# TECHNICAL NOTE

# ADVANCED DIAGNOSTICS IN EMERSON ENVIRONMENT



# Table of Content

1	Introduction	. 3
2	Components of the Advanced Diagnostic System	. 4
2	.1 The Advanced Diagnostic Module HD2-DM-A	. 4
2	.2 The Power Hub Diagnostic Bus	. 4
	2.2.1 RS 485 Bus: Connection cable	. 4
	2.2.2 Diagnostic Gateway	. 4
2	.3 The Diagnostic Manager Software	. 4
	2.3.1 Diagnostic Manager – Basic Edition	. 4
	2.3.2 Diagnostic Manager – Professional Edition	. 5
2	.4 The FieldConnex Diagnostic Server	. 5
	2.4.1 Basic Functions	. 5
3	Overview of Integration into Emerson Environment	. 6
3	.1 The Pepperl+Fuchs ADM Project Builder Emerson	. 6
3	.2 AMS Alert Adapter	. 7
4	Software Installation Process in Chronological Order	. 9
5	ADM Project Builder Emerson1	10
5	.1 Setup FieldConnex Diagnostic Manager Topology1	10
6	Setup of Emerson's AMS <sup>K</sup> Environment	19
	6.1.1 Setup AMS <sup>K</sup> Alert Adapter 1	19
	6.1.2 Create a Linked Application with the Generic Application Launcher	22
6	.2 Setup Alert Monitor for Advanced Diagnostic	28
7	Alarm Workflow Example	29
7	.1 Alarm Message Overview	31
8	Change of Topology, Add or Delete Segments	32
8	.1 How to change Topology:	32



# 1 Introduction

This document describes how the Advanced Diagnostic Module is integrated into Emerson environment. The Advanced Diagnostic Module is a comprehensive measurement tool for the fieldbus physical layer and plugs into the motherboards of FieldConnex Power Hub product family. It is well suited for commissioning, online monitoring and maintenance. Passive input circuits leave the physical layer untouched, avoiding alteration of the signal. The Advanced Diagnostic Module HD2-DM-A is a plug-in module for the FieldConnex Power Hub.

The module provides the exact segment and individual device data needed for detection of gradual or sudden changes in the fieldbus physical layer. Intermittent segment malfunctions can be traced.

The Diagnostic Manager software is the user interface. It displays all measurement values with fast screen updates in the control room. The Commissioning Wizard generates automated reports; the software displays clear-text messages for troubleshooting of out-of spec behavior. It is based on FDT/DTM technology and needs a framework such as PACT*ware*<sup>TM</sup> to run.



Figure 1: Advanced Diagnostic Module plugged onto a FieldConnex Power Hub

This solution requires the following hard- and software components.

- Advanced Diagnostic Module HD2-DM-A
- Advanced Diagnostic Gateway Module KT-MB-GT2AD
- Diagnostic Manager Version 2.0.3.\* or higher
- PACT*ware*<sup>TM</sup> 4.0 or higher
- Emerson AMS<sup>R</sup> Suite Version 10.5 or higher (for alarm integration)
- Emerson DeltaV Suite Version 10.0 or higher (for project import)
- A dedicated FF-Device

The following further auxiliary software is required for operation:

 .NET framework 2.0. This software is required for PACT*ware*<sup>™</sup> operation. This software is available at Microsoft or Pepperl+Fuchs web site or included in the Diagnostic Manager CD-ROM package.

The following documentation is additionally recommended for easy installation and commissioning:

- Quick Installation Guide Advanced Diagnostics
- Manual Advanced Diagnostic Solutions

All documents are available for download at www.pepperl-fuchs.com.



# 2 Components of the Advanced Diagnostic System

Performing Advanced Diagnostics requires different components for proper operation. Components and their functions are described in this chapter.

### 2.1 The Advanced Diagnostic Module HD2-DM-A

The Advanced Diagnostic Module HD2-DM-A mounts on Power Hub motherboards hosting the fieldbus power supplies. Its task is to monitor all physical properties of the system platform, the Fieldbus segments and connected Field Devices. The preferred type of usage is lifecycle support, long term supervision and proactive service of complete Fieldbus plants or parts of it with extended demands on reliability and continuity.

### 2.2 The Power Hub Diagnostic Bus

The Diagnostic Bus is part of the Power Hub system and allows the connection of multiple Advanced Diagnostic Modules to the FieldConnex Diagnostic Server (FDS). The bus is operating independent of the monitored Fieldbus. Optimum monitoring of the Fieldbus communication is assured by its separate connection without loading the communication between the field devices and the instrumentation and control system with additional data traffic. The maximum number of 31 diagnostic modules can be connected to one Diagnostic Bus.

### 2.2.1 RS 485 Bus: Connection cable

The Diagnostic Bus is RS 485 interface based and looped from Power Hub to Power Hub. Adjacent Power Hub motherboards can be connected with the ACC-MB-HDC connection cable. Greater distances are bridged with simple, individual cables. A shielded cable is not required. The overall length of the bus should not exceed 30 m. Cause of the short distance a bus termination is not needed.

### 2.2.2 Diagnostic Gateway

The Diagnostic Gateway bridges the Diagnostic data from Ethernet to RS 485 and vice versa. It is typical to have Ethernet on top of the Cell and Fieldbus network running as high level network. This is why we recommend using such a device to make the integration into the existing structures as effortless as possible.

### 2.3 The Diagnostic Manager Software

The Diagnostic Manager is the powerful software tool, which can configure process and visualize the functions at the Advanced Diagnostic Module (ADM). The Diagnostic Manager is DTM based and can run in  $PACTware^{TM}$  or any other FDT compatible and proven framework.

