



Operating Instruction Manual
DTM for Hilscher Sercos Master Devices
Configuration of Hilscher Master Devices

Hilscher Gesellschaft für Systemautomation mbH

www.hilscher.com

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1 Introduction

1.1 About this Manual

This manual provides information on how to set and configure the device parameters of a netX based Sercos Master device using the Sercos Master DTM, and what can be read from the diagnosis panes.

1.1.1 Descriptions of the Dialog Panes

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

Section	Subsection	Page
<i>Settings</i>	<i>Overview Settings</i>	29
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Table 1: Descriptions Dialog Panes

1.1.2 Online Help

The Sercos Master 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	Component	Chapter	Revision
8	15-10-22	1.5.x.x, 1.5.x.x	SIIMasterDTM.dll SIIMasterGUI.ocx	2, 3.2, 4.5, 5.6, 6	Safety information added throughout the document.: Chapter <i>Safety</i> , section <i>Safety Messages on Firmware or Configuration Download</i> , section <i>Firmware Download</i> and further safety messages according to firmware and configuration download. Section <i>Process Data</i> revised. Chapter <i>Online Functions</i> : Note 'Getting Access to SYCON.net Online Functions' added and safety messages according to firmware and configuration download.
9	17-02-17	1.1000.x.x, 1.1000.x.x	SIIMasterDTM.dll SIIMasterGUI.ocx	1.4.1	Section <i>Requirements</i> Internet access added, Windows 8.1 and Windwos 10 added. Terminology adapted to current Sercos convention ("sercos" => "Sercos").

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>

Positions in Figures

The *Positions* ①, ②, ③ ... or ①, ②, ③ ... or ①, ②, ③ ... refer to the figure used in that section. If the numbers reference to a section outside the current section then a cross reference to that section and figure is indicated.

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1.4 About Sercos Master DTM

You can use the Sercos Master DTM to configure the Sercos Master device within a FDT Framework.

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 und 64-Bit) SP1,
Windows® 8 (32-Bit und 64-Bit),
Windows® 8.1 (32-Bit und 64-Bit),
Windows® 10 (32-Bit und 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 another PC,

- the other PC must also comply to these system requirements,
- the device description files of the devices used in the project must be imported to the configuration software SYCON.net on the other PC,
- respectively the DTMs of the devices used in the project must be installed on the other PC.

Requirements Sercos Master DTM

To configure the Sercos Master device with the Sercos Master DTM the following requirements have to be accomplished:

- Completed hardware installation of a netX based DTM-compatible Sercos Master device, inclusive loaded firmware, license and loaded cifX configuration file
- Installed FDT/DTM V 1.2 compliant frame application
- Loaded DTM in the Device Catalog of the FTD Framework



Note: If the Sercos Master DTM and the Sercos Master device are installed on the same PC, the **cifX Device Driver** must be installed on that PC, as you can connect the DTM to the device.



For more information to the hardware installation, please refer to the corresponding **User Manual** of your device.

To get information on how to order and to download the license to the device, please refer to section *Licensing* on page 91.

1.5 Dialog Structure of the Sercos Master 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.

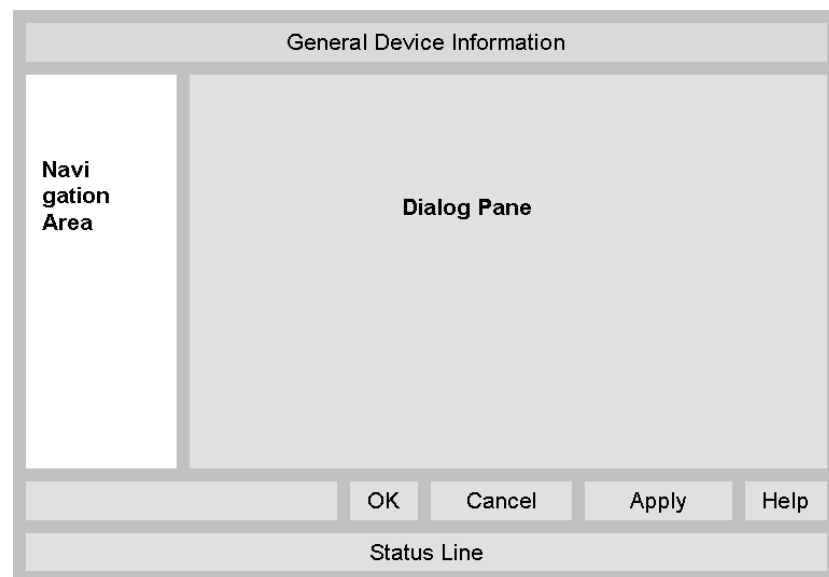


Figure 1: Dialog Structure of the Sercos Master DTM

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 2: General Device Information

1.5.2 Navigation Area

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

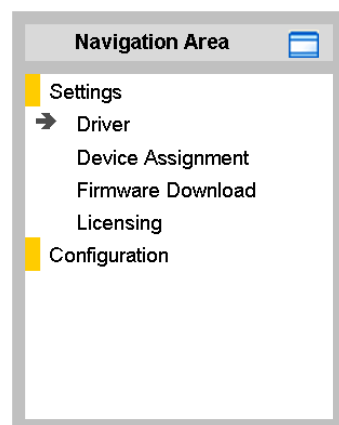


Figure 2: Navigation Area

- 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 **Settings**, **Configuration**, **Diagnosis/Extended Diagnosis** or the **Tools** panes are opened via the corresponding folder in the navigation area.

Settings	
Driver	To establish a connection from the Sercos Master DTM to the Sercos Master device, on the pane Driver you can verify if the default driver is checked and respectively check another driver or multiple drivers. For further information, refer to section <i>Driver</i> on page 32.
Device Assignment	On the pane Device Assignment you select the device and assign the device to the driver. For further information, refer to section <i>Device Assignment</i> on page 41.
Firmware Download	The dialog on the pane Firmware Download is used to load a new firmware into the device. A detailed description can be found in section <i>Firmware Download</i> on page 47.
Licensing	Using the license dialog, you can order licenses for Master protocols or Utilities and download them to your device. A detailed description can be found in section <i>Licensing</i> on page 91.
Configuration	
General Settings	The General Settings pane displays general Sercos Master information. For more information, refer to section <i>General Settings</i> on page 57.
Master Settings	The Master Settings pane allows to adjust important device related settings for the master. For more information, refer to section <i>Master Settings</i> on page 63.
Slave Table	The Slave Table pane informs about the slaves connected to the master and their settings. For more information, refer to section <i>Slave Table</i> on page 67.
Process Data	The Process Data serves for the Sercos Master DTM as an external process data interface. For further information, refer to section <i>Process Data</i> on page 70.
Address Table	The Address Table shows a list of all DPRAM addresses used in the process data image. For further information, refer to section <i>Address Table</i> on page 70.
Diagnosis	
Diagnosis/ Extended Diagnosis	At the Diagnosis panes information can be read for troubleshooting. For further information, refer to section <i>Overview Diagnosis</i> on page 104 or section <i>Overview Extended Diagnosis</i> on page 110.
Tools	
Packet Monitor/ IO Monitor/ Process Image Monitor	Under Tools the Packet Monitor and the IO Monitor are provided for test and diagnosis purposes. For further information, refer to section <i>Packet Monitor</i> on page 124, section <i>IO Monitor</i> on page 127 or section <i>Process Image Monitor</i> on page 128.

Table 3: Overview Dialog Panes



Note: Accessing the **Diagnosis** panes of the Sercos Master DTM requires an online connection from the Sercos Master DTM to the Sercos Master device.



For further information, refer to section *Connecting/Disconnecting Device* on page 74.

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 4: OK, Cancel, Apply and Help

1.5.5 Table Lines

In the DTM dialog pane table lines can be selected, inserted or deleted.

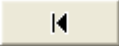





	Meaning
	To select the first line of a table use First Line .
	To select the previous line of a table use Previous Line .
	To select the next line of a table use Next Line .
	To select the last line of a table use Last Line .
	Create a new Line inserts new lines into the table.
	Delete selected Line deletes the selected line from the table.

Table 5: Selecting, inserting, deleting Table Line

1.5.6 Status Bar

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

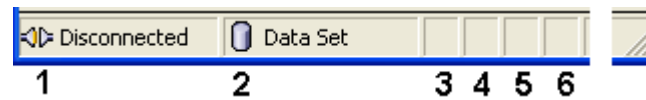
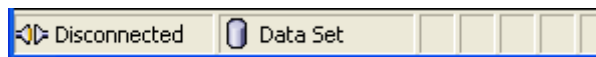


Figure 3: Status Bar – Status Fields 1 to 6

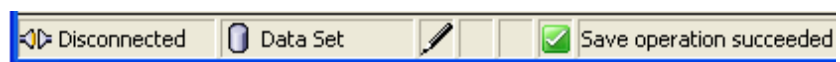
Status Field	Icon / Meaning	
1	DTM Connection States	
		Connected: Icon closed = Device is online
		Disconnected: Icon opened = Device is offline
2	Data Source States	
		Data set: The displayed data are read out from the instance data set (database).
		Device: The displayed data are read out from the device.
3	States of the instance Date Set	
		Valid Modified: Parameter is changed (not equal to data source).
4	Changes directly made on the Device	
		Load/configure diagnosis parameters: Diagnosis is activated.
6	Device Diagnosis Status	
		Save operation succeeded: The save operation has been successful. Further messages due to successful handling of device data.
		Firmware Download: Firmware Download is running
		Save operation failed: The save operation has failed. Further fail operation messages due to incorrect communication due to malfunction in the field device or its peripherals.

Table 6: Status Bar Icons [1]

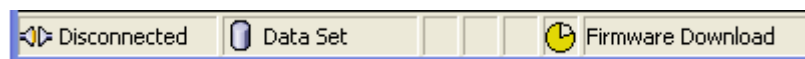
Offline State



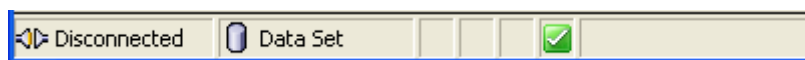
Save operation succeeded



Firmware Download



Firmware Download successful



Online State and Diagnosis

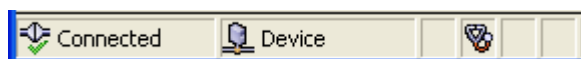


Figure 4: Status Bar Display Examples

2 Safety

2.1 General Note

The documentation in the form of a user manual, an operating instruction manual or other manual types, as well as the accompanying texts have been created for the use of the products by educated personnel. When using the products, all Safety Messages, Integrated Safety Messages, Property Damage Messages and all valid legal regulations must be obeyed. Technical knowledge is presumed. The user has to assure that all legal regulations are obeyed.

2.2 Intended Use

The Sercos Master DTM serves for configuration and diagnosis of Sercos Master devices.

2.3 Personnel Qualification

Personnel responsible for the application of the network system shall be aware of the system behavior and shall be trained in using the system.

2.4 Personal Injury

To ensure your own personal safety and to avoid personal injury, you necessarily must read, understand, and comply with the safety instructions and safety messages in this manual before you configure your system.

2.4.1 Communication Stop

If you perform a firmware download or a configuration download via the Sercos Master DTM be aware of the following:

- Together with the firmware download, an automated device reset is performed that will interrupt all network communications and established connections will drop.
- If you attempt to download the configuration during bus operation, the communication between Master and Slaves is stopped.
- Unexpected equipment operation may cause personal injury.
- Stop the application program before starting upgrading the firmware or downloading the configuration.
- Make sure that your equipment operates under conditions that prevent personal injury. All network devices should be placed in a fail-safe mode before upgrading the firmware or downloading a configuration.

You find the description about the firmware download in section *Firmware Download* on page 47 and about the configuration download in section *Download Configuration* on page 84.

2.4.2 Mismatching System Configuration

Mismatching system configuration loaded into the device could result in faulty data mapping in the application program and thus unexpected equipment operation may cause personal injury.

2.5 Property Damage

To avoid property damage respectively device destruction and damage to your system or to your equipment, you necessarily must read, understand, and comply with the safety instructions and safety messages in this manual before you configure your system.

2.5.1 Communication Stop

If you perform a firmware download or a configuration download via the Sercos Master DTM be aware of the following:

- Together with the firmware download, an automated device reset is performed that will interrupt all network communications and established connections will drop.
- If you attempt to download the configuration during bus operation, the communication between Master and Slaves is stopped.

Damage of Equipment

- Unexpected equipment operation may cause property damage.
- Stop the application program before starting upgrading the firmware or downloading the configuration.
- Make sure that your equipment operates under conditions that prevent property damage. All network devices should be placed in a fail-safe mode before upgrading the firmware or downloading a configuration.

Loss of Device Parameters

- Both the firmware download and the configuration download erase the configuration data base. The firmware download overwrites the existing firmware in the network device.
- Device parameters that have not been saved non-volatile are getting lost during the reset.
- To complete the firmware update and to make the device operable again, re-download the configuration when the firmware update has been finished.

2.5.2 Invalid Firmware

Loading invalid firmware files could render your module unusable.

2.5.3 Mismatching System Configuration

Mismatching system configuration loaded into the device could result in faulty data mapping in the application program and thus unexpected equipment operation may cause damage of equipment.

2.6 Labeling of Safety Messages

- The **Section Safety Messages** at the beginning of a chapter are pinpointed particularly and highlighted by a signal word according to the degree of endangerment. The kind of danger is specified exactly by the safety message text
- The **Integrated Safety Messages** within an instruction description are highlighted with a signal word according to the degree of endangerment. The kind of danger is specified exactly by the safety message text.




Signal Word	Meaning (international)	Meaning (USA)
 DANGER	Indicates a direct hazard with high risk, which will have as consequence death or grievous bodily harm if it isn't avoided.	Indicates a Hazardous Situation Which if not Avoided, will Result in Death or Serious Injury.
 WARNING	Indicates a possible hazard with medium risk, which will have as consequence death or (grievous) bodily harm if it isn't avoided.	Indicates a Hazardous Situation Which if not Avoided, could Result in Death or Serious Injury.
 CAUTION	Indicates a minor hazard with medium risk, which could have as consequence simple battery if it isn't avoided.	Indicates a Hazardous Situation Which if not Avoided, may Result in Minor or Moderate Injury.

Table 7: Signal Words in Safety Messages on Personal Injury


Signal Word	Meaning (international and USA)
 NOTICE	Indicates a Property Damage Message.

Table 8: Signal Words in Safety Messages on Property Damage

In this document all Safety Instructions and Safety Messages are designed according both to the international used safety conventions as well as to the ANSI Z535.6 standard, refer to reference safety [S1].

In this document the signal words 'WARNING', 'CAUTION' and 'NOTICE' are used according to ANSI Z535.6 standard. The meaning given in ISO/IEC 26514 [S4] section '11.11 Contents of warnings and cautions' is not relevant in this manual.

