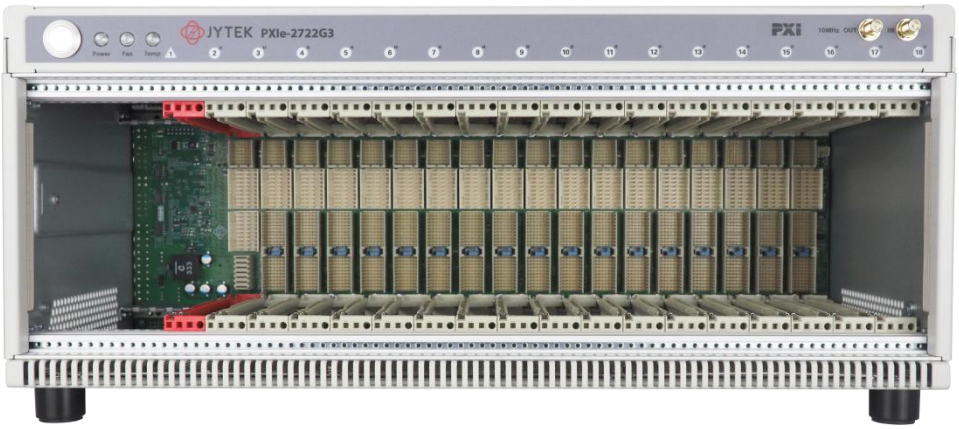
PXIe-2722 Chassis

User Manual



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1. Introduction

1.1 Overview

PXIe-2722 series are flexibility and high performance 18-slot all-hybrid PXIe chassis which features up to 24 GB/s system bandwidth and 58 W of power and cooling in every slot.

Depanding on PCIe link speed capability, PXIe-2722 series provide two models as shown inTable 1.

Model Name	PCIe Link Speed Capability	System Bandwidth	Slot Bandwidth
PXIe-2722G3	Gen3	24 GB/s	8 GB/s
PXIe-2722G2	Gen2	8 GB/s	4 GB/s

Table 1 PXIe-2722 series model name

Note:

- system bandwidth defined as data rate between controller and chassis backplane.
- slot bandwidth defined as data rate between peripheral module and chassis backplane.

1.2 Main Features

- PXI-5 PXI Express hardware specification Rev.1.0 compliant
- High data throughput 18-slot PCIe Gen2 (PXIe-2722G2) or Gen3 (PXIe-2722G3) PXIe chassis
- Up to 24 GB/s (PCI Express 3.0 x8 and x16 link) system bandwidth (PXIe-2722G3)
- Up to 8 GB/s (PCI Express 3.0 x8 link) bandwidth for all peripheral slots (PXIe-2722G3)
- High clock accuracy and low phase jitter
- Low power ripple-noise
- Specially designed for cost effective PXI/PXIe applications
- 0°C to 55°C extended operating temperature range
- Ideal for OEM vendors

2. Hardware

2.1 Backplane Overview

2.1.1 PXIe-2722G3 Backplane Architecture

All of the PXIe peripheral slots can support PCIe Gen3 x8 link providing a maximum slot bandwidth of 8 GB/s. The system slot can support PCIe Gen3 x24 link (x8 + x16) and has a maximum system bandwidth of 24 GB/s.

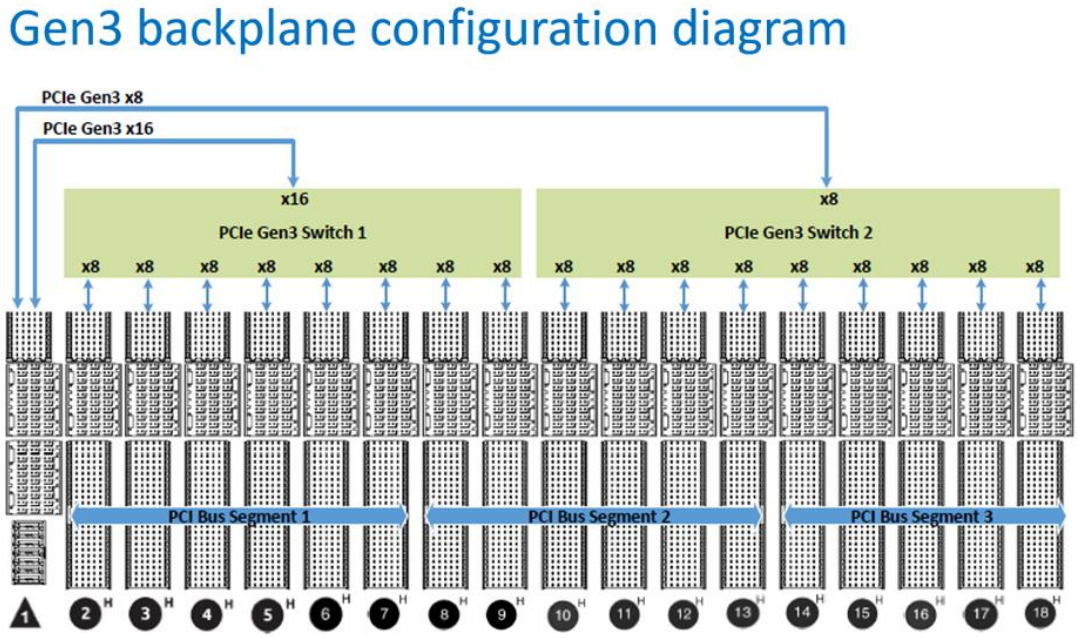


Figure 1 PXIe-2722 Gen3 Backplane Architecture

2.1.2 PXIe-2722G2 Backplane Architecture

The system slot can support PCIe Gen2 x16 link (x8 + x8), it has a maximum system bandwidth of 8 GB/s. Four of the PXIe peripheral slots have a PCIe Gen2 x8 link providing a maximum slot bandwidth of 4 GB/s. The 13 remaining peripheral slots have a PCIe Gen2 x4 link providing a maximum slot bandwidth of 2 GB/s.

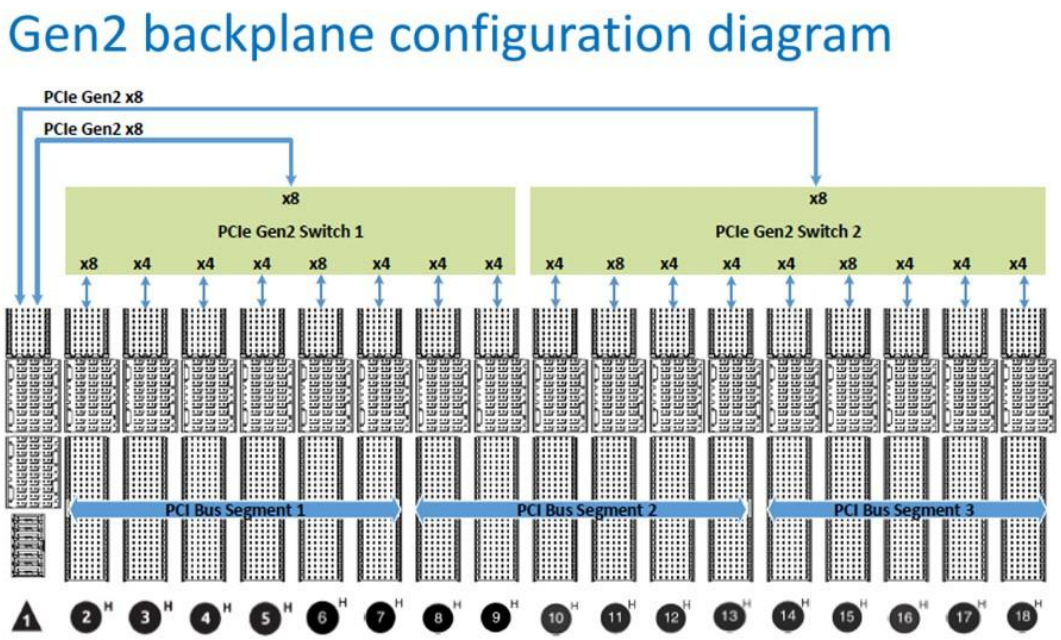


Figure 2 PXIe-2722 Gen2 Backplane Architecture

Note:

- Slot2, slot6, slot11 and slot15 can support PCIe Gen2 x8, the remaining peripheral slots can support PCIe Gen2 x4.

2.1.3 System Controller Slot

The System Controller slot is a fixed PCIe 2-Link configuration. Link 1 and Link 2 are routed to PCIe switch board, and then downstream to every peripheral slot. The chassis can accommodate a maximum 4-slot width PXIe controller.

2.1.4 Peripheral Slot

PXIe-2722 provides seventeen hybrid peripheral slots. It can accept the following peripheral modules:

- PXI Express Peripheral Module
- CompactPCI Express Type-2 Peripheral Module
- Hybrid slot compatible PXI-1 Peripheral Module
- CompactPCI 32-bit Peripheral Module

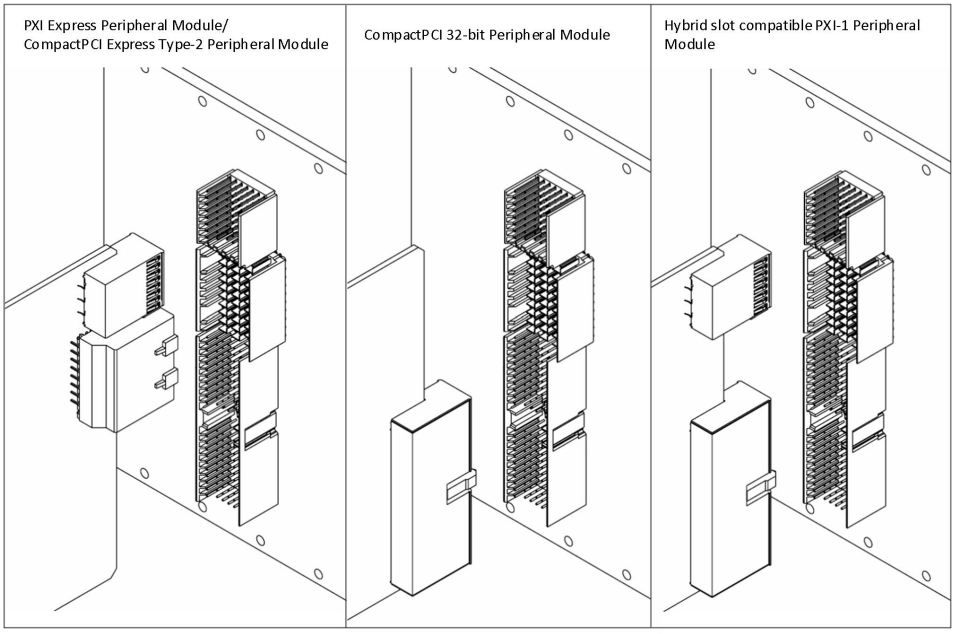


Figure 3 PXIe-2722 Peripheral Slot Compatible Modules

Each peripheral slot PCIe link can support Gen3 x8 (PXIe-2722G3) or Gen2 x8 (PXIe-2722G2), providing maximum single-direction bandwidth of 8GB/s or 4GB/s. And each peripheral slot can also support 32bit PCB bus, providing maximum single-direction bandwidth of 132MB/s.

2.1.5 PXI Trigger Bus

Three trigger bus segments on the PXIe-2722 consist of a first segment from 1st to 6th slots, a second from 7th to 12th slots, and a third from 13th to 18th slots, with each trigger bus segment containing 8 trigger lines connecting all slots on the same segment, providing inter-module synchronization.

Trigger bus buffers can connect or disconnect the trigger lines of adjacent segments. As shown in Figure 5, eight combinations of trigger bus segment connections are possible between the three bus segments, with any applicable to each of the eight trigger lines.

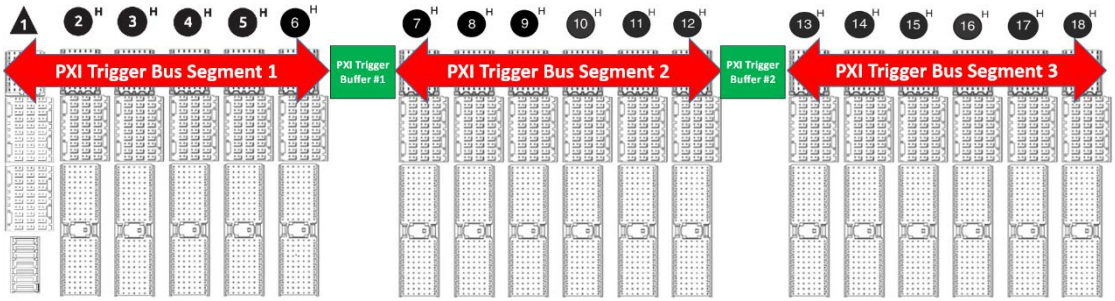


Figure 4 PXI Trigger Bus Connectivity Diagram

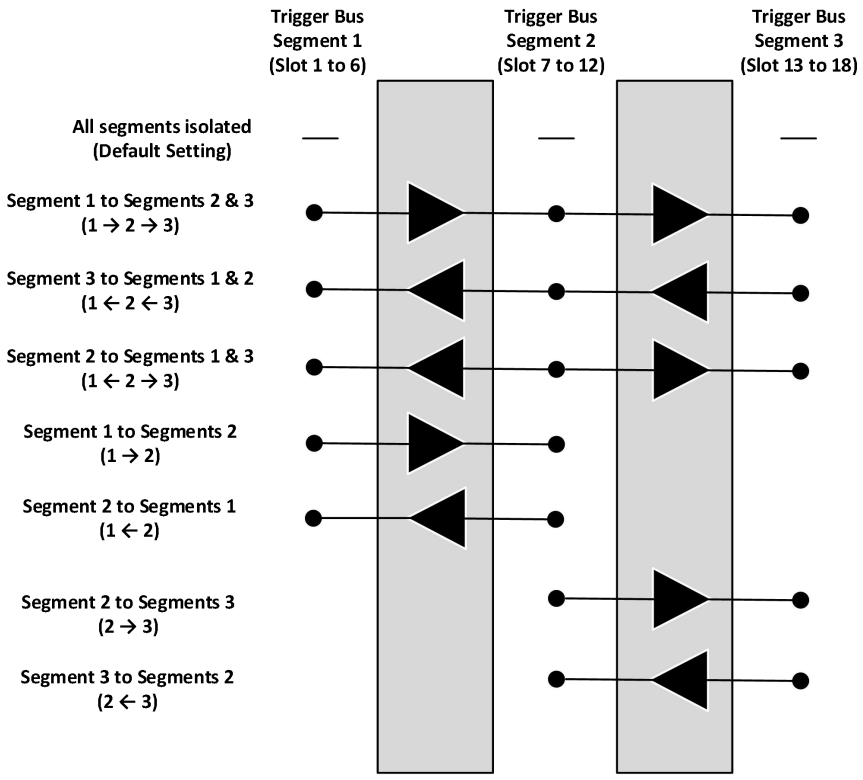


Figure 5 Trigger Bus Buffer Routing

Note:

- The triangle shown represents the direction of the trigger.
- The trigger bus buffer routing can be configured via the JYDM utility.

2.1.6 PXI Local Bus

The local bus on PXIe-2722 is a daisy-chained bus that connects each peripheral slot with adjacent peripheral slots to the left and right, which by routing PXI Local Bus 6 signal between adjacent peripheral slots.

2.1.7 System Reference Clock and Synchronization Signal

The PXIe-2722 backplane supplies 10MHz reference clock (PXI_CLK10), 100MHz reference clock (PXIe_CLK100) and synchronization signal (PXIe_SYNC100) to each peripheral slot for inter-module synchronization.

The PXI_CLK10 and PXIe_CLK100 clocks are in-phase according to the PXI-5 specification. A phase-lock loop (PLL) circuit on the backplane synchronizes the PXI_CLK10 and PXIe_CLK100 clock.

There are two 10 MHz reference clock source:

- Built-in 10 MHz clock source on backplane.
- External 10 MHz clock through front panel's SMA connector.

The PXIe-2722 automatically selects the 10 MHz reference clock source and its priority as follows.

SMA Connector on Front Panel	10MHz Clock Source of Peripheral Slots
No clock present	Backplane's local oscillator
10MHz clock present	SMA connector

Table 2 Reference Clock Priority

The PXIe-2722 has the default timing relationship of PXI_CLK10, PXIe_CLK100 and PXIe_SYNC100 as show in Figure 4 which comply with PXI-5 specification.

