Technical Information

Fieldbus Segment Diagnostics with Pepperl+Fuchs Advanced Diagnostic Module

PRM™ Plant Resource Manager

TI 33Y05Q31-32E

YOKOGAWA

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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 a user needs for engineering, and commissioning of the Pepperl+Fuchs Components and to integrate them into the Yokogawa environment. It will qualify the user to do the first steps with PRM in connection with 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, please 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 and to proactively detect degradations 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.

In conjunction 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.

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Fieldbus Segment Diagnostics with Pepperl+Fuchs Advanced Diagnostic Module

TI 33Y05Q31-32E 1st Edition

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1. System Environment and Infrastructure

In general the diagnostic infrastructure is made up of different hardware (e.g. Diagnostic Modules, Yokogawa ALF111 Fieldbus Communication Module) and software (e.g. PRM, FieldConnex Diagnostic Server (FDS), Diagnostic Manager) components. Fig. 1-1 provides an overview of all included components and how they inter-connect together.

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 a RS 485 protocol, called the Diagnostic Bus (see also Fig. 1-1). The Diagnostic Bus connects up to 31 ADM modules at a length of max. 30 meters. A COM Port converter installed within the field cabinet transmits the RS 485 Diagnostic Bus information to a virtual COM port and connects PCs using standard Ethernet topology.

The FieldConnex Diagnostic Server (FDS) installed on this PC provides access to the ADM diagnostic information straight to a DTM tool. Additionally 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 may handle 1000 ADM devices and overall 4000 FOUNDATION fieldbus segments.

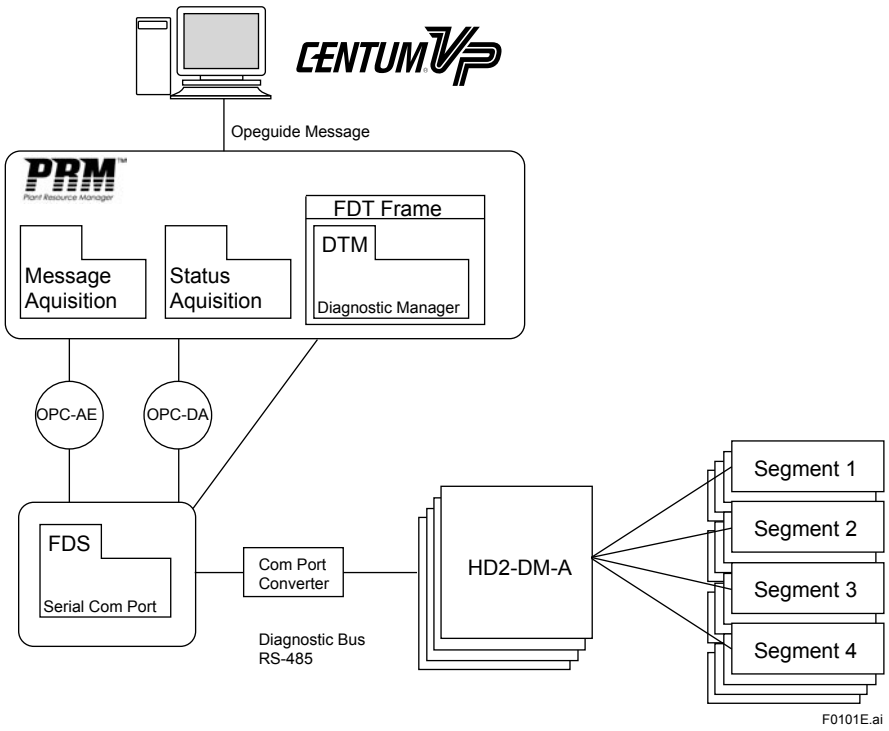


Fig. 1-1 Overview of System Environment

The FDS is directly connected to the Yokogawa Plant Resource Manager via OPC. The monitoring takes place for every single segment and the status of the segment is shown within the PRM Network view.

By importing the device path configuration definition file created with the Yokogawa Setup Tool the Diagnostic Manager (DTM) generates a so called mimosa file for data exchange with the PRM.

This whole procedure is semi-automatic and software-assisted, it secures that the same fieldbus topology is represented within the PRM, FDS and Diagnostic Manager. Messages sent by the Diagnostic Module are also shown within the PRM overview, this connectivity also enables to launch the Diagnostic Manager straight out of the PRM menu with focus on the fieldbus segment on which a diagnostic message occurred.

1.1 Segment Hierarchy and ADM Representation within PRM

Each fieldbus segment monitored by the Advanced Diagnostic Module contains a “virtual” Device. Fig. 1-2 shows that the segments monitored by the Advanced Diagnostic Module are represented by devices within PRM Network view.

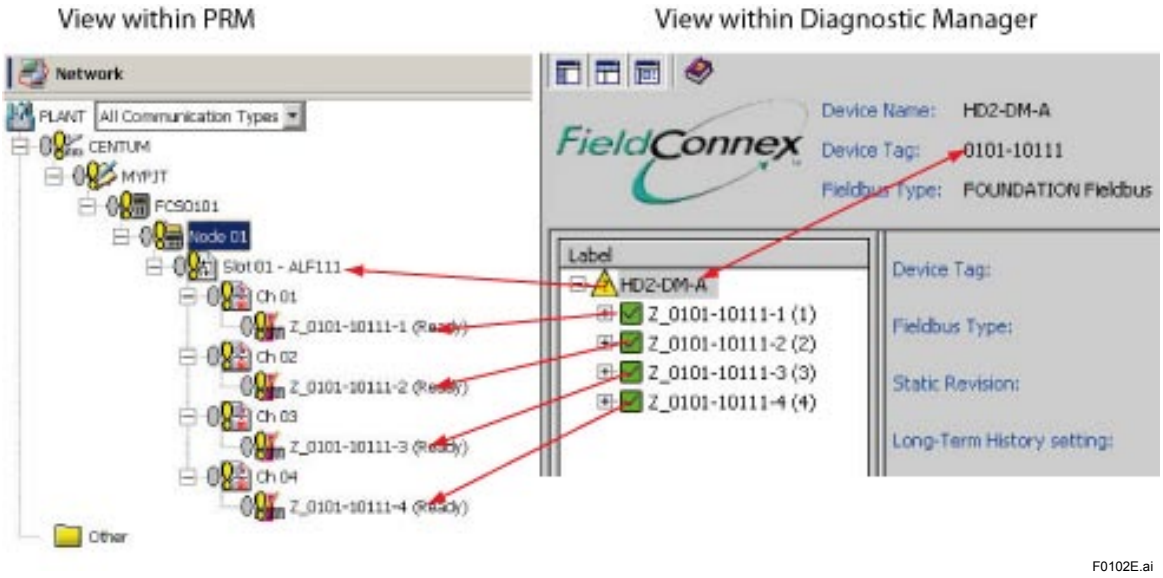


Fig. 1-2 Segment Hierarchy within PRM

1.1.1 Mapping Conventions

During the engineering procedure a mapping takes place to establish a relationship between the COM-port of the Advanced Diagnostic Module and the appropriate PRM instance. Each Slot / ALF111 is mapped to one COM-port. The COM-port addresses are automatically assigned by the integration software tools. ADM-ports start at port number 1. PRM nodes starts at port number 20. The Device Tag is built up as follows: Z_XXXX-YYYYY-S. The S represents the segment.

This proposed hierarchy and name conventions can be modified during the engineering procedure or later at any time.

2. System Requirements

2.1 PC System Requirements

Personal Computer for PRM and FieldConnex Diagnostic Server (FDS)

- Operating System Windows XP SP2 or later
- 3 GB RAM for PRM, 100 MB RAM for FDS, 100 MB RAM for Diagnostic Manager (DTM)

2.2 Required Hardware

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

2.3 Required Software

Software	Description
FDS 1.25.0.0 or later	FieldConnex Diagnostic Server is acting as an interface and a data access coordinator for the HD2-DM-A, includes the OPC-AE service.
Diagnostic Manager DTM 1.25.0.0 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 dialogues and undertakes device configuration and diagnosis. The DTM can be launched straight out of the PRM.
PRM R3.02 or later	Plant Resource Manager

3. 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.

3.1 System Topology Description

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

To simplify the engineering this document will describe the three most common installation topologies and the corresponding work steps for proper installation of all components. The required software components are the same for all of the described topologies but the hardware and where to install them differs.

The figure Fig. 3-1 shows a stylized comparison about the three most common installation topologies:

A. All Components on the same PC

B. PRM Client and PRM/FDS-Server

C. PRM Client, PRM-Server and separate FDS-Server

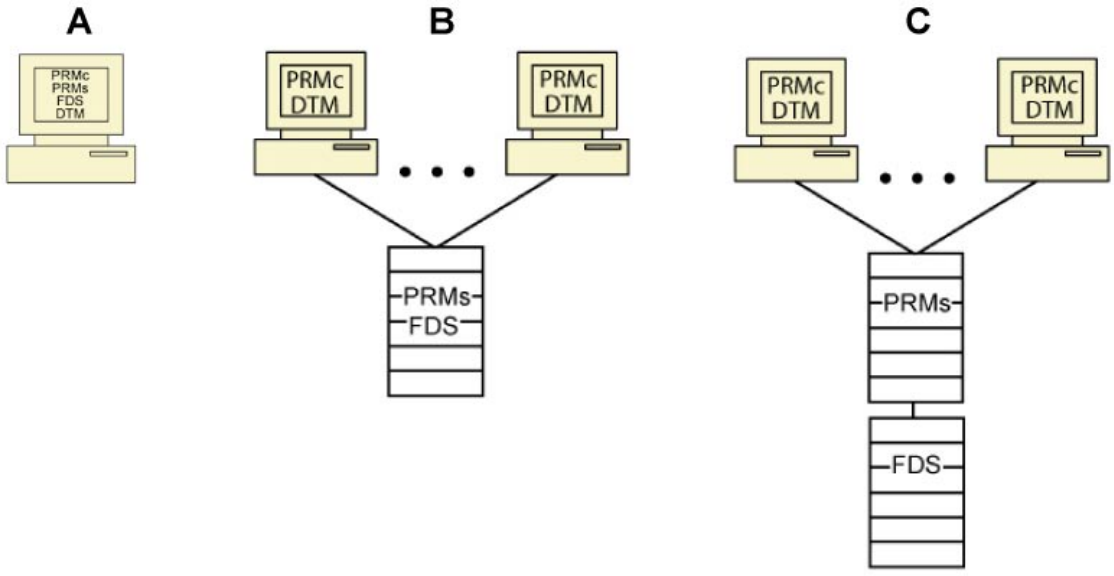


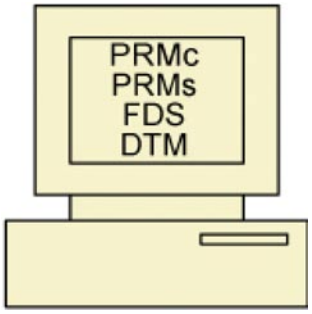
Fig. 3-1 Installation topology comparison

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

3.1.1 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 see chapter 3.4.

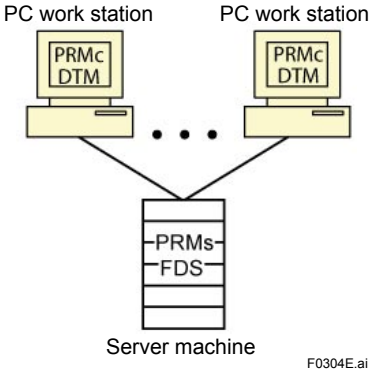
Components on hardware	Diagnostic Manager Setup parameter
 F0302E.ai **PC work station / PC server machine**	Install these components on the PC:  F0303E.ai

PRMc: Plant Resource Manager Client Software
PRMs: Plant Resource Manager Server Software may include Field Communication Server
FDS: FieldConnex Diagnostic Server
DTM: Diagnostic Manager

3.1.2 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 have to perform a PRM Client Setup (Diagnostic Manager) on each PRM client PC and the Server Setup (FieldConnex Diagnostic Server) on the server machine. For detailed engineering work steps see chapter 3.5.

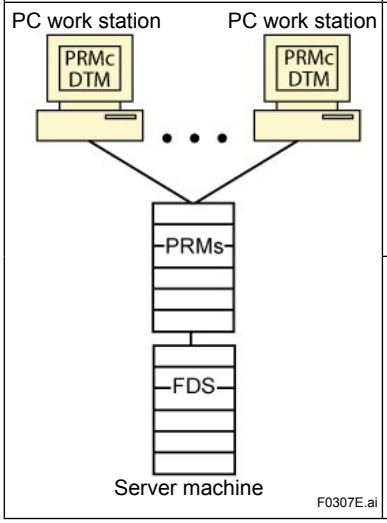
Components on hardware	Diagnostic Manager Setup parameter
 F0304E.ai	Install these components on each PC:  F0305E.ai Install these components on the server:  F0306E.ai

PRMc: Plant Resource Manager Client Software
PRMs: Plant Resource Manager Server Software may include Field Communication Server
FDS: FieldConnex Diagnostic Server
DTM: Diagnostic Manager

3.1.3 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 have to perform a PRM Client Setup (Diagnostic Manager) on each PRM client PC and the Server Setup (FieldConnex Diagnostic Server) on the PRM server machine and on the FDS server machine. For detailed engineering work steps see chapter 3.6.

Components on hardware	Diagnostic Manager Setup parameter
	Install these components on each PC:  Install these components on the PRMs server and the FDS server: 

PRMc: Plant Resource Manager Client Software
PRMs: Plant Resource Manager Server Software may include Field Communication Server
FDS: FieldConnex Diagnostic Server
DTM: Diagnostic Manager

3.2 Required Software for Engineering

DTM Advanced Diagnostic Manager 1.25.0.0 or later

COM-Port Converter driver (depends on the used device)

FieldConnex Diagnostic Server (FDS) with OPC AE support 1.25.0.0 or later

Plant Recourse Manager (PRM) R3.02 or later

- PRM Device Setup Tool
- PRM Hierarchy Import Tool
- PRM Integration Wizard

3.3 Work Step Overview

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

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

Preconditions:

The PRM as well as 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.

S	Task	Tool
1	Installation of the P+F Software	Diagnostic Manager, FDS
2	PRM setup for integration of 3rd party condition monitoring for connection to FDS	PRM Integration Wizard
3	Generation of project specific FDT project including ADM. Generation of P+F FDS-Project including project documentation needed to perform steps 5, 6 and 8	- Yokogawa FDT Project Management Tool - PRM Setup Tool - P+F FDS-DTM - P+F 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	COM Converter Driver Software
7	COM Port mapping	COM Converter Driver Software
8	Add ADM Icons to PRM	PRM
9	Commissioning FOUNDATION fieldbus. Baseline measurements of the physical layer parameters to define limits for online diagnostics. (max. 12 devices per segment)	Diagnostic Manager

3.4 Installation Topology A Detailed Work Step Description

Below you will find all work steps to proceed if all components should be installed on the same PC.

1. P+F Software Installation

Install all appropriate software. For the P+F tools use the installation CD and proceed as follows:

A. Choose setup.exe.

B. Accept License.

C. Enter User name and Organization.

D. Choose [Custom Installation].

E. Choose the following settings:

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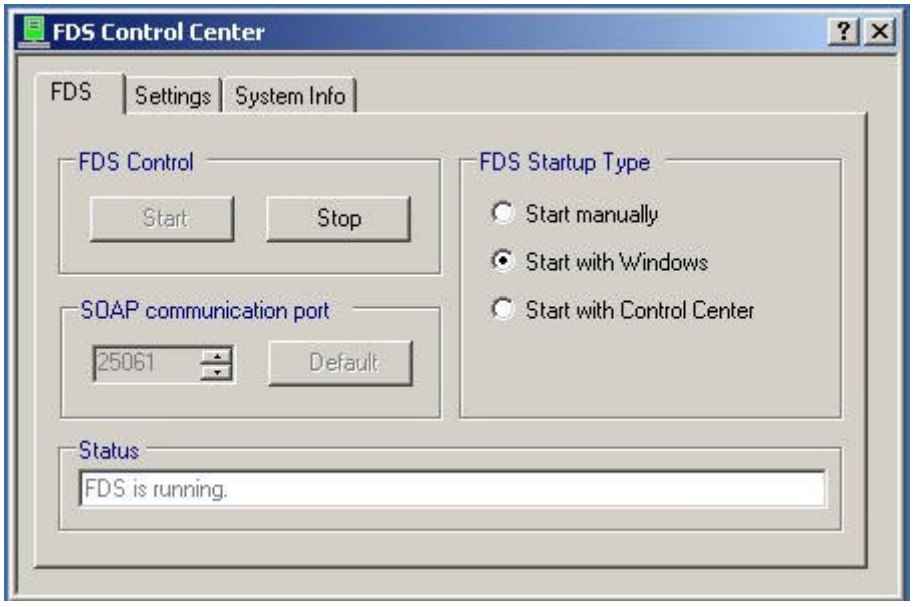
F. Click [Next] and proceed with the installation wizard till installation is complete.