2.7 References Safety

- [S1] ANSI Z535.6-2006 American National Standard for Product Safety Information in Product Manuals, Instructions, and Other Collateral Materials
- [S4] 26514-2010 - IEEE Standard for Adoption of ISO/IEC 26514:2008 Systems and Software Engineering--Requirements for Designers and Developers of User Documentation




3 Getting started

3.1 Configuration Steps

The following overview provides to you the step sequence on how to configure a netX based Sercos Master device with Sercos Master DTM as it is typical for many cases. At this time it is presupposed that the hardware installation was 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 Sercos Slave in the Device Catalog	Add the Slave 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 Master or Slave into configuration	Depending of the FDT Container: For netDevice: - in the Device Catalog click to the Master, - and insert the device via drag and drop to the line in the network view, - in the Device Catalog click to the Slave*, - and insert the device via drag and drop to the Master bus line in the network view. (*This step won't be necessary if the network structure is scanned automatically. See step 17.)	(See Operating Instruction Manual netDevice and netProject)	-
5	Open the Master DTM configuration dialog	Open the Master DTM configuration dialog. - Double click to the device icon of the Master. - The Master DTM configuration dialog is displayed.	-	-

#	Step	Short Description	For detailed information see section	Page
6	Verify or adapt Driver Settings	<p>In the Master DTM configuration dialog: - select Settings > Driver.</p> <p> Note! For PC cards cifX the cifX Device Driver is preset as a default driver. For all the other Hilscher devices the netX Driver is preset as a default driver.</p> <ul style="list-style-type: none"> • Use the cifX Device Driver if the Sercos Master DTM is installed on the same PC as the Sercos Master device. • Use the netX Driver to establish a USB, Serial (RS232) or TCP/IP connection from the Sercos Master DTM to the Sercos Master device. • The 3SGateway Driver for netX (V3.x) is used only in relationship with CODESYS. <p>To search for devices you can check one or multiple drivers simultaneously.</p> <p>- Verify that the default driver is checked. - If necessary, check another driver or multiple drivers.</p>	<p><i>Settings for Driver and Device Assignment and Driver</i></p>	<p>30</p> <p>32</p>
7	Configure Driver	<p>If you use the netX Driver, you respectively must configure it.</p> <p>For netX Driver and communication via TCP/IP set the IP address of the device: - Select Settings > Driver > netX Driver > TCP Connection. - Via  add an IP range. - Under IP Address enter the IP Address of the device or an IP range. - Click Save.</p> <p>Adjust the driver parameters netX Driver USB/RS232 only if they differ from the default settings.</p> <p> Note!</p> <ul style="list-style-type: none"> • The cifX Device Driver requires no configuration. • The configuration of the 3SGateway Driver for netX (V3.x) is carried out via the CODESYS surface. 	<p><i>Configuring netX Driver</i></p>	<p>35</p>
8	Assign Master device (with or without firmware)	<p>Assign the device to this driver.</p> <p>In the Master DTM configuration dialog: - select Settings > Device Assignment, - select a Master device (with or without firmware), - therefore check the appropriate checkbox, - select Apply.</p>	<p><i>Selecting the Device (with or without firmware)</i></p>	<p>44</p>

#	Step	Short Description	For detailed information see section	Page
9	Select and download firmware	<p>If not yet a firmware was loaded to the device:</p> <ul style="list-style-type: none"> - Adhere to the necessary safety precautions to prevent personnel injury and property damage that may occur in consequence of a communication stop. <p>In the Master DTM configuration dialog:</p> <ul style="list-style-type: none"> - select Settings > Firmware Download, - select Browse.., - select a firmware file, - select Open, - select Download and Yes. 	<p><i>Safety Messages on Firmware or Configuration Download</i></p> <p><i>Firmware Download</i></p>	<p>27</p> <p>47</p>
10	Assign Master device once more (with firmware and system channel) <i>For repeated download this step is omitted.</i>	<p>In the Master DTM configuration dialog:</p> <ul style="list-style-type: none"> - select Settings > Device Assignment, - select Scan, - select the Master device (with loaded and defined system channel), - therefore check the appropriate checkbox, - select Apply, - close the Master DTM configuration dialog via OK. 	<i>Selecting the Device once more (with Firmware)</i>	45
11	Configure Slave device	<p>Configure the Slave device.</p> <ul style="list-style-type: none"> - Double click to the device icon of the slave. - The Slave DTM configuration dialog is displayed. <p>In the Slave DTM configuration dialog:</p> <ul style="list-style-type: none"> - select Configuration > General, - set the Watchdog control and Interval, - select Configuration > Electronic Label, - check device-specific information, - select Configuration > FSP IO, - set the module Parameters, - Select Configuration > FSP Drives, - perform detailed parameterization, - close the Slave DTM configuration dialog via OK. 	<i>(See Operating Instruction Manual Generic Slave DTM for Sercos Slave Devices)</i>	-
12	Configure Master device	<p>Configure the Master device.</p> <ul style="list-style-type: none"> - Double click to the device icon of the Master. - The Master DTM configuration dialog is displayed. <p>In the Master DTM configuration dialog:</p> <ul style="list-style-type: none"> - select Configuration > General Settings, - set the general parameters, - select Configuration > Master Settings, - set the master settings, - select Configuration > Slave Table, - configure slave-specific settings, - select Configuration > Process data, - set symbolic names for the configured modules or signals. - select Configuration > Address table, - set the device address, if necessary, - close the Master DTM configuration dialog via OK. 	<p><i>Configuring Device Parameters</i></p> <p><i>General Settings</i></p> <p><i>Master Settings</i></p> <p><i>Slave Table</i></p> <p><i>Process Data</i></p> <p><i>Address Table</i></p>	<p>56</p> <p>57</p> <p>63</p> <p>67</p> <p>70</p> <p>71</p>
13	Save project	<p>Depending of the frame application.</p> <p>For the configuration software:</p> <ul style="list-style-type: none"> - select File > Save. 	<i>(See Operating Instruction Manual of the Frame Application)</i>	-

#	Step	Short Description	For detailed information see section	Page
14	Connect Master device	Depending of the FDT Container. For netDevice: - right click to the device icon of the Master, - select Connect .	<i>Connecting/Disconnecting Device</i>	74
15	Licensing	How to order licenses later and how to transfer them to the device.	<i>Licensing</i>	91
16	Download Configuration	- Adhere to the necessary safety precautions to prevent personnel injury and property damage that may occur in consequence of a communication stop or in consequence of a mismatching system configuration. Depending of the FDT Container. For netDevice: - right click to the device icon of the Master, - select Download .	<i>Safety Messages on Firmware or Configuration Download</i> <i>Download Configuration</i>	27 84
17	Network Scan	As an alternative to manually configure the Slave device, you can automatically scan the network structure by using the context menu Network Scan . Therefore proceed the following steps: 1. Start the Network Scan function. 2. Make the settings in the Scan Response of Device dialog. 3. Create devices. 4. Download of the Device configuration to the Master device (Download).	<i>Network Scan</i>	76
18	Diagnosis	Depending of the FDT Container. For netDevice: - right click to the device icon of the Master, - select Diagnosis . - The Master DTM diagnosis dialog is displayed. (1) Check whether the communication is OK: Diagnosis > General Diagnosis > Device status "Communication" must be green! (2) "Communication" is green: Open the IO Monitor and test the input or output data. (3) "Communication" is not green: Use Diagnosis and Extended diagnosis for troubleshooting. - close the Master DTM diagnosis dialog via OK .	<i>Overview Diagnosis</i>	104
19	IO Monitor	Depending of the FDT Container: For netDevice: - right click to the device icon of the Master, - select Diagnosis , - select Tools > IO Monitor . - Check the input or output data, - close the IO Monitor dialog via OK .	<i>IO Monitor</i>	127
20	Disconnect	Depending of the FDT Container. For netDevice: - right click to the device icon of the Master, - select Disconnect .	<i>Connecting/Disconnecting Device</i>	74

Table 9: Getting started - Configuration Steps

3.2 Safety Messages on Firmware or Configuration Download

If you perform a firmware download or a configuration download via the Sercos Master DTM adhere to the necessary safety precautions to prevent personnel injury and property damage that may occur in consequence of a communication stop or in consequence of a mismatching system configuration. Also invalid or non-authorized firmware can damage your device.

Personnel Injury



Communication Stop

- Together with the firmware download, an automated device reset is performed that will interrupt all network communications and established connections will drop.
- If you attempt to download the configuration during bus operation, the communication between Master and Slaves is stopped.
- Unexpected equipment operation may cause personal injury.
- Stop the application program before starting upgrading the firmware or downloading the configuration.
- Make sure that your equipment operates under conditions that prevent personal injury. All network devices should be placed in a fail-safe mode before upgrading the firmware or downloading a configuration.

Mismatching System Configuration

- Mismatching system configuration loaded into the device could result in faulty data mapping in the application program and thus unexpected equipment operation may cause personal injury.
-

For more refere to next page.

Property Damage

NOTICE**Communication Stop**

- Together with the firmware download, an automated device reset is performed that will interrupt all network communications and established connections will drop.
- If you attempt to download the configuration during bus operation, the communication between Master and Slaves is stopped.

Damage of Equipment

- Unexpected equipment operation may cause property damage.
- Stop the application program before starting upgrading the firmware or downloading the configuration.
- Make sure that your equipment operates under conditions that prevent property damage . All network devices should be placed in a fail-safe mode before upgrading the firmware or downloading a configuration.

Loss of Device Parameters

- Both the firmware download and the configuration download erase the configuration data base and overwrites the existing firmware in the device.
- Device parameters that have not been saved non-volatile such as a temporary IP address are getting lost during the reset.
- Before you initiate firmware or a configuration download make sure that your project configuration data are saved non-volatile in order to prevent loss of configuration data.
- To complete the update and to make the device operable again, please re-download the configuration when this operation has finished.

Invalid or non-authorized Firmware

- Loading invalid or non authorized firmware files could render your module unusable. Only proceed with a authorized firmware update.

Mismatching System Configuration

- Mismatching system configuration loaded into the device could result in faulty data mapping in the application program and thus unexpected equipment operation may cause property damage.
-

4 Settings

4.1 Overview Settings

Settings Dialog Panes

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

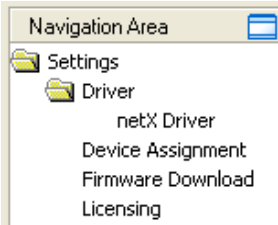
Sercos Master DTM	Folder Name / Section	Subsection	Manual Page
 <p>Navigation Area – Settings (Example)</p> <p>Additional drivers can be displayed.</p>	Driver		32
		Verify or adapt Driver Settings	32
		cifX Device Driver	34
		netX Driver	34
		Configuring netX Driver	35
	Device Assignment		41
		Scanning for Devices	41
		Scanning for all Devices or for suitable only	43
		Selecting the Device (with or without firmware)	44
		Selecting the Device once more (with Firmware)	45
	Firmware Download		47
	Licensing		91

Table 10: Descriptions of the Dialog Panes Settings



Note: To edit the **Settings** dialog panes you need *User Rights* for “Maintenance”.



Notice the descriptions in the section *Settings for Driver and Device Assignment* on page 30.

To access to the online help with the descriptions of the drivers:

- Select **Settings > Driver > [Name of the assigned driver]**.
- Press the **F1** key.

4.2 Settings for Driver and Device Assignment

The following steps are needed to establish a connection from the Sercos Master DTM to the Sercos Master device:

Verifying or adapting Driver Settings

Verify the Driver Settings and adapt them if necessary.

1. Open the DTM configuration dialog.
 - In the FDT container **netDevice** double click to the Sercos Master device icon.
2. Verify that the default driver is checked and respectively check another or multiple drivers.
 - Select **Settings > Driver**.



Note! For PC cards cifX the **cifX Device Driver** is preset as a default driver. For all the other Hilscher devices the **netX Driver** is preset as a default driver.

- Use the **cifX Device Driver** if the Sercos Master DTM is installed on the same PC as the Sercos Master device.
- Use the **netX Driver** to establish an USB, Serial (RS232) or TCP/IP connection from the Sercos Master DTM to the Sercos Master device.
- The **3SGateway Driver for netX (V3.x)** is used only in relationship with CODESYS.

To search for devices on the network you can check one or multiple drivers simultaneously.

- Verify that the default driver for your device is checked.
- If necessary, check another driver or multiple drivers.

Configuring Driver



Note!

- The **cifX Device Driver** requires no configuration.
- The configuration of the **3SGateway Driver for netX (V3.x)** is carried out via the CODESYS surface.

If you use the **netX Driver**, you respectively must configure it.

3. Configure the **netX Driver** if necessary.

For the driver **netXDriver** an individual driver dialog window can be opened where you can configure the driver.

- Select **Settings > Driver > netX Driver**.
- For netX Driver and communication via TCP/IP set the IP address of the device.

Adjust the driver parameters **netX Driver USB/RS232** only if they differ from the default settings.

Assigning the Master device to the DTM

4. Scan for and select the devices (with or without firmware).

- Select **Settings > Device Assignment**.
- Under **Device selection** select *suitable only* or *all* and then **Scan**.
- In the table check the required devices.
- Select **Apply**.

Selecting and downloading the Firmware

5. If not yet a firmware was loaded to the device, select and download the firmware.
 - Select **Settings > Firmware Download**.
 - Select and download the firmware via **Download**.
 - Select **Apply**.
6. Scan for and select the devices (with firmware and defined system channel) once more.

For repeated download this step is omitted.

 - Select **Settings > Device Assignment**.
 - Select **Scan**.
 - In the table check the required device.
7. Close the DTM configuration dialog via **OK**.

Connecting the Device

8. In **netDevice** put a right-click on the Sercos Master device icon.
9. Select the **Connect** command from the context menu.
- 🔗 In the network view the device description at the device icon of the Master is displayed with a green colored background. The Sercos Master device now is connected to the Sercos Master DTM via an online connection.

Further Information



For descriptions about these steps refer to the sections following here-after.

4.3 Driver

The **Driver** dialog pane displays the drivers to be used for a Sercos Master DTM to establish a device communication connection.



Note! A **default driver** is set in the configuration software.

Driver			
	Driver	Version	ID
<input checked="" type="checkbox"/>	CIFX Device Driver	1.101.1.9801	{368BEC5B-0E92-4C0E-B4A9-64F62AE7AAFA}
<input type="checkbox"/>	3SGateway Driver for netX (V3.x)	0.9.1.2	{787CD3A9-4CF6-4259-8E4D-109B6A6BEA91}
<input type="checkbox"/>	netX Driver	1.103.2.5183	{B54C8CC7-F333-4135-8405-6E12FC88EE62}

Figure 5: Default Driver 'CIFX Device Driver' for PC cards cifX

Parameter	Meaning
Driver	Name of the driver (for more details see descriptions hereafter)
Version	ODMV3 Version of the respective driver
ID	ID of the driver (driver identification)

Table 11: Driver Selection List Parameters

To establish a connection from the Sercos Master DTM to the Sercos Master device, verify if the default driver is checked and respectively check another driver or multiple drivers.

4.3.1 Verify or adapt Driver Settings

Proceed as follows:

1. Select **Settings > Driver** in the navigation area.
- The **Driver** dialog pane is displayed with the available drivers and the setting for the default driver.

Driver			
	Driver	Version	ID
<input checked="" type="checkbox"/>	CIFX Device Driver	1.101.1.9801	{368BEC5B-0E92-4C0E-B4A9-64F62AE7AAFA}
<input type="checkbox"/>	3SGateway Driver for netX (V3.x)	0.9.1.2	{787CD3A9-4CF6-4259-8E4D-109B6A6BEA91}
<input type="checkbox"/>	netX Driver	1.103.2.5183	{B54C8CC7-F333-4135-8405-6E12FC88EE62}

Figure 6: Default Driver 'CIFX Device Driver' for PC cards cifX (example)

Driver			
	Driver	Version	ID
<input type="checkbox"/>	CIFX Device Driver	1.101.1.9801	{368BEC5B-0E92-4C0E-B4A9-64F62AE7AAFA}
<input type="checkbox"/>	3SGateway Driver for netX (V3.x)	0.9.1.2	{787CD3A9-4CF6-4259-8E4D-109B6A6BEA91}
<input checked="" type="checkbox"/>	netX Driver	1.103.2.5183	{B54C8CC7-F333-4135-8405-6E12FC88EE62}

Figure 7: Default Driver 'netX Driver' for Hilscher devices except for PC cards cifX (example)

2. Verify that the default driver is checked.
- Verify that the default driver for your device is checked.

Default Driver (Pre-settings in the Configuration Software): For PC cards cifX the **cifX Device Driver** is preset as a default driver. For all the other Hilscher devices the **netX Driver** is preset as a default driver.

3. Respectively check another driver.



Note! The driver used for the connection from the Sercos Master DTM to the Sercos Master device must be supported by the device and must be available for the device.

- Use the **cifX Device Driver** if the Sercos Master DTM is installed on the same PC as the Sercos Master device.
 - Use the **netX Driver** to establish a USB, Serial (RS232) or TCP/IP connection from the Sercos Master DTM to the Sercos Master device.
 - The **3SGateway Driver for netX (V3.x)** is used only in relationship with CODESYS. The version V3.x refers to the driver version defined by 3S-Smart Software Solutions GmbH.
- Check the checkbox for the driver in the selection list.

4. Respectively check multiple drivers.

To search for devices on the network you can check multiple drivers simultaneously.

Driver			
	Driver	Version	ID
<input checked="" type="checkbox"/>	CIFX Device Driver	1.101.1.9801	{368BEC5B-0E92-4C0E-B4A9-64F62AE7AAFA}
<input type="checkbox"/>	3SGateway Driver for netX (V3.x)	0.9.1.2	{787CD3A9-4CF6-4259-8E4D-109B6A6BEA91}
<input checked="" type="checkbox"/>	netX Driver	1.103.2.5183	{B54C8CC7-F333-4135-8405-6E12FC88EE62}

Figure 8: Manual Selection of multiple drivers (Example)

4.3.2 cifX Device Driver

In the Sercos Master DTM for the **cifX Device Driver** no driver dialog pane is available, since for the **cifX Device Driver** no driver settings are required.