### 2.3.1 Diagnostic Manager – Basic Edition

The Basic Edition is a free version. It can be used with the mobile DM-AM module and with the stationary Power Hub mountable HD2-DM-A module. Up to 3 HD2-DM-A modules can be configured and monitored. The basic version is not fully featured but is made for immediate system setup and monitoring. Functions of the Basic Edition are:

- Online parameterization
- Offline parameterization
- Download of the configuration to the diagnostic modules
- Printing the project
- Saving the project

The software can be downloaded from www.pepperl-fuchs.com.



### 2.3.2 Diagnostic Manager – Professional Edition

A software license is required for the Professional Edition. The Professional Edition offers all value-added features such as the oscilloscope, commissioning wizard, high-speed segment monitoring, history data export and many more. Diagnostic Managers for the HD2-DM-A and the DM-AM are described in detail in their respective data sheets and manuals.

### 2.4 The FieldConnex Diagnostic Server

#### 2.4.1 Basic Functions

The FieldConnex Diagnostic Server (FDS) as part of the Diagnostic Manager is a software which coordinates the access of data between the diagnostic modules and the Diagnostic Manager. The FDS is installed on the PC the diagnostics buses are physically connected or assigned to. The Diagnostic Manager and the FDS can run simultaneously on the same PC or be installed separately on different PCs.



## 3 Overview of Integration into Emerson Environment

The integration philosophy of Advanced Diagnostics into an Emerson environment is based on two main software tools developed from Pepperl+Fuchs: the AMS Alert Adapter and the ADM Project Builder Emerson.

Both tools are independent from each other, so FieldConnex Advanced Diagnostic can be implemented within a wide range of different Emerson system environments.

Use both Pepperl+Fuchs tools if AMS and DeltaV are implemented within your plant for optimal Advanced Diagnostic integration.

Following both tools the AMS Alert Adapter and the ADM Project Builder Emerson are described in detail.

### 3.1 The Pepperl+Fuchs ADM Project Builder Emerson

The Pepperl+Fuchs ADM Project Builder Emerson takes-over fieldbus topology information of the DeltaV to automatically generate a FieldConnex Diagnostic Manager project in PACT*ware*<sup>TM</sup> and to configure the FDS with current data.

The ADM Project Builder Emerson software contains the complete set of rules to match the DeltaV topology onto the FieldConnex Advanced Diagnostic topology, thus enables an efficient work with the Advanced Diagnostic Modules. Addressing and tagging in the Diagnostic Manager and FDS is also performed automatically based on the information taken out of DeltaV. Find the basic mapping conditions below.

#### DeltaV basic mapping conditions:

- Each Controller (node) contains up to 64 FF H1 cards
- Each FF H1 card has two ports
- Each port is connected to one fieldbus segment

#### FieldConnex Advanced Diagnostic basic mapping conditions

• Each FDS port is able to manage up to 32 Advanced Diagnostic Modules; this is a fixed limit which the ADM Project Builder Emerson takes into account during the mapping process.





The figure above shows the interconnection of the hard and software components. Each FF-H1 card of an Emerson controller is connected to two segments on the Power Hub motherboard which contains one Advanced Diagnostic Module (ADM). Depending on the type of motherboard up to 4 segments in redundant configuration are provided and monitored by the ADM. The Power Hub motherboards are series connected (Diagnostic Bus) via a Diagnostic Gateway and Ethernet to the FieldConnex<sup>R</sup> Diagnostic Server (FDS).

Because the Emerson DeltaV Controller topology differs from the FieldConnex<sup>R</sup> Advanced Diagnostic topology the P+F ADM Project Builder Emerson was developed for the automatically mapping. It takes over the current node and tag information from DeltaV during the setup process and prepares them for the FDS. This means during work within the Diagnostic Manager original segment and tag information is shown for optimized device overview.

### 3.2 AMS Alert Adapter

The AMS Alert Adapter builds the connection between the Emerson AMS Suite and the FieldConnex<sup>R</sup> Diagnostic Server. This connection provides the powerful Diagnostic Manager alarm handling straight out of the AMS<sup>R</sup> Alert Monitor.

AMS Alert Adapters ' way of working:

- 1. A dedicated FF device located within the plant is operating as an implement to transfer diagnostic information into the AMS<sup>R</sup> Alert Monitor. A physical device is needed since this is able to configure devices recognized by a network scan only.
- 2. A custom software component, called AMS<sup>R</sup> Alert Adapter links the common diagnostic components into the AMS<sup>R</sup> environment, respectively into the dedicated FF devices alarm handler.
- 3. The Diagnostic Manager launched straight from the AMS<sup>R</sup> Alert Monitor, provides detailed diagnosis information for maintenance personnel



To integrate Advanced Diagnostics in AMS<sup>R</sup> environment a FF device (should not be used for other purposes) has to be installed in the field and configured within the AMS<sup>R</sup> environment like a common FF device. The AMS<sup>R</sup> Alarm Adapter projects all status and alarm messages onto this dedicated device.

After proper configuration the Diagnostic Manager can be started directly from  $AMS^R$  Alert Monitor. For this purpose it has to be defined as a linked application in  $AMS^R$ . Next to the manager application itself project file has to be created at  $PACT_{ware}^{TM}$  it shall come up with when it is started from  $AMS^R$  in order to perform Advanced Diagnostics on the correct fieldbus segments.

Fieldbus commissioning and monitoring is easily granted within your familiar environment. Upcoming Fieldbus alarms can be diagnosed in any detail and allows you to find the source of error easily. Advanced Diagnostics respectively the Diagnostic Module gives you enough time to look for the source of error in the Diagnostic Manager since an alarm is raised already even if just a tolerable maintenance limit is exceeded.



