OEMs in the Digital Era

CREATING NEW REVENUE STREAMS AND IMPROVING END USER OPERATIONS WITH THE INDUSTRIAL INTERNET

The sun has risen in our digital-mandatory world. All organizations are seeing changes – with many more to come. For design engineers, the Industrial Internet of Things (IIoT) is having an impact at their own organizations but also requires a response to changes that end users are experiencing.

With a digital thread of data, analytics and powerful apps, there are tremendous opportunities to improve the end user experience and even create new OEM revenue streams.

A Bright Future

Thought leaders around the world anticipate that the most valued companies in the future will be digital industrial companies that blend combinations of digital capabilities and industrial assets. Digital capabilities are required, in partnership with physical assets and processes, to drive productivity and efficiency to new levels across an organization or environment.

As the IIoT takes off, automation apps will guide predictive maintenance of equipment, so they never go offline. Equipment will seamlessly adjust to market demands – all the while providing cleaner, more efficient capabilities than ever before.

Furthermore, everything will have a "Digital Twin." The idea involves building a digital model, or twin, of every machine – from a jet engine to a locomotive – to grow and create new business and service models through the Industrial Internet.

This digital industrial era will bring OEMs and their end customers even closer together. OEMs are the beginning of the digital thread – which employs data and analytics across the complete product life cycle. It allows companies to optimize equipment efficiency, from design to operation to maintenance, to service in a closed loop.

Today, fourth-generation automation software enables OEMs to leverage the Industrial Internet, combining real-time data, advanced algorithms for analytics, data models, and cloud technologies to help users connect, analyze and optimize. Proactive OEMs are taking advantage of these opportunities right now to grow their businesses and gain competitive advantage.

Filtering and Serving Information

Traditionally, design engineers have made machine data actionable by pushing it to a screen for a reaction. An operator sees a list of alarms, identifies a critical alarm and reacts to it. In most cases, operator actions are reactionary rather than predictive, which results in higher machine and equipment downtime and inefficiencies.

With innovative software apps and mobile technologies, OEMs can drive real-time operational Intelligence – taking the data from machines and pushing it to operators, engineers and managers in an intelligent way. The right operator can receive the right information at the right time and place through IIoT technologies.

It sounds idealistic – yet, it is happening now with today's mobile devices and industrial software apps. The same way mobile devices and real-time information have changed our personal lives, mobile devices and IIoT are changing our industrial world.

Technology allows us to be smarter now about how we filter and serve information. Design engineers can drive the data to the device that makes sense and identify the particular data that would mean something to the mobile operator. In some cases, that could be all of the display tags associated with a particular piece of equipment. In most cases, the ideal would be to take the mass of raw data, turn it into better information, and deliver the key performance indicators that make sense for an asset– such as, perhaps, electric demand or temperature.

By selecting the right data, users can access information in a mobile fashion to make better sense of it instead of sifting through hundreds of different pieces of raw data about a particular pump or machine.

Creating New Revenue Streams with Better Information

OEMs can create new revenue streams with this real-time, end-user data. As an example, a refrigeration OEM now offers new service contracts to improve customer performance. In this OEM's industry – like many others – issues with uptime can have consumer safety and brand protection implications, making uptime critical.