The **cifX Device Driver** will be used if the Sercos Master DTM is installed in the same PC as the Sercos Master device.



Note: To establish a connection from a DTM to a Master device via the **cifX Device Driver**, the **cifX Device Driver** must be installed and the driver must have access to the Master device.

4.3.3 netX Driver

The **netX Driver** is used to connect the DTM to the device via different connection types. The DTM communicates with the device via an USB connection, a serial (RS232) connection or a TCP/IP connection. The **netX Driver** establishes

- via the USB interface of the device and the USB port of the PC an USB connection to the device,
- via the RS232 interface of the device and the COM port of the PC a serial connection (RS232) to the device
- and via Ethernet a TCP/IP connection to the device.

To connect the DTM to the physical layer of the device the **netX Driver** software works in combination with the software components:

- “USB/COM connector” for the USB connection and for the serial connection (RS232) and
- “TCP/IP connector” for the Ethernet connection.

4.3.4 Configuring netX Driver

The following steps are required to configure the netX Driver:

USB/RS232 Connection

To set the driver parameters for an USB/RS232 connection note:




Note: Adjust the driver parameters netX Driver USB/RS232 only if they differ from the default settings. After saving the changed driver parameters, these parameters are used for the device assignment when scanning devices.

For setting the driver parameters for an USB connection or a serial connection:

1. Select **Settings > Driver > netX Driver > USB/RS232 Connection**.
 - Set the driver netX Driver USB/RS232 parameters.

TCP/IP Connection

For setting the driver parameters for a TCP/IP connection:

1. Select **Settings > Driver > netX Driver > TCP Connection**.
2. Set IP Address of the device:
 - Add an IP Range via **Select IP Range** .
3. Under **IP Range Configuration > IP Address** enter the IP Address of the device (**Use IP Range** is unchecked).

Or

4. Set IP Range:
 - Check **Use IP Range**.
 - Under **IP Range Configuration > IP Address** enter the start address (left side) and the ending address of the IP scanning range (right side).
 5. Click **Save**, to save the IP address or the IP range.
- After saving the changed driver parameters, these parameters are used for the device assignment when scanning devices.

4.3.5 netX Driver - USB/RS232 Connection

The communication from the DTM to the device via an **USB/RS232 Connection** is used when the DTM is installed on a PC and between the PC and the device

- an USB connection
- or a serial connection (RS232) exists.

The DTM accesses the device via the USB interface or via the RS232 interface. This requires either to connect an USB port of the PC to the USB interface of the device using an USB cable or to connect a physical COM port of the PC to the RS232 interface of the device via a serial cable.

The **netX Driver / USB/RS232 Connection** supports all physical and virtual COM ports available on the PC.

Via the RS232 interface or USB interface, the device is configured or diagnosis is performed.

4.3.5.1 Driver Parameters for netX Driver - USB/RS232 Connection

The settings of the driver parameters for the USB/RS232 connection are made via the **netX Driver / USB/RS232 Connection** configuration dialog.

- Open the **USB/RS232 Connection** dialog via navigation area **Settings > Driver > netX Driver**.

- The **USB/RS232 Connection** dialog is displayed:

The screenshot shows the 'netX Driver' configuration window with the 'USB/RS232 Connection' tab selected. The 'TCP Connection' tab is also visible. The 'Enable USB/RS232 Connector (Restart of ODM required)' checkbox is checked. The 'Select Port:' dropdown is set to 'COM1'. The 'Port Configuration' section contains a 'Disable Port' checkbox (unchecked) and several settings: 'Baud Rate' (115.2 kBit/s), 'Byte Size' (8 Byte), 'Stop Bits' (1 Stopbit), 'Parity' (No Parity), 'Send Timeout' (1000 ms), 'Keep Alive Timeout' (2000 ms), and 'Reset Timeout' (10000 ms). At the bottom, there are three buttons: 'Restore', 'Save', and 'Save All'.

Figure 9: netX Driver > USB/RS232 Connection


Parameter	Meaning	Range of Value / Default Value
Enable USB/RS232 Connector (Restart of ODM required)	checked: The netX Driver can communicate via the USB/RS232 interface. unchecked: The netX Driver can <u>not</u> communicate via the USB/RS232 interface. If the check mark for Enable USB/RS232 Connector is set or removed, then the ODM server must be restarted ¹ , to make the new setting valid. ¹ Restart the ODM server via the ODMV3 Tray Application : - In the foot line click on  using the right mouse key. - In the context menu select Service > Start .	checked, unchecked; Default: unchecked
Select Port	Depending on the COM ports (interfaces) available on the PC, they will be listed under Select Port .	COM 1 to COM N
Port Configuration		
Disable Port	checked: No connection. unchecked: The netX Driver tries to establish a connection using the configured USB/RS232 interface.	checked, unchecked (Default)
Baud rate	Transfer rate: number of bits per second. The device must support the baud rate.	9.6, 19.2, 38.4, 57.6 or 115.2 [kBit/s]; Default (RS232): 115.2 [kBit/s]
Stop bits	Number of stop bits sent after the transfer of the send data for synchronization purposes to the receiver.	Stop bit: 1, 1.5, 2; Default (RS232): 1
Send Timeout	Maximum time before the transfer of the transmission data is canceled, when the send process fails, for example, because of the transfer buffer is full.	100 ... 60.000 [ms]; Default (RS232 and USB): 1000 ms
Reset Timeout	Maximum time for a device reset, including the re-initialization of the physical interface used for the communication.	100 ... 60.000 [ms]; Default (RS232 and USB): 5000 ms
Byte size	Number of bits per byte by byte specification	7 Bit, 8 Bit; Default (RS232): 8 Bit
Parity	In the error detection in data transmission using parity bits, "parity" describes the number of bits occupied with 1 in the transmitted information word. No Parity: no parity bit Odd Parity: The parity is "odd" if the number of bits occupied with 1 in the transmitted information word will be odd. Even parity: The parity is "even" if the number of bits occupied with 1 in the transmitted information word will be even. Mark Parity: if the parity bit is always 1, this will be named mark-parity (the bit does not contain any information). Space Parity: if the parity bit always 0, this will be named space-parity (the bit represents an empty space).	No Parity, Odd Parity, Even Parity, Mark Parity, Space Parity; Default (RS232): No Parity
Keep Alive Timeout	The "Keep Alive" mechanism is used to monitor whether the connection to the device is active. Connection errors are detected using a periodic heartbeat mechanism. The heartbeat mechanism will be initiated after the set time has elapsed if the communication has failed.	100 ... 60.000 [ms]; Default (RS232 and USB): 2000 ms
Restore	Resets all settings in the configuration dialog to the default values.	
Save	Saving all settings made in the configuration dialog netX Driver > Save USB/RS232 Connection , i. e. only for the selected connection type.	
Save All	Saving all settings made in the configuration dialog netX Driver , i. e. for all connection types.	

Table 12: Parameters netX Driver > USB/RS232 Connection

4.3.6 netX Driver - TCP/IP Connection

The communication from the DTM to the device via a **TCP/IP Connection** is used in the following two typical applications:

Application 1: The device has its own Ethernet interface. The DTM is installed on a PC and the TCP/IP connection is established from this PC to the stand-alone device. The IP address of the device is used.

Application 2: The device is installed in a remote PC. The DTM is installed on an additional PC and the TCP/IP connection is established from this PC to the remote PC. The IP address of the remote PC is used. For the TCP/IP connection is made, on the remote PC the cifX TCP/IP server must be started. The cifX TCP/IP server allows the remote access to the device via a TCP/IP connection.



Note: An exe file for the cifXTCP/IP server is provided on the product CD in the *Tools* directory.




Via the TCP/IP interface of the device or of the remote PC, the device is configured or diagnosis is performed.

4.3.6.1 Driver Parameters for netX Driver - TCP/IP Connection

The settings of the driver parameters for the TCP/IP connection are made via the **netX Driver / TCP Connection** configuration dialog.

- Open the **TCP Connection** dialog via navigation area **Settings > Driver > netX Driver**.
- The dialog **netX Driver** is displayed:
- Select **TCP Connection**.

Figure 10: netX Driver > TCP Connection

Parameter	Meaning	Range of Value / Default Value
Enable TCP Connector (Restart of ODM required)	<p>checked: The netX Driver can communicate via the TCP/IP interface.</p> <p>unchecked: The netX Driver can <u>not</u> communicate via the TCP/IP interface.</p> <p>If the check mark for Enable TCP Connector is set or removed, then the ODM server must be restarted¹, to make the new setting valid.</p> <p>¹ Restart the ODM server via the ODMV3 Tray Application:</p> <ul style="list-style-type: none"> - In the foot line click on  using the right mouse key. - In the context menu select Service > Start. 	checked, unchecked; Default: unchecked
Select IP Range	<p>Via Select IP Range already created IP ranges can be selected.</p> <p>Via  an additional IP range can be added.</p> <p>Via  an IP range can be deleted.</p>	

Parameter	Meaning	Range of Value / Default Value
Scan Timeout [ms]	With Scan Timeout can be set, how long to wait for a response while a connection is established.	10 ... 10000 [ms]; Default: 100 ms
IP Range Configuration		
Disable IP Range	checked: No connection. unchecked: The netX Driver tries to establish a connection using the configured TCP/IP interface.	checked, unchecked (Default)
IP Address (left)	Enter the IP address of the device, (if Use IP Range is not checked). Enter the start address of the IP scanning range, (if Use IP Range is checked).	valid IP address; Default: 192.168.1.1
Use IP Range	checked: An IP address range is used. unchecked: Only one IP address is used.	checked, unchecked; Default: unchecked
IP Address (right)	Enter the ending address of the IP scanning range, (only if Use IP Range is checked).	valid IP address; Default: 0.0.0.0
Address Count	Displays the scanning range address count, depending on the selected IP-start or IP-end address. (For this read the note given below.)	recommended: 10
TCP Port	Identifies the endpoint of a logical connection or addresses a specific endpoint on the device or PC.	0 - 65535; Default Hilscher device: 50111
Send Timeout [ms]	Maximum time before the transfer of the transmission data is canceled, when the send process fails, for example, because of the transfer buffer is full.	100 ... 60.000 [ms]; Default (TCP/IP): 1000 ms
Reset Timeout [ms]	Maximum time for a device reset, including the re-initialization of the physical interface used for the communication.	100 ... 60.000 [ms]; Default (TCP/IP): 2000 ms
Keep Alive Timeout [ms]	The "Keep Alive" mechanism is used to monitor whether the connection to the device is active. Connection errors are detected using a periodic heartbeat mechanism. The heartbeat mechanism will be initiated after the set time has elapsed if the communication has failed.	100 ... 60.000 [ms]; Default (TCP/IP): 2000 ms
Restore	Resets all settings in the configuration dialog to the default values.	
Save	Saving all settings made in the configuration dialog netX Driver > Save TCP/IP Connection , i. e. only for the selected connection type.	
Save All	Saving all settings made in the configuration dialog netX Driver , i. e. for all connection types.	

Table 13: Parameters netX Driver > TCP Connection



Note: Do not use large IP ranges in combination with a low scan timeout. Microsoft introduced in Windows® XP SP2 a limit of concurrent half-open outbound TCP/IP connections (connection attempts) to slow the spread of virus and malware from system to system. This limit makes it impossible to have more than 10 concurrent half-open outbound connections. Every further connection attempt is put in a queue and forced to wait. Due to this limitation a large IP range used in combination with a low scan timeout could prevent the connection establishment to a device.

4.4 Device Assignment



Note: In the **Device Assignment** dialog pane you first must assign the Sercos Master device to the Sercos Master DTM by checking the check box. This is essential to establish an online connection from the Sercos Master DTM to the Sercos Master device later, as described in section *Connecting/Disconnecting Device* on page 127.

Therefore in the **Device Assignment** dialog pane you scan for the Sercos Master device and select it.

If the device did not get a firmware or shall get a new firmware:

1. first you scan for the device (with or without firmware) and select the device,
2. then you download a firmware to the device and
3. subsequently you scan for the device (with firmware) once more and select the device again.

4.4.1 Scanning for Devices

1. Select **Settings > Device Assignment** in the navigation area.

➤ The dialog pane **Device Assignment** is displayed.

Device	Hardware Port 0/1/2/3	Slot number	Serial number	Driver	Channel Protocol	Access path
<input type="checkbox"/> Device Cl*	-/-/PROFIBUS/-	1	20148	CIFX Device Driver	Undefined Undefined	...\cifX3_SYS

Figure 11: Device Assignment - detected Devices (* The name of the device class is displayed.) – Example for a device without firmware

2. Under **Device Selection** select *suitable only*.
3. Select **Scan**, to start the scanning process.

➤ In the table all devices are displayed, which can be connected to the Sercos Master DTM via the preselected driver.



Note: For devices, which have been found via the **cifX Device Driver** in the column **Access path** the indication **...\cifX[0toN]_SYS** is displayed. This is correct, as long as a device did not get a firmware. After the firmware download has been completed, in the column **Access path** the indication **...\cifX[0toN]_Ch[0to3]** is displayed.

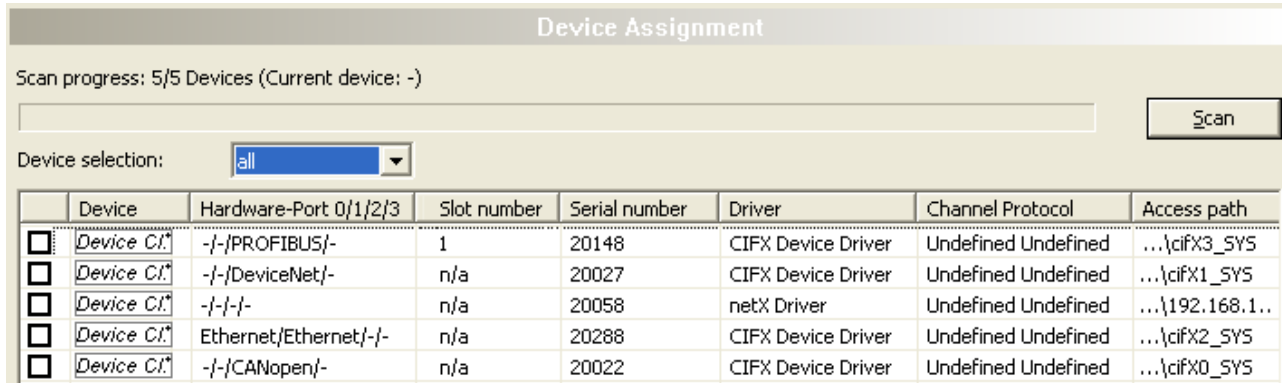
Parameter	Meaning	Range of Value / Default Value
Device selection	Selecting suitable only or all devices.	suitable only, all
Device	Device class of the Sercos Master Devices.	
Hardware Port 0/1/2/3	Shows, which hardware is assigned to which communication interface.	
Slot number	Shows the Slot Number (Card ID) preset at the PC card cifX via the Rotary Switch Slot Number (Card ID) . The indication n/a means, that no Slot-Nummer (Card ID) exists. This will occur if the PC card cifX is not equipped with a Rotary Switch Slot Number (Card ID) or for PC cards cifX equipped with a Rotary Switch Slot Number (Card ID) if the rotary switch is set to the value 0 (zero).	1 to 9, n/a
Serial number	Serial number of the device	
Driver	Name of the driver	
Channel Protocol	Shows, which firmware is loaded to which device channel. The data for the used channel consists of the protocol class and the communication class. a.) For devices without firmware: Undefined Undefined, b.) For devices with firmware: Protocol name corresponding to the used Firmware	
Access path (last column on the right)	Depending on the used driver in the column Access path different data to the device are displayed. For the cifX Device Driver the following data are displayed: a.) For devices without firmware: ...cifX[0toN]_SYS, b.) For devices with firmware: ...cifX[0toN]_Ch[0to3]. cifX[0toN] = Board number 0 to N Ch[0to3] = Channel number 0 to 3	Depending on the device and on the driver: board or channel number, IP address or COM interface
Access path (at the lower side of the dialog pane)	If in the table a device is checked, under Access path (at the lower side of the dialog pane) the driver identification or depending on the used driver additional data to the device will be displayed. For the cifX Device Driver the following data are displayed: a.) For devices without firmware: ...cifX[0toN]_SYS, b.) For devices with firmware: ...cifX[0toN]_Ch[0to3]. cifX[0toN] = Board number 0 to N Ch[0to3] = Channel number 0 to 3	driver identification (ID) depending on the device and on the driver: board or channel number, IP address or COM interface

Table 14: Parameters of the Device Assignment

4.4.1.1 Scanning for all Devices or for suitable only

all

1. Under **Device Selection** select *all*.
2. Select **Scan**.



Device Assignment

Scan progress: 5/5 Devices (Current device: -)

Device selection: all

	Device	Hardware-Port 0/1/2/3	Slot number	Serial number	Driver	Channel Protocol	Access path
<input type="checkbox"/>	Device Cl.*	-/-/PROFIBUS/-	1	20148	CIFX Device Driver	Undefined Undefined	...\cifX3_SYS
<input type="checkbox"/>	Device Cl.*	-/-/DeviceNet/-	n/a	20027	CIFX Device Driver	Undefined Undefined	...\cifX1_SYS
<input type="checkbox"/>	Device Cl.*	-/-/-/-	n/a	20058	netX Driver	Undefined Undefined	...\192.168.1..
<input type="checkbox"/>	Device Cl.*	Ethernet/Ethernet/-/-	n/a	20288	CIFX Device Driver	Undefined Undefined	...\cifX2_SYS
<input type="checkbox"/>	Device Cl.*	-/-/CANopen/-	n/a	20022	CIFX Device Driver	Undefined Undefined	...\cifX0_SYS

Figure 12: Device Assignment - detected Devices (* The name of the device class is displayed.) Example for Devices without Firmware

- ⇒ In the table all devices are displayed, which are attainable in the network and which can be connected to a single DTM each via the preselected drivers.



