

# Black Tech & Ingenious Details

---

Hidden Behind Vecow Offerings, Now let's dig them out!

Nov 2<sup>nd</sup>, 2018



# ToC

---

- **Power**

- 300/200W Power Budget
- 160V Extra-Wide Power Module

- **Display**

- Multi-Displays
- Particular Display Connectors

- **I/Os**

- Full Function of GPIO
- 10Gbps USB 3.1 Gen2

- **Memory**

- Capacity of 96GB DDR4

- **Design**

- MXM Tailor-made Cooling Copper
- Rotary Storage Device
- FAN Ventilation

- **Reliability**

- 85°C Operating Wide-Temp
- 5G Vibration
- Hardware Monitor UI

## About Power

---

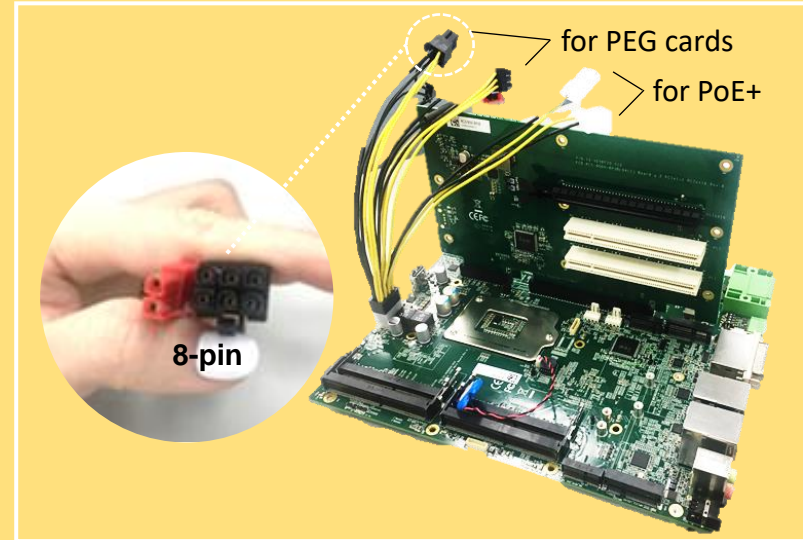
- 300/200W Power Budget
- 160V Extra-Wide Power Module

# Power Budget

## ◆ 300W



**RCX-1000F**



## ◆ 200W



**ECX-1400/1300**



**ECX-1200(M)/1100**

## Objectives

- w/o extra power input
- for more and more high power-consumption PEG Cards

### • NVIDIA :

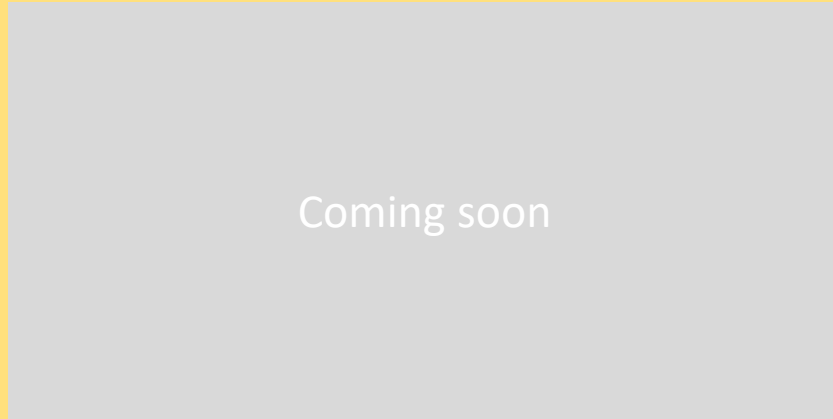
TITAN V / Xp	(250W)
TESLA P100	(250W)
RTX 2080 Ti	(250W)
RTX 2080	(215W)
RTX 2070	(175W)

### • AMD Radeon :

Pro SSG	(260W)
Pro WX9100	(230W)

