

INTRODUCING

PI Edge

Data management extended to
remote assets and IIoT devices

Capture real-time data from assets operating
outside your primary network





Valuable operations data may be stranded in remote locations, on isolated platforms, deep undersea, out in the field, or on the road.

Edge data can accelerate digital transformation by helping optimize resources, reduce costs, and improve real-time decision-making. However, getting access to data outside your primary control network can be difficult and costly. Data collection is often limited by physical isolation or harsh conditions. Transmission can be unreliable due to unstable or intermittent connectivity. And hosting a data store at each location is impractical when there are dozens or even hundreds of remote assets. You need an easy and cost-effective way to make edge data part of your overall data management strategy.

PI Edge: Cost-effective edge visibility

Traditional data management systems are not a good fit for remote locations where space, technical expertise, and network connectivity are limited. PI Edge products overcome these challenges by providing lightweight data collection and

data storage software. This software runs on low-cost, small-footprint devices that you can deploy almost anywhere and don't require onsite IT support.

Monitor remote or mobile assets

The substantial cost of connecting remote assets in isolated locations to your network means many critical assets go largely unmonitored. Unfortunately, this lack of visibility increases the risk of an unexpected outage or asset failure in precisely the locations that are hardest to reach.

PI Edge products bring remote assets out of the shadows. You can collect and store key performance data and make it available for historical comparison, trending, data modeling, and other analysis. Give local operators real-time data for better decision-making or transmit edge data back to your PI Core or PI Cloud deployments for advanced analysis.

Gather data from industrial IoT devices

Inexpensive sensors power many smart, new industrial devices capable of transmitting data in real time. This Industrial Internet of Things (IIoT) data has tremendous potential for enabling energy management, enhanced field service, asset tracking, and predictive maintenance, as well as helping you address environmental health and safety concerns.

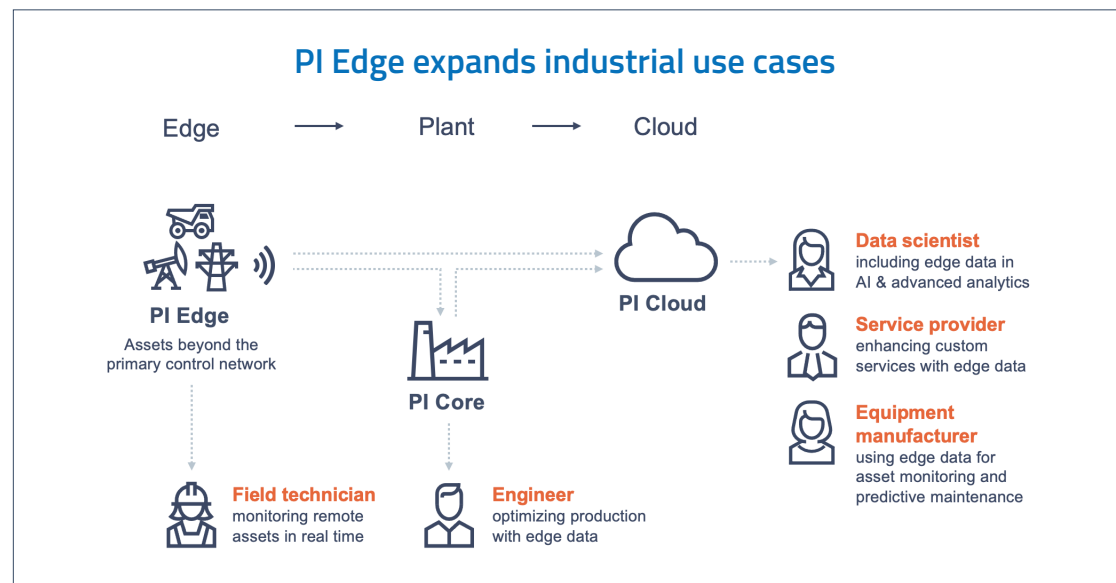
PI Edge reduces the cost and complexity of collecting IIoT data from hundreds or even thousands of devices and makes it available for advanced analysis, application integration, and sharing

with colleagues in other parts of the company.

