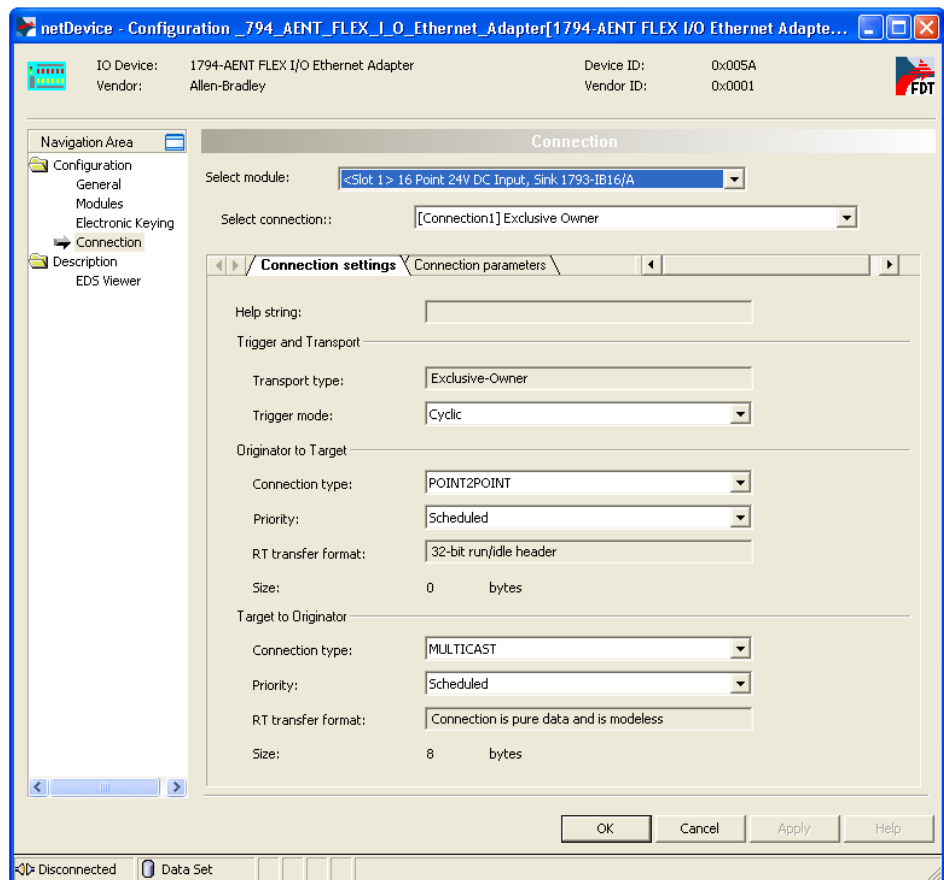


Operating Instruction Manual

Generic, Modular Generic DTM from EDS File for non-modular and modular EtherNet/IP Adapter Devices

Configuration of EtherNet/IP Adapter Devices

V1.1000



Hilscher Gesellschaft für Systemautomation mbH

www.hilscher.com

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Table of Contents

1	INTRODUCTION.....	4
1.1	About this Manual	4
1.1.1	Descriptions of the Dialog Panes	4
1.1.2	Online Help	4
1.1.3	List of Revisions	4
1.1.4	Conventions in this Manual	5
1.2	Legal Notes.....	6
1.3	Registered Trademarks.....	9
1.4	About EtherNet/IP Generic Adapter DTM from EDS File	10
1.4.1	Requirements	10
1.5	Dialog Structure of the EtherNet/IP generic EDS Adapter DTM.....	11
1.5.1	General Device Information.....	12
1.5.2	Navigation Area	12
1.5.3	Dialog Panes	13
1.5.4	OK, Cancel, Apply and Help.....	13
1.5.5	Status Bar	14
2	GETTING STARTED	15
2.1	Configuration Steps for non-modular Adapter Devices	15
2.2	Configuration Steps for modular Adapter Devices	16
3	CONFIGURATION	18
3.1	Overview Configuration	18
3.2	Configuring Parameters of the non-modular Adapter Device.....	19
3.3	Configuring Parameters of the modular Adapter Device	20
3.4	General	22
3.5	Modules (modular DTM).....	23
3.6	Electronic Keying	25
3.7	Connection	27
3.7.1	Select Connection	27
3.7.2	Connection settings	27
3.7.3	Connection Parameters.....	30
4	DEVICE DESCRIPTION.....	35
4.1	Overview Description	35
4.2	EDS Viewer.....	35
5	APPENDIX	36
5.1	User Rights	36
5.1.1	Configuration, Description	36

Introduction	3/40
5.2	References..... 36
5.3	List of Figures 37
5.4	List of Tables..... 37
5.5	Glossary 38
5.6	Contacts..... 40

1 Introduction

1.1 About this Manual

Read in this manual, how to use the **EtherNet/IP generic - modular generic EDS Adapter DTM** to configure within a FDT Framework the device parameters of a non-modular EtherNet/IP Adapter device or of a modular EtherNet/IP Adapter device, which are described with EDS files. To perform the configuration procedure the **EtherNet/IP generic - modular generic EDS Adapter DTM** is inserted in a network project to the Master busline of an EtherNet/IP Scanner DTM. The User Interface of the DTM looks for the

- **non-modular** EtherNet/IP Adapter devices from an EDS file like an **EtherNet/IP generic EDS Adapter DTM**

and for the

- **modular** EtherNet/IP Adapter devices from an EDS file like an **EtherNet/IP modular generic EDS Adapter DTM**.

1.1.1 Descriptions of the Dialog Panes

The table below gives an overview for the individual dialog panes descriptions:

Section	Subsection	Manual Page
Configuration	Overview Configuration	18
	General	22
	Modules (modular DTM) (for modular DTM only)	23
	Electronic Keying	25
	Connection	27
Description	EDS Viewer	35

Table 1: Descriptions Dialog Panes

1.1.2 Online Help

The EtherNet/IP generic - modular generic EDS Adapter DTM contains an integrated online help facility.

- To open the online help, click on **Help** or press **F1**.

1.1.3 List of Revisions

Index	Date	Version	Chapter	Revisions
5	17-02-24	1.1000	1.4.1	Section <i>Requirements</i> Internet access added, Windows 8.1 and Windwos 10 added.
6	14.02.18	1.1000		Versioning information revised (title page and this section).

Table 2: List of Revisions

1.1.4 Conventions in this Manual

Notes, operation instructions and results of operation steps are marked as follows:

Notes



Important: <important note you must follow to avoid malfunction>



Note: <general note>



<note, where to find further information>

Operation Instructions

1. <instruction>

2. <instruction>

or

➤ <instruction>

Results

⇒ <result>

Language Convention for EtherNet/IP

The EtherNet/IP specification defines the term "Scanner" instead of "Master" and "Adapters" instead of "Slave".

The short term "EtherNet/IP generic EDS Adapter DTM" is used in the textual descriptions of these manual instead of the full term "EtherNet/IP generic - modular generic EDS Adapter DTM".

1.2 Legal Notes

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- Nuclear fusion processes in nuclear power plants;
- Medical devices used for life support and
- Vehicle control systems used in passenger transport

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Costs of support, maintenance, customization and product care

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All other mentioned trademarks are property of their respective legal owners.

1.4 About EtherNet/IP Generic Adapter DTM from EDS File

You can use the **EtherNet/IP generic - modular generic EDS Adapter DTM** to configure within a FDT Framework the device parameters of a non-modular EtherNet/IP Adapter device or of a modular EtherNet/IP Adapter device, which are described with EDS files.

