Leveraging digitalization to overcome manufacturing disruptions

How manufacturers can maintain productivity and profitability during a pandemic, economic downturn, or natural disaster

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Use the industrial IoT to prepare for disruptions

Disruptions can be entirely unpredictable, leaving manufacturers and their supply chain at risk – resources may become sparse, teams may be unable to work, or operations may not be safe to resume. Moving forward, organizations need to find ways to establish continuity plans that allow them to maintain some level of productivity and profitability during a disruption. In these efforts, manufacturers need to ask several questions to become better prepared, whether the disruption is a pandemic, an economic turndown, a natural disaster, or another occurrence:

- How do you safely ramp down operations if you cannot keep assets or processes up and running?

- How do you increase efficiency to maintain profitability when you're not running at 100% capacity?

- How do you maintain productivity if teams cannot physically go to the plant?

By pursuing smart factory initiatives, in part by adopting the industrial Internet of Things (IoT), manufacturers can embrace solutions that help answer these questions. Those that have some level of digitalization underway are better positioned to handle the ups and downs of a disruption.

This ebook takes a look at a few areas where the IIoT can help manufacturers better prepare for unforeseen and uncontrollable events.

Safely ramping down operations and empowering a remote workforce

If an external force requires that teams stay home, supplies be cut off, or operations shut down, manufacturers need a way to safely ramp down processes at a moment's notice. Without the right mechanisms in place to do so, organizations risk processes running without enough supervision, introducing additional risk to operations and safety.
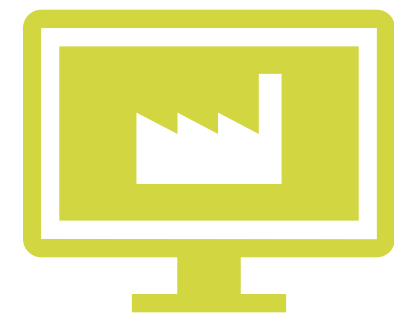
Monitor assets remotely

Industrial IoT can help manufacturers solve this problem by enabling teams to remotely monitor assets across plants.

With this level of visibility, industrial organizations can view and control processes within their plants, even if the workforce is not physically present. As a result, they can ramp down processes that cannot safely function, they can track machine health, and they can identify performance issues arising on a production line. Should problems arise, people can be sent in to diagnose the issue, only if and when it is necessary.

Using virtual simulation software, manufacturers can also stand up virtual factories – a digital representation of a real-world plant. Doing this allows remote team members to virtually "enter" a factory and navigate to a given area. Here, they can receive up-to-date information about operations, allowing them to enhance decision making and solve issues without actually being present.
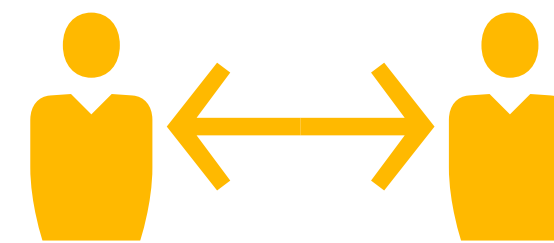
Enforce social distancing

To plan for workers to safely resume in-person activities, organizations can again leverage virtual simulation software in tandem with an industrial IoT solution. Doing so allows organizations to increase automation across operations and limit the amount of personnel needed at the plant.

From there, they can simulate key processes, which in turn reveal when two or more workers would come within an unsafe distance of one another. By understanding when and where these occurrences take place, manufacturers can more easily enforce social distancing, which protects workers and keeps operations up and running.
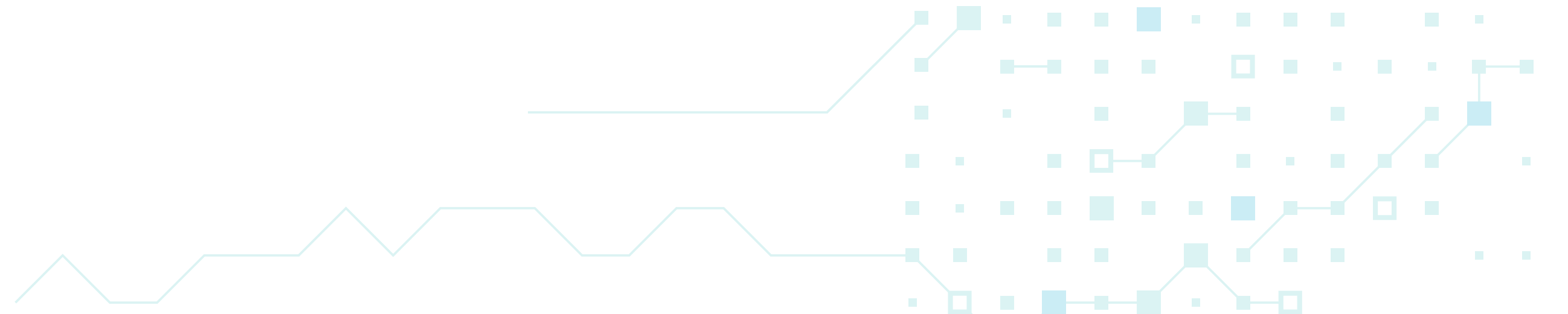
Increasing efficiency when operations ramp down

Once operations are ramped down, manufacturers look for ways to supplement production. While these efforts may not provide the same level of production as before, industrial organizations can drive efficiency to help lower fixed costs and maintain profitability.

