

NVIDIA 945-137766-0000-000

NVIDIA Jetson Orin Nano Super Developer Kit

User Manual

PRODUCT OVERVIEW

The NVIDIA Jetson Orin Nano Super Developer Kit is a compact and powerful computer designed for generative AI applications on small edge devices. It delivers up to 67 TOPS of AI performance, significantly improving upon previous generations, enabling the execution of vision transformers, large language models, and more.

This platform is supported by NVIDIA's comprehensive AI software stack and a broad ecosystem, making it an accessible and affordable solution for developers. Existing users can upgrade their systems with a simple software update to unlock new possibilities in generative AI.

The developer kit includes a Jetson Orin Nano 8GB module and a reference carrier board. This board is designed to accommodate all Orin Nano and Orin NX modules, serving as an ideal platform for prototyping next-generation edge AI products. The Jetson Orin Nano 8GB module features an Ampere GPU and a 6-core ARM CPU, facilitating multiple concurrent AI application pipelines and high-performance inference. The carrier board offers a wide array of connectors, including two MIPI CSI connectors that support camera modules with up to 4-lanes, allowing for higher resolution and frame rates.

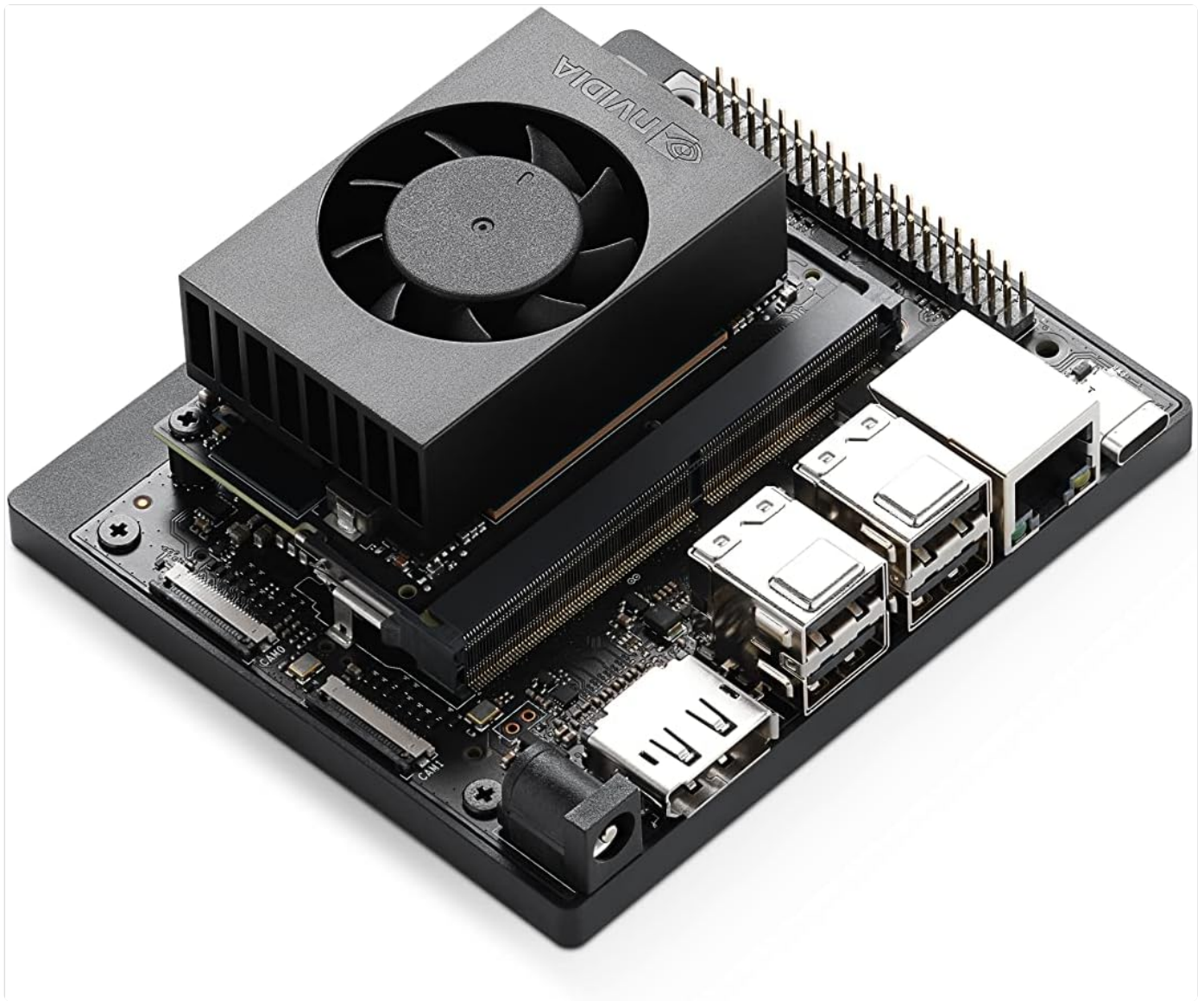


Figure 1: The NVIDIA Jetson Orin Nano Super Developer Kit, showcasing its compact design and integrated cooling fan.

