NVIDIA DRIVE AGX Orin Developer Kit

Hardware Quick Start Guide
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Introduction

Before You Begin

This hardware quick start guide provides the basic steps needed to get your NVIDIA DRIVE AGX Orin™ Developer Kit (hereinafter referred to simply as developer kit) up and running.

The developer kit ships with the NVIDIA DRIVE AGX Orin Developer System (referred to hereinafter as the developer system) with the NVIDIA DRIVE® OS pre-installed.

For more details beyond the high-level view of the developer system and steps on how to bring it up, refer to the NVIDIA DRIVE AGX Orin Developer Kit Mechanical and Installation Guide along with other documentation located at the NVIDIA DRIVE AGX Orin Documentation page.

Other related up-to-date information is available as follows:

- DRIVE AGX Orin Developer Kit Product Brief.
- DRIVE AGX Orin Regulatory Compliance and Safety Guide.
- A list of hardware accessories, which may be purchased separately.
- Details regarding configuration of your development environment.

Developers are required to join as an NVIDIA Developer and be part of the NVIDIA DRIVE AGX SDK Developer Program to obtain access to up-to-date information.

Note: Files marked with a lock icon require membership to the NVIDIA DRIVE AGX™ SDK Developer Program.
Components

This section describes the developer kit hardware components.

Table 1 lists the hardware components and accessories associated with the developer kit and Figure 1 contains a pictorial description of the various developer kit components.

Table 1. NVIDIA DRIVE AGX Orin Developer Kit Hardware List

<table>
<thead>
<tr>
<th>Item</th>
<th>Label</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Developer System</td>
<td>NVIDIA DRIVE AGX Orin Developer System</td>
</tr>
<tr>
<td>2</td>
<td>AC Power Cable</td>
<td>AC Power Cable (See Note)</td>
</tr>
<tr>
<td>3</td>
<td>Micro USB</td>
<td>USB Type A to Micro USB Cable</td>
</tr>
<tr>
<td>4</td>
<td>Type A-to-C USB Cable</td>
<td>USB Type A to USB Type C Cable</td>
</tr>
<tr>
<td>5</td>
<td>Type C-to-C USB Cable</td>
<td>USB Type C to USB Type C Cable</td>
</tr>
<tr>
<td>6</td>
<td>MATE-AX Camera Splitter Cable</td>
<td>Quad GMSL FAKRA Camera Splitter Cable</td>
</tr>
<tr>
<td>7</td>
<td>Dual H-MTD Splitter</td>
<td>Dual H-MTD Splitter Cable</td>
</tr>
<tr>
<td>8</td>
<td>Quad H-MTD Splitter</td>
<td>Quad H-MTD Splitter Cable</td>
</tr>
<tr>
<td>9</td>
<td>MATEnet Splitter</td>
<td>MATEnet Splitter Cable</td>
</tr>
<tr>
<td>10</td>
<td>NIC Adapter</td>
<td>1 GbE NIC Adapter</td>
</tr>
</tbody>
</table>

Note: The AC power cable is included in a select number of developer kit versions.
Figure 1. NVIDIA DRIVE AGX Orin Developer Kit Components

Disclaimer: The line-art images shown here are for illustration purposes only. Your developer kit accessories may differ due to product enhancements, modifications, and substitutions.

- Developer System
- AC Power Cable
- Micro USB Cable
- Type A-to-C USB Cable
- Type C-to-C USB Cable
- Camera Splitter Cable
- Dual H-MTD Splitter
- Quad H-MTD Splitter
- MATEnet Splitter
- NIC Adapter
Connectors

The figures in this section illustrate the broad range of connectors supported by the developer system.

Figure 2. Rear Panel Connectors

CAUTION: To prevent overheating, it is important to take airflow into consideration when mounting the developer kit. Make sure that there is enough clearance on all sides. Cool air intake must be provided on the front panel where the fan is located; and hot air exhaust should be allowed to flow out from the rear panel. Refer to the DRIVE AGX Orin Developer Kit Mechanical and Installation Guide for details.
AC Power Cable

The developer system accepts an IEC C13 connector for the power cable.

Note the location of the AC Power Cord connector in Figure 2 which shows the rear panel connectors. Figure 3 shows the zoomed-in location of the power connector on the rear panel and the IEC 60320 C13 power cord (on the right). The international rating of this connector is 250V/10A.

Figure 3. Power Connector and Cord
Ethernet Port Connections

Figure 4 shows the Ethernet port connections.

Figure 4. Ethernet Port Connections
Accessories

This section provides information on hardware components that are required for the development system as well as optional accessories which expand the usage of the development system.

