

Focus on Reliable Assets



Five Strategies to Drive Reliability with Handheld Communicators

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Fix It When You Find It

Using Field Diagnostics to Work More Efficiently

Monitoring and tracking the status of equipment in the field is an essential part of day-to-day plant operation. Field technicians are the eyes and ears of the plant, whether they are investigating a known issue or are simply monitoring assets during regular rounds. From asset management software to field tools, everything should work together seamlessly to ensure maintenance is efficient, data is accurate, and devices are healthy.

More handheld field devices are available to assist field technicians than ever before. Yet according to a 2016 PdM survey conducted by *Plant Services*¹, pen and paper data collection is still a significant part of plant practice for 64.9% of respondents. If handheld devices deliver high value, why aren't field technicians using them? Perhaps it's because low-end or non-dedicated handheld data collectors create more problems than they solve.

Extra hours spent on repairs could be better spent on other tasks; not having access to diagnostic data in the field is a significant performance handicap.

The Problems with Paper

Tracking diagnostics in the field using pen and paper leaves the plant vulnerable to data loss. Notes taken in the field are likely to be hasty, illegible, and unreliable. Steps may be overlooked, and issues that seem minor at the time of repair might be forgotten and go unrecorded. The bigger and more serious a problem is, the less time technicians have to record accurate data about diagnosis and repair.

When the Right Tool Isn't at Hand

The absence of an effective handheld communicator increases the likelihood of process disruption. A technician may hear or see something on a piece of equipment that suggests a problem, but without accurate tools for analysis, the field technician can't necessarily diagnose the problem. When sight and sound aren't enough, the technician will have to bring the failing device back to the shop for inspection and analysis. At best, this means a long trip back with a piece of equipment, wasting a great deal of time. At worst, the removed component may create a gap in the process requiring that it be shut down until the technician can analyze the problem back at the shop, get the device repaired, and return it.

When field technicians don't have access to robust portable diagnostic equipment, they are forced to jump through hoops that leave them spending extra time analyzing problems instead of fixing them. Trying to analyze failing equipment without the right tools means adding additional non-value added work in order to properly diagnose issues. When those issues are diagnosed, they often take longer to repair. Extra hours spent on repairs could be better spent on other tasks; not having access to diagnostic data in the field is a significant performance handicap.



Improving Field Diagnostics

To avoid or minimize process upset, the plant must provide technicians with powerful and portable diagnostic tools so they can identify and troubleshoot device issues in the field.

With the AMS Trex™ Device Communicator technicians won't waste time transporting failing devices back to the shop for analysis or reconfiguration. They can diagnose many instrumentation problems with FOUNDATION Fieldbus and HART devices while the devices continue to run. Simple issues can be addressed on the spot, avoiding unnecessary, and potentially destructive, invasive physical investigation of the problem.

Moreover, some issues are much easier to diagnose in the field. While it may not be possible to tell the difference between a configuration problem and a wiring problem from the control room, a mobile technician, supported by wiring diagrams and diagnostic tools on the communicator would have little difficulty diagnosing the problem at the source.

The Trex communicator speeds diagnosis in the field, automatically presenting configuration screens when connected to devices it recognizes. The communicator offers segment and loop diagnostic tools, allowing users to validate loop and fieldbus segment characteristics no matter where in the plant they may find themselves.

A field technician carrying an AMS Trex Communicator can feel confident in having the tools at hand to properly diagnose any device issues encountered. Diagnosis in the field means significant savings in work hours and peace of mind knowing that problems will be fixed quickly and properly the first time.

¹ Plant Services. PdM Survey. February 2016.



Do More with a Single Tool

When Technology Delivers Flexibility in the Field and Workshop

Technicians are responsible for a larger number of devices than ever before. As plant demand for data increases, so too does the number of devices in the plant. While the data delivered by these devices is a welcome tool for keeping the plant running at peak performance, with more devices comes more opportunity for failure and more requirement for configuration, putting extra strain on maintenance crews.

Keeping up with critical maintenance tasks requires a tool that can help technicians operate more efficiently and with greater flexibility. Technicians need tools that eliminate repetitive tasks and reduce the wide array of tools that may be needed for tasks performed at the workbench or in the field.