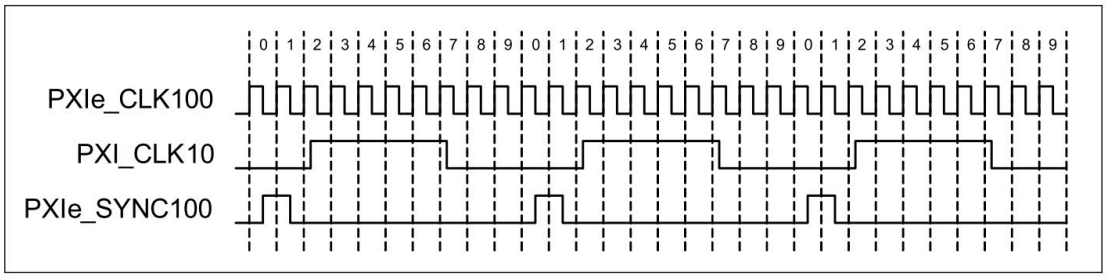


Figure 6 System Reference Clock Default Behavior

2.2 Specifications

2.2.1 Basic

Descriptions	PXIe-2722G3	PXIe-2722G2
PXI Chassis Type	PXIe	PXIe
Slot Count	18	18
Maximum slot bandwidth	8 GB/s (PCIe Gen3 x8)	4 GB/s (PCIe Gen2 x4 or x8)
Maximum system bandwidth	24 GB/s (PCIe Gen3 x24)	8 GB/s (PCIe Gen2 x16)
Chassis Power Supply Type	AC	AC
Slot Cooling Capacity	58 W (0°C ~ 40°C) 38W (0°C ~ 55°C)	58 W (0°C ~ 40°C) 38W (0°C ~ 55°C)
Onboard Clock Type	VCXO	VCXO
External Clocking	Yes	Yes
Number of hybrid slots	17	17
Number of PXIe slots	0	0
Number of PXI slots	0	0
System timing slot	No	No
External Trigger Access	No	No
Redundant HW	No	No

Table 3 Basic Specification

2.2.2 Electrical

AC Input	
Descriptions	PXIe-2722 G3/G2
Total Chassis Power	1300 W
Input voltage range	100 to 240 VAC
Input frequency	50/60 Hz
Input current rating	12-6 A
Efficiency	91%
DC Output	
Descriptions	PXIe-2722 G3/G2
Total Available Power	1170W (0℃ ~ 45℃ , 220VAC) 990W (45℃ ~ 55℃ , 220VAC)
+3.3 V	77 A
+5 V	53 A
+12 V	72 A
–12 V	4 A
5 Vaux	4 A
+3.3V Load Regulation	5%
+5V Load Regulation	5%
+12V Load Regulation	5%
-12V Load Regulation	5%
5Vaux Load Regulation	5%
+3.3V Maximum Ripple and Noise	39 mVpp
+5V Maximum Ripple and Noise	19 mVpp
+12V Maximum Ripple and Noise	15 mVpp
-12V Maximum Ripple and Noise	4 mVpp
5Vaux Maximum Ripple and Noise	4 mVpp
Maximum power dissipation	
Descriptions	PXIe-2722 G3/G2
System Controller Slot	140W
Hybrid Peripheral Slot	58W

System Controller Slot Current Capacity	
Descriptions	PXIe-2722 G3/G2
+3.3 V	15 A
+5 V	15 A
+12 V	30 A
5 Vaux	3 A
Hybrid Peripheral Slot with PXI-5 Peripheral Slot Current Capacity	
Descriptions	PXIe-2722 G3/G2
+3.3 V	9 A
+12 V	6 A
5 Vaux	1 A
Hybrid Peripheral Slot with PXI-1 Peripheral Slot Current Capacity	
Descriptions	PXIe-2722 G3/G2
+3.3 V	6 A
+5 V	6 A
+12 V	1 A
–12 V	1 A
V (I/O)	11 A

Table 4 Electrical Specification

2.2.3 System Synchronization Clock

PXI_CLK10

Maximum slot-to-slot skew	160 ps
Accuracy	±15 ppm max
Maximum jitter	3.5 ps RMS phase-jitter (10 Hz–1 MHz range)
Duty-factor	45%–55%
Unloaded signal swing	3.3 V ±0.3 V

PXIe_CLK100

Maximum slot-to-slot skew	125 ps
Accuracy	±15 ppm max
Maximum jitter	1.7 ps RMS phase-jitter (12 kHz–20 MHz range)
Duty-factor	45%–55%
Absolute differential voltage	400–1000 mV

PXIe_SYNC100

Maximum slot-to-slot skew	125 ps
Accuracy	±15 ppm max
Maximum jitter	3.6 ps RMS phase-jitter (12 kHz–20 MHz range)
Duty-factor	45%–55%
Absolute differential voltage	400–1000 mV

External 10 MHz Reference Output(SMA connector)

Maximum jitter	3.3 ps RMS phase-jitter (10 Hz–1 MHz range)
Output amplitude	1 VPP ±20% square-wave into 50 Ω
	2 VPP unloaded
Output impedance	50 Ω ±5 Ω

External 10 MHz Reference Input(SMA connector)

Frequency	10 MHz ±100 PPM
Input amplitude	100 mVPP to 5 VPP square-wave or sine-wave
Input impedance	50 Ω ±5 Ω

Table 5 System Synchronization Clock

2.2.4 Physical and Enviornment

Operating Environment

Maximum altitude	3048 m
Ambient temperature range	0 to 55 °C
Relative humidity range	10% to 90%, noncondensing

Storage Environment

Ambient temperature range	-40°C to 70°C
Relative humidity range	5% to 95% noncondensing

Shock and Vibration

Operational shock	30 g peak, half-sine, 11 ms
Random Vibration (Operating)	5 to 500 Hz, 0.3 Grms, 3 axes
Random Vibration (Nonoperating)	5 to 500 Hz, 2.46 Grms, 3 axes

Sound Pressure Level

Auto fan (up to ~25 °C ambient)	46 dBA
High fan	64 dBA

Sound Power

Auto fan (up to ~25 °C ambient)	56 dBA
High fan	76 dBA

Backplane

Size	3U

Chassis Size and Weight

Descriptions	PXIe-2722G3	PXIe-2722G2
Width	440.2 mm	440.2 mm
Depth	455.2 mm	455.2 mm
Height	177.8 mm	177.8 mm
Net Weight	12.65 kg	12.65 kg
Gross Weight (with package, power cable)	16.55 kg	16.55 kg

Table 6 Physical and Environment

2.3 Mechanical Dimensions

All dimensions are shown in mm (millimeters)