Note: During a subsequent firmware download in the selection window **Select Firmware File** all files from the selected folder are displayed, under **Files of Type** „All Files (*.*)“ is displayed and the check box **Validate the selected firmware file.** is unchecked.

suitable only

1. Under **Device Selection** select *suitable only*.
2. Select **Scan**.

- ⇒ In the table all devices are displayed, which can be connected to the Sercos Master DTM via the preselected drivers.



Note: During a subsequent firmware download in the selection window **Select Firmware File** only firmware files from the selected folder are displayed, under **Files of Type** „Firmware Files (*.nxm)“ or „Firmware Files (*.nxf)“ is displayed and the check box **Validate the selected firmware file.** is checked.

4.4.2 Selecting the Device (with or without firmware)



Note: A connection with the Sercos Master DTM can only be established with one Sercos Master device.

To select the physical Sercos Master device (with or without firmware):

1. Check the appropriate device.

Device Assignment

Scan progress: 5/5 Devices (Current device: -)

Device selection: suitable only Scan

	Device	Hardware Port 0/1/2/3	Slot number	Serial number	Driver	Channel Protocol	Access path
<input checked="" type="checkbox"/>	Device Cl	-/-/PROFIBUS/-	1	20148	CIFX Device Driver	PROFIBUS Master	...\cifX3_SYS

Access path: {368BEC5B-0E92-4C0E-B4A9-64F62AE7AAFA}\cifX3_SYS

Figure 13: Device Assignment - Selecting the Device (* The name of the device class is displayed.) – Example for a device without firmware / one Device is selected

- Under **Access path** (below in the dialog pane) the access path to the device, e. g. the driver identification, or depending on the used driver additional access data of the device are displayed.

2. Select **Apply**, to apply the selection.



Note: Before an online connection from the Sercos Master DTM to the Sercos Master device can be established, a firmware must be loaded to the device and the device must be selected once more.



For further information refer to section *Firmware Download* on page 47 or to section *Selecting the Device once more (with Firmware)* on page 45.

4.4.3 Selecting the Device once more (with Firmware)



Note: For repeated download this step is omitted.

To select the Sercos Master device (with firmware and defined system channel) once more, proceed as described hereafter:

all

1. Under **Device Selection** select *all*.
2. Select **Scan**.
 - In the table all devices are displayed, which are attainable in the network and which can be connected to a DTM via the preselected drivers.
3. Check the appropriate device.

Device Assignment

Scan progress: 5/5 Devices (Current device: -)

Device selection: all Scan

	Device	Hardware-Port 0/1/2/3	Slot number	Serial number	Driver	Channel Protocol	Access path
<input checked="" type="checkbox"/>	Device Cl.*	-/-/PROFIBUS/-	1	20148	CIFX Device Driver	PROFIBUS-DP Master	...\cifX3_Ch0
<input type="checkbox"/>	Device Cl.*	-/-/DeviceNet/-	n/a	20027	CIFX Device Driver	DeviceNet Master	...\cifX1_Ch0
<input type="checkbox"/>	Device Cl.*	-/-/-/-	n/a	20058	netX Driver	Undefined Undefined	...\192.168....
<input type="checkbox"/>	Device Cl.*	Ethernet/Ethernet/-/-	n/a	20288	CIFX Device Driver	PROFINET IO Device	...\cifX2_Ch0
<input type="checkbox"/>	Device Cl.*	-/-/CANopen/-	n/a	20022	CIFX Device Driver	Undefined Undefined	...\cifX0_SYS

Access path: {368BEC5B-0E92-4C0E-B4A9-64F62AE7AAFA}\cifX3_Ch0

Figure 14: Device Assignment - Selecting the Device (* The name of the device class is displayed.) – Example for Devices with and without Firmware / one Device is selected



Note: After the firmware download has been completed, for the devices which have been detected via the **cifX Device Driver** the following data are displayed:

- In the column **Channel Protocol**: the data for the firmware for the used channel
- In the column **Access path** or under **Access path** (below in the dialog pane): the data: ...\\cifX[0toN]_Ch[0to3].
 cifX[0toN] = board number 0 to N
 Ch[0to3] = channel number 0 to 3

4. Select **Apply**, to apply the selection.
5. Or select **OK**, to apply the selection and to close the DTM interface dialog.
6. Connect the DTM to the device using the context menu (right mouse click).

Or:

suitable only

1. Under **Device Selection** select *suitable only*.
2. Select **Scan**.
- ↗ In the table all devices are displayed, which can be connected to the Sercos Master DTM via the preselected drivers.
3. Check the appropriate device.

Device Assignment

Scan progress: 5/5 Devices (Current device: -)

Device selection: suitable only Scan

	Device	Hardware Port 0/1/2/3	Slot number	Serial number	Driver	Channel Protocol	Access path
<input checked="" type="checkbox"/>	Device Cl*	-/-/PROFIBUS/-	1	20148	CIFX Device Driver	PROFIBUS-DP Master	...\cifX3_Ch0

Access path: {368BEC5B-0E92-4C0E-B4A9-64F62AE7AAFA}\cifX3_Ch0

Figure 15: Device Assignment - Selecting the Device (* The name of the device class is displayed.) – Example for a device with firmware / one Device is selected



Note: After the firmware download has been completed, for the devices which have been detected via the **cifX Device Driver** the following data are displayed:

- In the column **Channel Protocol**: the data for the firmware for the used channel
- In the column **Access path** or under **Access path** (below in the dialog pane): the data: ...\\cifX[0toN]_Ch[0to3].
cifX[0toN] = board number 0 to N
Ch[0to3] = channel number 0 to 3

4. Select **Apply**, to apply the selection.
5. Or select **OK**, to apply the selection and to close the DTM interface dialog.
6. Connect the DTM to the device using the context menu (right mouse click).



For further information how to establish an online connection from the Sercos Master DTM to the Sercos Master device, refer to section *Connecting/Disconnecting Device* on page 74.

4.5 Firmware Download

Using the **Firmware Download** dialog a firmware can be transferred to the device.



Note: Prior to the firmware download, you must select the driver and the Master device (with or without firmware) and the device must be assigned to the hardware.



For further information refer to section **Overview Settings** on page 29.

To load the firmware to the device:

1. In the navigation area select **Settings > Firmware Download**.

➤ The dialog **Firmware-Download** pane is displayed.

Figure 16: Firmware Download

Element	Meaning
Name	The path and name of the firmware file selected are displayed.
Version	The version and build version of the firmware file selected are displayed.
Browse...	Via 'Browse...' you can select the firmware file for the download.
Download	Via 'Download' you can download the firmware to the device.

Table 15: Parameter Firmware Download

2. Select the firmware file.

➤ Select **Browse**.

Device is not assigned to the Hardware

If the device is not assigned to the Hardware, the error message 'The device is not assigned to the hardware!' is displayed:

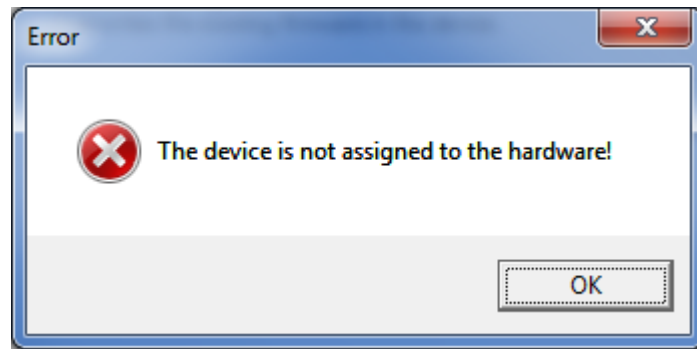


Figure 17: Error Message 'The device is not assigned to the hardware!'

- Click **OK** and select and assign the Master device as described in section *Device Assignment*.

Device is assigned to the Hardware

- The selection window **Select Firmware File** is displayed.
- Enlarge the selection window to view the columns **Hardware** and **Version**.

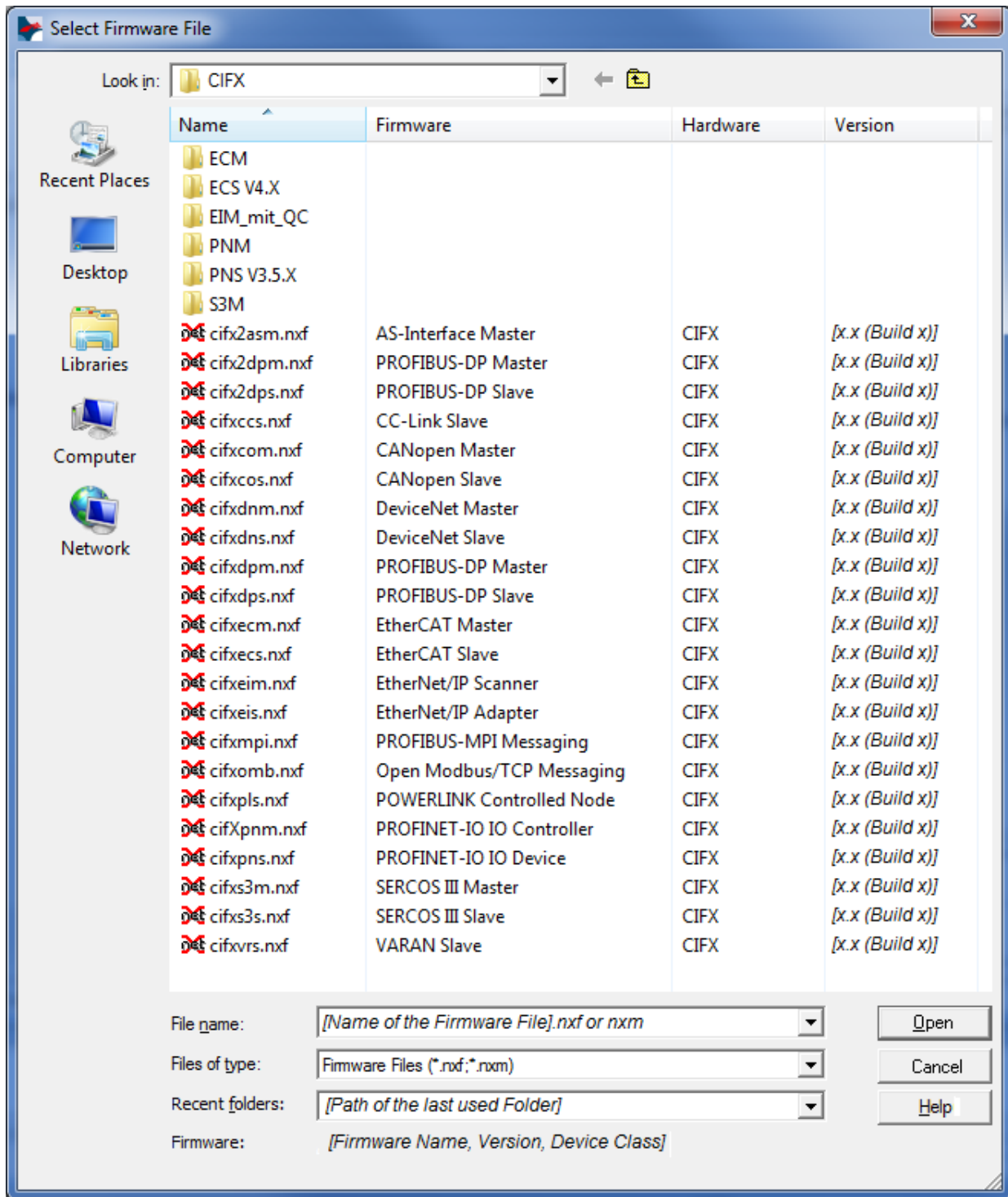


Figure 18: Window 'Select Firmware File' (Example CIFX)

Parameter	Meaning	Range of Value / Default Value
Column Name	File name of the firmware file To sort the entries of the window Select Firmware File by name click to the column head Name .	nxf, nxm
Column Firmware	Name of the firmware (consisting of the protocol name and protocol class)	
Column Hardware	Device class of the associated hardware	e. g. CIFX, COMX, COMX 51, NETJACK 10, NETJACK 50, NETJACK 51,

		NETJACK 100, NETTAP 50 (Gateway), NETTAP 100 (Gateway), NETBRICK 100 (Gateway)
Column Version	Firmware version	x.x (build x)
Tooltip	To view the tooltip information move with the mouse pointer over the selected firmware line. <div style="border: 1px solid #ccc; padding: 5px; width: fit-content;"> Type: Hilscher firmware file for netX-based targets (NXF) Size: 563 KB Date of change: 2013/03/26 11:10 </div>	
Files of Type	„All Files (*.*)“ if before in the Device Assignment pane under Device selection <i>all</i> was selected. „Firmware Files (*.nxm)“ or <i>Firmware Files (*.nxf)</i> if before in the Device Assignment pane under Device selection <i>suitable only</i> was selected.	All Files (*.*), Firmware Files (*.nxm), Firmware Files (*.nxf)
Recent folders	Path of the recently opened folder	
Firmware	As soon as the firmware file has been selected, under Firmware the name, the version and the build version as well as the device class for the selected firmware is displayed.	Name, Version, Build Version, Device Class for the selected firmware
Help	Button, to open the online help of the DTM.	

Table 16: Parameters Select Firmware File




Further descriptions to the selection window **Select Firmware File** are included in the context sensitive help (**F1** key) of the Microsoft Corporation.




Note: After in the **Device Assignment** pane under **Device selection** *all* or *suitable only* has been set, during a subsequent firmware download in the selection window **Select Firmware File** the following data are displayed or set:

(for list box entry →)	all	suitable only
In the selection window Select Firmware File :	all files from the selected folder	only firmware files from the selected folder
Under Files of Type *:	„All Files (*.*)“	„Firmware Files (*.nxm)“, „Firmware Files (*.nxf)“
Validation:	A restricted validation will be performed if the selected firmware is applied for the download.	A validation is made whether the firmware file is suitable for the Sercos Master DTM.

*These settings in the selection window **Select Firmware File** can also be changed manually.

- In the selection window mark the firmware file to be loaded using the mouse.
-  In the selection window under **Firmware** the name and the version of the firmware are displayed.
- In the selection window select the **Open** button.

Validation

-  A validation is made, whether the selected firmware file is suitable for the Sercos Master device.

Invalid Firmware

NOTICE

Device Destruction caused by invalid Firmware

Loading invalid firmware files could render your device unusable.

- If a firmware file is selected, which is not valid for the assigned device, the request **Select Firmware File** will be displayed.

‘Invalid firmware for assigned device!’

[*detailed explication*]

Shall firmware file nevertheless be applied for the download?’



Figure 19: Request Select Firmware File - Example Invalid Firmware

- Answer to the request with **No** and select a valid firmware.
- The selection window is closed.

Valid Firmware

➤ The selection window is directly closed (without dialog).

