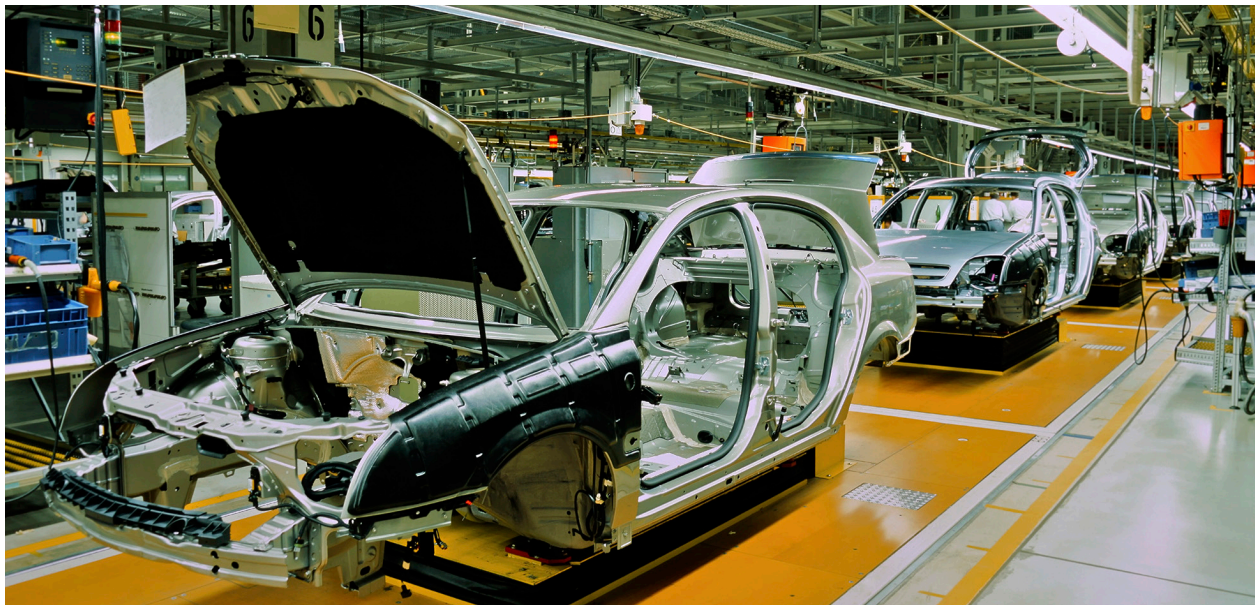
Overcoming the Challenges of OPC for Industrial IoT Applications

Gain greater flexibility, dramatically lower latency and accelerate your time to value with Telit deviceWISE



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The challenge of keeping pace in a connected manufacturing world

Manufacturing is undergoing a major revolution, driven by internet of things (IoT) technologies that use lightweight, low-power sensors to connect a multitude of devices across the factory floor. Today's industrial environments are increasingly connected and mobile, creating the potential for substantial business benefits — in fact, the Aberdeen Group found that 91 percent of its survey respondents see manufacturing benefits in IoT.

By monitoring and analyzing performance on the factory floor, companies are driving process improvements, bringing rich analytics to data that was once separate and isolated. Informed by the resultant insights, these manufacturers can examine their own supply chains, technologies and processes, and look for ways to accelerate innovation.

However, current technologies are limiting manufacturers' ability to fully realize the promise of IoT. One of the biggest limiting factors lies with the existing communications standards. Many manufacturers rely on Open Platform Communications (OPC), a key interoperability standard for communications that has been around since 1996. However, this aging standard can no longer keep pace with today's changing needs.

To fully connect their organizations and make the most of the IoT revolution, manufacturers need a better way. They need to quickly establish connectivity from the shop floor to the top floor — and out to their ecosystems.

Telit has the answer: Telit deviceWISE. In this paper, you'll learn how the capabilities of deviceWISE far surpass those of OPC, and why deviceWISE is the ideal choice for manufacturers who seek to address their top challenges today and intend to be ready for new ones in the years to come.

