ACCEL-JS2000

NVIDIA® IGX Orin

Medical AI Imaging processing platform

ACCEL-JS2000 Series Manual 1st Ed
Jan, 2024

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Packing List

Before you begin installing your Medical Station, please make sure that the following items have been shipped:

- ACCEL-JS2000

If any of these items are missing or damaged, you should contact your distributor or sales representative immediately.

*** Use power cord should follow then specification below:**

Listed, Detachable, Type SJT or above. 125/250 V minimum, 18 AWG/3C mini-mum, 3.0 m long maximum. One end terminates in 125 V, 10 A, with NEMA 5-15P or 250 V, 10 A with NEMA 6-15P, grounding type, the other end with an appliance coupler. Hospital grade.

Headquarters

Onyx Healthcare Inc.

4F, No.135, Lane 235, Pao-Chiao Rd.,

Hsin-Tien City, Taipei 231, Taiwan, R.O.C.

TEL: +886-2-8919-2188

FAX: +886-2-8919-1699

E-mail: sales@onyx-healthcare.com

http://www.onyx-healthcare.com

Worldwide Offices:

Onyx Healthcare, USA Inc.

2663 Saturn street, Brea, CA 92821, USA

Tel : +1-714-996-1800

Fax: +1-714-996-1811

Email: usasales@onyx-healthcare.com

Onyx Healthcare EUROPE B.V.

Primulalaan 42,5582 GL Waalre,The Netherlands

Tel : +31-(0)499-745600

Email: eusales@onyx-healthcare.com

Onyx Healthcare Technology GmbH

An der Trift65d

63303 Dreieich , Germany

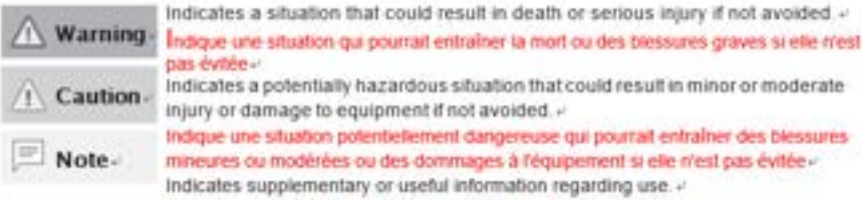
TEL: +49-(0)61033-7479-00

Fax: +49-(0)61033-7479-49

Email: eusales@onyx-healthcare.com

Safety & Warranty

1. Read these safety instructions carefully.
2. Keep this user's manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Do not use liquid or spray detergents for cleaning. Use a damp cloth.
4. For pluggable equipment, the power outlet must be installed near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall could cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. DO NOT COVER THE OPENINGS.
8. **Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.**
9. **WARNING: To avoid risk of electric shock, this equipment must only be connected to a supply mains with protective earth (L'alimentation électrique est spécifiée comme faisant partie de ME EQUIPMENT Avertissement: Pour éviter tout risque de choc électrique, cet appareil doit être connecté à une alimentation secteur avec une prise de terre)**



10. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
11. All cautions and warnings on the equipment should be noted.
12. If the equipment is not used for a long time, unplug the power cord to disconnect it from the power source to avoid damage by transient over-voltage.
13. Never pour any liquid into an opening. This could cause fire or electrical shock.
14. Never open the equipment. For safety reasons, only qualified service personnel should open the equipment.
15. **Warning: Do not modify this equipment without authorization of the manufacturer.**

(AVERTISSEMENT: ne modifiez pas cet équipement sans l'autorisation du fabricant.)

16. **If any of the following situations arises, get the equipment checked by service personnel:**
    a. The power cord or plug is damaged.
    b. Liquid has penetrated into the equipment.
    c. The equipment has been exposed to moisture.

d. The equipment does not work well, or you cannot get it to work according to the users manual.

e. The equipment has been dropped and damaged.

f. The equipment has obvious signs of breakage.

17. DO NOT LEAVE THIS EQUIPMENT IN AN UNCONTROLLED ENVIRONMENT WHERE THE STORAGE TEMPERATURE IS BELOW -20° C (-4°F) OR ABOVE 60° C (140° F). IT MAY DAMAGE THE EQUIPMENT.

