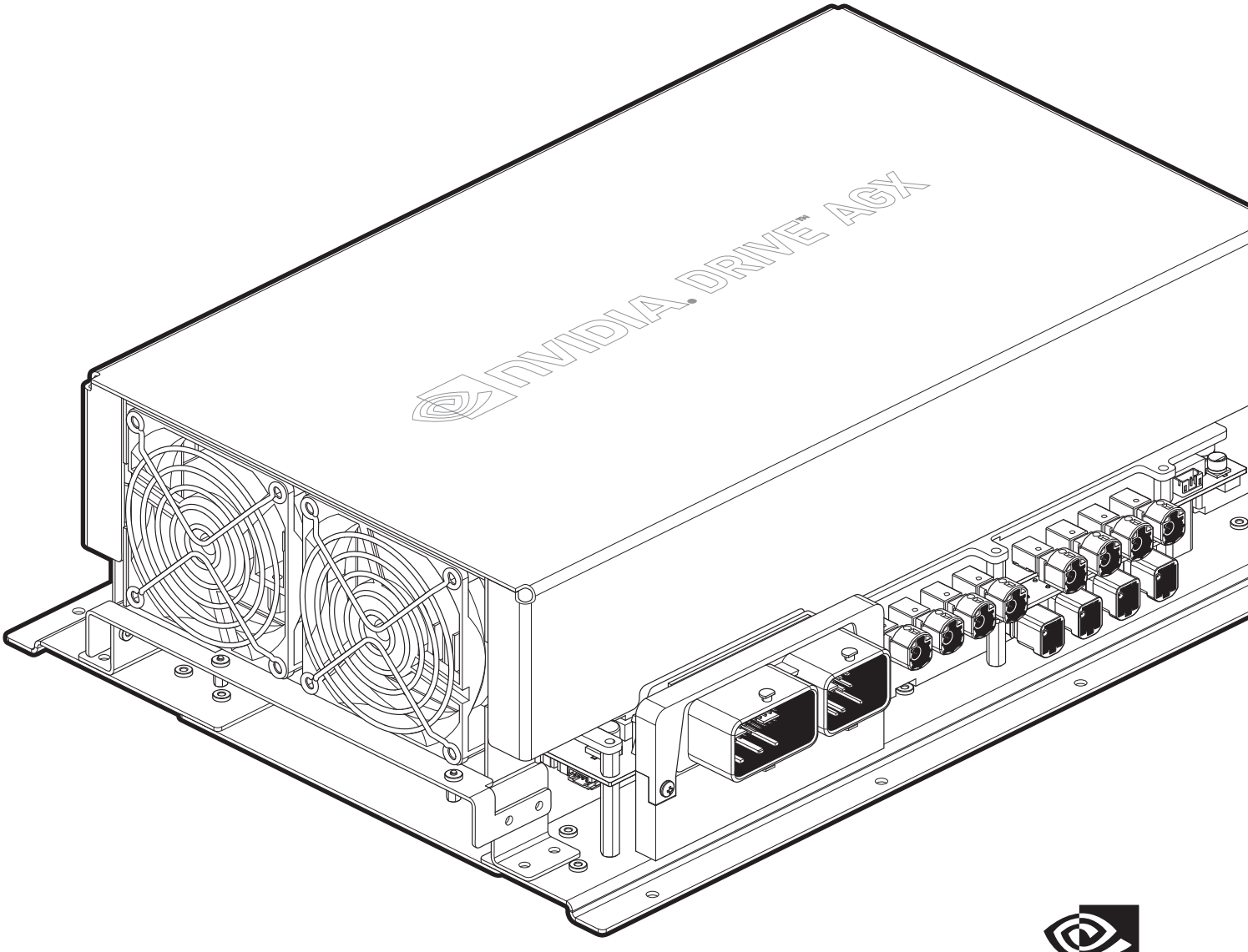
NVIDIA DRIVE™ AGX DEVELOPER KIT

HARDWARE QUICK START GUIDE



NVIDIA

INTRODUCTION

Before You Begin

This document provides the basic steps needed to get your NVIDIA DRIVE™ AGX up and running. Please refer to the DRIVE developer documentation on DevZone for additional information on developing for NVIDIA DRIVE. The kit comes with a Developer System and its accessories. There are two variants:

> NVIDIA DRIVE™ AGX Xavier Developer Kit: This kit comes with a Developer System containing 2 Xavier SoCs.
> NVIDIA DRIVE™ AGX Pegasus Developer Kit: This kit comes with a Developer System containing 2 Xavier SoCs and 2 SXM2 GPU modules.

This Developer Kit comes pre-installed with NVIDIA DRIVE software. At the end of this guide, your Developer Kit will display either a QNX splash page or a Linux desktop, depending on which OS is pre-loaded. Once you see this, you will be able to run through multiple sample projects.

Please refer to the DevZone located at https://developer.nvidia.com/drive for more information and resources.

HARDWARE

Table 1. NVIDIA DRIVE AGX Developer Kit – Included Hardware
Note: Your Developer Kit will arrive in two boxes — the Main box and the Accessories box.
DRIVE Developer System (Item 1) will be in the Main box. All of the remaining parts (Items 2 to 10) will be in the Accessories box.

