



## Listening to the Voice of the Machine™ : The Value of Discrete IoT





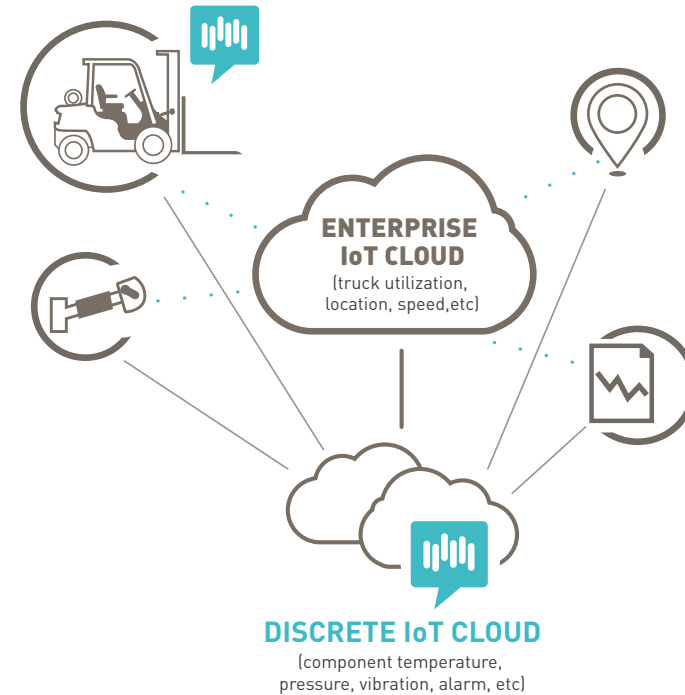
## INTRODUCTION

When you hear, Voice of the Machine, you may imagine a robot from the movies warning of danger in a voice that can be easily understood by the people around it.

Today's IoT-empowered machines – machines with a voice – can warn you of danger, but not quite that dramatically.

By empowering machines to “speak,” valuable data is generated and captured as these machines perform their intended function, whether that function is delivering compressed air or transferring fluids. IoT enables those empowered machines to communicate with each other and with management systems that consolidate data to provide visibility into components and systems that have, until now, been “in the dark.”

Much of the focus of IoT development has been on enterprise-level platforms that provide a top-down view of large systems. Yet, enterprise-level IoT, while indispensable to the future, captures only about 10 percent of the data available, limiting the ability to support predictive maintenance and performance optimization at the component level. Unless supported by discrete-level IoT systems to deliver the remaining 90 percent of data from critical components, enterprise-level systems are unable to tap their potential to transform the business.