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It's time to think beyond OPC

OPC has long provided a standardized approach for supervisory control and data acquisition (SCADA) and human machine interface (HMI) systems to interface and understand commands from programmable logic controllers (PLCs) on the factory floor. The original OPC specification was closely tied to the Microsoft Windows operating system, and OPC Data Access (OPC DA) and Microsoft took connected manufacturing a major step forward.

However, using OPC DA in today's manufacturing climate poses several challenges. Because the underlying technology employed by OPC is so closely aligned with Microsoft, it isn't compatible with many other technologies. As operating system choices such as Linux become more popular in manufacturing, companies relying on OPC DA can find their plans for interoperability thwarted.

Dynamics is another major pain point. OPC is designed in such a way that it must constantly interrogate devices, consuming significant compute time and hampering efficiency, and thus limiting throughput and scalability. Supporting the frequent polling process also requires additional servers, which creates scalability and management issues.

These traditional connectivity standards also face limitations in functionality. For example, OPC DA and OPC Unified Architecture (OPC UA) focus on accessing information only from devices — that's all. Manufacturers that want to integrate business logic and enterprise logic must either purchase an application that is compatible with their OPC solution or develop an application on their own through custom coding. And custom coding is time-consuming, often requiring more than 60 percent of each project for device and enterprise IT connectivity. Custom coding is also heavily dependent on individual developers, leaving manufacturers vulnerable if the original coder leaves.

Move ahead with the Telit deviceWISE advantage

To overcome these limitations, manufacturers need a comprehensive platform that can enable all their devices and applications to talk to one another smoothly and easily. deviceWISE is a single, integrated solution that manufacturers can use to quickly connect factory to enterprise and the value chain, so that they can unlock the data they need to improve productivity and drive growth and revenue.

deviceWISE incorporates business logic and data connectors together in one package. It can be set up and deployed by a subject matter expert rather than a technical IT specialist, so organizations can rapidly develop a business solution with minimal technical staff. The platform integrates seamlessly with a wide variety of enterprise systems right out of the box, further enhancing business agility.

deviceWISE also offers superior performance compared to traditional communications solutions such as OPC, delivering faster speed for faster device access and improved efficiency. Best of all, deviceWISE does not require custom coding for integration. Organizations can simply plug it in, let deviceWISE automatically connect devices and applications, and then start configuring with drag-and-drop logic.

Telit deviceWISE vs. OPC solutions

Take a closer look at each of the features and capabilities of deviceWISE and how they compare to those available with OPC solutions:

A comprehensive platform

Telit deviceWISE offers a complete platform that spans the device, business, and enterprise logic layers of the manufacturing environment. In contrast, OPC addresses only the device layer. The broad functionality of deviceWISE allows it to easily connect to business logic, IT connectors, and relational databases — transparently connecting any system to any system, regardless of the back-end location. It can interact seamlessly with third-party offerings such as IBM Watson, SAP HANA, Siemens MindSphere and more.

Real-time data federation

Data extraction, data processing and enterprise connectivity capabilities are deeply integrated into deviceWISE. Unlike OPC, which offers only data extraction functions, deviceWISE is capable of aggregating data and immediately transforming it into actionable information.

Shorter time to market

Telit deviceWISE helps manufacturers get the competitive edge they need by accelerating time to market. The platform can be deployed rapidly, with no custom coding, enabling organizations to stand up new manufacturing environments and turn on a dime when changes are necessary. Deploying and applying alterations to OPC, on the other hand, requires custom coding that significantly slows the process.

Flexible deployment

Today's manufacturers can choose from a wide variety of technology solutions from many different vendors. To take advantage of that freedom of choice, they need a platform that provides full deployment flexibility. Telit deviceWISE is compatible with multiple operating systems (OSs) and runs on almost any combination of OSs, CPUs, mainframes, servers, and leading switches and routers. Unlike OPC solutions, which must deploy on a Microsoft operating system, deviceWISE lets manufacturers deploy the solution that best aligns with their legacy equipment and business requirements.