Item	Label	Description
1	Developer System	NVIDIA DRIVE™ AGX System
2	System Power	1200W Power Supply, US/Japan Power Cord
3a*	Vehicle Harness	Vehicle Cable Harness for DRIVE AGX Pegasus Developer Kit
3b*	Vehicle Harness	Vehicle Cable Harness for DRIVE AGX Xavier Developer Kit
4	Accessories Power	Power Adapter for Accessories
5	RTC Module	Real-time Clock Module and PPS Cable
6	Ethernet	Dual GbE Dongle and HSD Cable
7	Camera Breakout	Quad Camera Breakout Cable
8	Camera	Sekonix 2MP RCCB AR0231 60° FOV GMSL Camera and Fakra Coax Cable
9	USB Hub	USB 3.0 Hub
10	USB Type A Cable	USB Type A to Type A Cable

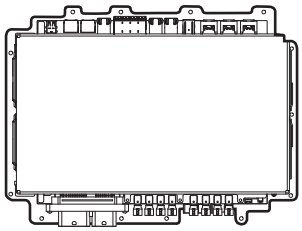
Table 2. Additional Hardware Required to Complete this Hardware Quick Start Guide (Duplicate set needed to operate Xavier B)

Item	Description
1	HDMI Display with HDMI cable
2	Keyboard
3	Mouse

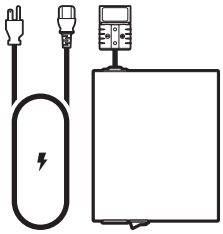
Table 3. Additional Hardware That Is Required for Development

Item	Description
1	Linux Host PC for Cross-Compiling, Flashing, and Console Access
2	Ethernet Cable for Internet Access

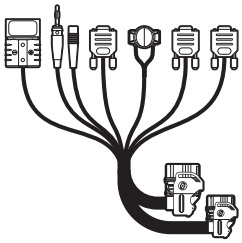
DRIVE AGX Developer Kit Components



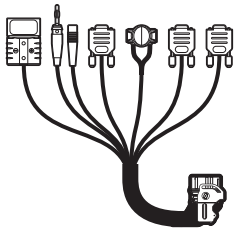
1. Developer System



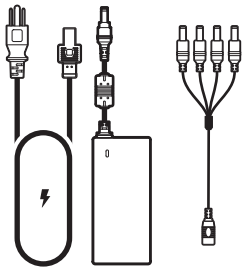
2. Power Supply, Power Adapter and US Power Cord



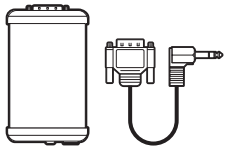
3a. Vehicle Cable Harness for DRIVE AGX Pegasus Developer Kit



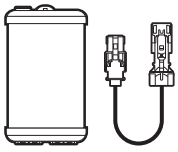
3b. Vehicle Cable Harness for DRIVE AGX Xavier Developer Kit



