



ISA108 Intelligent Device Management (IDM)



Intelligent Digital Devices - Have Self-Diagnostics and More



Eight-channel two-wire temperature transmitter



Intelligent two-wire inventory intrinsically safe tank gauging system



Fully integrated gas chromatograph



Intelligent two-wire on/off valve



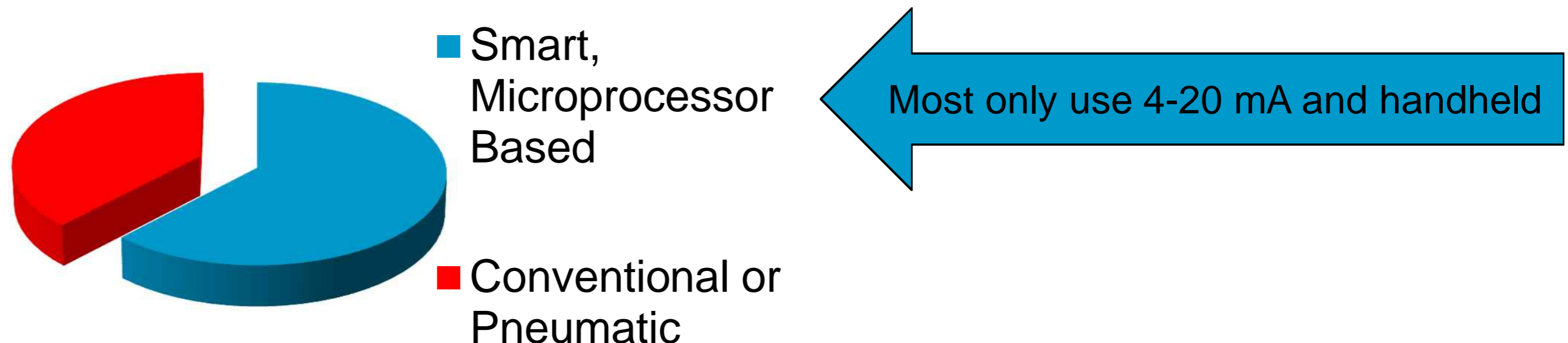
Electric actuators / Motor Operated Valve (MOV) with two-wire control



Intelligent Devices

- Intelligent devices are pervasive, but are not used properly
 - Most diagnostics are not prioritized or utilized
- ISA108 is needed
 - Technology and products are widely available
 - Work processes and best practices are the key

Installed Base



Most Diagnostic Alerts Go Directly to a “Black Hole”

- Diagnostics may need to go to engineering, maintenance or operations



Topics Covered

- Intelligent Device Management (IDM)
- Engineered solution and deployment
- ISA108 standard

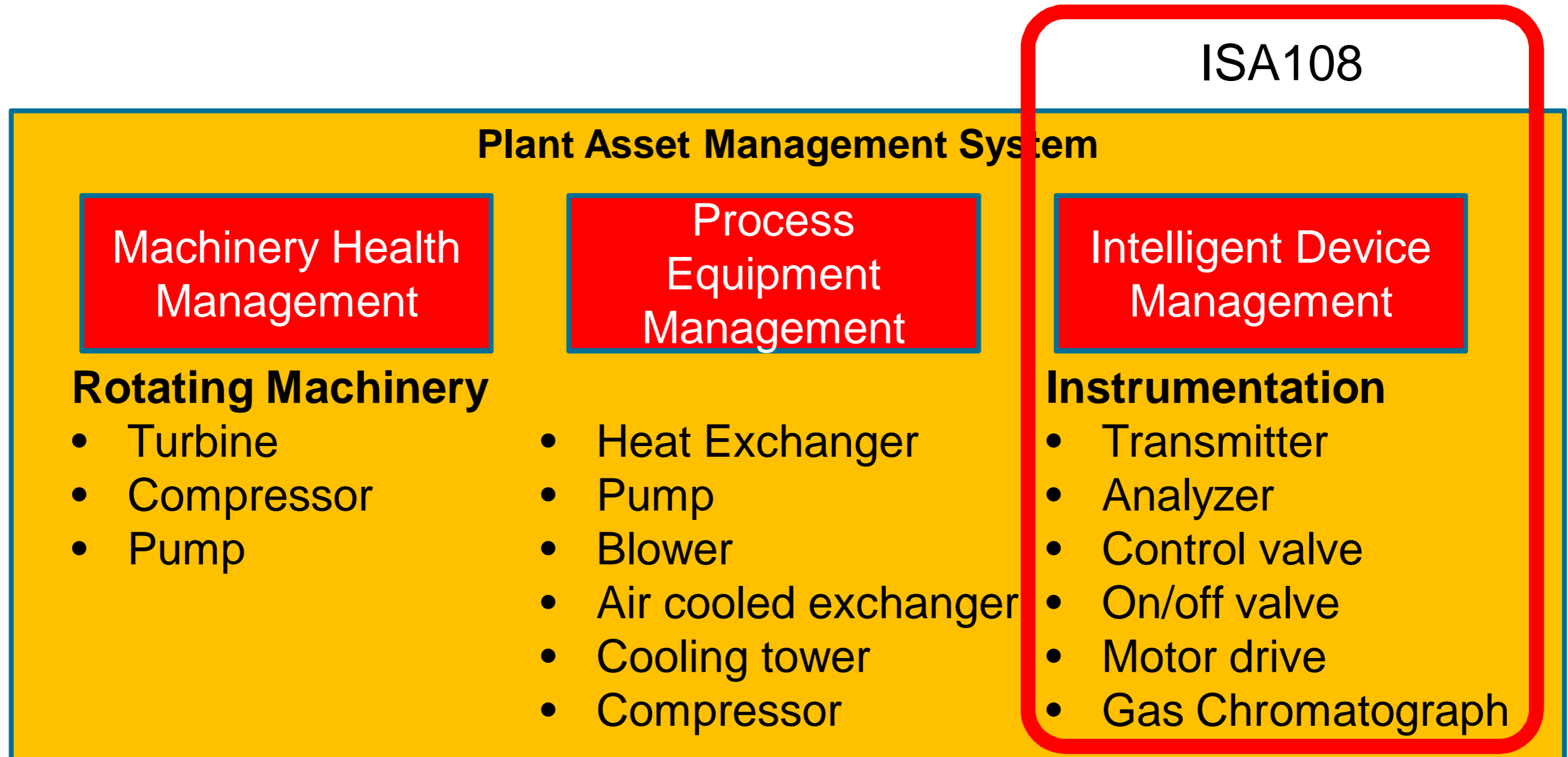




Intelligent Device Management (IDM)



Intelligent Device Management is Part of Plant Asset Management (PAM)