Out-of-the-box enterprise integration

Integration with a manufacturer's existing equipment, system architecture and the cloud is key to enabling enterprise-class communications. With the extensive, out-of-the-box integration built into the deviceWISE platform, manufacturers can take advantage of complete access to the systems and processes they require, without requiring time-consuming custom coding. In contrast, the integration available with OPC solutions is very limited.

Low latency

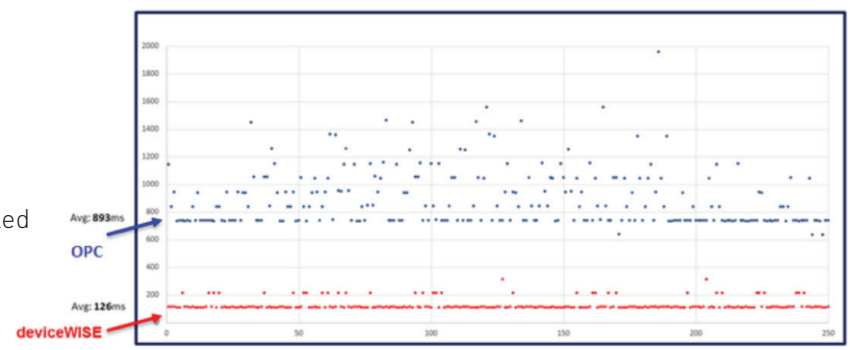
Compared to OPC, deviceWISE offers extremely low latency, with benchmark tests showing data performance up to ten times faster than the traditional protocol. In fact, with deviceWISE, latency is often near-zero, allowing manufacturers to realize significant improvements in efficiency across the enterprise.

In the world of industrial IoT, latency is a critical concern. As more data is produced, the ability to efficiently collect and analyze it can significantly impact machines productivity. For example, if a process demands data validation, every millisecond that it takes for the system to respond causes downtime. As a result of OPC replacement by deviceWISE, one car maker increased uptime by 3,000 minutes per year in one plant, creating a return on investment of US$90 million per year.

Lab Testing in Stable Environment

Timing data scattered due to:

- Single-threaded nature of application/ communications
- PLC creates and destroys OPC tag references every time transaction is called
- PLC scan time variances



Built-in analytics

Intelligence at the network edge is especially important for IoT applications, which are constantly gathering data in real time. To provide support for today's modern applications and IoT processes, deviceWISE includes integrated edge analytics that let manufacturers create sophisticated business logic with no programming required. Achieving these capabilities in OPC deployments requires time-consuming development of custom code.

Robust security

Security is essential in the manufacturing environment, with its many endpoints — and many potential vulnerabilities. deviceWISE delivers the security required to address today's changing threat landscape, with extensive, integrated, role-based security. It is ready for Microsoft Active Directory, with support for firewall, SSL and third-party authentication out of the box. OPC, in contrast, does not support Active Directory or LDAP authentication and offers limited protection.

Operations advantage

OPC solutions increasingly require manufacturers to hire multiple third-party providers to keep up with advances in technology. With so many consultants and vendors involved, accountability can be difficult to track, and the resulting friction can hamper troubleshooting and reduce business agility. With deviceWISE, manufacturers gain a single point of contact for all development and layers — a "one-stop shop" for all questions and issues.

Lower cost of ownership

deviceWISE enables a total cost of ownership (TCO) that is substantially lower than that of OPC deployments. Although an OPC server is relatively inexpensive on its own, manufacturers must add a significant number of third-party applications and vendors or create and maintain their own custom code to realize the operational and business advantages that deviceWISE offers out of the box. On top of that, OPC applications tend to have hidden latency costs that can impact factory productivity. This latency cost is most often represented by thousands of minutes of downtime in behind data polling time.

Frost & Sullivan recognizes Telit as a Customer Value Leader

Frost & Sullivan, an industry-leading company in market research and analysis, recognized Telit with its 2017 European Customer Value Leadership Award citing Telit's broad portfolio of IIoT-driven offerings, including modules, connectivity solutions, industrial and IoT platforms and its general expertise in the field.