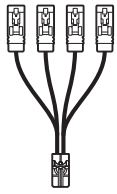
4. Power Adapter for Accessories



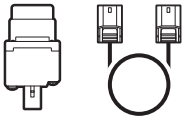
5. Real-time Clock Module and PPS Cable



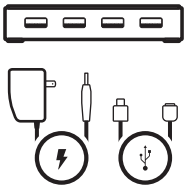
6. Dual GbE Dongle and HSD Cable



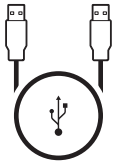
7. Quad Camera Breakout Cable



8. Sekonix AR0231 GMSL Camera and Fakra Coax Cable



9. USB 3.0 Hub with Power Supply and USB 3.0 Cable

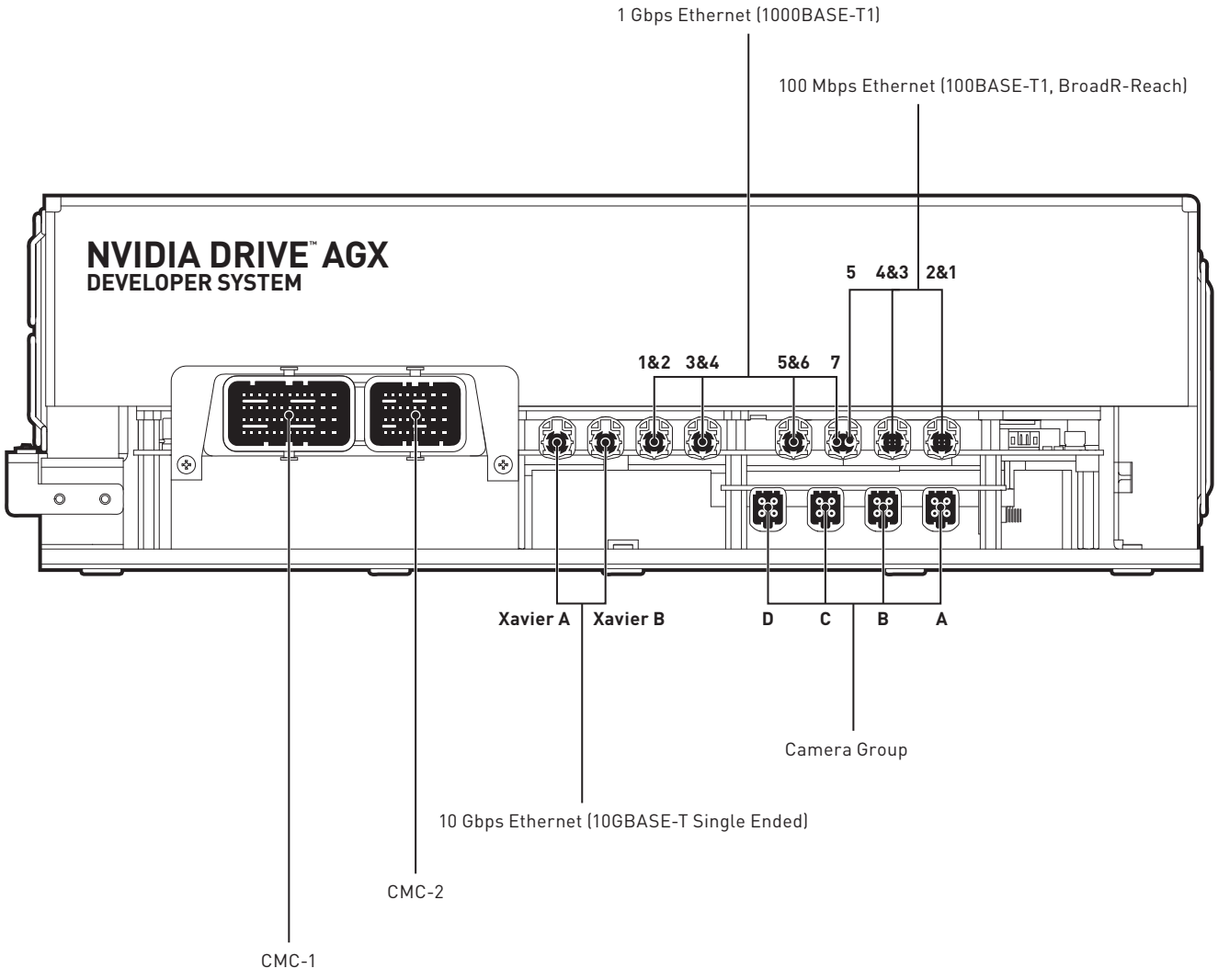


10. USB 2.0 Type A to Type A Cable for connecting to the Linux Host

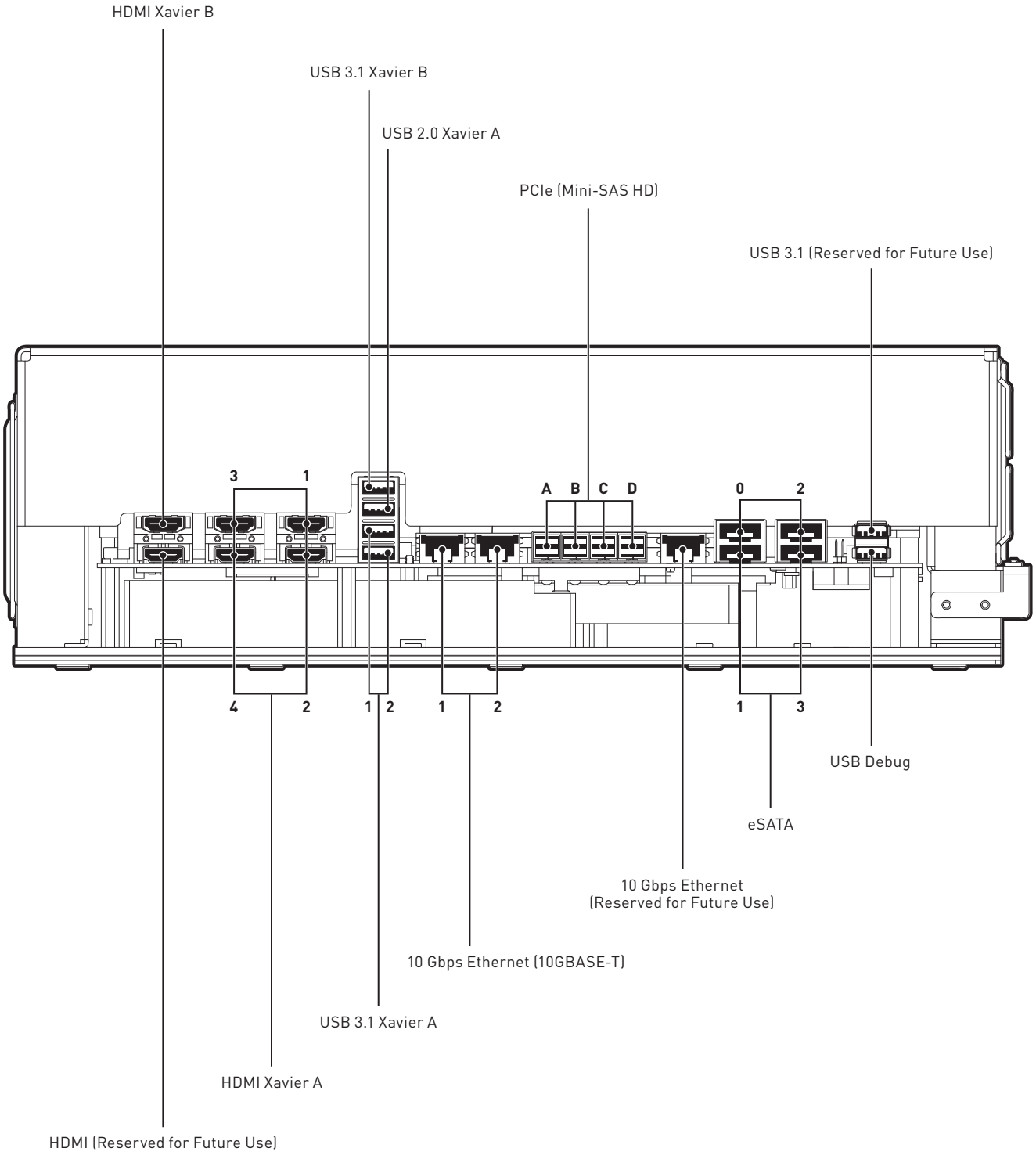
Disclaimer: The provided line-art images are for illustration purposes. Your Developer Kit accessories may differ due to product enhancements, modifications and substitutions.