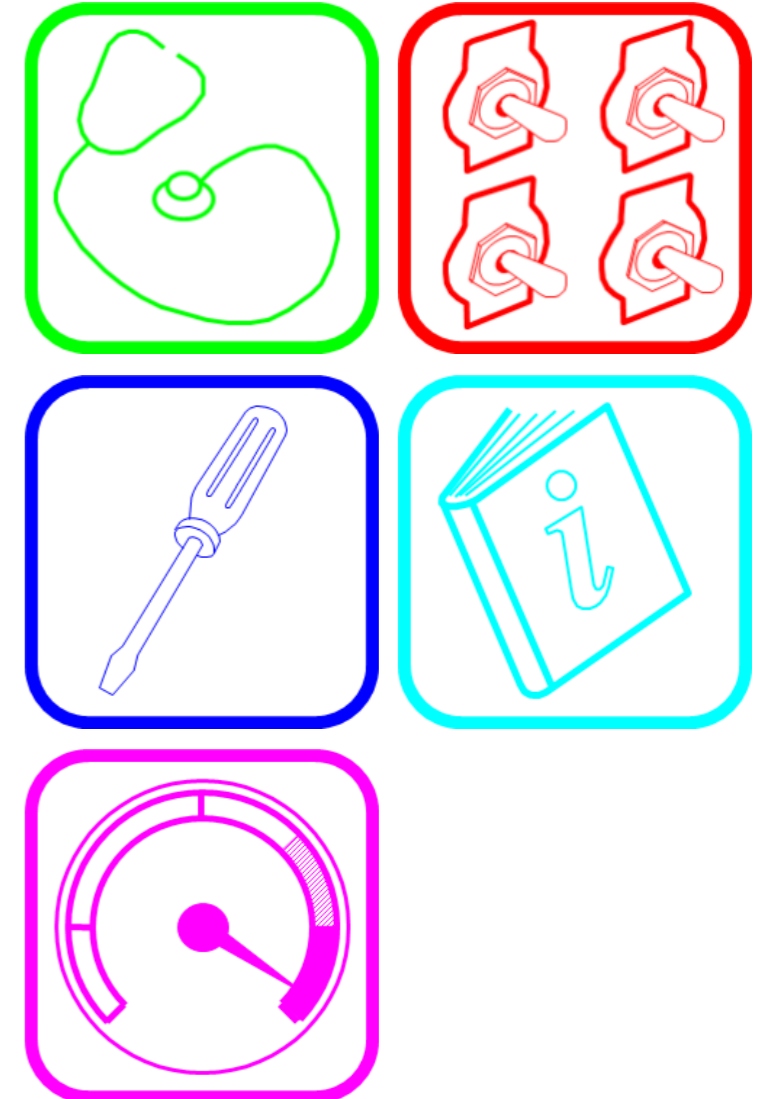


- Intelligent Device Management (IDM) software is one of many parts in a Asset Management System (AMS)



Intelligent Device Management (IDM)

- Device Diagnostics
 - Device diagnostic alarm management
- Device Configuration
 - Device configuration management
- Device Calibration
 - Calibration management
- Device Information
 - Device information management
- Internal Variables
 - External monitoring





Types of Diagnostics

2. Device Diagnostics

- Electronics (memory etc.)
- Internal mechanical parts
- Supply

3. Process Connection Diagnostics

- Valve
- Actuator
- Impulse line

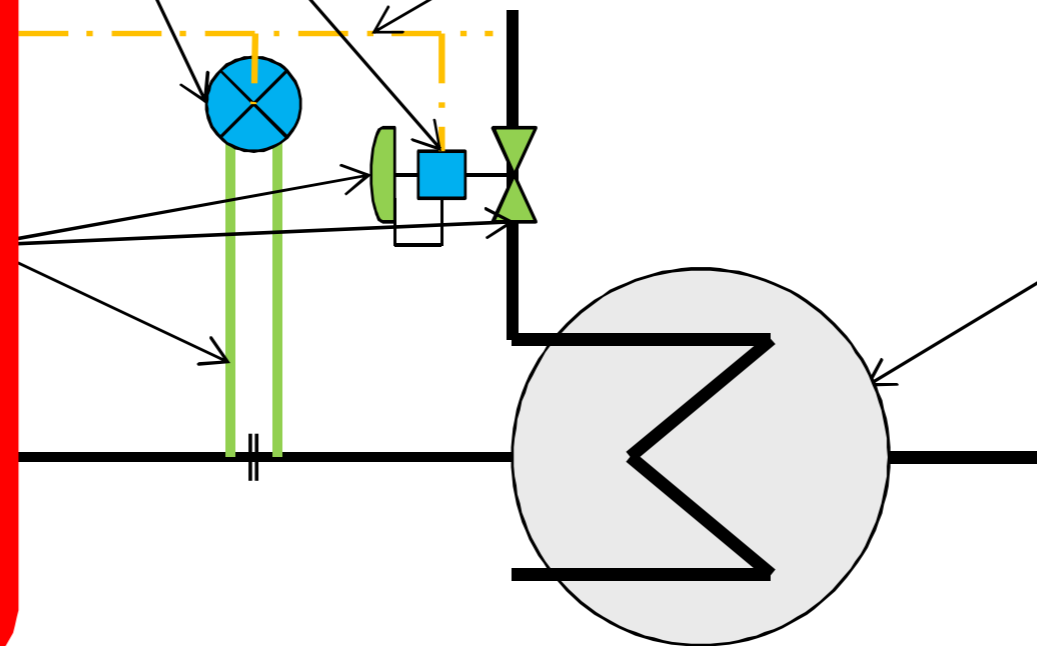
ISA108

1. Signal Diagnostics

- Communication Errors
- 4-20 mA integrity
- Wireless signal strength

4. Process Equipment Diagnostics

- Heat exchanger
- Pump
- Blower
- Air cooled exchanger





Device Diagnostics

TT-345 [3144 Fieldbus Temperature Transmitter Rev. 2]

File Actions Help

Overview

Overview

Overview

Status

Device: **Failed** Troubleshoot

Mode: **In Service** Change

Primary Purpose Variables

Sensor 1

21.21 deg C

Bad

Sensor 2

21.27 deg C

Good

Shortcuts

Device Information Calibrate Sensors Configure Sensors

OK Cancel Apply Help

Device last synchronized: 3/9/2009 11:28:08 AM



Detail Diagnostics and Troubleshooting Guidance

Alerts

Active Alerts


Failed - Fix Now

Primary Value Failure - Sensor 1 is Open

Sensor 1 is open.

Recommended Actions:

1. Verify the sensor connection and wiring. Refer to the wiring diagrams found on the terminal cover to ensure proper wiring.
2. Verify the integrity of the sensor and sensor lead wires. If the sensor is faulty, repair or replace the sensor.



Sensor 1 Information

Print Close



Device Diagnostics Alarm Summary

- View all device diagnostic alarms in one location
 - Schedule daily maintenance and turnarounds
- Prioritized

The screenshot shows a software window titled "Alert Monitor - Alert List". It features a menu bar (File, Edit, View, Help) and a toolbar with icons for "Configure", "Station Monitoring", "Audit Trail", "Alert Details", "Acknowledge", "Clear Entry", and "Silence". Below the toolbar are tabs for "Active Alerts" and "Unacknowledged Alerts". The main area contains a table with the following columns: AMS Tag, Count, Time, Severity, Description, Device Group, Plant Location, Station, and Manufacturer. The table lists various alarms with their respective counts and severities. At the bottom, a status bar shows "Active Alert Count = 13" and "Unacknowledged Alert Count = 14".