Too Many Components

It is difficult for a technician to be efficient if every diagnosis and repair requires multiple tools to be successful. To evaluate a device, the technician often needs to connect a power supply, and ensure adequate loop resistance before diagnosis can begin. This means spending time searching the shop for the appropriate components before starting to work on a failed device.

Whether the technician is in the field or in the shop, extra time spent searching for components is frustrating under the best of circumstances. And when a device failure has caused an outage, these delays become even more serious.

“The ability to power a hard loop off of the Trex unit is huge. We no longer need to have an additional power supply or loop simulator on hand, whether it’s out in the field or back in our shop. It’s a huge advantage for the technician.”

– Monsanto



Many Tools in One Communicator

Frantically searching the shop for the correct power supply is no longer a concern with Power the Loop technology from Emerson. When a device requires an external power supply, the AMS Trex communicator anticipates the need for power and provides a notification to connect the device to the powered terminals. The technician can select the option to provide power to the device directly from the communicator, allowing immediate configuration or diagnosis, without the need to waste time searching the shop for a compatible power supply or confirming adequate loop resistance before connecting.

On the bench, Power the Loop technology means faster configuration, diagnosis, and repair of devices, enabling technicians to have a less cluttered work space. In the field, technicians can easily isolate devices from their environment, making it easier to discover problems with power supplies and wiring. In addition, the AMS Trex communicator eliminates the need to drag bulky power supplies and loop simulators out to remote devices, allowing technicians to reach and repair problem devices more efficiently.

Power the Loop technology can also be used at start up. If instruments are installed, organizations don’t have to wait for the host system installation, or for hardware, I/O, and cabling to be run. Technicians can install and configure devices in the field without waiting for anything else. Instead of transmitter configuration happening at the end of a project, technicians can begin configuring devices as soon as they arrive, helping organizations gain flexibility in schedule and workforce, and taking configuration off the critical path.



Go Anywhere in the Plant

Why a Built for Purpose Tool is Needed for Effective Maintenance

From the results of the PdM study conducted by *Plant Services*, it is clear that organizations are responding to the needs of field technicians. The survey indicates a steep rise in procurement of mobile devices for plant data collection since 2014. This is most likely a result of the flexibility of purpose such devices offer. However, not all devices are created equal; reliance on consumer-grade mobile devices for data collection may be premature, particularly for plants that value rapid response from field technicians.

There are an increasing number of workflow management and clipboard replacement apps for consumer grade smartphones that allow technicians to keep track of activities in the field. So why are field technicians leaving these devices back at the shop when they perform rounds? The answer is simple: the sensitive, fragile devices are hard to use and easy to break.

A device built for the consumer market is not developed to withstand the physical abuse of a plant environment. Tablets and smartphones are not designed to be used by technicians wearing heavy work gloves while trying to access hard to reach places. Under these circumstances, devices get dropped, scratched, and banged frequently.

Anyone who has dropped a tablet or smartphone knows that they break easily. These consumer devices do not stand a chance when dropped multiple times onto concrete or packed gravel floors in a plant.

Even if a consumer device is housed in a protective case, its sensitive touchscreen and small buttons will be nearly impossible to use when a technician is wearing heavy gloves, and will often require both hands to operate, a luxury technicians won't always have.

“Consumer smartphones increase total cost of ownership by up to 50 percent compared to ruggedized devices.”

– “The Hidden Costs of Using Consumer-Grade Mobile Technology.”
Motorola Solutions. 2014.

