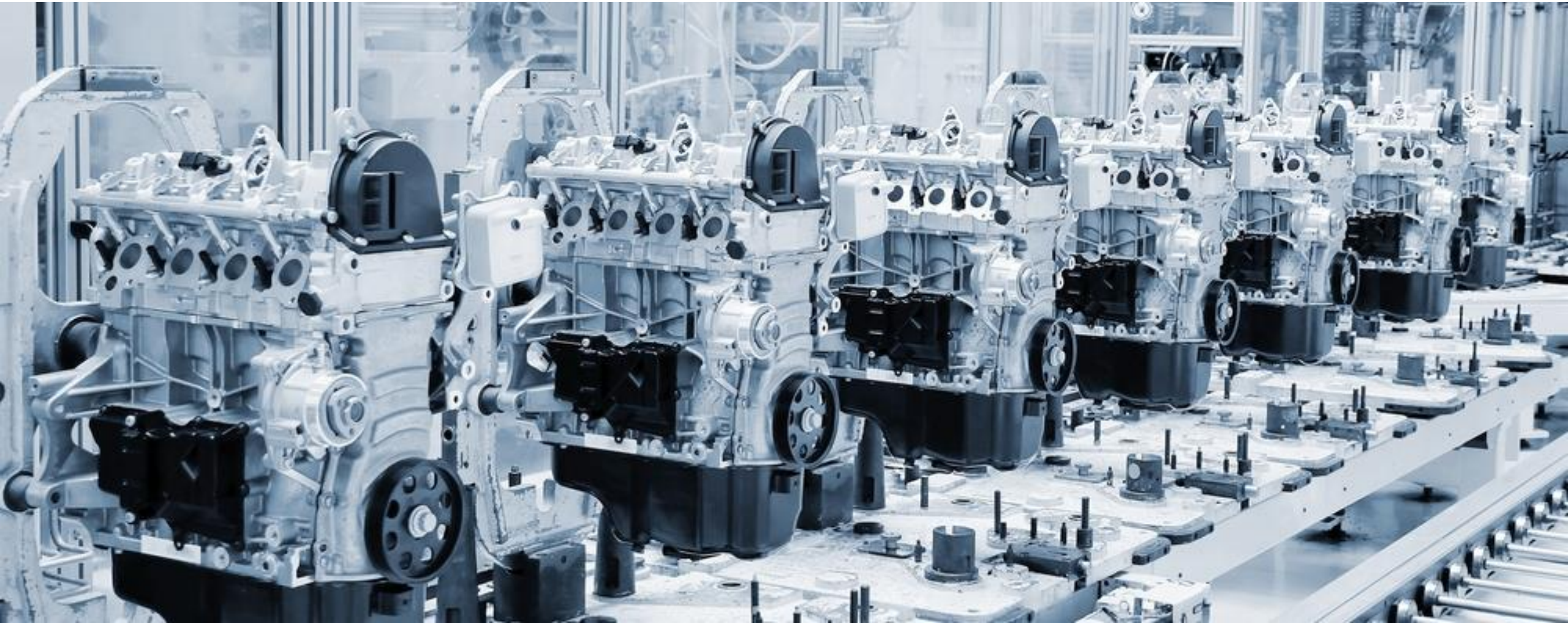
Avnet /IOTCONNECT Solutions Suite

Smart Factory Solutions

AVNET®

/IOTCONNECT®

Manage | Secure | Deploy



/ Solution Accelerator & Marketplace Index

AVNET

/IOTCONNECT enabled solutions

- Smart Generator Monitoring
- Smart City Noise Detection
- Smart Asset Monitoring
- Smart Facility Solutions
- Smart Factory Solutions
- Smart Fleet Management
- Smart Warehouse Monitoring

SaaS offering

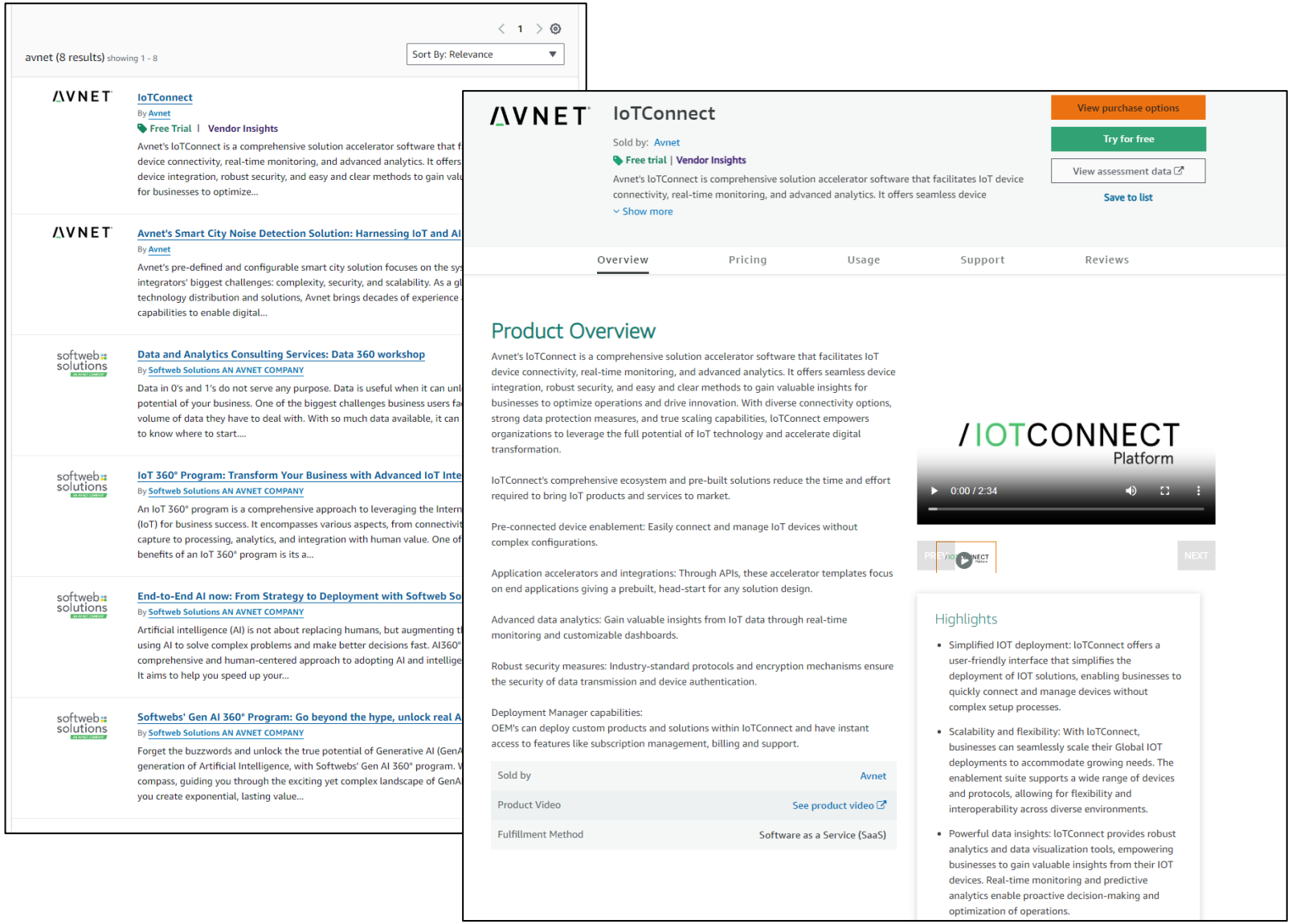
/IOTCONNECT®

Avnet's Smart Factory Solutions powered by IoT and AI

Get real-time insights across the factory floor Avnet's Smart Factory solution, built on /IOTCONNECT™, helps you monitor and track of production and performance on your factory floor. You can collect and analyze data across machines to make your processes faster and more efficient, while gaining real-time insights to make informed decisions. Benefits of the solution include: • Higher quality products • Real-time operational visibility for all locations • Integration with SCM systems • ML-based prescriptive analytics capabilities KPIs: • Availability • Quality • Down Time • Behind Plan • Actual Performance • OEE • Machine Down / Idle Time / In Use

aws Qualified Software

Visit Our Marketplace Listings



[All Avnet Listings]

