



DAVIS-STANDARD®

Realizing the Intrinsic Value of Digital Transformation with DS Activ-Check™

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The power of digital transformation to improve processing efficiency, product quality, and bottom-line profitability is at your fingertips. Whether you're in the business of medical, packaging, consumer products, automotive, or building and construction, it's time to take advantage and improve your OEE (Overall Equipment Effectiveness).

Our Industry is Ready for Digital Transformation

Digital transformation impacts our lives daily. The multiple features on our cell phones, the navigational systems in our cars, instant access to information, live streaming of media into our homes; are just a few examples of how the Internet of Things (IoT) has changed the way we live and do business.

Manufacturing operations are extremely complex, which is why digital infrastructure has been slower to occupy this space. As a result, our industry looked inward to strengthen



operational efficiency and profitability. Improvements focused on control systems for the factory floor through automated control systems that improve safety, reduce human interaction, strengthen local data collection using improved SCADA systems (Supervisory Control and Data Acquisition), and access equipment via the internet. These steps served as the initial building blocks for digital transformation within operations.

This movement accelerated as digital technology proved to be more reliable. Our industry realized the potential and initiatives gained traction. The fourth Industrial Revolution, known as Industry 4.0 or I 4.0, quickly gained popularity. The possibilities and advantages of Industry 4.0 spread around the globe, and today we have the Industrial Internet of Things or IIoT.

The IIoT platform enables the development of new technology by leveraging information from existing control capabilities. Currently, line control systems can display and collect performance information, providing an interface for operating equipment. However, this presents disparate information that is difficult for operators to translate. New digital technology expands this platform by introducing a human factors concept of situational awareness to improve performance while incorporating preventative and predictive tools into our operations. This gives you instant data access, imagery, and connectivity not previously available.

Digital Transformation's Value = Increased Situational Awareness

The multitude of benefits realized through increased situational awareness provides you with a customized **digital toolbox** (literally) that will both simplify and amplify your operation.

Situational awareness is defined as developing and maintaining a dynamic awareness of the situation and the

risks present in an activity. This is based on gathering information from multiple sources from the task environment, understanding what the information means, and using it to think ahead about what may happen next.

The three aspects of information processing include perception, understanding/interpretation, and prediction.

Perception or gathering of information directly using our senses of vision, hearing and touch, or indirectly through a complex control system involving HMI displays, and interfaces.

Understanding information by combining this data from the production process or equipment with existing knowledge and experience from memory. Information gathered is given meaning. This includes developing an accurate and complete picture of the operation, better informing our decisions.

Prediction and projection into the future, which includes thinking ahead. This involves predicting what to expect as well as what not to expect.

- What happened? (perception)
- What is happening? (comprehension)
- What might happen in the near future? (projection or what to expect in the near future)

Situational awareness provides context to the complex data that your team receives from your production environment. It helps your team interpret data, to make informed decisions that result in positive projected outcomes. It makes it possible to transition from a historical perspective of "running to failure" using post-failure analysis to a preventative and

forward-looking system using real-time information from your process and equipment. We will use Davis-Standard's DS Activ-Check™ as the example to show how this works.