Table 2 lists additional hardware components that are required for the development system.

Table 2. Additional Hardware Required

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>VESA® DisplayPort™ Display with DisplayPort Cable (See Note)</td>
</tr>
<tr>
<td>2</td>
<td>Ubuntu Host PC for Cross-Compiling, Flashing, and Console Access</td>
</tr>
<tr>
<td>3</td>
<td>Ethernet Cable for Internet and Networking Access</td>
</tr>
</tbody>
</table>

Note:
The developer system does not support passive DP to HDMI adapters; an ACTIVE DP-to-HDMI or DP-to-DVI adapter may be used with HDMI or DVI displays.

PCle Mini-SAS

The developer kit supports mini-SAS cables for the PCIe interfaces.

*Note that standard mini-SAS cables do not work with the developer kit.*

Table 3 lists the cables from Amphenol which are compatible with the developer kit.

Table 3. PCIe Mini SAS Cables

<table>
<thead>
<tr>
<th>Description</th>
<th>Mfg P/N</th>
</tr>
</thead>
<tbody>
<tr>
<td>CABLE Assy miniSAS-HD x4 GEN4 500MM Black Male 0° PCI Express to Male 0°</td>
<td>NEDDDF-N904</td>
</tr>
<tr>
<td>PCI Express wire 100ohm UL WW-1</td>
<td></td>
</tr>
<tr>
<td>CABLE Assy miniSAS-HD x4 GEN4 1000MM Black Male 0° PCI Express to Male 0°</td>
<td>NEDDDF-N901</td>
</tr>
<tr>
<td>PCI Express wire 100ohm UL WW-1</td>
<td></td>
</tr>
<tr>
<td>CABLE Assy miniSAS-HD x4 GEN4 3000MM Black Male 0° PCI Express to Male 0°</td>
<td>NEDDDF-N903</td>
</tr>
<tr>
<td>PCI Express wire 100ohm UL WW-1</td>
<td></td>
</tr>
</tbody>
</table>
Vehicle Accessory Kit

NVIDIA makes available, for separate purchase, an optional vehicle accessory kit to install the developer system in a vehicle. The part number for the vehicle accessory kit is provided in Table 5.

The vehicle accessory kit consists of the following:
- Vehicle Harness H1B
- Vehicle Harness H2A
- Vehicle Mounting Tray

Note: The Vehicle Accessory Kit may be purchased through Arrow - the NVIDIA DRIVE Worldwide Distributor. To request a quote, please complete the Arrow Request Form.

Additional Accessory Purchase Information

Accessories listed in Table 4 below are included in the accessory kit.

Table 4 provides the manufacturer’s part numbers in case additional accessories need to be purchased.

<table>
<thead>
<tr>
<th>Table 4. Accessory Manufactures and Part Numbers</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Label</td>
<td>Manufacture</td>
<td>Mfg P/N</td>
</tr>
<tr>
<td>Micro USB</td>
<td>Simula Technology, Inc</td>
<td>CB842A-8000-10F</td>
</tr>
<tr>
<td>Type A-to-C USB Cable</td>
<td>Simula Technology, Inc</td>
<td>CB8A5E-6200-10F</td>
</tr>
<tr>
<td>Type C-to-C USB Cable</td>
<td>Wieson America Inc.</td>
<td>AB9932-0011-001-HH</td>
</tr>
<tr>
<td>MATE-AX Camera Splitter Cable</td>
<td>TE Connectivity Ltd.</td>
<td>1-120091-2</td>
</tr>
<tr>
<td>Dual H-MTD Splitter</td>
<td>Rosenberger of North America, LLC.</td>
<td>LCA-115-1000-Z-ZZ</td>
</tr>
<tr>
<td>Quad H-MTD Splitter</td>
<td>Rosenberger of North America, LLC.</td>
<td>LCA-114-1000-Z-ZZZZ</td>
</tr>
</tbody>
</table>

Note: Please contact TE representative Kent Vu at kent.vu@te.com for details on how to purchase the Camera Splitter Cable.
Accessories listed in Table 5 may be purchased through Arrow - the NVIDIA DRIVE Worldwide Distributor. To request a quote, please complete the Arrow Request Form.