The Jetson platform runs the NVIDIA AI software stack, which includes use-case-specific application frameworks such as NVIDIA Isaac for robotics, NVIDIA Metropolis for vision AI, and NVIDIA Holoscan for sensor processing. Developers can also leverage NVIDIA Omniverse Replicator for synthetic data generation (SDG) and NVIDIA TAO Toolkit for fine-tuning pre-trained AI models from the NGC catalog.

A robust ecosystem of partners provides additional AI and system software, developer tools, and custom software development services. These partners can also assist with cameras, other sensors, carrier boards, and design services for product development.

Jetson Orin modules offer unmatched performance and efficiency for robots and autonomous machines, providing the flexibility to create advanced AI solutions using the latest NVIDIA technology. Combined with the industry-standard NVIDIA AI software stack and a comprehensive ecosystem, the path to market for new products is significantly accelerated.

SETUP GUIDE

1. Unboxing and Initial Inspection

Carefully unpack all components from the box. Verify that all items listed below are present and in good condition. If any items are missing or damaged, contact your vendor immediately.

- NVIDIA Jetson Orin Nano Super Developer Kit (main board with module)

- Power Adapter
- Type B (US, JP) Power Cable
- Type I (CN) Power Cable
- Quick Start and Support Guide



Figure 2: The NVIDIA Jetson Orin Nano Developer Kit packaging and main components.

2. Connecting Peripherals

Before powering on the device, connect necessary peripherals. The carrier board provides various I/O options:

- **Display:** Connect a monitor to the DisplayPort output.
- **USB Devices:** Connect a keyboard, mouse, and any other USB peripherals to the available USB ports.
- **Network:** Connect an Ethernet cable to the RJ45 port for wired network access, or ensure Wi-Fi is configured for wireless connectivity.
- **Cameras:** Utilize the two MIPI CSI connectors for camera modules, supporting up to 4-lanes for higher resolution and frame rates.

