JY-5710 Series
Family of Analog Output Function Modules

User Manual

User Manual Version: v1.0.8

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Table of Contents

1. Introduction

This chapter presents the information how to use this manual and how to quick start if you are already familiar with Microsoft Visual Studio and C# programming language.

1.1 Overview

The JY5710 Series is a family of Analog Output function modules, which can run on PCIe, PXIe, TXI (Thunderbolt) and USB buses. Depending on the model number, a 5710 series provide different AO channels, sampling rate.

JY5711 features up to 32 channels analog output module with 16 bits resolution and maximum update rate to 2MS/s, 3 lines of digital input/output.

Please check with JYTEK for the latest JY5710 series offering.

1.2 Main Features

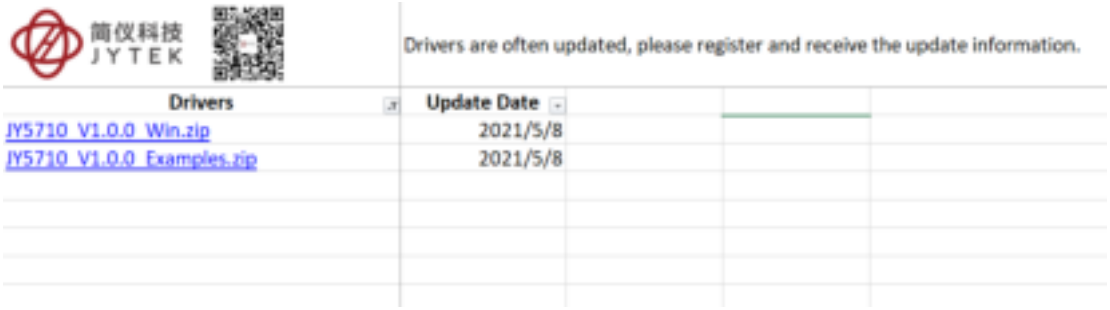
- High accuracy: 0.02%
- 32 channels of voltage output
- 16 bits DAC
- Output range: ±10 V
- Maximum update rate
  - 8 channels (2 MS/s/ch per bank)
  - 32 channels: 1 MS/s
- Output current drive: ±10 mA
- Overdrive current：15 mA
- 8M samples FIFO buffer size per channel
- DMA for data transfers

1.3 Abbreviations

AO: Analog Output
DI: Digital Input
DO: Digital Output
DAC: Digital-to-Analog Conversion
PFI: Programmable Function Interface
SE: Single-Ended
PPM: Parts Per Million

1.4 Learn by Example

JYTEK has added **Learn by Example** in this manual. We provide many sample programs for this device. Please download the sample programs for this device. You can download a JYPEDIA excel file from our web www.jytek.com. Open JYPEDIA and search for JY5710 in the driver sheet, select **JY5710 Examples.zip**. In addition to the download information, JYPEDIA also has a lot of other valuable information, JYTEK highly recommend you use this file to obtain information from JYTEK.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Drivers are often updated, please register and receive the update information.

Drivers	Update Date
JY5710_V1.0.0_Win.zip	2021/5/8
JY5710_V1.0.0_Examples.zip	2021/5/8

Figure 1 JYPEDIA Information

In a **Learn by Example** section, the sample program is in bold style such as **Analog Output-->Winform AO Continuous Wrapping Soft Trigger**; the property name in the sample program is also in bold style such as **SamplesToUpdate** the technical names used in the manual is in italic style such as *UpdateRate*. You can easily relate the property names in the example program with the manual documentation.

In an **Learn by Example** section, the experiment is set up as follow. A PCIe/PXIe-5710 card is plugged in a PXI Chassis. The PCIe/PXIe-5710 is connected to a TB-68 terminal block. A Oscilloscope is also connected to the same terminal block as shown Figure 2.

Figure 2 PCIe/PXIe-5710 experiment

2. Hardware Specifications

2.1 Analog Output Specifications

Number of channels	32 ch
Resolution	16 bits
DNL	±1 LSB
Unscaled data format	Signed integer (-32768 to 32767)
Monotonicity	16 bits
Clock	200 MHz
Maximum update rate	
1 channel	2 MS/s
8 channels (1 channel per bank)*	2 MS/s
32 channels	1 MS/s
Output range	±10 V
Output coupling	DC
Output impedance	0.2 Ω
Output current drive	±10 mA
Overdrive protection	±15 V
Overdrive current	15 mA
Power-on state	±200 mV
FIFO buffer size	8M Samples per channel
Data transfers	DMA
AO waveform modes	Nonperiodic waveform, Periodic waveform regeneration mode from onboard FIFO, Periodic waveform regeneration from host buffer including dynamic update
Slew rate	20 V/µs
Noise	400 µVrms, DC to 1 MHz
AO update glitch Glitch energy	5 nVs
Channel crosstalk	-65 dB
Reference clock	PXIe_DSTARA, PXIe_DSTARB, PXIe_CLK100
External sample clock	PFI, PXI_TRIG
Trigger source	Digital, Software
Trigger type	Start Trigger
Digital trigger source	PFI, PXI_TRIG
* Each bank consists of four AO channels using two DACs. Any channels being used within a single bank will update simultaneously.	

Table 1 Analog Output Specifications

2.2 AO Accuracy

JY5711 AO Basic Accuracy = ±(% of Output+% of Range)								
Nominal Range (V)	24 Hour Tcal ±1C°			90 Days Tcal ± 5°			24 Hr Full-Scale Accuracy	90 Days Full-Scale Accuracy
10	0.003	+	0.005	0.012	+	0.008	790 uV	2000 uV

Table 2 Analog Output Basic Accuracy

JY5711 AO Additional Accuracy Adjustment				
Nominal Range (V)	Temperature Coefficients (/ °C)			Full-Scale Temp Adjustment (uV/ °C)
10	0.0007	+	0.0002	90 uV

Table 3 Analog Output Additional Accuracy

2.3 Digital IO / PFI Specifications

Static Characteristics

Number of channels	3 DIO
Ground reference	DGND
Direction control	Each terminal individually programmable as input or output
Pull-down resistor	50 kΩ typical
Input voltage protection	±15 V

PFI Functionality

Number of channels	3
External digital trigger interface	Trigger voltage 3.3 V TTL; Trigger edge: Rising/Falling
Initial state	Input

Recommended Operating Conditions

Minimum Input high voltage (V_{IH})	2.2 V
Maximum Input high voltage (V_{IH})	5.25 V
Minimum Input low voltage (V_{IL})	0 V
Maximum Input low voltage (V_{IL})	0.8 V
Maximum Output high current (I_{OH})	-16 mA
Maximum Output low current (I_{OL})	16 mA

Table 4 Digital IO / PFI Specifications

2.4 Bus and Power Specification

Bus Interface

Form factor	x4 PXI Express peripheral module
Slot compatibility	x1 and x4 PXI Express or PXI Express hybird slots

Power Requirements

3.3 V:	3.0 W
+12 V:	14.0 W

Table 5 Bus and Power Specification

2.5 Physical and Environment

Operating Environment

Ambient temperature range	0 ℃ to 50 ℃
Relative humidity range	20% to 80%, noncondensing

Storage Environment

Ambient temperature range	-20 ℃ to 80 ℃
Relative humidity range	10% to 90%, noncondensing

Table 6 Physical and Environment

2.6 Front Panel and Pin Definition

Figure 3 PXIe/PCIe 5710 Front Panel

PCIe/PXIe-5710 series boards are connected to outside signals by one 68-pin cable for the 32 channel configurations, Table 7 shows the pin definitions of PCIe/PXIe-5711 .