To perform the configuration insert the **EtherNet/IP generic - modular generic EDS Adapter DTM** in the network project to the Master busline of the EtherNet/IP Scanner DTM.

1.4.1 Requirements

System Requirements

- PC with 1 GHz processor or higher
- Windows® XP SP3,
Windows® Vista (32-Bit) SP2,
Windows® 7 (32-Bit and 64-Bit) SP1,
Windows® 8 (32-Bit and 64-Bit),
Windows® 8.1 (32-Bit and 64-Bit),
Windows® 10 (32-Bit and 64-Bit)
- Administrator privilege required for installation
- Internet Explorer 5.5 or higher
- RAM: min. 512 MByte, recommended 1024 MByte
- Graphic resolution: min. 1024 x 768 pixel
- Keyboard and Mouse
- Restriction: Touch screen is not supported.



Note: If the project file is used on a further PC,

- this PC must also comply with the above system requirements,
- the device description files of the devices used in the project must be imported into the configuration software SYCON.net on the new PC,
- and the DTMs of the devices used in the project must also be installed on that further PC.

Requirements EtherNet/IP Generic EDS Adapter DTM

To configure an EtherNet/IP Adapter device or a modular EtherNet/IP Adapter device with the EtherNet/IP generic EDS Adapter DTM the following requirements must be accomplished:

- Installed FDT/DTM V 1.2 compliant frame application,
- Installed EtherNet/IP Scanner DTM,
- EDS file of the devices to configure,
- The DTM must be loaded to the device catalog.

Loading EDS files

To add devices to the **netDevice** device catalog, the EDS file of the used device must be imported via **netDevice** menu **Network > Import Device Descriptions** into the EDS folder of the DTM. Then the Device Cataloge must be reloaded.

The folder EDS inclusively Windows® XP is located in the application data directory (All Users) of the configuration software (or from with Windows® 7 on in the *C:\ProgramData\SYCONnet* directory).



For further information refer to section *Configuration Steps for non-modular Adpater Devices* on page 15 , under step 1 and 2.

1.5 Dialog Structure of the EtherNet/IP generic EDS Adapter DTM

The graphical user interface of the DTM is composed of different areas and elements listed hereafter:

1. A header area containing the **General Device Information**,
2. The **Navigation Area** (area on the left side),
3. The **Dialog Pane** (main area on the right side),
4. **OK, Cancel, Apply, Help**,
5. The **Status Line** containing information e. g. the online-state of the DTM.

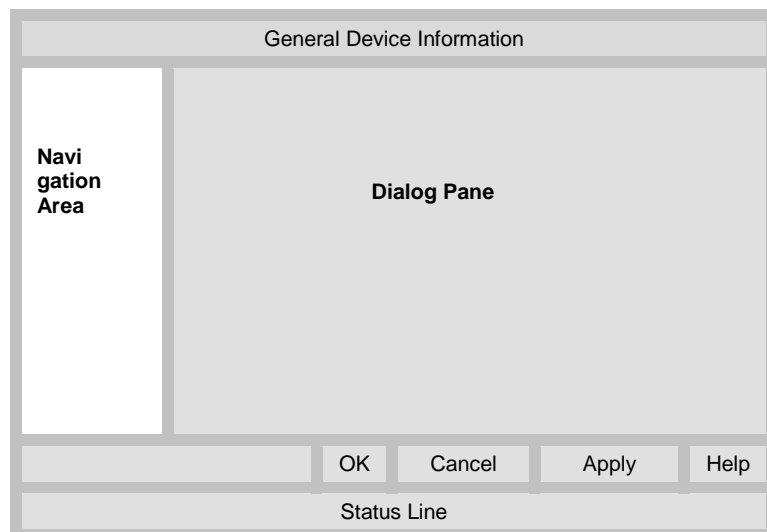


Figure 1: Dialog Structure of EtherNet/IP generic EDS Adapter DTM

1.5.1 General Device Information

Parameter	Meaning
IO Device	Name of the device
Vendor	Vendor name of the device
Device ID	Identification number of the device
Vendor ID	Identification number of the vendor

Table 3: General Device Information

1.5.2 Navigation Area

The **Navigation Area** contains folders and subfolders to open the dialog panes of the DTM.

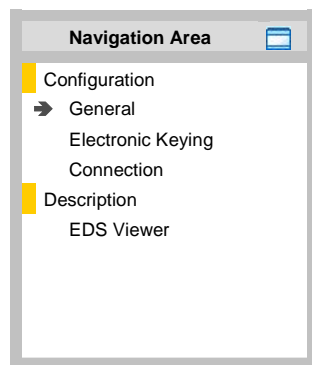


Figure 2: Navigation Area

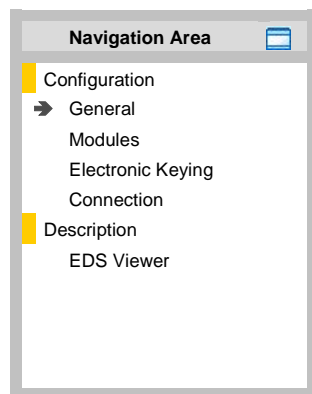


Figure 3: Navigation Area (modulare DTM)

- Select the required folder and subfolder.
- The corresponding Dialog pane is displayed.

Hide / display Navigation

	Hiding the navigation area (above right side).
Show navigation area	Opening the navigation area (below left side).

1.5.3 Dialog Panes

At the dialog pane the **Configuration** or **Description** panes are opened via the corresponding folder in the navigation area.

Configuration	
General	On the pane General EtherNet/IP Adapter information is displayed. For further information, refer to section <i>General</i> on page 22.
Modules (modular DTM only)	At the Modules page the modules can be configured. For further information, refer to section <i>Modules (modular DTM)</i> on page 23.
Electronic Keying	At the Electronic Keying pane for online validation of adapters an electronic keying method can be selected and the keying can be configured. For further information, refer to section <i>Electronic Keying</i> on page 25.
Connection	At the Connection pane the connection can be parameterized. For further information, refer to section <i>Connection</i> on page 27.
Description	
EDS Viewer	By use of the EDS-Viewer an EDS file can be searched through. Further information to this you find in section <i>EDS Viewer</i> on page 35.

Table 4: Overview Dialog Panes

1.5.4 OK, Cancel, Apply and Help

OK, Cancel, Apply and Help you can use as described hereafter.

	Meaning
OK	To confirm your latest settings, click OK . All changed values will be applied on the frame application database. <i>The dialog then closes.</i>
Cancel	To cancel your latest changes, click Cancel . Answer to the safety query Configuration data has been changed. Do you want to save the data? by Yes , No or Cancel . Yes: The changes are saved or the changed values are applied on the frame application database. <i>The dialog then closes.</i> No: The changes are <u>not</u> saved or the changed values are not applied on the frame application database. <i>The dialog then closes.</i> Cancel: <i>Back to the DTM.</i>
Apply	To confirm your latest settings, click Apply . All changed values will be applied on the frame application database. <i>The dialog remains opened.</i>
Help	To open the DTM online help, click Help .

Table 5: OK, Cancel, Apply and Help

1.5.5 Status Bar

The **Status Bar** displays information about the current state of the DTM. The current activity, e.g. the DTM connection state, is signaled graphically via icons in the status bar.

