SIEMENS

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CMS X-Tools

User Manual - 04 - Device Management System

English

Release 2014-11

Safety Guidelines

This document contains notices which you should observe to ensure your own personal safety as well as to avoid property damage. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring to property damage only have no safety alert symbol

Danger

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

Warning

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

Caution

Used with the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

Notice

Used without the safety alert symbol indicates a potential situation which, if not avoided, may result in an undesirable result or state.

When several danger levels apply, the notices of the highest level (lower number) are always displayed. If a notice refers to personal damages with the safety alert symbol, then another notice may be added warning of property damage.

Qualified Personnel

The device/system may only be set up and operated in conjunction with this documentation. Only qualified personnel should be allowed to install and work on the equipment. Qualified persons are defined as persons who are authorized to commission, to earth, and to tag circuits, equipment and systems in accordance with established safety practices and standards.

Intended Use

Please note the following:

Warning

This device and its components may only be used for the applications described in the catalog or technical description, and only in connection with devices or components from other manufacturers approved or recommended by Siemens. This product can only function correctly and safely if it is transported, stored, set up and installed correctly, and operated and maintained as recommended.

All designations marked with ® are registered trademarks of Siemens AG. Other designations in this documentation might be trademarks which, if used by third parties for their purposes, might infringe upon the rights of the proprietors.

Disclaimer of Liability

We have checked the contents of this document for agreement with the hardware and software described. Since deviations cannot be precluded entirely, we cannot guarantee full agreement. However, the data in the manual are reviewed regularly, and any necessary corrections will be included in subsequent editions. Suggestions for improvement are welcomed.

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Table of Figures

1   Preface

1.1   Purpose of this Document

This document provides detailed information about the functionalities and usage of the software

- CMS X-Tools

of the CMS product line.

In addition to the detailed information about each dialog and functionality of the **Device Management System** which is found within this document, also the following documentation is available:

- CMS X-Tools - User Manual - 01 - Introduction
  - o provides an introduction into the basic functionalities of CMS *X-Tools*
- CMS X-Tools - User Manual - 02 - Master Data System
  - o provides detailed information about the functionality which is provided by the **Master Data System**
- CMS X-Tools - User Manual - 03 - Main Management System
  - o provides detailed information about the functionality which is provided by the **Main Management System**
- CMS X-Tools - User Manual - 05 - Monitoring System
  - o provides detailed information about the functionality which is provided by the **Monitoring System**
- CMS X-Tools - User Manual - 06 - Analyzing System
  - o provides detailed information about the functionality which is provided by the **Analyzing System**
- CMS X-Tools - User Manual - 07 - Storage System
  - o provides detailed information about the functionality which is provided by the **Storage System**
- CMS X-Tools - Release Notes
  - o provides additional information about the released version of CMS *X-Tools*
- CMS X-Tools - Change Log
  - o provides an overview about the changes which have been introduced with the current version of CMS *X-Tools*

1.2   Validity of this Document

This document is valid for the following software:

- CMS X-Tools Pro V 04.02
- CMS X-Tools ODV V 04.02

During the following pages, these software packages will be referred to by the term *X-Tools*. Not all editions of *X-Tools* provide all functionality, thus it may be that some of the descriptions within the user manual do not apply to all editions.

1.3   Audience

This document is intended for personnel involved in the commissioning and using of the software:

- *X-Tools*

1.4   Notations

The following notations are used within this document:

- ***bold, italic*** text is being used for the main executables of ***X-Tools***
  - examples: ***X-Tools Client***, ***X-Tools Server***
- **bold** text is being used for the software modules of ***X-Tools***
  - examples: **Main Management System**, **Device Profile Editor**, **IPE Socket T001**
- green text is being used for controls like tables and trees
  - examples: Main Profile Settings table, Device Profile Data table
- orange text is being used for simple controls like a menu button, a single row/column/cell of a table or a branch of a tree
  - examples: Open… menu button, IP Address column, Target Device Name cell, Interfaces Branch
- dark yellow text is being used for the entries of context menus
  - examples: Advanced Append…, Edit
- Camel Notation is being used for major terms of ***X-Tools***
  - examples: Main Profile, Interface Profile, User Accounts File, Analyzing Function
- < and > brackets are being used for keyboard keys
  - examples: <Ctrl>, <Alt>, <Shift>, <Del>
- [and] brackets are being used for mouse operations
  - examples: [left mouse button down], [mouse move]

2   Device Management System

2.1   Device Management System Explorer

2.1.1   Overview

The **Device Management System Explorer** (in the following, the **DMS Explorer**) is used in order to visualize and maintain all of the files and modules which are relevant for the **Device Management System**. It is displayed as a tree which contains all of the relevant and available **Device Management System** items. Via Drag&Drop the user is able to move items within the **DMS Explorer** and from the **DMS Explorer** to other dialogs of the **Device Management System**. The following lines provide a short overview about the information that is available from the **DMS Explorer**.

The following screenshot shows an example of a **DMS Explorer**:
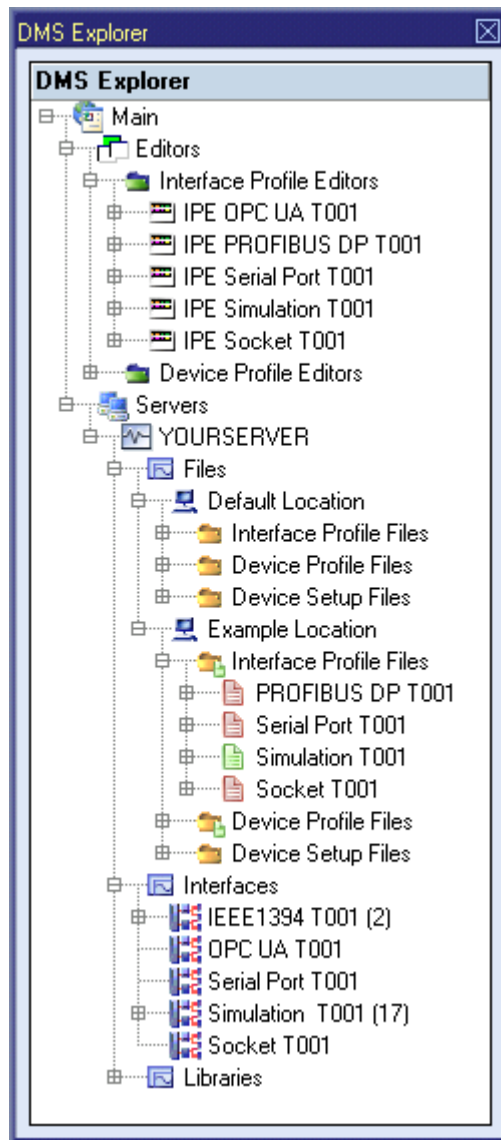
*Figure 1: Example of a **DMS Explorer***

Each branch of the **DMS Explorer** has a defined task and provides certain functionalities. The following major branches are provided by the **DMS Explorer**:

- Main Branch
- Editors Branch
- Interface Profile Editors Branch
- Interface Profile Editor Branch
- Device Profile Editors Branch
- Device Profile Editor Branch
- Servers Branch
- Server Branch
- Files Branch
- File Location Branch
- Interface Profile Files Branch
- Device Profile Files Branch
- Device Setup Files Branch
- Interfaces Branch
- Interface Branch
- Device Branch
- Libraries Branch
- Device Process Modules Branch
- Device Process Module Branch
- Find References Dialog

2.1.2   Main Branch

The one and only Main Branch provides all of the other items of the **DMS Explorer**. It can be expanded and collapsed in order to show or hide its sub-items.

2.1.3   Editors Branch

The one and only Editors Branch provides all of the editors which are available within the **Device Management System**.

2.1.4   Interface Profile Editors Branch

The one and only Interface Profile Editors Branch provides all of the **Interface Profile Editors** which are available within the **Device Management System**. The tree of shown **Interface Profile Editors** is updated automatically whenever an editor file at the local disk is added/removed/modified.

2.1.5   Interface Profile Editor Branch

Each Interface Profile Editor Branch represents one available **Interface Profile Editor**. Dragging of an Interface Profile Editor Branch into the **Device Management System** workspace opens an empty editor of the dragged type. After the editor has been opened, any of the present files of correct type can be dragged into it for visualization and/or editing.

The following specific context menu items are provided:

Context Menu Item	Description
Open	opens an empty **Interface Profile Editor** of the chosen type within the **Device Management System** workspace
New Interface Profile > …	opens an **Interface Profile Editor** of the chosen type within the **Device Management System** workspace, creates a new Interface Profile and initializes it with default values <Ctrl> + <N> can be pressed in order to achieve the same effect

2.1.6   Device Profile Editors Branch

The one and only Device Profile Editors Branch provides all of the **Device Profile Editors** which are available within the **Device Management System**. The tree of shown **Device Profile Editors** is updated automatically whenever an editor file at the local disk is added/removed/modified.

2.1.7   Device Profile Editor Branch

Each Device Profile Editor Branch represents one available **Device Profile Editor**. Dragging of a Device Profile Editor Branch into the **Device Management System** workspace opens an empty editor of the dragged type. After the editor has been opened, any of the present files of correct type can be dragged into it for visualization and/or editing.

The following specific context menu items are provided:

Context Menu Item	Description
Open	opens an empty **Device Profile Editor** of the chosen type within the **Device Management System** workspace
New Device Profile > …	opens a **Device Profile Editor** of the chosen type within the **Device Management System** workspace, creates a new Device Profile and initializes it with default values <Ctrl> + <N> can be pressed in order to achieve the same effect

2.1.8   Servers Branch

The one and only Servers Branch provides all of the *X-Tools Servers* which are connected at the moment. The tree of shown *X-Tools Servers* is updated automatically whenever an *X-Tools Server* is attached or detached.

2.1.9   Server Branch

Each Server Branch represents one of the currently connected *X-Tools Servers*.

The following specific context menu item is provided:

Context Menu Item	Description
Find References…	opens the **Find References** dialog for the chosen *X-Tools Server*

2.1.10   Files Branch

The Files Branch of each connected *X-Tools Server* provides all of the files which are available within the **Device Management System**.

The following specific context menu item is provided:

Context Menu Item	Description
Add Location…	opens the **Add Location** dialog and adds a new Configuration File location afterwards

2.1.11 File Location Branch

Each File Location Branch provides all of the **Device Management System** specific files which are available from the directory to which the Configuration File location points.

The following specific context menu items are provided:

Context Menu Item	Description
Delete Location	deletes the chosen file location from the hard disk
Remove Location	removes the chosen file location from *X-Tools* but keeps it at the hard disk

2.1.12 Interface Profile Files Branch

Each Interface Profile Files Branch provides all of the Interface Profiles which are available from the directory to which its Configuration File location points. The tree of shown Interface Profiles is updated automatically whenever an Interface Profile at the disk is added/deleted/modified.

Drag&Drop can be used in order to copy/move Interface Profile directories and Interface Profile files. The default Drag&Drop operation within an *X-Tools Server* is "move", but when the <Ctrl> key is pressed a "copy" operation is performed. The default Drag&Drop operation from one *X-Tools Server* to another is "copy", but when the <Shift> key is pressed a "move" operation is performed.

Interface Profile directories and Interface Profile files can be copied/moved within Interface Profile Files Branches (either within one *X-Tools Server* or over different *X-Tools Servers*) but they can not be copied/moved to another files branch. As the unique name of each Interface Profile also includes its storage directory, multiple Interface Profiles with matching file names can be stored in different Interface Profile directories.

Dragging of an Interface Profile into the **Device Management System** workspace opens the **Interface Profile Editor** for the dragged Interface Profile.

In case an Interface Profile Directory Branch (or any of its sub-branches) contains a suspended Interface Profile, the icon of the Interface Profile Directory Branch shows an according overlay. When there is no suspended Interface Profile but there is at least one started Interface Profile, the icon of the Interface Profile Directory Branch shows an according overlay also.

The following specific context menu items are provided:

Context Menu Item	Description
New Interface Profile > …	opens an **Interface Profile Editor** of the chosen type within the **Device Management System** workspace, creates a new Interface Profile and initializes it with default values <Ctrl> + <N> can be pressed in order to achieve the same effect
Edit	opens a new **Interface Profile Editor** for the chosen file within the **Device Management System** workspace
Cut	cuts the currently selected items
Copy	copies the currently selected items
Paste	pastes currently copied/cut items
Delete	deletes the selected items from the disk
Rename	allows to rename the selected item directly within the **DMS Explorer**
New Directory…	opens the **Add Directory** dialog and creates a new directory afterwards
Start	starts the currently selected items
Restart	restarts (= stops and starts) the currently selected items
Pause	pauses the currently selected items
Continue	continues the currently selected items
Stop	stops the currently selected items

The following icons are provided and indicate the current status of each Interface Profile:

Icon	Description
(stopped)	The Interface Profile is stopped and does not perform any operations.
(started)	The Interface Profile is started and attempts to connect to the configured devices. In addition, it also attempts to re-connect to the configured devices in case the connection is broken at any moment.
(paused)	The Interface Profile is paused and does not attempt to connect to the configured devices. The already established connections are not being terminated but in case a connection breaks it is not being re-established.
(suspended)	The Interface Profile is suspended because it has detected an error condition. The Interface Profile will resume after the error condition has been solved and it does not connect or reconnect to any devices until it can resume. In case the Interface Profile is suspended and its according Interface Profile File at the disk is being updated, the updated Interface Profile File is being loaded and the Interface Profile uses the updated configuration for its further processing.

2.1.13   Device Profile Files Branch

Each Device Profile Files Branch provides all of the Device Profiles which are available from the directory to which its Configuration File location points. The tree of shown Device Profiles is updated automatically whenever a Device Profile at the disk is added/deleted/modified.

Drag&Drop can be used in order to copy/move Device Profile directories and Device Profile files. The default Drag&Drop operation within an *X-Tools Server* is "move", but when the <Ctrl> key is pressed a "copy" operation is performed. The default Drag&Drop operation from one *X-Tools Server* to another is "copy", but when the <Shift> key is pressed a "move" operation is performed.

Device Profile directories and Device Profile files can be copied/moved within Device Profile Files Branches (either within one *X-Tools Server* or over different *X-Tools Servers*) but they can not be copied/moved to another files branch. As the unique name of each Device Profile also includes its storage directory, multiple Device Profiles with matching file names can be stored in different Device Profile directories.

Dragging of a Device Profile into the **Device Management System** workspace opens the **Device Profile Editor** for the dragged Device Profile.

In case a Device Profile Directory Branch (or any of its sub-branches) contains a suspended Device Profile, the icon of the Device Profile Directory Branch shows an according overlay. When there is no suspended Device Profile but there is at least one started Device Profile, the icon of the Device Profile Directory Branch shows an according overlay also.

The following specific context menu items are provided:

Context Menu Item	Description
New Device Profile > …	opens a **Device Profile Editor** of the chosen type within the **Device Management System** workspace, creates a new Device Profile and initializes it with default values <Ctrl> + <N> can be pressed in order to achieve the same effect
Edit	opens a new **Device Profile Editor** for the chosen file within the **Device Management System** workspace
Cut	cuts the currently selected items
Copy	copies the currently selected items
Paste	pastes currently copied/cut items
Delete	deletes the selected items from the disk
Rename	allows to rename the selected item directly within the **DMS Explorer**
New Directory…	opens the **Add Directory** dialog and creates a new directory afterwards
Start	starts the currently selected items
Restart	restarts (= stops and starts) the currently selected items
Pause	pauses the currently selected items
Continue	continues the currently selected items
Stop	stops the currently selected items

The following icons are provided and indicate the current status of each Device Profile:

Icon	Description
(stopped)	The Device Profile is stopped and does not perform any operations.
(started)	The Device Profile is started and receives the configured data from the configured target device. The resulting data is put into the ring buffers and can be accessed via the **MDS Explorer**.
(paused)	When the Device Profile is paused it freezes the current contents of the ring buffers of its data. In addition, also the data transmission from the device to *X-Tools* is stopped. However, the data which is produced by the Device Profile is removed from the **MDS Explorer** and becomes unavailable in case the target device disappears.
(suspended)	The Device Profile is suspended because it has detected an error condition (e.g. because the target device has been detached or because there is too little RAM left, …). The Device Profile will resume after the error condition has been solved and all of the data which is produced by the Device Profile is being removed from the **MDS Explorer** until the Device Profile can resume.

In case the Device Profile is suspended and its according Device Profile File at the disk is being updated, the updated Device Profile File is being loaded and the Device Profile uses the updated configuration for its further processing. |

2.1.14 Device Setup Files Branch

Each Device Setup Files Branch provides all of the Device Setups which are available from the directory to which its Configuration File location points. The tree of shown Device Setups is updated automatically whenever a Device Setup at the disk is added/deleted/modified.

Drag&Drop can be used in order to copy/move Device Setup directories and Device Setup files. The default Drag&Drop operation within an *X-Tools Server* is "move", but when the <Ctrl> key is pressed a "copy" operation is performed. The default Drag&Drop operation from one *X-Tools Server* to another is "copy", but when the <Shift> key is pressed a "move" operation is performed.

Device Setup directories and Device Setup files can be copied/moved within Device Setup Files Branches (either within one *X-Tools Server* or over different *X-Tools Servers*) but they can not be copied/moved to another files branch. As the unique name of each Device Setup also includes its storage directory, multiple Device Setups with matching file names can be stored in different Device Setup directories.

The following specific context menu items are provided:

Context Menu Item	Description
Cut	cuts the currently selected items
Copy	copies the currently selected items
Paste	pastes currently copied/cut items
Delete	deletes the selected items from the disk
Rename	allows to rename the selected item directly within the **DMS Explorer**
New Directory…	opens the **Add Directory** dialog and creates a new directory afterwards

2.1.15 Interfaces Branch

Each Interfaces Branch provides all of interfaces which are available for a connected *X-Tools Server* at the moment.

The following specific context menu item is provided:

Context Menu Item	Description
New Interface Profile > …	opens an **Interface Profile Editor** of the chosen type within the **Device Management System** workspace, creates a new Interface Profile and initializes it with default values

2.1.16 Interface Branch

Each Interface Branch provides all of the devices of its interface type which are connected to the parent *X-Tools Server* at the moment. The tree of shown devices is updated automatically whenever a device is being attached to or removed from the interface. In case there is at least one device present below an interface, the total number of currently present devices of this interface is added in brackets to the name of the interface (e.g. "IEEE1394 T001 (13)").

The following specific context menu items are provided:

Context Menu Item	Description
Start Interface Profile	starts the latest Interface Profile which was started for the interface
Pause Interface Profile	pauses the current Interface Profile of the interface
Continue Interface Profile	continues the current Interface Profile of the interface
Stop Interface Profile	stops the current Interface Profile of the interface
New Interface Profile	opens the proper **Interface Profile Editor** within the **Device Management System** workspace, creates a new Interface Profile and initializes it with default values <Ctrl> + <N> can be pressed in order to achieve the same effect
Edit Interface Profile	opens the **Interface Profile Editor** with the latest Interface Profile which was started for the interface
Force IEEE1394 Bus Reset	this context menu item is present only for the IEEE1394 T001 interface

2.1.17   Device Branch

Each Device Branch represents one of the currently connected devices.

The following specific context menu items are provided:

Context Menu Item	Description
Rename	allows to rename the selected device directly within the **DMS Explorer**
Start Device Profile	starts the latest Device Profile which was started for the device
Pause Device Profile	pauses the current Device Profile of the device
Continue Device Profile	continues the current Device Profile of the device
Stop Device Profile	stops the current Device Profile of the device
New Device Profile	opens the proper **Device Profile Editor** within the **Device Management System** workspace, creates a new Device Profile and initializes it with default values <Ctrl> + <N> can be pressed in order to achieve the same effect
Edit Device Profile	opens the **Device Profile Editor** with the latest Device Profile which was started for the device

2.1.18   Libraries Branch

The Libraries Branch of each connected *X-Tools Server* provides all of the libraries which are available for the **Device Management System**.

2.1.19   Device Process Modules Branch

The Device Process Modules Branch of each connected *X-Tools Server* provides all of the **Device Process Modules** which are available for the **Device Management System**. The tree of shown **Device Process Modules** is updated automatically whenever a **Device Process Module** at the disk is added/removed/modified.

2.1.20   Device Process Module Branch

Each Device Process Module Branch represents one available **Device Process Module**.

The following specific context menu item is provided:

Context Menu Item	Description
New Device Profile	opens a **Device Profile Editor** of the chosen type within the **Device Management System** workspace, creates a new Device Profile and initializes it with default values

2.1.21 Find References Dialog

2.1.21.1 Overview

The following screenshot shows an example of a **Find References** dialog:
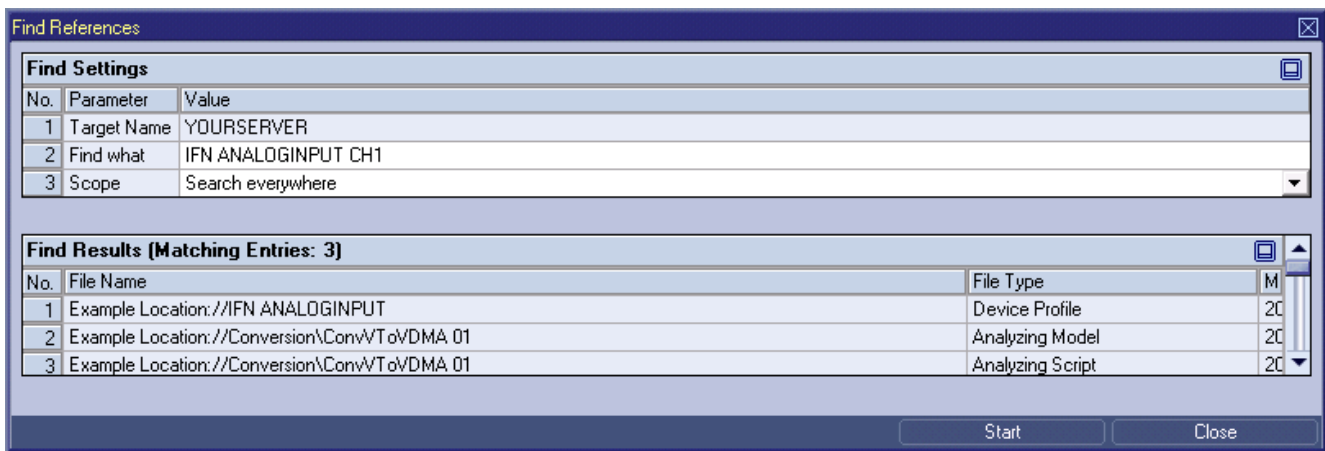
*Figure 2: Example of a **Find References** Dialog*

2.1.21.2 Find Settings Table

The Find Settings table contains the parameters which shall be used during the search of the references:

Parameter	Description
Target Name	Contains the name of the **X-Tools Server** for which the dialog has been called.
Find what	Allows to enter the string which shall be found.
Scope	Allows to choose where the search operation shall take place.

Find what

The search operation is not case sensitive and can be used in order to find data names within any of the Configuration Files of **X-Tools** (Device Profiles, Monitoring Views, Analyzing Models, Analyzing Scripts, User Functions, Storage Profiles and Loading Profiles).

It is not possible to find items or values which are not data names.

Scope

Scope	Description
Search everywhere	searches for the specified find string within all Configuration Files
Search only the DMS (Device Profiles)	searches for the specified find string only within the Configuration Files of the **Device Management System**
Search only the MTS (Monitoring Views)	searches for the specified find string only within the Configuration Files of the **Monitoring System**
Search only the ANS (Analyzing Models, Analyzing Scripts and User Functions)	searches for the specified find string only within the Configuration Files of the **Analyzing System**
Search only the STS (Loading Profiles and Storage Profiles)	searches for the specified find string only within the Configuration Files of the **Storage System**

2.1.21.3 Find Results Table

The Find Results table receives the the results of the search:

Parameter	Description
File Name	receives the name of the Configuration File which contains the find string
File Type	receives the type of the Configuration File which contains the find string
Modification Date	receives the last modification date of the Configuration File which contains the find string

A double-click onto any row of the Find Results table opens the displayed Configuration File within its according editor.

2.2 Interface Profile Editors

2.2.1 Overview

Interface Profile Editors are used in order to edit Interface Profiles. An Interface Profile contains all of the information which is needed in order to configure an interface. Multiple Interface Profiles can be created for each interface, but only one Interface Profile can be started for each interface at a time.

Interface Profile Editors are known and accessed exclusively by the *X-Tools Client*, the *X-Tools Server* has no knowledge about **Interface Profile Editors** at all. However, the *X-Tools Server* is responsible to maintain Interface Profile Files and therefore all Interface Profile reading and writing operations are performed via the *X-Tools Server*.

2.2.2 Common Controls

2.2.2.1 Overview

As all **Interface Profile Editors** are built up in a similar way, they share some common controls (e.g. tables and the menu bar) which are the same in all **Interface Profile Editors**.

Each control of an **Interface Profile Editor** has a defined task and provides certain functionalities. The following major controls are provided by the **Interface Profile Editors**. Depending to the **Interface Profile Editor**, one or more parts may not be supported (because they are not needed) and one or more parts may be present in addition to the following ones (because they are necessary):

- Interface Profile Settings Table
- Menu Bar

2.2.2.2 Interface Profile Settings Table

The Interface Profile Settings table contains all of the profile-dependent settings which can be configured within an Interface Profile:

Parameter	Description
Target Name	contains the name of the target to which the Interface Profile is stored
Storage Path	contains the path to which the Interface Profile is stored (absolute or symbolic path)
Creation Date	contains the creation date of the Interface Profile
Modification Date	contains the last modification date of the Interface Profile
Target Interface Name	contains the name of the target interface
Profile Description	contains the description of the Interface Profile
Company Name	contains the company name
Author Name	contains the author name

Target Name

All of the information about the Target Name and Storage Path is set up within the **Save As** dialog.