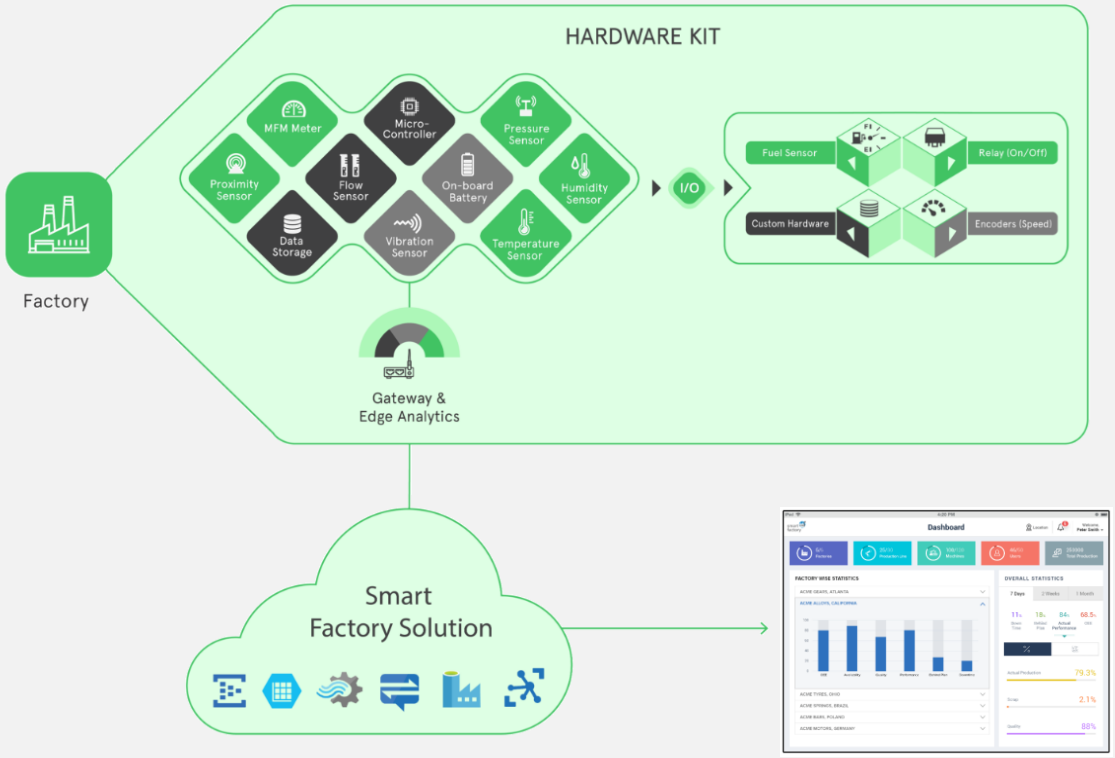
Smart Factory Solution

Avnet's Smart Factory solution, built on the /IOTCONNECT™ platform and hosted on Amazon's AWS, is designed to transform traditional manufacturing environments into efficient, data-driven operations. This modular solution enables real-time monitoring and tracking of production and performance across the factory floor, providing manufacturers with critical insights to optimize processes, reduce downtime, and improve product quality.

Seamless integration & rapid deployment: Our smart factory solutions enable quick deployment with minimal disruption, leveraging an extensive expertise and a strong partner ecosystem reducing time, costs, and risks.

Advanced Technology for High ROI: Streamline operations by leveraging IoT, machine learning, AI, and advanced analytics to provide real-time insights.

Secure and Scalable Platform: Our solutions implement comprehensive end-to-end data security, adhering to the appropriate industry and federal standards.



Features

Our Smart Factory Solution has the capability to connect multiple sensors to monitor the status, automate, collect data, analyze it and derive useful insights to improve manufacturing operations.

- Edge analytics
- Factory performance monitoring and predictive analytics
- Smart ticketing systems for issue tracking
- Anomaly diagnosis and precisions

Learn more **Marketplace Listing**

AVNET

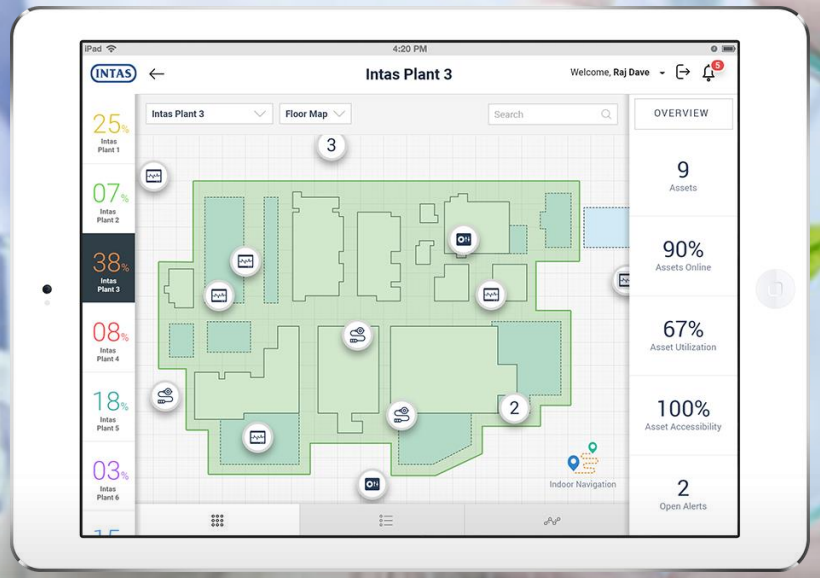
A leading pharmaceuticals company

SITUATION:

A leading, vertically integrated global pharmaceutical formulation development, manufacturing, and marketing company. Committed to challenging the unmet medical and societal needs through a comprehensive pharmaceutical value chain spanning across the world.

VALUE PROPOSTION:

Identify an efficient way to adhere to stringent compliance requirements. With Avnet's Smart Factory solution, they were able to easily monitor and manage the factory environment in real time to ensure optimum product quality; while meeting Title 21 CFR Part 11 compliant.



HARDWARE CONNECTED TO IOTCONNECT

- PLCs and HMIs - The first phase was connecting 74 PLCs including: Panasonic, Siemens, Mitsubishi, Allen-Bradley, Omron

DATA ACQUISITION HARDWARE

- Masibus MINT Communication Processor (Data Connector)
- Masibus MINT Intelligent Digital and Analog I/Os (I/O device)

IOT GATEWAY

- Dell Edge Gateway 3003

→READ MORE

DEPLOYING IOT WITH AVNET HAS ENABLED:

Dashboards accessible via mobile apps help factory floor supervisors and management monitor the factory environment in real-time from anywhere.

Machine learning enables devices to alter their course without the need for human intervention, saving time and resources.

Wireless sensors enable continual monitoring of key environmental variables to ensure quality standards are met.

Sensor data is transmitted directly to the cloud so it can be analyzed and used to identify areas for improvement.