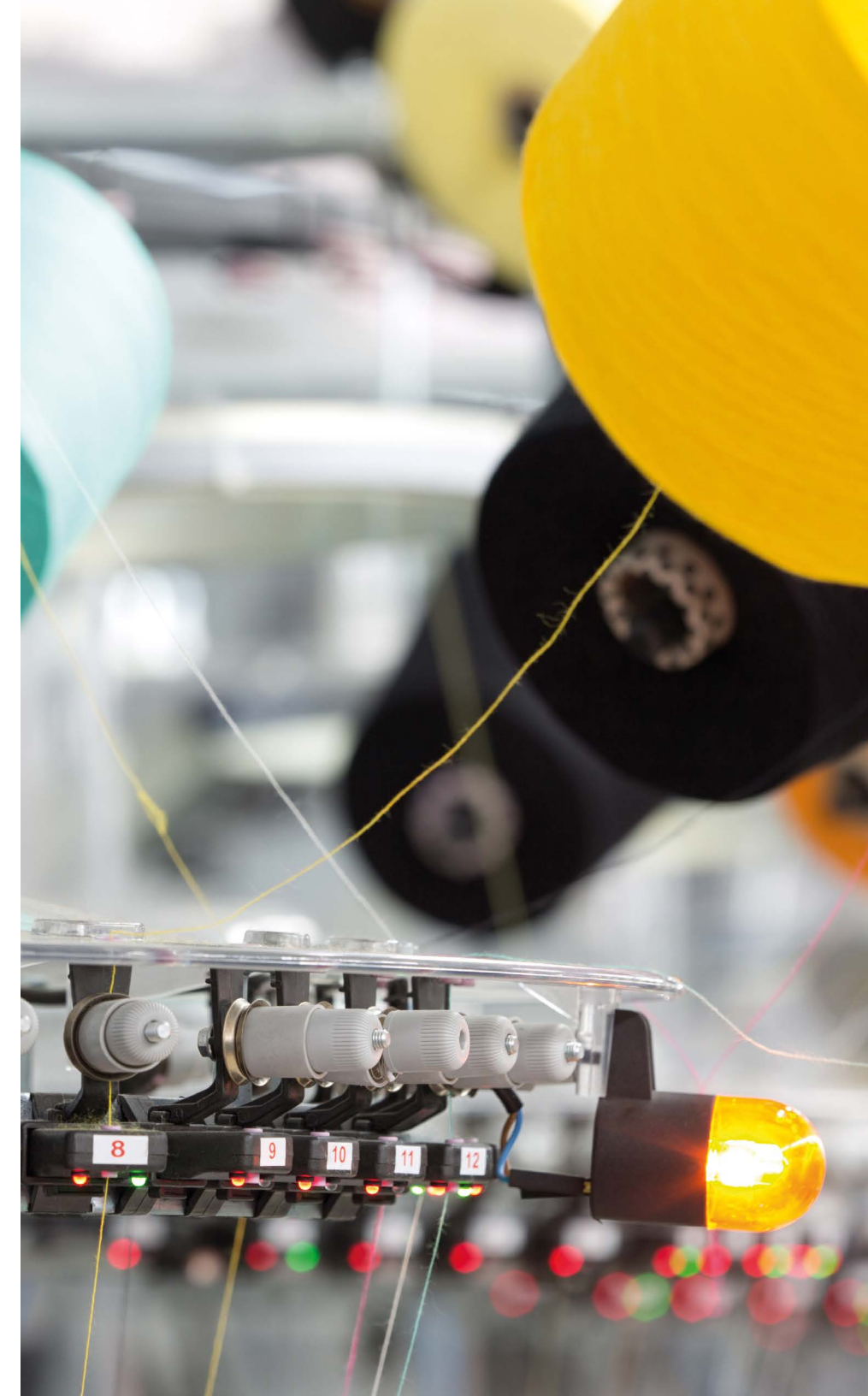
Voice of the Machine™ solutions take IoT to the last mile by providing visibility into critical components.

*Enterprise-level IoT, while indispensable to the future, capture only about 10 percent of the data available, limiting the ability to support predictive maintenance and performance optimization on the component level.*

Fortunately, the reverse is not true: discrete IoT systems can deliver immediate value independent of the enterprise-level system while still supporting the long-term objectives of those systems. [Tweet this.](#)

To move forward with IoT, Parker believes an immediate opportunity exists in discrete application areas. Voice of the Machine was created to help you capitalize on this opportunity. It is central to our digital transformation and builds on our 100 years of application experience at the discrete component level. Our extensive history, broad solution set and commitment to IoT through Voice of the Machine, make Parker uniquely positioned to help operators of critical industrial systems implement IoT in the way that makes the most sense for their organization.

This paper outlines our IoT approach delivered under the Voice of the Machine platform, and how the supporting technology allows industrial operators to begin leveraging the benefits of IoT today while maintaining future flexibility.







# UNDERSTANDING THE VOICE OF THE MACHINE

The Voice of the Machine embodies Parker’s approach to IoT, including our centralized initiative to standardize IoT technology across our businesses, IoT-empowered products that result from that initiative, and our promise to customers.

Through Voice of the Machine, we have established a common set of standards, principles and best practices across our operating groups. As a result, all Parker products use the same communication standards, security architecture, and visualize data in the same way. This ensures we deliver value through interoperability and create a consistent user experience.

