Industrial IT
Asset Master 5.0
Powered by 800xA System Version 5.0

Basic Configuration and Operation

Industrial IT enabled

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Asset Master 5.0
Powered by 800xA System Version 5.0

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Release: January 2007
Document number: 3KXD151800R4201

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Appendix A - Terminology

About This Book

General

This manual describes the configuration, operation and commissioning of Asset Master including display navigation, device integration for Foundation Fieldbus, PROFIBUS and HART.

Document Conventions

The following conventions are used for the presentation of content:

- The words in names of screen elements (for example, the title in the title bar of a window, the label for a field of a dialog box) are initially capitalized.
- Capital letters are used for the name of a keyboard key if it is labeled on the keyboard. For example, press the ENTER key.
- Lowercase letters are used for the name of a keyboard key that is not labeled on the keyboard. For example, the **space bar**, **comma key**, and so on.
- Press **CTRL+C** indicates that you must hold down the CTRL key while pressing the C key (to copy a selected object in this case).
- Press **ESC E C** indicates that you press and release each key in sequence (to copy a selected object in this case).
- The names of push and toggle buttons are boldfaced. For example, click **OK**.
- The names of menus and menu items are boldfaced. For example, the **File** menu.
  - The following convention is used for menu operations: MenuName > MenuItem > CascadedMenuItem. For example: select **File** > **New** > **Type**.

  - The **Start** menu name always refers to the Start menu on the Windows Task Bar.

- System prompts/messages are shown in the Courier font, and user responses/input are in the boldfaced Courier font. For example, if you enter a value out of range, the following message is displayed:

```
Entered value is not valid. The value must be 0 to 30.
```

You may be asked to enter the string TIC132 in a field. The string is shown as follows in the procedure:

`TIC132`

Variables are shown using lowercase letters.

sequence name

Warning, Caution, Information, and Tip Icons

This publication includes **Warning**, **Caution**, and **Information** where appropriate to point out safety related or other important information. It also includes **Tip** to point out useful hints to the reader. The corresponding symbols should be interpreted as follows:

Electrical warning icon indicates the presence of a hazard which could result in *electrical shock.*

Warning icon indicates the presence of a hazard which could result in *personal injury.*

Caution icon indicates important information or warning related to the concept discussed in the text. It might indicate the presence of a hazard which could result in *corruption of software or damage to equipment/property.*

Information icon alerts the reader to pertinent facts and conditions.

Tip icon indicates advice on, for example, how to design your project or how to use a certain function

Although **Warning** hazards are related to personal injury, and **Caution** hazards are associated with equipment or property damage, it should be understood that operation of damaged equipment could, under certain operational conditions, result in degraded process performance leading to personal injury or death. Therefore, **fully comply** with all **Warning** and **Caution** notices.

Terminology

A list of terms associated with Asset Master is provided at Appendix A, Terminology.

Related Documentation

Following is a list of documents related to Asset Master.

Title	Description
Asset Master 5.0 Installation	This manual descries how to install Asset Master software.
Asset Master 5.0 Advanced Configuration Manual	This document provides greater detail on all areas of usage of Asset Master. It is intended for advanced usage of Asset Master covering details such as SNMP and CMMS setup.
Industrial Ethernet: A Pocket Guide Publisher: ISA - The Instrumentation, Systems, and Automation Society, May 2002 ISBN: 1556177887	How to Plan, Install, and Maintain TCP/IP Ethernet Networks: The Basic Reference Guide for Automation and Process Control Engineers.
Foundation Fieldbus: A Pocket Guide Publisher: ISA - The Instrumentation, Systems, and Automation Society, July 2002 ISBN: 1556177755	Summary of background information, tips, tricks, and items to note when installing, maintaining, or trouble-shooting.

Additional Information Related to Documentation

This book refers, at places, to 800xA System documentation and individual product documentation. Consider the following while referring to these documents in the context of Asset Master:

- Ignore all the sections and descriptions referring to 800xA specific configuration and operation. For example:
  - Configuration of AC800M controller and its I/O Modules
  - User Interfaces like Plant Explorer Workplace, Operator Workplace etc,.
  - All referrences to ControlBuilder M
- Relate 800xA user accounts to corresponding Asset Master user accounts. For example: “800xA Service User” corresponds to “Asset Master Service User”.

Section 1 Overview

Asset Master is an application used for configuration, parameterization, diagnostics and maintenance of field devices.

The key functional areas within Asset Master are:

- Field Device Management
- Asset Optimization

Users have access to information from these areas via the Asset Master Workplace. The traditional engineering functions for device parameterization and configuration are available.

The enabling technique for the above is the Aspect Object™ technology.

For further information, refer to:

- *3BDS100972R5001 - Industrial*^{IT} *800xA System Engineering Concepts*

The documents can be found on DVD1 in the folder *Released Documentation\800xA*. Alternately, the latest version of the documents can be downloaded from ABB Solutions Bank.

System Functions - Introduction and Description

Aspects Object - Introduction

What is an Aspect Object™?

Any plant today is made up of many tangible entities such as pipes, tanks, valves, motors etc,. In the Aspect Object solution these entities or objects are modeled in Asset Master. Such a modeled object is called an “Aspect Object” and can be a simple lowest level object or contain other objects. Objects containing other objects are called composite objects.

The Aspect Object system can also handle computer related objects the same way as real entity objects. Example of such objects are user object, node object, workplace object etc.

What is an Aspect?

There are a number of different types of information connected to each object. These types of information are called Aspects in the Aspect Object solution. For example a valve may have a mechanical drawing, an operation manual and so on. Aspect Objects have a number of default aspects; for example its name.

Aspect Objects are visualized with different tools like trends, alarm lists, etc. The aspect context menu for an object is displayed by right- clicking on it. This will display a list of present aspects from which a desired aspect can be selected. Depending on the aspect and the environment, the information will be presented on the screen in the appropriate tool.

What is an Aspect View?

A view is a visual representation of an aspect on the screen. Some aspects have more than one view. One example is an Acrobat Reader **.pdf* file of the Operation Manual. Most aspects also have a configuration view.

Object Types

An Object Type defines certain characteristics that are common to several physical objects, such as a basic set of common aspects. This makes it possible to create and efficiently re-use standardized solutions to frequently recurring problems. For example, rather than building an Object from scratch for every valve in a plant, you can define a set of valve object types, and then create all valve objects as instances of these types. When an instance of an object type is created, the aspects that are defined in the object type are instantiated and associated with it.

Basic Structures

The Asset Master allows you to build up and maintain a model for the plant that has to be managed and supervised.

The relations between objects are established by placing them in one of the following predefined basic structures for aspect objects:

- Functional Structure
- Location Structure
- Control Structure
- Asset Structure

Placing objects into these predefined structures supports the navigation among engineering data, and the designation of the objects in the plant. One aspect object can be part of several structures at the same time Figure 1.

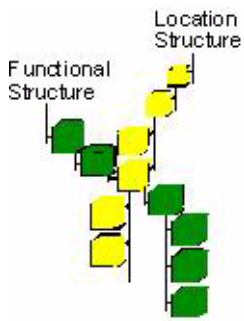

Figure 1. One Aspect Object in two structures

Asset Master Start-up

Open Asset Master Workplace

Open the Asset Master Workplace by double-clicking the My ePlant icon on desktop.

Figure 2. My ePlant Icon

Alternatively, right-clicking on the icon, a Workplace can be selected from a displayed context menu. For Asset Master there is only one Workplace and as the default Workplace it is boldfaced. The next section displays the available system, which is named Asset Master.

The Workplace cannot be opened if the system is not running. To start the system, the logged on user must have administrator privileges. The system is started by opening the Configuration Wizard by double clicking it on the desktop or by selecting it at **Start > All Programs > ABB Industrial IT 800xA > System > Configuration Wizard**.

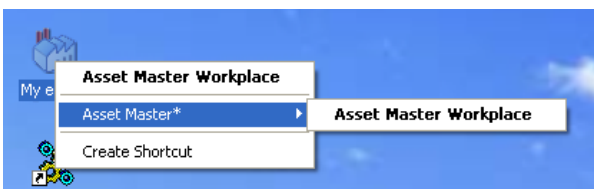

Figure 3. Context Menu of My ePlant Icon

The workplace can also be started by selecting **Start > All Programs > ABB Industrial IT 800xA > System > Workplace**. The ABB Workplace Login window opens on the screen, see Figure 4.

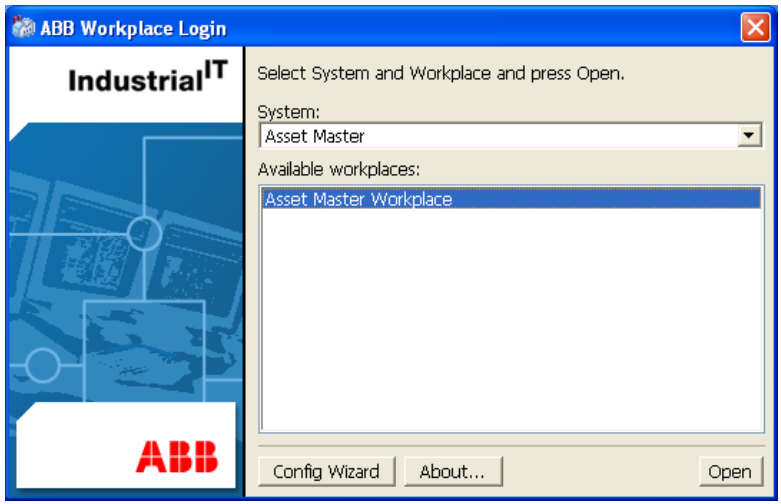

Figure 4. Asset Master Workplace Login

Select the system that you want to login to in the **System** drop-down menu. The available workplace for the chosen system is displayed. Then select the workplace you want to use and click the **Open** button.

Close Asset Master Workplace

Use the **Close Workplace** button in the Application Bar to close the Asset Master Workplace.

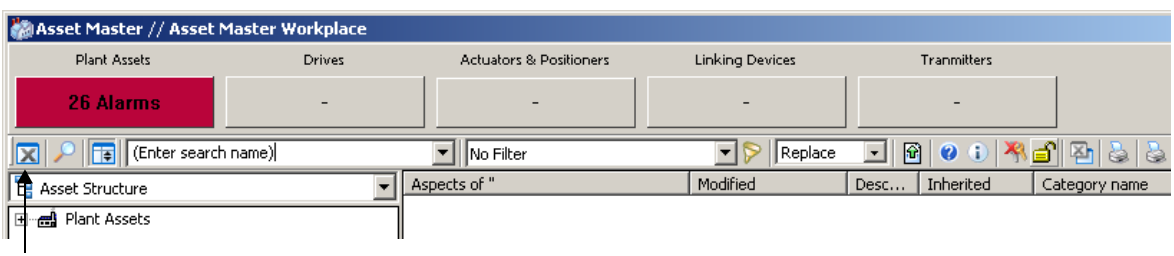

Figure 5. Close Asset Master Workplace

Asset Master Workplace

The Asset Master Workplace is the environment from which the user views and configures the plant devices.

Basic Display

The Asset Master Workplace Window is divided into these main parts: the Application Bar, two Object Browser, the Aspect Browser, the Display Bar, the Display Area and the Status Bar, all of which are described in this section.

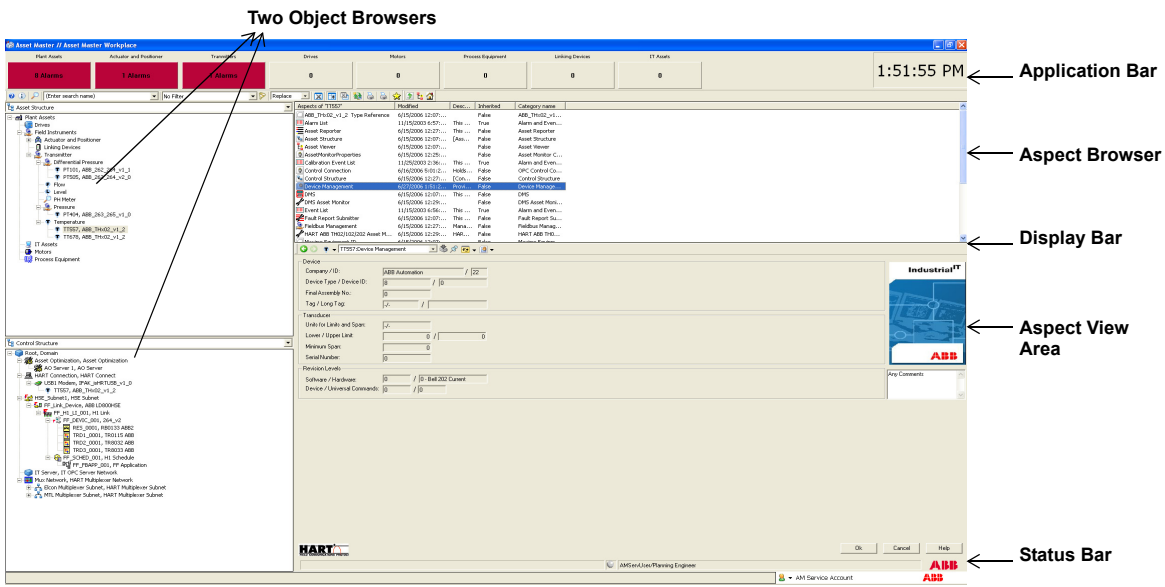

Figure 6. Asset Master Workplace

Application Bar

The Application Bar occupies the area at the top of the Asset Master Workplace window. It is used to show information that must be visible all the time.

The main use is to show the latest alarms, give easy access to the alarm situation for a process area as well as direct links to displays or other aspects and tools.

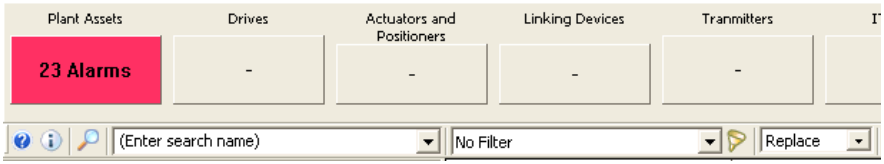

Figure 7. Application Bar

- The **Alarm Band** provides a summary display for selected alarm lists and provides a link to the corresponding alarm list display. The number on a button (for example 11 for Process Alarms) represents the number of currently unacknowledged alarms. The color of the button shows the highest priority alarm presented at the moment. To go to an alarm list, click on the button. See for more information about the alarm band.

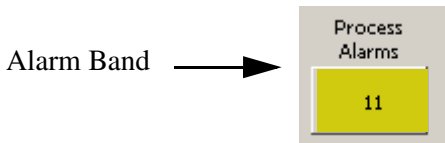

Figure 8. Alarm Band

- The **Tool Bar** gives you access to different useful tools.

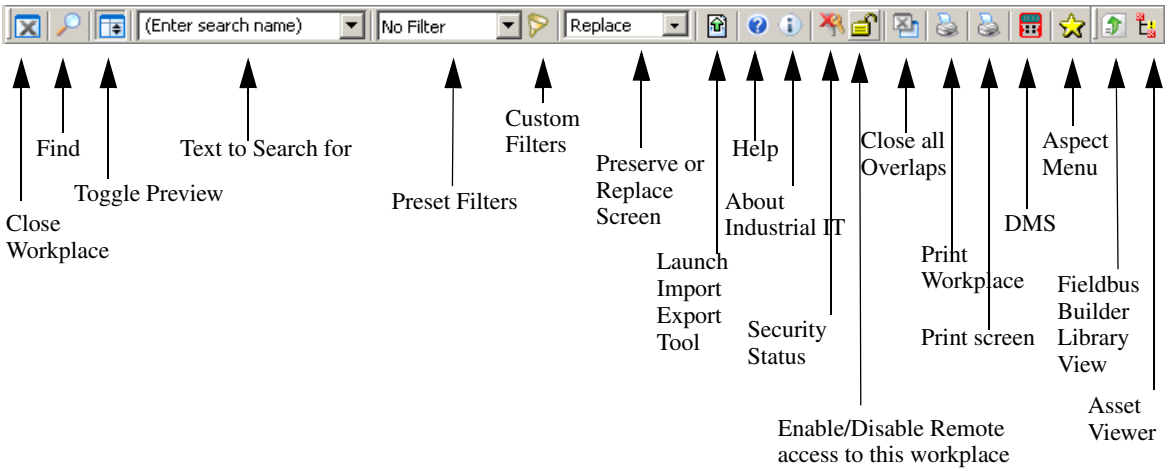

Figure 9. The Tool Bar

- The **Find Tool** gives fast access to one particular aspect or aspect objects sharing the same name by typing the name of the aspect object or the path to the aspect object in the Find Tool dialog.
- The **Toggle Preview** switches the Aspect Viewer on and off. When it is switched on, the Aspect Viewer is not shown. When the button is not switched on the Aspect Viewer is displayed.
- **Aspect Menu (Favorites)** shows a listing of the aspects that you have chosen to place in the favorites list for fast access. See also Favorites.
- **Print Screen** is used to print the Operator Workplace contents. The screen where the tool is clicked will be printed.
- **Close All Overlaps** will close all overlapping windows (pop-up windows) opened in the Operator Workplace.
- **Show Help** shows the On-line Help.
- **About Industrial IT...** shows information about the installed systems and extensions
- **FF Upload** displays the FF Upload aspect.
- **Asset Viewer** displays the plant assets object type structure (FF libraries).

– **DMS** - opens the Meriam's DMS software.

Object Browser

The object browser lists all objects created or inserted into the selected structure. The viewed objects vary depending on the selected structure. Below is the Control Structure which lists objects related to how they physically connect to the control system. Below is the Asset Structure which lists objects by the type of asset they represent.

Selection of the structure to view and interact with objects is made using the pull down list. In the Asset Master workplace, there are 2 object browser lists, with one directly over the other. The default view with the top list using the Asset Structure and bottom list using the Control Structure can be freely changed with other structure selections. The same object can appear in multiple structures. Copying of an object shortcut from one structure to another is supported by drag-and-drop while holding the shift-key. Right clicking on an object calls up a context menu allowing selection of other aspects or actions (i.e., alarm acknowledgement). Objects are maintained in an object tree format similar to that used by Windows Explorer. Indented objects are grouped under non-indented objects for better understanding of the relationship between objects.

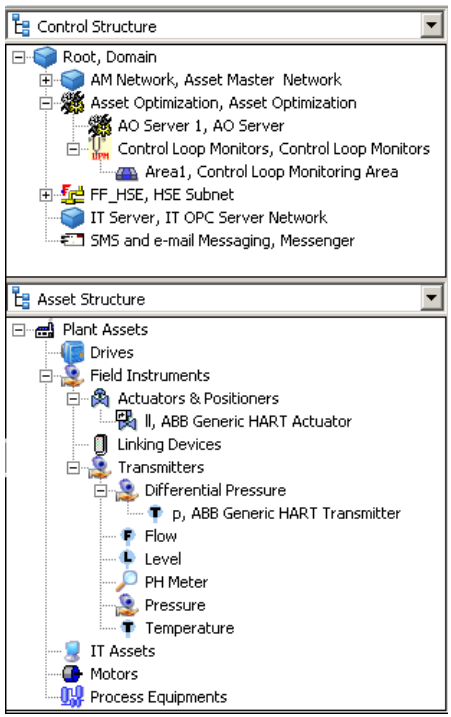

Figure 10. Object Browsers

Aspect Browser

The aspect browser lists all aspects created or inserted for the selected object. The selected object can be from either object browser list with the last selected object being the one used to populate the aspect browser. Unlike the object browser, the aspect browser lists all aspects in a flat structure without any grouping or indenting of aspects. Right clicking on an aspect calls up a context menu allowing selection of other aspects or actions (i.e., alarm acknowledgement). Each aspect has a default view. Selection of an Aspect in the Aspect Browser list puts the default view into the Display Area.

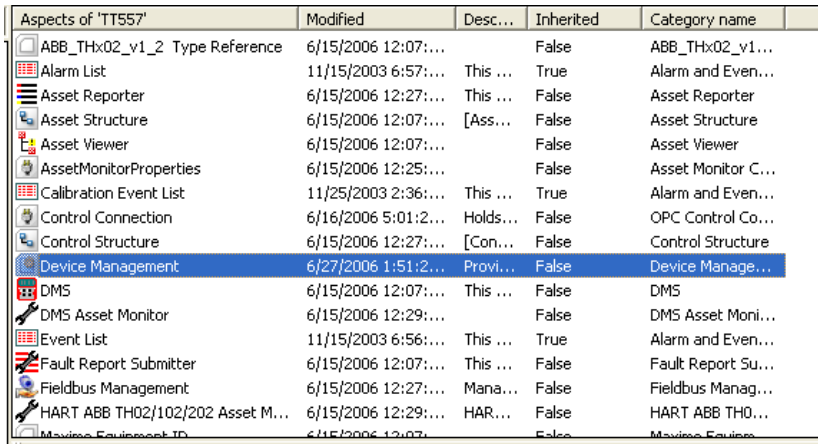

Figure 11. Aspect Browser

Display Bar

The Display Bar, see Figure 12, is provided above the Aspect View area and can be used to control and identify the contents of the Aspect View Area.

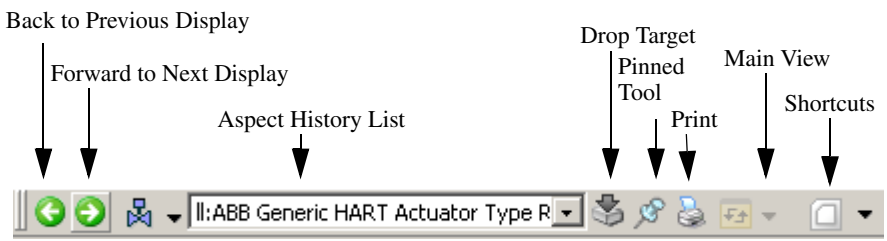

Figure 12. The Display Bar

- **Back to Previous Display** shows the previous display. See also Backward and Forward Buttons (on page 26).
- **Forward to Next Display** shows the next displays. See also Backward and Forward Buttons (on page 26).
- **Aspect History List** shows a listing of the most recently viewed aspects or type of information (the latest used display on top).

- By dragging an aspect to the **Drop Target**, it will be displayed in the Display Area.
- The **Pinned Tool** pins the display like a note on a billboard. The display can not be changed by clicking on the Backward or Forward button, or drop a display on the Drop Target tool. To enable change of display, you first have to remove the pinning of the display.
- **Main View** shows a drop-down menu of the other available views of the aspect you have selected. Also, if you place the cursor on the View Selector, a tool tip will show the current view.
- **Shortcuts** provides shortcuts to specific displays. Shortcuts can be added and configured to point out specific displays.

Display Area

The display area is for displaying the Aspect Views. It is used to show a view of an aspect (a display), and can be used to present information like documents, alarm lists, DTM, etc. (You can also present displays as pop-up displays by double clicking on the aspect.)

You can use the tools in the Asset Master Workplace to control and identify the contents of the Display area.

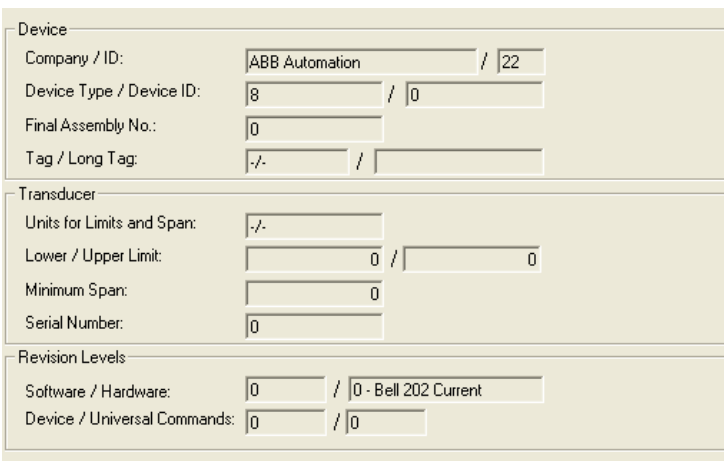

Figure 13. The Display Area

Status Bar

The Status Bar occupies the lower part of the Asset Master Workplace window.

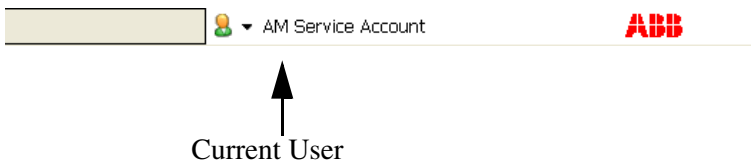

Figure 14. The Status Bar

- The **Current User Tool** shows who the current user is. Users have different roles and privileges depending on security settings.

Navigation

This section describes how to navigate to different displays, or aspects in the Asset Master Workplace. The aspect types involved include DTMs, asset reporting documents, alarm lists etc.

Basic Navigation

The previous section describes the basic display of Asset Master, which contains a number of tools to find objects and aspects in the system. The tool icons are present in one of two bars:

- Application Bar (on page 18). It contains information that must be present all the time, regardless of what displays are shown. One example is the alarm band.
  Tools in the application bar typically influence the workplace or handle aspect objects. Some of the tools are very useful for navigating to displays.
- Display Bar (on page 23). It influences the display area only and is the main area for navigating between displays.

To navigate between displays, the following tools and handling should be considered. They are highlighted here because of the few steps needed to invoke a new display on the screen and ease of use.

The most efficient tools are shortcuts:

- In the application bar. **Favorites** (Aspect Menu) contain a menu of displays such as DTM, asset reporting and document displays respectively. The user can add favorites when needed. The resulting shortcuts are presented as Icons to the right in the application bar.
- In the display bar **Shortcuts** can be configured holding a number of displays. If the plant has a number of sections, typically displays contained in each section may be stored under an Icon in the display bar.
- In the display **Shortcuts** may be built in as a way of navigating to another display. In this way you can browse among displays in a section of the plant or any configuration.

Other feasible tools:

- **Right Mouse** button. You can always point at an object in a display or in a list and right click. The context menu shows the possible display alternatives for that object.
- In the display bar **t**he **Forward** and **Backward** button shows previous or next display used.

In the ensuing section these tools for navigation are described.

Display Switching

There are different ways of navigation in the Asset Master Workplace. Below are the most basic ways for fast access to aspect objects described.

Shortcuts

Shortcuts make it easy to navigate to the most important and/or most frequently used aspects of different aspect objects.

Backward and Forward Buttons

You can move back to the previous display by clicking on the **Back to Previous Display** button. If the button is disabled, it is not possible to go backward.

You can move forward to the next display by clicking on the **Forward to Next Display** button. If the button is disabled, it is not possible to go forward.

Figure 15. Backward and Forward Buttons

Favorites

By clicking the Aspect Menu icon in the Tool Bar the Aspect Menu will be presented, see Figure 16. From the Aspect Menu you can navigate to different displays by clicking on your Aspect Favorites.

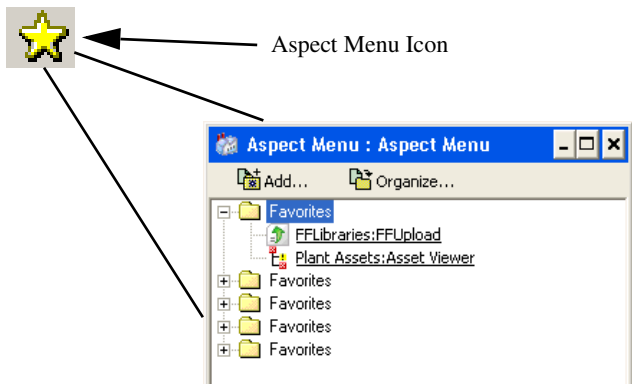

Figure 16. Aspect Menu Icon and Aspect Menu

The Aspect Favorites can be accessed from the Tool Bar by clicking on the Aspect Menu icon. The Aspect Menu tool gives you the possibility to add, copy, paste and rearrange the Aspect Favorites by using the **Add** and **Organize** buttons. It is also possible to add aspects to the user's Aspect Favorites using the aspect context menu.

Aspect Favorites can be defined per user and per user group. The modifications a user makes, using the favorites function, will only be applied to the user's Aspect Favorites.

Accessing and Using the Aspect Menu

Click on the icon and the Aspect Menu will be presented at the configured position on the screen. This can be as a pop-up or in the display area, if it includes a

dedicated area for the tool. The Aspect Menu shows the Aspect Favorites of the current user and the user group he belongs to.