18. External equipment intended for connection to signal input/output or other connectors, shall comply with relevant UL / IEC standard (e.g. UL 60950-1 for IT equipment and ANSI/AAMI ES 60601-1: 2005 AND CAN/CSA-C22.2 No. 60601-1:08) Any person who connects external equipment to signal input, signal output, or other connectors has formed a system and is therefore responsible for the system to comply with the standard IEC 60601-1, safety requirements for medical electrical systems.

19. Warning : The device intends to be used in the highly sensitive medical environments and these environments are prevented from access by general hospital staff, and the device should be installed in a suitable and safe location to avoid unauthorized contact. The top cover of device is allowed to be opened by authorized personnel for professional service purpose only.

Avertissement : L'appareil est destiné à être utilisé dans des environnements médicaux hautement sensibles et ces environnements sont interdits d'accès au personnel hospitalier général, et l'appareil doit être installé dans un endroit approprié et sûr pour éviter tout contact non autorisé. Le capot supérieur de l'appareil ne peut être ouvert que par le personnel autorisé à des fins de service professionnel uniquement.

20. **ACCEL-JS2000is applying for the medical instruments main system but without the medication analysis, disease detection, and medical diagnosis function.**
21. **Do not touch the device and Patient at the same times.**

Classification

1. Degree of production against electric shock: not classified
2. Mode of operation: Continuous
3. Type of protection against electric shock: Class I equipment
4. No Applied Part, No AP/APG

FCC

This device complies with Part 18 FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received including interference that may cause undesired operation.

UL Module Description

CLASSIFIED c UL us	*ACCEL-JS2000modules are developed to suitable for the Classification Mark requirement*

Safety Symbol Description

The following safety symbols are the further explanations for your reference.

	*Follow operating instructions.*
	*Ground wire* *Protective Ground wire.*
	*Alternating current*
	*Equipotentiality* *To identify the terminals, when connected together, bring the various parts of an equipment or of a system to the same potential.*
	*Stand-by switch* *(PC power button)* *Green LED – Power on*
I/O	Power supply switch (on/off)

Contents

Chapter 1

General Information

1.1 Introduction

The ACCEL-JS2000 is powered by the NVIDIA IGX Orin platform, an industrial-grade edge AI platform combining enterprise level hardware, software, and support for the fastest way to bring AI and functional safety to the edge. Purpose-built for medical environments,

IGX empowers organizations with the performance, durability, security and safety required for AI at the edge. The ACCEL-JS2000 combines an NVIDIA IGX Orin module, NVIDIA RTX A6000 GPU and NVIDIA ConnectX network interface and dedicated safety MCU for security to offer powerful medical AI experience that is designed to be ready for IEC/UL 60601-1 safety and IEC/UL 60601-1-2 EMC certification.

More importantly, ACCEL-JS2000 also integrates a 7-inch front touch screen, allowing users to view captured images and manipulate the system or adjust values through the front screen. ACCEL-JS2000 includes 7-10 years of standard product longevity with an optional extended 10-year support program. The ACCEL-JS2000 is already launch in June 2024.

1.2 Feature

- Supports the NVIDIA IGX Orin platform with RTX A6000 GPU card, providing performance of up to 875 TOPS.
- Compatible with RTX A6000 graphics card, featuring Tensor Cores, RT Cores, and Cuda Cores, achieving 600~1500 TOPS.
- Integrates the ConnectX-7 high-speed edge network chip, offering 2 x 100Gbe connections to accelerate data processing speed.
- Expandable artificial intelligence performance ranging from 250 to 1705 TOPS to meet diverse application requirements.
- Supports efficient power with a 700W medical-grade power supply.
- Integrates a silent fan with a well-designed convection system, allowing users to operate in a quiet medical environment without fan noise interference.
- Integrates a 7-inch front-facing touchscreen, allowing users to view images and manipulate the system or adjust values through the front screen.
- the product's component selection ensures a guaranteed supply for at least 7-10 years, providing assurance for equipment manufacturers during product development.
- Complies with the latest medical safety standards and electromagnetic compatibility certifications IEC/EN60601-1, IEC/EN60601-1-2, and UL60601-1, ensuring the safe use of medical equipment.

- Front dual USB design for user convenience.