G. Start FDS Control Center within task bar, or click [Start] > [All programs] > [Pepperl+Fuchs] > [FDS Control Center].

H. Make sure that the option [Start with Windows] is enabled within window FDS.



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I. Execute Activation ([Start] > [Pepperl+Fuchs] > [Activation Tool]).

J. Open Window Settings.

K. Set Adjust Firewall to allow Remote Access within area Remote Access.

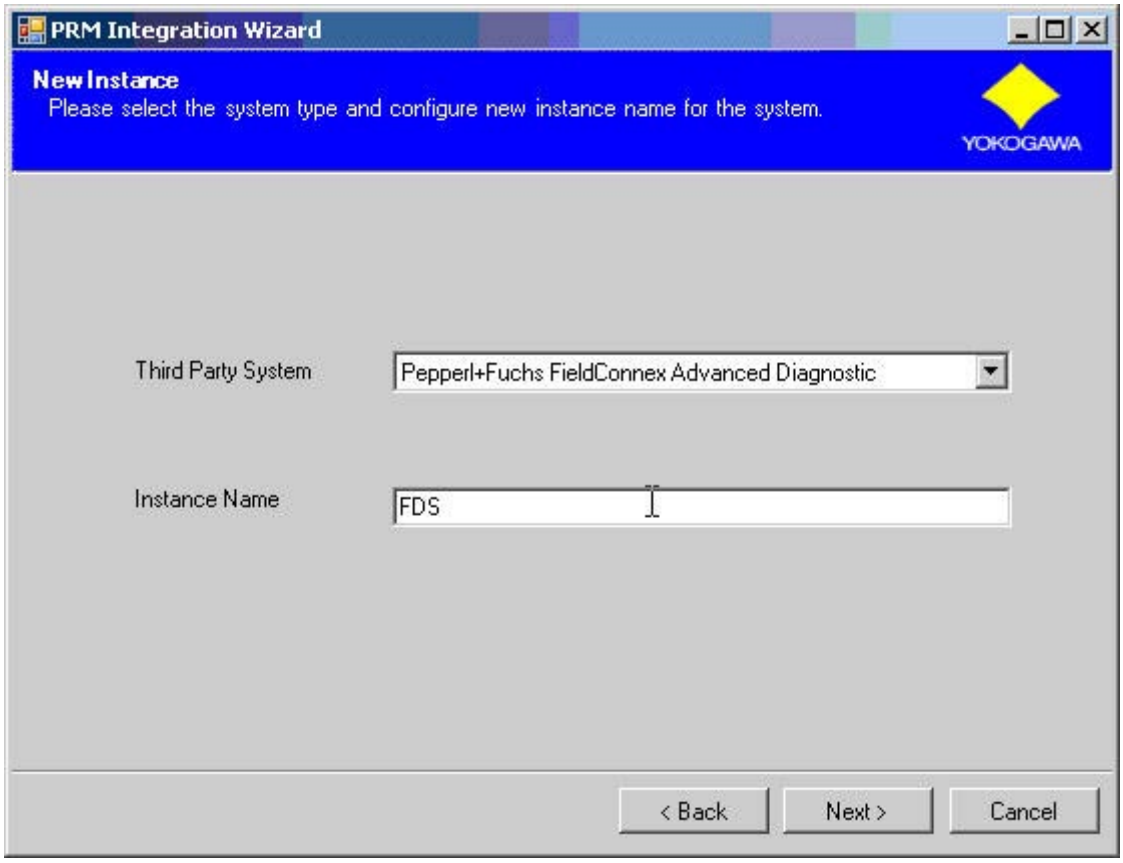
For further information please refer to the HD2-DM-A manual. (Find manual at www.pepperl-fuchs.com.)

2. PRM Setup for Integration of 3rd Party Condition Monitoring for Connection to FDS

This step defines the OPC interface information which is needed to pass ADM diagnostic messages to PRM Operator Guidance Messages and PRM Action Guidance Messages.

A. Start Integration Wizard (e.g. C:\PRM\Tool\IntegrationWizard\PrmIntegrationWizard.exe).

B. Window New Instance appears.



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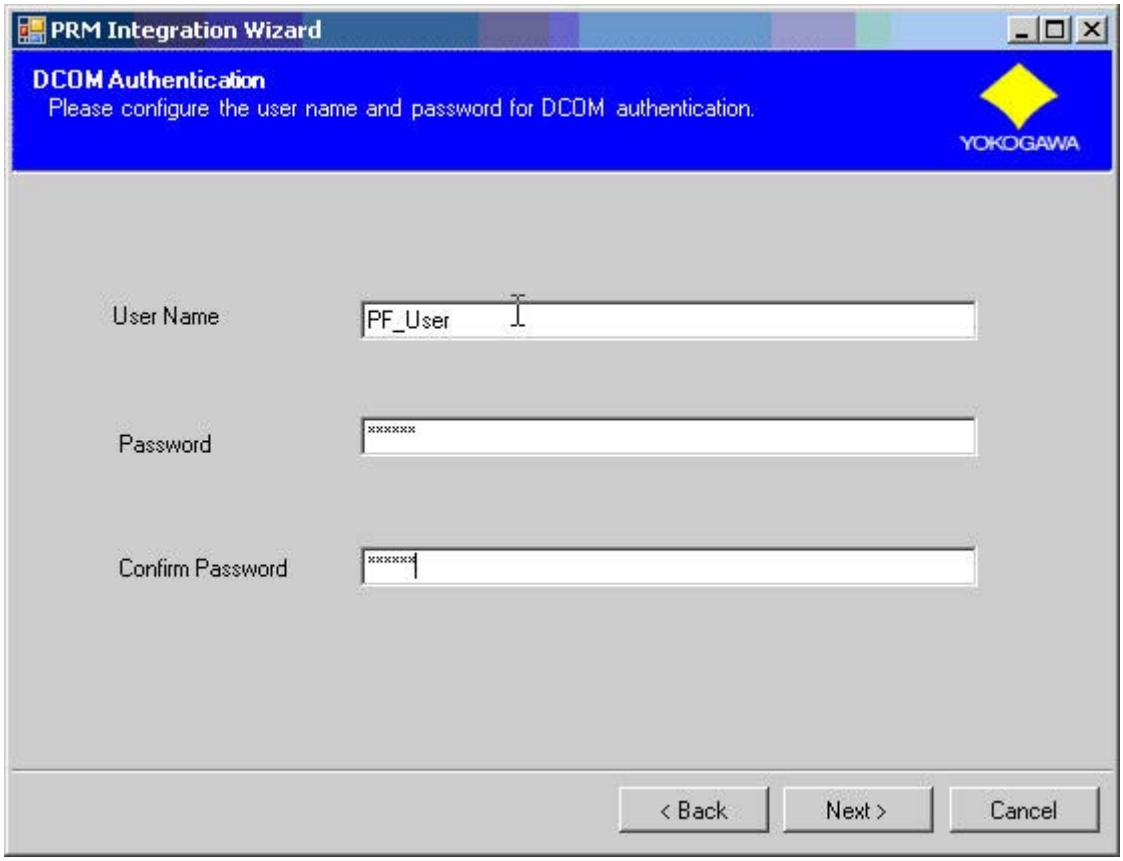
C. In the Third Party System drop-down list, choose [Pepperl+Fuchs FieldConnex Advanced Diagnostic].

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

E. Window DCOM Authentication appears.



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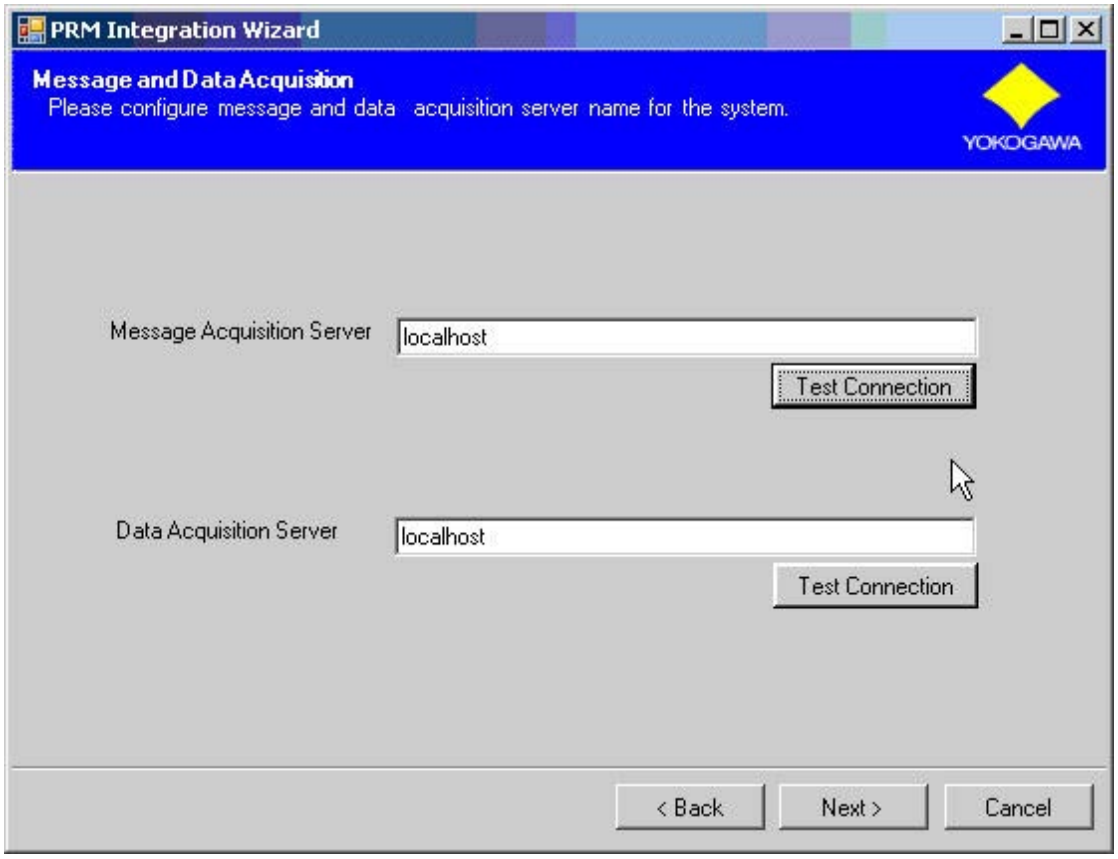
F. Enter name of a local user account and password. Press [Next].

G. Window Message and Data Acquisition appears.



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H. Enter localhost into fields Message Acquisition Server and Data Acquisition Server. Press [Test Connection] to validate the connection.

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I. Then Press [Next].

J. Window Operation Guide Template appears. Press [Next].

K. Window Integration Summary appears. Press [Finish].

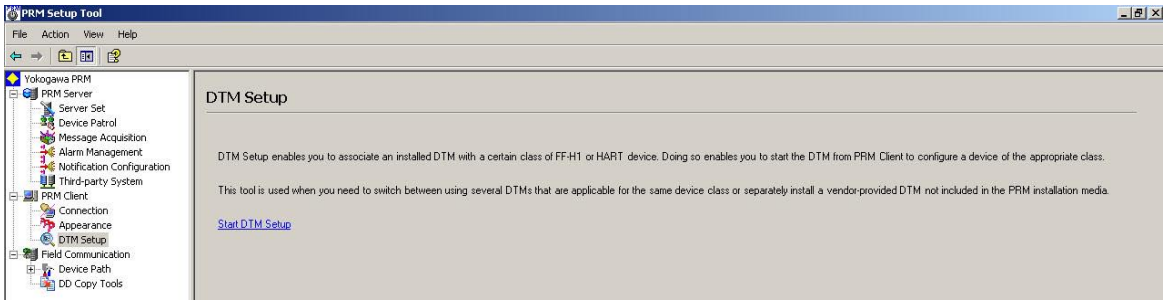
L. Need Restart PRM Server Service dialog appears. Press [OK].

3. Generation of Project Specific PRM Data Base Including ADM

Make sure that the file DevicePath.txt is available.

A. Start PRM Setup Tool ([Start] > [All programs] > [YOKOGAWA PRM] > [tool] > [PRM Setup Tool]).

B. Open node [PRM Client] > [DTM Setup] and start DTM setup.



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C. After setup is complete close PRM Setup Tool.

D. Start Yokogawa FDT project management tool (e.g. C:\PRM\Program\FMFieldMate.exe).

E. Create a new FDT project.

F. Open Device Catalog.

G. Add Device FieldConnex Diagnostic Server (PRM) into the new project.

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H. Then add a HD2-DM-A device below the FDS.

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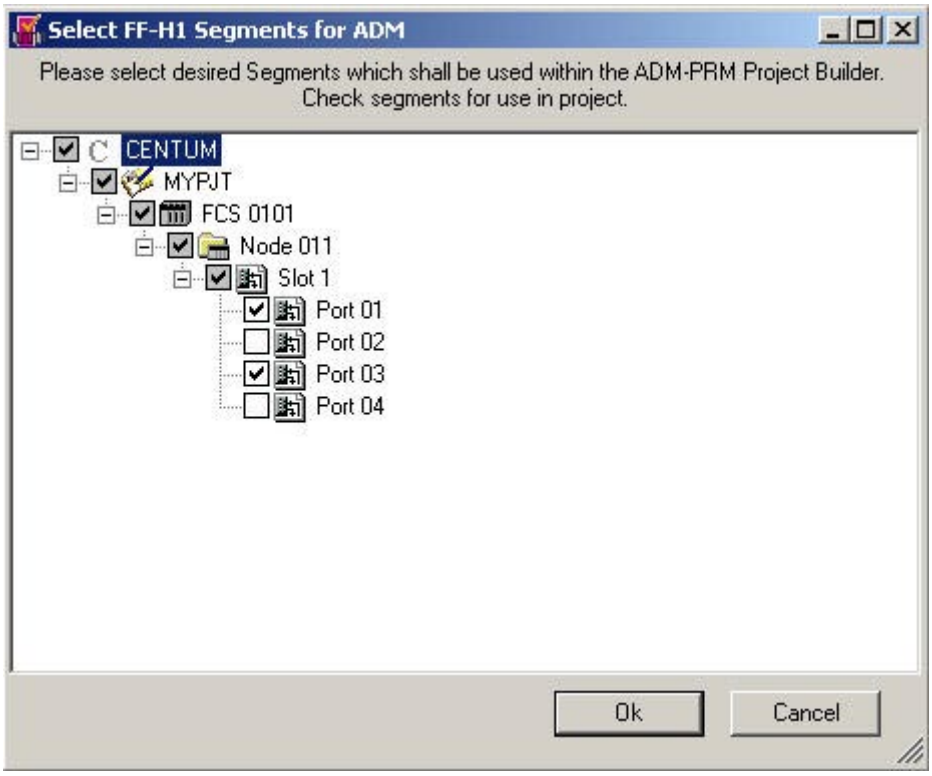
I. Double click on node FieldConnex Diagnostic Server (PRM).

J. The Offline-parameterization Window appears. Choose Tab [FDS Topology Settings].

K. Press button [Read Device Path File]. Browse to your project folder and choose the Device Path File. Con-firm message box with yes.

L. Choose segments to be monitored with ADM.



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M. Press [Ok] to continue.

N. Press [Set topology].

O. Press [Export for PRM]. Choose/change export folder and press Export. Three files will be created and saved at the export 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

P. Press [Save FDT Project].

4. Importing Project Structure into PRM

The Yokogawa “PRM Hierarchy Import Tool” imports Plant View and Network View hierarchy definitions and devices for the FOUNDATION fieldbus segments which have been created by Pepperl+Fuchs ADM Project Builder.

A. Start PRM Hierarchy Import Tool (e.g. C:\PRM\Program\HierarchyImport.exe).

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

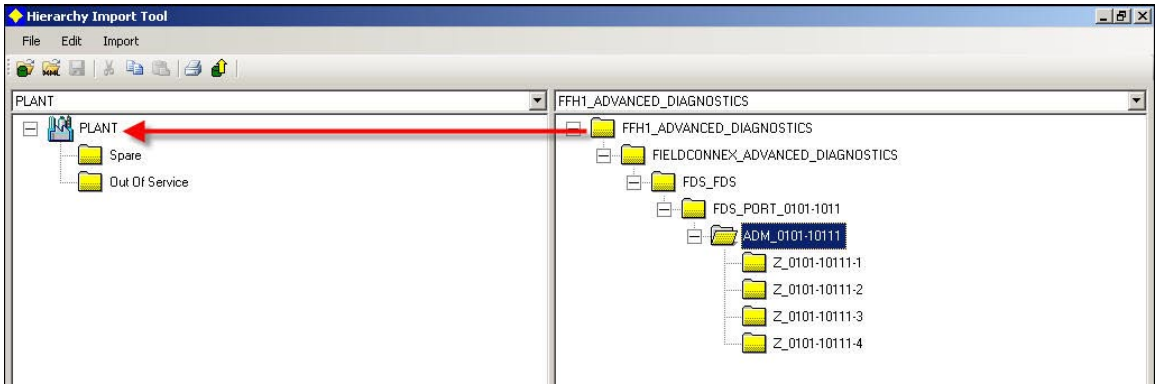
C. Enter log in data and confirm with [OK].