Figure 2: Hardware und Software Integration of the Advanced Diagnostics in Emerson environment



# 4 Software Installation Process in Chronological Order

The order of software installation steps is as follows:

- 1. Install .NET framework, PACT*ware*<sup>™</sup> and FieldConnex<sup>®</sup> Diagnostic Manager (for further information please refer to the Quick Installation Guide FieldConnex<sup>®</sup> Advanced Diagnostics)
- 2. Install Diagnostic Gateway (for further information please refer to the manual)
- 3. Make sure that AMS<sup>R</sup> Suite 10.5 or higher is installed
- 4. Install AMS Alert Adapter, required for installations with Emerson AMS<sup>R</sup> Suite
- 5. Install ADM Project Builder Emerson, required for installations with DeltaV
- 6. Install AMS<sup>R</sup> Application Launcher included on CD2 of the AMS<sup>R</sup> install package, directory: \Supplemental\_Tools\GenericApplicationLauncher\Setup.exe

Be sure to have administrator rights on your PC in order to let the applications make their proper registry chances.



# 5 ADM Project Builder Emerson

### 5.1 Setup FieldConnex Diagnostic Manager Topology

To get a general idea of the integration process the required steps are listed below in short:

- Export of the DeltaV Control Network topology
- Import of the DeltaV Control Network topology into the ADM Project Builder Emerson. Some specific files will be created for Diagnostic Manager configuration.
- Configuration of PACTware<sup>™</sup>, Diagnostic Manager and FDS

Work steps:

1. Open Emerson DeltaV Explorer

	🛗 English (United States) 🛛 🕄 📮				_ 8 ×	
e Edit View Object Applications Iools Help						
🖸 🕺 🦓 🎎 🗶 🛍 🖒	X   🖗   🎟 🖿 🗖 🛱   🕵   💺	li 🚯 😂 💋 👧	🛼 🖬 🎬 🦉 🛛 🜌 🔬	l 🔍 🍿 🕅		
Contents of 'Control Network'					<i></i>	
Name PELLDELTAV NODE1 NODE2 NODE3	Type ProfessionalPlus Station Controller Controller Controller	Descri N U No No	Control Network: Number 1 1 1 1	Primary IP Address 010.004.000.006 010.004.000.018 010.004.000.086 010.004.000.090	Primary Sub 255.254.00 255.254.00 255.254.00 255.254.00 255.254.00	
	Elep Contents of 'Control Network' Name DELLDELTAV NODE1 NODE2 NDDE3					

2. Do right mouse click on Control Network and choose [Export]

À Exploring Delta¥		🛗 English (United States) 🛛 🤶		
<u>File Edit View Object Applications Io</u>	ols <u>H</u> elp			
Control Network	🖸 🕺 🦓 🧩 X 🗅 🖒	X   🌚   🎟 🎟 🏛 🗖 🖗 🚛 🕹	. 🔦 🖾 🏅 🐒 🐺 🐺 🖉 🖉	a 🛃 💿 🝿 🕅
All Containers	Contents of 'Control Network'			
DeltaY_System     DeltaY_System     Confurce Library     System Configuration     Recipes     Setup     Control Strategies     Control Strategies     Control Strategies     Control Strategies     Control Strategies     Control Network     Decommissioned Nodes     Explore     New     Update Do     Download     Yeily witho     Diagnose     Configure Library     Decommission     Uplad     Check Libe     Explore	Name DELLDELTAV NODE1 NODE2 NODE3 NODE3 NODE3 NODE3 NODE3 NODE3 NODE3 NODE3 NODE3 NODE3	Type ProfessionalPlus Station Controller Controller Controller	Descri N Control Network Numb U 1 U 1 No. 1 No. 1	ver Primary IP Address Primary Sub 010.004.000.006 255.254.00 010.004.000.018 255.254.00 010.004.000.06 255.254.00 010.004.000.090 255.254.00

3. Enter file name and save file



xport							?
Save jn:	My Docum	ents	-	G	1 🖻	•	
My Recent Documents Desktop	My Music My Pictures SQL Server Visual Studic Visual Studic	Management Studio Expres 5 2005 5 Projects	75				
My Documents							
My Computer							
My Network Places	File <u>n</u> ame: Save as <u>t</u> ype:	Control Network	าห)		•		<u>S</u> ave Cancel

- 4. Open ADM Project Builder Emerson software
- 5. Choose [Import DeltaV file]

률 ADM Project Builder Emerson		
File Edit Help		
ધ 🔒 🗟 💁 🕸 🕸 🗶 🖏		
FDS Target Topology	Unassigned	Controller
	Name	Description



6. Open the file created within step 3



7. Merge Result window appears. Press [OK].

Merge Result				Į.	ж
	Changes detec	ted in the Pro	ject:		
NODE1 will be added. NODE2 will be added. NODE3 will be added. NODE4 will be added.					
7			Ok	Cancel	٦



8. Drag&Drop NODE1 to the FDS node



9. Configure Diagnostic Gateway Address

aDM Project Builder Emerson					
File Edit Help					
ધ 🛃 🗟 🖄 🕸 🕸 🖊 🖏					
FDS Target Topology			Unassigned Controller		
Warning: The address is not set for one or more FDS Ports.		Name	Description		
← CFDS>FDS Server → CT2;PORT001>F Change Address Change Tag	Charles Bart S. Marco	NODE2 NODE3	Control Subsystem Control Subsystem Control Subsystem	)	
	Port type:   Diagnost  Serial Po	tic Gateway rt			
Change Tag	Serial Port: COM1		¥	5	
Tag: MyDGW OK Cancel	IP-Address: 192.168.1.2	ОК	Cancel	C02>HD2-DM-A C04>HD2-DM-A	

10. Drag&Drop NODE2 to the Diagnostic Gateway



11. Drag&Drop NODE3 to the FDS node to create a new Diagnostic Gateway port. Or Click on the icon to crate a COM port and move NODE onto it.