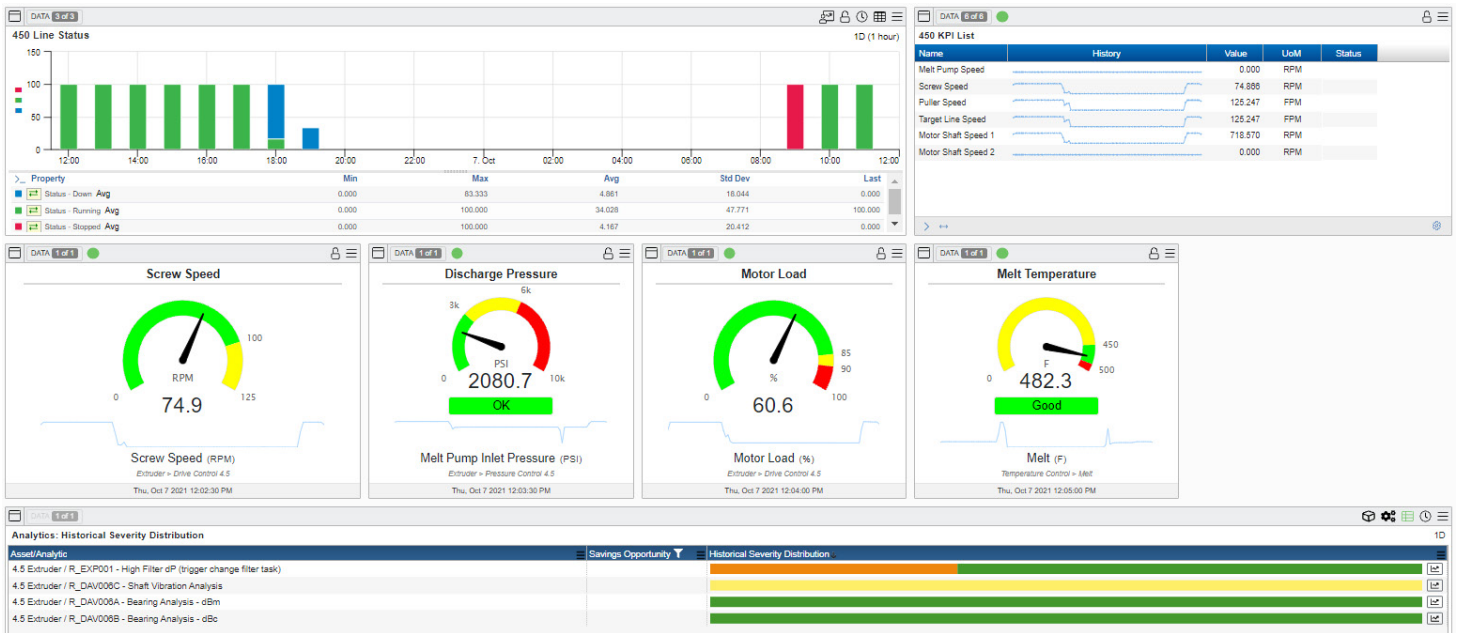
DS Activ-Check™ is a custom-designed, cloud-based platform that improves the operator's situational awareness to enhance extrusion production line performance and productivity. DS Activ-Check™ leverages systems and strategies offered by the IIoT to increase operator effectiveness, leading to reduced downtime, better product quality, and reinforced operator safety. The configurable platform engine uses analytical tools based on long-term cloud data storage along with process and equipment technology algorithms to help management and production teams identify and improve product quality and line efficiency.

PERCEPTION – What has happened/is happening on my process and equipment?

Visuals transform data into useful information using colorful charts to summarize current process conditions and equipment performance. This enables your team of process technicians, maintenance, engineering, and management to understand the current state of the operation instantly and at-a-glance.

Team members do not have to download files or create graphs to gain insight. Instead, the information is presented logically in the form of informational dashboards. Dashboards are generated by the system and can be calendar-based, run-time-based, and/or critical need-based to improve productivity. This allows for precious time to be spent resolving the is-





sues and not hunting for them. In addition, users can gain access to their data anytime and anywhere via browser or mobile application. Accessibility can be tailored to each user, allowing system administrators to fully control the level of access and what data is visible to each user.

Example of an extruder overview dashboard:

COMPREHENSION – How is the system operating? Evaluation of current quality parameters/trends.

Dashboards like the one above are designed to keep you aware of current line conditions and add context to data, so your team has a complete understanding of how system components interact and affect product quality.

An aggregate analytic continuously monitors important KPIs during production runs and displays the degree of variation and overall average. Analytics are based on existing production data to establish pre-defined performance settings that recognize processing deviations that are either too high or too low. Then, using

computer programming that runs on the cloud, these analytics provide alerts and steps to corrective action. Finally, the operator sees the visualization of these analytics so that system performance can be understood by glancing at the dashboard.

PROJECTION – Helping your team use information effectively to predict future outcomes.

Trends of production system analytics are continuously monitored, tracked, and visually displayed using an activity map. This determines the direction of your process and equipment. Categories include good trending better, good trending worse, bad trending better, and bad trending worse. Proactive steps can be taken to improve performance using this information. The team can clearly see how recent actions impact system performance in real-time.