D. Press [Open XML 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.

G. Drag&Drop node FFH1 Advanced Diagnostics from the right window into Plant in the left window. The node here is an example. You have to create this structure project-specifically first.



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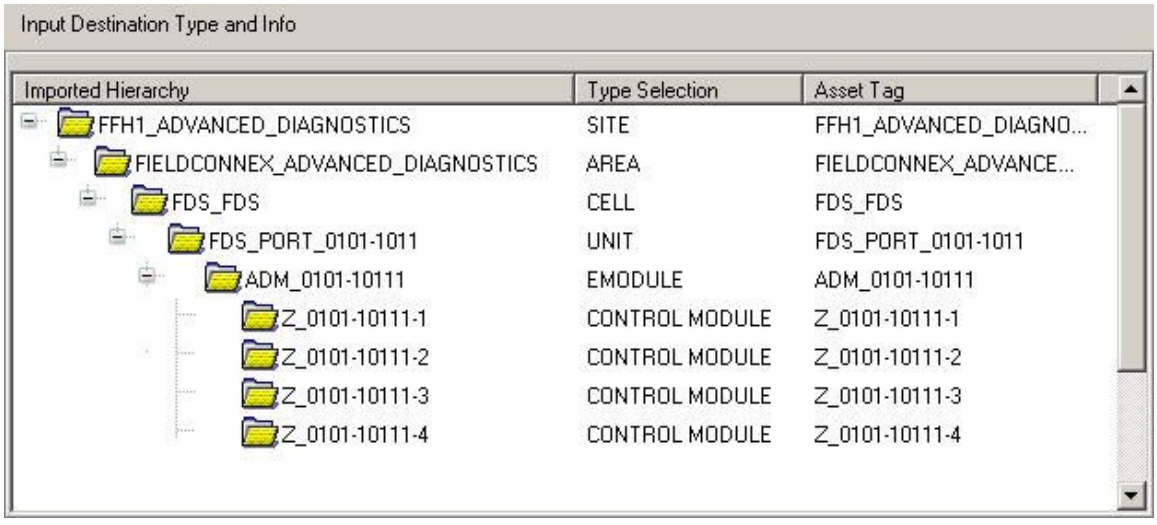
H. Window ModifiedImportController appears.

I. Check that the segments are marked with type CONTROL Module within the Type Selection column.



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J. Confirm with [OK].

K. Press [Upload to database].

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 desired address, for address scheme see label on the module (for further information see also HD2-DM-A manual).

This step has to be performed for each module. The proper address for each module can be found on the report, created at step 3.

6. COM Converter Driver Installation

Because the diagnostic system can be built up with COM Port Converter devices form different manufacturers no detailed information about the installation process can be given here. For further information please refer to the devices manual.

A. Use manufacturers' installation CD of the COM Port Converter to install the appropriate driver.

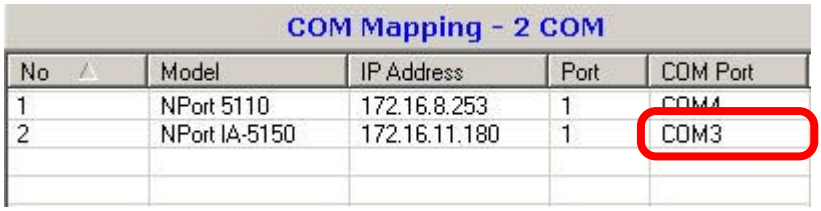
B. When the driver has been installed correctly, open the administration menu of the COM Port Converter driver.

C. Adjust the project specific COM port addresses. You will find this information on the report, created at step 3.

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

7. COM Port Mapping

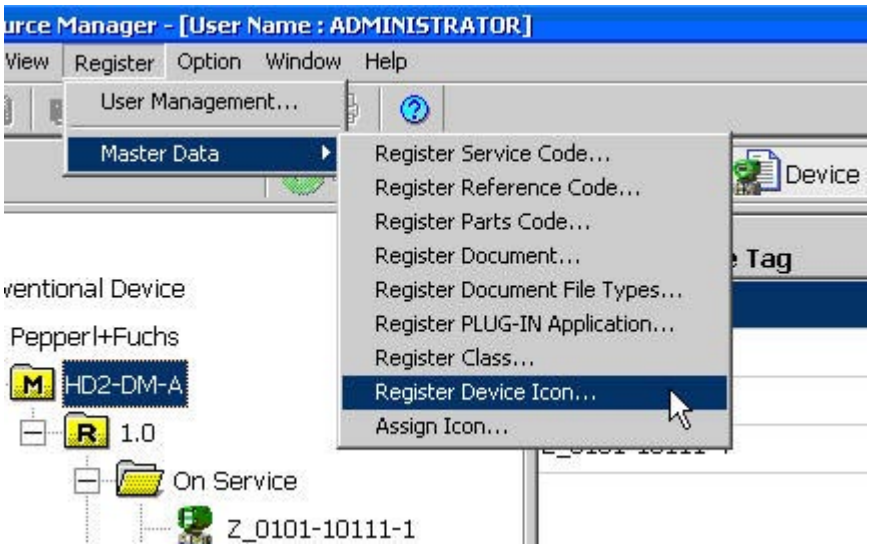
A. Open Driver-/Administration-menu of the COM port converter and enter the COM port and ADM port values. Usually the COM port number will be started from COM20.



8. Add ADM Icons to PRM

A. Start PRM. The currently imported hierarchy should be shown.

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



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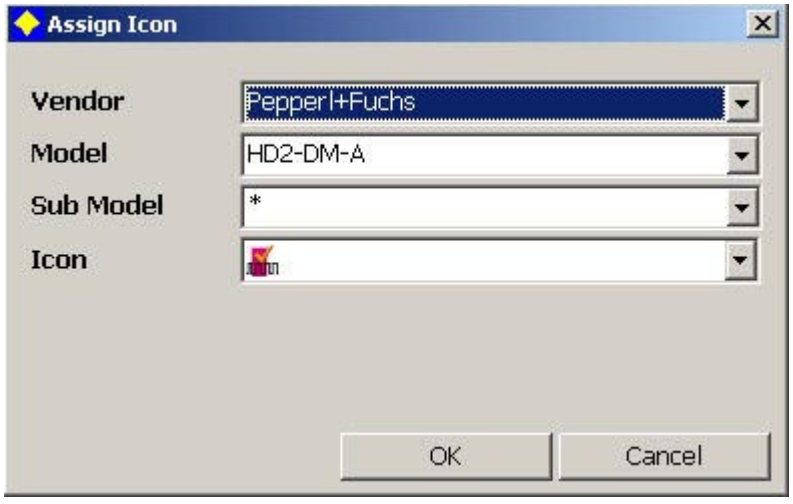
C. Press button [Add…].

D. Choose image ADMBitmap.bmp out of the former created export folder.

E. Confirm with [OK].

F. Choose [Register] > [Master Data] > [Assign Icon] and make the following settings:



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G. Confirm with [OK].

9. Automatic FOUNDATION Fieldbus Segment Diagnostic Commissioning

To match the limits of the monitored physical layer parameters to a specific physical segment within the PRM, an automatic scan and setup procedure has to be launched per 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 data base will be automatically updated with the baseline settings generated by the Commissioning Wizard.

3.5 Installation Topology B Detailed Work Step Description

1. P+F Software Installation

For the P+F tools use the installation CD and proceed as follows:

Client installation. This step may be done on each client PC.

IMPORTANT

Install PRM Client software on each client PC.

A. Start Setup.exe on the Diagnostic Manager CD.
B. Accept License.
C. Enter User name and Organization.
D. Choose [Custom Installation].
E. Choose the following settings:

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F. Click [Next] and proceed with the installation wizard till installation is complete.
G. Execute Activation ([Start] > [Pepperl+Fuchs] > [Activation Tool]).

Server installation

IMPORTANT

Install PRM server software first.

A. Start Setup.exe on the Diagnostic Manager CD.

B. Accept License.

C. Enter User name and Company.

D. Choose [Custom Installation].

E. Choose the following settings:

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F. Click [Next] and proceed with the installation wizard till installation is complete.

G. Start FDS Control Center within task bar, or click [Start] > [All programs] > [Pepperl+Fuchs] > [FDS Control Center].

H. Make sure that the option [Start with Windows] is enabled within window FDS.

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I. Open Window Settings.

J. Set Adjust Firewall to allow Remote Access within area Remote Access.

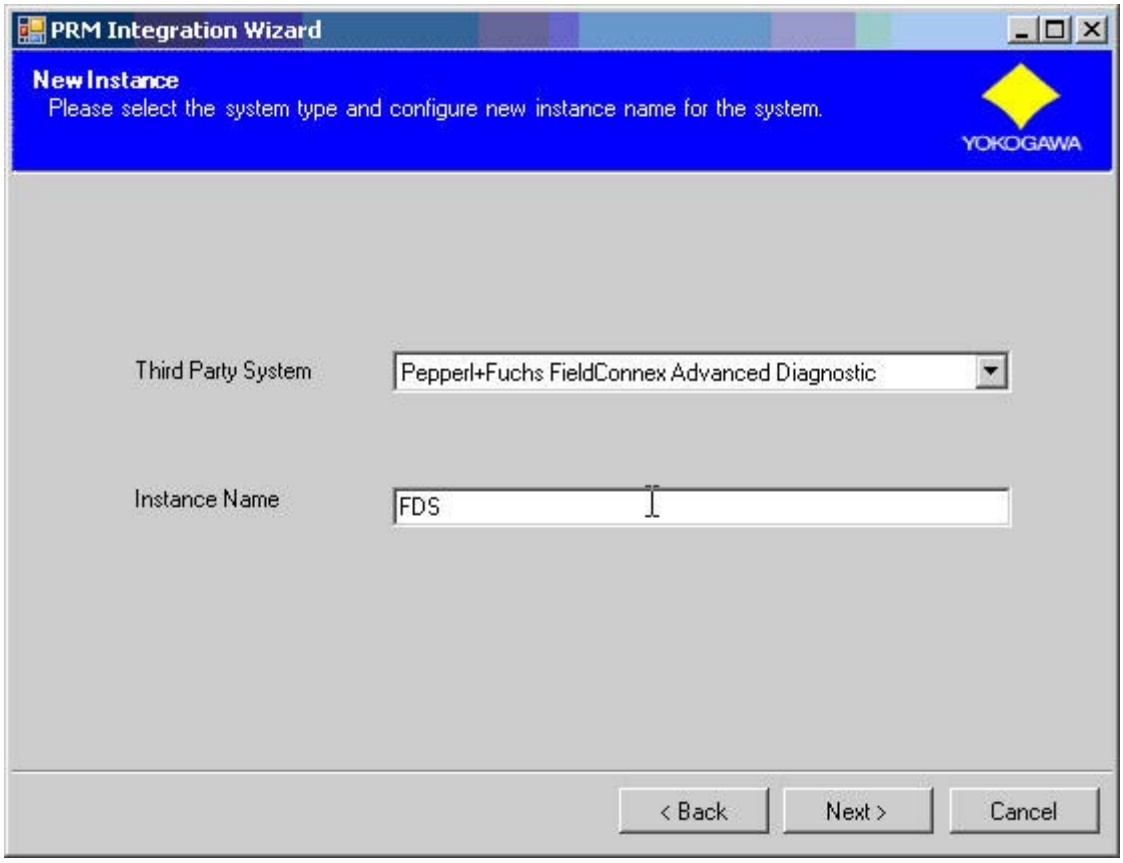
For further information please refer to the HD2-DM-A manual. (Find manual at www.pepperl-fuchs.com).

2. PRM Setup for Integration of 3rd Party Condition Monitoring for Connection to FDS

This step defines the OPC interface information which is needed to pass ADM diagnostic messages to PRM Operator Guidance Messages and PRM Action Guidance Messages.

A. Start Integration Wizard (C:\PRM\Tool\IntegrationWizard\PrmIntegrationWizard.exe).

B. Window New Instance appears.

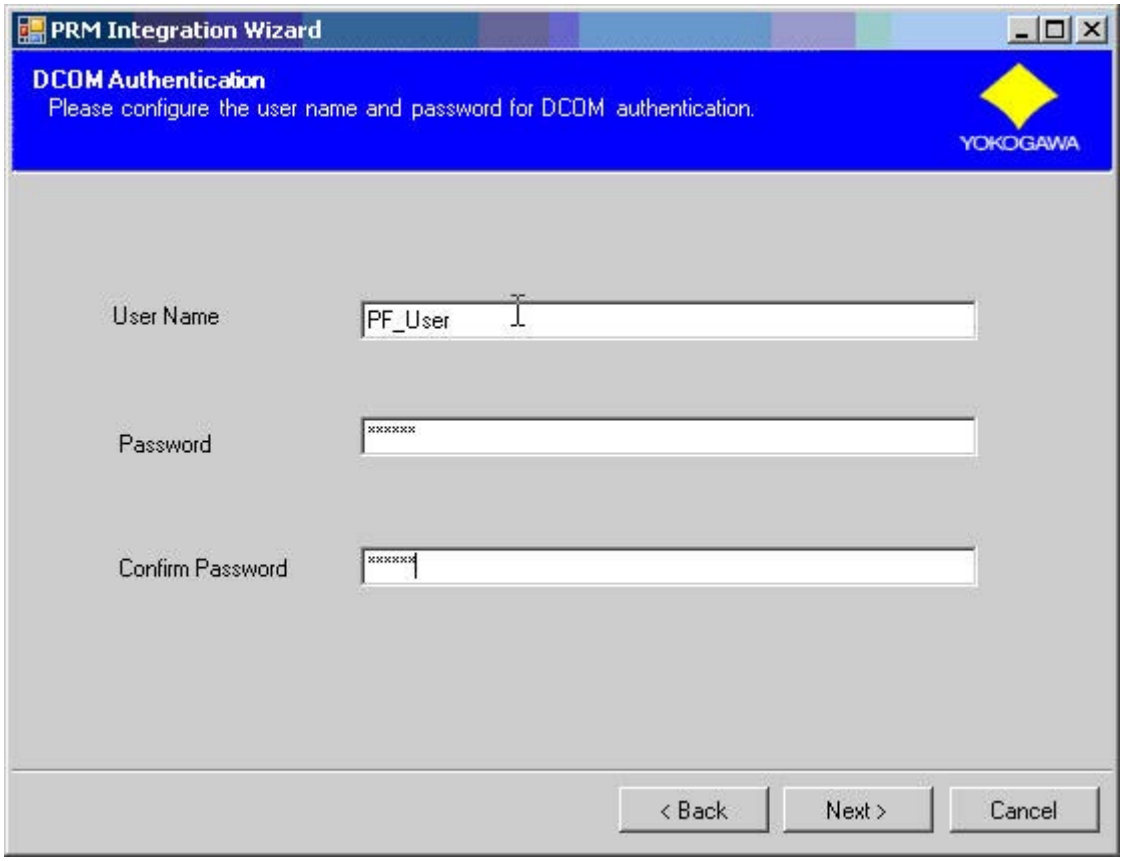


F0309E.ai

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. Window DCOM Authentication appears.



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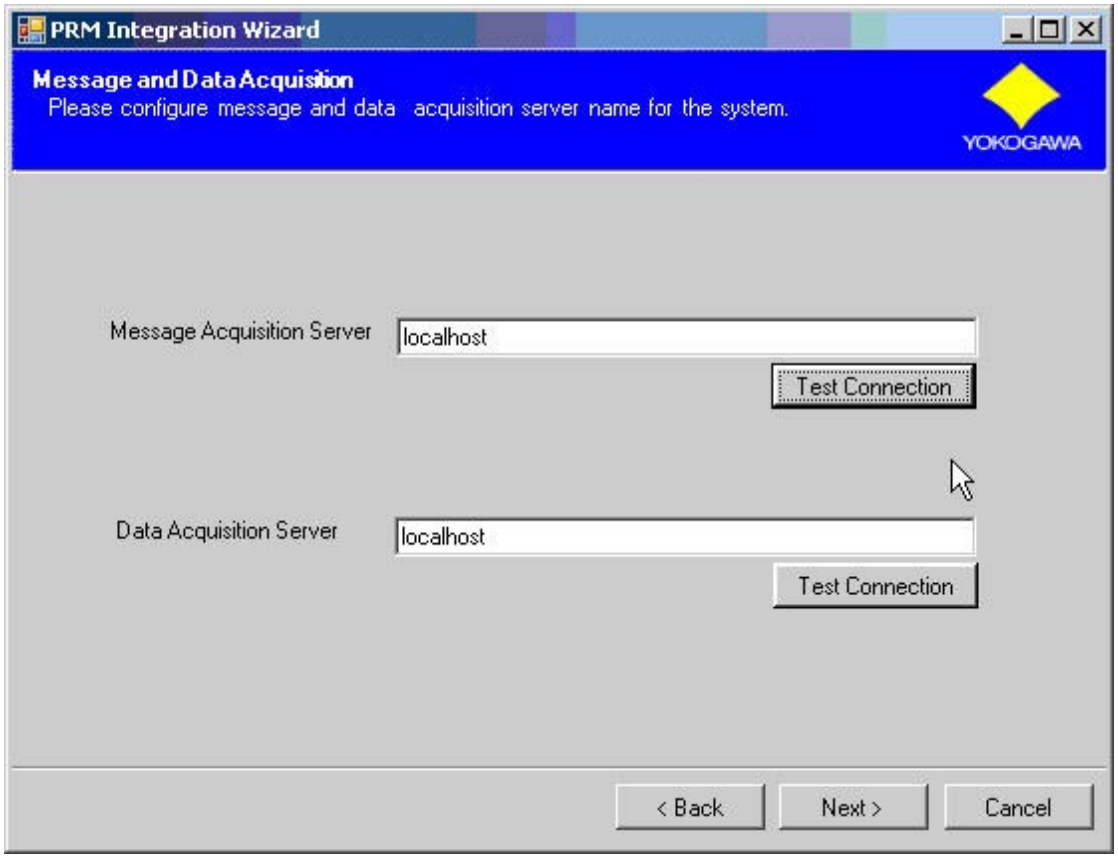
F. Enter name of a local user account and password. Press [Next].