From a technology perspective, we’ve focused our efforts on minimizing the challenges that have prevented operators in critical industries from leveraging IoT to solve operating problems, such as downtime and maintenance costs. If you’ve considered this transformation for your operation, you’re already aware of challenges like legacy devices that are not IoT-enabled, competing communication protocols used by various suppliers, securing devices and data, and determining what data to collect and how to present it to the people who can use it to improve operations.

*Voice of the Machine™... makes it easier and more cost effective for you to remotely monitor assets, reduce risk, maintenance cost and unplanned downtime while uncovering hidden opportunities to improve efficiency.*

## VOICE OF THE MACHINE ADDRESSES THESE CHALLENGES THROUGH SOLUTIONS THAT DELIVER:

### • INTEROPERABILITY:

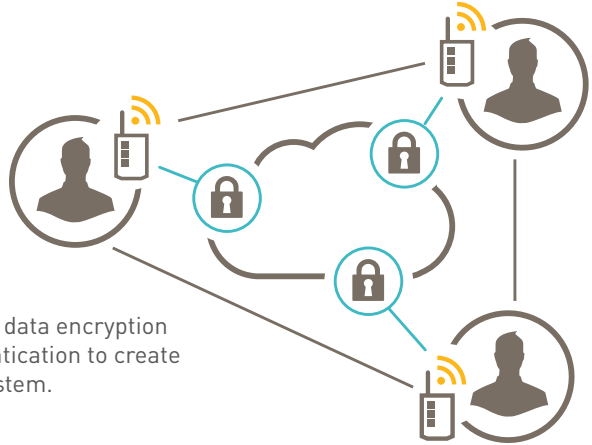
The value of any IoT solution is directly proportional to the level of interoperability achieved. Parker is a founding member of the OPC Foundation, creators of the OPC Unified Architecture (OPC UA). The OPC UA is an open machine-to-machine communication protocol for industrial automation that offers robust security and compatibility across operating systems and programming languages.

Parker is also an active member of the Industrial Internet Consortium, a global partnership focused on accelerating the growth of the industrial internet by identifying, assembling and promoting best practices, including defining and developing the reference architecture and frameworks necessary for interoperability.

Affiliation with these industry associations, combined with our centralized approach, have enabled us to consistently employ open standards and architectures across all of our Voice of the Machine products to provide out-of-the-box interoperability between Parker components. We’ve also implemented an exchange-based architecture that simplifies integration with third-party products, platforms and services.

### • SECURITY:

All Voice of the Machine enabled products have been designed with a consistent security architecture that provides device and user authentication and maintains device and user identities in a secure fashion. We employ best-practice data encryption in motion and storage to create an end-to-end secure ecosystem. We use best-in-class security practices that protect device communications both up and down the stack. Our cloud-based solutions provide strong encryption, transaction authentication, segregation of user and device data, and application logic and logging systems to proactively monitor for vulnerabilities.



Voice of the Machine™ uses data encryption and device and user authentication to create a secure end-to-end ecosystem.

### • SCALABILITY:

There’s little doubt IoT will become an increasingly important tool in managing industrial technology as it continues to evolve. That’s why it’s critical to deploy technologies today that can scale as your use of IoT expands. Our commitment to interoperability ensures you won’t get locked into a proprietary technology at the product, application or platform level. Across the spectrum, we can work with third-party products or platforms, delivering meaningful data in a form they can use. In addition, our Voice of the Machine development partners allow us to quickly customize an IoT solution to your application globally.

### • DATA ACCESS AND VISUALIZATION:

Critical to the success of any IoT implementation is knowing what data is necessary to achieve the objectives of the implementation. Our approach prioritizes quality over quantity so you don’t get bogged down with meaningless data. Our growing library of visualizations is portable across all Voice of the Machine products to ensure a consistent experience. We provide data and alerts in a form that makes sense for your business.

While the technology itself is impressive, Voice of the Machine is more than a suite of products; it represents our commitment, expressed through our cohesive strategy, to deliver solutions that make it easier and more cost effective for you to remotely monitor assets to reduce risk, maintenance cost and unplanned downtime while uncovering hidden opportunities to improve efficiency.





