AIME
artificial intelligence machines

User Guide

AIME WORKSTATIONS
T500 | T502 | T504

Contents

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1. Device Description & Scope of Delivery

Device Description

The AIME T500 workstation series is designed for deep learning development and has been optimized for maximum performance with regard to low volume development and the lowest possible energy consumption without compromising on durability and reliability.

All installed components were selected for their energy efficiency, durability, compatibility and high performance. They are perfectly balanced with each other so that there are no performance bottlenecks.

With the sophisticated cooling system of the AIME T500 series, the CPU and all built-in GPUs are cooled highly effectively. High thermal conduction blocks and the far higher cooling capabilities of liquid compared to air keeps the operation temperature of all components well below 60°C.

The secured low operation temperature reduces stressful overheating for GPU and CPU silicons and allows that all components keep operating at their highest performance levels even under full load in 24/7 scenarios.

The large radiators in the front and on top of the system are cooled by high durability noise reduced fans with a guaranteed operation of more than 10 years MTBF. This setup keeps the system cooler, more performant, durable and far less noisy than a collection of many small fans for each component.

The AIME T500 enables you to train deep learning models at up to four times the speed of a single GPU, without throttling the computing power due to heat. This means AI supercomputing performance with over 400 trillion tensor FLOPS, which is equivalent to the performance of hundreds of conventional servers.

AIME workstations are delivered with a pre-installed Linux operating system and are preconfigured with the latest drivers and frameworks such as Tensorflow, Keras, PyTorch and Mxnet.

The pre-installed AIME ML Container Manager offers a comprehensive software stack, allowing developers to comfortably set up AI projects and navigate between frameworks and projects. The libraries and GPU drivers required for the respective deep learning framework are loaded in preconfigured Docker containers and can be configured and started with simple commands. The most common frameworks - i.a. TensorFlow, Keras, PyTorch and Mxnet - are pre-installed and ready to use.

The AIME ML Container Manager makes life easier for developers, so they don't have to worry about problems installing the framework versions.

AIME customers log in immediately after unpacking and start development right away with their preferred deep learning framework.

Scope of Delivery

1x AIME Workstation T500 | T502 | T504
1x power cable for power supply (2x for T504) (IEC connector on protective contact)
1x WLAN antenna
1x quick start guide with individual access data
1x technical specifications

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2. Important Safety Instructions

CAUTION - RISK OF ELECTRIC SHOCK!

WATCH OUT! When using the workstation, the basic safety rules must always be followed to avoid injuries, overvoltage, fire and electric shock:

1. Follow the manufacturer's instructions and safety instructions during installation. Failure to do so can damage the device and cause serious injury or death.

2. The device operates on high voltage. Never open the device and do not try to repair it. Above all, never open the power supply - not even when it is switched off - there is a risk to life and can lead to injuries, overvoltage, fire and electric shock!

3. This product is only intended for indoor use.

4. Do not use the device near water or at high temperatures or in environments with high humidity.

5. Do not use the device during thunderstorms. In the event of a thunderstorm, pull the power plug from the power supply to protect it from damage caused by lightning and overvoltage and to protect people.

6. Do not place the device near heat sources such as fan heaters, heaters, stoves or other devices that generate heat.

7. Do not insert any objects into the open areas of the ventilation or fan grilles of the device.

8. The device needs adequate ventilation. Make sure there is a distance of at least 10 cm on both sides, front and back. Do not place any objects on the top, the fans must remain free.

9. Do not modify any cables or connectors included with this device.

10. Only use power cords that are compatible with the device's power supply model. When using other cables, the contacts may not be compatible, which can seriously damage your device.

11. Modifications inside the device are only to be carried out by a specialist. Before starting such work, switch off the device and pull out the main power plug. ESD protective measures must be observed during all work.

12. Failure to observe the manufacturer's instructions or one of these safety instructions, as well as opening the device or removing, severing or damaging one of the guarantee seals leads to the immediate loss of all warranty and guarantee claims.

13. This device has been developed in such a way that all specified EN classifications are only met if it is used within a completely closed metal housing.