Target Interface Name

The Target Interface Name is the only link between the stored Interface Profile and its target interface. The **Interface Profile Editors** set this value related to their interface.

2.2.2.3   Menu Bar

Menu Button	Description
New	This button creates a new, empty Interface Profile and initializes the Interface Profile Settings table with the default values for new Interface Profiles.
	In case there is an Interface Profile opened already, it is closed automatically before the new one is being created.
	<Ctrl> + <N> can be pressed in order to achieve the same effect.
Open…	This button opens the **Open** dialog where the user is able to select the file which shall be opened.
	<Ctrl> + <O> can be pressed in order to achieve the same effect.
Save	This button saves the currently opened Interface Profile to the currently known storage location. In case the storage location has not been defined yet, the **Save As** dialog is popping up automatically and the user is able to select the desired storage location.
	<Ctrl> + <S> can be pressed in order to achieve the same effect.
Save As…	This button opens the **Save As** dialog where the user is able to select the desired storage location.
Close	This button closes the editor. In case the currently opened Interface Profile is not saved, the editor asks the user whether the Interface Profile shall be saved before it is closed.
	<Ctrl> + <F4> can be pressed in order to achieve the same effect.

2.2.3   IPE Serial Port T001

2.2.3.1   Overview

The **IPE Serial Port T001** is used in order to visualize, create and edit Interface Profiles of type "Serial Port T001". Multiple editors of this type can be opened and used simultaneously.

The following screenshot shows an example of an **IPE Serial Port T001**:

*Figure 3: Example of an **IPE Serial Port T001***

Each control of the **IPE Serial Port T001** has a defined task and provides certain functionalities. The following major controls are provided by the **IPE Serial Port T001**:

- Interface Profile Settings Table
- Connections Table
- Menu Bar
- Dropping of Items

2.2.3.2   Interface Profile Settings Table

The standard Interface Profile Settings table is being used by the **IPE Serial Port T001** (see point 2.2.2.2).

2.2.3.3 Connections Table

The Connections table contains all of the connections which are defined within the currently opened Interface Profile:

Column	Description
No.	contains the row number
Enabled	specifies whether the connection within this row shall be enabled during the start of the Interface Profile or not
COM Port	contains the COM port of the target
Baud Rate	contains the baud rate of the target
Byte Size	contains the byte size of the target
Stop Bits	contains the stop bits of the target
Parity	contains the parity of the target
Parity Check Mode	contains the parity check mode of the target
Binary Mode	contains the binary mode of the target

The user is able to highlight a complete row (or multiple rows) and to delete them via the context menu (Remove context menu item) and/or via the keyboard (<Del> key).

In addition, a highlighted row (or multiple rows) can be copied/cut/pasted to another row of the Connections table via mechanisms of the context menu (Copy, Cut and Paste context menu items) and/or via the keyboard (<Ctrl+C>, <Ctrl+X> and <Ctrl+V> keys).

Any definition which is copied from the Connections table of an **IPE Serial Port T001** also can be copied to the Connections table of another **IPE Serial Port T001**.

The last row of the Connections table always is an empty row and therefore it allows the user to add a new connection by entering another COM Port into this last row. All other cells of the last row are empty and disabled as long as the COM Port field is empty. Whenever a new COM port has been entered into the COM Port field, another new, empty row is added to the Connections table automatically.

The value of each COM Port field must be unique among all enabled connections when the user wants to save the Interface Profile. The according check is done before the actual saving is started. In case the value of the COM Port field of an enabled connection is not unique among the currently enabled connections of the Interface Profile, red text is being used for displaying of values of the affected COM Port fields.

2.2.3.4 Menu Bar

The standard Menu Bar is being used by the **IPE Serial Port T001** (see point 2.2.2.3).

2.2.3.5 Dropping of Items

Dropped Item	Description
Interface Profile File Branches of type "IPF Serial Port T001"	opens the dropped Interface Profile

2.2.4   IPE Simulation T001

2.2.4.1   Overview

The **IPE Simulation T001** is used in order to visualize, create and edit Interface Profiles for simulation interfaces. Multiple editors of this type can be opened and used simultaneously.

The following screenshot shows an example of an **IPE Simulation T001**:

Figure 4: Example of an IPE Simulation T001

Each control of the **IPE Simulation T001** has a defined task and provides certain functionalities. The following major controls are provided by the **IPE Simulation T001**:

- Interface Profile Settings Table

- Connections Table

- Menu Bar

- Dropping of Items

2.2.4.2   Interface Profile Settings Table

The standard Interface Profile Settings table is being used by the **IPE Simulation T001** (see point 2.2.2.2).

2.2.4.3   Connections Table

The Connections table contains all of the connections which are defined within the currently opened Interface Profile:

Column	Description
No.	contains the row number
Enabled	specifies whether the connection within this row shall be enabled during the start of the Interface Profile or not
Device Name	contains the device name of the target
Device Type	contains the device type of the target
Device UIK	contains the device UIK of the target

The user is able to highlight a complete row (or multiple rows) and to delete them via the context menu (Remove context menu item) and/or via the keyboard (<Del> key).

In addition, a highlighted row (or multiple rows) can be copied/cut/pasted to another row of the Connections table via mechanisms of the context menu (Copy, Cut and Paste context menu items) and/or via the keyboard (<Ctrl+C>, <Ctrl+X> and <Ctrl+V> keys).

Any definition which is copied from the Connections table of an **IPE Simulation T001** also can be copied to the Connections table of another **IPE Simulation T001**.

The last row of the Connections table always is an empty row and therefore it allows the user to add a new connection by selecting another device type from the Device Type field of this last row. All other cells of the last row are empty and disabled as long as the Device Type field is empty. Whenever a new device type has been selected from the Device Type field, another new, empty row is added to the Connections table automatically.

The device names must be unique among all enabled connections when the user wants to save the Interface Profile. The according check is done before the actual saving is started.

The device UIKs must be unique among all enabled connections when the user wants to save the Interface Profile. The according check is done before the actual saving is started.

2.2.4.4   Menu Bar

The standard Menu Bar is being used by the **IPE Simulation T001** (see point 2.2.2.3).

2.2.4.5   Dropping of Items

Dropped Item	Description
Interface Profile File Branches of type "IPF Simulation T001"	opens the dropped Interface Profile

2.2.5   IPE Socket T001

2.2.5.1   Overview

The **IPE Socket T001** is used in order to visualize, create and edit Interface Profiles for socket interfaces. Multiple editors of this type can be opened and used simultaneously.

The following screenshot shows an example of an **IPE Socket T001**:
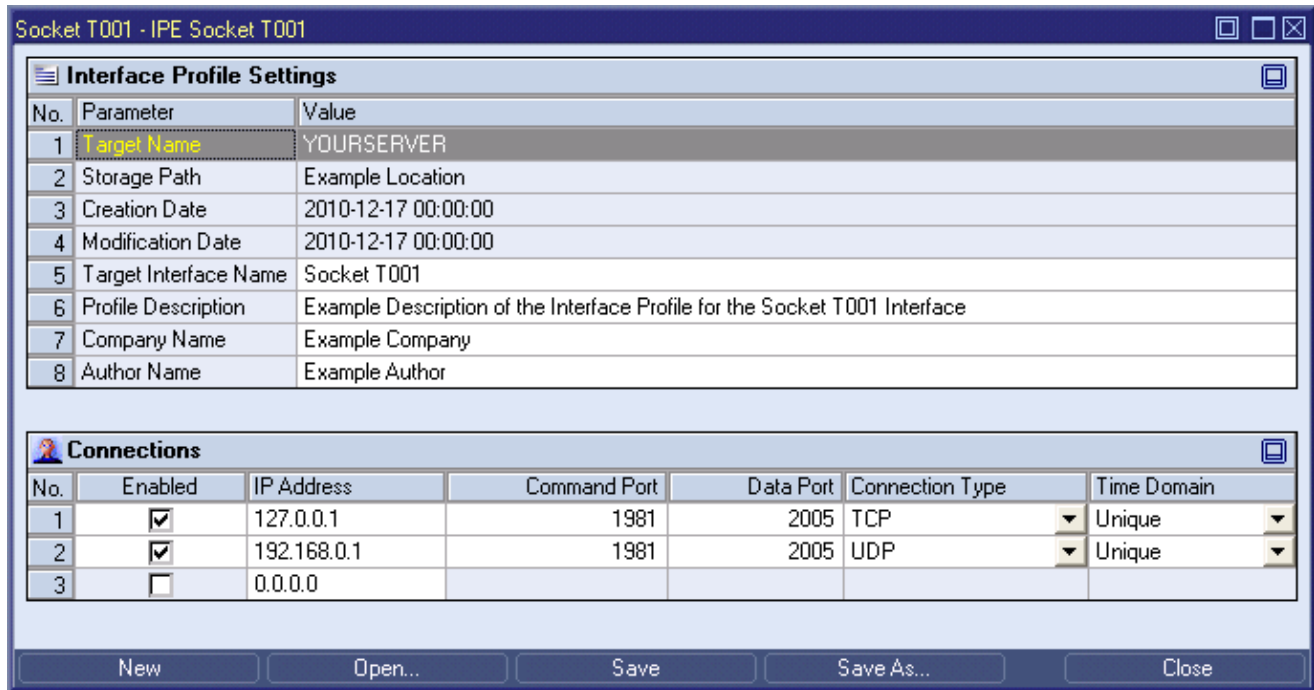
*Figure 5: Example of an **IPE Socket T001***

Each control of the **IPE Socket T001** has a defined task and provides certain functionalities. The following major controls are provided by the **IPE Socket T001**:

- Interface Profile Settings Table
- Connections Table
- Menu Bar
- Dropping of Items

2.2.5.2   Interface Profile Settings Table

The standard Interface Profile Settings table is being used by the **IPE Socket T001** (see point 2.2.2.2).

2.2.5.3   Connections Table

The Connections table contains all of the connections which are defined within the currently opened Interface Profile:

Column	Description
No.	contains the row number
Enabled	specifies whether the connection within this row shall be enabled during the start of the Interface Profile or not
IP Address	contains the IP address of the target
Command Port	contains the command port of the target
Data Port	contains the data port of the target
Connection Type	contains the connection type of the target
Time Domain	contains the time domain of the target

The user is able to highlight a complete row (or multiple rows) and to delete them via the context menu (Remove context menu item) and/or via the keyboard (<Del> key).

In addition, a highlighted row (or multiple rows) can be copied/cut/pasted to another row of the Connections table via mechanisms of the context menu (Copy, Cut and Paste context menu items) and/or via the keyboard (<Ctrl+C>, <Ctrl+X> and <Ctrl+V> keys).

Any definition which is copied from the Connections table of an **IPE Socket T001** also can be copied to the Connections table of another **IPE Socket T001**.

The last row of the Connections table always is an empty row and therefore it allows the user to add a new connection by typing another IP address into the IP Address field of this last row. All other cells of the last row are empty and disabled as long as the IP Address field is empty. Whenever a new IP address has been entered into the IP Address field, another new, empty row is added to the Connections table automatically.

When a new IP address is entered manually, the values of the Command Port, Data Port, Connection Type and Time Domain fields automatically are set to the values which have been entered at last for another row by the user.

Each combination of IP address and command port and IP address and data port must be unique among all of the enabled connections when the Interface Profile shall be saved. The according check is performed before the saving is started.

Time Domain

The *X-Tools Server* is performing time synchronization for the values which it receives from socket devices. Typically, each of the connected socket devices has its own time base without any time synchronization between them. In such cases, the Time Domain cell of each connection shall be set to "Unique" and as a result the *X-Tools Server* maintains unique time correction values for the time synchronization to each connected device.

In addition, there are also applications where multiple socket devices share a common time base, e.g. because their system clocks are synchronized by an external mechanism or because multiple socket devices are running at the identical hardware (for example, multiple ION SIMATIC TDC T001 devices can be engineered into a single SIMATIC TDC rack). In such cases, the devices which share the same time base shall be assigned to a common time domain and the *X-Tools Server* maintains only one set of time correction values for all devices which belong to one time domain. Without assigning of a common time domain, the *X-Tools Server* would maintain unique time correction values for each connected device which can result in artificial time shifts between the data values of the devices because the calculation of the time correction values can not be 100% exact.

In case the incoming timestamps from devices which are configured to share the same time domain are differing too much from each other, the *X-Tools Server* outputs according log entries. In this case, the devices must be configured for different time domains and/or the system time synchronization of the affected devices must be improved.

2.2.5.4   Menu Bar

The standard Menu Bar is being used by the **IPE Socket T001** (see point 2.2.2.3).

2.2.5.5   Dropping of Items

Dropped Item	Description
Interface Profile File Branches of type "IPF Socket T001"	opens the dropped Interface Profile

2.2.6   IPE OPC UA T001

2.2.6.1   Overview

The **IPE OPC UA T001** is used in order to visualize, create and edit Interface Profiles for OPC UA interfaces. Multiple editors of this type can be opened and used simultaneously.

The following screenshot shows an example of an **IPE OPC UA T001**:

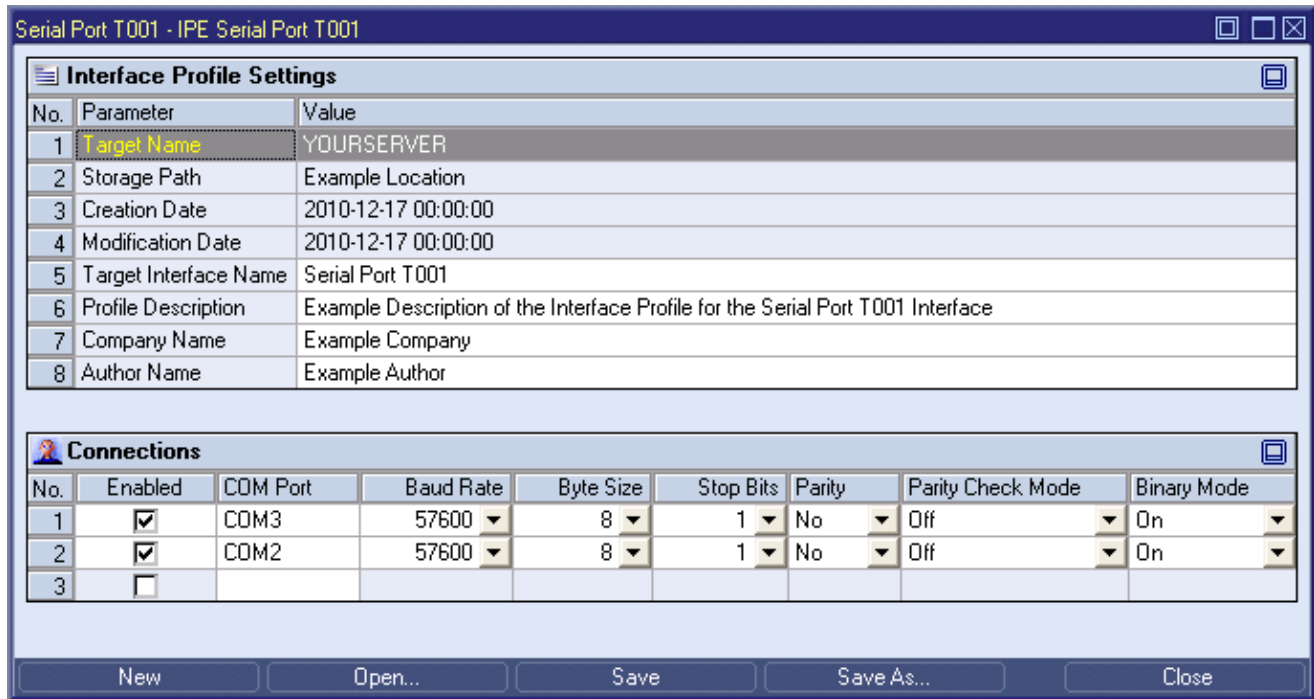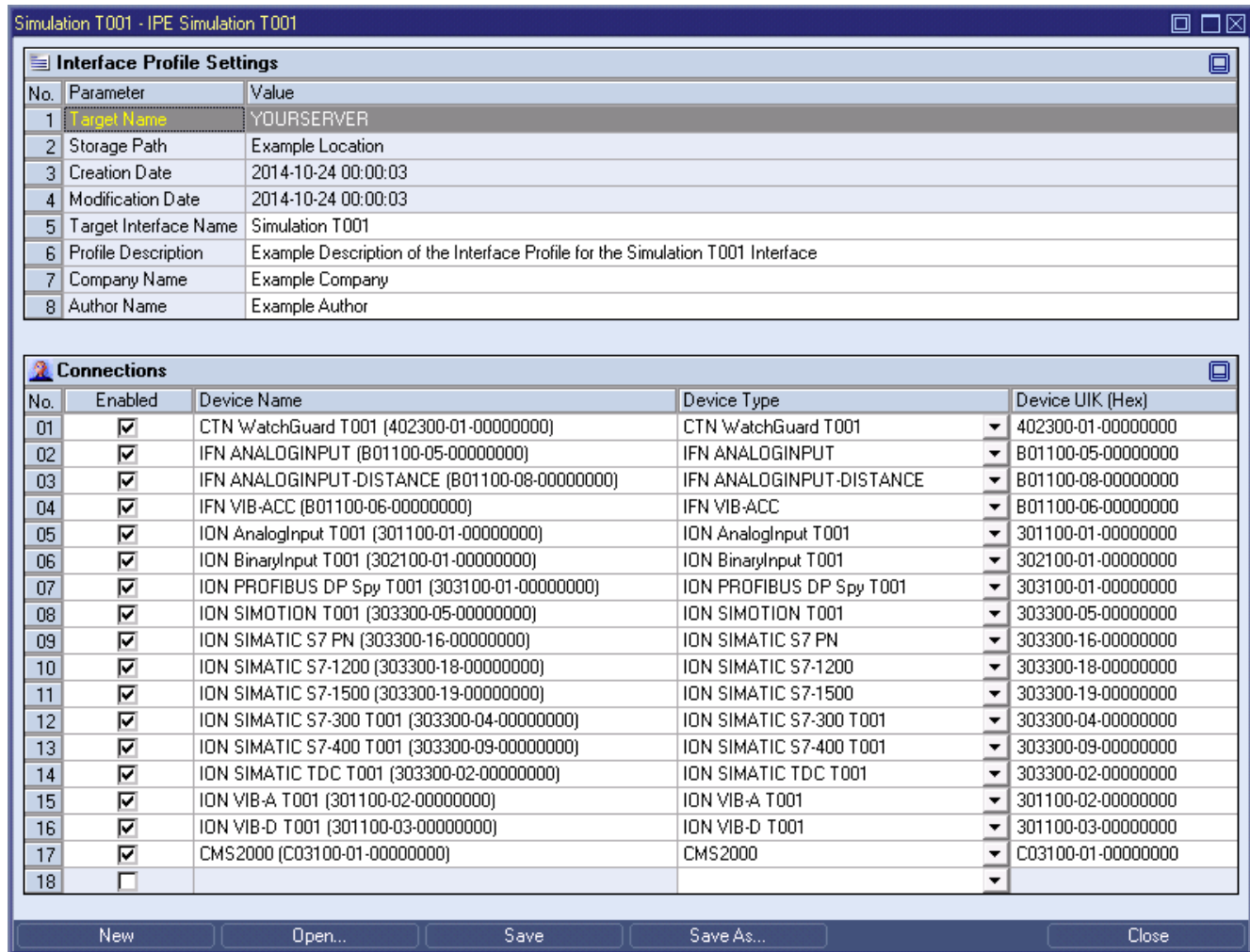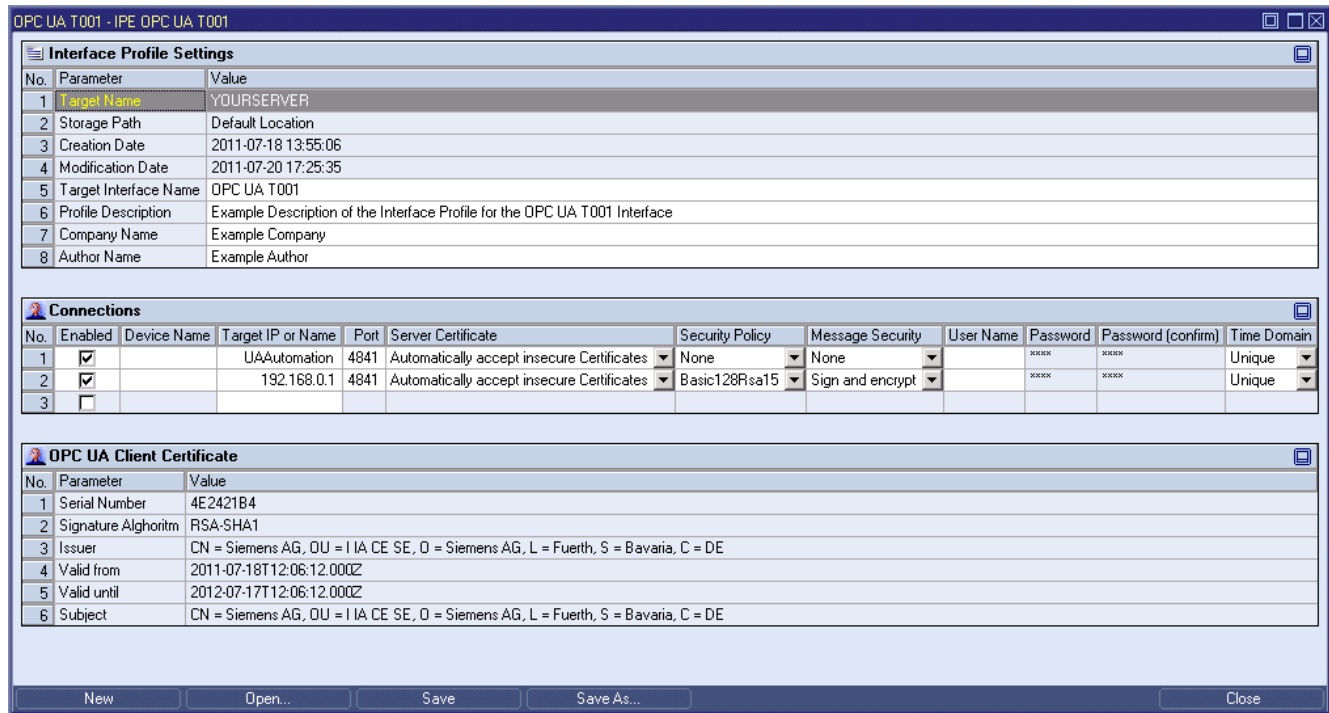*Figure 6: Example of an **IPE OPC UA T001***

Each control of the **IPE OCP UA T001** has a defined task and provides certain functionalities. The following major controls are provided by the **IPE OPC UA T001**:

- Interface Profile Settings Table
- Connections Table
- OPC UA Client Certificate Table
- Create new OPC UA Client Certificate Dialog
- Menu Bar
- Dropping of Items

2.2.6.2   Interface Profile Settings Table

The standard Interface Profile Settings table is being used by the **IPE OPC UA T001** (see point 2.2.2.2).

2.2.6.3   Connections Table

The Connections table contains all of the connections which are defined within the currently opened Interface Profile:

Column	Description
No.	contains the row number
Enabled	specifies whether the connection within this row shall be enabled during the start of the Interface Profile or not
Device Name	contains the device name of the target
Target IP or Name	contains the IP address or name of the target
Port	contains the port which shall be used for the communication
Server Certificate	contains the type of the handling of the server certificate
Security Policy	contains the type of the to-be-used security policy
Message Security	contains the type of the to-be-used message security
User Name	contains the user name which shall be used for the access to the target
Password	contains the password of the user account which shall be used for the access to the target
Password (confirm)	contains the password for the user account (for confirmation) which shall be used for the access to the target
Time Domain	contains the time domain of the target

The user is able to highlight a complete row (or multiple rows) and to delete them via the context menu (Remove context menu item) and/or via the keyboard (<Del> key).

In addition, a highlighted row (or multiple rows) can be copied/cut/pasted to another row of the Connections table via mechanisms of the context menu (Copy, Cut and Paste context menu items) and/or via the keyboard (<Ctrl+C>, <Ctrl+X> and <Ctrl+V> keys).

Any definition which is copied from the Connections table of an **IPE OPC UA T001** also can be copied to the Connections table of another **IPE OPC UA T001**.

The last row of the Connections table always is an empty row and therefore it allows the user to add a new connection by typing another IP address or name into the Target IP or Name field of this last row. All other cells of the last row are empty and disabled as long as the Target IP or Name field is empty. Whenever a new IP address or name has been entered into the Target IP or Name field, another new, empty row is added to the Connections table automatically.

When a new IP address or name is entered manually, the values of the Port, Server Certificate, Security Policy, Message Security and Time Domain fields automatically are set to the values which have been entered at last for another row by the user.

In case the device name within a row is not an empty string, it must be unique among all enabled connections when the user wants to save the Interface Profile. Rows with not-unique device names are highlighted with red text. The according check is done before the actual saving is started.

Each combination of IP address (or name) and port must be unique among all of the enabled connections when the Interface Profile shall be saved. The according check is performed before the saving is started.

Device Name

The specified device name is being used as default device name when the device is being added to the **DMS Explorer**. The device name also can be determined by the *X-Tools Server* automatically. In order to enable the automatic detection of the device name, "" (an empty string) must be entered as device name. The automatic device name which is determined by the *X-Tools Server* automatically always is in format "Target IP or Name:Port".

Device names which have a value of "" are ignored by the check whether the currently provided device names are unique.

