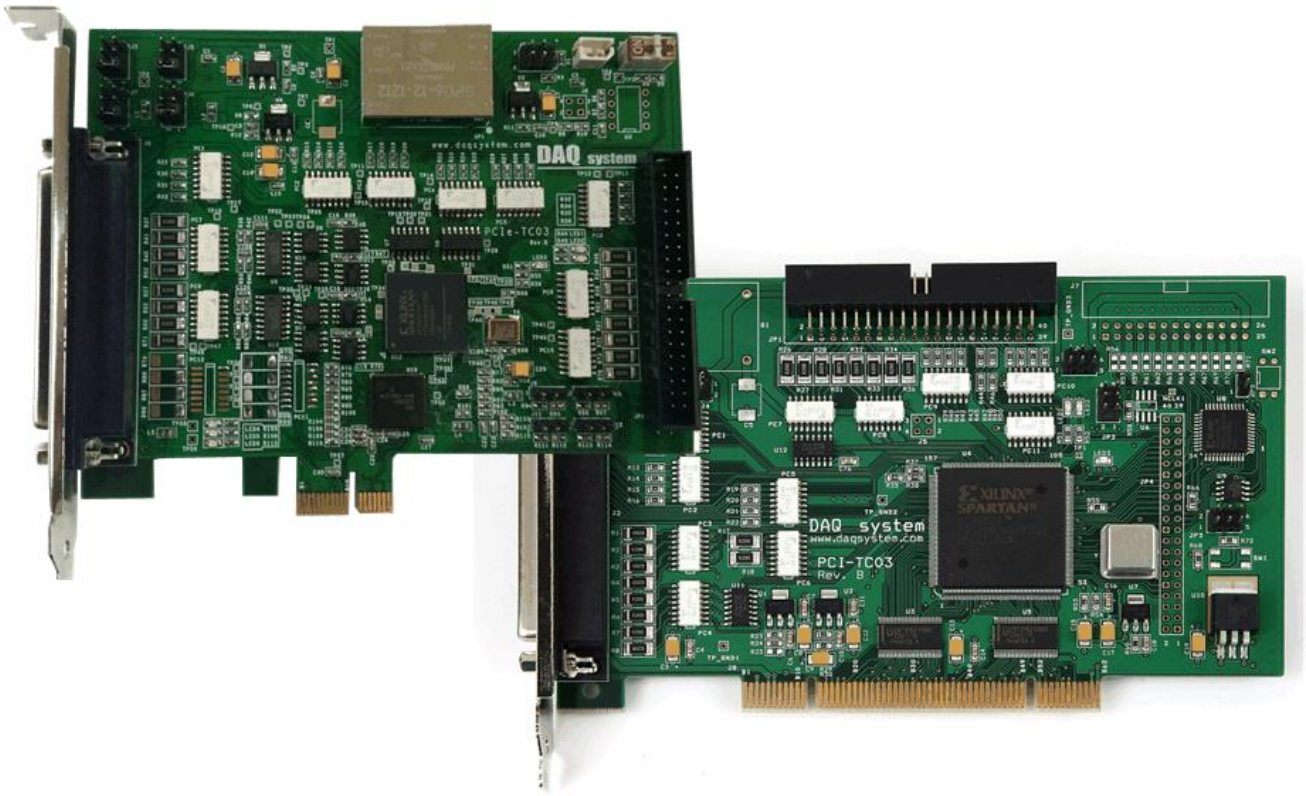
PCI(e)-TC03

API Manual

Version 1.1



DAQ SYSTEM
Measurement & Automation

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Board Level API Functions

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OpenDAQDevice

This function opens the device of a single board system. In the program using the PCI-TC03 board, the device must be opened by calling the function once at the beginning.

BOOL **OpenDAQDevice (void)**

Parameters:

Return Value:

If device open is successful, the number of devices currently installed in the system (PC) is returned. In case of failure, "-1" is returned.