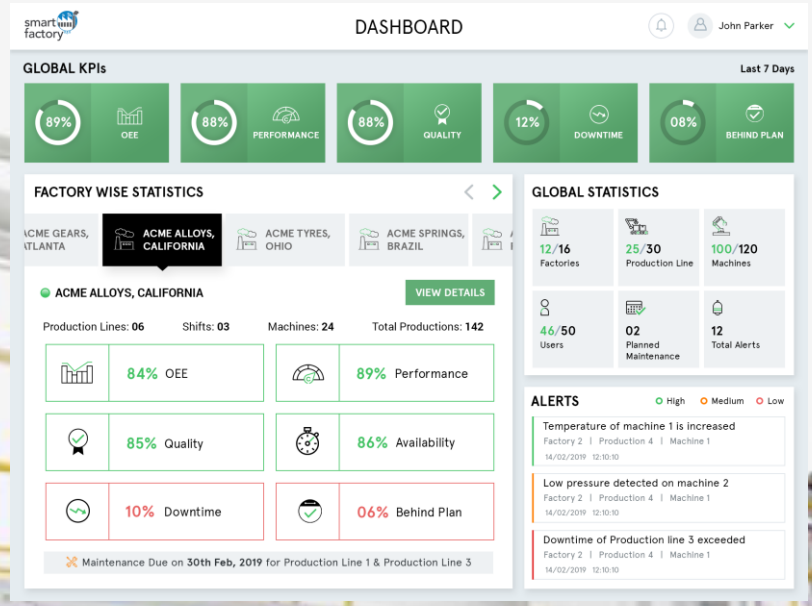
A leading powder coating manufacturing company

SITUATION:

- World class manufacturer of high-quality powder coatings.
- The company was founded in 1999 and since then has become the largest privately owned powder coating manufacturer in the U.S.
- The company has two state-of-the-art facilities, centrally located to ensure rapid delivery across the USA and beyond.

VALUE PROPOSTION:

- Monitor their production lines and also provide detailed insights
- Detect anomalies using ML
- Improve the overall efficiency
- Real-time alerts based on rules defined in the system
- Reports based on usage



PRODUCTION IMPROVEMENTS:

- 59 assets made connected and smart
- Increased throughput by around 23%
- Reduced inventory or material holding costs by 11%
- $0.97 million in ROI generated by March 2019 (First Quarter)

→READ MORE

DEPLOYING IOT WITH AVNET HAS ENABLED:

Delivered a smart factory solution that empowers client to monitor their production lines from a centralized dashboard

The solution enabled them to connect multiple production lines and machines to the smart factory solution

Smart rules for autonomous actions

Enabled the ability to acquire data at different stages of production, remote monitoring, view analytics, anomaly detection and predict maintenance

Summary & Next Steps

Benefits

1. **Seamless Integration and Rapid Deployment:** Our smart factory solutions leverage extensive expertise and a strong partner ecosystem, enabling quick deployment with minimal disruption. The modern networking infrastructure easily integrates with existing systems, reducing time, costs, and risks.
2. **Advanced Technology for High ROI:** Featuring cutting-edge technologies such as IoT, machine learning, AI, and advanced analytics, our solutions provide real-time insights and streamline operations, driving accelerated return on investment.
3. **Secure and Scalable Platform:** Our solutions prioritize comprehensive data security, adhering to the highest industry and federal standards. Built on the /IOTCONNECT platform, they offer proven scalability to support future growth and evolving needs.

Outcomes

1. **Enhanced Operational Efficiency:** Provides real-time insights into production and performance across the factory floor, helping optimize processes and improve efficiency.
2. **Data-Driven Decision Making:** Collects and analyzes machine data, enabling informed decisions and supporting prescriptive analytics through machine learning for improved operations.
3. **Improved Product Quality and Performance:** Monitors key performance indicators (KPIs) such as availability, quality, downtime, and OEE, ensuring higher-quality products and operational visibility across all locations.

Next Steps

Let's team up to automate your industrial manufacturing unit

Contact us: IoT@Avnet.com

More about Avnet /IOTCONNECT and Softweb solutions (an Avnet company)

About Avnet

Quick facts

- Founded in 1921
- Headquartered in Phoenix, Arizona
- $26.5B in revenue (FY23)
- AVT listed on the NYSE since 1960
- AVT listed on NASDAQ since 2018
- #163 on FORTUNE 500 (US) in 2022

15,300
Employees worldwide

1,925
Engineers around the world

2.8M+
Engineering community members

1M+
Customers in 140 countries

250+
Locations globally

283B+
Units shipped annually

Avnet Investments

AVNET

CORE SEMI

softweb solutions AN AVNET COMPANY

CLOUD APPLICATION DEVELOPMENT

Witekio AN AVNET COMPANY

EMBEDDED SOFTWARE DESIGN SERVICES

TRIA AN AVNET COMPANY

EMBEDDED MODULES & BOARDS

DESIGNED BY AVNET

SOLUTIONS DEVELOPMENT: ADVANCED APPLICATIONS GROUP

IoT Sales Team

A global specialized IoT team focused on providing unique hardware, software and cloud expertise to OEMs

Extensive line card

Semiconductors, IP&E, embedded systems, software and cloud

Hardware Edge Design

Technology selection and support provided by 800+ Field Application Engineers

Embedded Software Design

Design, develop, and integrate embedded OS, firmware, and application software

Cloud and Digital Design

Complete IoT solutions (cloud, apps, data insights) built on /IOTCONNECT

Supply Chain and Logistics

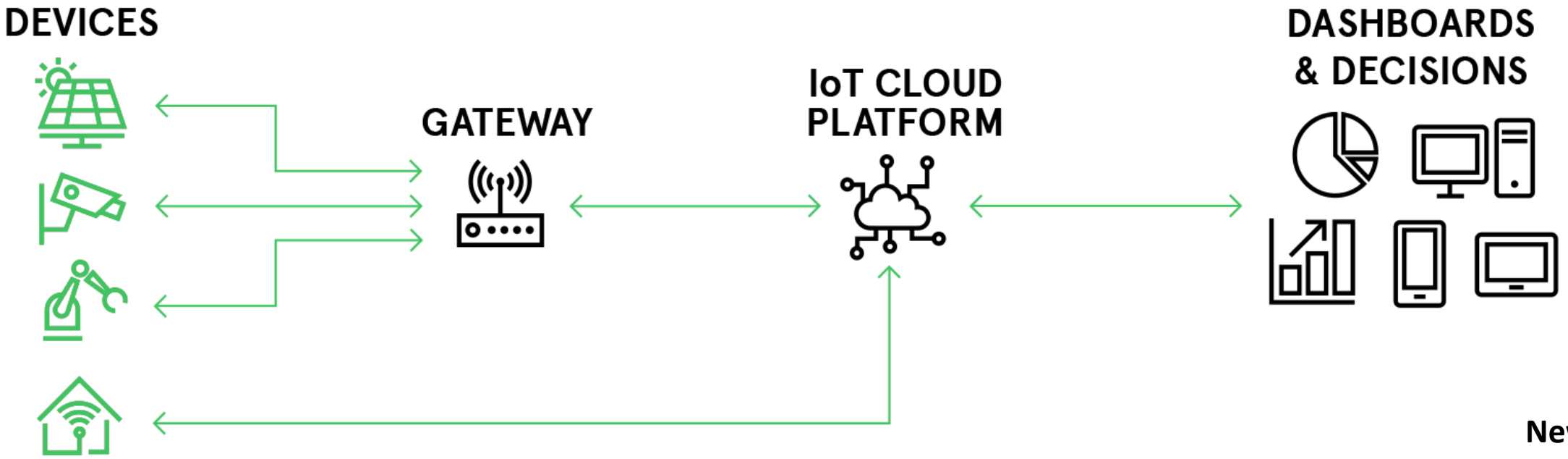
Supply chain models to address each customer's priorities