* Each developer kit is shipped with only one vehicle harness (that is, only one of 3a or 3b) which is best suited for the respective Developer System.

DRIVE™ AGX Connectors



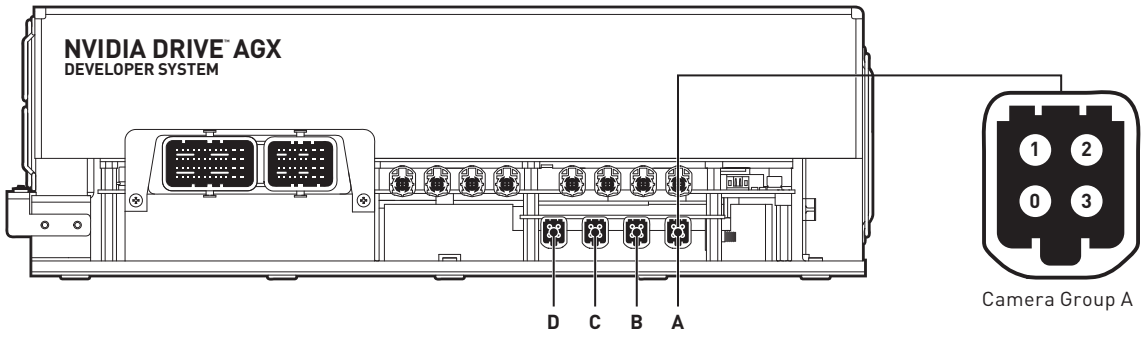
DRIVE™ AGX Developer System (Front View)



DRIVE™ AGX Developer System (Rear View)

USB Debug port is used by the Linux Host PC to have UART console access and JTAG to Xavier A, Xavier B and the MCU (Microcontroller) as well as using it to flash firmware. Connect USB cable from PC to USB Debug port only.

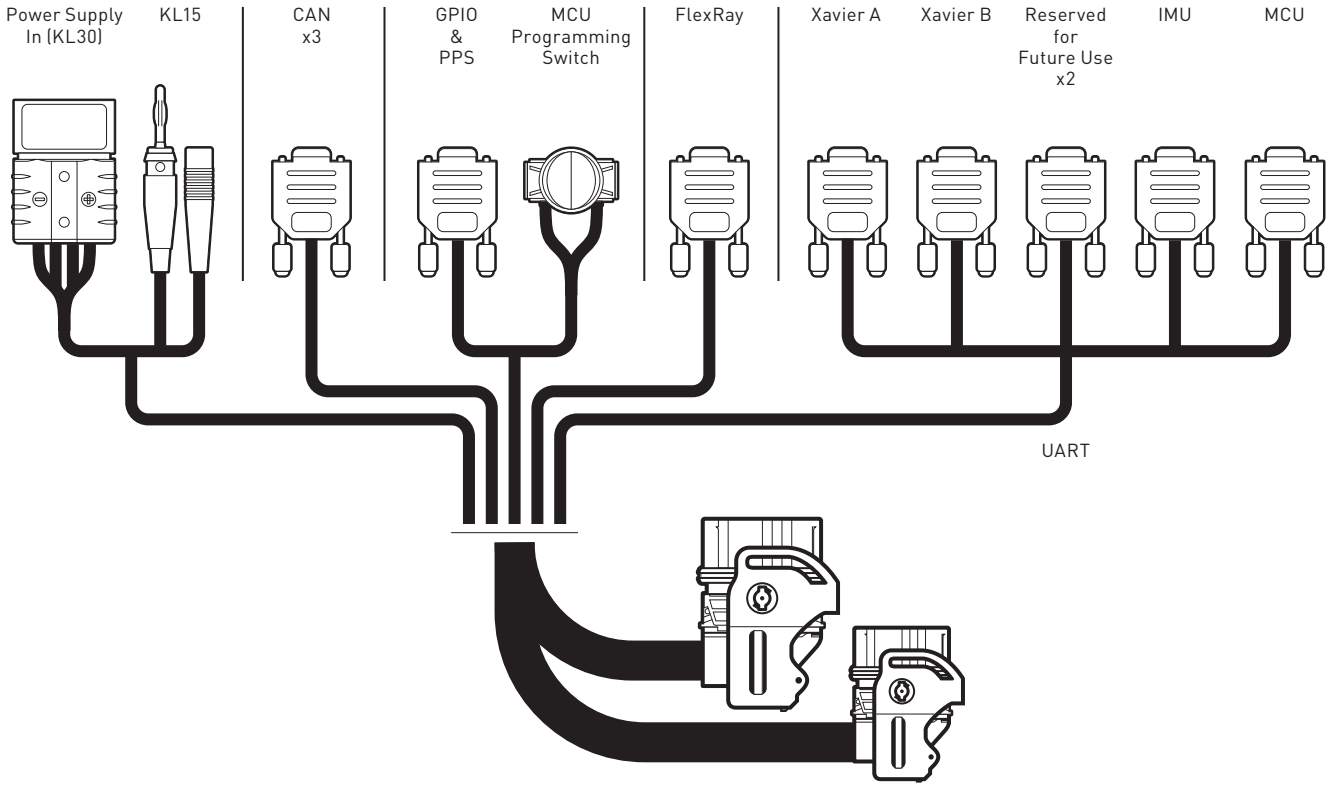
The mapping of the camera connectors is explained in the figure below.