Adding Aspect Favorites

There are three ways to add a favorite.

1. Select the aspect to be added. Open its context menu and select **Add to Aspect Menu**. A dialog will be displayed, where you select folder and name for the new favorite.
2. Open the drop-down menu from the aspect icon in the Display Bar (if available) and select **Add to Aspect Menu**.
3. Click on the **Add** button in the Aspect Menu. The Add Aspect Favorite dialog will be displayed (see Figure 17) which allows you to select the aspect to add to your favorites list. The favorite will be added to the folder selected in the Aspect Menu. In the Add Aspect Favorite dialog, you can select the folder to create the aspect Favorite in by clicking on it. Select **New Folder** if you wish to place the Aspect favorite in a new folder. You can also change the name of the Aspect Favorite.
4. Click **OK** to add the Aspect Favorite.

Organizing Aspect Favorites

It is possible to organize your Aspect Favorites in folders. This is done either when new Aspect Favorites are added by using the Organize Aspect Menu dialog box. In the Aspect Menu, click the **Organize** button to open the Organize Aspect Menu dialog.

In this dialog, see Figure 18, new folders can be created, moved, deleted or removed. Aspect Favorites can be moved, rename or deleted. You can also move folders and favorites by dragging and dropping.

Favorites Bar in the Application Bar

A Favorites Bar can be displayed in the Application Bar. The Favorites Bar shows the same favorites as the Aspect Menu. Click on an aspect icon to open the favorite. Click on the drop-down arrow to see a list of favorites organized under this folder.

Place the mouse pointer over an icon, and the tool tip will display the name of the favorite aspect.

Context Menu

Right-click on an object or an aspect to bring up the context menu. You can e.g. select an aspect, action or a referenced display for the object or aspect from the context menu.

The contents of the context menu will differ depending on which object or aspect you have selected. The contents will also differ depending on the filter that is active.

The different parts of the object context menu are as follows (Figure 17):

- The **Default Aspect** (always the one in bold) gives the default aspect for the currently selected object.
- The **Aspect List** is a list of all viewable aspects connected to the object which are not filtered away by the active aspect filter.

References contains a list of displays the object has references to.

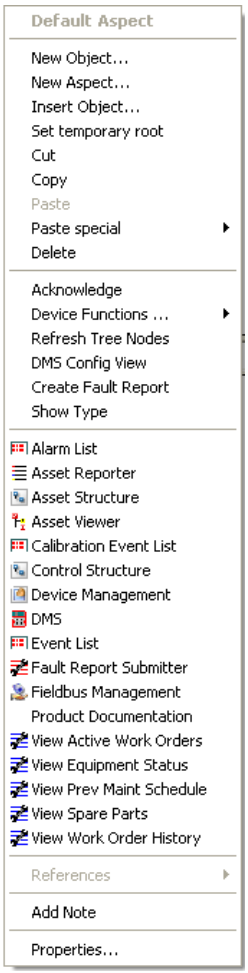

Figure 17. Example of an Object Context Menu

Maintenance Filters and Asset Structure

The Asset Structure provides the possibility for maintenance personnel to group and arrange plant assets in the way it is needed for efficient daily work. Control topology constraints can be overcome and even devices with different fieldbus protocols can be grouped together if they require similar maintenance procedures.

The Asset Structure comes by default with five major groups of Assets:

- Drives.
- Field Instruments.
- IT Assets.
- Motors.
- Process Equipment.

The typical structure to work with in the Asset Master Workplace is the Asset Structure (Figure 18). The Asset Structure shows, by default, five groups of plant assets. The Field Instruments group has subgroups for Actuator, Linking Devices, and Transmitters. The Transmitter group is further structured to allow a unique group for the different transmitter types.

The user is able to change the structure at any time by adding, renaming, rearranging, or deleting Asset Groups or subgroups.

The primary Asset Groups have Alarm List aspects that report the Asset Alarms from all objects beneath them. These Alarm Lists drive the Alarm Groups in the

Alarm Band of the Asset Master Workplace (Figure 19). Asset Alarms are Asset Health Condition information reported by Asset Monitors.

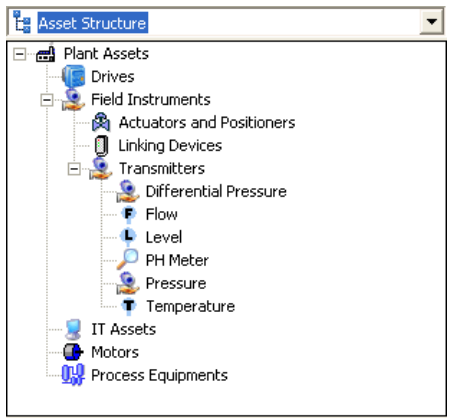

Figure 18. Asset Structure

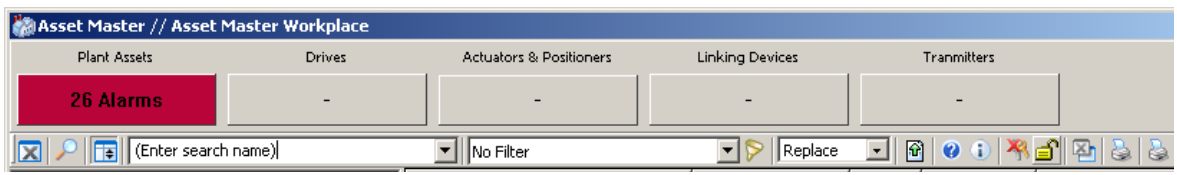

Figure 19. Alarm Band

Maintenance Filter

The Asset Master Workplace comes with three default filters that are designed to expose only those aspects that are needed for the typical maintenance workflow. Figure 20 highlights the Alarm Band with the Maintenance - Technician filter selected.

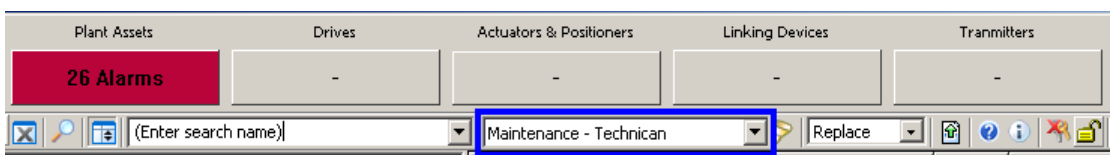

Figure 20. Maintenance Filter

The different default filters are:

- Maintenance - Technician: The standard filter for all maintenance technicians. It exposes only those aspects needed to view diagnostic or health condition information and react or execute the related actions. Figure 21 shows all available aspects for this filter.

Figure 21. Available Aspects for Maintenance - Technician Filter

- Maintenance - Manager: Makes more specific diagnostic aspects available. For example, it provides access to all Asset Monitor aspects rather than the Asset Reporter only.
- Maintenance - Engineer: Shows all aspects that would be needed to do configuration work in the system from a maintenance point of view. For example, adding Asset Monitors to Objects, commissioning Asset Monitors, etc.

Alarm and Events

Alarms from the devices can be viewed and acted upon via the Asset Master Workplace via lists, alarm summary indication etc.

An alarm list only includes the alarms that a user needs to pay attention to, normally unacknowledged and still active alarms.

Alarm List

Accessing and Reading

Examples of how to access different Alarm lists are listed below.

- Click on an Alarm List aspect to see a list of all alarms for a specific device type, see Figure 22. To know more about Alarm Band see Alarm Band (on page 38).

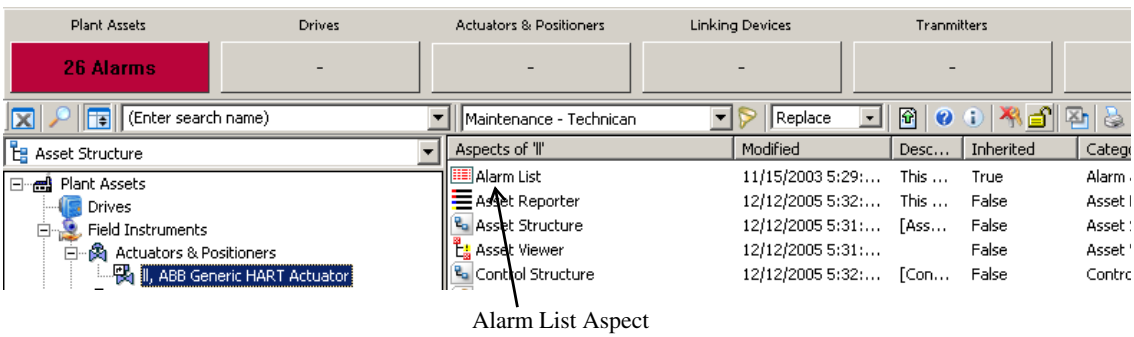

Figure 22. Accessing the Alarm List

- Click on the Alarm List aspect in the Aspect List area to see a list of all alarms for the selected device.

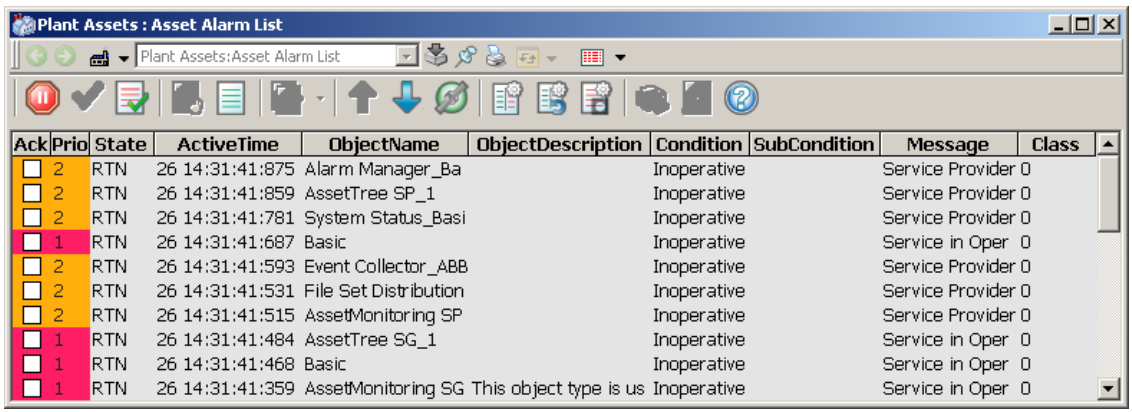

Figure 23. Process Alarm List

Columns

The different default columns in the Alarm List are described below:

- **Ack State** - shows if the process alarm is acknowledged or not
- **Active Time** - shows the time when the process alarm was generated
- **Source Name**- name of the process object
- **Condition** - name of the condition, for example Limit exceeded
- **Message Description** - short description of the process alarm

Context Menu

You can right-click on an alarm line in the alarm list to bring up the context menu. See Figure 24. By using the context menu you can perform some actions on this alarm line for example acknowledge the selected alarm, silence the audible alarm or add a note.

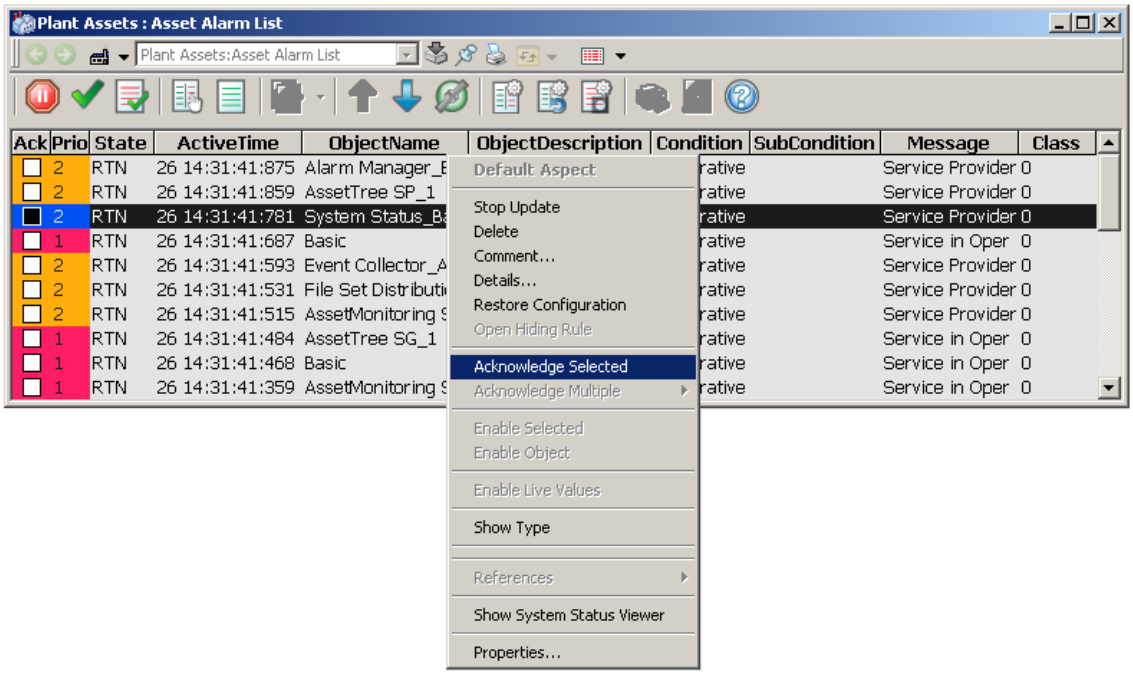

Figure 24. Context Menu for Alarm

Acknowledge

You can acknowledge alarms for an object in the following ways:

- By clicking on the **Ack State** box for the alarm in the list.
- By right-clicking on an alarm line and selecting **Acknowledge** (all alarms for that object will be acknowledged) or **Acknowledge Selected** (only the selected object will be acknowledged) from the context menu.
- By selecting one or several alarms in the alarm list and clicking the **Acknowledge** button (green check mark)
- By clicking on the alarm status button in a faceplate

- By using the Hot Key CTRL+SHIFT+Q (all active alarms will be acknowledged).

To acknowledge an alarm you need to be granted permission for this operation.

Working with an Alarm List

Activities describing how to work with an Alarm List are described below.

Alarm List Tool Bar.

Below are the different tools in the Alarm List Tool Bar described:

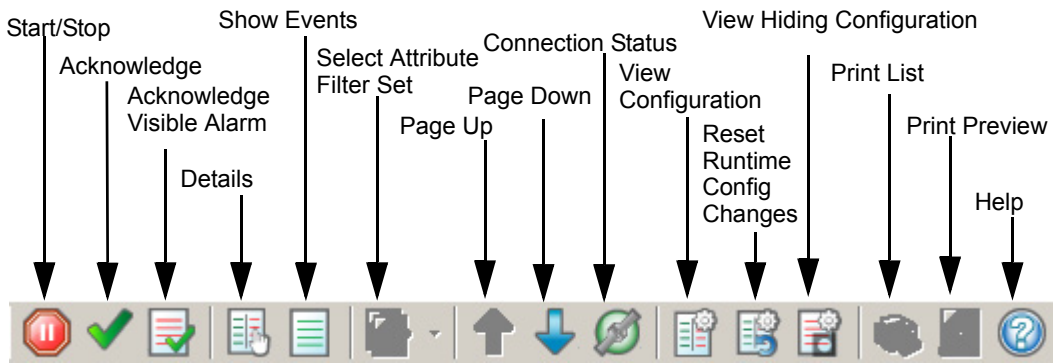

Figure 25. Alarm List Tool Bar

- **Stop/Start/Restart** - You can start, restart or stop list updates using the **Start** button.
- **Acknowledge** - See Acknowledge on page 36.
- **Details** - Click the **Details** button to see extended information about the selected alarm.
- **Page Up** - If you click the **Page Up** button the previous 500 alarms will be shown in the list.
- **Page Down** - If you click the **Page Down** button the next 500 alarms will be shown in the list.

- **View Hiding Configuration** - Click the **View Hiding Configuration** button to view the Hiding Mask Manager. See Asset Master Detailed Configuration and Operation Manual.
- **Print List** - See Print on page 38.
- **Print Preview** - See Print on page 38.
- **Help** - Click the **Help** button if you want to read about things regarding the alarm list in the On-line Help.

Sorting Columns

To sort a column double click on the column header. Repeat this action to reverse the sorting. For example, sorting **Source Name** once may cause the items in the list to be sorted in alphabetical order (A...Z). Sorting a second time will cause the sorting to be reversed (Z...A).

Print

Figure 26. Print Buttons

If you click on the **Print List** button the shown list will be printed on a default local or network printer.

If you click the **Print Preview** button the shown list will be presented in a preview window (only if you have printer software installed in your workstation).

Alarm Band

Accessing and Reading

The Alarm Band provides a link to an Alarm List for a specific process area. The number within the band represents the number of unacknowledged alarms. The color of the band represent the highest priority alarm present. Click on the Alarm Band (button) to go to the Alarm List.

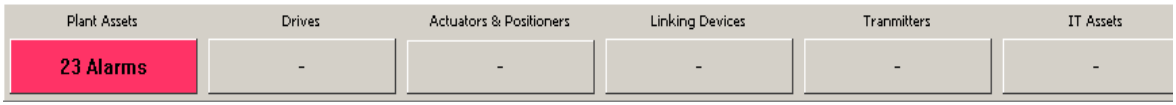

Figure 27. Alarm Band

A red cross over the Alarm Band indicates that the alarm band does not have contact with the Asset Master alarm service.

For further information, refer to:

- *3BSE036903R5001 - Industrial IT 800xA System Basic Operation*

  Ignore sections 3, 5, 8 and 9 in the above manual.

The documents can be found on DVD1 in the folder *Released Documentation\800xA*. Alternately, the latest version of the documents can be downloaded from ABB Solutions Bank.

Backup & Restore

It is possible for software and data to become corrupted. A contingency to such an event is to take a backup of the system, and restore it later on when the system becomes corrupted. The backup and restore procedure consists of two different parts; backup of standard Windows system and backup of the System application data.

The procedures for backup and restore are explained in greater depth in the manual *3BSE037410R5001-Industrial IT 800xA System Administration and Security.*

Section 2 FOUNDATION Fieldbus

Product Overview

FOUNDATION Fieldbus provides an open standard for process automation applications and is supported by all the major control and automation product manufacturers. It consists of a low-speed bus (H1) designed for the interconnection of “field” equipment such as sensors, actuators, and I/O, and a high-speed bus (HSE, High Speed Ethernet) allowing optimization of network design and integration of high speed controllers (such as PLC or DCS), H1 subsystems (via linking devices), data servers and workstations. FOUNDATION Fieldbus provides built-in capability to distribute the control application across the network.

FOUNDATION Fieldbus (FF) supports two communication profiles, H1 and HSE. The H1 profile, with a transmission rate of 31.25 kilobits per second, is preferably used for direct communication between field devices in one link (H1 link). The HSE profile, which is based on standard Ethernet and typically features a transmission rate of 100 megabits per second, serves first and foremost as a powerful backbone for the connection between H1 links. The devices that are already available on the market and support the HSE profile are FF linking devices. They serve as a gateway between the field devices on the H1 links and the HSE backbone. Asset Master supports the ABB Linking Device LD 800HSE.

FOUNDATION Fieldbus Device Integration integrates the FOUNDATION Fieldbus architecture and field devices into the Asset Master environment. It consists of these main components:

- Fieldbus Builder FOUNDATION Fieldbus
- OPC Server FOUNDATION Fieldbus
- FOUNDATION Fieldbus Device Integration Library

Please refer to the following 800xA documents for configuration of FOUNDATION Fieldbus in Asset Master:

- *3BDD012902R5001 - Field^{IT} FOUNDATION Fieldbus Linking Device LD 800HSE User Instructions*
- *3BDD011677R0501 - Industrial^{IT} 800xA Device Management FOUNDATION Fieldbus Configuration*

The documents can be found on DVD1 in the folder *Released Documentation\800xA*. Alternately, the latest version of the documents can be downloaded from ABB Solutions Bank.

Section 3 PROFIBUS/HART Interface

Overview

Asset Master supports connectivity to PROFIBUS and HART field devices independent of ABB's control systems. HART Multiplexer and ifak HART modem interfaces are used to communicate with HART devices. ifak PROFIBUS adapter is used to communicate with PROFIBUS devices.

PROFIBUS and HART Device Object Types must be installed separately using Device Library Wizard. Refer to Section 4, Device Library Wizard

It is recommended to connect upto a maximum of 16 devices per communication interface, that is upto 16 devices can be connected to each of the HART multiplexers and PROFIBUS adapters.

For HART Modem, a maximum of 15 devices can be connected.

General

In Asset Master, PROFIBUS and HART devices must be instantiated in the Asset Structure which is used as pool of pre-configured device instances. Then these instances can be inserted into Control Structure and used to communicate with the actual device with pre-configured DTMs. It is possible to delete these instances from Control Structure without loosing DTM offline configurations. This will avoid repeat efforts for the user.

Adding Devices to Asset Structure

Following steps will describe the workflow to create the instance.

1. Open the Asset Master workplace
2. Select the Asset Structure from the structure list

3. From the Object List, expand the Asset Structure below the Plant Assets object
4. Right click on the Plant Assets category, for example Field Instruments\Actuators & Positioners, where the device is to be added and select New Object
5. From the New Object window, select the desired field device.(Ex: For ABB 263/265 HART Pressure Transmitters, select **Object Type** -> **Field Devices** -> **HART Transmitter** -> **ABB_253_265_v2_0**.)
   - HART Object Types are located under Filed Devices
   - PROFIBUS Object Types are located under PROFIBUS Devices
6. Type in an appropriate name for the device
7. Click [Create]
8. Repeat steps 5 through 8 for all PROFIBUS and HART devices.

Adding Devices to Control Structure

Field device instance can be created under its communication or gateway interface. For exampl, a HART field device instance can be created under ifak HART modem or HART multiplexer subnet.

PROFIBUS and HART devices can also be instantiated in the Control structure.

1. Open the Asset Master workplace
2. Select the Control Structure from the structure list
3. From the Object List, expand the Control Structure
4. Right click on the gateway interface where the device is to be added and select Insert Object
5. In the Insert Object dialog, select previously created instance from Asset Structure and click Insert.
6. Repeat steps 4 & 5 to add more device instances.

The sections below describes the configuration and operation of PROFIBUS and HART interface in Asset Master.

Connect/Disconnect Communication Interface

Follow the procedure below when HART modem or PROFIBUS adapter interface is disconnected while the fieldbus branch is online:

1. Close all the DTM windows.
2. Disbale fieldbus communication.
3. Connect the HART modem or PROFIBUS interface to the same USB port.
4. Enable fieldbus communication.

PROFIBUS Adapter Interface

Once the Asset Master node is setup, the PROFIBUS Adapter's driver needs to be configured on Windows for the operating system to recognize and communicate with the adapter hardware.

The driver software is installed by the Asset Master installer.

Post-installation Configuration

Restore the “ifak_System_is_Pro_USB” Device Object Type using Device Library Wizard, if you have not done it during the post-installation of Asset Master Installer. Refer to Restore Device Types on page 152 to perform the restore operation.

Configuring Modem Driver

Once the PROFIBUS Adapter is connected to the computer for the first time, the operating system detects the new hardware. The “Found New Hardware Wizard” starts automatically as shown in Figure 28.

Figure 28. Welcome screen of Found New Hardware Wizard

Once this screen, select “No, not this time” and click on the **Next** button.

In the resulting screen, similar to the one shown in Figure 29, select the option "Install from a list or specific location (Advanced)" and click on **Next** button.

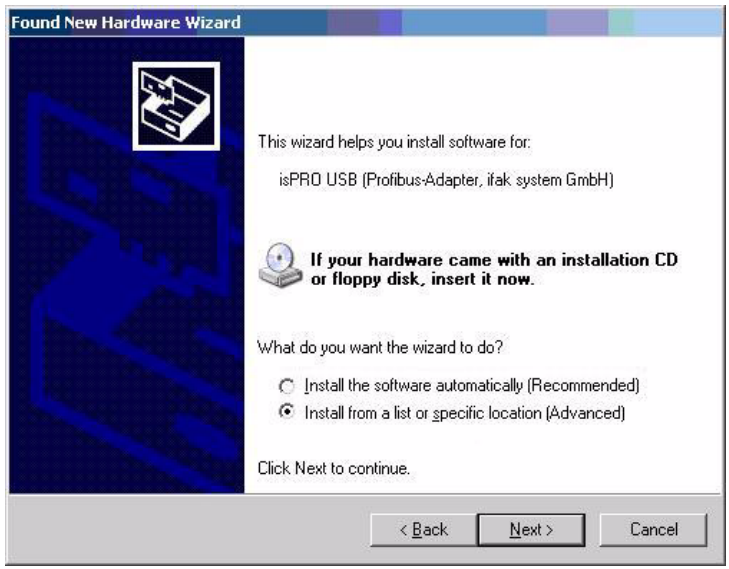

Figure 29. Select Installer Location

In the resulting screen, similar to the one shown in Figure 30, select the option "Don't search. I will choose the driver to install." and click on **Next** button.

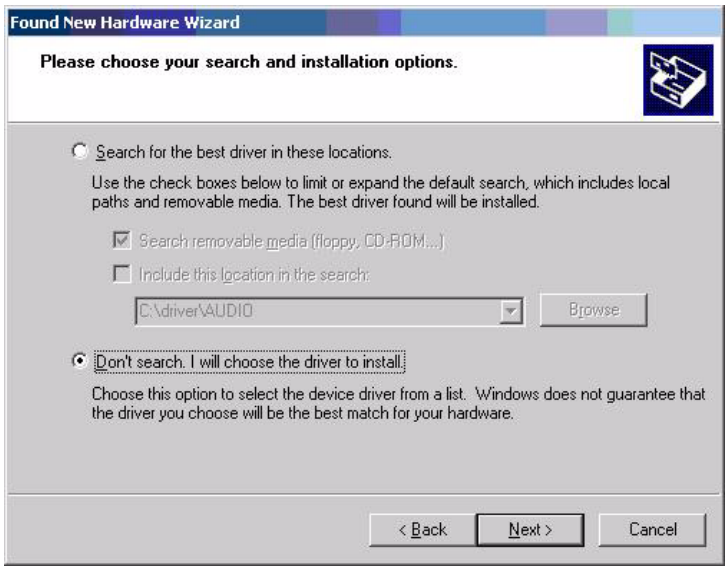

Figure 30. Search and Installation Options

In the resulting screen similar to the one shown in Figure 31, the isPRO USB device driver for the PROFIBUS Adapter is detected automatically. Select this driver and click on **Next** button.

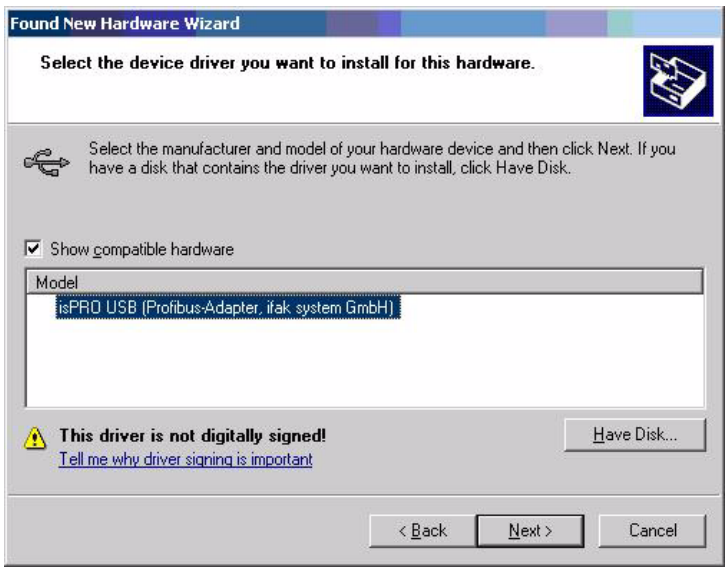

Figure 31. Select Device Driver

For the isPRO USB driver to be detected automatically, ifak PROFIBUS Multidriver software must be installed. The installation of this software is done by the system installer. If this does not get listed, then ifak PROFIBUS Multidriver software must be reinstalled.

When the driver is selected a warning message is displayed as shown in Figure 32. Click on **Continue Anyway** button.

