Broadsound Corporation

Pulser/Receiver

Model 6006PR PLUS

Programmer's Reference

Document Number: PR.PP6006.1, Version 1.0

5 F., No. 31, Sintai Road, Jhubei City, Hsinchu County 30252, Taiwan (R.O.C.)
Tel: 886-3-5539868 Fax: 886-3-5539808 http://www.broadsound.com.tw

Table of Contents

Document Number: PR.PP6006.1, Version 1.0

5 F., No. 31, Sintai Road, Jhubei City, Hsinchu County 30252, Taiwan (R.O.C.)
Tel: 886-3-5539868 Fax: 886-3-5539808 http://www.broadsound.com.tw

1 Overview

The API provides a simple C++ programming interface to control the Pulser/Receiver 6006PR PLUS. The API, which includes BS6006PRPLUS_DLL.dll, BS6006PRPLUS_DLL.lib, and BS6006PRPLUS_DLL.h, are installed by default into the C:\Broadsound Corporation\Pulser-Receiver Model 6006PR PLUS\API.

To use the API, you need to include the heard file BS6006PRPLUS_DLL.h, in files that access the BS6006PRPLUS_DLL.dll. The import library (BS6006PRPLUS_DLL.lib) contains information about their DLL export functions.

Version of the .dll file is available for use with Microsoft Visual Studio 2013. This manual does not show you how to solve every possible programming problem. Specific questions should be directed to Broadsound's application engineers.

Document Number: PR.PP6006.1, Version 1.0

5 F., No. 31, Sintai Road, Jhubei City, Hsinchu County 30252, Taiwan (R.O.C.)
Tel: 886-3-5539868 Fax: 886-3-5539808 http://www.broadsound.com.tw

2 Functions

2.1 PR_ConnectDevice

bool PR_ConnectDevice(HANDLE hDevice)

Description

The PR_ConnectDevice(HANDLE hDevice) creates a handle for the driver of pulser/receiver and returns true if the pulser/receiver is connected. When PR_ConnectDevice(HANDLE hDevice) is true, the pulser/receiver is ready to perform operations via other functions of BS6006PRPLUS_DLL.dll.

Parameters

[In] hDevice: hDevice is a handle to the application's main window (the window will process USB PnP events). If you are building a console application or don't want your window to receive PnP events, you may omit the parameter (PR_ConnectDevice(NULL)).

Returns

True: the pulser/receiver is connected successfully.
False: the pulser/receiver is not connected.

2.2 PR_CheckDeviceExistance

bool PR_CheckDeviceExistance(void)

Description

The function checks the connection of the pulser/receiver.

Returns

True: the pulser/receiver has been connected.
False: the pulser/receiver is not connected.

2.3 PR_DisconnectDevice

void PR_DisconnectDevice(void)

Description

The PR_DisconnectDevice() closes the handle for the driver of pulser/receiver, if one is open.

Document Number: PR.PP6006.1, Version 1.0

5 F., No. 31, Sintai Road, Jhubei City, Hsinchu County 30252, Taiwan (R.O.C.)
Tel: 886-3-5539868 Fax: 886-3-5539808 http://www.broadsound.com.tw

2.4 PR_DeviceHandle

HANDLE PR_DeviceHandle(void)

Description
The PR_DeviceHandle() returns the handle of the driver if the pulser/receiver is connected.

Returns
INVALID_HANDLE_VALUE: no device is currently connected.
Others: the handle of the driver.

2.5 PR_SerialNumber

void PR_SerialNumber(wchar_t *SN)

Description
The function gets the serial number of the pulser/receiver which is connected.

Parameters
[Out] SN: serial number of the pulser/receiver.

2.6 PR_SwitchToPulseEchoMode

void PR_SwitchToPulseEchoMode(void)

Description
The function sets the mode of Pulser/Receiver is ECHO mode for pulse-echo testing.

2.7 PR_SwitchToThruMode

void PR_SwitchToThruMode (void)

Description
The function sets the mode of Pulser/Receiver is THRU mode for pitch-catch testing.