5. Start firmware upgrade.

⚠ WARNING

Personnel Injury in Consequence of a Communication Stop

- Stop your application program before starting upgrading the firmware.
- Make sure that your equipment operates under conditions that prevent personal injury. All network devices should be placed in a fail-safe mode before upgrading the firmware.
- Unexpected equipment operation may cause personal injury.

NOTICE

Damage of Equipment and Loss of Device Parameters in Consequence of a Communication Stop

- Stop your application program before starting upgrading the firmware.
- Make sure that your equipment operates under conditions that prevent property damage. All network devices should be placed in a fail-safe mode before upgrading the firmware.
- Unexpected equipment operation may cause property damage.
- Before you initiate firmware download make sure that your project configuration data are saved non-volatile in order to prevent loss of configuration data.

Invalid or non-authorized Firmware

- Loading invalid or non authorized firmware files could render your module unusable. Only proceed with a authorized firmware update.
- In the dialog pane **Firmware Download** click to the **Download** button, to download the firmware.
- The request **Do you really want to download the firmware?** is displayed.

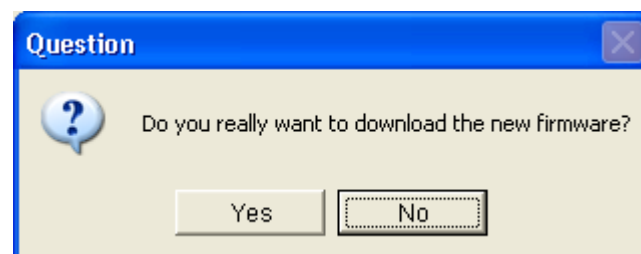


Figure 20: Request - Do you really want to download the firmware?

6. Click **Yes**.

- If you are sure, that you have selected the appropriate firmware file answer to the request with **Yes** otherwise with **No**.

- During the download a progress bar is displayed ('Download active, device performs initialization...'), in the status line a clock / green hook symbol is displayed and in the dialog pane **Firmware Download** **Download** is grayed out.

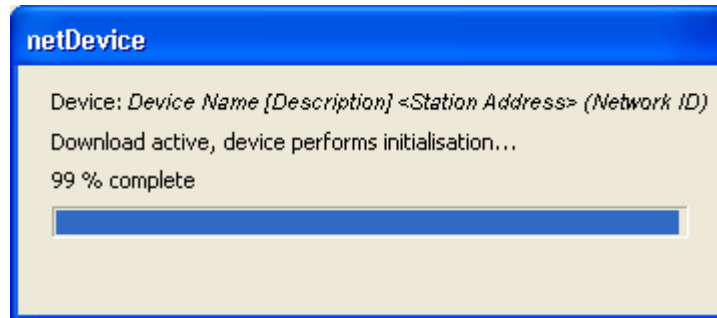


Figure 21: Firmware Download - Progress Bar

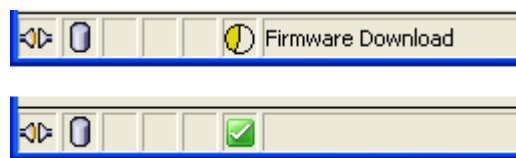


Figure 22: Clock Symbol and Hook Symbol green

- In the **Firmware-Download** dialog pane the path and name as well as the version of the selected firmware file are displayed.

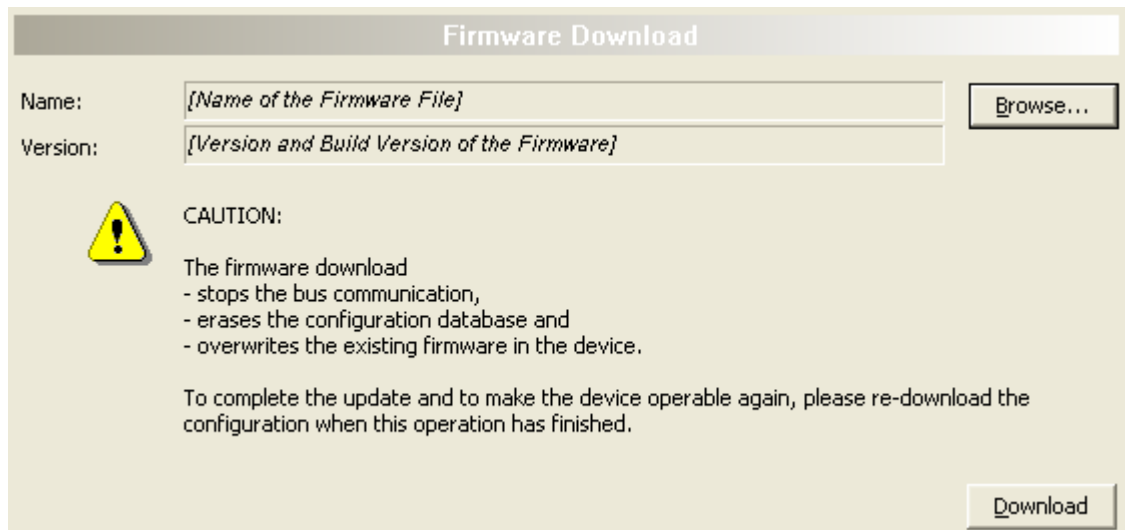


Figure 23: Firmware Download – Download

4.6 Licensing

To open the Licensing pane:

1. In the navigation area select **Settings > Licensing**.
- The dialog **Licensing** pane is displayed.

Licensing

License Type

	Existing	Order
▶ Master protocols		
One General Master License	NO	<input type="checkbox"/>
Two General Master Licenses	NO	<input type="checkbox"/>
PROFIBUS Master	YES	<input type="checkbox"/>
CANopen Master	YES	<input type="checkbox"/>
DeviceNet Master	YES	<input type="checkbox"/>
AS-Interface Master	YES	<input type="checkbox"/>
PROFINET IO RT Controller	YES	<input type="checkbox"/>

Request Form, please fill out

Name	Value
▶ License type	User Single Device License
Manufacturer*	00000001
Article number*	01250510
Serial number*	00020086
Chiptype*	00000002
Step*	00000000
Romcode revision*	00000002

Fields marked with '*' are mandatory.

Hilscher Germany

E-mail...

license@hilscher.com

Print Fax Form...

+49 6190 9907-50

Telephone...

+49 6190 9907-0

Export License Request...

Download License

Figure 24: Licensing



For a detailed description refer to section *Licensing* on page 91.

5 Configuration

5.1 Overview Configuration

Dialog Panes “Configuration”

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

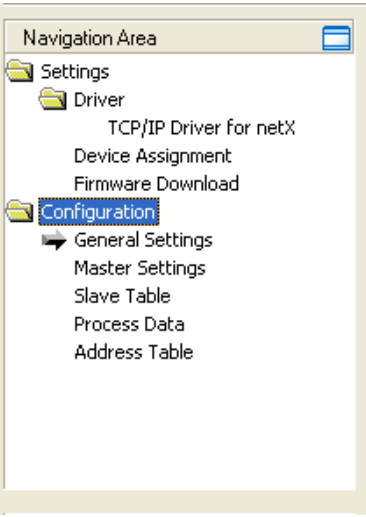
Sercos Master DTM	Folder Name / Section	Page
 <p>Navigation Area – Configuration</p>	<i>General Settings</i>	57
	<i>Master Settings</i>	63
	<i>Slave Table</i>	67
	<i>Process Data</i>	70
	<i>Address Table</i>	71

Table 17: Descriptions of the Dialog Panes Configuration



Have in mind the descriptions in section *Configuring Device Parameters* on page 56.

5.2 Configuring Device Parameters

The following steps are required to configure the parameters of the Sercos Master device using the Sercos Master DTM:

General Settings

1. Set the general settings (**Configuration > General Settings**) such as, for instance, timing adjustments and communication parameters.



Note: The communication cycle now has a lower limit of 250 µs.

Master Settings

2. Set the master settings (**Configuration > Master Settings**) such as Start of bus communication, Application monitoring, Process image storage format, Module Alignment or Process data handshake.

Slave Table

3. Check the slave table (**Configuration > Slave Table**) such as slave addresses and descriptive texts.

Process Data

4. Check the process data (**Configuration > Process Data**) such as signal names and information on data passing to the OPC Server.
 - The configured modules or signals can be named using tags. In addition, signal data available to the OPC server can be checked.

Address Table

5. Check the address table (**Configuration > Address Table**) containing signal type information, length and address.

Close Master DTM Configuration Dialog

6. Click **OK** in order to close the Master DTM configuration dialog and to store your configuration.

Configuration Download to the Sercos Master Device

Adhere to the necessary safety precautions to prevent personnel injury and property damage that may occur in consequence of a communication stop or in consequence of a mismatching system configuration.



Note: In order to transfer the configuration to the Sercos Master device, download the data of the configuration parameters in the Sercos Master device. See section *Download Configuration* on page 84.

Further Information



For more information according to the required steps for the configuration refer to the sections *General Settings* on page 57, *Master Settings* on page 63, *Slave Table* on page 67, *Process Data* on page 70 and *Address Table* on page 71.

5.3 General Settings

The **General Settings** dialog page shows some basic settings such as the current device name, the description of the Sercos Master and the communication cycle time.

To access the dialog page 'General Settings':

- Select **Configuration > General** in the navigation area.
- The dialog page 'General Settings' appears.

General Settings

Device name:

Description:

Timing settings

Communication cycle time (tScyc): µs (250 - 65000 µs in steps of 250 µs)

AT0 transmission starting time (t1): µs

Command value valid time (t3): µs

Feedback acquisition capture point (t4): µs

NRT transmission time, t6: µs

NRT transmission time, t7: µs

Communication parameters

Target phase:

Communication mode:

☐ Freerun

☒ Bus synchronous

Bus cycle started by:

☒ Internal trigger

☐ External trigger

OK Cancel Apply Help

Figure 25: Configuration > General Settings (*The current device name is displayed.)

The fields contained there have the following meaning:

Parameter	Meaning	Range of Values
Name	Network name of the Sercos Master station. Must be a DNS compatible name.	1 - 240 characters
Description	Symbolic Name of the Sercos Master DTM.	(string)
Communication cycle time	<p>Communication cycle time of Sercos network. This parameter describes the basic cycle time for communication.</p> <p>The communication cycle time (t_{Scyc}) defines the intervals during which the configured real-time data (MDTs, ATs) and non real-time data shall be transferred by the master to all present slaves. It is relevant for communication phases CP3 and CP4. It corresponds to IDN S-0-1002 as described in the specification of Sercos in the third generation.</p> <p>Caution: In order to avoid possible malfunction, communication cycle time values less than 250 μs are no longer selectable here.</p>	250 μ s up to 65000 μ s in steps of 250 μ s
AT0 Transmission Starting Time (t_1)	<p>This parameter describes the nominal time interval between the end of MST and begin of AT0. The master sends its AT0 based on the MST in CP3 and CP4.</p> <p>In the specification of Sercos in the third generation this value is denominated as t_1. This item corresponds to IDN S-0-1006.</p> <p>The AT0 Transmission Starting Time t_1 is represented by an unsigned decimal value with 3 places after the decimal point. It is specified in units of microseconds. The minimum value is 0, the maximum value t_{Scyc}, see section "Communication Cycle Time" above.</p>	0 - t_{Scyc}
Command Value Valid Time (t_3)	<p>This parameter describes the command value valid time. According to the Sercos specification, this time indicates the duration after which the slave can access the new values from the MDT related to the synchronization time.</p> <p>This value is often denominated as t_3. It corresponds to IDN S-0-1008.</p>	0 - t_{Scyc}
Feedback acquisition time (Synchronization time) (t_4)	<p>This parameter determines the time duration between the end of the MST and the feedback acquisition capture point.</p> <p>In the specification of Sercos in the third generation this value is denominated as t_4. This item corresponds to IDN S-0-1007.</p> <p>The synchronization time is represented by an unsigned decimal value with 3 places after the decimal point. It is specified in units of microseconds. The minimum value is 0, the maximum value is t_{Scyc}.</p>	0 - t_{Scyc}
NRT Transmission Time (t_6)	<p>These parameters determine the start and the end of the transmission time window of the NRT (Non-real-time) transmission.</p> <p>In the specification of Sercos in the third generation these values are denominated as t_6 and t_7. These items are stored within IDN S-0-1017.</p> <p>The NRT Transmission Times t_6 and t_7 are represented each by an unsigned decimal value with 3 places after the decimal point. It is specified in units of microseconds (μs). The minimum value is 0, the maximum value t_{Scyc}, see section "Communication Cycle Time" above.</p> <p>The difference between t_7 and t_6 must not be smaller than 20 μs (minimum allowed length of NRT time slot).</p> <p>If t_6 is 0, the NRT channel is completely switched off, the NRT channel is completely switched off.</p>	0 - t_{Scyc}
NRT Transmission Time (t_7)	Refer to t_6 directly above.	0 - t_{Scyc}
Target phase	The communication phase to be set.	NRT, CP0, CP1, CP2, CP3, CP4
Communication mode	The communication mode decides between bus synchronous or free running operation. (independently from bus-cycles).	Free run Bus synchronous
Bus cycle started by	Choice between triggering the bus cycle internally or externally.	Internal trigger External trigger

Table 18: Configuration > General – Settings

- Edit the text in the *Description* field.
- Choose the desired communication cycle time of your Sercos network. Take care of the fact that lower communication cycle time values than 250 μs are not supported by the Sercos Master Protocol Stack.



Note: At specifying the communication cycle time t_{scyc} values not matching correctly are automatically adapted in the following manner: if the specified value does not exactly match one of the allowed values, the next higher value contained within the list is taken. Thus, values up to 249 lead to a communication cycle time of 250 μs , values up to 499 lead to 500 μs and so on. Values exceeding the maximum communication cycle time of 65000 will lead to 65000 μs .

Therefore no error message box will appear here in any case.

- Choose the desired communication cycle time for your Sercos network. If a value exceeding the allowed upper limit of less than t_{Scyc} is specified, the following error message box will appear:

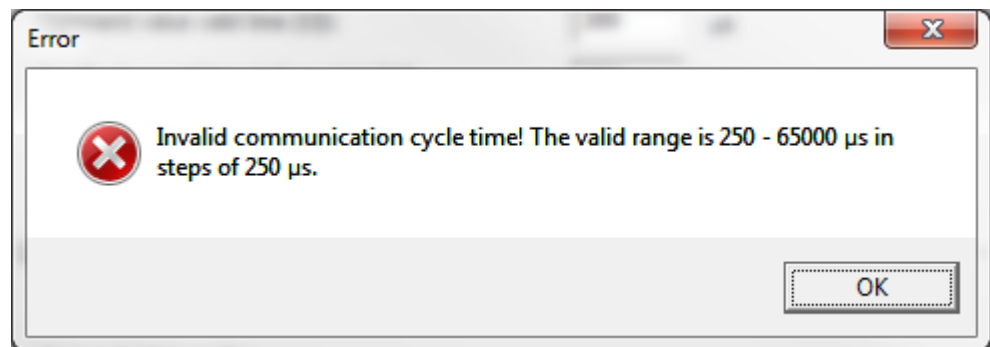


Figure 26: Error Message Box at "Invalid Communication Cycle Time t_1 "

- Choose the desired AT0 Transmission Starting Time for your Sercos network. If a value exceeding the allowed upper limit of less than t_{Scyc} is specified, the following error message box will appear:

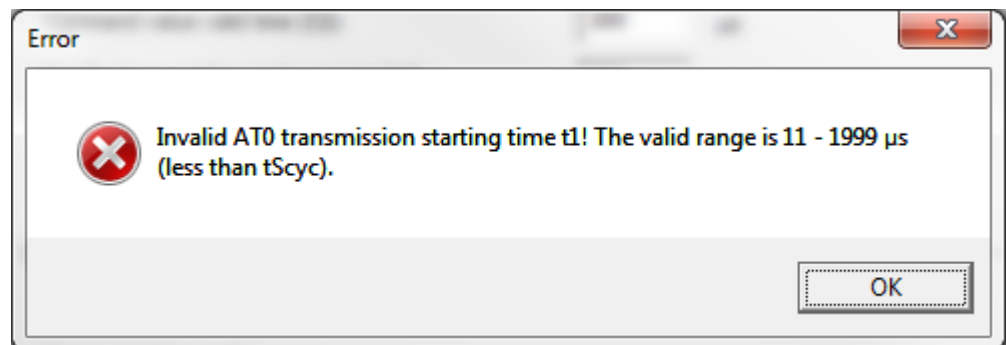


Figure 27: Error Message Box at "Invalid AT0 transmission starting time t_1 "

