Fieldbus Segment Diagnostics with the ADM

Plant Resource Manager

Technical Information

Your automation, our passion.

PEPPERL+FUCHS

Disclaimer

This document provides a general overview of the Pepperl+Fuchs Advanced Diagnostic Solutions and contains technical information on engineering, commissioning, and operation of the Pepperl+Fuchs Advanced Diagnostic Module system with the Yokogawa Plant Resource Manager.

With regard to the supply of products, the current issue of the following document is applicable: The General Terms of Delivery for Products and Services of the Electrical Industry, published by the Central Association of the Electrical Industry (Zentralverband Elektrotechnik und Elektroindustrie (ZVEI) e.V.) in its most recent version as well as the supplementary clause: "Expanded reservation of proprietorship"

Table of Contents

1. Introduction

This document describes the principles of the Pepperl+Fuchs Advanced Diagnostic integration into the Yokogawa Plant Resource Manager Software (PRM).

It also contains all information required for engineering, and commissioning of the Pepperl+Fuchs components and to integrate them into the Yokogawa environment. It qualifies the user to do the first steps with PRM and the Advanced Diagnostic tools. However, this document does not cover the complete functionality of the Pepperl+Fuchs Advanced Diagnostic solution. To learn more about the powerful possibilities and usage of all functions, refer to the following documentation found at www.pepperl-fuchs.com:

- Manual Advanced Diagnostic Solutions

- Quick Start Guide Advanced Diagnostics

About the Advanced Diagnostic Module

The Advanced Diagnostic Module (ADM) is specially designed to analyze signal and segment parameters. It also allows you to monitor and measure specific system, segment and field device values. The continuous live monitoring of all relevant physical layer parameters enables the constant validation of the signal quality. This way degradations can be proactively detected before the segment communication fails.

The Diagnostic Module is part of the diagnostic system, which consists of different hardware and software components that act as a whole.

With the FDT/DTM based Diagnostic Manager the Diagnostic Module provides analysis of signal and segment parameters as well as measurement of specific system and field device physical layer values. The integrated powerful oscilloscope function visualizes the current communication at each segment.

PEPPERL+FUCHS

Copyright and Trademark Notices

- CENTUM and PRM are registered trademarks of YOKOGAWA.

- FieldConnex® is a registered trademark of Pepperl+Fuchs.

- Microsoft®, Windows® and Windows® XP are either registered trademarks or trademarks of Microsoft® Corporation in the United States and/or other countries.

- Ethernet is a registered trademark of XEROX Corporation.

- "FOUNDATION" in "FOUNDATION Fieldbus" is a registered trademark of Fieldbus Foundation.

- All other company and product names mentioned in this manual are trademarks or registered trade-marks of their respective companies.

PEPPERL+FUCHS

2. System Environment and Infrastructure

The diagnostic infrastructure consists the following hardware and software components:

- Diagnostic Modules

- Yokogawa ALF111 Fieldbus Communication Module

- PRM

- FieldConnex® Diagnostic Server (FDS)

- Diagnostic Manager

Figure 1 provides an overview of all included components and how they inter-connect.

Each Advanced Diagnostic Module monitors up to 4 segments. The diagnostic communication is independent from the fieldbus communication and takes place via a separate 2-line wire using an RS 485 protocol, called the Diagnostic Bus (see also Figure 1). The Diagnostic Bus connects up to 31 ADM modules at a length of max. 30 meters. A Diagnostic Gateway installed within the field cabinet transmits the RS-485 Diagnostic Bus information to the FieldConnex® Diagnostic Server (FDS) using standard Ethernet topology.

The FieldConnex® Diagnostic Server (FDS) installed on a PC provides access to the ADM diagnostic information straight through a Diagnostic Manager tool (DTM tool). Also, the FDS supports OPC-AE and OPC-DA services, thus, PRM Status and Message acquisition services are fed with alarm and maintenance information of all configured Advanced Diagnostic Modules. The FDS provides up to 255 FDS ports and handles 1 000 ADM devices and overall 4 000 FOUNDATION FieldbusFieldbus segments.
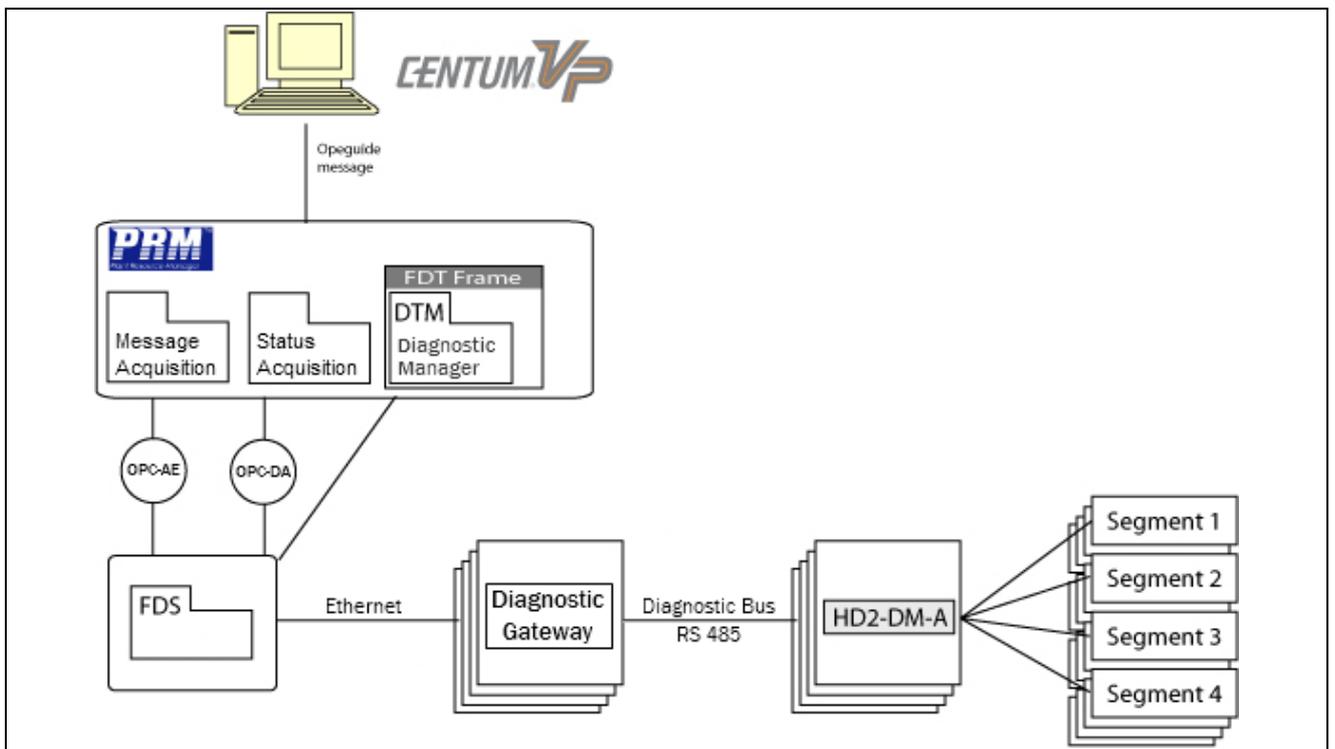
Figure 1: Overview of the system environment

PEPPERL+FUCHS

2.1.1 Segment Hierarchy and ADM Representation in PRM

Each fieldbus segment monitored by the Advanced Diagnostic Module contains a "virtual" device. Figure 2 shows that the segments monitored by the Advanced Diagnostic Module are represented by devices within the PRM Network view.
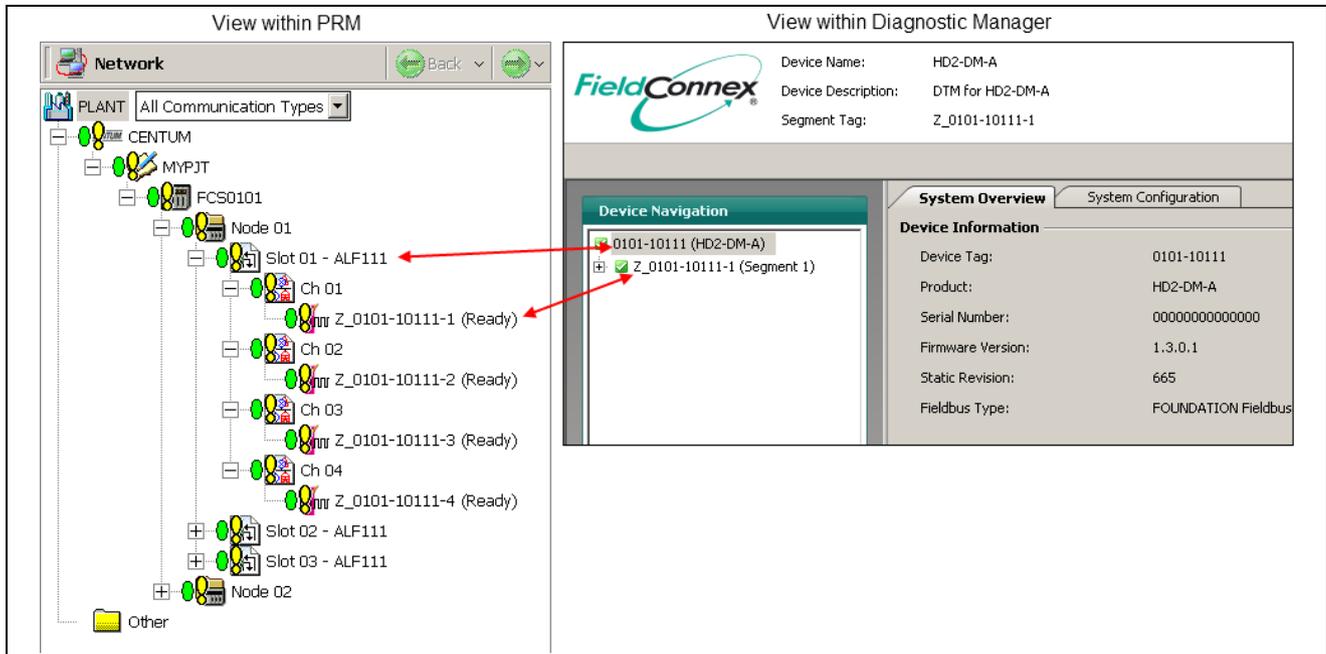
Figure 2

During the engineering procedure a mapping takes place to establish a relationship between the Advanced Diagnostic Module and the appropriate PRM instance.

By default, the following mapping is applied:

- Each Slot/AKF111 has assigned one HD2-DM-A device which monitors up to 4 channels of the slot.

- All Slots/ALF111 of one node are mapped to one port inside the FDS DTM (see chapter 7).

For mapping details refer to chapter 7.

3. System Requirements

3.1 PC System Requirements

Personal computer for PRM and FieldConnex® Diagnostic Server (FDS)

- Operating systems:

  - Windows® Vista SP2 (32-bit)

  - Windows® 7 SP1 (64-bit)

  - Windows® Server 2008 SP2 (32-bit)

  - Windows® Server 2008 R2 SP1 (64-bit)

- 3 GB RAM for PRM, 100 MB RAM for FDS, 100 MB RAM for Diagnostic Manager (DTM)

3.2 Hardware Requirements

Hardware Required

Component	Description
HD2-DM-A	Advanced Diagnostic Module plugged onto the Fieldbus Power Hub motherboard.
Diagnostic Gateway	Device that provides serial Ethernet to RS-485 connectivity.
VP or CS 3000	Distributed Control System

3.3 Software Requirements

Software Required

Program	Description
FDS 2.2.0.2465 or later	FieldConnex® Diagnostic Server is an interface and a data access coordinator for the HD2-DM-A, includes the OPC-AE service.
Diagnostic Manager DTM 2.2.0.2465 or later	Device Type Manager that represents the FDS, ports and connected HD2-DM-A modules. A DTM is the device's configuration and management software. It contains the graphic user dialogs and undertakes device configuration and diagnosis. The DTM can be launched straight out of the PRM.
PRM R3.20 or later	Plant Resource Manager

PEPPERL+FUCHS

4. Engineering

This chapter describes the software engineering procedures to integrate the Pepperl+Fuchs Advanced Diagnostic Module (ADM) into Yokogawa PRM.

In addition, the necessary hardware and software configuration settings, as part of the engineering procedures, are described.

4.1 System Topology Description

Depending on the size and complexity of the plant, many different installation topologies are possible in practice. Thus, the hardware requirements depend on the given topology. For that reason, many different software installation workflows are possible.

To simplify the engineering, this publication describes the three most common installation topologies and the corresponding work steps (WS) for proper installation of all components. The required software components are the same for all described topologies, but the hardware and where to install these components differs.

Figure 3 shows a stylized comparison about the three most common installation topologies:

A.   All Components on the same PC

B.   PRM Client, Field Communication Server and PRM/FDS-Server

C.   PRM Client, Field Communication Server, PRM-Server and separate FDS-Server
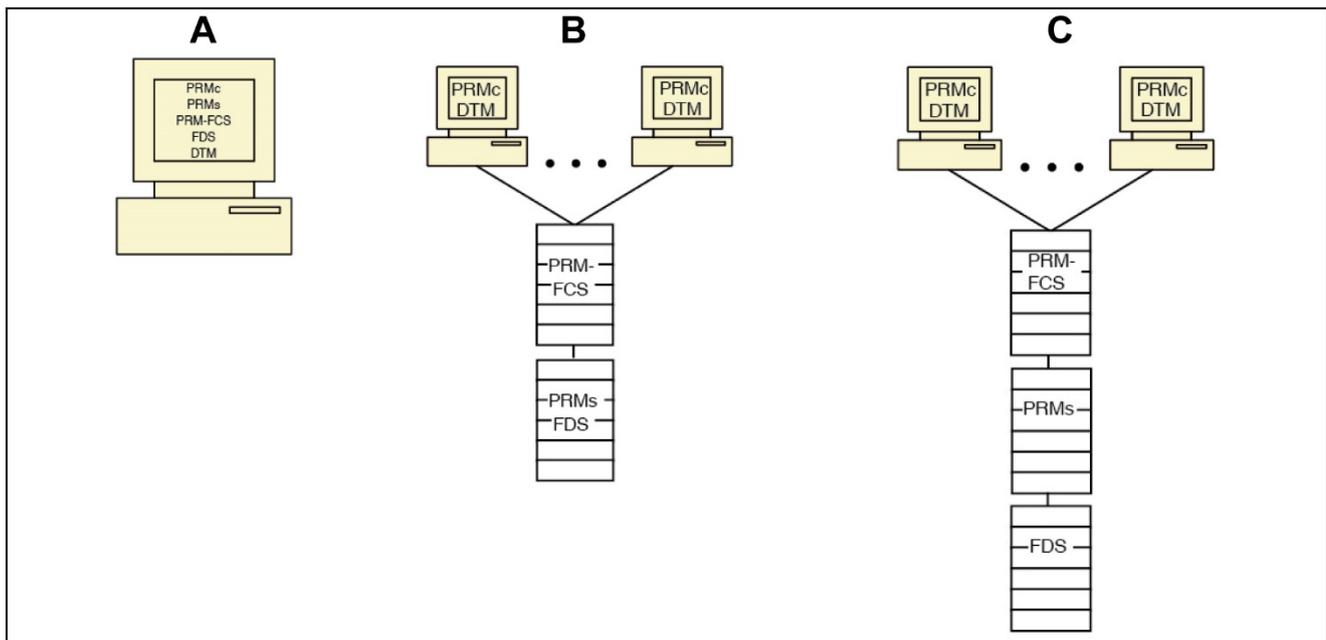
Figure 3: Installation topology comparison

PEPPERL+FUCHS

Following the engineering procedure for each installation topology is described in detail.

4.1.1 Installation Topology A: All Components on the Same PC

All system components are installed on the same PC.

In this case, you have to perform a complete PRM HD2-DM-A setup on this PC. For detailed engineering work steps (WS) see chapter 4.4.

Components on hardware	FieldConnex® Diagnostic Manager Setup installation profile
PRMc PRMs PRM-FCS FDS DTM	○ FDT/DTM Environment ○ Yokogawa PRM Integration - Server ○ Yokogawa PRM Integration - Client ◉ Yokogawa PRM Integration - Single Machine
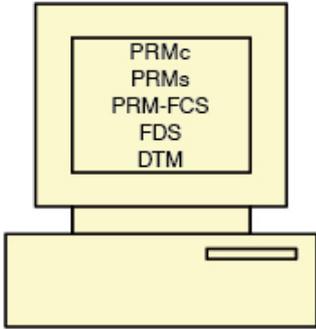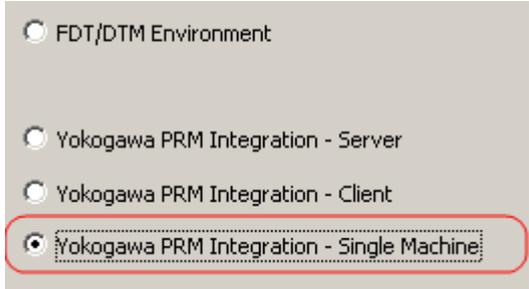
Legend:	
	PC workstation / PC server machine
PRMc	Plant Resource Manager Client Software
PRMs	Plant Resource Manager Server Software
PRM-FCS	Plant Resource Manager Field Communication Server
FDS	FieldConnex® Diagnostic Server
DTM	Diagnostic Manager

4.1.2 Installation Topology B: PRM Client and PRM/FDS Server

The PRM clients are installed on separate PCs, the PRM server and the FDS are installed on the same server machine.

In this case, you are required to perform both the following:

- PRM client setup on each PRM client PC with the Diagnostic Manager

- Server setup on the server machine with the FieldConnex® Diagnostic Server

For detailed engineering work steps (WS) see chapter 4.5.