ResetBoard

This function initializes the device currently installed in the system (PC).

BOOL **ResetBoard (int nBoard)**

Parameters:

nBoard : Shows the board number currently installed in the system.
The board number is set using the DIP switch of the board.

Return Value:

If the function call fails, "FALSE" is returned.
If the function call succeeds, "TRUE" is returned.

CloseDAQDevice

This function closes all open PCI-TC03 device of a single board system. When the use of the device is finished, be sure to close the device so that other programs can use it.

BOOL CloseDAQDevice (void)

Parameters:

Return Value:

If the function call fails, "FALSE" is returned.

If the function call succeeds, "TRUE" is returned.

OpenDAQDeviceMul

This function opens the device of a multi-board system. In the program using the PCI-TC03 board, the device must be opened by calling the function once at the beginning.

BOOL OpenDAQDeviceMul (int nBoard)

Parameters:

nBoard : Shows the board number currently installed in the system.
The board number is set using the DIP switch of the board.

Return Value:

If the function call fails, "FALSE" is returned.

If the function call succeeds, "TRUE" is returned.

OpenDAQDeviceMulEx

다중 보드 시스템의 디바이스를 Open한다. 프로그램에서 초기에 반드시 한번 함수를 호출하여 디바이스를 Open 하여야 하며, 장치의 로직 버전을 알 수 있다.

BOOL OpenDAQDeviceMulEx (int nBoard, int *Version)

Parameters:

nBoard : Shows the board number currently installed in the system.
The board number is set using the DIP switch of the board.

*Version : Logic version . PCI-TC03은 "0x0_", PCIe-TC03은 "0x_0"의 헥사 값을 가진다.

Return Value:

If the function call fails, "FALSE" is returned.

If the function call succeeds, "TRUE" is returned.

CloseDAQDeviceMul

This function closes all open PCI-TC03 device of a multi-board system. When the use of the device is finished, be sure to close the device so that other programs can use it.

BOOL CloseDAQDeviceMul (int nBoard)

Parameters:

nBoard : Shows the board number currently installed in the system.
The board number is set using the DIP switch of the board.

Return Value:

If the function call fails, "FALSE" is returned.
If the function call succeeds, "TRUE" is returned.

Counter API Functions

Overview

BOOL Counter_Init (int num)
BOOL Counter_Enable (int num)
BOOL Counter_Disable (int num)
BOOL Counter_Clear (int num)
BOOL Counter_ReadPresent (int num, DWORD *dwVal)
BOOL Counter_ReadTarget (int num, DWORD *dwVal)
BOOL Counter_WriteTarget (int num, DWORD dwVal)
BOOL Counter_InitMul (int nBoard, int num,)
BOOL Counter_EnableMul (int nBoard, int num)
BOOL Counter_DisableMul (int nBoard, int num)
BOOL Counter_ClearMul (int nBoard, int num)
BOOL Counter_ReadPresentMul (int nBoard, int nBoard, int num, DWORD *dwVal)
BOOL Counter_ReadTargetMul (int nBoard, int num, DWORD *dwVal)
BOOL Counter_WriteTargetMul (int nBoard, int num, DWORD dwVal)
BOOL ENC_ClearCountMul (int nBoard, int nENC)
BOOL ENC_GetCountMul (int nBoard, int nENC, DWORD *nUp, DWORD *nDn)
BOOL ENC_EnableCountMul (int nBoard, int nENC)
BOOL ENC_DisableCountMul (int nBoard, int nENC)

Conter_Init

This function initializes the counters of a single board system.

BOOL Counter_Init (int num)

Parameters :

num : Select the counter number. (0 ~ 7)

Return Value :

If the function call fails, “FALSE” is returned.

If the function call succeeds, “TRUE” is returned.

Count_Enable

This function enables the counter of a single board system.