Connector 0			
Pin	**Signal Name**	**Pin**	**Signal Name**
1	PFI0/DIO_0	35	DGND
2	PFI1/DIO_1	36	PFI2/DIO_2
3	AO_0	37	AO_GND
4	AO_1	38	AO_GND
5	AO_2	39	AO_GND
6	AO_3	40	AO_GND
7	AO_4	41	AO_GND
8	AO_5	42	AO_GND
9	AO_6	43	AO_GND
10	AO_7	44	AO_GND
11	AO_8	45	AO_GND
12	AO_9	46	AO_GND
13	AO_10	47	AO_GND
14	AO_11	48	AO_GND
15	AO_12	49	AO_GND
16	AO_13	50	AO_GND
17	AO_14	51	AO_GND
18	AO_15	52	AO_GND
19	AO_16	53	AO_GND
20	AO_17	54	AO_GND
21	AO_18	55	AO_GND
22	AO_19	56	AO_GND
23	AO_20	57	AO_GND
24	AO_21	58	AO_GND
25	AO_22	59	AO_GND
26	AO_23	60	AO_GND
27	AO_24	61	AO_GND
28	AO_25	62	AO_GND
29	AO_26	63	AO_GND
30	AO_27	64	AO_GND
31	AO_28	65	AO_GND
32	AO_29	66	AO_GND
33	AO_30	67	AO_GND
34	AO_31	68	AO_GND

Table 7 5710 Pin Definition

Notes to Legend in the Pin Definitions

AO_GND	Analog Output Reference Ground
AO<0..31>	Analog Output channel
D_GND	Digital Signal Reference Ground
PFI<0..2>	Programmable Function Interface

Table 8 Notes to Legend

3. Performance and Tests

3.1 AO Accuracy

The best AO accuracy is limited by two factors: Total Gain Error and Total Offset Error as shown in the following table. The PCIe/PXIe-5710 device is first calibrated.

JY5711 AO Basic Accuracy = ±(% of Output+% of Range)								
Nominal Range (V)	24 Hour Tcal ±1C°			90 Days Tcal ± 5°			24 Hr Full-Scale Accuracy	90 Days Full-Scale Accuracy
10	0.003	+	0.005	0.007	+	0.011	790 uV	1800 uV

Table 9 Typical AO Accuracy

3.2 Temperature Drift

The temperature change will affect the AO accuracy by the gain error and offset error. The typical gain error and offset error of PCIe/PXIe-5710 are show below.

JY5711 AO Additional Accuracy Adjustment				
Nominal Range (V)	Temperature Coefficients (/ °C)			Full-Scale Temp Adjustment (uV/ °C)
10	0.0007	+	0.0002	90 uV

Table 10 Temperature Drift

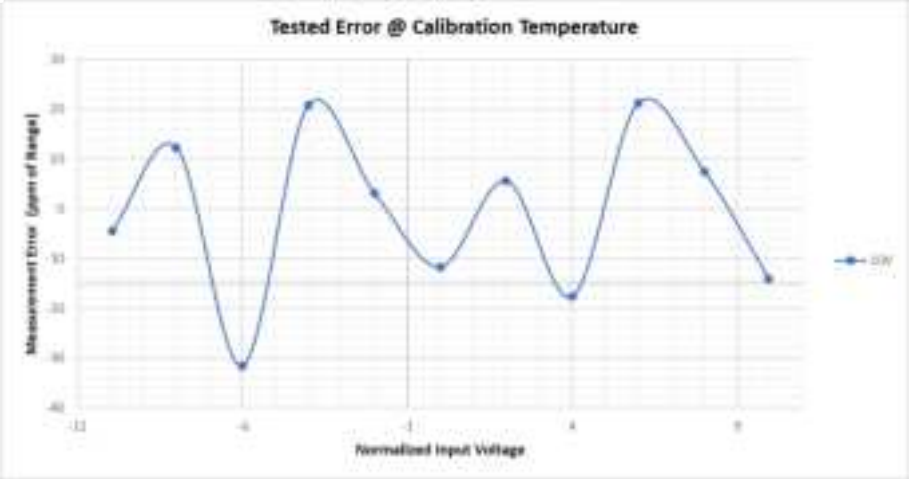

Figure 4 Temperature Drift

3.3 Crosstalk

Reference Channel	Tested Channel	Crosstalk (dB at 100 KHz)
0	1	-71.8
0	15	-71.4
0	16	-70.4
1	2	-71.8
6	7	-71.4
6	22	-70.9
10	11	-72.1
16	17	-67.2
31	30	-71.6

Table 11 Crosstalk

4. Software

4.1 System Requirements

PCIe/PXIe-5710 boards can be used in a Windows or a Linux operating system.

Microsoft Windows: Windows 7 32/64 bit, Windows 10 32/64 bit.

Linux Kernel Versions: There are many Linux versions. It is not possible JYTEK can support and test our devices under all different Linux versions. JYTEK will at the best support the following Linux versions.

Linux Version
Ubuntu LTS
16.04： 4.4.0-21-generic(desktop/server)
16.04.6：4.15.0-45-generic(desktop) 4.4.0-142-generic(server)
18.04： 4.15.0-20-generic(desktop) 4.15.0-91-generic(server)
18.04.4：5.3.0-28-generic (desktop) 4.15.0-91-generic(server)
Localized Chinese Version
中标麒麟桌面操作系统软件（兆芯版）V7.0（Build61）: 3.10.0-862.9.1.nd7.zx.18.x86_64
中标麒麟高级服务器操作系统软件V7.0U6: 3.10.0-957.el7.x86_64

Table 12 Supported Linux Versions

4.2 System Software

When using the PCIe/PXIe-5710 in the Window environment, you need to install the following software from Microsoft website:

Microsoft Visual Studio Version 2015 or above,

.NET Framework version is 4.0 or above.

.NET Framework is coming with Windows 10. For Windows 7, please check .NET Framework version and upgrade to 4.0 or later version.

Given the resources limitation, JYTEK only tested PCIe/PXIe-5710 be with .NET Framework 4.0 with Microsoft Visual Studio 2015. JYTEK relies on Microsoft to maintain the compatibility for the newer versions.

4.3 C# Programming Language

All JYTEK default programming language is Microsoft C#. This is Microsoft recommended programming language in Microsoft Visual Studio and is particularly suitable for the test and measurement applications. C# is also a cross platform programming language.

4.4 PCIe/PXIe-5710 Series Hardware Driver

After installing the required application development environment as described above, you need to install the PCIe/PXIe-5710 hardware driver.

JYTEK hardware driver has two parts: the shared common driver kernel software (FirmDrive) and the specific hardware driver.

Common Driver Kernel Software (FirmDrive): FirmDrive is the JYTEK's kernel software for all hardware products of JYTEK instruments. You need to install the FirmDrive software before using any other JYTEK hardware products. FirmDrive only needs to be installed once. After that, you can install the specific hardware driver.

Specific Hardware Driver: Each JYTEK hardware has a C# specific hardware driver. This driver provides rich and easy-to-use C# interfaces for users to operate various PCIe/PXIe-5710 function. JYTEK has standardized the ways which JYTEK and other vendor's DAQ boards are used by providing a consistent user interface, using the methods, properties and enumerations in the object-oriented programming environment. Once you get yourself familiar with how one JYTEK DAQ card works, you should be able to know how to use all other DAQ hardware by using the same methods.

Note that this driver does not support cross-process, and if you are using more than one function, it is best to operate in one process.

4.5 Install the SeeSharpTools from JYTEK

To efficiently and effectively use PCIe/PXIe-5710 boards, you need to install a set of free C# utilities, SeeSharpTools from JYTEK. The SeeSharpTools offers rich user interface functions you will find convenient in developing your applications. They are also needed to run the examples come with PCIe/PXIe-5710 hardware. Please register and download the latest SeeSharpTools from our website, www.jytek.com.

4.6 Running C# Programs in Linux

Most C# written programs in Windows can be run by MonoDevelop development system in a Linux environment. You would develop your C# applications in Windows using Microsoft Visual Studio. Once it is done, run this application in the MonoDevelop environment. This is JYTEK recommended way to run your C# programs in a Linux environment.