PEPPERL+FUCHS

Components on hardware	FieldConnex® Diagnostic Manager Setup installation profile
	Install these components on each PC and on the server running PRM-FCS (Field Communication Server): ○ FDT/DTM Environment ○ Yokogawa PRM Integration - Server ● Yokogawa PRM Integration - Client ○ Yokogawa PRM Integration - Single Machine Install these components on the server running PRMs/FDS: ○ FDT/DTM Environment ● Yokogawa PRM Integration - Server ○ Yokogawa PRM Integration - Client ○ Yokogawa PRM Integration - Single Machine

Legend:	
	PC workstation
	Server machine
PRM-FCS	Plant Resource Manager Field Communication Server
PRMc	Plant Resource Manager Client Software
PRMs	Plant Resource Manager Server Software
FDS	FieldConnex® Diagnostic Server
DTM	Diagnostic Manager

PEPPERL+FUCHS

4.1.3 Installation Topology C: PRM Client, PRM Server and Separate FDS Server

All components are installed on different work stations and server machines. In this case, you are required to perform the following:

- PRM client setup on each PRM client PC with the Diagnostic Manager

- Server setup on the PRM server machine and on the FDS server machine with the FieldConnex® Diagnostic Server

For detailed engineering work steps (WS) see chapter 4.6.

Components on hardware	FieldConnex® Diagnostic Manager Setup installation profile
	Install these components on each PC running PRM-FCS (Field Communication Server): Install these components on the PRM server, Field Communication Server and the FDS server:

Legend:	
	PC workstation
	Server machine
PRM-FCS	Plant Resource Manager Field Communication Server
PRMc	Plant Resource Manager Client Software
PRMs	Plant Resource Manager Server Software
FDS	FieldConnex® Diagnostic Server
DTM	Diagnostic Manager

PEPPERL+FUCHS

4.2 Required Software for Engineering

Advanced Diagnostic Manager DTM 2.2.0.2465 or later
COM port converter driver (depends on the used device)
FieldConnex® Diagnostic Server (FDS) with OPC AE support 2.2.0.2465 or later
Plant Resource Manager (PRM) R3.20 or later

- PRM Setup Tool

- PRM Hierarchy Import Tool

- PRM Integration Wizard

- PRM

4.3 Work Step (WS) Overview

To integrate the Advanced Physical Layer Diagnostics into the PRM environment, several work steps (WS) are necessary. These work steps do not depend on the kind of installation topology.

The following table gives an overview about the work steps with the expected duration. The work steps must be performed in the correct order.

Preconditions:

The PRM and all Yokogawa-specific system components must be installed correctly. The plant hierarchy must be configured and the appropriate device path configuration definition file must be available and be imported into PRM.

PEPPERL+FUCHS

S	Task	Tool
1	Installation of the Pepperl+Fuchs Software	Diagnostic Manager Setup, FDS Control Center
2	PRM setup for integration of third-party condition monitoring for connection to FDS	PRM Integration Wizard
3	Generation of FDT project including ADM. Generation of Pepperl+Fuchs FDS-Project including project documentation and PRM integration data needed to perform the work steps (WS) 4, 5, 6, and 7.	▪ PRM Setup Tool ▪ Yokogawa FDT Project Management Tool (DTMWorks) ▪ Pepperl+Fuchs FDS-DTM ▪ Pepperl+Fuchs ADM-DTM
4	Import of PRM-specific mimosa file into PRM to generate Plant View and Network View hierarchies	PRM Hierarchy Import Tool
5	Address assignment of the Advanced Diagnostic Module hardware	n.a.
(6)	(COM Converter driver installation (only required when COM converters are used instead of Diagnostic Gateways))	(COM Converter Driver Software)
7	Add ADM Icons to PRM	PRM
8	Commissioning FOUNDATION Fieldbus. Baseline measurements of the physical layer parameters to define limits for online diagnostics. (max. 12 devices per segment)	Diagnostic Manager

4.4 Installation Topology A: Detailed Work Step (WS) Description

Below you find all work steps (WS) required to proceed if all components are installed on the same PC.

WS 1　　　　**Pepperl+Fuchs Software Installation**

A.　Install all appropriate software. Download the FieldConnex® Diagnostic Manager from www.pepperl-fuchs.com and proceed as follows to install the tool:

PEPPERL+FUCHS

B.   Choose "FieldConnexDiagnosticSetup.exe".

C.   Accept License.

D.   Choose installation profile "Yokogawa PRM Integration – Single Machine".

E.   Press [Next] and proceed with the installation wizard until the installation is complete.

F.   Start License Activation Tool from start menu ([Start] > [Pepperl+Fuchs] > [Activation Tool]).

G.   Enter a valid license key for HD2-DM-A and press [Activate].

H.   Press [Finish] to close License Activation Tool.

Start FDS Control Center from task bar (double-click 🖳 icon) or start menu (click [Start] > [Pepperl+Fuchs] > [FDS Control Center]).
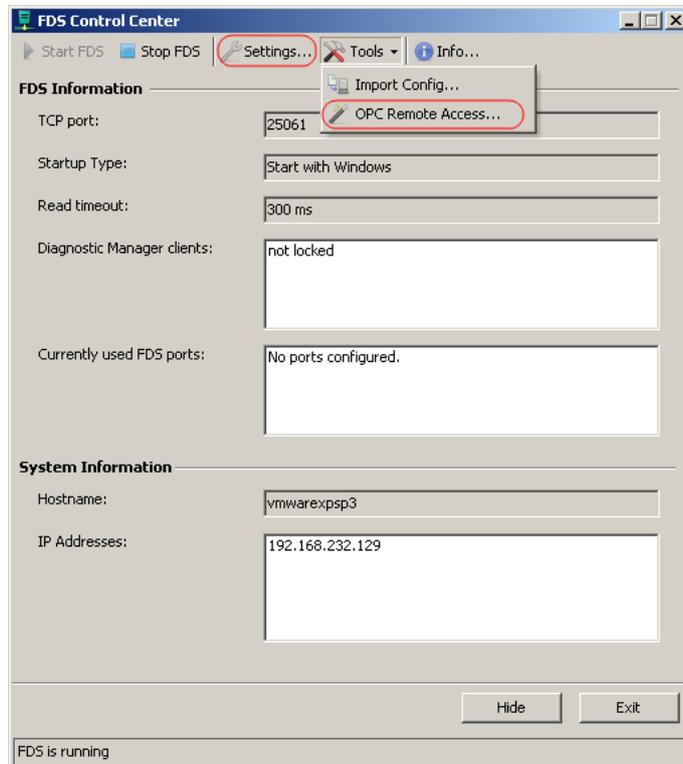
I. Press [Settings…] button in toolbar of FDS Control Center to open settings window.
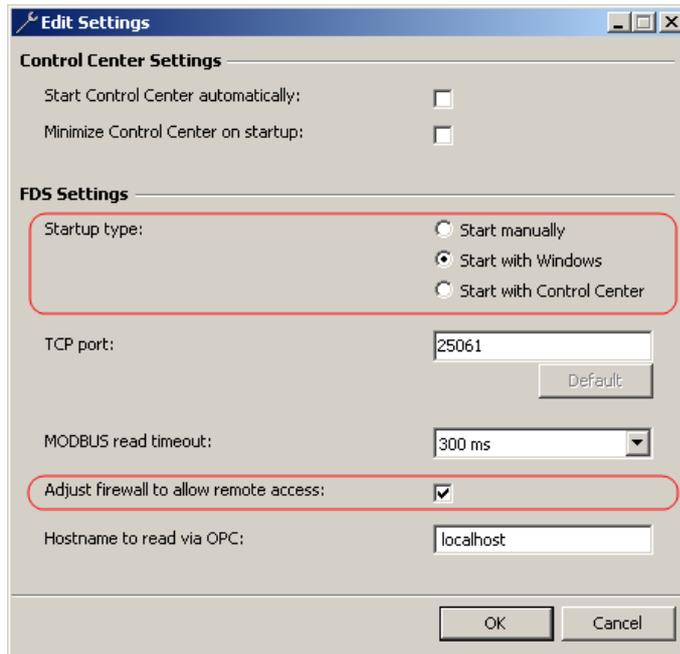
J. Make sure that the option [Start with Windows®] is set as "Startup type".

K. Set "Adjust firewall to allow remote access" option.

L. Press [OK] to close settings dialog.

M. Choose [Tools] from the toolbar and select [OPC Remote Access…] in popup menu.

N. Skip the intro page and on the next page, select "PRM_PROCESS" from the user combo box.
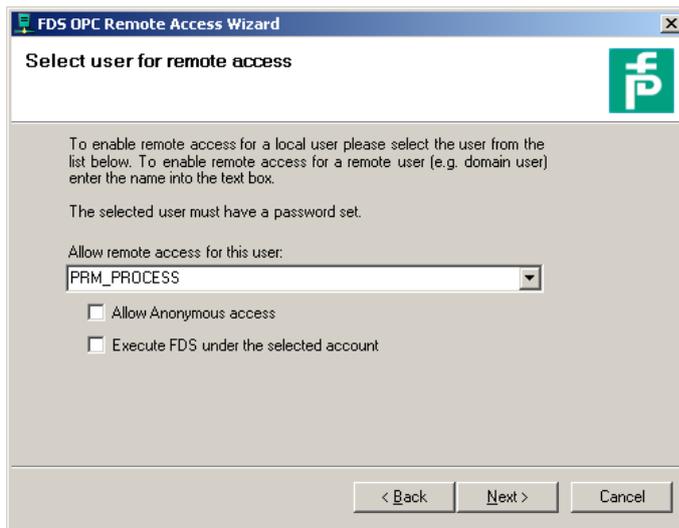
O. Uncheck "Allow Anonymous access" and "Execute FDS under the selected account" check box.

PEPPERL+FUCHS

P.   Finish the Wizard. Do NOT restart Windows® since the wizard has to be executed a second time.

Q.   Choose [Tools] from the toolbar and select [OPC Remote Access…] in popup menu.

R.   Skip the intro page and on the next page, select an account for DCOM communication. This account must be a member of the Administrators group.
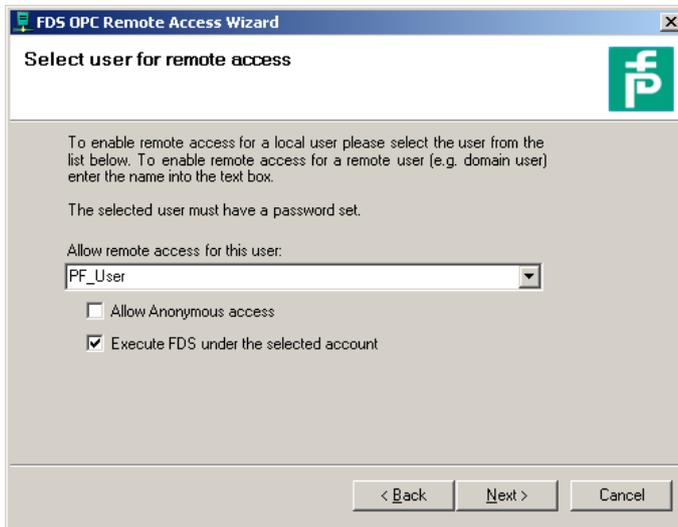
S.   Uncheck "Allow Anonymous access" check box.

T.   Activate "Execute FDS under the selected account" check box.

U.   On the next page, enter the password for the selected account.

V.   Finish the wizard and restart Windows® to apply settings.
For further information refer to the HD2-DM-A manual. You can download the manual at www.pepperl-fuchs.com.

WS 2   PRM Setup for Integration of Third-Party Condition Monitoring for Connection to FDS

This work step (WS) defines the OPC interface information required to pass ADM diagnostic messages to PRM Operator Guidance Messages and PRM Action Guidance Messages.

A.   Start the Integration Wizard (by default "C:\PRM\Tool\IntegrationWizard\PrmIntegrationWizard.exe").

PEPPERL+FUCHS

B. Skip the first page(s) up to page "New Instance".
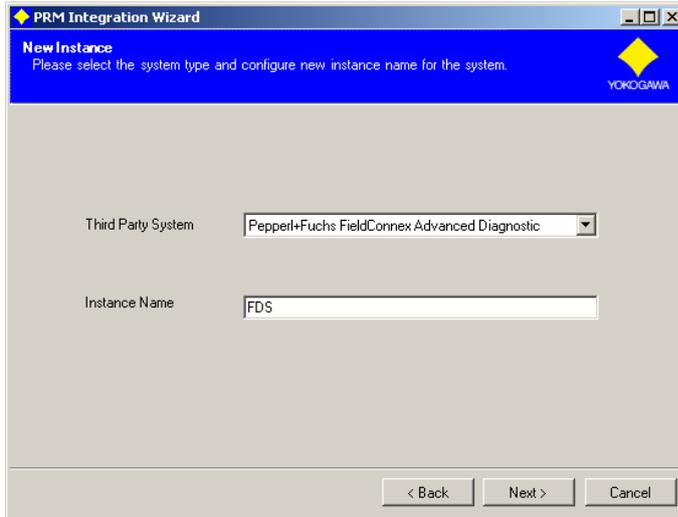
C. In the Third-Party System drop-down list, choose [Pepperl+Fuchs FieldConnex® Advanced Diagnostic].

D. In the Instance Name box, enter the term "FDS", then press [Next].

E. On "DCOM Authentication" page, enter the same account data as entered in "OPC Remote Access Wizard" before (WS 1, N.-R.) and press [Next].

PEPPERL+FUCHS
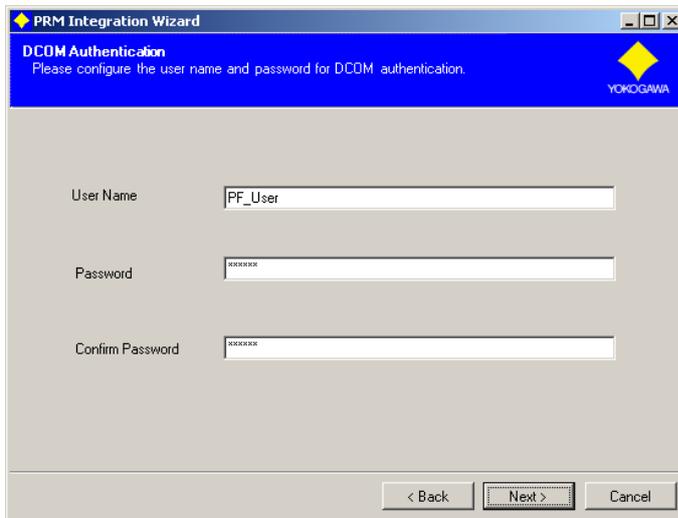
F. On "Message and Data Acquisition" page enter "localhost" into fields "Message Acquisition Server" and "Data Acquisition Server".
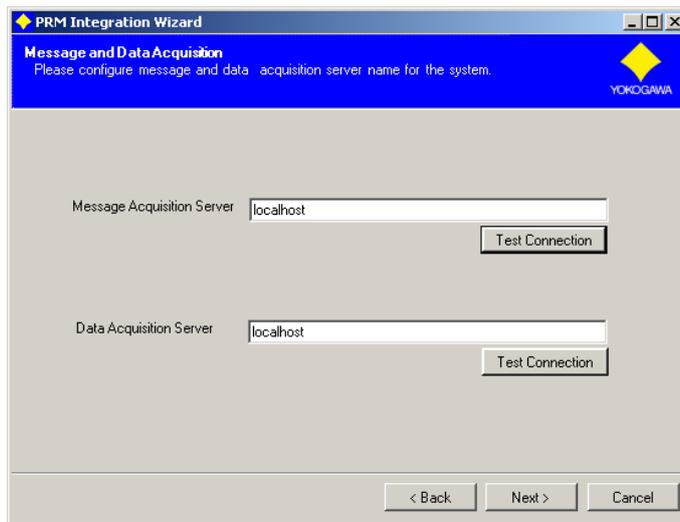
G. Press [Test Connection] to validate the connection.

H. Press [Next].

I. Page "Operator Guide Template" appears. Press [Next].

J. Page "Integration Summary" appears. Press [Finish] and on final page [Close].

K. "PRM Server service" restart dialog appears. Press [Yes] to restart "PRM Server service".

WS 3   **Generation of FDT Project, Pepperl+Fuchs FDS-Project and PRM Integration Data**

A.   Make sure that the file DevicePath.txt is available.

B.   Start PRM Setup Tool by selecting [Start] > [PRM Tools] > [PRM Setup Tool].

C.   Open the node [Field Communication] > [FDT Project Management (P+F ADM)] .

D.   Press the tool button [New] and assign a project name.

↳ The FDT project management tool "DTM Works" opens.

E.   Update the DTM catalog in DTM Works by selecting [View] > [DTM Catalog] from the menu. In the "DTM Catalog" window, press "Update" and answer the subsequent request with "Yes".

F.   Right-click the root node in the "FDT Topology" window and select "Add" from context menu.

G.   Add the "FieldConnex Diagnostic Server (PRM)" DTM.

H.   Right-click on the new DTM ("FieldConnex Diagnostic Server (PRM)") in the "FDT Topology" window and select "Add" from the context menu.

I.   Add the "HD2-DM-A" DTM.

PEPPERL+FUCHS

J. Double-click on node FieldConnex® Diagnostic Server (PRM) in FDT Topology window.

K. The Offline parameterization window appears. Choose tab [FDS Topology Settings].

L. Press button [Read Device Path File]. Browse to your project folder and choose the Device Path File.

M. Confirm "Merge Result" dialog with [OK] to continue.

N. Choose segments to be monitored with ADM.
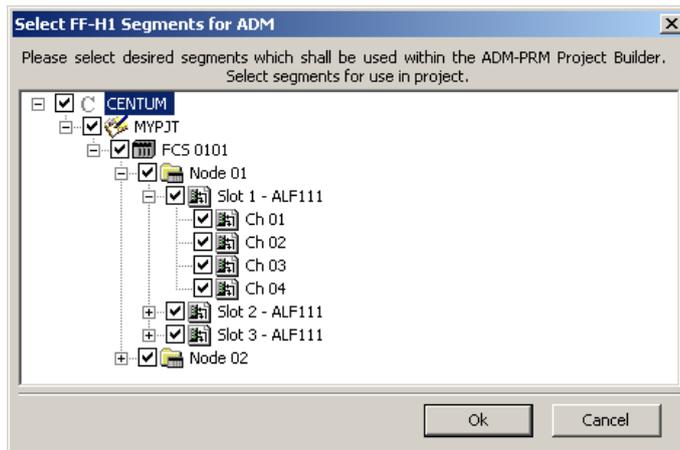
O. Press [Ok] to continue.

P. Back on tab [FDS Topology Settings] go to the tree "Proposed ADM topology", right-click on the first "Port" node and select "Change Address" from the appearing popup menu.
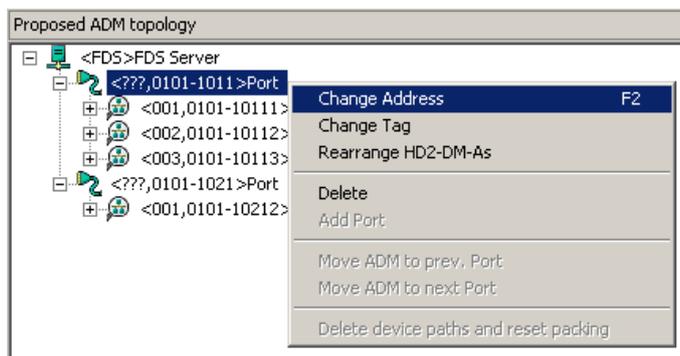
Q. Enter the IP of the Diagnostic Gateway that the assigned ADMs are connected to. (For details also see chapter 7).
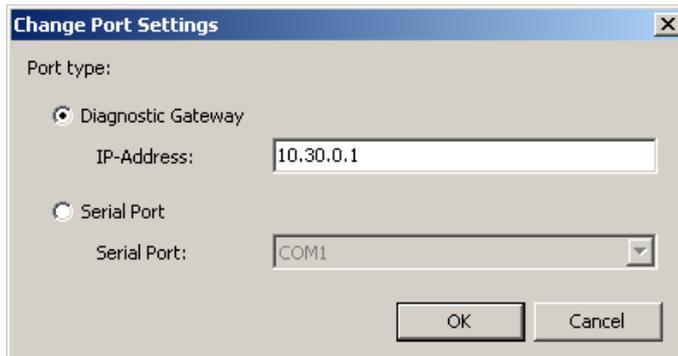
R. Press [OK] and assign Diagnostic Gateways to all other Ports of the project, too.