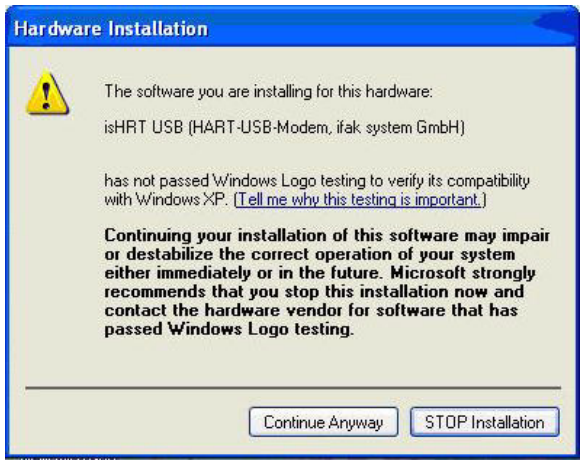

Figure 32. Windows Warning

The driver installation proceeds and a screen similar to Figure 33 is displayed after the installtion is complete. Click on the **Finish** button to exit.

Figure 33. Driver Installation Complete

The ifak PROFIBUS Adapter driver is now installed and is ready for use.

Configuring PROFIBUS Adapter

Asset Master includes a pre-configured PROFIBUS adapter object that is ready to use after installation. Prior to connecting devices to the adapter, the communication between the Asset Master node and the adapter must be verified.

Asset Master supports simultaneous access two PROFIBUS adapters i.e. it is posible to configure two PROFIBUS adapters. This section describes a set-up for the PROFIBUS adapter.

PROFIBUS Adapter configuration is a two step process.

Step 1: Use ‘is PRO Configurator’ to detect the connected adapter.

Step 2: Use ifak PROFIBUS Adapter DTM.

Reserve Asset Master Network for exclusive “modify” access.

Single Adapter Configuration

Step 1

Once the device driver is installed for the adapter, you need to configure it. To configure the adapter, go to **Start -> ifak System -> is PRO Multidriver** and open 'is PRO Configurator'. See Figure 34.

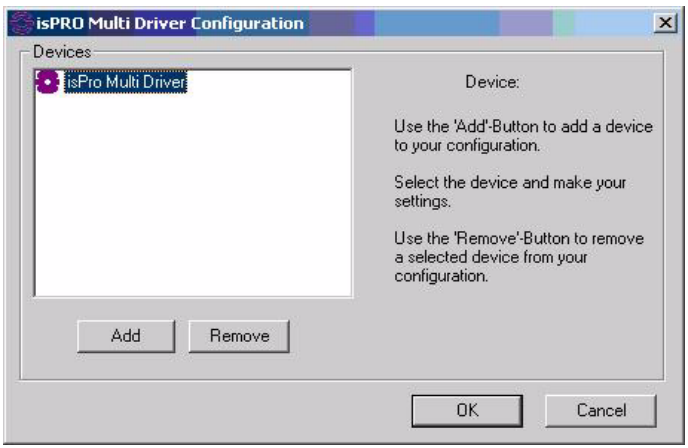

Figure 34. isPro Driver Configurator

Select "isPro Driver Configuration" and click on the **Add** button.

In the resulting screen, similar to the one shown in Figure 35, select the option "USB" and click on the **OK** button.

Figure 35. Add Device

In the resulting screen, as shown in Figure 36, a USB device is listed in the isPRO Configurator. Select the USB device and click on **Search attached device** button. A window "attached USB devices" is displayed which lists the device id of the

PROFIBUS Adapter connected. Select the id of the PROFIBUS Adapter in use and click on the **Select** button.

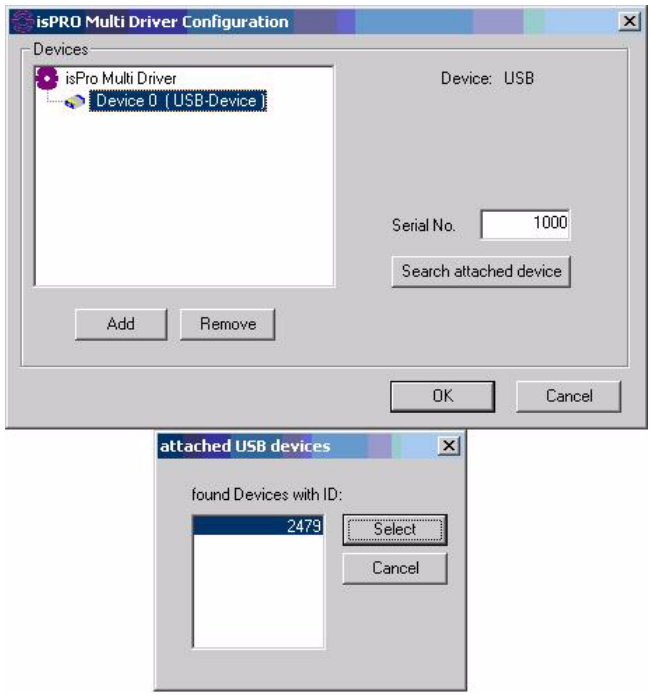

Figure 36. Search Attached Device

Now you can see the id of the selected adapter in the “Serial No.” text box as shown in Figure 37. Click on the **OK** button to continue.

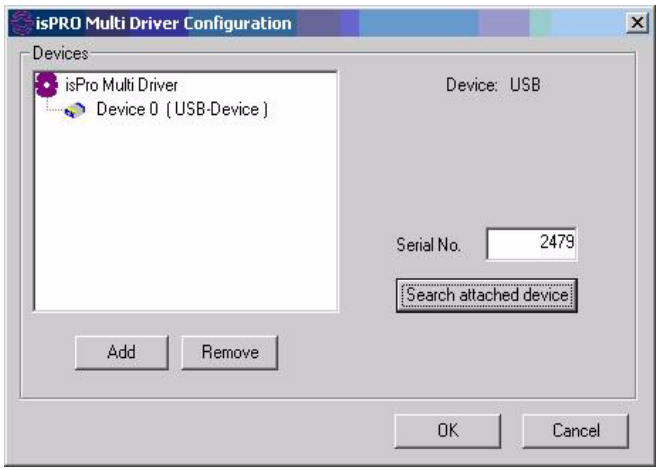

Figure 37. Serial Number Selector

The configuration progess is then indicated on the screen. Once the configuration is complete, click on the **Exit** button. This completes the configuration of the PROFIBUS Adapter.

Step 2

Prior to connecting devices to the adapter, the communication between the PC and the adapter must be verified.

1. Open Asset Master Workplace.
2. Select **Control Structure** from the structure list.
3. Right-click on the Asset Master Network and select **Reserve**.
4. Select ‘ifak Profibus Adapter’ instance under the Asset Master Network.
5. Select the Device Management aspect from the Aspect list.
6. In the Aspect View, use the View Selector and select the ‘Channel Selection’ view.

7. Click **Refresh List** and verify that the Adapter serial number is displayed in the list of connected PROFIBUS devices window area.

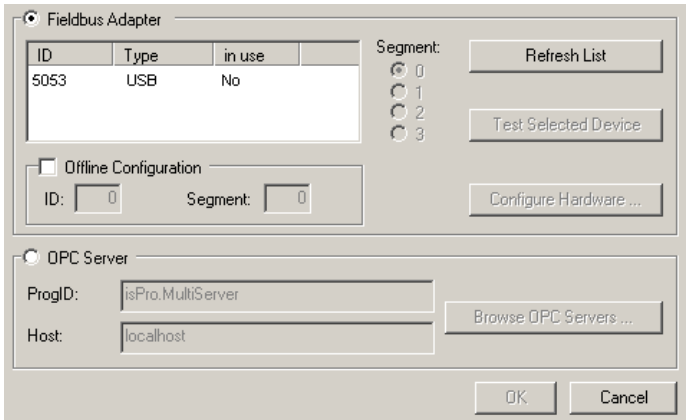

Figure 38. List of PROFIBUS Adapters

8. Select the Fieldbus Adapter ID from the list and click **OK**.

Connecting second PROFIBUS Adapter

This section describes the configuration steps required if two PROFIBUS USB adapters are used simultaneously. Connect second PROFIBUS USB Adapter to the Asset Master node

To be able to use both the adapters simultaneously, do NOT insert device instances under any of the adapter before the following steps are performed.

Step 1

1. Open “is PRO Configurator” and add two USB Devices.
2. Select **Device 0** and search for attached adapters. Select one of the listed adapters from the search result. Repeat this step to select other adapter.

Step 2

1. Open the Asset Master workplace.
2. Select the Control Structure from the structure list.

3. From the Object List, expand the Control Structure below the Root object.
4. Right click on the Asset Master Network and select **Reserve**.
5. Right click on the Asset Master Network object and select New Object.
6. Navigate to '**PROFIBUS Devices -> PROFIBUS Interface**' and select the PROFIBUS adapter object. Type in a name of your choice and click **Create**.
7. Select the new instance of PROFIBUS adapter.
8. Select the Device Management aspect from the Aspect List.
9. In the Aspect View, use the View Selector to select the 'Channel Selection' view.
10. Click **Refresh List** and verify that the Adapter serial number is displayed in the List of connected is PROFIBUS devices window area.

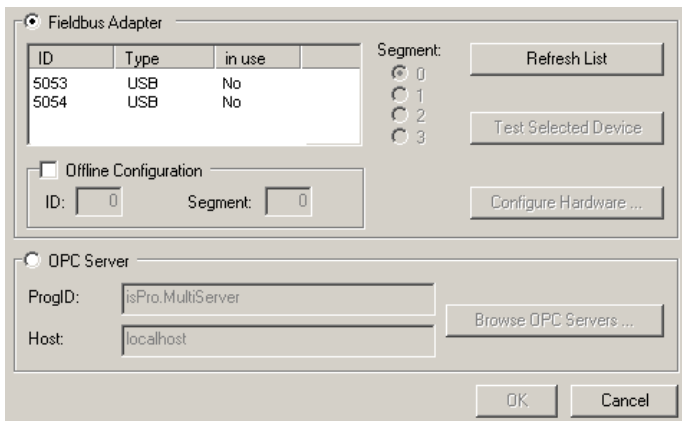

Figure 39. List of PROFIBUS Adapters

11. Select the Fieldbus Adapter ID from the list and click **OK**.
12. Select second instance of PROFIBUS Adapter, and repeat the steps from 7 through 10. In step 10, select the second Fieldbus Adapter ID from the list.

Working with PROFIBUS

Unless described otherwise, all configuration steps described throughout this section must be done in the Configuration Disabled mode.

Enable/Disable Fieldbus Communication

The menu item for both methods toggles between Enable or Disable Communication depending on the current status. If the menu item reads Enable Communication, then the communications is already disabled and vice versa.

Asset Master Network must be reserved to Enable/Disable fieldbus communication. **Reserve** option is available in the context menu of any object below Asset Master Network,

Fieldbus segment must be in offline mode to perform number of actions, such as adding and removing a device from the adapter. There are two ways to Enable/Disable fieldbus communication.

Using Device Function from context menu

1. Open Asset Master Workplace
2. From Control Structure select the PROFIBUS adapter instance.
3. From the context menu, select Device Functions.
4. Select **Enable/Disable Communication**.

Using Fieldbus Management aspect

1. Open the Asset Master Workplace
2. Select Control Structure from the structure list
3. Select the PROFIBUS Adapter instance.
4. Select Fieldbus Management aspect from the aspect list
5. In the Aspect View area, right click on Fieldbus Management
6. Select **Enable/Disable Comunication**.

The ‘Mode’ icon at the bottom left of the Aspect View window indicates the current mode.

If the Asset Master network is reserved by another user, it cannot be reserved again, unless the first reservation is released.

The default communications status for a new installation of Asset Master or newly created PROFIBUS adapter is Disabled.

Scanning PROFIBUS Devices

1. Open Asset Master Workplace
2. Select Control Structure from structure list
3. Select PROFIBUS Adapter instance under the Asset Master Network
4. Enable communication.
5. Right click on the Device Management aspect and select Device List from the context menu
6. In the Device Management popup, click **Update List**
7. [Screen shot of Device List dialog]
8. All available devices are listed in the Channel Device List

Update List operation may take few minutes to complete. The message "update in progress - please wait" will be displayed while the operation is in progress.

Asset Master does not yet support an automatic method for populating the found devices into the Control Structure. As a result, the devices need to be configured manually.

Adding Devices

It is recommended to create Device Object Type instances in Asset Structure by using Create->New Object context menu.

Prior to adding device object types, the communication must be disabled and the instance must be available in Asset Structure. The following steps describe how to add device instance to the Control Structure.

1. Open Asset Master Workplace
2. Select Control Structure from the structure list

3. Select the PROFIBUS Adapter object
4. Ensure that the communication is disabled
5. Right click on the PROFIBUS Adapter object and select Insert Object
6. In the Insert Object popup, select the Asset Structure, expand the Asset Structure to locate the device. Once the device is located, select the device and click **Insert**
7. In the resulting DTM pop-up window, provide 'Tag' and 'Address' of the device.
8. Repeat the steps 6 and 7 to add more PROFIBUS devices.

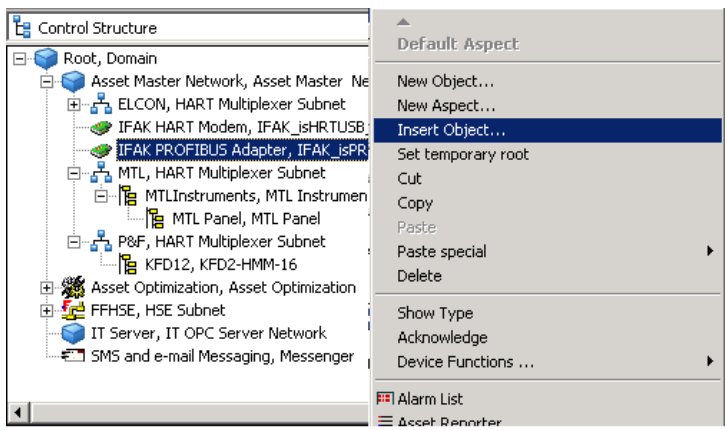

Figure 40. Insert Object

Deleting Devices

Prior to deleting device object types, the communication must be disabled. The following steps describe how to delete device object types from the Control Structure.

1. Open Asset Master workplace
2. Switch to Control Structure
3. Open the substructure below Asset Master network

4. Select the field device to be deleted from the Control Structure
5. Right click on the device and select **Delete** from the context menu.

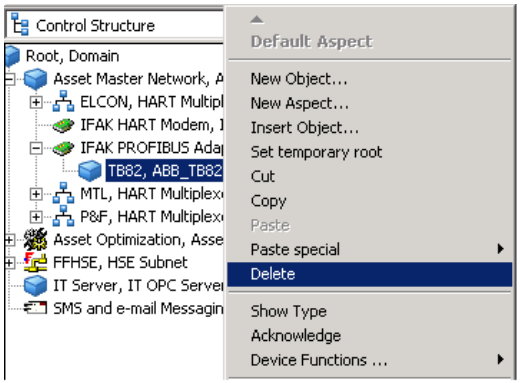

Figure 41. Delete Object

Ensure that the network is reserved before deleting a device.

Configuring and Commissioning of PROFIBUS Device Object

Once the PROFIBUS Device Objects have been instantiated, they can be configured for the application via DTM. A configuration describes the creation of a set of parameters for a particular device in Asset Master. To configure field device objects, DTMs should be started with the communication disabled. If changes are to be made directly to the device, the communication should be enabled.

Depending on whether the communication is enabled or disabled, the DTM displays various user windows. These enabling or disabling of the device is selected through the Fieldbus Management aspect of the relevant device instance.

A DTM view can be opened in one of the following ways:

1. From Device Management aspect in the Aspect view

2. From the context menu of Device Functions in Control Structure

Device specific DTMs can only be started via the Device Functions context menu. With these DTMs, the Device Management window has a gray background without any graphic display. The configuration of the device via a DTM is described in the associated DTM documentation and is not included in this documentation.

Once the configuration is complete for all PROFIBUS Device Objects, the data records for the relevant device or selection of devices can be

- verified,
- loaded to the device/selection of devices,
- saved in one or more export file(s)

These functions are executed via the Fieldbus Management Aspect and its subconditions. Aspect Instance data can be verified and exported with the Fieldbus Management in Communication enabled mode. In order to send completed device configurations to one or more devices, select the line from the context menu of the Fieldbus Management and click on **Download Selection** to start.

Verify

Selecting the verify option in the Fieldbus Management aspect control menu compare the online device data with the stored offline Asset Master configuration data set. The result is *true*, if the data set are equal, otherwise *false*.

If the verification result is false, an upload or download is recommended for data synchronization.

Download and Upload

When several devices are selected, the PROFIBUS/HART Fieldbus Builder starts a batch process for up- or download, which is processed sequentially. Execution of the batch process continues even if errors occur in individual DTMs. Each event (faulty/successful execution) is documented in the Fieldbus Management status

window. If an error occurs, an error message is displayed after the end of the batch process to indicate that the batch process is faulty.

Loading errors can arise if this function is not supported by the DTM, or if the DTM cannot establish a connection to the device.

Export and Import

The export file of an instance data record is saved with a time stamp in a folder which is specific to the Device Object. This makes it possible to build up a device configuration history. Exported device data set can be imported again by selecting the specific export file. The export and import process is carried out manually by the user.

HART Modem Interface

Once the Asset Master node is setup, the HART modem driver needs to be configured on Windows for the operating system to recognize and communicate with the modem.Post-installation Configuration of HART Modem

The driver software is installed by the Asset Master installer.

Restore the “ifak_System_isHRT_USB” Device Object Type using Device Library Wizard, if you have not done it during the post-installation of Asset Master Installer. Refer to Restore Device Types on page 152 to perform the restore operation.

ifak HART modem is not supported on Windows 2003 Server OS.

Configuring Modem Driver

Once the HART Modem is connected to the computer for the first time, the operating system detects a new hardware. The “Found New Hardware Wizard” starts automatically as shown in Figure 42.

Figure 42. Welcome screen of Found New Hardware Wizard

Once this screen, select “No, not this time” and click on the **Next** button.

In the resulting screen, similar to the one shown in Figure 43, select the option "Install from a list or specific location (Advanced)" and click on **Next** button.

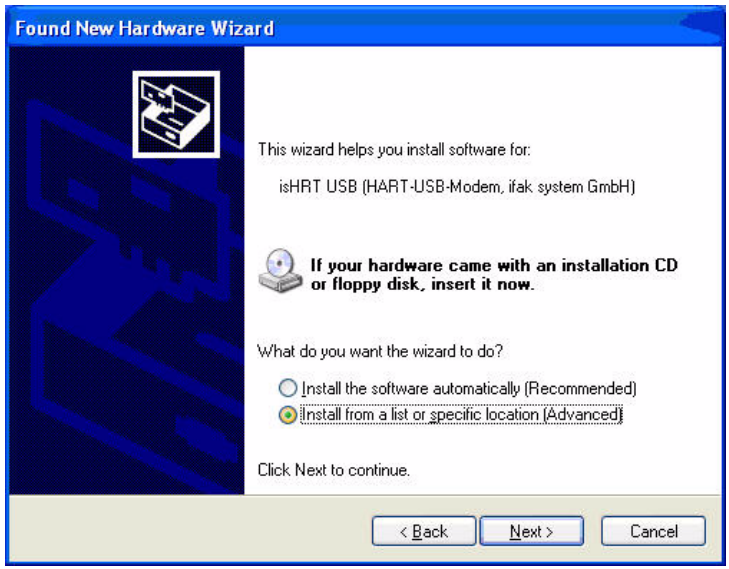

Figure 43. Select Installer Location

In the resulting screen, similar to the one shown in Figure 44, select the option "Don't search. I will choose the driver to install." and click on **Next** button.

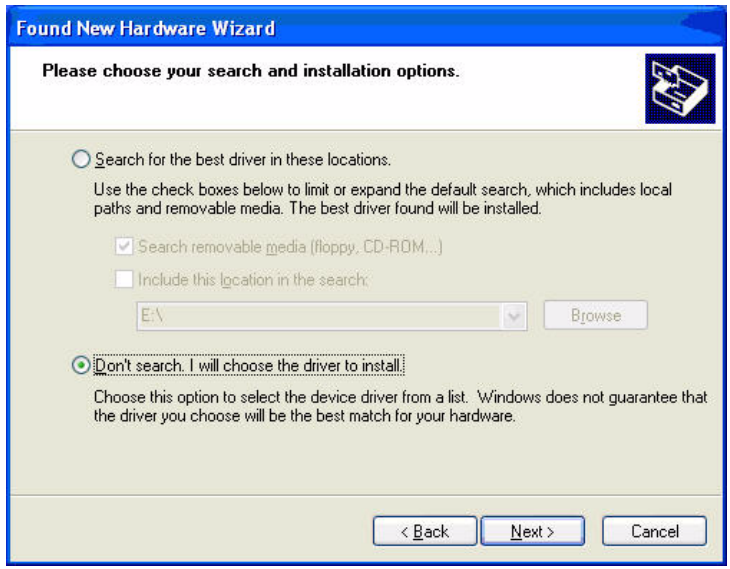

Figure 44. Search and Installation Options

In the resulting screen similar to the one shown in Figure 45, the isHRT USB device driver for the modem is detected automatically. Select this driver and click on **Next** button.

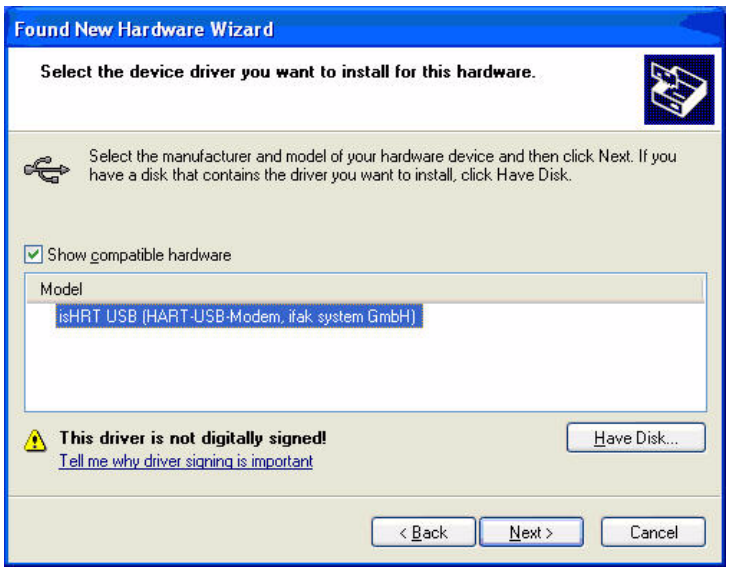

Figure 45. Select Device Driver

For the isHRT USB driver to be detected automatically, ifak HART Multidriver software must be installed. The installation of this software is done by Asset Master installer. If this does not get listed, then ifak HART Multidriver software must be reinstalled.

When the driver is selected a warning message is displayed as shown in Figure 46. Click on **Continue Anyway** button.

Figure 46. Windows Warning

The driver installation proceeds and finally a screen similar to Figure 47 is displayed after the installtion is complete. Click on the **Finish** button to exit.

Figure 47. Driver Installation Complete

Configuring HART modem

Asset Master is capable of setting up a HART communication with both HART modem and multiplexer. This section describes a set-up for the HART modem.

Asset Master includes a pre-configured HART modem object that is ready to use after installation. Prior to connecting devices to the modem, the communications between the Asset Master node and the modem must be verified.

HART modem configuration is a two step process.

Step 1: Use ‘is HRT Configurator’ to detect the connected modem.

Step 2: Use ifak HART modem DTM.

Connecting the HART modem

Step 1

Once the device driver is installed for the modem, you need to configure the modem. To configure the modem, go to **Start** -> **ifak System** -> **is HRT Multidriver** and open ‘is HRT Configurator’. See Figure 48.

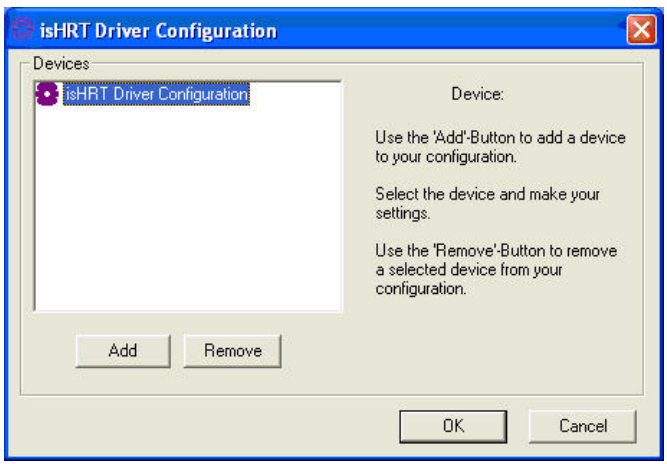

Figure 48. isHRT Driver Configurator

Select “isHRT Driver Configuration” and click on the **Add** button.

In the resulting screen, similar to the one shown in Figure 49, select the option “USB” and click on the **OK** button.

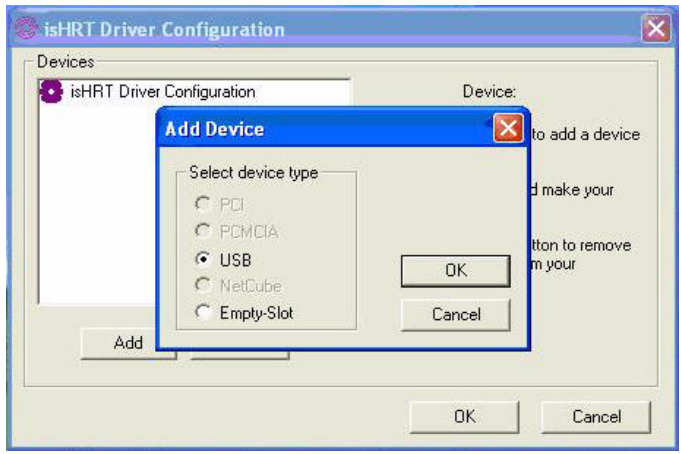

Figure 49. Add Device

In the resulting screen, as shown in Figure 50, a USB device is listed in the isHRT Configurator. Select the USB device and click on **Search attached device** button. A window “attached USB devices” is displayed which lists the device id of the HART

modem connected. Select the id of the HART modem in use and click on the **Select** button.

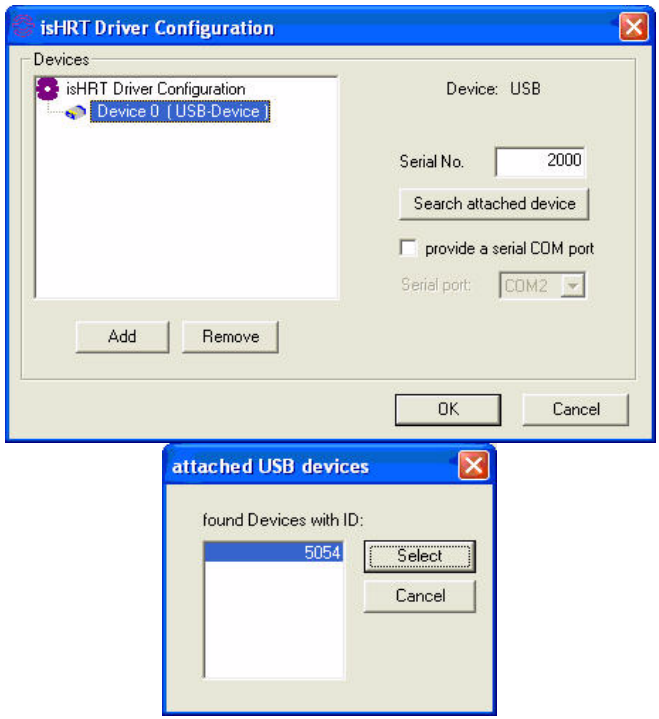

Figure 50. Search Attached Device

Now you can see the id of the selected modem in the “Serial No.” text box as shown in Figure 51. Click on the **OK** button to continue.