# Wide Voltage Power Module

◆ 6 ~ 160V **Extra-Wide!!!!**



**WPM-110**

◆ 9 ~ 36W



**WPM-100**

**SPC-4020A**

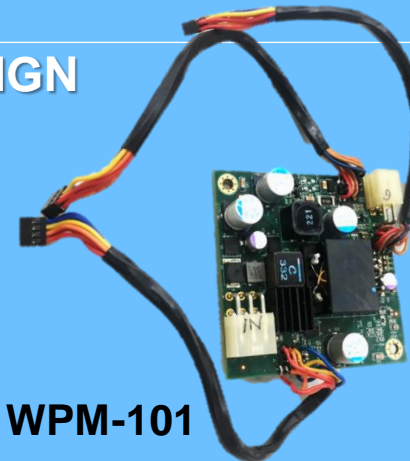


◆ w/ PoE+ & IGN

**SPC-4600**



**WPM-101**



## Objectives

- More and more standard systems/SBC reserves for **single 12V** DC-in, in order to strive for better selling prices.
- If requested for wide-voltage power, we are developing modules to fit the customers' needs.

## **About Display**

---

- Multi-Displays
- Particular Display Connectors

# Multiple Displays

◆ 7-in-9 Port  
(3 8K)



ECX-1400 GTX1070

◆ 7-in-8 Port  
(3 8K)

FAN cover  
FAN module  
optional



RCX-1000F GTX1080

◆ 6-in-7 Port  
(1 8K)



ECX-1200 GTX1050(T)

(4 8K)

Fanless!!!!



EVS-1000 GTX1050



EVS-1100 GTX1070

## Objectives

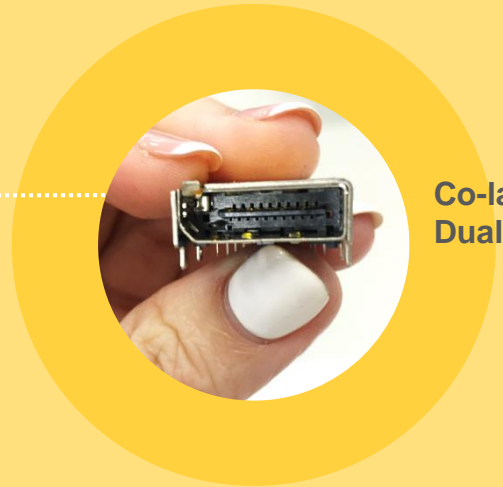
- For increasing demands on pop AI-driven and autonomous drive (AVs) applications.

- Standard PCIe :  
RTX 2080 (validating)  
GTX 1080  
GTX 1070  
GTX 1050/1050 Ti

- MXM :  
GTX 1080  
GTX 1070  
GTX 1060  
GTX 1050 / 1050 Ti  
GT 1030

# Particular Display Connectors

## ◆ Dual-Mode Digital Displays (DP + HDMI)



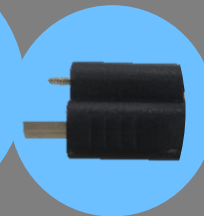
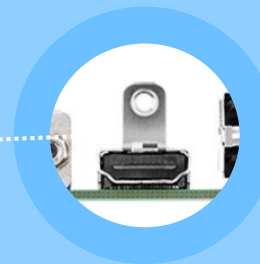
Co-layout on this  
Dual-mode connector

## Objectives

- There are much more requirements on HDMI.
- Therefore, we try to remain HDMI display in the limited space/circuit.
- For anti-shock/vibration ability on board-level and also whole system, we choose special connector with lock. (also the corresponding cable)