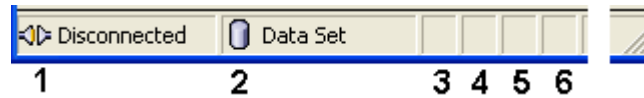


Figure 4: Status Bar – Status Fields 1 to 6






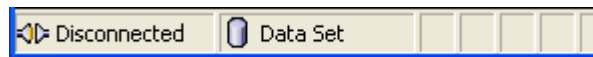
Status Field	Icon / Meaning	
1	DTM Connection States	
		Connected: Icon closed = Device is online
		Disconnected: Icon opened = Device is offline
2	Data Source States	
		Data set: The displayed data are read out from the instance data set (database).
		Device: The displayed data are read out from the device.
3	States of the instance Date Set	
		Valid Modified: Parameter is changed (not equal to data source).

Table 6: Status Bar Icons [1]

Offline State



Online State

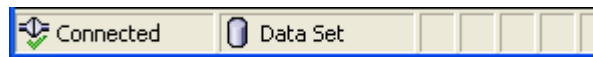



Figure 5: Status Bar Display Example

2 Getting Started

2.1 Configuration Steps for non-modular Adpater Devices

The following table describes the steps to configure a non-modular EtherNet/IP Adapter device with the EtherNet/IP generic EDS Adapter DTM as it is typical for many cases. At this time it is presupposed that the EtherNet/IP Scanner DTM installation was already done.

The overview lists all the steps in a compressed form. For detailed descriptions of each step refer to the sections noted in the column For detailed information see section.

#	Step	Short Description	For detailed information see section	Page
1	Add Ether-Net/IP generic EDS Adapter DTM in the Device Catalog	Add the adapter DTM in the Device Catalog by importing the device description file to the Device Catalog. Depending of the FDT Container. For netDevice: - Network > Import Device Descriptions.	(See Operating Instruction Manual netDevice and netProject)	-
2	Load Device Catalog	Depending of the FDT Container: For netDevice: - select Network > Device Catalog , - select Reload Catalog.	(See Operating Instruction Manual netDevice and netProject)	-
3	Create new project /Open existing project	Depending of the frame application. For the configuration software: - select File > New or File > Open.	(See Operating Instruction Manual of the Frame Application)	-
4	Insert Scanner or Adapter device icon into configuration	Depending of the FDT Container. For netDevice: - in the Device Catalog click to the Scanner icon, - and insert the device icon via drag and drop to the Root line in the network view, - in the Device Catalog click to the Adapter device icon, - and insert the device icon via drag and drop to the Master bus line in the network view.	(See Operating Instruction Manual netDevice and netProject)	-
5	Configure EtherNet/IP Adapter device	<p>Configure the Adapter device:</p> <ul style="list-style-type: none"> - Double click to the device icon of the Adapter. - The EtherNet/IP generic EDS Adapter DTM configuration dialog is displayed. <p>In the Adapter DTM configuration dialog:</p> <ol style="list-style-type: none"> 1.) Select Configuration > Electronic Keying, - select the keying method* and if necessary - configure the keying paramters, 2.) Select Configuration > Connection, - select the connection, - make the Connection Settings* and - configure the Connection Parameters, Therefore - depending by the EDS file adapt the parameter value for the Instance ID, - adapt the parameter value for the Format, - adapt the parameter value for the Length. <div style="border: 1px solid black; padding: 5px; margin-top: 10px;">  <p>Note! When making the configuration of the Connection Parameters check each entry wether it must be changed.</p> </div> <p>- Close the Adapter DTM configuration dialog via OK.</p> <p>*In general the default values can be used.</p>	<p>Configuration Steps for non-modular Adpater Devices</p> <p>Electronic Keying</p> <p>Connection</p>	<p>15</p> <p>25</p> <p>27</p>

#	Step	Short Description	For detailed information see section	Page
6	Configuration Steps Scanner device	Configure device via EtherNet/IP Scanner DTM. Important: Enter the IP settings of the EtherNet/IP Adapter device.	(See <i>Operating Instruction Manual DTM for EtherNet/IP Scanner devices</i>)	-
7	Save project	Depending of the frame application. For the configuration software: - select File > Save .	(See <i>Operating Instruction Manual of the Frame Application</i>)	-

Table 7: Getting Started - Configuration Steps

2.2 Configuration Steps for modular Adapter Devices

The following table describes the steps to configure a modular EtherNet/IP Adapter device with the EtherNet/IP generic EDS Adapter DTM as it is typical for many cases. At this time it is presupposed that the EtherNet/IP Scanner DTM installation was already done.

The overview lists all the steps in a compressed form. For detailed descriptions of each step refer to the sections noted in the column For detailed information see section.

#	Step	Short Description	For detailed information see section	Page
1	Add EtherNet/IP generic EDS Adapter DTM in the Device Catalog	Add the adapter DTM in the Device Catalog by importing the device description file to the Device Catalog. Depending of the FDT Container. For netDevice: - Network > Import Device Descriptions .	(See <i>Operating Instruction Manual netDevice and netProject</i>)	-
2	Load Device Catalog	Depending of the FDT Container: For netDevice: - select Network > Device Catalog , - select button Reload Catalog .	(See <i>Operating Instruction Manual netDevice and netProject</i>)	-
3	Create new project /Open existing project	Depending of the frame application. For the configuration software: - select File > New or File > Open .	(See <i>Operating Instruction Manual of the Frame Application</i>)	-
4	Insert Scanner or Adapter device icon into configuration	For netDevice: - in the Device Catalog click to the Scanner icon, - and insert the device icon via drag and drop to the line in the network view, - in the Device Catalog click to the Adapter device icon, - and insert the device icon via drag and drop to the Scanner bus line in the network view.	(See <i>Operating Instruction Manual netDevice and netProject</i>)	-
5	Configure modular EtherNet/IP Adapter device	Configure the modular Adapter device: - Double click to the device icon of the Adapter. - The EtherNet/IP generic EDS Adapter DTM configuration dialog is displayed. In the Adapter DTM configuration dialog: 1.) Select Configuration > Modules , - select the chassis, - add a modul, - set the Slot Number and the Module Name , - add and configure all required Modules.	<i>Configuration Steps for modular Adapter Devices</i> <i>Modules (modular DTM) (for modular DTM only)</i>	16 23



#	Step	Short Description	For detailed information see section	Page
5	Configure modular EtherNet/IP Adapter device (continued)	 Note! For identic adapter modules create the module configuration for keying and connection first <u>once</u> and then copy and paste it via Copy Module / Paste Module .	<i>Electronic Keying</i>	25
		<p>For each Module:</p> <p>2.) Select Configuration > Electronic Keying,</p> <ul style="list-style-type: none"> - select the module, - select the keying method* <p>and if necessary</p> <ul style="list-style-type: none"> - configure the keying paramters, <p>3.) Select Configuration > Connection,</p> <ul style="list-style-type: none"> - select the module, - select the connection, - make the Connection Settings* and - configure the Connection Parameters, <p>Therefore</p> <ul style="list-style-type: none"> - depending by the EDS file adapt the parameter value for the Instance ID, - adapt the parameter value for the Format, - adapt the parameter value for the Length.  Note! When making the configuration of the Connection Parameters check each entry wether it must be changed.	<i>Connection</i>	27
6	Configuration Steps Scannner device	Configure device via EtherNet/IP Scanner DTM. Important: Enter the IP settings of the EtherNet/IP Adapter device.	(See Operating Instruction Manual DTM for EtherNet/IP Scanner devices)	-
7	Save project	Depending of the frame application. For the configuration software: - select File > Save .	(See Operating Instruction Manual of the Frame Application)	-

Table 8: Getting Started - Configuration Steps

3 Configuration

3.1 Overview Configuration

Configuration Dialog Panes

The table below gives an overview for the **Configuration** dialog panes descriptions:

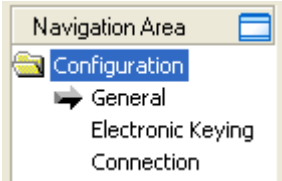
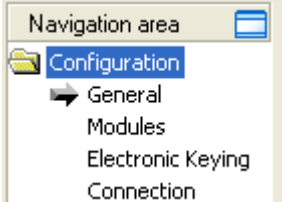
EtherNet/IP Adapter DTM	Folder Name / Section	Page
 <p>Navigation Area – Configuration (EtherNet/IP Generic EDS Adapter DTM)</p>	General	22
	Modules (modular DTM) (for modular DTM only)	23
	Electronic Keying	25
	Connection	27
 <p>Navigation Area - Configuration (EtherNet/IP Modular Generic EDS Adapter DTM)</p>		

Table 9: Descriptions of the Dialog Panes Configuration



Notice the descriptions in the section *Configuration Steps for non-modular Adapter Devices* on page 15 and in the section *Configuration Steps for modular Adapter Devices* on page 16 .