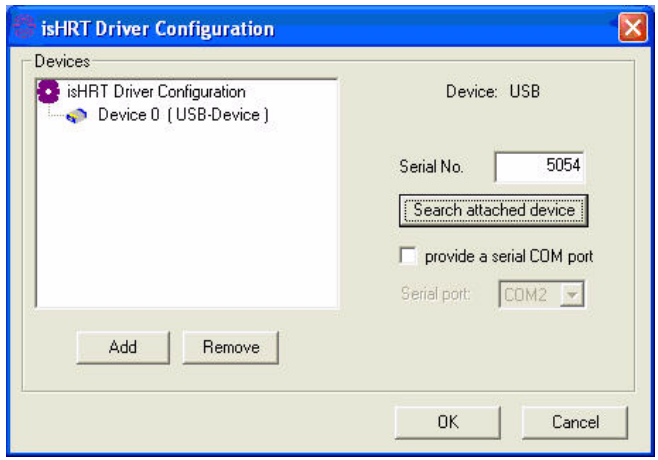

Figure 51. Serial Number Selector

The configuration progess is indicated. Once the configuration is complete, click on the **Exit** button. This completes the configuration of the HART Modem.

Only one ifak HART USB modem is supported in this relase of Asset Master.

Step 2

1. Connect the ifak HART USB modem to the Asset Master node.
2. Open the Asset Master workplace
3. Select the Control Structure from the structure list
4. Right-click on the Asset Master Network and select **Reserve**.
5. Expand the Asset Master Network
6. Select the HART Modem instance
7. Select the Device Management aspect from the Aspect List
8. In the Aspect View, from the View Selector select the *Driver Configuration* view

9. Press [Refresh List] and verify that the modem serial number is displayed in the List of connected is HRT devices window area

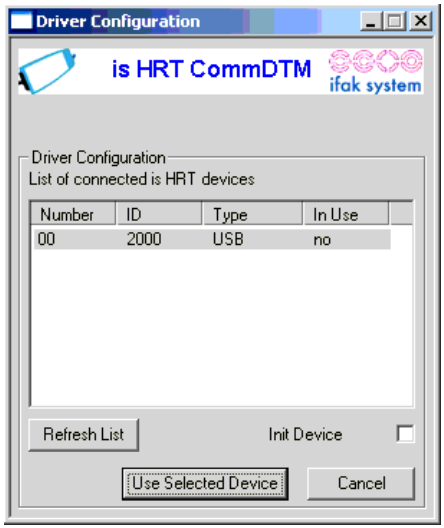

Figure 52. List of Connected HART Modems

Working with HART

Unless described otherwise, all configuration steps described throughout this section must be done in the Configuration disabled mode.

Enable/Disbale Fieldbus Communication

The menu item for both methods toggles between Enable or Disable Communication depending on the current status. If the menu item reads Enable Communication, then the communications is already disabled and vice versa.

Fieldbus segment must be in offline mode to perform number of actions, such as adding and removing a device from the adapter. There are two ways to Enable/Disable fieldbus communication.

Using Device Function from context menu

1. Open Asset Master Workplace

2. From Control Structure select the HART modem instance.
3. From the context menu, select Device Functions.
4. Select **Enable/Disable Communication**.

Using Fieldbus Management aspect

1. Open the Asset Master Workplace
2. Select Control Structure from the structure list
3. Select the HART modem instance.
4. Select Fieldbus Management aspect from the aspect list
5. In the Aspect View area, right click on Fieldbus Management
6. Select **Enable/Disable Comunication**.

The ‘Mode’ icon at the bottom left of the Aspect View window indicates the current mode.

If the Asset Master network is reserved by another user, it cannot be reserved again, unless the first reservation is released.

The default communications status for a new installation of Asset Master or newly created HART modem is Disabled.

Scanning HART Devices

1. Open the Asset Master workplace
2. Select the Control Structure from the structure list
3. Select the HART modem instance under the Asset Master Network
4. Enable communication
5. Right click on the *Device Management* aspect and select *Device List* from the context menu

6. From the Device Management pop-up, click [Update List]

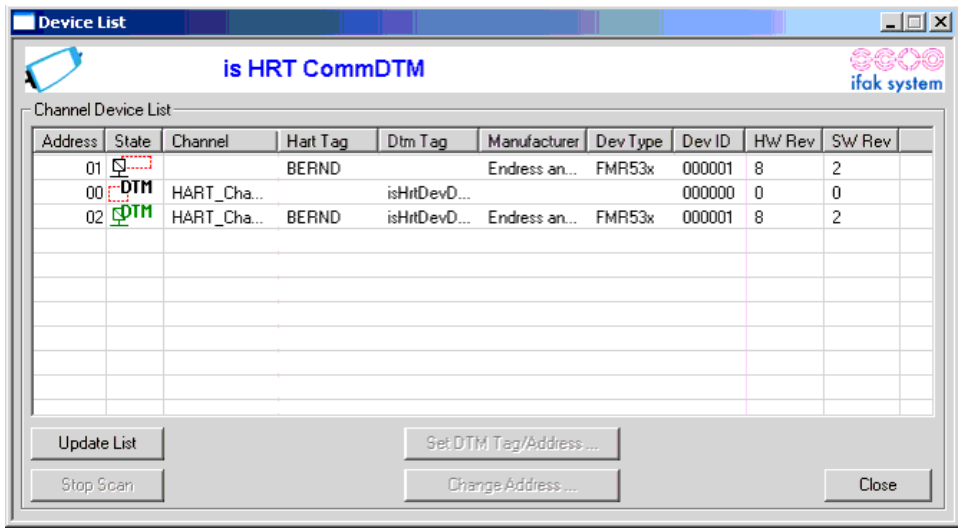

Figure 53. HART Device List

7. All the field devices connected on HART fieldbus segment will be detected and listed in the Channel Device List table.

Update List operation may take few minutes to complete. The message "update in progress - please wait" will be displayed while the operation is in progress.

Asset Master does not automatically populate the found devices into the Control and Asset Structures. As such, the devices need to be manually added.

If the Multiplexer DTM is called in an offline mode, the *List of HART Devices* provides a list of found devices. The *State* field is used to display an icon, that reflects the state of device configuration. The following icons are possible:

Table 1. Icons, used in Device List

Icon	Content
	This icon represents an instantiated device object in the Asset Master system, which is not associated to any physically existing HART device. This icon only appears, if more than one HART device is configured in the Asset Master Workplaces Control Structure to a specific channel, supporting multi-drop mode. For changing the polling address of the specific object, use the *Set DTM Tag/Address* button.
	This icon represents an physically existing HART device, identified from the device scan (*Update List*). Changing the polling address of the physical device hardware use the *Set Change Address* button.
	This icon represents an instantiated device object, which is configured and assigned to an physically existing HART device.

Adding Devices

1. Open the Asset Master workplace
2. Select the Control Structure from the structure list
3. Select the modem object

4. Ensure that the modem communications are disabled.
5. Right click on the modem object and select *Insert Object*
6. From the Insert Object pop-up, select the Asset Structure, expand the structure to locate the device and select the device (Ex: PT-404)
7. Click [Insert]. A DTM dialog pops-up. Enter the DTM Tag and HART Address information and click OK.

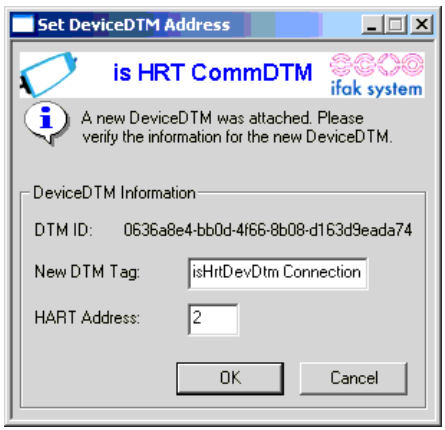

Figure 54. Change DTM Tag/Address

Unique address must be assigned to a device in multi-drop configuration. Only, addresses between 0 to 15 can be used.

8. For a multi-drop HART device network, repeat steps 5 through 7 for up to 15 connected HART devices.

Setting HART Device Tag and Address

HART modem DTM allows modification of the HART device configuration. The Set DTM Tag/Address button is only available if the modem DTM is in offline mode (Communication disabled) and exactly one device object, which shall be assigned to a multi-drop address, is selected in the list. To modify the DTM Tag and Address of configred device,

1. Select Device List from view selector drop down menu.

2. Click ‘Set DTM Tag/Address’ button. This will open a new window. see Figure 54
3. Enter new DTM Tag and HART Device Address and click **OK**.

Setting HART Device Poll Address

The ***Change Address*** button is only available if the DTM is in online mode (Communication enabled) and exactly one physical HART device, which shall be set to a poll address, is selected in the list

When two devices with same poll address are connected to HART modem, only one device, which responds first, will be detected by the HART modem.

1. Select Device List from view selector drop down menu.
2. Select the online device for which you want to change the poll address and click ‘Change Address’ button. This will open a new window.

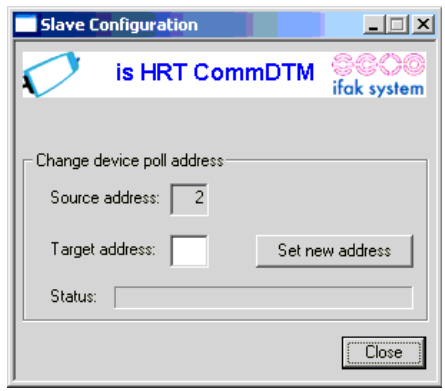

Figure 55. Change Poll Address

3. In the Slave Configuration dialog, see Figure 55, enter Target Address and click ‘Set New Address’.

Deleting Devices

Deleting device objects can only be made in *Communication Disabled* mode.

The following operations must be carried out to delete the field device from the Control Structure:

1. Open Asset Master workplace.
2. Switch to the Control Structure.
3. Right-click on the Asset Master Network and select **Reserve**.
4. Open the substructure below the Asset Master Network object.
5. Select the field device to be deleted in the Control Structure of the Asset Master Workplace.
6. Click with the right mouse button to open the context menu.
7. Select *Delete* in the context menu.

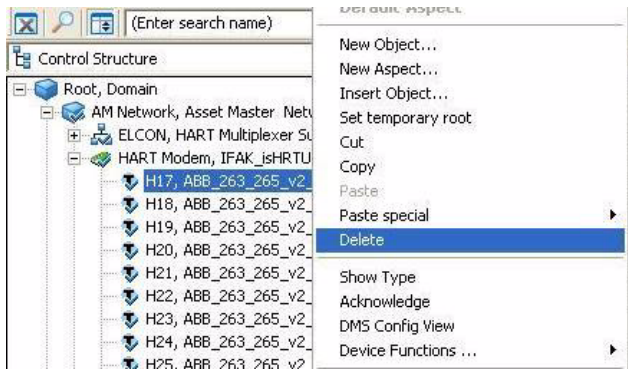

Figure 56. Delete Device Object

PROFIBUS/HART OPC Server data access

Simultaneous access to device data via device DTM and OPC Server is not supported for HART modem configuration. It is not possible to connect to the device when both fieldbus branch is online and PH OPC Server service running.

PH OPC Server provides OPC access to field device data. PH OPC Server comes as pre-configured service with Asset Master. By default PH OPC Server service is not running. This service must be running to access the OPC data. The service can be started from Service Structure.

The service provider name can be found under Service Structure -> Services -> OpcDA_Connector -> SG_AM Network.

The name used here is *OPCDA_Provider_<NodeName>*

Check Enabled check box to start the service. See Figure 57

[Screen shot to enable this service]
Figure 57. Start PH OPC Server service.

Once the service is started, subscribe to OPC data from Control Connection aspect on the device instance.

Make sure that Fieldbus communication is disabled.

PH OPC Server service must be running to use Asset Monitoring.

Configuration and commissioning of HART Device Objects

Once the HART Device Objects have been instanced they can be configured for the application via DTM. A configuration describes the creation of a parameter set for a particular device in Asset Master.

DTMs can be started in Communication disabled mode to configure field device objects or, if changes are to be made directly in the device, in Communication enabled mode. Depending on the mode, the DTM will appear with various functional windows. The various modes are selected via the Fieldbus Management aspect of the relevant device object.

A DTM view can be opened in one of the following ways:

1. From Device Management aspect in the Aspect view
2. From the context menu of Device Functions in Control Structure

Device specific DTMs can only be started via the Device Functions context menu. With these DTMs, the Device Management window has a gray background without any graphic display. The configuration of the device via a DTM is described in the associated DTM documentation and is not included in this documentation.

It is not recommended to connect DTM and Meriam calibrator simultaneouly with the same device. This may lead to unexpected behavior of DTM or the calibrator.

Once the configuration phase is complete for all HART Device Objects, the data records for the relevant device or selection of devices can be

- verified,
- loaded to the device/selection of devices,
- saved in one or more export file(s)

These functions are executed via the *Fieldbus Management* Aspect and its subconditions. Instance data can be verified and exported with the Fieldbus Management in *Communication disabled* mode, but loading is only possible in *Communication enabled* mode. In order to load fieldbus lines, select the line via the context menu of the Fieldbus Management and then click on *Download selection* to start.

Verify

Selecting the verify option in the Fieldbus Management aspect control menu compare the online device data with the stored offline Asset Master configuration data set. The result is *true*, if the data set are equal, otherwise *false*.

If the verification result is false, an up- or download is recommended for data synchronization.

Download and Upload

When several devices are selected, the PROFIBUS/HART Fieldbus Builder starts a batch process for up- or download, which is processed sequentially. Execution of the batch process continues even if errors occur in individual DTMs. Each event (faulty/successful execution) is documented in the Fieldbus Management status window. If an error occurs, an error message is displayed after the end of the batch process to indicate that the batch process is faulty.

Loading errors can arise if this function is not supported by the DTM, or if the DTM cannot establish a connection to the device.

HART modem DTM does not update the disconnected status of HART modem while upload is in progress.

Export and Import

The export file of an instance data record is saved with a time stamp in a folder which is specific to the Device Object. This makes it possible to build up a device configuration history. Exported device data set can be imported again by selecting the specific export file. The export and import process is carried out manually by the user.

HART Multiplexer Interface

The HART Multiplexer interface enables communication between HART devices already connected to the Asset Master. This offers the possibility to integrate large number of field devices trhrugh single interface for continuous monitoring

To establish HART communication between the devices and the Asset Master at least the following requirements shall be met:

- HART devices are connected via Multiplexer to Asset Master (RS232/RS485)
- Asset Master is installed and licensed

Two communication DTMs build up the base for the HART device integration via Multiplexer:

- **HART Subnet DTM**
  includes the HART Server from HCF (HART Communication Foundation)
- **HART Mux DTM**
  used to represent the Multiplexer devices of the HART network.

A Multiplexer is an addressable piece of equipment that connects to a network. It may have additional connection modules called panels. Ultimately, it bridges communication between the controlling network and multiple instruments attached via a channel.

The following HART Multiplexer are supported:

- Pepperl&Fuchs: KFD2-HMM-16

- MTL: MTL4840 Series
- Elcon: Series 2700-G

Elcon Series 2700-F Multiplexer is not supported in Asset Master 5.0.

The supported infrastructure depends on the used Multiplexer type:

Table 2. Supported Multiplexers

Vendor	Multiplexer Type	Channels	Module Support
Pepperl&Fuchs	KFD2-HMM-16	255	no
MTL	MTL4840	0	yes
Elcon	Series 2700	32	no

This is applicable only if USB to Serial converter is used to connect the multiplexer.

Do not disconnect USB to Serial converter while HART server is configured and running. Disconnecting of the converter will require a restart of Asset Master node to establish online communication with multiplexer.

Additional Requirements

The operation of the HART Multiplexer package requires the installation of the HART Server version 2.1, which is done during installation of the Asset Master.

The user must have Windows Administrator rights to configure the HART Multiplexer. Windows Administrator rights are not needed to access online data from HART devices and to do device configuration.

Functionality

The Communication DTMs of the HART Multiplexer interface are implemented according to FDT 1.2 including the following:

Multi User support

The DTM supports multi user scenarios according to the FDT specification by Locking/Unlocking the data set and exchanging the data set changes via the FDT/DTM-Mechanism.

Audit Trail

The HART Multiplexer interface with its Communication DTMs support Audit Trail sessions according to the FDT specification. Following Audit Trail events are issued:

- Change of parameter
- Change of online state
- Call of functions

User Roles

The Communication DTMs check the user rights when an application starts up. Certain users may even be barred from using some applications. If access to an application is permitted, a distinction is made between restricted access (read-only) and full access (read and write) to its functions

Table 3. User Role Access.

Applications	User Roles		
(Note to self: Access privileges to be checked)	Maintenance Technician	Maintenance Supervisor	Maintenance Engineer
List of HART Devices	R	R	R/W
List of Multiplexer	R	R	R/W
HART Channel Configuration	-/-	-/-	R/W
Host Selection	-/-	-/-	R/W
About	R	R	R

-/- = The user interface is not available for selection

R = Data output only (read)

R/W = Data input (write) and output (read)

If, in addition to the roles above, you have administrator or OEM service rights, the role of an observer will grant you unrestricted access to all applications.

HART Server

The HART Server acts as the interface between the system software and the underlying physical HART network including Multiplexers, connection panels, channels and devices. The HART Server user interface is used only to configure and manage the physical components that comprise a HART server hierarchy.

The configuration of a HART device is done with Asset Master via device specific Device Type Manager (DTM).

The HART Server is included in the installation routine of Asset Master.

Configuration of HART Multiplexer topology in HART Server must be done using *AMServUser* login.

HART Server Overview

The HART Server provides a user interface that is similar to the one used in Windows Explorer, so most features of the interface should be familiar. The window features are as follows:

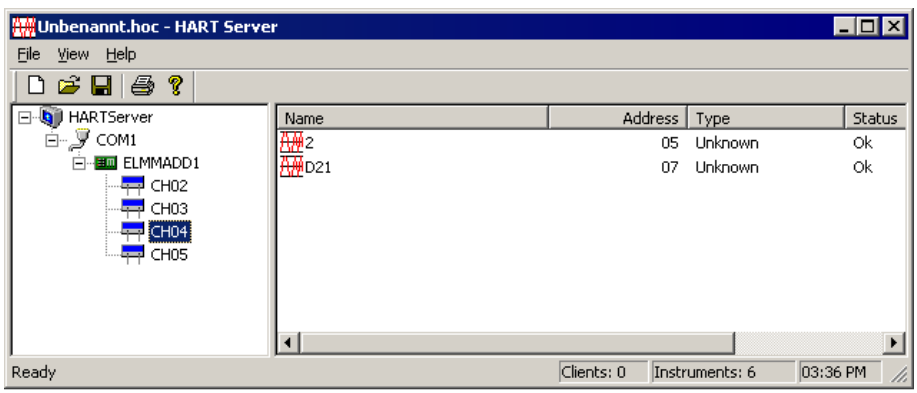

Figure 58. HART Server

The user interacts with the equipment on the networks through a tree control in the left pane and a list control in the right pane. Context menus are used to configure the network.

Tree and List Controls

The first item in the tree control is its root, the HART Server icon. This icon represents the running application. Under the HART Server icon is a hierarchical representation of the physical components the server manages (networks, Multiplexers, connection panels and channels). Just as individual files do not appear in the Windows Explorer tree control, individual instruments do not appear in the HART OPC Server tree control.

The list control displays information about the children of the selected item in the tree control. The information is shown under four columns: Name, Address, Type, and Status.

Items in the list can be sorted by name or address simply by clicking on the appropriate column heading. The width of columns is adjustable, and the column widths are saved when the server is shut down.

The following table summarizes the types of entries in the tree and list.

Table 4. Icons in HART Server

Tree Selection (Left Pane)	Description	Right Pane Displays
Hart Server	The highest level of the tree control. Represents the whole system. The root node of the tree.	Networks
Network	Any connected network of instrumentation. Normally a serial port on the server, but, in the future, it could be a TCP/IP or other LAN connection.	Multiplexers Istruments Dependent upon network support
Multiplexer	Representation of a hardware component that is attached to the network	Panels Channels Dependent upon network support
Panel	Representation of a hardware component that is attached to a multiplexer.	Channels
Channel	Representation of a hardware component that is attached to a multiplexer or panel.	Instruments

Detailed information is described in the HART Servers online help, accessible via the help menu inside the tool.

HART Server Configuration

The following steps need to be carried out to configure the HART Server:

1. Run the HART Server by starting *hartopc.exe* located at *C:\Program Files\ABB Industrial IT\HART Multiplexer Connect\HART Server*

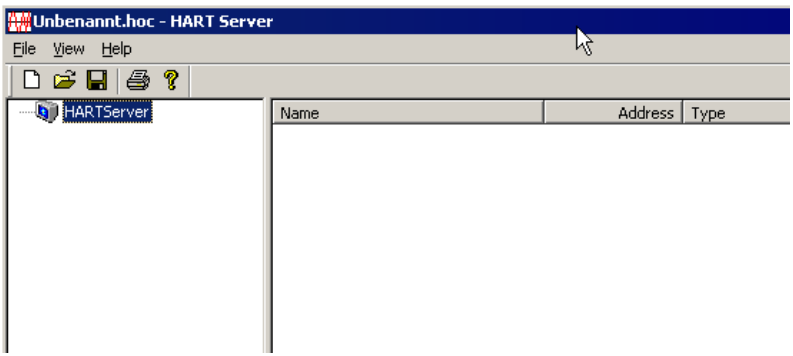

Figure 59. HART OPC Server

2. Select the root node *HART Server.*
3. Click with the right mouse button and choose *Add Network.*

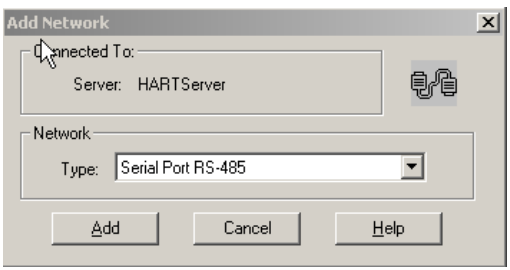

Figure 60. Add Network

4. Choose one of two types of networks from the pull down menu identified as *Type*.
   - *Serial Port RS-485*
     Supports RS485 communication with HART Multiplexers.
   - *Single Serial Port*
     A single RS232 connection to a HART modem that supports multidrop operation.

5. Click [Add].
6. Insert a network name.

This name must be included in the HART Subnet DTM, which is described in HART Server Configuration on page 86. Please keep the name in mind for later Asset Master configuration.

7. Enter correct COM Port and baud rate (Should match with the baud rate of the Multiplexer hardware). Entries shown below are typically valid for most PC connections.

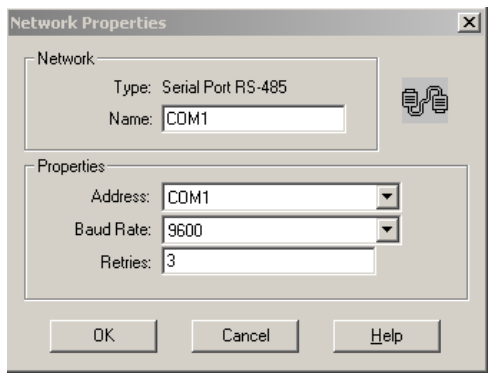

Figure 61. Network Properties

8. Click [OK].

Steps 2 to 8 need to be repeated for any additional multiplexer networks connected to Asset Master.

The network is added to the HART Server.

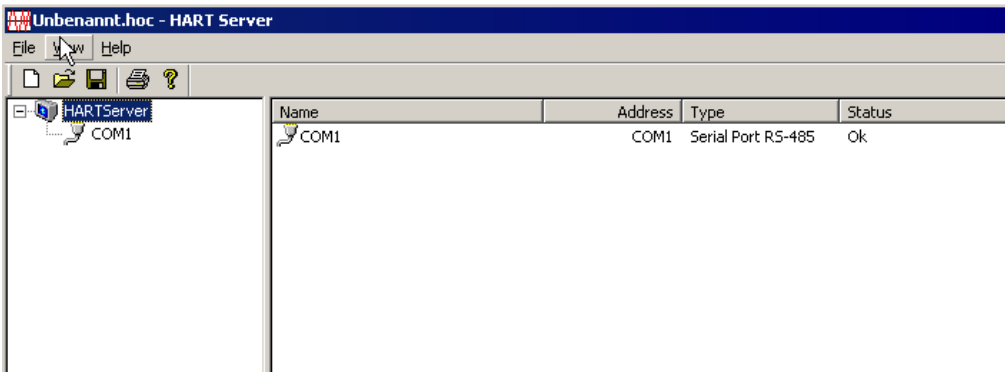

Figure 62. Network View

9. Select the new network node below the *HART Server* node (COM1 in the example).

10. Click with the right mouse button and choose *Learn*. This scans the network for the available Multiplexer and lists them.
    Example: If a Pepperl&Fuchs Multiplexer is connected to the network, it will be found and added to the network.

This step is very important as the HART Mux DTM relies only on the HART Server for the connectivity to the network. If the HART Server fails to find the Multiplexer on the network, the HART Mux DTM can not work properly. Check in this case the properties of the network as well as the installed wiring and hardware.

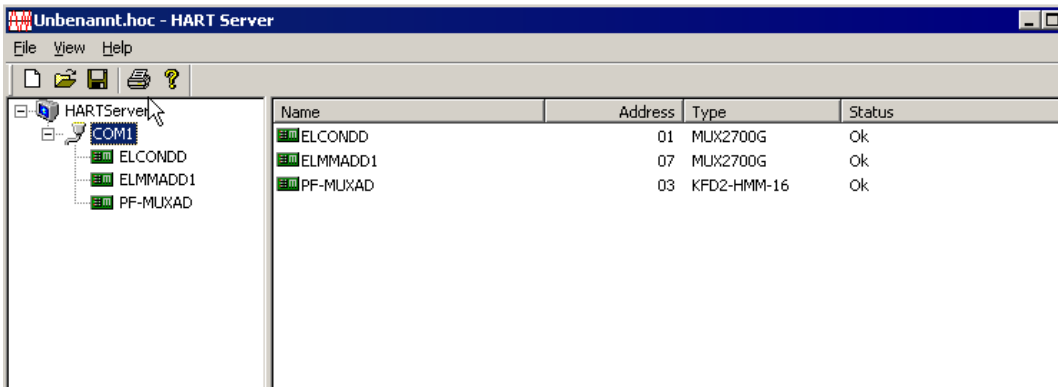

Figure 63. Scanned and Found Multiplexer

The found Multiplexer can now be enquired for available devices.

Refer to Enabling Slaves in Pepperl & Fuchs Multiplexer on page 113. This describes how to enable the slave modules in P&F Multiplexer.

11. Select a Multiplexer.
12. Click with the right mouse button and choose *Learn*. This scans the Multiplexer channels and list the devices connected.

Steps 10 to 11 need to be performed on as many Multiplexers as are found the during learn sequence.

Errors in communication and configuration need to be solved before going ahead with the HART Mux DTM configuration. If no Multiplexer is found in the network by the HART Server, the communication can not be established from the Asset Master node. In this case check wiring, hardware and installation.

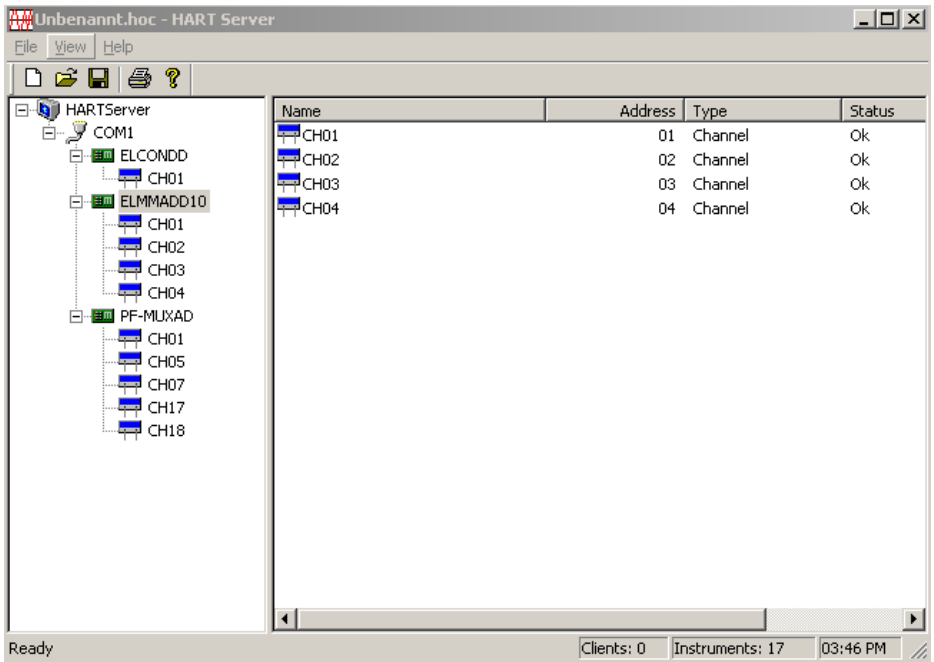

Figure 64. List of the HART devices on different channels

Setting up a Fieldbus Topology for HART Multiplexer

Asset Master is capable of setting up a HART communication with both HART modems and multiplexers. This section describes a sample set-up for the HART multiplexer which is performed using both the Asset and Control structures. HART devices can only be instantiated in the Asset structure which serves as a database repository for all devices in a plant. The HART devices are then inserted into and removed from the Control structure where communications are established between the multiplexer and the device.

