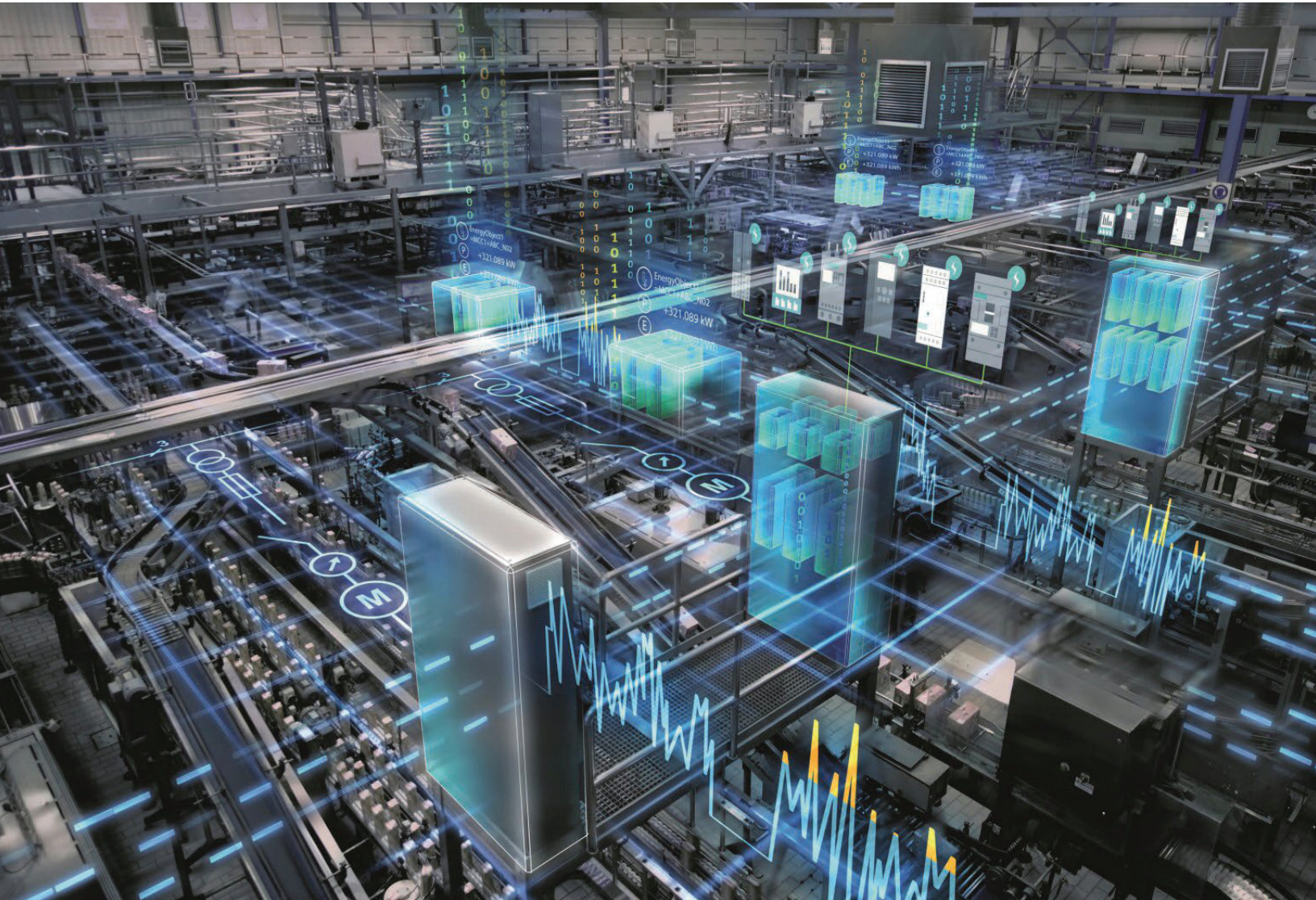# SIEMENS
Ingenuity for life

MindSphere

The industrial IoT as a service solution

products.electro-matic.com/industrial-iot/mindsphere/
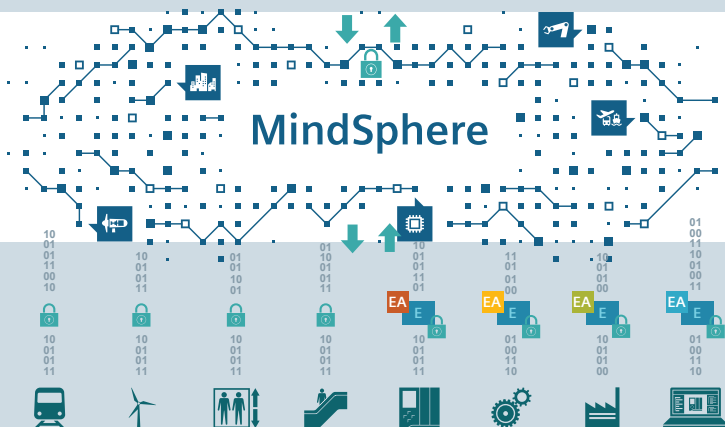
Applications
Powerful industry solutions
with advanced analytics

mx mendix

Develop robust industrial
IoT solutions faster
with global scalability

MindSphere

Edge Management
Edge Device Management,
Edge App Management,
and Edge App Store

Edge Apps
Siemens, partner (OEM),
and 3rd-party Edge Apps

Connectivity
Connect products, plants,
systems, machines and
enterprise applications

Edge Devices
Multiple enabled devices hosting
the Industrial Edge Platform

ELECTRO-MATIC
a SunSource Company

MindSphere

Every machine and system in your business provides a wealth of data with insights and benefits yet to be fully realized. Using MindSphere®, the industrial IoT as a service solution from Siemens, enables you to transform this data into productive business results. By connecting your machines and physical infrastructure to the digital world, MindSphere provides powerful industrial applications with advanced analytics and digital services to unleash increased productivity and efficiency across your entire business. It was built as a secure and scalable industrial end-to-end solution for everything from connecting products, plants, systems and machines to unlocking your Internet of Things (IoT) data potential.

MindSphere offers you:

- Secure, end-to-end solutions for connecting devices, storing data and developing and running applications

- Extensive device, enterprise and database connectivity options to support a variety of IoT-ready assets

- Industrial IoT as a service solution with numerous options for data exchange using Siemens open application programming interfaces (APIs) and native cloud accessibility

- Fast development of robust industry-driven IoT solutions with advanced analytics capabilities

- Combined global scalability of Siemens, the number one automation provider, with the world's largest cloud providers

MindSphere enables you to transform data into productive business results.