File Edit Help		
ڬ 🛃 🗟 🖹 🕸 🕸 🔉 🖏		
FDS Target Topology	Unassigned Co	ntroller
E	Name	Description
- 192.168.1.2, MyDGW>Port	NODE3	Control Subsystem
<2>NODE2	NODE4	Control Subsysten

12. Your topology may look like above. The ADM Topology Preview window in the bottom right corner shows the result of the mapping process. You can see where the nodes are located and that the actual tag names of DeltaV are used within the Diagnostic topology.

ADM Topology Preview		
=- 💂 <fds></fds>	FDS Server	
- 👌 🍡 <1	92.168.1.2, MyDGW>Port	
£ 😥	<001,ADM_NODE1_C01_C02>HD2-DM-A	
±	<003,ADM_NODE1_C03_C04>HD2-DM-A	
±-@	<065,ADM_NODE2_C01_C02>HD2-DM-A	
÷	<067,ADM_NODE2_C03_C04>HD2-DM-A	
±-@	<069,ADM_NODE2_C05_C06>HD2-DM-A	
± 🔂	<071,ADM_NODE2_C07_C08>HD2-DM-A	
±-@	<073,ADM_NODE2_C09_C10>HD2-DM-A	
± 🔂	<075,ADM_NODE2_C11_C12>HD2-DM-A	
±-@	<077,ADM_NODE2_C13_C14>HD2-DM-A	
⊕_⊕	<079,ADM_NODE2_C15_C16>HD2-DM-A	
÷ 😥	<081,ADM_NODE2_C17_C18>HD2-DM-A	
±	<083,ADM_NODE2_C19_C20>HD2-DM-A	
±-@	<085,ADM_NODE2_C21_C22>HD2-DM-A	
± 🔂	<087,ADM_NODE2_C23_C24>HD2-DM-A	
÷-@	<089,ADM_NODE2_C25_C26>HD2-DM-A	
± 🔂	<091,ADM_NODE2_C27_C28>HD2-DM-A	
- A	<093 ADM NODE2 C29 C30>HD2-DM-A	

13. Choose [File] > [Export FDS configuration]

Open project file	<b>د</b> ا
<ul> <li>Import DeltaV file</li> <li>Export FDS configuration</li> </ul>	
Exit	



14. Choose directory and file name. Press [Export].



15. Choose [File] > [Save project file]. Choose directory and filename of current ADM Project Builder Emerson configuration and press [Save].



16. The following files (step 13 and step 15) are now created and saved to the chosen directory:

	The
Config XMI	Interchange format for PACTware <sup>IM</sup> import
oorniginane	
Poport ndf	Mapping table of ADM and DoltaV topology for field installation
Keport.pui	mapping table of ADM and Deltay topology for held installation
Projectbuilderexample.epb	Saved ADM Project Builder Emerson configuration file.
<i>,</i> , , ,	5

Saving these files makes you able to do iterative configuration changes without performing the whole setup again.

17. Open PACTware<sup>™</sup>



18. Choose [Extras] > [Options]. Set value: Use memory-optimized project management

Options	×
Sprache/Language English	Project Depen last project at program start Restore project layout when loading the project Auto-connect at project load Open device windows maximized Use memory-optimized project management (recommended for projects with more than 30 devices) OK Cancel

- 19. Choose [Window] > [Device Catalog]
- 20. Choose [All Devices] > [Pepperl+Fuchs GmbH]. Drag&Drop FieldConnex Diagnostic Server to the Host PC node within the Project window.

PACTware					_ 8 ×
Eile Edit View Project Device Extras Window	Help				
L 😂 🕼 🕼 🕮 🕸 🖾 🖉 🖉 🖉	b¢ ≠¢				
Project <b>P</b> ×	Device catalog				• × 🧖
Device tag	🖃 🚊 All Devices	All Devices			R
HOST PC	E PEPPERL+FUCHS GmbH	Device	A Protocol	Vendor	Vice
		PDS Port	FDS Communication	PEPPERL+FUCHS GmbH	cata
		FieldConnex Diagnostic Server	FDS Communication	PEPPERL+FUCHS GmbH	
		D2-DM-A	FDS Port	PEPPERL+FUCHS GmbH	in the second se

21. Right mouse click on the FDS node and choose [Connect]





22. Right mouse click on the FDS node and choose [Additional functions] > [Topology Scan and Import]

Project	<b>д х</b>		
Device tag B HOST PC			
ा FDS	Connect Disconnect	]	
<u>谏</u>	Get device state Load from device Store to device		
	Parameter Measured value Simulation Diagnosis		
	Display channels Channels		
	Up-/Download-Manager Print		
	Additional functions		Compare offline
₩ 1 1 1 1 1 1 1 1 1 1 1 1 1	Add device Delete device		Set value
	Properties <fds>FieldConnex Diagnostic Server</fds>	-	Topology Scan and Import
		Ю	Write device data to file

23. Browse to the output folder of step 13

FieldConnex	Device Name: Device Description: Tag of the FDS:	FieldConnex Diagnostic Servi Communication Driver for th FDS	er e Pepperl + Fuchs FieldCo	onnex Diagnostic Server
Get Topology wizard - Impor	<b>t source</b> the FDS topology ir	mport. Press 'Next' to continue		
Topology Scan or Import Sou	rce: @Re CRe CSc CSc	ead from File ead from FDS ean Diagnostic Gateways ean available FDS Ports		
Set new Topology to FDS serv Filename:	rer: 🔽			
			Browse	



