



2021 Buyer's Guide

# Industrial IoT Platforms

Edge-to-Cloud Smart Manufacturing Platforms



**Over the last few years, all of the pieces have fallen into place to establish a very clear vision and opportunity for Industrial IoT. The technology has matured; assets are connected, industrial connectivity is robust, data is available in mass, and cloud adoption is widespread.**

The potential use cases are also advancing, from condition-based monitoring and predictive maintenance, to machine learning and AI. However, manufacturers have struggled to figure out exactly how to put their data to work to implement these use cases at scale for productivity and efficiency gains.

IIoT must start with data connectivity and end with a unified edge-to-cloud strategy. The time is now to choose an IIoT platform that can connect to every asset for a complete data picture, perform local analytics, integrate with enterprise and cloud systems, and then enable machine learning and applications back at the edge.

Manufacturers can no longer afford not to adopt a modern IIoT platform to become more efficient and agile; the challenge is choosing the right strategy that will make use of the right data at the right time and in the right place. Plus, the ideal IIoT platform helps manufacturers modernize without rebuilding the entire shop floor.

This IIoT Platform Buyer's Guide will explain the challenges and building blocks for a successful edge-to-cloud IIoT solution, essential platform capabilities, and most importantly how several leading vendors in this space are positioned to help companies collect data and use it to feed cloud applications and drive better business decisions.

# IloT Challenges

**Agreeing on a definition of IloT helps to frame a conversation around the ideal solution. IloT uses connected assets to create a complete data picture for improved industrial processes. An IloT platform collects, normalizes and analyzes high volumes of live data from industrial assets and makes it available to OT and IT systems via edge-to-cloud integration.**

Depending on their level of maturity, companies working to embrace IloT find a number of challenges. First, figuring out how to make use of data from all of the heterogeneous assets from various vendors on the factory floor. They use numerous protocols and data formats, and although they may be connected to an OT system, they usually cannot easily share data with IT enterprise and cloud systems as well.

The next challenge is understanding the right balance between edge and cloud computing. Companies often choose to focus on one or the other without realizing they can, and should, do both. Cloud computing has its benefits for long-term analysis but is limited by bandwidth and often collects vast amounts of data but only uses a small portion. The value of the edge, or on-premise, lies in taking action on data where it has the greatest impact and zero latency.

Even after these issues are solved, many companies struggle to scale IloT solutions. According to McKinsey, only 30 percent of IloT projects are moving beyond a pilot into large-scale rollout. Successful implementations provide the ability to connect to any number of assets, manage devices, and deploy applications and analytics across any number of sites from one central location.

A modern IloT platform can solve all of these challenges by connecting all industrial devices and systems, enabling companies to collect, normalize, analyze and take action on real-time data at the source, then integrate the data with cloud and enterprise systems for advanced analytics and use cases. Even better, the right platform can do all of this painlessly without much, if any, onsite development work.

# 50%

**Gartner predicts 50% of industrial enterprises will use IloT platforms by 2025**

# Top IIoT Use Cases

The desired outcomes for IIoT initiatives are surprisingly similar across industries including Manufacturing, Oil & Gas, Energy, Distribution, and Transportation. Most companies aim for better insight into asset health and performance, improved OEE, predictive maintenance, and improved processes and efficiency from machine learning. Following are four of the most common use cases for IIoT.



## Machine Learning and AI

Machine learning and AI starts with connectivity at the edge. Connecting devices, collecting and normalizing production data and making that data available to big data and machine learning systems allows companies to develop the ML models needed to improve operations. Being able to rapidly deploy and run these new models at the edge completes the feedback loop, and provides the edge-to-cloud intelligence needed for continuous optimization.



## Predictive Maintenance

Anomalies in the production line often lead to unplanned downtime and costly maintenance. IIoT platforms can enable predictive maintenance to reduce the cost of failure. The ideal platforms come with KPIs for asset utilization, uptime/downtime, and more. Use cases often start with reactive maintenance, move to predictive, and eventually prescriptive maintenance to reduce repair costs, minimize downtime, maximize output, and improve remediation efficiency.