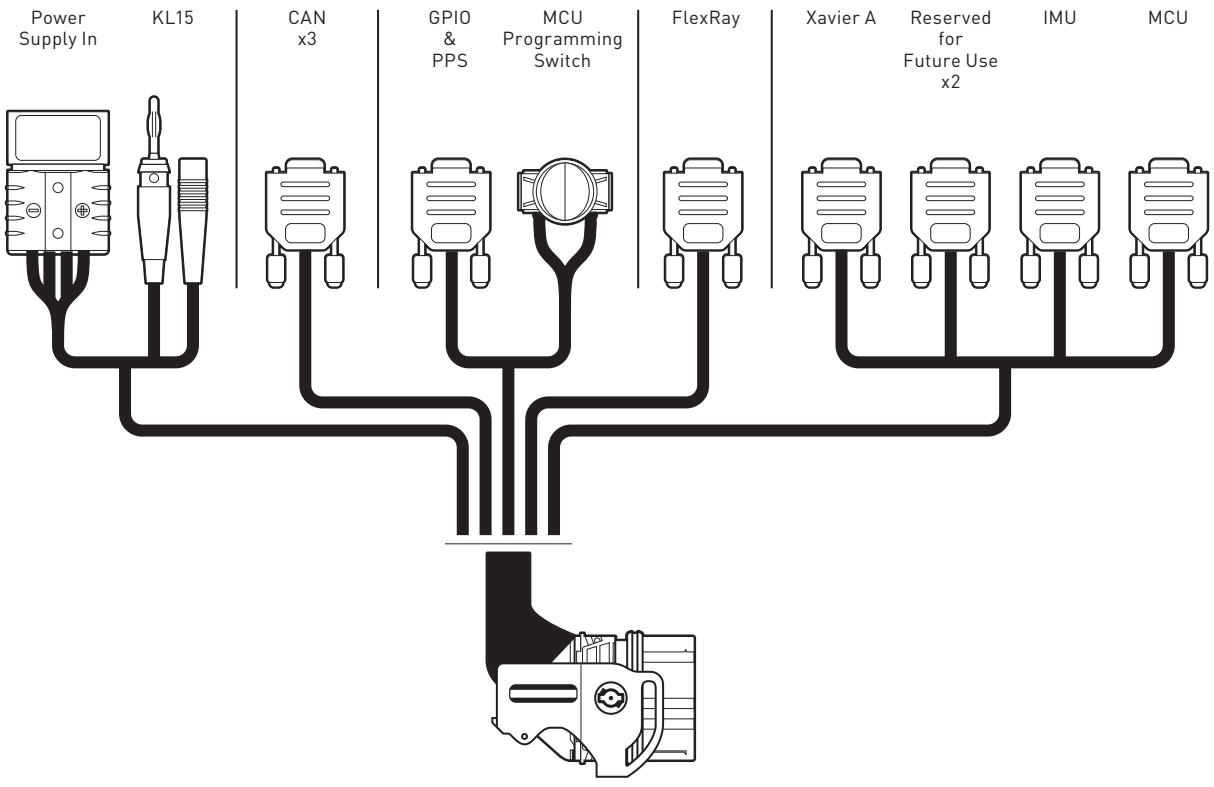
Front view of GMSL camera input connectors. Labels show physical connections.

! GMSL cameras are organized into quads (A, B, C and D) and all four cameras within a quad must be identical. Different cameras may be used in different quads.

Always ensure that there is no power to the Developer System when connecting or disconnecting GMSL cameras. Because power over coax is used, not ensuring that power is off may result in damage to the GMSL camera or to the Developer System.



Ports and connectors included in the Vehicle Cable Harness for DRIVE AGX Pegasus Developer Kit



Ports and connectors included in the Vehicle Cable Harness for DRIVE AGX Xavier Developer Kit

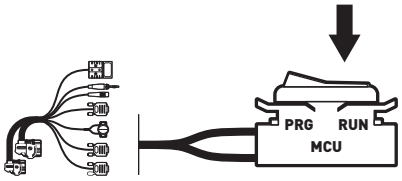
STARTING THE BOARD FOR THE FIRST TIME

! We care about the safety and security of your data; please change your password before enabling the network on DRIVE AGX Systems.

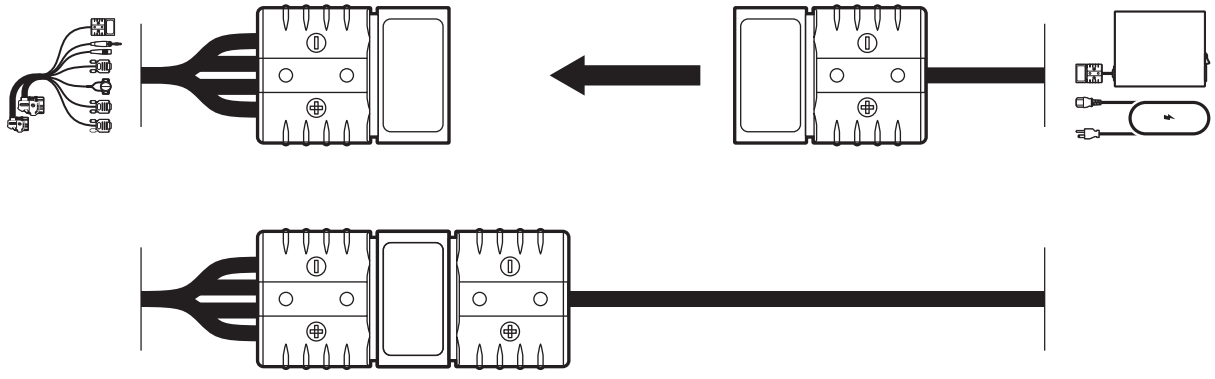
Make sure the main power supply and the accessory power supply are both unplugged from an AC outlet before performing steps 1 through 10.