G. Window Message and Data Acquisition appears.



F0311E.ai

H. Enter localhost into fields Message Acquisition Server and Data Acquisition Server. Press [Test Connection] to validate the connection.

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I. Then Press [Next].

J. Window Operation Guide Template appears. Press [Next].

K. Window Integration Summary appears. Press [Finish].

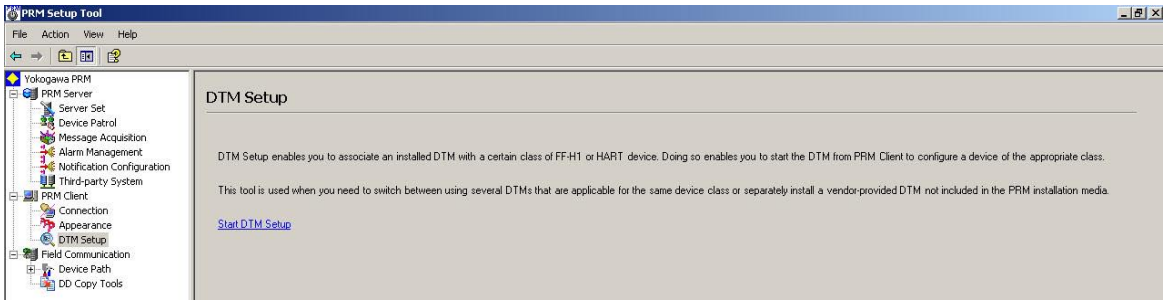
L. Need Restart PRM Server Service dialog appears. Press [OK].

3. Generation of Project Specific PRM Data Base Including ADM

Make sure that the file DevicePath.txt is available within folder C:\PRM\FBCom\Config.

A. Start PRM Setup Tool ([Start] > [All programs] > [YOKOGAWA PRM] > [tool] > [PRM Setup Tool]).

B. Open node [PRM Client] > [DTM Setup] and start DTM setup.



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C. After setup is complete close PRM Setup Tool.

D. Start Yokogawa FDT project management tool (e.g. C:\PRM\Program\FMFieldMate.exe).

E. Create a new FDT project.

F. Open Device Catalog.

G. Add FieldConnex Diagnostic Server (PRM) into a new project.

F0314E.ai

H. Then add a HD2-DM-A device below the FDS.

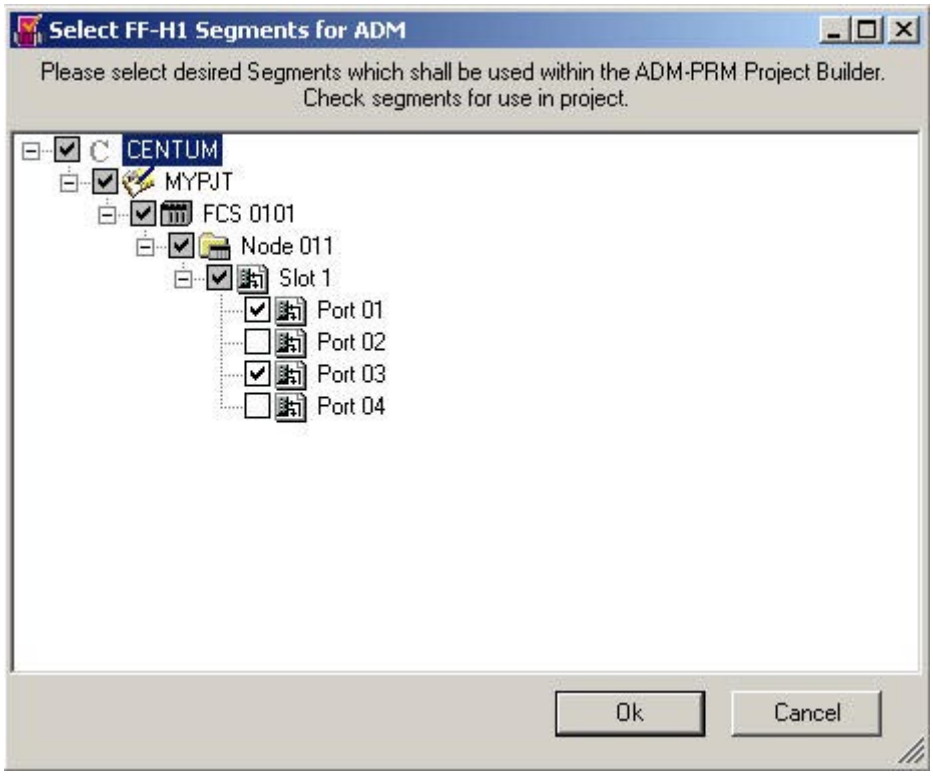
F0315E.ai

I. Double click on node FieldConnex Diagnostic Server (PRM).

J. The Offline-parameterization Window appears. Choose Tab [FDS Topology Settings].

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

L. Choose segments to be monitored with ADM.



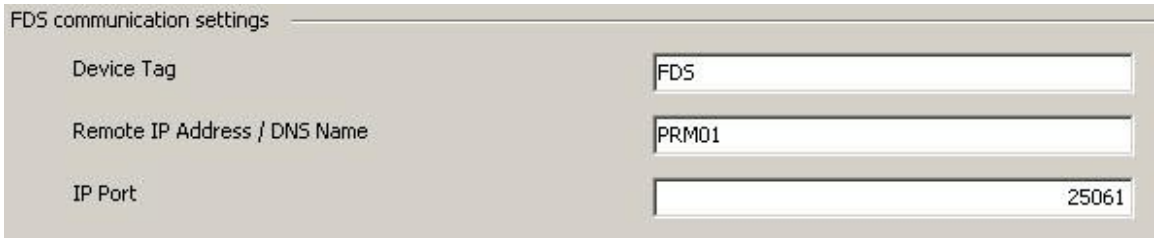
F0316E.ai

M. Press [Ok] to continue.

N. Open Tab [FDS Parameter].

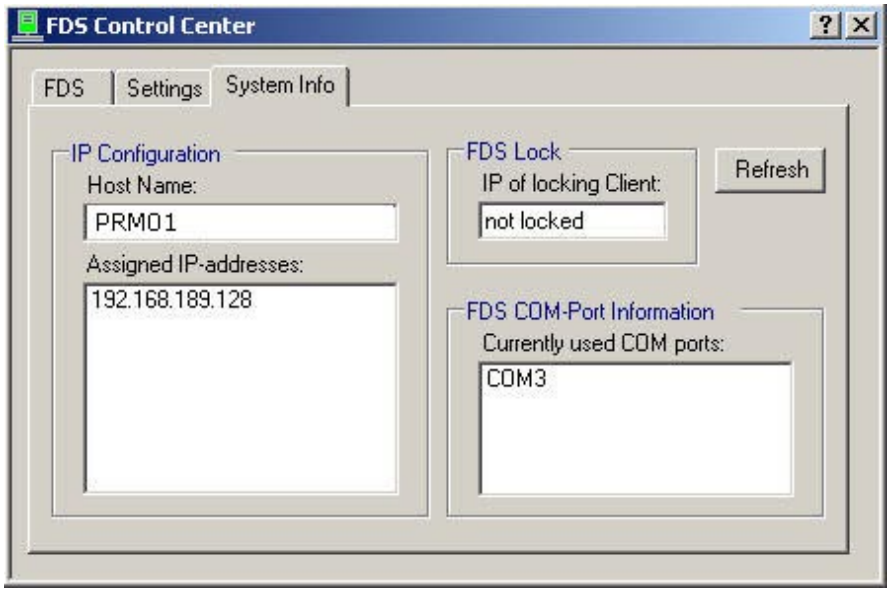
F0322E.ai

O. Enter IP address or host name of the PC/server the FDS is running on. Do not use localhost.



F0323E.ai

You will find this information within the FDS Control Center Console window System Info.



F0324E.ai

P. Press [Set topology].

Q. Press [Export for PRM]. Choose/change export folder and press Export. Three files will be created and saved to the export 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

R. Press [Save FDT Project]

4. Importing Project Structure into PRM

The Yokogawa “PRM Hierarchy Import Tool” imports Plant View and Network View hierarchies’ definitions and devices for the FOUNDATION fieldbus segments which have been created by the Pepperl+Fuchs ADM Project Builder.

A. Start PRM Hierarchy Import Tool (e.g. C:\PRM\Program\HierarchyImport.exe).

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

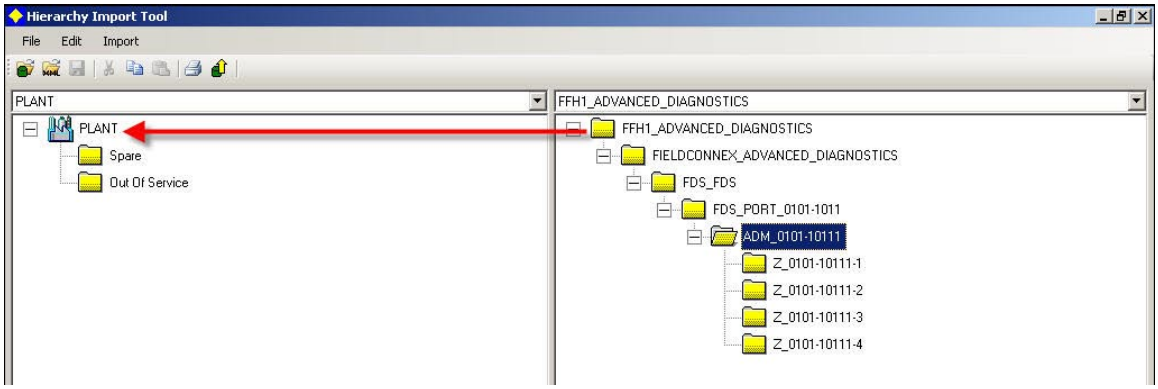
C. Enter log in data and confirm with [OK].

D. Press [Open XML 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.

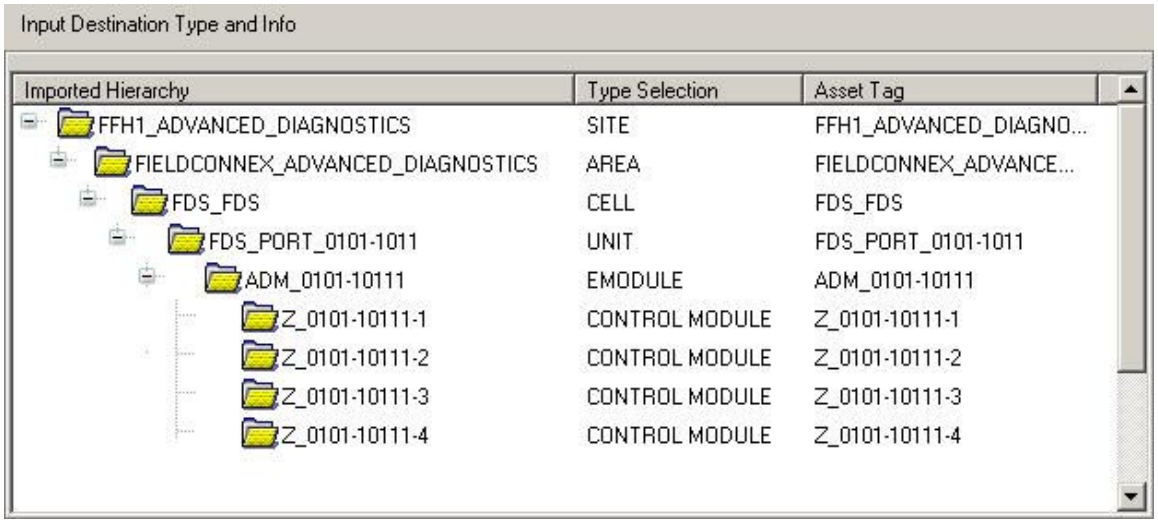
G. Drag&Drop node FFH1 Advanced Diagnostics from the right window into Plant in the left window. The node here is an example. You have to create this structure project-specifically first.



F0317E.ai

H. Window ModifiedImportController appears.

I. Check that the segments are marked with type CONTROL Module within the Type Selection column.



F0318E.ai

J. Confirm with [OK].

K. Press [Upload to database].

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 desired address, for address scheme see label on the module (for further information see also HD2-DM-A manual).

This step has to be performed for each module. The proper address for each module can be found on the report, created at step 3.

6. COM Converter Driver Installation

Because the diagnostic system can be built up with COM Port Converter devices form different manufacturers no detailed information about the installation process can be given here. For further information please refer to the devices manual.

A. Use manufacturers' installation CD of the COM Port Converter to install the appropriate driver.

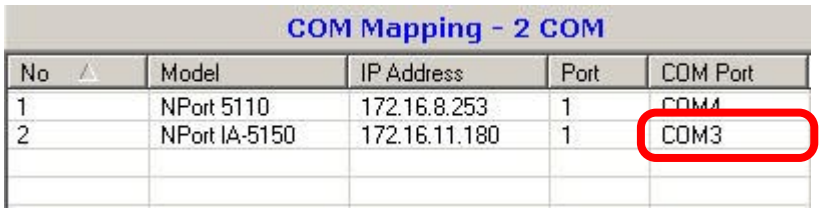
B. When the driver has been installed correctly, open the administration menu of the COM Port Converter driver.

C. Adjust the project specific COM port addresses. You will find this information on the report, created at step 3.

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

7. COM Port Mapping

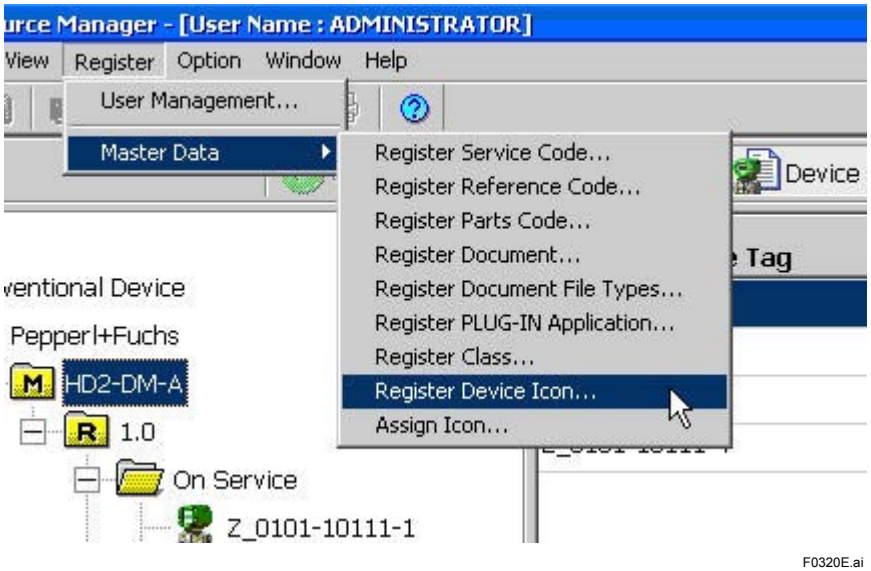
A. Open Driver-/Administration-menu of the COM port converter and enter the COM port and ADM port values. Usually the COM port number will be started from COM20.



