. This memory must have been allocated for enough space to store output data.
WriteCount : the number of output operation to be performed.
Iterations : the number of times the data in *Buffer* to output to the Port. A value of 0 means that digital output operation proceeds indefinitely. If the digital output operation is performed **synchronously**, this argument must be set as **1**.
SampleRate : The sampling rate you want for digital output in hertz (samples per second). Your maximum rate depends on the card type and your computer system. This argument is only useful if the DO trigger mode was set as internal programmable pacer (TRIG_INT_PACER and TRIG_DO_CLK_TIMER_ACK) by calling **`DO_7200_Config()`** or

DO_7300_Config(). For the other settings, you have to set this argument as CLKSRC_EXT_SampRate.

SyncMode : Whether this operation is performed synchronously or asynchronously.
Valid values:
SYNCH_OP: synchronous digital input, that is, the function does not return until the digital input operation complete.
ASYNCH_OP: asynchronous digital input operation

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport, ErrorInvalidIoChannel, ErrorTransferCountTooLarge , ErrorContIoNotAllowed

2.2.79 DO_InitialMemoryAllocated

@ Description

This function returns the available memory size for continuous digital output in the device driver of this card. The continuous digital output transfer size can not exceed this size.

@ Cards Support

7200, 7300A

@ Syntax

Microsoft C/C++ and Borland C++

I16 DO_InitialMemoryAllocated (U16 CardNumber, U32 *MemSize)

Visual Basic

DO_InitialMemoryAllocated (ByVal CardNumber As Integer, MemSize As Long) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.
MemSize : The available memory size in device driver of this card.
The unit is KB (1024 bytes).

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered

2.2.80 DO_PGStart

@ Description

This function performs pattern generation for digital output with the data stored in Buffer at a rate as close to the rate you specified.

@ Cards Support

7300A

@ Syntax

Microsoft C/C++ and Borland C++

I16 DO_PGStart (U16 CardNumber, void *Buffer, U32 WriteCount, F64 SampleRate)

Visual Basic

DO_PGStart (ByVal CardNumber As Integer, Buffer As Any, ByVal WriteCount As Long, ByVal SampleRate As Double) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.

Buffer : The starting address of the memory containing the output data of pattern generation. This memory must have been allocated for enough space to store output data.

WriteCount : the number of pattern generation output samples.

SampleRate : The sampling rate you want for digital output in hertz (samples per second). Your maximum rate depends on the card type and your computer system. This argument is only useful if the DO trigger mode was set as internal programmable pacer (TRIG_INT_PACER) by calling **`DO_7300_Config()`**.

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport, ErrorTransferCountTooLarge

2.2.81 DO_PGStop

@ Description

This function stops pattern generation for digital output operation.

@ Cards Support

7300A

@ Syntax

Microsoft C/C++ and Borland C++

I16 DO_PGStop (U16 CardNumber)

Visual Basic

DO_PGStop (ByVal CardNumber As Integer) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport

2.2.82 DO_ReadLine

@ Description

Read back the digital logic state of the specified digital output line in the specified port.

@ Cards Support

6208, 6308, 7200, 7248, c7249R, 7296, 7300A, 7396, 7250/51, 7252, 7256, 7258, 9116, 9118

@ Syntax

Microsoft C/C++ and Borland C++

I16 DO_ReadLine (U16 CardNumber, U16 Port, U16 Line, U16 *State)

Visual Basic

DO_ReadLine (ByVal CardNumber As Integer, ByVal Port As Integer, ByVal Line As Integer, State As Integer) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.

Port : Digital output port number. The valid value:
PCI-6208V/16V/08A: 0
PCI-6308V/08A: 0
PCI-7200: 0
cPCI-7200: 0, 1 (auxiliary output port)
PCI-7250/51: 0 through 3
cPCI-7252: 0
PCI-7256: 0
PCI-7258: 0, 1
cPCI-9116: 0
PCI-9118DG/HG/HR: 0
PCI-7300A/cPCI-7300A: 1 (auxiliary output port)
PCI-7248/96, cPCI-7249R, PCI-7396: refer to the function *DI_ReadLine* section.

Line : The digital line to be accessed. The valid value:
PCI-6208V/16V/08A: 0 through 3
PCI-6308V/08A: 0 through 3
PCI-7200/cPCI-7200: 0 through 31 (for port 0)
0 through 3 (auxiliary output port of cPCI-7200)
PCI-7250/51: 0 through 7
cPCI-7252: 0 through 7
PCI-7256: 0 through 15
PCI-7258: 0 through 15
PCI-7300A/cPCI-7300A: 0 through 3
cPCI-9116: 0 through 7
PCI-9118DG/HG/HR: 0 through 3
PCI-7248/96, cPCI-7249R, PCI-7396: refer to the function *DI_ReadLine* section.

State : Returns the digital logic state, 0 or 1, of the specified line.

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport, ErrorInvalidIoChannel

2.2.83 DO_ReadPort

@ Description

Read back the output digital data from the specified digital output port.

@ Cards Support

6208, 6308, 7200, 7248, c7249R, 7296, 7300A, 7396, 7250/51, 7252, 7256, 7258, 9116, 9118

@ Syntax

Microsoft C/C++ and Borland C++

I16 DO_ReadPort (U16 CardNumber, U16 Port, U32 *Value)

Visual Basic

DI_ReadPort (ByVal CardNumber As Integer, ByVal Port As Integer, Value As Long) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.

Port : Digital output port number. The valid value:
PCI-6208V/16V/08A: 0
PCI-6308V/08A: 0
PCI-7200: 0
cPCI-7200: 0, 1 (auxiliary output port)
PCI-7250/51: 0 through 3
cPCI-7252: 0
PCI-7256: 0
PCI-7258: 0, 1
PCI-9118DG/HG/HR: 0
cPCI-9116: 0
PCI-7300A/cPCI-7300A: 1 (auxiliary output port)
PCI-7248/96, cPCI-7249R, PCI-7396: refer to the function *DI_ReadPort* section.