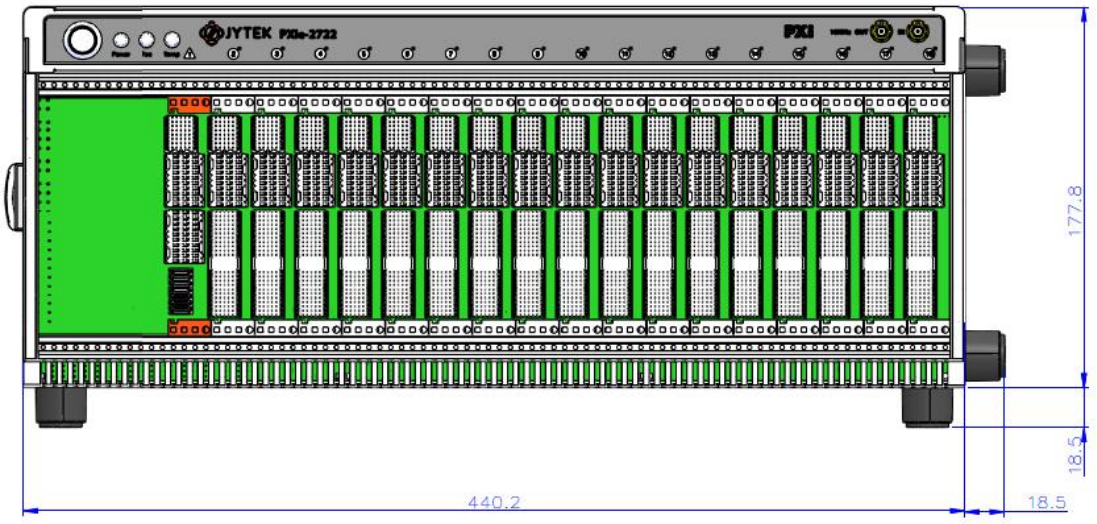


Figure 7 Front View

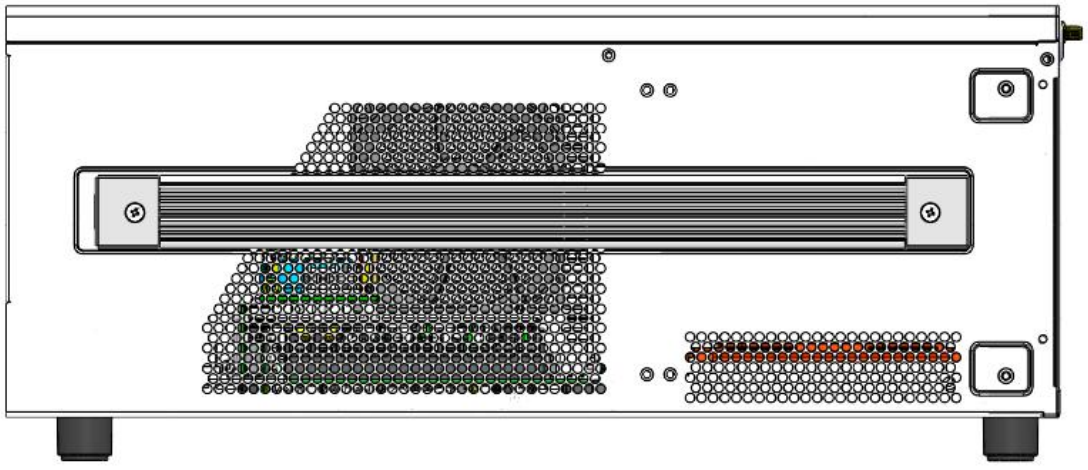


Figure 8 Left Side View

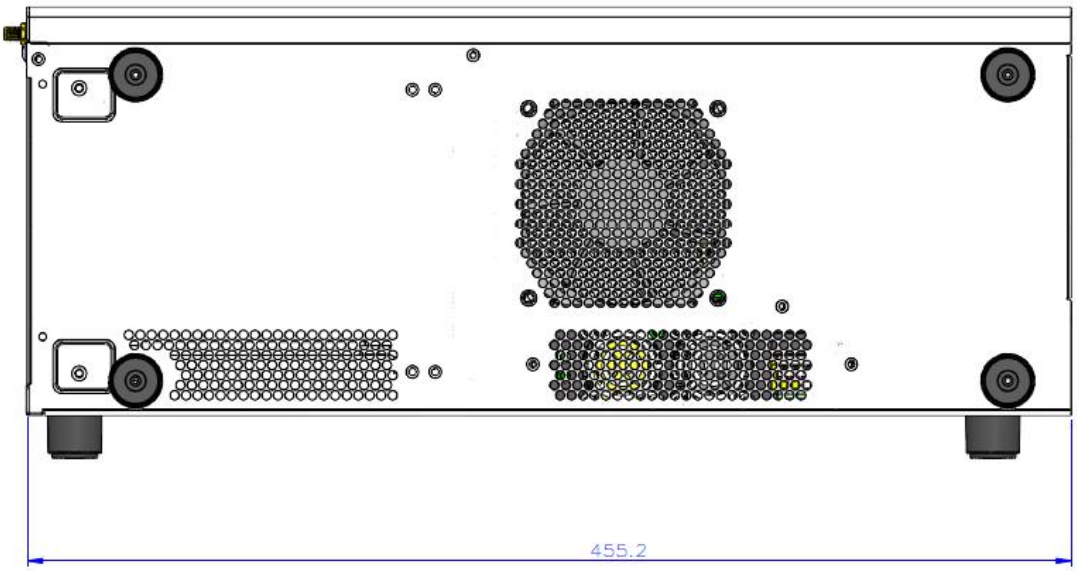


Figure 9 Right Side View

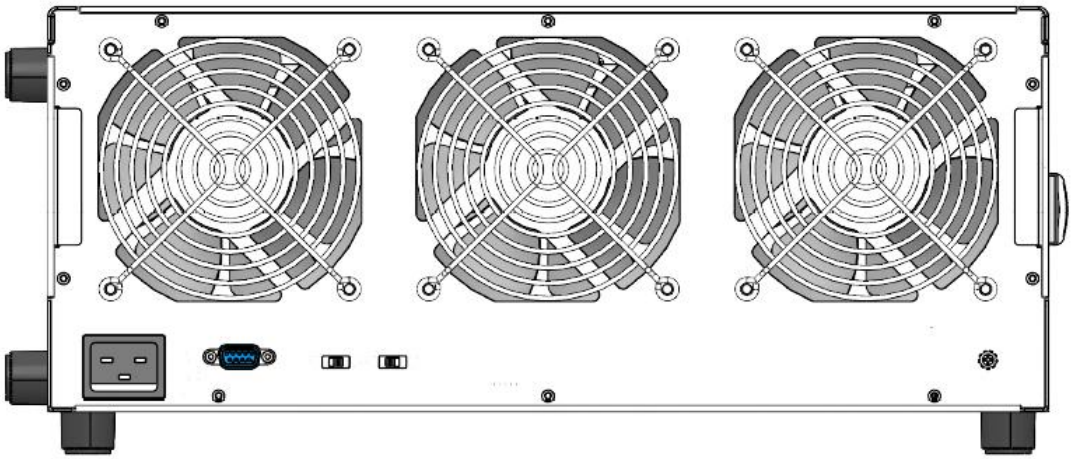


Figure 10 Rear View

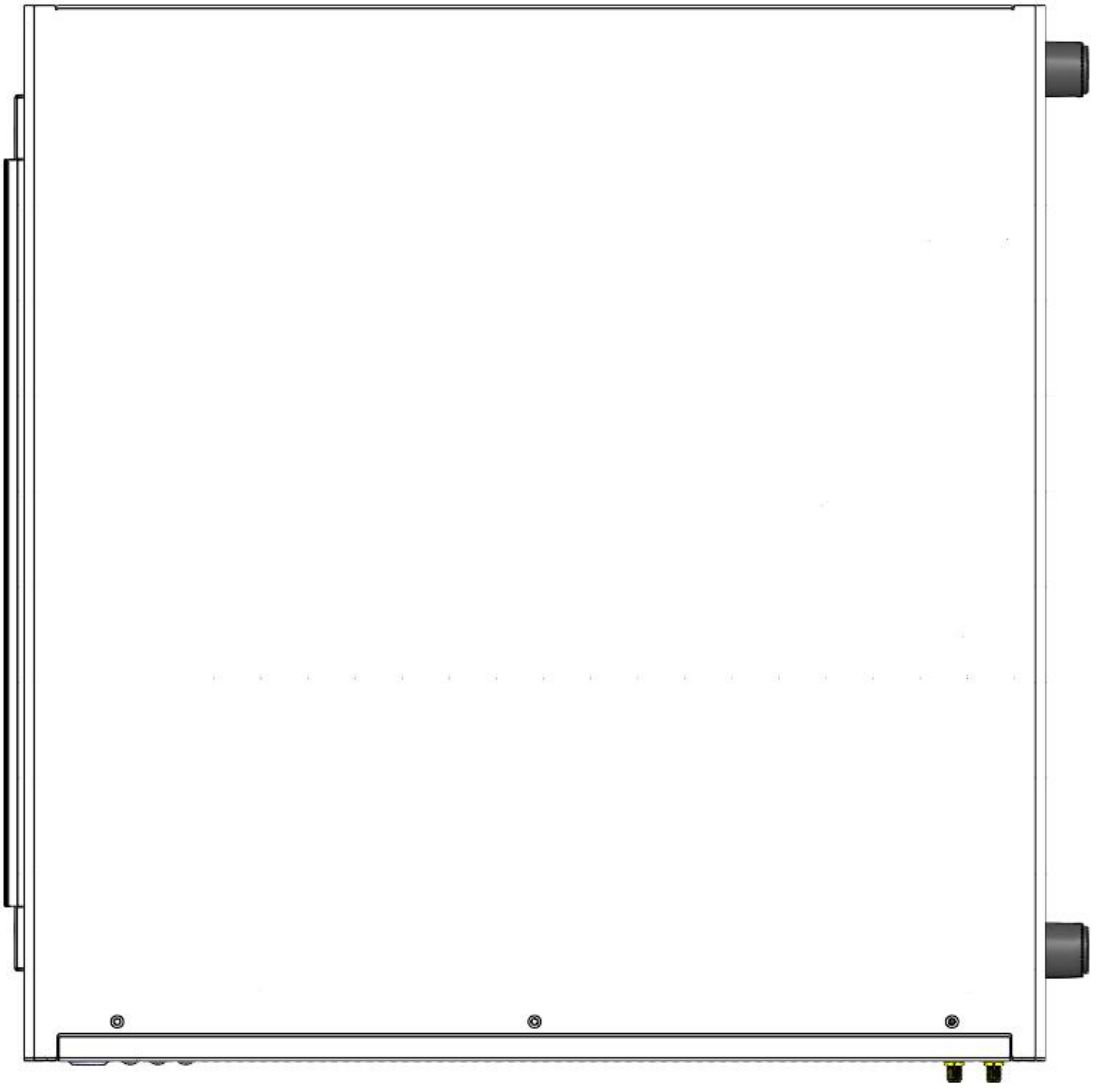


Figure 11 Top View

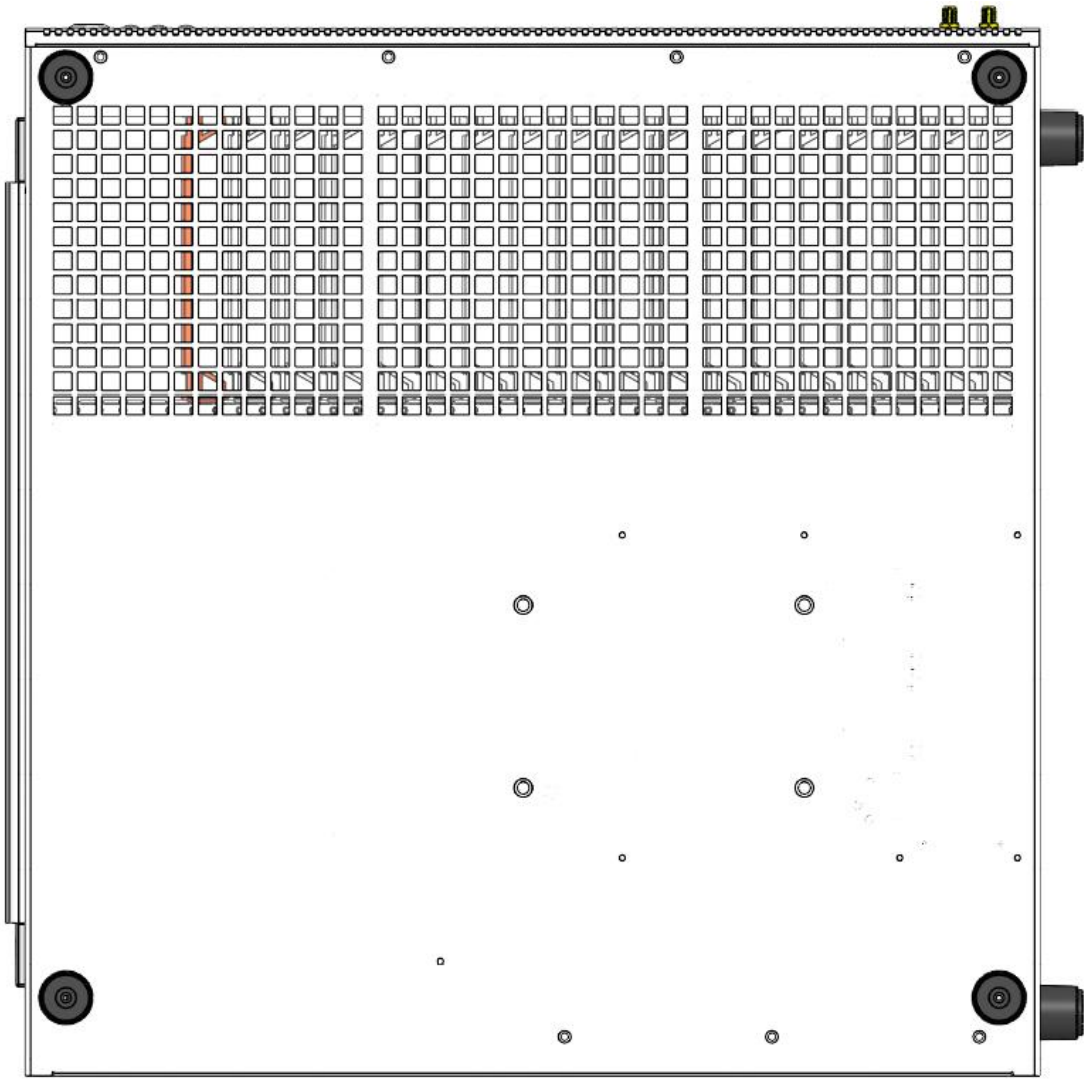


Figure 12 Bottom View

2.4 Front and Rear Panels

2.4.1 Front Panel

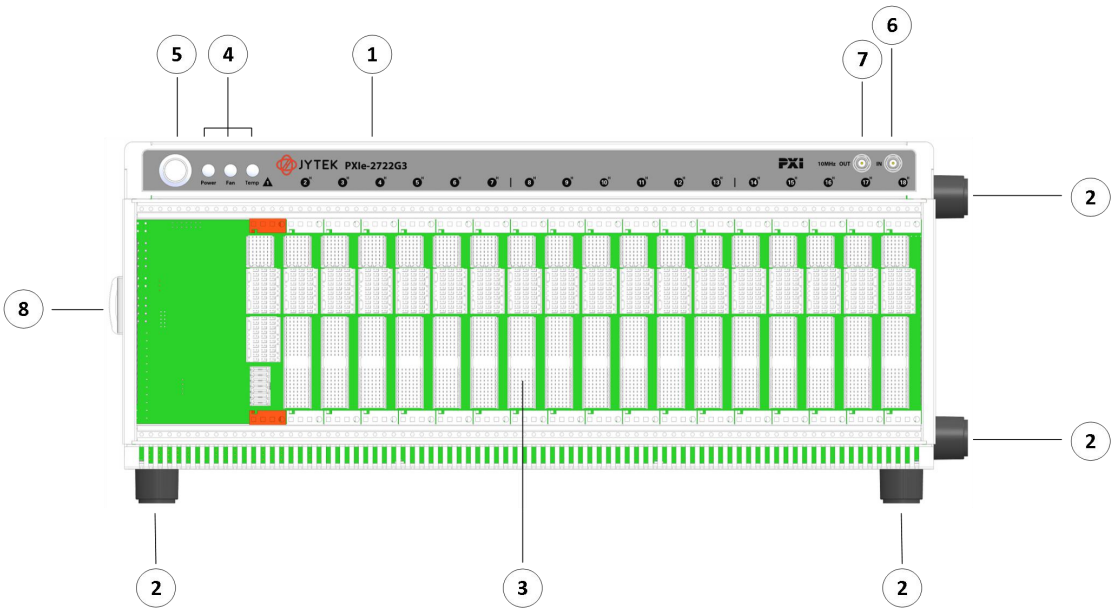


Figure 13 Front Panel

Location	Feature
1	Chassis Model Name
2	Removable Feet
3	Backplane Connectors
4	Chassis Status LED
5	Power Switch
6	10MHz REF CLK IN
7	10MHz REF CLK OUT
8	Handle

Table 7 Front Panel

2.4.2 Rear Panel

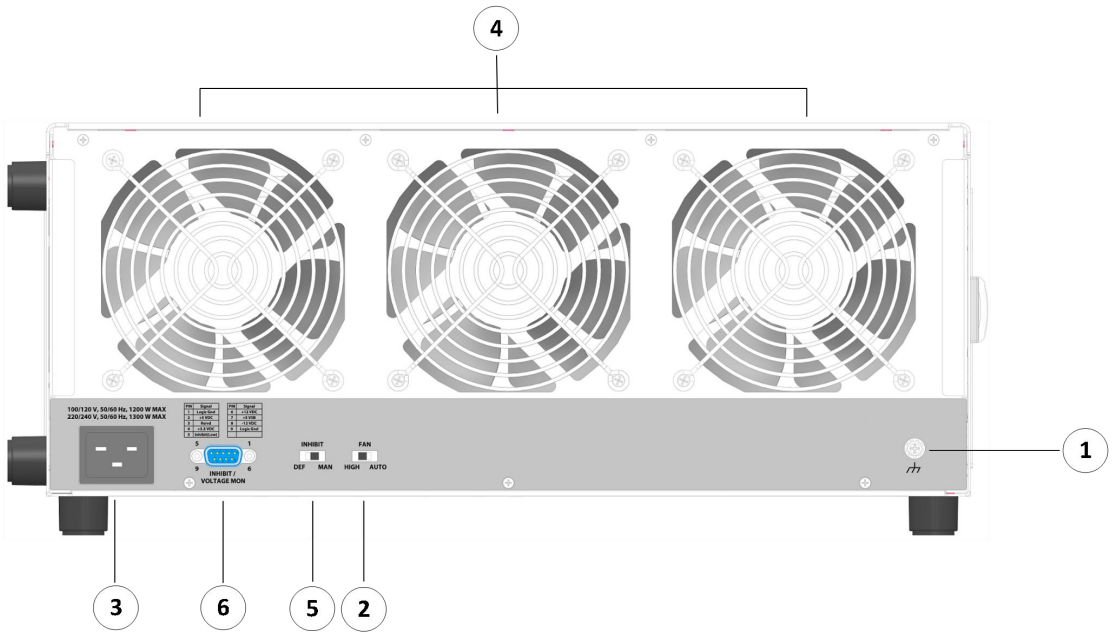


Figure 14 Rear Panel

Location	Feature
1	Chassis Ground Screw
2	FAN Switch
3	AC Input
4	Rear Output Vents
5	Inhibit Switch
6	Inhibit/Voltage Monitoring DB-9 Connector

Table 8 Rear Panel

2.4.3 Inhibit/Voltage Monitoring DB-9 Connector

The DB-9 connector monitors the four main power rails via digital multimeter. Power rail pin assignments shown in Figure 15. There are 10 kΩ current-limiting resistors on each power rail prevents accidental overload. One Inhibit (active low) pin is provided to power the chassis on/off when the Inhibit Switch is in the MAN (manual) position, such that chassis is powered on when Inhibit pin is logic high or open, and off when Inhibit pin is grounded.

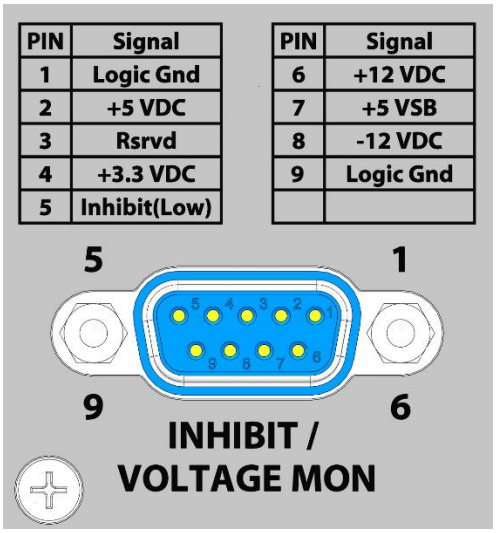


Figure 15 Inhibit/Voltage Monitoring DB-9 Connector

2.4.4 Inhibit Switch

In the **DEF** (default) position, the front panel power button turns the power supply on/off, and in the **MAN** (manual) position, the **Inhibit** pin on the DB-9 connector turns the power supply on/off.

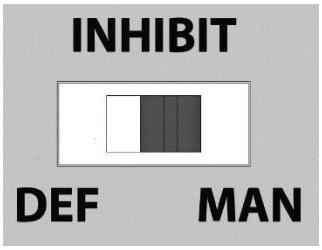


Figure 16 Inhibit Switch

2.4.5 FAN Switch

In the **HIGH** position, fans operate at maximum speed, and in **AUTO,** the fans run based on the monitored chassis temperature.

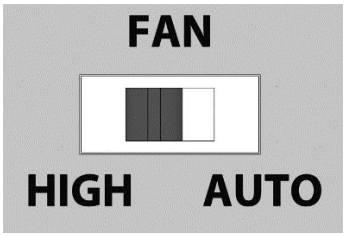


Figure 17 FAN Switch

2.4.6 Chassis Status LED

Chassis Status LED	Temp LED (Amber)	Fan LED (Green)	Power LED (Blue)
On	Chassis MCU is abnormal	Fan is normal	Power is normal
Off	Temperature is normal	Chassis is powered down	Chassis is powered down
Blinking	Temperature sensors exceeds threshold temperature (default is 70℃)	Fan falls below threshold speed (default is 800RPM)	Power rail exceeds threshold setting (default is ±5%)

Table 9 Chassis Status LED

2.4.7 Fan Mode

PXIe-2722 provides the smart fan control mechanism as blow curve. It provides two fan modes.

Fan Mode	Fan's duty cycle	Fan's speed	Note
AUTO	40% ~ 100%	1680 rpm ±10% to 4200 rpm ±10%	Based on temperature sensors.
HIGH	100%	4200 rpm ±10%	

Table 10 Fan Mode

When the **Fan Switch** is set to **AUTO** mode, the fan speed is controlled based on the measured temperature of sensor.

Fans run at 40% duty cycle if the measured temperature less than 25°C, and begin ramping up when any temperature reading exceeds 25°C.

Fans run at 100% duty cycle (full speed) if any temperature reading exceeds 50°C.

When the **Fan Switch** is set to **HIGH** mode, fans run at 100% duty cycle immdiately.

The factory default fan control curve shows as following Figure.

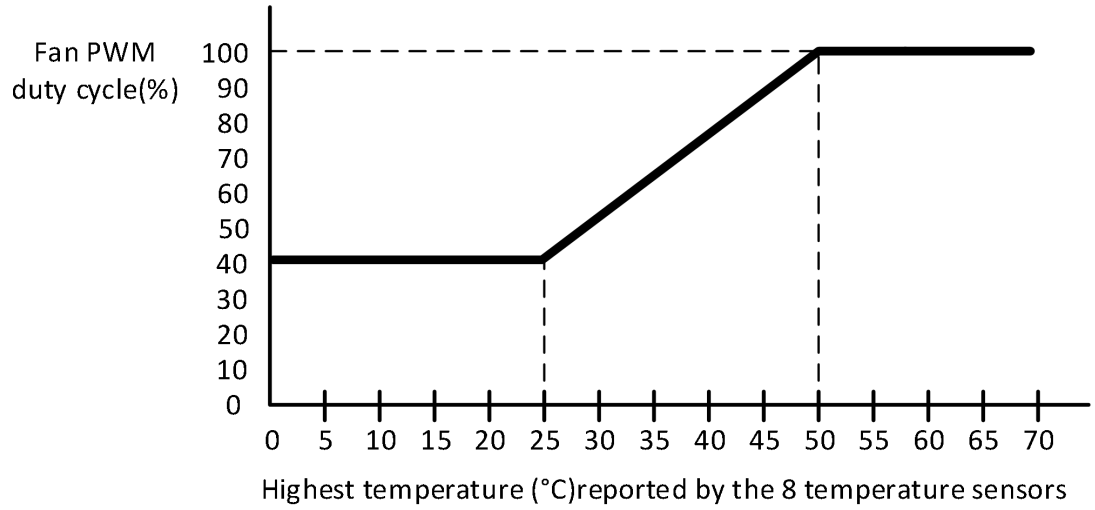


Figure 18 Fan Control Curve

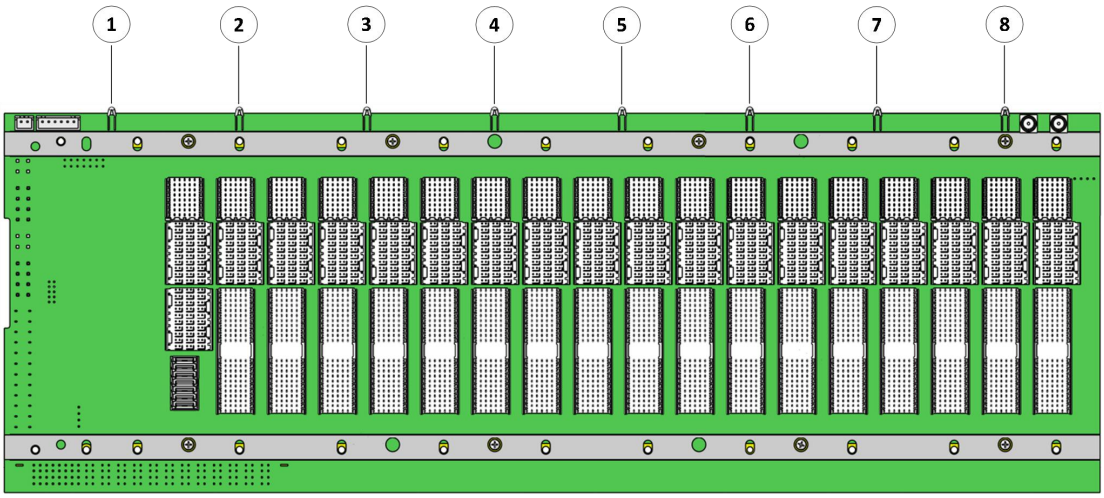


Figure 19 Position of temperature sensors

Note:

- For details about chassis temperature monitoring, please see JYDM utility on page 32.

2.5 Chassis Cooling Considerations

2.5.1 PXI/PXIe Modules Cooling

For PXI/PXIe modules cooling, there are three fans on the rear panel draw cool air from the bottom side and front panel to be exhausted to the rear panel.