## VOICE OF THE MACHINE IN ACTION

Voice of the Machine is being implemented across a broad range of Parker products. Here are three examples:

### • CONNECTED FACTORY COMPRESSED AIR SYSTEMS

In manufacturing, compressed air is critical to keeping lines operating. With IoT-empowered compressed air systems, you can quickly deploy condition monitoring and predictive maintenance routines for factory compressed air piping systems. The condition monitoring system uses advanced sensors, software and wireless or Bluetooth connectivity to provide a comprehensive picture of system performance through both real-time and historical data.

By providing data on vital operating metrics, such as pressure, temperature, humidity, power and flow, through an easy-to-use interface, users can rapidly diagnose problems, such as leaks, and employ predictive maintenance routines that allow them to address seemingly minor issues before they snowball into serious problems.

### • ELECTRO-HYDRAULIC CONTROL

Parker's IQAN® Connect solution integrates intelligent hydraulic components with electronic control hardware and software to create a seamless digital system. With IQAN Connect, equipment performance is optimized and remote monitoring is simplified for OEMs and fleet managers. The system's building-block approach reduces development time and enables advanced functions to be added without custom programming.

Because IQAN Connect stores data in the cloud, information can be accessed instantly, allowing adjustments to machine operation to be made in real time. Assets are managed with live diagnostics to help reduce downtime, maximize return on investment, and improve safety and productivity.

### • ASSET MANAGEMENT

The Parker Tracking System (PTS) is an innovative component-tagging and asset management solution that focuses on critical-wear components to drive new levels of productivity, efficiency, and reliability.

Ideal for companies looking to plan for and perform asset management and replacement services for a wide variety of product types, PTS can establish detailed asset location data, create and deploy custom inspection templates, store and retrieve historical inspection results and schedule and personalize MRO alerts and notifications.

PTS has been engineered with key industries and user profiles in mind. What makes PTS unique is the ability to move asset records between accounts or create "Affiliate" relationships between users.



# GETTING STARTED WITH DISCRETE IOT

Before getting started with any IoT implementation first consider what you're trying to accomplish and whether IoT is the best technology to achieve your objectives. It's easy to get caught up with the promise of IoT, but not every operating challenge requires an IoT solution. The right partner can help you determine the correct approach for your operation at this time.

With that caveat, it's important to note that by "lighting up" assets that have previously been dark, IoT is proving capable of addressing some of the core issues that have troubled operators for years. It represents a new solution to problems you may have simply learned to live with.

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*First-time IoT users often start with a condition monitoring solution for one or two critical assets. This addresses the common problem of downtime and its expense while allowing a controlled pilot of IoT that can impact the bottom line and inform future IoT implementations.*

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HERE ARE SIX STEPS TO HELP ENSURE SUCCESS WITH YOUR FIRST IOT IMPLEMENTATION: [Tweet this.](#)

Here are six steps to help ensure success with your first IoT implementation:

1. It's often beneficial to engage with a knowledgeable partner early in the process to brainstorm the problems that are holding you back. What are those problems that you've lived with for so long that you don't even think about solving them anymore? Addressing those issues through a focused IoT solution may represent the best path forward.
2. Determine what business metrics are relevant to the solution and work with your partner to develop a solution that addresses the identified problems. First-time IoT users often start with a condition monitoring solution for one or two critical assets. This addresses the common problem of downtime and its expense while allowing a controlled pilot of IoT that can impact the bottom line and inform future IoT implementations.
3. Consider a strategy in which you listen to the most critical machines or processes without necessarily attaching a sensor to every machine or component. List the assets of critical importance to your operation and identify a small subset of those assets to begin gathering greater operational insight. Machines that are difficult to repair or have rare parts should be added to the short list, as well as assets that could present a danger to employees if conditions go unchecked.
4. Identify the conditions most critical to each asset on your short list, such as temperature, pressure, humidity and vibration. What are the conditions that allow operators to predict that asset's health? Focus on the quality of the data you'll be getting, rather than the quantity.
5. You'll need an Internet infrastructure to support data transmission to the cloud. Our Voice of the Machine platform provides a centralized collection server to receive and transmit data from all sensors in the network. If sensors are out of range, repeaters can be installed to extend the signal without interference.
6. Find a balance between monitoring frequency and operational costs. Cloud-based solutions allow for more constant monitoring, as well as alerts for when conditions breach a threshold. Leaving cloud-based sensors active on an asset allows users to zero in on problem areas with large, complex equipment. You can also connect to the sensors to plot data trends and diagnose where the problem is occurring quicker and more easily than if the operator was using manual gauges and manifolds.