Drive production with condition monitoring, predictive maintenance and asset performance management

Industrial IoT enables transparency into your operations, allowing you to implement solutions like condition monitoring, predictive maintenance, and asset performance management to maximize asset performance and health. These solutions can solve common challenges that add risk to operations and/or limit production, such as:

- Lack of awareness to predict when an asset failure may occur
- Excessive downtime caused by calendar-based maintenance approaches
- Inability to use a machine at peak performance, without causing failure

Reduce energy consumption

Organizations can increase efficiency by driving sustainability. Before industrial IoT adoption, many organizations have no proficient way to understand and optimize their own resource consumption. With this level of knowledge, however, organizations can significantly reduce costs.

With visibility into how much energy is actually being consumed, you can determine ways to reduce waste. For example, an IIoT-enabled factory can help you identify a leak that is causing excessive water loss. Or you may pinpoint a process that can be run during non-peak hours, incurring an energy discount.

Increasing asset reliability to mitigate unpredictable occurrences

Because disruptions are typically outside of a manufacturer's control, organizations should look for ways to increase reliability in areas they can manage.
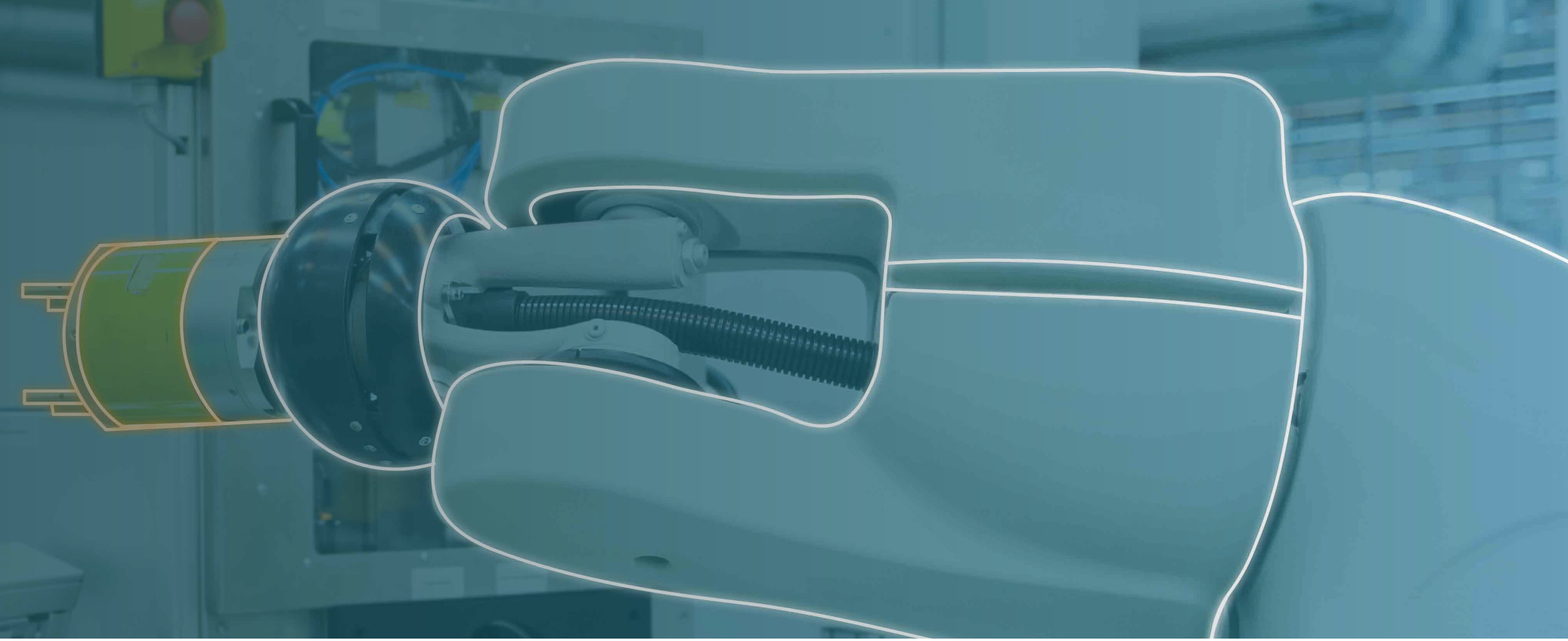
Gain real-time feedback with the closed-loop digital twin

With industrial IoT, organizations can create a closed-loop digital twin of the product with live performance data. This capability captures and aggregates real-time data from products and plants in operation. From there, manufacturers can analyze this data to virtually validate the performance of assets in the real world and understand how they act under various conditions. This allows them to execute extensive testing to understand machines at a deeper level, in a fraction of the time and cost of physical efforts. Digital twin data can be used to optimize assets in production, or to influence future product designs and improve quality.