AMS Tag	Count	Time	Severity	Description	Device Group	Plant Location	Station	Manufa
TT-345	1	6/9/2009 9:08:55 ...	Failed	Primary Value Failure	1	Texas\Austin\Ch...	USRTC-PLANTW...	Rosemor
FC-400	28	6/5/2009 3:42:55 ...	Abnormal	Device Not Responding	1	Minnesota\Eden ...	USRTC-PLANTW...	Fisher Co
FT-405	40	6/5/2009 3:42:52 ...	Abnormal	Device Not Responding	1	Minnesota\Eden ...	USRTC-PLANTW...	Rosemor
8LOGIC	24	6/5/2009 3:20:22 ...	Failed	No I/O Power	1	Minnesota\Eden ...	USRTC-PLANTW...	Rosemor
XMT-239E	19	6/5/2009 3:20:00 ...	Failed	Broken glass	1	Texas\Austin\En...	USRTC-PLANTW...	Rosemor
FC-111	25	6/5/2009 3:19:53 ...	Maintenance	NPV Out of Limits	1	Texas\Austin\En...	USRTC-PLANTW...	Fisher Co
FC-111	25	6/5/2009 3:19:53 ...	Failed	Field Device Malfunction	1	Texas\Austin\En...	USRTC-PLANTW...	Fisher Co
XMT-239E	6	6/5/2009 2:56:26 ...	Failed	Field Device Malfunction	1	Texas\Austin\En...	USRTC-PLANTW...	Rosemor
XMT-239E	6	6/5/2009 2:56:26 ...	Failed	NPV Out of Limits	1	Texas\Austin\En...	USRTC-PLANTW...	Rosemor
FT-405	2	5/18/2009 12:06:5...	Advisory	Electrodes open circuit	1	Minnesota\Eden ...	USRTC-PLANTW...	Rosemor
FT-405	2	5/18/2009 12:06:5...	Advisory	Empty pipe detected	1	Minnesota\Eden ...	USRTC-PLANTW...	Rosemor
FT-405	2	5/18/2009 12:06:5...	Failed	Field device malfunction	1	Minnesota\Eden ...	USRTC-PLANTW...	Rosemor
FT-405	2	5/18/2009 12:06:5...	Abnormal	More status available	1	Minnesota\Eden ...	USRTC-PLANTW...	Rosemor



Device Audit Trail – Status Alerts

Date	Time	AMS Tag	User	Event Type	Reason
6/9/2009	9:11:26 AM	TT-345	FS.usrtc-plantweb1	Status Alerts	FAILED: Primary Value Failure
6/9/2009	9:08:55 AM	TT-345	FS.usrtc-plantweb1	Status Alerts	FAILED: Primary Value Failure
6/9/2009	9:08:38 AM	TT-345	Local.SSADMIN	Configuration Change	Alert Monitor configuration changed for AMS Tag: 'TT-3
6/9/2009	9:00:53 AM		Local.SSADMIN	Application	Successful login of user: Local.SSADMIN with permission
6/6/2009	6:59:57 AM	LT-9834E	FS.usrtc-plantweb1	Status Alerts	MAINT: Loop Current Saturated
6/6/2009	6:59:31 AM	LT-9834E	FS.usrtc-plantweb1	Status Alerts	MAINT: NPV Out of Limits
6/6/2009	6:59:27 AM	LT-9834E	FS.usrtc-plantweb1	Status Alerts	MAINT: Loop Current Saturated
6/6/2009	6:59:10 AM	LT-9834E	FS.usrtc-plantweb1	Status Alerts	MAINT: NPV Out of Limits
6/5/2009	3:42:55 PM	FC-400	PS.USRTC-PLANTWE...	Status Alerts	ABNORM: Device Not Responding
6/5/2009	3:42:52 PM	FT-405	PS.USRTC-PLANTWE...	Status Alerts	ABNORM: Device Not Responding
6/5/2009	3:42:41 PM		PS.USRTC-PLANTWE...	Application	Ams Device Manager has been started
6/5/2009	3:37:11 PM		PS.USRTC-PLANTWE...	Application	Ams Device Manager has been shutdown
6/5/2009	3:37:06 PM		Local.SSADMIN	Application	User logged out: Local.SSADMIN
6/5/2009	3:26:13 PM	FC-400	PS.USRTC-PLANTWE...	Status Alerts	ABNORM: Device Not Responding
6/5/2009	3:26:10 PM	FT-405	PS.USRTC-PLANTWE...	Status Alerts	ABNORM: Device Not Responding
6/5/2009	3:26:08 PM		Local.SSADMIN	Application	Successful login of user: Local.SSADMIN with permission
6/5/2009	3:26:01 PM		PS.USRTC-PLANTWE...	Application	Ams Device Manager has been started
6/5/2009	3:25:56 PM		admin	Application	User logged out: admin
6/5/2009	3:25:55 PM		admin	System Maintenance	Database Maintenance
6/5/2009	3:25:09 PM		admin	Application	Successful login of user: admin with permission: Device \
6/5/2009	3:25:09 PM		Plant Server (do not re...	Application	User logged out: admin
6/5/2009	3:24:27 PM		Local.SSADMIN	Application	Scan New cancelled on \USRTC-PLANTWEB1\DeltaV
6/5/2009	3:20:28 PM		Local.SSADMIN	Application	Scan New started on \USRTC-PLANTWEB1\DeltaV Ne
6/5/2009	3:20:22 PM	8LOGIC	FS.usrtc-plantweb1	Status Alerts	FAILED: No I/O Power
6/5/2009	3:20:22 PM		Local.SSADMIN	Application	Rebuild Hierarchy performed on \USRTC-PLANTWEB1\
6/5/2009	3:20:00 PM	XMT-239E	FS.usrtc-plantweb1	Status Alerts	FAILED: Broken glass



Device Configuration

The screenshot displays the PT-100 [3051 Rev. 7] configuration software interface. The window title is "PT-100 [3051 Rev. 7]" and the menu bar includes "File", "Actions", and "Help". The interface is divided into several sections:

- Left Navigation Panel:** Contains a tree view under "Configure/Setup" with sub-items: "Basic Setup", "Device Configuration" (selected), "Variables Configuration", and "Calibration Configuration". Below this are buttons for "Configure/Setup", "Device Diagnostics", "Process Variables", and "Compare".
- Tabbed Interface:** The main area has tabs for "Identification", "Alarm/Sat Levels", "Variable Mapping", "LCD", "Comm Setup", and "Materials of Construction". The "Identification" tab is active.
- Identification Fields:**
 - Tag: PT-09342
 - Manufacturer: Rosemount
 - Model: 3051
 - Transmitter S/N: 9876518
 - Sensor S/N: 16777215
 - Write Protect: Off
 - Date: 07/23/2005
 - Descriptor: (empty)
 - Message: (empty)
 - Model Numbers:
 - Model Number I: (empty)
 - Model Number II: (empty)
 - Model Number III: (empty)
- Revision Numbers:**
 - HART Universal Rev: 5
 - Field Device Rev: 7
 - Software Rev: 1
 - Hardware Rev: 1
- Buttons:** "Config Write Protect" is located below the "Write Protect" field. At the bottom right are "OK", "Cancel", "Apply", and "Help" buttons.
- Time:** A dropdown menu at the bottom left shows "Time: Current".
- Log:** At the bottom left, it says "Device last synchronized: 11/20/2008 7:31:22 AM".
- Logos:** The "ROSEMOUNT" logo is at the bottom center, and the "EMERSON Process Management" logo is at the bottom right, accompanied by an image of a pressure transmitter.