Server Certificate

In case the server certificate is configured to "Do not accept insecure Certificate", each unknown OPC UA server certificate which is received is rejected and saved to the following folder of the *X-Tools* installation:

- ..\X-Tools\Server\User\Certificates\OPC UA Client\Rejected

In oder to enable the connection via such a rejected certificate, the certificate must be moved manually to the folder of trusted certificates from OPC UA servers:

- ..\X-Tools\Server\User\Certificates\OPC UA Client\Certificates

Afterwards, the Interface Profile must be stopped and restarted in order to retry to connect as OPC UA client.

Security Policy

In order to be able to use a security policy different to "None", an OPC UA client certificate must be created within the **IPE OPC UA T001**. This OPC UA client certificate is stored by the *X-Tools Server* and can be used for all following connection attempts to OPC UA servers.

For all connections to OPC UA servers with a security policy different to "None", *X-Tools* sends its OPC UA client certificate during the connection attempt. The target OPC UA server must accept this certificate in order to allow the connection. In case the target OPC UA server does not accept the OPC UA client certificate of *X-Tools* automatically, contact the administrator for your OPC UA server so that he can configure the OPC UA client certificate of *X-Tools* as trusted certificate.

In case there is no need for security and in case the target OPC UA server supports unsecured connects, the OPC UA client certificate is not needed and the connect can be established with a security policy of "None".

User Name

The provided user name is being used by the OPC UA server during the connection process in order to identify the *X-Tools Server*. Depending to the user name, the *X-Tools Server* may receive more or less rights for operating the OPC UA server.

The User Name cell can be left empty. In this case, the Password and Password (confirm) cells are disabled and the *X-Tools Server* attempts to log in to the OPC UA server anonymously.

Password

The provided password must match the provided user name as it is configured at the target OPC UA server.

The contents of the Password and Password (confirm) cells must be identical.

The user name is case-insensitive. The password is case-sensitive.

Note

Some OPC UA clients use the credentials of Windows for their allowed combinations of username and password. In case a username and password are provided to the **IPE OPC UA T001**, they also must be stored into the according Interface Profile. Although the provided password is stored in encrypted form by *X-Tools*, the access to the stored Inferface Profile must be restricted via the standard mechanisms of Windows in case of applications which require high security strength.

Time Domain

The *X-Tools Server* can perform time synchronization for the values which it receives from OPC UA servers. This time synchronization can be turned off in case the system clocks of the OPC UA server and the *X-Tools Server* are synchronized by an external mechanism and also in cases where the OPC UA server and the *X-Tools Server* are running at the same computer.

In addition, there are also applications where multiple OPC UA servers share a common time base, e.g. because their system clocks are synchronized by an external mechanism. In such cases, the OPC UA servers which share the same time base shall be assigned to a common time domain and the *X-Tools Server* maintains only one set of time correction values for all OPC UA servers which belong to one time domain. Without assigning of a common time domain, the *X-Tools Server* would maintain unique time correction values for each connected OPC UA server which can result in artificial time shifts between the data values of the OPC UA servers because the calculation of the time correction values can not be 100% exact.

2.2.6.4   OPC UA Client Certificate Table

The OPC UA Client Certificate table contains detailed information about the currently used OPC UA client certificate. This table is read-only and can not be used in order to change the OPC UA client certificate.

Via the context menu of the OPC UA Client Certificate table, the current OPC UA client certificate can be deleted and the **Create new OPC UA Client Certificate** dialog can be called in order to create a new OPC UA client certificate.

Whenever a new OPC UA client certificate is being created, also a private key with the same length is being created. In case the current OPC UA client certificate is being deleted, also the private key is being deleted.

2.2.6.5   Create new OPC UA Client Certificate Dialog

2.2.6.5.1   Overview

The following screenshot shows an example of the **Create new OPC UA Client Certificate** dialog:
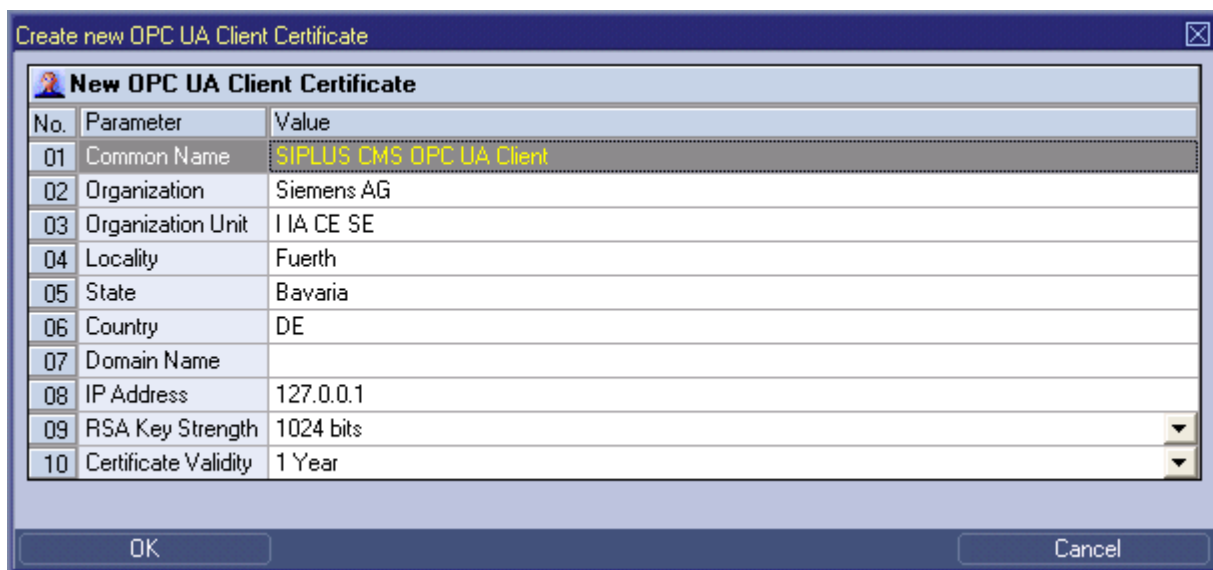
*Figure 7: Example of the **Create new OPC UA Client Certificate** Dialog of the **IPE OPC UA T001***

2.2.6.5.2   New OPC UA Client Certificate Table

The New OPC UA Client Certificate table contains the parameters for the creation of a new OPC UA client certificate:

Parameter	Description
Common Name	contains the common name which shall be used for the new certificate
Organization	contains the organization which shall be used for the new certificate
Organization Unit	contains the organization unit which shall be used for the new certificate
Locality	contains the locality which shall be used for the new certificate
State	contains the state which shall be used for the new certificate
Country	contains the country which shall be used for the new certificate
Domain Name	contains the domain name which shall be used for the new certificate
IP Address	contains the IP address which shall be used for the new certificate
RSA Key Strength	contains the RSA key strength which shall be used for the new certificate
Certificate Validity	contains the validity which shall be used for the new certificate

Domain Name

Either the Domain Name or the IP Address must be provided. In case a Domain Name is specified, it must match the domain of the PC at which the **X-Tools Server** shall run.

IP Address

Either the IP Address or the Domain Name must be provided. In case an IP Address is specified, it must match the IP address of the PC at which the *X-Tools Server* shall run.

Country

The country must be specified as the two letter code which is known from Internet domains (see ISO 3166-1), e.g. "US", "EN" or "DE".

2.2.6.5.3   Menu Bar

Menu Button	Description
OK	Attempts to create a new OPC UA client certificate on base of the provided settings. A message box is displayed afterwards which informs about the success or failure of this operation.
Cancel	Closes the dialog and discards all user inputs.

2.2.6.6   Menu Bar

The standard Menu Bar is being used by the **IPE OPC UA T001** (see point 2.2.2.3).

2.2.6.7   Dropping of Items

Dropped Item	Description
Interface Profile File Branches of type "IPF OPC UA T001"	opens the dropped Interface Profile

2.3   Device Profile Editors

2.3.1   Overview

Device Profile Editors are used in order to edit Device Profiles. A Device Profile contains all of the data descriptions and information which is needed in order to start the data transfer from its device to the **X-Tools Server** which started the Device Profile. Multiple Device Profiles can be created for each device, but only one Device Profile can be started for each device at a time.

Device Profile Editors are known and accessed exclusively by the **X-Tools Client**, the **X-Tools Server** has no knowledge about **Device Profile Editors** at all. However, the **X-Tools Server** is responsible to maintain Device Profile Files and therefore all Device Profile reading and writing operations are performed via the **X-Tools Server**.

2.3.2   Common Controls

2.3.2.1   Overview

As all **Device Profile Editors** are built up in a similar way, they share some common controls (e.g. tables and the menu bar) which are the same in all **Device Profile Editors**.

Each control of a **Device Profile Editor** has a defined task and provides certain functionalities. The following major controls are provided by the **Device Profile Editors**. Depending to the **Device Profile Editor**, one or more parts may not be supported (because they are not needed) and one or more parts may be present in addition to the following ones (because they are necessary):

- Device Profile Settings Table
- Device Profile Parameters Table
- Device Profile Data Table
- Message Channel Contents Table
- Message Channels Table
- Menu Bar

2.3.2.2   Device Profile Settings Table

The Device Profile Settings table contains all of the profile-dependent settings which can be configured within a Device Profile:

Parameter	Description
Target Name	contains the name of the target to which the Device Profile is stored
Storage Path	contains the path to which the Device Profile is stored (absolute or symbolic path)
Creation Date	contains the creation date of the Device Profile
Modification Date	contains the last modification date of the Device Profile
Target Device Name	contains the name of the target device
Profile Description	contains the description of the Device Profile
Company Name	contains the company name
Author Name	contains the author name
Data Name Prefix	contains the data name prefix
Data Supervision Time	contains the data supervision time

Target Name

All of the information about the Target Name and Storage Path is set up within the **Save As** dialog.

Target Device Name

The Target Device Name is the only link between the stored Device Profile and its target device.

Whenever a device is being dragged from the **DMS Explorer** and dropped onto the Device Profile Settings table of the **Device Profile Editor**, the name of the dropped device is entered into the Target Device Name cell automatically.

The Target Device Name can be used as parameter of the Device Profile. Therefore, the following context menu items are provided:

Context Menu Item	Description
Add Parameter	adds the Target Device Name as parameter of the Device Profile
Go to Parameter	highlights the parameter which represents the Target Device Name within the Provided Parameters table
Remove Parameter	removes the Target Device Name as parameter of the Device Profile

Data Name Prefix

The Data Name Prefix is part of the final data name. When the **Device Profile Editor** saves the Device Profile to disk, the Data Name Prefix is inserted at the beginning of each of the defined data names.

The length of the final data name (= data name prefix + data name) can be up to 63 characters.

The Data Name Prefix can be used as parameter of the Device Profile. Therefore, the following context menu items are provided:

Context Menu Item	Description
Add Parameter	adds the Data Name Prefix as parameter of the Device Profile
Go to Parameter	highlights the parameter which represents the Data Name Prefix within the Provided Parameters table
Remove Parameter	removes the Data Name Prefix as parameter of the Device Profile

Data Supervision Time

The Data Supervision Time can be used in order to establish a kind of watchdog for incoming data. In case the entered value is 0, "Off" is displayed within the value cell and no watchdog functionality is initialized at any time. Contrary, when the Data Supervision Time is not equal to 0, the **Device Management Engine** monitors the incoming data from the target device as soon as the Device Profile is started and generates according messages within the system log in case no data from the target device arrived within the specified supervision time. In addition, the **Device Management Engine** suspends the affected Device Profile and tries to restart it automatically until it is running again. During the restart, no measurement data can be acquired from the affected device.

The Data Supervision Time can be used as parameter of the Device Profile. The following context menu items are provided:

Context Menu Item	Description
Set to Off	sets the data supervision time to 0 seconds
Set to Default	sets the data supervision time to 0.75 seconds
Add Parameter	adds the Data Supervision Time as parameter of the Device Profile
Go to Parameter	highlights the parameter which represents the Data Supervision Time within the Provided Parameters table
Remove Parameter	removes the Data Supervision Time as parameter of the Device Profile

2.3.2.3   Provided Parameters Table

The Provided Parameters table contains all of the parameters which have been configured within a Device Profile:

Parameter	Description
Full Name	allows to enter the full name of the parameter
Short Name	allows to enter the short name of the parameter
Unit	allows to enter the unit of the parameter
Description	allows to enter the description of the parameter
Default Value	allows to enter the default value of the parameter
Reference	contains the name of the setting to which this parameter is assigned

Full Name

The Full Name of each parameter must be unique among the parameters of the Device Profile.

Short Name

The Short Name of each parameter must be unique among the parameters of the Device Profile.

Context Menu

The following context menu items are provided by the Provided Parameters table:

Context Menu Item	Description
Move up	moves the selected parameter(s) one row up
Move down	moves the selected parameter(s) one row down
Go to Definition	expands the parent table of the according setting and highlights the setting
Remove	removes the currently selected parameter(s)

2.3.2.4   Device Profile Data Table

The Device Profile Data table contains all of the data which is defined within the currently opened Device Profile. Depending to the parent **Device Profile Editor**, one or more columns may not be supported (because they are not needed) and one or more columns may be present in addition to the following ones (because they are device-dependent):

Column	Description
No.	contains the row number
Enabled	specifies whether the data within this row shall be enabled during the start of the Device Profile or not
Name	contains the name of the data
Unit	contains the unit of the data
Description	contains the description of the data
Source Type	contains the source type of the data
Destination Type	contains the destination type of the data
Size	contains the size of the data
Normalization Mode	contains the normalization mode of the data
Normalization Parameters	contains the normalization parameters of the data
Record Mode	contains the record mode of the data
Record Parameters	contains the record parameters of the data
Data Format	contains the format of the data
Buffer Mode	contains the buffer mode of the data
Buffer Parameters	contains the buffer parameters of the data
Message Channel	contains the name of the message channel from which this data is generated
Byte Offset	contains the byte offset of the data within its message channel
Bit Offset	contains the bit offset of the data within its byte

The user is able to highlight a complete row (or multiple rows) and to remove them via the context menu (Remove context menu item) and/or via the keyboard (<Del> key). Depending to the possibilities of each **Device Profile Editor**, a removed row within the Device Profile Data table either stays empty and grays all cells except the Name cell or it is removed from the Device Profile Data table completely.

In order to put some data definition into an empty row, a new, valid data name can be entered or the definitions from another row can be pasted into the empty one. New data definitions also can be added via copy/move operations of existing data definitions from other Device Profiles of matching type.

In case of **Device Profile Editors** which provide a Message Channel Contents table, new data definitions also can be added either via the Message Channel Contents table.

A highlighted row (or multiple rows) can be copied/cut/pasted to another row of the Device Profile Data table of the current or any other **Device Profile Editor** of matching type via mechanisms of the context menu (Copy, Cut and Paste context menu items) and/or via the keyboard (<Ctrl+C>, <Ctrl+X> and <Ctrl+V> keys). In case of **Device Profile Editors** which provide a Message Channel Contents table, the copied/cut data definitions also can be pasted into the Message Channel Contents table of the current or any other **Device Profile Editor** of matching type

Any selection of a row within the Device Profile Data table automatically causes the same data to become selected within the Message Channel Contents table (if there is any provided by the **Device Profile Editor**). In addition, the source message channel of the data is highlighted within the Message Channels table (if there is any provided by the **Device Profile Editor**).

All invalid and all conflicting data definitions are highlighted and indicated to contain invalid entries.

Name

The Name of each present row can be used as parameter of the Device Profile. Therefore, the following context menu items are provided:

Context Menu Item	Description
Add Parameter	adds the entry from which the context menu is called as parameter of the Device Profile
Go to Parameter	highlights the parameter which represents the entry from where the context menu has been called within the Provided Parameters table
Remove Parameter	removes the entry from which the context menu is called as parameter of the Device Profile

Destination Type

The incoming data from a **Device** is being normalized with decimal precision first and converted into the destination type afterwards. In case of integer destination types, truncation (not rounding) is being used for the conversion. For Boolean destination types, a value of 0.0 after the normalization is false and everything else (including negative numbers) is true.

Size

This column is present only within **Device Profile Editors** which support the data type "string". Its value is enabled only in case the value of Source Type is "String" – in this case, Size contains the number of characters which can be hold by the string.

Normalization Mode

The normalization mode can be used in order to normalize the incoming data from a device (e.g. +/- 16384 [digits] or +/- 200 [%]) to the value range which shall be used within **X-Tools** (e.g. +/- 1500 [rpm]). The formula which is being used for the actual normalization is:

- $Value_{InsideX-Tools} = Value_{FromDevice} * m + b$

In case x0, y0, x1 and y1 are being provided, m and b are determined automatically according to the following formula:

- $m = (y1 - y0) / (x1 - x0)$

- $b = y0 - (m * x0)$

Normalization Mode	Description
m; b	In case the normalization mode "m; b" is chosen, the m and b values of the normalization which have been entered via the Normalization Parameters are being used for the normalization of the data values from the source type to the destination type.
x0; y0; x1; y1	In case the normalization mode "x0; y0; x1; y1" is chosen, the x0, y0, x1 and y1 values of the normalization which have been entered via the Normalization Parameters are being used for the normalization of the data values from the source type to the destination type.
m; b; x0; y0; x1; y1	In case the normalization mode "m; b; x0; y0; x1; y1" is chosen, the m, b, x0, y0, x1 and y1 values of the normalization which have been entered via the Normalization Parameters are being used for the normalization of the data values from the source type to the destination type.

Record Mode

Record Mode	Description
Each Value	In this record mode, each incoming value from the device is put into the ring buffer of the according data.
Changes only	In this record mode, an incoming value from the device is put into the ring buffer of the according data only in case the difference in between the incoming value from the source and the last value from the ring buffer is bigger than the specified hysteresis.
Interval only	In this record mode, an incoming value from the device is never put into the ring buffer of the according data directly. Instead, the last known incoming value which is received from the device is put into the ring buffer each amount of time which is specified as interval.

Data Format

Data Format	Description
Big Endian (Motorola, MSB first)	When this data format is chosen, the incoming value from the device is interpreted with the most significant byte as first byte.
Little Endian (Intel, LSB first)	When this data format is chosen, the incoming value from the device is interpreted with the least significant byte as first byte.

Buffer Mode

Buffer Mode	Description
Absolute Size	In this buffer mode, the absolute size of the ring buffer of the data can be specified, in number of values.
Relative Size	In this buffer mode, the relative size of the ring buffer of the data can be specified, in % of the ring buffer size from the global options.

2.3.2.5   Message Channel Contents Table

The Message Channel Contents table contains a graphical representation of all of the data message channels which are defined within the current Device Profile:

Column	Description
No.	contains the row number
1 – 10	contains 10 bytes of the message channel, where multiple rows may be used for each message channel in case its size is longer than the available space within one row
11 – 20	contains 10 bytes of the message channel, where multiple rows may be used for each message channel in case its size is longer than the available space within one row
21 – 30	contains 10 bytes of the message channel, where multiple rows may be used for each message channel in case its size is longer than the available space within one row
…	additional columns (e.g. 31-40, 41-50, …) are dependent to the actual width of the Message Channel Contents table and to the size of the message channel itself

The rows of this table depend to the definitions within the Message Channels table and are added/removed according to the modifications there.

For every specified message channel there is an array which contains the specified amount of data bytes. The user is able to select any of the displayed bytes and to add a data definition there (New Data Definition context menu item). The amount of data bytes which are covered by the new data definition is dependent to the chosen source data type of the new definition and can be more than one byte.

Editing of already existing data definitions is done via the Device Profile Data table, only.

A highlighted data definition (or multiple data definitions) can be copied/cut/pasted to another position within the Message Channel Contents table of the current or any other **Device Profile Editor** via mechanisms of the context menu (Copy, Cut and Paste context menu items) and/or via the keyboard (<Ctrl+C>, <Ctrl+X> and <Ctrl+V> keys).

Selecting of data within the Message Channel Contents table automatically highlights the same data within the Device Profile Data table. In addition, the source message channel of the data is highlighted within the Message Channels table (if there is any provided by the **Device Profile Editor**).

The order of the rows (message channels) within the Message Channel Contents table from top to bottom matches the order of the rows (message channels) within the Message Channels table. Whenever the order of rows (message channels) within the Message Channels table is being changed, also the order of rows (message channels) within the Message Channel Contents table is being updated accordingly.

1 - 10, 11 - 20, 21 - 30, …

The 1 … 10, 11 … 20, 21 …30 and all following columns contain always 10 bytes of a message channel. These columns do not have a functional purpose but are used for a better organization of the bytes of the present message channels.

Each data byte which is part of a defined data is highlighted through colors. Different source data types are highlighted with different colors in order to provide a better overview and additional information. At each byte position, only one data definition can be placed, and also overlapping of multiple data definitions is not allowed.

The following specific context menu items are provided:

Context Menu Item	Description
New Data Definition > …	creates a new data definition with the specified source type and at the byte position from which the context menu has been called; the Name cell of the new data definition within the Device Profile Data receives the input focus and is put into edit mode so that the user is able to enter a proper data name immediately
Resize > …	changes the source type of the data definition from which the context menu has been called to the chosen value
Cut	cuts the currently selected data definitions
Copy	copies the currently selected data definitions
Paste	pastes the currently copied/cut data definitions; eventually already present data definitions are being overwritten automatically
Remove	deletes the currently selected data definitions

2.3.2.6 Message Channels Table

The Message Channels table contains all of the message channels which are defined within the current Device Profile. Depending to the parent **Device Profile Editor**, one or more columns may not be supported (because they are not needed) and one or more columns may be present in addition to the following ones (because they are device-dependent):

Column	Description
No.	contains the row number
Enabled	specifies whether the data within this message channel shall be enabled during the start of the Device Profile or not
Name	contains the name of the message channel
Description	contains the description of the message channel
Length	contains the length of the message channel
Header Mask Length	contains the length of the header mask of the message channel, if any
Header Mask Offset	contains the offset of the header mask of the message channel, if any
Header Mask	contains the header mask of the message channel, if any

The user is able to highlight a complete row (or multiple rows) and to remove them via the context menu (Remove context menu item) and/or via the keyboard (<Del> key). A removed row is removed from the Message Channels table completely.

In order to put some message channel definition into an empty row, a new, valid message channel name can be entered or the definitions from another row can be pasted into the empty one. New message channel definitions also can be added via copy/move operations of existing message channel definitions from other Device Profiles of matching type.

A highlighted row (or multiple rows) can be copied/cut/pasted to the Message Channel Contents table of the current or any other **Device Profile Editor** via mechanisms of the context menu (Copy, Cut and Paste context menu items) and/or via the keyboard (<Ctrl+C>, <Ctrl+X> and <Ctrl+V> keys).

Any selection of a row within the Message Channels table automatically causes all data from this message channel to become selected within the Device Profile Data table. In addition, the according message channel also is highlighted within the Message Channel Contents table.

The last row of the Message Channels table always is empty and therefore allows the user to add a new message channel by typing another name into the Name field of this last row. All other cells of the last row are empty and disabled as long as the Name field is empty. Whenever a new name has been entered into the Name field, another new, empty row is added to the Message Channels table automatically.

All invalid and all conflicting message channels are highlighted and indicated to contain invalid entries.

Header Mask Length

In case a header mask length bigger than zero is specified, the **Device Management Engine** uses the specified header mask as identifier in addition to the other, device specific identifiers of the message channel. Therefore, devices which support the functionality of header masks can use it in order to transmit different data with each packet and to mark which data is being delivered currently via the header mask.

Header Mask Offset

The header mask offset specifies the position of the first byte of the header mask within the message channel.

Header Mask

The header mask itself can be entered as hexadecimal array of values. The number of to-be-entered bytes matches the specified Header Mask Length.

2.3.2.7   Menu Bar

Menu Button	Description
New	This button creates a new Device Profile and initializes the Device Profile Settings table with the default values for new Device Profiles.
	In case there is a Device Profile opened already, it is closed automatically before the new one is being created.
	Dependent to the target device and its capabilities, some **Device Profile Editors** are able to fill the new Device Profile with default values which can be used to start the new Device Profile immediately whereas others are not able to provide any default data definitions.
	<Ctrl> + <N> can be pressed in order to achieve the same effect.
Open…	This button opens the **Open** dialog where the user is able to select the file which shall be opened.
	<Ctrl> + <O> can be pressed in order to achieve the same effect.
Save	This button saves the currently opened Device Profile to the currently known storage location. In case the storage location has not been defined yet, the **Save As** dialog is popping up automatically and the user is able to select the desired storage location.
	<Ctrl> + <S> can be pressed in order to achieve the same effect.
Save As…	This button opens the **Save As** dialog where the user is able to select the desired storage location.
Close	This button closes the editor. In case the currently opened Device Profile is not saved, the editor asks the user whether the Device Profile shall be saved before it is closed.
	<Ctrl> + <F4> can be pressed in order to achieve the same effect.

2.3.3   DPE CMS2000

2.3.3.1   Overview

The **DPE CMS2000** is used in order to visualize, create and edit Device Profiles of type "CMS2000". Multiple editors of this type can be opened and used simultaneously.

The following screenshot shows an example of a **DPE CMS2000**:

*Figure 8: Example of a **DPE CMS2000***

Each control of the **DPE CMS2000** has a defined task and provides certain functionalities. The following major controls are provided by the **DPE CMS2000**:

- Device Profile Settings Table

- Provided Parameters Table

- Device Profile Data Table

- Device Profile Parameters Table

- VIB Channel Configuration Table

- Menu Bar

- Dropping of Items

2.3.3.2   Device Profile Settings Table

The standard Device Profile Settings table is being used by the **DPE CMS2000** (see point 2.3.2.2).