2.8 PR_SetPulse

bool PR_SetPulse(int PulseIndex)

Description

Document Number: PR.PP6006.1, Version 1.0

5 F., No. 31, Sintai Road, Jhubei City, Hsinchu County 30252, Taiwan (R.O.C.)
Tel: 886-3-5539868 Fax: 886-3-5539808 http://www.broadsound.com.tw

The function sets the level of pulser of Pulser/Receiver. When the pulse repetition frequency is set to be higher than 5 kHz, the PulseIndex should be less than 12.

Parameters

[In] PulseIndex: the PulseIndex corresponds to the level of pulse as shown as follows:

PulseIndex	Level of Pulse
0	-25 V, 0.1 μJ, DC–20 MHz
1	-45 V, 0.4 μJ, DC–30 MHz
2	-75 V, 1.0 μJ, DC–35 MHz
3	-120 V, 2.4 μJ, DC–45 MHz
4	-190 V, 5.0 μJ, DC–50 MHz
5	-190 V, 11 μJ, DC–25 MHz
6	-190 V, 15 μJ, DC–20 MHz
7	-190 V, 20 μJ, DC–15 MHz
8	-190 V, 25 μJ, DC–12 MHz
9	-190 V, 30 μJ, DC–10 MHz
10	-190 V, 35 μJ, DC–9 MHz
11	-190 V, 40 μJ, DC–8 MHz
12	-190 V, 45 μJ, DC–7 MHz
13	-190 V, 50 μJ, DC–6 MHz

Returns

True: the level of pulse is set successfully.
False: the setting of pulse is failed.

2.9 PR_CurrentPulseIndex

int PR_CurrentPulseIndex(void)

Description

The function gets the current index of pulse setting.

Returns

0 ~ 13: current index of pulse setting.

2.10 PR_SetPRF

bool PR_SetPRF(int PRF)

Document Number: PR.PP6006.1, Version 1.0

5 F., No. 31, Sintai Road, Jhubei City, Hsinchu County 30252, Taiwan (R.O.C.)
Tel: 886-3-5539868 Fax: 886-3-5539808 http://www.broadsound.com.tw

Description

The function sets the pulse repetition frequency of pulser. When the index of pulse is set to be greater than 11, the PRF should be less than 5000.

Parameter

[In] PRF: the input parameter of PRF corresponds to the pulse repetition frequency as shown as follows:

PRF	Pulse Repetition Frequency
100	100 Hz
200	200 Hz
500	500 Hz
1000	1 kHz
2000	2 kHz
5000	5 kHz
10000	10 kHz

Returns

True: the pulse repetition frequency of pulser is set successfully.
False: the setting of pulse repetition frequency is failed.

2.11 PR_CurrentPRF

int PR_CurrentPRF(void)

Description

The function gets the current index of pulse repetition frequency.

Returns

100, 200, 500, 1000, 2000, 5000, or 10000: current index of pulse repetition frequency (Hz).

2.12 PR_SetTriggerSource

void PR_SetTriggerSource(int TriggerSource)

Description

The function sets the trigger source of pulser/receiver.

Parameters

[In] TriggerSource: the index of trigger source of pulser/receiver.

Document Number: PR.PP6006.1, Version 1.0

5 F., No. 31, Sintai Road, Jhubei City, Hsinchu County 30252, Taiwan (R.O.C.)
Tel: 886-3-5539868 Fax: 886-3-5539808 http://www.broadsound.com.tw

TriggerSource	Status of Trigger Source
0	Internal
1	External

2.13 PR_CurrentTriggerSource

int PR_CurrentTriggerSource(void)

Description

The function gets the current index of trigger source.

Returns

0: internal
1: external

2.14 PR_SetReceiverGain

void PR_SetReceiverGain(int Gain)

Description

The function sets the gain of receiver.

Parameters

[In] Gain: the gain of receiver. The gain ranges from -28 to 70 (dB).

