APPENDIX A. DUAL GIGABIT ETHERNET DONGLE

The NVIDIA® Dual Gigabit Ethernet dongle is designed to convert the automotive 1000BASE-T1 Ethernet to standard RJ45 1000BASE-T Ethernet. The dongle also supports automotive 100BASE-T1 along with the BroadR-Reach standard.

Table A-1.   Supported Ethernet Standards

Automotive Ethernet Standard	Converted to
1000BASE-T1	1000BASE-T (RJ45)
100BASE-T1	100BASE-T (RJ45)

Notes:
1. Rate conversion between 1000Mb/s and 100Mb/s is not supported.
2. The dongle will advertise 1000BASE-T if the T1 link is 1000Mb/s. However, if the RJ45 link partner is 100BASE-T, which supports only 100Mb/s, the RJ45 link will drop data. When this is happening, it will be indicated through the LED as described in Table A-2.
3. Half duplex is not supported.

E3579 ETHERNET DONGLE

The E3579 Dual Gigabit Ethernet dongle, as shown in Figure A-1, is one of the accessories shipped with the NVIDIA DRIVE AGX™ Developer Kit.

Figure A-1.   E3579 Dual Ethernet Dongle with HSD Connector

The dongle is designed to allow the automotive 1000BASE-T1 port on the HSD connectors of the NVIDIA DRIVE AGX™ System to communicate with other systems through the standard RJ45 Ethernet connectors and Ethernet cables.

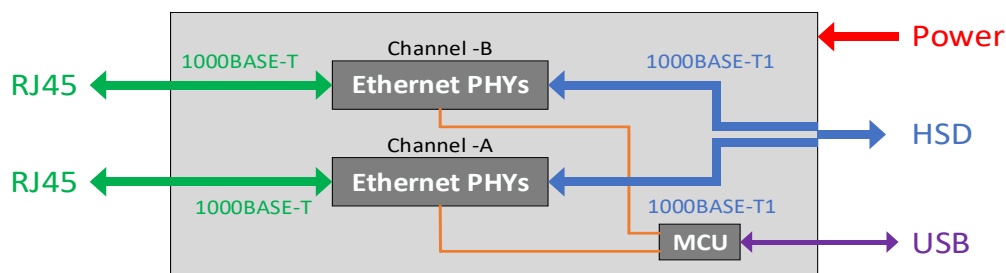Figure A-2 shows the high-level block diagram of the dongle.

Figure A-2.   E3579 Dual Ethernet Dongle High Level Block Diagram

As illustrated in Figure A-3, the dongle I/O ports on both the front and the rear panels are:

▶ **Power jack**: 4.75V to 28V DC power (Mating plug: 5.5x2.5mm)

▶ **Mini USB connector**: connecting to the USB port of a PC

▶ **LED indicators**: Blue for data transmitted, Yellow for data received, Red for power

▶ **HSD connector**: for connecting to the DRIVE AGX System HSD connectors

▶ **RJ45 connectors**: two connectors with LEDs for connecting to the other systems

Figure A-3.   Front and Rear Panels of the E3579 Ethernet Dongle

E3579 LED INDICATORS

There are three LEDs on the front panel. Each of the two RJ45 connectors on the rear panel also has two LEDs. These LEDs are used for indicating the dongle status. See Table A-2 for the details.

Table A-2.   LED Locations and Status Descriptions

Panel	LED Location	LED Color	LED Activity	Status Description
Front	TX (Left)	Blue	Lit / Blink	Serial data bits transferring
	RX (Middle)	Yellow	Lit / Blink	Serial data bits receiving
	PWR (Right)	Red	Lit	External power is okay
			Blink	External power is missing
Rear	RJ45 x2 (Lower Left)	Green	Lit / Blink	Ethernet link running at 1GbE
		Orange	Lit / Blink	Ethernet link running at 100MbE
	RJ45 x2 (Lower Right)	Yellow	Lit	HSD/1000BASE-T1 linked up
			Blink	T1 link is faster than RJ45 link