S. Press [Apply].

T. Right-click on node FieldConnex® Diagnostic Server (PRM) in FDT Topology window and choose "Connect" to set the DTM online.

U. Press [Set topology] button in toolbar.

V. Press [Export for PRM] in toolbar. Adapt "Output Folder" if necessary and press [Export].

↳ Three files are created in the output folder:
ADM_devices_mimosa.xml > Contains all device and path information for the PRM integration
Report.pdf > Device installation/identification document
ADMBitmap.bmp > Icon for PRM integration

W. Open [File] menu and press [Save Project].

X. Close "DTM Works" and "PRM Setup Tool".

WS 4   Importing Project Structure into PRM

The Yokogawa "PRM Hierarchy Import Tool" imports Plant View and Network View hierarchy definitions and devices for FOUNDATION Fieldbus segments. These definitions and devices were created by the Pepperl+Fuchs FDS for the PRM DTM in the previous WS 3.

A. Start "Hierarchy Import Tool" (by default "C:\PRM\Program\HierarchyImport.exe").

B. Press [Open PRM Hierarchy]. Log-in dialog appears.

C. Enter log-in data and confirm with [OK].

D. Press [Open Import file].

PEPPERL+FUCHS

E. In the drop-down list, choose FDS and confirm with [OK].

F. Choose file "ADM_devices_mimosa.xml" from the export folder you created earlier and press [Open].

G. Drag and drop the node "FFH1 Advanced Diagnostics" from the right window into "PLANT" in the left window. The node here is an example. Ensure you create this structure project-specifically first.
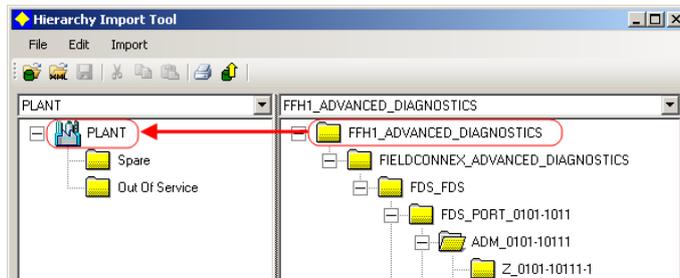
H. In the appearing dialog "Merge Hierarchy Info", check that the segments are marked with type "CONTROL MODULE" within the "Type Selection" column.

I. Confirm with [OK].

J. Press [Upload to database] button (⬆) in toolbar.

K. Close "Hierarchy Import Tool".

WS 5   Address Assignment of the Advanced Diagnostic Module Hardware

Place the eight switches of the DIP switch at the left module side in the correct position to generate the required address. For address scheme, see label on the module (for further information see also HD2-DM-A manual).

This work step (WS) has to be performed for each module. The appropriate address for each module can be found on the report created in WS 3.

Make sure that the ADMs are connected to the Diagnostic Gateway with the IP address specified in WS 3. This information, too, can be found in the report created in WS 3.

PEPPERL+FUCHS

WS 6   COM Converter Driver Installation

If Diagnostic Gateways are used for connection between ADM devices and FDS PC, continue with WS 7.

If using a COM port converter instead of Diagnostic Gateways, proceed as follows: Install the drivers delivered with the COM port converter and adjust the COM ports to match the settings set in WS 3. For details also see chapter 7.

WS 7   Add ADM Icons to PRM

A. Start PRM by selecting [Start] > [PRM] > [Plant Resource Manager] and log in. The currently imported hierarchy appears.

B. Choose [Register] > [Master Data] > [Register Device Icon…].

C. Press button [Add…].

D. Choose image "ADMBitmap.bmp" from the export folder created in WS 3.

E. Confirm with [OK] and close "Device Icon List" dialog.

F. Choose [Register] > [Master Data] > [Assign Icon].

G. Press button [Add…] and make the following settings:

H. Confirm with [OK] and close "Assignment of Device Icons" dialog.

PEPPERL+FUCHS

WS 8   **Automatic FOUNDATION Fieldbus Segment Diagnostic Commissioning**

Match the limits of the monitored physical layer parameters to a specific physical segment within the PRM. To do so, launch an automatic scan and setup procedure for each physical FOUNDATION Fieldbus segment.

The Pepperl+Fuchs Diagnostic Manager provides a special function for commissioning issues, the so called commissioning wizard.

This is a comfortable tool for fast and easy start-up with the Diagnostic Module. The wizard leads you step-by-step through a complete system and segment analysis to ensure that a segment is healthy to go online. Afterwards, the PRM database is automatically updated with the baseline settings generated by the commissioning wizard.

4.5   Installation Topology B: Detailed Work Step (WS) Description

WS 1.1   **Pepperl+Fuchs Software Installation**

Download the Pepperl+Fuchs tools from www.pepperl-fuchs.com. In order to install the software, proceed as follows.

Client installation. Install the client on each client PC and on Field Communication Server.

Tip

PRM Client Software

Ensure you install the PRM Client software on each client PC.

A.   Choose "FieldConnexDiagnosticSetup.exe."

B.   Accept License.

C.   Choose the installation profile "Yokogawa PRM Integration – Client".
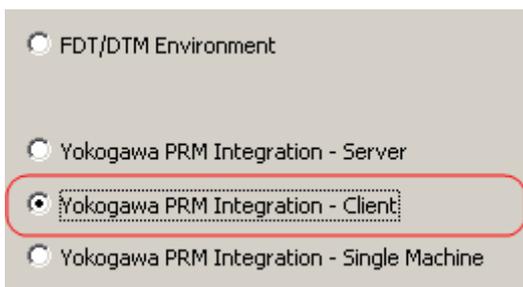
PEPPERL+FUCHS

D. Press [Next] and proceed with the installation wizard until installation is complete.

E. Start License Activation Tool from start menu ([Start] > [Pepperl+Fuchs] > [Activation Tool]).

F. Enter a valid license key for HD2-DM-A and press [Activate].

G. Press [Finish] to close License Activation Tool.

WS 1.2   PRM Server/FDS Server Installation

Tip

PRM Server Software

Install PRM server software first.

A. Choose "FieldConnexDiagnosticSetup.exe."

B. Accept License.

C. Choose the installation profile "Yokogawa PRM Integration – Server".
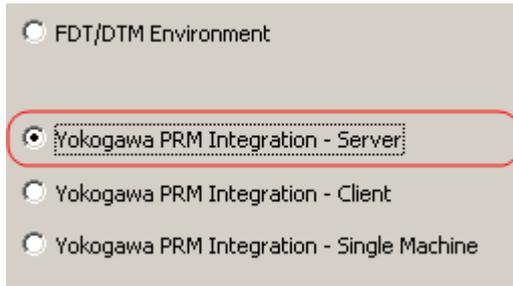
D. Press [Next] and proceed with the installation wizard until installation is complete.

PEPPERL+FUCHS

E. Start FDS Control Center from task bar (double-click ⬛ icon) or start menu (click [Start] > [Pepperl+Fuchs] > [FDS Control Center]).
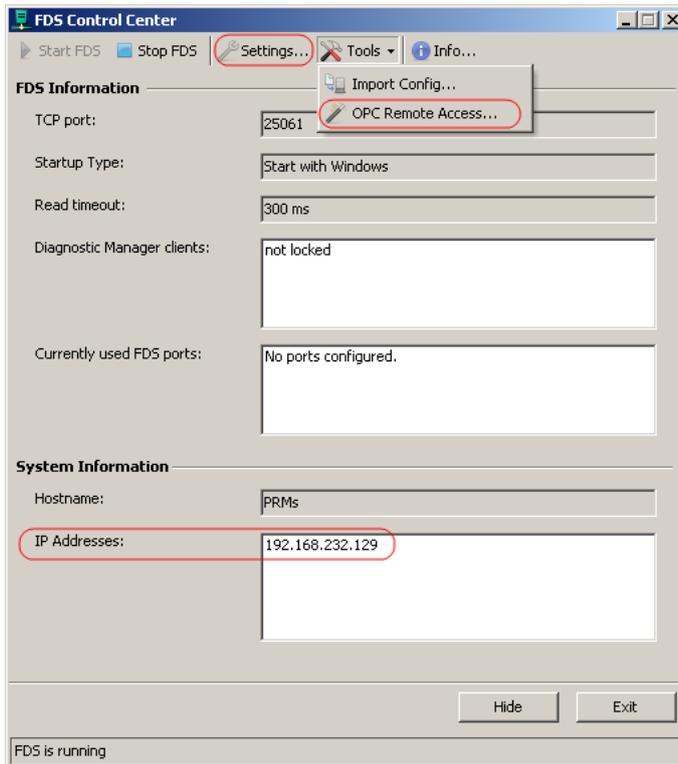
F. Keep the IP address listed under "IP Addresses" in mind. You will need it in WS 3.

G. Press [Settings…] button in toolbar of FDS Control Center to open settings window.

H. Make sure that the option [Start with Windows®] is set as "Startup type".

I. Set "Adjust firewall to allow remote access" option.

[F] PEPPERL+FUCHS

J. Press [OK] to close settings dialog.

K. Choose [Tools] from the toolbar and select [OPC Remote Access…] in popup menu.

L. Skip the intro page and on the next page, select "PRM_PROCESS" from the user combo box.
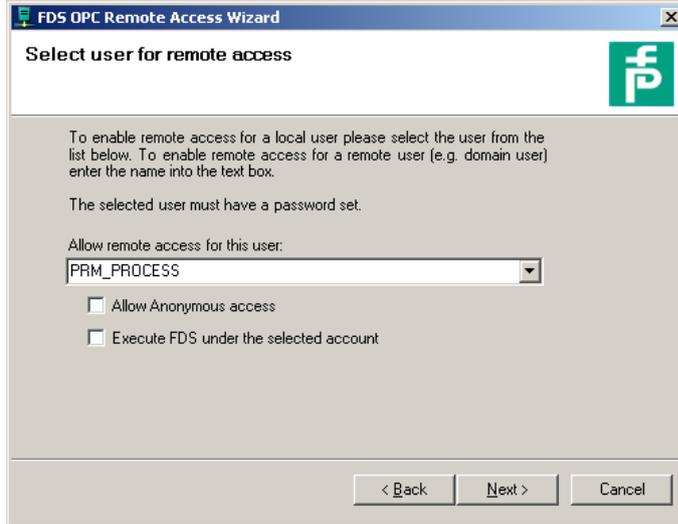
M. Uncheck "Allow Anonymous access" and "Execute FDS under the selected account" check box.

N. Finish the wizard. Do NOT restart Windows® since the wizard has to be executed a second time.

O. Choose [Tools] from the toolbar and select [OPC Remote Access…] in popup menu.

P. Skip the intro page and on the next page, select an account for DCOM communication. This account must be a member of the Administrators group.

Q. Uncheck "Allow Anonymous access" check box.

R. Activate "Execute FDS under the selected account" check box.

PEPPERL+FUCHS

S.   On the next page, enter the password for the selected account.

T.   Finish the wizard and restart Windows® to apply the settings.

For further information please refer to the HD2-DM-A manual. The manual can be downloaded at www.pepperl-fuchs.com.

WS 2   **PRM Setup for Integration of Third-Party Condition Monitoring for Connection to FDS**

This work step (WS) defines the OPC interface information which is needed to pass ADM diagnostic messages to PRM Operator Guidance Messages and PRM Action Guidance Messages. The following actions have to be executed on the PRM/FDS server.

A.   Start the Integration Wizard (by default "C:\PRM\Tool\IntegrationWizard\PrmIntegrationWizard.exe").

B.   Skip the first page(s) up to page "New Instance".
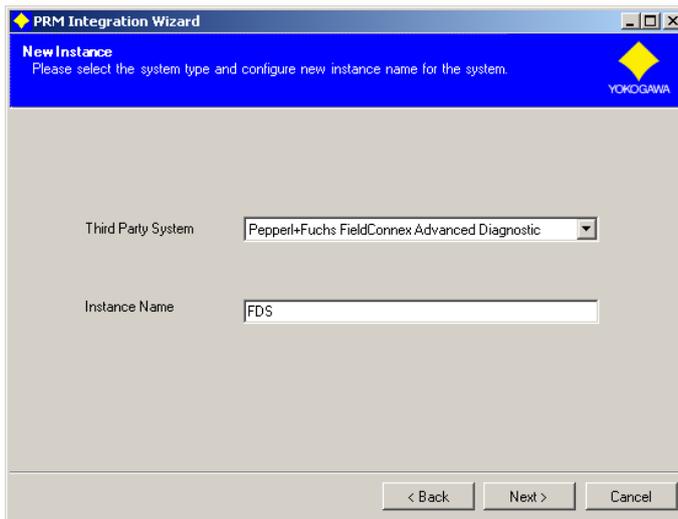
C.   In the Third-Party System drop-down list, choose [Pepperl+Fuchs FieldConnex® Advanced Diagnostic].

D.   In the Instance Name box, enter the term "FDS", then press [Next].

![PEPPERL+FUCHS]

E. On "DCOM Authentication" page, enter the same account data as entered in "OPC Remote Access Wizard" before (WS 1.2, L.-P.) and press [Next].
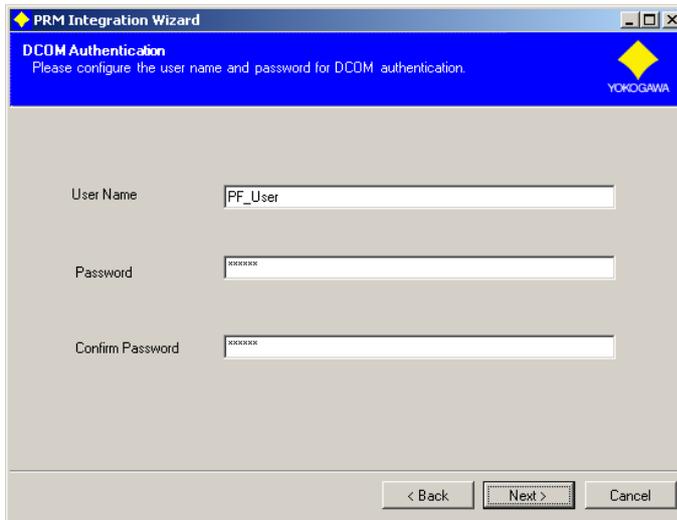
F. On "Message and Data Acquisition" page enter "localhost" into the fields "Message Acquisition Server" and "Data Acquisition Server".
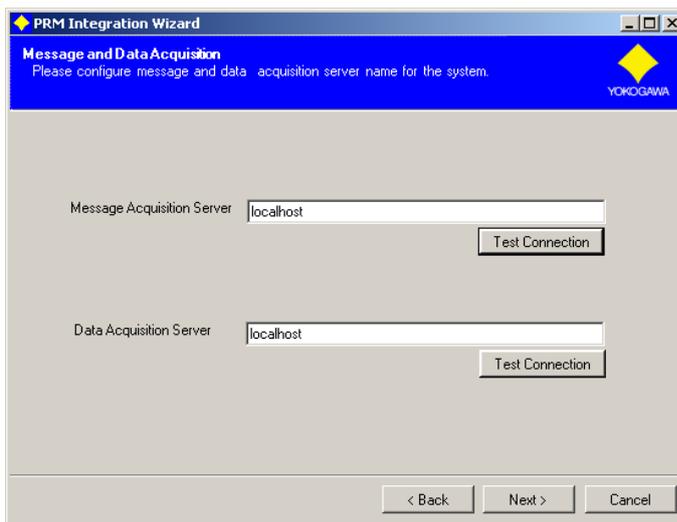
G. Press [Test Connection] to validate the connection.

H. Press [Next].

I. Page "Operator Guide Template" appears. Press [Next].

J. Page "Integration Summary" appears. Press [Finish] and on final page [Close].

K. "PRM Server service" restart dialog appears. Press [Yes] to restart "PRM Server service".

PEPPERL+FUCHS

WS 3   **Generation of FDT Project, Pepperl+Fuchs FDS-Project and PRM Integration Data**

The following actions have to be executed on the PRM/FDS server.

A.   Make sure that the file DevicePath.txt is available.

B.   Start PRM Setup Tool by selecting [Start] > [PRM Tools] > [PRM Setup Tool].

C.   Open the node [Field Communication] > [FDT Project Management (P+F ADM)].

D.   Press the tool button [New] and assign a project name.

    ↳ The FDT project management tool "DTM Works" opens.

E.   Update the DTM catalog in DTM Works by selecting [View] > [DTM Catalog] from the menu. In the "DTM Catalog" window, press "Update" and answer the subsequent request with "Yes".