Connecting real things to the digital world

The MindConnect API enables programming of customer- or use-case-specific connectivity agents by interacting with MindSphere standardized APIs.

Industries undertaking IoT initiatives face the challenge of connecting to a wide range of assets quickly, affordably and securely from disparate locations. MindSphere MindConnect®, the Siemens IoT connectivity solution, offers flexible software and hardware options for connecting both Siemens and non Siemens assets to MindSphere.

With the MindConnect IoT Extension, virtually any IoT-ready asset from any manufacturer can be connected to MindSphere. Numerous field protocols are supported out-of-the-box, along with a wide range of hardware connectivity agents to bridge the gap for other protocols.

Additionally, the MindConnect API enables programming of customer- or use-case-specific connectivity agents by interacting with MindSphere standardized APIs. The API for connectivity facilitates data transmission from assets to MindSphere, securely and efficiently.

Along with asset connectivity, the MindConnect Integration option provides a way to connect multiple data systems to MindSphere, including historian databases, enterprise resource planning (ERP), manufacturing execution system (MES) and supervisory control and data acquisition (SCADA) systems. Using browser-based tools to graphically configure data value mapping, users can build a flexible integration to bring enterprise systems both on-cloud and on-premise into context with MindSphere.

The MindConnect Nano and the MindConnect IoT2040 offer hardware connections to MindSphere with different levels of service for any size production environment. Both devices create a direct and secure connection through both greenfield and brownfield installations.

You can also leverage existing Siemens S7-1500 programmable logic controllers (PLCs) to connect directly to MindSphere and the digital world using a TIA Portal STEP 7 library. The TIA (totally integrated automation) Portal STEP 7 library extends the function of the S7-1500 PLC to transmit PLC data to MindSphere.