Asset Master includes 2 pre-configured HART multiplexer objects that are ready to use after installation. Prior to connecting devices to the multiplexer, the communications between the PC and the multiplexer must be verified as described earlier using the HART Server application.

One of the HART multiplexer objects is for an Elcon / Pepperl & Fuchs 2700 Series interface and the other is for an MTL4840 server interface. These objects can remain in the Control Structure even if they are not being used. However, it is OK to delete them by right clicking on the object and selecting Delete.

Disabling Multiplexer Communications

A number of actions, such as adding or removing a device from a multiplexer, require that the multiplexer communications with the PC first be disabled. There are two (2) ways for doing this. One is via the context menu of the *Fieldbus Management* aspect at the multiplexer object. The other is via the *Device Functions* context menu from the multiplexer object.

The default communications status for a new installation of Asset Master or newly created multiplexer is Disabled.

Method using *Device Functions* context menu

1. Open the Asset Master workplace
2. Select the Control Structure from the structure list
3. Right click on the multiplexer object
4. Move the cursor over the *Device Function* context menu item
5. Select the *Disable Communication* menu item to the right of the context menu item.

Method using *Fieldbus Management* aspect

1. Open the Asset Master workplace
2. Select the Control Structure from the structure list
3. Select the multiplexer object
4. Select the *Field Management* aspect from the Aspect List
5. The mode icon at the bottom left of the Aspect View window indicates the current mode. Proceed to the next steps if it reads *Communication enabled.*
6. In the Aspect View area right click on the *Fieldbus Management* item

7. Select the *Disable Communications* menu item from the context menu.

The menu item for both methods toggles between Enable or Disable Communication depending on the current status. If the menu item reads Enable Communication, then the communications is already disabled and no action is needed.

Enabling Multiplexer Communications

Perform the same steps above for Disabling Multiplexer Communications except select *Enable Communication* instead *of Disable Communication.*

Unless described otherwise , all configuration steps described throughout this section must be done in the Configuration disabled mode.

Scanning for Multiplexer Hardware

The following operation identifies all connected multiplexers

1. Open the Control Structure.
2. Select the appropriate HART Multiplexer Subnet.

3. Select *Device Management* aspect and use the pull down menu to select *List of Multiplexer*

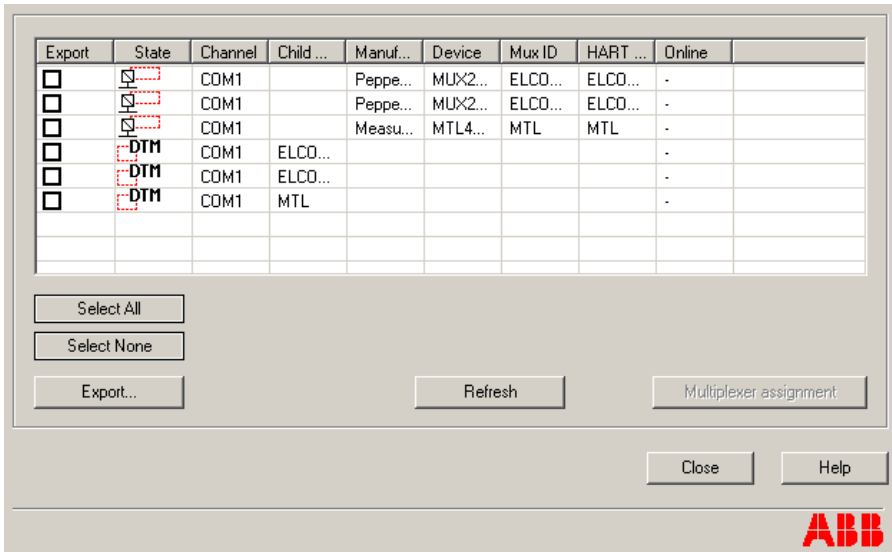

Figure 65. List of Multiplexer

4. Click [Refresh].

   The list view shows the instantiated Multiplexer objects and the physically existing Multiplexer hardware, found during the scan procedure of the HART Server.

List of Multiplexer

The HART Subnet DTM with its *List of Multiplexer* window provides information about instantiated Multiplexer objects and physically existing Multiplexer hardware (vendor, type, channel information), connected to the RS485/RS232 networks.

The *State* field is used to display an icon, that reflects the state of device configuration. The following icons are possible.

Table 5. Icons used in list multiplexers

Icon	Description
	This icon represents an instantiated Multiplexer object in the Asset Master system, which is not associated to any physically existing Multiplexer.
	This icon represents an physically existing Multiplexer, identified from the HART Server during network scan.
	This icon represents an instantiated Multiplexer object, which is configured and assigned to an physically existing Multiplexer.

The ***Refresh*** button allows to update the list by scanning the network for physical Multiplexer hardware, connected to the HART Server. While the refresh process is active, this button is labeled *Stop Refresh* and all other buttons are disabled. Selecting *Stop Refresh* cancels the refresh process.

The button ***Multiplexer assignment*** is only available if the DTM is in offline mode (Communication disabled) and exactly one Multiplexer object is selected in the list. This button will open a separate dialog, which allows the assignment of the instantiated Multiplexer object and the physically existing Multiplexer hardware.

The ***Export*** field in the list allows a selection of rows to export information. If the *Export* button is selected, the information about the selected entries are exported in a file. If no check box of the list is checked the *Export* button is disabled. It is recommend to use a **.csv* or **.xls* file extension for export.

Assignment of the Multiplexer Object to the Multiplexer Hardware

The Multiplexer hardware from MTL does not support different channels, but it supports instead different panels. During instantiation of the MTL Multiplexer object a panel is automatically created below the MTL Multiplexer object. If more then one panel is physically used, select the MTL Multiplexer object, right mouse click and create a new panel object. Repeat this step till all panels are instantiated.

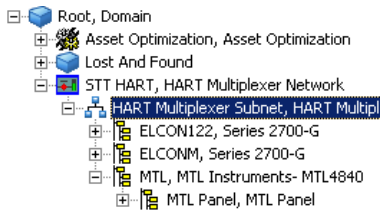

Figure 66. Multiplexer Subnets

For Elcon multiplexers assign the physical channel to the Multiplexer.

For MTL multiplexers assign the physical panel to the Multiplexer panel object as described in this section. A channel configuration for the MTL panels is not required and can be skipped.

The following operation associates an Asset Master multiplexer object for Elcon or MTL to a physical multiplexer

1. Select the Multiplexer object, which must be assigned to a physically existing Multiplexer.

Multiplexer objects, which are not assigned to Multiplexer hardware, are shown in the state column as DTM.

2. Click [Multiplexer assignment].

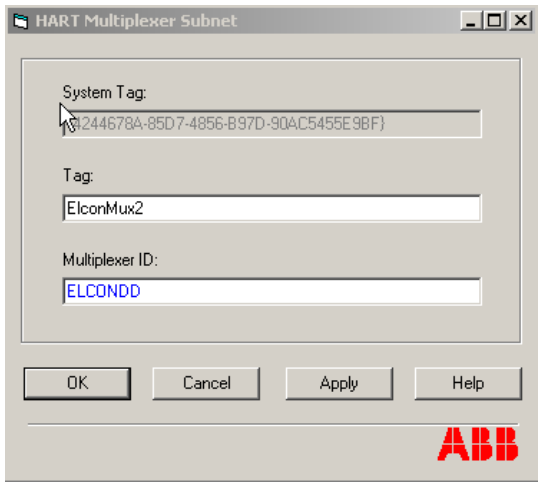

Figure 67. Assigning of the Multiplexer object to the hardware

3. Type in the *TAG* of the Multiplexer.
4. Type in the Multiplexer ID as shown in the *List of Multiplexer* DTM window in the column *Mux ID*.

5. Click [OK].

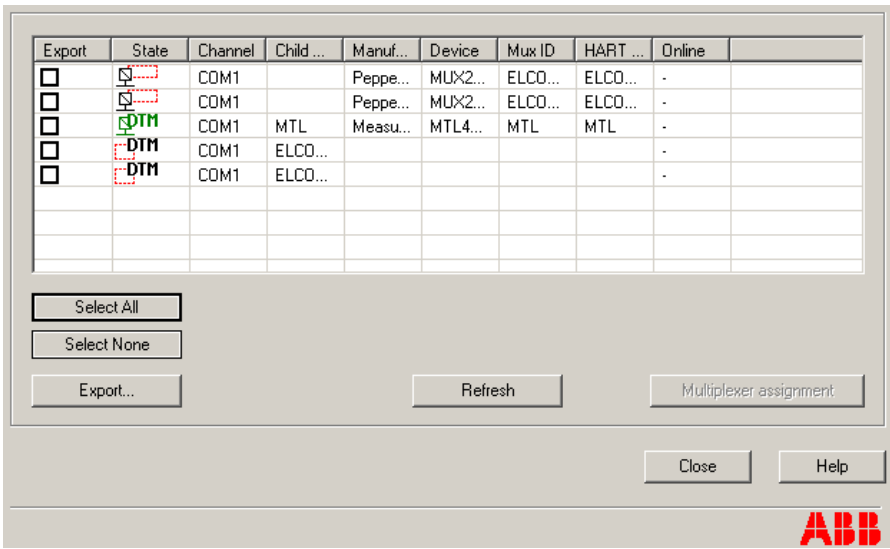

Figure 68. Assigned object to the Multiplexer hardware

If an Asset Master object matches to the physical hardware type, only one entry will be visible for the Multiplexer object and the hardware. The icon of that entry will be green.

Repeat steps 1 to 5 till all Multiplexer hardware is assigned to the proper object in the Asset Master.

Scanning HART Devices

This operation finds all HART devices that are physically connected to a multiplexer.

1. Select the Multiplexer object.
2. Select *Device Management* aspect of the Multiplexer object and use the view selector to invoke *List of HART Devices*.

3. Click [Refresh].

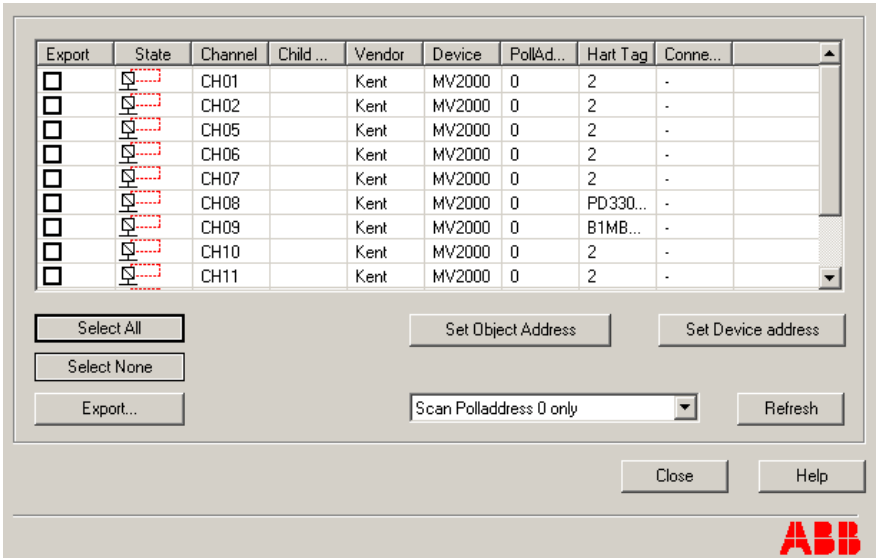

Figure 69. List of HART devices

The physically existing devices are shown in the list. The displayed devices must be configured manually in the Asset Structure and inserted into the Control Structure.

List of HART Devices

The specific Multiplexer DTM provides information about HART devices (vendor, type, channel information) that are connected to HART channels of the selected Multiplexer.

If the Multiplexer DTM is called in an offline mode, the *List of HART Devices* provides a list of found devices. The *State* field is used to display an icon, that reflects the state of device configuration. The following icons are possible:

Table 6. Icons, used in List of Multiplexer

Icon	Content
	This icon represents an instantiated device object in the Asset Master system, which is not associated to any physically existing HART device. This icon only appears, if more than one HART device is configured in the Asset Master Workplaces Control Structure to a specific channel, supporting multi-drop mode. For changing the polling address of the specific object, use the *Set Object address* button.
	This icon represents an physically existing HART device, identified from the HART Server during device scan (refresh). Changing the polling address of the physical device hardware use the *Set Device address* button.
	This icon represents an instantiated device object, which is configured and assigned to an physically existing HART device.

The ***Refresh*** button allows to update the list by scanning the Multiplexer for physical device hardware. While the refresh process is active, this button is labeled *Stop Refresh* and all other buttons are disabled.
Selecting *Stop Refresh* cancels the refresh process.

The ***Set Object address*** button is only available if the Multiplexer DTM is in offline mode (Communication disabled) and exactly one device object, which shall be assigned to a multi-drop address, is selected in the list.

Device objects are shown in the state column as DTM

Set Object address button will open a separate dialog for setting the Address/Tag of the HART device object. The entered address is not synchronized with the physically existing device hardware.

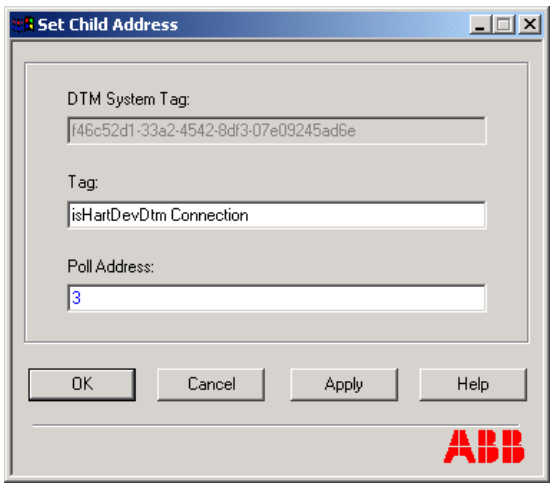

Figure 70. Set Object polling address and TAG

Changing the HART address of the physically existing device hardware is done via Set Device address button in the List of HART Devices window.

The ***Set Device address*** button is only available if the DTM is in online mode (Communication enabled) and exactly one physical HART device, which shall be set to a poll address, is selected in the list.

Physical HART devices are shown in the state column as DTM

Set Device address button will open a separate dialog for setting the poll address of the physical HART device. The entered address is not synchronized with the device object.

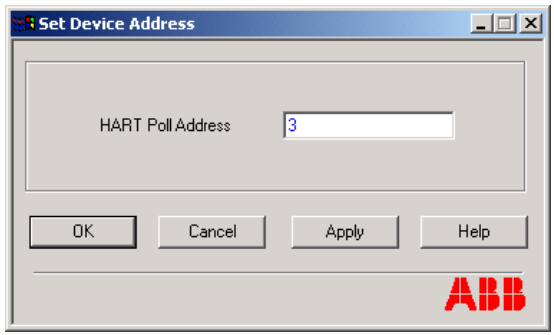

Figure 71. Set Device Address

Changing the address of the device object is done via Set Object address button in the List of HART Devices window.

The ***Export*** field in the list allows a selection of rows for export information. If the *Export* button is selected, the information about the selected entries are exported in an excel file. If no check box of the list is checked the *Export* button is disabled. It is recommend to use a **.csv* or **.xls* file extension for export.

Use ***Select all*** button, if the export file shall contain the complete list of HART devices, shown in the window. All devices and objects are checked for export.

The ***Deselect all*** button removes all check marks of the selected objects.

There is a combobox for choosing the kind of scanning. Either only address 0 is scanned or the channels are polled from 0 to 15.

Instancing HART devices

For each scanned device an appropriate HART device object must be instantiated in the Asset Structure and inserted into the Control Structure. The *List of HART*

Devices shows these devices with information about vendor, device type and the connected channel.

Select all objects in the List of HART Devices window and start an export. Use the export file (e.g. excel) to have the device information to be on hand for next steps.

Instancing HART device objects in the Asset Master is only possible in Communication disabled mode.

Asset Master provides preconfigured object types for corresponding device types, connected to the Multiplexer hardware.

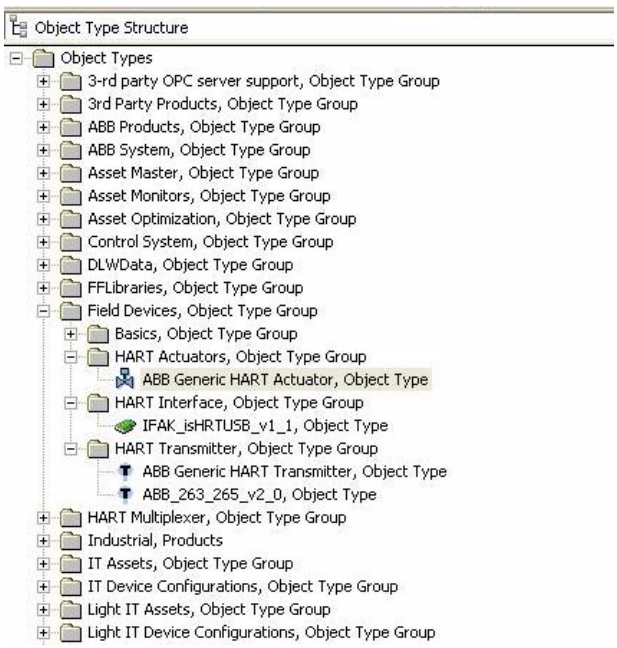

Figure 72. Preconfigured HART object types

Refer to Adding Devices to Asset Structure on page 43 for adding devices to the Asset Structure.

For HART, object types are stored inside the Field Devices folder. Please use device types from HART Actuators and HART Transmitter Object Type Groups instead of the object types in the Basics, Object Type Group folder.

Asset Master includes HART Device Objects, for use with vendor specific DTMs. In most cases the DTM is installed as part of an object type using the Device Library Wizard.

Vendor specific DTMs sometimes include a license mechanism to run the DTM without limitations. The DTM license has to be ordered separately from the DTM vendor. Licenses for a DTM are not included in the Asset Master licensing.

This operation inserts required device object types from the Asset Structure into the Control Structure where a physical connection to the device is established.

1. Open the Control Structure.
2. Select the Multiplexer object below which the HART device object will be placed, e.g. Elcon's *Series 2700*.
3. Click with the right mouse button to open the context menu.
4. Select *Insert Object* in the context menu.

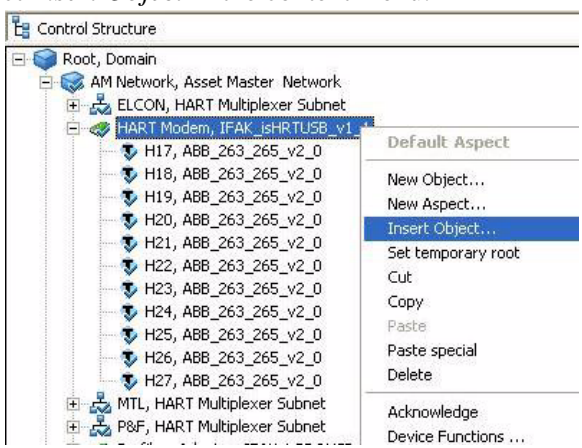

Figure 73. Inserting a new device object

5. Open the Asset Structure in the new window, and locate and select the required device object.

6. Enter a name for the specific device in the Name box, e.g. the TAG.

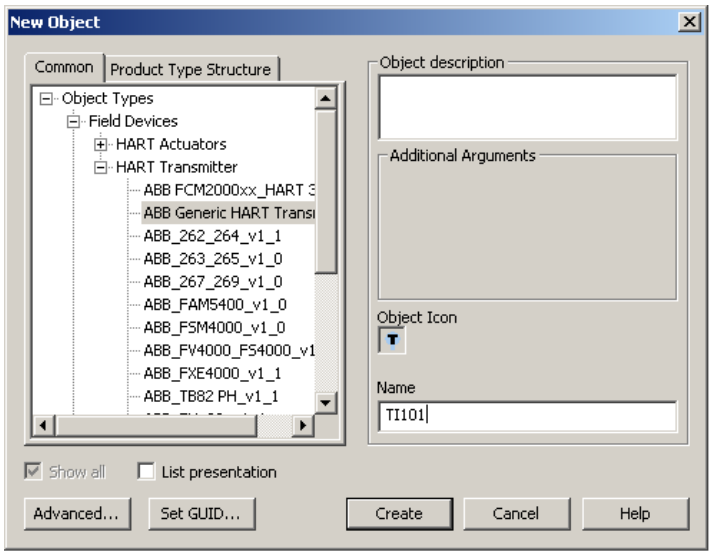

Figure 74. Selecting a device object

7. Click [Create].

The new device object is placed below the Multiplexer object. Repeat steps 2 to 7 until all of the desired device objects have been placed on the Multiplexer object.

Channel allocation on Multiplexer object

The following operations must be carried out to assign the HART device objects to the Multiplexer channels:

1. Open the Control Structure.
2. Select the *Fieldbus Management* aspect on the Multiplexer object type, e.g. Elcon's *Series 2700*.
3. The user interface of the Fieldbus Builder PROFIBUS/HART appears in the main window. The Fieldbus Builder PROFIBUS/HART copies the fieldbus tree from the Control Structure to its fieldbus tree in the main window. To improve performance levels, the partial tree is not copied in its entirety.
4. Click "+" to open the next level of the partial tree.

5. All positioned field devices, together with the channel information from the Multiplexer objects, now appear in the partial tree.

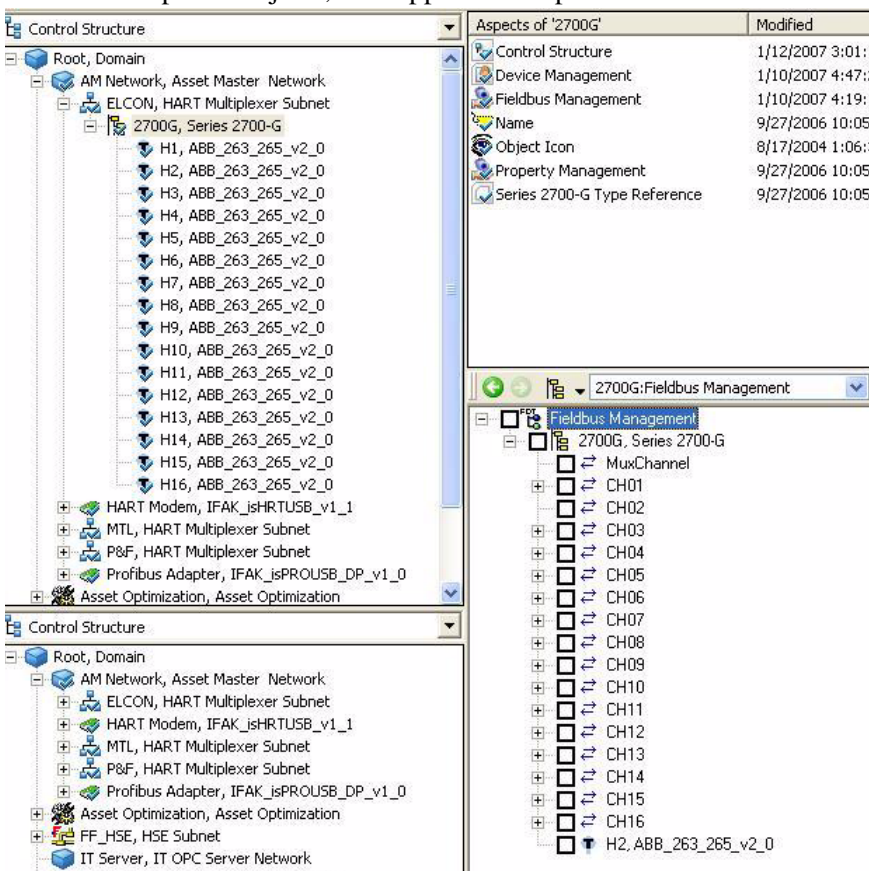

Figure 75. Fieldbus Management view

6. The field device is selected and moved to the required channel by pressing and holding down the mouse button (drag'n drop). The field device automatically moves to the channel.

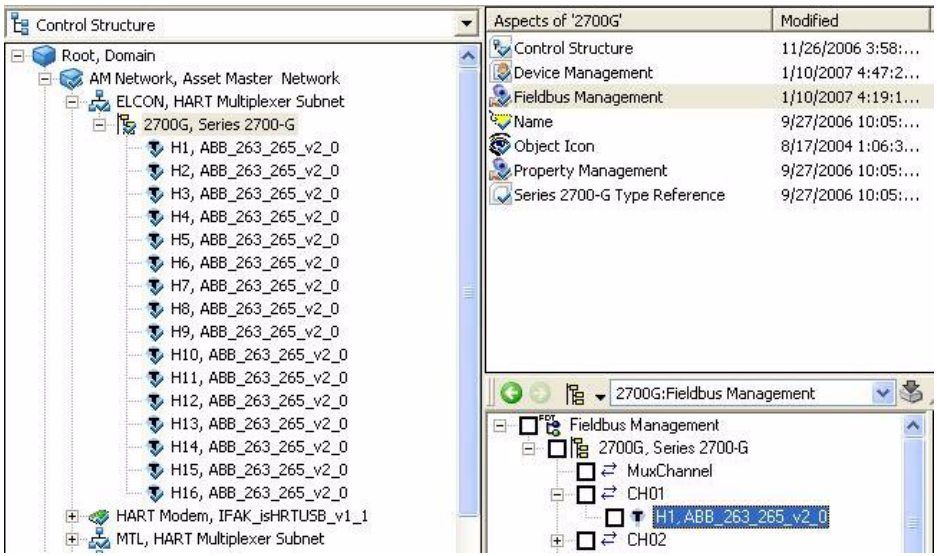

Figure 76. Assigned devices on Multiplexer channel

7. If the check box next to the device object is selected, the status window is updated and the object information is displayed.

This completes the Multiplexer channel configuration for the HART Mux DTM. Repeat steps 2 to 7 until all of the desired device objects have been placed on the right Multiplexer channel.

To check, if all device objects are instantiated and assigned to the right Multiplexer channel, the List of HART Devices window on the Multiplexer object can be used.

1. Select the Multiplexer object.
2. Select *Device Management* aspect of the Multiplexer object and invoke *List of HART Devices*.

3. Click [Refresh].

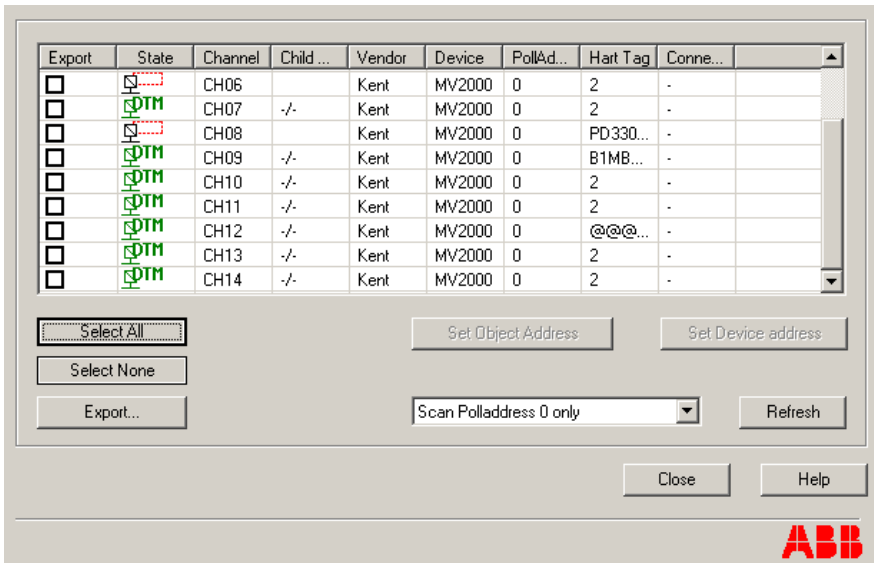

Figure 77. List of HART devices

If the device object matches to the physically existing HART device, only one entry will be shown for the HART device. Correct configured device objects are indicated with green DTM sign. Not configured device types have to be configured as described in the steps above.