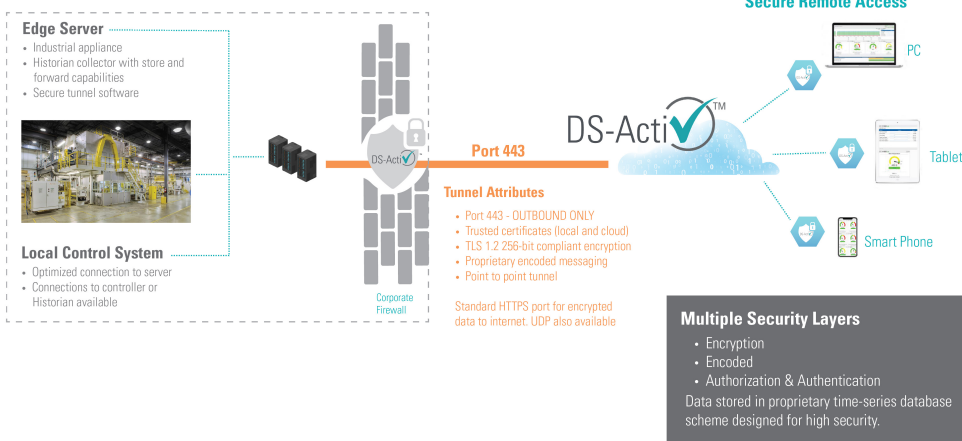
You can put your production data to work by taking this a step further. Production run information, including analytical performance parameters and KPIs are used to select the best conditions for your process and equipment using an optimi-

zation toolbox. This guides your team to select the most desirable line conditions – or the “Golden Run” to achieve the best performance for future production runs. The advantages are threefold and interconnected.

- 1. With a cloud-based digital platform, you can take advantage of:**
 - Real-time monitoring
 - Run-time analytics
 - Alert/status notifications
 - Task management
 - Collaboration/remote access
- 2. Improve efficiency, reduced down time, and best practices through:**
 - Optimized equipment performance
 - Product assurance
 - Advanced maintenance
 - Preventative detection
 - Expert analysis
- 3. Deliver positive results to customers with:**
 - Product quality
 - Operational efficiency
 - Equipment reliability
 - Employee impact



Secure System Architecture



Inside the Digital Toolbox and its Advantages

The digital architecture of a cloud-based system is shown in the figure below. The DS Activ-Check™ system continuously monitors the production line equipment on the left. The real-time operational data, including KPIs (Key Performance Indicators) from the production line PLC or SCADA system historian, are sent to an edge server inside the plant. The edge server collects, buffers, and encrypts the data before sending the information on a secure Port 443 through a secure firewall. The server is located behind a secure firewall to prevent unwanted access.

The data moving on the secure Port 443 travels over the internet and is stored on the cloud. The cloud refers to servers or computers accessed over the internet and the software and databases that run on those servers. This is where cloud computing giants such as Amazon, Netflix, Google Maps, Google Earth, and the DS Activ-Check™ system reside, among many others. Major players providing cloud-based services include Google, Amazon Web Services, and Microsoft, to name a few. The right side of the image shows how the information from the cloud-based system can be securely accessed remotely from anywhere using your smartphone, tablet, or PC with a secure internet connection.

What advantages does using cloud-based monitoring offer?

Information storage and access

Data collection and storage capacity is unlimited. Your valuable production data is securely stored and can be used in the future for comparing production performance between lines and plants, optimizing production processes, and more.

Connectivity

You have the ability to securely monitor your production process from anywhere at any time. This is a force multiplier for your process, maintenance, and operations teams. They will be able to address issues before failure, eliminating lost production. They will be able to identify a specific issue and take corrective action quickly versus spending countless hours trying to determine a root cause. They can deploy maintenance tasks with all records of completion stored for future reference. They can collaborate and troubleshoot issues in real-time to prevent costly production downtime.

The data storage capacity for a typical SCADA system is limited to 180 days. After 180 days, the data is lost. A cloud-based system ensures your data is never lost.

Scalability

Production equipment can be easily added to the system starting from one line. In addition, production lines in the plant and from other locations, domestically and internationally, can be included. This is a very important feature for digitally transforming multiple locations.

Analytics Running in Real-Time

The cloud platform provides the capability to continuously run software that analyzes equipment performance. Using real-time data from your production process, software programs continually monitor the performance of your operation and provide critical information to key players. This reduces or eliminates unwanted downtime and guides your decision-making with regard to preventative and predictive maintenance items.

Your Digital Toolbox Awaits

As with any new technology, digital transformation is a journey that evolves and develops as it is implemented. The time to take that first step is now, that vital step that opens up a world of efficiency and troubleshooting possibilities for your extrusion and/or converting operation. By taking advantage of DS Activ-Check™, you have a digital toolbox at your fingertips. You can use the most up-to-date technology to enhance the performance of your equipment for bottom-line results and increasing OEE. You will have greater control of operational variables that influence value, profitability, and better processing for you and your team. The possibilities are endless!

For more information about DS Activ-Check™, contact us today 860-650-1612.



DS-Acti✓™



Improve extrusion and converting line productivity.

 **Get a quote today!**
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