By connecting, collecting and analyzing both current and historical data, operation teams, business analysts and data scientists alike will discover valuable and actionable insights to transform their businesses. For the first time, companies will have transparency across their entire operations to not only optimize processes, but also develop new business models to increase profitability.

Security is a top priority for Siemens as the world's leading automation provider with 30 million automated systems, 75 million contracted smart meters and one million connected products in the field. MindSphere provides state-of-the-art security while acquiring data in the field, and transmitting and storing it in the cloud. The security framework of MindSphere is aligned with the principles of industry standards, such as International Electrotechnical Commission (IEC 62443), International Organization for Standardization (ISO)/IEC 27001) and governmental recommendations for data handling in cloud environments.

MindConnect Integration provides a flexible way to connect multiple data systems to MindSphere.

Industrial IoT as a service

Transforming IoT data into meaningful and actionable information for companies is not one size fits all. With open standards and robust APIs, MindSphere enables developers to build applications that suit a broad range of business requirements, and connect and exchange data with a wide range of products with little effort.

With Siemens' domain expertise across industries and the global scale of Amazon Web Services (AWS), Alibaba Cloud and Microsoft Azure public cloud infrastructures, IoT solution development is accelerating. By accessing MindSphere open APIs, partners can develop high-value applications and deliver digital services in collaboration with Siemens and AWS, Alibaba Cloud or Azure. With open APIs and interoperability with other systems, partners can develop, deploy and distribute their MindSphere solutions and offer them to the entire MindSphere community.

The MindSphere MindAccess™ DevOps Plan includes a Developer Plan and an Operator Plan, providing access to a complete environment for application development and lifecycle management, including managing applications in the production environment.

MindSphere enables developers to build applications to suit a broad range of business requirements.

developers can create robust IoT applications using advanced analytics and services, including data management, predictive learning and visualization to accelerate the development process. Developers can easily develop, register and validate their applications as well as access a continuously expanding list of APIs and services. The MindAccess Operator Plan provides a dedicated environment for running production applications. System administrators can seamlessly manage, run, monitor and publish applications for customers and partners by patronizing the MindSphere Store.

Powerful industrial applications and digital services

With MindSphere, Siemens is paving the way for businesses to offer their organizations and end customers new digital services. By using powerful industrial applications to leverage advanced analytics, businesses realize higher availability as well as improved productivity and efficiency for individual machines, entire plants, systems or globally distributed machine fleets.
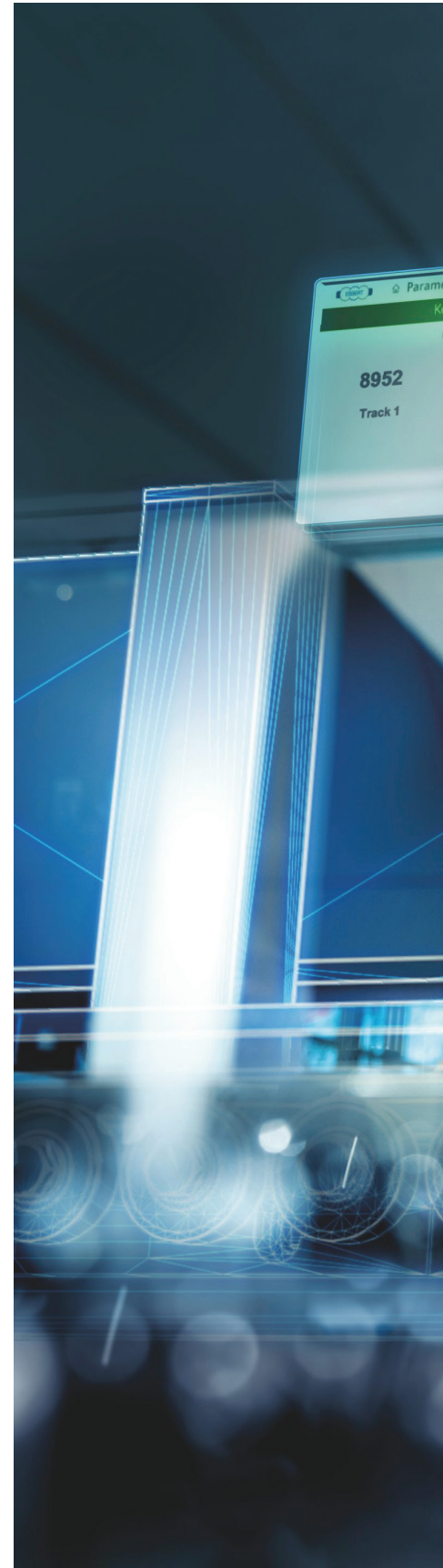
As a standard and best-practice IoT starting point, MindSphere users can leverage the MindAccess IoT Value Plan to quickly configure assets and begin collecting data and monitoring with the MindSphere Fleet Manager. With easy-to-use data model configuration, MindSphere users can locate connected assets at a glance on a geographical map and monitor the condition of the assets in real time. Additional MindSphere applications can be accessed to further unleash the value of IoT data.