## ◆ Lockable HDMI

**SPC-4000**  
**EMBC-2000**





## About I/Os

---

- Full Function of GPIO
- 10Gbps USB 3.1 Gen2

# Full Function of GPIO

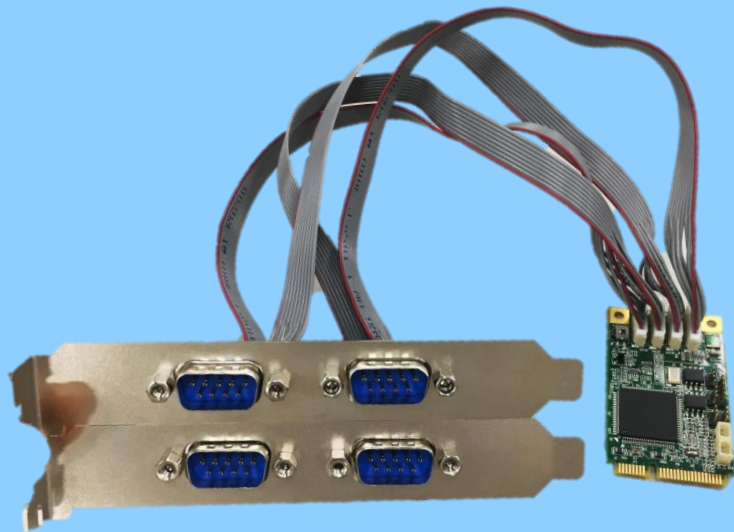
## ◆ 32-bit GPIO

Supports with Timer, Interrupt & Counter Functions

## ◆ Isolated DIO Sink & Source Modes

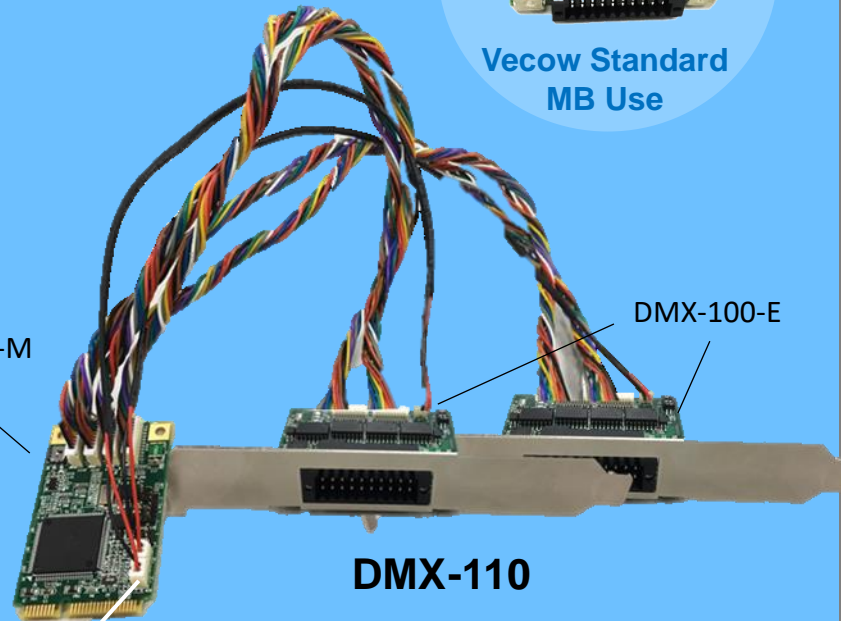


Vecow Standard  
MB Use



DMX-100

DMX-100-M



DMX-110

DMX-100-E

Sink & Source Modes Supported via Switch

## Objectives

- For increasing demands on robot control for both sinking (ASIA) and sourcing (US & Europe) modes of Digital I/O.

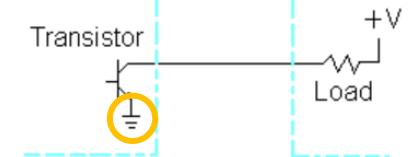


Figure 1: Sinking Digital Output Circuit

Ground needed to the load

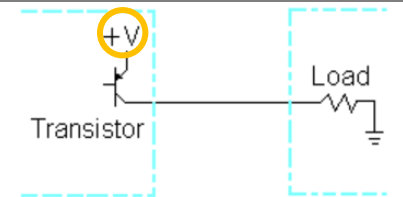


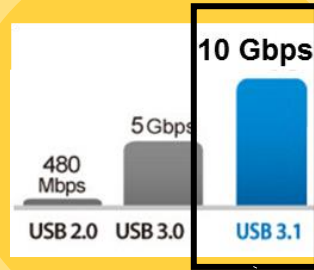
Figure 2: Sourcing Digital Output Circuit

Voltage needed to the load

# 10Gbps USB 3.1 Gen2

## ◆ 6-Port

Speed x2 times ↑



RCX-1000

## ◆ 4-Port



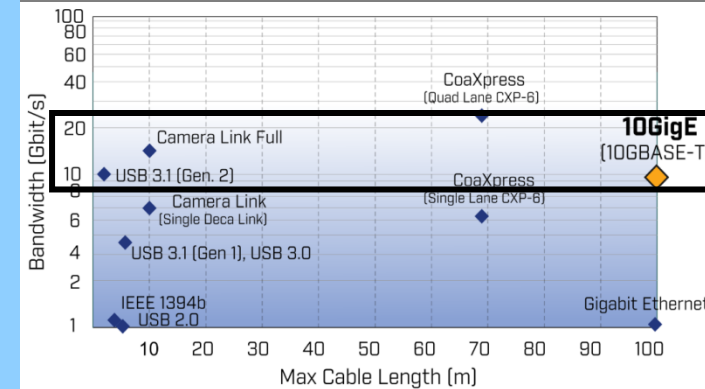
ECX-1200/1100



ECX-1400/1300

## Objectives

- In machine vision and computer vision business, there are much more requirements on higher speed to fit in zero-latency monitoring.