1.3 Specification

System Specifications

Model	ACCEL-JS2000
AI Accelerator	NVIDIA IGX Orin
NVIDIA Orin SoC	● NVIDIA Ampere architecture GPU ● Arm Cortex-A7 ● DL accelerator (2 x NVDLA 2.0 Engines, 1408Mhz)
System Memory	64GB 256-bit LPDDR5 3200Mhz
Storage	● 2.5” SATA SSD x 2 ● M.2 Key M 2280 x 1
NVIDIA BMC Module	Aspeed AST2600 Microchip ERoT
NVIDIA CONNECTX-7	Networking and PCIe Bridge
Safety MCU(SMCU)	Infineon Aurix TC397

Rear I/O	1 x USB 3.2 GEN2 Type-C (5V/3A) 4 x USB 3.2 GEN2 Type-A (5V/0.9A) 2 x RJ-45 Gigabit LAN 2 x QSFP28 up to 100GbE ** The QSFP module should comply with IEC/EN 60825 for class I product. 2 x COM 1 x AC Power Input **Sound:** 1 x Line-out, 1 x Mic-in **Function Port** 1 x Recovery Button (see Ch 3.2 to details) 1 x Reset Button (for Restart PC) 1 x Equipotentiality Pin **Video Output** 1 x DisplayPort 1.4a output from mainboard 4 x DisplayPort 1.4a output from discrete graphic card
Front I/O	2 x USB 3.1 GEN1 Type-A (5V/0.9A)
Power Supply	100-240V, 50-60 Hz, 10-5A, Medical ATX PSU
Expansion Slot	● Gen 5 x8 lanes within 16 x Physical connector ● Gen 5 x 16 lanes within 16 x physical connector
OS Support	IGX OS, Compliant with Ubuntu 22.04

Mechanical Specifications

Construction	Metal chassis
Dimension	400W) x 406(L) x 166(H) mm
Carton Dimension	560 x 305 x 628 mm
Net Weight	12KG
Gross Weight	14KG
Packing Filler	PE foam

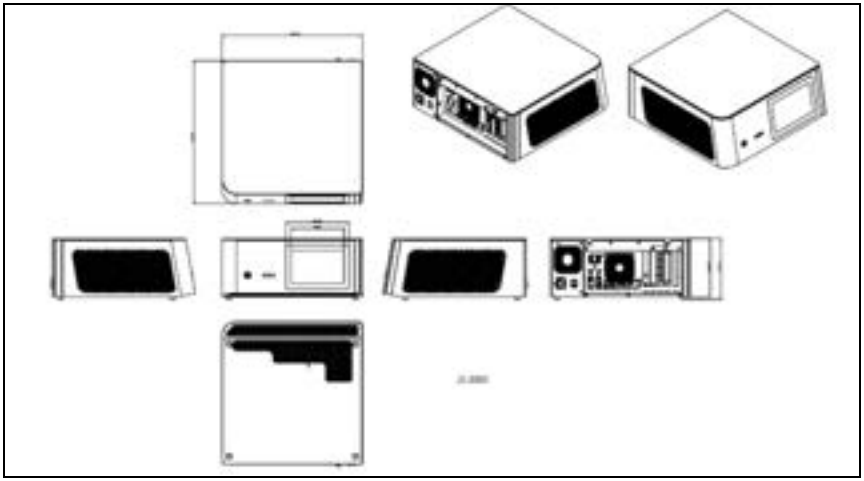
Front Touch Screen (Optional)

Display Type	7” LED
Max. Resolution	1280 x 800
Max Colors	16.7M
Luminance (cd/m2)	400nits
Back Light Life Time	30,000 hours.
Viewing angle	88/88/88/88
Touch Technology	Projective Capacitive
Touch Interface	USB

Environment Specifications

Operating Environment	0˚C to 35˚C (32 ˚F ~95˚F) 30% ~ 75% @ 40°C, Non-Condensing 700~1060 hPa
Storage / Transport Environment	-20˚C to 60˚C (-4˚F ~140˚F) 10% ~ 90% @ 35°C, Non-Condensing 700~1060 hPa
EMI / Safety	CE: EN 60601-1-2 2015/A1:2021(ed 4.1), EN 60601-1:2006/A1:2013/A12:2014/A2:2021(ed 3.2) UL: ANSI AAMI ES 60601-1:2005/A1:2012/A2:2021(ed 3.2) cUL: CAN/CSA-C22.2 No. 60601-1:14/A2:22(ed 3.2)