14. Make sure that your data is backed up regularly to prevent data loss due to faulty data carriers, memory modules and other hardware and software errors or malware. In the event of a defect, the data can then quickly be restored.

*: Notes on ESD protection
Electronic components are very sensitive to electrostatic discharge. Therefore, never touch chips and contacts on circuit boards directly, but only on the outer edges of the circuit board without touching contacts or components. Ensure electrical grounding on the housing or on metallic objects, e.g. radiators.

The following applies in particular to the T504:

The T504 is supplied with two power adapters due to its increased power requirements.
It is important to keep in mind to only operate the device when both power adapters are plugged in and turned on.

CAUTION: To prevent damage to the device both power adapters have to be connected to the power grid via the IEC cables before turning the device on. Also both power adapters should be turned on at the back of the device. Only then the workstation should be started by touching the switch on the front panel!

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3. Technical Specification

PERFORMANCE

CPU Options
T500 | T504:
Threadripper 3960X (24 cores, 4.5 GHz)
Threadripper 3970X (32 cores, 4.5 GHz)
Threadripper 3990X (64 cores, 4.3 GHz)

T502:
AMD Ryzen 5 3600XT (6 cores, 4.5 GHz)
AMD Ryzen 5 5600X (6 cores, 4.6 GHz)
AMD Ryzen 7 3800XT (8 cores, 4.5 GHz)
AMD Ryzen 7 5800X (8 cores, 4.7 GHz)
AMD Ryzen 9 3900XT (12 cores, 4.7 GHz)
AMD Ryzen 9 5900X (12 cores, 4.8 GHz)

RAM
64 to 256 GB, ECC optional

GPU Options
T500:
2 bis 3 NVIDIA RTX 3090 24 GB
2 bis 3 NVIDIA RTX A6000 48 GB

T502:
2x NVIDIA RTX 3080 10 GB
2x NVIDIA RTX 3090 24 GB

T504:
4 NVIDIA RTX 3090 24 GB

Cooling
CPU liquid cooled
Low-noise radiator fan > 100000h MTBF

Main Memory
up to 2 X 4TB NVMe SSD, configurable:

QLC: 1500 MB/s read, 1000 MB/s write
TLC: 3500 MB/s read, 1750 MB/s, write
MLC: 3500 MB/s read, 2700 MB/s write

Chipset
AMD TRX40

Power Supply
1600 or 1200 watts of power (depending on the number of GPUs installed), T504 is equipped with two power supplies. Please note the instructions on page 4 for handling and switching on sequence.

80 PLUS Titanium or Platinum certified (96% Efficiency):
92% at 20% utilization
94% at 20% utilization
90% at 80% utilization

Noise Level
Idle < 30dBA, Full Load < 50dBA
T504: Idle < 35dBA, Full Load < 60 dBA

DESIGN

Type
Mid Tower Workstation

Dimensions (WxHxD)
270 x 465 x 476 mm

Weight
T500 | T502: approx. 26 kg
T504: approx. 30 kg

SOFTWARE

Preinstalled
Linux OS (Ubuntu)
AIME ML Container Manager, Docker,
AI-Frameworks (TensorFlow, Keras, PyTorch, Mxnet)

CONNECTIVITY

Front
2x USB 3.1 Gen 1 ports
1x HD-Audio In
1x HD-Audio Out (Stereo)
1x USB Type-C™ port mit USB 3.1 Gen 1

Back
GPU outputs depending on configuration
(HDMI 2.0b, USB Type-C)
2x USB 3.2 Gen1 Ports (USB32G1_1_2)
2x USB 3.2 Gen1 Ports (USB32G1_3_4)
2x USB 3.2 Gen2 Type-A Ports (USB32G2_1_2)**
1x USB 3.2 Gen2x2 Type-C Port
PS/2 Mouse/Keyboard Port
2 x MMCX antenna connectors (2T2R)
1 x optical S/PDIF Out
5 x audio jacks (Center/Subwoofer Speaker Out, Rear Speaker Out, Line In, Line Out, Mic In)