Value : Returns the digital data read from the specified output port.
PCI-6208V/16V/08A: 4-bit data
PCI-6308V/08A: 4-bit data
PCI-7200/cPCI-7200: 32-bit data (for port 0)
4-bit data (for auxiliary output port of cPCI-7200)
PCI-7250/51: 8-bit data
cPCI-7252: 8-bit data
PCI-7256: 16-bit data
PCI-7258: 16-bit data
PCI-7300A/cPCI-7300A: 4-bit data
cPCI-9116: 8-bit data
PCI-9118DG/HG/HR: 4-bit data
PCI-7248/96, cPCI-7249R, PCI-7396: refer to the function *DI_ReadPort* section.

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport, ErrorInvalidIoChannel

2.2.84 DO_WriteExtTrigLine

@ Description

Sets the digital output trigger line to the specified state. This function is only available for PCI-7200.

@ Cards Support

7200

@ Syntax

Microsoft C/C++ and Borland C++

I16 DO_WriteExtTrigLine (U16 CardNumber, U16 Value)

Visual Basic

DO_WriteExtTrigLine(ByVal CardNumber As Integer, ByVal Value As Integer) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.
Value : The new digital logic state, 0 or 1.

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport

2.2.85 DO_WriteLine

@ Description

Sets the specified digital output line in the specified digital port to the specified state. This function is only available for these cards that support digital output read-back functionality.

@ Cards Support

6208, 6308, 7200, 7248, c7249R, 7296, 7300A, 7396, 7250/51, 7252, 7256, 7258, 9116, 9118

@ Syntax

Microsoft C/C++ and Borland C++

I16 DO_WriteLine (U16 CardNumber, U16 Port, U16 Line, U16 State)

Visual Basic

DO_WriteLine(ByVal CardNumber As Integer, ByVal Port As Integer, ByVal DoLine As Integer, ByVal State As Integer) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.
Port : Digital output port number. The valid value:
PCI-6208V/16V/08A: 0
PCI-6308V/08A: 0
PCI-7200: 0
cPCI-7200: 0, 1 (auxiliary output port)
PCI-7250/51: 0 through 3
cPCI-7252: 0
PCI-7256: 0
PCI-7258: 0, 1
PCI-9118DG/HG/HR: 0
cPCI-9116: 0
PCI-7300A/cPCI-7300A: 1 (auxiliary output port)
PCI-7248/96, cPCI-7249R, PCI-7396: refer to the function *DI_ReadLine* section.
Line : The digital line to write to. The valid value:
PCI-6208V/16V/08A: 0 through 3
PCI-6308V/08A: 0 through 3
PCI-7200/cPCI-7200: 0 through 31(for port 0)
: 0 through 3 (auxiliary output port of cPCI-7200)
PCI-7250/51: 0 through 7
cPCI-7252: 0 through 7
PCI-7256: 0 through 15

PCI-7258: 0 through 15
PCI-7300A/cPCI-7300A: 0 through 3
PCI-9118DG/HG/HR: 0 through 3
cPCI-9116: 0 through 7
PCI-7248/96, cPCI-7249R, PCI-7396: refer to the function *DI_ReadLine* section.

State : The new digital logic state, 0 or 1.

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport, ErrorInvalidIoChannel

2.2.86 DO_WritePort

@ Description

Writes digital data to the specified digital output port.

@ Cards Support

6208V/16V/08A, 6308V/08A, 7200, 7230, 7234, 7248, 7249, 7250/51, 7252, 7256, 7258, 7296, 7300A, 7349, 7432, 7433, 7434, 8554, 9111, 9112, 9116, 9118

@ Syntax

Microsoft C/C++ and Borland C++

```
I16 DO_WritePort (U16 CardNumber, U16 Port, U32 Value)
```

Visual Basic

```
DO_WritePort (ByVal CardNumber As Integer, ByVal Port As Integer, ByVal Value
        As Long) As Integer
```

@ Parameter

CardNumber : The card id of the card that want to perform this operation.

Port : Digital output port number. The cards that support this function and their corresponding valid value are as follows:
PCI-6208V/16V/08A: 0
PCI-6308V/08A: 0
PCI-7200: 0
cPCI-7200: 0, 1 (auxiliary digital output port)
PCI-7230/cPCI-7230: 0
PCI-7234: 0
PCI-7248/cPCI-7248:
Channel_P1A, Channel_P1B,
Channel_P1C, Channel_P1CL,
Channel_P1CH, Channel_P2A,
Channel_P2B, Channel_P2C,
Channel_P2CL, Channel_P2CH
cPCI-7249R:
Channel_P1A, Channel_P1B,
Channel_P1C, Channel_P1CL,
Channel_P1CH, Channel_P2A,
Channel_P2B, Channel_P2C,
Channel_P2CL, Channel_P2CH
PCI-7250/51: 0 through 3

cPCI-7252: 0
PCI-7256: 0
PCI-7258: 0, 1
PCI-7296:
Channel_P1A, Channel_P1B,
Channel_P1C, Channel_P1CL,
Channel_P1CH, Channel_P2A,
Channel_P2B, Channel_P2C,
Channel_P2CL, Channel_P2CH,
Channel_P3A, Channel_P3B,
Channel_P3C, Channel_P3CL,
Channel_P3CH, Channel_P4A,
Channel_P4B, Channel_P4C,
Channel_P4CL, Channel_P4CH
PCI-7300A/cPCI-7300A: 1 (auxiliary digital output port)
PCI-7396:
Channel_P1A, Channel_P1B,
Channel_P1C, Channel_P1,
Channel_P2A, Channel_P2B,
Channel_P2C, Channel_P2
Channel_P3A, Channel_P3B,
Channel_P3C, Channel_P3,
Channel_P4A, Channel_P4B,
Channel_P4C, Channel_P4
PCI-7432/cPCI-7432: 0
cPCI-7432R: 0, P7432R_DO_LED
cPCI-7433R: P7433R_DO_LED
PCI-7434/cPCI-7434: PORT_DO_LOW, PORT_DO_HIGH
cPCI-7434R: PORT_DO_LOW, PORT_DO_HIGH, P7434R_DO_LED
PCI-8554: 0
PCI-9111: P9111_CHANNEL_DO, P9111_CHANNEL_EDO
PCI-9112/cPCI-9112: 0
cPCI-9116: 0
PCI-9118: 0
PCI-9114: 0

Note: The value, Channel_P*n*, for argument *Port* is defined as all of the ports (Port A, B and C) in channel *n*.