Add legacy assets to your network

In some industries, critical assets operate outside the control network because they don't conform to modern communication standards. Once legacy assets are outfitted with sensors, however, you can use PI Edge software to capture key performance data and bring legacy assets out of the dark.

Proactive monitoring helps you keep aging assets healthy and avoid expensive rip-and-replace projects that require downtime to complete.



PI Edge extends your overall data management system to include performance data from remote assets.



The PI Edge approach

PI Edge software components help you overcome the obstacles to accessing data from remote assets.

- **PI Adapter** software captures data from devices that use a variety of operations and IIoT communications protocols such as Modbus TCP or OPC-UA right out of the box. You can deploy stand-alone, lightweight PI Adapters to forward data when you don't need edge storage.
- **Edge Data Store (EDS)** combines standard data connectivity with configurable local storage that runs on Linux or Windows operating systems. Capacity is limited only by the size of the underlying device. You can also write data directly into EDS using REST APIs to connect to nonstandard data sources and transfer data to visualization tools, applications, and artificial intelligence and machine learning platforms.
- **Seamless integration** means that PI Edge software can transmit data natively to a PI Server on-premises or to OSIsoft Cloud Services (OCS) for enterprise-wide data management.
- **Self-healing technology** allows PI Edge products to operate with resilience in harsh and rugged conditions. Buffering technology protects data when the asset loses power or connectivity or moves out of range—a common issue with mobile assets or isolated locations.



Benefits of PI Edge

Reduce cost of data capture

Industrial operators have long used traditional Windows-based technology and VPN connections to capture and analyze operations data. However, this approach can become costly as the number of assets grows and spreads across a greater distance. PI Edge helps you reduce this cost. You can deploy EDS on simple Linux cards or devices and immediately begin transferring data to your PI Server over existing communication networks—no need for VPNs or local IT support.

Increase operating efficiency

Having access to data at the edge can also increase the operating efficiency of your remote assets. One oil and gas company uses EDS to capture high-fidelity data from underwater pumps and identify exceptional events for deeper analysis. Filtering the raw data before transmission significantly reduces

satellite bandwidth requirements.

Asset operators can take action without waiting for results from analysts onshore.

Improve asset monitoring

Asset outages can cause unplanned downtime, increase operating costs, and start a cascading series of negative consequences. Asset monitoring is critical for preventing unexpected failures, but valuable data is often stranded just outside the control network. PI Edge products and sensor technology provide a cost-effective way to collect key performance data such as motor vibration, pressure, and temperature, so operators can detect stress and act before an asset fails.

A mining company deployed EDS to monitor the large-scale agitator it uses to mix ore and slurries. If the agitator goes down, so does the entire operation. Now operators can collect diagnostic data from sensors embedded in the agitator, visualize the data with

PI System tools, and implement more effective maintenance schedules to reduce surprise failures and business disruptions.

Protect health and safety

Some assets are deployed in harsh environments where it is too dangerous to post local operators or send technicians. Keep your employees safe and your assets healthy by keeping watch over performance indicators with PI Edge products. Analyze data from remote assets to diagnose emerging issues and develop situational awareness.

For example, offshore drilling is a complex and dangerous process that involves large crews and heavy equipment. One drilling company integrated EDS with its CCTV technology to ensure the safety of the ground crew when moving drilling pipes. PI Edge technology supports real-time monitoring to prevent safety incidents and improve overall performance.

Empower local or field operators

PI Edge products also provide operators with the real-time data they need to make faster, more accurate operating decisions, reducing both costs and risk.

A specialty chemical provider previously relied on a third-party telemetry company to calculate the product

supplied to customers from its delivery trucks. Both the provider and customers waited to receive precise delivery data from the third party. Since deploying PI Edge, the provider is now able to send data directly from trucks to its PI Server over the cellular network. Truck operators can now optionally access local data for on-the-spot decision-making, even without network connectivity.

Create a truly enterprise-wide system of record

Sometimes you need a comprehensive view of operations to maximize efficiency. PI Edge products let you create an enterprise-wide data platform by sending edge data to either your PI Server on-premises or to OCS.