8. Add ADM Icons to PRM

A. Start PRM. The currently imported hierarchy should be shown.

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

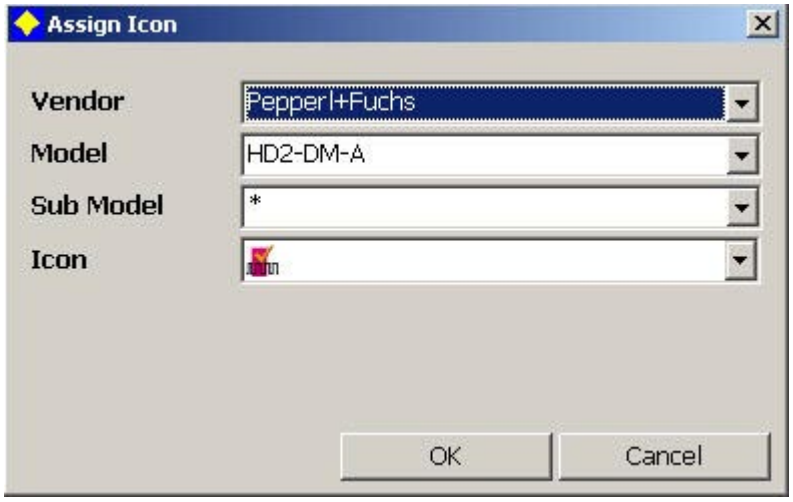


C. Press button [Add…].

D. Choose image ADMBitmap.bmp out of the former created export folder.

E. Confirm with [OK].

F. Choose [Register] > [Master Data] > [Assign Icon] and make the following settings:



F0321E.ai

G. Confirm with [OK].

9. Automatic FOUNDATION fieldbus Segment Diagnostic Commissioning

To match the limits of the monitored physical layer parameters to a specific physical segment within the PRM, an automatic scan and setup procedure has to be launched per 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 data base will be automatically updated with the baseline settings generated by the Commissioning Wizard.

3.6 Installation Topology C Detailed Work Step Description

1. P+F Software Installation

For the P+F tools use the installation CD and proceed as follows:

IMPORTANT

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. This step may be done on each client PC.

IMPORTANT

Install PRM Client software on each client PC.

A. Start Setup.exe on the Diagnostic Manager CD.
B. Accept License.
C. Enter User name and Organization.
D. Choose [Custom Installation].
E. Choose the following settings:

F0305E.ai

F. Click [Next] and proceed with the installation wizard till installation is complete.
G. Execute Activation ([Start] > [Pepperl+Fuchs] > [Activation Tool]).

Server installation PRM

IMPORTANT

Install PRM server software.

Server installation FDS

A. Start Setup.exe on the Diagnostic Manager CD.

B. Accept License.

C. Enter User name and Organization.

D. Choose [Custom Installation].

E. Choose the following settings:

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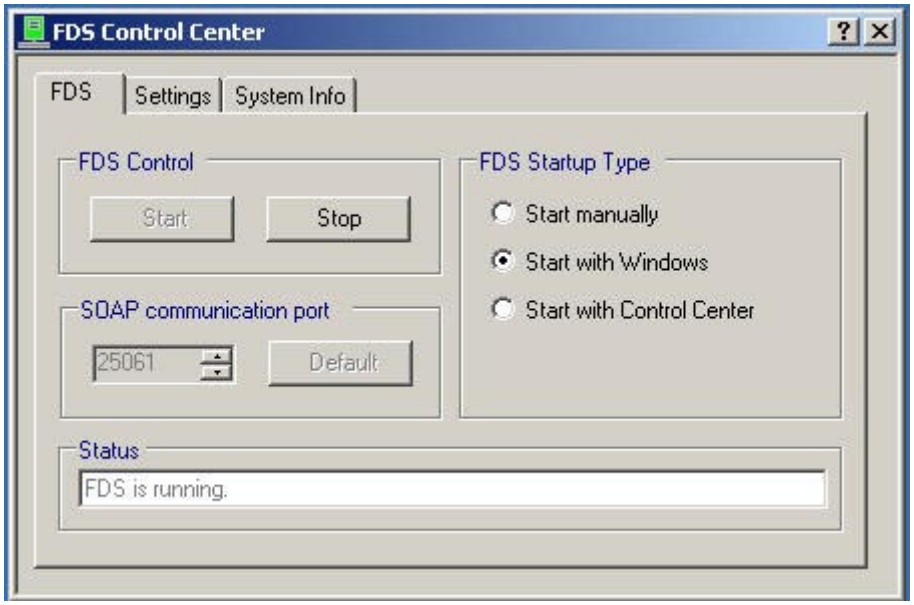
F. Click [Next] and proceed with the installation wizard till installation is complete.

G. Start FDS Control Center within task bar, or click [Start] > [All programs] > [Pepperl+Fuchs] > [FDS Control Center].

H. Make sure that the option [Start with Windows] is enabled within window FDS.



F0308E.ai

I. Open Window Settings.

J. Set Adjust Firewall to allow Remote Access within area Remote Access.

For further information please refer to the HD2-DM-A manual. (Find manual at www.pepperl-fuchs.com).

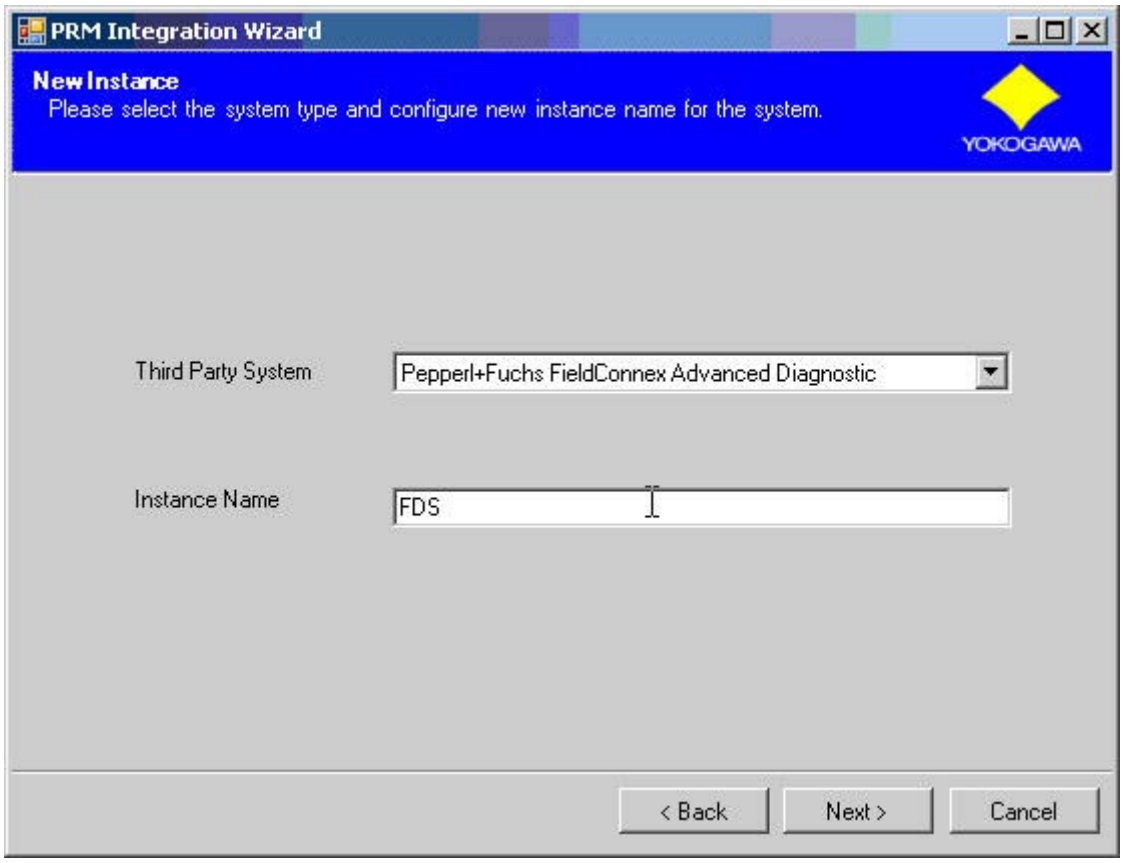
2. PRM Setup for Integration of 3rd Party Condition Monitoring for Connection to FDS

This step defines the OPC interface information which is needed to pass ADM diagnostic messages to PRM Operator Guidance Messages and PRM Action Guidance Messages.

The next steps have to be done on the machine the PRM server is installed on.

A. Start Integration Wizard (e.g. C:\PRM\Tool\IntegrationWizard\PrmIntegrationWizard.exe).

B. Window New Instance appears.

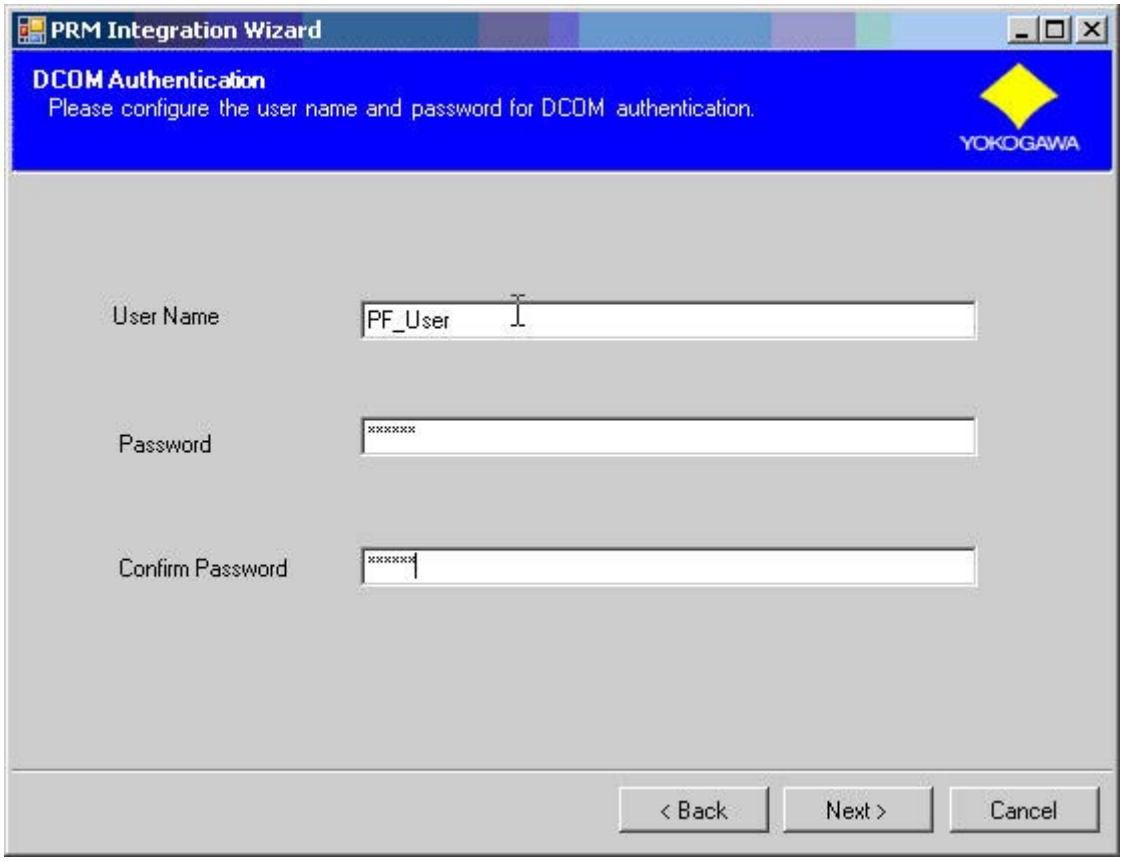


F0309E.ai

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].

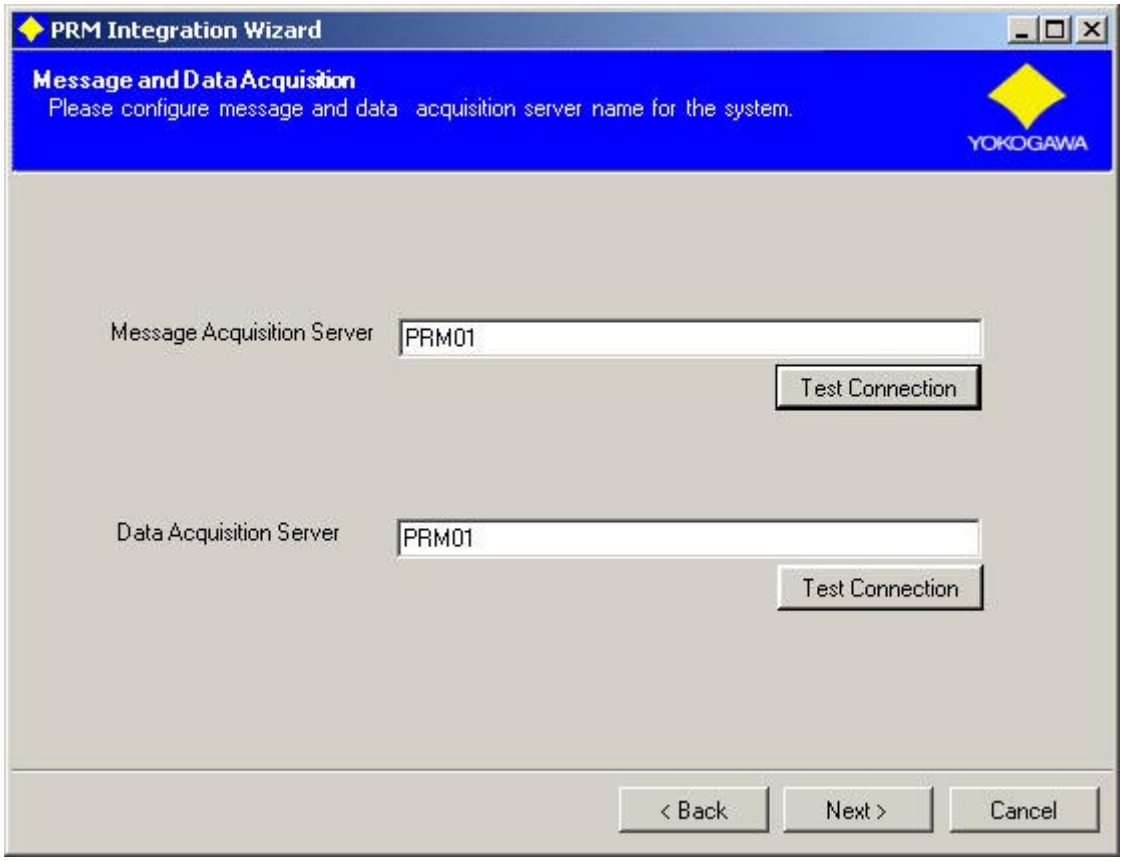
E. Window DCOM Authentication appears.



F0310E.ai

F. Enter name of a local user account and password. Press [Next].

G. Window Message and Data Acquisition appears.



F0325E.ai

H. Enter into fields Message Acquisition Server and Data Acquisition Server the host name or IP address of the PC in both boxes (Don't use localhost, but always the host name or IP address). Press [Test Connection] to validate the connection.

F0312E.ai

I. Then Press [Next].

J. Window Operation Guide Template appears. Press [Next].

K. Window Integration Summary appears. Press [Finish].

L. Need Restart PRM Server Service dialog appears. Press [OK].

The steps M to R have to be done on the machine the FDS is installed on.

M. Make sure the user account used at step F does also exist on the machine the FDS is installed on.

N. Start [FDS Control Center] .

O. Open Window Settings.

P. Set Adjust Firewall to allow Remote Access within area Remote Access.

Q. Press [Start Wizard] within OPC Remote Access.

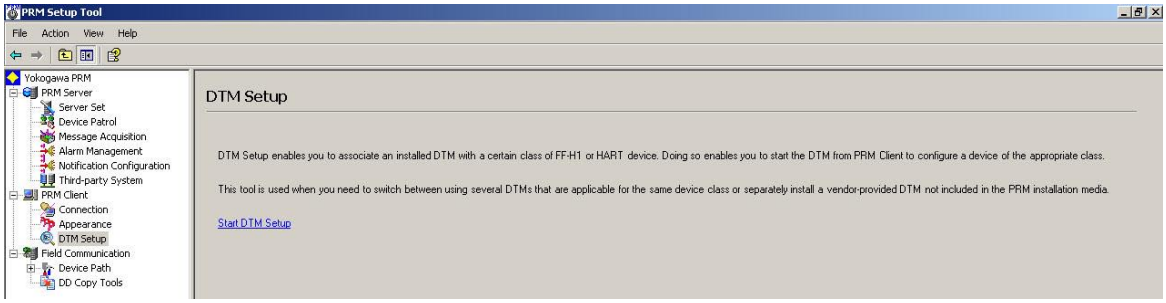
R. Follow instructions of the Wizard, enter local user account (see step F) and press [Next].

3. Generation of Project Specific PRM Data Base Including ADM

Make sure that the file DevicePath.txt is available.