- Choose the desired Command Value Valid Time (t_3) for your Sercos network. If a value exceeding the allowed upper limit of less than t_{Scyc} is specified, the following error message box will appear:

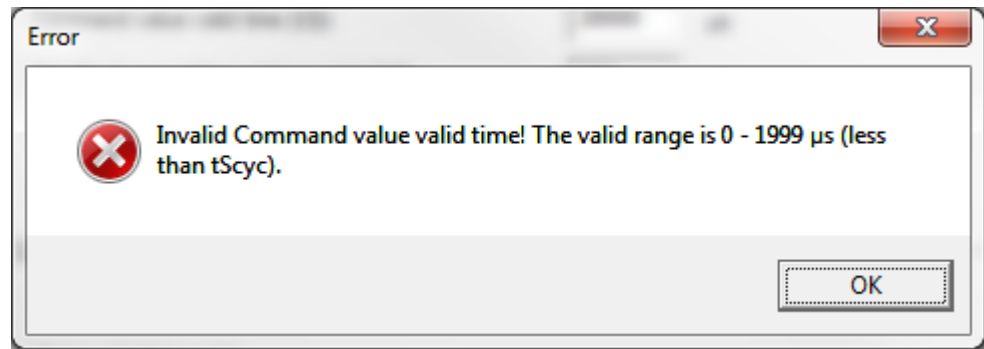


Figure 28: Error Message Box at "Invalid Command Value Valid Time t3"

- Choose the desired feedback acquisition time (Synchronization time) (t_4) for your Sercos network. If a value exceeding (or equal to) the specified communication cycle time is specified, the following error message box will appear:

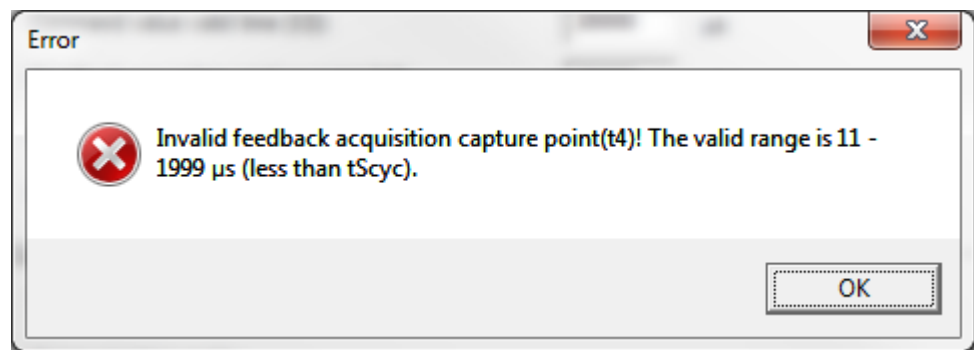


Figure 29: Error Message Box at incorrect Feedback Acquisition Capture Point (t_4)

- In this case, you need to correct the specified value of the *feedback acquisition time (Synchronization time)* (t_4).
- Choose the desired NRT Transmission Time (t_6) for your Sercos network. If a value outside of the allowed range is specified, the following error message box will appear:

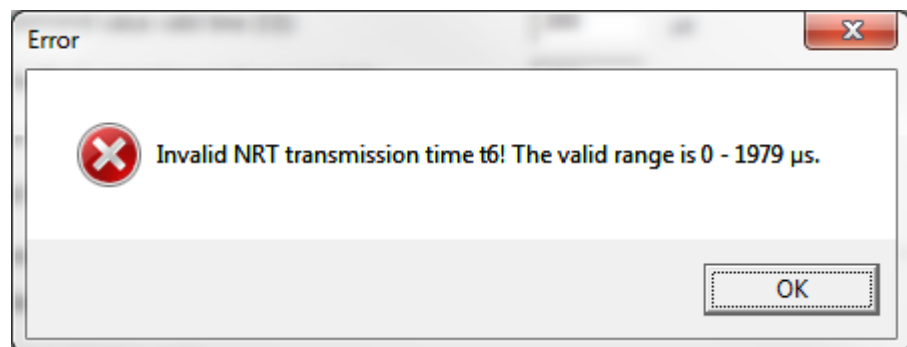


Figure 30: Error Message Box at incorrect NRT Transmission Time (t_6)

- In this case, you need to correct the specified value of the *NRT Transmission Time* (t_6)
- Choose the desired *NRT Transmission Time* (t_7) for your Sercos network.
If a value outside of the allowed range is specified, the following error message box will appear:

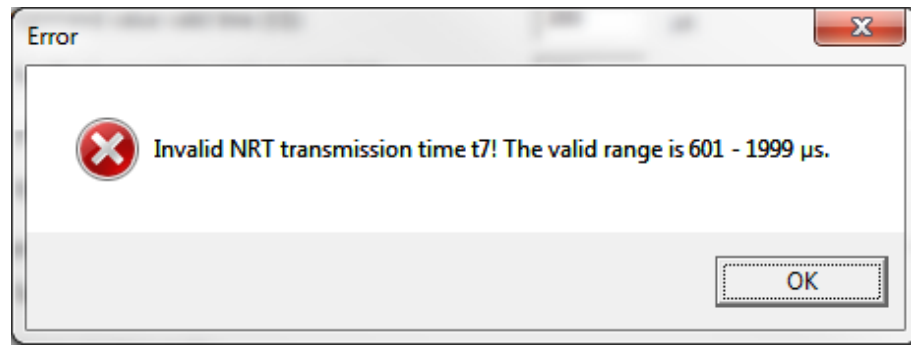
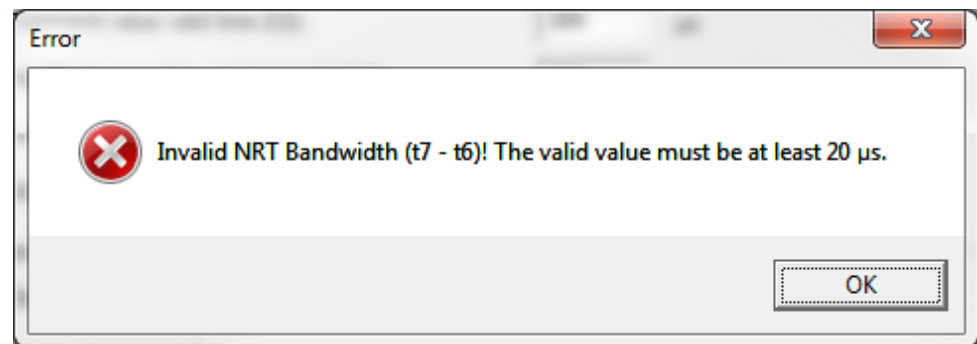


Figure 31: Error Message Box at incorrect NRT Transmission Time (t_7)

➤ In this case, you need to correct the specified value of the *NRT Transmission Time* (t_7)

If a value is specified that leads to a too low NRT bandwidth (i.e. difference between t_7 and t_6), the following error message box will appear:



➤ In this case, you also need to correct the specified value of the *NRT Transmission Time* (t_7) accordingly. Set the value at least to the sum of t_6 and 20 μs in order to avoid this message.

➤ Choose the desired communication phase. The following values are available there:

- NRT
- CP0
- CP1
- CP2
- CP3
- CP4



For more information on the details of the Sercos communication phases and their transitions see the Sercos Master Protocol API Manual (Reference [2]) from Hilscher or the specification of Sercos in the third generation (Reference [3]).

- Now choose the communication mode, i.e. decide between free running and bus-synchronous operation of the Sercos Master. If you choose free running operation, there is not any relation (in time) between the bus cycle and the I/O data exchange. At bus-synchronous operation, these are synchronized.
- Finally, choose between internal and external synchronization of the Sercos Master (this is relevant at bus-synchronous operation).

🔗 The **General Settings** have now been finished.

5.4 Master Settings

At the **Master Settings** pane device related settings can be made. These settings only become active after the configuration was downloaded to the device.



Information about the download you find in section *Download Configuration* on page 84).

Figure 32: Configuration > Master Settings



Note: The setting options at the dialog pane **Master Settings** for client specific variants of the configuration software can differ from the setting options displayed here.

5.4.1 Start of Bus Communication

Figure 33: Master Settings > Start of Bus Communication

If **Automatically by device** is selected, the Sercos Master device will start with the data exchange on the bus after the initialization has been ended.

When **Controlled by application** is selected, the application program must activate the data exchange on the bus.



Note: The setting options under **Start of Bus Communication** for client specific variants of the configuration software can differ from the setting options displayed here.

5.4.2 Application Monitoring

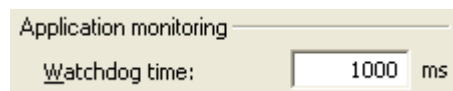


Figure 34: Master Settings > Application Monitoring

The **Watchdog time** determines the time within which the device watchdog must be re-triggered from the application program while the application program monitoring is activated. When the watchdog time value is equal to 0 the watchdog is deactivated and the application program monitoring is deactivated too.

The permissible range of values of the watchdog time is 20 to 65535. By default the watchdog time value equals to 1000 ms.

Watchdog time	Range of Value / Default Value
Permissible range of values	20 ... 65535 ms
Default	1000 ms
The software watchdog is deactivated.	0 ms

Table 19: Range of Value / Value for the Watchdog time



Note: The setting options under **Application Monitoring** for client specific variants of the configuration software can differ from the setting options displayed here.

If a value outside of the allowed range of values is specified for the watchdog time, the following error message box will be displayed:

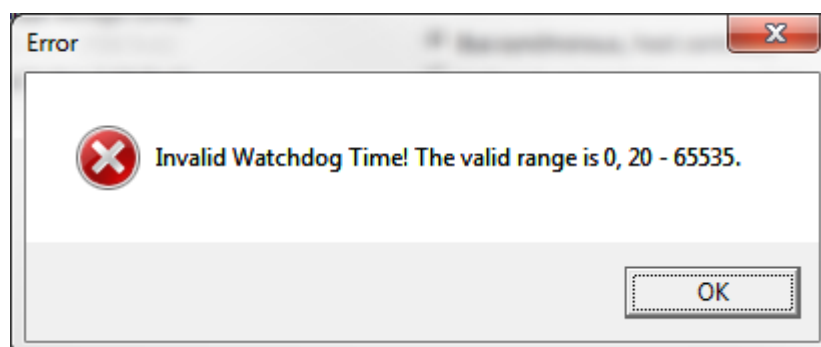


Figure 35: Error Message Box at "Invalid Watchdog Time"

5.4.3 Process Image Storage Format

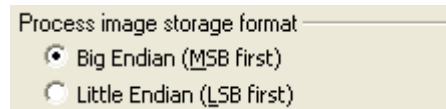


Figure 36: Master Settings > Process Image Storage Format

The **Process Image Storage Format** determines how the data words are stored in the process image.

For the data type Word it is possible to choose **Big Endian** or **Little Endian**.

Storage format (word module)	
Big Endian	MSB/LSB = higher/lower = Motorola format = Big Endian
Little Endian	LSB/MSB = lower/higher = Intel format = Little Endian

Table 20: Master Settings Pane Parameters - Process Image Storage Format



Note: The setting options under **Process Image Storage Format** for client specific variants of the configuration software can differ from the setting options displayed here.

5.4.4 Module Alignment

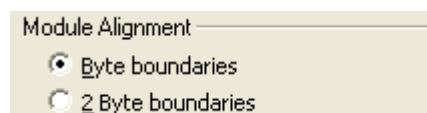


Figure 37: Master Settings > Module Alignment

The **Module Alignment** defines the addressing mode of the process data image. The addresses (offsets) of the process data are always interpreted as byte addresses. The **Module Alignment** then defines the addressing mode, **Byte boundaries** or **2 Byte boundaries**.

Parameter	Meaning
Byte boundaries	The module address can start at any byte offset.
2 Byte boundaries	The module address can only start at even byte offsets.

Table 21: Parameters Master Settings > Module Alignment



Note: The setting options under **Module Alignment** for client specific variants of the configuration software can differ from the setting options displayed here.

5.4.5 Process Data Handshake

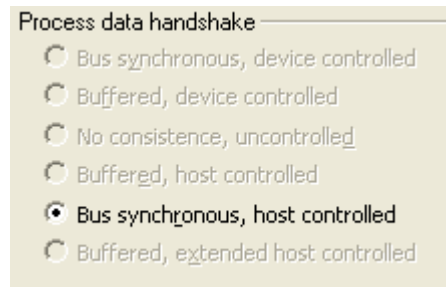


Figure 38: Master Settings > Process Data Handshake

The various types of **Process Data Handshakes** are used for setting the handshake of the process data for the Sercos Master device.

The selection of the used process data handshake is important for the correct data exchange between the application program and the device.

The used handshake mode of the process data needs to be supported by the used application program.

Only the **Bus synchronous, host controlled** handshake mode is supported.



Note: Maybe the choice is restricted to fewer options here.



Note: The setting options under **Process Data Handshake** for customer specific variants of the configuration software can differ from the setting options displayed here.

5.5 Slave Table

The **Slave Table** dialog page shows a table containing some basic information about the slaves administered by the Sercos Master such as the current slave device name, its Sercos address, vendor and the description of the Sercos Slave.

To access the dialog page 'Slave Table':

- Select **Configuration > Slave Table** in the navigation area.
- The dialog page 'Slave Table' appears.

Slave Table						
	Optional	Hotplug	Topology Address	Slave Address	Slave Index	Description
▶	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1	1	0	CIFX_RE_S3S_FIXCFG_1000_CIFX_RE_S3S_FI 1000
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2	2	0	CIFX_RE_S3S_VARCFG_1000_CIFX_RE_S3S_1 1000
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	3	3	0	CIFX_RE_S3S_FIXCFG 1000
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	4	4	0	CIFX_RE_S3S_VARCFG 1000

Figure 39: Configuration >General Settings (*The current device name is displayed.)

The fields contained there have the following meaning:

- **Optional**

Mark this field when the slave is optional.

- **Hotplug**

This checkbox indicates whether the respective slave can be used for hotplugging.

- **Topology Address**

This field contains the topology address of the specific slave. This value is automatically assigned by the configuration software.

The field is not editable. The table can be sorted by the topology address in ascending or descending order by clicking once or twice on the column head of the topology address.

- **Slave Address (Sercos Address)**

This field contains the slave address of the specific slave.


This field is editable. An integer value must be specified. The allowed range of values extends from 1 to 511. Attempts to specify other values cause the input cell to be marked with a red exclamation sign such as  when attempting to specify the value 0. In this case also the following error message box appears:



Figure 40: Error Message Box at invalid Slave Address Error

If a slave address is used twice in the configuration (in the example slave address 1 is used twice), the following error message box appears:

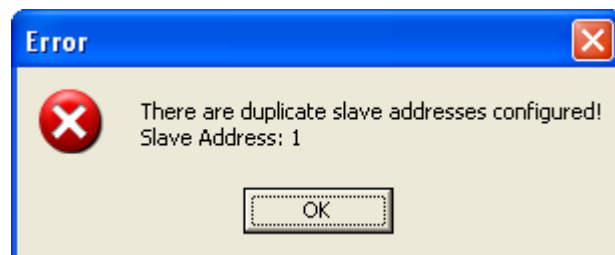


Figure 41: Error Message Box at Duplicate Slave Address Configuration

- **Slave Index**

This field contains the slave index of Sercos slave.

This field is not editable.

- **Description**

This field contains a brief description of the Sercos Slave. This field is editable.

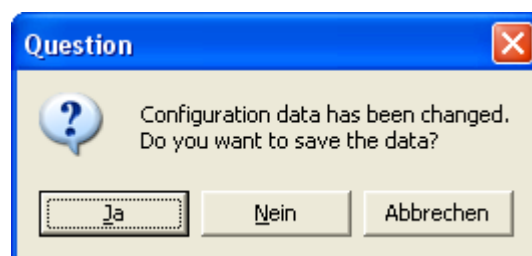


Figure 42: Error Message Change of Configuration Data

- **Vendor**

This field contains the vendor of the Sercos Slave

This field is not editable.

The navigation buttons below the table have the following meaning:

- **1st**

Puts the currently marked entry to the top of the list.

- **up**

Moves the currently marked entry one line higher.

- **down**

Moves the currently marked entry one line lower.

- **last**

Puts the currently marked entry to the bottom of the list.