2.15 PR_CurrentReceiverGain

int PR_CurrentReceiverGain (void)

Description

The function gets the current gain of receiver.

Returns

-28 ~ 70: current gain of receiver (dB).

2.16 PR_SetNoAcqSignal

int PR_SetNoAcqSignal(int Number)

Description

Document Number: PR.PP6006.1, Version 1.0

5 F., No. 31, Sintai Road, Jhubei City, Hsinchu County 30252, Taiwan (R.O.C.)
Tel: 886-3-5539868 Fax: 886-3-5539808 http://www.broadsound.com.tw

The function sets the number of signals to be acquired. The product of Number and Length, which is the input parameter of PR_SetLengthOfSignal, should be less than 262144.

Parameters

[In] Number: the number of signals to be acquired. The number ranges from 1 to 256.

Returns

1 ~ 256: the number of signals has been set.

2.17 PR_CurrentNoAcqSignal

int PR_CurrentNoAcqSignal(void)

Description

The function returns the actual number of acquired signals.

Returns

1 ~ 256: the actual number of signals has been acquired.

2.18 PR_SetLengthOfSignal

int PR_SetLengthOfSignal(int Length)

Description

The function sets the length of each signal to be acquired. The product of Length and Number, which is the input parameter of PR_SetNoAcqSignal, should be less than 262144.

Parameters

[In] Length: the length of each signal to be acquired. The Length should be a multiple of 1024.

Returns

1 ~ 262144: the actual length of each signal has been set.

2.19 PR_CurrentLengthOfSignal

int PR_CurrentLengthOfSignal(void)

Description

The function gets the current length of each signal has been set.

Document Number: PR.PP6006.1, Version 1.0

5 F., No. 31, Sintai Road, Jhubei City, Hsinchu County 30252, Taiwan (R.O.C.)
Tel: 886-3-5539868 Fax: 886-3-5539808 http://www.broadsound.com.tw

Returns

1 ~ 262144: the current length of each signal has been set.

2.20 PR_SetTriggerDelay

void PR_SetTriggerDelay(int Delay)

Description

The function sets the trigger delay for acquiring signals. Trigger delay is the amount of time that elapses between when a trigger occurs and when the analog-to-digital converter triggers.

Parameters

[In] Delay: the trigger delay for acquiring signals. The Delay ranges from 0 to 65535. The unit of Delay is μs.

2.21 PR_CurrentTriggerDelay

int PR_CurrentTriggerDelay (void)

Description

The function gets the trigger delay for acquiring signals.

Returns

0 ~ 65535: the current trigger delay (μs).

2.22 PR_SetSampingFrequency

void PR_SetSampingFrequency(int Freq)

Description

The function sets the sampling frequency of analog-to-digital converter.

Parameters

[In] Freq: the sampling frequency of analog-to-digital converter. The Freq corresponds to the sampling frequency as shown as follows:

Freq	Sampling Frequency
48	48 MHz
80	80 MHz
240	240 MHz

Document Number: PR.PP6006.1, Version 1.0

5 F., No. 31, Sintai Road, Jhubei City, Hsinchu County 30252, Taiwan (R.O.C.)
Tel: 886-3-5539868 Fax: 886-3-5539808 http://www.broadsound.com.tw

2.23 PR_CurrentSamplingFrequency

int PR_CurrentSamplingFrequency(void)

Description

The function gets the current sampling frequency.

Returns

48, 80, or 240: current sampling frequency (MHz).

2.24 PR_EnableAcquireSignal

void PR_EnableAcquireSignal(bool bEnabled)

Description

The function sets the status of the function of the analog-to-digital converter of pulser/receiver.

Parameters

[In] bEnabled: status of the analog-to-digital converter of pulser/receiver. If the bEnabled is true, the analog-to-digital converter of pulser/receiver is ready to work.

2.25 PR_RunAndAcquireSignal

void PR_RunAndAcquireSignal(char* DataArray)

Description

The function triggers the pulser/receiver starts to generate pulse and acquire the received signals. When the trigger source is internal, the number of pulses would be generated according to the setting of number of signals to be acquired.