F.   Right-click the root node in the "FDT Topology" window and select "Add" from context menu.

G.   Add the "FieldConnex Diagnostic Server (PRM)" DTM.

H.   Right-click on the new DTM ("FieldConnex Diagnostic Server (PRM)") in the "FDT Topology" window and select "Add" from the context menu.

I.   Add the "HD2-DM-A" DTM.

PEPPERL+FUCHS

J.   Double-click on the node FieldConnex® Diagnostic Server (PRM) in FDT Topology window.

K.   The Offline parameterization window appears. Choose tab [FDS Parameters].

L.   Change "FDS Location" to "Remote" and enter the IP address of the PRMs/FDS PC in field "Remote IP Address". The IP address is the same address as seen in FDS Control Center at WS 1.2, F.
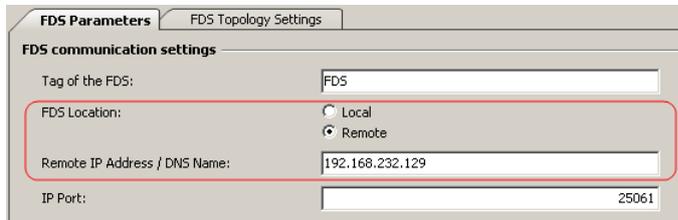
M.   Choose tab [FDS Topology Settings].

N.   Press button [Read Device Path File]. Browse to your project folder and choose the Device Path File.

O.   Confirm "Merge Result" dialog with [OK] to continue.

P.   Choose segments to be monitored with ADM.

Q.   Press [Ok] to continue.

PEPPERL+FUCHS
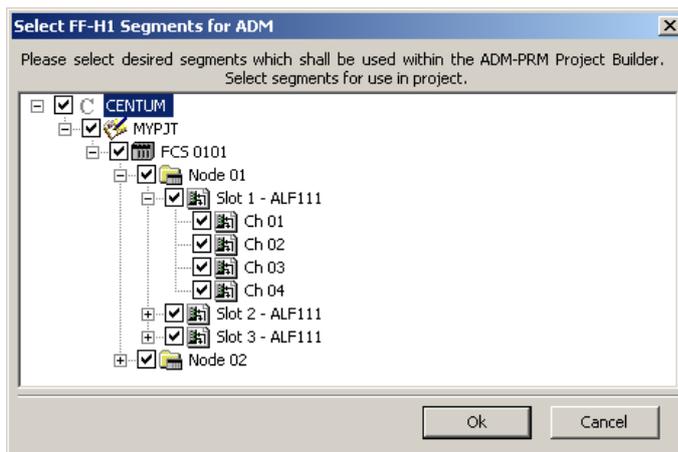
R. Back on tab [FDS Topology Settings] go to the tree "Proposed ADM topology", right-click on the first "Port" node and select "Change Address" from the appearing popup menu.

S. Enter the IP address of the Diagnostic Gateway the assigned ADMs are connected to. (For details also see chapter 7).

T. Press [OK] and assign Diagnostic Gateways to all other ports of the project, too.

U. Press [Apply].

V. Right-click on node FieldConnex® Diagnostic Server (PRM) in FDT Topology window and choose "Connect" to set the DTM online.

W. Press [Set topology] button in toolbar.

X. Press [Export for PRM] in toolbar. Adapt "Output Folder" if necessary and press [Export].

> ↳ Three files are created in the output folder:
> ADM_devices_mimosa.xml > Contains all device and path information for the PRM integration
> Report.pdf > Device installation/identification document
> ADMBitmap.bmp > Icon for PRM integration

Y. Open [File] menu and press [Save Project].

Z. Close "DTM Works" and "PRM Setup Tool".

PEPPERL+FUCHS

WS 4   Importing Project Structure into PRM

The Yokogawa "PRM Hierarchy Import Tool" imports Plant View and Network View hierarchy definitions and devices for FOUNDATION Fieldbus segments. These definitions and devices were created by the Pepperl+Fuchs FDS for the PRM DTM in the previous WS 3. The following actions have to be executed on the PRM/FDS Server.

A.   Start "Hierarchy Import Tool" (by default "C:\PRM\Program\HierarchyImport.exe").

B.   Press [Open PRM Hierarchy]. The log-in dialog appears.

C.   Enter log-in data and confirm with [OK].

D.   Press [Open Import file].

E.   In the drop-down list, choose FDS and confirm with [OK].

F.   Choose file "ADM_devices_mimosa.xml" from the export folder you created earlier and press [Open].

G.   Drag and drop the node "FFH1 Advanced Diagnostics" from the right window into "PLANT" in the left window. The node here is an example. Ensure you create this structure project-specifically first.

H.   In appearing dialog "Merge Hierarchy Info", check that the segments are marked with type "CONTROL MODULE" within the "Type Selection" column.

I.   Confirm with [OK].

J.   Press [Upload to database] button ( ) in toolbar.

K.   Close "Hierarchy Import Tool".

PEPPERL+FUCHS

WS 5   **Address Assignment of the Advanced Diagnostic Module Hardware**

Place the eight switches of the DIP switch at the left module side in the correct position to generate the required address. For address scheme, see label on the module. For further information see also the HD2-DM-A manual.

This work step (WS) has to be performed for each module. The appropriate address for each module can be found on the report created in WS 3.

Make sure that the ADMs are connected to the Diagnostic Gateway with the IP address specified in WS 3. This information, too, can be found in the report created in WS 3.

WS 6   **COM Converter Driver Installation**

If Diagnostic Gateways are used for the connection between ADM devices and the FDS PC, continue with WS 7.

If using a COM port converter instead of Diagnostic Gateways, proceed as follows: install the drivers delivered with the COM port converter and adjust the COM ports to match the settings set in WS 3. For details also see chapter 7.

WS 7   **Add ADM Icons to PRM**

A.   Start PRM by selecting [Start] > [PRM] > [Plant Resource Manager] and log in. The currently imported hierarchy appears.

B.   Choose [Register] > [Master Data] > [Register Device Icon].

C.   Press button [Add…].

D.   Choose image "ADMBitmap.bmp" from the export folder created in WS 3.

E.   Confirm with [OK] and close "Device Icon List" dialog.

F.   Choose [Register] > [Master Data] > [Assign Icon].

PEPPERL+FUCHS

G. Press button [Add…] and make the following settings:

Assign Icon		
Communication Type	Conventional Device	
Vendor	Pepperl+Fuchs	
Model	HD2-DM-A	
Sub Model	*	
Icon		

OK   Cancel

H. Confirm with [OK] and close "Assignment of Device Icons" dialog.

WS 8   Automatic FOUNDATION Fieldbus Segment Diagnostic Commissioning

Match the limits of the monitored physical layer parameters to a specific physical segment within the PRM. To do so, launch an automatic scan and setup procedure for each physical FOUNDATION Fieldbus segment.

The Pepperl+Fuchs Diagnostic Manager provides a special function for commissioning issues, the so called commissioning wizard.

This is a comfortable tool for fast and easy start-up with the Diagnostic Module. The wizard leads you step-by-step through a complete system and segment analysis to ensure that segment is healthy to go online. Afterwards, the PRM database is automatically updated with the baseline settings generated by the commissioning wizard.

4.6   Installation Topology C: Detailed Work Step (WS) Description

WS 1.1   Pepperl+Fuchs Software Installation

Download the Pepperl+Fuchs tools from www.pepperl-fuchs.com. In order to install the tools, proceed as follows.

Make sure that the same local user account with the same password is installed on the PC/Server machine of the PRM Server and of the FDS.

Client installation: Repeat WS 1.1 on each client PC and on Field Communication Server.

PEPPERL+FUCHS

Tip

PRM Client Software

Ensure you install the PRM Client software on each client PC.

A. Choose "FieldConnexDiagnosticSetup.exe."

B. Accept License.

C. Choose the installation profile "Yokogawa PRM Integration – Client".
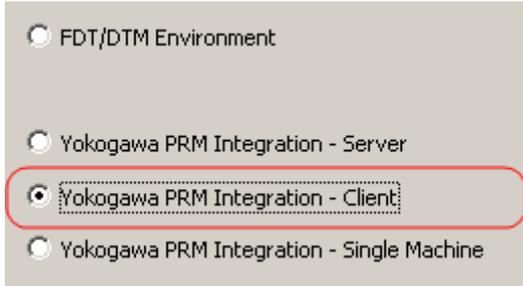
D. Press [Next] and proceed with the installation wizard until installation is complete.

E. Start License Activation Tool from start menu ([Start] > [Pepperl+Fuchs] > [Activation Tool]).

F. Enter a valid license key for HD2-DM-A and press [Activate].

G. Press [Finish] to close License Activation Tool.

WS 1.2   Server Installation PRM

Tip

PRM Server Software

Install PRM server software.

PEPPERL+FUCHS

WS 1.3   Server Installation FDS

A.   Choose "FieldConnexDiagnosticSetup.exe" from folder "FieldConnex® Diagnostic Manager."

B.   Accept License.

C.   Choose the installation profile "Yokogawa PRM Integration – Server".
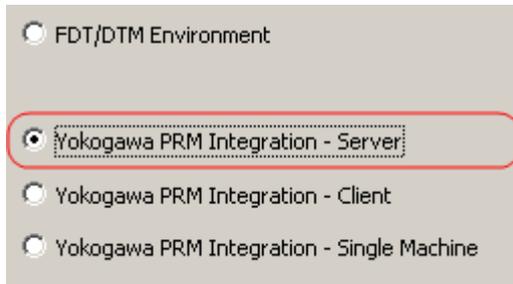
D.   Press [Next] and proceed with the installation wizard until installation is complete.

E.   Start FDS Control Center from task bar (double-click icon) or start menu (click [Start] > [Pepperl+Fuchs] > [FDS Control Center]).
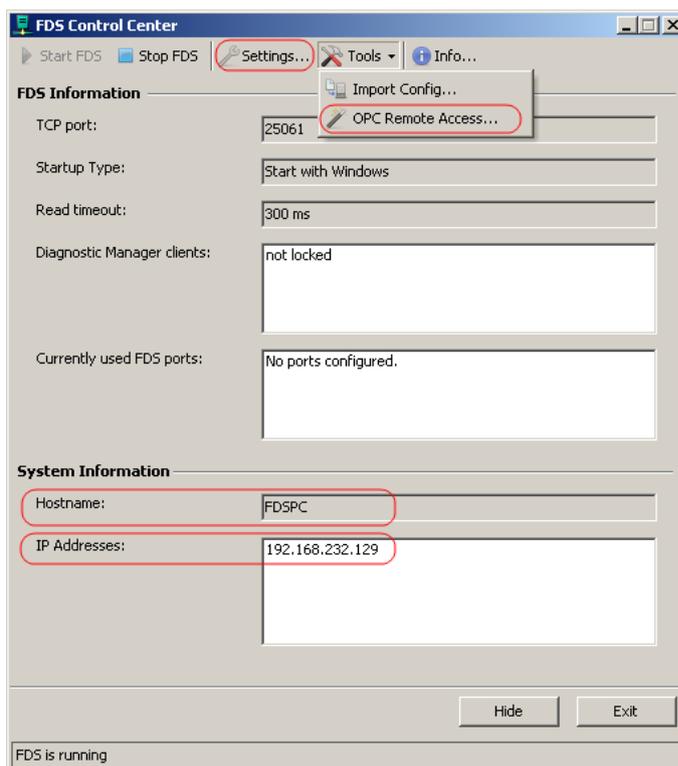
F.   Keep the host name and IP address (of the FDS PC) at hand for WS 2 and WS 3.

PEPPERL+FUCHS

G. Press [Settings…] button in toolbar of FDS Control Center to open settings window.
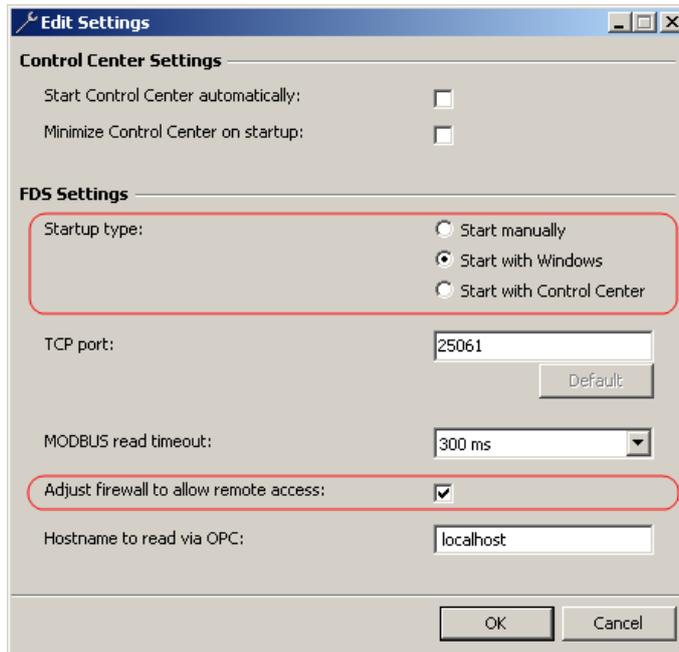
H. Make sure that the option [Start with Windows®] is set as "Startup type".

I. Set "Adjust firewall to allow remote access" option.

J. Press [OK] to close settings dialog.

K. Choose [Tools] from the toolbar and select [OPC Remote Access…] in popup menu.

L. Skip the intro page and on the next page, select "PRM_PROCESS" from the user combo box.

M. Uncheck "Allow Anonymous access" and "Execute FDS under the selected account" check box.

PEPPERL+FUCHS

N. Finish the wizard. Do NOT restart Windows® since the wizard has to be executed a second time.

O. Choose [Tools] from the toolbar and select [OPC Remote Access…] in popup menu.

P. Skip the intro page and on the next page, select an account for DCOM communication. This account must be a member of the Administrators group. Remember: An account with the same user name and password is required on the PRM server PC.

Q. Uncheck "Allow Anonymous access" check box.

R. Activate "Execute FDS under the selected account" check box.

S. On the next page, enter the password for the selected account.

T. Finish the wizard and restart Windows® to apply the settings.

For further information, refer to the HD2-DM-A manual. The manual can be downloaded at www.pepperl-fuchs.com.

WS 2   PRM Setup for Integration of Third-Party Condition Monitoring for Connection to FDS

This work step (WS) defines the OPC interface information required to pass ADM diagnostic messages to PRM Operator Guidance Messages and PRM Action Guidance Messages.

Carry out the following actions on the machine on which the PRM server is installed on.

A. Start the Integration Wizard (by default "C:\PRM\Tool\IntegrationWizard\PrmIntegrationWizard.exe").

PEPPERL+FUCHS

B.   Skip the first page(s) up to page "New Instance".

C.   In the Third-Party System drop-down list, choose [Pepperl+Fuchs FieldConnex® Advanced Diagnostic].

D.   In the Instance Name box, enter the term "FDS", then press [Next].

E.   On "DCOM Authentication" page, enter the same account data as entered in "OPC Remote Access Wizard" before (WS 1.3, L.-P.) and press [Next].

![PEPPERL+FUCHS]

F. On "Message and Data Acquisition" page enter the host name or IP address of FDS PC into fields "Message Acquisition Server" and "Data Acquisition Server". To resolve host name and IP address open the FDS Control Center on FDS PC (see WS 1.3, F.).
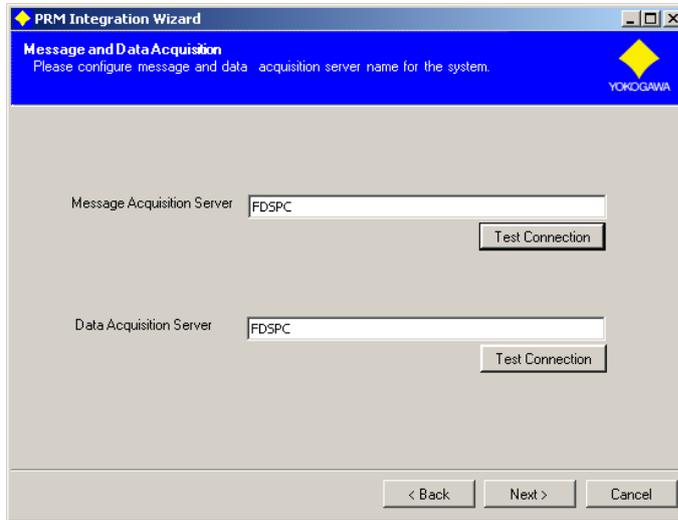
G. Press [Test Connection] to validate the connection.

H. Press [Next].

↳ Page "Operator Guide Template" appears.

I. Press [Next].

↳ Page "Integration Summary" appears.

J. Press [Finish] and on final page [Close].

↳ "PRM Server service" restart dialog appears.

K. Press [Yes] to restart "PRM Server service".

WS 3 Generation of FDT Project, Pepperl+Fuchs FDS-Project and PRM Integration Data

The following actions have to be executed on the Field Communication Server.

A. Make sure that the file DevicePath.txt is available.

B. Start PRM Setup Tool by selecting [Start] > [PRM Tools] > [PRM Setup Tool].

PEPPERL+FUCHS

C. Open the node [Field Communication] > [FDT Project Management (P+F ADM)].

D. Press the tool button [New] and assign a project name.

↳ The FDT project management tool "DTM Works" opens.

E. Update the DTM catalog in DTM Works by selecting [View] > [DTM Catalog] from the menu. In the "DTM Catalog" window, press "Update" and answer the subsequent request with "Yes".

F. Right-click the root node in the "FDT Topology" window and select "Add" from context menu.

G. Add the "FieldConnex Diagnostic Server (PRM)" DTM.

H. Right-click on the new DTM ("FieldConnex Diagnostic Server (PRM)") in the "FDT Topology" window and select "Add" from the context menu.

I. Add the "HD2-DM-A" DTM.

J. Double-click on the node FieldConnex® Diagnostic Server (PRM) in the FDT Topology window.

K. The Offline parameterization window appears. Choose tab [FDS Parameters].

L. Change "FDS Location" to "Remote" and enter the IP address of the PRMs/FDS PC in field "Remote IP Address". The IP address is the same address as seen in

![PEPPERL+FUCHS]

the FDS Control Center in WS 1.3, F.
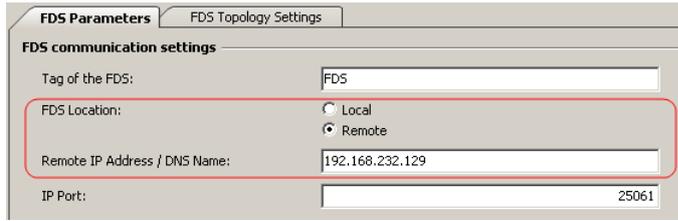
M. Choose tab [FDS Topology Settings].