5.6 Process Data

For the Sercos Master DTM the **Process Data** pane serves as an external process data interface, e. g. for data transfer to a PLC unit. The process data pane lists the Slave devices connected to the Master, as well as the configured modules or input or output signals of the devices. This makes the fieldbus structure visible.

For the configured modules or signals names can be set (Column *Tag*).

In addition signal data available to the OPC server can be checked (Column *SCADA*).
























Process Data				
	Type	Tag	SCADA	
	NXIO_100-RE_S3S_FIXCFG_1000_NXIO_100-RE_S3S_FIXCFG<Slave Index 0, Address 0x0000>		<input type="checkbox"/>	
	NXIO_50-RE_S3S_VARCFG_1000_NXIO_50-RE_S3S_VARCFG<Slave Index 0, Address 0x0000>		<input type="checkbox"/>	
	NXIO_50-RE_S3S_VARCFG_1000_NXIO_50-RE_S3S_VARCFG<Slave Index 1, Address 0x0000>		<input type="checkbox"/>	
	CIFX_RE_S3S_FIXCFG_1000_CIFX_RE_S3S_FIXCFG<Slave Index 0, Address 0x0000>		<input type="checkbox"/>	
	Indradrive MPB06_100_FWA-INDRV*-MPB-06<Slave Index 0, Address 0x0005>		<input type="checkbox"/>	
	NIC_50-RE_S3S_FIXCFG_1000_NIC_50-RE_S3S_FIXCFG<Slave Index 0, Address 0x0000>		<input type="checkbox"/>	
	Producer Connection <Instance 0>	Connection_0	<input type="checkbox"/>	
	Connection control word	Connection_Control	<input type="checkbox"/>	
	Channel signal	IO_Status	<input type="checkbox"/>	
	Input IO Data	Slot0_Input00	<input type="checkbox"/>	
	Input IO Data	Slot0_Input01	<input type="checkbox"/>	
	Consumer Connection <Instance 1>	Connection_1	<input type="checkbox"/>	
	Connection control word	Connection_Control	<input type="checkbox"/>	
	Channel signal	IO_Control	<input type="checkbox"/>	
	Output IO Data	Slot0_Output00	<input type="checkbox"/>	
	Output IO Data	Slot0_Output01	<input type="checkbox"/>	

Figure 43: Process Data (Example)

Column	Symbol	Meaning
Type	 device	Device labeling* provided by the hardware followed by the device's name of station in pointy brackets
	 module, submodule	Description of the modules or input or output signals configured to the device (not editable)
	 I/O signal	
Tag	 device	Symbolic name* of the device
	 module, submodule	Symbolic name for the modules or for the input or output signals configured to the device (editable)
	 I/O signal	
	 warning	Duplicate Tag at the same level can cause errors by use of OPC!
SCADA	Option which module or signal data shall be provided for the OPC server. „SCADA“ (= Supervisory Control and Data Acquisition), here used with the meaning „to provide for visualizing purposes“.	

*Depending on the protocol, either the device name or the symbolic name can be edited via the device symbol context menu.

Table 22: Process Data

5.7 Address Table

The **Address Table** dialog pane shows a list of all devices with their corresponding addresses used in the process data image. The displayed addresses refer to the used Sercos.

To display the address data:

- Select **Configuration > Address Table** in the navigation area.

Address Table

☒ Auto addressing

Display mode:

Decimal

CSV Export

Inputs:

Device	Station address	Slave Index	Connection Instance	Signal name	Type	Length	Address	
NXIO_100-RE_S3S_FIXCFG_1000_N1	0	0	0	Connection_Control Iw	2	0		
NXIO_100-RE_S3S_FIXCFG_1000_N1	0	0	0	ID_Status	IB	2	2	
NXIO_100-RE_S3S_FIXCFG_1000_N1	0	0	0	Slot0_Input00	IB	0.1	4.0	
NXIO_100-RE_S3S_FIXCFG_1000_N1	0	0	0	Slot0_Input01	IB	0.1	4.1	
NXIO_100-RE_S3S_FIXCFG_1000_N1	0	0	0	Slot0_Input02	IB	0.1	4.2	
NXIO_100-RE_S3S_FIXCFG_1000_N1	0	0	0	Slot0_Input03	IB	0.1	4.3	
NXIO_100-RE_S3S_FIXCFG_1000_N1	0	0	0	Slot0_Input04	IB	0.1	4.4	
NXIO_100-RE_S3S_FIXCFG_1000_N1	0	0	0	Slot0_Input05	IB	0.1	4.5	
NXIO_100-RE_S3S_FIXCFG_1000_N1	0	0	0	Slot0_Input06	IB	0.1	4.6	
NXIO_100-RE_S3S_FIXCFG_1000_N1	0	0	0	Slot0_Input07	IB	0.1	4.7	
NXIO_100-RE_S3S_FIXCFG_1000_N1	0	0	0	Slot0_Input08	IB	0.1	5.0	

Outputs:

Device	Station address	Slave Index	Connection Instance	Signal name	Type	Length	Address	
NXIO_100-RE_S3S_FIXCFG_1000_N1	0	1	1	Slot0_Output03	QB	0.1	4.3	
NXIO_100-RE_S3S_FIXCFG_1000_N1	0	1	1	Slot0_Output04	QB	0.1	4.4	
NXIO_100-RE_S3S_FIXCFG_1000_N1	0	1	1	Slot0_Output05	QB	0.1	4.5	
NXIO_100-RE_S3S_FIXCFG_1000_N1	0	1	1	Slot0_Output06	QB	0.1	4.6	
NXIO_100-RE_S3S_FIXCFG_1000_N1	0	1	1	Slot0_Output07	QB	0.1	4.7	
NXIO_100-RE_S3S_FIXCFG_1000_N1	0	1	1	Slot0_Output08	QB	0.1	5.0	
NXIO_100-RE_S3S_FIXCFG_1000_N1	0	1	1	Slot0_Output09	QB	0.1	5.1	
NXIO_100-RE_S3S_FIXCFG_1000_N1	0	1	1	Slot0_Output10	QB	0.1	5.2	
NXIO_100-RE_S3S_FIXCFG_1000_N1	0	1	1	Slot0_Output11	QB	0.1	5.3	
NXIO_100-RE_S3S_FIXCFG_1000_N1	0	1	1	Slot0_Output12	QB	0.1	5.4	
NXIO_100-RE_S3S_FIXCFG_1000_N1	0	1	1	Slot0_Output13	QB	0.1	5.5	

Figure 44: Configuration > Address Table (In the Figure shown here, in the column Device or Name example devices are displayed.)

5.7.1 Explanation of the Parameters

The following table explains the meaning of the columns of the address table.

Parameter	Meaning
Device	Device name of the Slave device
Station Address	Station address of the Slave device
Slave Index	Index no. of slave
Connection Instance	Instance of connection
Signal Name	Name of the signal
Type	Type of input and output data
Length	Length of the input and output data
Address	Offset address of the input and output data within the process data image of the Sercos Master

Table 23: Parameters of the Dialog Box Address Table - Inputs / Outputs

Concerning parameter *Connection Instance*:

Typically, two connections are established between the Sercos Master and the Slave. Connection instance 0 usually represents the connection from Slave to Master while connection instance 1 represents the connection from Master to Slave.

Concerning parameter *Signal Name*:

The meaning of the codes displayed in this column can be taken from the following table:

Code	Meaning
IW	Input Word
IB	Input Byte
QW	Output Word
QB	Output Byte

Table 24: Coding of Parameter „Signal Name“

Concerning parameter *Length*:

Values behind the point mean the number of bits

(for instance, 0.1 means 1 Bit).

5.7.2 Auto Addressing, Display Mode, CSV Export

Auto Addressing

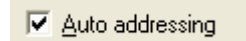


Figure 45: Configuration > Address Table - Auto Addressing

The **Auto Addressing** is used by default.

Note: Currently manual addressing is not supported, thus the checkbox is always checked.

Display Mode

- Use the **Display Mode** drop-down list to select data decimal or hexadecimal display mode.



Figure 46: Configuration > Address Table - Display Mode

CSV Export

The **CSV Export** option allows to export input and output addresses as CSV file (CSV = comma separated value). Therefore:

- Click to the **CSV Export** button.
- A file saving dialog opens.
- Save the data as *.CSV file.

You can open the generated data by means of a spreadsheet application.

Sort Addresses

- To sort the address data, click on the respective column header.

6 Online Functions

Getting Access to SYCON.net Online Functions



Note! If under 'Configuration' > 'Master Settings' > 'Start of bus communication' > 'Controlled by application' is selected, after 'Power on Reset' the Master device is in 'Offline' state! In this state you can not use the SYCON.net online function 'Network Scan'. To get access to this online function in case the Master device is used together with an application program, you must make sure that the application program will start the communication. Alternatively you can start the communication manually from the context menu 'Start communication' of the the Master device.

6.1 Connecting/Disconnecting Device



Note: Several Sercos Master DTM functions e. g. **Diagnosis** or the configuration download in the FDT Framework require an online connection from the Sercos Master DTM to the Sercos Master device.

Connecting Device

The following steps are needed to establish a connection from the Sercos Master DTM to a Sercos Master device:

Under **Settings** in the **Driver** pane:

1. Verify that the default driver is checked and respectively check another or multiple drivers.
2. Configure the driver if necessary.

Under **Settings** in the **Device Assignment** pane:

3. Scan for the devices (with or without firmware).
4. Select the device (with or without firmware) and apply the selection.



Before you download the firmware adhere to the necessary safety precautions to prevent personnel injury and property damage that may occur in consequence of a communication stop. For more refer to section *Safety Messages on Firmware or Configuration Download* on page 27.

Under **Settings** in the **Firmware Download** pane if not yet a firmware was loaded to the device:

5. Select and download the firmware.

Under **Settings** in the **Device Assignment** pane if not yet a firmware was loaded to the device:

6. Scan for the device (with firmware) once more.
7. Select the device (with firmware) once more.



An overview of the descriptions for these steps you find in the section *Overview Settings* on page 29.

8. In the DTM interface dialog select the **OK** button, to apply the selection

and to close the DTM interface dialog.

9. Put a right-click on the Sercos Master device icon.

10. Select the **Connect** command from the context menu.

⇒ The Sercos Master device now is connected to the Sercos Master DTM via an online connection. In the network view the device description at the device icon of the Master is displayed with a green colored background.

Disconnecting Device

To disconnect an online connection from the Sercos Master device to a Sercos Master DTM take the following steps:

1. In the DTM interface dialog select the **OK** button, to close the DTM interface dialog.

2. Right-click on the Sercos Master device icon.

3. Select the **Disconnect** command from the context menu.

⇒ In the network view the device description at the device icon of the Master is not any more displayed with a green colored background. Now the Sercos Master device is disconnected from the DTM.

6.2 Network Scan

With the function **Network Scan...** of the Sercos Master DTM you can find out automatically which Sercos Slaves are attached to the Sercos Master device and how these devices are configured. During the network scan the Master device requests the ident codes of the Slave devices found at the bus. For each connected Slave device its ident code is read out.

In the **Scan Response** dialog of the Master DTM the assigned device description files or DTM devices are displayed. Exactly one ident code is assigned to each device description file and to each DTM device. Different versions (also language versions) of the same device description file are defined by the same ident code. For every identified device you can select the assigned DTM device according to the firmware loaded in that Slave device. Via **Create Devices** for each Slave device the selected DTM device is created.

Requirements

The Sercos Master device must be configured.



Important: The configuration of the Master device must be downloaded in the Master device. For more see section *Configuration Steps* on page 23 .

Overview of the Steps

1. Starting the **Network Scan** function of the Master DTM.
2. Make the settings in the **Scan Response** dialog of the Master DTM.
3. Click **Create Devices**.
4. Via the **Download** function of the Master DTM, download the current configurations of the Slave devices to the Master device.

6.2.1 Starting 'Network Scan'

1. Starting the **Network Scan** function of the Master DTM.

- In netDevice: right-click on the device symbol of the Sercos Master DTM.
- Select **Network Scan...** from the context menu.

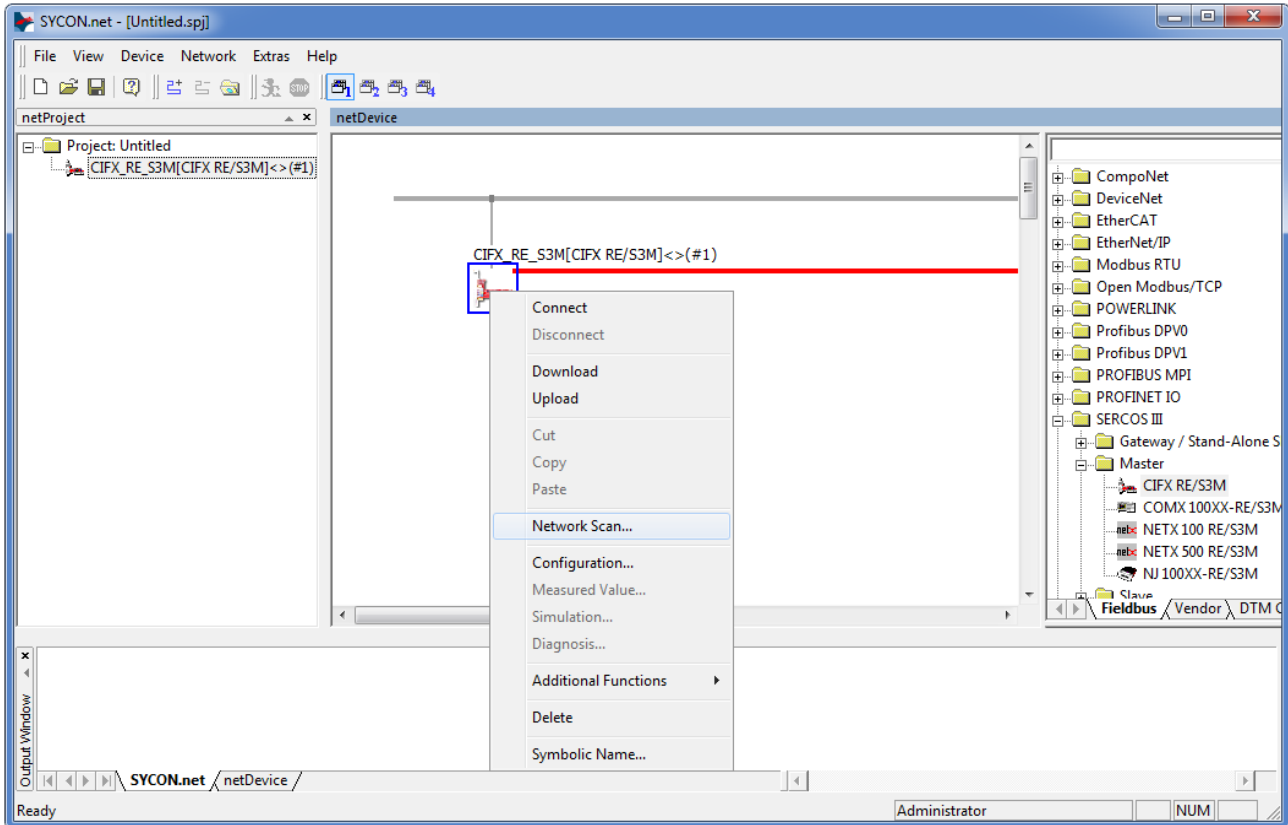


Figure 47: Starting 'Network Scan' (Example)

- Wait for a short time.
- If the query is displayed if the IO communication shall be stopped, click **Yes**.



Note: It can last some seconds, until the **Network Scan...** dialog is displayed.

Via **Network Scan...** an online connection from the Sercos Master DTM to the Sercos Master device is established. The configuration software scans, which Sercos Slaves are attached to the Sercos network or to the Sercos Master device.

➤ The **Scan Response** dialog of the Master DTM is displayed.