CONFIGURING THE VEHICLE CABLE HARNESS

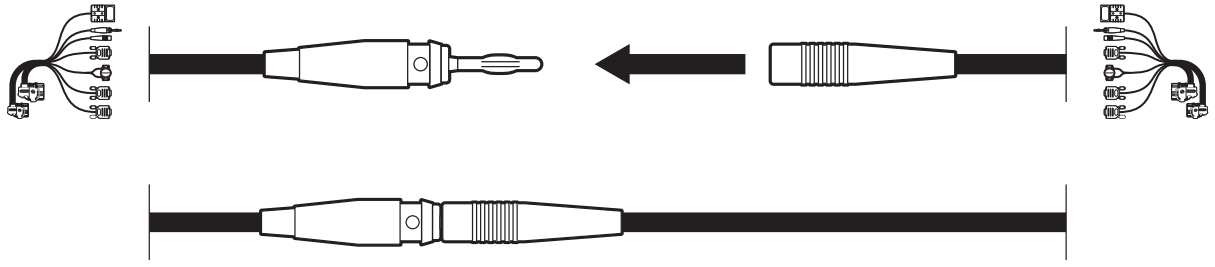
1. Ensure that the RUN side of the Program/Run MCU (Microcontroller) programming switch is depressed.



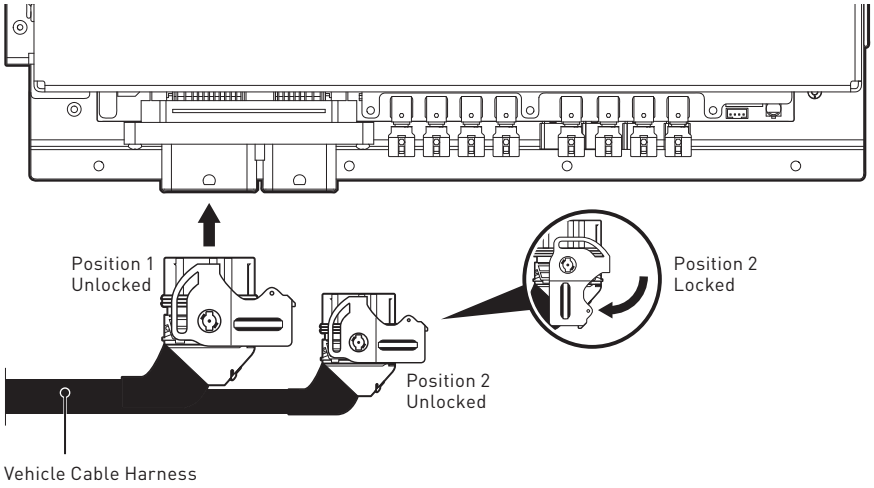
2. Connect the large black power connector on the Vehicle Cable Harness (labeled Power) to its matching black power connector from the power supply. Ensure that the connectors are firmly connected together with an audible click.



3. Connect the red KL15 ignition banana plug to its corresponding red jack. Both the plug and the jack can be found on the Vehicle Cable Harness. This connection corresponds to turning the ignition switch to the On position.



4. Connect the Vehicle Cable Harness to the CMC-1 Connector on the front of the Developer System. After inserting the connector, make sure it is firmly locked in place as shown.



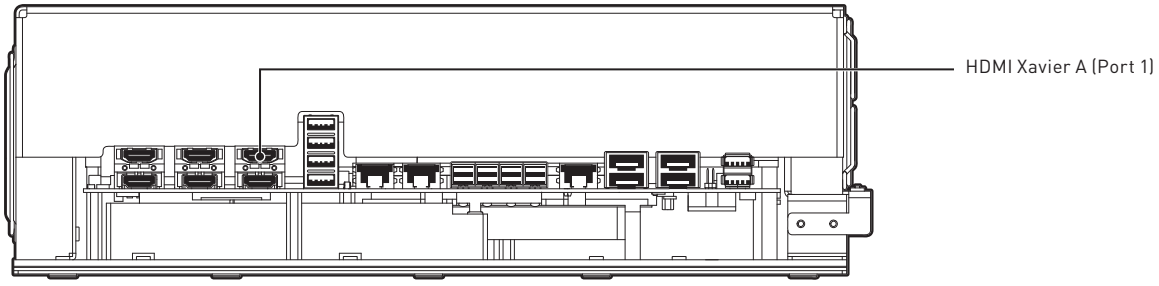
Before attempting to connect the Vehicle Cable Harness, please make sure the connector on the harness is fully rotated to Position 1: Unlocked, and the bundle of cables should be oriented to the left of the board.

While the connector on the harness is partially inserted, rotate the connector on the harness to Position 2: Locked. The connector is now fully inserted and locked in place.