Device Configuration – Guided Setup

The screenshot displays the PT-470 configuration software interface. The main window is titled "PT-470 [3051S Rev. 23]" and features a menu bar with "File", "Actions", and "Help". A toolbar contains icons for printing, help, and navigation. On the left, a "Configure" sidebar lists "Configure", "Guided Setup" (selected), "Manual Setup", and "Alert Setup". Below this are navigation buttons for "Overview", "Configure", "Service Tools", and "Compare".

The main area is titled "Guided Setup" and contains two sections:

- Initial Setup:** Includes buttons for "Zero" (Eliminates the pressure offset due to mounting or installation effects.), "Change Damping" (Sets the pressure damping.), and "Local Display Setup" (Configures the LCD display. It is possible to display up to 4 values.).
- Plugged Line Diagnostics and Statistical Process Monitor:** Includes buttons for "Plugged Line Diagnostic Setup" (Configures the plugged line diagnostic algorithm.) and "Statistical Process Monitor Setup" (Configures the statistical process monitor.).

A "Time:" dropdown menu is set to "Current". At the bottom left, it states "Device last synchronized: 11/25/2008 1:49:00 PM".

An overlaid dialog box titled "Change Damping - PT-470" prompts the user to "Enter the new Damping value:" with a text input field containing "0.40" and the unit "Sec". The dialog has "Next >", "Cancel", and "Help" buttons at the bottom.



Device Audit Trail - Configuration

The screenshot displays the 'Audit Trail' application window with the 'Configuration' tab selected. The 'Detail Viewer' window is open, showing the details of a configuration change event.

Audit Trail Table:

Date	Time	AMS Tag	User	Event Type	Rea
6/9/2009	9:11:26 AM	TT-345	FS.usrtc-plantweb1	Status Alerts	FAIL
6/9/2009	9:08:55 AM	TT-345	FS.usrtc-plantweb1	Status Alerts	FAIL
6/9/2009	9:08:38 AM	TT-345	Local.SSADMIN	Configuration Change	Aler
6/9/2009	9:00:53 AM		Local.SSADMIN	Application	Suc
6/6/2009	6:59:57 AM	LT-9834E	FS.usrtc-plantweb1	Status Alerts	MAI
6/6/2009	6:59:31 AM	LT-9834E	FS.usrtc-plantweb1	Status Alerts	MAI
6/6/2009	6:59:27 AM	LT-9834E	FS.usrtc-plantweb1	Status Alerts	MAI
6/6/2009	6:59:10 AM	LT-9834E	FS.usrtc-plantweb1	Status Alerts	MAI
6/5/2009	3:42:55 PM	FC-400	PS.USRTC-PLANTWE...	Status Alerts	ABM
6/5/2009	3:42:52 PM	FT-405	PS.USRTC-PLANTWE...	Status Alerts	ABM
6/5/2009	3:42:41 PM		PS.USRTC-PLANTWE...	Application	Ams
6/5/2009	3:37:11 PM		PS.USRTC-PLANTWE...	Application	Ams
6/5/2009	3:37:06 PM		Local.SSADMIN	Application	Use
6/5/2009	3:26:13 PM	FC-400	PS.USRTC-PLANTWE...	Status Alerts	ABM
6/5/2009	3:26:10 PM	FT-405	PS.USRTC-PLANTWE...	Status Alerts	ABM
6/5/2009	3:26:08 PM		Local.SSADMIN	Application	Suc
6/5/2009	3:26:01 PM		PS.USRTC-PLANTWE...	Application	Ams
6/5/2009	3:25:56 PM		admin	Application	Use
6/5/2009	3:25:55 PM		admin	System Maintenance	Dat
6/5/2009	3:25:09 PM		admin	Application	Suc
6/5/2009	3:25:09 PM		Plant Server (do not re...	Application	Use
6/5/2009	3:24:27 PM		Local.SSADMIN	Application	Sca
6/5/2009	3:20:28 PM		Local.SSADMIN	Application	Sca
6/5/2009	3:20:22 PM	8LOGIC	FS.usrtc-plantweb1	Status Alerts	FAIL
6/5/2009	3:20:22 PM		Local.SSADMIN	Application	Ret
6/5/2009	3:20:00 PM	XMT-239E	FS.usrtc-plantweb1	Status Alerts	FAIL

Detail Viewer Information:

- Date/Time of Event: Date 6/9/2009, Time 9:15:51 AM
- Source of Event: User Local.SSADMIN, Computer usrtc-plantweb1, Source AMS Device Manager Application, Tag FC-600, Manufacturer Fisher Controls International, Device Type Fisher DVC6000f - SC rev 1, Revision 1, Identifier 0051006000FisherDVC0050205182268, Block Name TRANSDUCER1200
- Event: Type Configuration Change, Category Change performed by AMS Device Manager
- Reason: Routine Service
- More Detail:

Parameter	As Found	As Left
Temperature Units	°F	°C
: Temp Hi Alrt Pt	186.8 °F	86.0 °C
: Temp Lo Alrt Pt	-63.4 °F	-53.0 °C