If you want to use your own Linux development system other than MonoDevelop, you can do it by using our Linux driver. However, JYTEK does not have the capability to support the Linux applications. JYTEK completely relies upon Microsoft to maintain the cross-platform compatibility between Windows and Linux using MonoDevelop.

5. Operating PCIe/PXIe-5710

This chapter provides the operation guides for PCIe/PXIe-5710, including AO, DI, DO, etc.

JYTEK provides extensive examples, on-line help and documentation to assist you to operate the PCIe/PXIe-5710 board. JYTEK strongly recommends you go through these examples before writing your own application. In many cases, an example can also be a good starting point for a user application.

5.1 Quick Start

After you have installed the driver software and the SeeSharpTools, you are ready to use Microsoft Visual Studio C# to operate the PCIe/PXIe-5710 products.

If you are already familiar with Microsoft Visual Studio C#, the quickest way to use PCIe/PXIe-5710 boards is to go through our extensive examples. We provide source code of our examples. In many cases, you can modify the source code and start to write your applications.

We also provide **Learn by Example** in the following sections. These examples will help you navigate and learn how to use this PCIe/PXIe-5710.

5.2 AO Operations

The PCIe/PXIe-5710 AO provides 16-bit simultaneous outputs. The analog output has three modes of operation: Finite, ContinuousWrapping, and ContinuousNoWrapping.

5.2.1 Finite Output

The finite output requires the user to write a piece of data. After starting the AO, it starts to output the written data until the output is completed.

Learn by Example 5.2.1

- Connect the PCIe/PXIe-5710 AO Ch0 (AO_0, Pin #3) to the probe tip of the oscilloscope, and AO ground (AO_GND, Pin #37) is connected to the grounding clip of the oscilloscope.
- PCIe/PXIe-5710 sends an analog signal through (AO_0, AO_GND) and reads the signal on an oscilloscope.
- Open **Analog Output-->Winform AO Finite**, set the following numbers as shown:

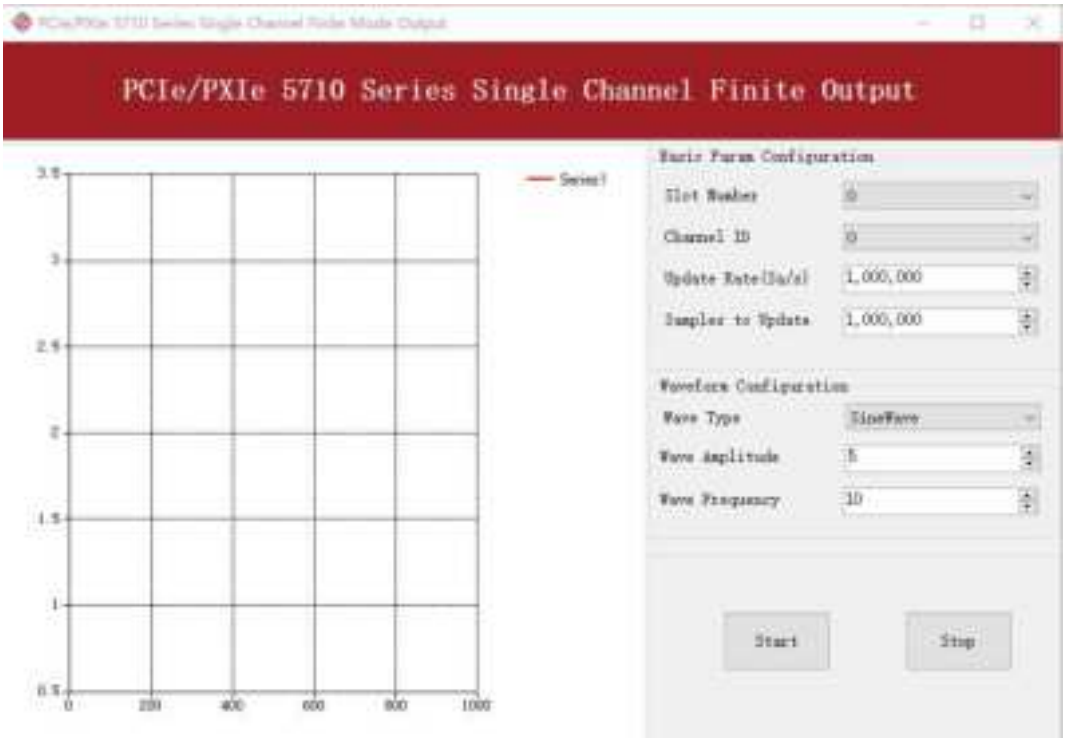

Figure 5 Finite Output for Single Channel Setting

- Click **Start** to generate a **SineWave**. The generated signal is shown below:

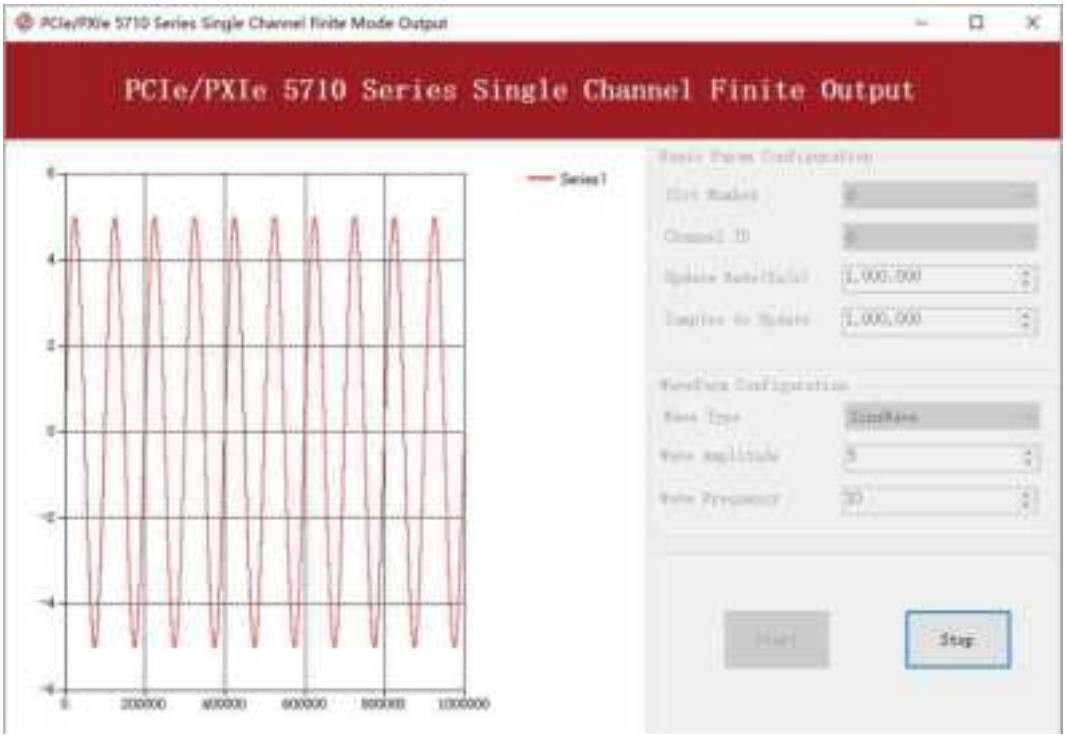

Figure 6 Finite Output for Single Channel

- The image on the oscilloscope is shown in the figure:

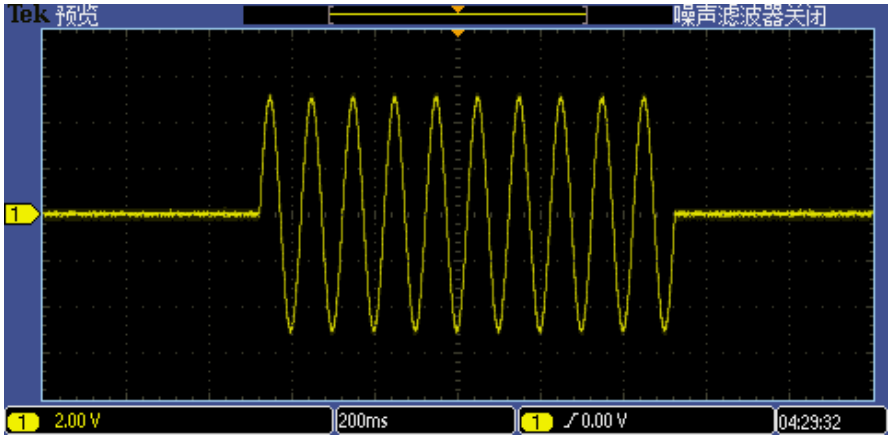

Figure 7 Finite Output Signal Image on the Oscilloscope

➢ The analog signal is successfully generated by PCIe/PXIe-5710.