The configuration is now done for the Multiplexer and the device objects.

Multiplexer Channel Configuration

This operation optimizes the multiplexer performance by elimination of scanning of unused channels.

1. Open the Control Structure.
2. Select the Multiplexer object.

3. Select *Device Management* aspect and use the View Selector to select *HART Channel Configuration.*

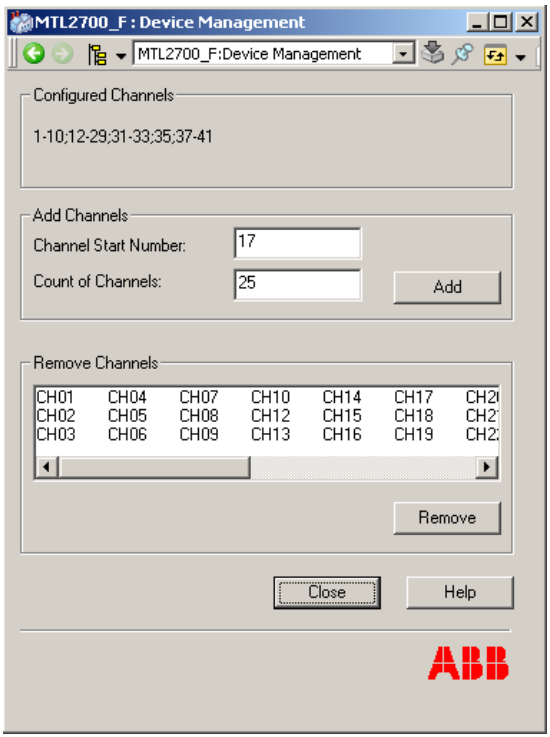

Figure 78. HART Channel Configuration

The current used and configured channels are shown in the frame *Configured Channels*. Channels, which are used from the Multiplexer hardware and not shown in this frame, can be inserted by using the frame *Add Channels*.

The channel are constructed as *CHxx* object name in the Control Structure, whereas *xx* is the number of the specific channel.

Add new Channels

The frame *Add Channels* allows to add further used channels of the Multiplexer, which are not configured yet.

1. Insert the *Channel Start Number* of the channels, which shall be added to the configuration.

Channel Start Number allows to define the first missed channel of the Multiplexer hardware.

Example:
The first missed channel is number 17. Enter number 17 in the name box.

2. Insert the increment number of channels in the field *Count of Channels.*

   The entered number in the *Count of Channels* field is the amount of used channels.

Example:
The first missed channel is number 17. The last missed channel is number 19. Enter the number 3 in the Count of Channels field. Channel 17, 18 and 19 are added to the configuration.

Remove Channels

The frame Remove channels allows to delete those channels, which are not used from the Multiplexer hardware. Multiple selection is possible. Clicking the Remove button results in deleting the selected channels.

Channel configuration optimizes the performance of the Multiplexer scan rate. Therefor only the physically used channels shall be configured.

The add and remove functionality of the HART Channel Configuration window is write protected if HART devices are already associated to any HART channel of the Multiplexer object or if the HART Multiplexer network is in Communication enabled mode.

A channel configuration is not possible till all inserted device objects below the Multiplexer object are deleted.

Check configured channels

1. Open the Control Structure
2. Select the *Fieldbus Management* aspect of the Multiplexer object.

3. Open the tree in the Fieldbus Management window.

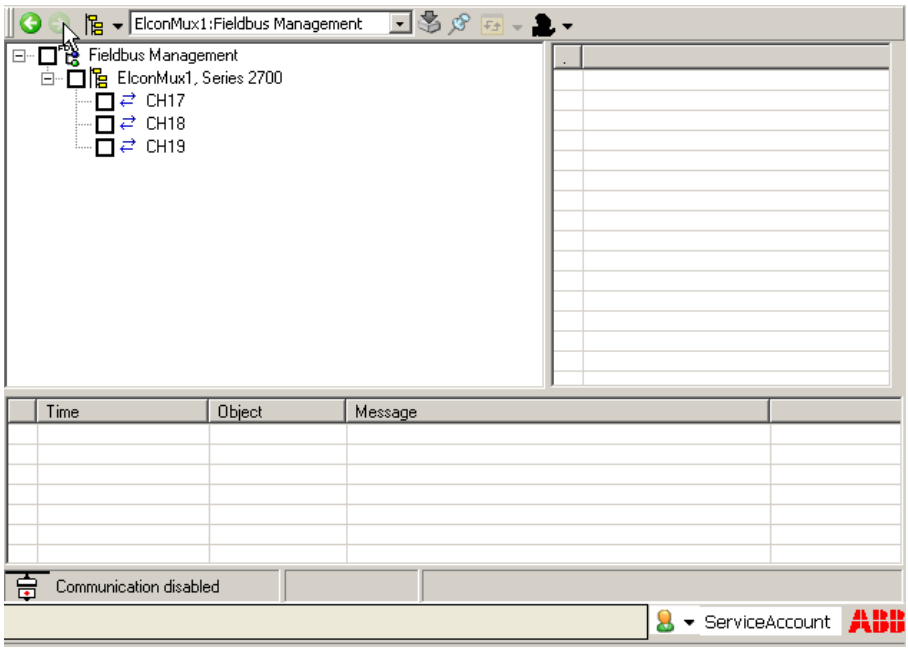

Figure 79. Configured HART Channels

Configured channels are visible in the Fieldbus Management tree below the Multiplexer object.

Repeat the procedure described in Multiplexer Channel Configuration on page 107 for each instantiated Multiplexer object.

The preinstalled Pepperl & Fuchs (Elcon) and MTL multiplexer networks are ready to use, and have already been set-up with Profibus / HART OPC Server addresses and Channel names. The remaining pages in this section are provided in case these parameters need modification in the multiplexer objects.

Only one Asset Master network can exist in Asset Master.

PROFIBUS/HART OPC Server Data Access

Unlike HART modem, simultaneous access to device data via device DTM and OPC Server is supported for HART Multiplexer configuration.

Refer to PROFIBUS/HART OPC Server data access on page 78.

HART Server Configuration

1. Open the Control Structure.
2. Select the Elcon or MTL Multiplexer Subnet.

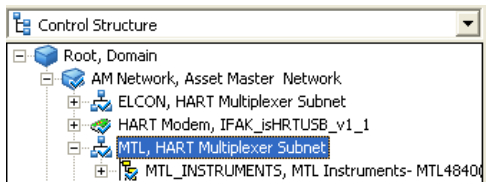

Figure 80. HART Multiplexer Subnet

3. Select the Aspect *Device Management* and use the View Selector to select “Host Selection”.

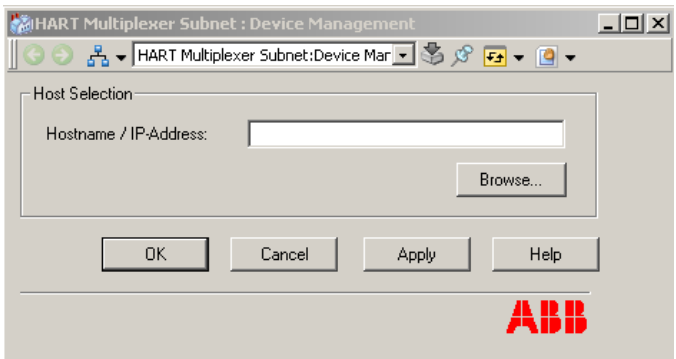

Figure 81. Specify the HART Server address

4. Type in the IP Address of Asset Master (default installation uses 192.168.1.24).

It is not allowed to insert “Localhost” as a local host name.

This setting has to be done in Communication disabled mode. If the Fieldbus Management is in Communication enabled mode, the IP address can be changed but is not accepted.

5. Use the View Selector to call up DTM *Channel Configuration*.

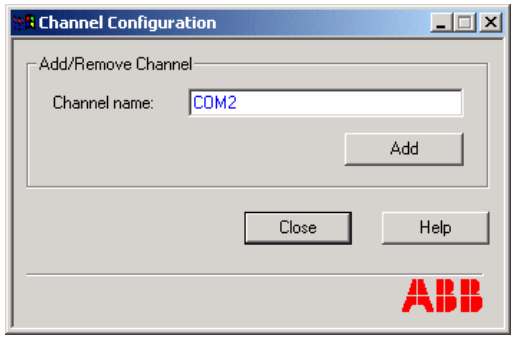

Figure 82. Channel Configuration

6. Type in the channel name as configured in the HART Server.

The HART Subnet DTM is preconfigured with a channel name for the different Multiplexer types. The default channel name is COM1. If another channel name is used, it has to be entered here. The channel name must already have been configured in the HART Server as the network name as described in HART Server Configuration on page 111.

7. Click [Add].

Repeat steps 2 to 6 till all host and channel names are configured for each subnet. Not included channel names can not access the physical HART Multiplexer in later configuration work.

8. Click [Close].

The button *Add* is relabeled according to the selected channel name. If the channel does not exist, the button is labeled *Add* and if the channel does exist, the button is labeled *Remove*.

If it is not possible to edit the list of channel, the button has become disabled. This occurs if the channel displayed in the edit field was already assigned a communication DTM.

Instantiation of HART Multiplexer Objects

The following steps are needed only if a pre-existing multiplexer object was deleted, and subsequently needed to be re-installed.

1. Open the Control Structure.
2. Select the HART Multiplexer Subnet.
3. Right-click on the mouse and select *New Object*.
4. Select the Multiplexer hardware from the list.

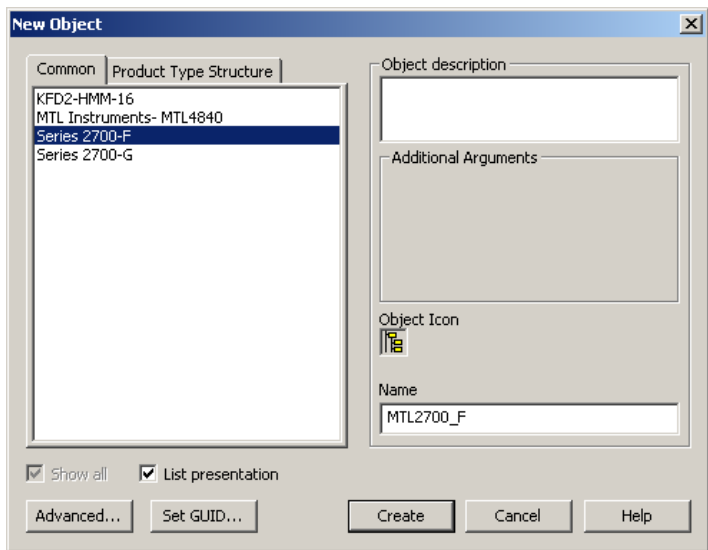

Figure 83. HART Multiplexer Objects in the Asset Master system

5. Insert a name and click [Create].

Repeat steps 1 to 5 till all used Multiplexers are instantiated.

Enabling Slaves in Pepperl & Fuchs Multiplexer

Pepperl & Fuchs multiplexer supports 16 slave modules. By default only slave 0 is enabled. Additional slaves addresses from 1 to 15 needs to be enabled manually. This section describes the procedure to enable additional slaves addresses.

1. Connect P&F multipleser and all the slave modules to Asset Master node.
2. Open **GnHost.exe** application located in *<Install Path>\HART Multiplexer Connect\HART Server*
3. Select the respective HART multiplexer in the device tree.
4. In the command tab, as shown in Figure 84, issue the *request* '**157**' with:
   - the data '**00FF**' to enable Multiplexer slave modules 0-7
   - the data '**FFFF**' to enable all slaves from 0-15

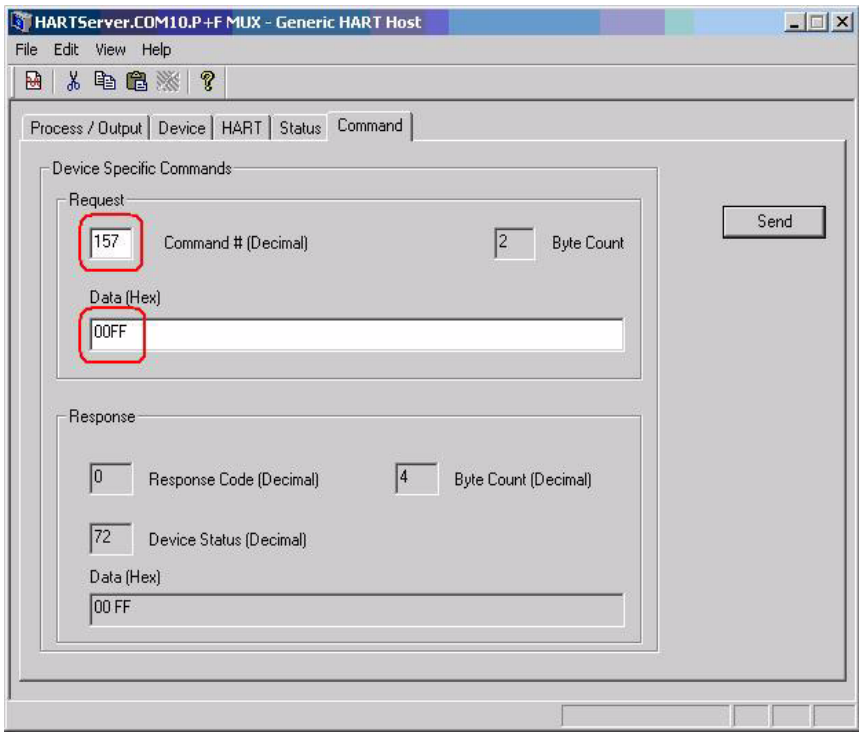

Figure 84. HART Server - Enabling Slaves

5. Once the data has been set, click on the [Send] button to enable the slaves in multiplexer.

Section 4 Device Library Wizard

Device Library Wizard

A range of pre-configured device types for Asset Master are available for the fieldbus protocols FOUNDATION Fieldbus, PROFIBUS and HART.

The Device Library Wizard is a tool that is used for adding these separately delivered device types to the device libraries of Asset Master.

This section describes the process of adding these device types to Asset Master using Device Library Wizard.

Detailed information about the Device Library Wizard and further functionality is described in *Industrial^{IT}, Device Library Wizard, FOUNDATION Fieldbus, HART, PROFIBUS, User Instructions (2PAA101272R5001).*

Device types for Asset Master environment are available from Asset Master DVD 2 and from ABB Solutionsbank for all supported fieldbus protocols in the form of device type files. This section describes a common workflow, how to work with Device Types in the Device Library Wizard for Asset Master.

A general workflow to add device types to the Asset Master system is listed below:

- **Step 1:** Install Device Library Wizard and perform Server settings.
- **Step 2:** Check availability of the required device types. Device types can be downloaded from ABB Solutionsbank. Additionally a set of released device types are available on Asset Master DVD 2.
- **Step 3:** Extract the device type files to the specific Device Integration Library folders on all involved Asset Master PCs using the Device Library Wizard.
- **Step 4:** Read corresponding device type release notes for details and limitations. Release Notes are provided together with the device type file or can be downloaded from ABB Solutionsbank (TechInfoBank).

- **Step 5:** Install the required device types to the Asset Master system.
- **Step 6:** Perform fieldbus protocol specific post-installation actions, if included in the device type release notes or the specific system release note.

Configure Device Library Wizard

Step 1: Device Library Wizard Settings

Perform the following procedure on the Asset Master system, where the Device Library Wizard Client is installed:

1. Open the Device Library Wizard: **Start > All Programs > Asset Master 800xA > Device Mgmt > ABB Device Library Wizard** or double-click the **ABB Device Library Wizard** shortcut on the Desktop.
2. When the Device Library Wizard opens with main window select **Device Library Wizard Settings** and click **Next**.

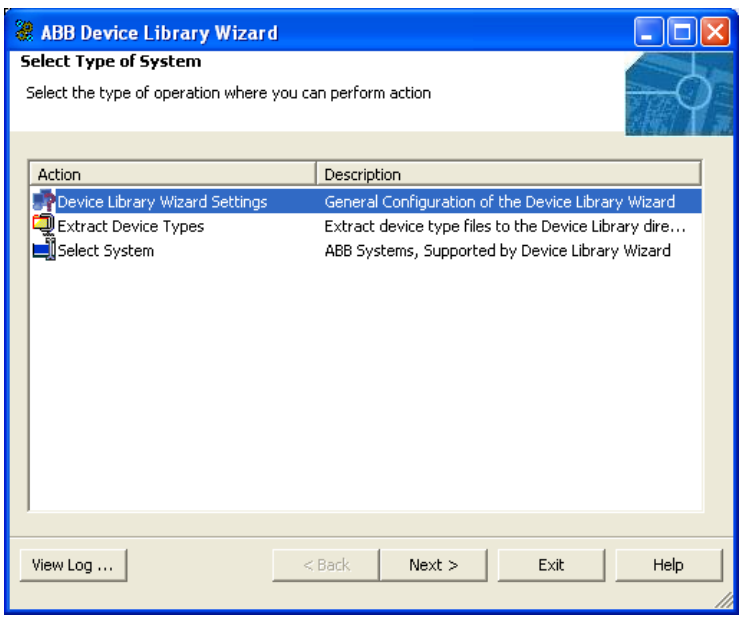

Figure 85. Device Library Wizard Settings window

3. Select **Server Setting** and click **Next**.

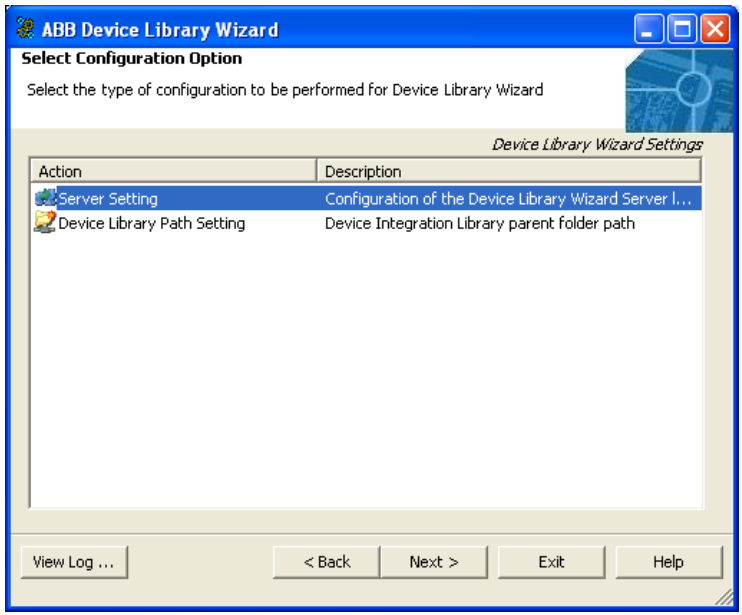

Figure 86. Server Setting Window

This Device Library Wizard window contains additionally the action “Device Library Path Settings”. By selecting this action it allows the user to adapt the project related path of the used ABB system. Normally the Device Library Wizard set the path according to the installed ABB system.

If the path is not set correctly software components delivered with the single device type object will not be installed properly, e.g. documentation will not copied, which will be visible in the log file or status line during object type installation. Only in this case the path shall be set manually according ABB system documentation, otherwise it highly recommended not to change the default path here.

4. Enter the Asset Master Server node name, and uncheck ‘Aspect Server 1 oo 2’ and ‘Aspect Server 2 oo 3.

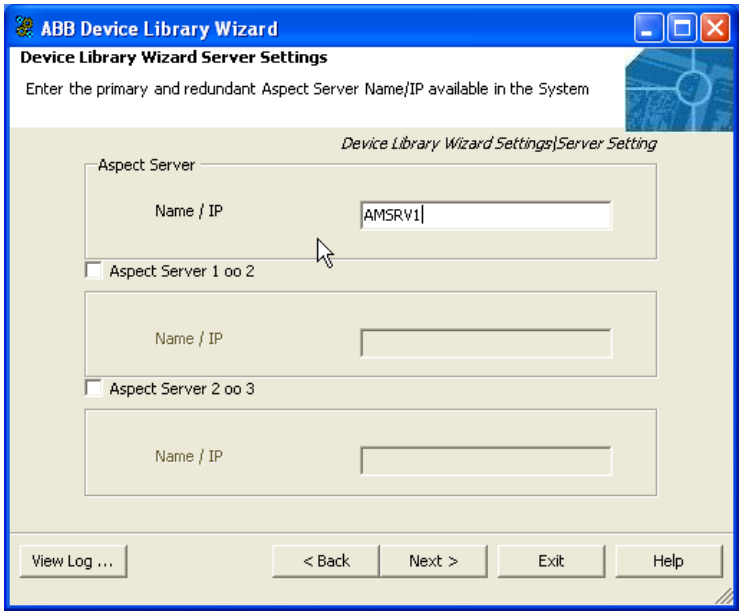

Figure 87. Configure Device Library Wizard Server Settings window

5. Click **Next**

6. Click **Finish** to confirm the Device Library Wizard server settings.

Successful connection to the server is indicated by **Configuring server settings is completed!** entry in the logger area.

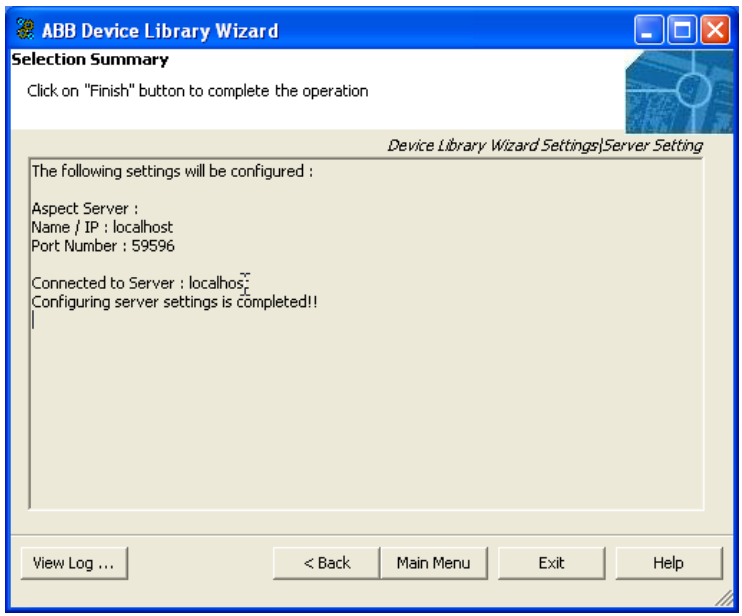

Figure 88. Connection to Server completed

It is only possible to work with Device Types using the Device Library Wizard after successfully completing the server node settings configuration.

7. Click **Main Menu** to navigate back to the Device Library Wizard main window.

Device Library Wizard generates a log file. To view the contents of the log file press **View Log** in the Device Library Wizard window.

The path to the log file is
<Installation path>\ABB Industrial IT\Engineer IT\ABB Device Integration Library\DLW.log.

8. Click **Exit** to close Device Library Wizard or proceed with the next step.

Step 2: Device Library Path Setting

This option allows to set the path to the location on the hard disk, where the ABB system stores project related data for device type objects. A default path is set during installation of the Device Library Wizard, which must not be changed in case of no installation problems.

Device Library Wizard installation will set the default path to:

<Installation drive>\ABB Industrial IT\Engineer IT

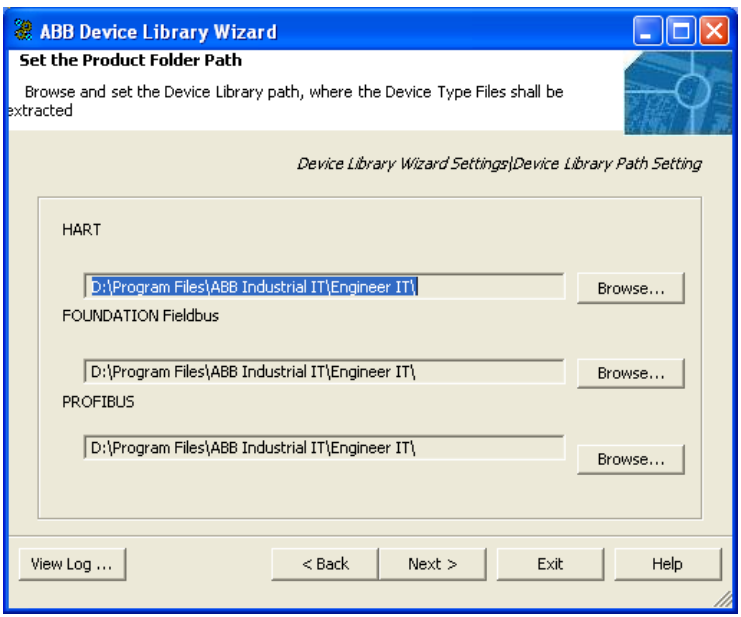

Figure 89. Setting of Protocol Library Folder Path

If the path is not set correctly software components delivered with the device type objects will not be installed properly, e.g. documentation will not copied, which will be visible in the log file or status line during device type installation. Only in this case the path shall be set manually according ABB system documentation.

Using Device Library Wizard

Step 1: Obtain Device Types

ABB provides a continuously increasing portfolio of system tested and certified ABB and third party device types. They are available from Asset Master System DVD2 or from ABB Solutionsbank.

Download from the Solutionsbank

1. Login to ABB Solutions Bank, http://solutionsbank.abb.com
2. Open **Download Bank > Download Bank Explorer**
3. Browse to
   - **Control Products and Systems / 800xA / Device Management - FOUNDATION Fieldbus / Device Library - <category>** for FOUNDATION Fieldbus device types or
   - **Control Products and Systems / 800xA / Device Management - HART / Device Library - <category>** for HART device types or
   - **Control Products and Systems / 800xA / Device Management - PROFIBUS / Device Library - <category>** for PROFIBUS device types

   and download the required device type files to your local machine.

Asset Master DVD 2

The device types are available on Asset Master DVD 2. The device type files are separately available in specific folders corresponding to the fieldbus protocol.

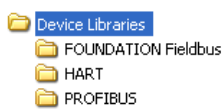

Figure 90. Asset Master DVD 2

Step 2: Extract Device Type Files

Device type files exist as zip files (.zip) or self extracting zip files (.exe). Both file extensions can be handled in parallel by the Device Library Wizard.

The location where device type files are stored can be different from the currently used system node. It is **not** required to copy all the device type files to local disk.

Extract the device type files in the following sequence:

1. Open the Device Library Wizard: **Start > All Programs > ABB Industrial IT 800xA > Device Mgmt > ABB Device Library Wizard** or double-click the **ABB Device Library Wizard** shortcut on the Desktop.
2. When the Device Library Wizard opens with main window select **Extract Device Types** and click **Next.**

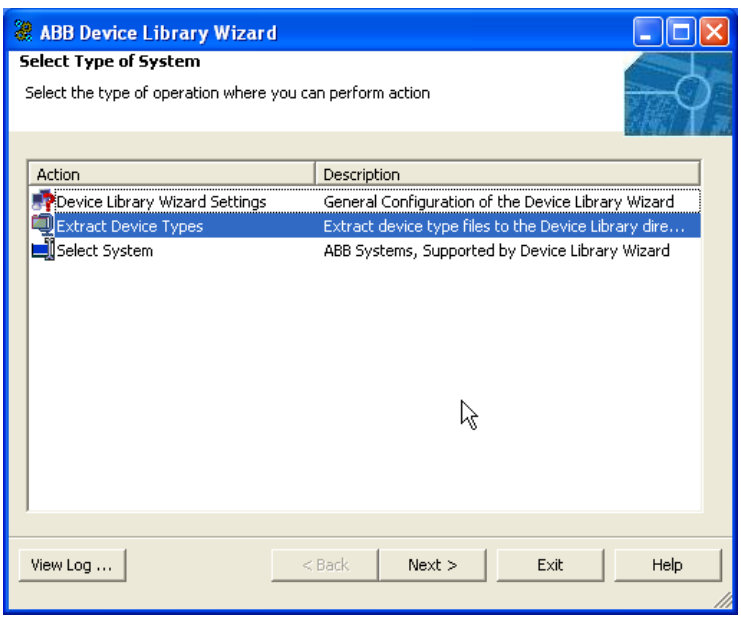

Figure 91. Selected Extract Device Types

3. Click **Browse** button and navigate to the corresponding folder that contains the device type files of the device types.
4. Select the required device type files (multiple selection is possible) and click **Open**.