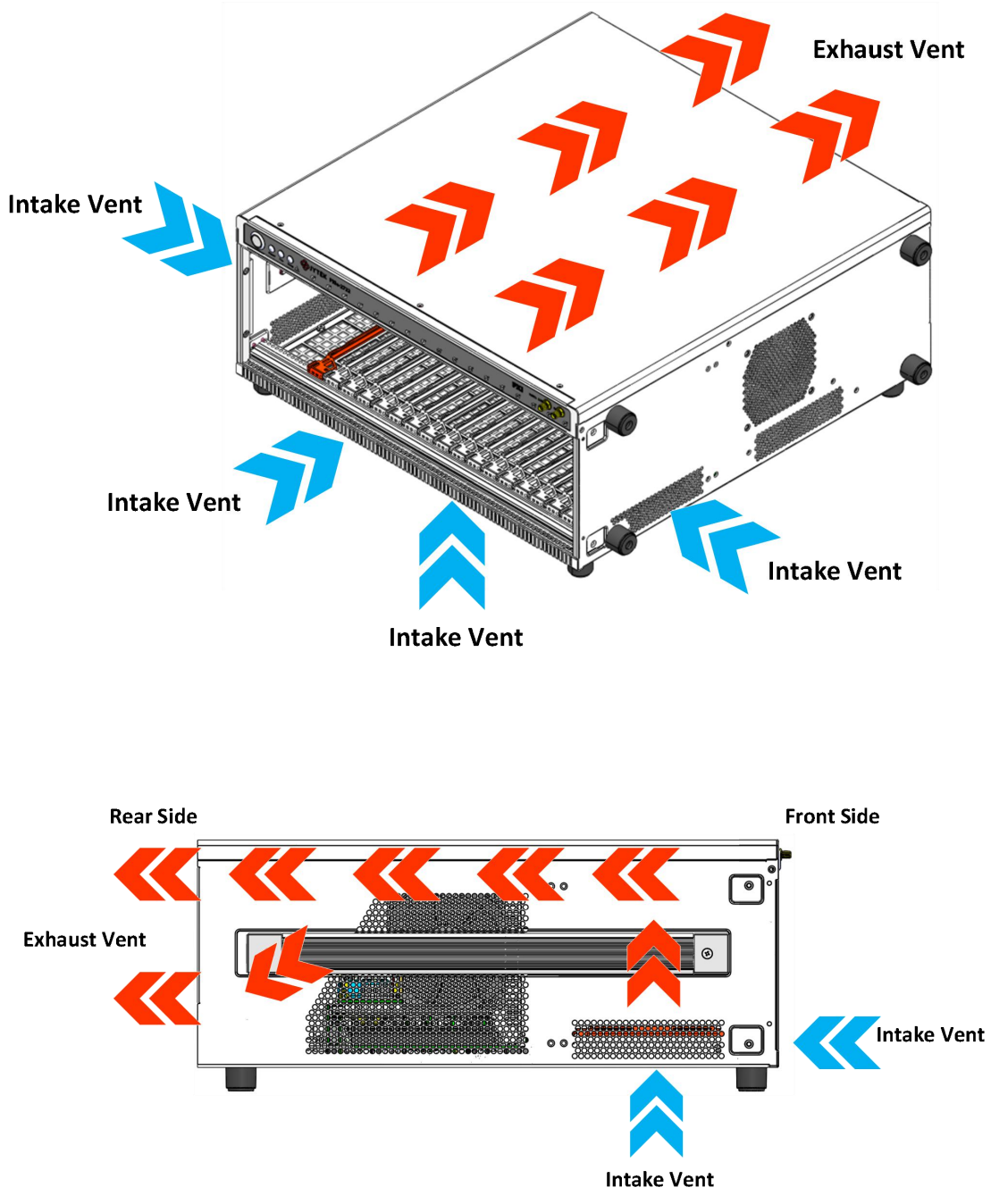


Figure 20 PXI/PXIe Modules Cooling

2.5.2 Power Supply Cooling

For power supply cooling, power supply's fan draws cool air from the right side, to be exhausted through the left side of the chassis.

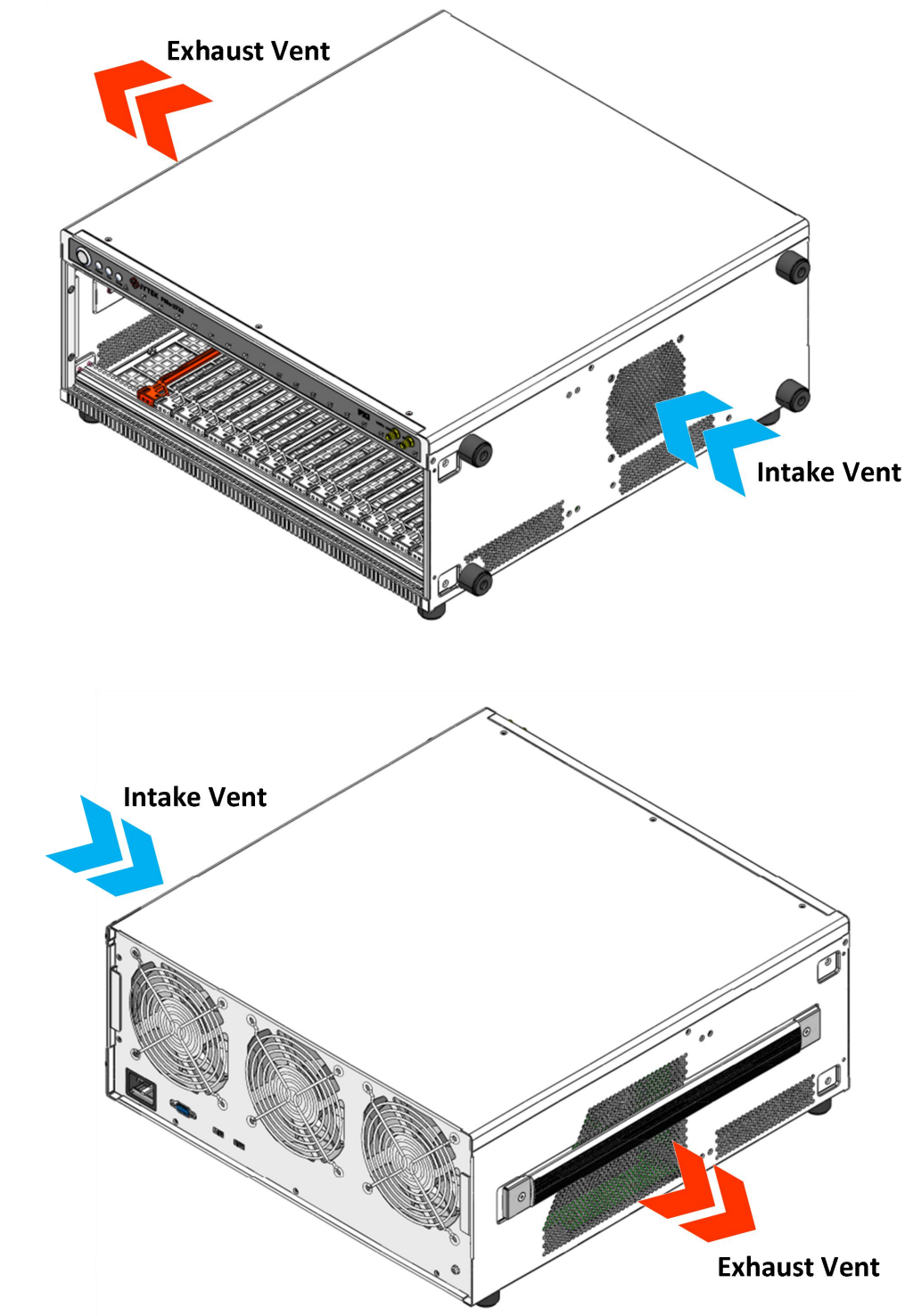


Figure 21 Power Supply Cooling

3. Performance

3.1 PCI Bus Throughput

PXIe-2722G3/G2 provides excellent throughput of PCI Bus as shown in below. There are three PCI Bus segments in the backplane. Slot2 to Slot7 is segment 1, and Slot8 to Slot13 is segment 2, and slot14 to slot18 is segment 3.

PCI Bus Segment	Slot	Test Module	Test Result
Segment 1	2	PXI-69846H	109 MB/s
	3	PXI-69846H	109 MB/s
	4	PXI-69846H	109 MB/s
	5	PXI-69846H	109 MB/s
	6	PXI-69846H	109 MB/s
	7	PXI-69846H	109 MB/s
Segment 2	8	PXI-69846H	109 MB/s
	9	PXI-69846H	109 MB/s
	10	PXI-69846H	109 MB/s
	11	PXI-69846H	109 MB/s
	12	PXI-69846H	109 MB/s
	13	PXI-69846H	109 MB/s
Segment 3	14	PXI-69846H	109 MB/s
	15	PXI-69846H	109 MB/s
	16	PXI-69846H	109 MB/s
	17	PXI-69846H	109 MB/s
	18	PXI-69846H	109 MB/s

Table 11 PCI Bus Throughput

Note:

- PCI Bus theoretical maximum bandwidth is 132 MB/s.
- PXI-69846H is 4-ch 40 MS/s 16-bit digitizer, its bandwidth is 320 MB/s.