Network
AQUANTIA® 10G LAN, Realtek 2.5G LAN
Intel® Wi-Fi 6 802.11ax (2.4Gbps) + BT 5.0
Bluetooth 5.0 + High speed class II, MU-MIMO

Electricity
T500 | T502: 1x 230V IEC connector
T504: 2x 230V IEC connector

ENVIRONMENTAL CONDITIONS

Ambient Temperature
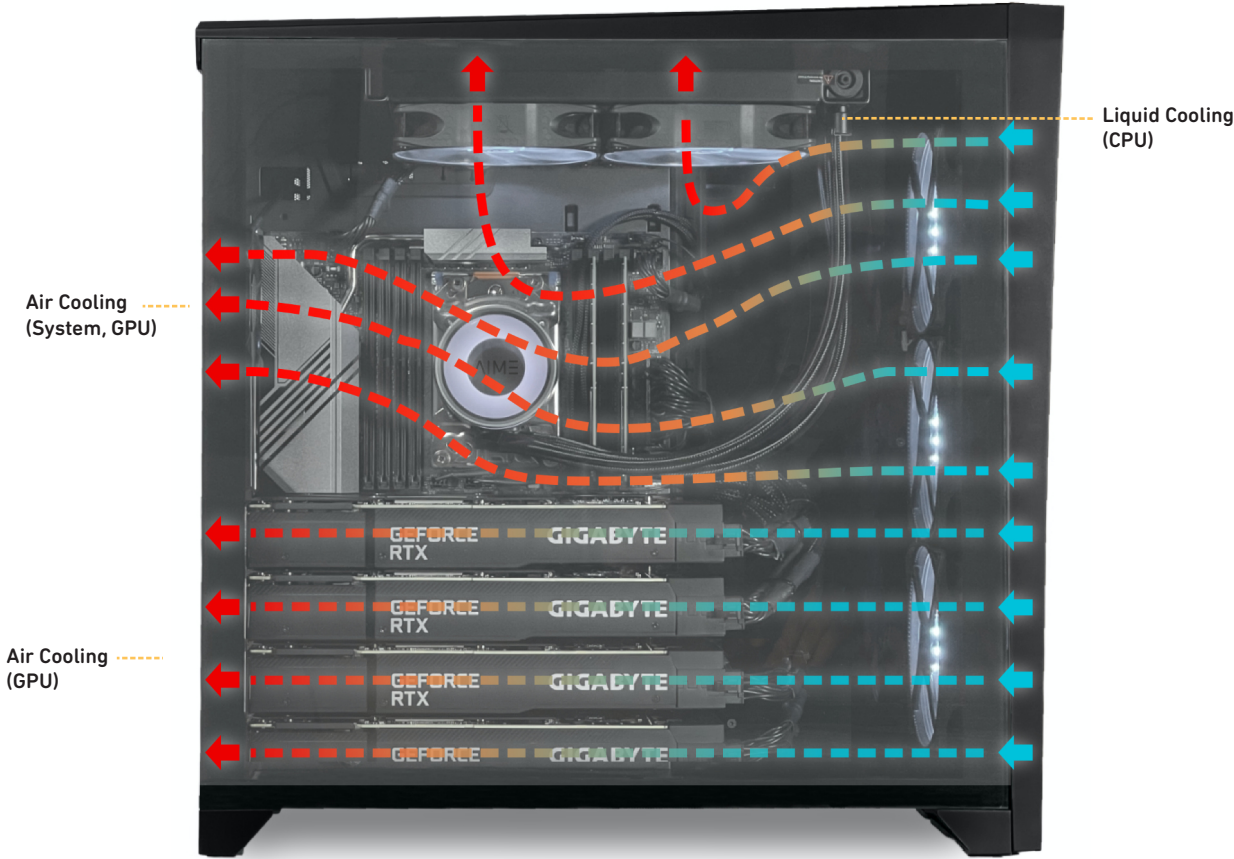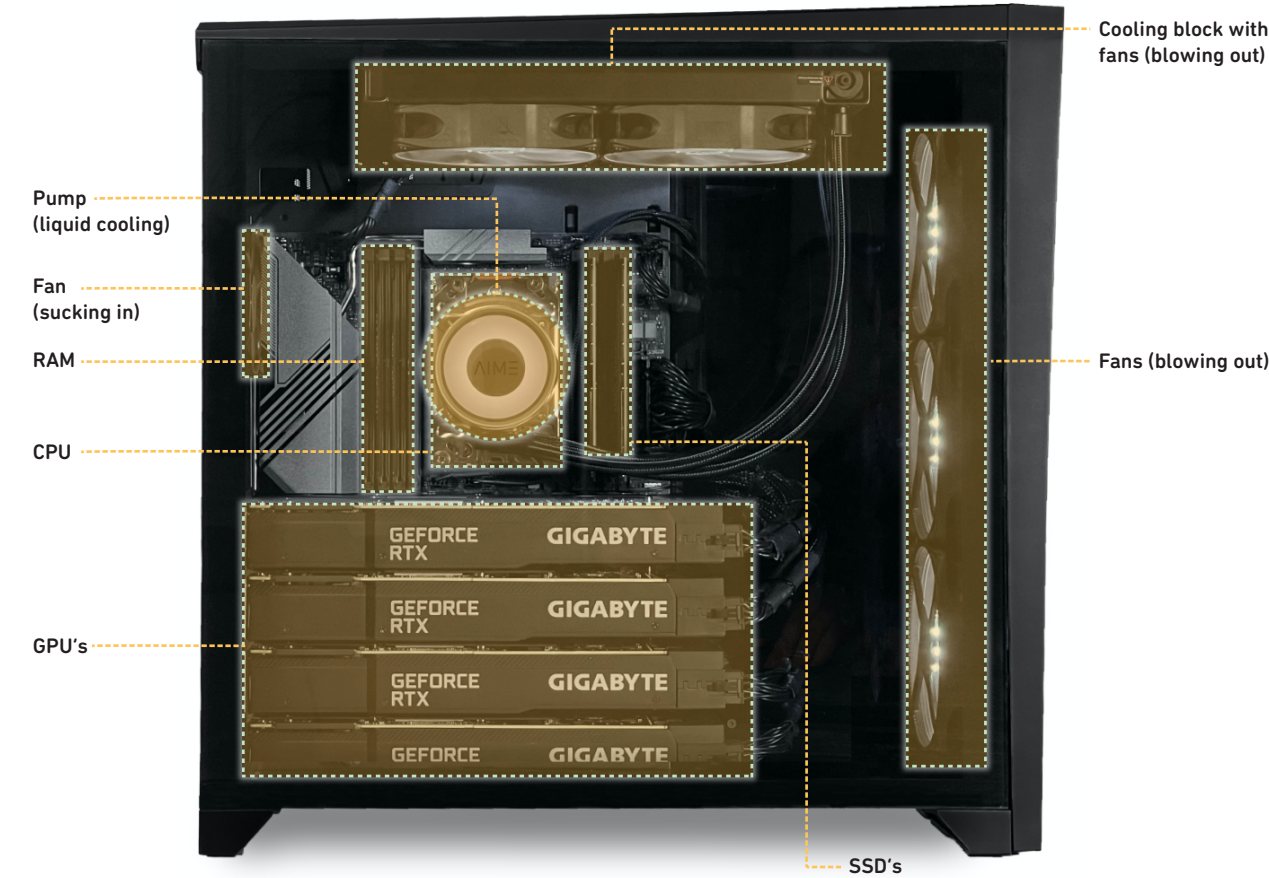In operation: 9°C - 37°C
Out of operation: 1°C - 60°C