Unsuitable for Hazardous Areas

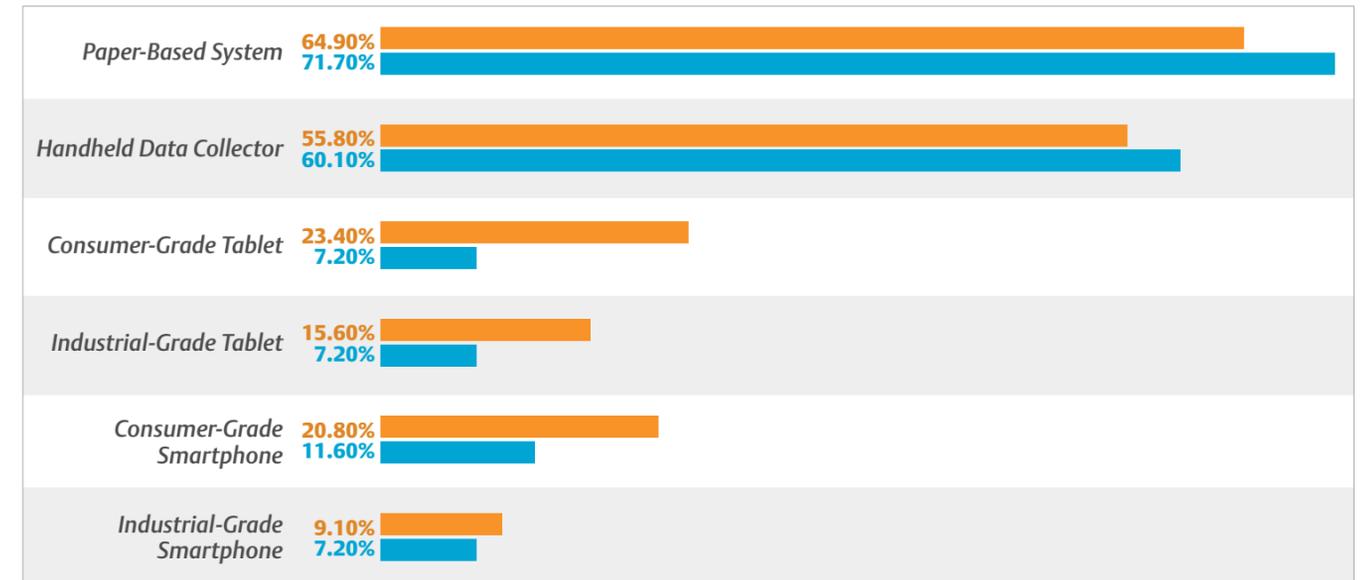
Technicians working in hazardous areas need equipment that can follow them into any situation. When a technician receives a call to investigate a possible equipment malfunction in a hazardous area, there are often safety regulations that make carrying consumer mobile devices problematic.

If a field communicator or mobile device that a technician carries is not intrinsically safe, the technician will be limited in ability to quickly respond. Consumer smartphones and tablets are not rated to be safely carried into hazardous areas. This means that a technician who is already in the field carrying a tablet or smartphone would have to return to the shop to exchange equipment before entering the hazardous area for investigation.

If the plant does not own any devices that are safe to carry into hazardous areas, the organization may have to pull a hot work permit in order to allow a technician to bring a portable device in to diagnose and make repairs on the faulty equipment. If time or safety concerns make permitting not possible, the process may need to be shut down in order for the work to occur, creating the very process interruption that a technician is trying to avoid.

Data Collection Methods Used with PdM

2016
2014



Plant Services. PdM Survey. February 2016.

Use a Tool That Allows You to Go Anywhere

AMS Trex communicators are built to withstand the abuse they will take in the field. Designed with harsh industrial environments in mind, the communicators feature a modern user experience, including a touchscreen display that allows for one-handed operation, even while wearing work gloves. The rugged display is visible in all types of lighting and is designed to take the bumps and drops that come from normal use in the plant.

The AMS Trex Device Communicator is certified to go anywhere a technician can go. Because it has Intrinsic Safety certifications including CENELEC/ATEX, FM, CSA, FISCO, and IECEx, there's no need to shut a process down or get a hot work permit. Technicians have the freedom and flexibility to go where they need to, when they need to, letting them solve more problems in less time.



Eliminate Configuration Drift

Take Action to Improve Data Integrity

Though more field devices are connected directly to asset management system databases than ever before, many plants still rely on devices that are stranded due to age, location, or criticality rating. And even with critical, connected devices, situations can arise where a technician needs to make repairs or run a diagnostic at the device.