2.3.3.3   Provided Parameters Table

The standard Provided Parameters table is being used by the **DPE CMS2000** (see point 2.3.2.3).

2.3.3.4   Device Profile Data Table

The standard Device Profile Data table is being used by the **DPE CMS2000** (see point 2.3.2.3). The following columns of the standard Device Profile Data table are supported by the **DPE CMS2000**:

Column	Description
No.	contains the row number
Enabled	specifies whether the data within this row shall be enabled during the start of the Device Profile or not
Name	contains the name of the data
Unit	contains the unit of the data
Description	contains the description of the data
Destination Type	contains the destination type of the data
Normalization Mode	contains the normalization mode of the data
Normalization Parameters	contains the normalization parameters
Record Mode	contains the record mode of the data
Record Parameters	contains the record parameters of the data
Buffer Mode	contains the buffer mode of the data
Buffer Parameters	contains the buffer parameters of the data
Reference	contains the name of the source of the data from this row

The Device Profile Data table always contains exactly 99 rows for data, because the CMS2000 device provides up to 99 channels.

When a data definition is removed from the Device Profile Data table, its according row stays empty and grays all cells except the Name cell. In order to get some data definition back to the empty row, a new, valid data name can be entered or the definitions from another row can be pasted into the empty one.

2.3.3.5   Device Profile Parameters Table

The Device Profile Parameters table contains the additional parameters of the currently opened Device Profile:

Parameter	Description
VIB-MUX1 present	provides information about whether the VIB-MUX1 is attached to the basic unit
VIB-MUX2 present	provides information about whether the VIB-MUX2 is attached to the basic unit
Temperature Module T1 present	provides information about whether the temperature module T1 is attached to the basic unit
Temperature Module T2 present	provides information about whether the temperature module T2 is attached to the basic unit
Sample Mode VIB1	allows to choose the sample mode for input VIB1
Sample Mode VIB2	allows to choose the sample mode for input VIB2
VIB1 Input Trigger Data	allows to choose the data which shall be used as trigger for switching of the input of VIB1
VIB2 Input Trigger Data	allows to choose the data which shall be used as trigger for switching of the input of VIB2

The following specific context menu item is provided:

Context Menu Item	Description
Reload Device Profile Parameters	reloads the Device Profile parameters from the target CMS2000

Sample Mode VIB1

Sample Mode	Description
Data based	the current value of VIB1 Input Trigger Data is being used in order to switch the multiplexer of VIB-MUX1
Time based	the time intervals from the VIB Channel Configuration table are being used in order to switch the multiplexer of VIB-MUX1
Automatic	the CMS2000 itself switches the multiplexer of VIB-MUX1 whenever it has finished the necessary calculations for the currently active channel

Sample Mode VIB2

See Sample Mode VIB1.

VIB1 Input Trigger Data

When the Sample Mode VIB1 is "Data based", a data can be inserted into VIB1 Input Trigger Data either via Drag&Drop from the online data section of the **MDS Explorer** or through typing of its name into the edit box directly.

The trigger must have Integer values in the range of 1 … 8. While the Device Profile is running, it constantly configures the multiplexer of VIB-MUX1 to the current value of the trigger data.

VIB2 Input Trigger Data

See VIB1 Input Trigger Data.

2.3.3.6   VIB Channel Configuration Table

The VIB Channel Configuration contains all of the configurations which are specific for the 18 VIB channels:

Column	Description
No.	contains the row number
Reference	contains the name of the source of the VIB channel from this row
Characteristic Value [mV/g]	contains the characteristic value for this VIB channel
Sample Interval [s]	contains the sample interval for this VIB channel

Sample Interval

The sample interval applies only in case the according VIB-MUX is configured to "Time based".

2.3.3.7   Menu Bar

The standard Menu Bar is being used by the **DPE CMS2000** (see point 2.3.2.7).

2.3.3.8   Dropping of Items

Dropped Item	Description
Device Profile File Branches of type "DPF CMS2000"	opens the dropped Device Profile
Device Branches of type "CMS2000" in case the **DPE CMS2000** is empty	creates a new Device Profile and sets the target device to the dropped device
Device Branches of type "CMS2000" in case the **DPE CMS2000** is not empty	sets the target device of the current Device Profile to the dropped device

2.3.4   DPE CTN WatchGuard T001

2.3.4.1   Overview

The **DPE CTN WatchGuard T001** is used in order to visualize, create and edit Device Profiles of type "CTN WatchGuard T001". Multiple editors of this type can be opened and used simultaneously.

The following screenshot shows an example of a **DPE CTN WatchGuard T001**:
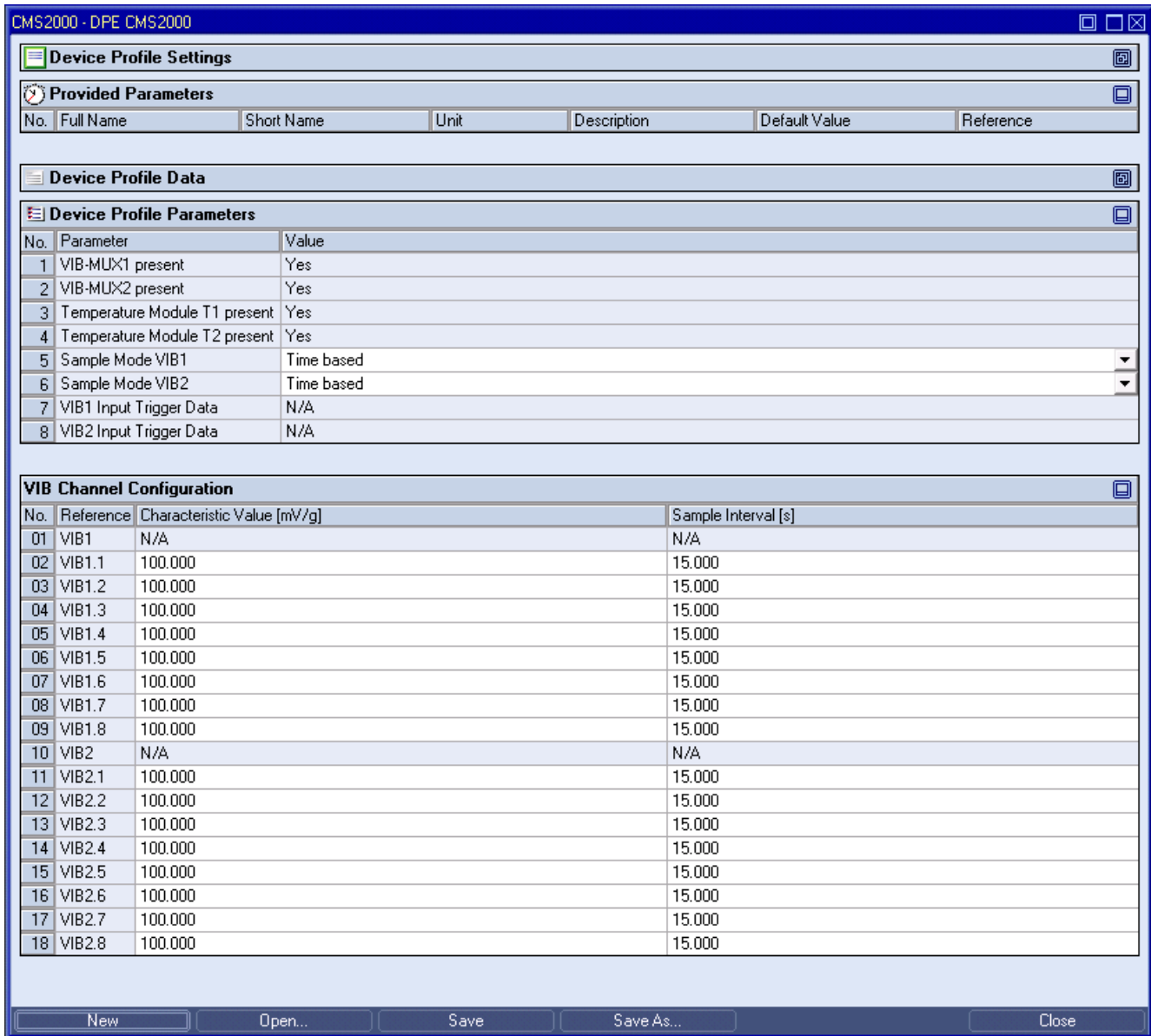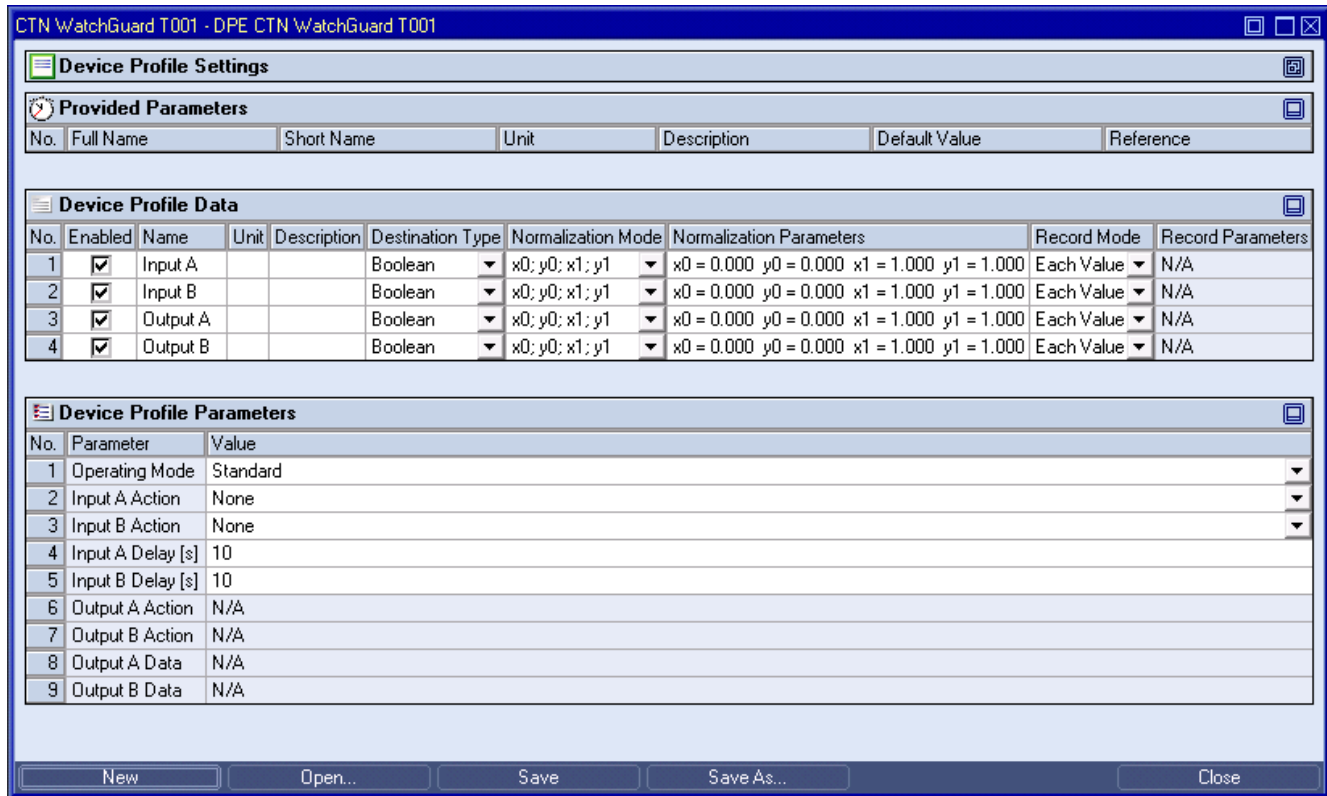

*Figure 9: Example of a **DPE CTN WatchGuard T001***

Each control of the **DPE CTN WatchGuard T001** has a defined task and provides certain functionalities. The following major controls are provided by the **DPE CTN WatchGuard T001**:

- Device Profile Settings Table
- Provided Parameters Table
- Device Profile Data Table
- Device Profile Parameters Table
- Menu Bar
- Dropping of Items

2.3.4.2   Device Profile Settings Table

The standard Device Profile Settings table is being used by the **DPE CTN WatchGuard T001** (see point 2.3.2.2).

2.3.4.3   Provided Parameters Table

The standard Provided Parameters table is being used by the **DPE CTN WatchGuard T001** (see point 2.3.2.3).

2.3.4.4 Device Profile Data Table

The standard Device Profile Data table is being used by the **DPE CTN WatchGuard T001** (see point 2.3.2.3). The following columns of the standard Device Profile Data table are supported by the **DPE CTN WatchGuard T001**:

Column	Description
No.	contains the row number
Enabled	specifies whether the data within this row shall be enabled during the start of the Device Profile or not
Name	contains the name of the data
Unit	contains the unit of the data
Description	contains the description of the data
Destination Type	contains the destination type of the data
Normalization Mode	contains the normalization mode of the data
Normalization Parameters	contains the normalization parameters
Record Mode	contains the record mode of the data
Record Parameters	contains the record parameters of the data
Buffer Mode	contains the buffer mode of the data
Buffer Parameters	contains the buffer parameters of the data

The Device Profile Data table always contains exactly four rows for data, because the CTN WatchGuard T001 device provides exactly 2 input and 2 output channels.

When a data definition is removed from the Device Profile Data table, its according row stays empty and grays all cells except the Name cell. In order to get some data definition back to the empty row, a new, valid data name can be entered or the definitions from another row can be pasted into the empty one.

2.3.4.5 Device Profile Parameters Table

The Device Profile Parameters table contains the additional parameters of the currently opened Device Profile:

Parameter	Description
Operating Mode	contains the operating mode
Input A Action	contains the action for input A
Input B Action	contains the action for input B
Input A Delay	contains the action delay for input A
Input B Delay	contains the action delay for input B
Output A Action	contains the action for output A
Output B Action	contains the action for output B
Output A Data	contains the output data for output A
Output B Data	contains the output data for output B

Operating Mode

Operating Mode	Description
Standard	In this operating mode, the outputs of the CTN WatchGuard T001 are not set to certain values when the Device Profile is started.
Watchdog	When the operating mode is set to "Watchdog", the Output A Action and Output B Action rows can be used in order to configure the desired watchdog operation.
UPS	In this operating mode, the CTN WatchGuard T001 uses its output A and output B in order to notify the shutdown status of the PC to the attached UPS. The relay of output a is attracted as long as the CTN is powered via USB in this mode and as a result the *X-Tools Server* is not able to change the state of output A. The state of output B can be set by the *X-Tools Server* to 0 or 1 (per definition, the relay of output B shall be released during normal operation of the *X-Tools Server*, and it shall be attracted when the *X-Tools Server* initializes its own shutdown). The combination of the information from output A and output B can be used by external devices in order to properly shutdown and restart a computer which is connected to a UPS.
Binary Output	In this operating mode, the outputs of the CTN WatchGuard T001 can be configured to be switched according to the provided binary data, thus a binary data from any system of the *X-Tools Server* (e.g. from a Device Profile, an Analyzing Model or an Analyzing Script) can be output via the CTN WatchGuard T001.

Input A Delay

The specified condition of Input A Action must be present for at least the time interval which is specified via Input A Delay before the specified action of input A is being executed.

Input B Delay

See Input A Delay.

Output A Action

Operating Mode	Description
None	When the action of output A is set to "None", the status of output A (relay attracted or not) is not being changed when the Device Profile is started.
Trigger Watchdog while X-Tools is running	When the action of output A is set to "Trigger Watchdog while X-Tools is running", the relay of output A keeps attracted while the *X-Tools Server* is running because the CTN WatchGuard T001 is triggered all the time. In case the CTN WatchGuard T001 is not triggered any more (e.g. because the *X-Tools Server* does not run any more), the relay of output A drops off after 10 seconds.
Trigger Watchdog while at least one Analyzing Model is running	When the action of output A is set to "Trigger Watchdog while at least one Analyzing Model is running", the relay of output A keeps attracted while at least one Analyzing Model is running because the CTN WatchGuard T001 is triggered all the time. In case the CTN WatchGuard T001 is not triggered any more (e.g. because all Analyzing Models have been stopped or suspended), the relay of output A drops off after 10 seconds.
Trigger Watchdog while at least one Analyzing Script is running	When the action of output A is set to "Trigger Watchdog while at least one Analyzing Script is running", the relay of output A keeps attracted while at least one Analyzing Script is running because the CTN WatchGuard T001 is triggered all the time. In case the CTN WatchGuard T001 is not triggered any more (e.g. because all Analyzing Scripts have been stopped or suspended), the relay of output A drops off after 10 seconds.
Trigger Watchdog while at least one Storage Profile is running	When the action of output A is set to "Trigger Watchdog while at least one Storage Profile is running", the relay of output A keeps attracted while at least one Storage Profile is running because the CTN WatchGuard T001 is triggered all the time. In case the CTN WatchGuard T001 is not triggered any more (e.g. because all Storage Profiles have been stopped or suspended), the relay of output A drops off after 10 seconds.
Output the Values of "Output A Data" via Output A	When the action of output A is set to "Output the Values of "Output A Data" via Output A", the relay of output A is being set once per 10 ms according to the current value of the specified Output A Data. The data of Output A Data is output with a delay of one second so that the rest of the system has a chance to provide the according values. In case the specified Output A Data is not available, the value of output A is not being changed. An according entry is added to the system log at the attach/detach of the specified Output A Data.

Output B Action

See Output A Action.

Output A Data

In case the operating mode is "Binary Output" and "Output the Values of "Output A Data" via Output A" is chosen as action of output A, a data can be inserted into Output A Data either via Drag&Drop from the online data section of the MDX or through typing of its name into the edit box directly.

Output B Data

See Output A Action.

2.3.4.6   Menu Bar

The standard Menu Bar is being used by the **DPE CTN WatchGuard T001** (see point 2.3.2.7).

2.3.4.7   Dropping of Items

Dropped Item	Description
Device Profile File Branches of type "DPF CTN WatchGuard T001"	opens the dropped Device Profile
Device Branches of type "CTN WatchGuard T001" in case the **DPE CTN WatchGuard T001** is empty	creates a new Device Profile and sets the target device to the dropped device
Device Branches of type "CTN WatchGuard T001" in case the **DPE CTN WatchGuard T001** is not empty	sets the target device of the current Device Profile to the dropped device

2.3.5 DPE IFN ANALOGINPUT

2.3.5.1 Overview

The **DPE IFN ANALOGINPUT** is used in order to visualize, create and edit Device Profiles of type "IFN ANALOGINPUT". Multiple editors of this type can be opened and used simultaneously.

The following screenshot shows an example of a **DPE IFN ANALOGINPUT**:
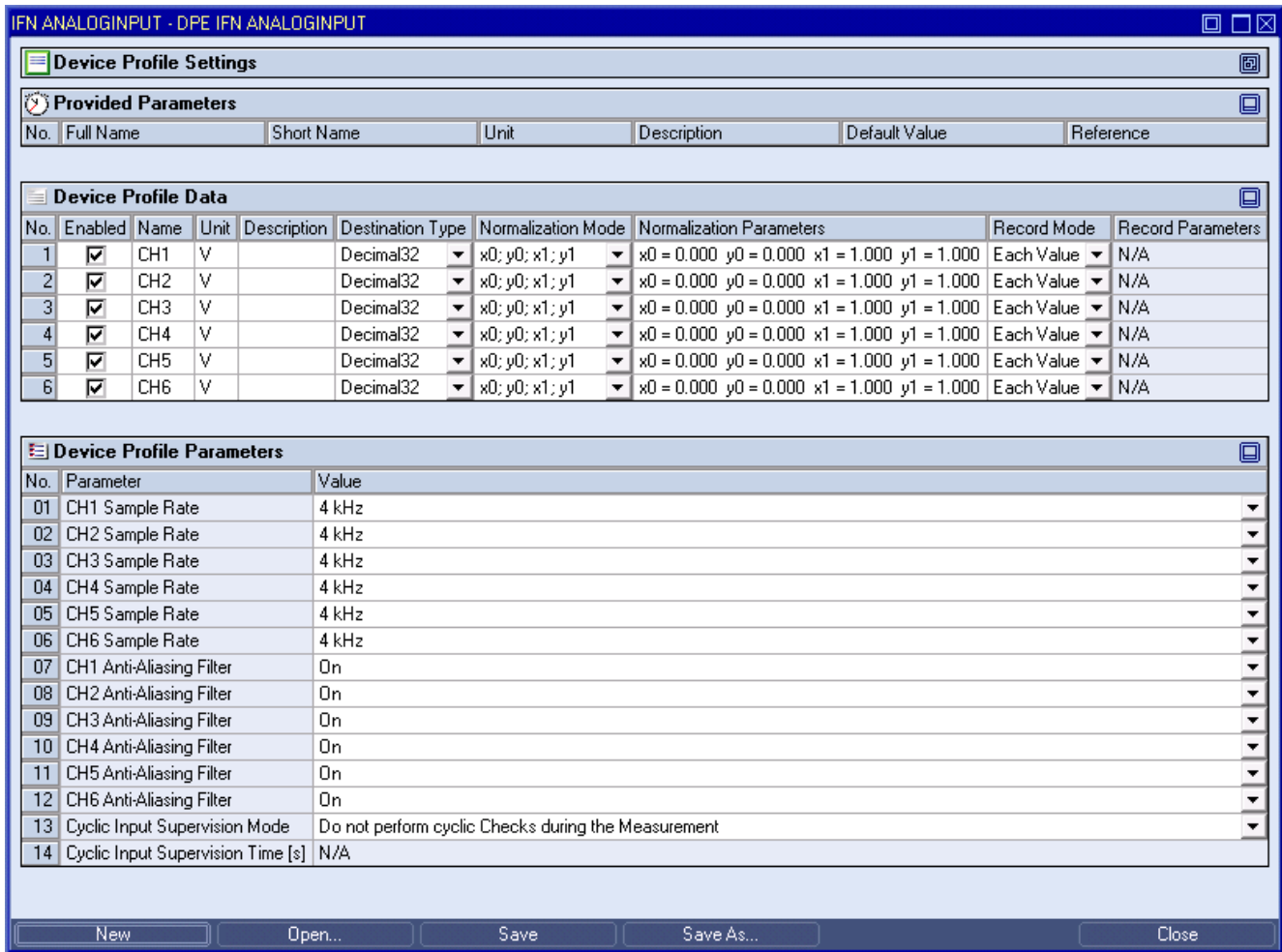
*Figure 10: Example of a **DPE IFN ANALOGINPUT***

Each control of the **DPE IFN ANALOGINPUT** has a defined task and provides certain functionalities. The following major controls are provided by the **DPE IFN ANALOGINPUT**:

- Device Profile Settings Table
- Provided Parameters Table
- Device Profile Data Table
- Device Profile Parameters Table
- Menu Bar
- Dropping of Items

2.3.5.2 Device Profile Settings Table

The standard Device Profile Settings table is being used by the **DPE IFN ANALOGINPUT** (see point 2.3.2.2).

2.3.5.3   Provided Parameters Table

The standard Provided Parameters table is being used by the **DPE IFN ANALOGINPUT T001** (see point 2.3.2.3).

2.3.5.4   Device Profile Data Table

The standard Device Profile Data table is being used by the **DPE IFN ANALOGINPUT** (see point 2.3.2.3). The following columns of the standard Device Profile Data table are supported by the **DPE IFN ANALOGINPUT**:

Column	Description
No.	contains the row number
Enabled	specifies whether the data within this row shall be enabled during the start of the Device Profile or not
Name	contains the name of the data
Unit	contains the unit of the data
Description	contains the description of the data
Destination Type	contains the destination type of the data
Normalization Mode	contains the normalization mode of the data
Normalization Parameters	contains the normalization parameters
Record Mode	contains the record mode of the data
Record Parameters	contains the record parameters of the data
Buffer Mode	contains the buffer mode of the data
Buffer Parameters	contains the buffer parameters of the data

The Device Profile Data table always contains exactly six rows for data.

When a data definition is removed from the Device Profile Data table, its according row stays empty and grays all cells except the Name cell. In order to get some data definition back to the empty row, a new, valid data name can be entered or the definitions from another row can be pasted into the empty one.

2.3.5.5   Device Profile Parameters Table

The Device Profile Parameters table contains the additional parameters of the currently opened Device Profile:

Parameter	Description
CH1 Sample Rate	contains the sample rate of CH1
CH2 Sample Rate	contains the sample rate of CH2
CH3 Sample Rate	contains the sample rate of CH3
CH4 Sample Rate	contains the sample rate of CH4
CH5 Sample Rate	contains the sample rate of CH5
CH6 Sample Rate	contains the sample rate of CH6
CH1 Anti-Aliasing Filter	contains the setting for the anti-aliasing filter of CH1
CH2 Anti-Aliasing Filter	contains the setting for the anti-aliasing filter of CH2
CH3 Anti-Aliasing Filter	contains the setting for the anti-aliasing filter of CH3
CH4 Anti-Aliasing Filter	contains the setting for the anti-aliasing filter of CH4
CH5 Anti-Aliasing Filter	contains the setting for the anti-aliasing filter of CH5
CH6 Anti-Aliasing Filter	contains the setting for the anti-aliasing filter of CH6
Cyclic Input Supervision Mode	contains the cyclic input supervision mode
Cyclic Input Supervision Time	contains the cyclic input supervision time

CH1 Sample Rate

The CH1 Sample Rate can be used as parameter of the Device Profile. Therefore, the following context menu items are provided:

Context Menu Item	Description
Add Parameter	adds the CH1 Sample Rate as parameter of the Device Profile
Go to Parameter	highlights the parameter which represents the CH1 Sample Rate within the Provided Parameters table
Remove Parameter	removes the CH1 Sample Rate as parameter of the Device Profile

CH2 Sample Rate … CH6 Sample Rate

See CH1 Sample Rate.