1.4 Dimension



Chapter 2

Hardware Introduction

‘

2.1 Safety Precautions

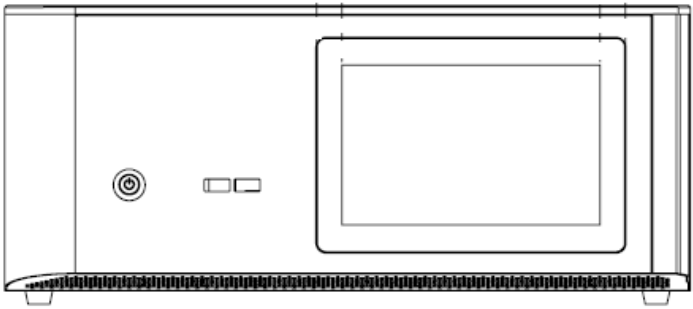
Always completely disconnect the power cord from your board whenever you are working on it. Do not make connections while the power is on, because a sudden rush of power can damage sensitive electronic components.

Always ground yourself to remove any static charge before touching the board. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis

2.2 A Quick Tour of the ACCEL-JS2000Series

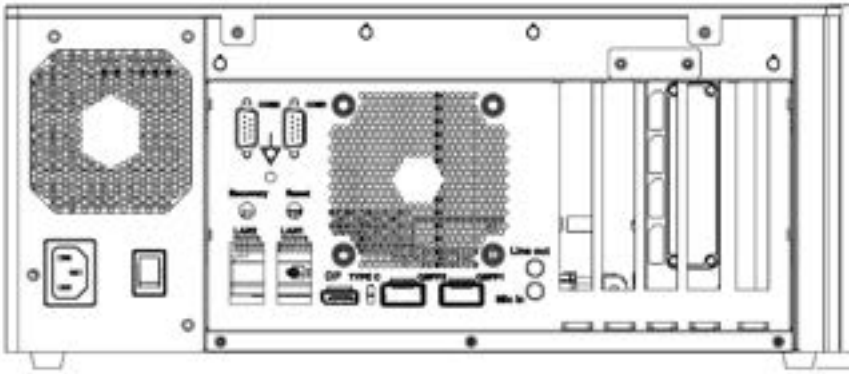
Before you start to set up the ACCEL-JS2000, take a moment to become familiar with the locations and purposes of the controls, drives, connections and ports, which are illustrated in the figures below.

Please place the ACCEL-JS2000 upright on the desktop, its front side appears as shown in Picture 1.1.



Picture 1.1: Front View of the ACCEL-JS2000

When you turn the ACCEL-JS2000 around and look at its rear side, as shown in Picture 1.2.



Picture 1.2: Rear view of the ACCEL-JS2000

2.3 Turn On and Boot up into IGX OS

This section is for Jetpack OS operating system only. If you are installing a different operating system, please contact your vendor for installation details.

Your ACCEL-JS2000 will begin loading IGX OS once you push the power button to turn power on. Initial Login for IGX OS is :

OS Account: onyx

OS Password: 123456

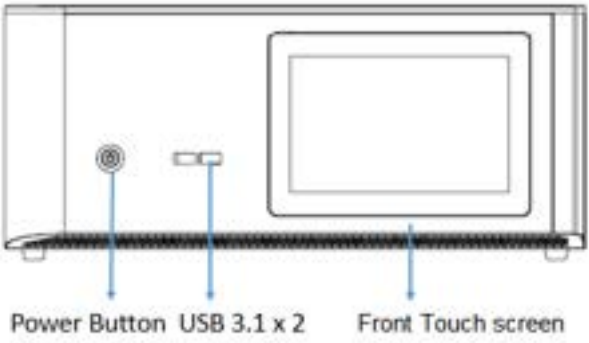
BMC Password: onyxJs2000! (exclamation mark included)