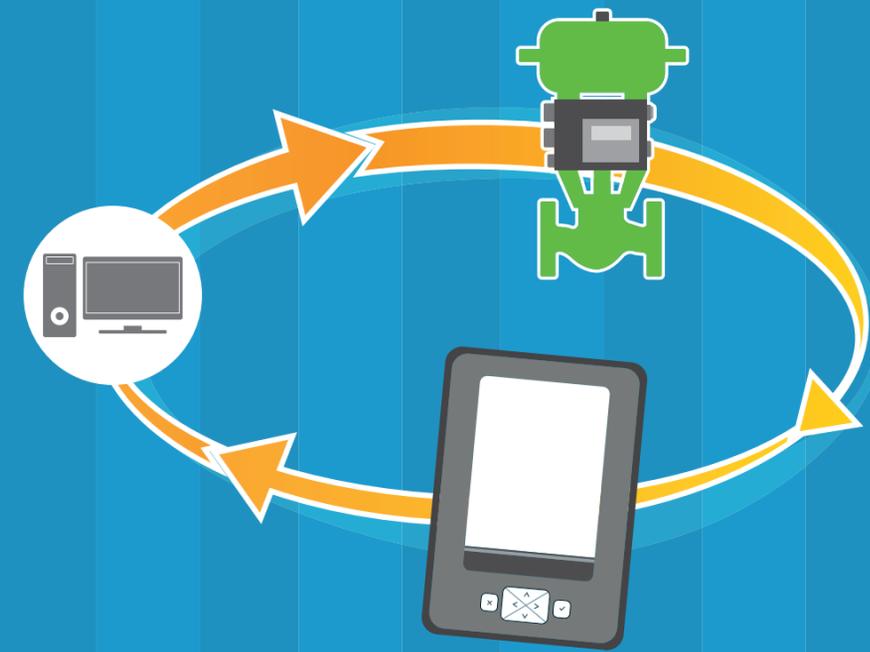
Unfortunately, the data collected by technicians making changes in the field often doesn't make it back to the asset management database. With many handheld communicators, the only way to be sure that data is kept up-to-date is to perform a manual synchronization every time the communicator is used. In the busy plant environment, however, it is all too common for this synchronization to be overlooked for days or even weeks, or to never happen at all.

A recent user survey by Emerson found that 52% of technicians spend approximately 5 hours each week transcribing data. Conversely 17% never transcribe data into their asset database.

When Data Begins to Drift

The failure to promptly sync device data with the master asset management database leads to configuration drift: the configurations of an organization's assets becoming more and more divergent from database records, due to manual changes and updates made by technicians operating in the field.

As configuration data begins to drift, operators and technicians are unable to take advantage of the data they need to keep the plant functioning properly. A technician in the field cannot be sure that the records in the asset management database accurately reflect what will be seen at the device. And for management, these same troubled records become a serious problem when they are required for compliance or internal auditing, sometimes leaving the organization to face fines, production outages, or potentially unsafe operating conditions.



Simpler Data Synchronization

The AMS Trex Device communicator has simplified the task of synchronizing data collected in the field—by eliminating the task altogether. Using Auto Sync technology, the communicator instantly delivers visibility of all field changes by automatically synchronizing any changes with the AMS Device Manager database.

Every change that is made in the field is automatically recorded, timestamped, and uploaded to the AMS Device Manager database, ensuring that the master database and audit trail reflect the current status of every device managed. Maintenance personnel can perform diagnostic and repair tasks without concern for how those changes will be entered into the master database.

Changes are reflected in the AMS Device Manager database as soon as the AMS Trex communicator detects a Wi-Fi signal or a USB cable connection. No technician intervention is necessary. Even if a technician is stranded in a dead zone, all changes are stored locally on the communicator and uploaded as soon as it detects a connection again.

With Auto Sync, organizations won't just get more frequent updates to the database, but also more reliable updates. The AMS Trex communicator logs and timestamps all changes *as they occur*, allowing technicians to know not only what was changed, but *when*, and by what device. Auto Sync delivers an automatically constructed and accurate timeline of events to help correlate data and make it more accessible for compliance requirements and decision support.



Maintain Valve Performance

Use Advanced Field Diagnostics to Avoid Unnecessary Repairs

Of all the devices that technicians monitor in the field, valves tend to be some of the most problematic and the most critical. Unlike other instrumentation, valves are often much more costly to diagnose and repair. Field technicians are often required to pull a valve to investigate a problem. Because removing valves means creating holes in the pipe, taking a valve out for inspection means shutting down the process.

In addition, valve problems can be particularly tricky to diagnose. Technicians frequently need to disassemble the valve to determine the root cause of the problem. Unfortunately this disassembly can cause further damage to the valve, making repairs more complicated and more expensive.

Valve troubleshooting is further complicated by the fact that key symptoms of a valve problem (the valve not controlling the process efficiently and/or a deviation in valve travel) can signal either a mechanical problem or a configuration problem: two issues with wildly different solutions.