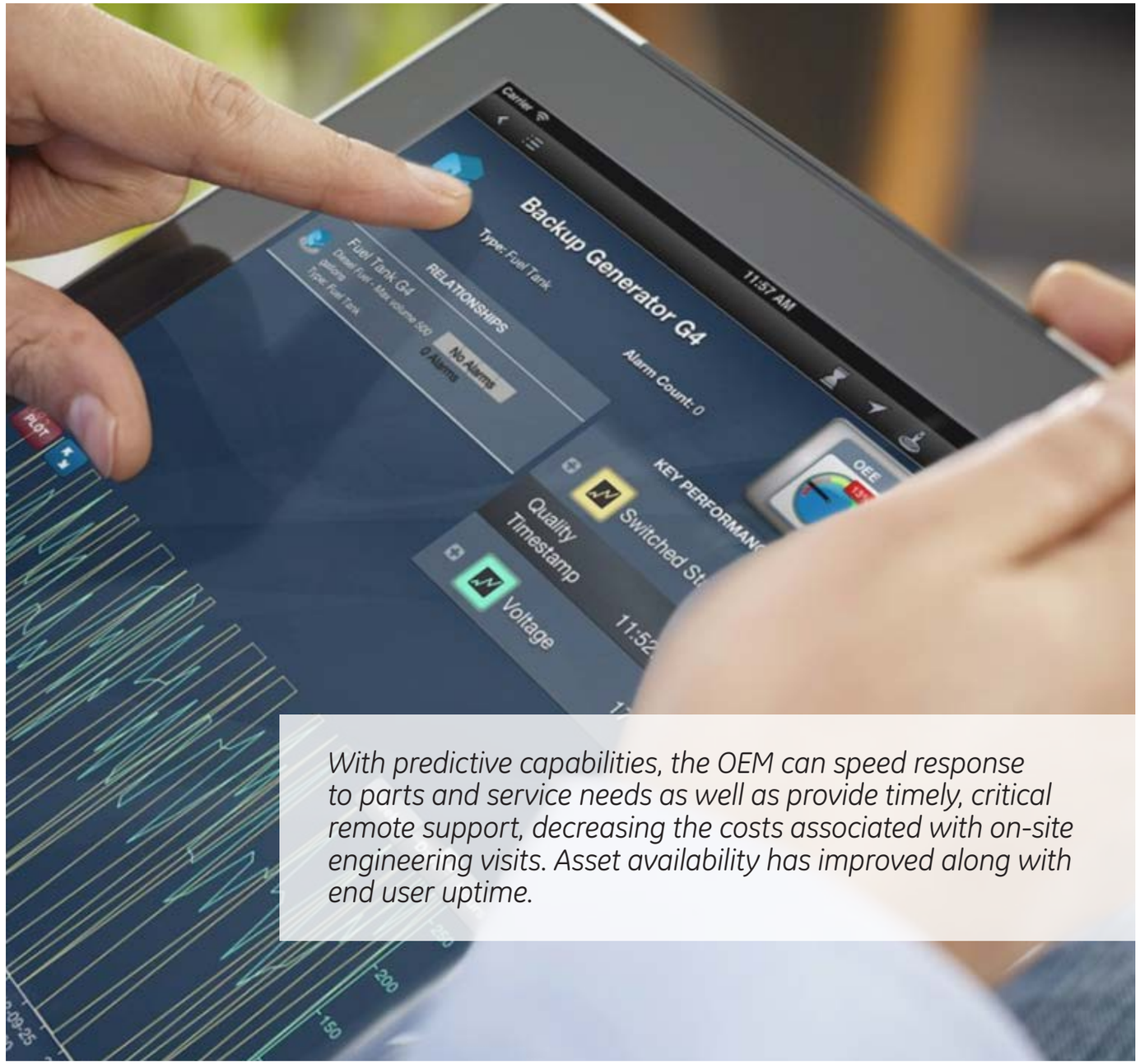
Recently, this international OEM turned to GE Digital automation apps to decrease the company's high warranty costs and provide a way to warn against possible failures. The new system runs diagnostics against real-time performance data from its machines installed at remote end user facilities.

With predictive capabilities, the OEM can speed response to parts and service needs as well as provide timely, critical remote support, decreasing the costs associated with on-site engineering visits. Asset availability has improved along with end user uptime.

In addition to 24/7 monitoring availability and predicting failures, the GE Digital software provides insight into how to improve end user performance – which this OEM has turned into a new revenue stream. Armed with real-time process intelligence, the OEM uses its engineering and industry expertise to improve end user system efficiency, decrease energy consumption, and minimize water usage. This is a win for the OEM and the end user customers – and just one way that OEMs can embrace the IIoT to grow their businesses.

Mobility and Availability

Beyond monitoring and analytics, OEMs can use mobility tools to provide access to subject matter experts anytime, anywhere. OEMs work for multiple customers, and new generation tools allow them to compare performance, usage, and other data from their equipment through various lenses such as customer types, geographies, and size. For example, an unusual breakage of a machine type in one geography versus another might be caused by untrained operators, harsh climate conditions, or something else that an OEM subject matter expert, quickly accessed through a mobile device, could identify with the right data and tools, and guide customers.



With predictive capabilities, the OEM can speed response to parts and service needs as well as provide timely, critical remote support, decreasing the costs associated with on-site engineering visits. Asset availability has improved along with end user uptime.