CONNECTING E3579 TO DRIVE AGX SYSTEM

As shown in Figure A-4, the dongle must be powered externally with the DC power adapter. The HSD connector of the dongle is connected to the HSD connector of the DRIVE AGX System through the HSD cable provided with the kit. The USB connection to the PC is optional and is not required for dongle operation.
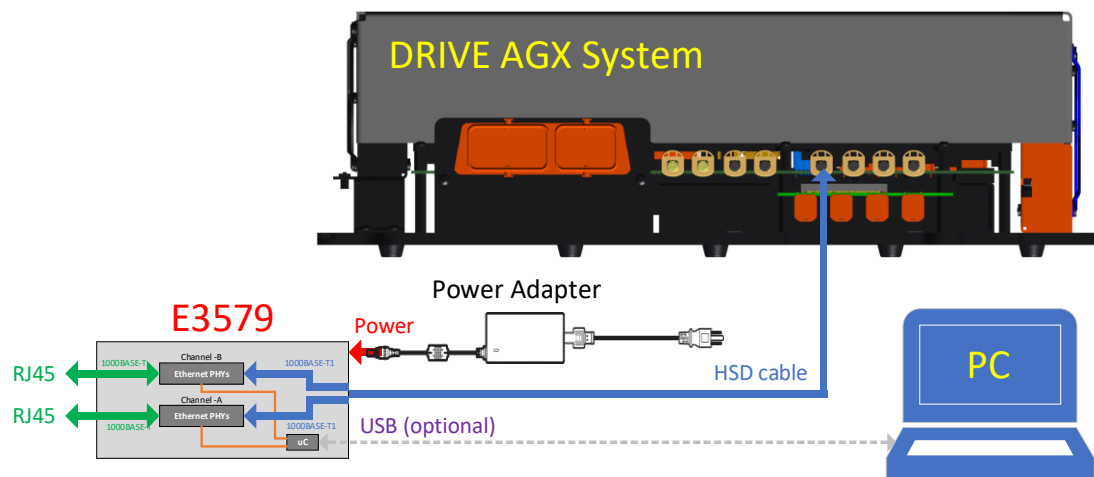

Figure A-4.   E3579 System Connections

Each of the HSD connectors on the DRIVE AGX System carries two Ethernet channels. The HSD connector on the dongle is the same as the HSD connectors on the DRIVE AGX System. The HSD connector pinout is shown in Table A-3.

The HSD connectors on the DRIVE AGX System support both 1000BASE-T1 and 100BASE-T1. Depending on which HSD connector the dongle is connected, the RJ45 channel may be 1Gbit Ethernet or 100Mbit Ethernet. Please refer to the NVIDIA document, *NVIDIA DRIVE AGX System Mechanical Installation Guide (DI-08957-001),* in which all the possible connections are listed in a table.

Table A-3.   HSD Connection Mapping

DRIVE AGX System HSD Pin #	Polarity	HSD Cable	E3579 HSD Pin #	Polarity	E3579 Channel #
2	P	→	3	P	Channel -A
4	N	→	1	N	Channel -A
3	P	→	2	P	Channel -B
1	N	→	4	N	Channel -B

DRIVE AGX System
HSD Connector

E3579 Dongle
HSD Connector

E3579 OPERATING VOLTAGE

Table A-4 lists the operating voltage range of the power input.

Table A-4.   Operating Voltage

Power Input Type	Voltage Range
DC Power	4.75V to 28V

E3579 OPERATING CURRENT

The operating current is depending on factors such as the number of active channels and the Ethernet speed. Table A-5 shows the required current when the power input is at 12V.

Table A-5.   Operating Current

Power Input Voltage	Current Range
12VDC (using the 12V power adapter)	0.15A to 0.25A
Note:	

Note:
The current numbers in this table are specified at the nominal input voltage of 12V. Please calculate the worst-case current based on the lowest possible input voltage, $Vmin\ (v)$, using the following equation:

$$Current\ @\ Vmin = Current\ @\ 12V \times \frac{12V}{Vmin\ (v)}$$

E3579 OPERATING AND STORAGE TEMPERATURE

The system should be operating and stored under the temperature specifications.

Table A-6.   Operating and Storage Temperatures

Mode	Ambient Temperature Range
Operating	0°C to 45°C
Storage	−40°C to 65°C

E3579 MECHANICAL SPECIFICATION

Figure A-5 shows how the enclosure dimensions are labeled and Table A-7 lists out the typical dimensions and the typical weight of the dongle.
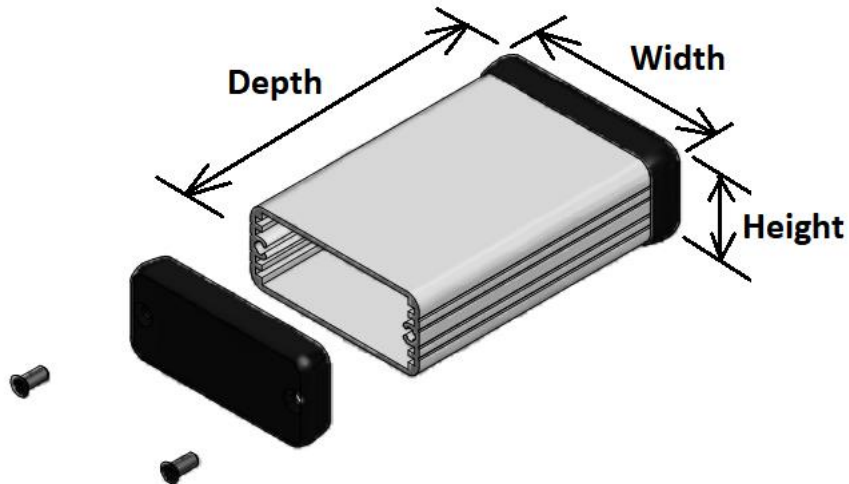

Figure A-5.   Dual Ethernet Dongle Enclosure Dimensions

Table A-7.   Dimensions and Weight

Dimensions (mm)	
Width	57.10
Height	26.00
Depth	85.50
Weight (g)	
With no cable connected	100 ± 3%