Simplifying Valve Monitoring

Valve health inevitably degrades over time. The parts move, resulting in wear. However, valves don't usually fail without warning, providing technicians with the tools to identify these warning signs.

To give technicians comprehensive control to solve valve issues, they need to have constant, easy access to advanced valve diagnostics in the field.

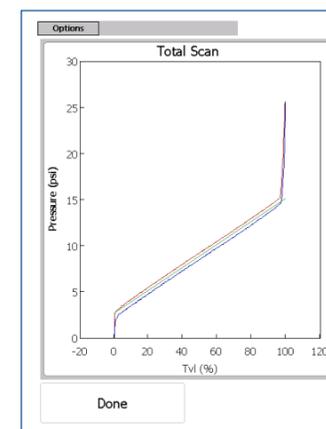
Using ValveLink™ Mobile software on the AMS Trex Device Communicator gives technicians the ability to perform advanced valve diagnostics in the field. They can accurately diagnose valve problems without having to pull the valve or perform potentially destructive troubleshooting.

With ValveLink Mobile software, technicians can quickly perform tests including valve signature, PD one button sweep, and step response, receiving results on an intuitive graphical interface. Test results provide a clear understanding of what is going on inside the valve, allowing for proper planning, parts procurement, and scheduling of repairs before the valve is taken out of service. This insight is also vitally important during a quick turnaround or in short maintenance durations.

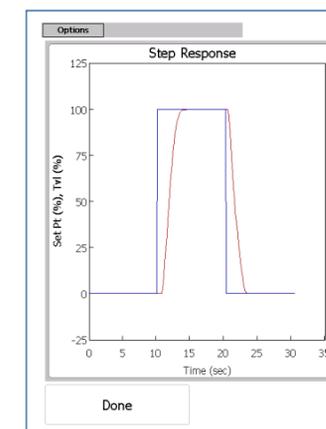
Any valve issues that stem from external problems (loose connections, improper wiring, or improper configuration) will be easier and less invasive to detect, empowering technicians to make key decisions in the field. With ValveLink Mobile at their fingertips, technicians gain the flexibility to treat each problem based on the information they witness in the field, saving time and money and improving safety.



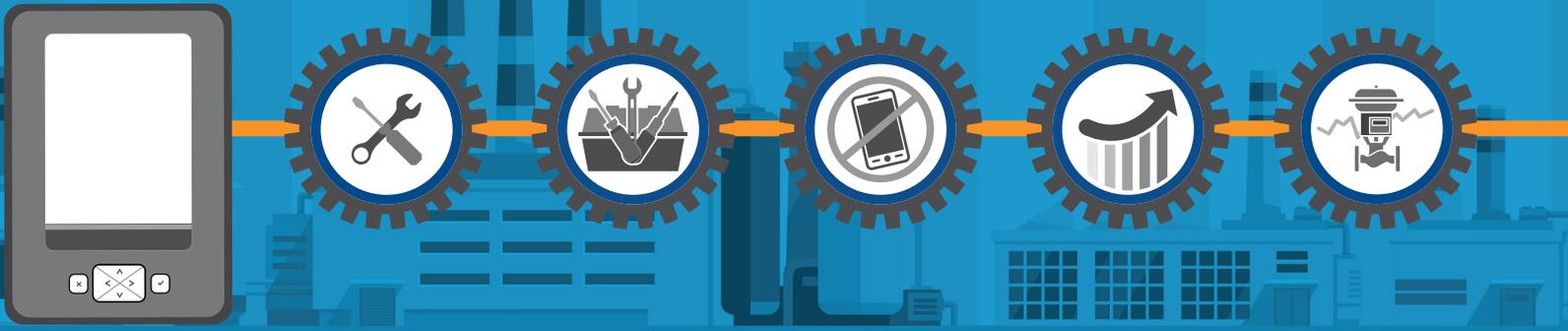
Advanced valve diagnostics allow you to perform tests like Total Scan, Step Response, and stroke valve right at the valve - without taking it out of service.



Use Total Scan to determine significant change in friction or irregularity to the valve's seating profile.



Quickly detect major issues with valve stroke diagnostics.



Emerson celebrates 25+ years of industry expertise in handheld communicator technology, delivering powerful predictive diagnostics while simplifying work in the field.

Learn more at www.emerson.com/trex

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