2.4 Turn off

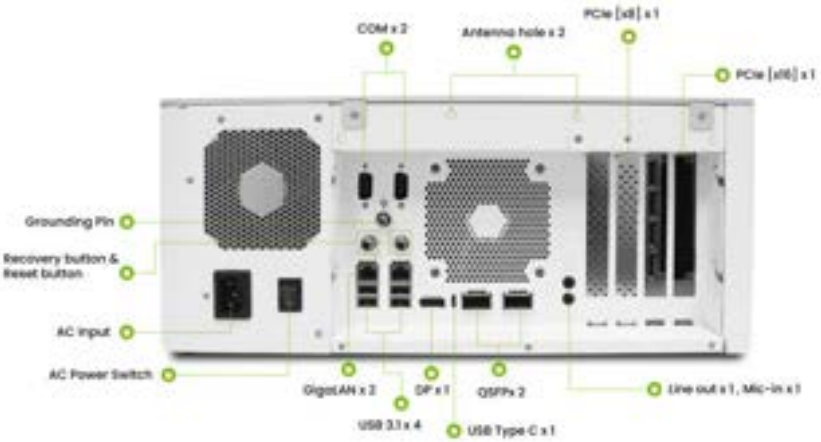
Turning off ACCEL-JS2000properly is important for system reliability.

1. On the menu, click “shut down” and select “OK”
2. And then the system will shut down automatically.

2.5 Front Panel Connectors



2.6 Rear Panel Connectors



Chapter

3

OS Flash Guide

3.1 Before installation

Before starting the process make sure your ACCEL-JS2000 system is turned off and the power in is disconnected. You will need a host PC running Ubuntu 20.04 or above

3.2 Installation

This manual is for JS-2000, including re-installing iGX OS r36v1.0.3 on JS-2000, updating FW.

- Default account info

  OS Account: onyx

  OS Password: 123456

  BMC Password: onyxJs2000! (exclamation mark included)

- Reference links

  [1] iGX Orin User Guide

  [2] iGX Orin Download Center

  [3] iGX Orin Forum

- Tools and path to download

  Path：https://developer.nvidia.com/igx-downloads

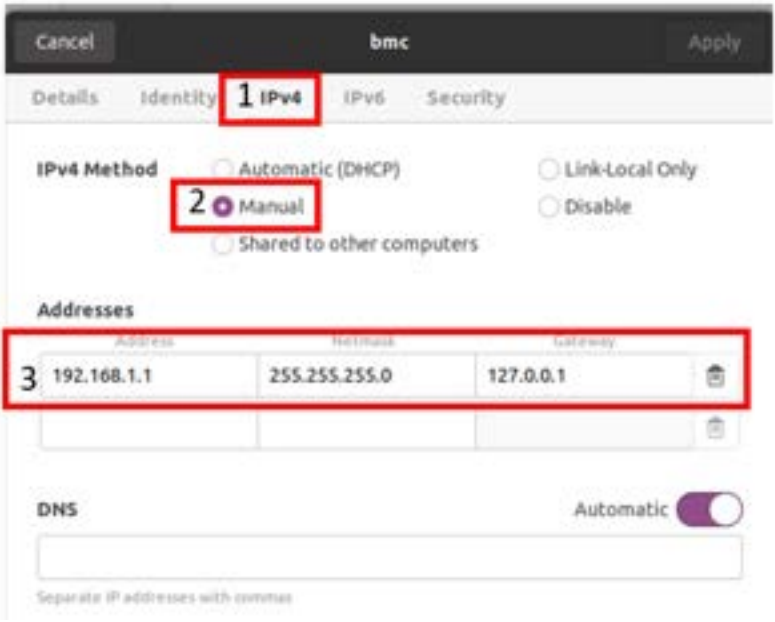
Tools	File names
iGX OS iso file	IGX-r36v1.0.3-2024-05-17-15-34-37.iso
Fan control file	nvfancontrol.zip