N. Press the button [Read Device Path File]. Browse to your project folder and choose the Device Path File.

O. Confirm "Merge Result" dialog with [OK] to continue.

P. Choose segments to be monitored with ADM.
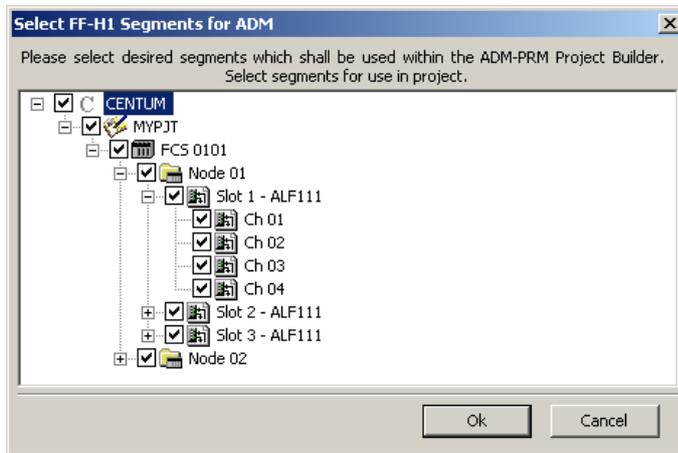
Q. Press [Ok] to continue.

R. Back on tab [FDS Topology Settings] go to the tree "Proposed ADM topology", right-click on the first "Port" node and select "Change Address" from the appearing popup menu.

PEPPERL+FUCHS

S. Enter the IP of the Diagnostic Gateway the assigned ADMs are connected to. (For details also see chapter 7).

T. Press [OK] and assign Diagnostic Gateways to all other Ports of the project, too.

U. Press [Apply].

V. Right-click on the node FieldConnex® Diagnostic Server (PRM) in FDT Topology window and choose "Connect" to set the DTM online.

W. Press [Set topology] button in toolbar.

X. Press [Export for PRM] in toolbar. Adapt "Output Folder" if necessary and press [Export].

    ↳ Three files are created in the output folder
        ADM_devices_mimosa.xml > Contains all device and path information for the PRM integration
        Report.pdf > Device installation/identification document
        ADMBitmap.bmp > Icon for PRM integration

Y. Open [File] menu and press [Save Project...].

Z. Close "DTM Works" and "PRM Setup Tool".

WS 4   Importing Project Structure into PRM

The Yokogawa "PRM Hierarchy Import Tool" imports Plant View and Network View hierarchy definitions and devices for FOUNDATION Fieldbus segments. These definitions and devices were created by the Pepperl+Fuchs FDS for PRM DTM in WS 3. The following actions have to be executed on the PRM server.

A. Start "Hierarchy Import Tool" (by default "C:\PRM\Program\HierarchyImport.exe").

B. Press [Open PRM Hierarchy]. Log-in dialog appears.

C. Enter log-in data and confirm with [OK].

D. Press [Open Import file].

E. In the drop-down list, choose FDS and confirm with [OK].

PEPPERL+FUCHS

F.   Choose file "ADM_devices_mimosa.xml" from the output folder you created earlier and press [Open].

G.   Drag and drop the node "FFH1 Advanced Diagnostics" from the right window into "PLANT" in the left window. The node here is an example. Ensure to create this structure project-specifically first.

H.   In appearing dialog "Merge Hierarchy Info", check that the segments are marked with type "CONTROL MODULE" within the "Type Selection" column.

I.   Confirm with [OK].

J.   Press [Upload to database] button (⬆) in toolbar.

K.   Close "Hierarchy Import Tool".

WS 5   Address Assignment of the Advanced Diagnostic Module Hardware

Place the eight switches of the DIP switch at the left module side in the correct position to generate the required address. For address scheme, see label on the module (for further information see also HD2-DM-A manual).

This work step (WS) has to be performed for each module. The appropriate address for each module can be found on the report created in WS 3.

Make sure that the ADMs are connected to the Diagnostic Gateway with the IP address specified in WS 3. This information, too, can be found in the report created in WS 3.

PEPPERL+FUCHS

WS 6   COM Converter Driver Installation

If Diagnostic Gateways are used for connection between ADM devices and the FDS PC, continue with WS 7.

If using a COM port converter instead of Diagnostic Gateways, install the drivers delivered with the COM port converter next and adjust the COM ports to match the settings set in WS 3. (For details also see chapter 7).

WS 7   Add ADM Icons to PRM

A. Start PRM by selecting [Start] > [PRM] > [Plant Resource Manager] and log in. The currently imported hierarchy appears.

B. Choose [Register] > [Master Data] > [Register Device Icon].

C. Press button [Add…].

D. Choose image "ADMBitmap.bmp" from the export folder created in WS 3.

E. Confirm with [OK] and close "Device Icon List" dialog.

F. Choose [Register] > [Master Data] > [Assign Icon].

G. Press button [Add…] and make the following settings:

H. Confirm with [OK] and close "Assignment of Device Icons" dialog.

WS 8   Automatic FOUNDATION Fieldbus Segment Diagnostic Commissioning

Match the limits of the monitored physical layer parameters to a specific physical segment within the PRM. To do so, launch an automatic scan and setup procedure for each physical FOUNDATION Fieldbus segment.

The Pepperl+Fuchs Diagnostic Manager provides a special function for commissioning issues, the so called commissioning wizard.

This is a comfortable tool for fast and easy start-up with the Diagnostic Module. The wizard leads you step-by-step through a complete system and segment analysis to ensure that segment is healthy to go online. Afterwards, the PRM database is automatically updated with the baseline settings generated by the commissioning wizard.

PEPPERL+FUCHS

5. Operation

5.1 Status, Maintenance and Alarm Messages

The integration of the Pepperl+Fuchs Advanced Diagnostic Module into Yokogawa PRM system makes the behavior of the H1 physical layer transparent for the user. This way, operation and maintenance personnel can proactively schedule repair work before communications or plant failure occur.

The Diagnostic Manager provides two different physical layer alarm categories:

- Maintenance alarms

- Out of specification alarms

You can adjust the maintenance alarms. All maintenance alarm limits can be adapted to the specific requirements of each segment. For each physical layer value, minimum and maximum limits can be set and activated. If the value violates the limit, a maintenance alarm is released in the Diagnostic Manager and via the OPC interface in the operator application. With this proactive diagnosis, error sources can be found before communication fails.

Out of specification alarm limit values are derived from the IEC 61158-2 standard. The alarm limit values can be switched on and off, but cannot be individually adjusted. If these limits are violated, there is an increased risk of communication failure.

5.1.1 PRM Message Information

To provide the best possible assistance for the user, the different statuses are shown with different colors. The table below gives an overview of these colors and the meaning of the message.

The device status icon indicates the current health of a device. It appears as a status color icon next to registered devices in the network view. Each color represents a different status.

Icon	Color	Description
		The exclamation mark shows that a maintenance alarm has occurred. This alarm has not been acknowledged.
	Green	Good, no message or alarm.
	Blue	Maintenance required: Maintenance required alarm exists for this segment
	Red	Hardware rrror: HW error was detected for the HD2-DM-A monitoring this segment.
	Gray	Communication error: A communication error was detected for the HD2-DM-A monitoring this segment.
	Yellow	Out of specification: Out of specification alarm exists for this segment.
	White	Pending: Occurs during start-up period when no diagnostic information is available.

5.1.2   Diagnostic Manager Message Information

Icon	Color	Description
	Green	Monitored value / segment healthy
	Blue	Maintenance alarm active
	Yellow	Monitored value / segment is out of specification

PEPPERL+FUCHS

6. How to Use the ADM

This section provides an overview of the workflow and the work steps required upon receiving a message.

The general workflow is:

- The message for the operator generated by the Advanced Diagnostic Module can be detected by CENTUM CAMS for HIS. Next, the operator can inform the maintenance personnel to look after the specific message / segment.

- The maintenance personnel opens PRM to check and validate the message and the status:

  - Alarm or message is still active. The maintenance personnel selects the Diagnostic Manager on PRM Device navigator, then right-click > open DTM Works. The current segment where the message has occurred is directly shown and active for detailed analysis.

  - Alarm is not active anymore > acknowledge message.

Figure 4 shows a stylized overview about involved personnel, software tools and activities.
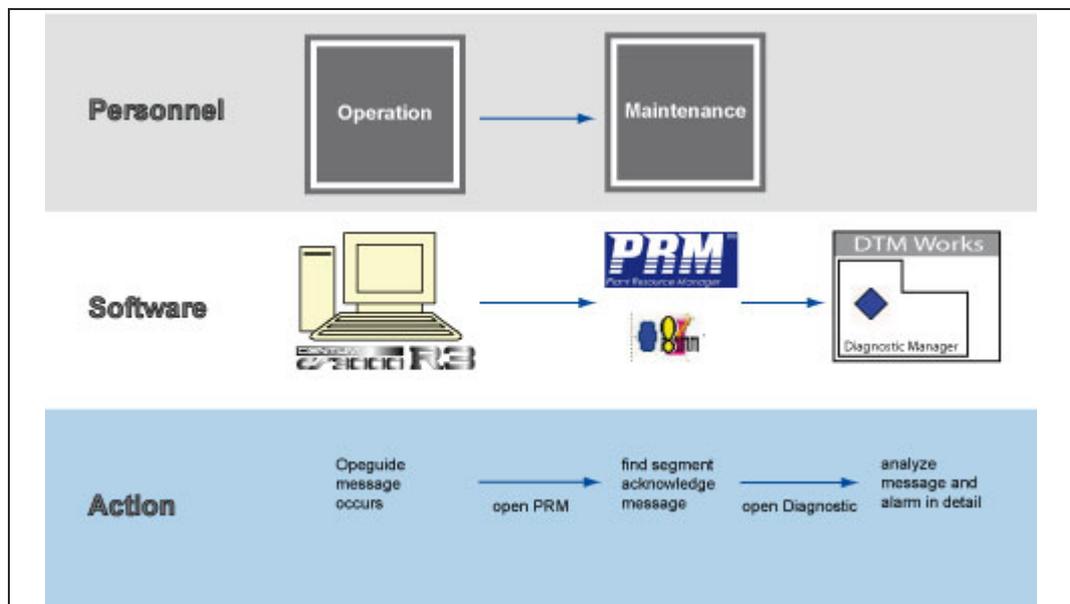
Figure 4: General workflow overview
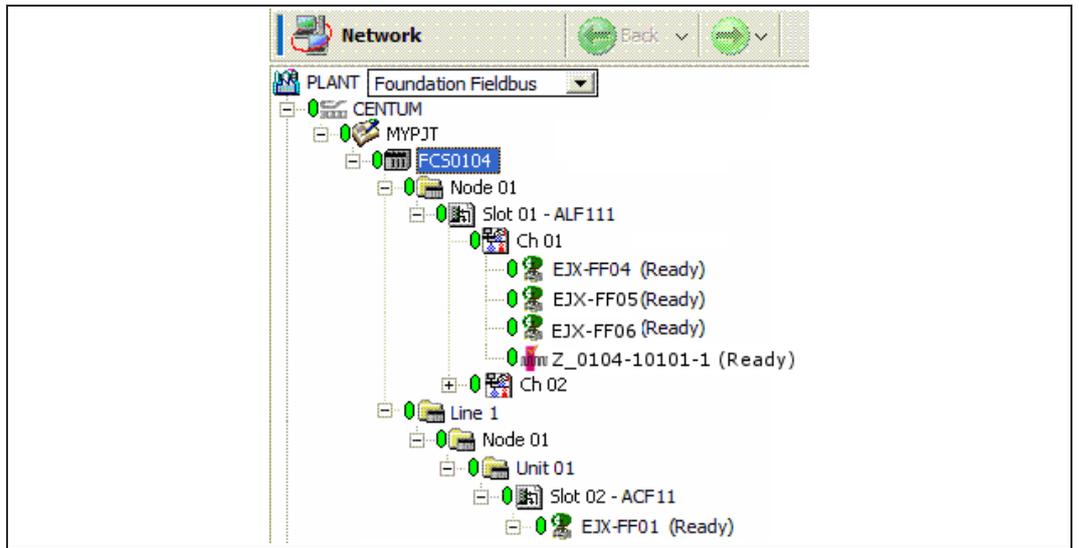
Figure 5: Status Representation within PRM

Figure 6: Message view within PRM
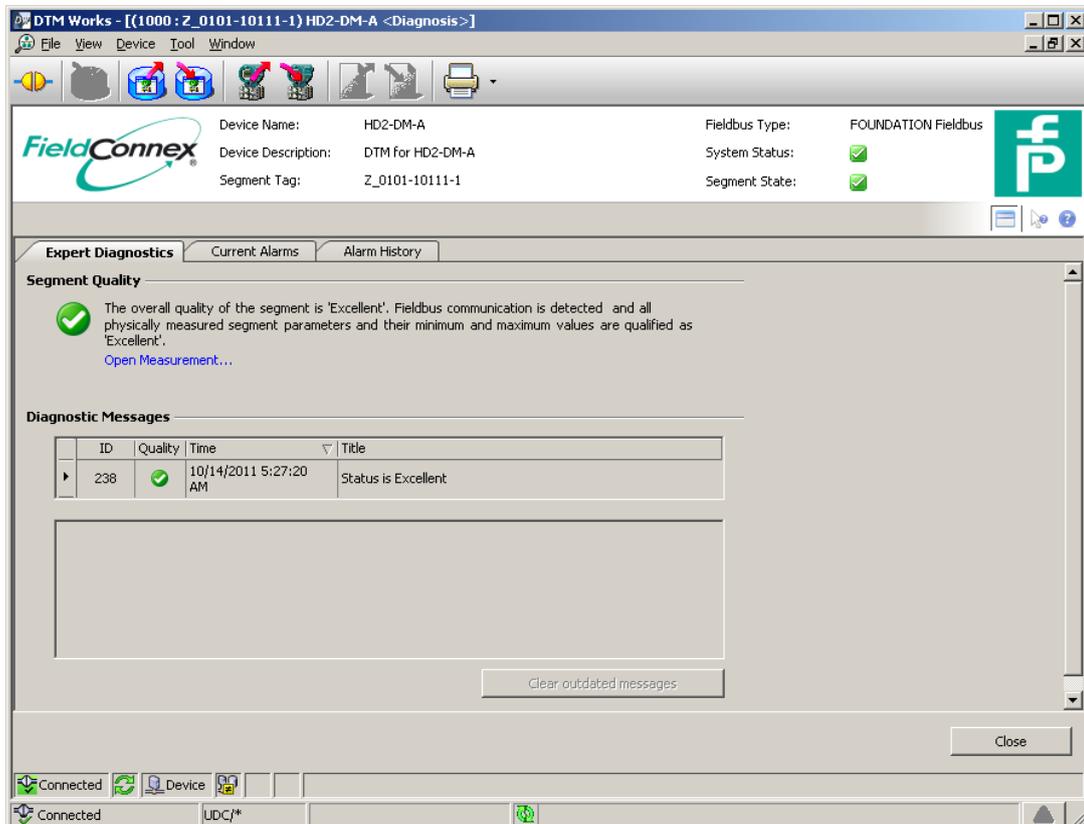
Figure 7: Diagnostic Manager detailed view

PEPPERL+FUCHS

7. Port Mapping and Packing

7.1 Port Mapping

During the engineering procedure a mapping takes place to establish a relationship between the Advanced Diagnostic Module and the appropriate PRM instance.

By default, the following mapping is applied:

- Each Slot/AKF111 has assigned one HD2-DM-A device which monitors up to 4 channels of the slot.