5.2.2 Continuous NoWrappping Output

The continuous acyclic output needs to write a piece of data before starting the AO. After the AO starts, user needs to continuously write new data to ensure the continuous output of the AO.

Learn by Example 5.2.1

- Connect the PCIe/PXIe-5710 AO Ch0 (AO_0, Pin #3) to the probe tip of the oscilloscope, and AO ground (AO_GND, Pin #37) is connected to the grounding clip of the oscilloscope.
- PCIe/PXIe-5710 sends an analog signal through (AO_0, AO_GND) and reads the signal on an oscilloscope.
- Open **Analog Output-->Winform AO Continuous NoWrapping**, set the following numbers as shown:

Figure 8 Continuous NoWrapping Output for Single Channel Setting

- In no wrapping analog output you can change the parameter of the signal whenever you want in **Waveform Configuration** when generating the wave. After the configuration you should click **Update** to apply the changes.

- Click **Start** to generate a sinewave first. The result is shown below.

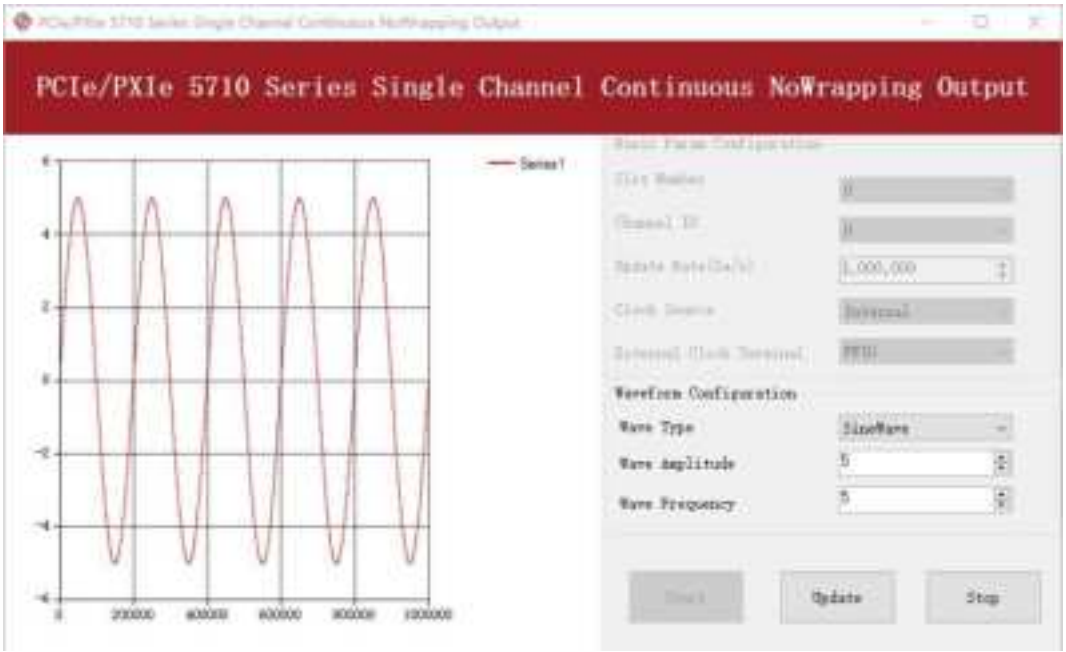

Figure 9 Continuous NoWrapping Output for Single Channel

- The image on the oscilloscope is shown in the figure:

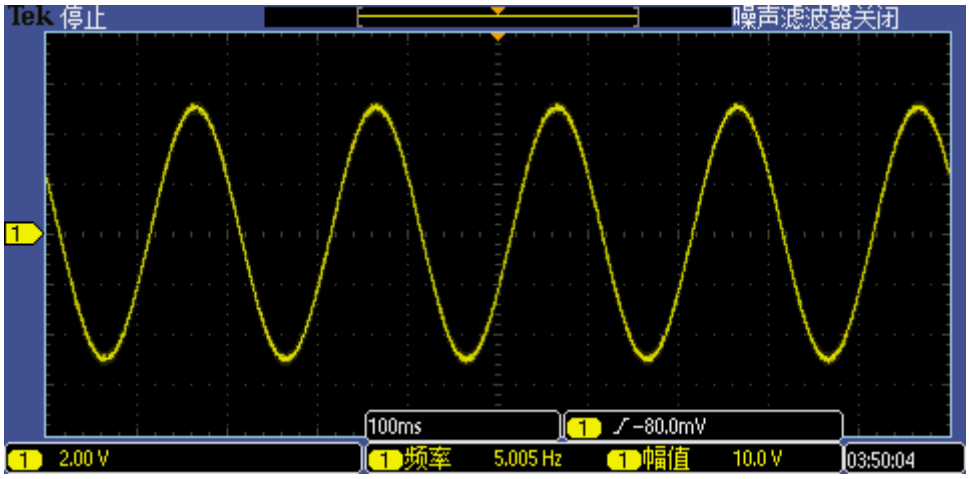

Figure 10 Continuous NoWrapping Signal Image on the Oscilloscope

- Now change the **Wave Type** to **Squarewave** and click **Update** to generate it. The result is shown below.

Figure 11 Continuous NoWrapping Output for Single Channel Squarewave Setting

- The image on the oscilloscope is shown in the figure:

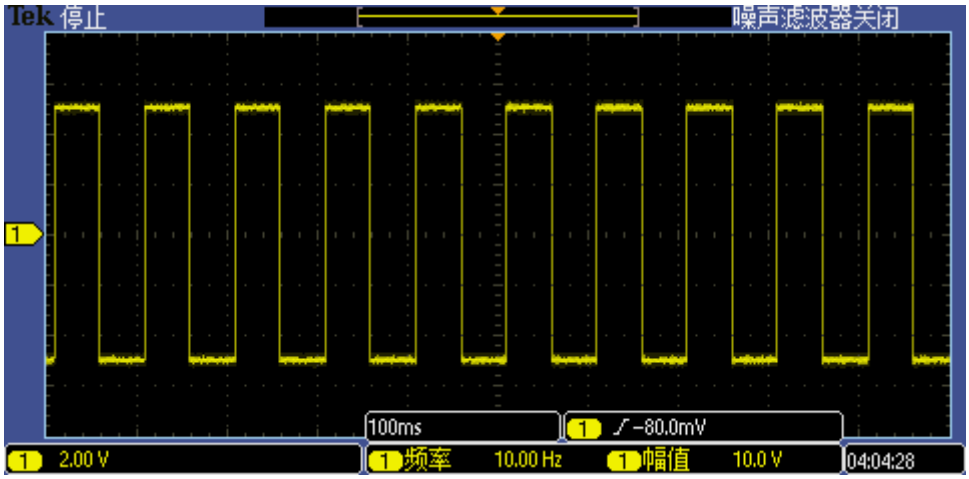

Figure 12 Continuous NoWrapping Signal Image on the Oscilloscope

- The analog signal is successfully generated by PCIe/PXIe-5710.