A. Start PRM Setup Tool ([Start] > [All programs] > [YOKOGAWA PRM] > [tool] > [PRM Setup Tool]).

B. Open node [PRM Client] > [DTM Setup] and start DTM setup.



F0313E.ai

C. After setup is complete close PRM Setup Tool.

D. Start Yokogawa FDT project management tool (e.g. C:\PRM\Program\FMFieldMate.exe).

E. Create a new FDT project.

F. Open Device Catalog.

G. Add Device FieldConnex Diagnostic Server (PRM) into a new project.

F0314E.ai

H. Then add a HD2-DM-A device below the FDS.

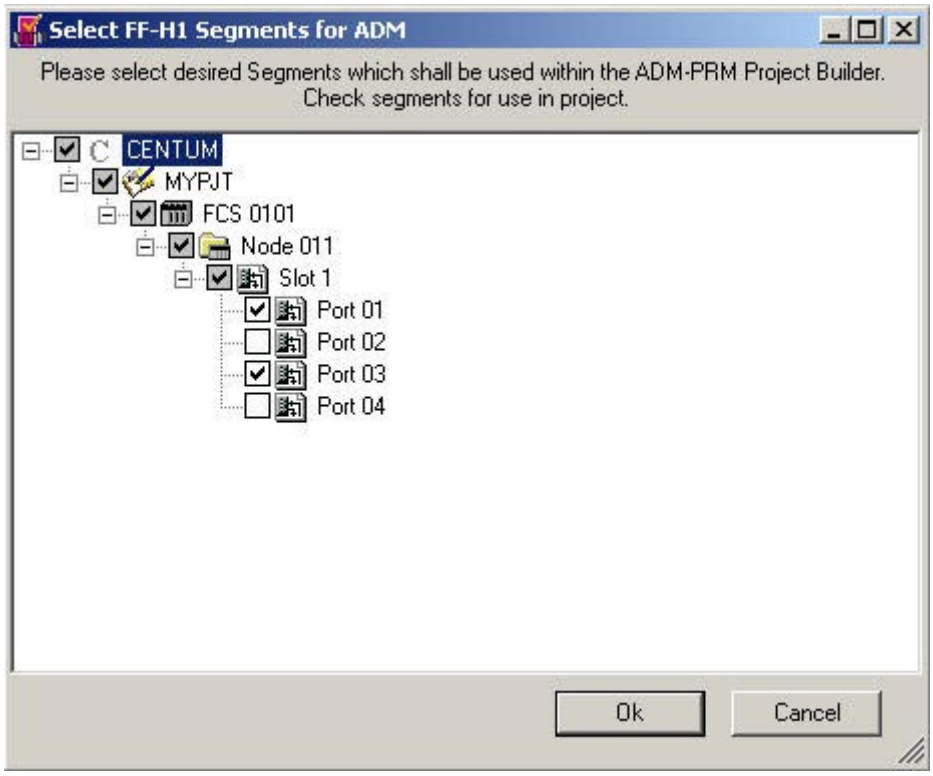
F0315E.ai

I. Double click on node FieldConnex Diagnostic Server (PRM).

J. The Offline-parameterization Window appears. Choose Tab [FDS Topology Settings].

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

L. Choose segments to be monitored with ADM.



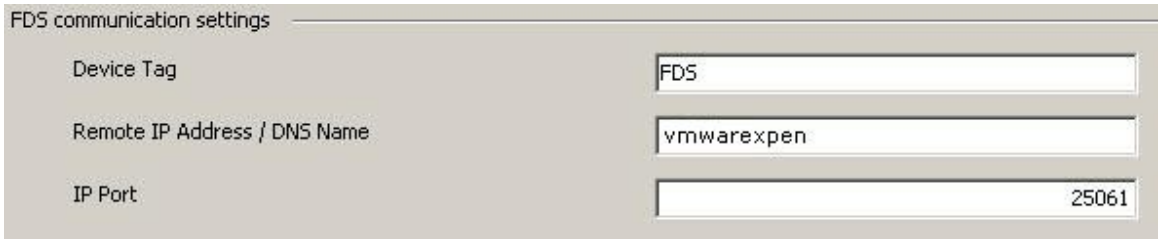
F0316E.ai

M. Press [Ok] to continue.

N. Open Tab [FDS Parameter].

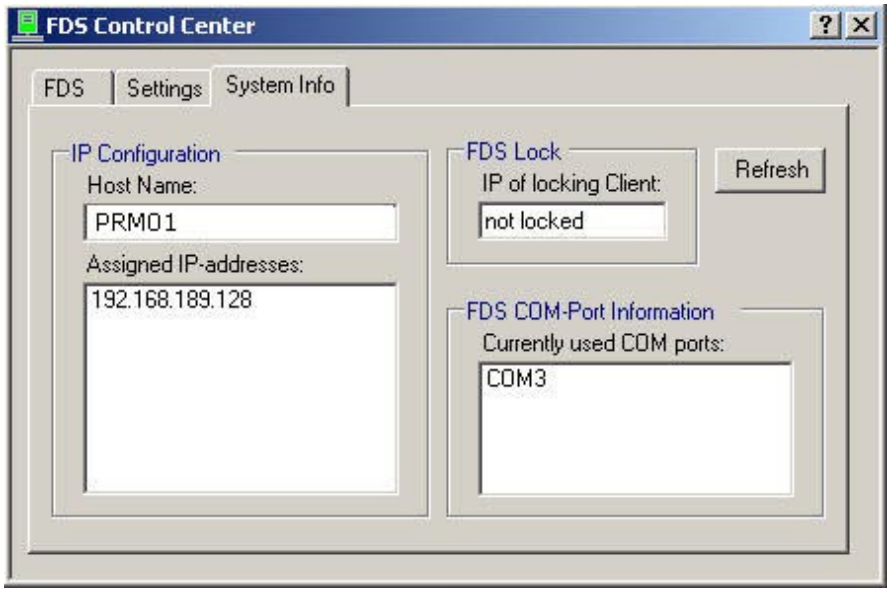
F0322E.ai

O. Enter IP address or host name of the PC/server the FDS is running on. Do not use localhost.



F0326E.ai

You will find this information within the FDS Control Center Console window System Info.



F0324E.ai

P. Press [Set topology].

Q. Press [Export for PRM]. Choose/change export folder and press [Export]. Three files will be created and saved to the export 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

R. Press [Save FDT Project]

4. Importing Project Structure into PRM

The Yokogawa “PRM Hierarchy Import Tool” imports Plant View and Network View hierarchies definitions and devices for the FOUNDATION fieldbus segments which have been created by the Pepperl+Fuchs ADM Project Builder.

A. Start PRM Hierarchy Import Tool (e.g. C:\PRM\Program\HierarchyImport.exe).

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

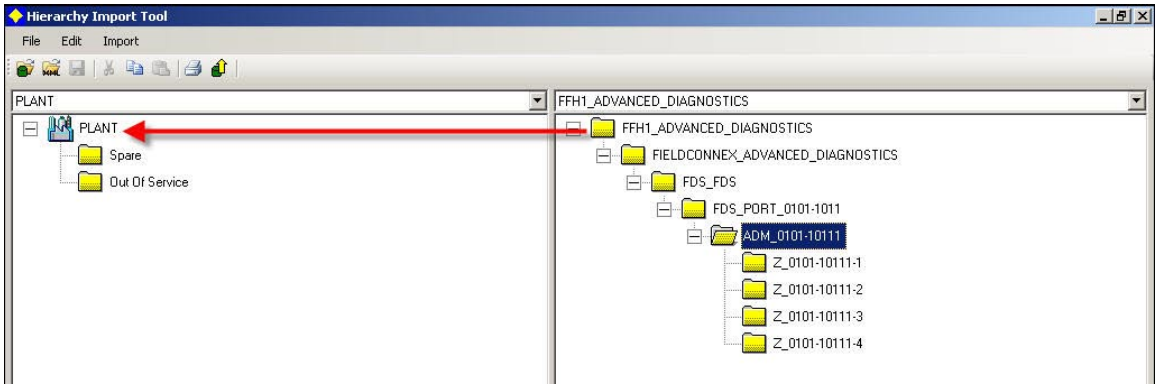
C. Enter log in data and confirm with [OK].

D. Press [Open XML 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.

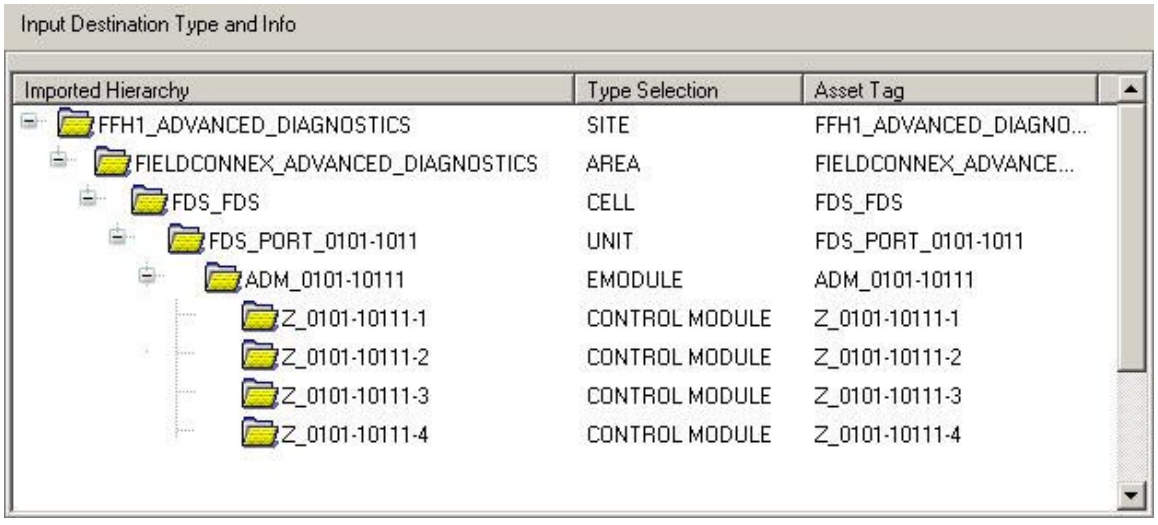
G. Drag&Drop node FFH1 Advanced Diagnostics from the right window into Plant in the left window. The node here is an example. You have to create this structure project-specifically first.



F0317E.ai

H. Window ModifiedImportController appears.

I. Check that the segments are marked with type CONTROL Module within the Type Selection column.



F0318E.ai

J. Confirm with [OK].

K. Press [Upload to database].

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 desired address, for address scheme see label on the module (for further information see also HD2-DM-A manual).

This step has to be performed for each module. The proper address for each module can be found on the report, created at step 3.

6. COM Converter Driver Installation

Because the diagnostic system can be built up with COM Port Converter devices form different manufacturers no detailed information about the installation process can be given here. For further information please refer to the devices manual.

A. Use manufacturers' installation CD of the COM Port Converter to install the appropriate driver.

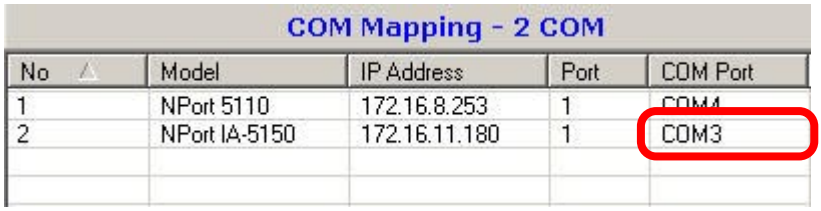
B. When the driver has been installed correctly, open the administration menu of the COM Port Converter driver.

C. Adjust the project specific COM port addresses. You will find this information on the report, created at step 3.

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

7. COM Port Mapping

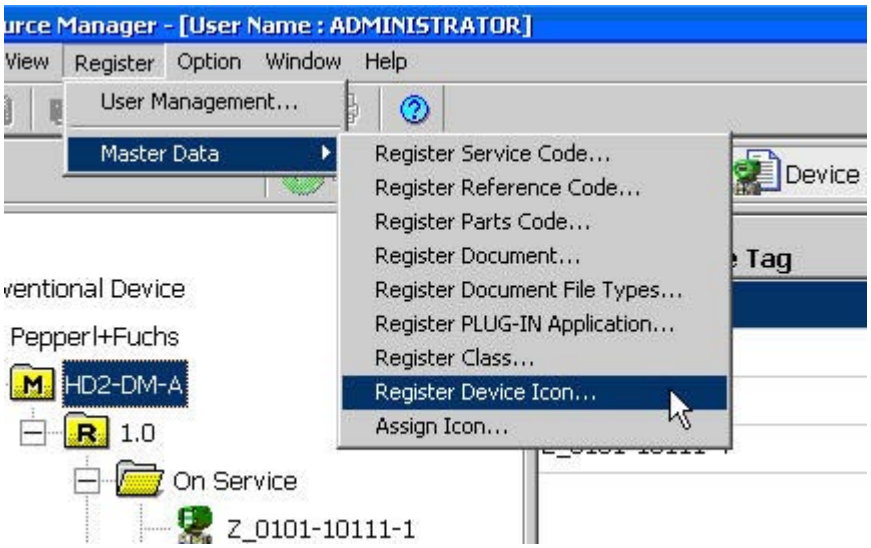
A. Open Driver-/Administration-menu of the COM port converter and enter the COM port and ADM port values. Usually the COM port number will be started from COM20.



8. Add ADM Icons to PRM

A. Start PRM. The currently imported hierarchy should be shown.

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



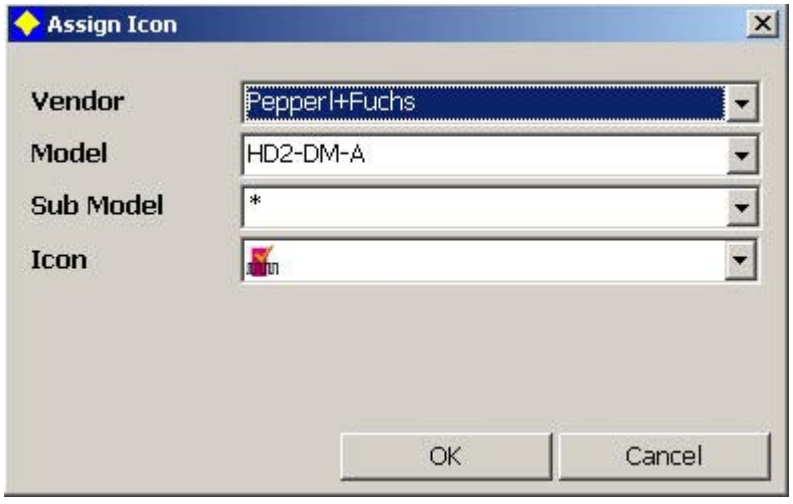
F0320E.ai

C. Press button [Add…].

D. Choose image ADMBitmap.bmp out of the former created export folder.

E. Confirm with [OK].

F. Choose [Register] > [Master Data] > [Assign Icon] and make the following settings:



F0321E.ai

G. Confirm with [OK].

9. Automatic FOUNDATION fieldbus Segment Diagnostic Commissioning

To match the limits of the monitored physical layer parameters to a specific physical segment within the PRM, an automatic scan and setup procedure has to be launched per 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 data base will be automatically updated with the baseline settings generated by the Commissioning Wizard.

4. Operation

4.1 Status, Maintenance and Alarm Messages

The integration of the Pepperl+Fuchs Advanced Diagnostic Module into Yokogawa PRM system is a powerful solution to make the behavior of the H1 physical layer transparent for the user. This will allow operation and maintenance personnel to proactively schedule repair work before communications or plant failure.

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 will be released in the Diagnostic Manager and via the OPC interface in the operator application. By means of 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, and they can be switched on and off but can not be adjusted by the user. If these limits are violated there is an increased risk of communication failure.

4.1.1 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 Error: HW Error was detected for the HD2-DM-A monitoring this segment.
	Grey	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.

4.1.2 Diagnostic Manager Message Information

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

5. How to use

Following you will find an overview about the workflow and work steps that have to be done when receiving a message.

The general work flow is:

- The message for the operator generated by the Advanced Diagnostic Module can be detected by CENTUM CAMS for HIS. Now the Operator may 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, then the maintenance personnel selects the Diagnostic Manager on PRM Device navigator then right mouse click > open DTM Works. The current segment which the message has occurred is directly shown and active for detailed analysis.
  - Alarm is not active anymore > acknowledge message.

Fig. 5-1 shows a stylized overview about involved personnel, software tools and activities.