Cyclic Input Supervision Mode

Cyclic Input Supervision Mode	Description
Do not perform cyclic Checks during the Measurement	In this input supervision mode, the measurement is not being interrupted for the determination of the hardware offsets or for the detection of cable breaks.
Determine Hardware Offsets during the Measurement	In this input supervision mode, the measurement is being stopped each defined Cyclic Input Supervision Time and the hardware offsets are being determined for the currently active channels. The detected hardware offsets are taken over immediately and are applied to all following measurement values until the next determination of hardware offsets. The first check is being performed directly after the start of the Device Profile.
Determine Cable Breaks during the Measurement	In this input supervision mode, the measurement is being stopped each defined Cyclic Input Supervision Time and cable break detection is being performed for the currently active channels. In case a cable break is being detected, an according message is being added to the system log. The first check is being performed directly after the start of the Device Profile.
Determine Hardware Offsets and Cable Breaks during the Measurement	In this input supervision mode, the measurement is being stopped each defined Cyclic Input Supervision Time and both hardware offsets detection and a cable break detection are being performed for the currently active channels. The detected hardware offsets are taken over immediately and are applied to all following measurement values until the next determination of hardware offsets. In case a cable break is being detected, an according message is being added to the system log. The first check is being performed directly after the start of the Device Profile.

Cyclic Input Supervision Time

The Cyclic Input Supervision Time can be used in order to establish a periodic check of the input channels.

The following specific context menu items are provided:

Context Menu Item	Description
Set to Default	sets the cyclic input supervision time to 3600 seconds

2.3.5.6   Menu Bar

The standard Menu Bar is being used by the **DPE IFN ANALOGINPUT** (see point 2.3.2.7).

2.3.5.7   Dropping of Items

Dropped Item	Description
Device Profile File Branches of type "DPF IFN ANALOGINPUT"	opens the dropped Device Profile
Device Branches of type "IFN ANALOGINPUT" in case the **DPE IFN ANALOGINPUT** is empty	creates a new Device Profile and sets the target device to the dropped device
Device Branches of type "IFN ANALOGINPUT" in case the **DPE IFN ANALOGINPUT** is not empty	sets the target device of the current Device Profile to the dropped device

2.3.6   DPE IFN ANALOGINPUT-DISTANCE

2.3.6.1   Overview

The **DPE IFN ANALOGINPUT-DISTANCE** is used in order to visualize, create and edit Device Profiles of type "IFN ANALOGINPUT-DISTANCE". Multiple editors of this type can be opened and used simultaneously.

The following screenshot shows an example of a **DPE IFN ANALOGINPUT-DISTANCE**:
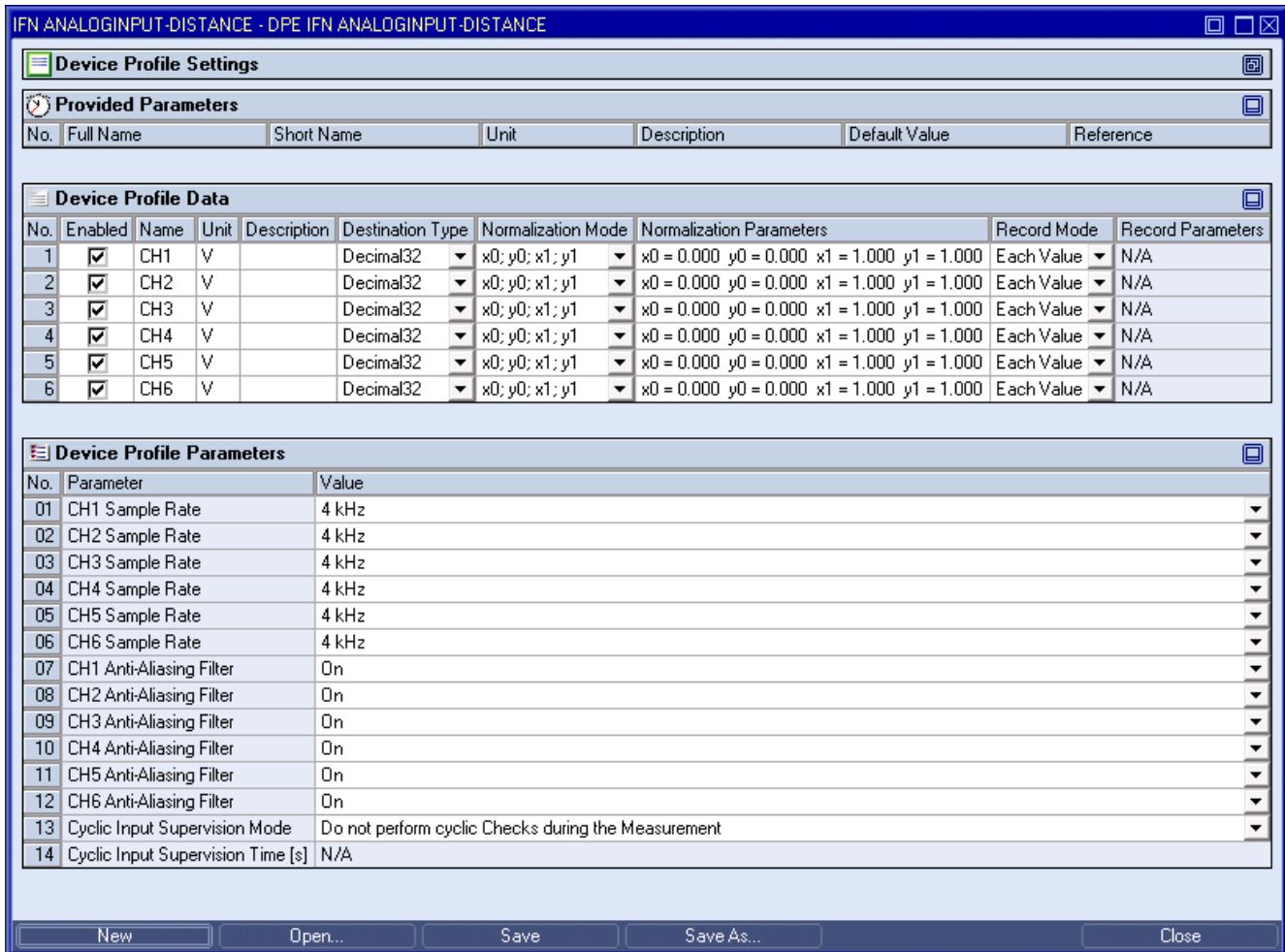
*Figure 11: Example of a **DPE IFN ANALOGINPUT-DISTANCE***

Each control of the **DPE IFN ANALOGINPUT-DISTANCE** has a defined task and provides certain functionalities. The following major controls are provided by the **DPE IFN ANALOGINPUT-DISTANCE**:

- Device Profile Settings Table

- Provided Parameters Table

- Device Profile Data Table

- Device Profile Parameters Table

- Menu Bar

- Dropping of Items

2.3.6.2   Device Profile Settings Table

The standard Device Profile Settings table is being used by the **DPE IFN ANALOGINPUT-DISTANCE** (see point 2.3.2.2).

2.3.6.3   Provided Parameters Table

The standard Provided Parameters table is being used by the **DPE IFN ANALOGINPUT-DISTANCE T001** (see point 2.3.2.3).

2.3.6.4   Device Profile Data Table

The standard Device Profile Data table is being used by the **DPE IFN ANALOGINPUT-DISTANCE** (see point 2.3.2.3). The following columns of the standard Device Profile Data table are supported by the **DPE IFN ANALOGINPUT-DISTANCE**:

Column	Description
No.	contains the row number
Enabled	specifies whether the data within this row shall be enabled during the start of the Device Profile or not
Name	contains the name of the data
Unit	contains the unit of the data
Description	contains the description of the data
Destination Type	contains the destination type of the data
Normalization Mode	contains the normalization mode of the data
Normalization Parameters	contains the normalization parameters
Record Mode	contains the record mode of the data
Record Parameters	contains the record parameters of the data
Buffer Mode	contains the buffer mode of the data
Buffer Parameters	contains the buffer parameters of the data

The Device Profile Data table always contains exactly six rows for data.

When a data definition is removed from the Device Profile Data table, its according row stays empty and grays all cells except the Name cell. In order to get some data definition back to the empty row, a new, valid data name can be entered or the definitions from another row can be pasted into the empty one.

2.3.6.5   Device Profile Parameters Table

The Device Profile Parameters table contains the additional parameters of the currently opened Device Profile:

Parameter	Description
CH1 Sample Rate	contains the sample rate of CH1
CH2 Sample Rate	contains the sample rate of CH2
CH3 Sample Rate	contains the sample rate of CH3
CH4 Sample Rate	contains the sample rate of CH4
CH5 Sample Rate	contains the sample rate of CH5
CH6 Sample Rate	contains the sample rate of CH6
CH1 Anti-Aliasing Filter	contains the setting for the anti-aliasing filter of CH1
CH2 Anti-Aliasing Filter	contains the setting for the anti-aliasing filter of CH2
CH3 Anti-Aliasing Filter	contains the setting for the anti-aliasing filter of CH3
CH4 Anti-Aliasing Filter	contains the setting for the anti-aliasing filter of CH4
CH5 Anti-Aliasing Filter	contains the setting for the anti-aliasing filter of CH5
CH6 Anti-Aliasing Filter	contains the setting for the anti-aliasing filter of CH6
Cyclic Input Supervision Mode	contains the cyclic input supervision mode
Cyclic Input Supervision Time	contains the cyclic input supervision time

CH1 Sample Rate

The CH1 Sample Rate can be used as parameter of the Device Profile. Therefore, the following context menu items are provided:

Context Menu Item	Description
Add Parameter	adds the CH1 Sample Rate as parameter of the Device Profile
Go to Parameter	highlights the parameter which represents the CH1 Sample Rate within the Provided Parameters table
Remove Parameter	removes the CH1 Sample Rate as parameter of the Device Profile

CH2 Sample Rate … CH6 Sample Rate

See CH1 Sample Rate.

Cyclic Input Supervision Mode

Cyclic Input Supervision Mode	Description
Do not perform cyclic Checks during the Measurement	In this input supervision mode, the measurement is not being interrupted for the determination of the hardware offsets or for the detection of cable breaks.
Determine Hardware Offsets during the Measurement	In this input supervision mode, the measurement is being stopped each defined Cyclic Input Supervision Time and the hardware offsets are being determined for the currently active channels. The detected hardware offsets are taken over immediately and are applied to all following measurement values until the next determination of hardware offsets. The first check is being performed directly after the start of the Device Profile.
Determine Cable Breaks during the Measurement	In this input supervision mode, the measurement is being stopped each defined Cyclic Input Supervision Time and cable break detection is being performed for the currently active channels. In case a cable break is being detected, an according message is being added to the system log. The first check is being performed directly after the start of the Device Profile.
Determine Hardware Offsets and Cable Breaks during the Measurement	In this input supervision mode, the measurement is being stopped each defined Cyclic Input Supervision Time and both hardware offsets detection and a cable break detection are being performed for the currently active channels. The detected hardware offsets are taken over immediately and are applied to all following measurement values until the next determination of hardware offsets. In case a cable break is being detected, an according message is being added to the system log. The first check is being performed directly after the start of the Device Profile.

Cyclic Input Supervision Time

The Cyclic Input Supervision Time can be used in order to establish a periodic check of the input channels.

The following specific context menu items are provided:

Context Menu Item	Description
Set to Default	sets the cyclic input supervision time to 3600 seconds

2.3.6.6 Menu Bar

The standard Menu Bar is being used by the **DPE IFN ANALOGINPUT-DISTANCE** (see point 2.3.2.7).

2.3.6.7 Dropping of Items

Dropped Item	Description
Device Profile File Branches of type "DPF IFN ANALOGINPUT-DISTANCE"	opens the dropped Device Profile
Device Branches of type "IFN ANALOGINPUT-DISTANCE" in case the **DPE IFN ANALOGINPUT-DISTANCE** is empty	creates a new Device Profile and sets the target device to the dropped device
Device Branches of type "IFN ANALOGINPUT-DISTANCE" in case the **DPE IFN ANALOGINPUT-DISTANCE** is not empty	sets the target device of the current Device Profile to the dropped device

2.3.7   DPE IFN VIB-ACC

2.3.7.1   Overview

The **DPE IFN VIB-ACC** is used in order to visualize, create and edit Device Profiles of type "IFN VIB-ACC". Multiple editors of this type can be opened and used simultaneously.

The following screenshot shows an example of a **DPE IFN VIB-ACC**:
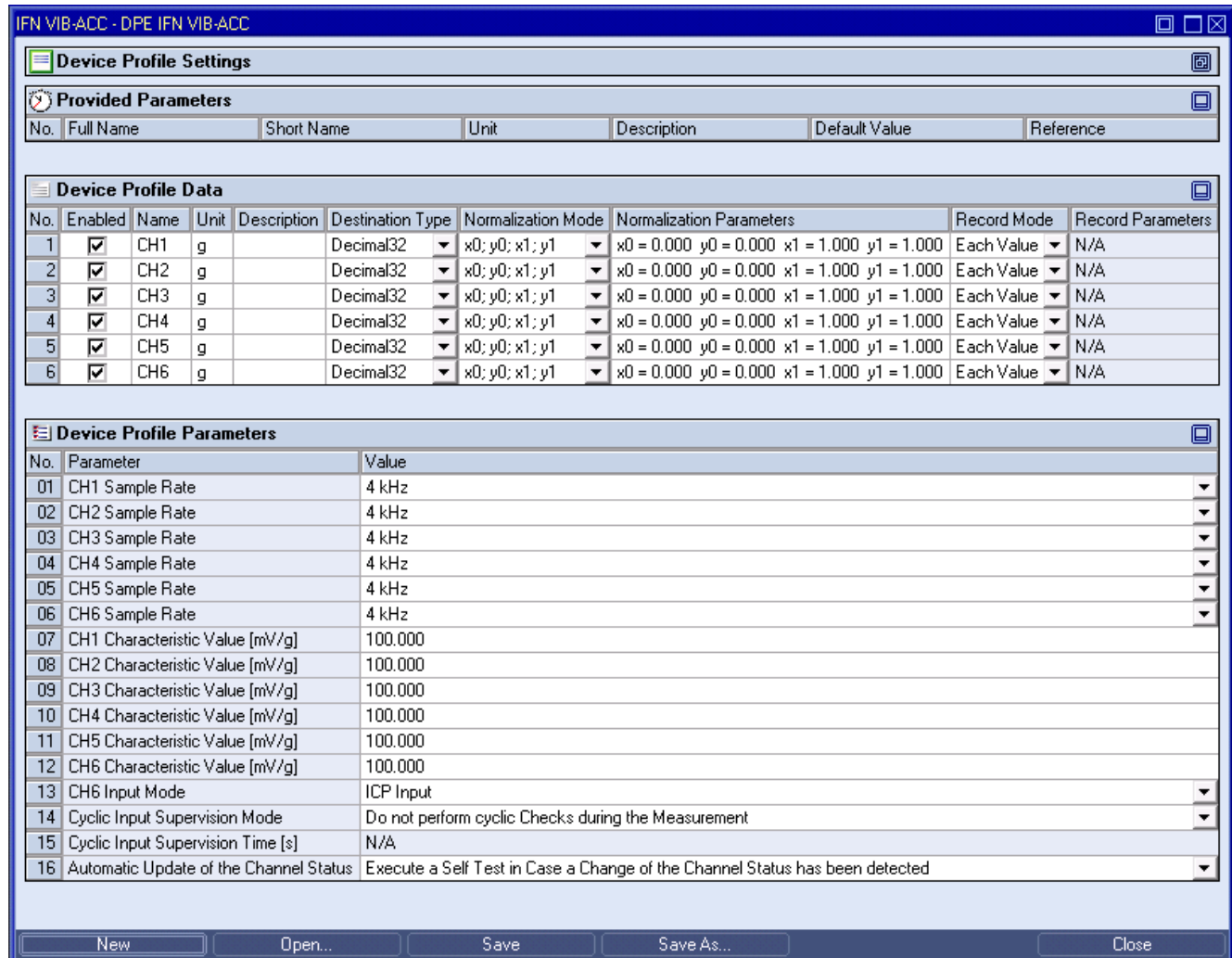
*Figure 12: Example of a **DPE IFN VIB-ACC***

Each control of the **DPE IFN VIB-ACC** has a defined task and provides certain functionalities. The following major controls are provided by the **DPE IFN VIB-ACC**:

- Device Profile Settings Table
- Provided Parameters Table
- Device Profile Data Table
- Device Profile Parameters Table
- Menu Bar
- Dropping of Items

2.3.7.2   Device Profile Settings Table

The standard Device Profile Settings table is being used by the **DPE IFN VIB-ACC** (see point 2.3.2.2).

2.3.7.3 Provided Parameters Table

The standard Provided Parameters table is being used by the **DPE IFN VIB-ACC T001** (see point 2.3.2.3).

2.3.7.4 Device Profile Data Table

The standard Device Profile Data table is being used by the **DPE IFN VIB-ACC** (see point 2.3.2.3). The following columns of the standard Device Profile Data table are supported by the **DPE IFN VIB-ACC**:

Column	Description
No.	contains the row number
Enabled	specifies whether the data within this row shall be enabled during the start of the Device Profile or not
Name	contains the name of the data
Unit	contains the unit of the data
Description	contains the description of the data
Destination Type	contains the destination type of the data
Normalization Mode	contains the normalization mode of the data
Normalization Parameters	contains the normalization parameters
Record Mode	contains the record mode of the data
Record Parameters	contains the record parameters of the data
Buffer Mode	contains the buffer mode of the data
Buffer Parameters	contains the buffer parameters of the data

The Device Profile Data table always contains exactly six rows for data.

When a data definition is removed from the Device Profile Data table, its according row stays empty and grays all cells except the Name cell. In order to get some data definition back to the empty row, a new, valid data name can be entered or the definitions from another row can be pasted into the empty one.

2.3.7.5 Device Profile Parameters Table

The Device Profile Parameters table contains the additional parameters of the currently opened Device Profile:

Parameter	Description
CH1 Sample Rate	contains the sample rate of CH1
CH2 Sample Rate	contains the sample rate of CH2
CH3 Sample Rate	contains the sample rate of CH3
CH4 Sample Rate	contains the sample rate of CH4
CH5 Sample Rate	contains the sample rate of CH5
CH6 Sample Rate	contains the sample rate of CH6
CH1 Characteristic Value	contains the characteristic value of the sensor which is being attached to CH1
CH2 Characteristic Value	contains the characteristic value of the sensor which is being attached to CH2
CH3 Characteristic Value	contains the characteristic value of the sensor which is being attached to CH3
CH4 Characteristic Value	contains the characteristic value of the sensor which is being attached to CH4
CH5 Characteristic Value	contains the characteristic value of the sensor which is being attached to CH5
CH6 Characteristic Value	contains the characteristic value of the sensor which is being attached to CH6
CH6 Input Mode	contains the input mode for CH6
Cyclic Input Supervision Mode	contains the cyclic input supervision mode
Cyclic Input Supervision Time	contains the cyclic input supervision time
Automatic Update of the Channel Status	specifies whether the channel status shall be updated automatically in case a possible change of the channel status is being detected

CH1 Sample Rate … CH6 Sample Rate

In case none of the currently active input channels is configured to a sample rate above 14 kHz, the Data Supervision Time within the Device Profile Settings table must be configured to a minimal value of 1 second. Smaller data supervision times can cause unwanted data supervision events because the data of 14 kHz is coming with a delay of up to 750 ms from the device.

CH1 Sample Rate

The CH1 Sample Rate can be used as parameter of the Device Profile. Therefore, the following context menu items are provided:

Context Menu Item	Description
Add Parameter	adds the CH1 Sample Rate as parameter of the Device Profile
Go to Parameter	highlights the parameter which represents the CH1 Sample Rate within the Provided Parameters table
Remove Parameter	removes the CH1 Sample Rate as parameter of the Device Profile

CH2 Sample Rate … CH6 Sample Rate

See CH1 Sample Rate.

CH1 Characteristic Value

The CH1 Characteristic Value can be used as parameter of the Device Profile. Therefore, the following context menu items are provided:

Context Menu Item	Description
Add Parameter	adds the CH1 Characteristic Value as parameter of the Device Profile
Go to Parameter	highlights the parameter which represents the CH1 Characteristic Value within the Provided Parameters table
Remove Parameter	removes the CH1 Characteristic Value as parameter of the Device Profile

CH2 Characteristic Value … CH6 Characteristic Value

See CH1 Characteristic Value.

CH6 Input Mode

CH6 Input Mode	Description
ICP Input	In this input mode, CH6 works like the inputs of the other five channels and can be used in order to attach an acceleration sensor.
DC Input	In this input mode, CH6 works as a DC input (+/-24 V).

Cyclic Input Supervision Mode

Cyclic Input Supervision Mode	Description
Do not perform cyclic Checks during the Measurement	In this input supervision mode, the measurement is not being interrupted for the determination of the hardware offsets or for the detection of cable breaks.
Determine Hardware Offsets during the Measurement	In this input supervision mode, the measurement is being stopped each defined Cyclic Input Supervision Time and the hardware offsets are being determined for the currently active channels. The detected hardware offsets are taken over immediately and are applied to all following measurement values until the next determination of hardware offsets. The first check is being performed directly after the start of the Device Profile.
Determine Cable Breaks during the Measurement	In this input supervision mode, the measurement is being stopped each defined Cyclic Input Supervision Time and cable break detection is being performed for the currently active channels. In case a cable break is being detected, an according message is being added to the system log. The first check is being performed directly after the start of the Device Profile.
Determine Hardware Offsets and Cable Breaks during the Measurement	In this input supervision mode, the measurement is being stopped each defined Cyclic Input Supervision Time and both hardware offsets detection and a cable break detection are being performed for the currently active channels. The detected hardware offsets are taken over immediately and are applied to all following measurement values until the next determination of hardware offsets. In case a cable break is being detected, an according message is being added to the system log. The first check is being performed directly after the start of the Device Profile.

Cyclic Input Supervision Time

The Cyclic Input Supervision Time can be used in order to establish a periodic check of the input channels.

The following specific context menu items are provided:

Context Menu Item	Description
Set to Default	sets the cyclic input supervision time to 3600 seconds

Automatic Update of the Channel Status

The IFN VIB-ACC constantly monitors its inputs and sends a notification to the *X-Tools Server* in case it detects a possible change at any of the currently active inputs. A change is any switch between the possible states "channel OK", "cable break" and "short circuit". After a possible change at an input has been detected, a self test must be executed in order to determine the actual state of all active inputs. However, the self test always interrupts the measurement from all inputs of the affected IFN VIB-ACC and therefore there may be situations where the automatic self test is not wanted during a running measurement and analysis task.

Automatic Update of the Channel Status	Description
Execute a Self Test in Case a Change of the Channel Status has been detected	whenever the IFN VIB-ACC detects a possible change at any of its inputs, the current measurement is interrupted, the self test of all input channels is being performed and the measurement is continued afterwards the automatic self test is not being performed more often than once each 60 seconds
Do not execute a Self Test automatically	in case of this setting the notifications from the IFN VIB-ACC about possible changes to its channel status are being ignored and no self test is being executed

2.3.7.6   Menu Bar

The standard Menu Bar is being used by the **DPE IFN VIB-ACC** (see point 2.3.2.7).

2.3.7.7   Dropping of Items

Dropped Item	Description
Device Profile File Branches of type "DPF IFN VIB-ACC"	opens the dropped Device Profile
Device Branches of type "IFN VIB-ACC" in case the **DPE IFN VIB-ACC** is empty	creates a new Device Profile and sets the target device to the dropped device
Device Branches of type "IFN VIB-ACC" in case the **DPE IFN VIB-ACC** is not empty	sets the target device of the current Device Profile to the dropped device

2.3.8 DPE ION AnalogInput T001

2.3.8.1 Overview

The **DPE ION AnalogInput T001** is used in order to visualize, create and edit Device Profiles of type "ION AnalogInput T001". Multiple editors of this type can be opened and used simultaneously.