3.3 Login to BMC Web-UI

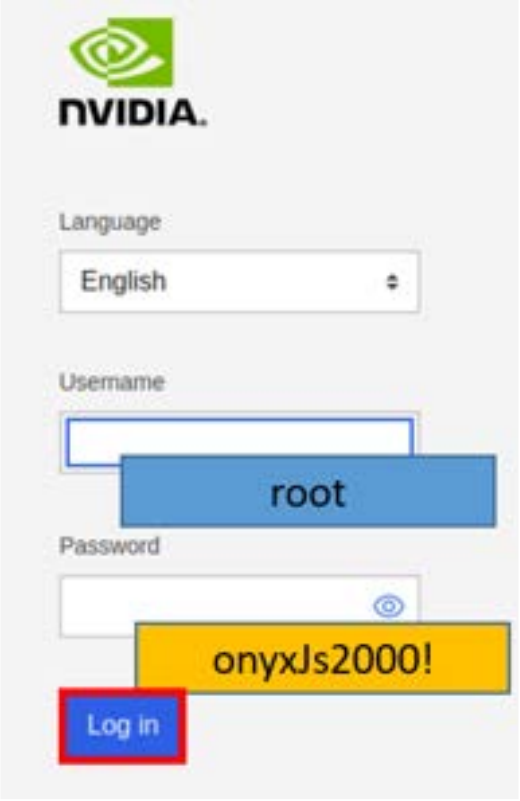
- Use RJ45 to connect BMC port and Host Ubuntu RJ45 port. BMC port is the Port 5 in pic.

- In host PC → Settings → Network → Wired, clikc + icon. Note that the **Wired** should be the corresponded interface that connected to the BMC.

- Select IPv4 → Manual, set Address, Netmask, Gateway as following.

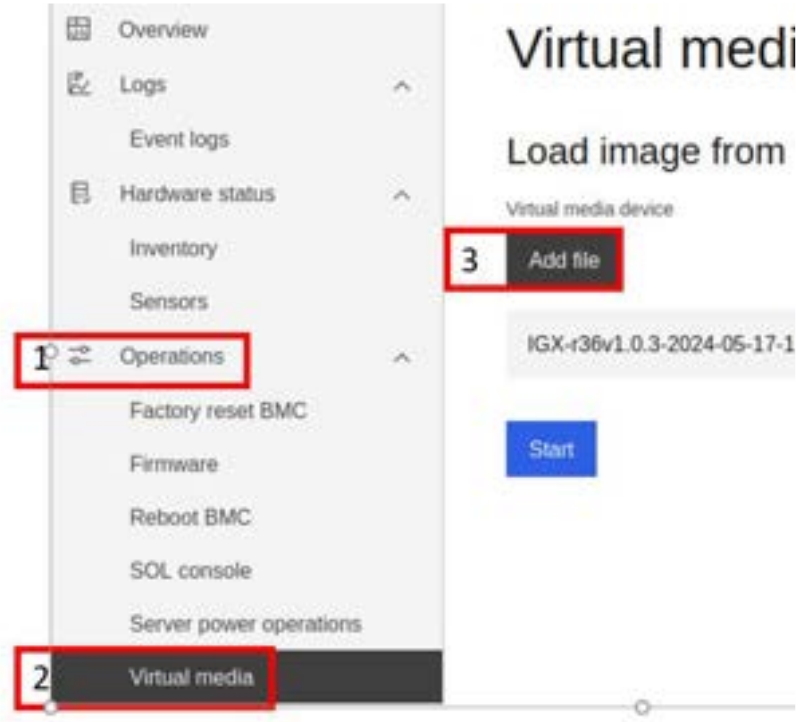


- Use a web browser to enter https://192.168.1.110, you should be able to see the login page as shown. The username is root and the default password is **onyxJs2000!**



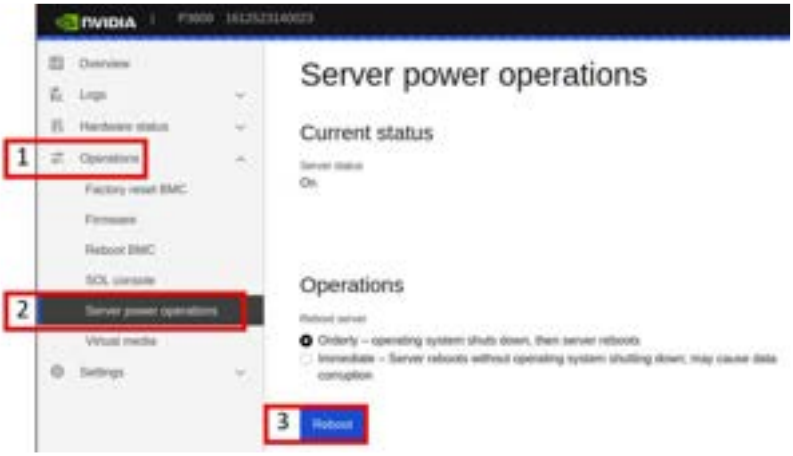
3.4 Install iGX OS r36v1.0.3

- Download iGX OS ISO file from Nvidia download center to your host PC.
- Login to BMC Web-UI.
- At the left side of Web-UI, click Operations → Virtual media → Add file, select the IGX OS ISO file from your host PC.



