

/IOTCONNECT®

Physical AI Implementation – Edge to Cloud

Challenges

Bridge the gap between AI innovation and real-world deployment

Organizations seeking to deploy Physical AI solutions often struggle to bridge the gap between cloud-based AI development and real-world operations. Deploying AI across connected devices, sensors, cameras, and industrial assets requires a scalable architecture that supports real-time edge inference, secure connectivity, and continuous data exchange with the cloud. At the same time, organizations must establish reliable processes for model training, deployment, monitoring, and lifecycle management across distributed environments. Validating AI performance in dynamic settings such as manufacturing facilities, warehouses, energy infrastructure, and autonomous systems can further increase complexity, making simulation and digital twin capabilities essential for reducing risk and accelerating deployment from pilot projects to production-scale implementations.

Avnet /IOTCONNECT Solution

Unlock scalable, real-time intelligence from edge to cloud

The Avnet /IOTCONNECT Physical AI Solution addresses these challenges by bringing together edge AI inference, cloud-based model training, secure IoT connectivity, and digital twin capabilities within a unified edge-to-cloud architecture. Built on AWS services and the /IOTCONNECT platform, the solution enables organizations to collect, process, and act on data from connected devices, sensors, cameras, and industrial assets in real time. Continuous data flows support ongoing model training, optimization, and deployment, while digital twin capabilities help validate performance and reduce implementation risk. By combining edge intelligence, cloud scalability, and centralized device management, organizations can accelerate Physical AI initiatives and efficiently deploy applications such as computer vision, predictive maintenance, smart manufacturing, asset tracking, and autonomous systems at scale.

Benefits



»» Real-Time Operational Intelligence:

Turn data from connected assets into actionable insights through edge AI inference and cloud analytics.

»» Continuous AI Model Optimization:

Leverage cloud-based model training and MLOps workflows to continuously improve AI performance using real-world operational data.

»» Secure Edge-to-Cloud Connectivity:

Connect devices, sensors, cameras, and industrial equipment through a scalable architecture that enables reliable data exchange and centralized management.

»» Real-Time Operational Intelligence:

Turn data from connected assets into actionable insights through edge AI inference and cloud analytics.

Physical AI Solutions

Avnet's /IOTCONNECT Physical AI Solution enables organizations to connect the digital and physical worlds through edge AI, cloud-based model training, secure connectivity, and digital twin capabilities. Built on AWS services and the /IOTCONNECT platform, the solution simplifies device onboarding, management, and data orchestration while enabling real-time insights from connected devices, sensors, and industrial assets.

By providing a unified edge-to-cloud architecture, organizations can deploy AI models at the edge for real-time decision-making while leveraging AWS for model training, simulation, and continuous optimization. /IOTCONNECT bridges edge and cloud environments through centralized device management, secure connectivity, and seamless data flow, helping accelerate Physical AI deployments from proof of concept to production.



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

Unifies edge AI, cloud services, and device management into a single architecture that simplifies deployment, streamlines operations, and scales Physical AI initiatives from pilot to production.

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 Edge to Cloud Physical AI Solutions

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