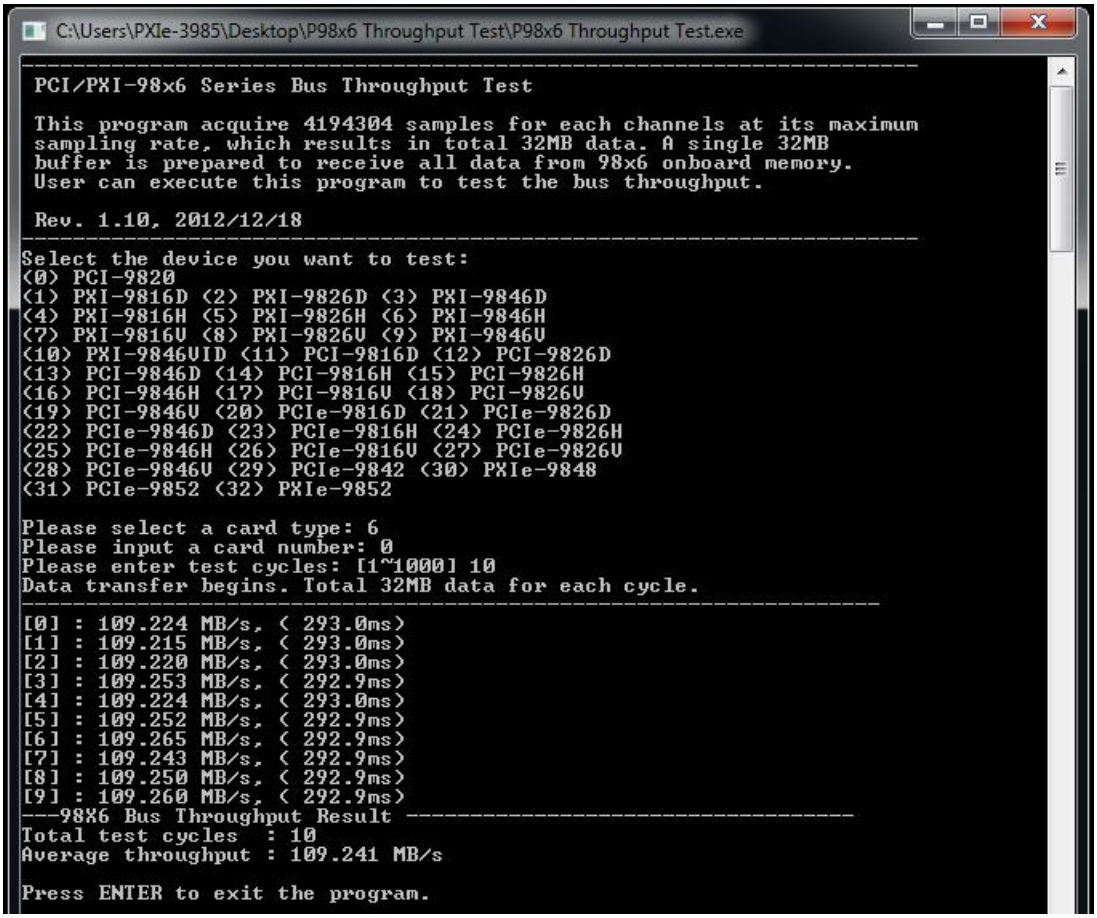


Figure 22 PCI Bus Throughput for segment 1

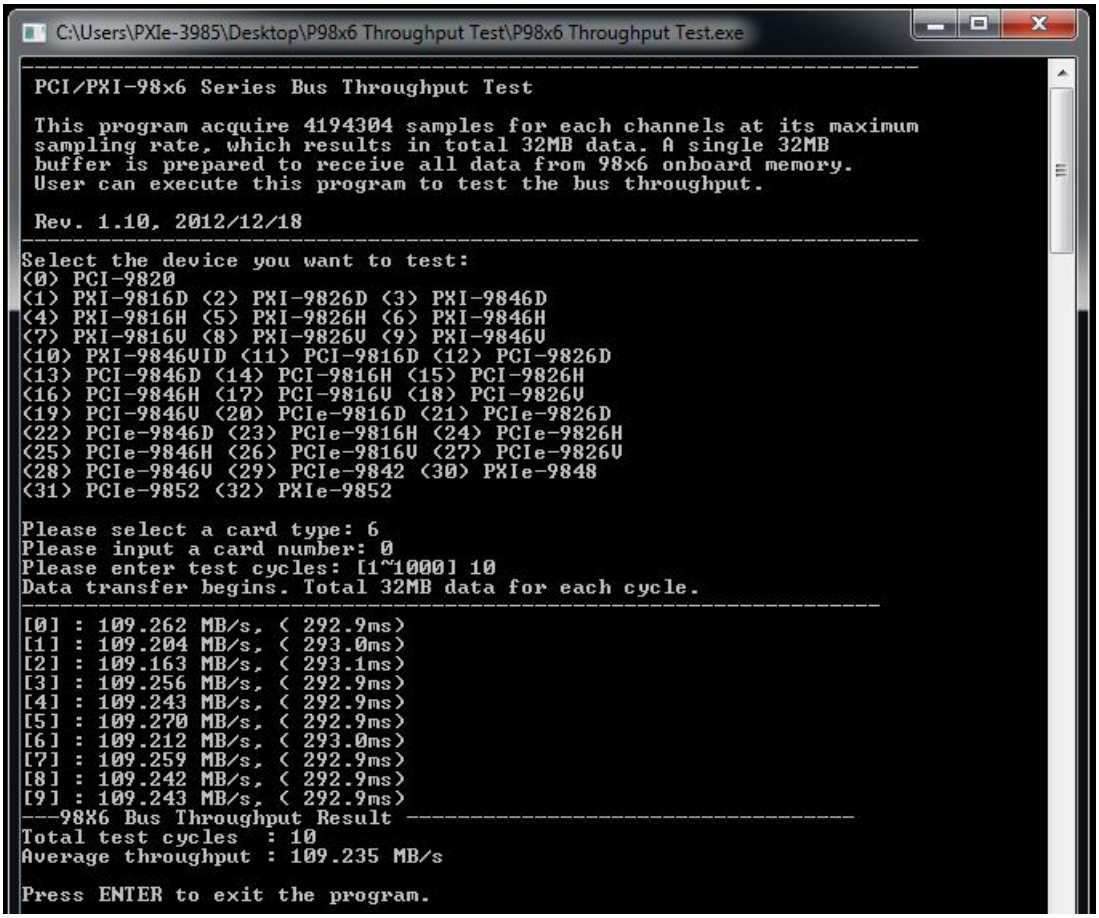


Figure 23 PCI Bus Throughput for segment 2

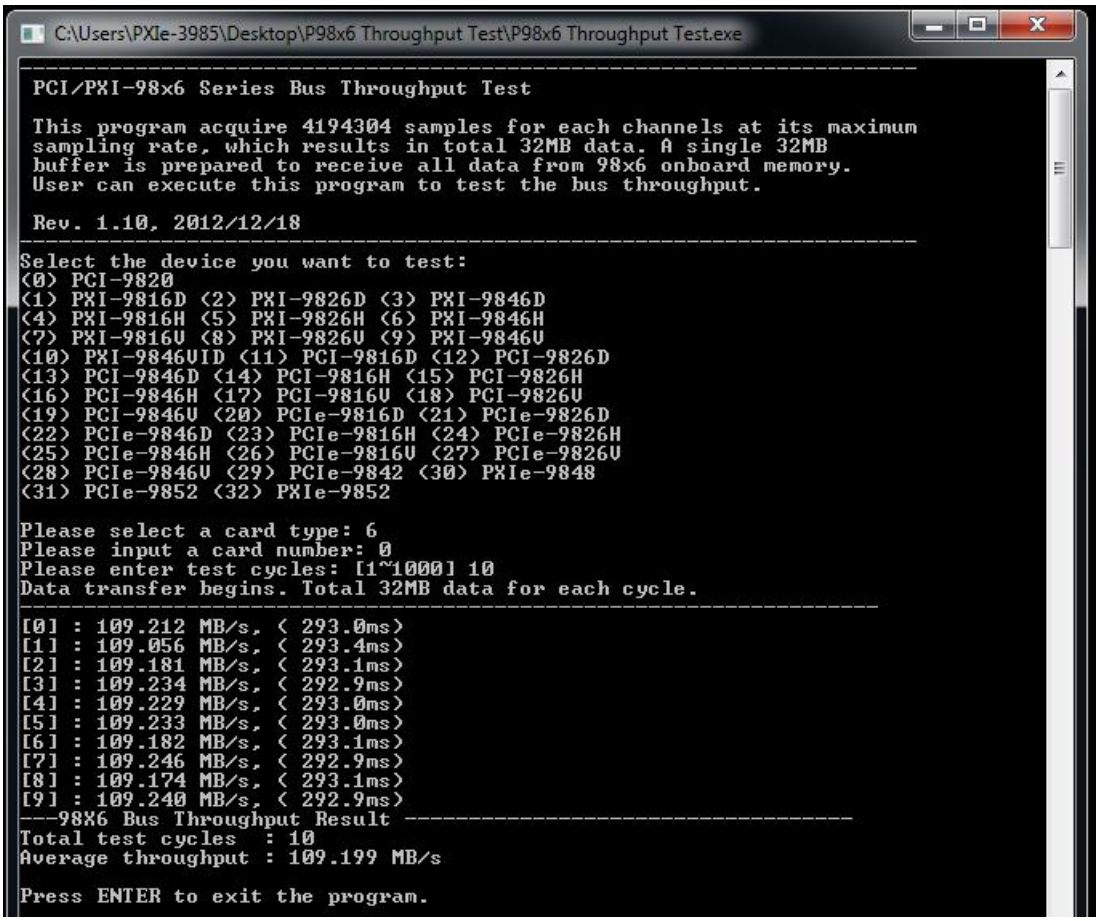


Figure 24 PCI Bus Throughput for segment 3

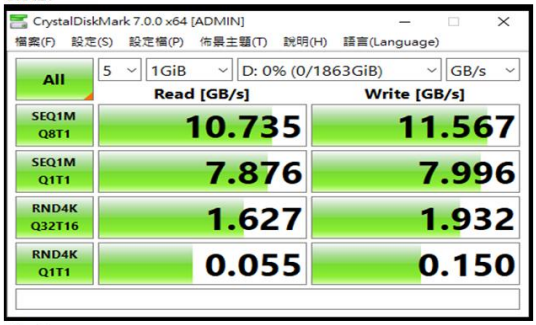
3.2 PCIe Bus Throughput

3.2.1 PXIe-2722G3 PCIe Bus Throughput

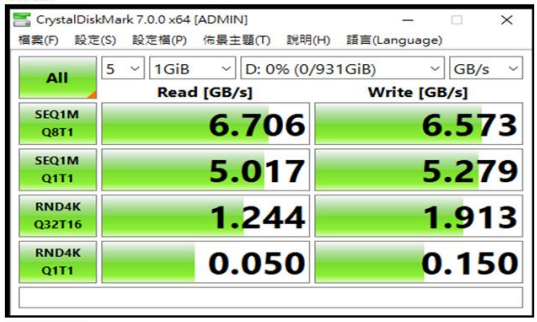
Slot	Fixture	Test Result
1	PXIe-63987 + PXIe RAID Card*2 + Samsung 970 EVO Plus SSD 500MB *4	Upstream: 10.7GB/s Downstream: 11.5GB/s
2	PXIe-63987 + PXIe RAID Card*1 + Samsung 970 EVO Plus SSD 500MB *2	Upstream: 6.7GB/s Downstream: 6.5GB/s
3	PXIe-63987 + PXIe RAID Card*1 + Samsung 970 EVO Plus SSD 500MB *2	Upstream: 6.8GB/s Downstream: 6.5GB/s
4	PXIe-63987 + PXIe RAID Card*1 + Samsung 970 EVO Plus SSD 500MB *2	Upstream: 6.6GB/s Downstream: 6.5GB/s
5	PXIe-63987 + PXIe RAID Card*1 + Samsung 970 EVO Plus SSD 500MB *2	Upstream: 6.7GB/s Downstream: 6.5GB/s
6	PXIe-63987 + PXIe RAID Card*1 + Samsung 970 EVO Plus SSD 500MB *2	Upstream: 6.4GB/s Downstream: 6.5GB/s
7	PXIe-63987 + PXIe RAID Card*1 + Samsung 970 EVO Plus SSD 500MB *2	Upstream: 6.9GB/s Downstream: 6.5GB/s
8	PXIe-63987 + PXIe RAID Card*1 + Samsung 970 EVO Plus SSD 500MB *2	Upstream: 7.2GB/s Downstream: 6.5GB/s
9	PXIe-63987 + PXIe RAID Card*1 + Samsung 970 EVO Plus SSD 500MB *2	Upstream: 6.5GB/s Downstream: 6.5GB/s
10	PXIe-63987 + PXIe RAID Card*1 + Samsung 970 EVO Plus SSD 500MB *2	Upstream: 6.5GB/s Downstream: 6.5GB/s
11	PXIe-63987 + PXIe RAID Card*1 + Samsung 970 EVO Plus SSD 500MB *2	Upstream: 6.6GB/s Downstream: 6.5GB/s
12	PXIe-63987 + PXIe RAID Card*1 + Samsung 970 EVO Plus SSD 500MB *2	Upstream: 6.6GB/s Downstream: 6.5GB/s
13	PXIe-63987 + PXIe RAID Card*1 + Samsung 970 EVO Plus SSD 500MB *2	Upstream: 6.8GB/s Downstream: 6.5GB/s
14	PXIe-63987 + PXIe RAID Card*1 + Samsung 970 EVO Plus SSD 500MB *2	Upstream: 6.5GB/s Downstream: 6.5GB/s
15	PXIe-63987 + PXIe RAID Card*1 + Samsung 970 EVO Plus SSD 500MB *2	Upstream: 6.5GB/s Downstream: 6.5GB/s
16	PXIe-63987 + PXIe RAID Card*1 + Samsung 970 EVO Plus SSD 500MB *2	Upstream: 6.9GB/s Downstream: 6.5GB/s
17	PXIe-63987 + PXIe RAID Card*1 + Samsung 970 EVO Plus SSD 500MB *2	Upstream: 6.7GB/s Downstream: 6.5GB/s
18	PXIe-63987 + PXIe RAID Card*1 + Samsung 970 EVO Plus SSD 500MB *2	Upstream: 6.5GB/s Downstream: 6.5GB/s

Table 12 PXIe-2722G3 PCIe Bus Throughput

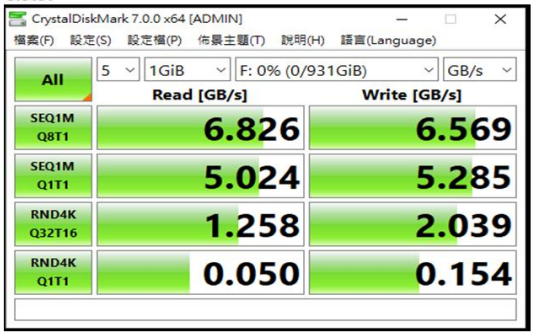
Slot1:



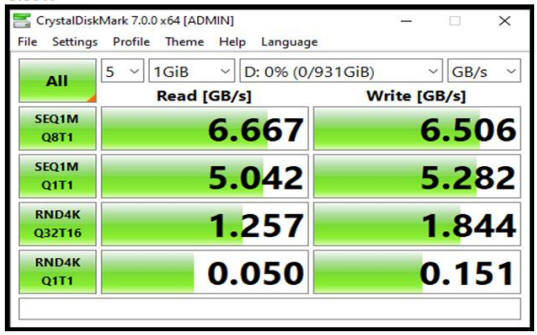
Slot2:



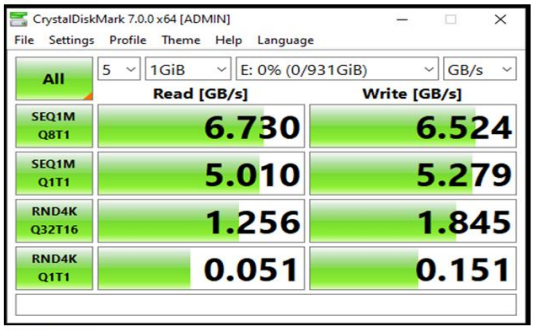
Slot3:



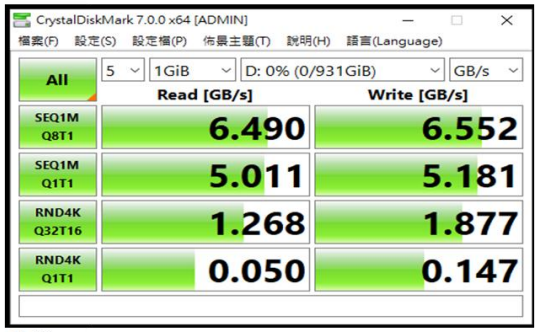
Slot4:



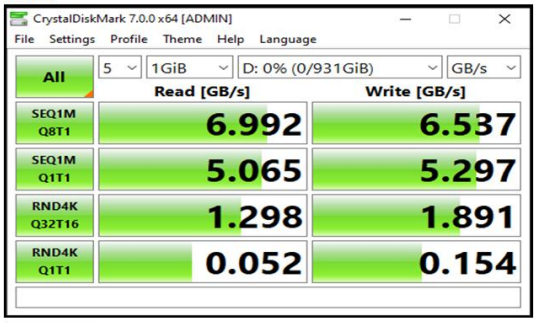
Slot5:



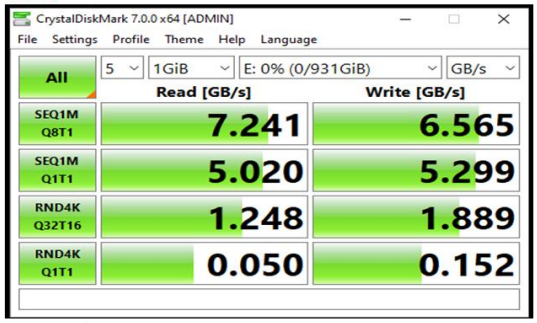
Slot6:



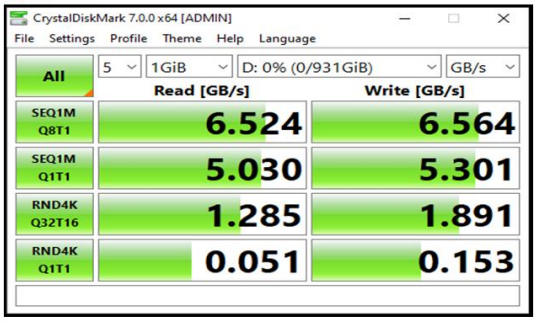
Slot7:



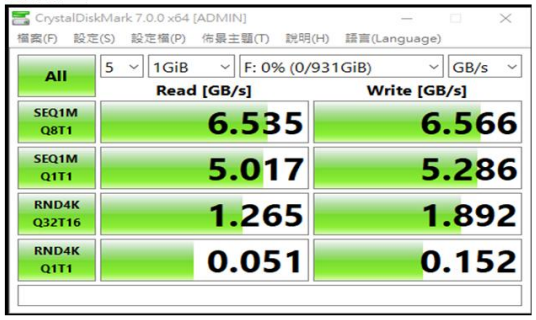
Slot8:



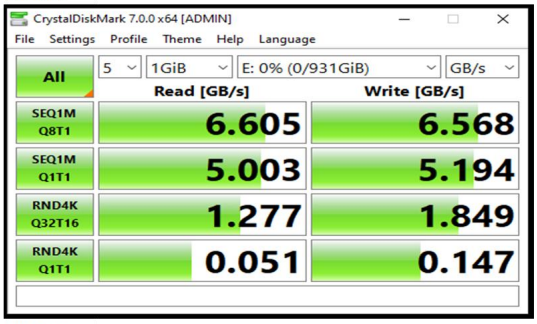
Slot9:



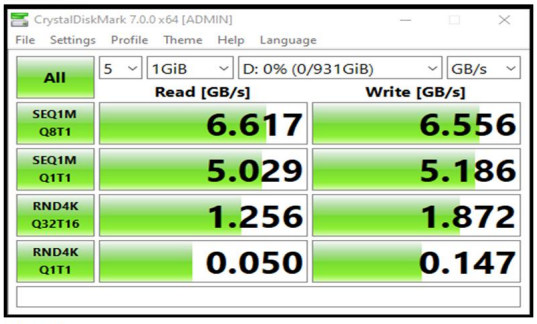
Slot10:



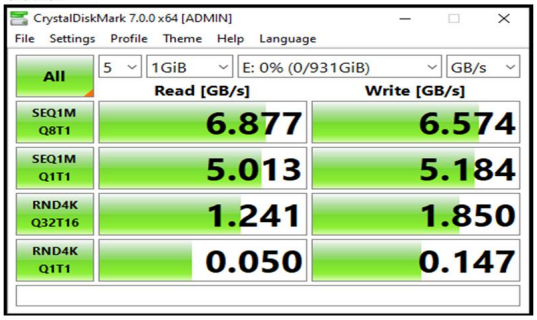
Slot11:



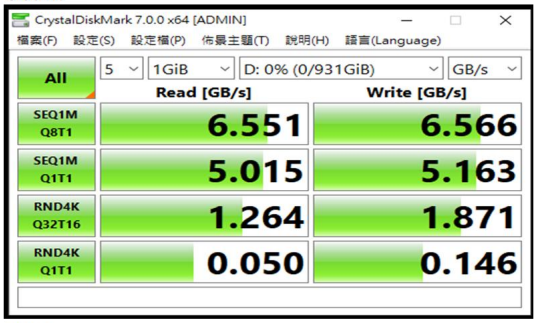
Slot12:



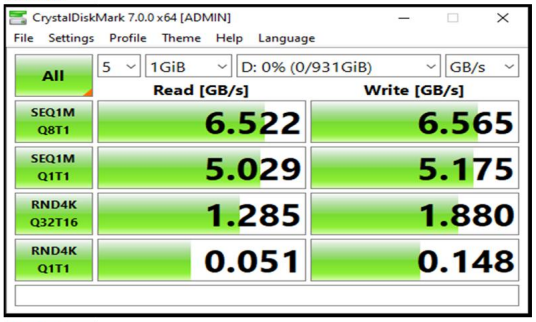
Slot13:



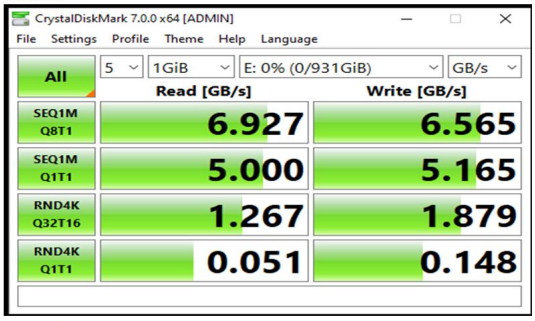
Slot14:



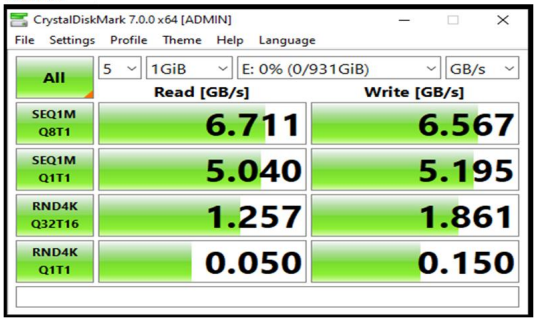
Slot15:



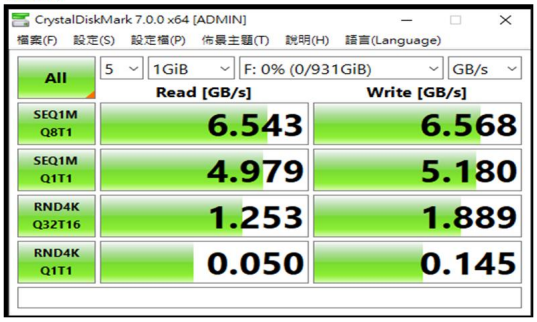
Slot16:



Slot17:



Slot18:



Note:

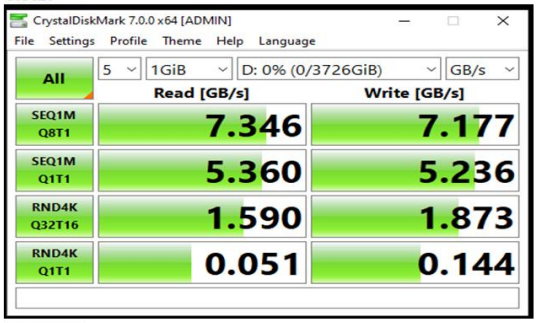
- PXIe-63987 has only 16GB/s theoretical maximum bandwidth.
- Slot 1 is the system bandwidth test; its theoretical maximum bandwidth is 24 GB/s (PCIe Gen3 x24).
- Slot 2 to 18 are the slot bandwidth test; its theoretical maximum bandwidth is 8 GB/s (PCIe Gen3 x8).