Ambient Humidity
rel. Air humidity without condensation
In operation: 20 - 80%
Out of operation: 20 - 85%

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4. Components & Cooling System

Cooling block with fans (blowing out)

Pump (liquid cooling)

Fan (sucking in)

RAM

CPU

GPU's

Fans (blowing out)

SSD's

Liquid Cooling (CPU)

Air Cooling (System, GPU)

Air Cooling (GPU)

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5. Connectivity

Back

1. BIOS Flashback Button
2. 2x USB 3.2 Gen1 Ports (USB32G1_1_2)
3. PS/2 Mouse/Keyboard Port
4. Antenna Ports
5. Clear CMOS Button
6. Optical SPDIF Out Port
7. Audio Out: Rear Speaker (Black)
8. Audio Out: Central / Bass (Orange)
9. Audio In: Microphone (Pink)
10. Audio Out: Front Speaker (Lime)*
11. Audio Line In (Light Blue)
12. 2x USB 3.2 Gen1 Ports (USB32G1_3_4)
13. 2.5G LAN RJ-45 Port (Dragon RTL8125AG)
14. USB 3.2 Gen2 Type-A Ports (USB32G2_1_2)**
15. 10G LAN RJ-45 Port (AQUANTIA® AQC107)
16. USB 3.2 Gen2x2 Type-C Port

* If you use a 2-channel speaker, please connect the speaker's plug into „Front Speaker Jack".

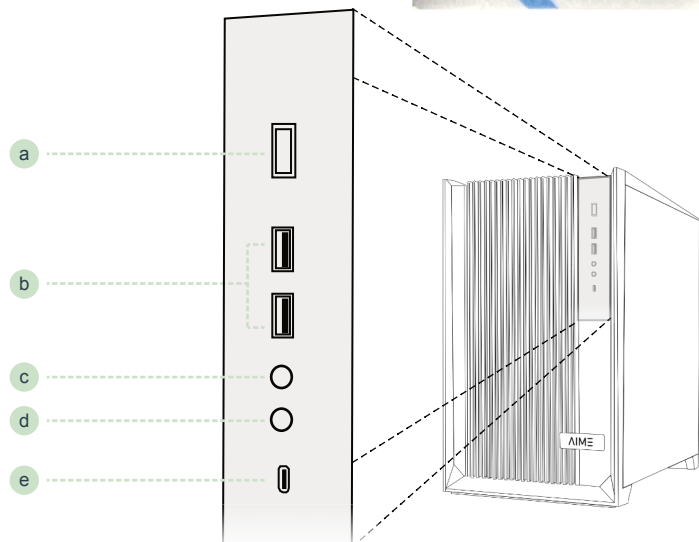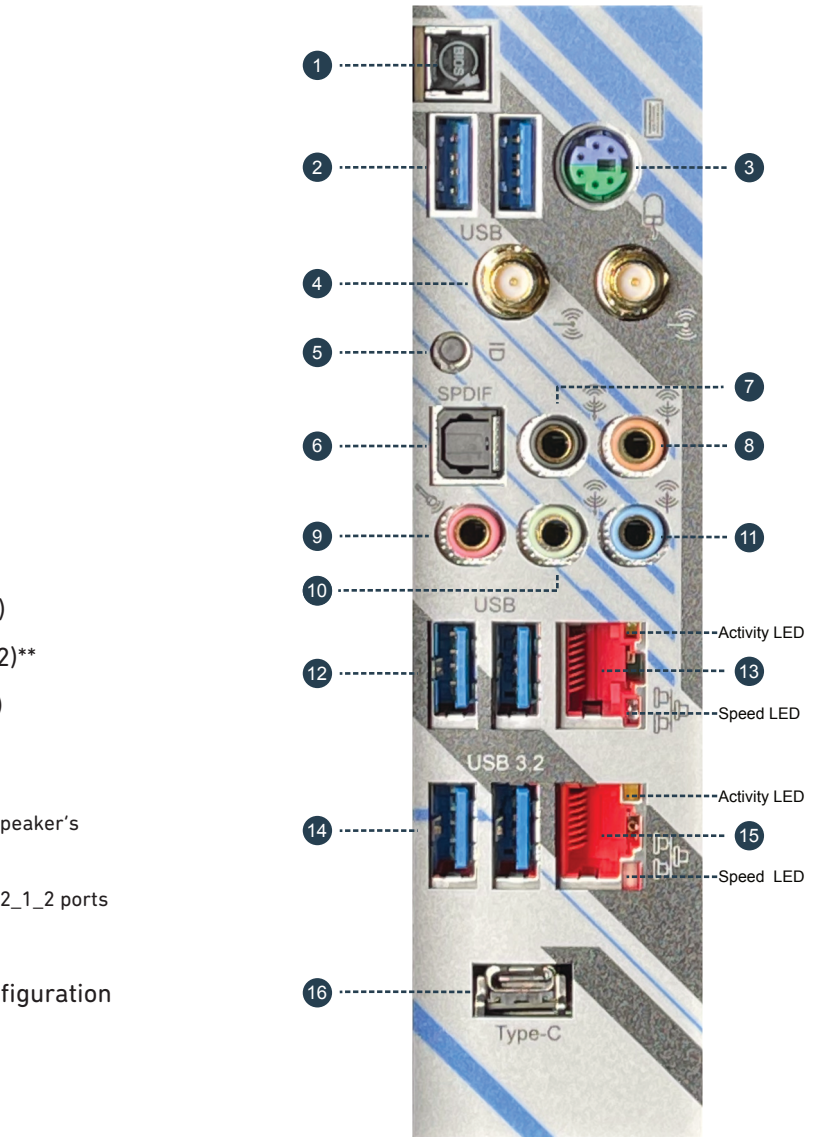** ACPI wake-up function is not supported on USB32G2_1_2 ports