24. Choose the Config.xml file

				?
config		• G	) 🤣 📂 🖽-	
Config.xml				
File name:	Config.xml		-	<u>O</u> pen
			and the second sec	
	Config.xml	Config.xml	Config Config.xml	Config Config.xml

25. Press Next and the Wizard will lead you trough the creation of the PACT*ware*<sup>™</sup> Diagnostic Project.

PACTware		
File Edit View Project Device E	Extras Window Help	
i 🗅 🧉 🛃 🎒 👘 🔛 🦉 🖬 🖬	ゆ 19   ゆ な 2   回 回	
Project # ×	EDS Topology Scan and Import	4 ▷ 🗙
Device tag HOST PC  FDS  PORTO01  PORTO01 PORTO01 PORTO01 PORTO01 PORTO01 PORTO01 PORTO01 PORTO01 PORTO01 PORTO01 PORTO01 PORTO01 PORTO01 PORTO01 PORTO01 PORTO01 PORTO01 PORTO01 PORTO	Field Connex Diagnostic Server Device Description: Communication Driver for the Pepperl + Fuchs FieldConnex Diagnostic Server Tag of the FDS: FDS	đ
ADM_CTER-014CA0_C01		
	Get Topology wizard - Summary Setting new topology finished.	
	Successfully added ADM DTM: PORT001.ADM_CTLR-014CA0_C01 Successfully added ADM DTM: PORT001.ADM_CTLR-014CA0_C01	
	<< Restart < Back Next >	Close

26. Choose [File] > [Save as...]. Choose directory and filename of the current PACT*ware*<sup>™</sup> project and press [Save].



# 6 Setup of Emerson's AMS<sup>R</sup> Environment

To get a general idea of the integration process the required steps are listed below in short:

- 1. Setup the P+F AMS Alert Adapter
- 2. Configuration of the generic Application Launcher
- 3. Setup Alert Monitor for FieldConnex Advanced Diagnostics

To integrate Advanced Diagnostics in AMS<sup>R</sup> a dedicated FF-device has to be installed in the field and configured within the AMS<sup>R</sup> environment.

#### 6.1.1 Setup AMS<sup>R</sup> Alert Adapter

The AMS<sup>R</sup> Alert Adapter connects the dedicated FF-device to the FieldConnex<sup>R</sup> Diagnostic Server (FDS). It runs as a background service.

- Server-machine: Execute DCOM-Wizard only for the intended user, anonymous access is **not** necessary
- Client-machine: AMSAlertAdapterService has to run under intended user Client-Firewall: Add TCP-Port 135 and the AMSAlertAdapterService to the Firewall-Exceptions

#### 6.1.1.1 Set up FDS for remote access:

- 1. Open Pepperl + Fuchs FDS Control Center
- 2. Choose [Settings...]
- 3. Set check-box [Adjust firewall to allow remote access:]

🔑 Edit Settings	
Control Center Settings	
Start Control Center automatically:	
Minimize Control Center on startup:	
FDS Settings	
Startup type:	Start manually
	Start with Windows
	Start with Control Center
TCP port:	25061 Default
MODBUS read timeout:	300 ms 🔻
Adjust firewall to allow remote access:	☑ ←
Hostname to read via OPC:	localhost
	OK Cancel

4. Choose [Tools /OPC Remote Access...]

FDS Control Center			
🕨 Start FDS 🛛 Stop FDS	🎾 Settings	🔀 Tools 🗸 🕕 Info	
FDS Information		Import Config	
TCP port:	25061	V OPC Remote Access	



- 5. Enter user
- 6. Disable check-box [Allow Anonymous access]
- 7. Set check-box [Execute FDS under the selected account]

-				
lo enable remote acc list below. To enable enter the name into th	ess for a local us remote access fo e text box	r a remote user (e.	e user from the g. domain user)	
The selected user mu	ist have a passwo	ord set.		
Allow remote access	for this user:			
intended us er			-	
Allow Anonymo	ous access			
→ □ Allow Anonymo → ⊽ Execute FDS u	ous access inder the selected	account		
→ C Allow Anonyme → V Execute FDS u	nder the selected	account		
→ □ Allow Anonyme → ☞ Execute FDS u	nder the selected	account		

- 8. Press [Next]
- 9. Enter password of remote user
- 10. Restart the PC
- 6.1.1.2 Set up the AMS<sup>R</sup> Alert Adapter:
  - 11. Make sure that the AMS<sup>R</sup> Alert Adapter is running.
  - 12. Double click on the icon within the task bar 🛃
  - 13. AMS<sup>R</sup> Alert Adapter configuration window opens.

AMS Alert	Adap	oter		- 0 💌
-AMS Tag: Status:	PDT O	1 AMS Alert Adapter is (	not running	
FDS Location: Status:	local	lhost AMS Alert Adapter is i	not running	
		70	Connect	Disconnect
			Exit	Hide

14. Enter AMS<sup>R</sup> Tag (Tag of the dedicated FF device) and location of the pc the FDS is running on.



If FDS is running on the same PC enter localhost

If FDS is running on a remote PC you need to enter the IP address or DNS.

Do not connect the dedicated FF device to the FDS before installation and commissioning of all segments and devices is completed. Otherwise performance problems may happen.

For commissioning purposes use PACT*ware*<sup>™</sup> and the Diagnostic Manager Commissioning Wizard function.