By beginning with business problems, identifying critical assets that benefit most from condition monitoring, and employing a cloud-based solution, you can get IoT up and running with minimal disruption. Parker IoT experts are available to assist you in developing an IoT strategy and implementation plan.

# INDUSTRIES WITH THE MOST TO GAIN FROM DISCRETE IOT

Industries that derive the most value from IoT today are those that have operations or equipment located in hard to get places, where there are safety concerns, where downtime is expensive, where the operations/processes themselves are expensive and in highly regulated environments, including:

*The value of any IoT solution is directly proportional to the level of interoperability achieved.*



**MINING:** Mining equipment operates in a harsh environment and often in remote places. IoT-Empowered solutions in operation on equipment ranging from roadheaders below ground to dump trucks above provide the visibility to decrease downtime and increase safety.



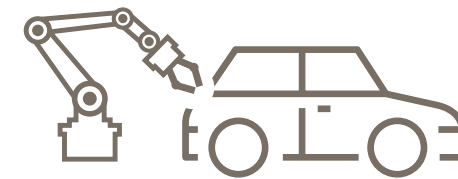
**OIL AND GAS:** Parker has been providing oil and gas solutions for decades. By enabling data from a connected pump, we have virtual flow meters and help direct maintenance staff to remote problem sites more efficiently.



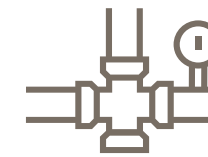
**MEDICAL DEVICES:** Parker makes a number of medical device components and solutions. Patient care and monitoring are areas where insights from connected products can have a major impact on patient outcomes.



**POWER GENERATION AND RENEWABLES:** Grid stability is always important. This is getting more difficult to manage as renewables comprise more of the grid. Parker's energy storage solutions not only keep the grid stable when disparate power sources enter the grid, they also allow these systems to be managed remotely in ways not previously possible, ensuring maximum uptime.



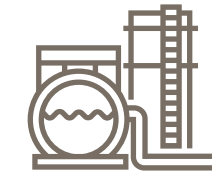
**AUTOMOTIVE MANUFACTURING:** Compressed air is essential to automotive manufacturing. Delivering it and maintaining constant pressure throughout the system consumes significant resources. To address this, Parker has created Transair SCOUT, which helps manage and optimize compressed air system performance.



**MUNICIPAL WATER TREATMENT AND WASTE MANAGEMENT:** Water treatment and waste management facilities are subject to a high number of safety and regulatory requirements. Parker offers wireless condition monitoring solutions that can be used to monitor water treatment processes to ensure compliance with regulatory demands and increase safety for workers.



**MOBILE INDUSTRIAL:** Mobile industrial vehicles are built with a purpose and that purpose can be critical to a company's profitability. When hydraulics are essential to that purpose, Parker can provide insights and direction to best optimize their operation.



**CHEMICAL PROCESSING:** With regulatory demands and increased safety concerns for workers in plants that either produce or work with chemicals, connected products can be used to enable visibility into critical operating parameters. IoT solutions will empower plant operations to report regulatory data in real time all the time.



## CONCLUSION

While IoT can be seen as early in its maturity, the technology has reached the point in its evolution where it can deliver significant value in industrial applications if the right partner and right approach are selected. Our Voice of the Machine initiative and solutions were created to enable a focused, cost-effective and secure approach to IoT. Through Voice of the Machine you can target your most critical assets for condition monitoring, realizing immediate benefits while laying the foundation for expanded use of IoT in the future.



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