3.2.2 PXIe-2722G2 PCIe Bus Throughput

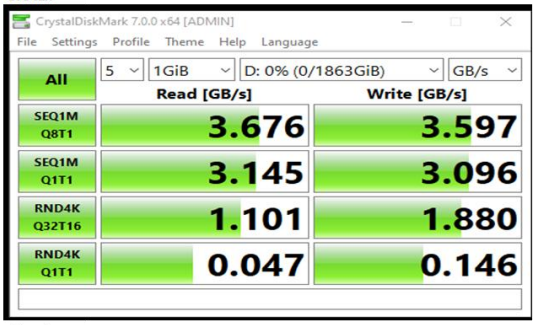
Slot	Fixture	Test Result
1	PXIe-63987 + PXIe RAID Card*2 + Samsung 970 EVO Plus SSD 1TB *4	Upstream: 7.3GB/s Downstream: 7.1GB/s
2	PXIe-63987 + PXIe RAID Card*1 + Samsung 970 EVO Plus SSD 1TB *2	Upstream: 3.6GB/s Downstream: 3.5GB/s
3	PXIe-63987 + PXIe RAID Card*1 + Samsung 970 EVO Plus SSD 1TB *2	Upstream: 1.8GB/s Downstream: 1.7GB/s
4	PXIe-63987 + PXIe RAID Card*1 + Samsung 970 EVO Plus SSD 1TB *2	Upstream: 1.8GB/s Downstream: 1.7GB/s
5	PXIe-63987 + PXIe RAID Card*1 + Samsung 970 EVO Plus SSD 1TB *2	Upstream: 1.8GB/s Downstream: 1.7GB/s
6	PXIe-63987 + PXIe RAID Card*1 + Samsung 970 EVO Plus SSD 1TB *2	Upstream: 3.6GB/s Downstream: 3.5GB/s
7	PXIe-63987 + PXIe RAID Card*1 + Samsung 970 EVO Plus SSD 1TB *2	Upstream: 1.8GB/s Downstream: 1.7GB/s
8	PXIe-63987 + PXIe RAID Card*1 + Samsung 970 EVO Plus SSD 1TB *2	Upstream: 1.8GB/s Downstream: 1.7GB/s
9	PXIe-63987 + PXIe RAID Card*1 + Samsung 970 EVO Plus SSD 1TB *2	Upstream: 1.8GB/s Downstream: 1.7GB/s
10	PXIe-63987 + PXIe RAID Card*1 + Samsung 970 EVO Plus SSD 1TB *2	Upstream: 1.8GB/s Downstream: 1.7GB/s
11	PXIe-63987 + PXIe RAID Card*1 + Samsung 970 EVO Plus SSD 1TB *2	Upstream: 3.6GB/s Downstream: 3.5GB/s
12	PXIe-63987 + PXIe RAID Card*1 + Samsung 970 EVO Plus SSD 1TB *2	Upstream: 1.8GB/s Downstream: 1.7GB/s
13	PXIe-63987 + PXIe RAID Card*1 + Samsung 970 EVO Plus SSD 1TB *2	Upstream: 1.8GB/s Downstream: 1.7GB/s
14	PXIe-63987 + PXIe RAID Card*1 + Samsung 970 EVO Plus SSD 1TB *2	Upstream: 1.8GB/s Downstream: 1.7GB/s
15	PXIe-63987 + PXIe RAID Card*1 + Samsung 970 EVO Plus SSD 1TB *2	Upstream: 3.6GB/s Downstream: 3.5GB/s
16	PXIe-63987 + PXIe RAID Card*1 + Samsung 970 EVO Plus SSD 1TB *2	Upstream: 1.8GB/s Downstream: 1.7GB/s
17	PXIe-63987 + PXIe RAID Card*1 + Samsung 970 EVO Plus SSD 1TB *2	Upstream: 1.8GB/s Downstream: 1.7GB/s
18	PXIe-63987 + PXIe RAID Card*1 + Samsung 970 EVO Plus SSD 1TB *2	Upstream: 1.8GB/s Downstream: 1.7GB/s

Table 13 PXIe-2722G2 PCIe Bus Throughput

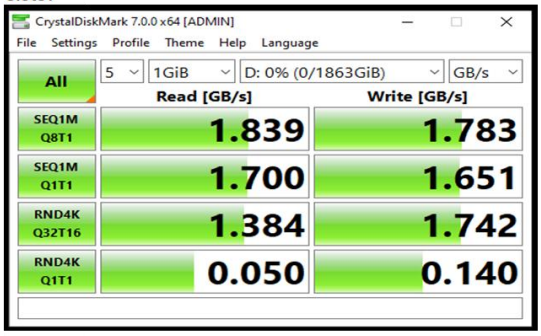
Slot1:



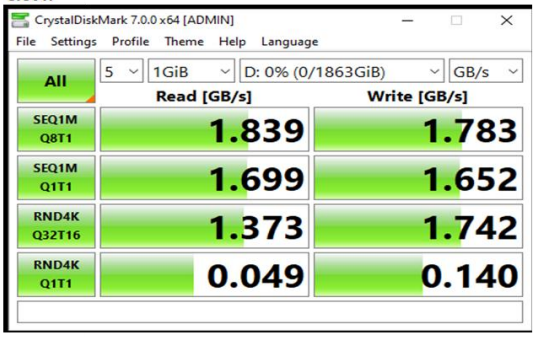
Slot2:



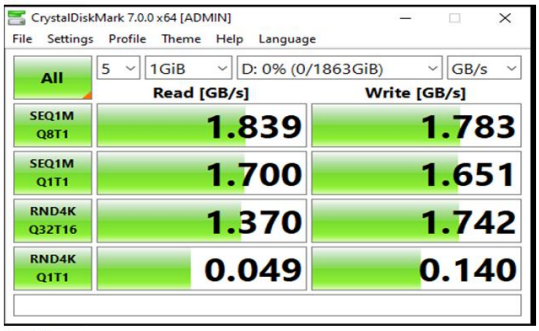
Slot3:



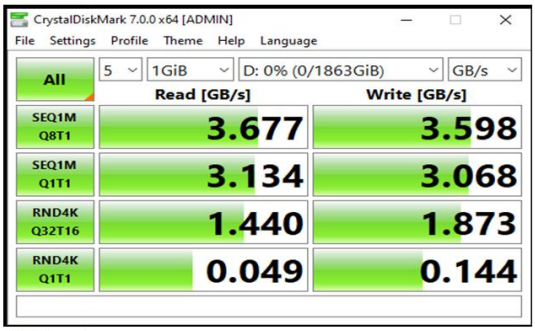
Slot4:



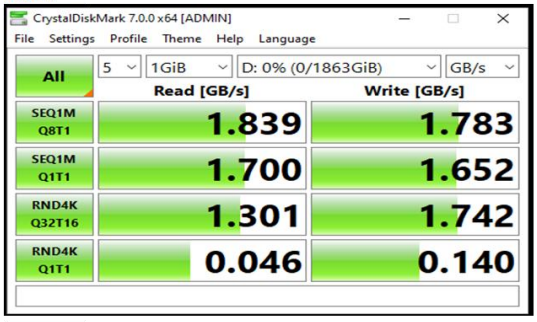
Slot5:



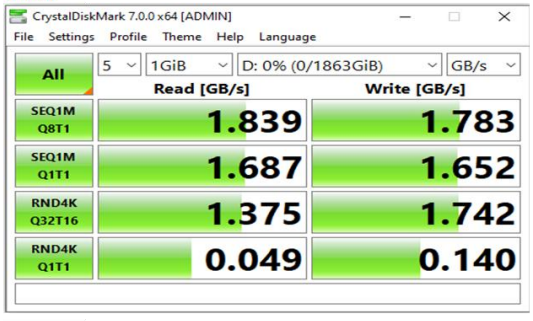
Slot6:



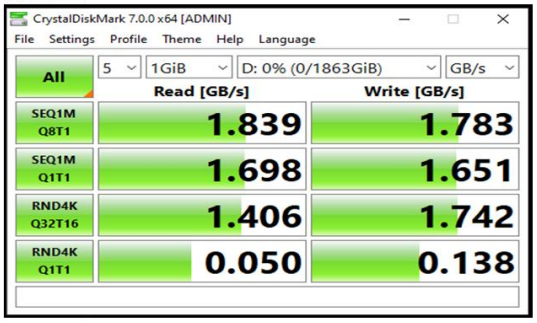
Slot7:



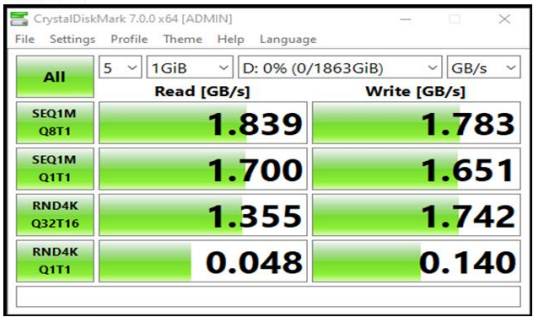
Slot8:



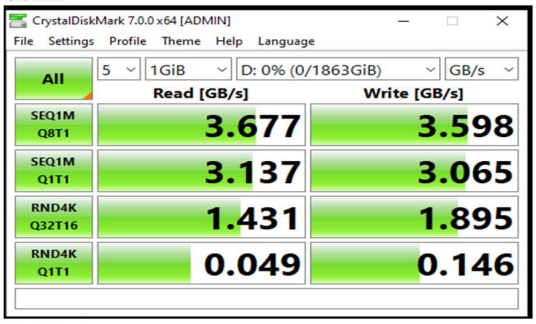
Slot9:



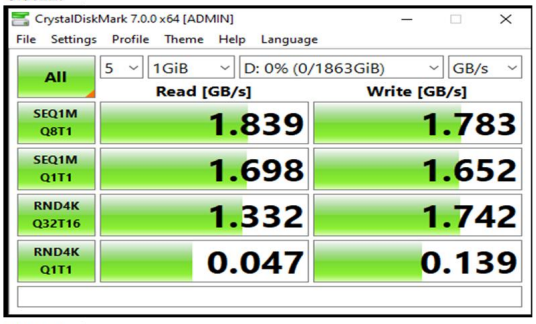
Slot10:



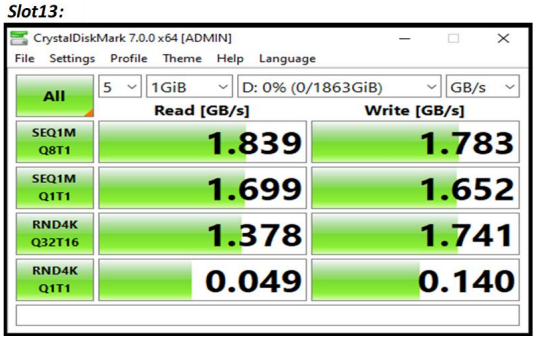
Slot11:



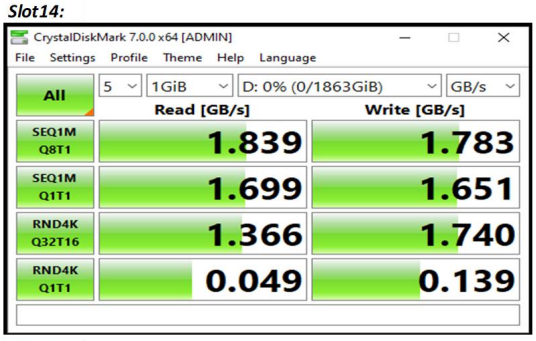
Slot12:



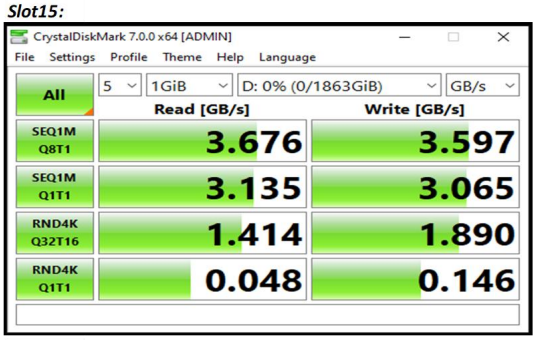
Slot13:



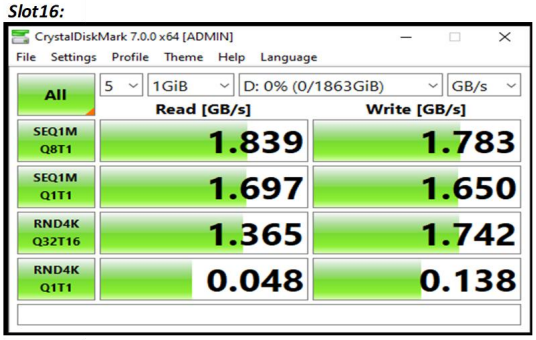
Slot14:



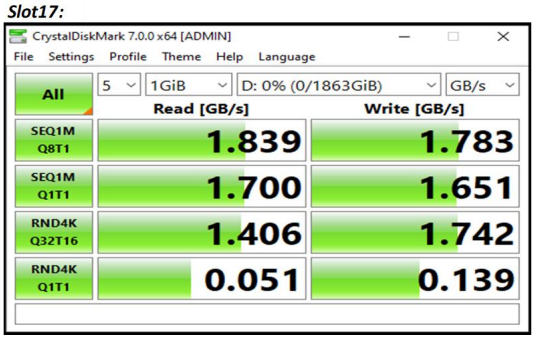
Slot15:



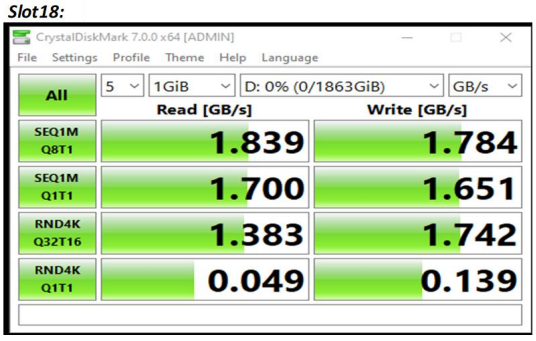
Slot16:



Slot17:



Slot18:



Note:

- Slot 1 theoretical maximum bandwidth is 8 GB/s (PCIe Gen2 x16).
- Slot2, slot6, slot11 and slot15 can support PCIe Gen2x8, its theoretical maximum bandwidth is 4 GB/s.
- Other peripheral slots can support PCIe Gen2x4, its theoretical maximum bandwidth is 2 GB/s.

3.3 Compatibility test

Chassis	Controller	Operating System	Moudle	Software	Driver	AI	DIO	CIO	Switch	Test result
PXIe2722	PXIe3985	Win7	Chroma PXI-52405	SFP52405 1.0.7.0	Version 1.9.3.8					Pass
PXIe2722	PXIe3985	Win7	Keysight DMM-9182A	Keysight M918x SFP(x64)	M918X_Setup-1.5.229.2					Pass
PXIe2722	PXIe3985	Win7	NI PXIe-5105	InstrumentStudio 2018	NI Scope18.10	Pass				Pass
PXIe2722	PXIe3985	Win7	NI PXIe-6124	NI MAX 19.0.0f1	DAQmx19.5	Pass				Pass
PXIe2722	PXIe3985	Win7	NI PXI-2503	NI MAX 19.0.0f1	DAQmx19.5				Pass	Pass
PXIe2722	PXIe3985	Win7	NI PXI-6509	NI MAX 19.0.0f1	DAQmx19.5		Pass			Pass
PXIe2722	PXIe3985	Win7	NI PXIe-4303	NI MAX 19.0.0f1	DAQmx19.5	Pass				Pass
PXIe2722	PXIe3985	Win7	NI PXIe-6363	NI MAX 19.0.0f1	DAQmx19.5	Pass				Pass
PXIe2722	PXIe3985	Win7	ADLINK PXIe-9529	JYPXIe69529 Example	V1.7.0	Pass				Pass
PXIe2722	PXIe3985	Win7	ADLINK PXIe-9848H	JYPXIe69848H Example	V1.5.0	Pass				Pass
PXIe2722	PXIe3985	Win7	ADLINK PXI-2206	JYPXI62206 Example	V1.5.0	Pass				Pass
PXIe2722	PXIe3985	Win7	ADLINK PXI-7921	JYPXI67921 .Example	V1.4.0				Pass	Pass
PXIe2722	PXIe3985	Win7	ADLINK PXIe-9834	JYPXI69834 .Example	V2.2.0	Pass				Pass
PXIe2722	PXIe3985	Win7	JYTEK PXIe-6301	JY6301.Example	V1.4.1	Pass				Pass
PXIe2722	PXIe3985	Win7	JYTEK PXIe-6302	JY6302.Example	V1.0.7	Pass				Pass
PXIe2722	PXIe3985	Win7	JYTEK PXIe-5516	JY5500.Example	V1.4.0	Pass				Pass
PXIe2722	PXIe3985	Win7	JYTEK PXIe-5211	JY5211.Example	V1.2.2			Pass		Pass
PXIe2722	PXIe3977	Win10	ADLINK PXIe-9529	JYPXIe69529 Example	V1.7.0	Pass				Pass
PXIe2722	PXIe3977	Win10	ADLINK PXIe-9848H	JYPXIe69848H Example	V1.5.0	Pass				Pass
PXIe2722	PXIe3977	Win10	ADLINK PXIe-9834	JYPXI69834 .Example	V2.2.0	Pass				Pass
PXIe2722	PXIe3977	Win10	JYTEK PXIe-6302	JY6302.Example	V1.0.7	Pass				Pass
PXIe2722	PXIe3977	Win10	JYTEK PXIe-6301	JY6301.Example	V1.4.1	Pass				Pass
PXIe2722	PXIe3977	Win10	JYTEK PXIe-5516	JY5500.Example	V1.4.0	Pass				Pass
PXIe2722	PXIe3977	Win10	JYTEK PXIe-5211	JY5211.Example	V1.2.2			Pass		Pass
PXIe2722	PXIe3977	Win10	Chroma PXI-52405	SFP52405 1.0.7.0	Version 1.9.3.8					Pass
PXIe2722	PXIe3977	Win10	Keysight DMM-9182A	Keysight M918x SFP(x64)	M918X_Setup-1.5.229.2					Pass
PXIe2722	PXIe3977	Win10	NI PXIe-5105	InstrumentStudio 2018	NI Scope18.10	Pass				Pass
PXIe2722	PXIe3977	Win10	NI PXIe-6124	NI MAX 19.0.0f1	DAQmx19.5	Pass				Pass
PXIe2722	PXIe3977	Win10	NI PXI-2503	NI MAX 19.0.0f1	DAQmx19.5				Pass	Pass
PXIe2722	PXIe3977	Win10	NI PXI-6509	NI MAX 19.0.0f1	DAQmx19.5		Pass			Pass
PXIe2722	PXIe3977	Win10	NI PXIe-4303	NI MAX 19.0.0f1	DAQmx19.5	Pass				Pass
PXIe2722	PXIe3977	Win10	NI PXIe-6363	NI MAX 19.0.0f1	DAQmx19.5	Pass				Pass
PXIe2722	PXIe3977	Win10	ADLINK PXI-2206	JYPXI62206 Example	V1.5.0	Pass				Pass
PXIe2722	PXIe3977	Win10	ADLINK PXI-7921	JYPXI67921 .Example	V1.4.0				Pass	Pass