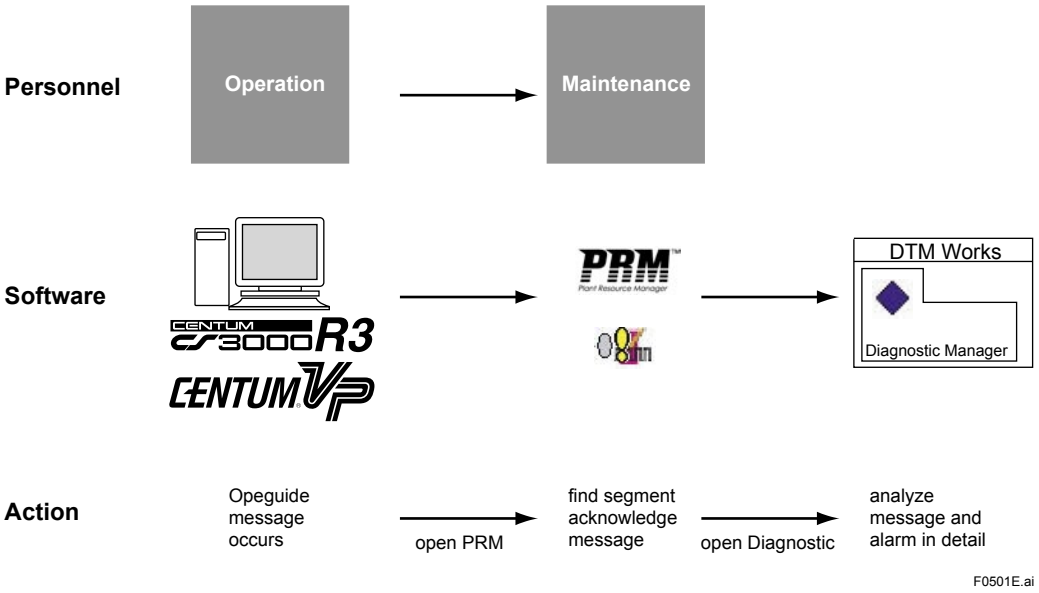
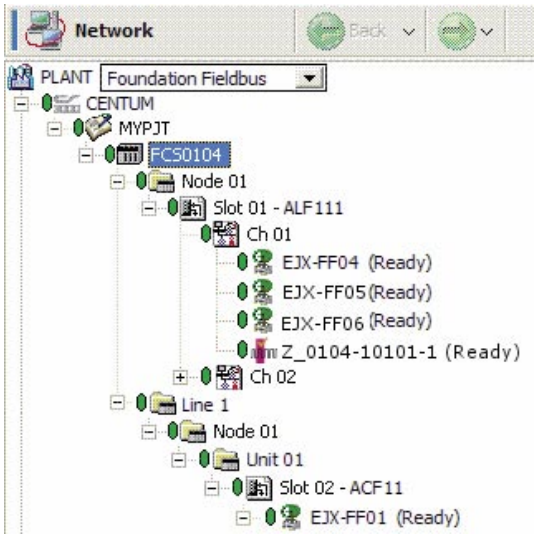
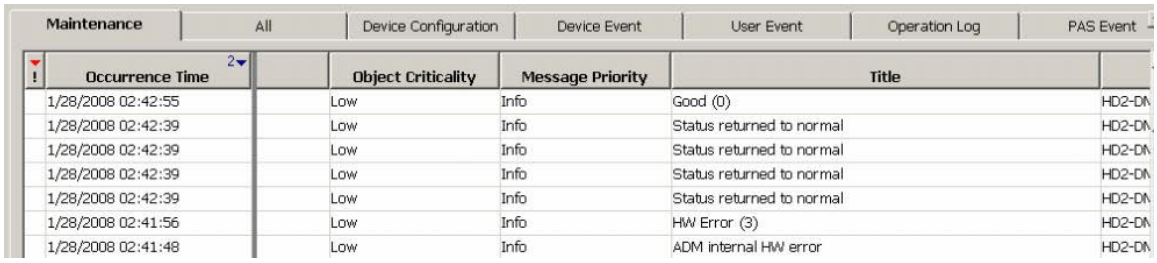


Fig. 5-1 General workflow overview



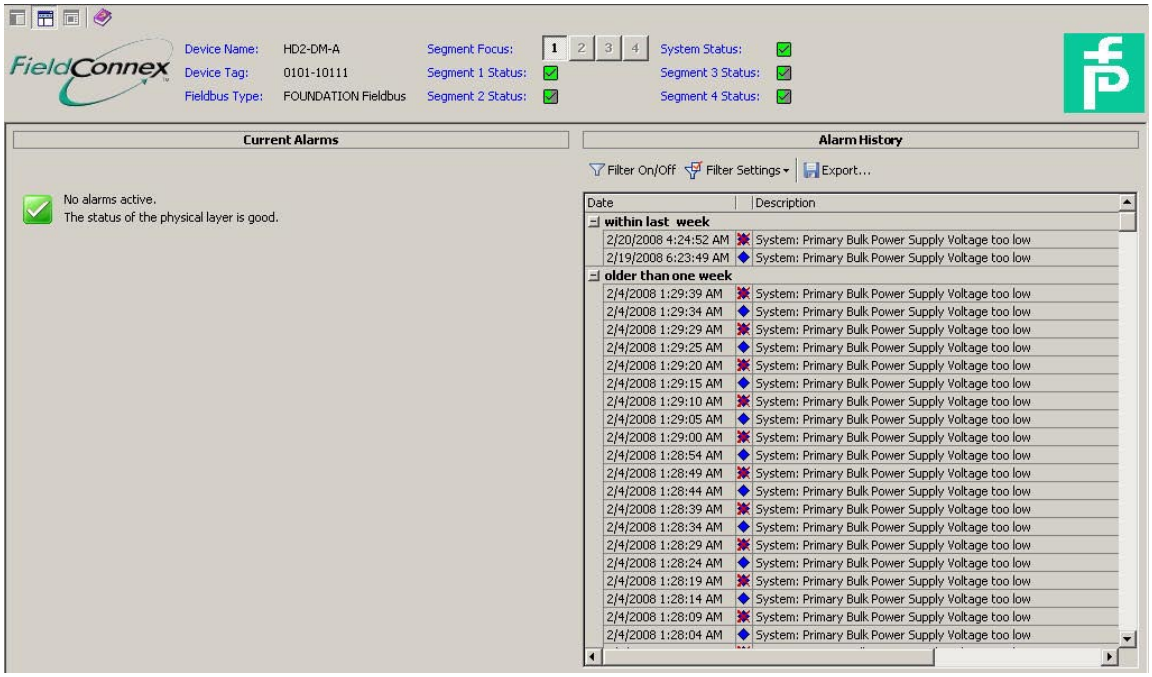
F0502E.ai

Fig. 5-2 Status Representation within PRM



F0503E.ai

Fig. 5-3 Message view within PRM



F0504E.ai

Fig. 5-4 Diagnostic Manager detailed view

6. 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 could make sense to perform a complete engineering from the beginning. To change single settings find the instructions below.

6.1 Add Fieldbus Segments

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

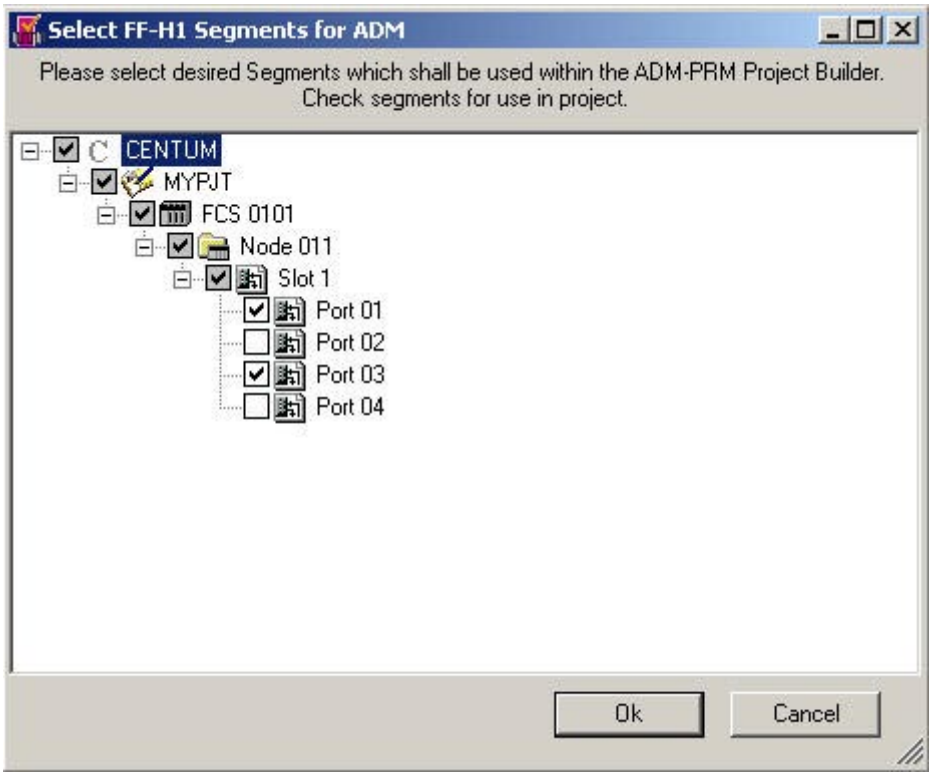
A. Start Yokogawa FDT project management tool (e.g. C:\PRM\Program\FMFieldMate.exe).

B. Double click on node FieldConnex Diagnostic Server (PRM).

C. The Offline-parameterization Window appears. Choose Tab [FDS Topology Settings].

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

E. Choose all segments to be monitored with ADM.



F0601E.ai

F. Press [Ok] to continue.

G. Press [Set topology].

H. Press [Export for PRM]. Choose/change export folder and press Export. Three files will be created and saved at the export 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

I. Start PRM Hierarchy Import Tool (e.g. C:\PRM\Program\HierarchyImport.exe).

J. Press [Open PRM Hierarchy]. Log in dialog appears.

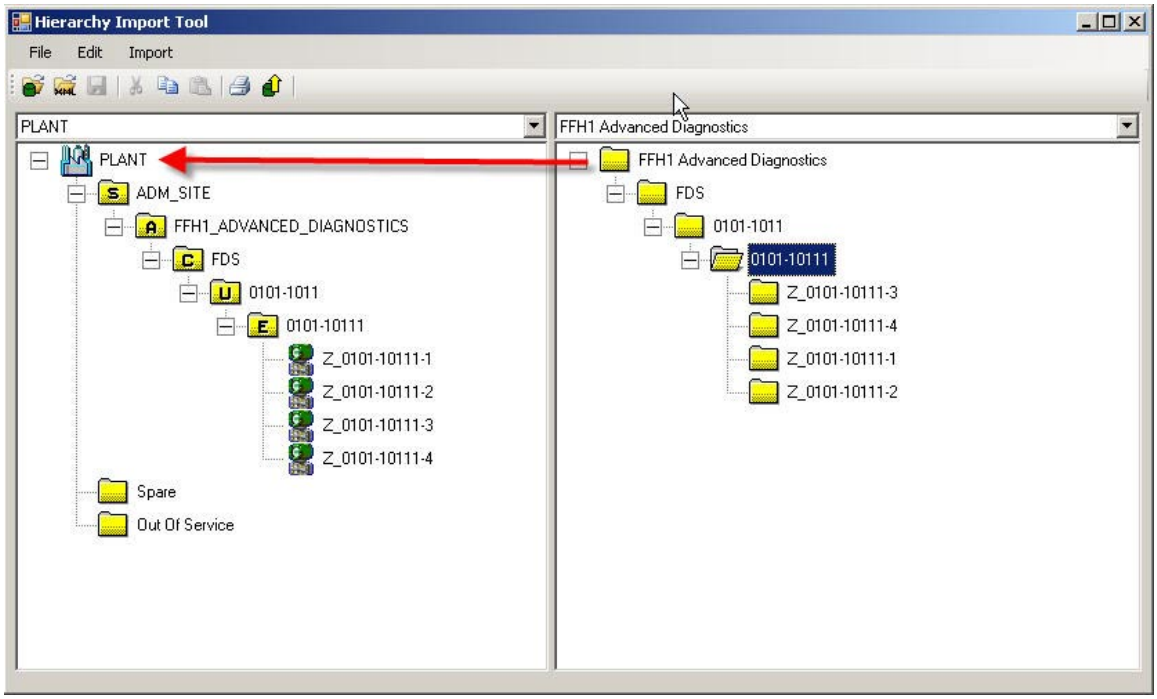
K. Enter log in data and confirm with [OK].

L. Press [Open XML import file].

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

N. Choose file ADM_devices_mimosa.xml from the export folder you created earlier.

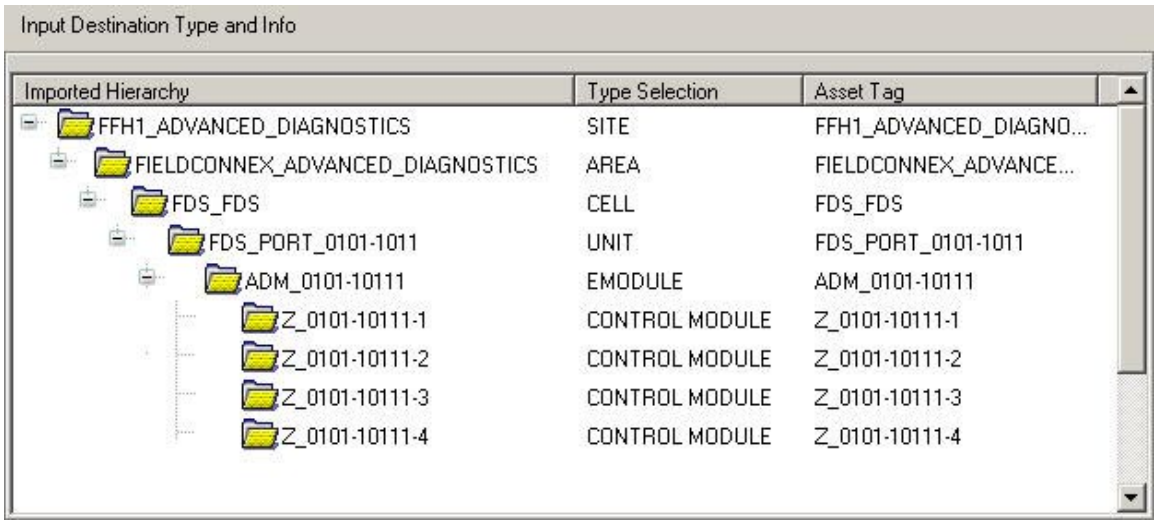
O. Drag&Drop node FFH1 Advanced Diagnostics from the right window into Plant in the left window. The node here is an example. You have to create this structure project-specifically first.



F0602E.ai

P. Window ModifiedImportController appears.

Q. Check that the segments are marked with type CONTROL Module within the Type Selection column.



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R. Confirm with [OK].

S. Press [Upload to database].

6.2 Change COM Port or ADM Address Configurations

6.2.1 Overview about Possible Configuration Changes

Following configurations can be done for the FDS:

Rearrange Ports	This function is changing all COM ports beneath this FDS node. You can choose the starting COM port number of the first port; all following will be numbered serially.
Add Port	This function adds a new COM port to this particular FDS node. Requires a new import of the ADM_devices_mimosa.xml file within PRM Hierarchy Import Tool.

Following configurations can be done for the COM port:

Change Address	This function is changing the COM port address this particular port.
Change Tag	This function is changing the tag of this particular COM port. Requires a new 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 COM port. You can choose the starting address number for the first device; all following will be numbered serially.
Delete	This function removes the COM port with all connected HD2-DM-A modules.

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.

6.2.2 Example of a Changing Procedure

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

IMPORTANT

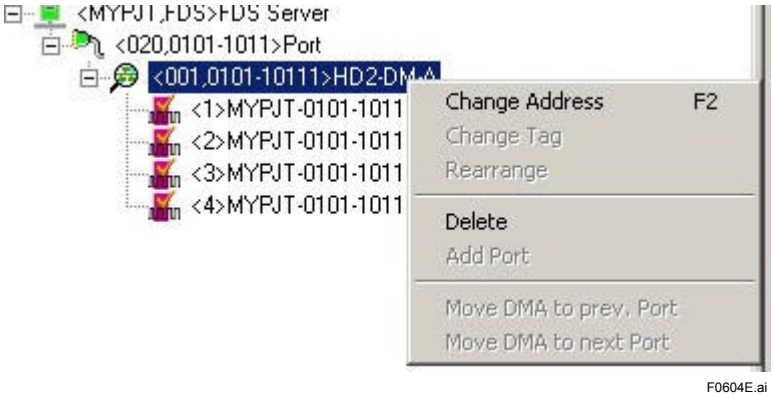
The Rearrange functions causing major changes within the configuration.

A. Start Yokogawa FDT project management tool (e.g. C:\PRM\Program\FMFieldMate.exe).

B. Double click on node FieldConnex Diagnostic Server (PRM).

C. The Offline-parameterization Window appears. Choose Tab [FDS Topology Settings].

D. Right Mouse Click on HD2-DM-A.



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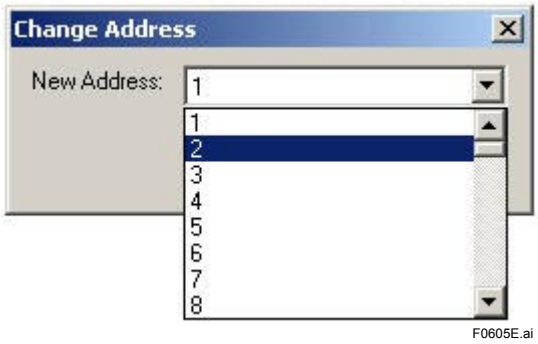
E. Choose [Change Address].



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F. Choose address.