BOOL Counter_Enable (int num)

Parameters :

num : Select the counter number. (0 ~ 7)

Return Value :

If the function call fails, "FALSE" is returned.

If the function call succeeds, "TRUE" is returned.

Count_Disable

This function disables the counter of a single board system.

BOOL Counter_Disable (int num)

Parameters :

num : Select the counter number. (0 ~ 7)

Return Value :

If the function call fails, "FALSE" is returned.

If the function call succeeds, "TRUE" is returned.

Count _Clear

This function clears the counter value of a single board system.

BOOL Counter_Clear (int num)

Parameters :

num : Select the counter number. (0 ~ 7)

Return Value :

If the function call fails, "FALSE" is returned.

If the function call succeeds, "TRUE" is returned.

Count_ReadPresent

This function reads the current value of the corresponding counter of a single board system.

BOOL Counter_ReadPresent (int num, DWORD *dwVal)

Parameters :

num : Select the counter number. (0 ~ 7)

*dwVal : It is a variable from which to read the current value of the input counter.

Return Value:

If the function call fails, "FALSE" is returned.

If the function call succeeds, "TRUE" is returned.

Count_ReadTarget

This function reads the current value of the target counter of a single board system.

BOOL Counter_ReadTarget (int num, DWORD *dwVal)

Parameters :

num : Select the counter number. (0 ~ 7)

*dwVal : It is a variable from which to read the value of the target counter.

Return Value:

If the function call fails, "FALSE" is returned.

If the function call succeeds, "TRUE" is returned.

Count_WriteTarget

This function outputs the target value to the output port of a single board system.

BOOL Counter_WriteTarget (int num, DWORD dwVal)

Parameters :

num : Select the counter number. (0 ~ 7)

*dwVal : The value to write to the output port of the target counter.

Return Value:

If the function call fails, "FALSE" is returned.

If the function call succeeds, "TRUE" is returned.

Conter_InitMul

This function initializes counter in a multi-board system.

BOOL **Counter_InitMul (int nBoard, int num)**

Parameters :

nBoard : Shows the board number currently installed in the system.
The board number is set using the DIP switch of the board.

num : Select the counter number. (0 ~ 7)

Return Value :

If the function call fails, "FALSE" is returned.

If the function call succeeds, "TRUE" is returned.

Count_EnableMul

This function enables the counter in a multi-board system.

BOOL **Counter_EnableMul (int nBoard, int num)**

Parameters :

nBoard : Shows the board number currently installed in the system.
The board number is set using the DIP switch of the board.

num : Select the counter number. (0 ~ 7)

Return Value :

If the function call fails, "FALSE" is returned.

If the function call succeeds, "TRUE" is returned.

Count_DisableMul

This function disables the counter in a multi-board system.

BOOL **Counter_DisableMul (int nBoard, int num)**

Parameters :

nBoard : Shows the board number currently installed in the system.
The board number is set using the DIP switch of the board.

num : Select the counter number. (0 ~ 7)

Return Value :

If the function call fails, "FALSE" is returned.

If the function call succeeds, "TRUE" is returned.

Count _ClearMul

This function clears the counter value in a multi-board system.

BOOL Counter_ClearMul (int nBoard, int num)

Parameters :

nBoard : Shows the board number currently installed in the system.
The board number is set using the DIP switch of the board.

num : Select the counter number. (0 ~ 7)

Return Value :

If the function call fails, "FALSE" is returned.

If the function call succeeds, "TRUE" is returned.

Count_ReadPresentMul

This function reads the current value of the corresponding counter in a multi-board system.

BOOL Counter_ReadPresentMul (int nBoard, int num, DWORD *dwVal)

Parameters :

nBoard : Shows the board number currently installed in the system.
The board number is set using the DIP switch of the board.

num : Select the counter number. (0 ~ 7)

*dwVal : It is a variable from which to read the current value of the input counter.

Return Value:

If the function call fails, "FALSE" is returned.