## Asset Condition Monitoring

Condition-based monitoring is often the first use case for IIoT. Many companies are reactive, solving problems as they see them with their own eyes. Condition-based monitoring allows them to move to the next step of intelligence, by collecting and analyzing machine data to understand how assets are performing. Creating KPIs and alerts for basic machine data such as temperature, vibration and velocity provides intelligence that can be acted on in real-time to ensure all machines run as planned.



## OEE

OEE (Overall Equipment Effectiveness) is a discrete manufacturing best practice that measures productivity based on three factors: availability, performance, and quality. OEE evaluates how effectively a manufacturing operation is utilized by comparing fully productive time to planned production time. Modern IIoT technology offers readily available, real-time data to fuel OEE measurements and then help companies determine how they can improve operations over time.

# IloT Platform Building Blocks

The right IloT platform enables rapid deployment by seamlessly handling device connectivity, edge analytics, data integration, and application enablement. The following building blocks are key in choosing an IloT platform.

## Device Connectivity

There are four essential parts to device connectivity – device drivers, data collection, data normalization and data storage. Basic data collection from a select few industrial machines does not meet the requirements for enterprise IloT. The ideal IloT platform offers rapid data connectivity to all modern and legacy industrial systems with just a few clicks – enabling data collection and structuring data to be used by any edge or enterprise application.

## Edge Analytics

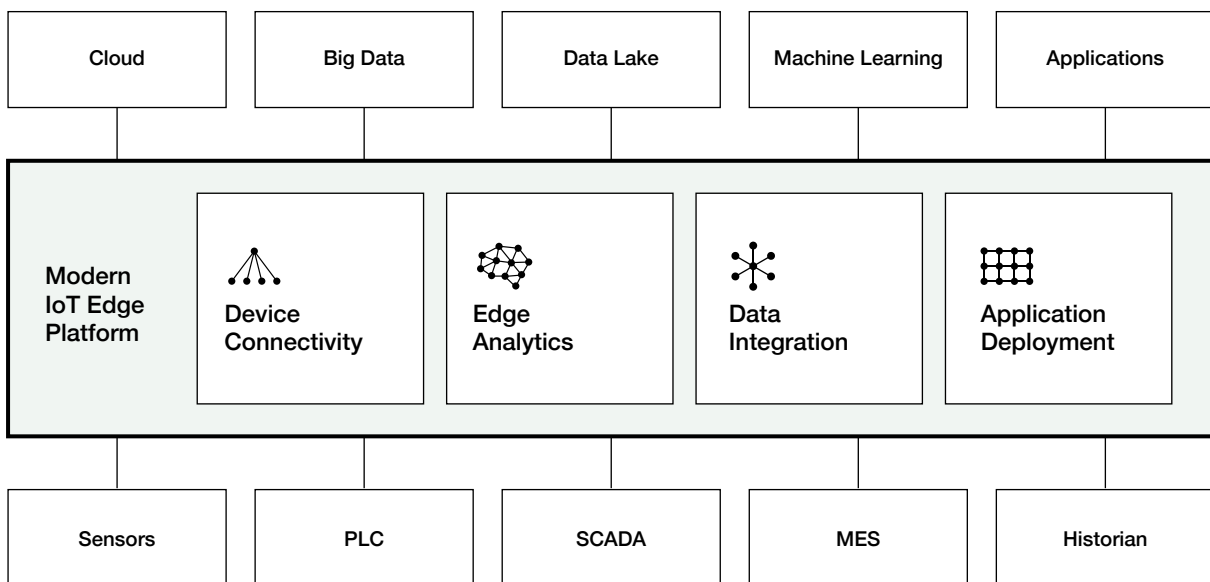
The platform should be able to perform analytics at the edge and enable advanced analytics and machine learning in the cloud. Pre-built data visualizations and analytics at the edge for common KPIs such as condition-based monitoring and OEE allow customers to realize rapid time-to-value. The ability to run data models created in the cloud back at the edge provides closed loop edge-to-cloud operations.

## Data Integration

The next building block for an IloT platform is pre-built integration with leading third-party cloud or big data systems for machine learning and advanced analytics. Once connectivity and analytics are enabled, the platform should be able to stream ready-to-use data to any cloud or enterprise system. The ability to send data bi-directionally between OT and IT systems provides the anywhere-to-anywhere integration needed to enable enterprise-scale IloT.