## **About Memory**

---

- Capacity of 96GB DDR4

# High Capacity DDR4

◆ 96GB (in 3 slots)

Thanks to vendor support, they come up with single DDR4 in **32GB** !!!



RCX-1000

◆ 64GB (in 2 slots)



ECX-1200/1100



ECX-1400/1300

## Objectives

- Higher capacity of DDR memory is indeed a gospel in **S/W** perspective (VMware Virtual Machine) and applications on digital image processing (DIP) and inspections to flexibly use on capacity distributions side by side.
- DDR4 Capacity ↑  
= Memory Access times ↓  
= System Heat ↓  
= Overall performance ↑

## About Design

---

- MXM Tailor-made Cooling Copper
- Rotary Storage Device
- FAN Ventilation

# MXM Tailor-made Cooling Copper

## ◆ Industry-First **FANLESS** GPU System

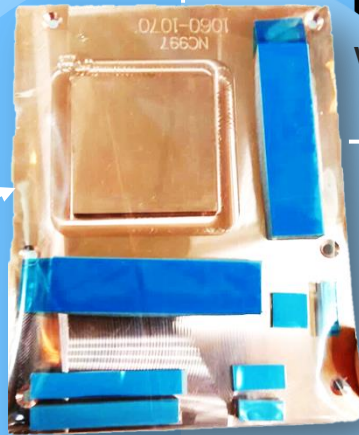


**EVS-1000**  
w/ GTX1050(Ti), GT1030 MXM



**EVS-1100**  
w/ GTX1080, GTX1070, GTX1060, GTX1050 MXM

**MXM**  
Mobile  
PCI Express  
Module



Different Copper  
in Different MXM

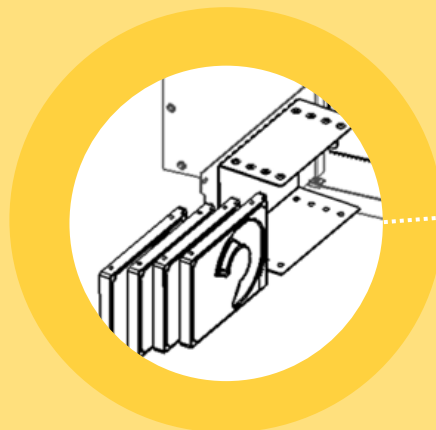


## Objectives

- AI/DL/ML are the most popular topics in each vertical fields and connected to our daily lives. So, the demands are getting even higher. Thus, we are the pioneer and have started GPU-accelerated systems since 2016.
- In 2017 Q4, unprecedented **Fanless MXM** has been just like the breeze to the market

# Rotary Storage Device

## ◆ 4-Slot External SSD/HDD Tray



- Easy Assembly
- Increased Space Usage
- Lower Total Cost of Ownership (TCO)

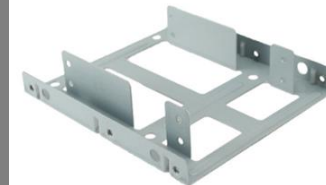
## Objectives

- As previous experiences, the storage device is extractive (external) or (internal). Yet, it is still inconvenient and complicated to disassembly.
- That's why we've come up with the new idea of rotating-open of the storage device.