A European energy company is installing innovative home heating systems using pumps, condensing boilers, and wastewater to reduce carbon-based fuel usage. The entire system is fully metered. Now the company is piloting the use of EDS to collect data from each residence and send it to its PI Server on-premises for aggregated analysis and customer billing based on their home's energy production and usage.

New business opportunities

PI Edge technology, combined with PI Cloud data sharing, also supports the delivery of new or expanded services that increase revenue.

Onboard asset analytics

EDS isn't just limited to remote assets. It's also a good fit for self-contained equipment systems. In this deployment scenario, EDS serves as the local platform for data collection, storage, and application to enable seamless integration with the plant historian. Manufacturers can use EDS as the onboard platform for delivering value-added applications and services such as predictive analytics. Continuous, real-time monitoring is an attractive feature that can help manufacturers differentiate themselves from competitors.

Aftermarket monitoring

Many industrial assets are complex and difficult to operate and maintain. Companies often prefer to outsource asset monitoring to the original equipment manufacturer or to a third party with deep expertise. EDS can easily collect operations data in its original fidelity and transfer the data to OCS for secure, cloud-based data sharing. Aftermarket services such

as asset monitoring and condition-based maintenance can significantly increase customer satisfaction, reduce operating risk, and strengthen a manufacturer's brand.

In addition to remote monitoring, detailed performance data provides product engineers with valuable data they can use to improve design and serviceability.

Connected services

PI Edge products also enable connected services, in which third parties use asset data to provide industry-specific analyses and expert recommendations.

One example is marine-asset intelligence services, which ensure that shipping companies operate according to global regulations and submit necessary compliance documentation. PI Edge and PI Cloud make it easy and cost-effective for shipping companies to supply data directly from ships at sea to highly specialized service providers.

PI Edge: Extend data management outside your primary control network

For data collection:

PI Adapters

Lightweight software that captures data from devices that use various communication protocols.

SDS or OMF REST APIs

Additional programmatic options for writing data directly to EDS.

For data storage and processing:

Edge Data Store (EDS)

Hardware-agnostic software that collects and stores data from remote assets and IIoT devices. Data can be used locally or sent to a PI Server on-premises or to OSIsoft Cloud Services (OCS) for use by enterprise data analysts, executives, or trusted external partners.

Sequential Data Store (SDS)

Component technology of EDS for storing sequential data, such as time-series or any data indexed in an ordered sequence. Local applications can easily read and write to this data store through several REST APIs.

For data visualization and integration:

SDS or OMF REST APIs

Current programmatic options for transmitting data from EDS to local applications or analysis tools. Data can also be natively transferred to PI Server or to OSIsoft Cloud Services (OCS) for visualization, analysis, or data sharing.



Summary

High-fidelity data from remote operations is often stranded outside the primary control network due to harsh conditions, limited connectivity, and space limitations. PI Edge data management overcomes these issues with automatic data collection and a scaled-down operations data historian. PI Edge is lightweight software that is easy to deploy. You can install PI Edge on low-cost, small-footprint devices that don't require on-site IT support and can be deployed almost anywhere.

PI Edge components are built to:

- Collect and store high-fidelity asset and sensor data.
- Protect against data loss.
- Empower local operators with access to real-time performance data.
- Transmit data natively to PI Server on-premises or to OCS in the cloud for advanced analytics and data sharing.

About OSIsoft

The world's most essential and complex industries rely on OSIsoft to manage the lifeblood of the industrial enterprise: operations data.

OSIsoft is a pioneer in data-infrastructure strategy and a global leader in operations data management software. The company brings over 40 years of experience helping industrial organizations meet next-generation demands for efficiency, reliability, security, sustainability, and resilience.

OSIsoft's market-leading PI System is the proven system of record for operations data in essential sectors such as power generation and utilities, water, oil and

gas, mining, metals, manufacturing, pharmaceutical, facilities, transportation, food and beverage, and more. Every day, industrial professionals in 146 countries rely on the PI System to improve performance, protect health and safety, keep the lights on, and make the world run more smoothly.

Learn why two-thirds of Fortune 500 industrial organizations choose PI System at www.osisoft.com.

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