3.2 Configuring Parameters of the non-modular Adapter Device

The following steps are required to configure the parameters of the non-modular EtherNet/IP Adapter device using the EtherNet/IP generic EDS Adapter DTM:

Electronic Keying

1. Select the **Keying Method** and configure the keying parameters if necessary.
 - Open the EtherNet/IP generic EDS Adapter DTM configuration dialog via a double click to the device icon of the Adapter.
 - Select **Configuration > Electronic Keying** in the navigation area.
 - Select the **Keying Method**
- and
- configure the keying parameters if necessary.

In general the default value „No Keying“ can be used.

Connection

2. Configure the **Connection**.
 - Select **Configuration > Connection** the navigation area.
 - Make the **Connection Settings**.

In general the default values can be used.

- Configure the **Connection Parameters**.
 - Depending by the EDS file adapt the parameter value for the **Instance ID**,
 - Adapt the parameter value for the **Format**,
 - Adapt the parameter value for the **Length**.



Note! When making the configuration of the Connection Parameters check each entry whether it must be changed.

Close Adapter DTM Configuration Dialog

3. Click **OK** in order to close the EtherNet/IP generic EDS Adapter DTM configuration dialog and to store your configuration.

Further Information



For more information refer to section *Electronic Keying* on page 25 and to section *Connection* on page 27.

3.3 Configuring Parameters of the modular Adapter Device

The following steps are required to configure the parameters of the modular EtherNet/IP Adapter device using the EtherNet/IP generic EDS Adapter DTM:

Modules

1. Configure the modules of the modular EtherNet/IP Adapter.

For a modular EtherNet/IP Adapter device, you must create the module configuration for keying and connection for each module. For identic adapter modules you can create the module configuration for keying and for the connect once, and then copy and paste it multiple times.

- Open the EtherNet/IP generic EDS Adapter DTM configuration dialog via a double click to the device icon of the Adapter.
- Select **Configuration > Modules** in the navigation area.
- Select the chassis.
- Add a modul.
- Set the **Slot Number** and the **Module Name**.



Note! For identic adapter modules create the module configuration for keying and connection first once and then copy and paste it via **Copy Module / Paste Module**.

For each Module

For modular EtherNet/IP Adapter devices you must perform the configuration for keying and connection for each module.

Electronic Keying

2. Select the **Keying Method** and configure the keying paramters if necessary.
 - Select **Configuration > Electronic Keying** in the navigation area.
 - Select the module via **Select Module**.
 - Select the **Keying Method**
- and
- configure the keying paramters if necessary.

In general the default value „No Keying“ can be used.

Connection

3. Configure the **Connection**.
 - Select **Configuration > Connection** the navigation area.
 - Select the module via **Select Module**.
 - Make the **Connection Settings**.
- In general the default values can be used.
- Configure the **Connection Parameters**.

- Depending by the EDS file adapt the parameter value for the **Instance ID**,
- Adapt the parameter value for the **Format**,
- Adapt the parameter value for the **Length**.



Note! When making the configuration of the Connection Parameters check each entry whether it must be changed.

Close the Adapter DTM Configuration Dialog

- Close the EtherNet/IP generic EDS Adapter DTM configuration dialog via **OK**.

Further Information



For more information refer to section *Modules (modular DTM)* on page 23t, to section *Electronic Keying* on page 25 and to section *Connection* on page 27.

3.4 General

The **General** dialog pane shows the **Description** of the EtherNet/IP Adapter device. The **IP Address** is set by the EtherNet/IP Scanner DTM.

To show the current device settings:

- Select **Configuration > General** in the navigation area.

Figure 6: Configuration > General

Parameter	Meaning
Description	Symbolic Name of the EtherNet/IP Adapter device.
IP Settings of the EtherNet/IP Adapter device	
IP Address	<p>The IP address of the EtherNet/IP Adapter device is set in the EtherNet/IP Scanner DTM. Here it is only displayed.</p> <p>The EtherNet/IP Scanner device transmits the IP address of the EtherNet/IP Adapter during startup via the EtherNet/IP network to the EtherNet/IP Adapter and thereby configures the EtherNet/IP Adapter.</p>

Table 10: General Pane Parameters

3.5 Modules (modular DTM)

In the EtherNet/IP modular generic EDS Adapter DTM at the **Modules** pane the modules of the modular EtherNet/IP Adapter can be configured.

- Select **Configuration > Modules** in the navigation area.

Modules

List of Chassis: Flex 8 slot chassis

Slots in Rack: 9

Configure modules:

Slot	Width	Module name	Revision	Vendor
0	1	1794-AENT FLEX I/O Ethernet Adapter	V4.1	Allen-Bradley
1	1	16 Point 24V DC Input, Sink 1793-IB16/A	V1.1	Allen-Bradley
2	1	10 Input/6 Output 24V DC, Sink/Source 179	V1.1	Allen-Bradley
3	1	16 Point 24V DC Input, Sink 1793-IB16/A	V1.1	Allen-Bradley
4	1	16 Point 24V DC Input, Sink 1793-IB16/A	V1.1	Allen-Bradley
5	1	10 Input/6 Output 24V DC, Sink/Source 179	V1.1	Allen-Bradley
6	1	16 Input/16 Output 24V DC, Sink/Protected	V1.1	Allen-Bradley
7	1	16 Point 24V DC Input, Sink 1793-IB16/A	V1.1	Allen-Bradley
8	1	8 Channel 24V DC Non-Isolated Voltage/Cul	V1.1	Allen-Bradley
		10 Input/6 Output 24V DC, Sink/Source 179	V1.1	Allen-Bradley

Add module Remove module Copy module Paste module

Modules

List of Chassis: Flex 8 slot chassis

Slots in Rack: 9

Configure modules:

Slot	Width	Module name	Revision	Vendor
0	1	1794-AENT FLEX I/O Ethernet Adapter	V4.1	Allen-Bradley
1	1	16 Point 24V DC Input, Sink 1793-IB16/A	V1.1	Allen-Bradley
2	1	10 Input/6 Output 24V DC, Sink/Source 179	V1.1	Allen-Bradley
3	1	16 Point 24V DC Input, Sink 1793-IB16/A	V1.1	Allen-Bradley
4	1	16 Point 24V DC Input, Sink 1793-IB16/A	V1.1	Allen-Bradley
5				
6				
7				
8				

Figure 7: Configuration > Modules Pane (modular DTM)

The top window **Modules** displays for the chassis selected the maximum possible number of inserted modules. The **Module Name** can be chosen from a list. In the bottom window some modules are deleted. Under **Slot** the non-configured slots can be selected.