When external forces add pressure to manufacturing operations, industrial organizations that leverage assets developed with digital twins, minimize the risk of failure and maximize performance levels.
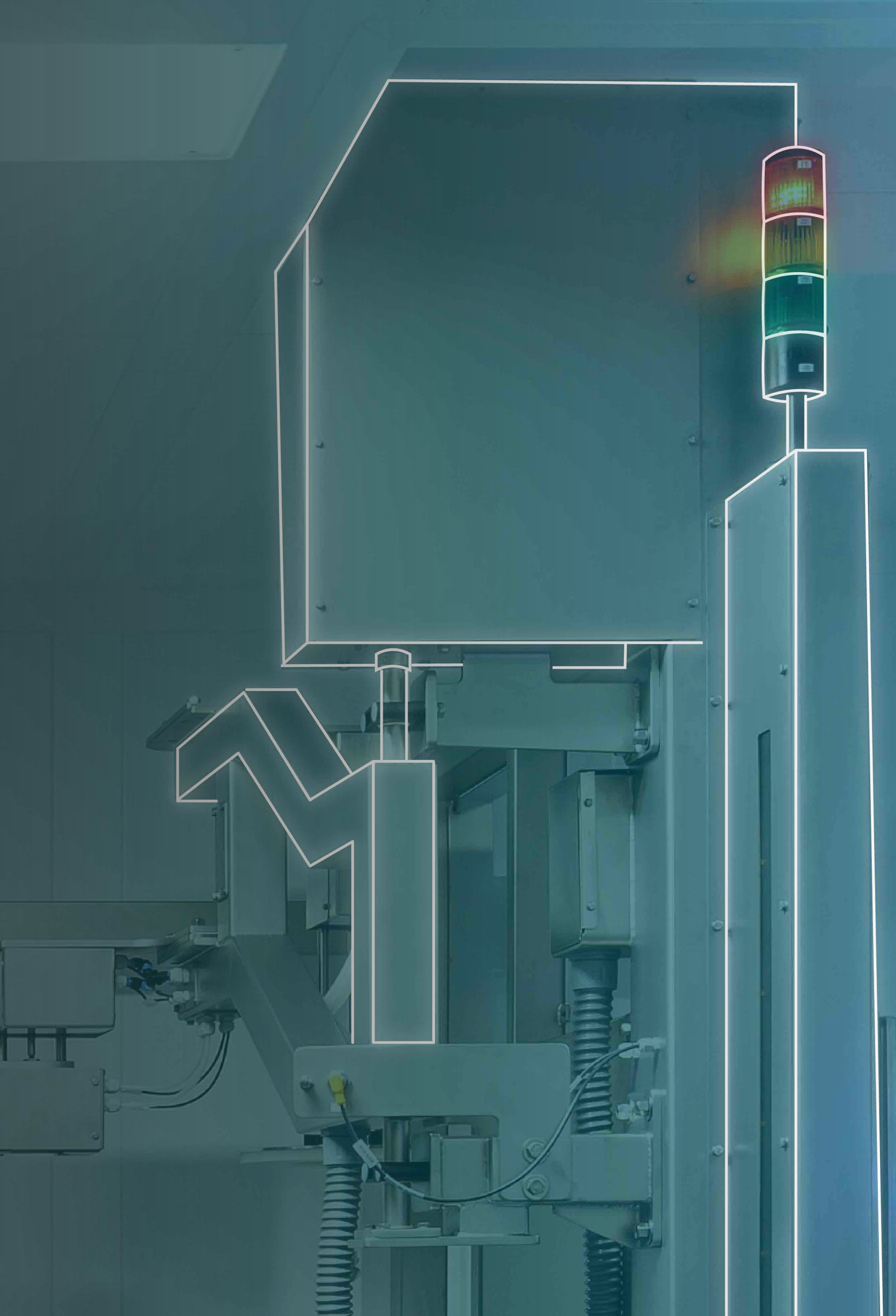
Accelerate IIoT adoption with MindSphere

Industrial organizations are already faced with increasing competition and razor-thin margins. When you add in an unexpected disruption, there is little room for error. Digitalization through industrial IoT adoption offers a clear path to overcome the challenges these disruptions bring about. And in the meantime, it can help you optimize operational efficiency and reduce costs.

Further, disruptions like pandemics and economic downturns bring about uncertainty that can limit IT budgets and require financial flexibility. So how can organizations pursue digitalization in this context?

MindSphere® is an industrial IoT as a service solution from Siemens that is built on Mendix, the low-code application development platform. Because it is offered as a service, organizations can implement the solution without significant upfront investments and benefit from CapEx pricing. MindSphere offers an accelerated route to digitalization, with technology based on over 200 years of industrial automation expertise, giving you confidence that it can meet your business' unique needs.

To learn more about MindSphere and the industrial IoT, visit siemens.com/mindsphere