- Click Start.

- Click operations → Server power operations → Reboot to reboot JS-2000.



- After reboot, select **Install IGX OS r36v1.0.3 (dGPU)**.

The installation will start automatically. After installation is finished, ACCEL-JS2000 will reboot automatically and went into a GUI setting scene to set user info, keyboard layout, etc.

3.5 Update Fan Config and compute stacks

- Install compute stacks

```
$ sudo apt update
$ sudo apt install nvidia-igx-ai-rm
$ sudo apt --fix-broken install
```

- Update fan profile

1..1 Put the **nvfancontrol.zip** onto JS-2000

1..2 Unzip it on JS-2000, then apply it.

```
$ unzip nvfancontrol.zip
$ sudo cp nvfancontrol.conf /etc/nvfancontrol.conf
```

1..3 Reboot JS-2000.

Chapter

4

OS

User Guide

4.1 Introduction

The ACCEL-JS2000 ‘s OS, Ubuntu/Linux version, and preinstalled packages components are as follows:

For IGX-OS GA version

1. Ubuntu/Linux version :
   A. Ubuntu version : 22.04
   B. Linux Kernel 5.15.0

2. Built-in below packages
   A. cuda 12.2
   B. tensorrt 8.6.2.2-1
   C. cudnn 8.9.4.25
   D. VPI 3.1.5
   E. Vulkan 1.3.204
   F. Nsight Compute 2023.2.2
   G. Nsight Systems 2023.2.3

4.2 Default Login user /Password

OS Account: onyx

OS Password: 123456

BMC Password: onyxJs2000! (exclamation mark included)

Appendix A

Miscellanea

A.1 General Cleaning Tips

You may need the following precautions before you begin to clean the computer. When you clean any single part or component for the computer, please read and understand the details below fully.

1. Never spray or squirt the liquids directly onto any computer component. If you need to clean the device, please rub it with a piece of cloth or the material that mentioned in the A.2 Cleaning tools
2. Be cautious of the tiny removable components when you use a vacuum cleaner to absorb the dirt on the floor.
3. Turn the system off before you start to clean up the component or computer.
4. Never drop the components inside the computer or get circuit board damp or wet.
5. Be cautious of all kinds of cleaning solvents or chemicals when you use it for the sake of cleaning. Some individuals may be allergic to the ingredients.
6. Try not to put any food, drink or cigarette around the computer.

A.2 Cleaning tools

Although many companies have created products to help improve the process of cleaning your computer and peripherals users can also use household items to clean their computers and peripherals. Below is a listing of items you may need or want to use while cleaning your computer or computer peripherals.

Keep in mind that some components in your computer may only be able to be cleaned using a product designed for cleaning that component, if this is the case it will be mentioned in the cleaning tips.

- **Cloth** - A piece of cloth is the best tool to use when rubbing up a component. Although paper towels or tissues can be used on most hardware as well, we still recommend you to rub it with a piece of cloth.
- **Vacuum cleaner** - Absorb the dust, dirt, hair, cigarette particles, and other particles out of a computer can be one of the best methods of cleaning a computer. Over time these items can restrict the airflow in a computer and cause circuitry to corrode.
- **Cotton swabs** - Cotton swaps moistened with rubbing alcohol or water are excellent tools for wiping hard to reach areas in your keyboard, mouse, and computer.
- **Foam swabs** - Whenever possible it is better to use lint free swabs such as foam swabs.

Note:

We strongly recommended that you should shut down the system before you start to clean any single components.

Please follow the steps below.

1. Close all application programs.
2. Close operating software.
3. Turn off power switch
4. Remove all device
5. Pull out power cable

A.3 Scrap Computer Recycling

If the computer equipments need the maintenance or are beyond repair, we strongly recommended that you should inform us as soon as possible for the suitable solution. For the computers that are no longer useful or work well, please contact with worldwide distributors for recycling

.

The worldwide distributors show on the following website:

http://www.onyx-healthcare.com.tw/Contact.php

Note:

Follow the national requirement to dispose unit