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Benefitting from the IIoT Thanks to Process Drives

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KEY TAKEAWAYS

- Intelligent connected drives offer measurable benefits to the business.

- IIoT drives collect data and make real-time decisions that optimize processes.

- Businesses decrease energy consumption and associated costs with process drives.

- Drives make real-time decisions that minimize costly asset downtime.

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OVERVIEW

Using modern process drives like Schneider Electric's Altivar Process variable speed drives (VSDs), plant operators are able to take advantage of the Industrial Internet of Things (IIoT). Using the IIoT, these drives collect and analyze data that helps the business optimize processes, manage energy consumption, and minimize costly asset downtime.

CONTEXT

Richard Jennens discussed the benefits IIoT-connected drives like Altivar bring to plant operations.

KEY TAKEAWAYS

Intelligent connected drives offer measurable benefits to the business.

The Industrial Internet of Things changes the way that system components interact, turning variable speed drives into information resources that help the business run. These intelligent connected drives offer measurable benefits to the business, including:

- Reduced downtime of up to 20%
- Optimized energy usage up to 30%
- Enhanced system safety

These next-generation drives—including Schneider Electric's Altivar Process VSDs—are services-oriented devices. They help businesses decrease costs by in three key areas:

1. **Process optimization** uses program functions within the driver to monitor processes and respond to changing conditions, maximizing the performance and efficiency of the process and assets.
2. **Energy management** monitors and optimizes the consumption and usage of energy.
3. **Asset management** integrates predictive maintenance functions and the detection of process abnormalities to reduce downtime and maintenance, as well as protect and prolong the life of physical equipment.

IIoT drives collect data and make real-time decisions that optimize processes.

A basic VSD follows instructions issued to it by the system to control when and how fast the motor should run. An intelligent VSD goes well beyond basic operations, collecting and analyzing information allowing it to respond to changing process conditions in real time.
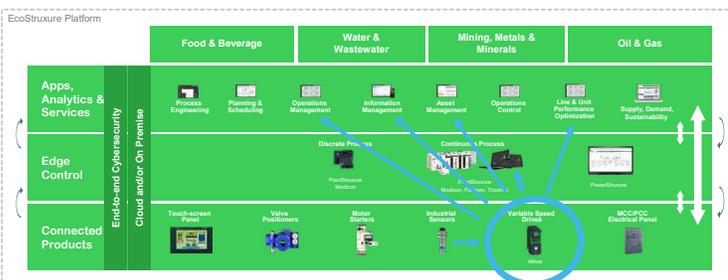
> Having an intelligent connected drive is like having an application engineer sitting full-time on your process, reviewing what's going on and making sure it's running smoothly.
>
> *Richard Jennens*

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IIoT drives use data to make decisions without human intervention, but offer operators dashboards and logs to give them visibility into the system. These drives will also alert operators when human intervention is necessary.

Altivar drives provide process optimizations in several ways, as shown below.

Altivar Drives Provide Process Optimization	
Real-Time Data	Monitors systems with real-time data, including for application control functions, system integration, and analytics. Offers application performance monitoring and optimization.
IIoT Plant Integration	Ease of integration saves money, both in time spent programming and configuring systems and in asset investment and maintenance costs.
Multi-Drive Link Architecture	Ethernet-based real-time communication between master and up to five slave drivers reduces costs with the advanced management of complete installations inside the drive and service continuity. This architecture is typically used with master slave systems, speed followers, and load sharing systems like conveyors, as well as with multiplex pumping systems.
Booster Control	Provides decentralized application expertise to maintain the desired pressure or flow at the system outlet using a multi-drive architecture. This decreases installation costs, reduces energy consumption, and manages mechanical wear.
Monitor Pump Operation and State Efficiency	Analyzes the pump characteristic curves input to monitor flow rates without the expense and difficulty of installing a flow measuring device. Signals operators in an emergency, such as a pipe breakage, so that they can resolve problems quickly.

Businesses decrease energy consumption and associated costs with process drives.

When plants first began using VSDs to control motors, one of the earliest reasons was to save energy and costs in operations. IIoT drives take energy management even further by enabling businesses to see what their actual energy consumption is and how their patterns are changing, and to guide them in their response.

Intelligent Altivar drives provide improved energy management in several ways, as shown in the table below.

Altivar Drives Aid in Energy Management	
Energy Monitoring	Smart metering with Altivar process drives provides energy consumption information of greater than 95% accuracy, enabling businesses to monitor energy consumption, detect trend changes, and anticipate maintenance to optimize the operation process and save costs.
Stop & Go Function	Increases energy savings up to 60% by moving a drive from standby mode to stop mode when it is not in use. This functionality is best used for drives that don't need to respond immediately when requested.
Friction Loss Compensation	Maintains pressure in a system that has a variable flow rate, such as in a heating, ventilation, and air conditioning (HVAC) system. This functionality provides accurate pressure control at point of use and additional energy savings at reduced flow rates.

Drives make real-time decisions that minimize costly asset downtime.

Asset management is critical to the business, since unplanned downtime can be costly. Today's process drives monitor performance, detecting, preventing, and alerting on issues that can help the business minimize costly unplanned downtime.

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> Minimizing or eliminating that downtime means more production time. It means a more stable operation. It means happier customers. It's the holy grail of process operations.
>
> *Richard Jennens*

Altivar drives help the business improve asset management and reduce costly downtime in several ways, as shown in the table below.

Altivar Drives Improve Asset Management	
Anti-Jam Function	Unwanted debris, such as a plastic bag in a waste water lift station, can clog and damage systems. The anti-jam function detects these potential problems and automatically executes forward and reverse pump rotations to clear the clog, alerting operators if it cannot clear it. This results in reduced downtime and manual maintenance.
Pipe System Protection	A low rate pipe fill mode eliminates the occurrence of water hammering, which can burst or break pipes when filled too rapidly.
Smarter Maintenance	Augmented reality, such as dynamic QR codes, helps operators access the information necessary to troubleshoot and resolve problems quickly, keeping downtime low.
Cybersecurity Achilles Level 2	Ensures the systems and networks are robust and meet both current and emerging cybersecurity standards and government regulations. This reduces costs associated with comparing claims of system robustness and security.

BIOGRAPHY

Richard Jennens

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Richard Jennens has 24 years of experience in Industrial and Process Automation in Services, Project and Product Management in Asia and the US. Richard has been working for Schneider Electric USA since 2011 and is currently the Product Manager for High Performance Drives for the US, focusing on how VFD's can provide process efficiency and productivity improvements.