Value : Digital data that is written to the specified port.
PCI-6208V/16V/08A: 4-bit data
PCI-6308V/08A: 4-bit data
PCI-7200/cPCI-7200: 32-bit data (for port 0)
4-bit data (for auxiliary output port of cPCI-7200)
PCI-7230/cPCI-7230: 16-bit data
PCI-7234: 32-bit data
PCI-7248/cPCI-7248: 8-bit data
cPCI-7249R: 8-bit data
PCI-7250/51: 8-bit data
cPCI-7252: 8-bit data
PCI-7256: 16-bit data

PCI-7258: 16-bit data
PCI-7296: 8-bit data
PCI-7300A/cPCI-7300A: 4-bit data
PCI-7396: 24-bit data (for Channel_P*n*T, where *n* is the channel number) or
8-bit data (for Channel_P*n*A, Channel_P*n*B, Channel_P*n*C , where *n* is the channel number)
PCI-7432/cPCI-7432/cPCI-7432R: 32-bit data
cPCI-7433R: 32-bit data
PCI-7434/cPCI-7434/cPCI-7434R: 32-bit data
PCI-8554: 8-bit data
PCI-9111: 16-bit data (for P9111_CHANNEL_DO) or
4-bit data (for P9111_CHANNEL_EDO)
PCI-9112/cPCI-9112: 16-bit data
PCI-9114: 16-bit data
cPCI-9116: 8-bit data
PCI-9118: 4-bit data

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered
ErrorFuncNotSupport, ErrorInvalidIoChannel

2.2.87 EDO_9111_Config

@ Description

Informs PCIS-DASK library of the mode of EDO channels for the PCI-9111 card with card ID *CardNumber*.

@ Cards Support

9111

@ Syntax

Microsoft C/C++ and Borland C++

I16 EDO_9111_Config (U16 CardNumber, U16 EDO_Fun)

Visual Basic

EDO_9111_Config (ByVal CardNumber As Integer, ByVal EDO_Fun As Integer) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.
EDO_Fun: The mode of EDO ports. The valid modes are:
P9111_EDO_INPUT: EDO channels are used as input channels
P9111_EDO_OUT_EDO: EDO channels are used as output channels
P9111_EDO_OUT_CHN: EDO channels are used as channel number output

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport

2.2.88 GCTR_Read

@ Description

Reads the counter value of the general-purpose counter without disturbing the counting process.

@ Cards Support

9116

@ Syntax

Microsoft C/C++ and Borland C++

I16 GCTR_Read (U16 CardNumber, U16 GCtr, U32 *Value)

Visual Basic

GCTR_Read (ByVal CardNumber As Integer, ByVal GCtr As Integer, Value As Long) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.
GCtr : The counter number.
Range: 0 for PCI-9116
Value : Returns the counter value of the specified general-purpose timer/counter.
Range: 0 through 65536

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport, InvalidCounter

2.2.89 GCTR_Clear

@ Description

Turns off the specified general-purpose timer/counter operation and reset the counter value to zero.

@ Cards Support

9116

@ Syntax

Microsoft C/C++ and Borland C++

I16 GCTR_Clear (U16 CardNumber, U16 GCtr)

Visual Basic

GCTR_Clear (ByVal CardNumber As Integer, ByVal GCtr As Integer) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.
GCtr : The counter number.
Range: 0 for PCI-9116

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport, InvalidCounter

2.2.90 GCTR_Setup

@ Description

Controls the operation of the selected counter/timer.

@ Cards Support

9116

@ Syntax

Microsoft C/C++ and Borland C++

I16 GCTR_Setup (U16 CardNumber, U16 GCtr, U16 GCtrCtrl, U32 Count)

Visual Basic

GCTR_Setup (ByVal CardNumber As Integer, ByVal GCtr As Integer, ByVal GCtrCtrl As Integer, ByVal Count As Long) As Integer

@ Parameter

CardNumber : The card id of the card that want to perform this operation.

GCtr : The counter number.
Range: 0 for cPCI-9116.

GCtrCtrl : The setting for general-purpose timer/counter control. This argument is an integer expression formed from one or more of the manifest constants defined in DASK.H. There are four groups of constants:

(1) **Timer/Counter Mode**
- General_Counter: General counter
- Pulse_Generation: Generation of pulse

(2) **Timer/Counter Source**
- GPTC_CLKSRC_INT : internal time base
- GPTC_CLKSRC_EXT : external time base from GP_TC_CLK pin

(3) **Timer/Counter Gate Source**
- GPTC_GATESRC_INT : gate is controlled by software
- GPTC_GATESRC_EXT: gate is controlled by GP_TC_GATE pin

(4) **Timer/Counter UpDown Source**
- GPTC_UPDOWN_SELECT_SOFT: Up/Down controlled by software
- GPTC_UPDOWN_SELECT_EXT : Up/Down controlled by GP_TC_UPDN pin

(5) **Timer/Counter UpDown Control**
- GPTC_DOWN_CTR: counting direction is down
- GPTC_UP_CTR: counting direction is up

(6) **Timer/Counter Enable**
- GPTC_ENABLE: general-purpose counter/timer enabled
- GPTC_DISABLE: general-purpose counter/timer disabled

When two or more constants are used to form the *GCtrCtrl* argument, the constants are combined with the bitwise-OR operator(|).

Count : The counter value of general-purpose timer/counter

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport, InvalidCounter

2.2.91 GetActualRate

@ Description

Gets the actual sampling rate the hardware will perform according to the board type and the rate you want.