Parameter	Meaning
List of Chassis	Displays the chassis which can be selected.
Slots in Rack	The total number of slots in rack depends by the selected chassis. By the number of slots in rack the number of modules which can be added to a device configuration is fixed.
Configure Modules	
Slot (editable) 	Shows the current Slot number assigned to a module. When clicking the slot field, the drop-down-list of the Slot numbers is displayed. Slot numbers marked by the key symbol can not be edited.
Width	Width of the module
Module name (editable) 	Textual modul name Module names marked by the key symbol can not be edited.
Revision	Revision of the EDS file for the module
Vendor	Vendor name of the EDS file for the module
'Add module'	Use Add Module to add a module to the device configuration.
'Remove module'	Use Remove Module to remove the selected module from the configuration.
'Copy module'	Use Copy module to copy the selected module.
'Paste module'	Use Paste module to add the copied module once more to the device configuration.

Table 11: Modules Pane Parameters

Further configuration steps:

- Select the chassis.
- Add a modul.
- Set the **Slot Number** and the **Module Name**.



Note! For identic adapter modules create the module configuration for keying and connection first once and then copy and paste it via **Copy Module / Paste Module**.

3.6 Electronic Keying

The concept of **Electronic Keying** was introduced by Allen-Bradley, RA. EtherNet/IP scanner implements compatible concept.

A set of attributes of an EtherNet/IP Adapter can be regarded as its electronic identity which can be used to differentiate adapters based on these attributes. EtherNet/IP scanner employs this electronic identity to build an **Electronic Key** and uses it to verify that an adapter connected to the network is the expected one. **Electronic keying** allows flexible online validation of adapters, provides a method for reliable network configuration.

Attributes of the electronic identity that can be used in keying are as follows: Minor Revision, Major Revision, Product Code, Product Type and Vendor ID.

- Select **Configuration > Electronic Keying** in the navigation area.

Figure 8: Configuration > Electronic Keying (Example)

EtherNet/IP Modular Generic Adapter DTM:

Figure 9: Configuration > Electronic Keying (Example modular DTM)

- Select a Module (only for modular Adapter devices).

Action	Meaning
Select module (modular DTM only)	For modular EtherNet/IP Adapter first in the modular generic Adapter DTM a module must be selected to allow to parameterize the electronic keying parameters.

Table 12: Electronic Keying > Select module (only for modular Adapter devices)

- Select a **Keying method**.

For modular EtherNet/IP Adapter devices you must set the keying method for each module.

Method	Meaning
Exact match	To validate an EtherNet/IP adapter connected to the network all attributes for the electronic identity must correspond to the attributes of an expected device.
Custom keying	To validate an EtherNet/IP adapter connected to the network all attributes must correspond to the configured keying.
No keying	No validation of the device identity.

Table 13: Electronic Keying > Keying Method

In general the default value „No Keying“ can be used.

For Custom Keying:

- Select **Custom Keying** and configure the keying attributes.

Parameter	Meaning
Relaxed Match	If checked: Restricted validation of the electronic identity for devices. To indicate relaxed match to an adapter, the scanner sets bit 7 in major revision.
Minor Revision	If checked: For electronic keying consistency to minor revision is relevant and gets verified.
Major Revision	If checked: For electronic keying consistency to major revision is relevant and gets verified.
Product Code	If checked: For electronic keying consistency to product code is relevant and gets verified.
Product Type	If checked: For electronic keying consistency to product type is relevant and gets verified.
Vendor	If checked: For electronic keying consistency to vendor ID is relevant and gets verified.

Table 14: Electronic Keying > Custom Keying

3.7 Connection

At the **Connection** pane the connection can be parameterized. For modular EtherNet/IP Adapter devices you must parameterize the connection for each module.

3.7.1 Select Connection

- Open **Configuration > Connection**.
- Under **Select Connection** select a connection.

Selection	Meaning	Range of Value / Value
Select Connection	Select Connection contains the connections with the name from the EDS file.	[Connection1] + name from EDS, [ConnectionN] + name from EDS, (N = 1, 2, ... 65535), Default: [Connection1] + name from EDS

Table 15: Select Connection

3.7.2 Connection settings

- Select the **Connection settings** tab.

The screenshot shows the 'Connection' configuration window. At the top, the 'Select connection' dropdown is set to '[Connection1] Discrete Exclusive Owner'. Below this, the 'Connection settings' tab is selected, displaying various configuration options. The 'Help string' is 'Discrete Exclusive Owner Connection'. Under 'Trigger and Transport', 'Transport type' is 'Exclusive-Owner' and 'Trigger mode' is 'Cyclic'. The 'Originator to Target' section includes 'Connection type' (POINT2POINT), 'Priority' (Scheduled), 'RT transfer format' (32-bit run/idle header), and 'Size' (2 bytes). The 'Target to Originator' section includes 'Connection type' (MULTICAST), 'Priority' (Scheduled), 'RT transfer format' (32-bit run/idle header), and 'Size' (12 bytes).

Figure 10: Connection Settings (Example)

Connection

Select module: <Slot 1> 16 Point 24V DC Input, Sink 1793-IB16/A

Select connection:: [Connection1] Exclusive Owner

Connection settings | Connection parameters

Help string: Exclusive Owner Connection

Trigger and Transport

Transport type: Exclusive-Owner

Trigger mode: Cyclic

Originator to Target

Connection type: POINT2POINT

Priority: Scheduled

RT transfer format: 32-bit run/idle header

Size: 0 bytes

Target to Originator

Connection type: MULTICAST

Priority: Scheduled

RT transfer format: Connection is pure data and is modeless

Size: 8 bytes

Figure 11: Connection Settings (Example modular DTM)

Parameter	Meaning	Range of Value / Value
Help string	Help String is a textual information note from the EDS file, which can be added for „help string“.	
Trigger and Transport		
Transport Type	Under Transport Type only one transport type can be set.	Listen-Only, Input-Only, Exclusive-Owner, Redundant-Owner
Trigger Mode	For Trigger Mode only “Cyclic” trigger mode is supported. Not supported are the trigger-mode “event” and the trigger-mode “application”.	Cyclic
Originator to Target Connection settings for the connection from the Originator to the Target: O->T		
Connection Type	The Connection Type is the connection type used to transfer the output data from the originator to the target, i. e. from the Scanner to the Adapter.	POINT2POINT, MULTICAST, NULL
Priority	For Priority only the priority “Scheduled” is supported. The values “High” and “Low” are not supported.	Scheduled

Parameter	Meaning	Range of Value / Value
RT transfer format	RT transfer format is the real time transfer format for the output data.	Connection is pure data and is modeless, Use zero data length to indicate idle mode, Heartbeat, 32-bit run/idle header, Safety
Size	Size is the size of the output data sent from the Scanner to the Adapter in Bytes. The size may be a fixed value or be defined by a parameter under Connection parameters > O->T > Size > Parameter value .	For "fixed size" no range is defined or the range is defined by the min. value and the max. value of a parameter.
Target to Originator Connection settings for the connection from the Target to the Originator: T->O		
Connection Type	The Connection Type is the connection type used to transfer the input data from the target to the originator, i. e. from the Adapter to the Scanner.	POINT2POINT, MULTICAST, NULL
Priority	For Priority only the priority "Scheduled" is supported. The values "High" and "Low" are not supported.	Scheduled
RT transfer format	RT transfer format is the real time transfer format for the input data.	Connection is pure data and is modeless, Use zero data length to indicate idle mode, Heartbeat, 32-bit run/idle header, Safety
Size	Size is the size of the input data sent from the Adapter to the Scanner in Bytes. The size may be a fixed value or be defined by a parameter under Connection parameters > T-> O > Size > Parameter value .	For "fixed size" no range is defined or the range is defined by the min. value and the max. value of a parameter.