GPU outputs, depending on the individual configuration (Display Port, HDMI, USB Type-C)

Activity LED
Speed LED
Activity LED
Speed LED

Type-C

Network

AQUANTIA® 10G LAN, Realtek 2.5G LAN
Intel® Wi-Fi 6 802.11ax (2.4Gbps) + BT 5.0
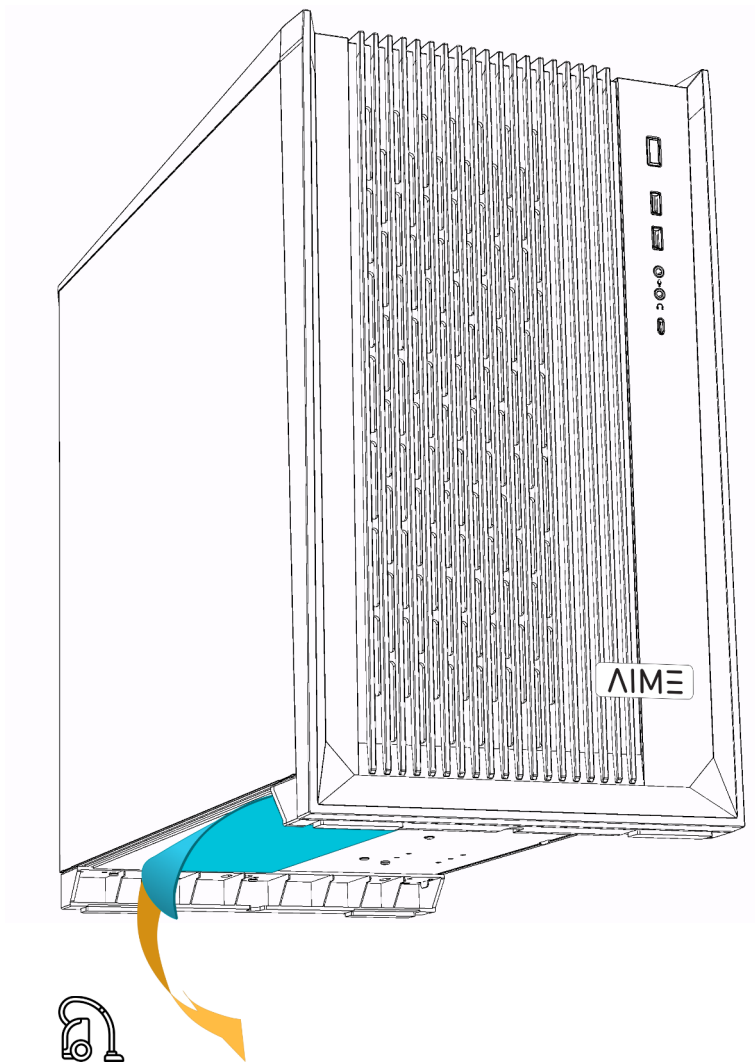Bluetooth 5.0 + High speed class II, MU-MIMO

Front

a. On / off switch
b. 2x USB 3.1 Gen 1 ports
c. 1x HD-Audio In
d. 1x HD-Audio Out (Stereo)
e. 1x USB Type-C™ port mit USB 3.1 Gen 1

6. Cleaning & Care

Filter Cleaning

The filter on the bottom of the AIME T500 Workstation is removable and can be cleaned with a vacuum cleaner. It is attached magnetically and easy to remove.