Buttons: Close, Help



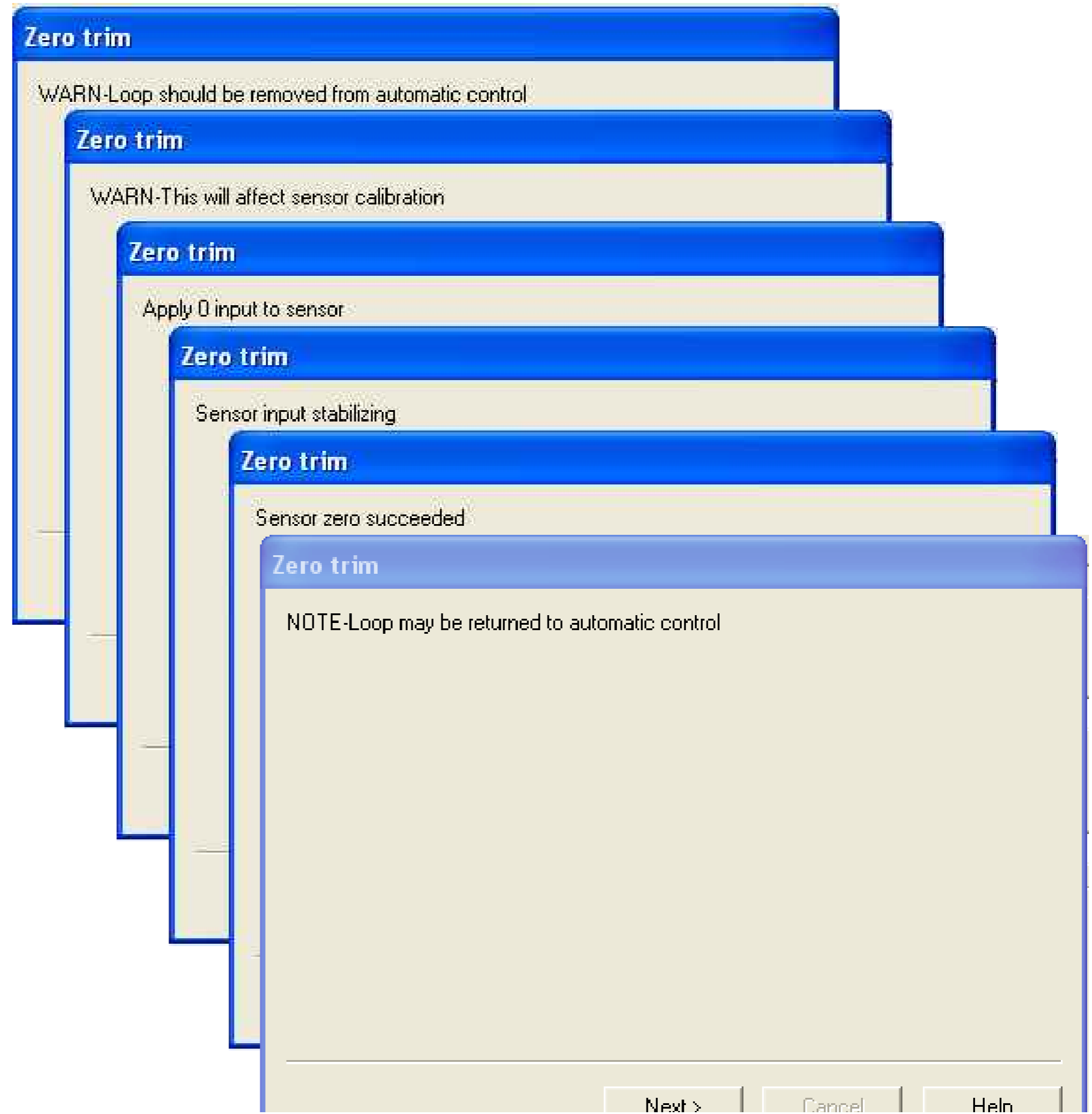
Configuration Templates

- Default configuration for a device or loop
- Must contain reasons for deviation from default
- Specific to a device revision level
- Used by
 - Host configuration tools
 - Bulk configuration tools
 - Maintenance replacement
 - Audits



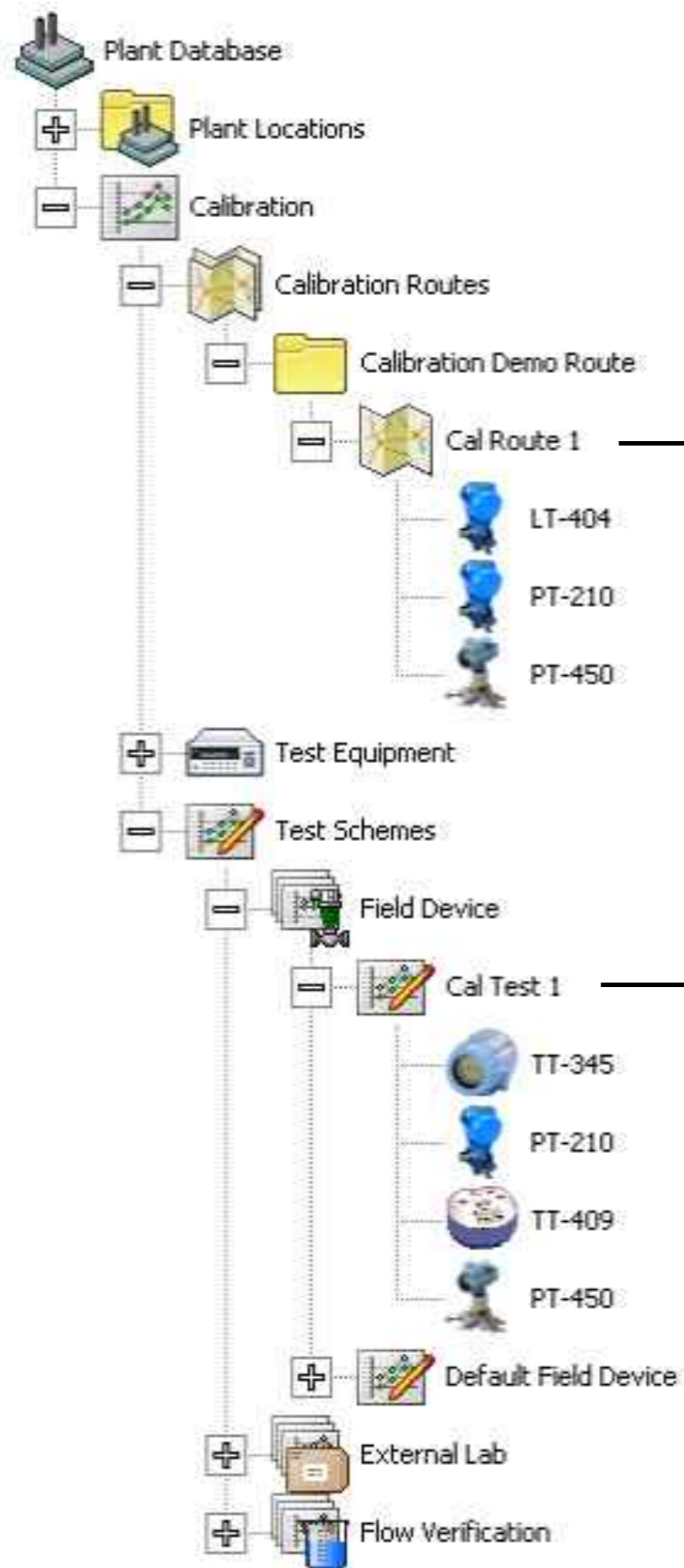
Calibration Made Easy: Sensor Trim Wizards

Zero This
Transmitter!





Calibration Management - Scheduling



Route Properties

Route Name:

Description:

Check Out For:

- Automated Data Collection
- Manual Data Collection

Calibrator Type:

Status: Available Override Status to Available

Last Checked Out: 7/23/2009 Last Checked In:

Tags in Route: 3

2) Create a new Calibration Route

Test Scheme - Cal Test 1

Setup/Safety Instructions | Cleanup Instructions

Schedule | Test Points | Accuracy | Connection

Define Test Points

Number of Points:

Start at: % of Span

Finish at: % of Span

Order

- One direction: from start to finish
- Two directions: from start to finish and back

Recalculate

Point#	%Span
1	0.00
2	25.00
3	50.00
4	75.00
5	100.00

Copy From | OK | Cancel | Help

1) Create a new Test Scheme



Calibration Reports

- Configure
- Compare
- Service Tools
- Overview**
- Scan Device
- SNAP-ON/Linked Apps
- Calibration Management**
 - Define Test...
 - Enter Test Data...
 - Calibration Status...
 - Calibration History...
- Methods
- Rename
- Unassign
- Replace
- Audit Trail
- Record Manual Event
- Drawings/Notes
- Help

AMS Tag: **PT-450**

Device: Rosemount 3051S 0011513051122504113917-01

Last Calibration: 8/25/2009

Calibration Result: Pass

Next Calibration Due: 9/15/2009 [UnSchedule]

OK Cancel Print Certificate Help

Calibration Data For: PT-450

Calibrated at: 8/25/2009 10:05:57 AM
Calibration Result: PASSED

Device Identification	
AMS Tag:	PT-450
Device Tag:	TRANSDUCER
Manufacturer:	Rosemount
Model Name:	3051S
Device Identifier:	0011513051122504113917-010024034
Block Name:	TRANSDUCER1100