15. Press [Connect]

0 ∏

Note

AMS Alert	Adapter		- • •
AMS Tag: Status:	РДТ1		
FDS Location: Status:	localhost OK		
		Connect	Disconnect
		Exit	Hide



### 6.1.2 Create a Linked Application with the Generic Application Launcher

To be able to start the Diagnostic Manager from inside AMS<sup>R</sup> a Snap-On has to be created. Close the AMS<sup>R</sup> Device Manager and start the Generic Application Launcher by running the AppLauncher.exe in the "...\bin" subdirectory of AMS<sup>R</sup> installation directory. Use again the username "admin" without a password to login.

If AppLauncher.exe is not available within this directory install the application from CD 2 of the AMS<sup>R</sup> suite package.

There are two different options to configure the application launcher:

- 1. AMS is blocked and cannot be used while the Diagnostic Manager is executed.
- 2. Diagnostic Manager and AMS can be use in parallel.

#### Option 1: AMS is blocked and cannot be used while the Diagnostic Manager is executed

- 1. In the [Application] Tab enter the Snap-On's name to be displayed later in AMS<sup>R</sup>.
- 2. Fill out the [help text] box with an expressive string for Diagnostic Manager's function like FieldConnex Diagnostic Manager.
- 3. Enter the path "C:\Program Files\PACTware Consortium\PACTware 4.0\App\PACTware.exe" of the program to be executed into the box [Path] and append to it the path and name of the project's file to be loaded automatically when started.

The Diagnostic Manager is not standalone software and is embedded into the PACT*ware*<sup>TM</sup> software always. This is why you have to specify PACT*ware*<sup>TM</sup> as initial software to be loaded and to enter the path of the application. Following you will find an example how this string could look like:

Application Launcher Configuratio	n : FieldConnex Diagnostic Manager	
File Edit Help		
Application App Help Pat	Command Line     Device Type       lication Name:     FieldConnex Diagnostic Manager       Text:     Pepperl+Fuchs Fieldbus Advanced Diagnostic Tool       1:     C:\Program Files\PACTware Consortium\PACTware 4.0\App\PACTware.exe	5



4. Enter path of the PACT*ware*<sup>™</sup> project file at Argument 1 of the Command Line Tab. This PACT*ware*<sup>™</sup> project file must be created before e.g. during commissioning with the ADM Project Builder Emerson if DeltaV is used see chapter 5.1 work step 26.

	2			
Ap	plication	Command Line		Device Types
	Add a space before argument	Delimiter	Arguments	Add quotation marks around passing arguments
krgument 1		"userpath\pwproject.PW4"		
rgument 2				
rgument 3				
rgument 4				
rgument 5				
rgument 6				
rgument 7			•	
rgument 8			<u>.</u>	
rgument 9				
rgument 10				
rgument 11				
rgument 12				
rgument 13				
command C:\F	Program Files\PACTware Consortiu	m\PACTware 4.0\App\PACTware.exe "use	erpath\pwproject.PW4"	*



#### Option 2: Diagnostic Manager and AMS can be use in parallel.

- 1. Enter in the [Application] Tab the Snap-On's name to be displayed later in AMS<sup>R</sup>.
- 2. Fill out the [help text] box with an expressive string for Diagnostic Manager's function like FieldConnex Diagnostic Manager.
- 3. Enter the path of the program to be executed into the box [Path] and append to it the path and name of the project's file to be loaded automatically when started.
- 4. Enter cmd.exe as path.

Application Launcher Configuration : FieldConne	k Diagnostic Manager	
File Edit Help		
Application Application Name: Help Text: Peppe Path: cmd.exe	Command Line FieldConnex Diagnostic Manager 1+Fuchs Fieldbus Advanced Diagnostic Tool	Device Types

5. On the Command Line Tab enter the following Arguments: Argument 1: /C start "Diag Manager" Argument 2: Path to Pactware, e.g. "C:\Program Files\PACTware Consortium\PACTware 3.0\App\PACTware.exe" Argument 3: The path to the PACT*ware*<sup>™</sup> project file must be entered at Argument1 of the Command Line Tab. This PACT*ware*<sup>™</sup> project file must be created before e.g. during commissioning with the ADM Project Builder Emerson if DeltaV is used see chapter 5.1 work step 26.

Make sure that Argument 2 and 3 are enclosed by quotation marks and "Add a space before argument" is activated.



	2			
Ą	pplication	Command Line		Device Types
	Add a space	Delimiter	Arguments	Add quotation marks
Argument 1		/C start "Diag Manager"	•	Γ
Argument 2		"c:\Program Files\PACTware (	•	
Argument 3		"userpath\pwproject.PW4"	•	
Argument 4				
Argument 5			•	
Argument 6				
Argument 7			-	
Argument 8			•	
Argument 9			•	
Argument 10			-	
Argument 11			•	
Argument 12			•	Γ
Argument 13				
Command Cm	d.exe /C start "Diag Manager" "c	:\Program Files\PACTware Consortium\PACT	ware 4.0\App\PACTware.exe" "	userpath\pwproject.PW4"

- 6. Open PACT*ware*<sup>™</sup>
- 7. Choose [Extras/Options]
- 8. Set check-box [PACTware may only be started once]

ptions	×			
Language English	Project Restore project layout when loading the project			
Error messages Display error message dialog on device error	Auto-connect at project load     Open device windows maximized			
Programm Programm PACTware may only be started once	Use memory-optimized project management (recommended for projects with more than 30 devices)			
Device State Scan	program startup     open empty project     C open last project			
Max. response timeout of a scan request in seconds	C show wizard			
	OK Cancel			



9. Switch to the [Device Types] tab to the right and select the device you have configured as the dedicated FF device (this example uses the Rosemount 3244MV device.