Lifecycle Management

Digital Managed Services, OTA updates, post sales support

Gives us Unmatched Capabilities

Challenge of IoT



Current Generation Product

New Hardware Development

New IoT Platform

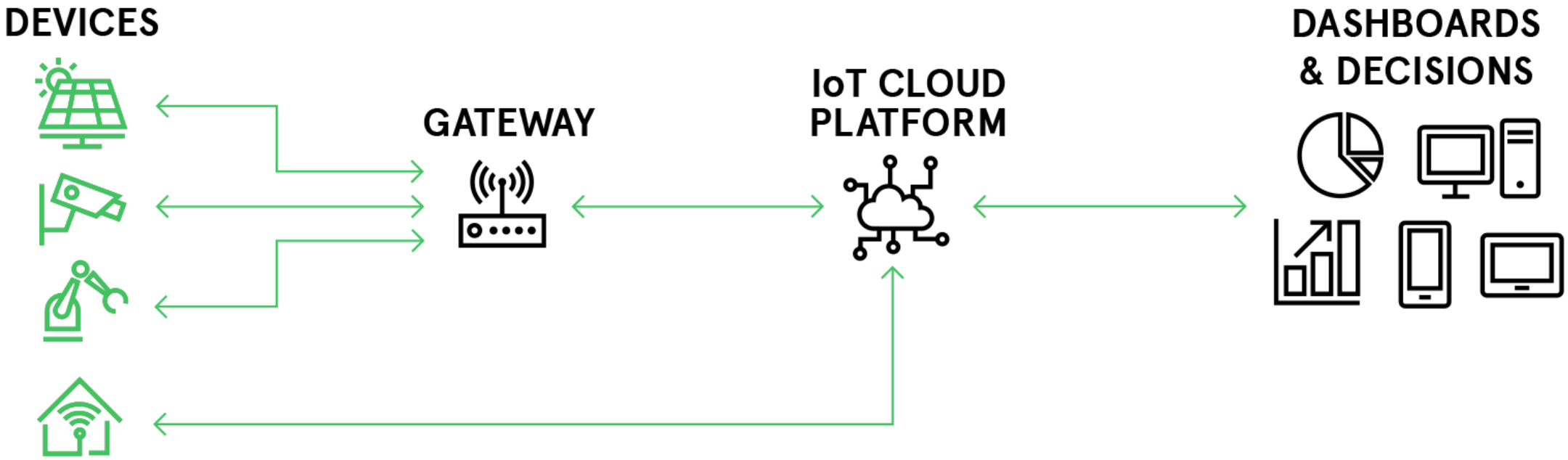
Legacy Infrastructure

New Communication Interfaces

Mobile App Integration

Developing an IoT product is costly, cumbersome, and time consuming.

/ Challenge of IoT



/ IOTCONNECT®

With /IOTCONNECT, IoT development becomes simple, secure, and scalable.