PXIe2722	PXIe3987	Win7	JYTEK PXIe-5211	JY5211.Example	V1.2.2			Pass		Pass
PXIe2722	PXIe3987	Win7	JYTEK PXIe-5516	JY5500.Example	V1.4.0	Pass				Pass
PXIe2722	PXIe3987	Win7	JYTEK PXIe-6301	JY6301.Example	V1.4.1	Pass				Pass
PXIe2722	PXIe3987	Win7	JYTEK PXIe-6302	JY6302.Example	V1.0.7	Pass				Pass
PXIe2722	PXIe3987	Win7	ADLINK PXIe-9529	JYPXIe69529 Example	V1.7.0	Pass				Pass
PXIe2722	PXIe3987	Win7	ADLINK PXIe-9834	JYPXI69834 .Example	V2.2.0	Pass				Pass
PXIe2722	PXIe3987	Win7	ADLINK PXI-7921	JYPXI67921 .Example	V1.4.0				Pass	Pass
PXIe2722	PXIe3987	Win7	ADLINK PXIe-9848H	JYPXIe69848H Example	V1.5.0	Pass				Pass
PXIe2722	PXIe3987	Win7	ADLINK PXI-2206	JYPXI62206 Example	V1.5.0	Pass				Pass
PXIe2722	PXIe3987	Win7	NI PXIe-5105	InstrumentStudio 2018	NI Scope18.10	Pass				Pass
PXIe2722	PXIe3987	Win7	NI PXI-2503	NI MAX 19.0.0f1	DAQmx19.5				Pass	Pass
PXIe2722	PXIe3987	Win7	NI PXIe-4303	NI MAX 19.0.0f1	DAQmx19.5	Pass				Pass
PXIe2722	PXIe3987	Win7	NI PXI-6509	NI MAX 19.0.0f1	DAQmx19.5		Pass			Pass
PXIe2722	PXIe3987	Win7	NI PXIe-6363	NI MAX 19.0.0f1	DAQmx19.5	Pass				Pass
PXIe2722	PXIe3987	Win7	NI PXIe-6124	NI MAX 19.0.0f1	DAQmx19.5	Pass				Pass
PXIe2722	PXIe3987	Win7	Chroma PXI-52405	SFP52405 1.0.7.0	Version 1.9.3.8					Pass
PXIe2722	PXIe3987	Win7	Keysight DMM-9182A	Keysight M918x SFP(x64)	M918X_Setup-1.5.229.2					Pass

Table 14 Compatibility test

4. Software

4.1 Introduction to JYDM

JYDM (**JY**TEK **D**evice **M**anagement) is the latest equipment management software of JYTEK. Its main functions are as follows:

- Support GUI information display and management of PXI-2/6 standard equipment.
- Support trigger configuration of PXI-9 standard chassis.
- JYTEK self-developed chassis information management.
- JYTEK self-developed card: alias management, driver and firmware online upgrade, online driver version management, board test panel.
- JYTEK SeeSharp card: driver information view, test panel.

4.2 Installation and use of JYDM

JYDM support operating system: Windows 7 32/64 bit, Windows 10 32/64 bit.

1. Install **.Net framework** (version 4.0 or above).
2. Download and install **FirmDrive** (version 1.3.3 or above) from the official website of JYTEK.
3. Download and Install the JYTEK **peripheral module driver** from the official website of JYTEK.
4. Download and install the **JYDM** installation package from the official website of JYTEK.

Figure 25 Install the JYDM

After the software installation complete, open JYDM and you will see the chassis, controller and peripheral module in the overall system as shown in the figure below.

Note:

- JYDM usually requires a few seconds to scan device.

The left side of the JYDM interface is the hardware device column, and the right side is the device details column. You can view and configure the current device information, and upgrade the driver and firmware.

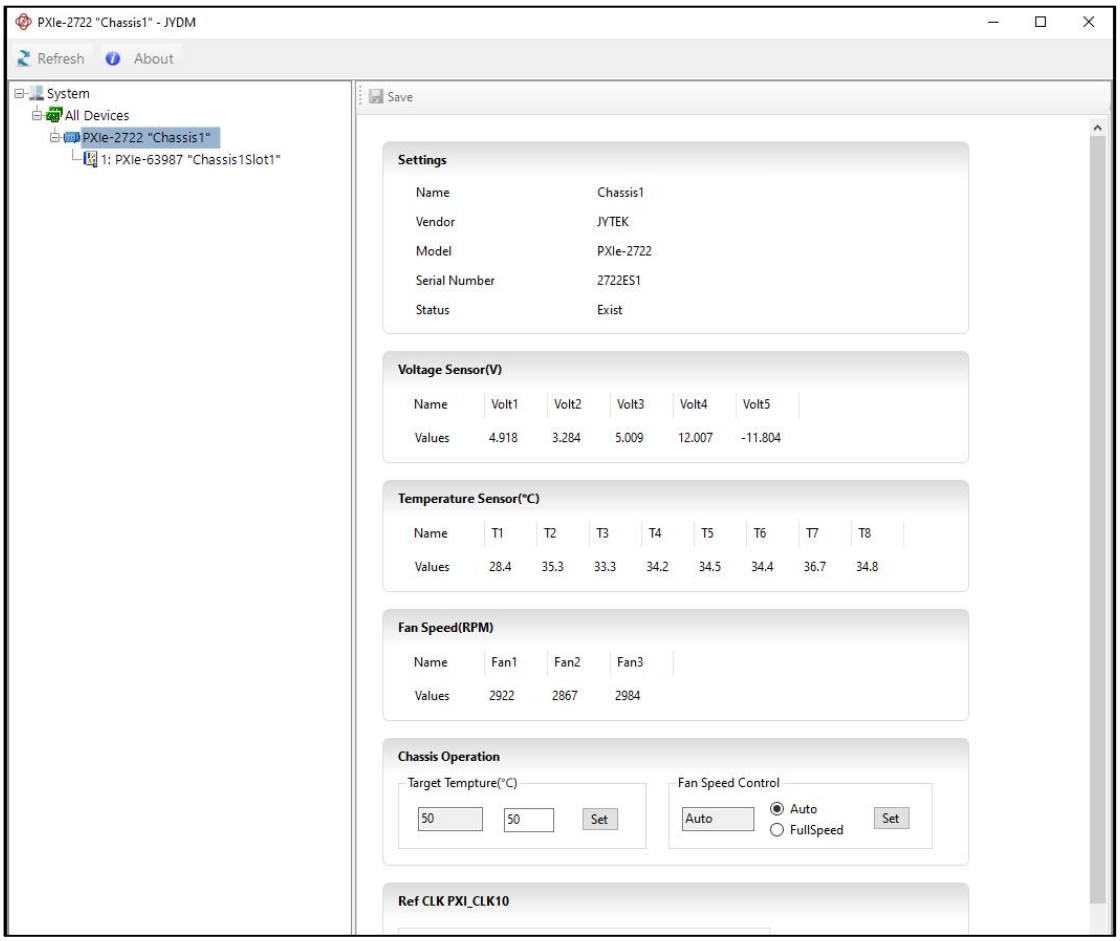


Figure 26 JYDM GUI application program

Note:

- JYTEK peripheral module driver has two parts: the shared common driver kernel software (FirmDrive) and the specific peripheral module driver.
- After firmware update of peripheral module, you need to **cold restart** your device.

➢ After driver update of peripheral module, you need to **warm restart** your device.

4.3 Chassis environment monitoring in JYDM

The JYDM provides the following chassis environment monitoring capabilities:

- Monitoring the chassis power rails: 5Vsb (standby power), 3.3V, 5V, 12V and -12V DC power.

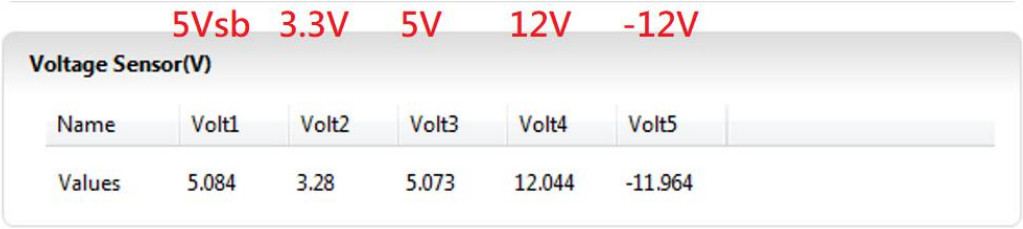


Figure 27 Monitoring the Chassis Power Rails

- Monitoring the chassis temperature sensors.

  (T1 sensor is located on the top side of backplane, close to slot1.)

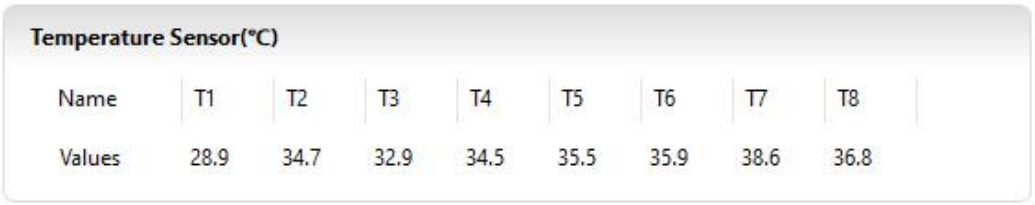


Figure 28 Monitoring the Chassis Temperature Sensors

- Monitoring the chassis fan speed.

  (Fan1 module ia located on the rear side of chassis, close to slot1.)

Figure 29 Monitoring the Chassis Fan Speed

4.4 Chassis cooling control in JYDM

PXIe-2722 chassis allow user to control the cooling capability via JYDM.

Figure 30 Chassis Cooling Control in JYDM

Target Temperature specifies the chassis temperature at which the maximum fan speed (100% duty cycle) is achieved as shown in below figure.

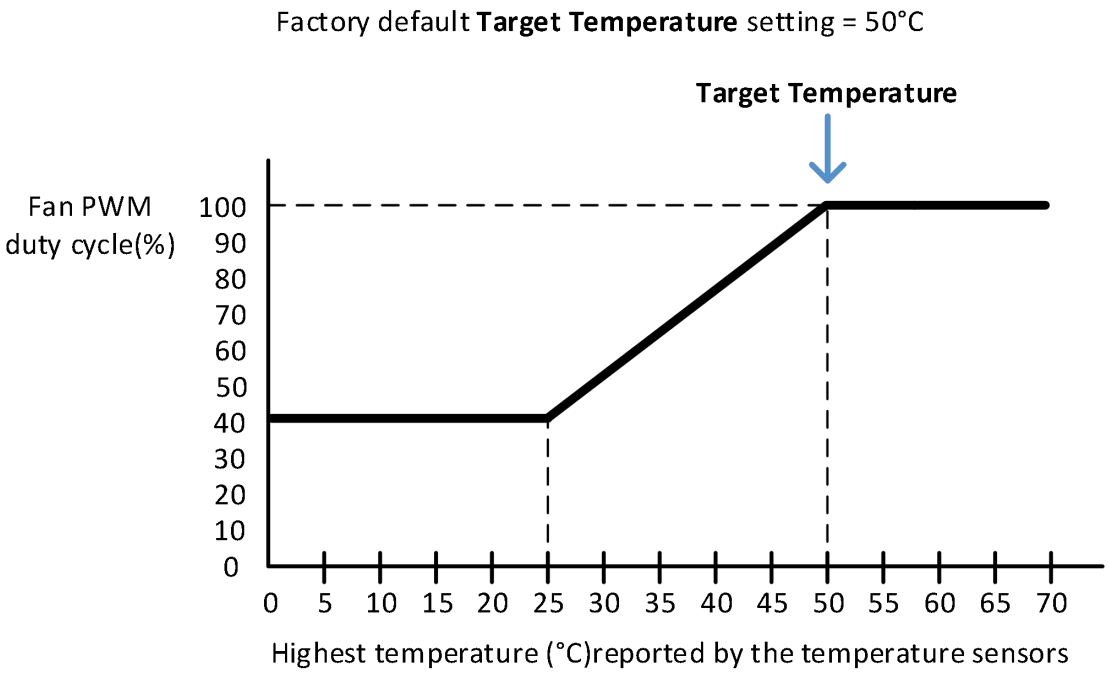


Figure 31 Factory default Target Temperature setting

The factory default target temperature setting is 50°C. User can change target temperature to lower value (ex. 40°C), it will increase fan speed if the factory default setting could not fulfill the peripheral modules cooling requirement.

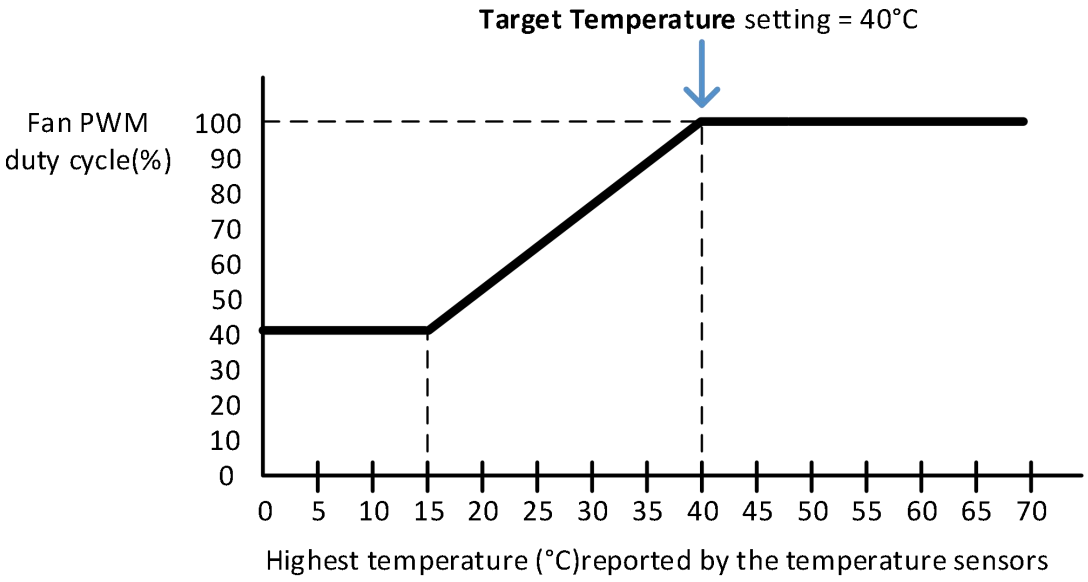


Figure 32 Change Target Temperature to 40°C

4.5 Reference Clock Status Display in JYDM

JYDM can display the 10MHz reference clock(PXI_CLK10) source which come from onboard (backplane's local oscillator) or external (front panel's SMA connector). The default clock source is **On Board** as shown in figure 33.

Figure 33 Reference Clock Status Display for default setting

If the external 10MHz clock input the chassis via SMA conncector, it will override the onboard 10MHz clock. A phase-lock loop (PLL) circuit on the backplane synchronizes the PXIe_CLK100 and external 10MHz clock, and then JYDM will display **Synchronized** and green indicator as shown in figure 34.

Figure 34 Reference Clock Status Display for external clock source

4.6 Trigger Bus Routing Control in JYDM

PXIe-2722 provides an interface to route PXI trigger bus. User can complete the following steps to route these trigger lines in JYDM.

1. Clicking on **My System** item, set **Default PXI Trigger Manger** to **JYTEK**, and then click **Save** to save the settings.
2. Clicking on the PXI chassis branch, and then click on the **Triggers** tab.
3. Select which trigger lines you would like to change routing.
4. Clicking on **Save** button.