	Application	<u> </u>		Command Lin	e	Ĵ D∙	evice Types		
ssociated Device T	ypes				Possible Device Type	es		N	
Manufacturer	Device Type	Device Rev	Protocol		Manufacturer	Device Type	Device Rev	Protocol	-
					Rosemount	3144P SIS	2	HART	
				2	Rosemount	3051S HDT	1	HART	
				S 10-0	Rosemount	3051S	1	HART	
				<	Rosemount	648	1	HART	
				<	Rosemount	1420	1	HART	
					Rosemount	3051 Fieldbus Pr	20	FF	
					Rosemount	3051 Fieldbus Pr	22	FF	
				<	Rosemount	3051 Fieldbus Pr	3	FF	
					Rosemount	3051 Fieldbus Pr	6	FF	
					Rosemount	3051 Fieldbus Pr	7	FF	
					Rosemount	3095MV Fieldbu	1	FF	
					Rosemount	3144 Fieldbus T	1	FF	
					Rosemount	3242 Device	1	FF	1
				1	Rosemount	3244MV Fieldbu	2	FF	
				>	Rosemount	3244MV Fieldbu	3	FF	
					Rosemount	3244MV Fieldbu	4	FF	
					Rosemount	3900 TankRada	1	FF	
				·····>	Rosemount	644 Fieldbus Te	1	FF	
				>	Rosemount	752 Fieldbus Re	2	FF	
					Rosemount	848 Fieldbus Te	4	FF	1000
				3	Bosemount	848 Fieldbus Te	5	FF	

10. Move the FF device into the [Associated Device Types] list to the left using the single "arrow to left" button in the middle of the screen. In addition the list box: [Add this linked application to the Tools main menu within AMS<sup>R</sup> Device Manager] must to be activated to ensure that this tool is visible later in AMS<sup>R</sup> Suite.

	Application	ľ		Command Lin	e	) D	evice Types		
ssociated Device T	ypes	1		_	- Possible Device Type	es			1
Manufacturer	Device Type	Device Rev	Protocol		Manufacturer	Device Type	Device Rev	Protocol	
Rosemount	3244MV Fieldbu	3	FF		Rosemount	3144P SIS	2	HART	_
					Rosemount	3051S HDT	1	HART	_
					Rosemount	3051S	1	HART	_
		-	-		Rosemount	648	1	HART	_
					Hosemount	1420	1	HART	
				_	Rosemount	3051 Fieldbus Pr	20	FF	_
				- L	Rosemount	3051 Fieldbus Pr	22	FF	_
		-	-		Rosemount	3051 Fieldbus Pr	3	FF	_
					Rosemount	3051 Fieldbus Pr	6	FF	_
					Rosemount	3051 Fieldbus Pr	7	FF	
				- 2	Rosemount	3095MV Fieldbu	1	FF	_
		-		2	Rosemount	3144 Fieldbus T	1	FF	
					Rosemount	3242 Device	1	FF	
					Rosemount	3244MV Fieldbu	2	FF	
		-		>	Rosemount	3244MV Fieldbu	4	FF	
					Rosemount	3900 TankRada	1	FF	
					Rosemount	644 Fieldbus Te	1	FF	_
				>	Rosemount	752 Fieldbus Re	2	FF	
		-		<u></u>	Rosemount	848 Fieldbus Te	4	FF	_
		-			Rosemount	848 Fieldbus Te	5	FF	
					Bosemount	5400 Tank Bad	2	FF	



- 11. Choose [File/Save] to save the configuration and terminate the Generic Application Launcher.
- 12. To start the Diagnostic Manager do right mouse click on the device and choose [SNAP ON/Linked Apps] > [Fieldconnex Diagnostic Manager].

🔩 Device Explorer				_ 🗆 ×
Current Device PDT1				
🖃 📲 AMS Device Manager	Tag Manufacturer	Device Type	Device Rev	Protocol
AMS Device Manager ADM2 Area Calibration Calibration Prysical Networks Physical Networks Physical Networks Calibration Controller - NOD Controller - NOD	Iag     Manufacturer       PDT     Configure/Setup       PDT     Compare       PDT     Device Diagnostics       PDT     Scan Device       PDT     Calibration Management       PDT     Calibration Management       PDT     Calibration Management       PDT     Rename       PDT     Rename       PDT     Rename       PDT     Rename       PDT     Replace       PDT     Audit Trail       Record Manual Event     Drawings/Notes       Help	Device type 3244MV Fieldbus Temperature Transmitter 3244MV Fieldbus Temperature Transmitter 3244MV Fieldbus Temperature Transmitter 3244MV Fieldbus Temperature Transmitter FieldConnex Diagnostic Manager 3244MV Fieldbus Temperature Transmitter 3244MV Fieldbus Temperature Transmitter	Device Hev 3 3 3 3 3 3 3 3 3 4 3 4 3 4 4	Protocol         FF           FF         FF



### 6.2 Setup Alert Monitor for Advanced Diagnostic

To display diagnostic information from the Advanced Diagnostic Module the dedicated FF device has to be configured within the AMS<sup>R</sup> Alert Monitor first:

1. Open Alert Monitor: [View] > [Alert Monitor]



- 2. Press [Configure], Device Selection List will open
- 3. Select the dedicated FF device from the list and confirm with [OK]

Alert Monitor - Device Selection	List	? ×
AMS Tag	Area	OK
0007D000805350030640 0011510848-FR-TEMP-0x8129EC0 EHTMT125_01342	Area\Unit\Equipment Module\Control Module     Area\Unit\Equipment Module\Control Module     Area\Unit\Equipment Module\Control Module	Cancel
PDT1 PDT11 PDT13 PDT25 PDT26 PDT3 PDT4 PDT5 PDT6 PDT7 PDT8	Area\Unit\Equipment Module\Control Module Area\Unit\Equipment Module\Control Module	Help
1		



# 7 Alarm Workflow Example

This example shows the benefits of both P+F tools within an Emerson environment containing the AMS<sup>R</sup> Suite and also DeltaV components. The AMS Alert Adapter provides the diagnostic information to the AMS<sup>R</sup> Suite and the ADM Project Builder Emerson is used to show DeltaV segment tags inside the Diagnostic Manager.

