AMS™ Suite: Intelligent Device Manager

Faster Device Alerts Delivered

This paper describes the enhanced polling feature of AMS Device Manager Version 7.0 and higher. Certain HART® multiplexer networks provide enhanced polling, or fast scanning, capabilities, a feature that bypasses the polling rate to scan the device as quickly as possible.

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HART multiplexers are used to establish communication between AMS Device Manager and HART field devices connected to any distributed control system or programmable logic controller. Enhanced polling is a capability supported in AMS Device Manager version 7.0 and higher. When used with certain HART multiplexer networks, enhanced polling employs an advanced scanning feature in the multiplexer to scan HART field devices more quickly. This translates to faster field device alerts and faster implementation of corrective action.

The challenge: Troublesome Field Devices

AMS Device Manager Alert Monitor is a powerful diagnostic tool used to observe field devices suspected of periodic or inconsistent malfunction, one of the most difficult failure modes to troubleshoot. Users configure and use Alert Monitor to watch for device failure patterns and to view alerts from SNAP-ON™ applications. Alert Monitor historically polled HART devices at a user-defined frequency to determine if an alert condition existed. Depending on system size and configuration, the overall time required to display important alerts can be lengthy.

Enhanced polling uses scanning features in the multiplexer and bypasses the user-defined polling rate to scan the device more quickly. However, not all HART multiplexers support enhanced polling and proper system configuration is required to avoid adverse impact on other aspects of system performance. See AMS Device Manager Books Online for more information on Alert Monitor performance guidelines

Enhanced Polling: Alert Monitor Performance Upgrade

Users of AMS Device Manager 7.0 and higher, particularly those upgrading from previous release versions will experience significant performance improvements when used with HART multiplexers that support enhanced polling. The improvements are even greater in system configurations using multiple multiplexers. Benchmark results show the following improvements:

- The time required to display a field device alert in Alert Monitor is 55-70% faster using 7.0 and higher with a HART multiplexer that supports enhanced polling than in AMS Device Manager 6.2 (30 seconds compared to 50-90 second average).

- The time required to scan a device on a network with multiple multiplexers can be up to 3-7 times faster using AMS Device Manager 7.0 and higher than 6.2, depending upon specific configuration. Device scan time using 7.0 and higher will typically be no more than 30 seconds, whereas it has been shown to take 3 minutes or longer using 6.2.

The key Alert Monitor performance differentiator is system scalability. AMS Device Manager 7.0 and above now have the ability to add devices and multiplexers to an existing HART multiplexer network, while maintaining a fast device update rate.

HART Multiplexers: A Brief Overview

HART multiplexers act as a gateway between the AMS Device Manager workstation and the HART field instruments. HART multiplexers interrogate each device and retrieve configuration, maintenance, and diagnostic information online while under the supervision of AMS Device Manager.

Only HART multiplexers using the ARCOM protocol support the enhanced polling capability of AMS Device Manager 7.0 and higher. A variety of HART multiplexer models from different manufacturers support the ARCOM protocol, including Arcom, P+F/Elcon, and MTL. Depending on Alert Monitor performance requirements, users may opt to upgrade to a specific multiplexer model with enhanced polling capability.

Supported HART multiplexers that do not use the ARCOM protocol are still compatible with AMS Device Manager 7.0 and higher. However, enhanced polling will not be provided and Alert Monitoring performance will be similar to previous releases of AMS Device Manager.

Additional information on HART multiplexers is available online at http://www.emersonprocess.com/ams/prodintopt.htm.

Dynamic Variable Monitoring: An extension of Alert Monitor

Dynamic Variable Monitoring (DVM) is a feature of AMS Device Manager that makes data readily available to third-party, OPC-based trending applications. It provides quicker access to device data typically not available to the control system. Most control systems that communicate with HART devices can access this information once the Integration Tools are licensed in AMS Device Manager. This feature is used to improve the time to display dynamic variable data for HART devices that are configured for inclusion in the Alert Monitor.

When setting up the AMS Device Manager system, care should be taken to prevent enabling the DVM checkbox for too many HART devices. Depending upon specific conditions, more than one DVM-enabled device on an enhanced polling multiplexer can degrade system performance. Refer to AMS Device Manager Books Online for additional DVM information and Alert Monitor performance guidelines.

Final Recommendations: Optimize Alert Monitor Performance

Follow the recommendations below to optimize the performance of Alert Monitor in AMS Device Manager 7.0 and higher:

- Only use HART multiplexers that support enhanced polling.

- Limit your total HART device count to a maximum of 500 devices per HART multiplexer network.

- Limit the total number of HART multiplexers to a maximum of 15 multiplexers per network.

- Limit total HART multiplexer networks to a maximum of 10 networks per server.

- If your facility has mission-critical HART field devices configured in Alert Monitor, limit your mission-critical HART device count to a maximum of 28, or 8 devices per HART multiplexer to maintain optimized performance.

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If your facility has DVM-enabled devices in use, we recommend:

- Limiting the total number of devices to a maximum of 4 monitored devices (DVM or non-DVM) per HART multiplexer.

- Limiting the total number of HART multiplexers to a maximum of 4 multiplexers (with DVM devices) per network.

Other resources

Improving availability is just one of the ways AMS Suite and the PlantWeb® digital plant architecture help improve process and plant performance. Emerson's technologies and services can also help increase throughput and quality, as well as reducing cost for operations and maintenance; safety, health, and environmental compliance; energy and other utilities; and waste and rework.
http://plantweb.emersonprocess.com/operational_benefits

AMS Suite: Intelligent Device Manager powers PlantWeb through predictive and proactive maintenance of intelligent field devices to improve availability and performance.

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