Geo-Intelligence Technology

Additionally, design engineers can leverage the availability of end user geographical information. Mobile devices have inherently built in geo-awareness, which adds tremendous value not just in dispersed applications such as water/wastewater or power but also even for a small manufacturing facility. Design engineers can now deliver the appropriate information to the right user, at the right location.

Design engineers can use geo-intelligence technology that takes data, puts context to assets, and then applies a geo-location to that asset. Now, when operators go up to the equipment, they don't navigate on their device to identify the particular equipment. An OEM can automatically serve the right information quickly on the mobile device – it is instantly available on the screen.

For example, the geo-intelligent mobile device knows that the equipment is Pump 2 in the South River Pump Station and automatically flips to the appropriate screen, instantly displaying data such as KPIs. In addition, the device can make use of an adjustable radius – or field of view, and can, for example, display all of the pumps located within three miles.

In a manufacturing environment, geo signals are even more accurate using Wi-Fi than they are using GPS and cell technology. Operators can be in a noisy factory and use the geo-intelligence and navigation to have the right information at their fingertips based on their specific location. Design engineers can use this technology to speed response and reduce troubleshooting time. Beyond automatic screens and navigation, the benefits of geo-intelligence multiply when applied to alarms and analytics.

Design engineers can use geo-intelligence technology that takes data, puts context to assets, and then applies a geo-location to that asset. Now, when operators go up to the equipment, they don't navigate on their device to identify the particular equipment. An OEM can automatically serve the right information quickly on the mobile device – it is instantly available on the screen.

Alarms to the Right Person, at the Right Place

With geo-intelligence, OEMs can deploy alarms to an operator, engineer or manager based on physical location. As an example, an engineer is standing on Floor 4 and an alarm goes off related to a machine on Floor 1, which is 25 minutes away. Does it make sense to deploy the alarm to that engineer? The geo-intelligent system determines that a colleague is standing 100 feet away from the machine – and instead sends the signal to the closest engineer for faster, more efficient response.

By adding geo-awareness to alarming, OEMs can make intelligent notifications possible and deploy alarms in a geo-context. The right information finds the right person in the right location, which is drastically different from the traditional automation world and goes far beyond simply capturing and mobilizing data and tag names.

In addition to deploying alarms based on location, design engineers can deploy IIoT technology to filter alarms to increase efficiency. According to analysts, 75% of all alarms are noise, and many companies must enhance the operator experience by reducing the number of alarms. Too often, companies are forced to accept that there is a level of noise from alarms, and operators must know what to pay attention to and what not to pay attention to. A problem arises with temporary staff operating machines or new operators coming on board. The temporary or new personnel don't have the experience to filter through the alarm noise and make sense of it.

Instead, design engineers can deploy a system that captures all of the raw alarms and applies a level of analytics to them. The system delivers the right alarm, perhaps even a derived or intelligent alarm, to the operator interface – whether stationary or mobile – rather than confusing raw data.

By adding geo-awareness to alarming, OEMs can make intelligent notifications possible and deploy alarms in a geo-context. The right information finds the right person in the right location, which is drastically different from the traditional automation world and goes far beyond simply capturing and mobilizing data and tag names.