G. Press [Set topology] within toolbar.

H. Press [Save FDT Project].

If you have added a COM port or changed a COM port tag proceed with the following steps additionally:

A. Start PRM Hierarchy Import Tool (e.g. C:\PRM\Program\HierarchyImport.exe).

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

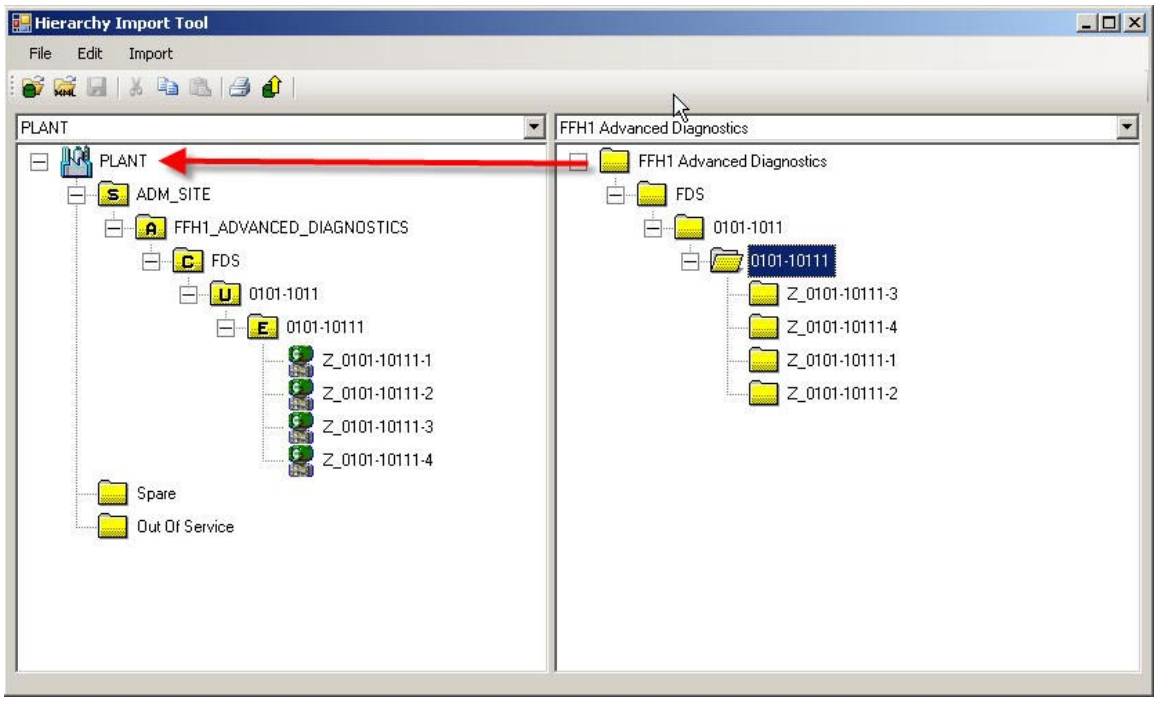
C. Enter log in data and confirm with [OK].

D. Press [Open XML 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.

G. Drag&Drop node FFH1 Advanced Diagnostics from the right window into Plant in the left window. The node here is an example. You have to create this structure project-specifically first.



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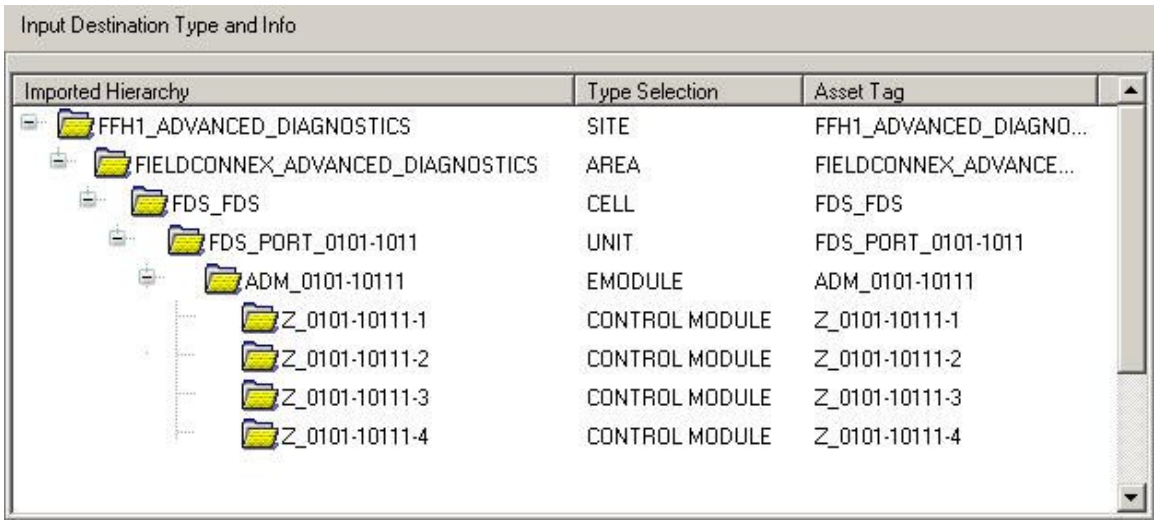
H. Window ModifiedImportController appears.

I. Check that the segments are marked with type CONTROL Module within the Type Selection column.



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J. Confirm with [OK].

K. Press [Upload to database].

6.3 Remove Advanced Diagnostic Modules or Segments

Make sure that the new file DevicePath.txt is available within folder e.g. C:\PRM\FBCom\Config.

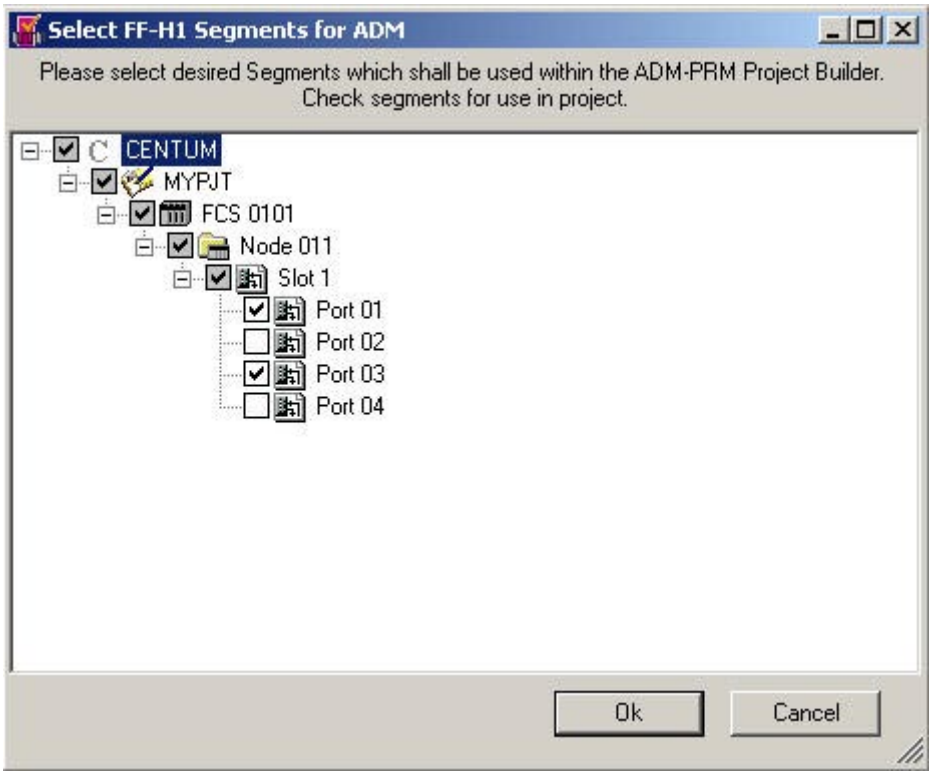
A. Start Yokogawa FDT project management tool (e.g. C:\PRM\Program\FMFieldMate.exe).

B. Double click on node FieldConnex Diagnostic Server (PRM).

C. The Offline-parameterization Window appears. Choose Tab [FDS Topology Settings].

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

E. Choose all segments to be monitored with ADM, exclude the segments/ ADM ports you want to delete from the current configuration.



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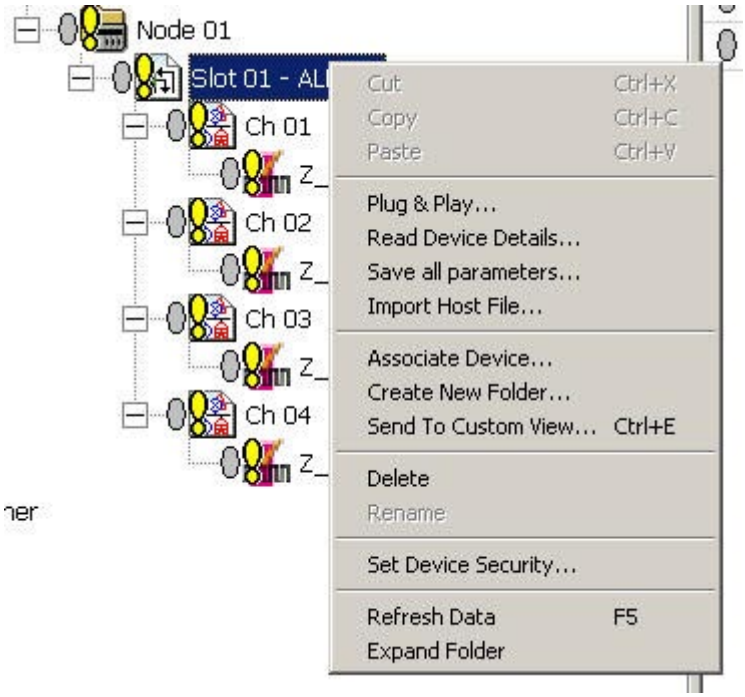
F. Press [Ok] to continue.

G. Press [Set topology].

H. Start PRM.

I. Search within the topology for the current excluded segments/ ADM ports. Right Mouse Click on the node and choose Delete.



6.4 Shift Advanced Diagnostic Modules to other Ports

Make sure that the new file DevicePath.txt is available within folder e.g. C:\PRM\FBCom\Config.

A. Start Yokogawa FDT project management tool (e.g. C:\PRM\Program\FMFieldMate.exe).

B. Double click on node FieldConnex Diagnostic Server (PRM).

C. The Offline-parameterization Window appears. Choose Tab [FDS Topology Settings].

D. Add ADM node to the appropriate port.

E. Press [Set topology].

F. Press [Export for PRM]. Choose/change export folder and press Export. Three files will be created and saved to the export 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

G. Start PRM Hierarchy Import Tool (e.g. C:\PRM\Program\HierarchyImport.exe).

H. Press [Open PRM Hierarchy]. Log in dialog appears.

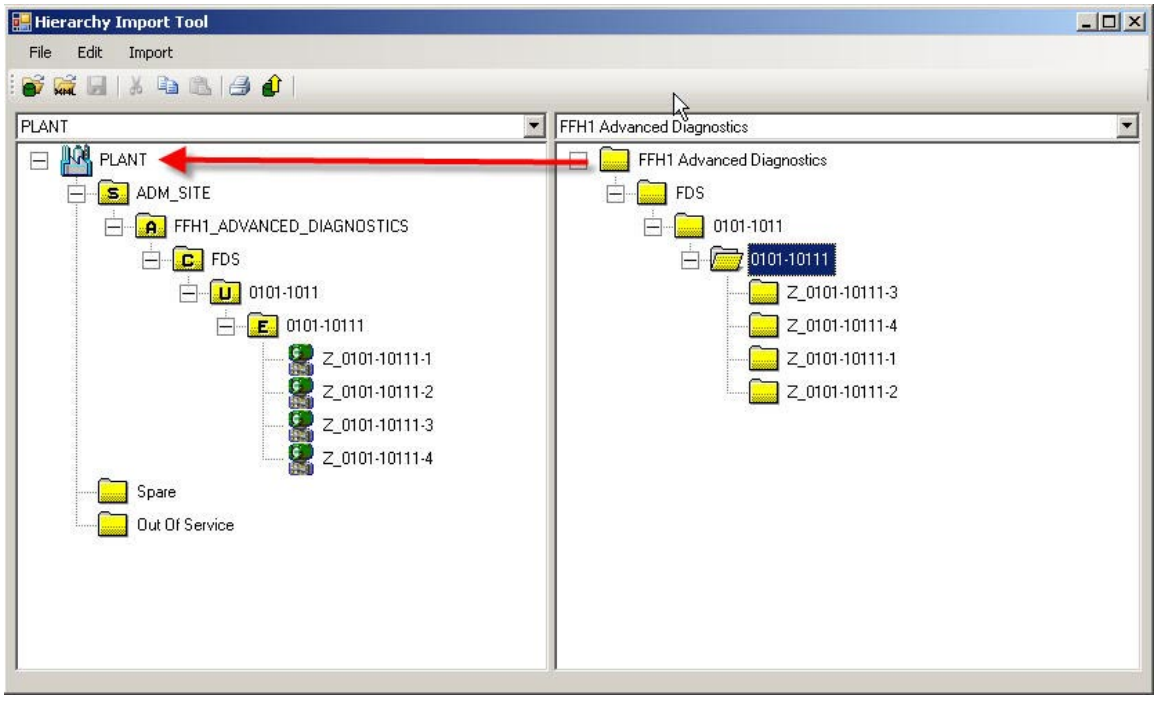
I. Enter log in data and confirm with [OK].

J. Press [Open XML import file].

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

L. Choose file ADM_devices_mimosa.xml from the export folder you created earlier.

M. Drag&Drop node FFH1 Advanced Diagnostics from the right window into Plant in the left window. The node here is an example. You have to create this structure project-specifically first.



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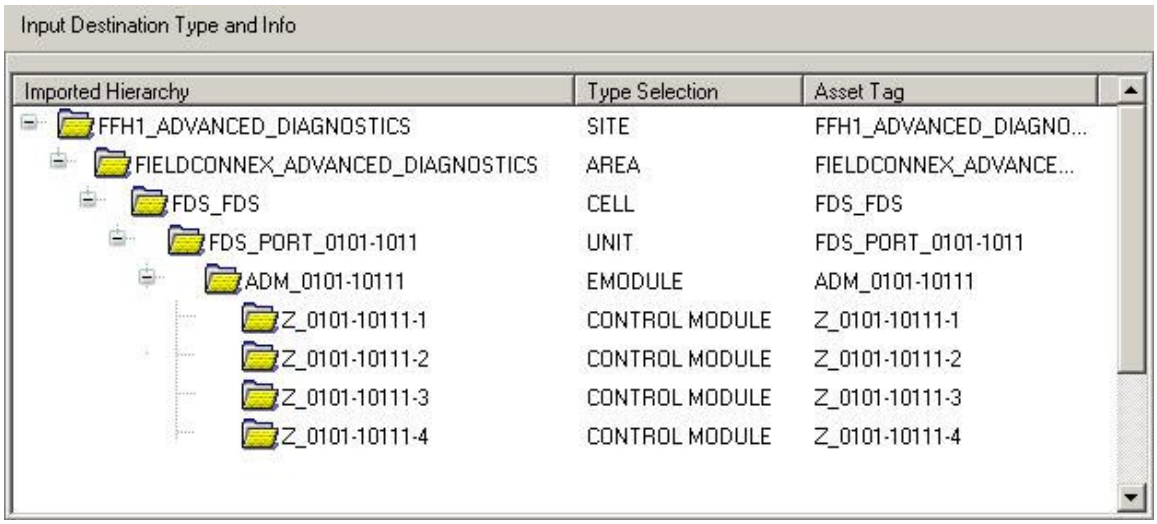
N. Window ModifiedImportController appears.

O. Check that the segments are marked with type CONTROL Module within the Type Selection column.



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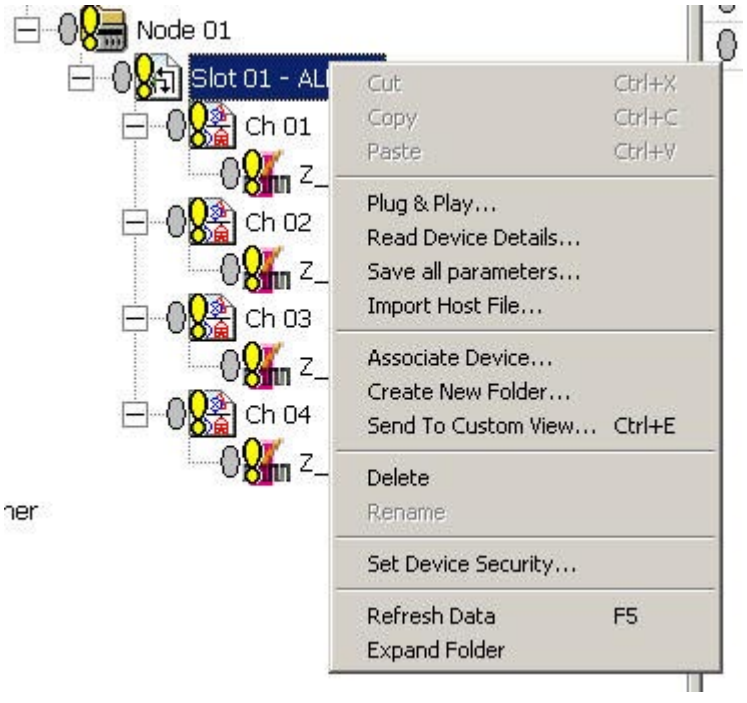
P. Confirm with [OK].

Q. Press [Upload to database].

R. Start PRM.

S. Search within the topology for the current moved segments/ ADM ports. Right Mouse Click on the node and choose Delete.



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