- All Slots/ALF111 of one node are mapped to one port inside the FDS DTM (see chapter 7).
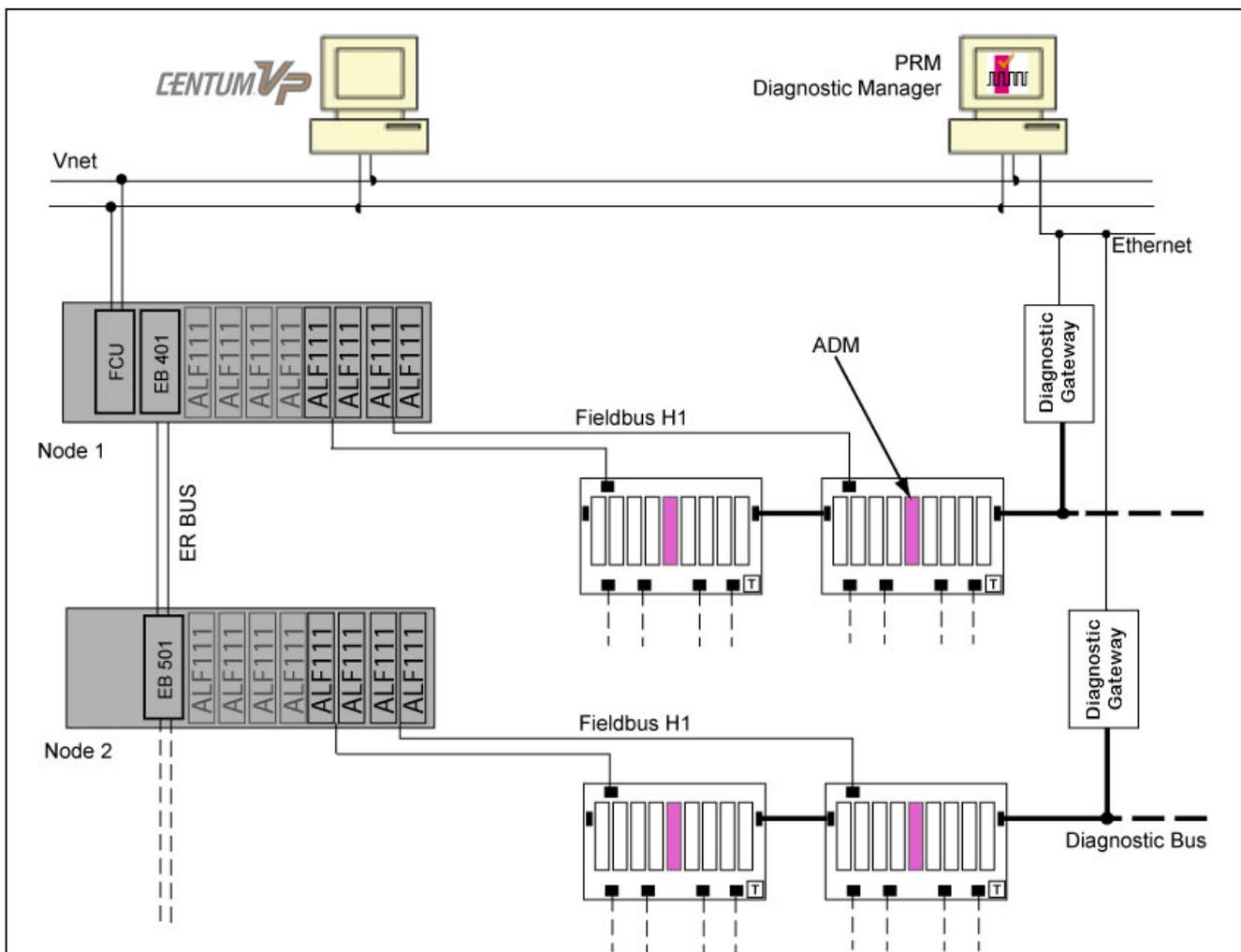
Figure 8

Depending on the connection path used between FDS and the HD2-DM-A devices, the addressing differs.
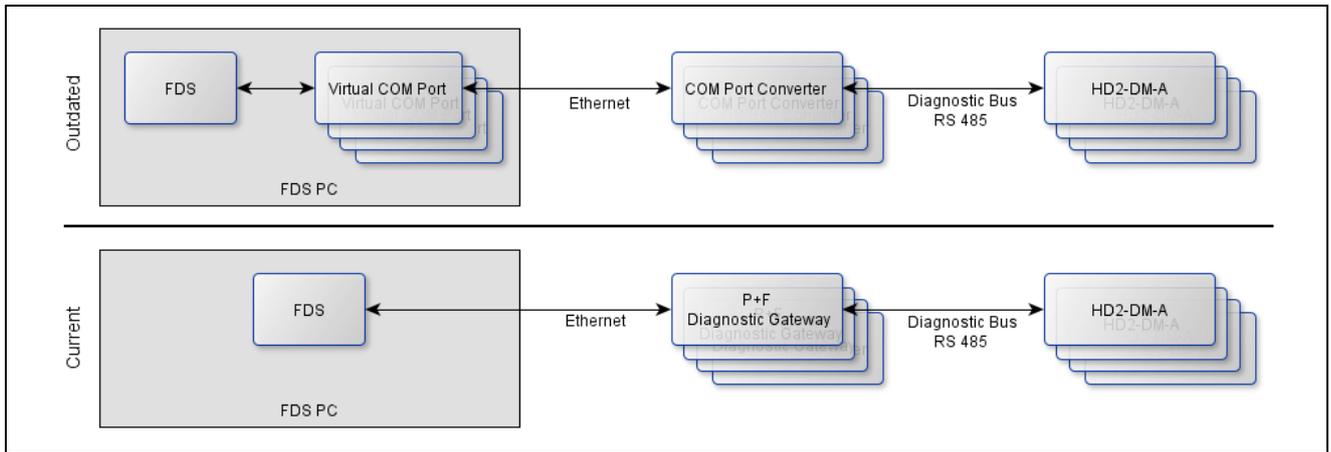
7.1.1 Use the Diagnostic Gateway

Using Pepperl+Fuchs Diagnostic Gateways is the recommended way to connect the HD2-DM-A devices to the PC the FDS is running on.

Each Diagnostic Gateway is capable to connect up to 64 HD2-DM-A devices.

Each Diagnostic Gateway is represented by a port inside FDS DTM.

The Diagnostic Gateway is addressed by IP address only. To obtain the IP addresses of the installed devices, use the FDS DTM (see below) or the Diagnostic Gateway Configuration Tool (DGCT) from Diagnostic Manager Installation CD.

Set the IP Address of a Port

To set the IP address of a port, perform the following procedure:

A. Start the „PRM Setup Tool" on the Field Communication Server by selecting [Start] > [PRM Tools] > [PRM Setup Tool].

B. From the node „Field Communication", open the project created during initial setup.

C. Double-click on node FieldConnex® Diagnostic Server (PRM) in FDT Topology window.

D. The Offline parameterization window appears. Choose tab [FDS Topology Settings].

PEPPERL+FUCHS

E. Right-click on "Port" node and select "Change Address" from the appearing popup menu.
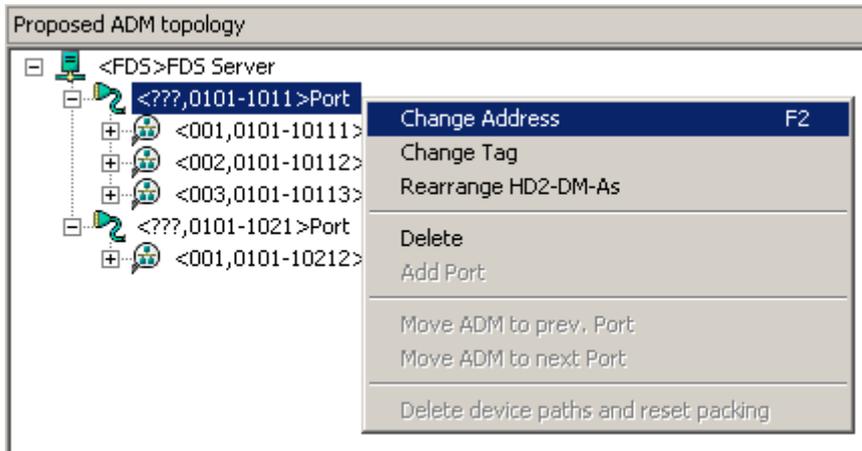
F. In the appearing window, select "Diagnostic Gateway" option and enter the IP address of the Diagnostic Gateway.
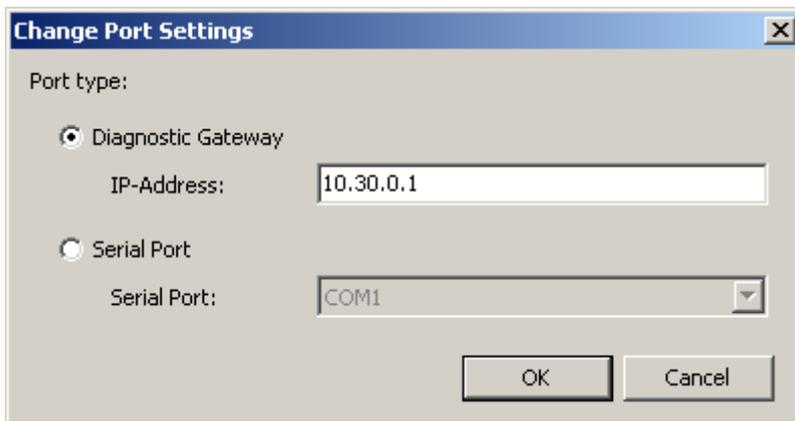
G. If an existing project is changed, it may be necessary to perform additional steps to make this setting work (see chapter 8.2).

If the IP addresses of the diagnostic gateways are not known yet, perform the following procedure:

A. Start the „PRM Setup Tool" on the Field Communication Server by selecting [Start] > [PRM Tools] > [PRM Setup Tool].

B. From the node „Field Communication", open the project created during initial setup.

C. Right-click on node FieldConnex® Diagnostic Server (PRM) in FDT Topology window and choose "Connect" to set the DTM online.

D. Double-click on node FieldConnex® Diagnostic Server (PRM) in FDT Topology window.

F PEPPERL+FUCHS

E. The Offline-parameterization window appears. Choose tab [FDS Topology Settings].

F. Take a look at the lower right section "Scanned Diagnostic Gateways".

G. If the Diagnostic Gateways are located in the same subnet as the PRM PC currently running, proceed as follows: press [Update] to get a list of all available Diagnostic Gateways.
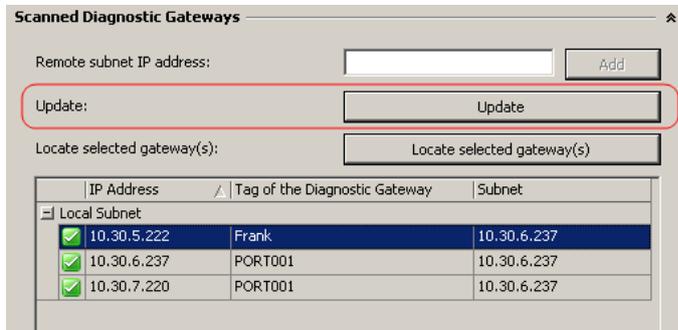
If the Diagnostic Gateways are located in another subnet (e. g., behind a router), it is required that the IP address of one diagnostic gateway is known. Enter this IP address in the field "Remote subnet IP address" and press [Add]. Then press [Update] to get a list of all Diagnostic Gateways in this subnet.
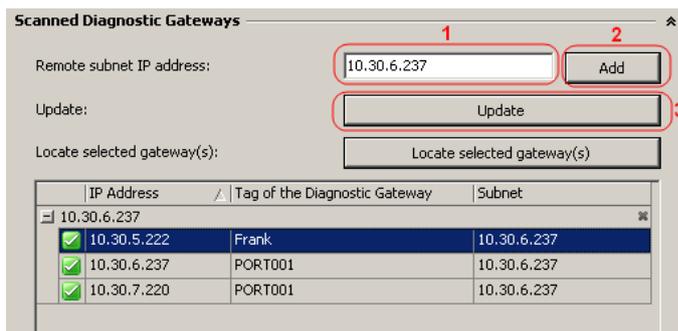
H. To assign a Diagnostic Gateway to a Port, click on the Diagnostic Gateway, drag it from the list and drop it on the required port.
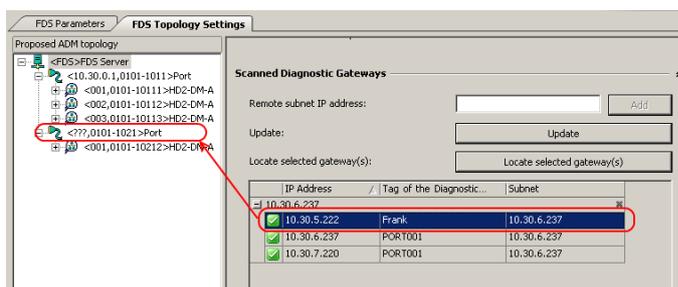
I. If an existing project is changed, it may be necessary to perform additional steps to make this setting work (see chapter 8.2).

PEPPERL+FUCHS

7.1.2   Use COM Port Converters

Using COM port converters to establish the physical connection between FDS PC and the HD2-DM-A devices is not supported anymore and only described for compatibility reasons.

7.1.2.1   Install COM Port Converters

COM port converters always consist of two parts: the physical Ethernet to RS-485 converter device and the driver software providing virtual COM ports to access the physical device. Each virtual COM port on the PC represents one physical COM port converter device.

Perform the following actions to set up COM port converters:

A.   Use manufacturer's installation CD of the COM port converter to install the appropriate driver on the PC the FDS/FDS Control Center is installed on.

B.   When the driver has been installed correctly, open the administration menu of the COM port converter driver.

C.   Adjust the project-specific COM port addresses. You find this information on the report created with FDS DTM using FieldMate. Usually, the COM port number start from COM20.

No △	Model	IP Address	Port	COM Port
1	NPort 5110	172.16.8.253	1	COM4
2	NPort IA-5150	172.16.11.180	1	COM3

COM Mapping - 2 COM

D.   Check if the setting RS-485 2-Wire is active.

7.1.2.2   Set Up a Project Using COM Port Converters

Inside FDS DTM, each COM converter is assigned to one FDS port. That means a virtual COM port has to be assigned to each FDS Port. The virtual COM ports normally start at COM20 and are enumerated in ascending order.

To set up or change a COM port, perform the following actions:

A.   Start the „PRM Setup Tool" on the Field Communication Server by selecting [Start] > [PRM Tools] > [PRM Setup Tool].

B.   From the node „Field Communication", open the project created during initial setup.

C.   Double-click on node FieldConnex® Diagnostic Server (PRM) in FDT Topology window.

D. The Offline parameterization window appears. Choose tab [FDS Topology Settings].

E. Right-click on "Port" node and select "Change Address" from the appearing popup menu
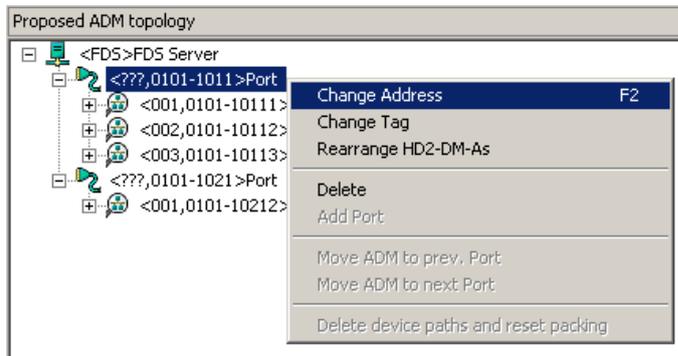
F. In the appearing window, select "Serial Port" option and select the required COM port in the combo box.
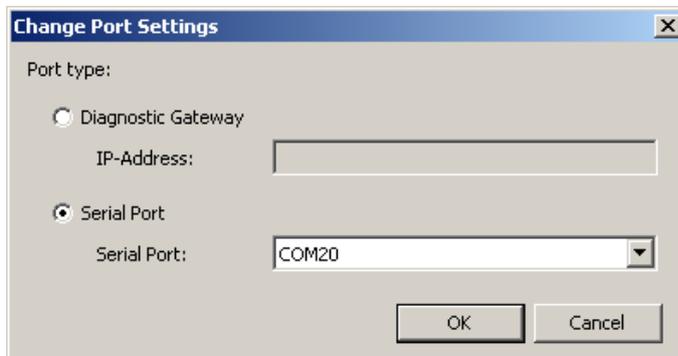
G. If an existing project is changed, it may be necessary to perform additional steps to make this setting work (see chapter 8.2).

7.2 Port Packing

One Diagnostic Gateway (or COM port converter) connects all Advanced Diagnostic Modules on the same Diagnostic Bus to one FDS port. By default, there is a 1:1 relation between nodes and FDS ports. That means each node is mapped to one FDS port. Depending on the real plant topology, this behavior may be not ideal for every case.

Therefore it is possible to change the mapping conventions of the FDS ports during the engineering process, to customize the topology to the given conditions. By using the packing function, it is possible to collect up to 8 nodes at one FDS port.

It is possible to choose the mapping method during the engineering procedure within the "Merge Result" dialog of FDS DTM. By default, one node is mapped to one FDS port.

![PEPPERL+FUCHS]
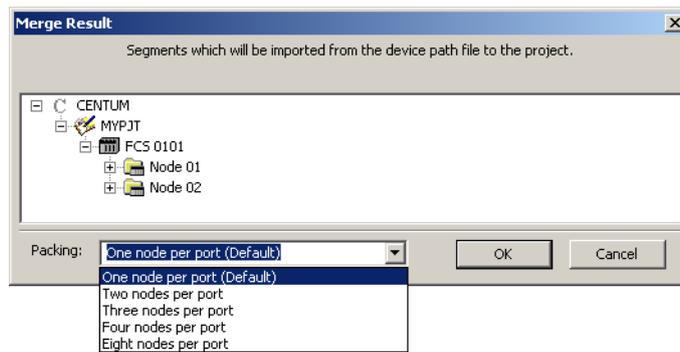
7.2.1 Packing = 1. Each node refers to one FDS port (default behavior)

The figure below shows that each node is assigned to one FDS port.
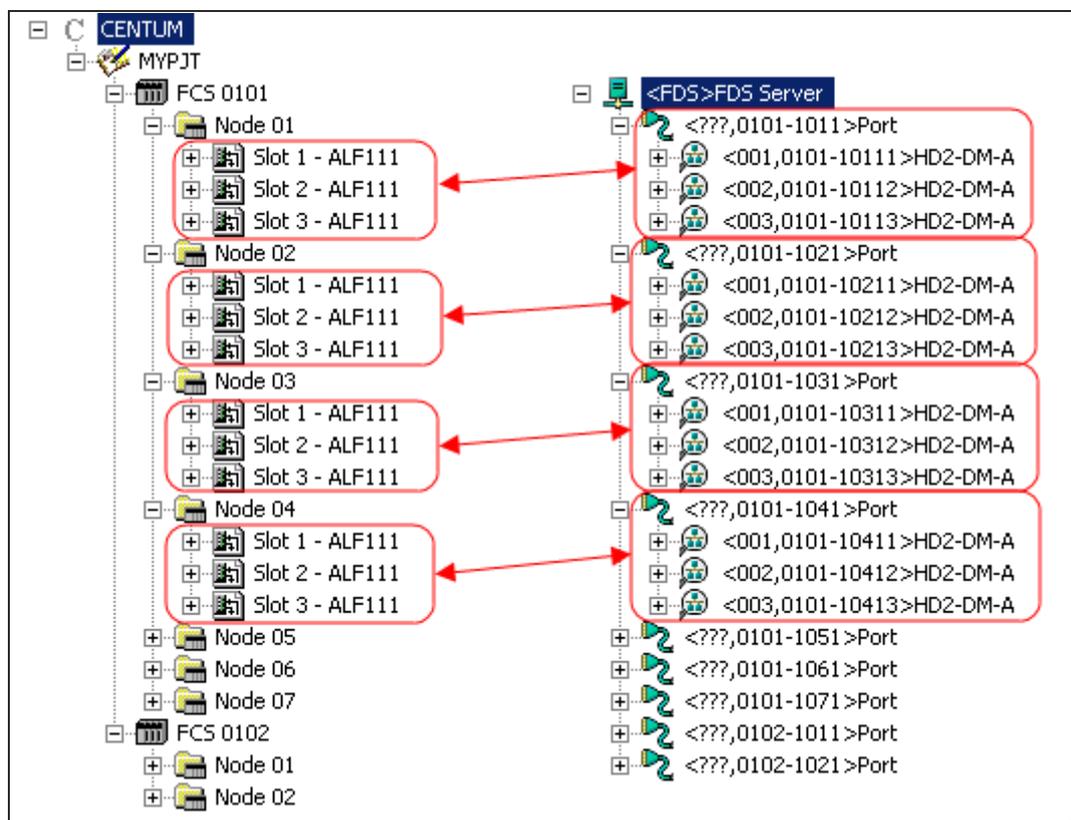
Figure 9

7.2.2 Packing = 2. Two nodes refer to one FDS port

The figure below shows the result. Nodes 01 and 02 are assigned to first port.