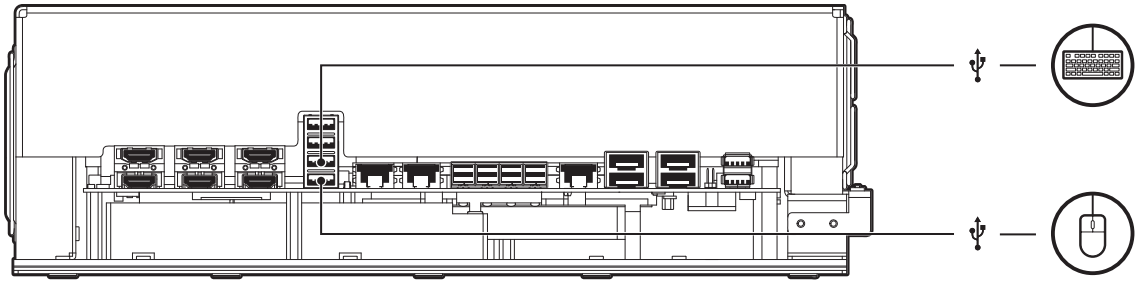
If your harness has the 32-pin vehicle connector, connect it to CMC-2 similar to the 48-pin connector.

BASIC CONNECTIONS FOR XAVIER A

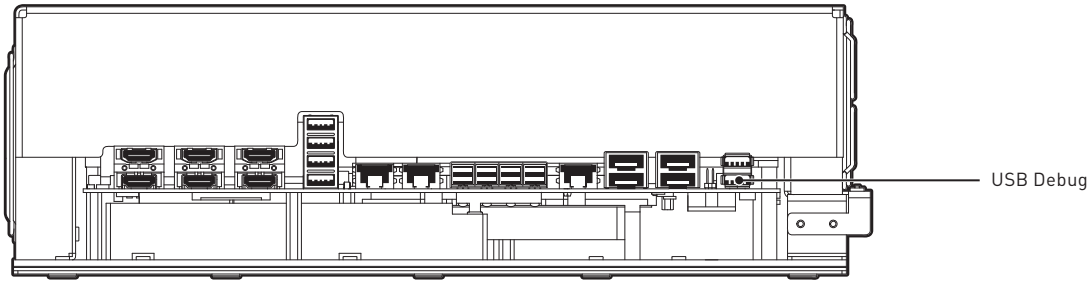
5. DISPLAY: On the rear side of the Developer System board, connect an HDMI cable from Xavier A HDMI port 1 to an HDMI display.



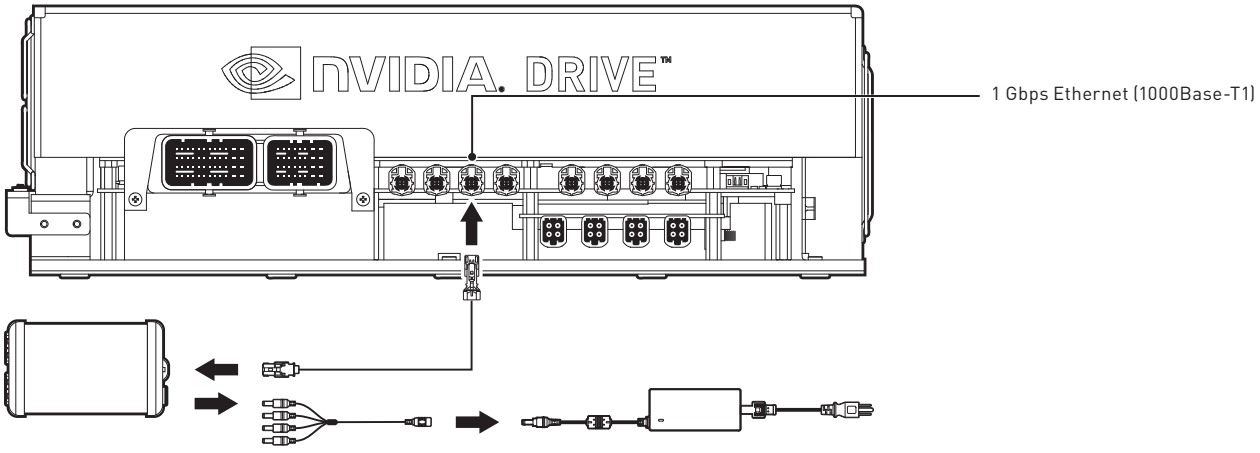
6. KEYBOARD and MOUSE: On the rear side of the Developer System board, connect a USB Mouse and USB Keyboard to Xavier A USB 3.1 Ports 1 and 2. Use the supplied USB 3.0 Hub if you want to only use one USB 3.1 port.