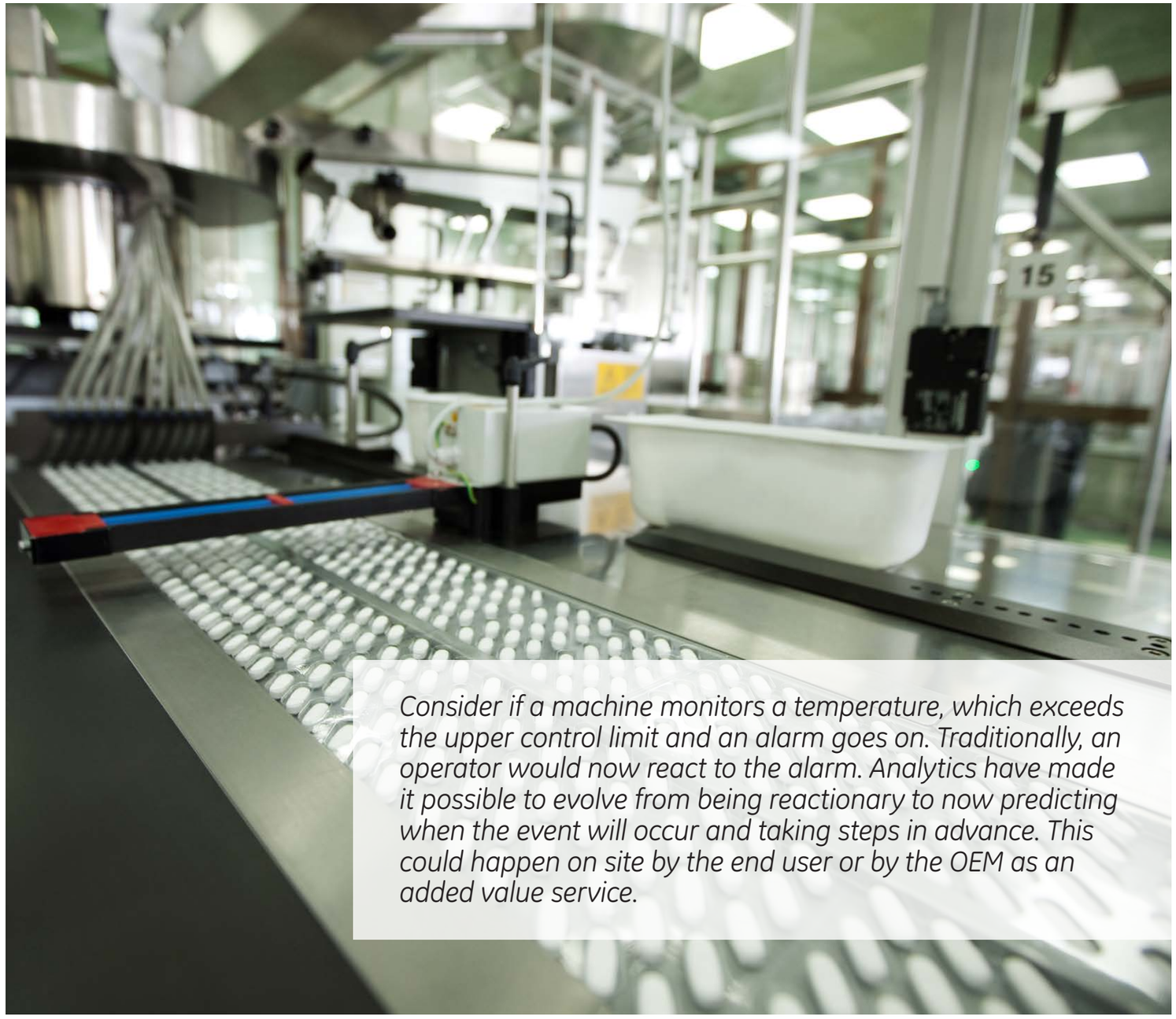
Predictive Knowledge and Action

With an IIoT foundation, design engineers can add a layer of proactive analysis to deliver predictive intelligent alarming. Today's technology isn't just about delivering the right information after an event has happened, it is also about delivering information before a catastrophic issue occurs and preventing it from taking place.

Consider if a machine monitors a temperature, which exceeds the upper control limit and an alarm goes on. Traditionally, an operator would now react to the alarm. Analytics have made it possible to evolve from being reactionary to now predicting when the event will occur and taking steps in advance. This could happen on site by the end user or by the OEM as an added value service.

As an example, software on food processing equipment can monitor a temperature data point, run an analytic on it and predict the temperature based on a statistical model. The OEM can design the equipment to push an alarm to an operator to ensure that action is taken faster, before a batch is ruined. The same could be true for an OEM running a remote monitoring and predictive service for their customers related to critical end user operations.

This applies to other industries as well, such as pharmaceutical with multi-million-dollar batches of product, as well as maintenance events on discrete equipment. The application of predictive knowledge, delivered as an intelligent alarm in a geo-aware context is far reaching and offers new possibilities for consistently optimized operations – high value that design engineers can provide to their end users.



Consider if a machine monitors a temperature, which exceeds the upper control limit and an alarm goes on. Traditionally, an operator would now react to the alarm. Analytics have made it possible to evolve from being reactionary to now predicting when the event will occur and taking steps in advance. This could happen on site by the end user or by the OEM as an added value service.