/IOTCONNECT®

AVNET

Things

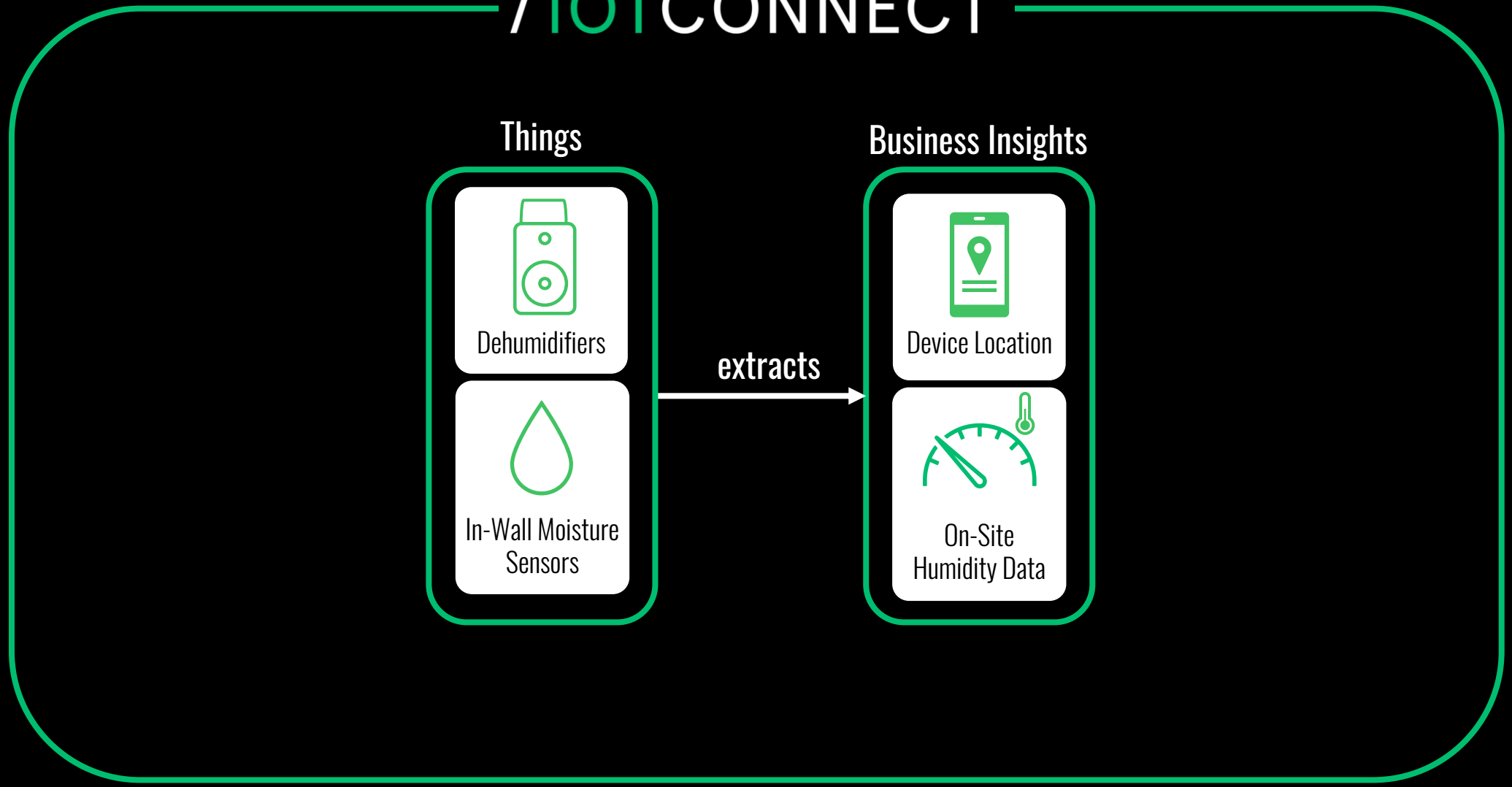
Dehumidifiers

In-Wall Moisture Sensors

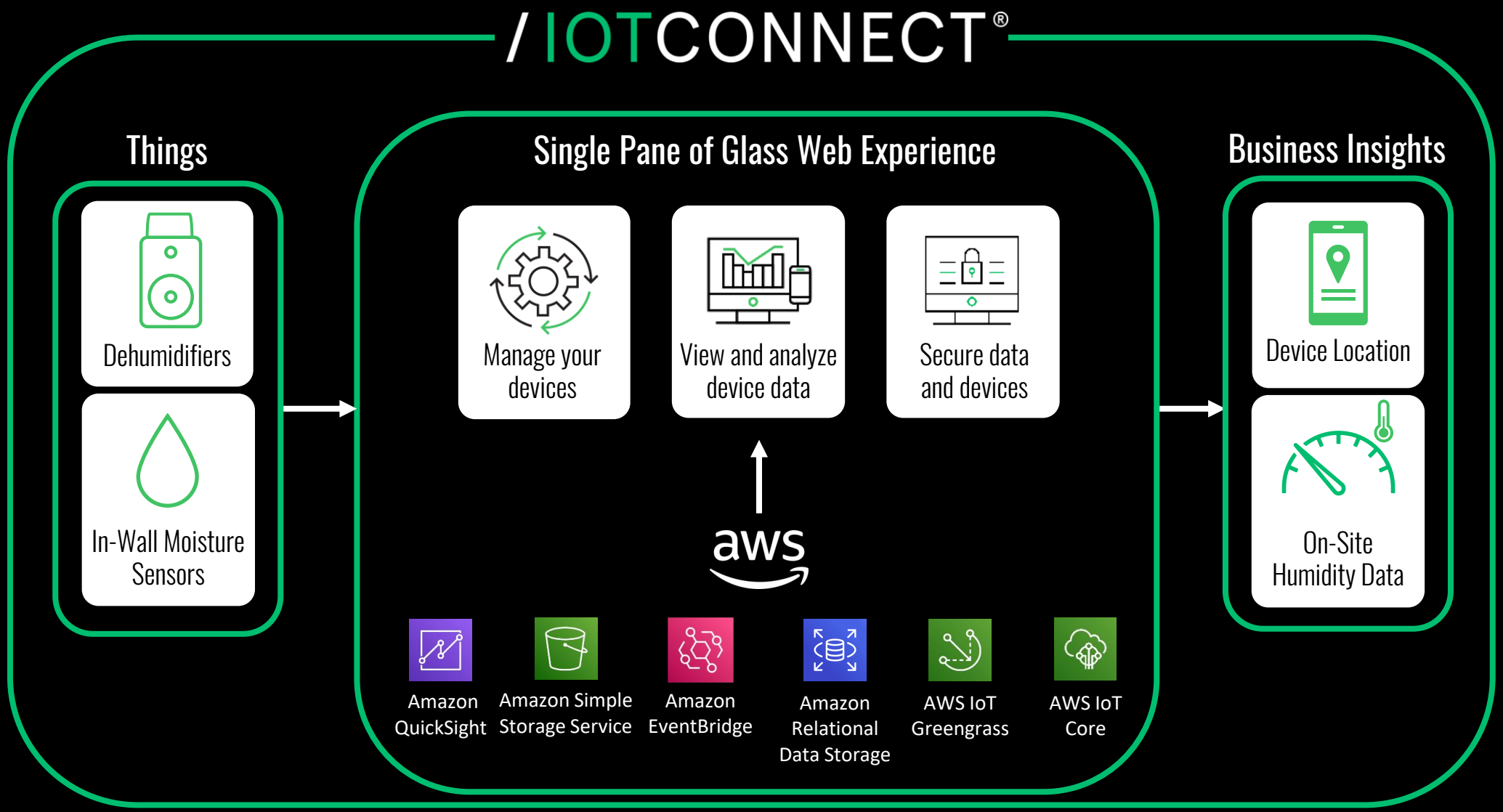
It takes **things** like **connected dehumidifiers** and **moisture sensors**

/IOTCONNECT®

AVNET



and **extracts valuable insights** to improve business intelligence



to create a **single pane of glass** experience that's **built on AWS**

Amazon QuickSight

Amazon SageMaker

Amazon Kinesis

Amazon EventBridge

Amazon Managed Grafana

Amazon DynamoDB

Amazon Relational Data Storage

AWS IoT Core

AWS IoT Core for Sidewalk

AWS IoT Core for LoRaWAN

AWS IoT Greengrass

Amazon Simple Storage Service

FreeRTOS

AWS Lambda

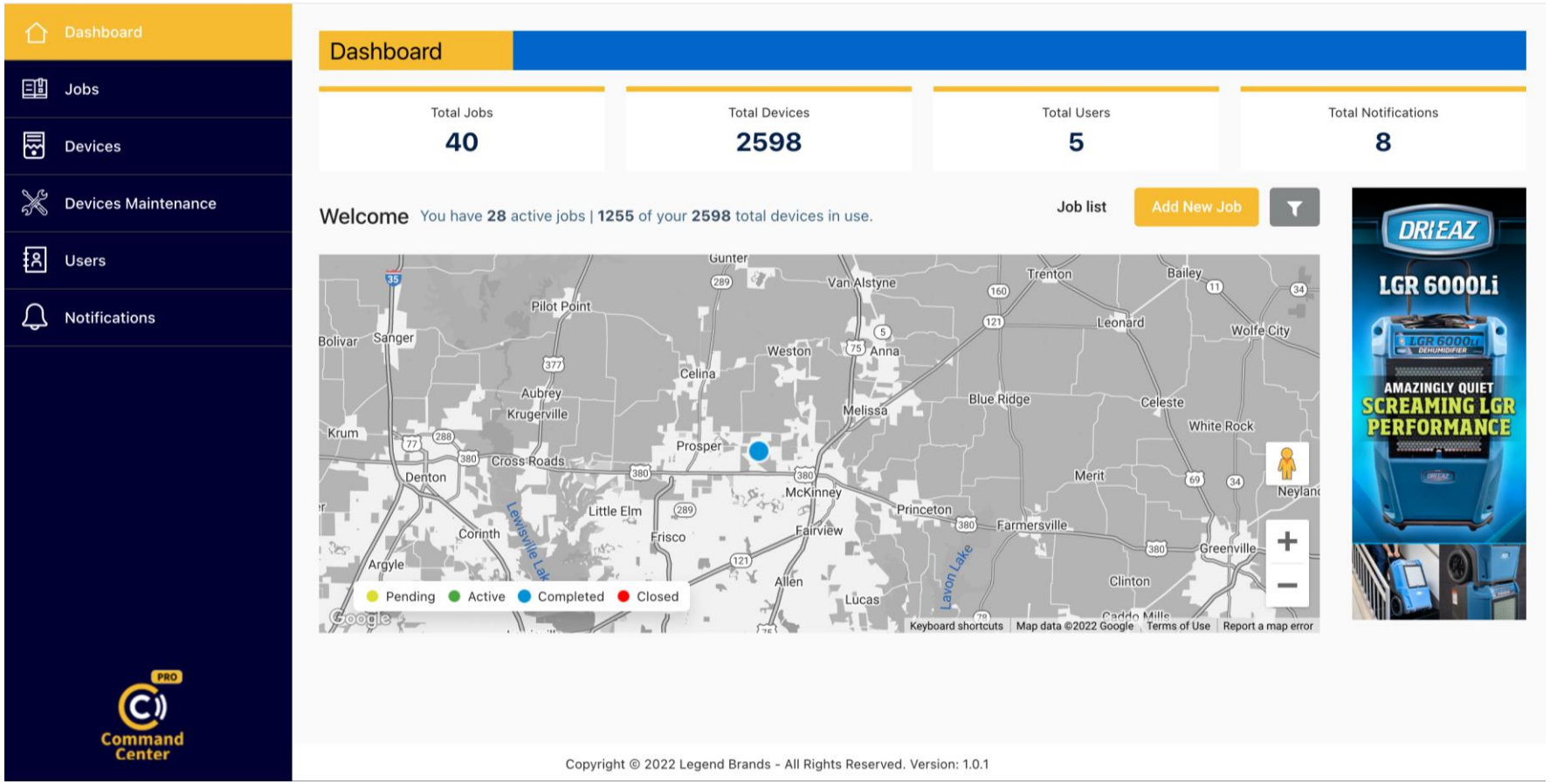
We take needed **AWS services** for IoT solution development