Table 5. Accessories For Purchase

<table>
<thead>
<tr>
<th>Accessory</th>
<th>Part Number</th>
<th>Included in Developer Kit?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicle Accessory Kit</td>
<td>VPN 930-62482-0000-100</td>
<td>No</td>
</tr>
<tr>
<td>Vehicle Harness H1B</td>
<td>VPN 030-1592-000</td>
<td>No</td>
</tr>
<tr>
<td>Vehicle Harness H2A</td>
<td>VPN 030-1463-000</td>
<td>No</td>
</tr>
<tr>
<td>DRIVE AGX Orin 10GbE H-MTD to RJ 45 Adapter</td>
<td>VPN 930-13584-0000-100</td>
<td>No</td>
</tr>
<tr>
<td>DRIVE AGX Orin 1GbE H-MTD to RJ 45 Adapter</td>
<td>VPN 930-13751-0000-100</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Versions

The NVIDIA DRIVE AGX Orin Developer Kit is available in different versions:

- Production versions: -100, -200, -300, and
- Sample versions: -A00, -B00, -C00, and -D00.

Product certification information is available in the list of documents located at: NVIDIA DRIVE Documentation.

Certified Production Versions:

- 940-63710-0010-100 comes with no AC Power Cable.
- 940-63710-0010-200 comes with North America, Japan, Philippines, Taiwan, and China AC Power Cables.
  IEC plug types B and I are used in North America, Taiwan, Japan, Philippines, and China.
- 940-63710-0010-300 comes with most European Union, United Kingdom, South Korea, and Serbia AC Power Cables.
  IEC plug types F and G are used in most European regions, United Kingdom, and South Korea.

Sample Versions:

- 940-63710-0010-A00
- 940-63710-0010-B00
- 940-63710-0010-C00
- 940-63710-0010-D00

All sample versions come with a North America AC Power Cable.
Getting Started

To use your developer system for the first time, you will need the following:
- Main AC Power Cable
- USB Type-A to Micro-USB Cable
- USB Type-A to USB Type-C Cable OR USB Type-C to USB Type-C Cable
- Ethernet Cable (optional)
- DisplayPort Cable (optional)
- Ubuntu 18.04 or 20.04 Host PC

Figure 5. Rear Panel of the Developer System

Use the following steps to get your developer system up and running:

1. Connect the Main AC Power Cable to the developer system, where applicable.
2. Connect the Micro-USB Cable from the Ubuntu Host PC to the Micro-USB port labeled “DEBUG” on the developer system.
3. Connect the USB Type-A-to-USB Type-C Cable (or USB Type-C-to-USB Type-C Cable depending on your Host PC) from the Ubuntu Host PC to the LEFT USB Type-C port on the developer system (for flashing). Do NOT connect the RIGHT USB Type-C port.
4. Connect a DisplayPort Monitor to the DisplayPort labeled “Display” (optional).
5. Connect an Ethernet Cable to the networking port labeled “1GbE” on the bottom/middle of the Developer System, next to the USB Type-C ports (optional).
6. Connect a Terminal Emulator from the Ubuntu Host PC to the developer system (putty or minicom recommended) before turning on power, to complete the setup of the developer system. Refer to the "Terminal Emulation" section in the DRIVE OS 6.x Linux SDK Developer Guide for more information.

7. Press the Main Power Switch to the ON position.

8. Accept the End User License Agreement (EULA) and set up account username(s) and password(s) in the Terminal Emulator window that was opened in Step 6.

9. Select the SSH Profile and other setup options.

After completing these prompts, the platform boots to the Ubuntu Desktop on the display and the UART console login prompt. To configure your development environment, visit the NVIDIA DRIVE AGX Orin Setup page for more detailed information.
## Changelog

<table>
<thead>
<tr>
<th>Version</th>
<th>Date</th>
<th>Description of Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>August 25, 2022</td>
<td>Initial release</td>
</tr>
</tbody>
</table>
| 02      | October 5, 2022 | • Added Section: AC Power Cable  
• Updated Section: Accessories; added subsections:  
  > PCIe Mini-SAS  
  > Vehicle Accessory Kit  
• Updated country support for developer kit version 940-63710-0010-300. |
| 03      | November 30, 2022 | • Added Product Brief to the list of reference documentation in Section: Before You Begin.  
• Updated Step #6 in Section: Getting Started |
| 04      | February 6, 2024 | • Updated Table 1 and Figure 1; added MATEnet Splitter Cable.  
• Added Section: Ethernet Port Connections.  
• Added Note to Table 2: Additional Hardware Required  
• Corrected Vehicle Harness H2B in Section: Vehicle Accessory Kit.  
• Added Section: Additional Accessory Purchase Information.  
• Added Figure 5 to Section: Getting Started. |
| 05      | July 2, 2024    | • Removed NDA related footer information on cover page.  
• Updated the Note in Section: Vehicle Accessory Kit with details pertaining to purchase of the accessory kit.  
• Corrected Camera Splitter Cable part number in Table 4. |
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