

## Field Device Lifecycle Information and PAM Improves Design, Operation and Maintenance

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### Keywords

Lifecycle Information, PAM, PID, Field Device DNA, Design, Operation, Maintenance

### Summary

Large users of field devices have come to the realization that what field devices are made of are just as important as their ability to measure when it comes to predicting the performance of control systems where field devices play an integral part. Transparency of information where information can be accessed anywhere at any time will be key to future productivity. However, before we can enjoy these benefits, we need to go back to where field

Users considering deploying a PAM initiative for field device management should not underestimate the value of field device historical information. An up-to-date database of assets from birth to current condition will be invaluable to improving the design, operation, and maintenance of complex automated manufacturing plants.

devices we come from (as built, as designed and enhancements) and how they performed in real-life applications. That means that suppliers must provide solutions that capture the birth and subsequent changes to the field device throughout its life to its current status. Using this information in conjunction with today's PAM solutions can help improve the design, operation and the maintenance of plants.

### Analysis

If we could capture all the experiences including the good and bad regarding the application of field devices, manufacturers will benefit in countless areas not to mention the design, operation and the maintenance of the increasing complexity automation systems that run the plant. However, this is a tall order due to the magnitude of disparate information distributed in many areas and in some areas the lack of information. Just as Rome was not built in a day, accomplishing this task will take small steps. One of the first steps is to determine the kinds of information needed so enterprises



can deploy an appropriate system to capture the information and select a PAM supplier capable of providing these needs with applications that will benchmark the performance of field devices in the area of application, performance, and reliability.

### Field Device Lifecycle Information Enhances PAM

PAM systems is a combination of hardware, software, and services used to assess the health of plant assets by monitoring asset condition to identify potential problems before they affect the process or lead to a catastrophic failure. In addition to diagnostics, configuration and calibration tools, the severity of asset problem and potential causes are provided. PAM use intelligence embedded in assets and deploys various measurement technologies to protect and predict the health of assets. By enhancing PAM systems with additional information, manufacturers cannot only improve the maintenance of assets but also plant design and operation as well.

Functionality	Description
Field Device DNA	As Built Design and Changes to the Field Device
Field Device Application	Process Design Conditions
PID	Updated PID Documents
Field Device Abnormal Conditions	Number and frequency of device alarms, out of range, etc.
Calibration & Repair	History of recalibration and repair
Product Reliability	Predicts Installed Reliability
Application Suitability	Benchmark the Performance of the Field Device

#### Added Functionality Improves the Value of PAM

Adding functionality to PAM systems will not only help the workforce improve the maintenance of field devices but improve the design of the plant by identifying equipment models and characteristics most appropriate for an application. In addition, if this information is used to identify the bad actors, then reliability will improve by default, which in turn will improve design of plants with new iterations.

For example, most plants have the original Pipe and Instrumentation Diagrams (PID), despite the numerous changes during start-up and routine operation throughout the lifecycle of the plant. Tying PIDs with a PAM

system puts this feature at the fingertips of the maintenance department that most likely will make changes to field device configuration, device replacements and piping changes as conditions warrant. By making it easier for the workforce to capture this information, manufacturers have a proven design when plant expansion or new plants are needed.

Similarly easy access to field device DNA information is important to design, operation and the maintenance of plants. Having the history of a particular field device provides great insight in assessing the appropriateness of the application particularly when there is a failure. For example, if the process conditions of the loop has changed exceeding the capability of the device, this will warrant the retirement of current device for a field device appropriate for the new operating conditions. In designing a new plant, the field device DNA and "as running" PID can be used as an additional crosscheck to ensure its application suitability before finalizing the design.

### **Integrated Systems**

Manufacturers do not have the luxury of trial and error when it comes to integrating the different pieces to obtain the desired functionality. Although open systems have overcome much of the integration work, pulling together applications from different vendors can still be challenging.

While many of the leading PAM suppliers offer increasing functionality, Endress + Hauser (E+H) is highlighted here to show the breath of a comprehensive Field Device Lifecycle Information enabled PAM solution. E+H FieldCare PAM solution manages field devices regardless of supplier origin and is used to configure, diagnose problems and manage information throughout its lifecycle. It has an embedded documentation management system that links operators with all associated documents from a single interface.

E+H FieldCare combined their modular solutions including: Installed Base Assistant, Applicator Selector, and W@M (Web-enabled Asset Management) provides a vast information library created from decades of experience. Designed for business and technical users, W@M captures key product information and allows users to access all related field device information by unique tag number. Licensed users are provided a secure, password-protected, 24 x 7 access to information on their assets.

Their Installed Base Assistant helps users create and update as-built PIDs into a digital format using a software inventory system to ease user development. Project engineers use their Applicator Selector to determine the most suitable instrument for each application. After the results are verified, this information is linked with the asset and follows it until the asset is retired or replaced. All of the information is managed by a SAP database.

Data accessible to users includes a complete service history, I/O manuals, material test reports, calibration certificates, replacement models, hardware and software versions, spare parts, and allows users to record all maintenance, checks, calibration performed during the life of the device.

## Recommendations

- PAM suppliers should expand the use of Field Device Lifecycle Information to expand the use of PAM to not only improve maintenance but also improve the design and operation of automation systems.
- Manufacturers must consider deploying solutions to not only improve productivity today but also capture and use information in a way to continuously improve the application of field device to improve the design of the plants tomorrow. For many enterprises just beginning to adopt PAM systems, it would be appropriate to collaborate with their preferred supplier to ensure that field device lifecycle information systems are included in the overall solution.

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