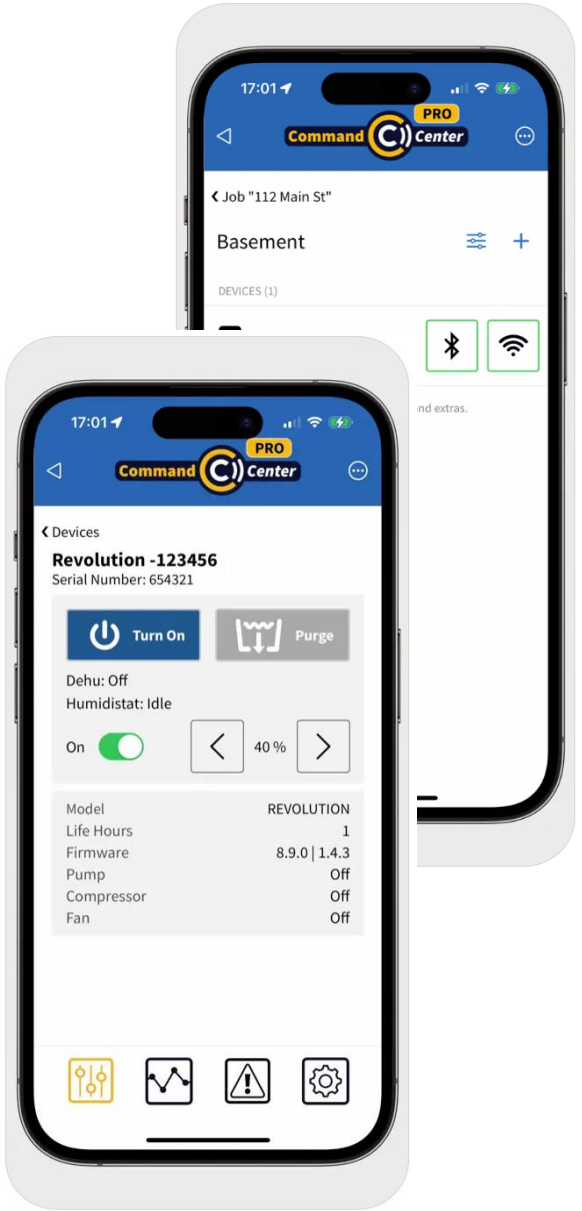
/IOTCONNECT®
Solutions Suite

One interface for AWS services

And aggregate them to create **one ecosystem** for **production ready IoT**

/IOTCONNECT SaaS Application in Action





Next Steps

/IOTCONNECT®

Avnet's Smart Factory Solution powered by IoT and AI

Challenges

Industrial automation and smart manufacturing of the future

Avnet's Smart Factory addresses several key challenges faced by manufacturers. Traditional systems often fail to provide a centralized, live view of the shop floor, making real-time monitoring difficult. Additionally, older systems lack the operational intelligence required to optimize production processes and improve efficiency.

Manufacturers also struggle with connecting multiple production lines and machines, leading to fragmented data and inefficiencies. Acquiring data at different stages of production from various sources can be complex and time-consuming with outdated systems. Furthermore, legacy systems often lack capabilities like remote monitoring, edge analytics, predictive maintenance, and digital twin technology, which are essential for modern manufacturing.

Avnet IoTConnect Solution

Begin your industrial IoT journey with our smart production line monitoring solution

Avnet's Smart Factory is a smart production line monitoring solution powered by AI and IoT technologies, which enables you to monitor everything on the shop floor from a centralized, live dashboard. Our industrial automation solution involves highly trained machine learning algorithms that can predict machine failures and brings higher operational intelligence that your legacy system was not able to perform.

Our Industry 4.0 solution enables manufacturers to connect multiple production lines and machines, acquire data at different stages of production from several disparate sources and develop capabilities like remote monitoring, edge analytics and predictive maintenance and digital twin.

Key Performance Indicators (KPIs)

Availability
- Measures the uptime of machines and equipment, ensuring that production schedules are met without delays.

Quality
- Tracks the consistency and standard of products, helping to maintain high-quality outputs.

Downtime
- Monitors and minimizes unplanned downtime, which can severely impact production efficiency.

Behind Plan
- Keeps track of production schedules, ensuring that any delays are quickly identified and addressed.

Actual Performance
- Evaluates the performance of machines against their expected capabilities, providing insights into areas for improvement.

Overall Equipment Effectiveness (OEE)
- Combines availability, performance, and quality metrics to provide a comprehensive view of manufacturing productivity.

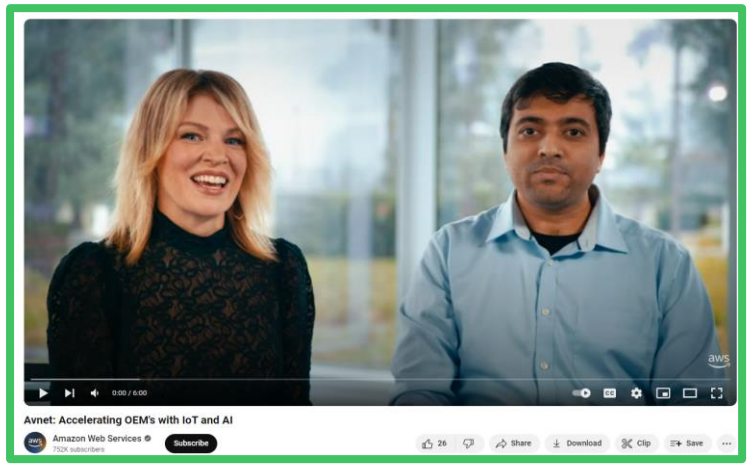
Machine Status
- Tracks whether machines are down, idle, or in use, allowing for better resource allocation and maintenance planning.

Avnet Contact: Gavin Kirk | Gavin.Kirk@avnet.com

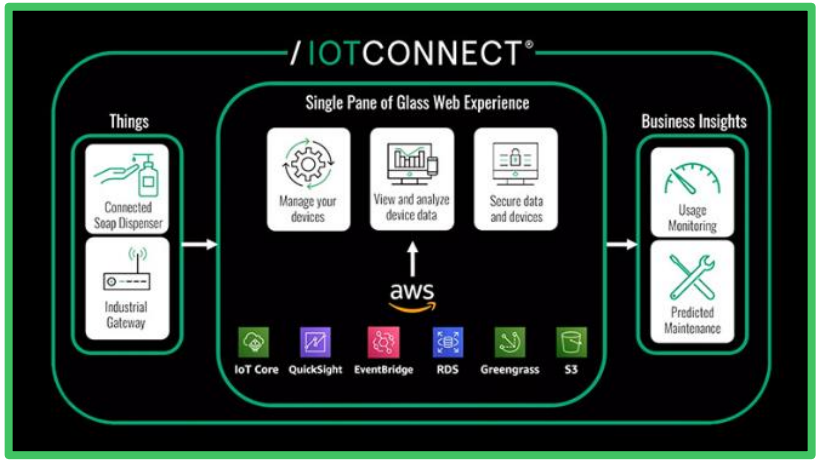
Contact us!

Learn more

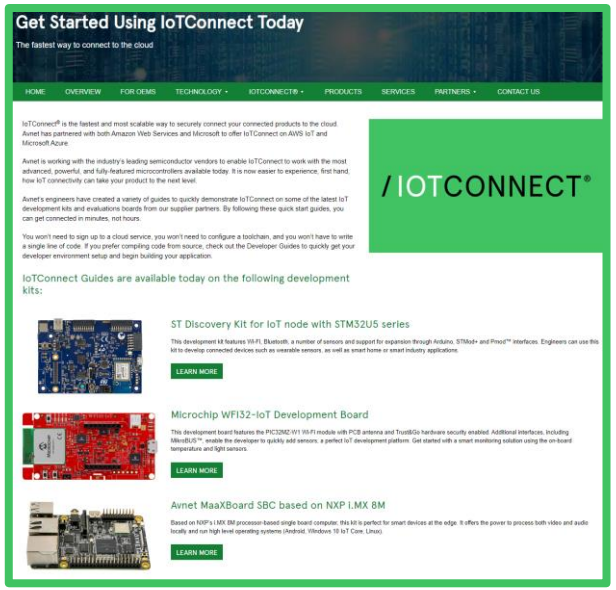
/ Resources



[Avnet and AWS:
This is My Architecture]



[Avnet
/IOTCONNECT Webinar]



