ADLINK
Leading EDGE COMPUTING

Solution Brief



DLAP-3000 Optimized for SWaP and AI Performance

This computing platform family combines a CPU and GPU to deliver higher performance AI processing for compact, low power, industrial-grade systems.

Edge AI Systems in High Demand

Artificial intelligence (AI) at the edge is being used to boost the capabilities of a wide range of devices in embedded market segments, including healthcare, manufacturing, maritime, aerospace, and transportation. The high demand for AI-based applications is reflected in the worldwide spending on edge AI hardware, which is forecast to grow at a CAGR of 20.6%, increasing from 610 million units in 2019 to around 1.6 billion units by 2024.[1]

Edge AI Design Challenges

Many AI workloads require large amounts of memory, parallel computing, and mathematical computation. The challenge for system architects developing edge AI systems is delivering sufficient computing performance while satisfying environmental hardening and stringent size, weight, and power (SWaP) constraints.

The computing requirements for AI workloads are diverse, best handled by a heterogeneous system built with both a CPU and a graphics processing unit (GPU). However, using two processing systems instead of one will increase power consumption and size. Moreover, many GPUs have a relatively short product availability, which is unacceptable for some embedded applications.

DLAP-3000 Designed for Edge AI Applications

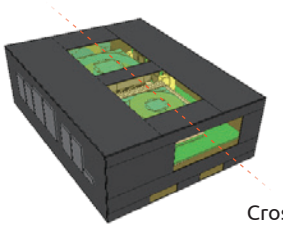
Overcoming these challenges, ADLINK applied its thermal and system design expertise to develop the DLAP-3000-CF Series, a family of deep learning acceleration platforms (DLAP). These systems are manufactured with long lifecycle products, including GPUs, to significantly extend their availability. DLAP-3000-CF utilizes Intel® Core™ processors and Mobile PCI Express Module (MXM) graphics cards to deliver compact, thermally-optimized, industrial designs with powerful inference capability.

Compact size

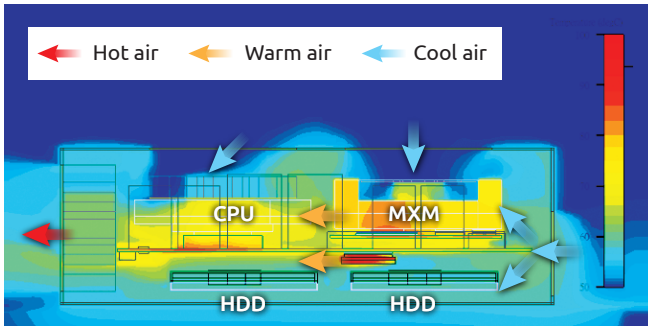
The DLAP-3000-CF is approximately 3.2 liters in size, about one-third the size of a MiniITX plus PCI Express Graphics (PEG) card of comparable performance. Measuring 235 x 182 x 75mm (W x D x H), the system is less than half the size of a men's shoe box.

Thermal design

To deliver a compact, high performance system, special attention was paid to designing a system with efficient air flow. It supports operating temperatures up to 50°C, even when configured with a powerful MXM card with an NVIDIA® GPU with 2048 CUDA cores. Compared to PEG cards, ADLINK MXM cards have better reliability, support temperature extremes from -40°C to 85°C, and consume about 60% less power.



Cross-section



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Industrial design

Designed for durability in harsh industrial and embedded environments, the DLAP-3000-CF operates at extended temperature (0°C to 50°C), vibration (up to 2 Grms), shock (up to 30 Grms), and relative-humidity (5% to 95%) ranges.

Edge AI Use Cases

The DLAP-3000-CF gives system developers the flexibility they need to cost-effectively achieve the right mix of SWaP and AI performance. They can choose from a minimum of seven types of MXM designs and five Intel® processor SKUs. With the DLAP-3000-CF, there is no need to buy a server to run AI inferencing, facial recognition, object detection, or many other AI-based applications at the edge.

Mobile medical imaging (C-ARM)

Healthcare facilities require powerful mobile imaging systems that provide sharp, detailed medical images and maneuverability to surgeons, radiologists, cardiologists, emergency care physicians, and technicians.

Since it is not possible to use a 4U or 6U server in this application, the DLAP-3000-CF is an ideal system, incorporating both a CPU and a GPU to deliver the required AI-augmented performance. Medical device developers designing mobile systems will appreciate the DLAP-3000-CF's compactness, resistance to shock, and relatively low power consumption.



Transportation security check

It is common to have luggage, bag, and personal belongings scanned at security checkpoints in airports, train stations, and public buildings. Security scanners usually need to be relatively small and high performance to quickly perform X-ray scans.

To help keep security lines moving, the DLAP-3000-CF can scan items quickly thanks to its exceptional thermal management that allows for powerful, AI-assisted object detection with the integration of a CPU and a GPU-enabled MXM. This highly-reliable, small-form-factor system offers a good cost-performance value.



A Computing Platform for Edge AI Systems

Many industries are pursuing AI with the hope of transforming their business through higher levels of automation, video analysis, machine learning, and more. For edge systems requiring high performance in a small factor, the DLAP-3000-CF is a perfect fit.

The applications requiring edge AI are diverse and so is the demand for edge AI systems. The DLAP Series has several platform families, including platforms featuring NVIDIA® Quadro® embedded graphics for high-performance, power-efficient applications or NVIDIA® Jetson™ supercomputers-on-a-module optimized for more space- and power-constrained installations.

To learn more about ADLINK's DLAP Series, please visit the ADLINK website.

[1] MarketsandMarkets Research, "Edge AI Hardware Market by Device," https://www.marketsandmarkets.com/Market-Reports/edge-ai-hardware-market-158498281.html.

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