Table 16: Parameters Connection Settings



Run/Idle Mode for Realtime Transfer Format: The Run/Idle header is a 32-bit field, added to packets flowing in the O->T or T->O direction. In O->T direction the run/idle field contains several bits of status information. Of primary interest is the "least significant bit", which reflects the mode of the connection originator. If the "least significant bit" is set, the originator is in Run mode, actively monitoring the inputs and the outputs. If the "least significant bit" is cleared the originator is in Idle mode, without monitoring the inputs and the outputs. The run/idle field is not counted as part of the configured data size in the EDS Connection Manager section. The run/idle field is counted in the FwdOpen Message O->T and in the FwdOpen Message T->O sizes however.

3.7.3 Connection Parameters

- Select the **Connection parameters** tab.

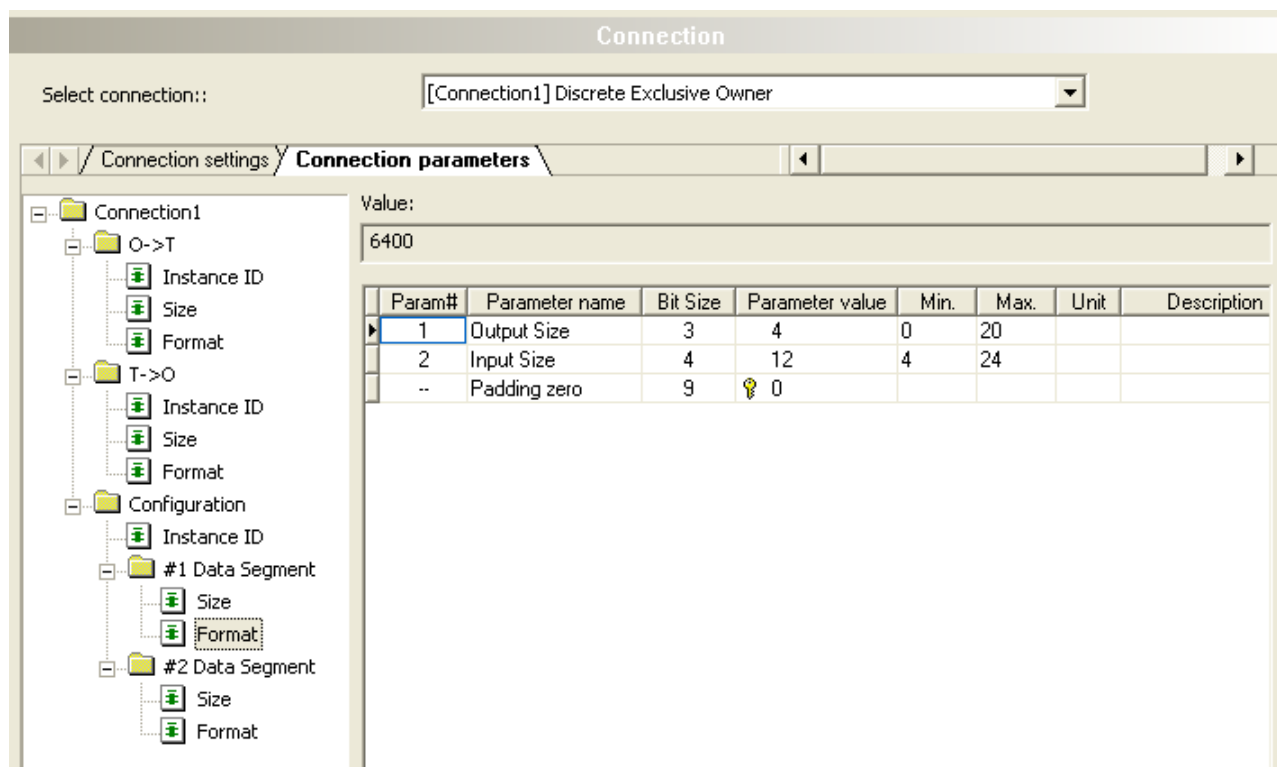


Figure 12: Connection Parameters (Example)

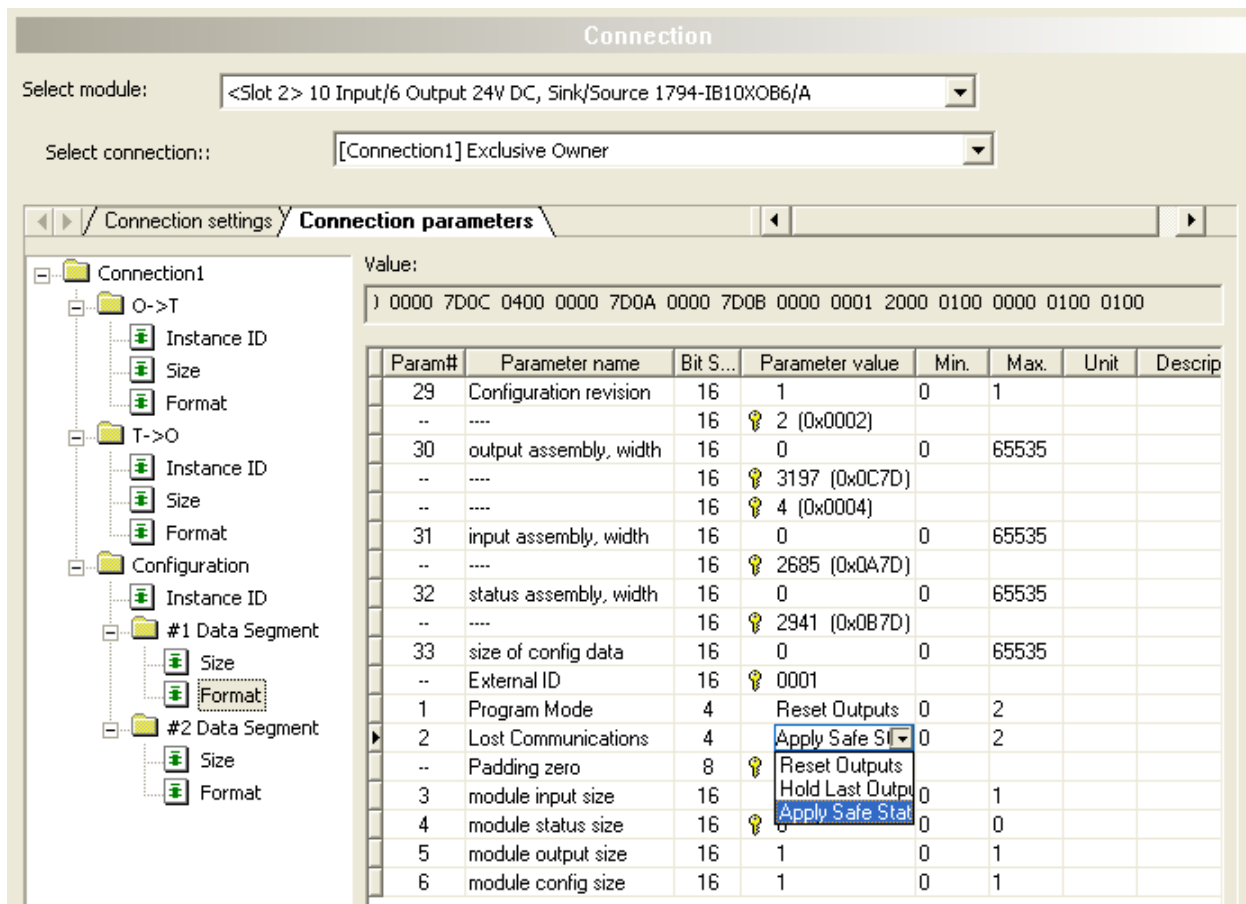


Figure 13: Connection Parameters (Example)

➤ Select in the tree structure (left side) the director for the connection parameters; for example:

- For **O->T** or **T->O**: each **Instance ID**, **Size** or **Format**

Or depending by EDS also:

- For **Configuration**: **Instance ID** or **#1 Data Segment** or **#2 Data Segment** each with **Size** or **Format**

➤ Configure the Connection Parameters.