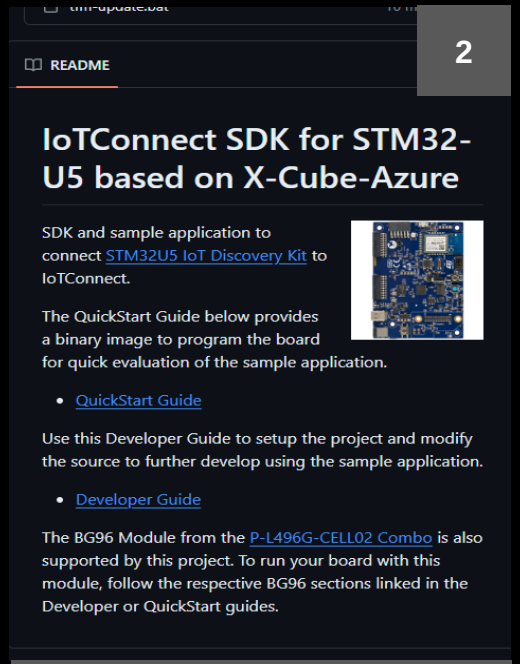
[/IOTCONNECT Quick Start
Development Kits]

/IOTCONNECT Quick Start Enablement

AVNET

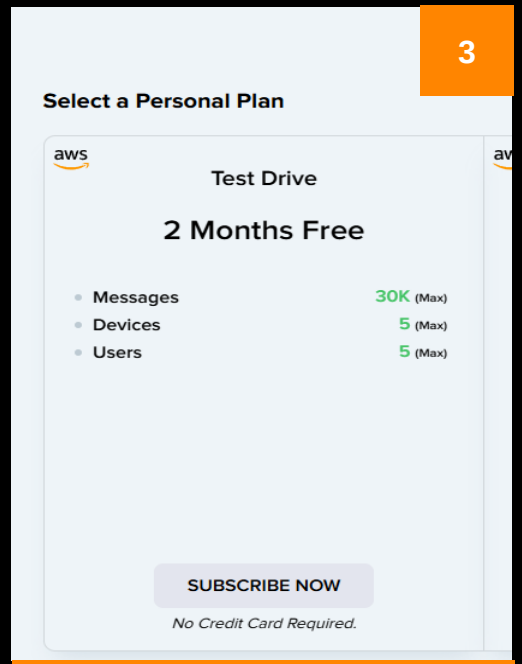
Pick a Board

Access our quick start landing page to look at the variety of developer board options that we have enabled. Select which board fits your need.



Access GitHub

Click the GitHub link to see the sample code we have created for each of these developer kits. These include templates and dashboards.



Sign up for Free Trial

Using the provided link from the quick start guide, sign up for a free /IOTCONNECT account and demo all of the design acceleration features.

Start Developing

With dynamic dashboards and easy onboarding widgets, /IOTCONNECT makes designing for your application simple, secure, and scalable.

Appendix

/IOTCONNECT Supports All Devices

AVNET

Services

- **AWS IoT Core**
- **AWS IoT Core for** LoRaWAN, amazon sidewalk
- **AWS IoT Greengrass**

Device Types

- Connected Devices
- Gateway & Child Devices
- Private LoRaWAN Base Station
- Private LoRaWAN Concentrator
- Public LoRaWAN Device
- Amazon Sidewalk Device
- Edge Server or Gateway

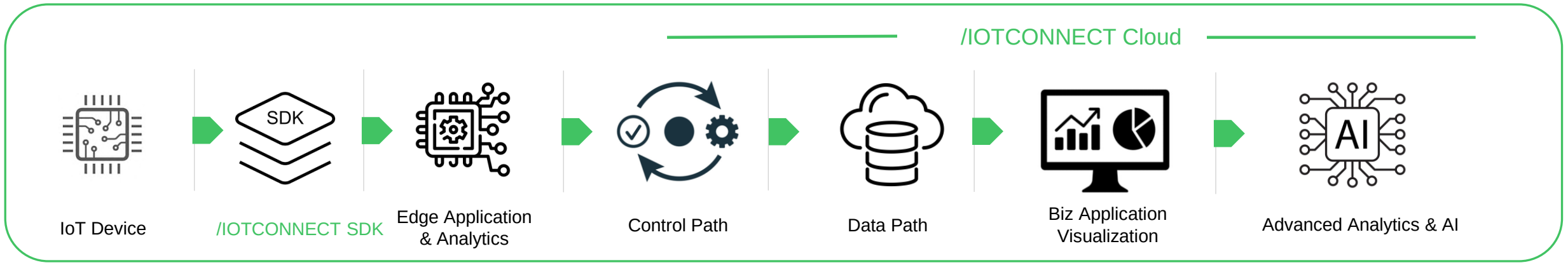
Device Enablement

GitHub

FreeRTOS, AWS IoT Greengrass, DEB, Eclipse Foundation ThreadX, Android, yocto LINUX, Arduino, Windows, Apple

/IOTCONNECT enables ALL devices types through a single pane of glass.