@ Cards Support

7200, 7300A, 9111, 9112, 9113, 9114, 9118, 9812/10

@ Syntax

Microsoft C/C++ and Borland C++

```
I16 GetActualRate (U16 CardNumber, F64 SampleRate, F64 *ActualRate)
```

Visual Basic

```
GetActualRate (ByVal CardNumber As Integer, ByVal SampleRate As Double,
        ActualRate As Double) As Integer
```

@ Parameter

CardNumber : The card id of the card that wants to perform this operation.
SampleRate: The desired sampling rate.
ActualRate: Returns the actual acquisition rate performed. The value depends on the card type and the desired sampling rate.

@ Return Code

NoError, ErrorInvalidCardNumber, ErrorCardNotRegistered, ErrorFuncNotSupport

2.2.92 Register_Card

@ Description

Initializes the hardware and software states of a NuDAQ PCI-bus data acquisition card, and then returns a numeric card ID that corresponds to the card initialized. Register_Card must be called before any other PCIS-DASK library functions can be called for that card. The function initializes the card and variables internal to PCIS-DASK library. Because NuDAQ PCI-bus data acquisition cards meets the plug-and-play design, the base address (pass-through address) and IRQ level are assigned by system BIOS directly.

@ Cards Support

6208V/6216V, 6208A, 6308V, 6308A, 7200, 7230, 7233, 7234, 7248, 7249, 7250, 7252, 7256, 7258, 7296, 7300A, 7396, 7432, 7433, 7434, 8554, 9111, 9112, 9113, 9114, 9116, 9118, 9812/10

@ Syntax

Microsoft C/C++ and Borland C++

```
I16 Register_Card (U16 CardType, U16 card_num)
```

Visual Basic

```
Register_Card (ByVal CardType As Integer, ByVal card_num As Integer) As Integer
```

@ Parameter

CardType : The type of card to be initialized. ADLink will periodically upgrades PCIS-DASK to add support for new NuDAQ PCI-bus data acquisition cards and NuIPC CompactPCI cards. Please refer to *Release Notes* for the card types that the current release of PCIS-DASK actually supports. Following are the constants defined in DASK.H that represent the NuDAQ PCI-bus data acquisition cards that DASK supports currently or in the near future:

PCI_6208V (for PCI-6208V/6216V)
PCI_6208A
PCI_6308V
PCI_6308A
PCI_7200 (for PCI-7200/cPCI-7200)
PCI_7230 (for PCI-7230/cPCI-7230)
PCI_7233 (for PCI-7233/PCI-7233H)
PCI_7234
PCI_7248 (for PCI-7248/cPCI-7248)
PCI_7249 (for cPCI-7249R)
PCI_7250
PCI_7252 (for cPCI-7252)
PCI_7256
PCI_7258
PCI_7296
PCI_7300A_RevA (for PCI_7300A_RevA/
cPCI_7300A_RevA)
PCI_7300A_RevB (for PCI_7300A_RevB/
cPCI_7300A_RevB)
PCI_7396
PCI_7432 (for PCI-7432/cPCI-7432/cPCI-7432R)
PCI_7433 (for PCI-7433/cPCI-7433/cPCI-7433R)
PCI_7434 (for PCI-7434/cPCI-7434/cPCI-7434R)
PCI_8554
PCI_9111DG
PCI_9111HR
PCI_9112 (for PCI-9112/cPCI-9112)
PCI_9113
PCI_9114DG
PCI_9114HG
PCI_9116 (for cPCI-9116)
PCI_9118DG
PCI_9118HG
PCI_9118HR
PCI_9810 (for PCI-9810)
PCI_9812 (for PCI-9812)

card_num : The sequence number of the card with ***the same card type*** (as defined in argument *CardType*) or belonging to ***the same card type series*** (Except PCI-7300A_RevA and PCI-7300A_RevB) plugged in the PCI slot. The card sequence number setting is according to the PCI slot sequence in the mainboard. The first card (in the most prior slot) is with card_num=0. For example, if there are one PCI-9111DG card (in the first PCI slot) and one PCI-9111HR card and two PCI-9112 cards plugged on your PC, the PCI-9111DG card should be registered with card_num=0, and the PCI-9111HR card with card_num=1. The PCI-9112 card in the prior slot should be registered with card_num=0, and the other one with card_num=1.

The following table categories the NuDAQ PCI devices by card type series.

Card Type Series	Device Type
PCI-6208 Series	PCI-6208V, PCI-6216V, PCI-6208A
PCI-6308 Series	PCI-6308V, PCI_6308A
PCI-7200/cPCI-7200	PCI-7200/cPCI-7200
PCI-7230/cPCI-7230	PCI-7230/cPCI-7230
PCI-7233	PCI-7233, PCI-7233H
PCI-7234	PCI-7234
PCI-7248/cPCI-7248	PCI-7248/cPCI-7248
PCI-7249	cPCI-7249R
PCI-7250	PCI-7250
PCI-7252	cPCI-7252
PCI-7256	PCI-7256
PCI-7258	PCI-7258
PCI-7296	PCI-7296
PCI_7300A_RevA/ cPCI-7300A_RevA	PCI-7300A_RevA/cPCI-7300A_RevA
PCI_7300A_RevB/ cPCI-7300A_RevB	PCI-7300A_RevB/cPCI-7300A_RevB
PCI-7396	PCI-7396
PCI-7432/cPCI-7432 series	PCI-7432/cPCI-7432/cPCI-7432R
PCI-7433/cPCI-7433 series	PCI-7433/cPCI-7433/cPCI-7433R
PCI-7434/cPCI-7434 series	PCI-7434/cPCI-7434/cPCI-7434R
PCI-8554	PCI-8554
PCI-9111 Series	PCI-9111DG, PCI-9111HR
PCI-9112/cPCI-9112	PCI-9112/cPCI-9112
PCI-9113	PCI-9113
PCI-9114 Series	PCI-9114DG, PCI-9114HG
PCI-9116	cPCI-9116
PCI-9118 Series	PCI-9118DG, PCI-9118HG, PCI-9118HR
PCI-9812 Series	PCI-9812, PCI-9810

@ Return Code

This function returns a numeric card id for the card initialized. The range of card id is between 0 and 31. If there is any error occurs, it will return negative error code, the possible error codes are listed below:
ErrorTooManyCardRegistered, ErrorUnknownCardType, ErrorOpenDriverFailed, ErrorOpenEventFailed

2.2.93 Release_Card

@ Description

There are at most 32 cards that can be registered simultaneously. This function is used to tell PCIS-DASK library that this registered card is not used currently and can be released. This would make room for new card to register. Also by the end of a program, you need to use this function to release all cards that were registered.