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7. AIME ML Container Manager

AIME ML Container Manager

AIME has developed a container management system that helps to easily install, run, execute and manage Docker containers for the most common deep learning frameworks.
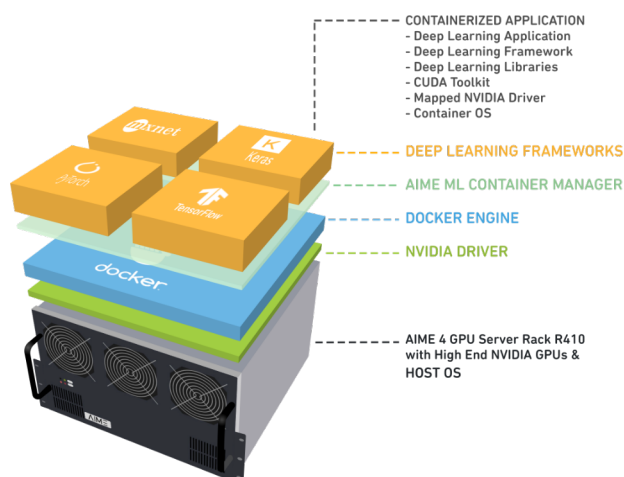
Features

- Setup and run a specific version of Tensorflow, Pytorch or Mxnet with one simple command

- Run different versions of machine learning frameworks and required libraries in parallel

- Manage required libraries (CUDA, CUDNN, CUBLAS, etc.) in containers, without compromising the host installation

- Clear separation of user code and framework installation, test your code with a different framework version in minutes

- Multi Session: Open and run many shell session on a single container simultaneously

- Multi User: Separate container space for each user

- Multi GPU: Allocate GPUs per user, container or session

- Runs with the same performance as a bare metal installation

- Repository of all major deep learning framework versions as containers

Available Frameworks

- Tensorflow

- Mxnet

- Pytorch

Available Versions

Tensorflow:	2.3, 1.15.4,
Mxnet:	2.0, 1.9, 1.8
Pytorch:	1.7

CONTAINERIZED APPLICATION
- Deep Learning Application
- Deep Learning Framework
- Deep Learning Libraries
- CUDA Toolkit
- Mapped NVIDIA Driver
- Container OS

DEEP LEARNING FRAMEWORKS

AIME ML CONTAINER MANAGER

DOCKER ENGINE

NVIDIA DRIVER

AIME 4 GPU Server Rack R410 with High End NVIDIA GPUs & HOST OS

For more information, visit the AIME GitHub website:
https://github.com/aime-team/aime-ml-containers

8. Compliance & Services

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13127 Berlin
Germany

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hello@aime.info

http://www.aime.info

SECURITY & TEST SEALS, STANDARDS

EU Directives
2011/65 / EU (restriction of the use of certain hazardous substances in electrical and electronic equipment)
2012/19 / EU (old electrical and electronic equipment)
2014/35 / EU (ready-to-use electrical equipment for use within certain voltage limits)
2014 / 30 / EU (electromagnetic compatibility)
2009/125 / EG (environmentally friendly design of computers and computer servers)

Harmonizing Standards (Power Supply)
EN 55032, Class B, EN 55024, EN 60950-1, EN 61000-3-2, Class A/D, EN 61000-3-3, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11, RoHS (DIRECTIVE 2011/65/), WEEE (Directive 2012/19/EU)

ENVIRONMENTAL CERTIFICATIONS

80 PLUS Power Supply
The 80 Plus certification stipulates an efficiency of 80% or more. Such a power supply saves at least 33% electricity compared to conventional power supplies.