If the function call succeeds, "TRUE" is returned.

Count_ReadTargetMul

This function reads the current value of the target counter in a multi-board system.

BOOL Counter_ReadTargetMul (int nBoard, int num, DWORD *dwVal)

Parameters :

nBoard : Shows the board number currently installed in the system.
The board number is set using the DIP switch of the board.

num : Select the counter number. (0 ~ 7)

*dwVal : It is a variable from which to read the value of the target counter.

Return Value:

If the function call fails, "FALSE" is returned.

If the function call succeeds, "TRUE" is returned.

Count_WriteTargetMul

This function outputs the target value to the output port in a multi-board system.

BOOL Counter_WriteTargetMul (int nBoard, int num, DWORD dwVal)

Parameters :

nBoard : Shows the board number currently installed in the system.
The board number is set using the DIP switch of the board.

num : Select the counter number. (0 ~ 7)

*dwVal : The value to write to the output port of the target counter.

Return Value:

If the function call fails, "FALSE" is returned.

If the function call succeeds, "TRUE" is returned.

ENC_ClearCountMul

This function initializes the counter value in the encoder input function in a multi-board system.

BOOL ENC_ClearCountMul (int nBoard, int num, int nENC)

Parameters :

nBoard : Shows the board number currently installed in the system.
The board number is set using the DIP switch of the board.
num : Select the counter number. (0 ~ 7)
nENC : Select the encoder number. (0 ~ 3)

Return Value:

If the function call fails, "FALSE" is returned.
If the function call succeeds, "TRUE" is returned.

ENC_GetCountMul

This function reads the counter value from the encoder input function in a multi-board system.

BOOL ENC_GetCountMul (int nBoard, int num, int nENC, DWORD *nUp, DWORD *nDn)

Parameters :

nBoard : Shows the board number currently installed in the system.
The board number is set using the DIP switch of the board.
num : Select the counter number. (0 ~ 7)
nENC : Select the encoder number. (0 ~ 3)
*nUp : This is a variable to read the CW pulse count value. 32-bit.
*nDn : This is a variable to read the CCW pulse count value. 32-bit.

Return Value:

If the function call fails, "FALSE" is returned.
If the function call succeeds, "TRUE" is returned.

ENC_EnableCountMul

This function operates a counter on the encoder input function of a multi-board system.

BOOL ENC_EnableCountMul (int nBoard, int num, int nENC)

Parameters :

nBoard : Shows the board number currently installed in the system.
The board number is set using the DIP switch of the board.
num : Select the counter number. (0 ~ 7)
nENC : Select the encoder number. (0 ~ 3)

Return Value:

If the function call fails, "FALSE" is returned.
If the function call succeeds, "TRUE" is returned.

ENC_DisableCountMul

This function stops the counter on the encoder input function in a multi-board system.

BOOL ENC_DisableCountMul (int nBoard, int num, int nENC)

Parameters :

nBoard : Shows the board number currently installed in the system.
The board number is set using the DIP switch of the board.
num : Select the counter number. (0 ~ 7)
nENC : Select the encoder number. (0 ~ 3)

Return Value:

If the function call fails, "FALSE" is returned.
If the function call succeeds, "TRUE" is returned.

DIO(Digital Input Output) API Functions

Overview

BOOL DIO_ReadInput (DWORD *dwVal)
BOOL DIO_ReadOutput (DWORD *dwVal)
BOOL DIO_WriteOutput (DWORD dwVal)
BOOL DIO_ReadInputMul (int nBoard, DWORD *dwVal)
BOOL DIO_ReadOutputMul (int nBoard, DWORD *dwVal)
BOOL DIO_WriteOutputMul (int nBoard, DWORD dwVal)

DIO_ReadInput

This function reads the digital value of the input port of a single board system.

BOOL DIO_ReadInput (DWORD *dwVal)

Parameters:

dwVal : It is a variable from which to read the current value of the input port.