@ Cards Support

6208V/6216V, 6208A, 6308V, 6308A, 7200, 7230, 7233, 7234, 7248, 7249, 7250/51, 7252, 7256, 7258, 7296, 7300A, 7396, 7432, 7433, 7434, 8554, 9111, 9112, 9113, 9114, 9116, 9118, 9812/10

@ Syntax

Microsoft C/C++ and Borland C++

I16 Release_Card (U16 CardNumber)

Visual Basic

Release_Card (ByVal CardNumber As Integer) As Integer

@ Parameter

CardNumber : The card id of the card that want to be released.

@ Return Code

NoError

Appendix A Status Codes

This appendix lists the status codes returned by PCIS-DASK, including the name and description.

Each PCIS-DASK function returns a status code that indicates whether the function was performed successfully. When a PCIS-DASK function returns a negative number, it means that an error occurred while executing the function.

Status Code	Status Name	Description
0	NoError	No error occurred
-1	ErrorUnknownCardType	The C*ardType* argument is not valid
-2	ErrorInvalidCardNumber	The CardNumber argument is out of range (larger than 31).
-3	ErrorTooManyCardRegistered	There have been 32 cards that were registered.
-4	ErrorCardNotRegistered	No card registered as id *CardNumber*.
-5	ErrorFuncNotSupport	The function called is not supported by this type of card..
-6	ErrorInvalidIoChannel	The specified *Channel* or *Port* argument is out of range..
-7	ErrorInvalidAdRange	The specified analog input range is invalid.
-8	ErrorContIoNotAllowed	The specified continuous IO operation is not supported by this type of card.
-9	ErrorDiffRangeNotSupport	All the analog input ranges must be the same for multi-channel analog input.
-10	ErrorLastChannelNotZero	The channels for multi-channel analog input must be ended with or started from zero.
-11	ErrorChannelNotDescending	The channels for multi-channel analog input must be contiguous and in descending order.
-12	ErrorChannelNotAscending	The channels for multi-channel analog input must be contiguous and in ascending order.
-13	ErrorOpenDriverFailed	Failed to open the device driver.
-14	ErrorOpenEventFailed	Open event failed in device driver.
-15	ErrorTransferCountTooLarge	The size of transfer is larger than the size of Initially allocated memory in driver.
-16	ErrorNotDoubleBufferMode	Double buffer mode is disabled.
-17	ErrorInvalidSampleRate	The specified sampling rate is out of range.
-18	ErrorInvalidCounterMode	The value of the *Mode* argument is invalid.
-19	ErrorInvalidCounter	The value of the *Ctr* argument is out of range.
-20	ErrorInvalidCounterState	The value of the *State* argument is out of range.

-21	ErrorInvalidBinBcdParam	The value of the *BinBcd* argument is invalid.
-22	ErrorBadCardType	The value of Card Type argument is invalid
-23	ErrorInvalidDaRefVoltage	The value of DA reference voltage argument is invalid
-24	ErrorAdTimeOut	Time out for AD operation
-25	ErrorNoAsyncAI	Continuous Analog Input is not set as Asynchronous mode
-26	ErrorNoAsyncAO	Continuous Analog Output is not set as Asynchronous mode
-27	ErrorNoAsyncDI	Continuous Digital Input is not set as Asynchronous mode
-28	ErrorNoAsyncDO	Continuous Digital Output is not set as Asynchronous mode
-29	ErrorNotInputPort	The value of AI/DI port argument is invalid
-30	ErrorNotOutputPort	The value of AO/DO argument is invalid
-31	ErrorInvalidDioPort	The value of DI/O port argument is invalid
-32	ErrorInvalidDioLine	The value of DI/O line argument is invalid
-33	ErrorContIoActive	Continuous IO operation is not active
-34	ErrorDblBufModeNotAllowed	Double Buffer mode is not allowed
-35	ErrorConfigFailed	The specified function configuration is failed
-36	ErrorInvalidPortDirection	The value of DIO port direction argument is invalid
-37	ErrorBeginThreadError	Failed to create thread
-38	ErrorInvalidPortWidth	The port width setting for PCI-7300A/cPCI-7300A is not allowed
-39	ErrorInvalidCtrSource	The clock source setting is invalid
-40	ErrorOpenFile	Failed to Open file
-41	ErrorAllocateMemory	The memory allocation is failed
-42	ErrorDaVoltageOutOfRange	The value of DA voltage argument is out of range
-201	ErrorConfigIoctl	The configuration API is failed
-202	ErrorAsyncSetIoctl	The async. mode API is failed
-203	ErrorDBSetIoctl	The double-buffer setting API is failed
-204	ErrorDBHalfReadyIoctl	The half-ready API is failed
-205	ErrorContOPIoctl	The continuous data acquisition API is failed
-206	ErrorContStatusIoctl	The continuous data acquisition status API setting is failed
-207	ErrorPIOIoctl	The polling data API is failed
-208	ErrorDIntSetIoctl	The dual interrupt setting API is failed
-209	ErrorWaitEvtIoctl	The wait event API is failed
-210	ErrorOpenEvtIoctl	The open event API is failed
-211	ErrorCOSIntSetIoctl	The cos interrupt setting API is failed
-212	ErrorMemMapIoctl	The memory mapping API is failed
-213	ErrorMemUMapSetIoctl	The memory Unmapping API is failed
-214	ErrorCTRIoctl	The counter API is failed