Device Calibration Data			
Date/Time Calibrated:	8/25/2009 10:05:57 AM	Max Error Limit:	0.50 % of Span
Technician:	Local SSADMIN	Notification Limit:	0.60 % of Span
User:	Local SSADMIN	Adjustment Limit:	0.40 % of Span
Ambient Temperature:	66.00 deg F	Calibration Interval:	3 Weeks
Temperature Standard:	ITS-90	Critical Service:	No
Work Order Number:		Input Range:	0.00 - 249.96 InH2O
Service Reason:	Calibration Testing	Output Range:	0.00 - 249.96 InH2O
Service Notes:			
Relationship:	Linear		

Calibration History - PT-450

Test Definition | Service Information | Test Equipment | Conditions | As Found | As Left | Historical Summary

Scaling: By Data | Error Type: Maximum

Legend: As Found (blue diamond), As Left (green star)

Show By: AMS Tag | Date: 8/25/2009 10:05:57 AM

Report Close Help



Documenting Calibrator Docking

- Paperless Calibration Records
 - As-found as As-left





Device Audit Trail - Calibration

Date	Time	AMS Tag	User	Event Type	Reason
6/9/2009	9:11:26 AM	TT-345	FS.usrtc-plantweb1	Status Alerts	FAILED: Primary Value Failure
6/9/2009	9:08:55 AM	TT-345	FS.usrtc-plantweb1	Status Alerts	FAILED: Primary Value Failure
6/9/2009	9:08:38 AM	TT-345	Local.SSADMIN	Configuration Change	Alert Monitor configuration changed for AMS Tag: 'TT-3
6/9/2009	9:00:53 AM		Local.SSADMIN	Application	Successful login of user: Local.SSADMIN with permission
6/6/2009	6:59:57 AM	LT-9834E	FS.usrtc-plantweb1	Status Alerts	MAINT: Loop Current Saturated
6/6/2009	6:59:31 AM	LT-9834E	FS.usrtc-plantweb1	Status Alerts	MAINT: NPV Out of Limits
6/6/2009	6:59:27 AM	LT-9834E	FS.usrtc-plantweb1	Status Alerts	MAINT: Loop Current Saturated
6/6/2009	6:59:10 AM	LT-9834E	FS.usrtc-plantweb1	Status Alerts	MAINT: NPV Out of Limits
6/5/2009	3:42:55 PM	FC-400	PS.USRTC-PLANTWE...	Status Alerts	ABNORM: Device Not Responding
6/5/2009	3:42:52 PM	FT-405	PS.USRTC-PLANTWE...	Status Alerts	ABNORM: Device Not Responding
6/5/2009	3:42:41 PM		PS.USRTC-PLANTWE...	Application	Ams Device Manager has been started
6/5/2009	3:37:11 PM		PS.USRTC-PLANTWE...	Application	Ams Device Manager has been shutdown
6/5/2009	3:37:06 PM		Local.SSADMIN	Application	User logged out: Local.SSADMIN
6/5/2009	3:26:13 PM	FC-400	PS.USRTC-PLANTWE...	Status Alerts	ABNORM: Device Not Responding
6/5/2009	3:26:10 PM	FT-405	PS.USRTC-PLANTWE...	Status Alerts	ABNORM: Device Not Responding
6/5/2009	3:26:08 PM		Local.SSADMIN	Application	Successful login of user: Local.SSADMIN with permission
6/5/2009	3:26:01 PM		PS.USRTC-PLANTWE...	Application	Ams Device Manager has been started
6/5/2009	3:25:56 PM		admin	Application	User logged out: admin
6/5/2009	3:25:55 PM		admin	System Maintenance	Database Maintenance
6/5/2009	3:25:09 PM		admin	Application	Successful login of user: admin with permission: Device \
6/5/2009	3:25:09 PM		Plant Server (do not re...	Application	User logged out: admin
6/5/2009	3:24:27 PM		Local.SSADMIN	Application	Scan New cancelled on \USRTC-PLANTWEB1\DeltaV
6/5/2009	3:20:28 PM		Local.SSADMIN	Application	Scan New started on \USRTC-PLANTWEB1\DeltaV Ne
6/5/2009	3:20:22 PM	8LOGIC	FS.usrtc-plantweb1	Status Alerts	FAILED: No I/O Power
6/5/2009	3:20:22 PM		Local.SSADMIN	Application	Rebuild Hierarchy performed on \USRTC-PLANTWEB1\
6/5/2009	3:20:00 PM	XMT-239E	FS.usrtc-plantweb1	Status Alerts	FAILED: Broken glass



Online Device Information - From Device

- Identification
- Materials of construction
- Valve and actuator

Device Information

Product Information | Materials of Construction | Licenses | Security and Simulation