Parameters

[Out] DataArray: acquired signals. The size of DataArray should equal the product of Length, which is the input parameter of PR_SetLengthOfSignal , and Number, which is the input parameter of PR_SetNoAcqSignal.

2.26 PR_AbortAcqSignal

void PR_AbortAcqSignal(void)

Description

The function aborts the process of acquiring signals.

Document Number: PR.PP6006.1, Version 1.0

5 F., No. 31, Sintai Road, Jhubei City, Hsinchu County 30252, Taiwan (R.O.C.)
Tel: 886-3-5539868 Fax: 886-3-5539808 http://www.broadsound.com.tw

2.27 PR_SetTimeOut

void PR_SetTimeOut(int Seconds)

Description

The function sets the timeout for acquiring signals.

Parameters

[In] Seconds: timeout for acquiring signals. The unit of Seconds is second.

2.28 PR_Run

void PR_Run(void)

Description

When the status of analog-to-digital converter is disabled, the function would trigger the pulser/Receiver starts to generate the pulse according to the pulse repetition frequency until the PR_Stop() is performed. When the function is performed, the status of analog-to-digital converter is set to be disabled automatically.

2.29 PR_Stop

void PR_Stop(void)

Description

The function stops the pulser/receiver to generate the pulse.

2.30 PR_CheckGeneralPower

bool PR_CheckGeneralPower(void)

Description

The function checks the powers of pulser/receiver.

Return

True: the powers of the pulser/receiver are normal.
False: the powers of the pulser/receiver would be damage. You can use PR_ErrorCode() to get detail information.

Document Number: PR.PP6006.1, Version 1.0

5 F., No. 31, Sintai Road, Jhubei City, Hsinchu County 30252, Taiwan (R.O.C.)
Tel: 886-3-5539868 Fax: 886-3-5539808 http://www.broadsound.com.tw

2.31 PR_CheckVoltageOfPulser

bool PR_CheckVoltageOfPulser(int VoltLevel)

Description

The function checks the voltage of pulser.

Parameters

[In] VoltLevel: the voltage of pulser. The VoltLevel could be -25, -45, -75, -120, or -190.

Returns

True: the voltage of pulser is normal.
False: the voltage of pulser is failed.

2.32 PR_ErrorCode

void PR_ErrorCode(bool *bErrorCode)

Description

The function gets the error code of the pulser/receiver.

Parameters

[Out] bErrorCode: error code of the pulser/receiver. The size of array of bErrorCode should be 13. If the bErrorCode[] returns true, the pulser/receiver has error. The bErrorCode corresponds to the status of pulser/receiver is shown as follows:

bErrorCode[]	Status of Pulser/Receiver
bErrorCode[0]	EEPROM error
bErrorCode[1]	Serial number is not acquired
bErrorCode[2]	Serial number is not correct
bErrorCode[3]	Calibration data of Receiver is corrupted
bErrorCode[4]	Power of 10.5 V is error
bErrorCode[5]	Power of -10.5 V is error
bErrorCode[6]	Power of 5 V is error
bErrorCode[7]	Timeout
bErrorCode[8]	Voltage of -190 pulser is error
bErrorCode[9]	Voltage of -120 pulser is error
bErrorCode[10]	Voltage of -75 pulse is error
bErrorCode[11]	Voltage of -45 pulse is error
bErrorCode[12]	Voltage of -25 pulse is error

Document Number: PR.PP6006.1, Version 1.0

5 F., No. 31, Sintai Road, Jhubei City, Hsinchu County 30252, Taiwan (R.O.C.)
Tel: 886-3-5539868 Fax: 886-3-5539808 http://www.broadsound.com.tw

5 F., No. 31, Sintai Road, Jhubei City, Hsinchu County 30252, Taiwan (R.O.C.)
Tel: 886-3-5539868 Fax: 886-3-5539808 http://www.broadsound.com.tw