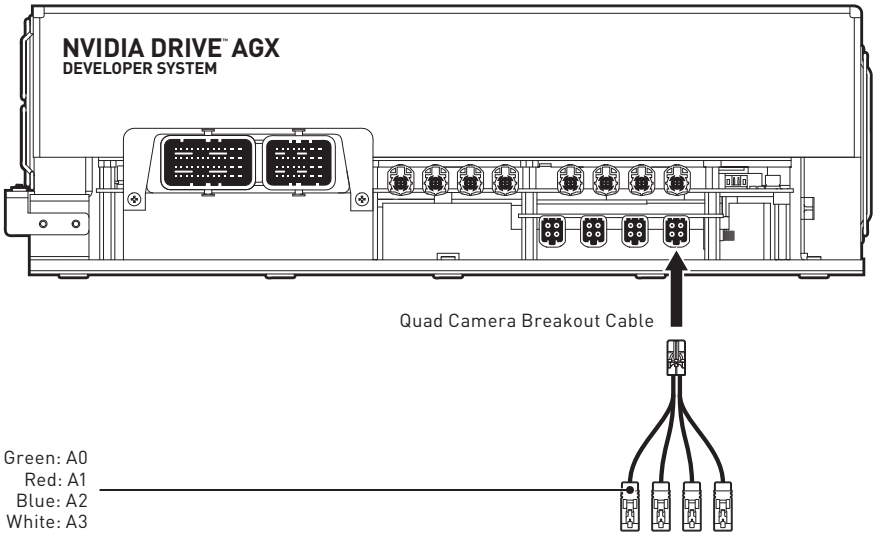
7. DEBUG: On the rear side of the Developer System board, connect the USB Type A to Type A Cable from the Linux Host PC to the NVIDIA DRIVE USB Debug port.



8. INTERNET: First plug one of the four Accessory Power plugs to the Dual GbE Dongle. Then connect the Dual GbE Dongle to one of the HSD ports on the developer system via the HSD Cable depending on your use case.
Please refer to the page 3 of this Quick Start Guide for HSD connector mapping. You can also refer to the DRIVE OS Development Guide for more details.



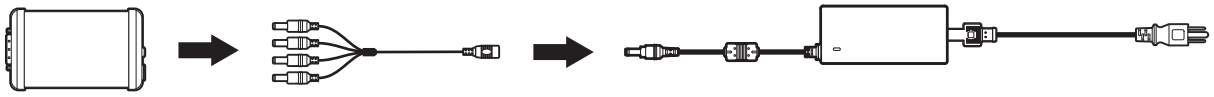
9. CAMERA: On the front of the Developer System board, connect the Quad Camera Breakout Cable to Camera Group A (rightmost quad camera port). Connect the Sekonix AR0231 GMSL Camera to NVIDIA DRIVE using the Fakra Coax Cable to the Quad Camera Breakout Cable, green colored port. The green colored port corresponds to GMSL Camera Port A0.



> Always turn off main power before connecting or disconnecting cameras from your development platform.

> If more than one camera is used, you must follow this order: A0, A1, A2, A3.

10. REAL-TIME CLOCK: Connect the connector on the Real-Time Clock Module to the "CAN 6&4" connector on the Vehicle Cable Harness. Connect the plug side of the PPS cable into the jack marked "PPS O/P" on the Real-Time Clock Module. Plug the connector side of the PPS cable to the "GPIO/PPS" connector on the Vehicle Cable Harness. Plug one of the four Accessory Power plugs into the Real-Time Clock Module.

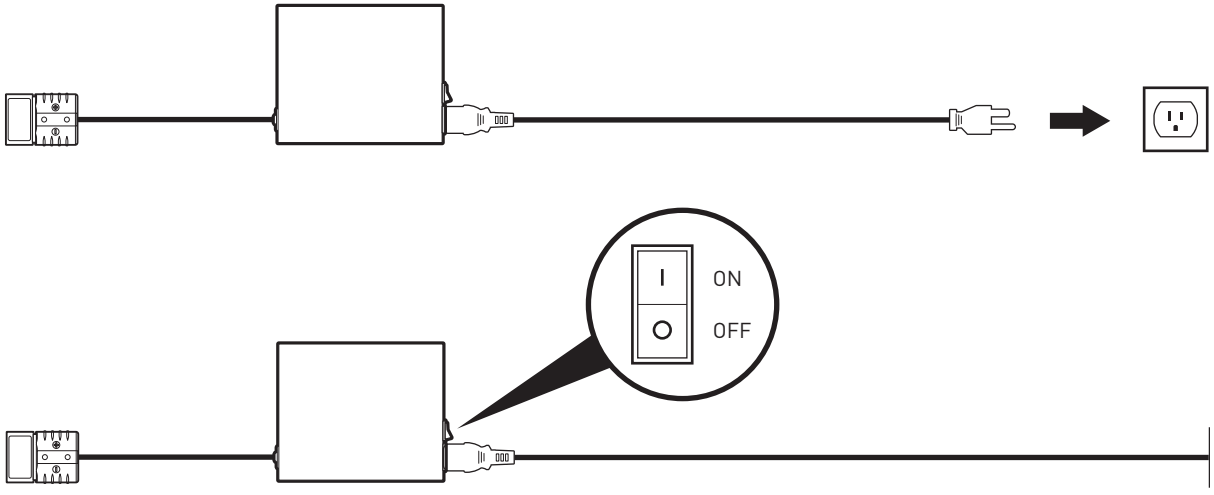


Please note that the RTC Module requires a CR2032 lithium coin battery to remember the time. The module opens with two screws and the battery may be installed.

POWERING UP THE DRIVE AGX DEVELOPER KIT

11. ACCESSORY POWER: Connect the Accessory Power Adapter to an AC outlet.

12. MAIN POWER: Connect the Power Supply to an AC outlet and turn the ON/OFF switch on the power supply to ON.



13. Once your Developer System is correctly connected and powered up, either a QNX splash page or a Linux desktop will be displayed, depending on which OS is pre-loaded. Once you see this, you will be able to run through multiple sample projects.

    Xavier B is pre-loaded with the same NVIDIA DRIVE Software as Xavier A. Similar to Xavier A, you will have to connect a display, keyboard and mouse to Xavier B to use it.

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