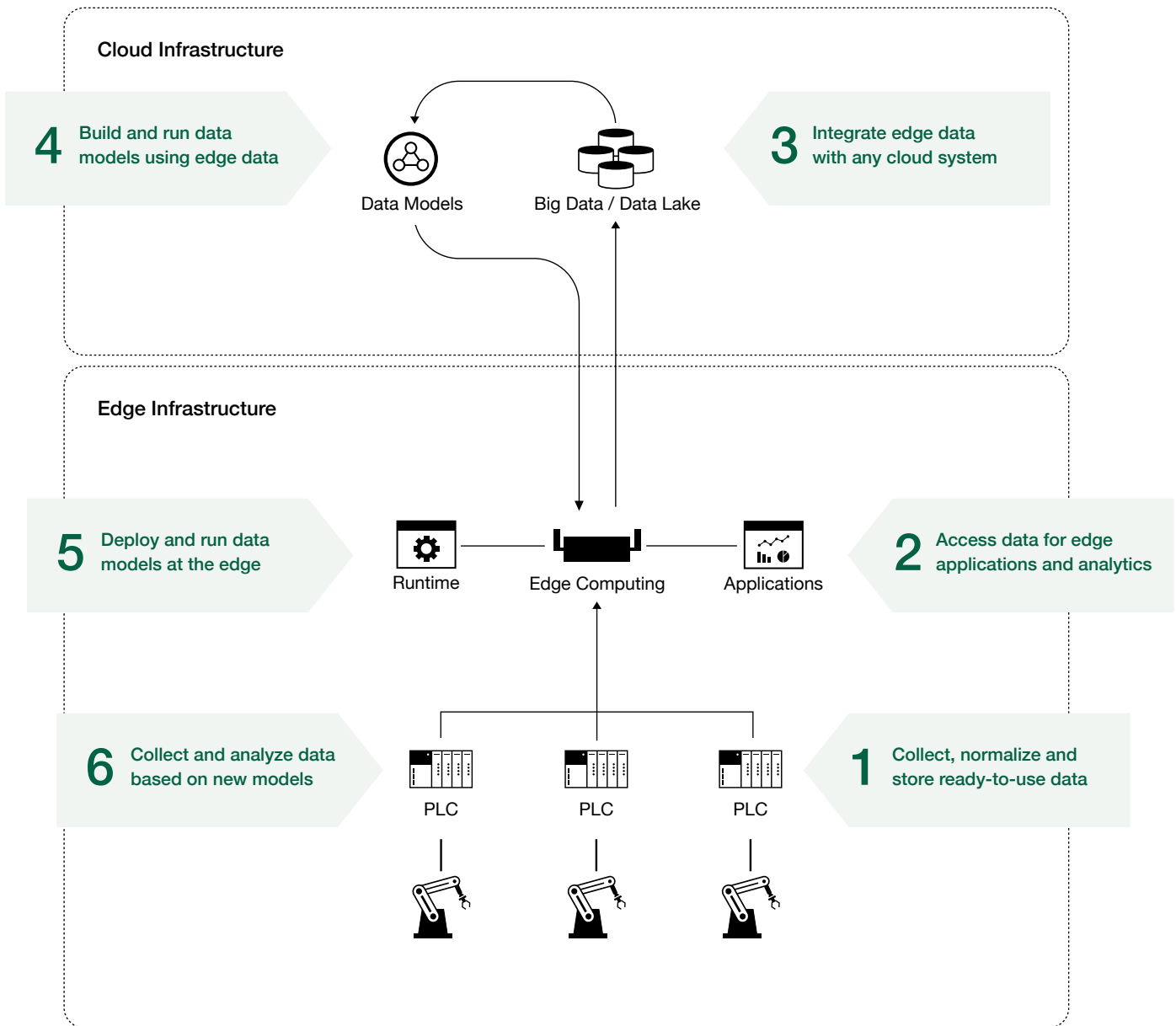
## Application Deployment

The IloT platform should be able to host and access public or private applications in a centralized repository, with the ability to rapidly and securely deploy and run applications at the edge. The IloT platform should also stream normalized and structured data to any pre-built or custom application at the edge, and run those same applications as close to the data source as possible.