### PREVIOUS DESIGN



External

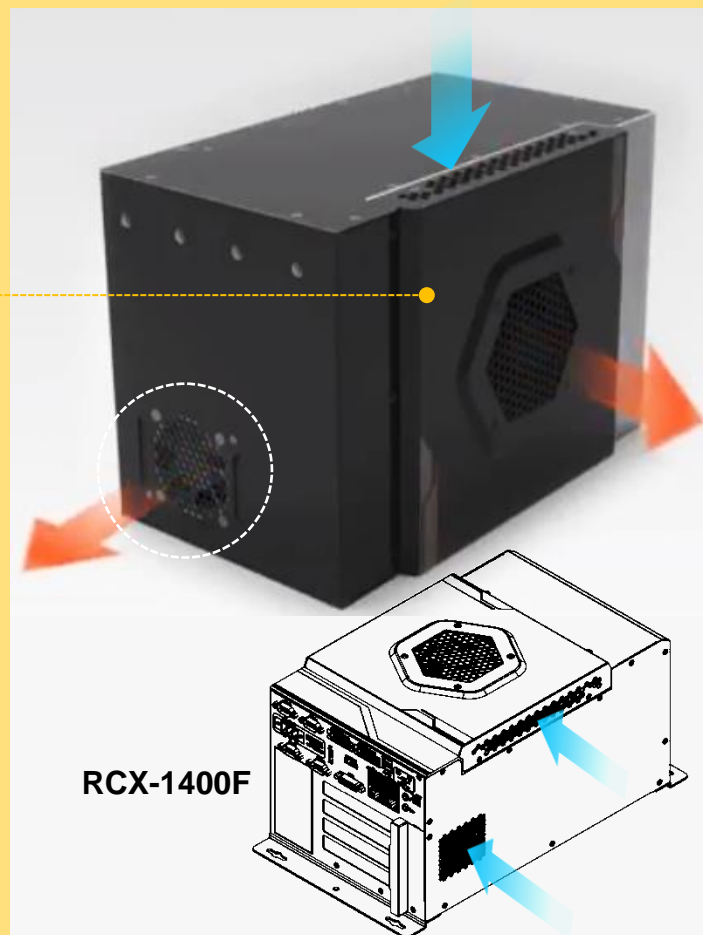


Internal



# FAN Ventilation

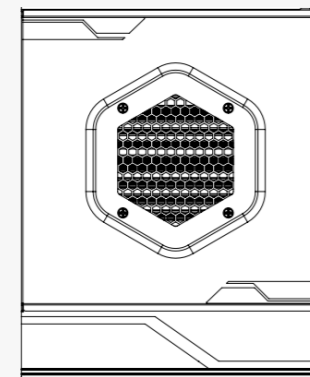
## ◆ FAN Modules & FAN Covers



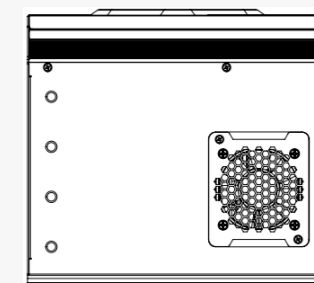
## Objectives

- Both fan modules and fan covers are in the purpose of better system heat ventilation.

FAN Cover  
(Optional)



FAN Module  
(Default in GPU series)



## **About Reliability**

---

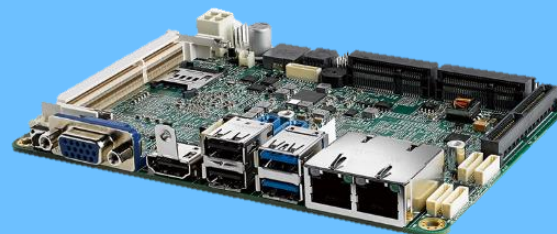
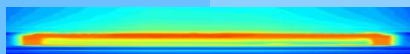
- 85°C Operating Wide-Temp
- 5G Vibration
- Hardware Monitor UI

# 85°C Operating Wide-Temp

## ◆ Thermal Simulation Improved



**EMBC-1000**  
(Core-i SKL/KBL-U)



**EMBC-2000**  
(Atom APL)

## Objectives

- Wide-Temp operating is always eye-catching feature, so we have done a lot of efforts on thermal simulation and improvements.
- Solutions on both heat-sink and heat-spreader.