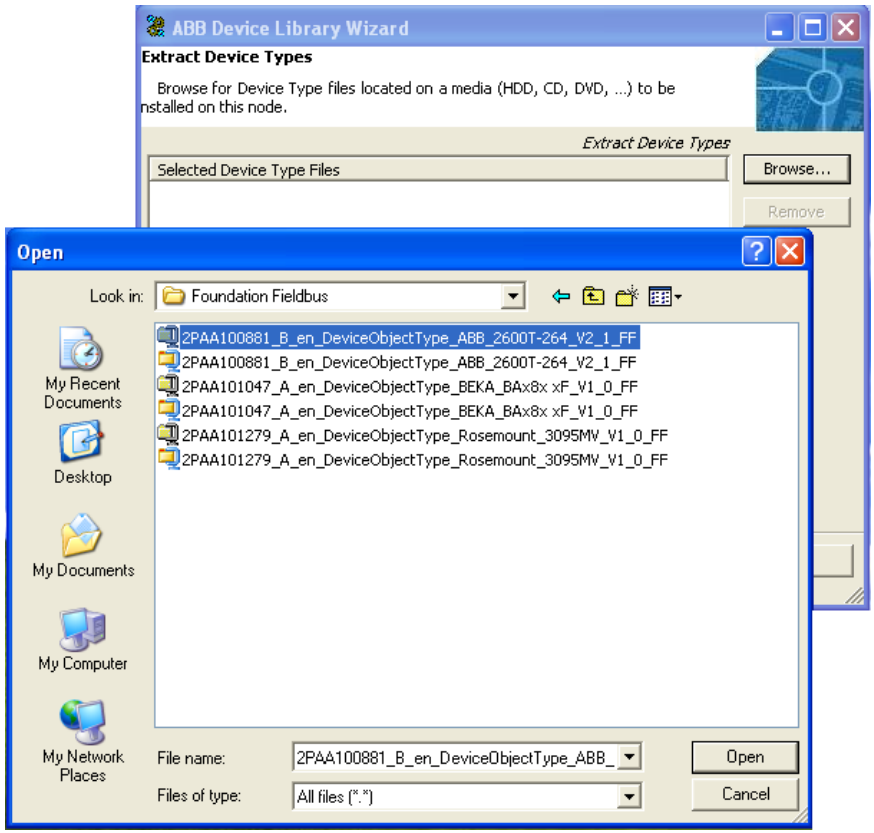

Figure 92. Selected Device Type Files

The selection is displayed in the Extract Device Types window.

5. Click **Next** to start the extracting operation.

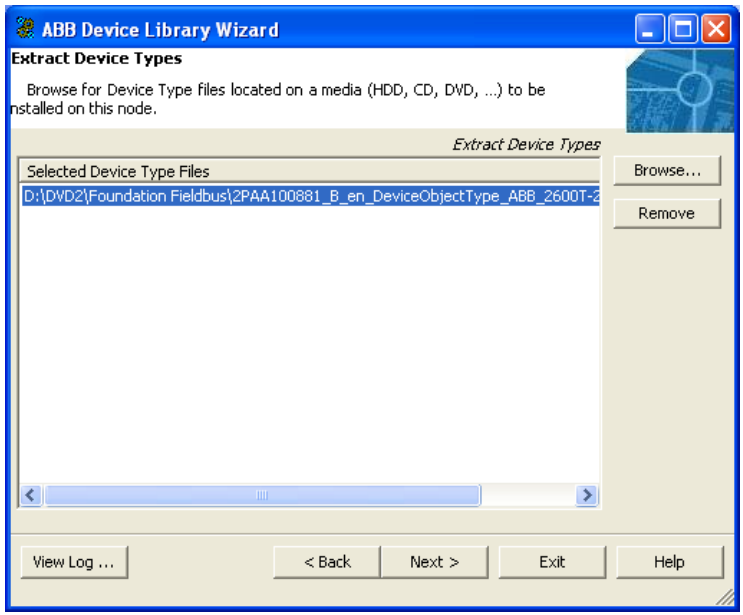

Figure 93. Device Type Files Selection View

6. Click **Finish** to complete the extracting operation.

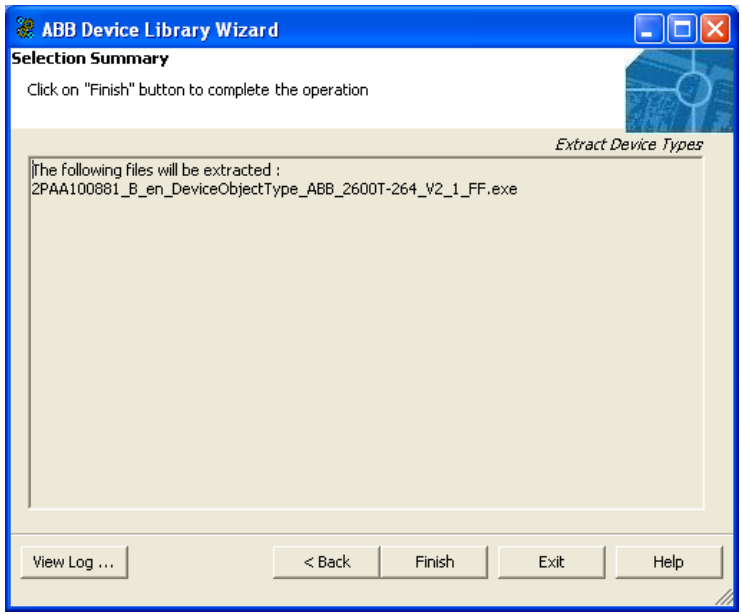

Figure 94. Complete the Extract Device Type Operation

Device type files include the extension _HART, _FF, _DP and _PA in the file name. On this basis the Device Library Wizard extract the device type file and ensures that the device types are placed in the appropriate folders:

For FOUNDATION Fieldbus:
<Installation path>\ABB Industrial IT\Engineer IT\ABB Device Integration Library\FF Device Integration Library

For HART:
<Installation path>\ABB Industrial IT\Engineer IT\ABB Device Integration Library\HART Device Integration Library

For PROFIBUS
<Installation path>\ABB Industrial IT\Engineer IT\ABB Device Integration Library\PROFIBUS Device Integration Library

These paths are fixed and can not be changed by the user.

Successful extracting operation will be shown in the logger area.

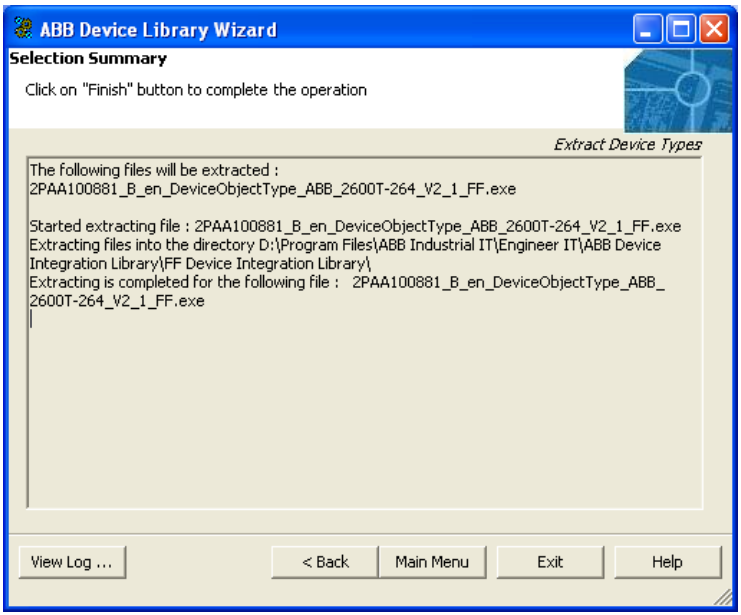

Figure 95. Extraction Successful

7. Repeat step 3 to 6 in this chapter for all required device types.
   Use **Main Menu** button to navigate directly to the main window. Click **Exit** button to close the program if no more operations are required.

Step 3: Read Release Notes of the Device Types

Each device type file includes a release note for the corresponding device type. Please read the release note carefully for detailed information or limitations.

The release notes are stored in the root folder of the specific device type.

- For FOUNDATION Fieldbus browse to:
  <Installation path>\ABB Industrial IT\Engineer IT\ABB Device Integration Library\FF Device Integration Library\<Device Type>
- For HART browse to:
  <Installation path>\ABB Industrial IT\Engineer IT\ABB Device Integration Library\HART Device Integration Library\<Device Type>

- For PROFIBUS browse to:
  <Installation path>\ABB Industrial IT\Engineer IT\ABB Device Integration Library\PROFIBUS Device Integration Library\<Device Type>

Step 4: Install Device Types via Device Library Wizard

Installation of device types via Device Library Wizard is possible in Asset Master for different fieldbus protocols (HART, PROFIBUS, FOUNDATION Fieldbus).

Please read the corresponding release notes, if the Device Library Wizard is released for the specific Asset Master system.

The Device Library Wizard offers the following functionality to add, extend or restore device type objects in Asset Master:

- Install Device Types
  New device types can be installed to the Asset Master. If the device type has been installed already, it will be re-installed. A windows message occurs to confirm overwriting the existing device type.

  This option must be also performed to install new minor version of a device type, where a previous version has already been installed. Confirm the overwriting dialog to get the device type be installed.

Already instantiated device type objects in the Asset Master may not be updated with new or enhanced aspects, if a new minor version devices type is installed to the system. In this case only new instances are carrying the complete set of aspects installed with the new minor version device type. Already created device object instances have to be updated or adapted manually by the user.

- Restore Device Types
  In ABB Asset Master system environment external device specific software such as Device Type Manager, Documentation or Asset Monitor files is not available after Asset Master system upgrade, if the Asset Master system software is new installed. External third party software is not covered by the Asset Master system backup and requires a re-installation. The Restore Device Type functionality of the Device Library Wizard just installs external software without modifying the device type objects in the ABB Asset Master System. It is recommended to take the latest available minor version of the used device

type in the previous system version for the restore function. Newest device types can be downloaded from ABB Solutionsbank at (http://solutionsbank.abb.com).

Restore device type function does not include any updates or enhancements of Aspects in the ABB system environment. To get the new functionality of the latest minor version device type in Asset Master, it has to be re-installation via Device Library Wizard *Install Device Type* function.

- Node Validation

  Node validation allows users to compare the installed software, required to work with the installed device type, between different PCs. Node validation is not required in Asset Master as it is a single node setup.

To perform the described functionality of the Device Library Wizard, the installed Asset Master system and the required fieldbus protocol must be selected by the user. Follow the instructions to install a device type to an Asset Master system:

1. Open the Device Library Wizard from the Windows task bar or double-click the **ABB Device Library Wizard** shortcut on the Desktop.

Windows and Asset Master system administrator rights are required to execute the Device Library Wizard on the PC.

2. Choose **Select System** from the main menu and click **Next**.
3. Select in the next window the type of supported Asset Master system and click **Next**.

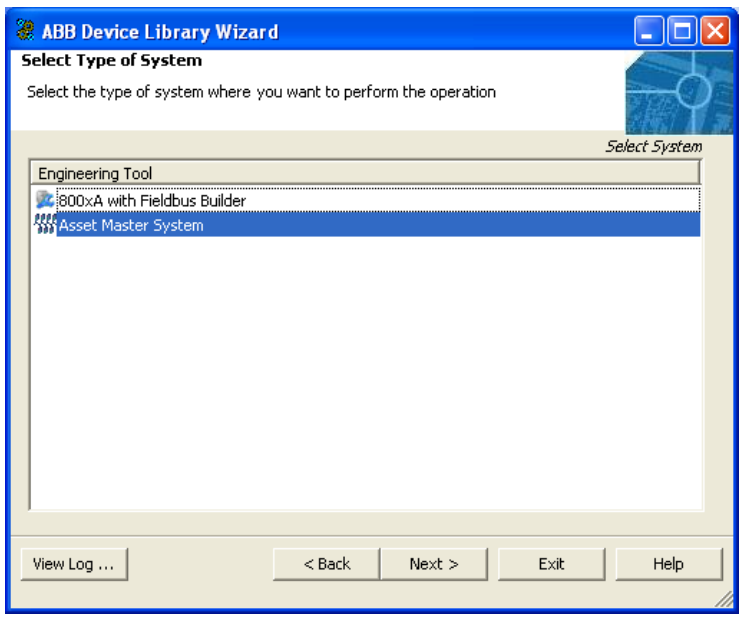

Figure 96. Asset Master System Selection Dialog

Every Device Library Wizard windows contains a **Back** button to re-open the previous window and a **Next** button to continue the wizard steps.

Some windows contains a **Main Menu** button to open the Device Library Wizard start window.

The **Exit** button closes the Device Library Wizard.

4. Choose **Install Device Types** to install new device types or re-install device type to the Asset Master system. Click **Next**.

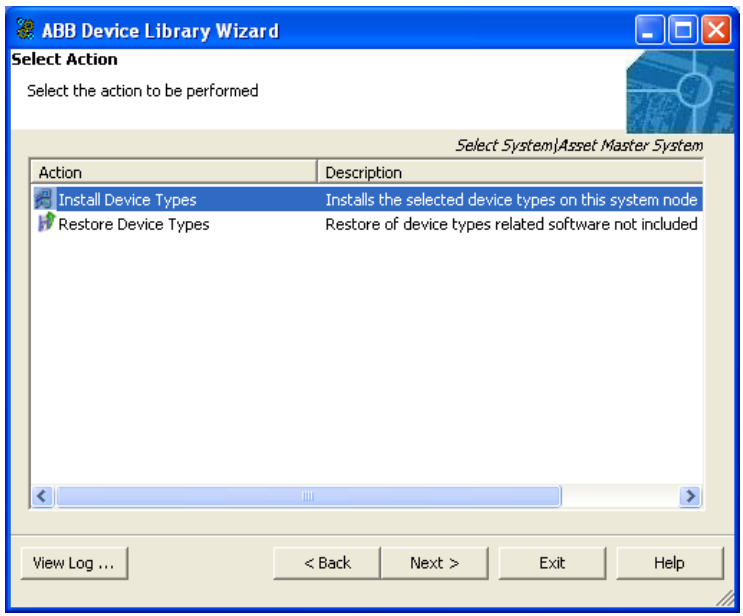

Figure 97. Action Selection Dialog

5. Select the fieldbus protocol. The following fieldbus protocols are currently supported:
   - **FOUNDATION Fieldbus** (HSE and H1)
   - **HART**
   - **PROFIBUS** (PROFIBUS DP and PA)

6. Click **Next** to confirm fieldbus selection.

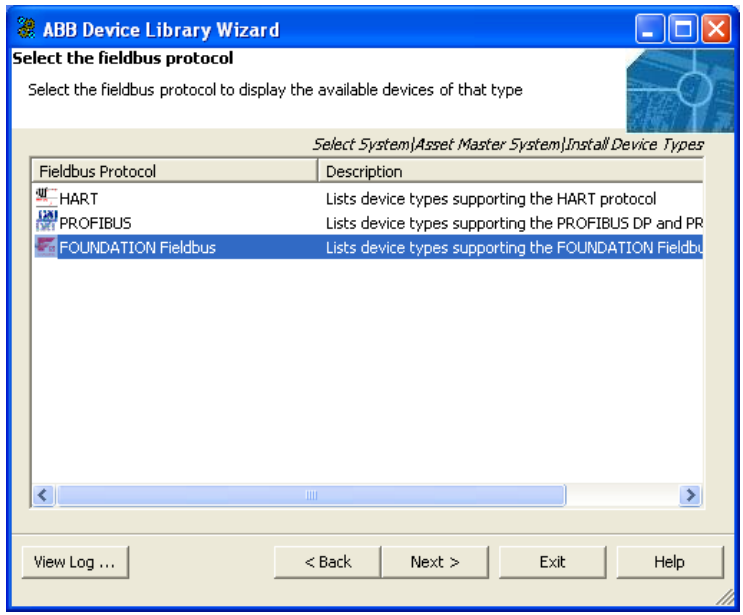

Figure 98. Fieldbus Protocol Selection Dialog

7. The new opened windows lists all extracted device type files of the specific fieldbus protocol except those, which have been installed already.
   To list all extratcted device type files available on the PC, enable the checkbox **Show All**. To install device types to the system, the particular device type has to be enabled by clicking the respective checkbox. Enable the checkbox **Select all** to mark all listed device types.

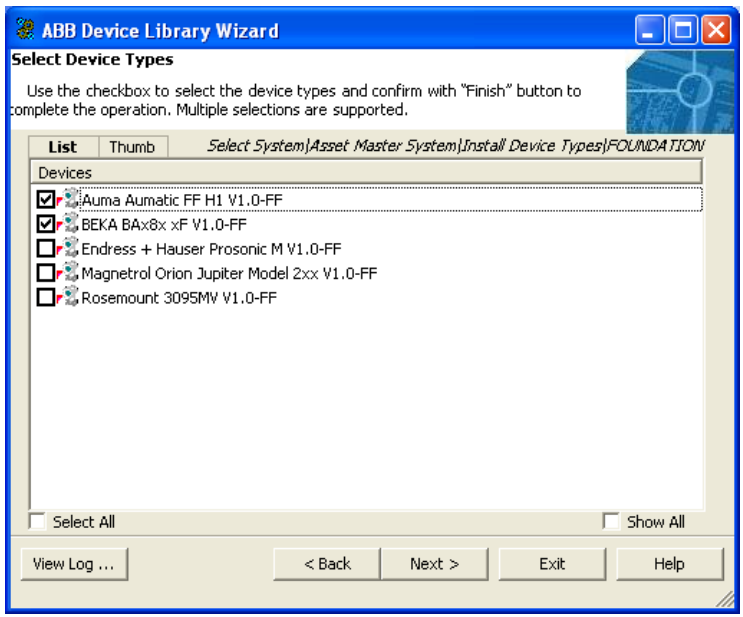

Figure 99. Device Selection Dialogue - List View

This window offers two tab cards representing the available device types for installation.

List view shows details to the device type name.

Thumb view shows device types as thumb view.

Icons shows the status of the selected device types:

- Installation successful - green checkmark icon
- Already installed Device Types – doubled green checkmark icon
- Installation incomplete - yellow triangle icon
- Installation failed - red crossed icon

8. Click **Next** to confirm the selection.
9. Click **Finish** to start the installation of the selected device types.

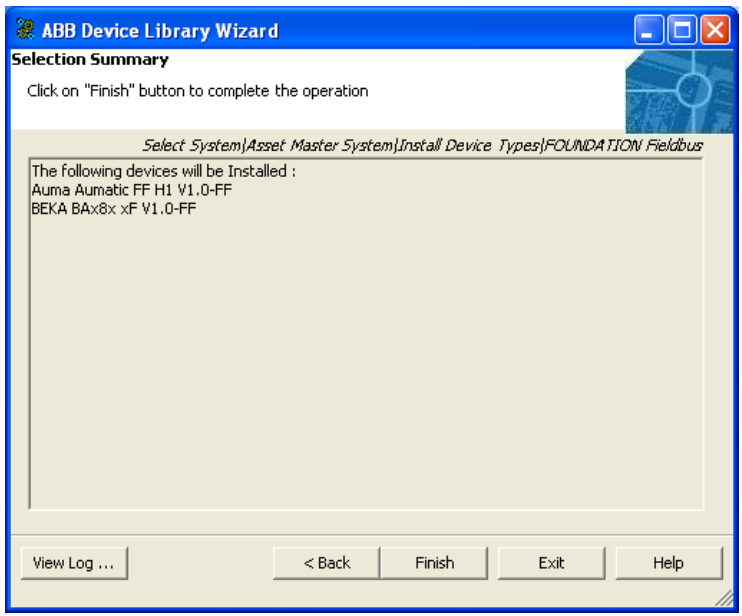

Figure 100. Start Device Type Installation

Device types, which have been installed already in the Asset Master System, will be overwritten. A confirmation of this operation will result in overwriting the existing device type object with its aspects.

User-made modifications at device type aspects will be overwritten. ABB recommends not to change or modify aspects at device types.

The status of operation will be shown in the logger area. Wait till installation is complete.

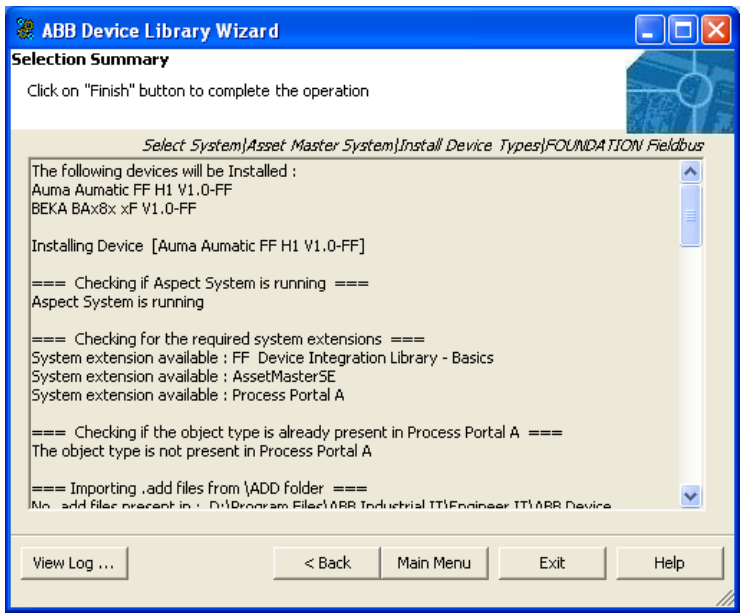

Figure 101. Progress Messages

Installation issues can stop the operation. In this case error messages are visible in the logger area. Please contact your local ABB representative for further assistance.

During device type installation product documentation and other software may be copied to the local disc. If those components can not be copied to the local disc check the project related path of the Device Library Wizard, which can be configured via Device Library Wizard Settings menu. Refer to Step 2: Device Library Path Setting (on page 120) or more details.

During installation of device types additional software may be installed on the PC, e.g. Device Type Manager (DTM). Please read the release notes of the selected device type carefully, whether license agreements for this software must be considered.

Successful installation is indicated with **Installation completed!** entry in the logger area.

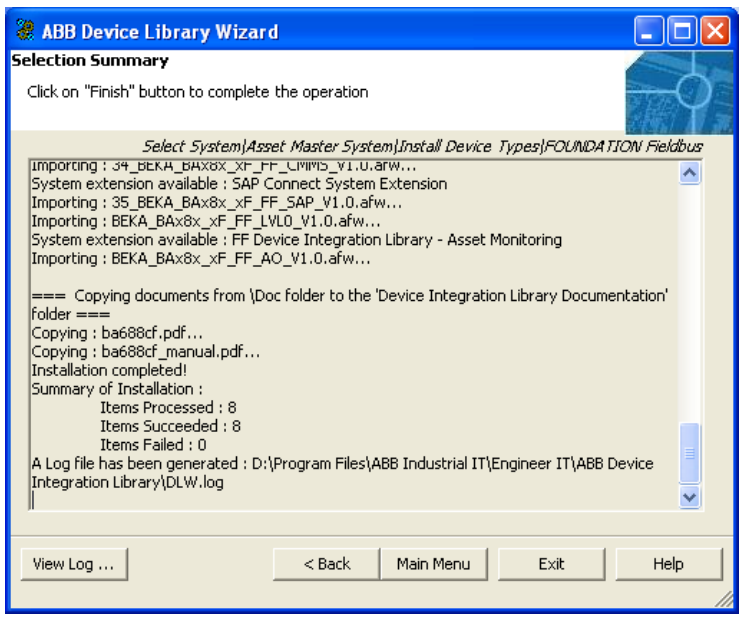

Figure 102. Installation Successful

Device Library Wizard generates a log file. To view the contents of the log file press **View Log** in the Device Library Wizard window.

The path to the log file is
<Installation path>\ABB Industrial IT\Engineer IT\ABB Device Integration Library\DLW.log.

10. To install more device types to the Asset Master, repeat step 3 to 9. Otherwise close Device Library Wizard with **Exit** button.

Step 5: Post-Installation

Post-Installation has to be done for special adjustments outside ABB responsibility. The corresponding release note of the device type lists those special adjustments and settings, if applicable. Post-installation issues have to be carried out to ensure a proper usage of the device types in Asset Master systems.

Examples for post-installation issues:

- Special settings for 3rd party software components, e.g. Device Type Manager, etc.
- Including of 3rd party licenses for Device Type Manager.
- Sharing of program folders on the node disk.
- Selection or usage of external programs.
- Copying of device specific files, which are not distributed during device type installation via Device Library Wizard

Detailed Window Description

The Device Library Wizard software can be downloaded from ABB Solutionsbank or is delivered in connection with the Asset Master System on DVD 1. The software available from ABB Solutionsbank is packed as archive file and requires to be extracted on the PC, where the tool is going to be installed.

The Device Library Wizard setup consist of a client and a server component. Asset Master environment requires the installation of both the components.

This section describes all specific graphical user interfaces (windows), which are available as standard with the Device Library Wizard - Client.

The following main functions are supported by the Device Library Wizard:

- Install Device Types:
  adds new device types to the Asset Master system or updates/overwrites existing device types (if only minor version numbers differ).
- Restore Device Types:
  restores device type related software not included in a Asset Master system backup.

Select Type of Operation (Main Window)

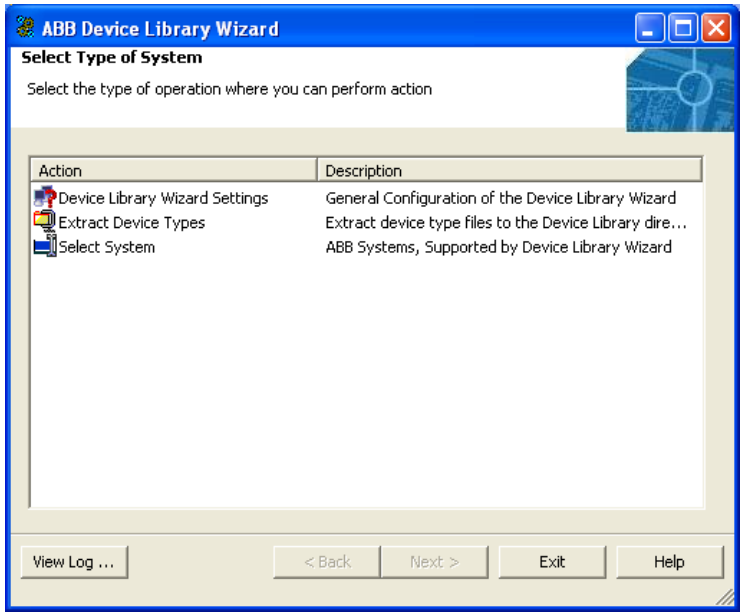

Figure 103. Operation in the Device Library Wizard

Table 7. Selection of Type of Operation

Action	Description
Device Library Wizard Settings	This option offers general Device Library Wizard configuration. Configuration settings must be applied in a single node and on all the nodes in a multi-node environment.

Table 7. Selection of Type of Operation

Action	Description
Extract Device Types	Device Type files are delivered as packed archive file. This option allows to extract device type files directly to the set path on the hard disk.
Select System	This option is the entry point for Device Library wizard main functionality. System selection offers the possibility to select the ABB system, for which the Device Type shall be installed.

