

/IOTCONNECT®

Physical AI Solutions – Advantech + AWS

Challenges

Bridge the gap between AI innovation and real-world deployment

Organizations working to deploy Physical AI solutions often struggle to bridge the gap between cloud-based AI development and real-world environments. Running advanced AI models on large volumes of sensor, vision, and operational data requires powerful and reliable edge infrastructure capable of real-time processing. At the same time, building, training, and scaling those models demands robust cloud resources and data pipelines. Ensuring seamless connectivity between edge systems and the cloud adds further complexity, while validating AI performance in dynamic environments—such as factories, robotics, or autonomous systems—can be costly and time-consuming without effective simulation and digital twin capabilities.

Avnet /IOTCONNECT Solution

Unlock scalable, real-time intelligence from edge to cloud

The Physical AI Solution from Advantech and AWS addresses these challenges by unifying industrial-grade edge computing with scalable cloud AI services into a single, cohesive architecture. Advantech's NVIDIA-powered edge platforms enable real-time data processing and decision-making directly at the source, while AWS services support model training, simulation, and lifecycle management in the cloud. Integrated IoT connectivity ensures seamless data flow between physical systems and cloud intelligence, allowing organizations to continuously improve models using real-world data. By combining edge inference, cloud scalability, and simulation capabilities, the solution accelerates deployment, reduces risk, and enables organizations to efficiently bring advanced applications—such as robotics, vision AI, autonomous systems, and digital twins—into production.

Benefits



»» Unified Device Management

The solution provides a single /IOTCONNECT portal to register, monitor, and manage Amazon Sidewalk-enabled STM32 devices, eliminating the need to build and maintain custom backend services.

»» GPS-Free Location Resolution

By integrating with AWS IoT Core Device Location, the solution enables location awareness using BLE, Wi-Fi, or GNSS data without requiring power-hungry GPS hardware, extending battery life for low-power devices.

»» Secure Manufacturing at Scale

The solution supports secure factory provisioning through HSM-based certificate generation, Sidewalk signing tools, and automated control log consolidation, enabling scalable and compliant mass production.

»» Accelerated Sidewalk Qualification

Avnet manages the “Works with Amazon Sidewalk” qualification process, including donor qualification when applicable, helping reduce testing effort and shorten time to market.

Physical AI Solutions

Avnet's Physical AI Solution, developed with Advantech and AWS, enables organizations to deploy intelligent systems that connect the digital and physical worlds. By combining Advantech's NVIDIA-powered edge platforms, AWS cloud services, and Avnet's /IOTCONNECT platform, the solution supports real-time processing, scalable AI model training, and seamless device connectivity. /IOTCONNECT simplifies device onboarding, management, and data orchestration, helping unify edge systems with cloud infrastructure.

This solution provides a unified edge-to-cloud architecture that accelerates deployment of Physical AI applications. AI models run at the edge for real-time decision-making, while AWS enables scalable training, simulation, and continuous optimization in the cloud. /IOTCONNECT bridges these environments by enabling secure connectivity, remote monitoring, and data flow between systems. Together, these capabilities reduce complexity and help organizations bring robotics, vision AI, and autonomous solutions into production faster.



Vision Defect Detection

Challenge:

- Limited 24/7 visibility across industrial facilities
- Difficulty detecting subtle liquid leaks
- Delayed detection increasing operational risk

Solution:

This solution uses image segmentation and anomaly detection to identify leaks by distinguishing liquid characteristics from normal surfaces. Running on thermal and RGB cameras, it provides continuous 24/7 monitoring with real-time detection and tracking. It requires no labeled data for deployment, while automated alerts enable faster response and containment.

Features



This solution is built on three core capabilities that enable scalable Physical AI deployment. By combining edge intelligence, cloud scalability, and unified device management, it provides a seamless foundation for connected, real-world AI systems.

1. Unified Edge-to-Cloud Architecture

Integrates Advantech edge systems, AWS services, and /IOTCONNECT into a scalable architecture for seamless data flow and centralized management.

2. Real-Time AI at the Edge

Runs AI models on NVIDIA-powered edge devices to enable fast, low-latency decision-making in real-world environments.

3. Integrated Device & Data Management (/IOTCONNECT)

The solution can be purchased through AWS Marketplace with flexible pricing and billing options, making it easier to align costs with project milestones and business needs.

/IOTCONNECT is available for subscription and a free trial on AWS Marketplace [HERE](#)



Get started with Advantech and AWS Physical AI Solutions

Contact our IoT experts – <mailto:lot@Avnet.com>