# 5G Vibration & 50G Shock

## ◆ Damper & Card Support Bracket

Integrated intensify in EMC Test

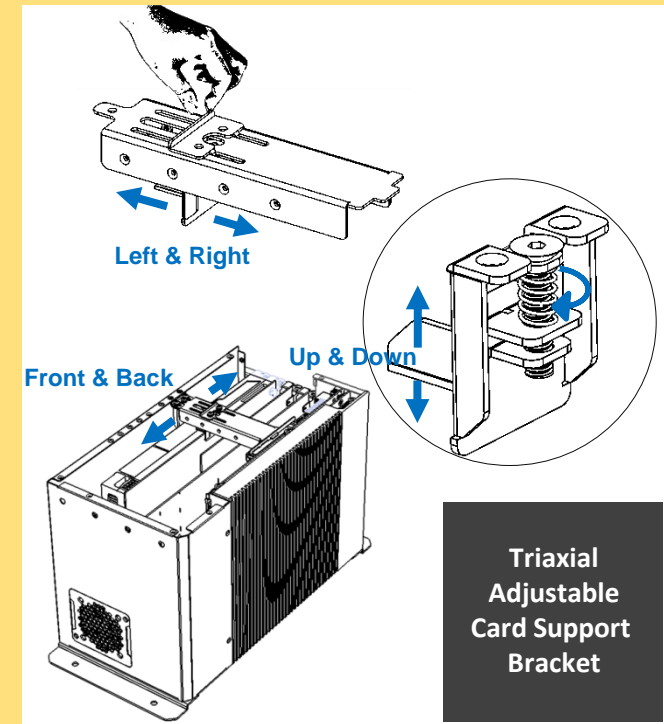
Shock	IEC 60068-2-27, 50G @ wall mount, Half-sine, 11ms
Vibration	IEC 60068-2-64, 5Grms, 5Hz to 500Hz, 3 Axis



RCX-1400F

## Objectives

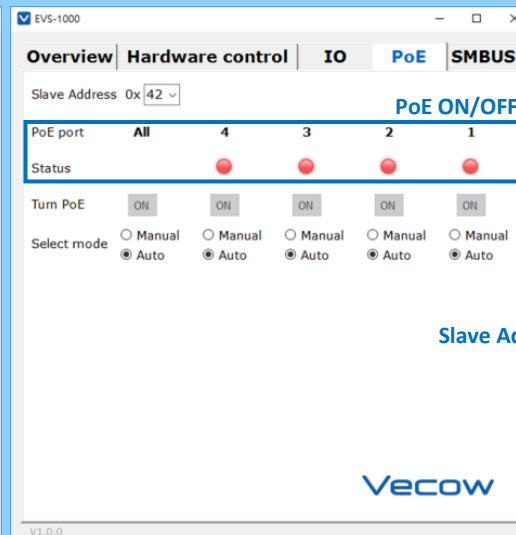
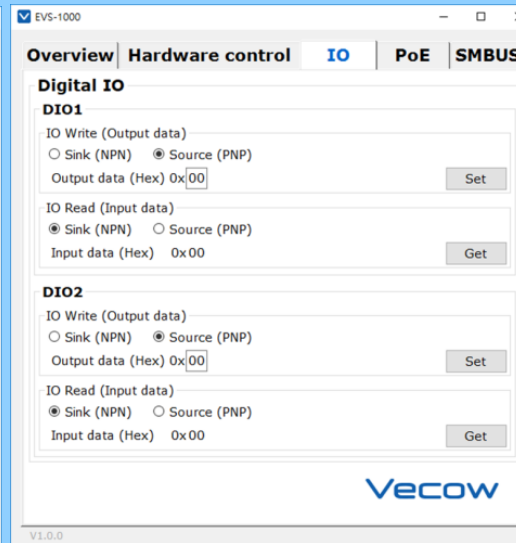
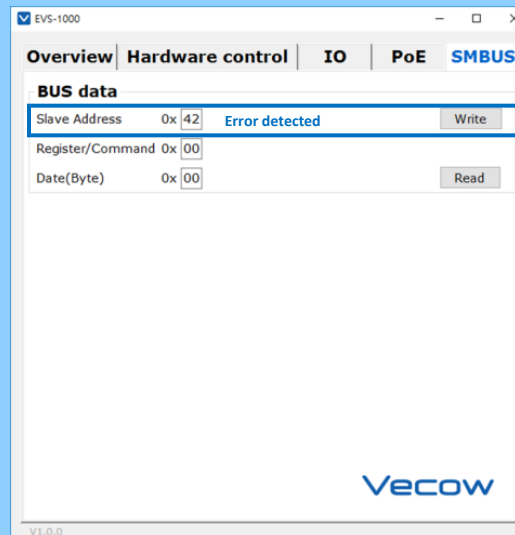
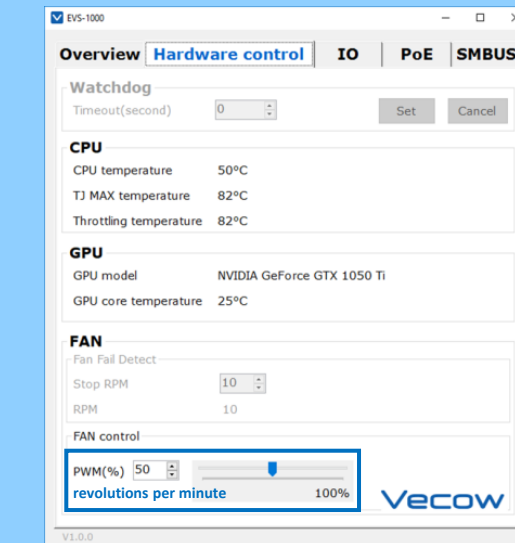
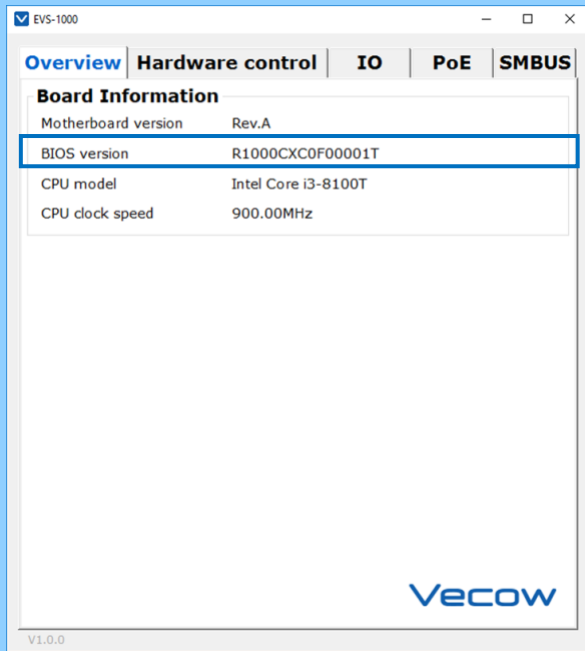
- More solid structure for full-sized GPU systems



