

Aries PCI Express[®] 4.0 and 5.0 Smart Retimer Add-in-Card

Product Brief

Asteralabs is a worldwide leader in purpose-built connectivity solutions for AI and cloud infrastructure. It is at the forefront of software-defined architectures that are both scalable and customizable. With PCIe[®], CXL[®], and Ethernet-based semiconductor solutions, Asteralabs addresses data, memory, and networking bottlenecks while fostering trusted partnerships with hyperscalers and the broader data center ecosystem.

1. Introduction

The Astera Labs Aries PCI Express® 4.0 add-in-card (ECLIPSE-REVC) and Aries PCI Express® 5.0 add-in-card (EQUINOX-REVC), are intended for in-system evaluation of the Aries PCIe 4.0 and 5.0 x16 Smart Retimer. The low-profile active add-in card has a x16 PCIe CEM-compliant edge finger to be plugged into a Gen-4/Gen-5 system, and features a x16 CEM connector on top to install an endpoint add-in card. It is configured for plug-and-play operation, meaning no retimer configuration is required and the Root Complex (e.g. CPU) and Endpoint (e.g. NIC) will automatically form a Link through the Aries Smart Retimer on power-up and de-assertion of PERST#. A Python SDK is available to read out various diagnostics information gathered by the Aries Smart Retimer through the I2C interface to a PC.

2. Technical Information

Feature	Specification
Form Factor	Standard half-height, half-length, single slot width PCIe AIC
Card Physical Dimension	147 mm (L) x 72 mm (H) PCIe AIC standard PCB thickness 0.063" +/- 0.008" (1.6 mm +/- 0.2 mm)
Retimer	Aries PCIe 4.0/Aries PCIe 5.0 Smart Retimer
Connectors	PCIe 4.0/5.0 x16 edge finger, PCIe 4.0/5.0 x16 CEM top slot
LED Indicators	Red: Retimer reset, PCIe fundamental reset Orange: EEPROM load done, retimer heartbeat, link status
Port Bifurcation Options	1x16, 2x8, 4x4, 8x2, others available via firmware
Debug Headers	1.8 V SMBus (retimer), 1.8 V SMBus (EEPROM)

3. Applications

- Evaluation of Aries PCIe x16 Smart Retimer for server, storage, JBOG, and other PCIe-based systems.
- Production-ready retimer add-in card to extend PCIe signal reach for rapid system deployment. For example, easy plug-and-play implementation for GPU accelerated servers, NIC extension, switches, and other topologies that can utilize a standard CEM slot.

4. Revision History

Table 4-1

Equinox board revision	Retimer IC	Straddle mount connector
EQUINOX-REVA	PT5161LB	Amphenol 10153266-A40110LF
EQUINOX-REVB	PT5161LC	Amphenol 10153266-A40110LF
EQUINOX-REVC	PT5161L (Production)	Amphenol 10163106-A41311HLF

Contact info@Asteralabs.com for the *ECLIPSE/EQUINOX-REVC User's Guide* and *SDK*.

Figure 4-1 EQUINOX-REVC Top Side