- Depending by the EDS file adapt the parameter value for the **Instance ID**,
- Adapt the parameter value for the **Format**,
- Adapt the parameter value for the **Length**,



Note! When making the configuration of the Connection Parameters check each entry whether it must be changed.

In general the default values can be used.

Detailed descriptions on the parameters you find in the subsequent given table.

Parameter	Meaning	Range of Value / Value
Tree Structure (left side)		
Connection [No.]	Connection is the selected connection.	Connection1 to Connection N, (N = 1, 2, ... 65535),
O->T For the connection from the Originator to the Target: O->T [=Originator to Target]		
Instance ID	Instance ID is the assembly instance ID of the consumer connection point.	1-255
Size	<p>Size is the size of the output data sent from the Scanner to the Adapter in Bytes. The size may be a fixed value or can be defined by a parameter in the configuration dialog.</p> <div>  <p>Note: If the size is defined as 0 in the EDS file, the O->T entry and its children entries will not be shown in the tree structure .</p> </div>	For "fixed size" no range is defined or the range is defined by the min. value and the max. value of a parameter.
Format	Format defines the structure of the consumer buffer for this connection.	
T->O For the connection from the Target to the Originator: T->O [=Target to Originator]		
Instance ID	Instance ID is the assembly instance ID of the producer connection point.	1-255
Size	<p>Size is the size of the input data sent from the Adapter to the Scanner in Bytes. The size may be a fixed value or can be defined by a parameter in the configuration dialog.</p> <div>  <p>Note: If the size is defined as 0 in the EDS file, the T->O entry and its children entries will not be shown in the tree structure.</p> </div>	For "fixed size" no range is defined or the range is defined by the min. value and the max. value of a parameter.
Format	Format defines the structure of the producer buffer for this connection.	
Configuration For the optional configuration data segment		
Instance ID	<p>Instance ID is the assembly instance ID of the configuration.</p> <div>  <p>Note: If the both sizes of the #1 data segment and the #2 data segment are defined as 0 in the EDS file, the configuration entry and its children entries will not be shown in the tree structure .</p> </div>	1-255
#1 Data Segment For the optional data segment #1		
Size	<p>Size is the size of the <u>configuration</u> data segment #1 in Bytes. The size may be a fixed value or can be defined by a parameter in the configuration dialog.</p> <div>  <p>Note: If the size of the #1 data segment is defined as 0 in the EDS file, the configuration entry and its children entries will not be shown in the tree structure .</p> </div>	For "fixed size" no range is defined or the range is defined by the min. value and the max. value of a parameter.
Format	Format is the format of the data segment #1. Format defines the structure and the value of the configuration data segment #1 buffer. The format may contain a list of parameters. The user can set the values in the configuration dialog to get different settings. For example he can define the types and ranges of signals, specify the output state during a communication fault etc.	
#2 Data Segment For the optional data segment #2		
Size	<p>Size is the size of the <u>configuration</u> data segment #2 in Bytes. The size may be a fixed value or can be defined by a parameter in the configuration dialog.</p> <div>  <p>Note: If the size of the #2 data segment is defined as 0 in the EDS file, the configuration entry and its children entries will not be shown in the tree structure .</p> </div>	For "fixed size" no range is defined or the range is defined by the min. value and the max. value of a parameter.


Parameter	Meaning	Range of Value / Value
Format	Format is the format of the data segment #2. Format defines the structure and the value of the configuration data segment #2 buffer. The format may contain a list of parameters. The user can set the values in the configuration dialog to get different settings. For example he can define the types and ranges of signals, specify the output state during a communication fault etc.	
Dialog window (right side)		
Value	Value is the value for the selected Instance ID, Size or Format in the tree structure.	
Param#	Param# is the number of the parameter from the EDS file.	N = 1, 2, ... 65535
Parameter name	Parameter name is the textual parameter name from the EDS file.	
Bit Size	Bit Size is the used parameter length in the data buffer in Bit.	
Parameter value (editable)	Parameter value is the value of the parameter. The parameter value can be entered as a numerical value or can be picked from a selection list.  Parameter values marked by the key symbol can not be edited.	
Min. value	Min. value is the minimum parameter value.	
Max. value	Max. value is the maximum parameter value.	
Unit	Unit is the textual displayed unit from the EDS file.	
Description	Description is the textual help string from the EDS file.	

Table 17: Parameters Connection parameters (Example)



Note for O->T, T->O and for Configuration: If the **Format** field and the **Size** field are not empty and if the **Size** field is smaller than the **Format** field, the least significant bytes of the **Format** field shall be used. If the **Format** field and the **Size** field are not empty and if the **Size** field is larger than the **Format** field, the entire **Format** field shall be followed by zero pads to extend the **Format** field to the size of the **Size** field.

3.7.3.1 Support for Epath Alignment

The option **Support for 16-Bit and 32-Bit Epath Alignment** allows if required that the 32-Bit alignment can be chosen. The 16-Bit alignment conforms to the default setting.

Requirement: Only if the EDS file includes the “Configuration” element, the **EPATH alignment** option is available and accessible.

- To open the pane ‘Connection parameters, support for Epath alignment’, select the **Connection parameters** tab.
- Select in the tree structure (left side) **Configuration**.