Return Value:

If the function call fails, "FALSE" is returned.

If the function call succeeds, "TRUE" is returned.

DIO_ReadOutput

This function reads the digital input value of the output port of a single board system.

BOOL DIN_ReadOutput (DWORD *dwVal)

Parameters:

*dwVal : It is a pointer variable from which to read the current value of the input port.

Return Value:

If the function call fails, "FALSE" is returned.

If the function call succeeds, "TRUE" is returned.

DOUT_WriteOutput

This function outputs a digital value to the output port of a single board system.

BOOL DIO_WriteOutput (DWORD dwVal)

Parameters:

dwVal : The value to write to the output port.

Return Value:

If the function call fails, "FALSE" is returned.

If the function call succeeds, "TRUE" is returned.

DIO_ReadInputMul

This function reads the digital value of the input port in a multi-board system.

BOOL DIO_ReadInputMul (int nBoard, DWORD *dwVal)

Parameters:

nBoard : Shows the board number currently installed in the system.
The board number is set using the DIP switch of the board.

dwVal : It is a variable from which to read the current value of the input port.

Return Value:

If the function call fails, "FALSE" is returned.

If the function call succeeds, "TRUE" is returned.

DIO_ReadOutputMul

This function reads the digital input value of the output port in a multi-board system.

BOOL DIN_ReadOutputMul (int nBoard, DWORD *dwVal)

Parameters:

nBoard : Shows the board number currently installed in the system.
The board number is set using the DIP switch of the board.

*dwVal : It is a pointer variable from which to read the current value of the input port.

Return Value:

If the function call fails, "FALSE" is returned.

If the function call succeeds, "TRUE" is returned.

DOUT_WriteOutputMul

This function outputs a digital value to the output port in a multi-board system.

BOOL DIO_WriteOutputMul (int nBoard, DWORD dwVal)

Parameters:

nBoard : Shows the board number currently installed in the system.
The board number is set using the DIP switch of the board.

dwVal : The value to write to the output port.

Return Value:

If the function call fails, "FALSE" is returned.

If the function call succeeds, "TRUE" is returned.

TMR(Timer) API Functions

Overview

BOOL Timer_Init (int num)
BOOL Timer_Read (int num, DWORD *dwVal)
BOOL Timer_SetControl (int num, DWORD dwVal)
BOOL Timer_GetControl (int num, DWORD *dwVal)
BOOL Timer_ReadSet (int num, DWORD *dwVal)
BOOL Timer_WriteSet (int num, DWORD dwVal)
BOOL Timer_InitMul (int nBoard, int num)
BOOL Timer_ReadMul (int nBoard, int num, DWORD *dwVal)
BOOL Timer_SetControlMul (int nBoard, int num, DWORD dwVal)
BOOL Timer_GetControlMul (int nBoard, int num, DWORD *dwVal)
BOOL Timer_ReadSetMul (int nBoard, int num, DWORD *dwVal)
BOOL Timer_WriteSetMul (int nBoard, int num, DWORD dwVal)

Timer_Init

This function initializes the timer of a single board system.

BOOL Timer_Init (int num)

Parameters :

num : Select a timer number. (0 ~ 7)

Return Value :

If the function call fails, "FALSE" is returned.

If the function call succeeds, "TRUE" is returned.

Timer_Read

This function reads the input value of the current timer of a single board system.

BOOL Timer_Read (int num, DWORD *dwVal)

Parameters :

num : Select a timer number. (0 ~ 7)

*dwVal : Variable from which to read the current value of the input timer.

Return Value:

If the function call fails, "FALSE" is returned.

If the function call succeeds, "TRUE" is returned.

Timer _SetControl

This function sets the COMMAND register for timer operation of a single board system. (TMR_CMD register setting)

BOOL Timer_SetControl (int num, DWORD dwVal)

Parameters :

num : Select a timer number. (0 ~ 7)

dwVal : As a register setting value, the register setting bits are as follows.