RECOMMENDED SERVICES

Warranty Extensions*
With its fixed term and fixed costs, this service enables you to plan your IT expenses more precisely. Protect your investment and reduce the total cost over its useful life.

Premium Support* **
You get direct contact to a qualified and experienced AIME technician with comprehensive hardware and software support. Your support inquiries are directly and professionally looked after at short notice and from start to finish.

*: Up to 5 years total term
**: May not be available in all regions.

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9. Warranty

AIME'S LIMITED WARRANTY

AIME UG (haftungsbeschränkt) - hereinafter referred to as AIME - guarantees the buyer of this device that it is free from defects in material and workmanship for 12 months from the date of purchase. Unless prohibited by applicable law, this guarantee is limited to the original purchaser and is not transferable. This warranty gives you specific legal rights. Depending on the applicable legislation, you may have additional rights. In general, this guarantee means for you that the function of the device as described in the data sheet and/or in the product documentation when used in the intended environment is guaranteed for the life of the product or for as long as stated on the data sheet.

Appeal

The total liability of AIME and your exclusive claim for violations of the guarantee are at AIME's sole discretion:
1) repair or replacement of the hardware or
2) the refund of the purchase price, provided the hardware is returned with the original invoice (or a valid copy) to the original place of purchase or to another location specified by AIME. You may be required to pay shipping and handling fees, customs fees, taxes, or other fees, unless prohibited by applicable law.

AIME may, at its sole discretion, use new or used/revised, functional parts to repair or replace the hardware. The repaired or replaced hardware warranty is valid for the remainder of the original warranty period, or for thirty (30) days, whichever is longer, or for an additional period required by applicable law.

Outdated or no longer manufactured system components

A system component that is out of date or no longer manufactured will be replaced by the same product if possible. If AIME is unable to replace an outdated or discontinued product with the same product, AIME will replace it with a product that has a similar function.

Exceptions

This guarantee does not apply to problems or damage that arise in particular from the following causes:
1. Wear caused by normal use
2. Modification, misuse, accident, dismantling, incorrect use or unauthorized repair
3. Removal of the rating plate or any manipulation of test labels or guarantee seals
4. Improper use, including use not in accordance with the supplied instructions for use
5. Connection to an unsuitable voltage source
6. Any other cause that is not related to a material or manufacturing defect of the product.

The transport, storage and operation of the workstation should only be carried out under the environmental conditions specified overleaf, to protect against damage and errors.

Limitation of Liability

AIME IS NOT LIABLE FOR SPECIAL AND INDIRECT DAMAGES OR CONSEQUENTIAL DAMAGES, IN PARTICULAR NOT FOR LOST PROFITS AND REVENUES, DIRECT OR INDIRECT DATA LOSSES OR ECONOMIC LOSSES FROM THE IDENTIFICANTLY, OR IN THE LOST, LOST, IMPROPRIATE WAY KNOWLEDGE HAS BEEN SET

Legislation in some countries prohibits the exclusion or limitation of special and indirect and consequential damages, so this limitation and exclusion may not apply to the legislation that applies to you.

Duration of the Floating Guarantees

UNLESS THAT IS PROHIBITED BY APPLICABLE LAW, ANY IMPLIED WARRANTY OR REPRESENTATION IS LIMITED TO THE MERCHANTABILITY OR FITNESS OF THIS APPLIANCE FOR A PARTICULAR PURPOSE, LIMITED TO THE DURATION OF THE APPLICABLE LIMIT.

Laws in some countries do not allow limitations on how long an implied warranty lasts, so this limitation may not apply to the legislation that applies to you.

National Legal Rights

Consumers may have legal rights under current legislation that regulates the sale of consumer goods. Such rights are not affected by the guarantees in this limited guarantee.

Registration of a Warranty Claim

We recommend that you contact our technical support team or read the technical support section on our website prior to submitting a warranty claim. You may be able to easily fix your problem yourself this way. You can find the contact details for our customer service on the Internet at http://www.aime.info/imprint. You will receive a goods-return-number by email via the contact address hello@aime.info.

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Notes