Triaxial Adjustable Card Support Bracket

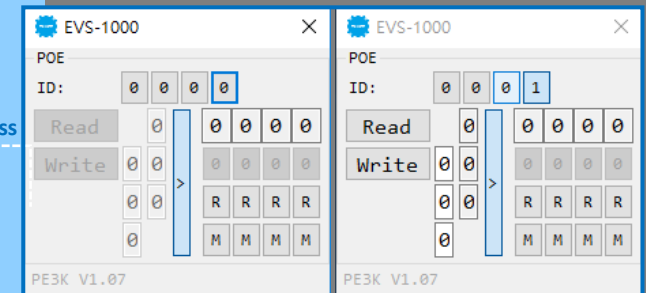
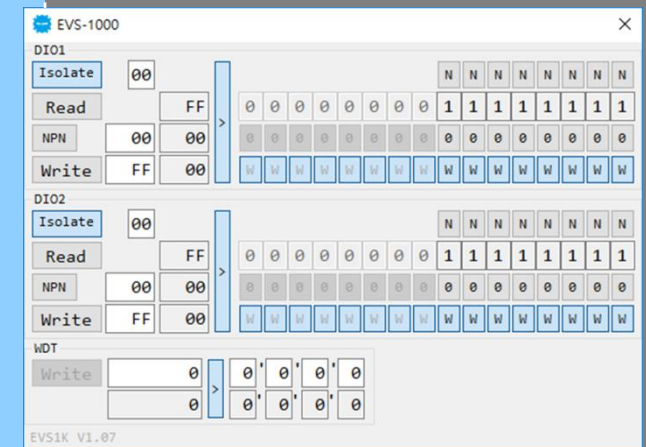
# Hardware Monitor UI

## ◆ 6-Gen System Afterwards



## Objectives

- Clear system remote check (Windows only)



Slave Address

**Q & A**  
**MANY THANKS!**

31415926535 8979323846 26433383279  
5028841971 6939937510 5820974944  
5923078165 0628620899 8628034825  
3421170679 8214808651 3282306647  
0938446095