Appendix B AI Range Codes

The ***Analog Input Range*** of NuDAQ PCI-bus Cards

AD_B_10_V	Bipolar -10V to +10V
AD_B_5_V	Bipolar -5V to +5V
AD_B_2_5_V	Bipolar -2.5V to +2.5V
AD_B_1_25_V	Bipolar -1.25V to +1.25V
AD_B_0_625_V	Bipolar -0.625V to +0.625V
AD_B_0_3125_V	Bipolar -0.3125V to +0.3125V
AD_B_0_5_V	Bipolar -0.5V to +0.5V
AD_B_0_05_V	Bipolar -0.05V to +0.05V
AD_B_0_005_V	Bipolar -0.005V to +0.005V
AD_B_1_V	Bipolar -1V to +1V
AD_B_0_1_V	Bipolar -0.1V to +0.1V
AD_B_0_01_V	Bipolar -0.01V to +0.01V
AD_B_0_001_V	Bipolar -0.01V to +0.001V
AD_U_20_V	Unipolar 0 to +20V
AD_U_10_V	Unipolar 0 to +10V
AD_U_5_V	Unipolar 0 to +5V
AD_U_2_5_V	Unipolar 0 to +2.5V
AD_U_1_25_V	Unipolar 0 to +1.25V
AD_U_1_V	Unipolar 0 to +1V
AD_U_0_1_V	Unipolar 0 to +0.1V
AD_U_0_01_V	Unipolar 0 to +0.01V
AD_U_0_001_V	Unipolar 0 to +0.001V

Valid values for each card:

PCI-9111 DG/HR : AD_B_10_V, AD_B_5_V, AD_B_2_5_V, AD_B_1_25_V, AD_B_0_625_V

PCI-9112/cPCI-9112 : AD_B_10_V, AD_B_5_V, AD_B_2_5_V, AD_B_1_25_V, AD_B_0_625_V, AD_U_10_V, AD_U_5_V, AD_U_2_5_V, AD_U_1_25_V

PCI-9113 : AD_B_10_V, AD_B_1_V, AD_B_0_1_V, AD_B_5_V, AD_B_0_5_V, AD_B_0_05_V, AD_U_10_V, AD_U_1_V, AD_U_0_1_V

PCI-9114 HG : AD_B_10_V, AD_B_1_V, AD_B_0_1_V, AD_B_0_01_V

PCI-9114 DG : AD_B_10_V, AD_B_5_V, AD_B_2_5_V, AD_B_1_25_V

cPCI-9116 : AD_B_5_V, AD_B_2_5_V, AD_B_1_25_V, AD_B_0_625_V, AD_U_10_V, AD_U_5_V, AD_U_2_5_V, AD_U_1_25_V

PCI-9118 DG/HR : AD_B_5_V, AD_B_2_5_V, AD_B_1_25_V, AD_B_0_625_V,

AD_U_10_V, AD_U_5_V,
AD_U_2_5_V, AD_U_1_25_V

PCI-9118 HG : AD_B_5_V, AD_B_0_5_V,
AD_B_0_05_V, AD_B_0_005_V,
AD_U_10_V, AD_U_1_V,
AD_U_0_1_V, AD_U_0_01_V

PCI-9812/10 : AD_B_1_V, AD_B_5_V

Appendix C AI DATA FORMAT

This appendix lists the AI data format for the cards performing analog input operation, as well as the calculation methods to retrieve the A/D converted data and the channel where the data read from.

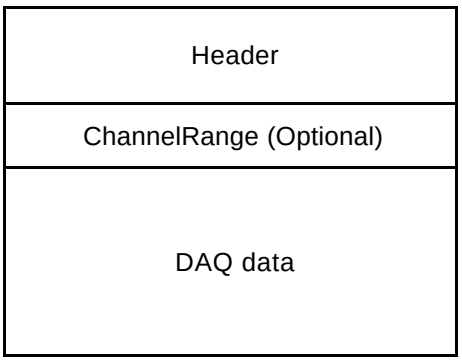
Card Type	**Data Format**	**AI type**	**Value calculation** ** channel no. (CH#)* ** A/D converted data (ND)* ** Value returned from AI function (OD)*
PCI-9111DG	*Every 16-bit signed integer data:* *D11 D10 D9 ..... D1 D0 C3 C2 C1 C0* *where D11, D10, ... , D0 : A/D converted data* *C3, C2, C1, C0 : converted channel no.*	One-Shot AI Continuous AI	CH# = OD & 0x0F ND = OD >>4 or ND = OD/16
PCI-9111HR	*Every 16-bit signed integer data:* *D15 D14 D13 ..... D1 D0* *where D15, D14, ... , D0 : A/D converted data*	One-Shot AI Continuous AI	ND = OD
PCI-9112/cPCI9112	*Every 16-bit unsigned integer data:* *D11 D10 D9 ..... D1 D0 C3 C2 C1 C0* *where D11, D10, ... , D0 : A/D converted data* *C3, C2, C1, C0 : converted channel no.*	One-Shot AI Continuous AI	CH# = OD & 0x0F ND = OD >>4 or ND = OD/16
PCI-9113	*Every 16-bit unsigned integer data (including 12-bit unsigned A/D data):* *B15 …B12 D11 D10 ... D1 D0* *where D11, D10, ... , D0 : A/D converted data* *B15 ~ B12: don' t care*	One-Shot AI	ND = OD & 0x0FFF
PCI-9113	*Every 32-bit unsigned integer data (including 12-bit unsigned A/D data):* *B31 …B21 C4 C3 C2 C1 C0 B15 …B12 D11 D10 ... D1 D0* *where D11, D10, ... , D0 : A/D converted data* *C3, C2, C1, C0 : converted channel no.* *B31 ~ B21 & B15 ~ B12: don' t care*	Continuous AI	CH# = (OD >>16) & 0x1F ND = OD & 0x0FFF
PCI-9114	*Every 16-bit signed integer data:* *D15 D14 ... D1 D0* *where D15, D14, ... , D0 : A/D converted data*	One-Shot AI	ND = OD
PCI-9114	*Every 32-bit unsigned integer data (including 16-bit signed A/D data):* *B31 …B21 C4 C3 C2 C1 C0 D15 D14 ... D1 D0* *where D15, D14, ... , D0 : A/D converted data* *C3, C2, C1, C0 : converted channel no.* *B31 ~ B21: don' t care*	Continuous AI	CH# = (OD >>16) & 0x1F ND = OD & 0xFFFF
cPCI-9116	*Every 16-bit signed integer data:*	One-Shot AI	ND = OD