5.2.3 Continuous Wrapping Output

The continuous loop output first writes a piece of data before starting the AO. After the AO starts, the board will repeatedly output this data until user sends a stop command.

Learn by Example 5.2.1

- Connect the PCIe/PXIe-5710 AO Ch0 (AO_0, Pin #3) to the probe tip of the oscilloscope, and AO ground (AO_GND, Pin #37) is connected to the grounding clip of the oscilloscope.
- PCIe/PXIe-5710 sends an analog signal through (AO_0, AO_GND) and reads the signal on an oscilloscope.
- Open **Analog Output-->Winform AO Continuous Wrapping**, set the following numbers as shown:

Figure 13 Continuous Wrapping Output for Single Channel Setting

- Click **Start** to generate the signal. The result is shown below.

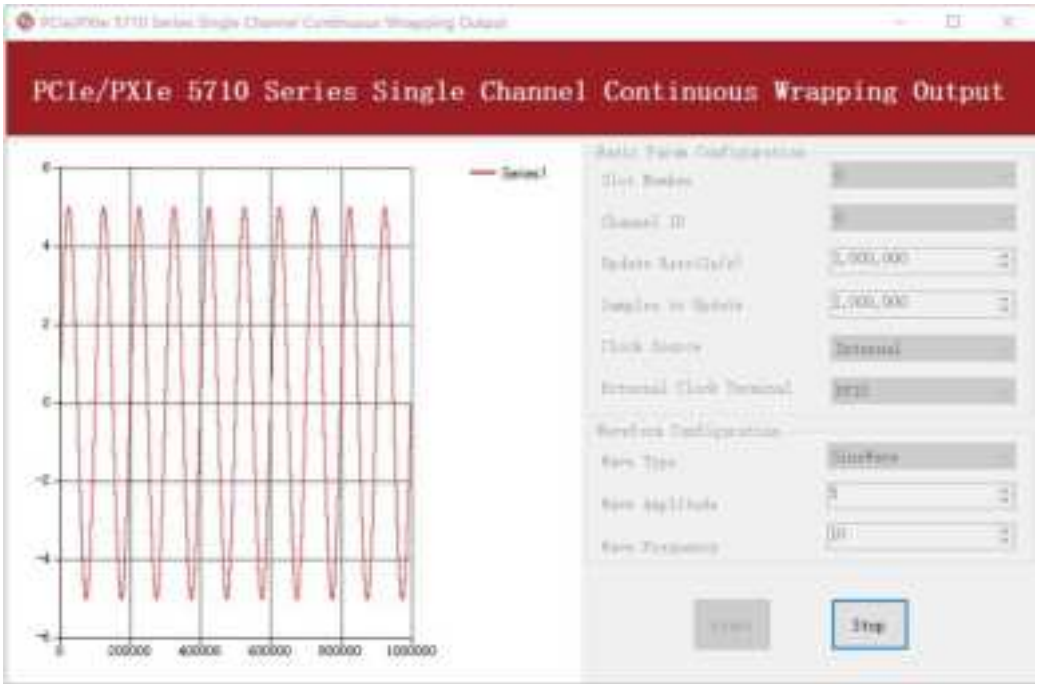

Figure 14 Continuous Wrapping Output for Single Channel

- The image on the oscilloscope is shown in the figure:

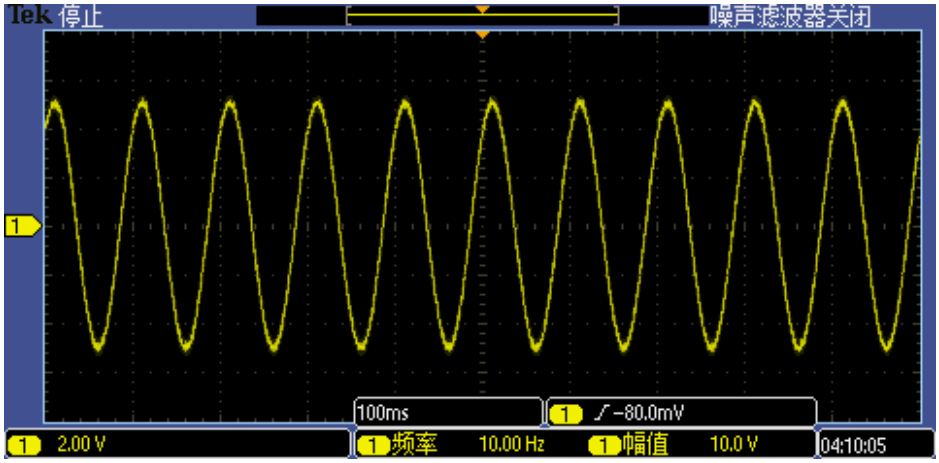

Figure 15 Continuous Wrapping Signal Image on the Oscilloscope

- The analog signal is successfully generated by PCIe/PXIe-5710.

5.3 Trigger Source

There are 3 trigger types: Immediate trigger, Software trigger, and Digital trigger. The trigger type is a property and set by driver software.

5.3.1 Immediate trigger

This trigger mode does not require configuration and is triggered immediately when an operation starts. The operation can be AO, DI, DO etc.

Learn by Example 5.2.1

- PCIe/PXIe-5710 AO Ch0 (AO_0, pin # 3) and AO Ch1 (AO_1, pin # 4) are connected to the probe tips of channel 1 and channel 2 of oscilloscope respectively. Connect AO ground (AO_GND, pin #37) to the ground clips of oscilloscope channels 1 and 2.
- PCIe/PXIe-5710 sends an analog signal through (AO_0,AO_GND)、（AO_1，AO_GND)and reads the signal on an oscilloscope.
- Open **Analog Output-->Winform AO Continuous Wrapping Multichannel**, set the following numbers as shown:

Figure 16 Continuous Wrapping Output for Multichannel Setting

- Click Start, the result is shown below.

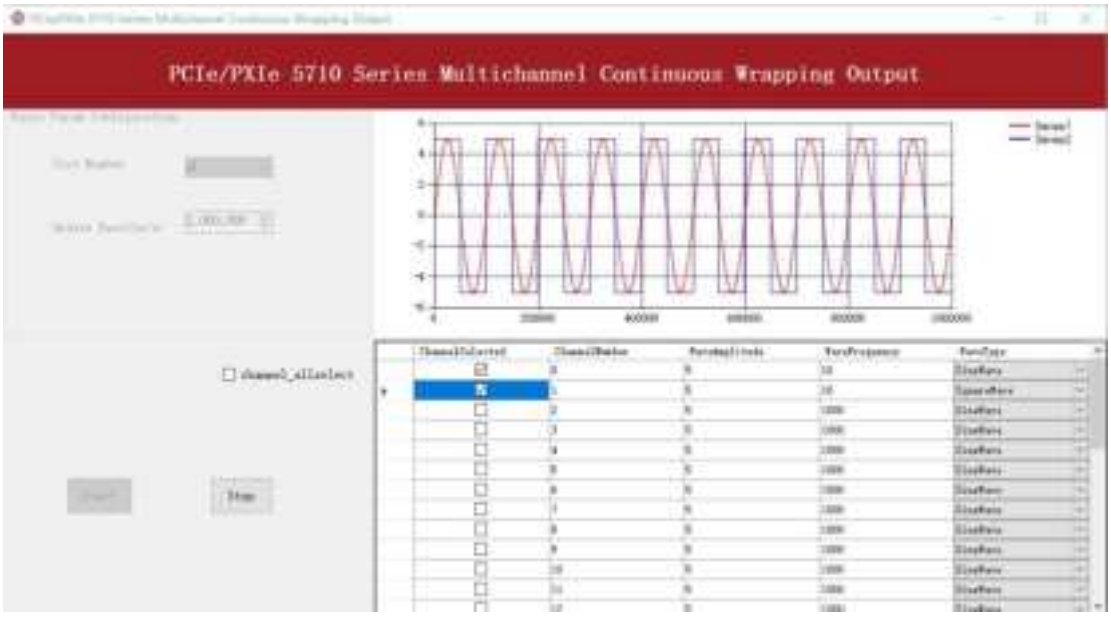

Figure 17 Continuous Wrapping Output for Multichannel

- The image on the oscilloscope is shown in the figure:

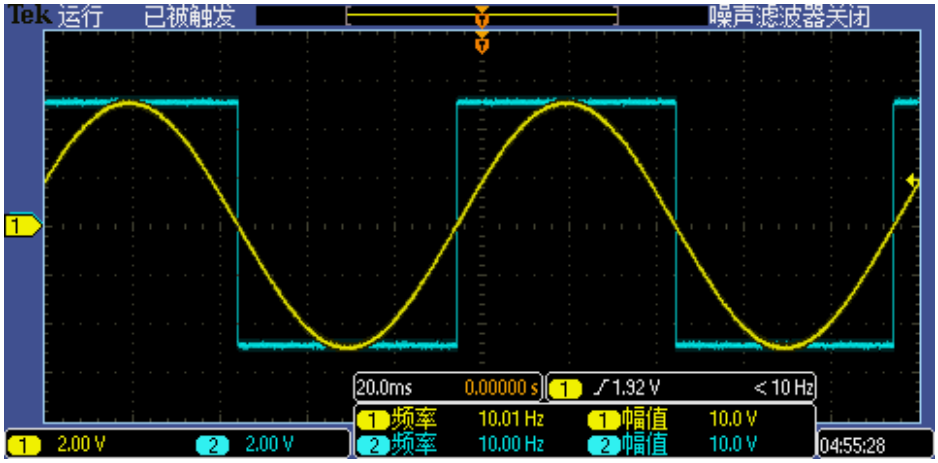

Figure 18 Continuous Wrapping Multichannel Signal Image on the Oscilloscope

- PCIe/PXIe-5710 multi-channel analog signal was successfully generated.

5.3.2 Software Trigger

A software trigger must be configured by the driver software. The trigger starts when a trigger software routine is called.

Learn by Example 5.3.2

- Connect the PCIe/PXIe-5710 AO Ch0 (AO_0, Pin #3) to the probe tip of the oscilloscope, and AO ground (AO_GND, Pin #37) is connected to the grounding clip of the oscilloscope.
- PCIe/PXIe-5710 sends an analog signal through (AO_0, AO_GND) and reads the signal on an oscilloscope.
- Open **Analog Output-->Winform AO Continuous Wrapping Soft Trigger**, set the following numbers as shown:

Figure 19 Continuous Wrapping Output Soft Trigger for Single Channel Setting

- Click **Start** to run the task.
  - Data will not be acquired until there is a positive signal from *Software Trigger* when **Send Soft Trigger** is clicked.
- After sending the trigger signal, the result will be like this:

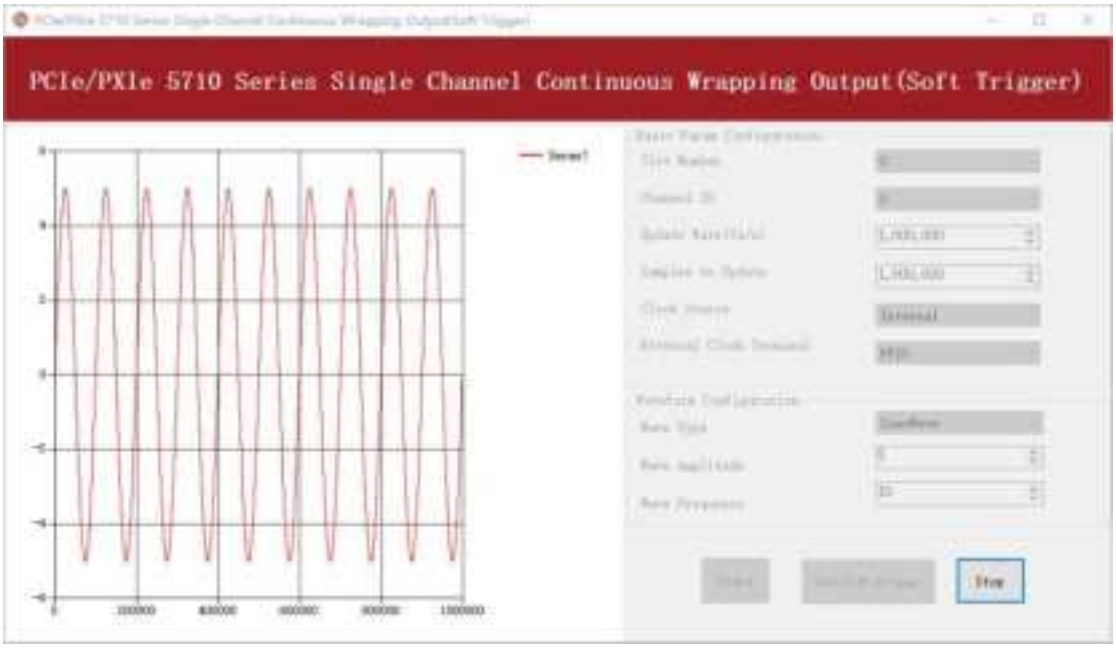

Figure 20 Continuous Wrapping Output Soft Trigger for Single Channel

- The image on the oscilloscope is shown in the figure:

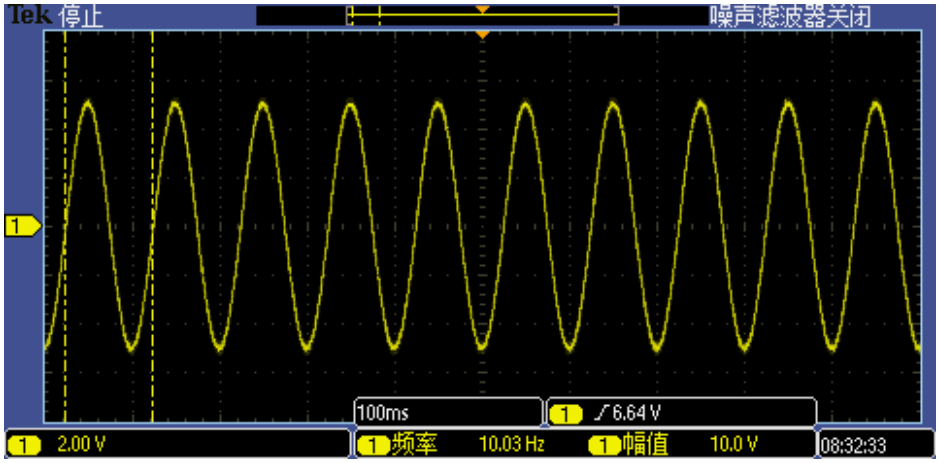

Figure 21 Continuous Wrapping Output Soft Trigger Signal Image on the Oscilloscope

5.3.3 External Digital Trigger

PCIe/PXIe-5710 supports different external digital trigger sources from PXI Trigger bus (PXI_TRIG<0..7>), and PFI. The high pulse width of digital trigger signal must be longer than 20 ns for effective trigger. The module will monitor the signal on digital trigger source and wait for the rising edge or falling edge of digital signal which depending on the set trigger condition, then cause the module to acquire the data as shown in Figure 22.