/IOTCONNECT Building Blocks w/ AWS



FreeRTOS

Python

C

Greengrass

Transport

amazon sidewalk

LoRaWAN

PRIVATE | PUBLIC

IoT Core

EventBridge

Kinesis

Lambda

RDS

S3 Data Lake

S3

DynamoDB

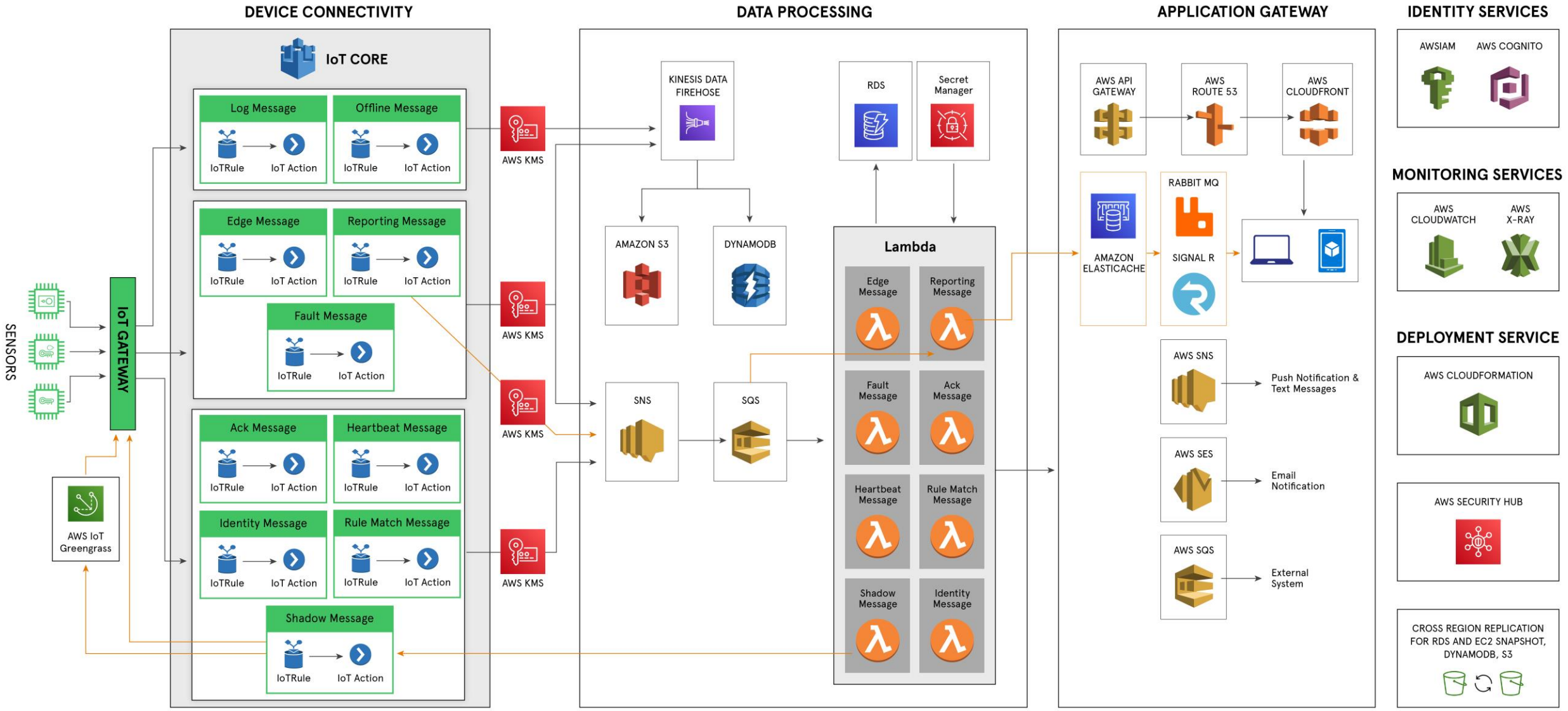
QuickSight

Grafana

SageMaker

/IOTCONNECT®

/IOTCONNECT Platform Architecture



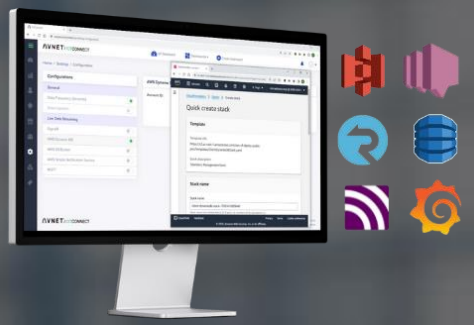
//IOTCONNECT Developer Personas

- Device, User, Roles, and Entity Admin
- Security manag
- Basic dashboarding
- Internal Ops

Device Builders & Deployment Managers

- RESTful API
- Predictable URLs
- Intelligent error handling
- OAuth 2.0 authentication
- Access to all IoTC functions

Application & UX Developers



- Dynamo DB, S3
- Signal R
- MQTT
- Grafana
- AWS SNS

Cloud Developer & Data Science

/IOTCONNECT SDKs: Deliver a Positive Developer Experience

Objectives:

- Deliver device-builders a positive developer-experience
- Integrate into the Avnet Supplier's development flow and ecosystem
- Provide confidence for a successful outcome at the onset of our customer's IoT journey

Software Resources

- /IOTCONNECT Enablement, Witekio, and Softweb service teams
- Access to global and scalable Avnet software services
- Skills: C, Python, Java, OS/RTOS, Applications, AI/ML

Deliverables

- /IOTCONNECT Library
- SDK (C / C# / Python / …)
- Test Strategy
- Platform Targeted Samples
- Developer Guide
- QuickStart Experience

Device Enablement: SDKs

Generic SDKs

Multiple Languages and Environments

C, C++, C#, python, node.js, Kotlin, Swift

Platform-specific SDKs

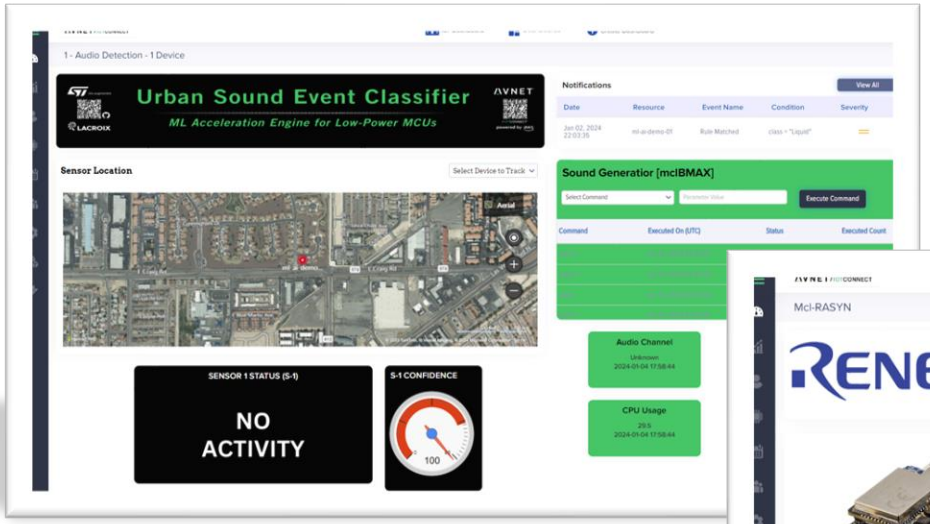
Development Boards and Embedded Hardware

Infineon, Microchip, NXP, ST life.augmented, Renesas, intel, ASUS, Advantech, DELL

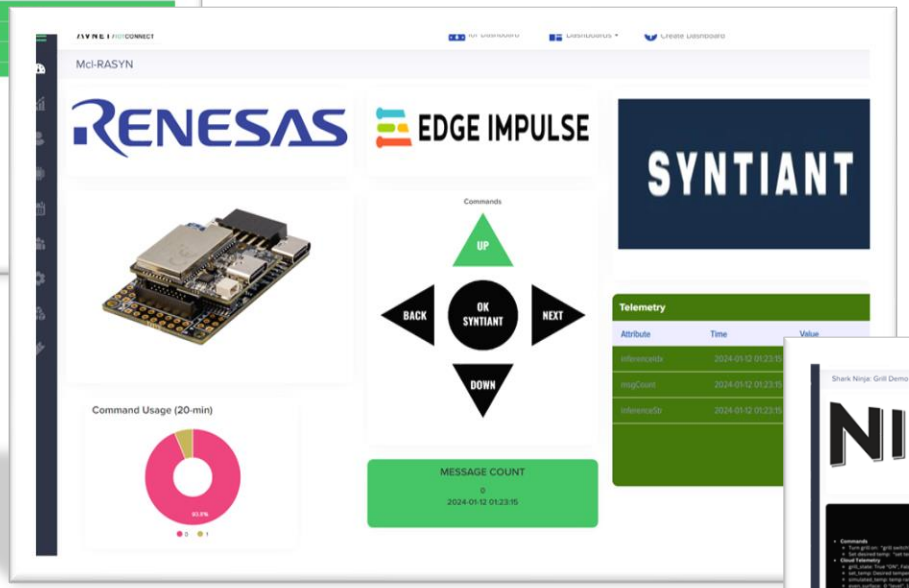
https://docs.iotconnect.io/iotconnect/sdk/

https://github.com/avnet-iotconnect/

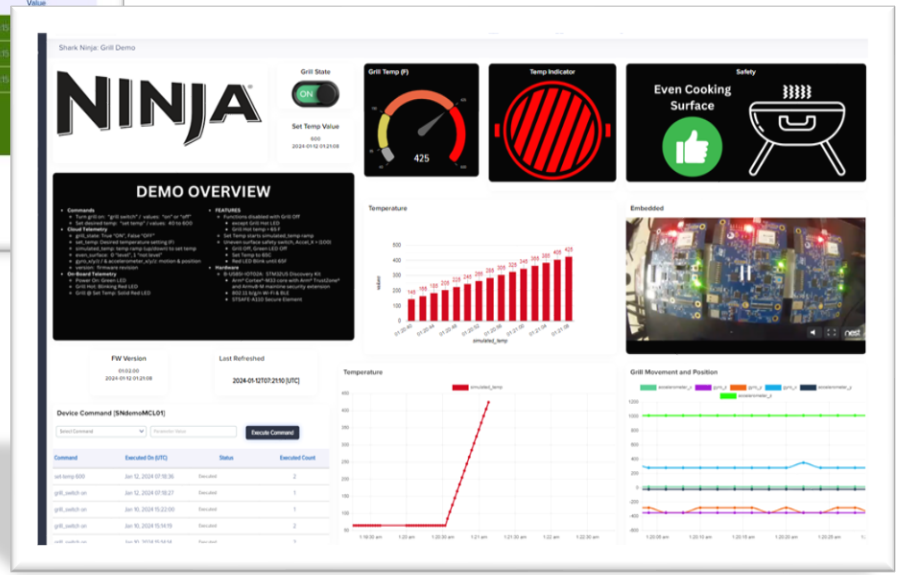
/IOTCONNECT AWS Demo Examples



AI/ML Audio Classification



Edge ML Voice and Motion Detection



Consumer Indoor Grill