Device Identification

Device Type
3051 Pressure

Device Revision
23

Hardware Revision
5

Software Revision String
2-00-004 - Fri Nov 21 08:19:07 2008

DD Revision
3


Final Assembly Number
383176

Output Board Serial Number
10000216

Message

Date
01/01/1984 00:00:00

Text



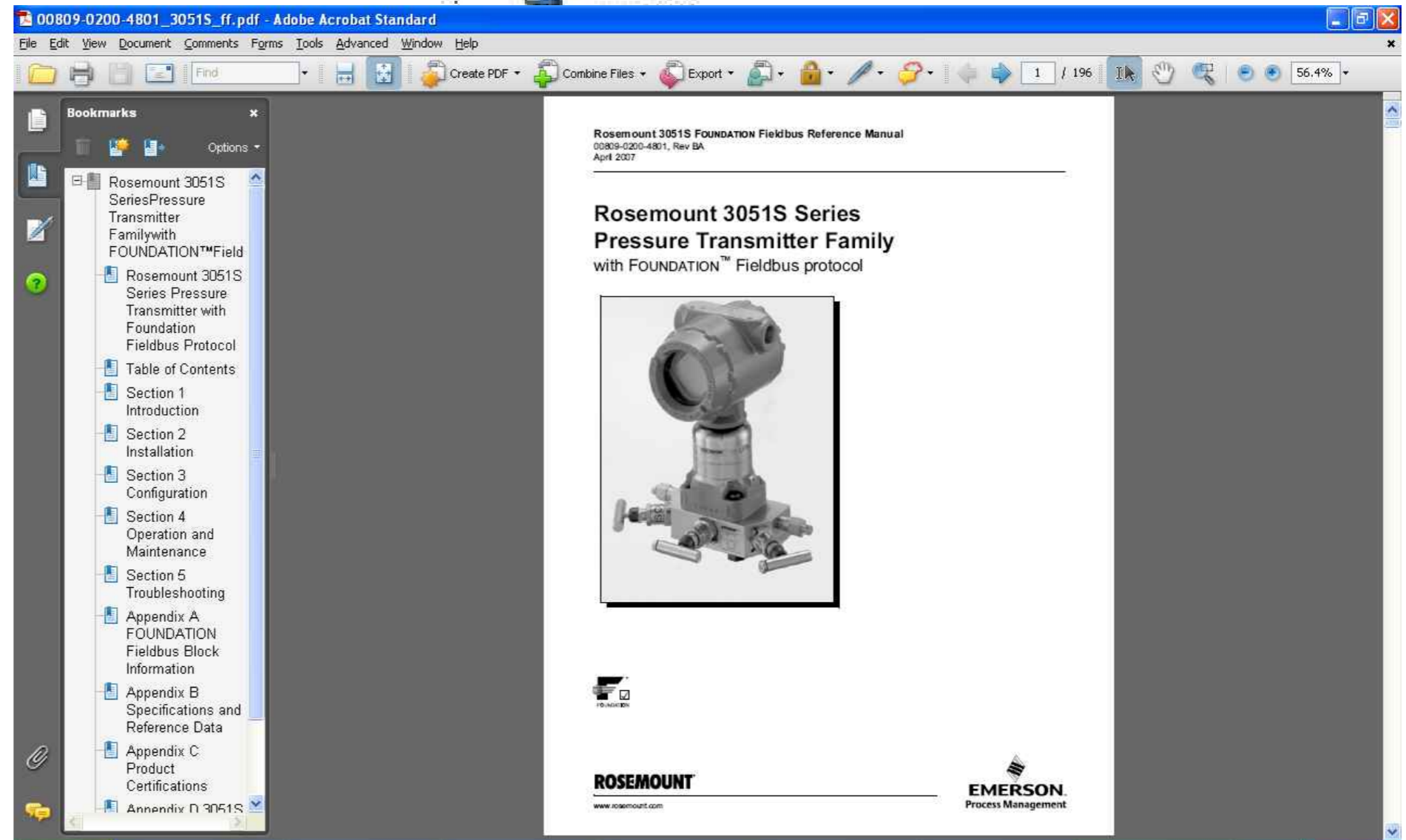
ROSEMOUNT EMERSON Process Management

Print Close



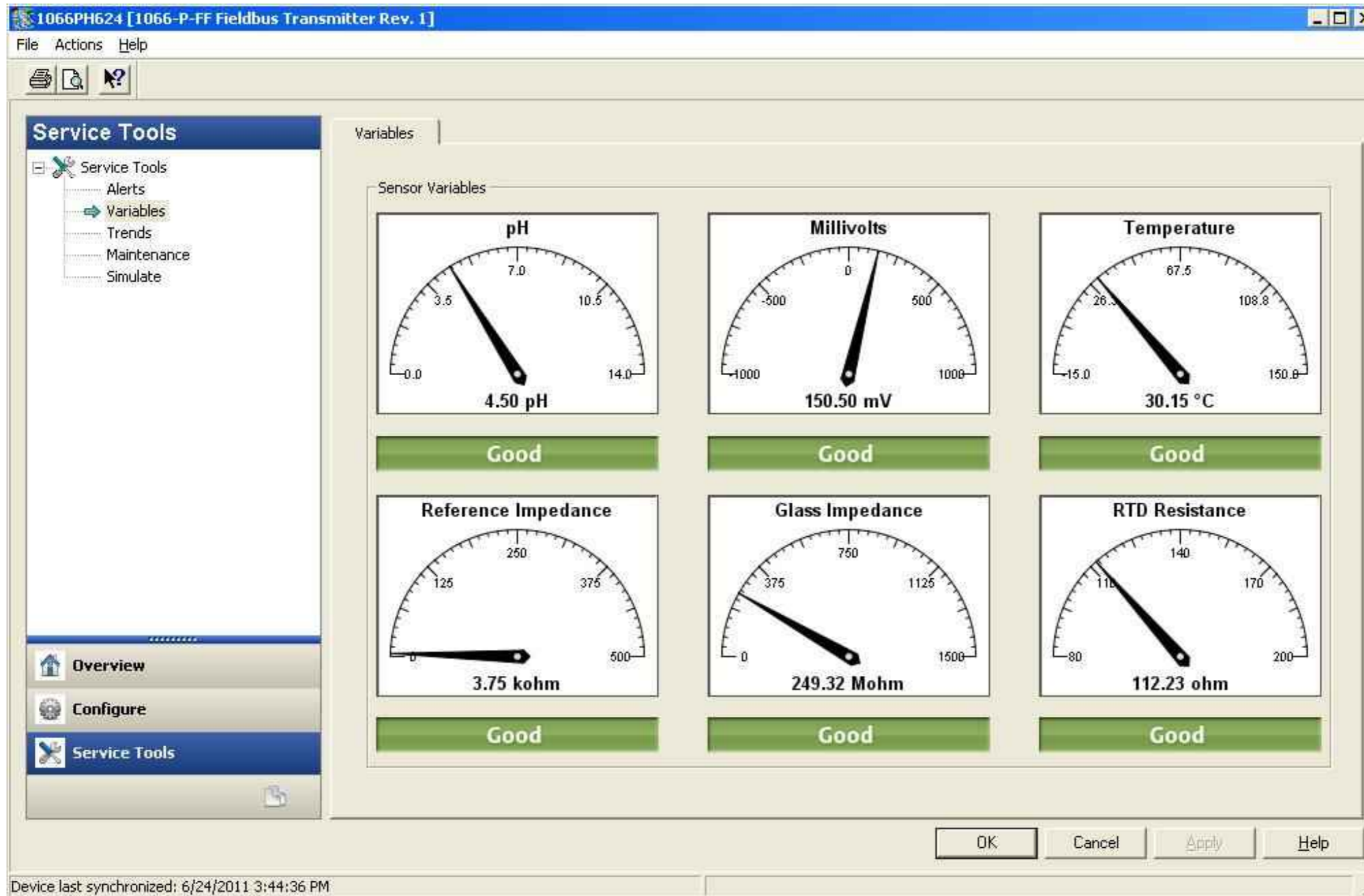
Device Documentation – Drawings & Notes

- Open links documentation
 - Device manual
 - Procedures
 - Drawings





Internal Variables





Third-Party Software Monitoring - Through OPC



The screenshot displays the Matrikon OPC Tag Studio interface. The main window is titled "Matrikon OPC Tag Studio - Matrikon OPC Explorer (test)". It features a menu bar (File, Edit, View, Help) and a toolbar with various icons. The interface is divided into several panels:

- Tag Entry:** Contains fields for "Item ID", "Data Type" (set to "Empty/Default"), "Access Path", and a "Create Active" checkbox.
- Tags To Be Added:** A list box containing a single tag entry: "/HSI/Multiplexer Network 1/1/Device/FT-103/Param/PV/ANALOG_VALUE/Value".
- Available Items in Server 'AMS.OPCServer.1':** A tree view showing the hierarchy of items: Modem, HSI, Multiplexer Network 1, 1, Device, FT-102, FT-103, Param, PV, ALARM_CODE, ANALOG_DAMPING, ANALOG_UNITS, ANALOG_VALUE, and AO1_CUTOFF.
- Item Info Panel:** Located at the bottom right, it displays properties for the selected tag: "Tag: /HSI/Multiplexer Network 1/1/Device/FT-103/Param/PV/ANALOG_VALUE/Value", "Access Path:", "Validated: No", "Data Type: Empty/Default", "Create Active: Yes", "Readable: ???", and "Writable: ???".
- Available Tags:** A list box at the bottom left showing "Label", "Unit", "Value", and "ValueAsString".