Device Library Wizard Settings

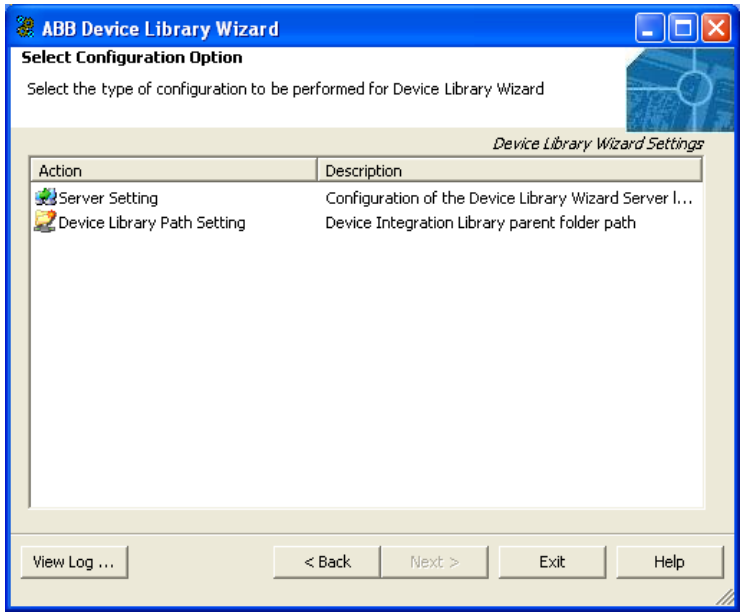

Figure 104. Device Library Wizard Configuration window

Table 8. Device Library Wizard Configuration Options

Action	Description
Server Settings	Base configuration to connect the Device Library Wizard Client to the Server. Without the server configuration an installation of Device types can not be performed.
Device Library Path Setting	This option allows to set the path to the location, which is used as project related path by the ABB system. The correct path is set during installation and must not be changed.

Server Setting

Configuration of the Server setting are be applied in Asset Master node. Enter name or IP address of Asset Master node in the window of Asspect server.

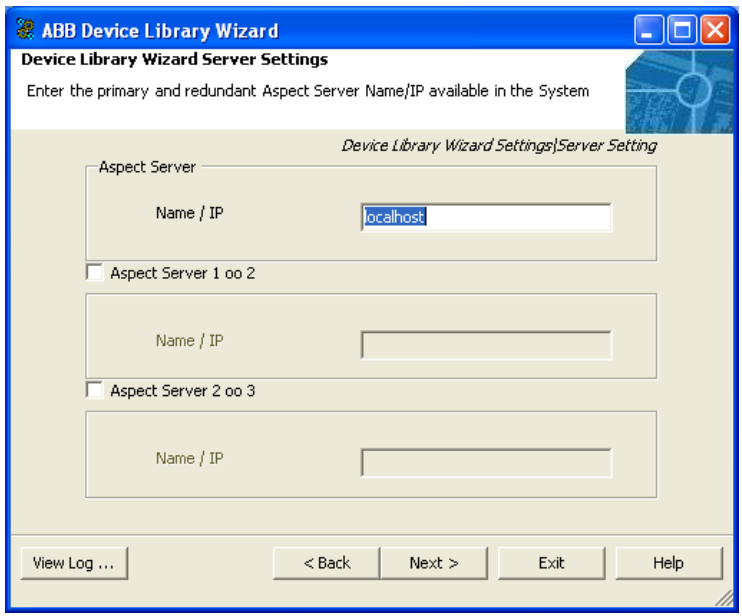

Figure 105. Configure Server Node Settings window

Device Library Path Setting

This option allows to set the path to the location on the hard disk, where the ABB system stores project related data for device type objects. A default path is set during installation of the Device Library Wizard, which must not be changed in case of no installation problems.

Device Library Wizard installation will set the default path to:

<Installation drive>\ABB Industrial IT\Engineer IT

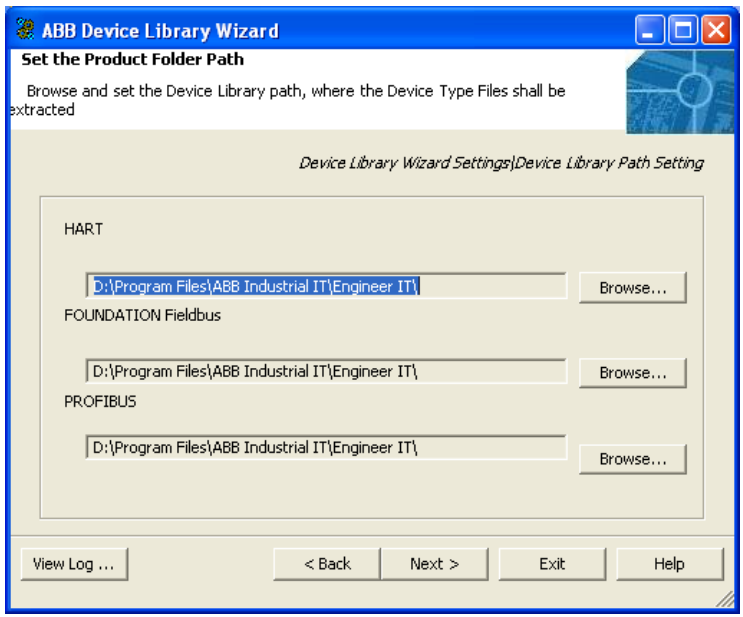

Figure 106. Setting of Protocol Library Folder Path

If the path is not set correctly software components delivered with the device type objects will not be installed properly, e.g. documentation will not copied, which will be visible in the log file or status line during device type installation. Only in this case the path shall be set manually according ABB system documentation.

Extract Device Types

This option allows to extract the device type files delivered as packed archives files (*.zip or *. exe). Browse to the location, where the files are stored by clicking the **Browse** button. Select the required device type files. Multiple selection is supported by the Device Library Wizard.

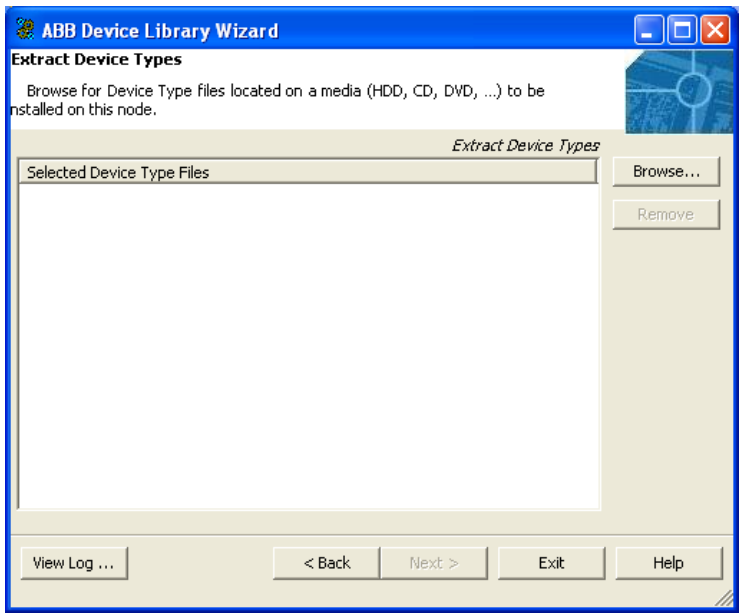

Figure 107. Extract Device Type window

Device type files contain device types and are existing as zip files (.zip) or self extracting zip files (.exe).

User can select the self extracting zip files available on local disk and/or local network and extract them. It is not mandatory to copy all the self extracting zip files to local disk before extracting them.

Device type files include the extension _HART, _FF, _DP and _PA in the file name. On this basis the Device Library Wizard extract the device type files and ensures that the device types are placed in the appropriate folders:

For FOUNDATION Fieldbus:
<Installation path>\ABB Industrial IT\Engineer IT\ABB Device Integration Library\FF Device Integration Library

For HART:
<Installation path>\ABB Industrial IT\Engineer IT\ABB Device Integration Library\HART Device Integration Library

For PROFIBUS
<Installation path>\ABB Industrial IT\Engineer IT\ABB Device Integration Library\PROFIBUS Device Integration Library

Select Type of System

This option allows the selection of the installed Asset Master system. The valid system must be chosen, otherwise the Device Library Wizard can prevent the device type installation.

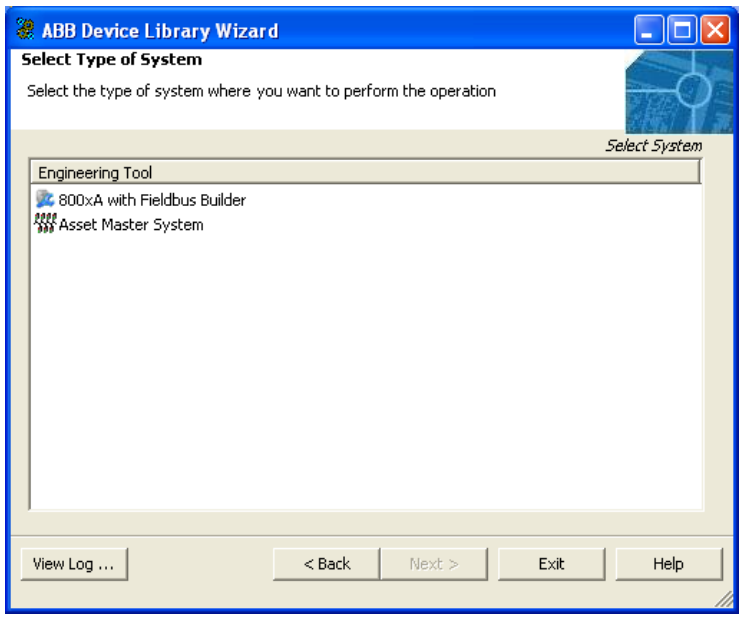

Figure 108. Selection of Asset Master System

Table 9. Selection of System Type

Engineering Tool	Description
800xA with Fieldbus Builder	Select this option, if the ABB 800xA system with Device Management PROFIBUS/HART or Device Management FOUNDATION Fieldbus in version 5.0 or higher is installed.
Asset Master System	Select this option, if the Asset Master system is installed. Device Management PROFIBUS/HART installation is required to use device types with DTMs.

Select Action

This window offers the main functionality of the Device Library Wizard to work with device types depending on the selected type of system.

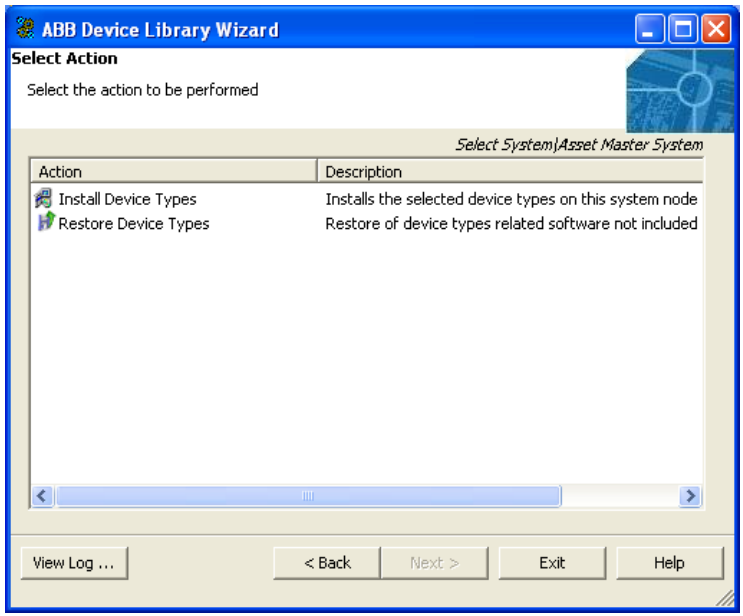

Figure 109. Actions with Asset Master Systems

Select the Fieldbus Protocol

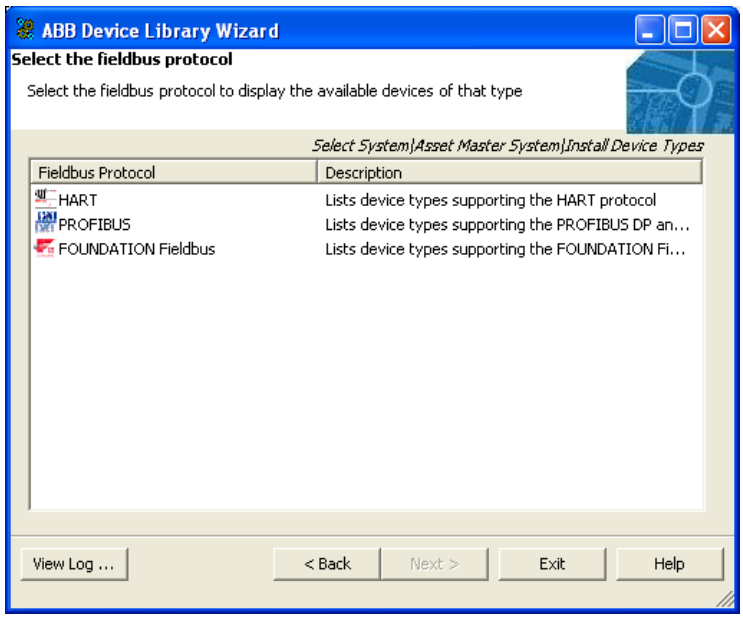

Figure 110. Fieldbus Protocol Selection window

Table 10. Selection of the Fieldbus Protocol

Fieldbus Protocol	Description
HART	Selecting this option allows to install all extracted Device Type, based on the HART protocol.
PROFIBUS	Selecting this option allows to install all extracted Device Type, based on the PROFIBUS DP or PROFIBUS PA protocol
FOUNDATION Fieldbus	Selecting this option allows to install all extracted Device Type, based on the FOUNDATION Fieldbus protocol.

Select the Devices

This window presents a list of extracted device type files of the specific fieldbus protocol.

In case of an used ABB Asset Master System, which has been upgraded from system version less than SV5.0 to SV5.0 and higher, **Check System for Device Types** option in **Restore Device Types** shall be started to identify device types already available in system.

In case of an used Asset Master System in version 5.x the Device Library Wizard stores information of already installed device types in the Aspect Directory. The benefit of this functionality is, that the Device Library wizard just shows those device types in the list, which have not been installed yet. To get a complete list of all extracted device type files the checkbox **Show All** shall be enabled.

Device Types, which have been check marked next to the device type name, will be installed on the system node. To select all visible device types the check box **Select All** shall be enabled. to deselect all device types disable the **Select All** check box.

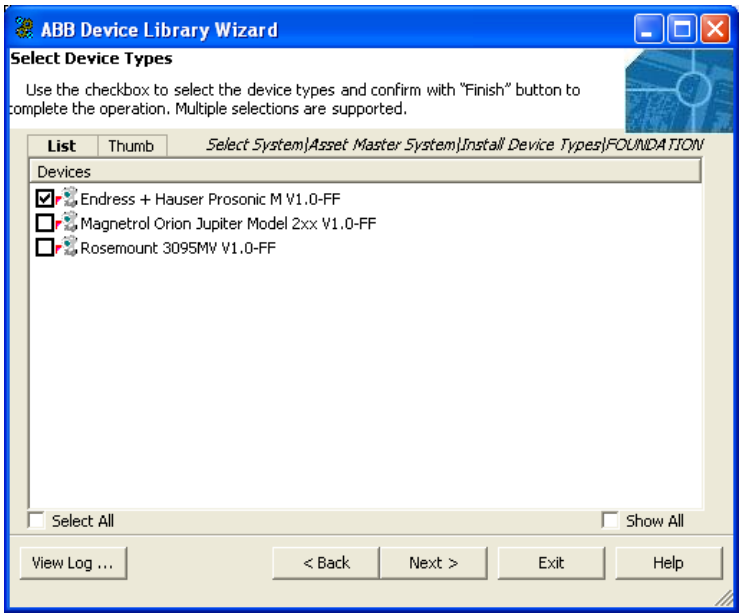

Figure 111. Device Selection window

Table 11. Check Box of the Device Selection

Check Box	Description
Select All	A checkmark in this box selects all listed device types to be installed in the Asset Master system.
Show All	A checkmark in this box lists all extracted device types, also those, which have been installed already to the system.

This window offers two tab cards representing the available device types for installation.

List view shows details to the device type name.

Thumb view shows details of the installation status with different icons.

- Installation successful - green checkmark icon
- Already installed Device Types – doubled green checkmark icon
- Installation incomplete - yellow triangle icon
- Installation failed - red crossed icon

Restore Device Types

Restore Device Types allows to install third party software like Device Type Manager (DTM), documentation and asset monitor application related to the specific device type on the hard disk. This is mainly required, if the Asset Master system is backuped with ABB internal system tools, which can not include those software to the backup file. If the Asset Master system is restored, the third party software must be re-installed on all PC's using device types. Restore Device Types function via Device Library Wizard prevents an installation of system related files included in the system backup. It is recommended to take the latest available minor version of the used device type in the previous system version for the restore function. Newest device types can be downloaded from ABB Solutionsbank (http://solutionsbank.abb.com).

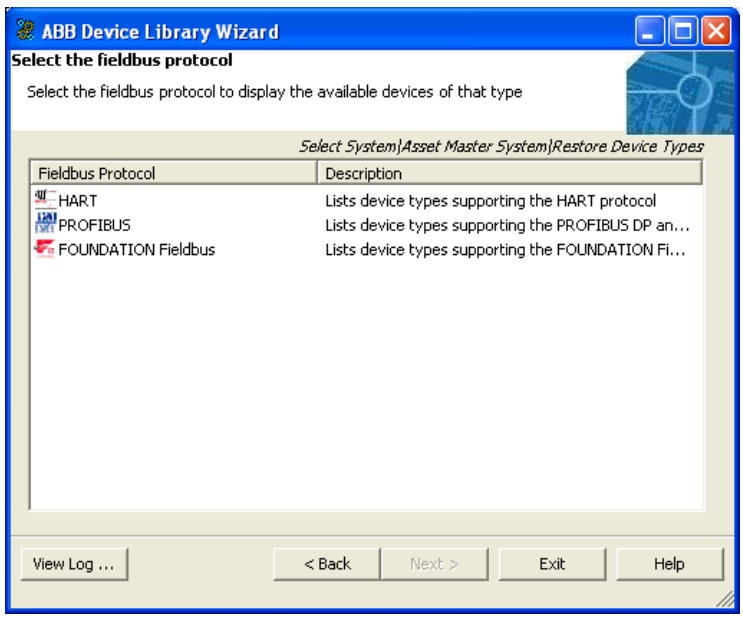

Figure 112. Restore Device Type Selection window

Restore device type function does not include any updates or enhancements of Aspects in the ABB system environment. To get the new functionality of the latest minor version device type in the system, it has to be re-installation via Device Library Wizard *Install Device Type* function.

Table 12. Selection of Restore Device Type

Fieldbus Protocol	Description
Check System for Device Types	This option allows to get a list of all device type objects, which have been installed in the Asset Master system. It is mandatory that the system is running and the system restore have been performed. The list of devices is available in the Device Library Wizard log file, accessible via **View log** button.
HART	Selecting this option allows to re-install third party software of the extracted Device Type, based on the HART protocol.
PROFIBUS	Selecting this option allows to re-install third party software of the extracted Device Type, based on the PROFIBUS DP or PROFIBUS PA protocol
FOUNDATION Fieldbus	Selecting this option allows to re-install third party software of the extracted Device Type, based on the FOUNDATION Fieldbus protocol.

Appendix A Terminology

This appendix lists the terms associated with Asset Master. We recommend you to memorize these terms.

Table 13. Terms Associated with Asset Master

Term	Description
Alarm	Abnormal state of a condition associated with an Aspect Object™. For example, the object FC101 may have the following conditions associated with it: Sensor error, flow over range, totalizer exceeded. An alarm is active as long as the abnormal state of the corresponding condition persists. An alarm is unacknowledged until a user acknowledges it.
Alarm acknowledgement	User action to confirm the recognition of an alarm. Acknowledgement changes the state of an alarm from unacknowledged to acknowledged.
Aspect	An aspect is the description of properties of an Aspect Object. Some examples of aspects are name, device management, DMS, and asset monitor.
Aspect category	Specialization of an aspect type. For example, the Asset Monitors aspect type includes all of the Basic Asset Monitor aspect categories.
Aspect Object	A computer representation of real objects such as pumps and valves or a number of virtual objects such as service or object type. An Aspect Object is described by its aspects and organised in structures.

Table 13. Terms Associated with Asset Master

Term	Description
Aspect Object Type	Defines certain characteristics that are shared between several object instances, such as a basic set of common aspects. This makes it possible to create and efficiently re-use standardized solutions to frequently recurring problems. For example, rather than building an object from scratch for every valve in a plant, you can define a set of valve types, and then create all valve objects of these instances.
Aspect Server	A server that runs the central functions of the Aspect Object architecture, such as Aspect Directory, Structure and Name Server, Cross Referencing, File Set Distribution, etc. Contains all Aspect Objects and their aspects.
Aspect system	A software system, which implements one or several aspect types by providing one or several aspect system objects.
Component Object Model (COM)	Definition programming interface to allow for the creation of components for use in integrating custom applications or to allow diverse components to interact.
Context menu	Appears when you right-click on an Aspect Object or an aspect. Lists aspect operations, actions, aspects, and global operations.
Distributed COM (DCOM)	Remote Procedure Calls to enable distributed component objects to communicate with each other.

Table 13. Terms Associated with Asset Master

Term	Description
Event	A detectable occurrence, which is of significance to an Aspect Object. May or may not be associated with a condition. For example, the transitions into HighAlarm and Normal conditions are events, that are associated with conditions. However, operator actions, system configuration changes, and system errors are examples of events, that are not related to specific conditions. OPC Clients may subscribe to be notified of the occurrence of specified events.
FOUNDATION Fieldbus (FF)	Bi-directional communications protocol used for communications among field instrumentation and control systems.
Graphical User Interface (GUI)	Graphical user interface
Industrial^{IT}	Industrial IT is ABB's solution for business processes. It allows seamless integration of systems for plant automation, plant optimisation and common business processes at run time.
Node	A computer communicating on a network e.g. the Internet, Plant, Control or I/O network. Each node typically has a unique node address with a format depending on the network it is connected to.

Table 13. Terms Associated with Asset Master

Term	Description
OLE for Process Control (OPC)	OPC is based on the Microsoft COM/DCOM technology. DCOM permits data exchange across computer boundaries.
OPC	OLE (Object Linking and Embedding) for Process Control, a standard interface for data, event and history access based on COM.
PC	Personal Computer. Computer running the Windows operating system.
Permission	A permission (or access mask) groups a set of operations that require the same authority. For each operation defined for an aspect, the aspect category specifies the permission needed to use that operation.
Security	Security controls a user's authority to perform different operations on Aspect Objects, depending on several parameters: The user's credentials, as provided by Windows The node where the user is logged in. This makes it possible to give a user different authority depending on where he/she is located, e.g. close to the process equipment, in a control room, or at home accessing the system through Internet. The object the user wants to perform the operation on.
Server	A node that runs one or several Services.
Structure	A hierarchical tree organization of Aspect Objects that describes the dependencies between the real objects. An Aspect Object can exist in multiple structures, for example both in a Functional Structure and in a Location Structure.

Table 13. Terms Associated with Asset Master

Term	Description
System	Collects all data of a project. Administrated by the Configuration Wizard.
View	Aspects can be presented in a number of ways depending on the task performed e.g. viewing or configuration. Each presentation form is called a view.

You should familiarise yourself with the following list of terms which refer to the FOUNDATION Fieldbus terminology.

Table 14. FOUNDATION Fieldbus Terminology

Term	Description
FF Network	A FOUNDATION Fieldbus network is comprised of one or more HSE subnets and/or one or more H1 links all interconnected
Fieldbus	A Fieldbus is a digital, two-way, multi-drop communication link among intelligent measurement and control devices. It serves as a Local Area Network (LAN) for advanced process control, remote input/output and high speed factory automation applications.
Fieldbus device	Device connected through an Asset Master supported fieldbus. Examples are smart sensors and actuators, but also controllers, robots, variable speed drives, etc., when these devices are connected through a supported fieldbus.
FOUNDATION Fieldbus Network	Please refer to FF Network.
H1	H1 is a term used to describe a FOUNDATION Fieldbus network operating at 31.25 kbit/second.

Table 14. FOUNDATION Fieldbus Terminology

Term	Description
H1 Field Device	An H1 Field Device is a fieldbus device connected directly to an H1 fieldbus. Typical H1 Field Devices are valves and transmitters.
H1 Link	An H1 link interconnects one or more H1 Devices. Please refer to Link
High Speed Ethernet (HSE)	High Speed Ethernet (HSE) is the Fieldbus Foundation's backbone network typically running at, but not being limited to 100 Mbit/second.
HSE Device	Any FOUNDATION Fieldbus device type connected directly to HSE Media. Examples include Linking Devices, I/O Gateway Devices, and HSE Field Devices.
HSE Linking Device	HSE Linking Devices interconnect one or more H1 links to an HSE subnet. Linking devices provide for access between HSE devices and H1 devices and for access between H1 devices interconnected by an HSE network. A linking device may also contain an H1 bridge that provides for H1 to H1 communications between bridged H1 links.
HSE Subnet	HSE Subnets are IP networks. They are permitted to contain bridges, but not routers. The HSE Subnet is used to qualify the Link Id. The combination of the HSE Subnet and the Link Id is unique across all HSE Subnets of a system. An HSE subnet consists of one or more HSE devices connected via Ethernet. HSE devices on a subnet may be interconnected with standard switches. Multiple HSE subnets may be interconnected using standard routers.

Table 14. FOUNDATION Fieldbus Terminology

Term	Description
Link	A Link is the logical medium by which H1 Fieldbus devices are interconnected. It is composed of one or more physical segments interconnected by bus Repeaters or Couplers. All of the devices on a link share a common schedule which is administered by that link's current LAS. In FOUNDATION Fieldbus, the term link is only used on H1 (H1 link), not on HSE (Please refer to HSE subnet).
Link Active Scheduler (LAS)	A Link Active Scheduler (LAS) is a deterministic, centralized bus scheduler that maintains a list of transmission times for all data buffers in all devices that need to be cyclically transmitted. At one point in time only one Link Master (LM) device on an H1 fieldbus Link can function as that link's LAS.
Linking Device	Please refer to HSE Linking Device.

The following is a list of terms associated with HART that you should be familiar with.

Table 15. HART Terminology

Term/Acronym	Description
Device Type Manager (DTM)	Software component (device driver) for configuring, diagnosing, forcing, and displaying the measured variables, etc. of a field device. It is familiar with the way the device works and supplies device-specific documentation.
Device Description Language (DDL)	Interpretable language for the formal description of device parameters

Table 15. HART Terminology

Term/Acronym	Description
Fieldbus device	Device connected through an Asset Master supported fieldbus. Examples are smart sensors and actuators, but also controllers, robots, variable speed drives, etc., when these devices are connected through a supported fieldbus.
Frame Application (FA)	Frame application (runtime environment) in accordance with the FDT specification for operating DTMs
Field Device Tool (FDT)	The FDT concept describes the interface between a Frame Application and the device-specific software (DTM = Device Type Manager) of the device manufacturer. It enables devices produced by different manufacturers and different fieldbuses to be integrated in a single system. Currently supporting fieldbus protocols for PROFIBUS and HART.
Highway Addressable Remote Terminal (HART)	Digital communication protocol developed for applications in industrial process control.

The following is a list of terms associated with Asset Optimization that you should be familiar with.

Table 16. Asset Optimization Terminology

Term/Acronym	Description
AO	Asset Optimization.
Asset Master Workplace	Provides a user interface for maintenance personnel to support their daily workflow most efficiently.

Table 16. Asset Optimization Terminology

Term/Acronym	Description
Asset Monitor	Application responsible for retrieving data from, and interacting with, multiple data servers, OLE for Process Control ® (OPC®) servers, etc.). It analyzes the data and when necessary, issues an Asset Condition Document and notifies the user of the detected condition.
DPC	Documenting Process Calibrator / Communicator. Portable intelligent field calibrator or configurator designed for in situ (field) configuration and calibration, reducing the time required to execute a calibration procedure. The DHH800-MFC and the DHH810-MFT are examples of such devices.
Fieldbus device	Device connected through an Asset Master System supported fieldbus. Examples are remote I/O and smart sensors and actuators, but also controllers, robots, variable speed drives, etc., when these devices are connected through a supported fieldbus.
MFT	Multifunctional Modular Calibrator / HART Communicator.
SNMP	Simple Network Management Protocol. A network management standard that defines a strategy for managing TCP/IP and Internet Packet Exchange (IPX) networks.

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Printed in USA (January 2007)

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3KXD151800R4201

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