# How Does an IIoT Platform Work?

A modern IIoT platform is purpose-built to solve the complex challenge of not only connecting to any industrial asset or data source, but then normalizing the data, integrating with cloud and enterprise systems, and enabling machine learning runtimes back at the edge for a unified edge-to-cloud solution.



# IloT Platform Vendor Ecosystem

With dozens of IloT platforms on the market, choosing a solution that checks all of the right boxes can be challenging. Below is a list of vendors who have appeared in IloT platform reports published by leading analyst firms. The top rated vendors have the most comprehensive solutions with all of the must-have IloT platform building blocks as outlined in this guide – device connectivity, edge analytics, data integration and application deployment.

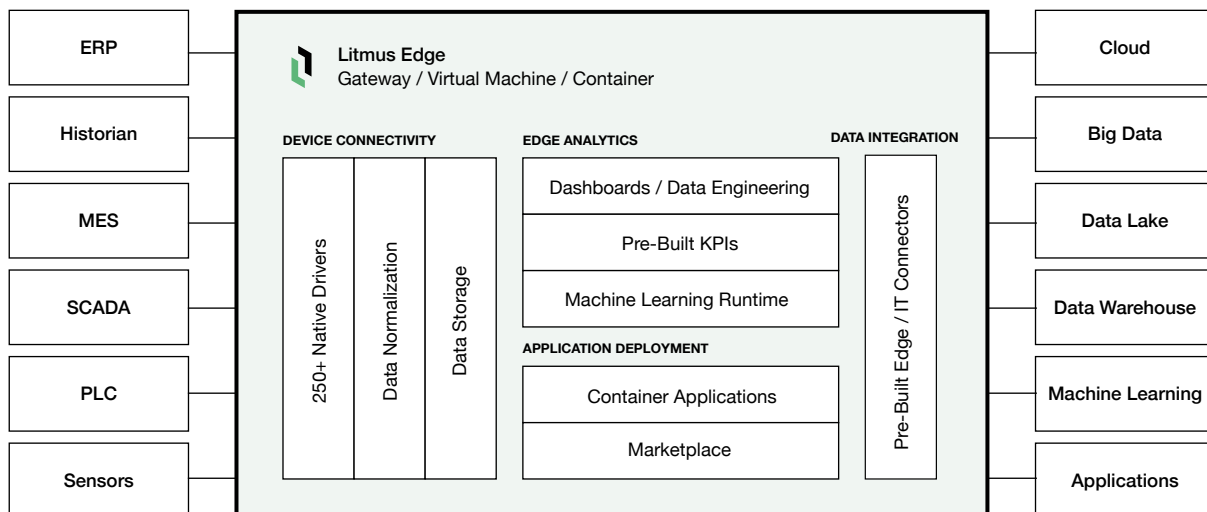


# Litmus

Looking at all of the Industrial IoT platforms, what makes Litmus a leader is its ability to handle every critical function at the edge – connecting to every device on the shop floor, performing data analytics at the edge, integrating data with any cloud or enterprise platform, and enabling applications at the edge. Litmus is the most complete edge IoT platform, integrating seamlessly with AWS, Azure, Google and others to provide the edge-to-cloud intelligence and data flow needed for smart manufacturing.

Litmus leads edge connectivity with more than 250 native drivers, the most in the industry. The platform normalizes data from any number of assets into one ready-to-use format. Litmus Edge offers real-time data visualizations, analytics, and pre-built KPIs for immediate value at the edge. Litmus easily integrates with cloud or enterprise applications to feed machine learning models and runs those models back at the edge to complete the feedback loop for continuous optimization.

Litmus enables secure and rapid edge application deployment with a centralized marketplace for public or private applications. Litmus streams data to pre-built or custom applications running in Docker containers on Litmus Edge. Litmus is a secure, offline-first platform that offers edge orchestration at scale with a single point of control for large-scale deployments. Litmus offers flexible deployment as an OS or VM on any gateway or local server.