TMR_CMD Register Bit Position & Usage								
31	7	6	5	4	3	2	1	0
Reserved	Used							

Bit	Name	Description	Default
0	Enable	When it is '1', the timer operates. (Up-Counter)	'0'
1	Clear	When it is '1', the current count (TMR_CUR) value is initialized to "0x00000000".	'0'
2	Auto	When it is '0', it generates One-Shot output, and when it is '1', when a timeout occurs, the timer value is automatically reloaded to the TMR_SET value and operates. When Auto ='1', Alt='0', the frequency is output as frequency = 5M/(TMR_SET+1) When Auto = '1', Alt = '1', the frequency is output as frequency = 10M/(TMR_SET+1).	'0'
3	Alt	As a bit for Alternative operation, when it is '0', the output value is inverted whenever a timeout occurs. When it is '1', '1' is output as many as the count set in ALT_CNT, and '0' is output until timeout occurs.	'0'
4	OutSel	When it is '1', the timer output is set to IO and output as "OutVal" value, and when it is '0', it is output as timer operation.	'0'
5	OutVal	This is the output value when the timer output is IO.	'0'
6		clear time over flag	'0'
31-8	-	For Future Use	All '0'

Return Value :

If the function call fails, "FALSE" is returned.

If the function call succeeds, "TRUE" is returned.

Timer _GetControl

This function outputs the COMMAND register for timer operation of a single board system.

BOOL Timer_GetControl (int num, DWORD *dwVal)

Parameters :

num : Select a timer number. (0 ~ 7)

*dwVal : Variable from which to read the current value of the input timer.

Return Value :

If the function call fails, "FALSE" is returned.

If the function call succeeds, "TRUE" is returned.

Timer_ReadSet

This function gets the register value that shows the operation status of a single board system. (Check the TMR_STA register)

BOOL Timer_ReadSet (int num, DWORD *dwVal)

Parameters :

num : Select a timer number. (0 ~ 7)

*dwVal : It is a variable pointer from which to read the register value. The bit usage of the register is as follows.

TMR_STA STATUS Register Bit Position & Usage		
31 16	15 1	0
Use	Reserved	Use

Bit	Name	Description	Default
0	TimeOut	When a timeout occurs (TMR_CUR>=TMR_SET), it becomes '1'.	'1'
15 - 1	-	For Future Use	All '0'
31 - 16	ALT_CNT	The 10Mhz clock count value for the output that is '1' used in the alternative operation. The minimum value is 1.	All '0'

Return Value:

If the function call fails, "FALSE" is returned.

If the function call succeeds, "TRUE" is returned.

Timer_WriteSet

This function outputs a register value that shows the operating status of a single board system.

BOOL Timer_WriteSet (int num, DWORD dwVal)

Parameters :

num : Select a timer number. (0 ~ 7)

dwVal : It means the hex value of the timer.

Return Value:

If the function call fails, "FALSE" is returned.

If the function call succeeds, "TRUE" is returned.

Timer_InitMul

This function initializes the timer in a multi-board system.

BOOL Timer_InitMul (int nBoard, int num)

Parameters :

nBoard : Shows the board number currently installed in the system.
The board number is set using the DIP switch of the board.

num : Select a timer number. (0 ~ 7)

Return Value :

If the function call fails, "FALSE" is returned.

If the function call succeeds, "TRUE" is returned.

Timer_ReadMul

This function reads the input value of the current timer in a multi-board system.

BOOL Timer_ReadMul (int nBoard, int num, DWORD *dwVal)

Parameters :

nBoard : Shows the board number currently installed in the system.
The board number is set using the DIP switch of the board.

num : Select a timer number. (0 ~ 7)

*dwVal : Variable from which to read the current value of the input timer.

Return Value:

If the function call fails, "FALSE" is returned.