At the bottom of the window, a status bar reads: "Select an item to view its properties in the Item Info panel, double click to edit, or right click for more options."



Engineered Solution and Deployment

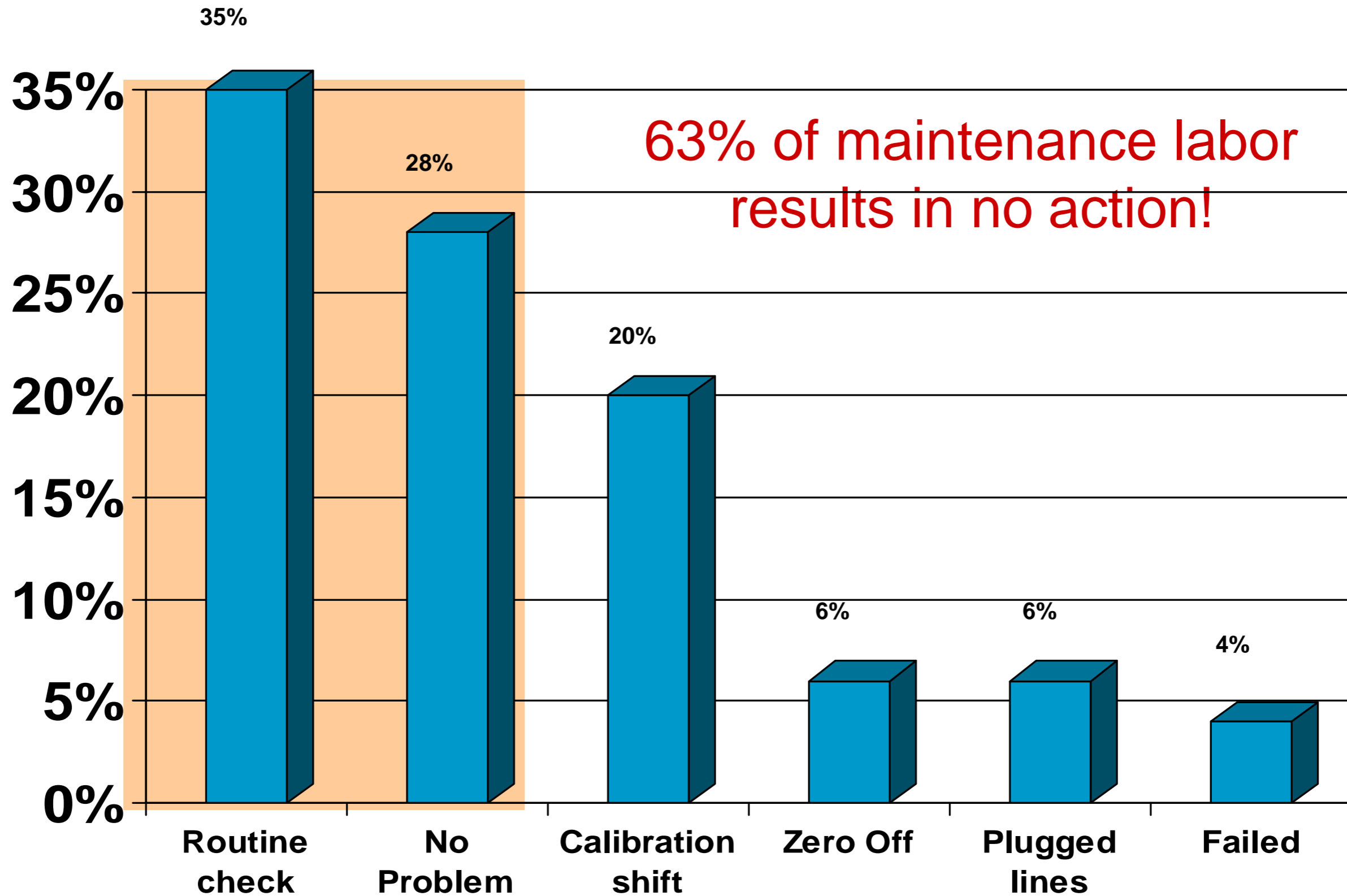


Traditional Maintenance Work Processes

- Waste effort on poorly defined problems (“broke”)
- Maintenance is often deferred for non-critical devices
- Scheduled inspection and testing is wasteful but necessary



Traditional Maintenance Methods Result in Wasted Effort



Source: Shell Global Solutions



Work Practices with Intelligent Device Management

- Allows maintenance on devices that actually need work, only when they need work
- Can give detailed information on problems before a field visit
- Can significantly reduce (or eliminate) the need for periodic testing
- Can reduce impact on operations by advance warning of failure
 - a significant but underutilized opportunity
 - biggest incentives on control valves



IDM Work Process Life Cycle Activities

- Feed
 - Criticality ranking
 - Vendor qualification & templating
- Design / FAT
 - Work process selections and design
 - Initial system configuration (build tools)
 - Training
- Install, commission, loop check
 - Device and system integration
 - Initial use of diagnostics
- Pre-startup safety review
- Routine maintenance
- Turnaround management

Work Processes
and Procedures
are required for
all Life Cycle
Phases



Intelligence Device Management

- Use and priority of diagnostics are determined by application criticality
 - Criticality ranking should be established in FEED
 - Alert priority depends on impact severity – not likelihood
 - Send alerts to operator and well as maintenance only if operator action is required (becomes an alarm, see ISA18 clause 3.1.46)
 - Log all alerts regardless of priority
 - Different from process alarm management
- Needs definition before configuration activities



Automated Use of Diagnostics

- Diagnostics must flag data quality
 - Data quality (PV status) must propagate to all applications and graphics in host systems for automated failure handling
- Data quality should include:
 - Active alerts (follow NAMUR NE107)
 - Good, bad, advisory, somebody is working on it
 - Full support by FOUNDATION fieldbus devices and hosts
 - Configuration mismatch with host
 - Excess communication errors
 - All device and loop blocks in normal mode
- Utilization of data quality in control schemes
 - Full support by FOUNDATION fieldbus function blocks



The ISA108 Standard



ISA108 Scope and Purpose

<https://www.isa.org/isa108/>

- Purpose
 - Define standard templates of best practices and work processes for implementation and use of diagnostic and other information provided by intelligent field devices in the process industries
- Scope
 - Recommended work processes and implementation practices for systems that utilize information from intelligent field devices and the people who use them
 - Work process templates by worker roles (such as maintenance or operations)
 - Best practices for implementation will be developed
 - Models for the flow of information from devices through the various systems that use the information



ISA108 Proposed Content

- Models and Terminology
 - We need unambiguous names and terms
- Implementation Guidelines
 - Cover the Life Cycle
- Work Processes
 - Configuration Management
 - Automated Diagnostic Handling
 - Diagnostics Based Maintenance
 - Auditing
 - Commissioning, Calibration, Troubleshooting, and Failure Analysis?



Conclusion



Conclusion

- Large incentives for intelligent device management
 - Most efficient system for maintenance utilizes diagnostics for on-line maintenance
 - Reduced impact of failures including unplanned outages and events
 - Reduce work during planned turnarounds
- Barriers are significant
 - Changes in engineering practices
 - Culture change for maintenance
 - Management ownership
- Standards will help