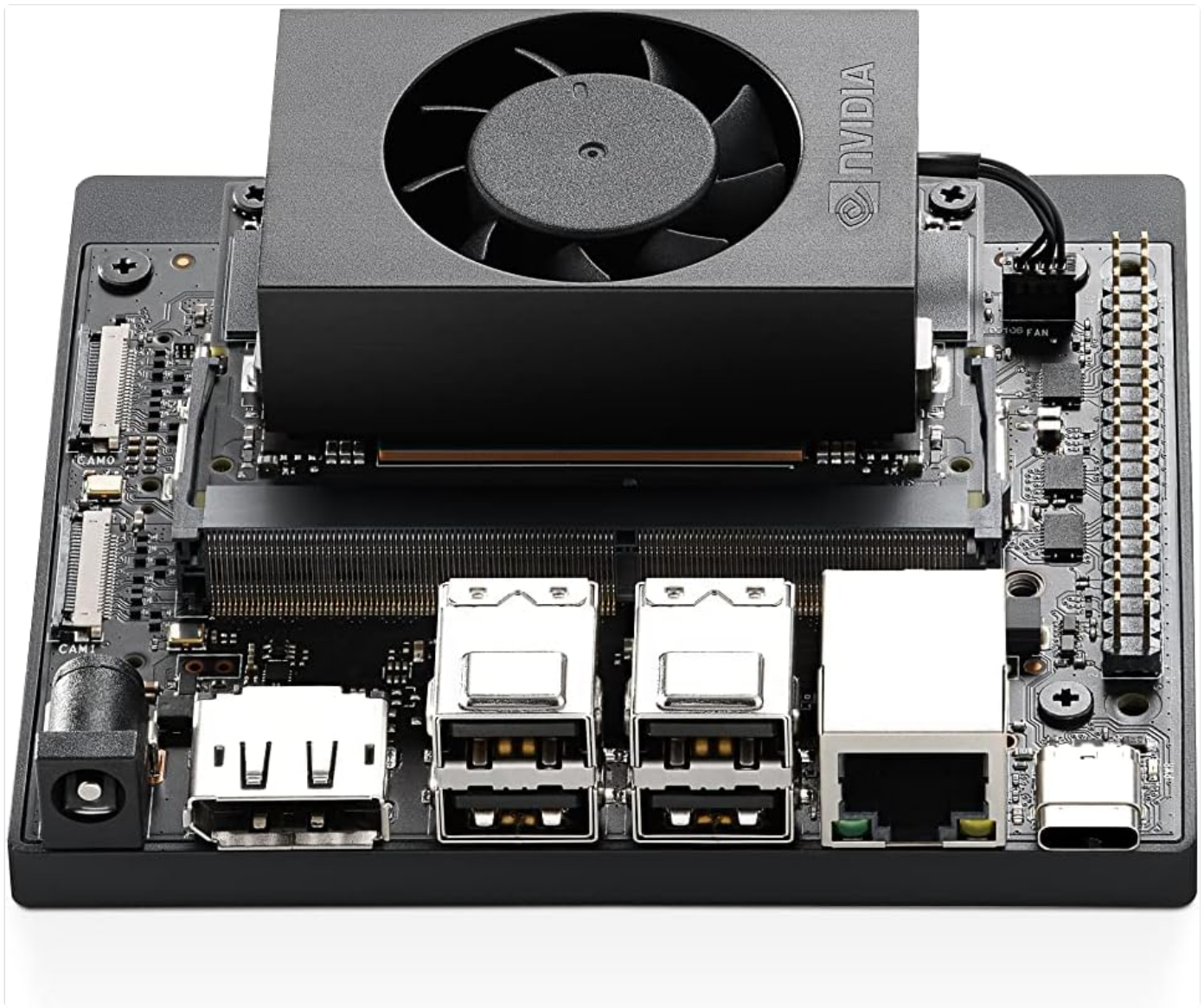


Figure 3: Top view of the Jetson Orin Nano Developer Kit, highlighting various ports and connectors for peripherals.

3. Powering On

Connect the appropriate power cable to the power adapter, then plug the adapter into the DC input jack on the Jetson Orin Nano Developer Kit. Finally, plug the power cable into a wall outlet. The system should power on automatically.

Your browser does not support the video tag.

Video 1: Product Overview. This video demonstrates the unboxing and initial components of the NVIDIA Jetson Orin Nano Developer Kit, providing a visual guide to its physical aspects and included accessories.

OPERATING INSTRUCTIONS

1. Software Environment

The Jetson Orin Nano Developer Kit runs on the NVIDIA AI software stack. This includes various frameworks and tools optimized for AI development and deployment.

- **NVIDIA JetPack SDK:** This is the most comprehensive solution for developing AI applications on Jetson. It includes the Jetson Linux Driver Package (L4T) with a Linux kernel, bootloader, NVIDIA drivers, flashing utilities, sample file system, and toolchains. It also includes libraries for AI, computer vision, and multimedia.
- **Application Frameworks:**
 - NVIDIA Isaac for robotics applications.

- NVIDIA Metropolis for vision AI applications.
- NVIDIA Holoscan for sensor processing.

- **Development Tools:**

- NVIDIA Omniverse Replicator for synthetic data generation (SDG).
- NVIDIA TAO Toolkit for fine-tuning pre-trained AI models from the NGC catalog.

Refer to the official NVIDIA Jetson documentation for detailed instructions on installing and configuring the software stack.

2. Running AI Applications

The Jetson Orin Nano is designed to run various AI models, including vision transformers and large language models. Its Ampere GPU and multi-core ARM CPU enable efficient inference.

- **Model Deployment:** Models can be deployed using frameworks like TensorFlow, PyTorch, and ONNX Runtime, optimized with NVIDIA TensorRT for maximum performance.
- **Concurrent Pipelines:** The hardware supports running multiple AI application pipelines simultaneously, making it suitable for complex edge AI solutions.
- **Power Modes:** The device supports various power modes to optimize performance and energy consumption based on application requirements. Consult the Jetson documentation for power management settings.

MAINTENANCE

Proper maintenance ensures the longevity and optimal performance of your NVIDIA Jetson Orin Nano Super Developer Kit.