	D15 D14 D13 ..... D1 D0 *where D15, D14, ... , D0 : A/D converted data*	Continuous AI	
PCI-9118HR	*Every 16-bit signed integer data:* *D15 D14 D13 ..... D1 D0* *where D15, D14, ... , D0 : A/D converted data*	One-Shot AI Continuous AI	ND = OD
PCI-9118DG/HG	*Every 16-bit unsigned integer data:* *D11 D10 D9 ..... D1 D0 C3 C2 C1 C0* *where D11, D10, ... , D0 : A/D converted data* *C3, C2, C1, C0 : converted channel no.*	One-Shot AI Continuous AI	CH# = OD & 0x0F ND = OD >>4 or ND = OD/16
PCI-9812	*Every 16-bit signed integer data:* *D11 D10 D9 ..... D1 D0 b3 b2 b1 b0* *where D11, D10, ... , D0 : A/D converted data* *b2, b1, b0 : Digital Input data.* *b3: trigger detection flag*	Continuous AI	ND = OD >>4 or ND = OD/16
PCI-9810/cPCI9810	*Every 16-bit signed integer data:* *D9 D8 D7 .... D1 D0 b5 b4 b3 b2 b1 b0* *where D9, D8, ... , D0 : A/D converted data* *b2, b1, b0 : Digital Input data.* *b3: trigger detection flag*	Continuous AI	ND = OD >>6 or ND = OD/64

Appendix D DATA File FORMAT

This appendix describes the file format of the data files generated by the functions performing continuous data acquisition followed by storing the data to disk.

The data file includes three parts, Header, ChannelRange (optional) and Data block. The file structure is as the figure below:



Header

The *header* part records the information related to the stored data and its total length is 60 bytes. The data structure of the file header is as follows:

Header			*Total Length: 60 bytes*
Elements	**Type**	**Size (bytes)**	**Comments**
ID	char	10	file ID *ex. ADLinkDAQ1*
card_type	short	2	card Type *ex. Pci7250, Pci9112*
num_of_channel	short	2	number of scanned channels *ex. 1, 2*
channel_no	unsigned char	1	channel number where the data read from (only available as the num_of_channel is 1) *ex. 0, 1*
num_of_scan	long	4	the number of scan for each channel (total count / num_of_channel)
data_width	short	2	the data width 0: 8 bits, 1: 16 bits, 2: 32 bits
channel_order	short	2	the channel scanned sequence 0: normal (ex. 0-1-2-3) 1: reverse (ex. 3-2-1-0) 2: custom* (ex. 0, 1, 3)
ad_range	short	2	the AI range code Please refer to Appexdix B

			ex. 0 (AD_B_5V)
scan_rate	double	8	The scanning rate of each channel (total sampling rate / num_of_channel)
num_of_channel_range	short	2	The number of ChannelRange* structure
start_date	char	8	The starting date of data acquisition *ex. 12/31/99*
start_time	char	8	The starting time of data acquisition *ex. 18:30:25*
start_millisec	char	3	The starting millisecond of data acquisition *ex. 360*
reserved	char	6	not used

* If the *num_of_channel_range* is 0, the *ChannelRange* block won't be included in the data file.
* The *channel_order* is set to "custom" only when the card supports variant channel scanning order.

ChannelRange

The *ChannelRange* part records the channel number and data range information related to the stored data. This part consists of several channel & range units. The length of each unit is 2 bytes. The total length depends on the value of *num_of_channel_range* (one element of the file header) and is calculated as the following formula:

Total Length = *2* * num_of_channel_range bytes

The data structure of each ChannelRange unit is as follows:

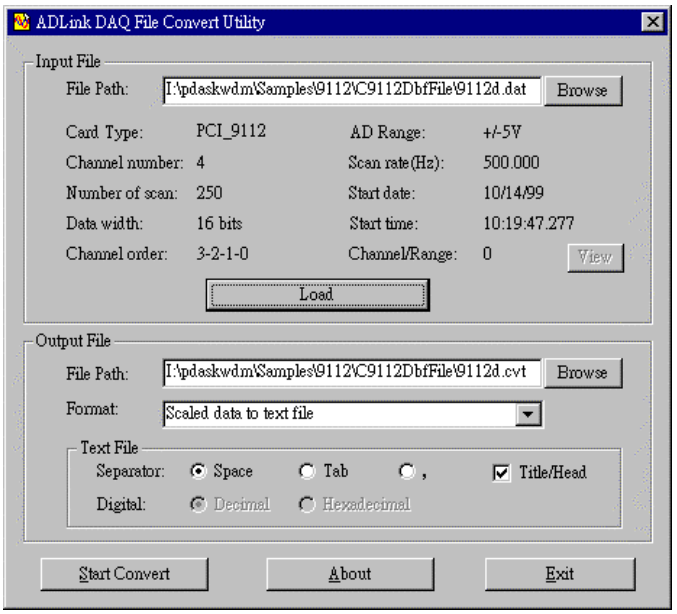
ChannelRange Unit *Length: 2 bytes*			
Elements	**Type**	**Size (bytes)**	**Comments**
channel	char	1	scanned channel number *ex. 0, 1*
range	char	1	the AI range code of *channel* Please refer to Appexdix B *ex. 0 (AD_B_5V)*

Data Block

The last part is the data block. The data is written to file in 16-bit binary format, with the lower byte first (little endian). For example, the value 0x1234 is written to disk with 34 first followed by 12. The total length of the data block depends on the data width and the total data count.

The file is written in Binary format and can't be read in normal text editor. You can use any binary file editor to view it or the functions used for reading files, e.g. fread, to get

the file information and data value. PCIS-DASK provides a useful utility *DAQCvt* for you to convert the binary file. The *DAQCvt* main window is as the figure below:



DAQCvt first translates the information stored in the header part and the ChannelRange part and then displays the corresponding information in the " Input File" frame of DAQCvt main window. After setting the properties (File Path, Format, ..etc) of the converted file and push " *Start Convert*" button in the " Output File" frame, DAQCvt gets rid of header and ChannelRange parts and converts the data in data block according to the card type and the data width. Finally, DAQCvt writes the converted data to disk. You thus can use any text editor or Excel to view or analyze the accessed data.