Figure 22 External Digital Trigger

Learn by Example 5.2.1

- Connect the PCIe/PXIe-5710 AO Ch0 (AO_0, Pin #3) to the probe tip of the oscilloscope, and AO ground (AO_GND, Pin #37) is connected to the grounding clip of the oscilloscope.
- The positive connector of function generator is connected to the digital trigger source(PFI0, Pin #1)of PCIe/PXIe-5710, and the negative connector is connected to the digital ground(DGND, Pin #35).Set up a squarewave signal (f=4Hz, Vpp=5v).
- Open **Analog Output-->Winform AO Continuous Wrapping Digital Trigger**, set the following numbers as shown:

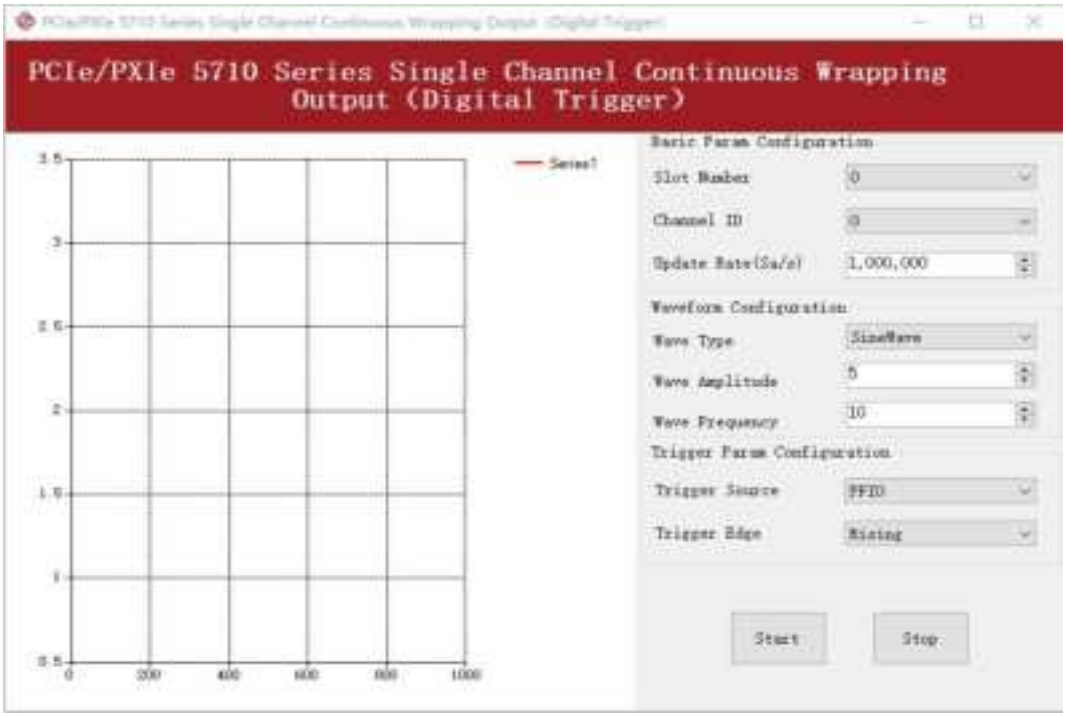

Figure 23 Continuous Wrapping Output Digital Trigger for Single Channel Setting

- **Trigger Source** must match the pin on 5710.
- There are two **Trigger Edge**: **Rising** and **Falling**.

■ Click **Start** and the result shows below:

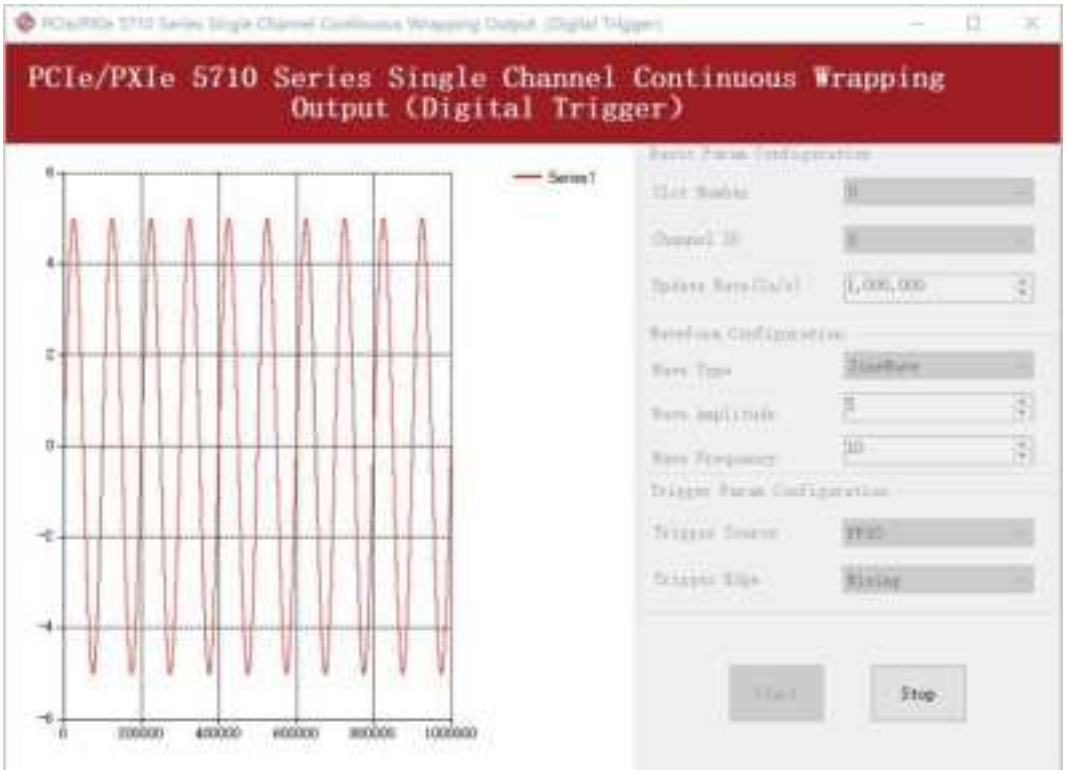

Figure 24 Continuous Wrapping Output Digital Trigger for Single Channel

- The image on the oscilloscope is shown in the figure:

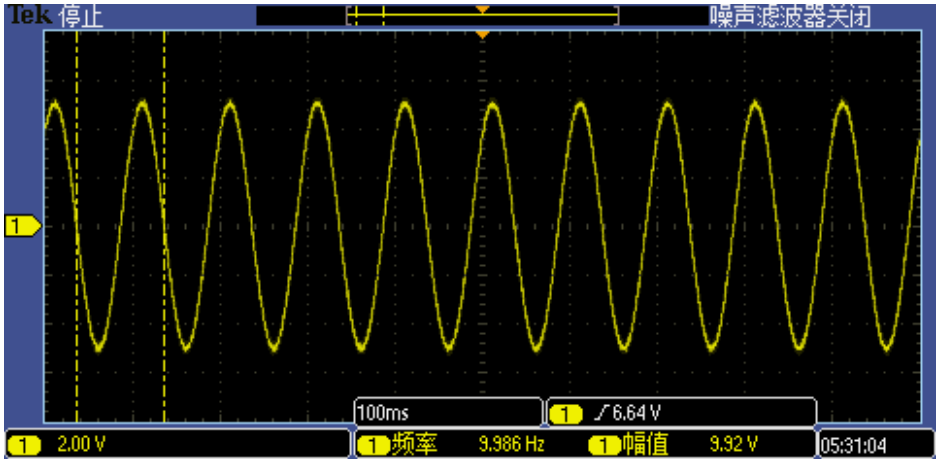

Figure 25 Continuous Wrapping Output Digital Trigger Signal Image on the Oscilloscope

- Since the squarewave is used for the digital trigger source, when a rising edge of the squarewave occurs, the digital trigger will be activated, and the data generation will start.

5.4 Digital I/O Operations

The PCIe/PXIe-5710 provides powerful programmable digital I/O functions.

5.4.1 Static DI/DO

Programmable I/O supports static TTL, 3 lines(0,1,2).User can acess these I/O information through software polling.