MindSphere application Product Intelligence automatically discovers insights from contextualized product performance data. By providing greater visibility into product and supply chain performance, you will prevent costly recalls, solve quality problems faster and close the loop between design and product performance.

MindSphere application Manage MyMachines provides transparency across your machines anywhere in the world. With the configuration and display of critical monitoring variables, insightful information on current operations and productivity history are used to reduce machine inspection and maintenance costs.

Using MindSphere MindServices® offerings accelerates your IoT initiative with flexible and cost-effective training and professional services. Benefit from the experience and insights of Siemens' MindSphere experts throughout your MindSphere journey. MindSphere Academy offers training for business users and developers to scale your business with digital solutions. MindSphere Professional Services provides support throughout your IoT solution lifecycle, from developing new applications to implementing your full MindSphere IoT solution.

To address the broad scope and complexity of digital transformation across all industries, MindSphere has established an extensive network of world-class partnerships with broad domain expertise and information technology (IT) capabilities. The MindSphere global partner ecosystem provides a robust offering of IoT solutions and services with the flexibility to match customers' requirements. MindSphere provides partners with an unparalleled opportunity to participate in the digital transformation of companies regardless of industry or size.

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Closed-loop innovation with end-to-end digital twin

Digitalizing and transforming IoT data into real business results are core drivers of MindSphere. High-value industry-based applications built on MindSphere deliver measurable results using digital services. In addition, companies can leverage MindSphere to close the digital twin loop with product ideation, realization and utilization. By seamlessly integrating operational data throughout the value chain, the digital twins

of performance, production and product are connected. This helps not only drive operational efficiency, but also to compare simulation and test results with real-world observations.

Customers can now optimize the entire value chain, from design and production to performance.

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MindSphere is the leading industrial IoT as a service solution

MindSphere connects real things to the digital world and enables high-value industry-based applications and digital services to drive business success.

As the world becomes increasingly connected, digitalization – using digital technologies to transform business operations – is a key differentiator that will enable companies to remain competitive. Using Internet of Things data driven by billions of intelligent devices generating massive volumes of data, digitalization promises lower costs, improved production quality, flexibility, efficiency, shorter response time to customer requests and market demands, and also opens up new business opportunities and services. With MindSphere, Siemens is addressing these challenges across our entire business and enabling other companies to unlock their full potential with IoT data.

Cutting throughput times, increasing flexibility, enabling individualized mass production, and optimizing consumption of energy and resources are some of the challenges facing companies today. They must optimize the entire value chain, from design, production planning and engineering to services. MindSphere and industry-driven applications and solutions are enabling the increased availability, capacity and resilience of any type of infrastructure in areas such as industry, energy and mobility healthcare systems, among others. By collecting, contextualizing and analyzing the vast amount of available data, companies will gain transformational insights to make informed decisions and changes to improve profitability.

MindSphere connects real things to the digital world and enables high-value industry-based applications and digital services to drive business success. With its capabilities, MindSphere enables a rich partner ecosystem, including solution partners, application developers and connectivity partners to offer innovative IoT solutions. By seamlessly integrating operational data throughout the value chain, companies will not only drive operational transparency, but also compare simulation and test results with real-world observations to gain a competitive advantage.

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