Steps to Take in the Digital Era

The Industrial Internet of Things has many implications. OEMs can consider several proven steps to achieve the true value of the IIoT and maximize the benefits of these new technologies.

1. Give Structure to Data

There is no shortage of data, and it is largely unstructured. The first step is to map data to a structured model, which helps companies capture data and start transforming it. An equipment model drives structured navigation. From this structure, users easily configure data to the level of entry that makes sense.

2. Deliver Context

Once the data is in a navigable structure, users can now easily apply analytics that create a context for action.

A perfect example is applying analytics to alarms. Most industrial assets have a variety of alarms – and usually an overwhelming amount on a daily basis. With an advanced alarming platform, OEMs can help by applying analytics to rationalize the alarms, taking away the noise, and only delivering the relevant alarms to the appropriate person by role – and based on location.

Operators, engineers and managers receive the right alarms in the context of the right piece of equipment. The cost- and time-savings are tremendous – with an estimated 20% or more increase in operator efficiency.

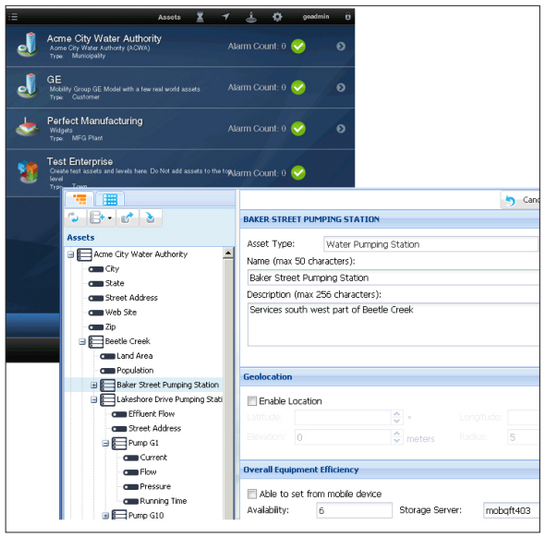
3. Make Transitions Seamless to Drive Action

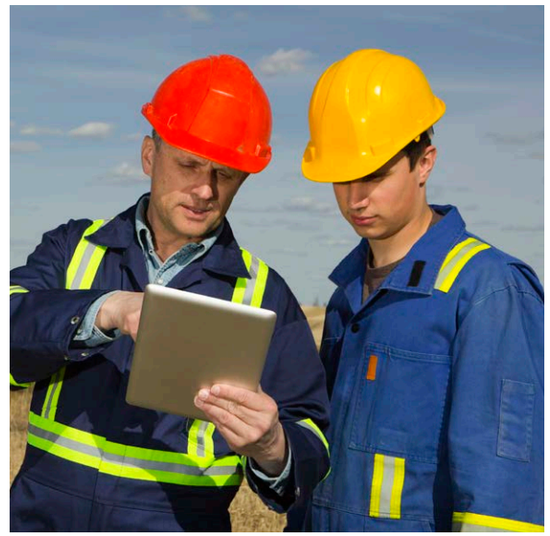
Now that there is a navigable structure and analytics for context, the next step is driving the appropriate action.

To lead a user to action, OEMs can deliver seamless transitions on any device, getting the user the right information quickly, at the right place and time. For example, if an operator receives a critical alarm, the mobile device immediately shows the right information to guide the user through the appropriate response steps.

4. Leverage Secure-by-Design Methodologies

Lastly, OEMs and end users must implement IIoT technology using secure-by-design methodologies. The confidentiality, integrity and availability of systems and data are critical. In our IIoT world, OEMs must consider how to deliver information in a staged fashion, how to limit control, and how to expose data for accessing information, anytime, anywhere for secure agility.





ABOUT GE

GE (NYSE: GE) is the world's Digital Industrial Company, transforming industry with software-defined machines and solutions that are connected, responsive and predictive. GE is organized around a global exchange of knowledge, the "GE Store," through which each business shares and accesses the same technology, markets, structure and intellect. Each invention further fuels innovation and application across our industrial sectors. With people, services, technology and scale, GE delivers better outcomes for customers by speaking the language of industry.

CONTACT INFORMATION

Americas: 1-855-YOUR1GE (1-855-968-7143)
gedigital@ge.com

WWW.GE.COM/DIGITAL/HMI-SCADA