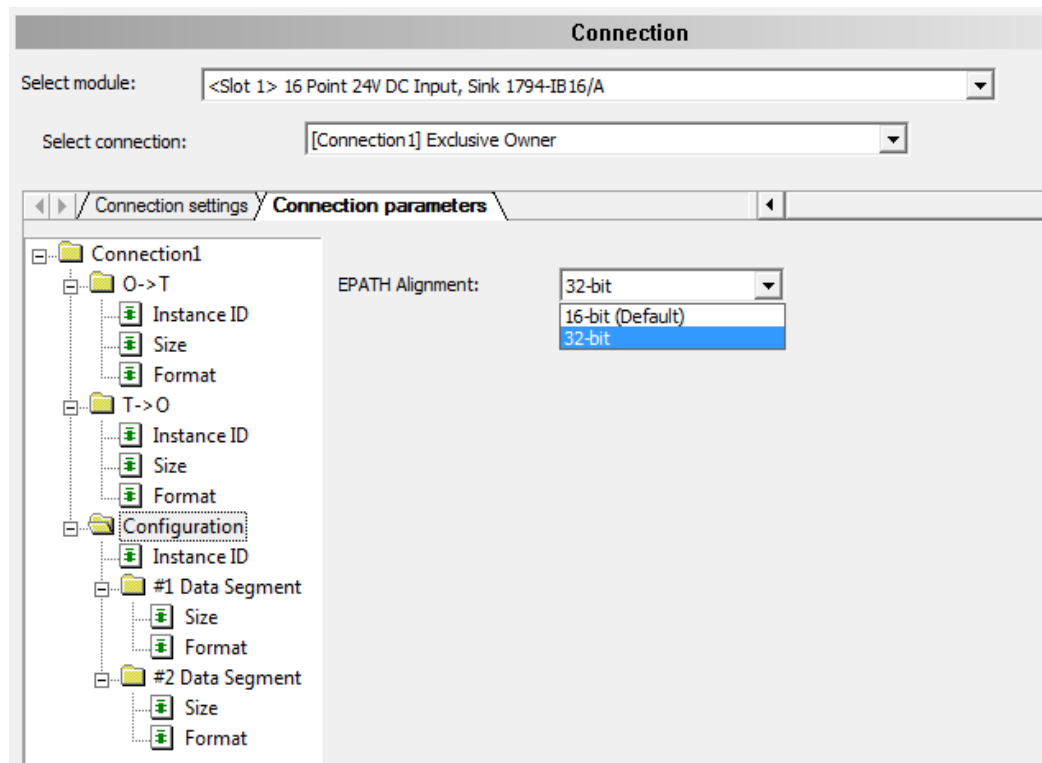


Figure 14: Connection Parameters / Epath Alignment (Example)

Parameter	Meaning	Range of Value / Value
Epath Alignment	<p>For modules with a 32-bit alignment more padding bits (zeros) are required than for default 16-bit alignment.</p> <p>The data length including padding corresponds with 16- or 32-bit always to a value from the series:</p> <ul style="list-style-type: none"> - 16-bit: 2, 4, 6, 8 bit ... - 32-bit: 4, 8, 12, 16 bits ... <p>Example Padding (Zeros) at</p> <ul style="list-style-type: none"> - 16-bit: Packing (data) 5 bit + padding (zero) 1 bit = 6 bits - 32-bit: Packing (data) 5 bit + padding (zero) 3 bits = 8 bits 	16-Bit (Default), 32-Bit

Table 18: Parameters Connection Parameters / Epath Alignment (Example)



All other descriptions of the dialog window **Connection parameters** (with support for 16- or 32-bit EPATH alignment), see section *Connection Parameters* on page 30 .

4 Device Description

4.1 Overview Description

Description Dialog Panes

The table below gives an overview for the individual **Description** dialog panes descriptions:

Subsection	Manual Page
EDS Viewer	35

Table 19: Descriptions of the Description Panes

4.2 EDS Viewer

The **EDS Viewer** shows the content of the EDS file in a text view.

Under **Filename** the file directory path and the file name of the displayed EDS file are shown. **Find what** offers a search feature to search for text contents within the text of the EDS file.

In the EDS Viewer window on the left side, the line number is displayed for simple overview, the further entries show the EDS file in text format.

Parameter	Meaning
Filename	File directory path and the file name of the displayed EDS file.
Find what	Place to enter text to search for text contents within the text of the EDS file.
Find Next	Continue search.
Match case	Search option
Match whole word	Search option

Table 20: Device Description – EDS Viewer

5 Appendix

5.1 User Rights

User-rights are set within the FDT-container. Depending on the level the configuration is accessible by the user or read-only.

To access the **Configuration** and **Description** panes of the generic EtherNet/IP EDS Adapter DTM you do not need special user rights.



Note: To edit, set or configure the parameters of the **Configuration** and **Description** panes, you need user rights for *Maintenance*, for *Planning Engineer* or for *Administrator*.

The following tables give an overview of the user right groups and which user rights you need to configure the single parameters.

5.1.1 Configuration, Description

	Observer	Operator	Maintenance	Planning Engineer	Administrator
<i>Configuration</i>					
<i>General</i>	D	D	X	X	X
<i>Connection</i>	D	D	X	X	X
<i>Electronic Keying</i>	D	D	X	X	X
<i>Description</i>					
<i>EDS Viewer</i>	D	D	X	X	X

Table 21: Configuration Description (D = Displaying, X = Editing, Configuring)

5.2 References

- [1] Device Type Manager (DTM) Style Guide, Version 1.0 ; FDT-JIG - Order No. <0001-0008-000>
- [2] EtherNet/IP Adapter Protocol API Manual, Revision 12, Hilscher GmbH 2013
- [3] The CIP Networks Library, Volume 1, Common Industrial Protocol. Ed. 3.8, April, 2010

5.3 List of Figures

Figure 1: Dialog Structure of EtherNet/IP generic EDS Adapter DTM	11
Figure 2: Navigation Area	12
Figure 3: Navigation Area (modulare DTM)	12
Figure 4: Status Bar – Status Fields 1 to 6	14
Figure 5: Status Bar Display Example	14
Figure 6: Configuration > General	22
Figure 7: Configuration > Modules Pane (modular DTM)	23
Figure 8: Configuration > Electronic Keying (Example)	25
Figure 9: Configuration > Electronic Keying (Example modular DTM)	25
Figure 10: Connection Settings (Example)	27
Figure 11: Connection Settings (Example modular DTM)	28
Figure 12: Connection Parameters (Example)	30
Figure 13: Connection Parameters (Example)	31
Figure 14: Connection Parameters / Epath Alignment (Example)	34

5.4 List of Tables

Table 1: Descriptions Dialog Panes	4
Table 2: List of Revisions	4
Table 3: General Device Information	12
Table 4: Overview Dialog Panes	13
Table 5: OK, Cancel, Apply and Help	13
Table 6: Status Bar Icons [1]	14
Table 7: Getting Started - Configuration Steps	16
Table 8: Getting Started - Configuration Steps	17
Table 9: Descriptions of the Dialog Panes Configuration	18
Table 10: General Pane Parameters	22
Table 11: Modules Pane Parameters	24
Table 12: Electronic Keying > Select module (only for modular Adapter devices)	26
Table 13: Electronic Keying > Keying Method	26
Table 14: Electronic Keying > Custom Keying	26
Table 15: Select Connection	27
Table 16: Parameters Connection Settings	29
Table 17: Parameters Connection parameters (Example)	33
Table 18: Parameters Connection Parameters / Epath Alignment (Example)	34
Table 19: Descriptions of the Description Panes	35
Table 20: Device Description – EDS Viewer	35
Table 21: Configuration Description (D = Displaying, X = Editing, Configuring)	36

5.5 Glossary

CIP

Common Industrial Protocol (Control and Information Protocol)

DHCP

Dynamic Host Configuration Protocol

DNS

Domain Name Service.

DTM

Device Type Manager.

The Device Type Manager (DTM) is a software module with graphical user interface for the configuration or for diagnosis of device.

EDS

An Electronic Data Sheet (EDS) provides information necessary to access and alter the configurable parameters of a device. An Electronic Data Sheet (EDS) is an external file that contains information for the device.

EPATH

Encoded Path

Data type under the Common Industrial Protocol [3]

A path can be represented in two different formats, as a Padded EPATH and a Packed EPATH.

EtherNet/IP

EtherNet/Industrial Protocol (CIP on Ethernet)

EtherNet/IP Scanner

A Scanner exchanges real-time I/O data with Adapters and Scanners. This type of node can respond to connection requests and can also initiate connections on its own.

EtherNet/IP-Adapter

An Adapter emulates functions provided by traditional rack-adapter products. This type of node exchanges real-time I/O data with a Scanner Class product. It does not initiate connections on its own.

FDT

Field Device Tool

FDT specifies an interface, in order to be able to use DTM (Device Type Manager) in different applications of different manufacturers.

TCP/IP

Transmission Control Protocol / Internet Protocol

UDP

User Datagram Protocol

5.6 Contacts

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