Following an exemplary workflow is shown you have to run through if an alarm happens.

If an alarm value is exceeded the dedicated FF device pops up in the Alert Monitors Active Alert List. Within the Description table cell you find information about the segment and the status of the current alarm messages (see 7.1).

	AMS Suite: Intelligent Device Manager - [Alert Monitor - Active Alert List]									
-										
Γ			Device Creve	Description	Charling 1					
3	PDT1 Area\Unit\Equipment Module\Control Module	7/15/2008 9:08:51 PM	1	MAINT: NODE1_C01_P01: Out of Specification (2007)	DELLDELTAV					
l										

To get a detailed view start the Diagnostic Manager as follows:

1. Do right mouse click on the dedicated FF device and choose [SNAP-ON/Linked Apps] > [FieldConnex Diagnostic Manager]

AMS Tag	Area		Ti	me	Device Grou
NPDT1	Area\Unit\Equipmen	Configure/Setup Compare Device Diagnostics Scan <u>D</u> evice		10/2008 10:45:33 AM	1
		SNAP-ON/Linked Apps Calibration Management Methods		FieldConnex Diagnostic f	4anager
		Rena <u>m</u> e <u>U</u> nassign Replace			
		Audit Trail Record Manual <u>E</u> vent Drawings/Notes Help			



2. Connect the Host PC: right mouse click [Connect]



3. Do right mouse click on the FDS and choose [Diagnostics]



4. Now an overview of all segments with the diagnostic information is shown. To directly reach the detailed view press [Open]

l	📮 FDS # Diagnostics						$\triangleleft$ $\triangleright$ $\times$
	FDS-Port	Device	Segment	Status	Diagnostics	Reason	
l	PORT020	ADM_NODE1_C01_C02			Open		
l			NODE1_C01_P01	Δ		Out of Specification	
I			NODE1_C01_P02	<b></b>			
l			NODE1_C02_P01	Image: A start and a start			
			NODE1_C02_P02	<b></b>			
			1				



5. Now a details list of alarms occurred for the segments and corresponding nodes

	Current Alar	ms	
1	Description	Value	
- Se	jment 1 📉		
	Segment Signal Level too high	1744 mV	
-I Not	des (Segment 1)		
	Address 34: Device's Signal Level too high	1743 mV	
	Address 246: Device's Signal Level too high	1593 mV	

### 7.1 Alarm Message Overview

How the alert string is build up:

Meaning:	AMS Alert Type	Segment	Alarm Status	Message ID
Display:	MAINT	Segment 1	Out of Specification	2007

The possible alarm statuses are:

- Good
- Maintenance required
- Out of Specification
- Hardware error
- Communication error
- Segment disabled

For more detailed information please refer to the manual Advanced Diagnostic Solutions.



# 8 Change of Topology, Add or Delete Segments

### 8.1 How to change Topology:

- 1. Export of the DeltaV Control Network topology (see chapter 5.1).
- 2. Load previously used project into ADM Project Builder Emerson.
- 3. Import new DeltaV Control Network topology into ADM Project Builder Emerson.

🔁 ADM Project Builder Emerson	
File Edit Help	
ઇ Open project file	K 🖬
🛃 Save project file	
🛃 Import DeltaV file	
Export FDS configuration	
Exit	-
The Merge-Mechanism up	dates/add/delete Nodes
Merge Result	
Changes detected	d in the Project:
NODE2 will be deleted. NODE3 will be updated. NODE4 will be added.	

- 4. Assign the new Node's to Ports, remove unused Ports
- 5. Export the new FDS Configuration



- 6. Load previous used Pactware Project
- 7. Right mouse click on the FDS node and choose [Connect]
- 8. Right mouse click on the FDS node and choose [Additional functions] > [Topology Scan and Import]



9. Load the new FDS Configuration with the "Read from File" capability into the FDS-DTM (and allow to "Set the new Topology to the FDS server")



10. Choose the new Config.xml file

Open							? ×
Look jn:	Config			•	) Ø 🖻	•	
My Recent Documents	onfig.xml						
Desktop							
My Documents							
ESV-EP1800							
Nu Naturali	File name:	Configural					Open
Places	Files of type:	FDS-Configural	tion file (*.xml)		-		Cancel

- 11. At next step occurs a change-preview, single ADM's can be de-selected
- 12. After finishing the import, you'll get a change-summary
- 13. Choose [File] > [Save] to Save the current Pactware Project.

The Topology change is completed now and can be used.



# PROCESS AUTOMATION ... PROTECTING YOUR PROCESS



#### Worldwide Headquarters

Pepperl+Fuchs GmbH 68307 Mannheim · Germany Tel. +49 621 776-0 E-mail: info@de.pepperl-fuchs.com

#### **USA Headquarters**

Pepperl+Fuchs Inc. Twinsburg, Ohio 44087 · USA Tel. +1 330 4253555 E-mail: sales@us.pepperl-fuchs.com

#### Asia Pacific Headquarters

Pepperl+Fuchs Pte Ltd. Company Registration No. 199003130E Singapore 139942 Tel. +65 67799091 E-mail: sales@sg.pepperl-fuchs.com

# www.pepperl-fuchs.com