The following screenshot shows an example of a **DPE ION AnalogInput T001**:
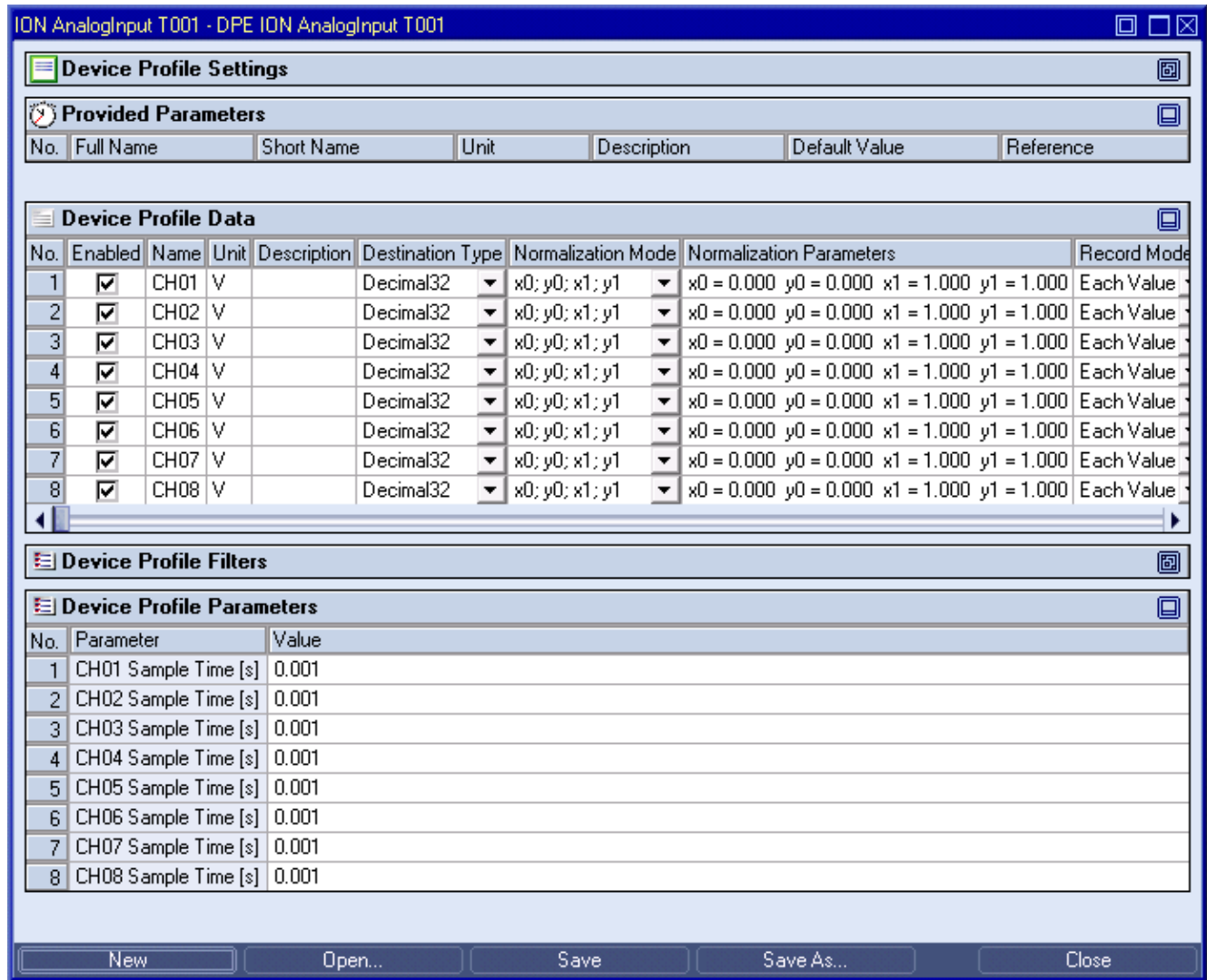
*Figure 13: Example of a **DPE ION AnalogInput T001***

Each control of the **DPE ION AnalogInput T001** has a defined task and provides certain functionalities. The following major controls are provided by the **DPE ION AnalogInput T001**:

- Device Profile Settings Table
- Provided Parameters Table
- Device Profile Data Table
- Device Profile Filters Table
- Device Profile Parameters Table
- Menu Bar
- Dropping of Items

2.3.8.2 Device Profile Settings Table

The standard Device Profile Settings table is being used by the **DPE ION AnalogInput T001** (see point 2.3.2.2).

2.3.8.3 Provided Parameters Table

The standard Provided Parameters table is being used by the **DPE ION AnalogInput T001** (see point 2.3.2.3).

2.3.8.4 Device Profile Data Table

The standard Device Profile Data table is being used by the **DPE ION AnalogInput T001** (see point 2.3.2.3). The following columns of the standard Device Profile Data table are supported by the **DPE ION AnalogInput T001**:

Column	Description
No.	contains the row number
Enabled	specifies whether the data within this row shall be enabled during the start of the Device Profile or not
Name	contains the name of the data
Unit	contains the unit of the data
Description	contains the description of the data
Destination Type	contains the destination type of the data
Normalization Mode	contains the normalization mode of the data
Normalization Parameters	contains the normalization parameters
Record Mode	contains the record mode of the data
Record Parameters	contains the record parameters of the data
Buffer Mode	contains the buffer mode of the data
Buffer Parameters	contains the buffer parameters of the data

The Device Profile Data table always contains exactly eight rows for data.

When a data definition is removed from the Device Profile Data table, its according row stays empty and grays all cells except the Name cell. In order to get some data definition back to the empty row, a new, valid data name can be entered or the definitions from another row can be pasted into the empty one.

Any selection of a row within the Device Profile Data table automatically causes the same row to become selected within the Device Profile Filters table. In addition, any copy/cut/paste operation of rows within the Device Profile Data table causes the same operation within the Device Profile Filters table.

2.3.8.5 Device Profile Filters Table

The standard Device Profile Data table is being used by the **DPE ION AnalogInput T001**. The following columns of the standard Device Profile Data table are supported by the **DPE ION AnalogInput T001**:

Column	Description
No.	contains the row number
Name	contains the name of the data as it is defined within the Device Profile Data table
a (1,0)	contains the filter coefficient a (1,0)
a (1,1)	contains the filter coefficient a (1,1)
a (1,2)	contains the filter coefficient a (1,2)
b (1,0)	contains the filter coefficient b (1,0)
b (1,1)	contains the filter coefficient b (1,1)
b (1,2)	contains the filter coefficient b (1,2)
a (2,0)	contains the filter coefficient a (2,0)
a (2,1)	contains the filter coefficient a (2,1)
a (2,2)	contains the filter coefficient a (2,2)
b (2,0)	contains the filter coefficient b (2,0)
b (2,1)	contains the filter coefficient b (2,1)
b (2,2)	contains the filter coefficient b (2,2)
a (3,0)	contains the filter coefficient a (3,0)
a (3,1)	contains the filter coefficient a (3,1)
a (3,2)	contains the filter coefficient a (3,2)
b (3,0)	contains the filter coefficient b (3,0)
b (3,1)	contains the filter coefficient b (3,1)
b (3,2)	contains the filter coefficient b (3,2)

The Device Profile Filters table always contains exactly eight rows for filters.

Any selection of a row within the Device Profile Filters table automatically causes the same row to become selected within the Device Profile Data table.

Internally, the ION AnalogInput T001 always samples with a sample rate of 40 kHz. Therefore, the filter coefficients also must configured for 40 kHz, even in cases where the actual sample time/rate within the Device Profile Parameters table is being set to another value.

2.3.8.6 Device Profile Parameters Table

The Device Profile Parameters table contains the additional parameters of the currently opened Device Profile:

Parameter	Description
CH01 Sample Time/Rate	contains the sample time/rate for the input channel 01
CH02 Sample Time/Rate	contains the sample time/rate for the input channel 02
CH03 Sample Time/Rate	contains the sample time/rate for the input channel 03
CH04 Sample Time/Rate	contains the sample time/rate for the input channel 04
CH05 Sample Time/Rate	contains the sample time/rate for the input channel 05
CH06 Sample Time/Rate	contains the sample time/rate for the input channel 06
CH07 Sample Time/Rate	contains the sample time/rate for the input channel 07
CH08 Sample Time/Rate	contains the sample time/rate for the input channel 08

2.3.8.7 Menu Bar

The standard Menu Bar is being used by the **DPE ION AnalogInput T001** (see point 2.3.2.7).

2.3.8.8   Dropping of Items

Dropped Item	Description
Device Profile File Branches of type "DPF ION AnalogInput T001"	opens the dropped Device Profile
Device Branches of type "ION AnalogInput T001" in case the **DPE ION AnalogInput T001** is empty	creates a new Device Profile and sets the target device to the dropped device
Device Branches of type "ION AnalogInput T001" in case the **DPE ION AnalogInput T001** is not empty	sets the target device of the current Device Profile to the dropped device

2.3.9   DPE ION BinaryInput T001

2.3.9.1   Overview

The **DPE ION BinaryInput T001** is used in order to visualize, create and edit Device Profiles of type "ION BinaryInput T001". Multiple editors of this type can be opened and used simultaneously.

The following screenshot shows an example of a **DPE ION BinaryInput T001**:
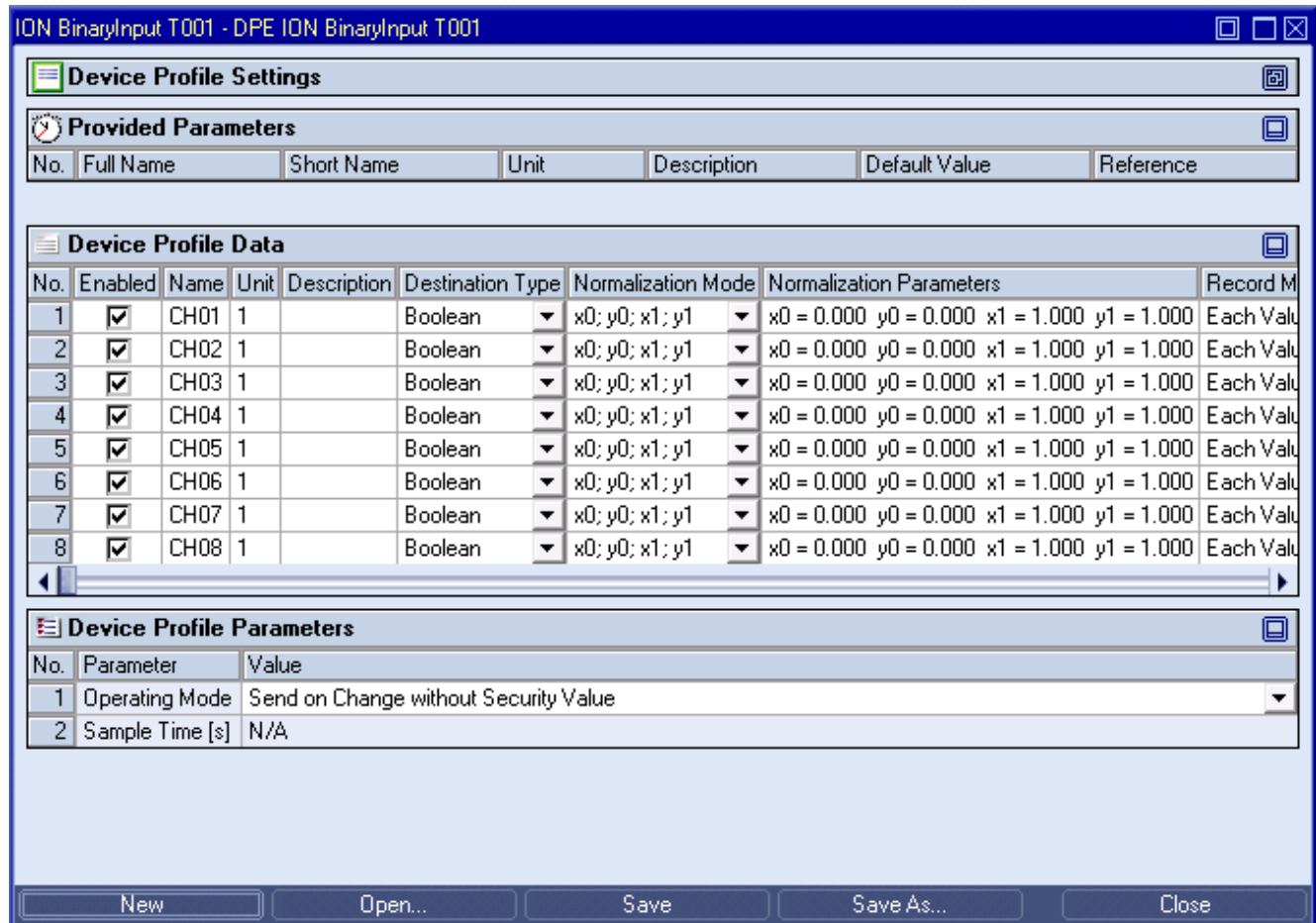

*Figure 14: Example of a **DPE ION BinaryInput T001***

Each control of the **DPE ION BinaryInput T001** has a defined task and provides certain functionalities. The following major controls are provided by the **DPE ION BinaryInput T001**:

- Device Profile Settings Table
- Provided Parameters Table
- Device Profile Data Table
- Device Profile Parameters Table
- Menu Bar
- Dropping of Items

2.3.9.2   Device Profile Settings Table

The standard Device Profile Settings table is being used by the **DPE ION BinaryInput T001** (see point 2.3.2.2).

2.3.9.3   Provided Parameters Table

The standard Provided Parameters table is being used by the **DPE ION BinaryInput T001** (see point 2.3.2.3).

2.3.9.4 Device Profile Data Table

The standard Device Profile Data table is being used by the **DPE ION BinaryInput T001** (see point 2.3.2.3). The following columns of the standard Device Profile Data table are supported by the **DPE ION BinaryInput T001**:

Column	Description
No.	contains the row number
Enabled	specifies whether the data within this row shall be enabled during the start of the Device Profile or not
Name	contains the name of the data
Unit	contains the unit of the data
Description	contains the description of the data
Destination Type	contains the destination type of the data
Normalization Mode	contains the normalization mode of the data
Normalization Parameters	contains the normalization parameters
Record Mode	contains the record mode of the data
Record Parameters	contains the record parameters of the data
Buffer Mode	contains the buffer mode of the data
Buffer Parameters	contains the buffer parameters of the data

The Device Profile Data table always contains exactly eight rows for data.

When a data definition is removed from the Device Profile Data table, its according row stays empty and grays all cells except the Name cell. In order to get some data definition back to the empty row, a new, valid data name can be entered or the definitions from another row can be pasted into the empty one.

2.3.9.5 Device Profile Parameters Table

The Device Profile Parameters table contains the additional parameters of the currently opened Device Profile:

Parameter	Description
Operating Mode	contains the operating mode
Sample Time/Rate	contains the sample time/rate which can be configured for some (not for all) operating modes

Operating Mode

Operating Mode	Description
Send on Change without Security Value	In this operating mode, the ION BinaryInput T001 sends the values of its inputs to the PC only in case at least one of the inputs has changed its level (from 0 to 1 or vice versa).
Send on Change with Security Value	In this operating mode, the ION BinaryInput T001 sends the values of its inputs to the PC in case at least one of the inputs has changed its level (from 0 to 1 or vice versa) and each amount of time which is specified as sample time/rate.
Send Cyclic	In this operating mode, the ION BinaryInput T001 sends the values of its inputs to the PC each amount of time which is specified as sample time/rate.
Send with 250kHz	In this operating mode, the ION BinaryInput T001 sends the values of its inputs to the PC each 4ns (= 250kHz).

2.3.9.6 Menu Bar

The standard Menu Bar is being used by the **DPE ION BinaryInput T001** (see point 2.3.2.7).

2.3.9.7   Dropping of Items

Dropped Item	Description
Device Profile File Branches of type "DPF ION BinaryInput T001"	opens the dropped Device Profile
Device Branches of type "ION Bina-ryInput T001" in case the **DPE ION BinaryInput T001** is empty	creates a new Device Profile and sets the target device to the dropped device
Device Branches of type "ION Bina-ryInput T001" in case the **DPE ION BinaryInput T001** is not empty	sets the target device of the current Device Profile to the dropped device

2.3.10   DPE ION PROFIBUS DP Spy T001

2.3.10.1   Overview

The **DPE ION PROFIBUS DP Spy T001** is used in order to visualize, create and edit Device Profiles of type "ION PROFIBUS DP Spy T001". Multiple editors of this type can be opened and used simultaneously.

The following screenshot shows an example of a **DPE ION PROFIBUS DP Spy T001**:

*Figure 15: Example of a **DPE ION PROFIBUS DP Spy T001***

Each control of the **DPE ION PROFIBUS DP Spy T001** has a defined task and provides certain functionalities. The following major controls are provided by the **DPE ION PROFIBUS DP Spy T001**:

- Device Profile Settings Table
- Provided Parameters Table
- Device Profile Data Table
- Message Channel Contents Table
- Message Channels Table
- Menu Bar
- Dropping of Items

2.3.10.2   Device Profile Settings Table

The standard Device Profile Settings table is being used by the **DPE ION PROFIBUS DP Spy T001** (see point 2.3.2.2).

2.3.10.3   Provided Parameters Table

The standard Provided Parameters table is being used by the **DPE ION PROFIBUS DP Spy T001** (see point 2.3.2.3).

2.3.10.4   Device Profile Data Table

The standard Device Profile Data table is being used by the **DPE ION PROFIBUS DP Spy T001** (see point 2.3.2.3). The following columns of the standard Device Profile Data table are supported by the **DPE ION PROFIBUS DP Spy T001**:

Column	Description
No.	contains the row number
Enabled	specifies whether the data within this row shall be enabled during the start of the Device Profile or not
Name	contains the name of the data
Unit	contains the unit of the data
Description	contains the description of the data
Source Type	contains the source type of the data
Destination Type	contains the destination type of the data
Normalization Mode	contains the normalization mode of the data
Normalization Parameters	contains the normalization parameters
Record Mode	contains the record mode of the data
Record Parameters	contains the record parameters of the data
Data Format	contains the format of the data
Buffer Mode	contains the buffer mode of the data
Buffer Parameters	contains the buffer parameters of the data
Message Channel	contains the name of the message channel from which this data is generated
Byte Offset	contains the byte offset of the data within its message channel
Bit Offset	contains the bit offset of the data within its byte

When a data definition is removed from the Device Profile Data table, its according row also is removed completely.

New data definitions can be added via the Message Channel Contents table.

2.3.10.5   Message Channel Contents Table

The standard Message Channel Contents table is being used by the **DPE ION PROFIBUS DP Spy T001** (see point 2.3.2.5).

2.3.10.6   Message Channels Table

The standard Message Channels table is being used by the **DPE ION PROFIBUS DP Spy T001** (see point 2.3.2.6). The following columns of the standard Message Channels table and the following additional columns are supported by the **DPE ION PROFIBUS DP Spy T001**:

Column	Description
No.	contains the row number
Enabled	specifies whether the data within this message channel shall be enabled during the start of the Device Profile or not
Name	contains the name of the message channel
Description	contains the description of the message channel
Length	contains the length of the message channel (= the total length of the PROFIBUS DP telegram at the PROFIBUS)
SD	contains the start delimiter (SD) of the message channel
SA	contains the source address (SA) of the message channel
DA	contains the destination address (DA) of the message channel
Header Mask Length	contains the length of the header mask of the message channel, if any
Header Mask Offset	contains the offset of the header mask of the message channel, if any
Header Mask	contains the header mask of the message channel, if any

Each combination of SD, SA, DA, Header Mask Length, Header Mask Offset and Header Mask must be unique within the Message Channels table. Also overlapping of different combinations which could be valid for an incoming message channel at the same time is not allowed (e.g., in case a message channel without any header mask has been specified, no other message channel with matching SD, SA and DA can be specified; furthermore, in case a header mask combination has been specified, no other message channel with the same header mask combination can be specified in case its specified header mask is a subset of an existing header mask (or, in case its specified header mask would make an already existing header mask to become a subset of the new header mask)).

2.3.10.7   Menu Bar

The standard Menu Bar is being used by the **DPE ION PROFIBUS DP Spy T001** (see point 2.3.2.7).

2.3.10.8   Dropping of Items

Dropped Item	Description
Device Profile File Branches of type "DPF ION PROFIBUS DP Spy T001"	opens the dropped Device Profile
Device Branches of type "ION PROFIBUS DP Spy T001" in case the **DPE ION PROFIBUS DP Spy T001** is empty	creates a new Device Profile and sets the target device to the dropped device
Device Branches of type "ION PROFIBUS DP Spy T001" in case the **DPE ION PROFIBUS DP Spy T001** is not empty	sets the target device of the current Device Profile to the dropped device

2.3.11   DPE ION SIMATIC S7

2.3.11.1   Overview

The **DPE ION SIMATIC S7** is used in order to visualize, create and edit Device Profiles of following types:

- ION SIMATIC S7-1200
- ION SIMATIC S7-1500
- ION SIMATIC S7-300 T001
- ION SIMATIC S7-400 T001
- ION SIMATIC S7-400 T002
- ION SIMATIC S7 PN

Multiple editors of this type can be opened and used simultaneously.

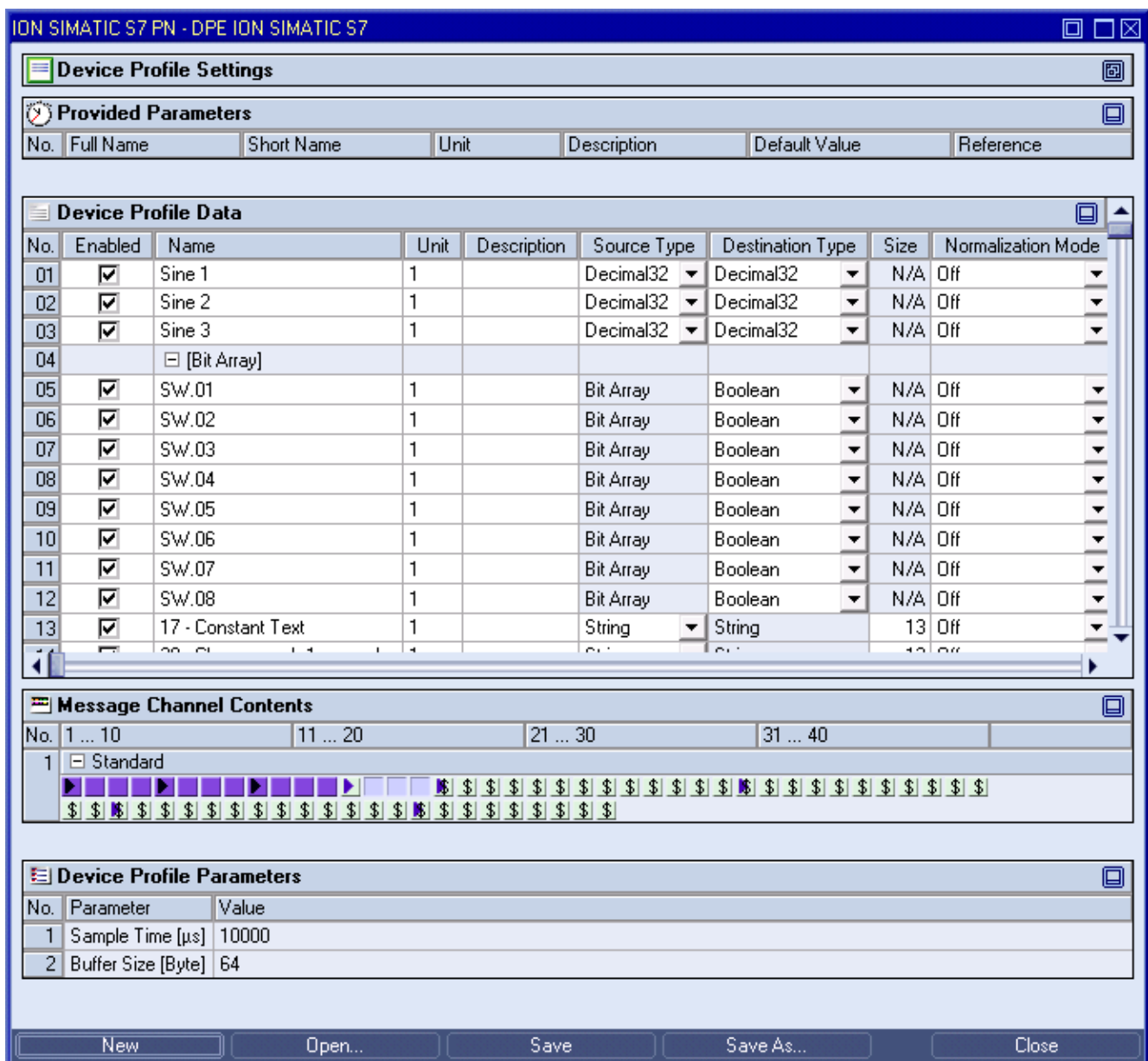The following screenshot shows an example of a **DPE ION SIMATIC S7**:

*Figure 16: Example of a **DPE ION SIMATIC S7***

Each control of the **DPE ION SIMATIC S7** has a defined task and provides certain functionalities. The following major controls are provided by the **DPE ION SIMATIC S7**:

- Device Profile Settings Table
- Provided Parameters Table
- Device Profile Data Table
- Message Channel Contents Table
- Device Profile Parameters Table
- Menu Bar
- Dropping of Items

2.3.11.2 Device Profile Settings Table

The standard Device Profile Settings table is being used by the **DPE ION SIMATIC S7** (see point 2.3.2.2).

2.3.11.3 Provided Parameters Table

The standard Provided Parameters table is being used by the **DPE ION SIMATIC S7** (see point 2.3.2.3).

2.3.11.4 Device Profile Data Table

The standard Device Profile Data table is being used by the **DPE ION SIMATIC S7** (see point 2.3.2.3). The following columns of the standard Device Profile Data table are supported by the **DPE ION SIMATIC S7**:

Column	Description
No.	contains the row number
Enabled	specifies whether the data within this row shall be enabled during the start of the Device Profile or not
Name	contains the name of the data
Unit	contains the unit of the data
Description	contains the description of the data
Source Type	contains the source type of the data
Destination Type	contains the destination type of the data
Size	contains the size of the data
Normalization Mode	contains the normalization mode of the data
Normalization Parameters	contains the normalization parameters
Record Mode	contains the record mode of the data
Record Parameters	contains the record parameters of the data
Data Format	contains the format of the data
Buffer Mode	contains the buffer mode of the data
Buffer Parameters	contains the buffer parameters of the data
Byte Offset	contains the byte offset of the data within its message channel
Bit Offset	contains the bit offset of the data within its byte

When a data definition is removed from the Device Profile Data table, its according row also is removed completely.

New data definitions can be added via the Message Channel Contents table.

2.3.11.5 Message Channel Contents Table

The standard Message Channel Contents table is being used by the **DPE ION SIMATIC S7** (see point 2.3.2.5).