PEPPERL+FUCHS
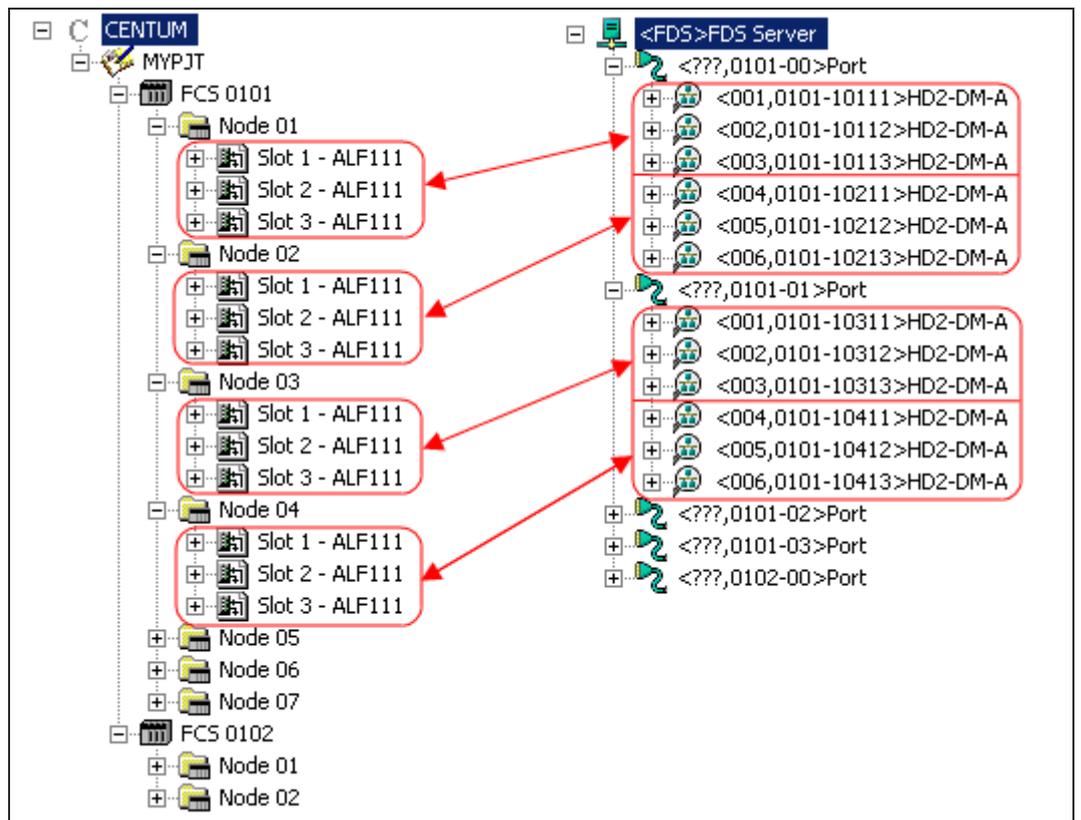
Figure 10

7.2.3 Packing = 3. Three nodes refer to one FDS port

Figure 11

PEPPERL+FUCHS
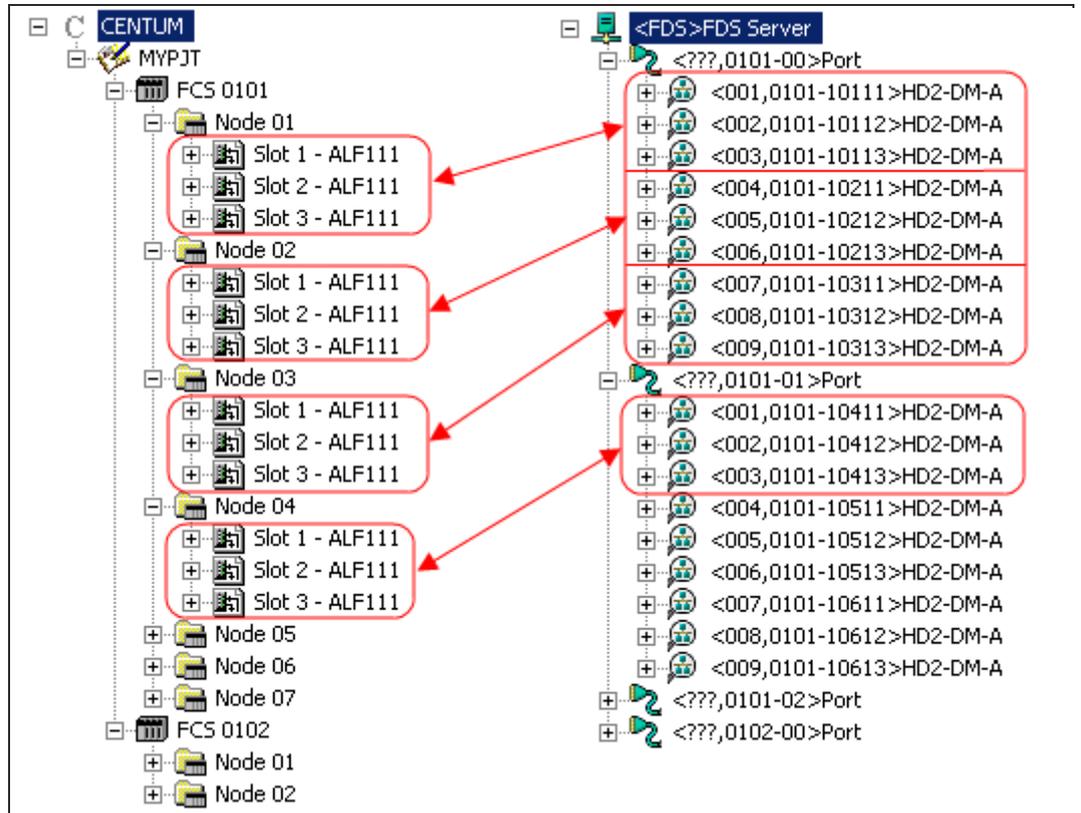
7.2.4 Packing = 4/8. Four/Eight nodes refer to one FDS port

The mapping always takes place in consecutive order. This means that the nodes are sorted by consecutive numbers. E. g., if the packing method "Four nodes per port" is selected, the nodes 1, 2, 3 and 4 are assigned to one port. The nodes 5 ... 8 are assigned to the next port and so on.

Example

The device FCS0101 contains node 1 to 3 with three devices each and node 5 with three devices as well. Node 4 is missing or does not contain FOUNDATION Fieldbus devices (see figure below left side).
As a result of the mapping, the first 3 nodes are assigned to the first FDS port.
Node 5 is, however, assigned to the next FDS port.

PEPPERL+FUCHS
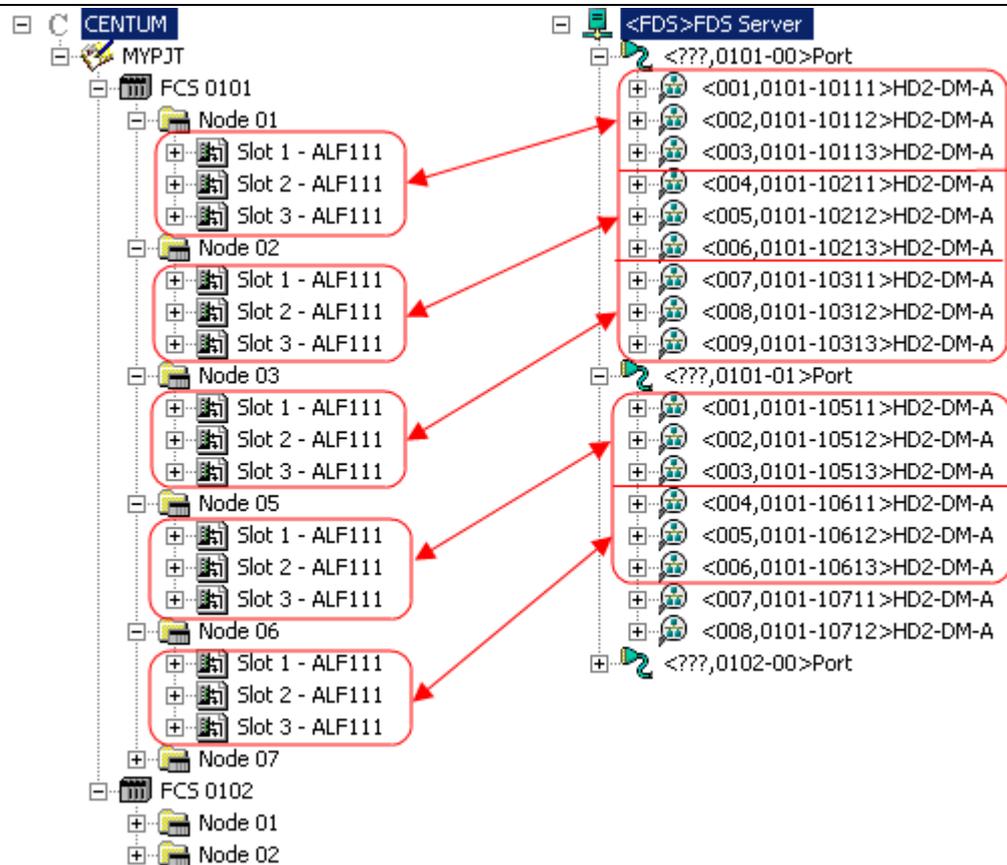
i   Note

Number of Diagnostic Modules

Within common installations, only 31 Diagnostic Modules are allowed on one COM port.
If four nodes with eight ALF 111 FF Communication Modules are used, 32 Diagnostic Modules can be assigned to one COM port. In this special case, this assembly works well.

PEPPERL+FUCHS

8. Changing Configurations

The setup configuration assigned during engineering may be changed at any time of operation. If major changes within the plant topology happen, it may make sense to perform a complete engineering from the beginning. To change single settings, follow the instructions below.

8.1 Add Segments

Make sure that the new file DevicePath.txt is available.

A. Start the „PRM Setup Tool" on the Field Communication Server by selecting [Start] > [PRM Tools] > [PRM Setup Tool].

B. From the node „Field Communication", open the project created during initial setup.

C. Right-click on node FieldConnex® Diagnostic Server (PRM) in FDT Topology window and choose "Connect" to set the DTM online.

D. Double-click on node FieldConnex® Diagnostic Server (PRM) in FDT Topology window.

E. The Offline parameterization window appears. Choose tab [FDS Topology Settings].

F. Press button [Read Device Path File]. Browse to your project folder and choose the Device Path File. Confirm message box with [Ok].

G. Choose segments to be monitored with ADM.
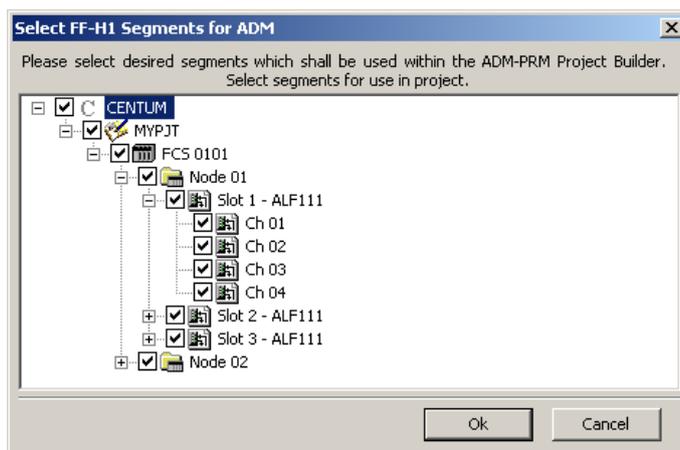
H. Press [Ok] to continue.

I. Adjust the address of the new segment(s).

J. Press [Set topology] button in toolbar.

PEPPERL+FUCHS

K. Press [Export for PRM] in toolbar. Adapt "Output Folder" if necessary and press [Export].

⤷ Three files are created in the output folder:
ADM_devices_mimosa.xml > Contains all device and path information for the PRM integration
Report.pdf > Device installation/identification document
ADMBitmap.bmp > Icon for PRM integration

L. Start "Hierarchy Import Tool" (by default "C:\PRM\Program\HierarchyImport.exe").

M. Press [Open PRM Hierarchy]. Log-in dialog appears.

N. Enter log-in data and confirm with [OK].

O. Press [Open Import file].

P. In the drop-down list, choose FDS and confirm with [OK].

Q. Choose file "ADM_devices_mimosa.xml" from the export folder you created earlier and press [Open].

R. Drag&Drop node "FFH1 Advanced Diagnostics" from the right window into "PLANT" in the left window. The node here is an example. Ensure to create this structure project-specifically first.
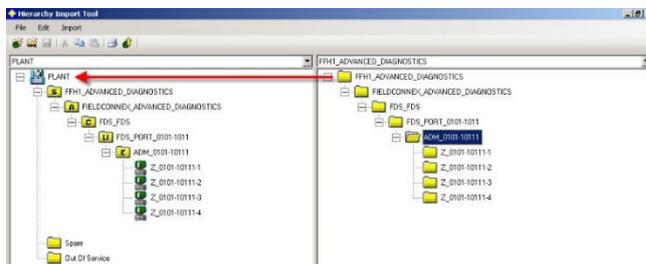
S. In appearing dialog "Merge Hierarchy Info", check that the segments are marked with type "CONTROL MODULE" within the "Type Selection" column.

PEPPERL+FUCHS
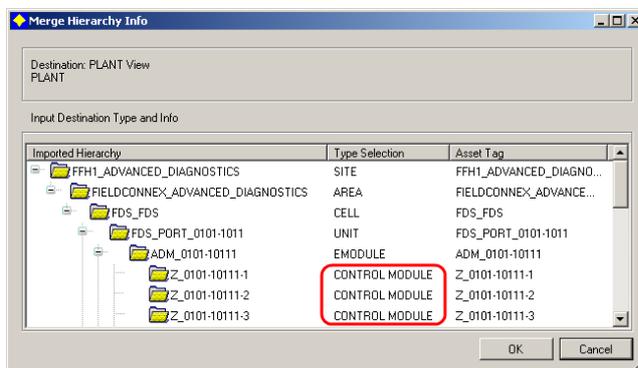
T. Confirm with [OK].

U. Press [Upload to database] button ( ) in toolbar.

V. Close "Hierarchy Import Tool".

8.2 Handling Port Address or ADM Address Configurations

8.2.1 Overview of Possible Configuration Changes

The following configurations can be done for the FDS:

Rearrange Ports	This function is for use with COM port converters only. Do not use it if Diagnostic Gateways are used.
	This function is changing all COM port addresses of the FDS ports beneath this FDS node. You can choose the starting COM port number of the first port. Everything that follows is numbered in ascending order.
Add Port	This function adds a port to this particular FDS node.
	(Requires new generation and afterwards import of the "ADM_devices_mimosa.xml" file within PRM Hierarchy Import Tool.)

The following configurations can be done for the COM port:

Change Address	This function is changing the IP address or COM port address of this particular port.
Change Tag	This function is changing the tag of this particular port.
	(Requires new generation and afterwards import of the "ADM_devices_mimosa.xml" file within PRM Hierarchy Import Tool.)
Rearrange HD2-DM-As	This function is changing all addresses of HD2-DM-A modules beneath this port. You can choose the starting address number for the first device. Everything that follows is numbered in ascending order.
Delete	This function removes the port with all connected HD2-DM-A modules.

The following configurations can be done for the HD2-DM-A module:

Change Address	This function is changing the address of this particular HD2-DM-A module.

8.2.2 Example of a Changing Procedure

The following example shows you how to change the address of a HD2-DM-A module. For changes of port or FDS configurations you can proceed as shown, but you have to focus the appropriate FDS or port node.

⚠️ **CAUTION!**

Consider before using Rearrange functions!

The Rearrange functions are causing major changes within the configuration.

A. Start the „PRM Setup Tool" on the Field Communication Server by selecting [Start] > [PRM Tools] > [PRM Setup Tool].

B. From the node „Field Communication", open the project created during initial setup.

C. Right-click on node FieldConnex® Diagnostic Server (PRM) in FDT Topology window and choose "Connect" to set the DTM online.

D. Double-click on node FieldConnex® Diagnostic Server (PRM) in FDT Topology window.

E. The Offline parameterization window appears. Choose tab [FDS Topology Settings].

F. Right-click on the required "HD2-DM-A" node and select "Change Address" from the appearing popup menu.
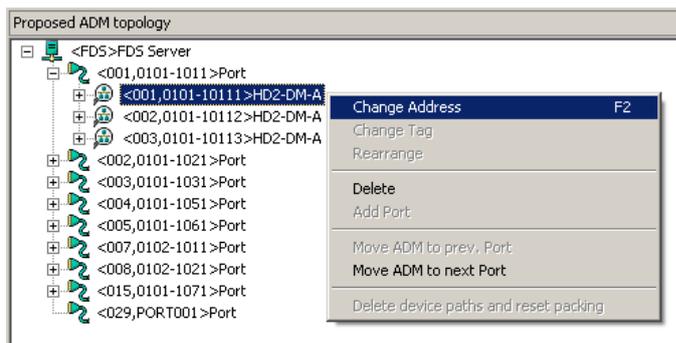
G. Choose new address and confirm with [OK].

PEPPERL+FUCHS
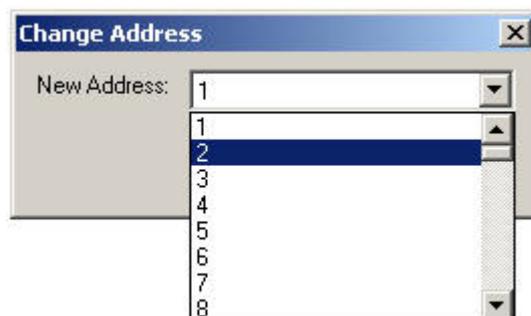
H. Press [Apply] and afterwards press [Set topology] in toolbar.