Appendix E Function Support

This appendix shows which data acquisition hardware each PCIS-DASK function supports.

Function \ Board	PCI-6208A	PCI-6208V\6216V	PCI-6308A	PCI-6308V	PCI-7200	PCI-7230\7258	PCI-7233	PCI-7234	PCI-7250\7251\7252	PCI-7256	PCI-7248\7249\7296	PCI-7396	PCI-7300A RevA	PCI-7300A RevB	PCI-7432	PCI-7433	PCI-7434	PCI-8554	PCI-9111	PCI-9112	PCI-9113	PCI-9114	PCI-9116	PCI-9118	PCI-9812\98110
AI_9111_Config																			●						
AI_9112_Config																				●					
AI_9113_Config																					●				
AI_9114_Config																						●			
AI_9116_Config																							●		
AI_9116_CounterInterval																							●		
AI_9118_Config																								●	
AI_9812_Config																									●
AI_AsyncCheck																			●	●	●	●	●	●	●
AI_AsyncClear																			●	●	●	●	●	●	●
AI_AsyncDblBufferHalfReady																			●	●	●	●	●	●	●
AI_AsyncDblBufferMode																			●	●	●	●	●	●	●
AI_AsyncDblBufferTransfer																			●	●	●	●	●	●	●
AI_ContReadChannel																			●	●	●	●	●	●	●
AI_ContReadMultiChannels																							●	●	
AI_ContScanChannels																			●	●	●	●	●	●	●
AI_ContReadChannelToFile																			●	●	●	●	●	●	●
AI_ContReadMultiChannelsToFile																							●	●	
AI_ContScanChannelsToFile																			●	●	●	●	●	●	●
AI_ContStatus																			●	●	●	●	●	●	●
AI_ContVScale																			●	●	●	●	●	●	●
AI_InitialMemoryAllocated																			●	●	●	●	●	●	●
AI_ReadChannel																			●	●	●	●	●	●	
AI_VReadChannel																			●	●	●	●	●	●	
AI_VScale																			●	●	●	●	●	●	
AO_6208A_Config	●																								
AO_6308A_Config			●																						
AO_6308V_Config			●																						
AO_9111_Config																			●						
AO_9112_Config																				●					
AO_VScale	●	●	●	●															●	●				●	
AO_VWriteChannel	●	●	●	●															●	●				●	
AO_WriteChannel	●	●	●	●															●	●				●	
CTR_8554_CK1_Config																		●							
CTR_8554_ClkSrc_Config																		●							
CTR_8554_Debounce_Config																		●							
CTR_Read											●	●						●	●	●	●	●		●	

Function \ Board	PCI-6208A	PCI-6208V\-62216V	PCI-6308A	PCI-6308V	PCI-7200	PCI-7230\-7258	PCI-7233	PCI-7234	PCI-7250\-7251\-7252	PCI-7256	PCI-7248\-7249\-7296	PCI-7396	PCI-7300A RevA	PCI-7300A RevB	PCI-7432	PCI-7433	PCI-7434	PCI-8554	PCI-9111	PCI-9112	PCI-9113	PCI-9114	PCI-9116	PCI-9118	PCI-98120\-98100
CTR_Reset											●	●						●		●				●	
CTR_Setup											●	●						●		●				●	
DI_7200_Config					●																				
DI_7300A_Config													●												
DI_7300B_Config														●											
DI_AsyncCheck					●								●	●											
DI_AsyncClear					●								●	●											
DI_AsyncDblBufferHalfReady					●																				
DI_AsyncDblBufferMode					●																				
DI_AsyncDblBufferTransfer					●																				
DI_AsyncMultiBufferNextReady													●	●											
DI_ContMultiBufferSetup													●	●											
DI_ContMultiBufferStart													●	●											
DI_ContReadPort					●								●	●											
DI_ContReadPortToFile					●								●	●											
DI_ContStatus					●								●	●											
DI_InitialMemoryAllocated					●								●	●											
DI_ReadLine	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●		●	●	●		●	●	●	
DI_ReadPort	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●		●	●	●		●	●	●	
DIO_7300SetInterrupt													●	●											
DIO_AUXDI_EventMessage													●	●											
DIO_GetCOSLatchData										●															
DIO_INT1_EventMessage						●	●			●	●	●			●	●									
DIO_INT2_EventMessage						●	●				●	●			●	●									
DIO_PortConfig											●	●													
DIO_SetCOSInterrupt										●		●													
DIO_SetDualInterrupt						●	●			●	●	●			●	●									
DIO_T2_EventMessage													●	●											
DO_7200_Config					●																				
DO_7300A_Config													●												
DO_7300B_Config														●											
DO_ContStatus					●								●	●											
DO_ContWritePort					●								●	●											
DO_AsyncCheck					●								●	●											
DO_AsyncClear					●								●	●											
DO_InitialMemoryAllocated					●								●	●											
DO_PGStart													●	●											
DO_PGStop													●	●											
DO_ReadLine	●	●	●	●	●				●	●	●	●	●	●									●	●	
DO_ReadPort	●	●	●	●	●				●	●	●	●	●	●									●	●	
DO_WriteLine	●	●	●	●	●				●	●	●	●	●	●									●	●	
DO_WritePort	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	
EDO_9111_Config																			●						
GCTR_Read																							●		
GCTR_Reset																							●		

Function \ Board	PCI-6208A	PCI-6208V\6216V	PCI-6308A	PCI-6308V	PCI-7200	PCI-7230\7258	PCI-7233	PCI-7234	PCI-7250\7251\7252	PCI-7256	PCI-7248\7249\7296	PCI-7396	PCI-7300A RevA	PCI-7300A RevB	PCI-7432	PCI-7433	PCI-7434	PCI-8554	PCI-9111	PCI-9112	PCI-9113	PCI-9114	PCI-9116	PCI-9118	PCI-98120\98100
GCTR_Setup																							●		
GetActualRate					●								●	●					●	●	●	●		●	●
Register_Card	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Release_Card	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●