If the function call succeeds, "TRUE" is returned.

Timer_SetControlMul

This function sets the COMMAND register for timer operation in a multi-board system. (TMR_CMD register setting)

BOOL Timer_SetControlMul (int nBoard, int num, DWORD dwVal)

Parameters :

nBoard : Shows the board number currently installed in the system.
The board number is set using the DIP switch of the board.

num : Select a timer number. (0 ~ 7)

dwVal : As a register setting value, the register setting bits are as follows.

TMR_CMD Register Bit Position & Usage								
31	7	6	5	4	3	2	1	0
Reserved	Used							

Bit	Name	Description	Default
0	Enable	When it is '1', the timer operates. (Up-Counter)	'0'
1	Clear	When it is '1', the current count (TMR_CUR) value is initialized to "0x00000000".	'0'
2	Auto	When it is '0', it generates One-Shot output, and when it is '1', when a timeout occurs, the timer value is automatically reloaded to the TMR_SET value and operates. When Auto ='1', Alt='0', the frequency is output as frequency = 5M/(TMR_SET+1)	'0'

		When Auto = '1', Alt = '1', the frequency is output as frequency = 10M/(TMR_SET+1).	
3	Alt	As a bit for Alternative operation, when it is '0', the output value is inverted whenever a timeout occurs. When it is '1', '1' is output as many as the count set in ALT_CNT, and '0' is output until timeout occurs.	'0'
4	OutSel	When it is '1', the timer output is set to IO and output as "OutVal" value, and when it is '0', it is output as timer operation.	'0'
5	OutVal	This is the output value when the timer output is IO.	'0'
6		clear time over flag	'0'
31-8	-	For Future Use	All '0'

Return Value :

If the function call fails, "FALSE" is returned.

If the function call succeeds, "TRUE" is returned.

Timer_GetControlMul

This function outputs the COMMAND register for timer operation in a multi-board system.

BOOL Timer_GetControlMul (int nBoard, int num, DWORD *dwVal)

Parameters :

nBoard : Shows the board number currently installed in the system.
The board number is set using the DIP switch of the board.

num : Select a timer number. (0 ~ 7)

*dwVal : Variable from which to read the current value of the input timer.

Return Value :

If the function call fails, "FALSE" is returned.

If the function call succeeds, "TRUE" is returned.

Timer_ReadSetMul

This function gets the register value that shows the operation status in a multi-board system. (Check the TMR_STA register)

BOOL Timer_ReadSetMul (int nBoard, int num, DWORD *dwVal)

Parameters :

nBoard : Shows the board number currently installed in the system.
The board number is set using the DIP switch of the board.

num : Select a timer number. (0 ~ 7)

*dwVal : It is a variable pointer from which to read the register value. The bit usage of the register is as follows.

TMR_STA STATUS Register Bit Position & Usage		
31 16	15 1	0
Use	Reserved	Use

Bit	Name	Description	Default
0	TimeOut	When a timeout occurs (TMR_CUR>=TMR_SET), it becomes '1'.	'1'
15 - 1	-	For Future Use	All '0'
31 - 16	ALT_CNT	The 10Mhz clock count value for the output that is '1' used in the alternative operation. The minimum value is 1.	All '0'

Return Value:

If the function call fails, "FALSE" is returned.

If the function call succeeds, "TRUE" is returned.

Timer_WriteSetMul

This function outputs a register value that shows the operating status in a multi-board system.

BOOL Timer_WriteSetMul (int nBoard, int num, DWORD dwVal)

Parameters :

nBoard : Shows the board number currently installed in the system.
The board number is set using the DIP switch of the board.

num : Select a timer number. (0 ~ 7)

dwVal : It means the hex value of the timer.

Return Value:

If the function call fails, "FALSE" is returned.

If the function call succeeds, "TRUE" is returned.

Memo

Contact Point

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DAQ SYSTEM
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