I. Open [File] menu and press [Save FDT Project].

If you have added a port or changed a port tag, proceed with the following actions additionally:

A. Continuation of action I. above:
Press [Export for PRM] in toolbar. Adapt "Output Folder" if necessary and press [Export].
Three files are created at the output folder:

ADM_devices_mimosa.xml > Contains all device and path information for the PRM integration
Report.pdf > Device installation/identification document
ADMBitmap.bmp > Icon for PRM integration

B. Close the "DTM Works" and the "PRM Setup Tool".

C. Start "Hierarchy Import Tool" (by default "C:\PRM\Program\HierarchyImport.exe").

D. Press [Open PRM Hierarchy]. Log-in dialog appears.

E. Enter log-in data and confirm with [OK].

F. Press [Open Import file].

G. In the drop-down list, choose FDS and confirm with [OK].

H. Choose file "ADM_devices_mimosa.xml" from the export folder you created in action A. and press [Open].

I. Drag and drop the node "FFH1 Advanced Diagnostics" from the right window into "PLANT" in the left window. The node here is an example. Ensure to create this structure project-specifically first.
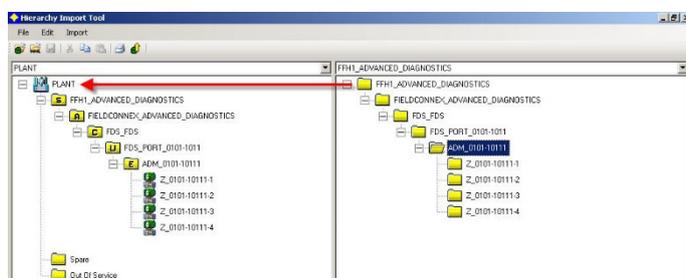
J. In appearing dialog "Merge Hierarchy Info", check that the segments are marked with type "CONTROL MODULE" within the "Type Selection" column.
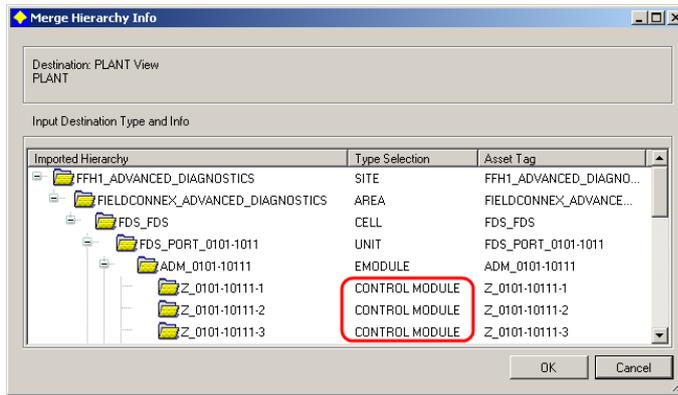
K. Confirm with [OK].

L. Press [Upload to database] button ( ) in toolbar.

M. Close "Hierarchy Import Tool".

8.3 Remove Advanced Diagnostic Modules or Segments

Make sure that the new file DevicePath.txt is available.

A. Start the „PRM Setup Tool" on the Field Communication Server by selecting [Start] > [PRM Tools] > [PRM Setup Tool].

B. From the node „Field Communication", open the project created during initial setup.

C. Right-click on the node FieldConnex® Diagnostic Server (PRM) in FDT Topology window and choose "Connect" to set the DTM online.

D. Double-click on the node FieldConnex® Diagnostic Server (PRM) in FDT Topology window.

E. The Offline parameterization window appears. Choose tab [FDS Topology Settings].

F. Press button [Read Device Path File]. Browse to your project folder and choose the Device Path File. Confirm message box with [Ok].

PEPPERL+FUCHS

G. Choose all segments to be monitored with ADM, exclude the Channels/Slots you want to delete from the current configuration.
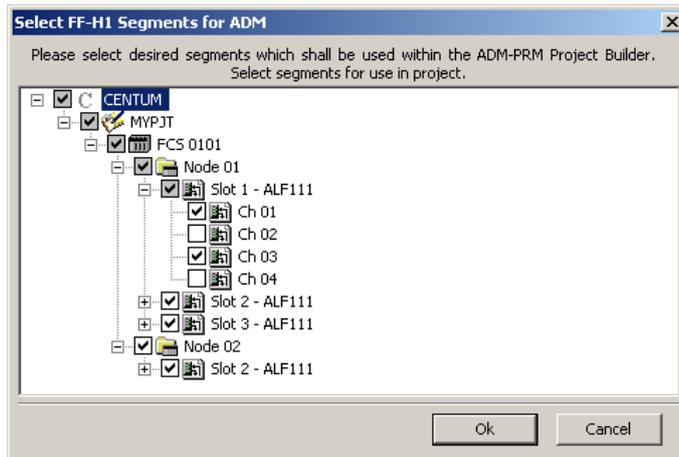
H. Press [Ok] to continue.

I. Press [Set topology] button in toolbar.

J. Close the "DTM Works" and the "PRM Setup Tool".

K. Start PRM ([Start] > [All Programs] > [YOKOGAWA PRM] > [Plant Resource Manager]).

L. Search within the topology for the excluded Channels/Slots. Right-click on the node and choose "Delete".
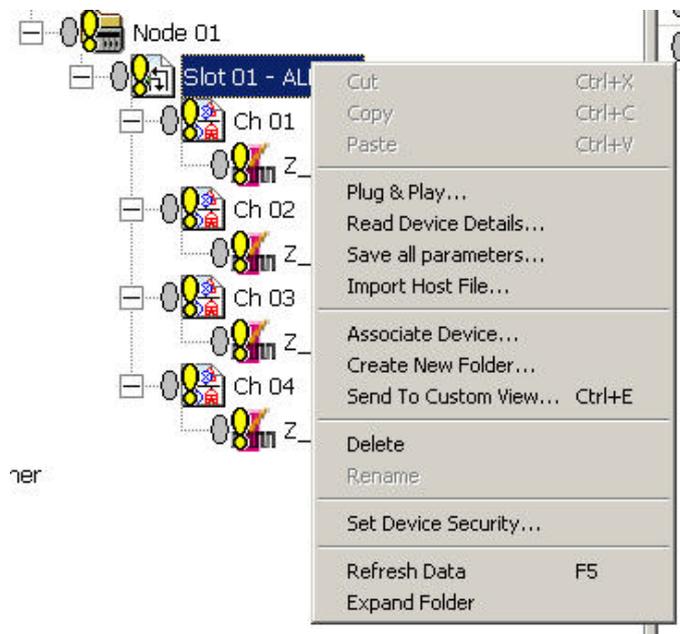
8.4 Shift Advanced Diagnostic Modules to Other Ports

Make sure that the new file DevicePath.txt is available.

A. Start the "PRM Setup Tool" on Field Communication Server by selecting [Start] > [PRM Tools] > [PRM Setup Tool].

B. From the node „Field Communication", open the project created during initial setup.

C. Right-click on the node FieldConnex® Diagnostic Server (PRM) in FDT Topology window and choose "Connect" to set the DTM online.

D. Double-click on the node FieldConnex® Diagnostic Server (PRM) in FDT Topology window.

E. The Offline-parameterization window appears. Choose tab [FDS Topology Settings].

F. Right-click on the required "HD2-DM-A" node and select "Move ADM to next Port" from the appearing popup menu.
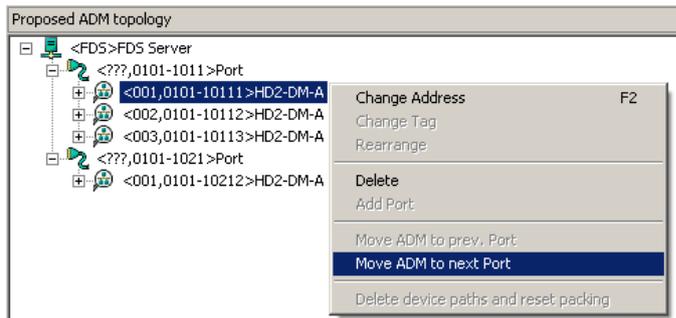
G. Alternatively, the required "HD2-DM-A" node can be dragged with the mouse directly to the target port.

H. If necessary adapt the address of the moved "HD2-DM-A".

I. Press [Apply] and afterwards press [Set topology] in toolbar.

J. Press [Export for PRM] in toolbar. Adapt "Output Folder" if necessary and press [Export].

↳ Three files are created at the output folder:
ADM_devices_mimosa.xml > Contains all device and path information for the PRM integration
Report.pdf > Device installation/identification document
ADMBitmap.bmp > Icon for PRM integration

K. Open [File] menu and press [Save FDT Project].

PEPPERL+FUCHS

L.   Close the "DTM Works" and the "PRM Setup Tool".

M.   Start "Hierarchy Import Tool" (by default "C:\PRM\Program\HierarchyImport.exe").

N.   Press [Open PRM Hierarchy]. Log-in dialog appears.

O.   Enter log-in data and confirm with [OK].

P.   Press [Open Import file].

Q.   In the drop-down list, choose FDS and confirm with [OK].

R.   Choose file "ADM_devices_mimosa.xml" from the export folder you created in action J. and press [Open].

S.   Drag and drop the node "FFH1 Advanced Diagnostics" from the right window into "PLANT" in the left window. The node here is an example. Ensure to create this structure project-specifically first.
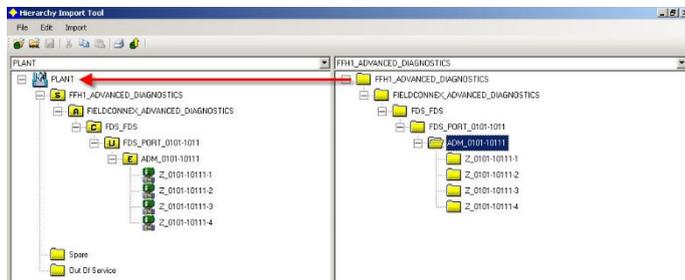
T.   In appearing dialog "Merge Hierarchy Info", check that the segments are marked with type "CONTROL MODULE" within the "Type Selection" column.
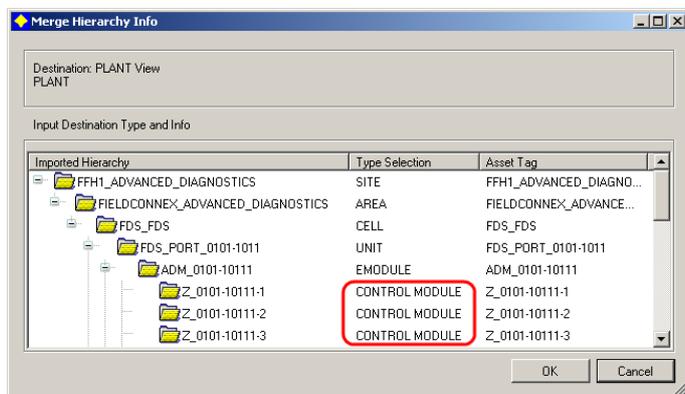
U.   Confirm with [OK].

V.   Press [Upload to database] button ( ) in toolbar.

W.   Close "Hierarchy Import Tool".

PEPPERL+FUCHS

9. Field Device Tag Import into Diagnostic Manager

The Diagnostic Manager provides a function to take over field device tag information from PRM to show the device tags at the Diagnostic Module/Diagnostic Manager, too.

9.1 Tag Import

A. Start PRM ([Start] > [All Programs] > [YOKOGAWA PRM] > [Plant Resource Manager]).

B. Choose [File] > [Export] > [Maintenance Info].
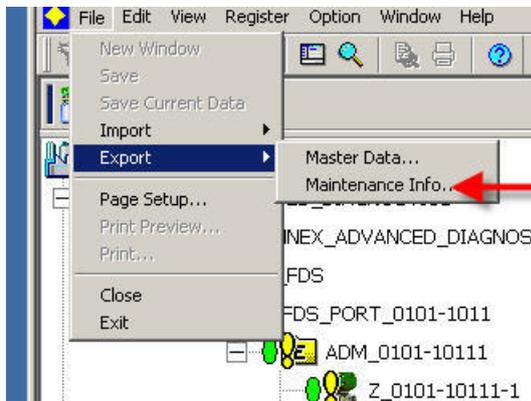
C. Select "Browse…" in dialog window "Export Maintenance Info".

D. Activate "Select" option and afterwards "Class View" option.

E. Select all FOUNDATION Fieldbus devices and proceed with [OK].

PEPPERL+FUCHS
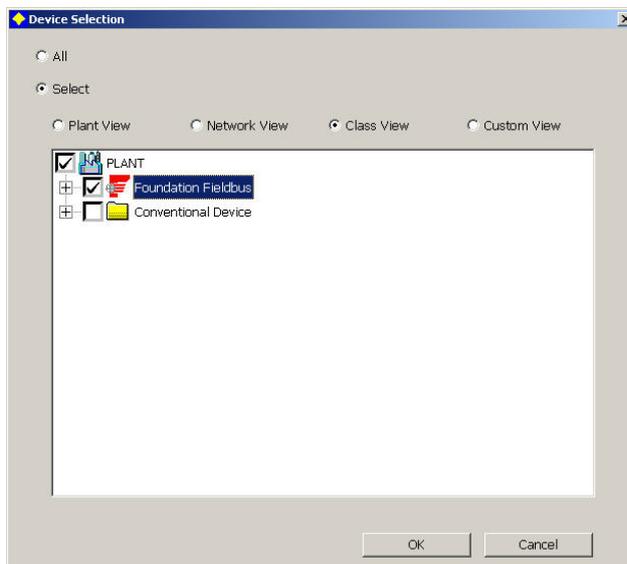
> **ℹ Note**
>
> **Device Tag Information**
>
> All FOUNDATION Fieldbus device tag information has to be exported.

F.   Select "Device" as only option in "Export Items" group.

G.   Press [OK] to start export.
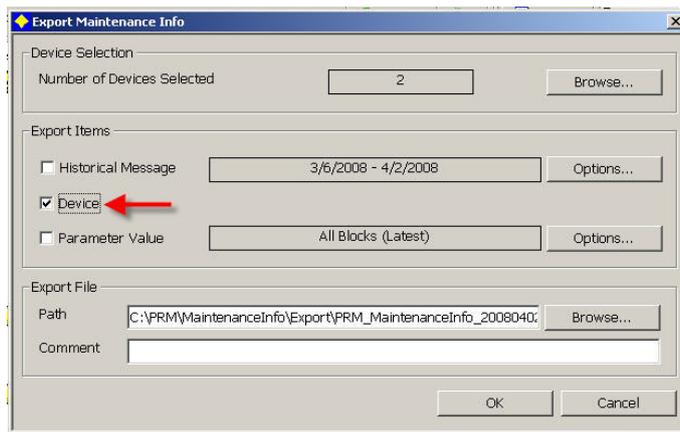
H.   Export is in progress.
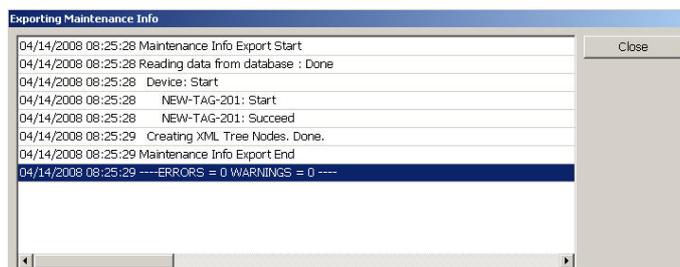
I.   Close PRM.

J.   Start the „PRM Setup Tool" on the Field Communication Server by selecting [Start] > [PRM Tools] > [PRM Setup Tool].

K.   From the node „Field Communication", open the project created during initial setup.

L.   Right-click on the node FieldConnex® Diagnostic Server (PRM) in FDT Topology window and choose "Connect" to set the DTM online.

M.   Double-click on the node FieldConnex® Diagnostic Server (PRM) in FDT Topology window.

N.   The Offline parameterization window appears. Choose tab [FDS Topology Settings].

O.   Press button [Import Device Tags].

⫘ PEPPERL+FUCHS

P.   Choose the "PRM_MaintenanceInfo_YYYYMMDD.xml" (file name contains date) exported in action G.

Q.   Confirm message box with [OK].

R.   Tag information is visible in topology tree now.
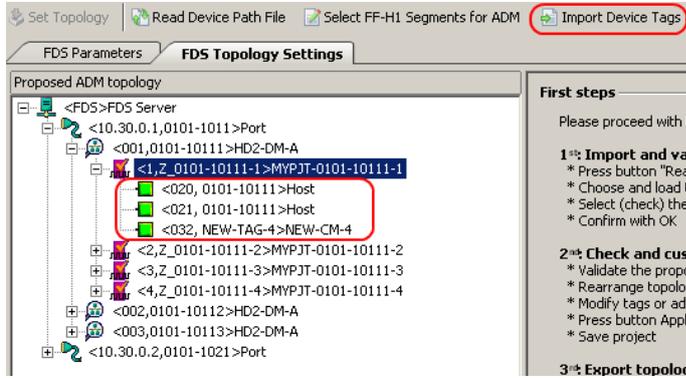
S.   To take over tag information into the Diagnostic Manager a run-through of the commissioning wizard is required (see chapter 9.2).
The figure below shows a comparison between PRM and Diagnostic Manager after commissioning wizard is completed. The field device tags now are consistent in both systems.
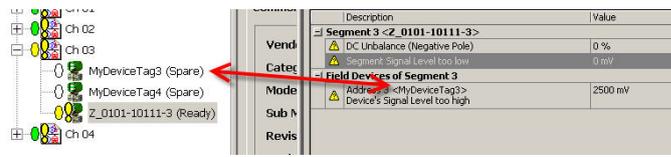
> **i**   **Note**
>
> **Device Tag Information in the Diagnostic Manager**
> Do not change field device tag information within Diagnostic Manager.
> Changes cannot be synchronized with PRM out of the Diagnostic Manager/Advanced Diagnostic Module.

9.2 Commissioning Wizard Additional Information

During commissioning of the Advanced Diagnostic module with the commissioning wizard, it is possible to store the field device tag information in the Advanced Diagnostic Module.

By default, the imported tags are already visible at the "Field Device Tags" commissioning wizard page. The only thing to do is to verify this information and to complete commissioning (see also manual of Diagnostic Manager).

PEPPERL+FUCHS

PEPPERL+FUCHS