Learn by Example 5.4.1

- In this example PCIe/PXIe-5710 outputs a digital signal by its DO function and reads it back by its DI function.
- Connect the PCIe/PXIe-5710 DIO_0/PFI0(pin #1) and DIO_1/PFI1(pin #2)；
- Open the first program **Digital Output-->Winform DO SinglePoint.**
- Select **line 0** for **Digital Output**, Set DO0 in High-Level positions, make sure all other lines are in Low-Level positions. Click **Start** to generate the High-Levels as shown.

Figure 26 Digital Output SinglePoint Setting

- Open the second program **Digital Input-->Winform DI SinglePoint**.
- Select **line 1** for **Digital Input** as shown, and click **Start**. The result is shown below.

Figure 27 Digital Output SinglePoint

- The result matches the high and low levels set before.

5.5 System Synchronization Interface（SSI）for PCIe Modules

The synchronization between PCIe modules are handled differently from the PXIe synchronization, it is implemented by the system synchronization interface (SSI). SSI is designed as a bidirectional bus and it can synchronize up to four PCIe modules. One PCIe module is designated as the master module and the other PCIe modules are designated as the slave modules.

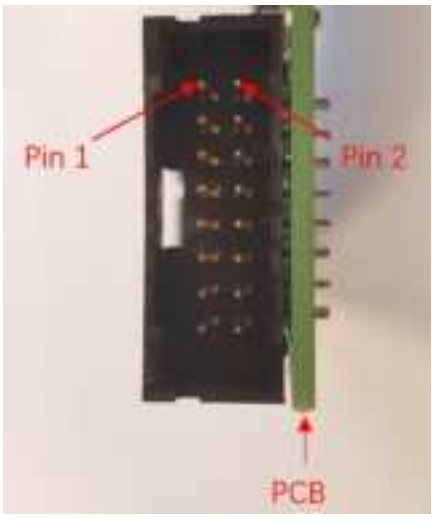

Figure 28 SSI Connector in PCIe-5710

Pin	Signal Name	Signal Name	Pin
1	PXI_TRIG0	GND	2
3	PXI_TRIG1	GND	4
5	PXI_TRIG2	GND	6
7	PXI_TRIG3	GND	8
9	PXI_TRIG4	GND	10
11	PXI_TRIG5	GND	12
13	PXI_TRIG6	GND	14
15	PXI_TRIG7	GND	16

Table 13 SSI Connector Pin Assignment for PCIe-5710

5.6 DIP Switch in PCIe-5710

PCIe-5710 series modules have a DIP switch. The card number can be adjusted manually by changing the DIP switch setting, which is used to identify the boards with different slot positions.

For example, if you want to set the card number to 3, you could turn the position 2 and 1 of the DIP switch to the ON position and the orthers to OFF. See below for details.

Figure 29 DIP Switch in PCIe-5710

	Position 4 (GA3)	Position 3 (GA2)	Position 2 (GA1)	Position 1 (GA0)
Slot 0	0	0	0	0
Slot 1	0	0	0	1
Slot 2	0	0	1	0
Slot 3	0	0	1	1
Slot 4	0	1	0	0
Slot 5	0	1	0	1
Slot 6	0	1	1	0
Slot 7	0	1	1	1
Slot 8	1	0	0	0
Slot 9	1	0	0	1
Slot 10	1	0	1	0
Slot 11	1	0	1	1
Slot 12	1	1	0	0
Slot 13	1	1	0	1
Slot 14	1	1	1	0
Slot 15	1	1	1	1
Note: OFF=0/ ON=1				

Table 14 Relationship between switch position and slot number

6. Calibration

PCIe/PXIe-5710 Series boards are precalibrated before the shipment. We recommend you recalibrate PCIe/PXIe-5710 board periodically to ensure the measurement accuracy. A commonly accepted practice is one year. If for any reason, you need to recalibrate your board, please contact JYTEK.

7. Using PCIe/PXIe-5710 in Other Software

While JYTEK's default application platform is Visual Studio, the programming language is C#, we recognize there are other platforms that are either becoming very popular or have been widely used in the data acquisition applications. Among them are Python, C++ and LabVIEW. This chapter explains how you can use PCIe/PXIe-5710 DAQ card using one of this software.

7.1 Python

JYTEK provides and supports a native Python driver for PCIe/PXIe-5710 boards. There are many different versions of Python. JYTEK has only tested in CPython version 3.5.4. There is no guarantee that JYTEK python drivers will work correctly with other versions of Python.

If you want to be our partner to support different Python platforms, please contact us.

7.2 C++

JYTEK internally uses our C++ drivers to design the C# drivers. We recommend our customers to use C# drivers because C# platform deliver much better efficiency and performance in most situations. We also make our C++ drivers available. However, due to the limit of our resources, we do not actively support C++ drivers. If you want to be our partner to support C++ drivers, please contact us.

7.3 LabVIEW

LabVIEW is a software product from National Instruments. JYTEK provides LabVIEW interface to PCIe/PXIe-5710 boards. You can download the LabVIEW drivers from our website. While JYTEK does not support LabVIEW applications, we may recommend you to a third party who can assist you to interface your LabVIEW with our PCIe/PXIe-5710 boards. We can also recommend you if you want to convert your LabVIEW applications to C# based applications.

8. About JYTEK

8.1 JYTEK China

Founded in June, 2016, JYTEK China is a leading Chinese test & measurement company, providing complete software and hardware products for the test and measurement industry. The company is a joint venture between Adlink Technologies and a group of experienced professionals form the industry. JYTEK independently develop the software and hardware products and is entirely focused on the Chinese market. Our Shanghai headquarters and production service center have regular stocks to ensure timely supply; we have R&D centers in Xi'an and Chongqing to develop new products; we also have highly trained direct technical sales representatives in Shanghai, Beijing, Tianjin, Xi'an, Chengdu, Nanjing, Wuhan, Haerbin, and Changchun. We also have many partners who provide system level support in various cities.

8.2 JYTEK Hardware Products

According to JYTEK's agreement with our equity partner Adlink Technologies, JYTEK's hardware is manufactured by the state-of-art manufacturing facility located in Shanghai Zhangjiang Hi-Tech Park. Adlink has over 20 years of the world-class low-volume and high-mix manufacturing expertise with ISO9001-2008, China 3C, UL, ROHS, TL9000, ISO-14001, ISO-13485 certifications. Its 30,000 square meters facilities and three high-speed Panasonic SMT production lines can produce 60,000 pieces boards/month; it also has full supply chain management - planning, sweeping, purchasing, warehousing and distribution. Adlink's manufacturing excellence ensures JYTEK's hardware has word-class manufacturing quality.

One core technical advantage is JYTEK's pursue for the basic and fundamental technology excellence. JYTEK China has developed a unique PCIe, PXIe, USB hardware driver architecture, FirmDrive, upon which many our future hardware will be based.

In addition to our own developed hardware, JYTEK also rebrands Adlink's PXI product lines. In addition, JYTEK has other rebranding agreements to increase our hardware coverage. It is our goal to provide the complete product coverage in PXI and PCI modular instrumentation and data acquisition.

8.3 JYTEK Software Platform

JYTEK has developed a complete software platform, SeeSharp Platform, for the test and measurement applications. We leverage the open sources communities to

provide the software tools. Our platform software is also open sourced and is free, thus lowering the cost of tests for our customers. We are the only domestic vendor to offer complete commercial software and hardware tools.

8.4 JYTEK Warranty and Support Services

With our complete software and hardware products, JYTEK is able to provide technical and sales services to wide range of applications and customers. In most cases, our products are backed by a 1-year warranty. For technical consultation, pre-sale and after-sales support, please contact JYTEK of your country.

9. Statement

The hardware and software products described in this manual are provided by JYTEK China, or JYTEK in short.

This manual provides the product review, quick start, some driver interface explanation for JYTEK PCIe/PXIe-5710 Series family of multi-function data acquisition boards. The manual is copyrighted by JYTEK.

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While we try to keep this manual up to date, there are factors beyond our control that may affect the accuracy of the manual. Please check the latest manual and product information from our website.

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