## Device Connectivity

- Pre-loaded device drivers
- Data collection
- Data normalization
- Data storage
- Data access

## Edge Analytics

- Visualizations and dashboards
- Common KPIs
- Zero setup analytics
- Video processing
- Statistical and analytical queries
- Time series data
- Machine learning runtimes

## Application Deployment

- One-click application orchestration
- Docker container-based
- Public or private application marketplace
- Default set of applications
- Ability to deploy to many edge devices
- Zero-touch provisioning
- Central lifecycle management

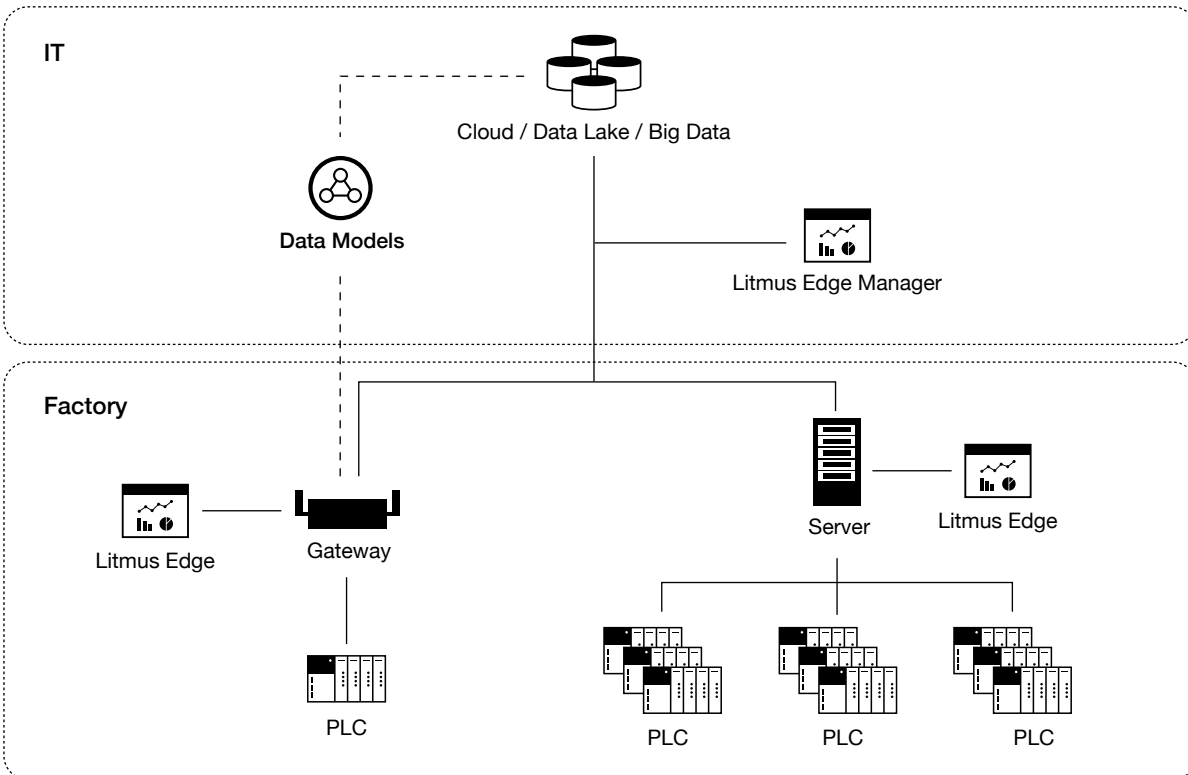
## Data Integration

- Send ready-to-use data
- Pre-built connectors
- Integrate with leading cloud providers
- Feed big data implementations



# How Litmus Edge Works

Litmus Edge can be deployed next to existing technology to modernize without rebuilding, is flexible and scalable, enables new use cases, and offers rapid time-to-value. Companies looking for a modern IIoT platform should consider the following benefits.



## One Platform

Litmus Edge combines data connectivity, analytics, application deployment, and pre-built integrations to send data to any enterprise application.

## Deployed at the Edge

Deploying at the edge enables real-time data analytics, visualization and insights to derive value at the source with zero latency, where it has the greatest value.

## Flexible and Scalable

Litmus Edge is easy to deploy with no programming, flexible enough to work alongside existing systems and can scale to any number of assets or sites with ease.

## Open Data Flow

Data can be analyzed at the edge, pushed to the cloud, into data lakes, or to any enterprise application, then back to the edge for true anywhere-to-anywhere data flow and connectivity.