2.3.11.6 Device Profile Parameters Table

The Device Profile Parameters table contains the additional parameters of the currently opened Device Profile:

Parameter	Description
Sample Time/Rate	contains the sample time/rate which is read from the attached target device
Buffer Size	contains the buffer size which is read from the attached target device

The following specific context menu item is provided:

Context Menu Item	Description
Reload Device Profile Parameters	reloads the Device Profile parameters from the target device

Sample Time/Rate

The Sample Time/Rate is read from the attached target device (e.g. ION SIMATIC S7-300 T001) and represents the cycle time of the SIMATIC block which is recording the data at the side of the target device. The cycle time is being set during the engineering of the SIMATIC and is not being measured by *X-Tools*.

The Sample Time/Rate can not be modified by the user.

Buffer Size

The Buffer Size is read from the attached target device (e.g. ION SIMATIC S7-300 T001) and represents the amount of data which is recorded during each cycle. In case the currently read buffer size is different to the so far known buffer size, the length of the one and only message channel within the Device Profile also is being updated automatically.

The Buffer Size can not be modified by the user.

2.3.11.7 Menu Bar

The standard Menu Bar is being used by the **DPE ION SIMATIC S7** (see point 2.3.2.7).

2.3.11.8 Dropping of Items

Dropped Item	Description
Device Profile File Branches of type "DPF ION SIMATIC S7-1200", "DPF ION SIMATIC S7-1500", "DPF ION SIMATIC S7-300 T001", "DPF ION SIMATIC S7-400 T001", "DPF ION SIMATIC S7-400 T002" or "DPF ION SIMATIC S7 PN"	opens the dropped Device Profile
Device Branches of type "DPF ION SIMATIC S7-1200", "DPF ION SIMATIC S7-1500", "ION SIMATIC S7-300 T001" , "ION SIMATIC S7-400 T001", "ION SIMATIC S7-400 T002" or "ION SIMATIC S7 PN" in case the **DPE ION SIMATIC S7** is empty	creates a new Device Profile and sets the target device to the dropped device
Device Branches of type "DPF ION SIMATIC S7-1200", "DPF ION SIMATIC S7-1500", "ION SIMATIC S7-300 T001", "ION SIMATIC S7-400 T001", "ION SIMATIC S7-400 T002" or "ION SIMATIC S7 PN" in case the **DPE ION SIMATIC S7** is not empty	sets the target device of the current Device Profile to the dropped device

2.3.12   DPE ION SIMATIC TDC T001

2.3.12.1   Overview

The **DPE ION SIMATIC TDC T001** is used in order to visualize, create and edit Device Profiles of type "ION SIMATIC TDC T001". Multiple editors of this type can be opened and used simultaneously.

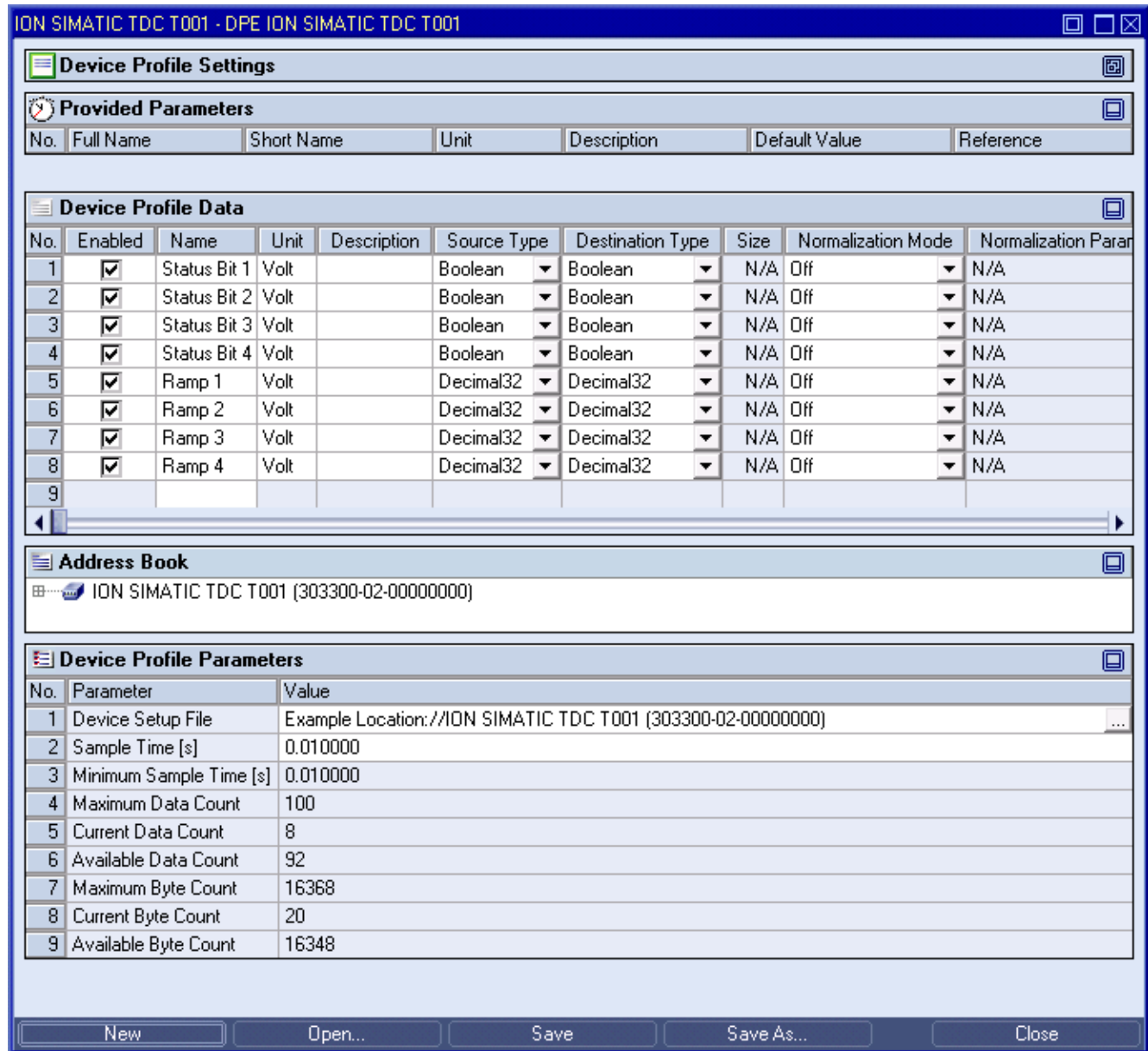The following screenshot shows an example of a **DPE ION SIMATIC TDC T001**:

*Figure 17: Example of a **DPE ION SIMATIC TDC T001***

Each control of the **DPE ION SIMATIC TDC T001** has a defined task and provides certain functionalities. The following major controls are provided by the **DPE ION SIMATIC TDC T001**:

- Device Profile Settings Table

- Provided Parameters Table

- Device Profile Data Table

- Address Book Tree

- Device Profile Parameters Table

- Menu Bar

- Dropping of Items

2.3.12.2   Device Profile Settings Table

The standard Device Profile Settings table is being used by the **DPE ION SIMATIC TDC T001** (see point 2.3.2.2).

2.3.12.3   Provided Parameters Table

The standard Provided Parameters table is being used by the **DPE ION SIMATIC TDC T001** (see point 2.3.2.3).

2.3.12.4   Device Profile Data Table

The standard Device Profile Data table is being used by the **DPE ION SIMATIC TDC T001** (see point 2.3.2.3). The following columns of the standard Device Profile Data table are supported by the **DPE ION SIMATIC TDC T001**:

Column	Description
No.	contains the row number
Enabled	specifies whether the data within this row shall be enabled during the start of the Device Profile or not
Name	contains the name of the data
Unit	contains the unit of the data
Description	contains the description of the data
Source Type	contains the source type of the data
Destination Type	contains the destination type of the data
Size	contains the size of the data
Normalization Mode	contains the normalization mode of the data
Normalization Parameters	contains the normalization parameters
Record Mode	contains the record mode of the data
Record Parameters	contains the record parameters of the data
Buffer Mode	contains the buffer mode of the data
Buffer Parameters	contains the buffer parameters of the data
Connector	contains the name of the connector from which this data is generated

The last row of the Device Profile Data table always is empty and therefore allows the user to add a new data definition by typing another name into the Name field of this last row. All other cells of the last row are disabled as long as the Name field is empty. Whenever a new name has been entered into the Name field, another new, empty row is added to the Device Profile Data table automatically.

When a data definition is removed from the Device Profile Data table, its according row also is removed completely.

New data definitions also can be added via the Address Book tree.

2.3.12.5   Address Book Tree

2.3.12.5.1   Overview

The Address Book tree displays all of the charts, blocks and connectors of the attached ION SIMATIC TDC T001. The user is able to select any of the displayed charts, blocks and/or connectors and to add them to the Device Profile Data table (Add context menu item).

Each branch of the Address Book tree has a defined task and provides certain functionalities. The following major branches are provided by the Address Book tree:

- Main Branch
- Chart Branch
- Block Branch
- Connector Branch

The following specific context menu item is provided:

Context Menu Item	Description
Reload Address Book	reloads the address book from the target ION SIMATIC TDC T001

2.3.12.5.2   Main Branch

The one and only Main Branch provides all of the charts which are available at the target ION SIMATIC TDC T001. Its caption matches the name of the target ION SIMATIC TDC T001 and it can be expanded and collapsed in order to show or hide its sub-items.

The following specific context menu item is provided:

Context Menu Item	Description
Add	adds all connectors from all blocks from all charts of the selected device to the Device Profile Data table

2.3.12.5.3   Chart Branch

Each Chart Branch represents one chart from the address book and provides all of the blocks which are available below its chart.

The following specific context menu item is provided:

Context Menu Item	Description
Add	adds all connectors from all blocks from the selected chart to the Device Profile Data table

2.3.12.5.4   Block Branch

Each Block Branch represents one block from the address book and provides all of the connectors which are available below its block.

The following specific context menu item is provided:

Context Menu Item	Description
Add	adds all connectors from the selected block to the Device Profile Data table

2.3.12.5.5 Connector Branch

Each Connector Branch represents one connector from the address book.

The following specific context menu item is provided:

Context Menu Item	Description
Add	adds the connector to the Device Profile Data table
Add as String	adds the connector to the Device Profile Data table as data of type "string"
	this context menu item is enabled only in case the connector is of type "Unsigned Integer32"

2.3.12.6 Device Profile Parameters Table

The Device Profile Parameters table contains the additional parameters of the currently opened Device Profile:

Parameter	Description
Device Setup File	contains the correlating Device Setup File
Sample Time/Rate	contains the sample time/rate
Minimum Sample Time/Rate	contains the minimum sample time/rate
Maximum Data Count	contains the maximum data count
Current Data Count	contains the current data count
Available Data Count	contains the available data count
Maximum Byte Count	contains the maximum byte count
Current Byte Count	contains the current byte count
Available Byte Count	contains the available byte count

The specified Device Setup File is being used by the **DPE ION SIMATIC TDC T001** in order to store and read the address book of the target ION SIMATIC TDC T001.

The full path information is being stored and displayed by the Device Setup File cell. The Device Setup File can be stored either within the same location where also the Device Profile File is stored, within any directory at the local disk or within any of the locations of the local or of a remote **X-Tools Server**. In case the location (together with the contained Device Profile Files and Device Setup Files) shall be copied from one computer to another computer, it is suggested to store the Device Setup File into the same location as the Device Profile File. This constellation also is the default for every new Device Profile File.

The following specific context menu item is provided:

Context Menu Item	Description
Reload Device Profile Parameters	reloads the Device Profile parameters from the target ION SIMATIC TDC T001

Sample Time/Rate

The Sample Time/Rate can be used as parameter of the Device Profile. Therefore, the following context menu items are provided:

Context Menu Item	Description
Add Parameter	adds the Sample Time/Rate as parameter of the Device Profile
Go to Parameter	highlights the parameter which represents the Sample Time/Rate within the Provided Parameters table
Remove Parameter	removes the Sample Time/Rate as parameter of the Device Profile

Minimum Sample Time/Rate

The Minimum Sample Time/Rate is read from the attached ION SIMATIC TDC T001 and represents the cycle time of the SIMATIC block which is recording the data at the side of the ION SIMATIC TDC T001. The cycle time is being set during the engineering of the SIMATIC TDC and is not being measured by **X-Tools**.

Maximum Data Count

The Maximum Data Count is read from the attached ION SIMATIC TDC T001 and represents the max amount of data which can be requested each cycle.

Current Data Count

The Current Data Count identifies how many data has been added to the Device Profile Data table of the current Device Profile already.

The Current Data Count can not be modified by the user and is recalculated automatically whenever data is added to or removed from the Device Profile Data table.

Available Data Count

The Available Data Count identifies how many data still can be added to the Device Profile Data table of the current Device Profile.

The Available Data Count can not be modified by the user and is recalculated automatically whenever data is added to or removed from the Device Profile Data table.

Maximum Byte Count

The Maximum Byte Count is read from the attached ION SIMATIC TDC T001 and represents the max amount of bytes which can be requested each cycle.

The Maximum Byte Count can not be modified by the user.

Current Byte Count

The Current Byte Count identifies how many data bytes have been added to the Device Profile Data table of the current Device Profile already.

The Current Byte Count can not be modified by the user and is recalculated automatically whenever data is added to or removed from the Device Profile Data table.

Available Byte Count

The Available Byte Count identifies how many data bytes still can be added to the Device Profile Data table of the current Device Profile.

The Available Byte Count can not be modified by the user and is recalculated automatically whenever data is added to or removed from the Device Profile Data table.

2.3.12.7   Menu Bar

The standard Menu Bar is being used by the **DPE ION SIMATIC TDC T001** (see point 2.3.2.7).

2.3.12.8   Dropping of Items

Dropped Item	Description
Device Profile File Branches of type "DPF ION SIMATIC TDC T001"	opens the dropped Device Profile
Device Branches of type "ION SIMATIC TDC T001" in case the **DPE ION SIMATIC TDC T001** is empty	creates a new Device Profile and sets the target device to the dropped device
Device Branches of type "ION SIMATIC TDC T001" in case the **DPE ION SIMATIC TDC T001** is not empty	sets the target device of the current Device Profile to the dropped device

2.3.13 DPE ION SIMOTION T001

2.3.13.1 Overview

The **DPE ION SIMOTION T001** is used in order to visualize, create and edit Device Profiles of type "ION SIMOTION T001". Multiple editors of this type can be opened and used simultaneously.

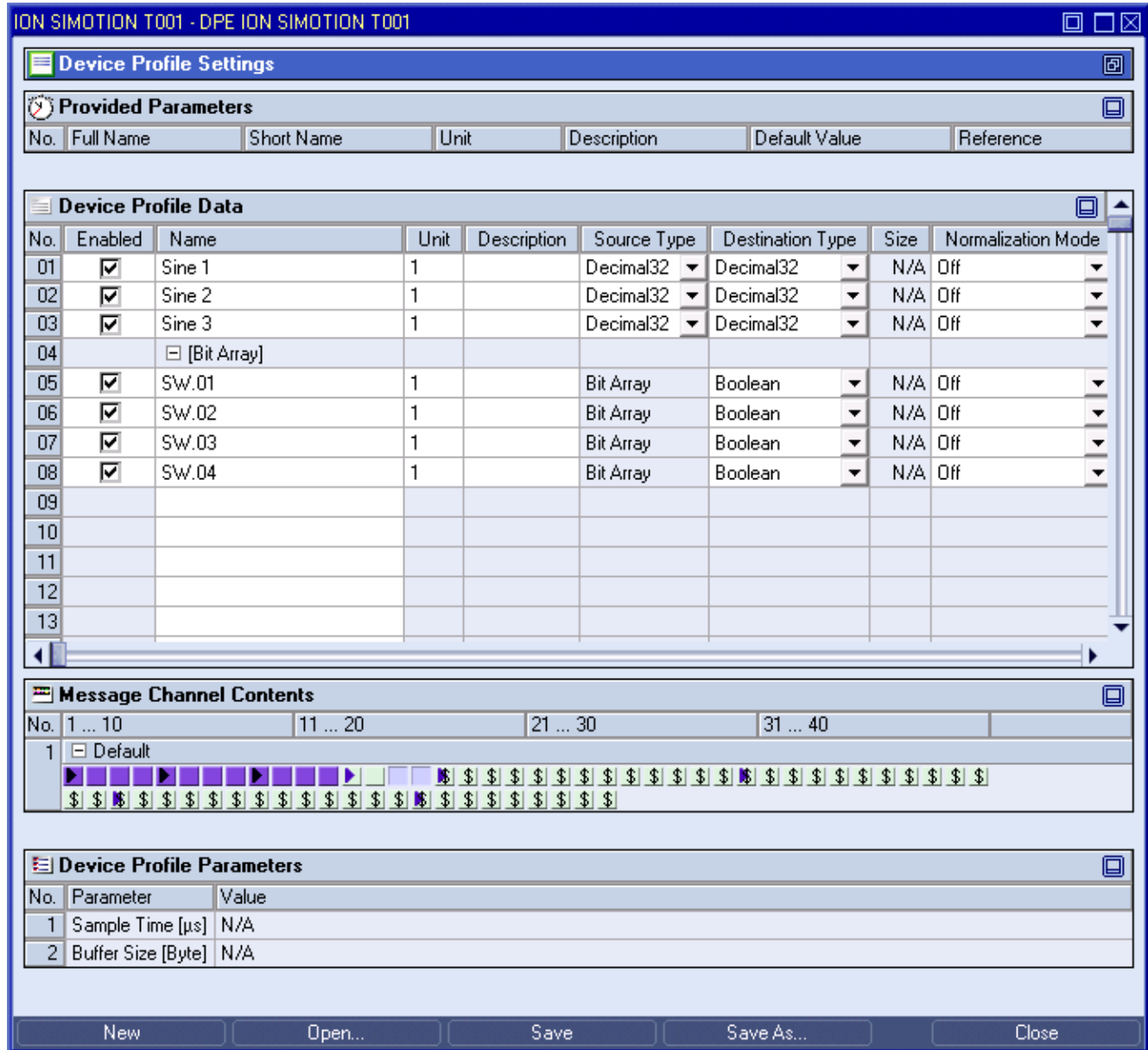The following screenshot shows an example of a **DPE ION SIMOTION T001**:

*Figure 18: Example of a **DPE ION SIMOTION T001***

Each control of the **DPE ION SIMOTION T001** has a defined task and provides certain functionalities. The following major controls are provided by the **DPE ION SIMOTION T001**:

- Device Profile Settings Table

- Provided Parameters Table

- Device Profile Data Table

- Message Channel Contents Table

- Device Profile Parameters Table

- Menu Bar

- Dropping of Items

2.3.13.2 Device Profile Settings Table

The standard Device Profile Settings table is being used by the **DPE ION SIMOTION T001** (see point 2.3.2.2).

2.3.13.3 Provided Parameters Table

The standard Provided Parameters table is being used by the **DPE ION SIMOTION T001** (see point 2.3.2.3).

2.3.13.4 Device Profile Data Table

The standard Device Profile Data table is being used by the **DPE ION SIMOTION T001** (see point 2.3.2.3). The following columns of the standard Device Profile Data table are supported by the **DPE ION SIMOTION T001**:

Column	Description
No.	contains the row number
Enabled	specifies whether the data within this row shall be enabled during the start of the Device Profile or not
Name	contains the name of the data
Unit	contains the unit of the data
Description	contains the description of the data
Source Type	contains the source type of the data
Destination Type	contains the destination type of the data
Size	contains the size of the data
Normalization Mode	contains the normalization mode of the data
Normalization Parameters	contains the normalization parameters
Record Mode	contains the record mode of the data
Record Parameters	contains the record parameters of the data
Data Format	contains the format of the data
Buffer Mode	contains the buffer mode of the data
Buffer Parameters	contains the buffer parameters of the data
Byte Offset	contains the byte offset of the data within its message channel
Bit Offset	contains the bit offset of the data within its byte

When a data definition is removed from the Device Profile Data table, its according row also is removed completely.

New data definitions can be added via the Message Channel Contents table.

2.3.13.5 Message Channel Contents Table

The standard Message Channel Contents table is being used by the **DPE ION SIMOTION T001** (see point 2.3.2.5).

2.3.13.6 Device Profile Parameters Table

The Device Profile Parameters table contains the additional parameters of the currently opened Device Profile:

Parameter	Description
Sample Time/Rate	contains the sample time/rate which is read from the attached ION SIMOTION T001
Buffer Size	contains the buffer size which is read from the attached ION SIMOTION T001

The following specific context menu item is provided:

Context Menu Item	Description
Reload Device Profile Parameters	reloads the Device Profile parameters from the target ION SIMOTION T001

Sample Time/Rate

The Sample Time/Rate is read from the attached ION SIMOTION T001 and represents the cycle time of the SIMOTION block which is recording the data at the side of the ION SIMOTION T001.

The Sample Time/Rate can not be modified by the user.

Buffer Size

The Buffer Size is read from the attached ION SIMOTION T001 and represents the amount of data which is recorded during each cycle. In case the currently read buffer size is different to the so far known buffer size, the length of the one and only message channel within the Device Profile also is being updated automatically.

The Buffer Size can not be modified by the user.

2.3.13.7 Menu Bar

The standard Menu Bar is being used by the **DPE ION SIMOTION T001** (see point 2.3.2.7).

2.3.13.8 Dropping of Items

Dropped Item	Description
Device Profile File Branches of type "DPF ION SIMOTION T001"	opens the dropped Device Profile
Device Branches of type "ION SIMOTION T001" in case the **DPE ION SIMOTION T001** is empty	creates a new Device Profile and sets the target device to the dropped device
Device Branches of type "ION SIMOTION T001" in case the **DPE ION SIMOTION T001** is not empty	sets the target device of the current Device Profile to the dropped device

2.3.14 DPE ION VIB-A T001

2.3.14.1 Overview

The **DPE ION VIB-A T001** is used in order to visualize, create and edit Device Profiles of type "ION VIB-A T001". Multiple editors of this type can be opened and used simultaneously.

The following screenshot shows an example of a **DPE ION VIB-A T001**:

*Figure 19: Example of a **DPE ION VIB-A T001***

Each control of the **DPE ION VIB-A T001** has a defined task and provides certain functionalities. The following major controls are provided by the **DPE ION VIB-A T001**:

- Device Profile Settings Table

- Provided Parameters Table

- Device Profile Data Table

- Device Profile Parameters Table

- Menu Bar

- Dropping of Items

2.3.14.2 Device Profile Settings Table

The standard Device Profile Settings table is being used by the **DPE ION VIB-A T001** (see point 2.3.2.2).

2.3.14.3 Provided Parameters Table

The standard Provided Parameters table is being used by the **DPE ION VIB-D T001** (see point 2.3.2.3).

2.3.14.4 Device Profile Data Table

The standard Device Profile Data table is being used by the **DPE ION VIB-A T001** (see point 2.3.2.3). The following columns of the standard Device Profile Data table are supported by the **DPE ION VIB-A T001**:

Column	Description
No.	contains the row number
Enabled	specifies whether the data within this row shall be enabled during the start of the Device Profile or not
Name	contains the name of the data
Unit	contains the unit of the data
Description	contains the description of the data
Destination Type	contains the destination type of the data
Normalization Mode	contains the normalization mode of the data
Normalization Parameters	contains the normalization parameters
Record Mode	contains the record mode of the data
Record Parameters	contains the record parameters of the data
Buffer Mode	contains the buffer mode of the data
Buffer Parameters	contains the buffer parameters of the data

The Device Profile Data table always contains exactly ten rows for data.

When a data definition is removed from the Device Profile Data table, its according row stays empty and grays all cells except the Name cell. In order to get some data definition back to the empty row, a new, valid data name can be entered or the definitions from another row can be pasted into the empty one.

2.3.14.5   Device Profile Parameters Table

The Device Profile Parameters table contains the additional parameters of the currently opened Device Profile:

Parameter	Description
Sample Time/Rate	contains the sample time/rate
Sensor 1 Cutoff Frequency	contains the cutoff frequency which is applied to sensor 1
Sensor 1 Input Range	contains the input range which is applied to sensor 1
Sensor 1 Characteristic Value	contains the characteristic value of sensor 1
Sensor 2 Cutoff Frequency	contains the cutoff frequency which is applied to sensor 2
Sensor 2 Input Range	contains the input range which is applied to sensor 2
Sensor 2 Characteristic Value	contains the characteristic value of sensor 2
Sensor 3 Cutoff Frequency	contains the cutoff frequency which is applied to sensor 3
Sensor 3 Input Range	contains the input range which is applied to sensor 3
Sensor 3 Characteristic Value	contains the characteristic value of sensor 3
Sensor 4 Cutoff Frequency	contains the cutoff frequency which is applied to sensor 4
Sensor 4 Input Range	contains the input range which is applied to sensor 4
Sensor 4 Characteristic Value	contains the characteristic value of sensor 4
Input Selector	contains the type of the input selector
Impulse Count	contains the impulses per rotation
Tacho Value	contains the analog tacho value
Gear Factor	contains the gear factor
Circumference	contains the circumference

2.3.14.6   Menu Bar

The standard Menu Bar is being used by the **DPE ION VIB-A T001** (see point 2.3.2.7).

2.3.14.7   Dropping of Items

Dropped Item	Description
Device Profile File Branches of type "DPF ION VIB-A T001"	opens the dropped Device Profile
Device Branches of type "ION VIB-A T001" in case the **DPE ION VIB-A T001** is empty	creates a new Device Profile and sets the target device to the dropped device
Device Branches of type "ION VIB-A T001" in case the **DPE ION VIB-A T001** is not empty	sets the target device of the current Device Profile to the dropped device

2.3.15   DPE ION VIB-D T001

2.3.15.1   Overview

The **DPE ION VIB-D T001** is used in order to visualize, create and edit Device Profiles of type "ION VIB-D T001". Multiple editors of this type can be opened and used simultaneously.