- **Cleaning:** Regularly clean the device to prevent dust accumulation, especially around the fan and heatsink. Use compressed air to gently clear dust from vents and components. Ensure the device is powered off and disconnected from power before cleaning.
- **Ventilation:** Ensure the developer kit is placed in a well-ventilated area. Avoid obstructing the fan or air vents, as this can lead to overheating and reduced performance.
- **Software Updates:** Keep the Jetson Linux Driver Package (L4T) and other NVIDIA software components updated to the latest versions. Updates often include performance improvements, bug fixes, and security patches.
- **Environmental Conditions:** Operate the device within recommended temperature and humidity ranges to prevent damage to electronic components.

TROUBLESHOOTING

This section addresses common issues and provides potential solutions for the NVIDIA Jetson Orin Nano Super Developer Kit.

- **Bluetooth Audio Disabled by Default**

Problem	Possible Cause / Solution
Limited LLM Performance (e.g., cannot run >8B models)	The Jetson Orin Nano has specific memory and processing limitations. For larger language models, consider optimizing the model, reducing its size, or utilizing techniques like quantization. Ensure sufficient RAM is available by minimizing background processes. Creating a larger swap file (e.g., 8-16GB) can also help manage memory for larger models.

Problem	Possible Cause / Solution
SD Card Imaging Issues / SDK Manager Problems	• Ensure you are using a high-quality, compatible SD card. • For flashing, a jumper cable between the reset pin and ground pin (located under the fan module on the outside of the board) might be required. • Connect a monitor to the DisplayPort while using the SDK Manager. Allow any activity on the external monitor to complete before proceeding in the SDK Manager. • Some users report better success with JetPack 5.x versions for initial firmware updates or NVMe drive usage, especially for models manufactured before May 2024. JetPack 6.x might require an initial flash with JetPack 5.x to update firmware before it can be installed.
Docker/Networking Errors (e.g., "failed to set up container networking")	These errors often indicate missing kernel modules or issues with iptables. Ensure your Jetson OS is fully updated. If the issue persists, consult NVIDIA's official forums or documentation for specific kernel module requirements or Docker configuration for Jetson. Recompiling the kernel from source is an advanced solution that may be required in some cases.
Difficulty Installing Libraries (e.g., PyTorch, OpenCV with GPU support)	Installation of these libraries with GPU support can be complex. Follow official NVIDIA guides or community-verified tutorials precisely. Incorrect installations can lead to lack of GPU acceleration or obscure errors. Verify CUDA and cuDNN installations are correct and compatible with your library versions.
This is a known configuration setting. Refer to the Jetson Linux documentation or community resources for instructions on how to enable Bluetooth audio by modifying the relevant configuration file.	
General Steep Learning Curve / System Instability	The Jetson platform is powerful but requires familiarity with Linux and embedded systems. Expect a learning curve. If the system becomes unstable or "bricked," re-flashing the Jetson OS is often the most reliable solution. Always back up important data. Utilize NVIDIA's extensive documentation, developer forums, and community resources for support.

SPECIFICATIONS

Feature	Detail
Brand	NVIDIA
Model Name	Jetson Orin Nano 8GB
Item Model Number	945-137766-0000-000
Processor	Arm® Cortex-A78AE (6-core)
GPU	Ampere Architecture

Feature	Detail
AI Performance	Up to 67 TOPS
RAM Memory Installed Size	8 GB
Operating System	Linux
Wireless Type	Bluetooth
Item Weight	1.7 pounds
Product Dimensions (LxWxH)	3.94 x 3.11 x 0.83 inches
Date First Available	March 21, 2023

WARRANTY AND SUPPORT

The NVIDIA Jetson Orin Nano Super Developer Kit is manufactured by NVIDIA. For specific warranty terms and conditions, please refer to the documentation included with your product or visit the official NVIDIA support website.

Optional protection plans may be available for purchase separately to extend coverage beyond the standard manufacturer's warranty. These plans typically offer additional benefits such as extended repair or replacement services.

For technical support, software downloads, and community forums, please visit the official NVIDIA Developer website for Jetson products. This resource provides comprehensive guides, tutorials, and a platform to connect with other developers.

© 2025 NVIDIA Corporation. All rights reserved.
NVIDIA and Jetson are trademarks of NVIDIA Corporation.

ASK A QUESTION ABOUT THIS MANUAL

Ask about setup, troubleshooting, compatibility, parts, safety, or missing instructions. Manuals+ will review the question and use this page's manual context to help answer it.

Name

Anonymous

Email

you@example.com

After a successful submission, we securely hash the supplied account or form email before sending it to Microsoft Advertising for conversion attribution. [Privacy details](#).

Question

Example: How do I reset this device or fix this error?

Details

Model number, symptoms, what you tried, or the section of the manual you are using.

Submit question