## Build On Existing Investments

Modernize without rebuilding by working alongside existing industrial automation systems to preserve previous investments while new value is derived.

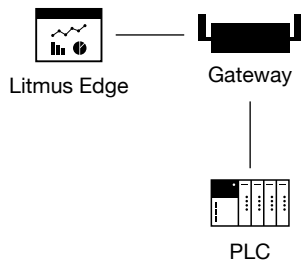
## Rapid Time-to-Value

Litmus Edge is purpose-built for industry and offers rapid time-to-value with native drivers, pre-built analytics and enterprise cloud integrations, enabling value in just days.

# Flexible Deployment Architecture

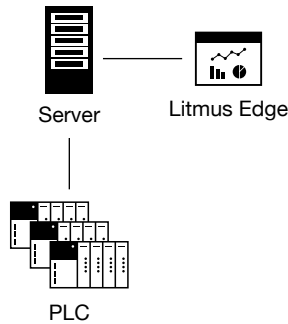
Choosing an IIoT platform with a flexible deployment architecture is the last key consideration for manufacturers who are ready to digitally transform. The Litmus deployment architecture is simple – customers start with a pilot on a single gateway to test out the solution, then they expand the initial use case to multiple machines for a production deployment. Last, the solution scales to multiple factories for a mass deployment. Additional sites can be deployed and managed from a centralized edge orchestration platform.

## DAY 1 Pilot Deployment



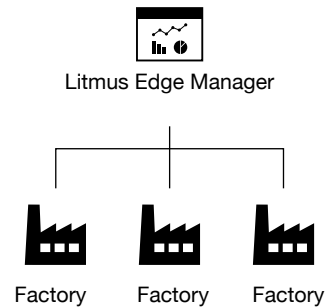
Get started quickly by adding Litmus Edge to one machine for a single use case. Start with one or two data points, collect, normalize and store the data, then see instant KPIs, dashboards, and visualizations. Prove out cloud connectivity for a complete pilot to prove the solution works from end-to-end.

## DAY 30 Production Deployment



Once the pilot is successful, create a “production-grade” application for a specific use case with measurable metrics. Expand to multiple machines and explore additional use cases. Begin sitewide data collection, analytics and integration. Within 30 days it becomes clear if the solution is working.

## DAY 90+ Mass Deployment



Scale the solution to multiple factories. Litmus Edge can handle any number of devices or sites with centralized edge management and application orchestration. More data streams and more use cases can be added to improve operations. Continue to evaluate and adjust regularly to increase business value.

# Capabilities Checklist

Not all platforms are created equally, but there are certain key capabilities that help customers create successful IIoT use cases. The customer should be able to implement, maintain, and scale the solution with ease, while experiencing time-to-value in weeks, not years. Use this checklist to compare and validate the top capabilities for any IIoT platform.

	Litmus	Vendor 1	Vendor 2	Vendor 3
Out-of-the-box support for hundreds of devices and protocols	✓			
Zero-programming device setup and configuration	✓			
Unified edge computing platform and common data layer	✓			
Stream normalized data between edge systems and applications	✓			
Edge orchestration from a single point of control	✓			
Pre-built edge analytics and alerts at the data source	✓			
Large marketplace of pre-built and custom applications	✓			
Pre-built data integration to any cloud or enterprise application	✓			
Run any data model from any machine learning system at the edge	✓			

# Getting Started

Choosing an IIoT platform is based on a number of customer requirements. Features, ease-of-use and time-to-value are all essential considerations. Many manufacturers have delayed embracing an IIoT platform because they are under the impression it will cause some growing pains and come at a high price in both time and hard costs. The beauty of the Litmus IIoT platform is it will tap into existing technology on the shop floor, add a very important layer of intelligence, and then send that data across the enterprise for fast results. The Litmus platform can be implemented in just a matter of days, providing instant value across the enterprise for both OT and IT teams.

## Litmus Edge Demo Video

<https://litmus.io/litmus-edge/demo/>

## Industrial IoT Playbook: Connecting OT Assets at Scale

<https://litmus.io/resource/industrial-iiot-playbook-connecting-ot-assets-at-scale/>



The Modern Edge Platform for Industry

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