In its award announcement, Frost & Sullivan highlighted the ability of the deviceWISE IoT platform to help customers solve interoperability issues across the manufacturing enterprise, improving productivity and accelerating time to value. The analysis cited a use case in which a German automotive company adopted Telit's platform to connect its assembly line, including robots, PLCs and even DC torque tools, to the factory back-office maintenance system to allow automatic scheduling of maintenance. Telit's platform enabled smooth asset integration, making the manufacturing IIoT environment ready in only one day.

"As machines become connected to enterprise systems, maintaining data integrity by ensuring secure data flow across the connected network becomes imperative," said Sharmila Annaswamy, Senior Analyst, Frost & Sullivan. "As such, customers need an advanced IoT platform that can facilitate the fast and seamless integration of industrial assets into a connected ecosystem, generate real-time actionable intelligence to boost performance, and significantly enhance performance quality and efficiency."[2]

[2] "Frost & Sullivan Recognizes Telit as a Customer Value Leader for Its Broad Portfolio of Industrial IoT (IIoT)-Driven Offerings," Telit, February 22, 2018 (https://www.telit.com/press-release/frost-sullivan-recognizes-telit-customer-value-leader-broad-portfolio-industrial-iot-iiot-driven-offerings/).

See Telit deviceWISE in action

Here are two examples of companies that chose deviceWISE to address their top challenges and are reaping the rewards.

Honda streamlines and scales operations

Honda, a leading automotive manufacturer, needed to improve its resource utilization and data quality and streamline operations by increasing the commonality and compatibility across its tools and plants. However, the company was running many of its major manufacturing applications on IBM mainframe and AIX platforms, which required custom code and middleware. The platforms were also inflexible and provided poor performance.

With deviceWISE, Honda can now smoothly integrate its applications with the factory floor, including production PLCs from Omron, Mitsubishi, Siemens and Rockwell. Instead of requiring custom coding, the firm can take advantage of as-built quality data. After deploying deviceWISE, Honda was able to improve its efficiency and interoperability, scaling its operations more easily to meet new market demands and ramp up new production facilities.

Siemens enables smooth PLC integration

Siemens, a global leader in industrial automation solutions, serves a wide variety of manufacturers in multiple industries. The company sought a better way to connect its PLCs to enterprise systems, including hardware devices from non-Siemens manufacturers.

With deviceWISE, manufacturers using Siemens systems benefit from a smooth, trouble-free integration of industrial automation machine data into their back-office business systems. deviceWISE works as an out-of-the-box connector to Siemens MindSphere, the cloud-based, open IoT operating system that connects products, plants, systems and machines.

Together with MindSphere, deviceWISE lets manufacturers take full advantage of the rich volume of data generated by IoT with advanced analytics. The platform also enables manufacturers to integrate non-Siemens hardware devices as part of their overall environment.

Bring home the big win with Telit and deviceWISE

To survive in today's highly competitive marketplace, manufacturers need to migrate to more intelligent, connected manufacturing with IoT — sooner, rather than later. Telit enables organizations to realize the potential of today's technologies by offering the world's most comprehensive portfolio of high-performance IoT modules, connectivity services and software.

Long before IoT became fashionable, Telit was accumulating extensive experience in connecting enterprise networks to machines. Its experts have pioneered a successful end-to-end system approach that assures that all the pieces work together seamlessly when connecting "things to apps," from device management to connectivity management and data management — and everything in between. This deep experience is backed by a focus on simplicity through removing barriers and risks to make onboarding IoT solutions simpler.

With deviceWISE, manufacturers can take advantage of a manufacturing communications platform that is easy to integrate and easy to change. It is accepted across a broad array of industries and used by a variety of OEMs, providing a "one-stop shop" for manufacturers to reap the benefits of a single, comprehensive solution.

Telit deviceWISE runs on a wide variety of computer platforms, including Microsoft Windows, Linux, IBM AIX, Raspberry Pi, and in-rack systems such as Siemens, Mitsubishi, and Rockwell. Designed for smooth, rapid deployment, it enables organizations to decrease installation and maintenance costs by eliminating the use of intermediate PC technology, custom programming, and home-grown solutions. With deviceWISE, manufacturers can reduce time to market by enabling connectivity that breaks through complicated data transfer layers.