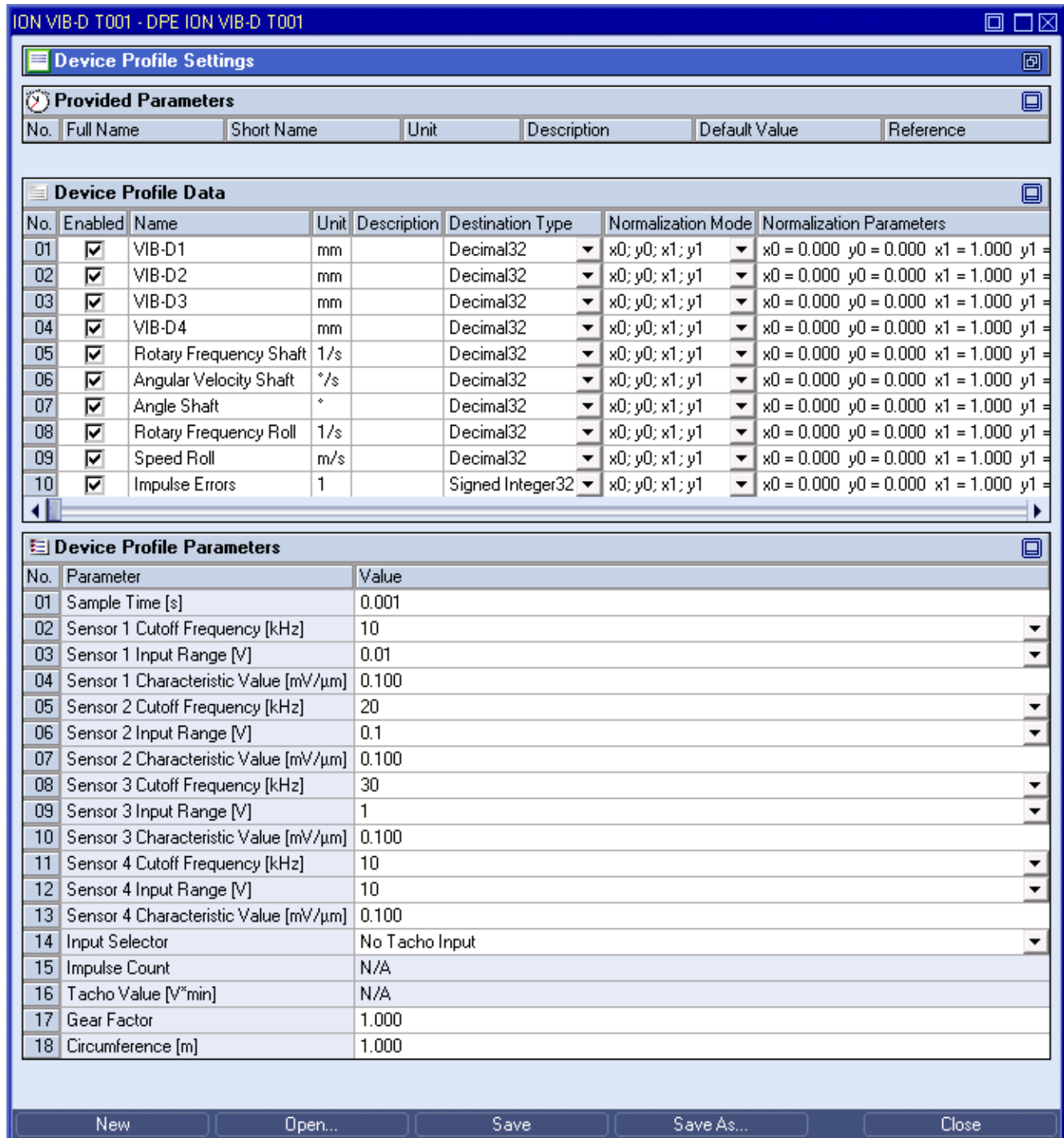The following screenshot shows an example of a **DPE ION VIB-D T001**:

*Figure 20: Example of a **DPE ION VIB-D T001***

Each control of the **DPE ION VIB-D T001** has a defined task and provides certain functionalities. The following major controls are provided by the **DPE ION VIB-D T001**:

- Device Profile Settings Table

- Provided Parameters Table

- Device Profile Data Table

- Device Profile Parameters Table

- Menu Bar

- Dropping of Items

2.3.15.2   Device Profile Settings Table

The standard Device Profile Settings table is being used by the **DPE ION VIB-D T001** (see point 2.3.2.2).

2.3.15.3   Provided Parameters Table

The standard Provided Parameters table is being used by the **DPE ION VIB-D T001** (see point 2.3.2.3).

2.3.15.4   Device Profile Data Table

The standard Device Profile Data table is being used by the **DPE ION VIB-D T001** (see point 2.3.2.3). The following columns of the standard Device Profile Data table are supported by the **DPE ION VIB-D T001**:

Column	Description
No.	contains the row number
Enabled	specifies whether the data within this row shall be enabled during the start of the Device Profile or not
Name	contains the name of the data
Unit	contains the unit of the data
Description	contains the description of the data
Destination Type	contains the destination type of the data
Normalization Mode	contains the normalization mode of the data
Normalization Parameters	contains the normalization parameters
Record Mode	contains the record mode of the data
Record Parameters	contains the record parameters of the data
Buffer Mode	contains the buffer mode of the data
Buffer Parameters	contains the buffer parameters of the data

The Device Profile Data table always contains exactly ten rows for data.

When a data definition is removed from the Device Profile Data table, its according row stays empty and grays all cells except the Name cell. In order to get some data definition back to the empty row, a new, valid data name can be entered or the definitions from another row can be pasted into the empty one.

2.3.15.5   Device Profile Parameters Table

The Device Profile Parameters table contains the additional parameters of the currently opened Device Profile:

Parameter	Description
Sample Time/Rate	contains the sample time/rate
Sensor 1 Cutoff Frequency	contains the cutoff frequency which is applied to sensor 1
Sensor 1 Input Range	contains the input range which is applied to sensor 1
Sensor 1 Characteristic Value	contains the characteristic value of sensor 1
Sensor 2 Cutoff Frequency	contains the cutoff frequency which is applied to sensor 2
Sensor 2 Input Range	contains the input range which is applied to sensor 2
Sensor 2 Characteristic Value	contains the characteristic value of sensor 2
Sensor 3 Cutoff Frequency	contains the cutoff frequency which is applied to sensor 3
Sensor 3 Input Range	contains the input range which is applied to sensor 3
Sensor 3 Characteristic Value	contains the characteristic value of sensor 3
Sensor 4 Cutoff Frequency	contains the cutoff frequency which is applied to sensor 4
Sensor 4 Input Range	contains the input range which is applied to sensor 4
Sensor 4 Characteristic Value	contains the characteristic value of sensor 4
Input Selector	contains the type of the input selector
Impulse Count	contains the impulses per rotation
Tacho Value	contains the analog tacho value
Gear Factor	contains the gear factor
Circumference	contains the circumference

2.3.15.6   Menu Bar

The standard Menu Bar is being used by the **DPE ION VIB-D T001** (see point 2.3.2.7).

2.3.15.7   Dropping of Items

Dropped Item	Description
Device Profile File Branches of type "DPF ION VIB-D T001"	opens the dropped Device Profile
Device Branches of type "ION VIB-D T001" in case the **DPE ION VIB-D T001** is empty	creates a new Device Profile and sets the target device to the dropped device
Device Branches of type "ION VIB-D T001" in case the **DPE ION VIB-D T001** is not empty	sets the target device of the current Device Profile to the dropped device

2.3.16   DPE OPC UA T001

2.3.16.1   Overview

The **DPE OPC UA T001** is used in order to visualize, create and edit Device Profiles of type "OPC UA T001". Multiple editors of this type can be opened and used simultaneously.

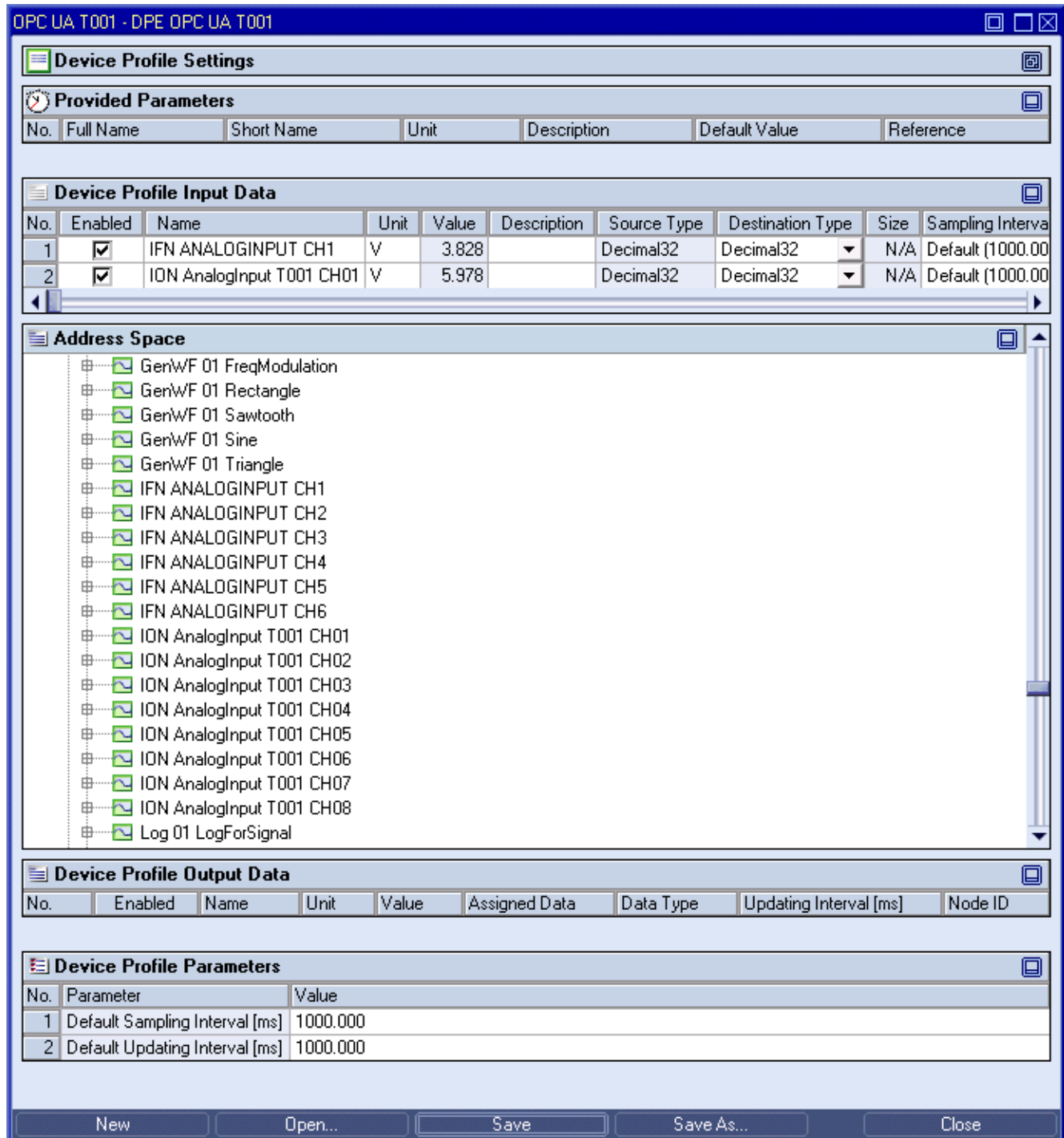The following screenshot shows an example of a **DPE OPC UA T001**:

*Figure 21: Example of a **DPE OPC UA T001***

Each control of the **DPE OPC UA T001** has a defined task and provides certain functionalities. The following major controls are provided by the **DPE OPC UA T001**:

- Device Profile Settings Table
- Provided Parameters Table
- Device Profile Input Data Table
- Address Space Tree
- Device Profile Output Data Table
- Device Profile Parameters Table
- Menu Bar
- Dropping of Items

2.3.16.2   Device Profile Settings Table

The standard Device Profile Settings table is being used by the **DPE OPC UA T001** (see point 2.3.2.2).

2.3.16.3   Provided Parameters Table

The standard Provided Parameters table is being used by the **DPE OPC UA T001** (see point 2.3.2.3).

2.3.16.4   Device Profile Input Data Table

The standard Device Profile Input Data table is being used by the **DPE OPC UA T001** (see point 2.3.2.3). The following columns of the standard Device Profile Input Data table are supported by the **DPE OPC UA T001**:

Column	Description
No.	contains the row number
Enabled	specifies whether the data within this row shall be enabled during the start of the Device Profile or not
Name	contains the name of the data
Unit	contains the unit of the data
Value	contains the current value of the data
Description	contains the description of the data
Source Type	contains the source type of the data
Destination Type	contains the destination type of the data
Sampling Interval [ms]	contains the sampling interval of the data
Normalization Mode	contains the normalization mode of the data
Normalization Parameters	contains the normalization parameters
Record Mode	contains the record mode of the data
Record Parameters	contains the record parameters of the data
Buffer Mode	contains the buffer mode of the data
Buffer Parameters	contains the buffer parameters of the data
Node ID	contains the node ID of the node from which this data is generated

When a data definition is removed from the Device Profile Input Data table, its according row also is removed completely.

New data definitions can be added only via the Address Space tree.

The following specific context menu item is provided:

Context Menu Item	Description
Reload selected OPC UA Nodes	reloads the unit, source type and value of the currently selected rows
Reload all OPC UA Nodes	reloads the unit, source type and value of all rows

Unit

In case a variable of type "AnalogItemType" is added to the Device Profile Input Data table and this variable provides a unit, this unit is inserted as default unit automatically.

Value

The Device Profile Input Data table updates the current value of its data automatically in the following cases:

- after opening of the Device Profile, in case the target OPC UA server is available at the moment

- after the target OPC UA server has been changed, in case the new OPC UA server is available at the moment

- in case the target OPC UA server was not available and became available right now

- automatically after a data has been added to the Device Profile Input Data table

- automatically after a data has been added to the Device Profile Output Data table

- automatically after the content of a Value cell has been edited within the Device Profile Output Data table

- whenever <F5> has been pressed

Description

In case a node is added to the Device Profile Input Data table and this node provides a description, this description is inserted as default description automatically.

Sampling Interval

The Sampling Interval is being used in order to configure how often the OPC UA server sends the value of this data. The context menu can be used in order to activate additional possibilities of the sampling interval:

Context Menu Item	Description
Set to Default	Sets the Sampling Interval to "Default (*x*)". In case of this setting, the sampling interval is configured to the value from the Default Sampling Interval cell of the Device Profile Parameters table.
Set to Fastest	Sets the Sampling Interval to "Fastest". In case of this setting, the sampling interval is configured to the fastest value which is supported by the target OPC UA server.

The specified sampling interval may not be kept totally exactly by the OPC UA server. A jitter and slightly different data transmission intervals can be caused by the used platform (e.g. an embedded system or Windows) and by the internal architecture of the OPC UA server. In addition, new values are transmitted from the OPC UA server to the *X-Tools Server* only in case the value has changed since the last transmission.

2.3.16.5   Address Space Tree

2.3.16.5.1   Overview

The Address Space tree displays all of the nodes of the attached OPC UA server which are supported by *X-Tools*. The user is able to select any of the displayed nodes and to add them to the Device Profile Input Data table (Add as Device Profile Input Data context menu item) and to the Device Profile Output Data table (Add as Device Profile Output Data context menu item).

The Rebrowse context menu item can be used in order rebrowse for the child node IDs of the node from which the context menu has been called.

Each branch of the Address Space tree has a defined task and provides certain functionalities. The following major branches are provided by the Address Space tree:

- Main Branch

- Objects Branch

- Folder Branch

- Variable Branch

- Property Branch

The following specific context menu item is provided:

Context Menu Item	Description
Rebrowse Address Space	clears all contents of the Address Space tree

2.3.16.5.2   Main Branch

The one and only Main Branch provides all of the supported nodes of the target OPC UA server. Its caption matches the name of the target OPC UA server and it can be expanded and collapsed in order to show or hide its sub-items.

Below the Main Branch, only the "Objects" folder of the OPC UA server is shown. All other folders are not supported by the Address Space tree.

The following specific context menu item is provided:

Context Menu Item	Description
Rebrowse	re-reads all of the information about the address space item from which the context menu has been called and about all of its sub-items

2.3.16.5.3   Objects Branch

Each Objects Branch represents one object from the address space and provides all of the supported nodes which are available below this object.

The following specific context menu items are provided:

Context Menu Item	Description
Rebrowse	re-reads all of the information about the address space item from which the context menu has been called and about all of its sub-items

2.3.16.5.4   Folder Branch

Each Folder Branch represents one folder from the address space and provides all of the supported nodes which are available below this folder.

The following specific context menu item is provided:

Context Menu Item	Description
Rebrowse	re-reads all of the information about the address space item from which the context menu has been called and about all of its sub-items

2.3.16.5.5   Variable Branch

Each Variable Branch represents one variable from the address space and provides all of the supported nodes which are available below this variable. Only variables of type "BaseDataType" (Boolean, signed and unsigned Integer 8/16/32/64, float and double) are shown within the Address Space tree.

The following specific context menu items are provided:

Context Menu Item	Description
Rebrowse	re-reads all of the information about the address space item from which the context menu has been called and about all of its sub-items
Add as Device Profile Input Data	adds the currently selected Variable Branches to the Device Profile Input Data table
Add as Device Profile Output Data	adds the currently selected Variable Branches to the Device Profile Output Data table

A variable can be added to the Device Profile Output Data table only in case its "UserAccessLevel" is "Readable" and "Writeable".

2.3.16.5.6   Property Branch

Each Property Branch represents one property from the address space and provides all of the supported nodes which are available below this property. Only properties of type "BaseDataType" (Boolean, signed and unsigned Integer 8/16/32/64, float and double) are shown within the Address Space tree

The following specific context menu items are provided:

Context Menu Item	Description
Rebrowse	re-reads all of the information about the address space item from which the context menu has been called and about all of its sub-items
Add as Device Profile Input Data	adds the currently selected Property Branches to the Device Profile Input Data table
Add as Device Profile Output Data	adds the currently selected Property Branches to the Device Profile Output Data table

A property can be added to the Device Profile Output Data table only in case its "UserAccessLevel" is "Readable" and "Writeable".

2.3.16.5.7 Other OPC UA Types

All other OPC UA types which are defined for the OPC UA address space are not shown within the Address Space tree.

2.3.16.6 Device Profile Output Data Table

The Device Profile Output Data table contains the data whose values shall be written. The following columns are supported by the **DPE OPC UA T001**:

Column	Description
No.	contains the row number
Enabled	specifies whether the data within this row shall be enabled during the start of the Device Profile or not
Name	contains the name of the data
Unit	contains the unit of the data
Value	contains the current value of the data
Assigned Data	contains the online data which shall be written to this output data
Data Type	contains the data type of the data
Updating Interval [ms]	contains the Updating interval of the data
Node ID	contains the node ID of the node from which this data is generated

When a data definition is removed from the Device Profile Output Data table, its according row also is removed completely.

New data definitions can be added only via the Address Space tree.

The following specific context menu item is provided:

Context Menu Item	Description
Reload selected OPC UA Nodes	reloads the unit, data type and value of the currently selected rows
Reload all OPC UA Nodes	reloads the unit, data type and value of all rows

Value

Whenever the user enters a new value into the Value cell and leaves the editing without cancelling of the editing, the new value is being written to the OPC UA server immediately.

The current value of each data is updated automatically in the following cases:

- after opening of the Device Profile, in case the target OPC UA server is available at the moment
- after the target OPC UA server has been changed, in case the new OPC UA server is available at the moment
- in case the target OPC UA server was not available and became available right now
- automatically after a data has been added to the Device Profile Input Data table
- automatically after a data has been added to the Device Profile Output Data table
- automatically after the content of a Value cell has been edited within the Device Profile Output Data table
- whenever <F5> has been pressed

Assigned Data

A data can be inserted into Assigned Data either via Drag&Drop from the online data section of the **MDS Explorer** or through typing of its name into the edit box directly.

While the Device Profile is started, the value of the assigned data is written to the OPC UA server in cyclic intervals. The duration of this interval is configured via the Updating Interval.

Updating Interval

The Updating Interval is being used in order to configure how often the value of the assigned data shall be written to the OPC UA server. The context menu can be used in order to activate additional possibilities of the updating interval:

Context Menu Item	Description
Set to Default	Sets the Updating Interval to "Default (x)". In case of this setting, the updating interval is configured to the value from the Default Updating Interval cell of the Device Profile Parameters table.

The specified updating interval may not be kept totally exactly by the **X-Tools Server**. A jitter and slightly different data transmission intervals can be caused by the operating system and by the internal architecture of the **X-Tools Server**. In addition, new values are transmitted to the OPC UA server only in case new values have appeared within the assigned data since the last transmission.

2.3.16.7   Device Profile Parameters Table

The Device Profile Parameters table contains the additional parameters of the currently opened Device Profile:

Parameter	Description
Default Sampling Interval	contains the default sampling interval
Default Updating Interval	contains the default updating interval

Default Sampling Interval

The Default Sampling Interval is being used in order to configure how often the OPC UA server shall send the value of its data. The Default Sampling Interval is being used for all data whose Sampling Interval (see point 2.3.16.4) is set to "Default".

The following context menu items are provided:

Context Menu Item	Description
Set to Fastest	Sets the Default Sampling Interval to "Fastest". In case of this setting, the sampling interval is configured to the fastest value which is supported by the target OPC UA server.
Add Parameter	adds the Default Sampling Interval as parameter of the Device Profile
Go to Parameter	highlights the parameter which represents the Default Sampling Interval within the Provided Parameters table
Remove Parameter	removes the Default Sampling Interval as parameter of the Device Profile

Default Updating Interval

The Default Updating Interval is being used in order to configure how often the updated value shall be written to the OPC UA server. The Default Updating Interval is being used for all data whose Updating Interval (see point 2.3.16.6) is set to "Default".

The Default Updating Interval can be used as parameter of the Device Profile. Therefore, the following context menu items are provided:

Context Menu Item	Description
Add Parameter	adds the Default Updating Interval as parameter of the Device Profile
Go to Parameter	highlights the parameter which represents the Default Updating Interval within the Provided Parameters table
Remove Parameter	removes the Default Updating Interval as parameter of the Device Profile

2.3.16.8   Menu Bar

The standard Menu Bar is being used by the **DPE OPC UA T001 T001** (see point 2.3.2.7).

2.3.16.9   Dropping of Items

Dropped Item	Description
Device Profile File Branches of type "DPF OPC UA T001"	opens the dropped Device Profile
Device Branches of type "OPC UA T001" in case the **DPE OPC UA T001** is empty	creates a new Device Profile and sets the target device to the dropped device
Device Branches of type "OPC UA T001" in case the **DPE OPC UA T001** is not empty	sets the target device of the current Device Profile to the dropped device

2.4   OPC UA Server

X-Tools is being delivered with a built-in OPC UA server. This OPC UA server can be used by standard OPC UA clients in order to read the values of the current online data from the **X-Tools Server**.

In order to turn on the OPC UA server, the global option "Enable OPC UA Server" must be configured to "Yes" (see tutorial, chapter "Providing of Data to standard OPC UA Clients").

OPC UA clients are able to read the values of all currently present online data which are of simple data types (Boolean, Integers and Decimals) from **X-Tools** but they can not read or modify the current configuration of the **X-Tools Server** and the can not access the currently present offline data. In addition, OPC UA clients can not write any values for a data to **X-Tools**.

In order to connect to the built-in OPC UA server, the following access data must be used by OPC UA clients:

Access Data	Value
Target IP or Name	IP or name of the computer which runs the **X-Tools Server**
Target Port	OPC UA port which has been configured within the global options of the **X-Tools Server**
Security Policy	None *or* Basic128Rsa *or* Basic256
Message Security	None *or* Sign *or* Sign and encrypt
User Name	Anonymous (= an empty user name in case of most OPC UA clients) *or* a valid Windows user name
Password	No password (for the anonymous access) *or* the correct password for the specified Windows user name

The anonymous access has the same access rights as all other (Windows) users, thus it typically does not make sense to use a different user than the anonymous one.

Note

In case the "Guest" account of Windows is enabled, the OPC UA server accepts any provided user name as valid (even in case there is no Windows user of this name). Therefore, it is strongly recommended to disable the "Guest" account of Windows in case the OPC UA server functionality of **X-Tools** shall be used within security relevant applications.

In case the OPC UA client uses a security policy different to "None", it sends its OPC UA client certificate to **X-Tools** during the connection attempt. By default, each unknown OPC UA client certificate which is received is rejected and saved to the following folder of the **X-Tools** installation:

- ..\X-Tools\Server\User\Certificates\OPC UA Server\Rejected

In oder to enable the connection via such a rejected certificate, the certificate must be moved manually to the folder of trusted certificates from OPC UA clients:

- ..\X-Tools\Server\User\Certificates\OPC UA Server\Certificates

Afterwards, the OPC UA client must retry to connect.

The OPC UA server of **X-Tools** does not require secured connections and can be used also with a security policy of "None".

Internally, the OPC UA server of **X-Tools** uses the XSI (X-Tools Server Interface) in order to be able to provide all necessary information to its OPC UA client. Only one XSI client can be served by **X-Tools** at a time, thus no other XSI client shall connect to **X-Tools** in case the internal OPC UA server is enabled.

3   Contact Information

Should you have any questions concerning the software application, please refer to the Industry Sector Technical Support.

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Thank you for using one of the above mentioned contacts to ensure your inquiry is registered and can be processed.