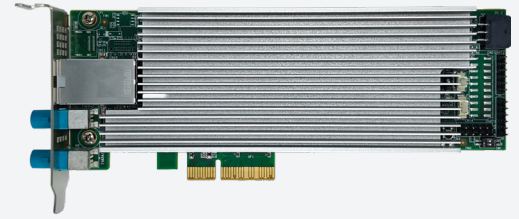




Modalix HHL PCIe Card

Product Brief



Overview

The Modalix™ HHL PCIe card provides the proven performance of the Modalix MLSoC architecture in a compact, low-profile PCIe deployment-ready form factor, purpose-built to Scale Physical AI applications.

The Modalix system architecture seamlessly integrates multiple compute engines and peripherals, delivering **best-in-class performance per watt** for advanced workloads, including multimodal transformers, Large Language Models (LLMs), Large Multimodal Models (LMMs), and Generative AI (GenAI). It also supports legacy convolutional neural networks (CNNs) and traditional computer vision (CV) algorithms, ensuring compatibility across modern and established ML pipelines.

Accelerated Development

SiMa.ai's Palette™ Software Suite with the Palette Neat™ Agentic Development Environment accelerates the development and deployment of Physical AI applications. Developers can rapidly build, optimize, and deploy complete AI solutions using industry-standard models, frameworks, and software tools.

From computer vision and multimodal AI to robotics and autonomous systems, SiMa.ai provides a streamlined development experience for efficient on-device AI processing. Support for ONNX models and popular frameworks such as OpenCV enables developers to leverage existing software investments, while accelerating time-to-market.



Benefits

Easy System Integration

Compact HHL PCIe form factor (167.65 x 68.9 x 20.32 mm) with Ethernet port and GSML camera connectors, for high-speed, long-range image sensor connectivity.

Best-in-Class Processing

Modalix purpose-built MLSoC architecture is optimized for demanding Physical AI workloads, delivering 50 TOPS of computing power.

Scalable Performance & Easy to Use

The Modalix HHL PCIe card is available with 8GB, and 16GB LPDDR5 memory options, providing scalable performance & eliminating hardware design.

Reliable and Efficient

Available in industrial and commercial temperature grades with advanced thermal management, real-time performance monitoring, ensuring robust and reliable performance and power efficiency on device.

Example Applications

- Smart Vision
- Conversational Interface
- Public Safety
- Robotics
- Industry 4.0
- Automotive
- Smart Retail / Healthcare
- Aerospace & Defense



Modalix HHHL PCIe Card Feature Highlights

Machine Learning Accelerator (MLA)

- 50 TOPs (BF16, INT8, INT16)
- Support of LLMs, Neural networks, and GenAI

Application Compute Unit (ACU)

- 8x Arm Cortex-A65 @1.4 GHz
- 32k Dhrystone MIPS

Memory

- 16/8GB of on-board 128-bit LPDDR5 (6400 Mbps) system memory

Boot and Security Unit (BSU)

- Secure boot with boot code authentication & encryption
- Secure key storage & management
- Security engine for user code

Video Codec

- Decode H.264/H.265/AV1 4K60
- Encode H.264/H.265/ 4K60

Computer Vision Unit (CVU)

- 4-core Synopsys EV74 DSP @ 1 GHz
- 720 16-bit GOPS

Low-latency Image Signal Processor (ISP)

- Arm Mali C-1 @ 1.2 GHz

Peripherals

- 2x GSML Camera Interfaces
- x8 PCIe Gen5 EP
- 1 x 10Gb Ethernet PHY
- 1 x Micro SD Interface
- 2 x UART ports

Storage

- 32GB eMMC flash
- 16 MB QSPI flash
- 2Mb EEPROM
- Extreme low Power
- No external power source required
- No Fan required

Compact Form Factor

- PCIe HHHL (Half-height, Half-length)
- Dimensions: 167.65 x 68.9 x 20.32 mm
- Wide Temperature Range support
- -40 to +85 °C

Software-First Development Environment

Compiling a ML-trained model for specific hardware can be challenging, especially when the software toolchain and hardware are not co-designed. SiMa.ai’s software-first approach provides a software architecture that allows support for a broad range of ML models through the ONNX framework.

SiMa.ai’s Palette™ software runs effortlessly on both the MLSoC and the Modalix MLSoC. With over 650 precompiled models, the software ensures a seamless user experience and provides industry-leading performance-per-watt. SiMa.ai’s effortless ML software framework supports any framework, network, mode, or sensor, allowing Physical AI applications to run entirely on a single device, supporting a broad range of applications.

Ordering Information

Product Description		Temperature Grade
Modalix HHHL PCIe card 8GB	Standart Product	Commercial & Industrial
Modalix HHHL PCIe card 16 GB	Standart Product	Commercial & Industrial



About SiMa.ai

SiMa.ai is a leader in Physical AI, delivering a purpose-built, software-centric platform that brings best-in-class performance, power efficiency, and ease of use to Physical AI applications. The company is focused on scaling Physical AI across robotics, automotive, drones, industrial automation, aerospace and defense, smart vision, and healthcare. Learn more at www.sima.ai.