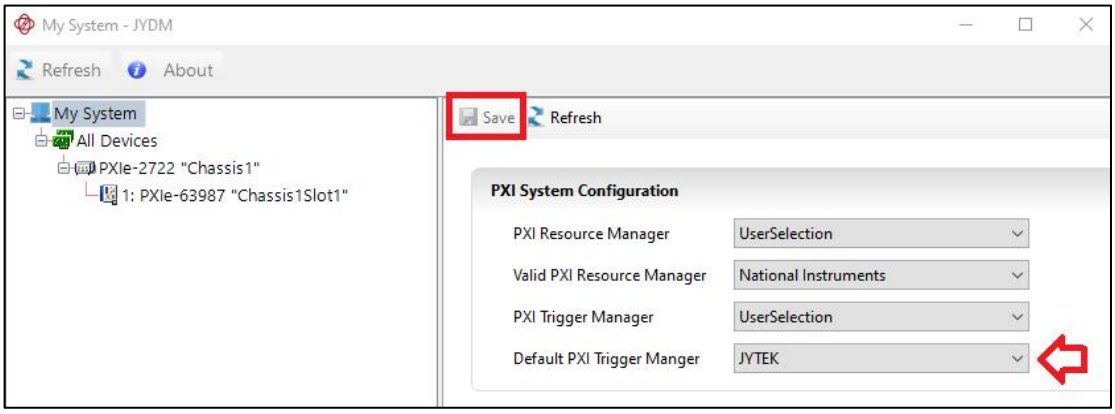


Figure 35 Change PXI Trigger Manager Setting To JYTEK

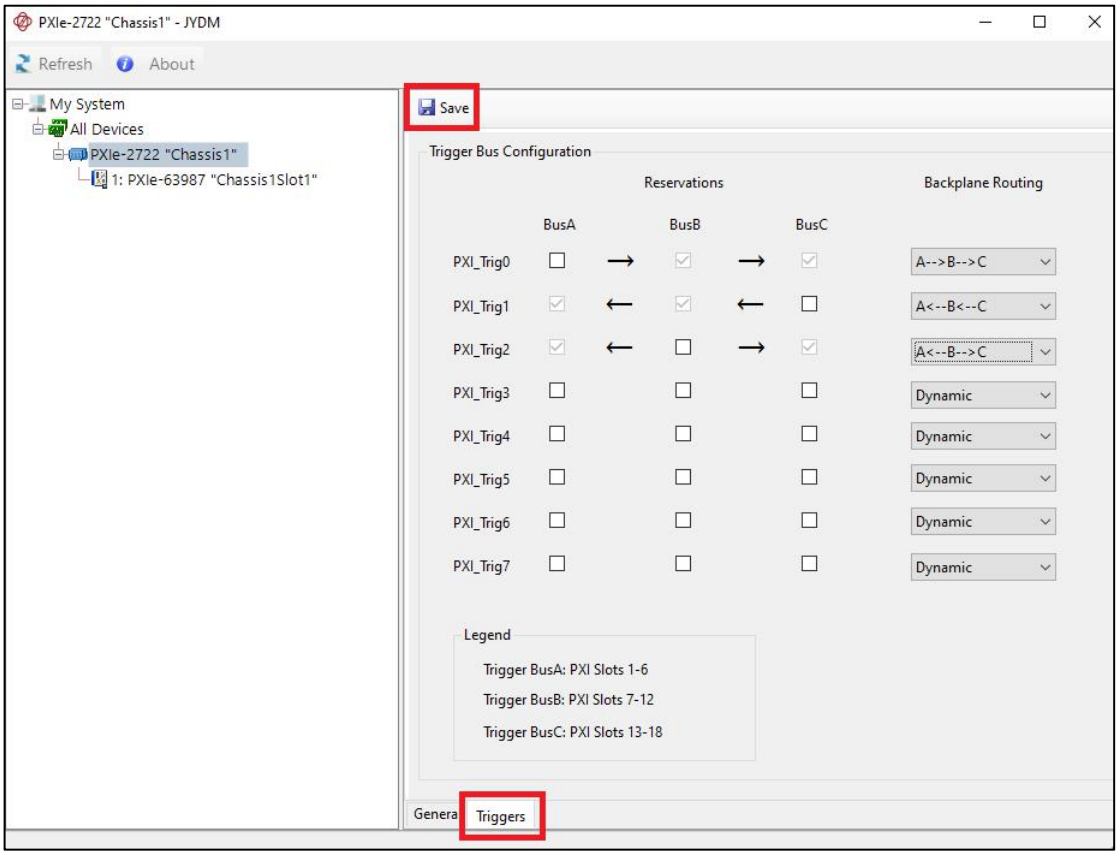


Figure 36 Trigger Bus Routing Control

4.7 Chassis identification in NI MAX

Download and install NI PXI platform services 20.0 or higher from NI website:

Figure 37 Install NI MAX

Open **JYDM**, set **Valid PXI Resource Manager** and **Default PXI Trigger Manger** to National Instruments, and then click **Save** to save the settings.

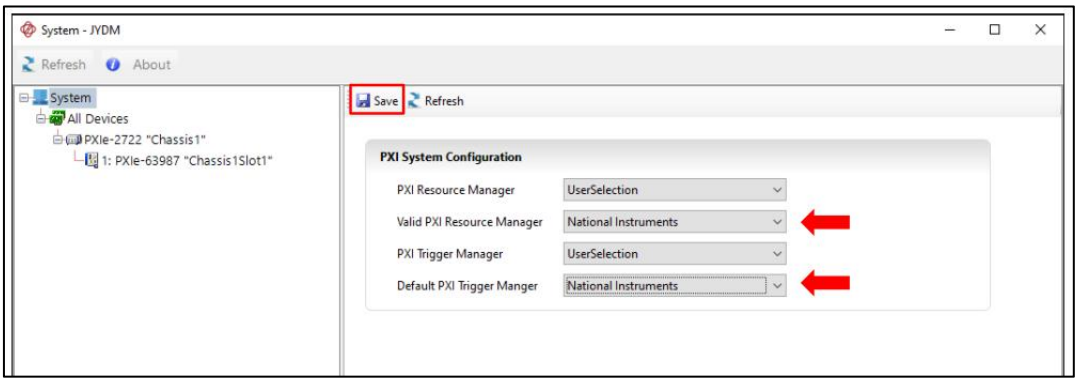


Figure 38 Change PXI Trigger Manager Setting

Open NI MAX after software installation and the devices can be identified:

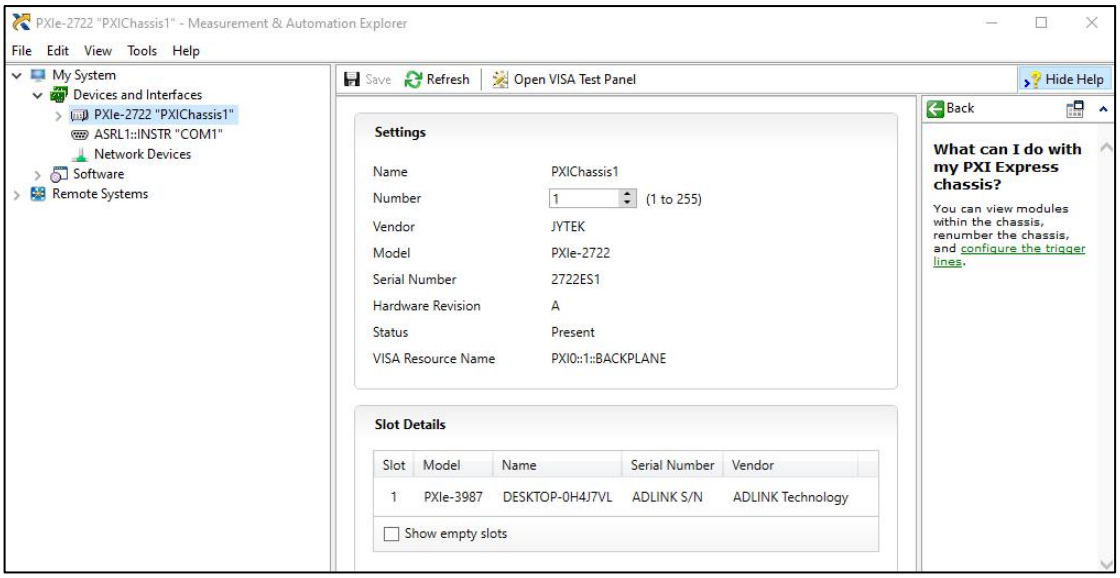


Figure 39 NI MAX GUI display JYTEK chassis and modules

5. Using PXIe-2722 Chassis

This chapter provides the operation guides for PXIe-2722.

5.1 Using PXIe-2722 with JYTEK PXI/PXIe Peripheral Modules

Using PXIe-2722 with JYTEK PXI/PXIe peripheral modules is straightforward. JYTEK also provide a device management software to view the modules in the chassis. For more information, please visit our web www.jytek.com to download.

5.2 Using PXIe-2722 with National Instruments PXI/PXIe Peripheral Modules

5.2.1 Use National Instruments PXI/PXIe Peripheral Modules without synchronization:

You can use the modules as usual without any additional setting. Chassis may not display correctly in NI MAX, but this will afftect nothing with module functions.

5.2.2 Use National Instruments PXI/PXIe Peripheral Modules with synchronization:

A few vi like" Get Full Terminal Name.vi" cannot use on the third party chassis:

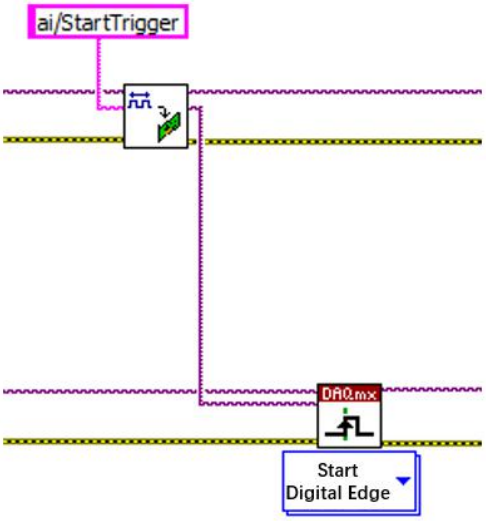


Figure 40 Trigger Routing

But you can use “DAQmx Export Signal” to set appointed clock/trigger routing:

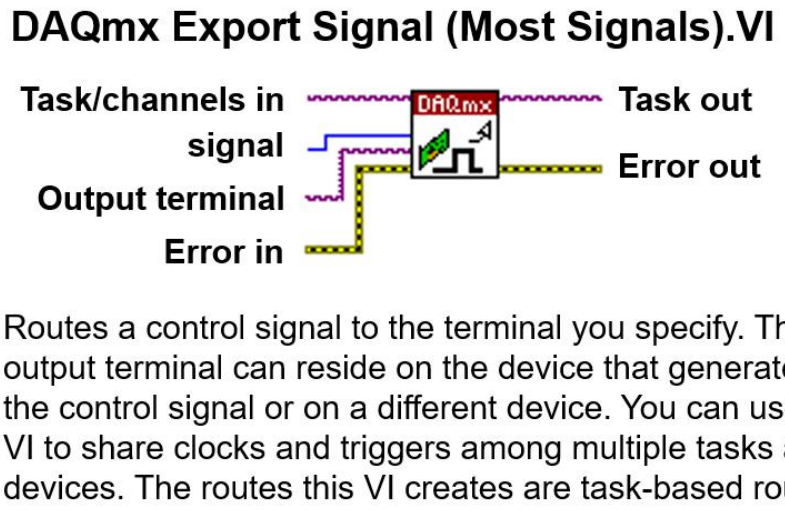


Figure 41 DAQmx Export Signal

DAQ synchronization reference code:

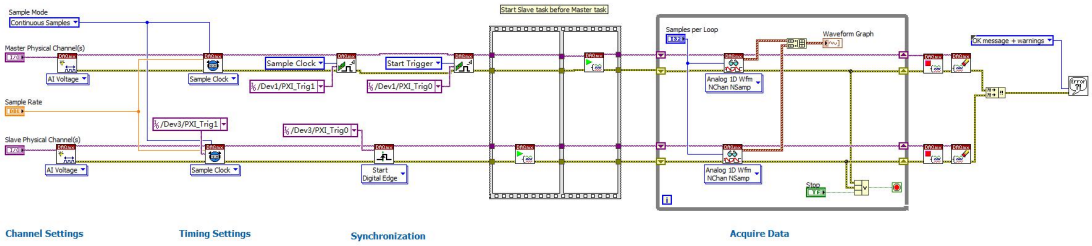


Figure 42 DAQ Synchronization Reference Code

6. Optional Equipment

6.1 Rack Mount Kits

JYTEK provides optional hardware for installation of PXIe-2722 chassis into a server or rack. The rack mounting kits dimension as following figure. All dimensions are shown in mm (millimeters).

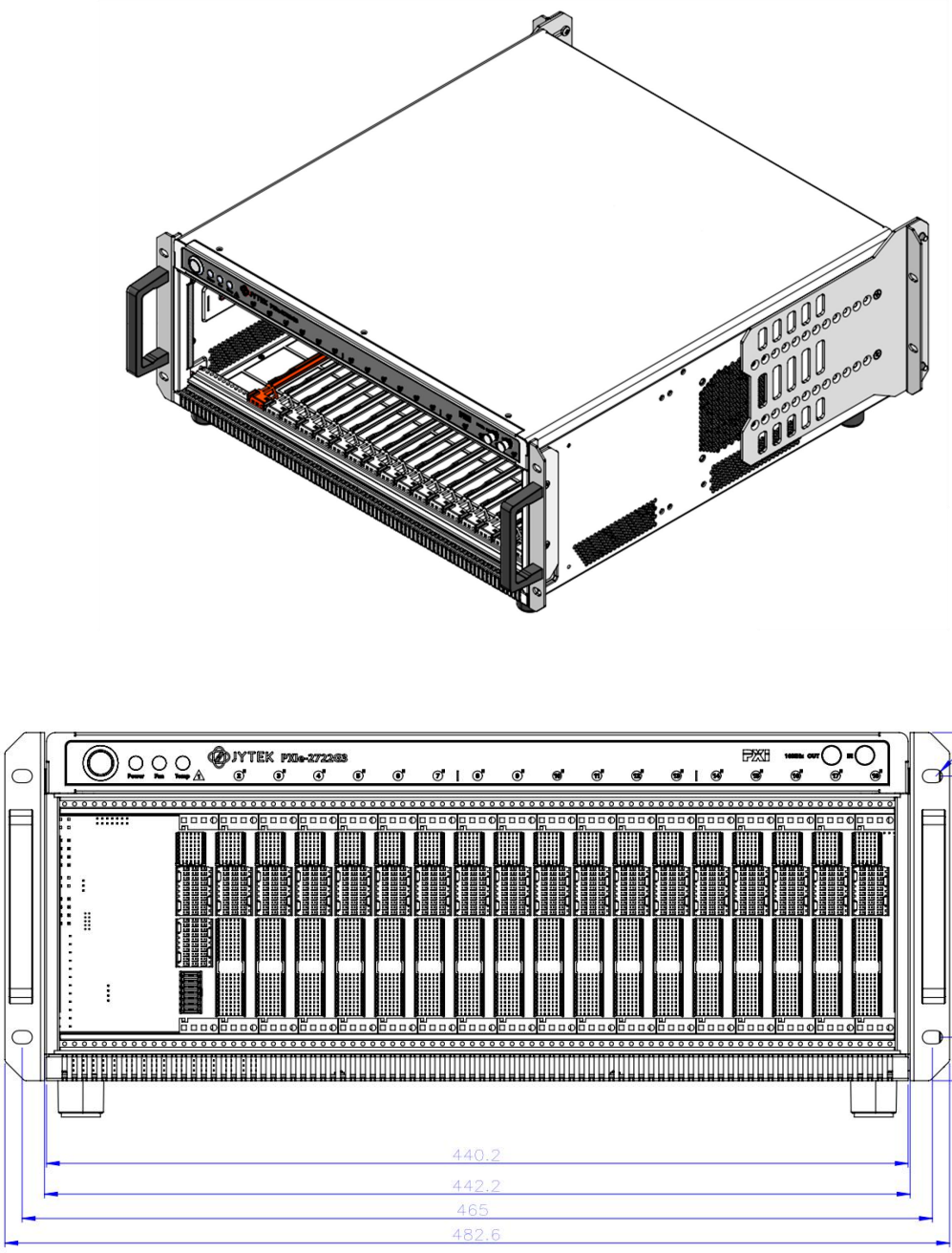


Figure 43 PXIe-2722 rack mount kits dimension

7. About JYTEK

7.1 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 independenly 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 patners who provide system level support in various cities.

7.2 JYTEK Korea and JYTEK In Other Countries

JYTEK Korea was the first JYTEK enterprise outside China to promote JYTEK products. Together with Adlink Technologies and JYTEK China, JYTEK is expanding to more countries. Each JYTEK location is an independently owned and operated franchise. It shares JYTEK’s philosophy and business approach. Together JYTEK entities promote the JYTEK brand, technology, and products.

7.3 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-volumn 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.

7.4 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.

7.5 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 2-year warranty. For technical consultation, pre-sale and after-sales support, please contact JYTEK of your country.

8. 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 explaination for JYTEK PXIe-2722 chassis. 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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