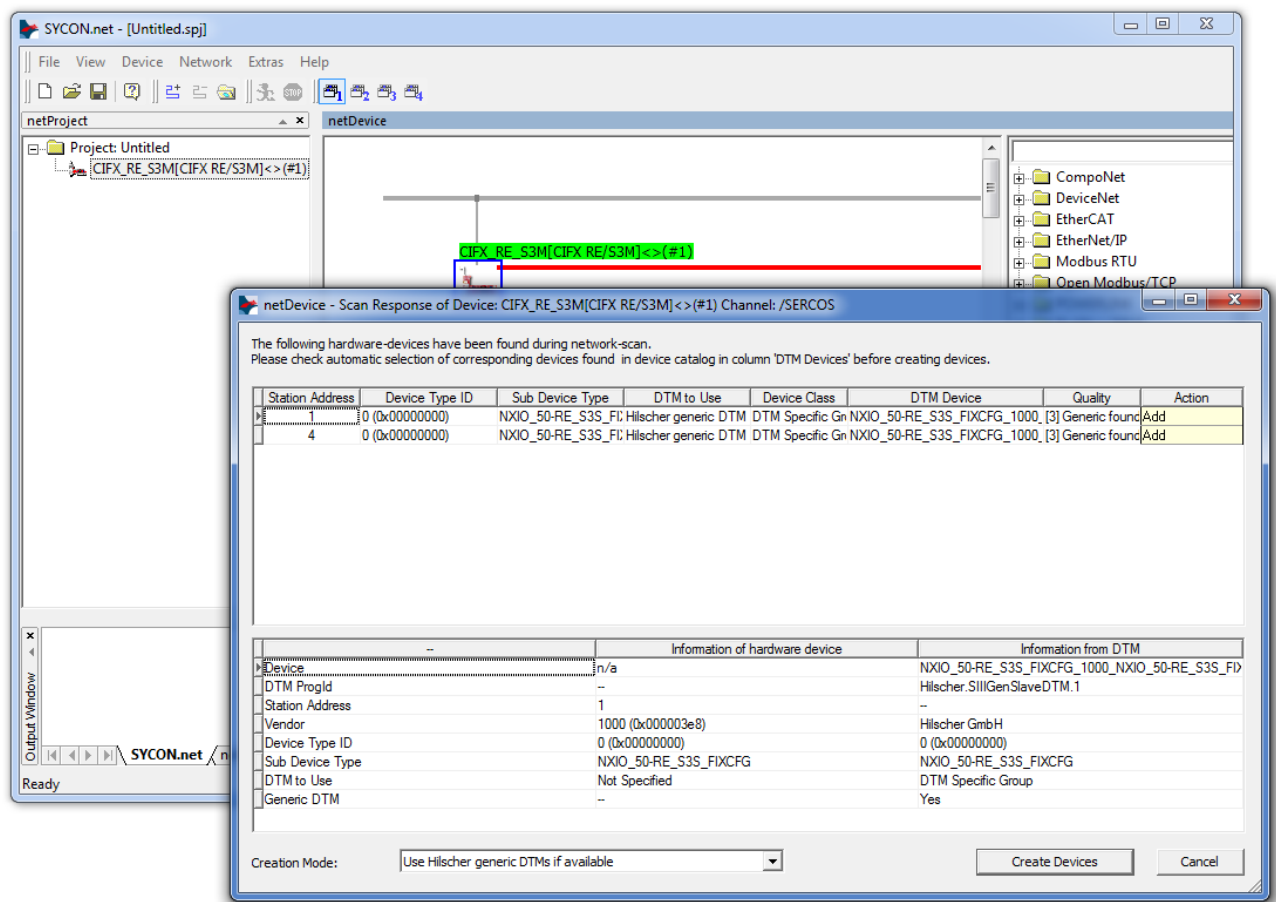


Figure 48: Scan Response dialog of the Master DTM (Example)

6.2.2 Settings in the Scan Response Dialog of the Master DTM

2. Make the settings in the **Scan Response** dialog of the Master DTM

- In the **DTM to Use** column the DTM devices assigned to the found ident codes appear.

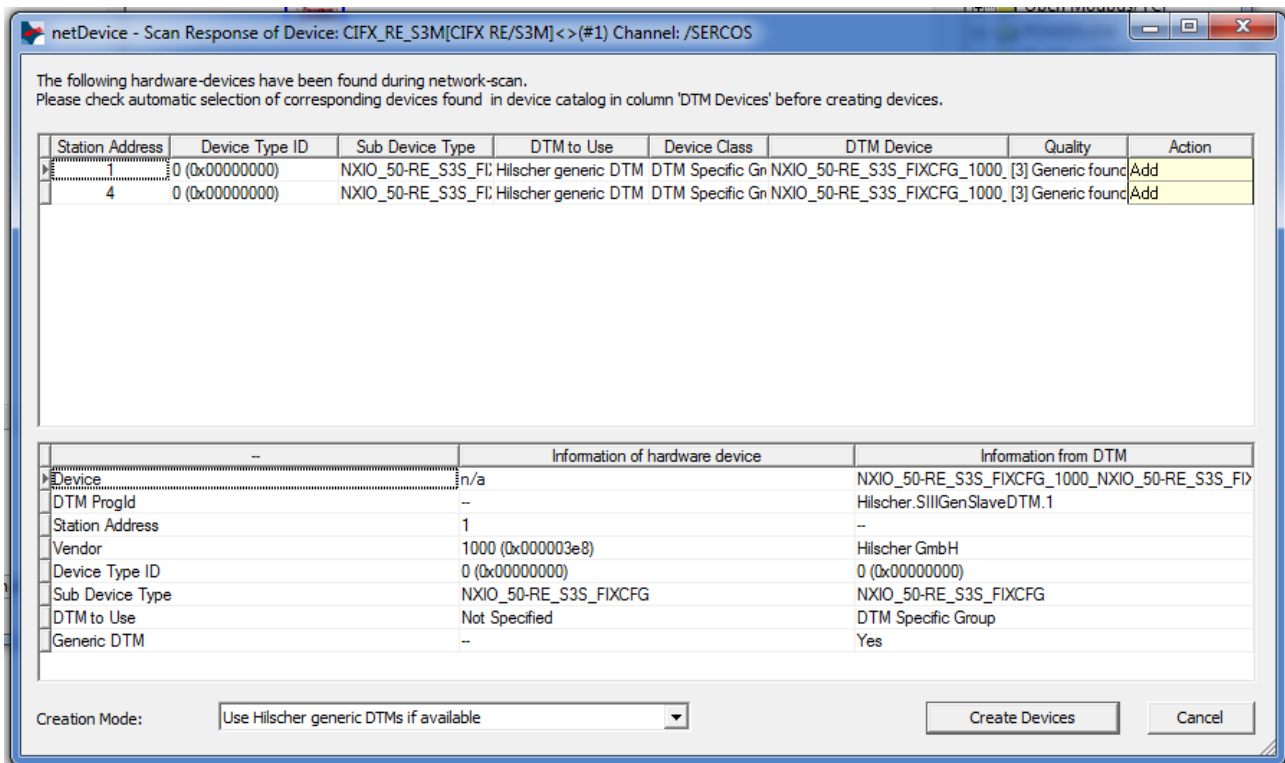


Figure 49: Scan Response dialog of the Master DTM (Example)

- In the **DTM to Use** column select for every identified device the DTM device corresponding to the firmware loaded in this Slave device (only if the corresponding DTM devices are in use).
- If in the **DTM to Use** column no DTM device or a DTM device not desired is displayed, add the required DTM devices to the device catalog.
- or adapt the creation mode under **Creation Mode**.
- In the **Action** column select, whether the found DTM device shall be:
 - *added or skipped*
(if a device is not yet present in the project),
 - *or replaced or skipped*
(if a device is already present in the project)

6.2.3 Description on the Scan Response dialog of the Master DTM

In the following table you find a description about the **Scan Response** dialog of the Master DTM.

Column	Description
Title Bar	With the text: <i>Symbolic Name of the Master Device [Device Description] <Device Address> (#Network ID) channel: /Sercos.</i>
Instruction	In the Network Scan window the instruction text is displayed: The following hardware-devices have been found during network scan. Please check automatic selection of corresponding devices found in device catalog in column 'DTM Devices' before creating devices.
Station Address	Sercos station address, which displays the logical sequence of the devices within a Sercos network.
Colors	Meaning of colors in the Scan Response dialog of the Master DTM: <div style="display: flex; align-items: flex-start;"> <div style="margin-right: 10px;"> <div style="background-color: red; width: 20px; height: 15px; display: inline-block; margin-bottom: 5px;"></div> Red </div> <div>If a field marked in red appears in column Station address, the respective DTM device is already present on the network.</div> </div> <div style="display: flex; align-items: flex-start; margin-top: 5px;"> <div style="margin-right: 10px;"> <div style="background-color: yellow; width: 20px; height: 15px; display: inline-block; margin-bottom: 5px;"></div> Yellow </div> <div>If a field appears marked in yellow, a selection can be made by a combo box.</div> </div>
Device Type ID	Value of the Sercos Slave device parameter „I/O Configuration“ according to the first position of the Slave profile.
Sub Device Type	Value of the Sercos Slave device parameter „I/O Code“ according to the second position of the Slave profile.
DTM to Use	<p>Display of the DTM devices, which are assigned to the ident codes found during scanning:</p> <p>If <u>Use Hilscher generic DTMs if available</u> is displayed <i>without color marking</i>, there is no selection possibility.</p> <p>If <u>Use Hilscher generic DTMs if available</u> is displayed <i>marked in yellow</i>, the following selection can be made:</p> <div style="display: flex; align-items: center; margin-top: 10px;"> <div style="border: 1px solid gray; padding: 2px;"> <div style="background-color: #f0f0f0; padding: 2px;">Use Hilscher generic DTMs if available</div> <div style="background-color: #e0e0e0; padding: 2px;">Use Hilscher generic DTMs if available</div> <div style="background-color: #d0d0d0; padding: 2px;">Use vendors DTMs if available</div> </div> <div style="margin-left: 10px;">(In the figure shown example DTMs are displayed.)</div> </div> <p>A selection will only be displayed if under Creation Mode > Choose for each device was selected and if another DTM has been found for the respective device.</p>
Device Class	DTM Specific Group (Information from DTM)
DTM Device	<p>Found DTM device (the device name as taken from the DTM)</p> <p>Only the device description files or DTM devices can be displayed within the column DTM Devices:</p> <ul style="list-style-type: none"> • Which are available in the device catalog for the scanned ident code, • Respectively, which belong to the selection made under Creation Mode • and which belong to the selection made under Creation Mode > Choose for each device under DTM to create. <div style="display: flex; margin-top: 10px;"> <div style="flex: 1;"> <p>For each device type ID in the column DTM Device the following is displayed:</p> <ul style="list-style-type: none"> • <u>no</u> device, • <u>one</u> single device • or <u>multiple</u> devices (within a combobox). </div> <div style="flex: 1; margin-left: 20px;"> <p>This means, within the device catalog of netDevice for the found ident code and the selected Creation Mode these alternatives are available:</p> <ul style="list-style-type: none"> • no DTM • A device description file or a DTM device of the manufacturer • One or more device description files or DTM devices of a manufacturer </div> </div>
Quality	Associated quality information Display: [1] DTM found, [3] Generic found


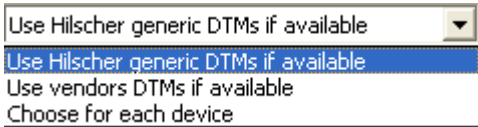
Column	Description
Action	<p>The action to be performed with the corresponding device during the process of device creation.</p> <ul style="list-style-type: none"> If no device is present within the current project, the selection Add/Skip will appear. If there is already a device present within the current project, the selection Replace/Skip will appear. <p>Add adds a new instance for the selected DTM during the process of creation of a device.</p> <p>Skip skips the process of creation of a device for the respective device address.</p> <p>Replace erases the instance of the DTM currently located at this address during the process of creation of a device, and replaces it with the instance of the chosen DTM.</p>
Table below	<p>The lower table in the Scan Response dialog of the Master DTM shows a comparison of possible differences in device information taken from:</p> <ul style="list-style-type: none"> The hardware device (displayed in central column of 3) and the DTM (displayed in right column of 3) <p>The left column contains which information is compared between the information sources 'Hardware Device' and 'DTM'.</p> <div>  <p>Note: If a field contains the text 'n/a', the corresponding information is not applicable in the current context (fieldbus).</p> </div>
Creation Mode	<p>Under Creation Mode one of the following options can be selected:</p> <ul style="list-style-type: none"> User Hilscher generic DTM if available Use vendors DTMs if available Choose for each device <div>  <p><i>Scan Response dialog of the Master DTM > 'Creation Mode'</i></p> </div>
Create Devices	<p>About Create Devices ...</p> <ul style="list-style-type: none"> for each Slave device the previously selected DTM device is created. the Slave device configuration is uploaded to the created Slave-DTM and thereby the module configuration is generated. <p>In case a conflict occurs between a device description file and a device, the Upload dialog appears, where conflicts are displayed in red.</p>
Cancel	Click Cancel to leave the dialog without creating a Device.

Table 25: Description on the Scan Response dialog of the Master DTM

6.2.4 Creating Devices

3. Click **Create Devices**

- In the **Scan Response** dialog of the Master DTM click **Create Devices**.
- For each Slave device the previously selected DTM device is created.
- The dialog **netDevice** appears showing the progress bar **Creating DTM Device**. The dialog shows the the progress of the device creating process.



Note: Depending on the manufacturer of the respective device, also a dialog with some slight deviations from this one may be displayed.

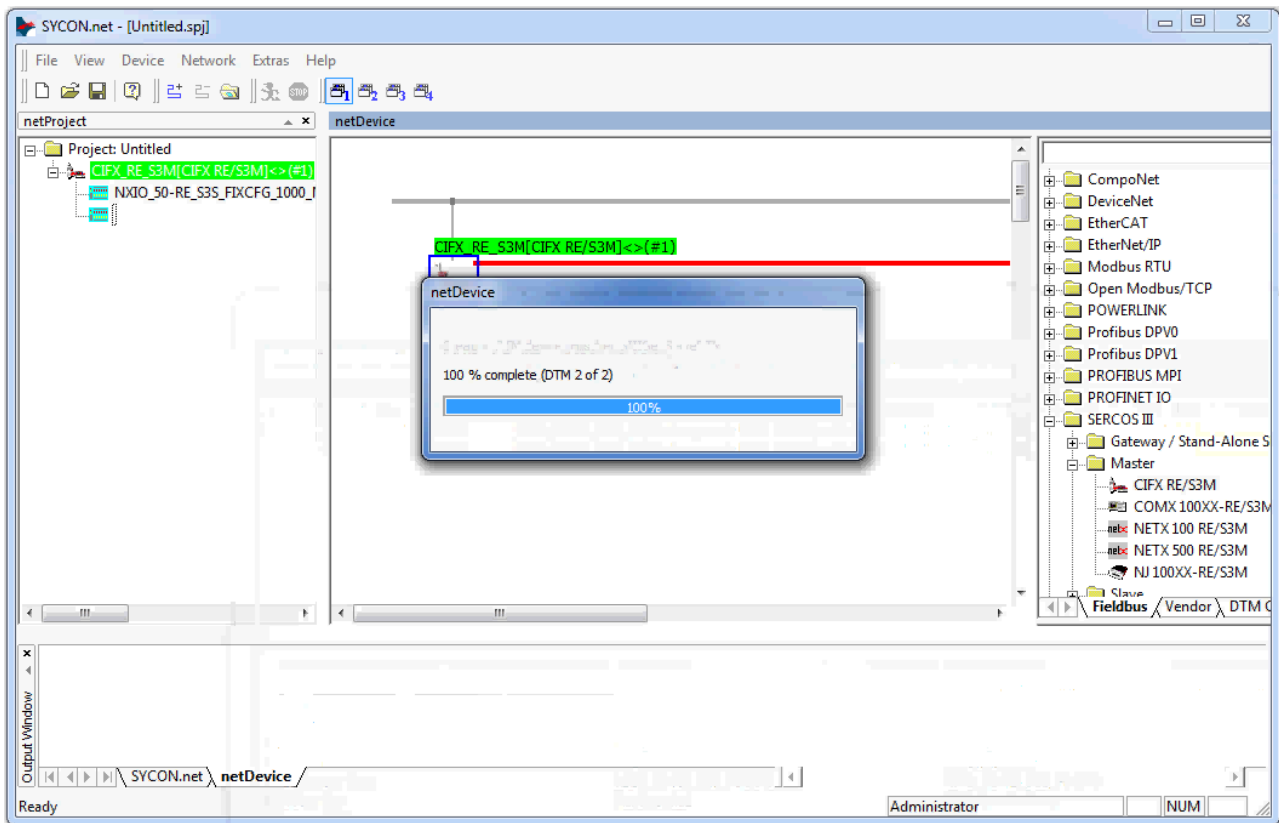


Figure 50: Creating the DTM devices (Example)

- The generated Slave devices are added to the Master bus in the network.

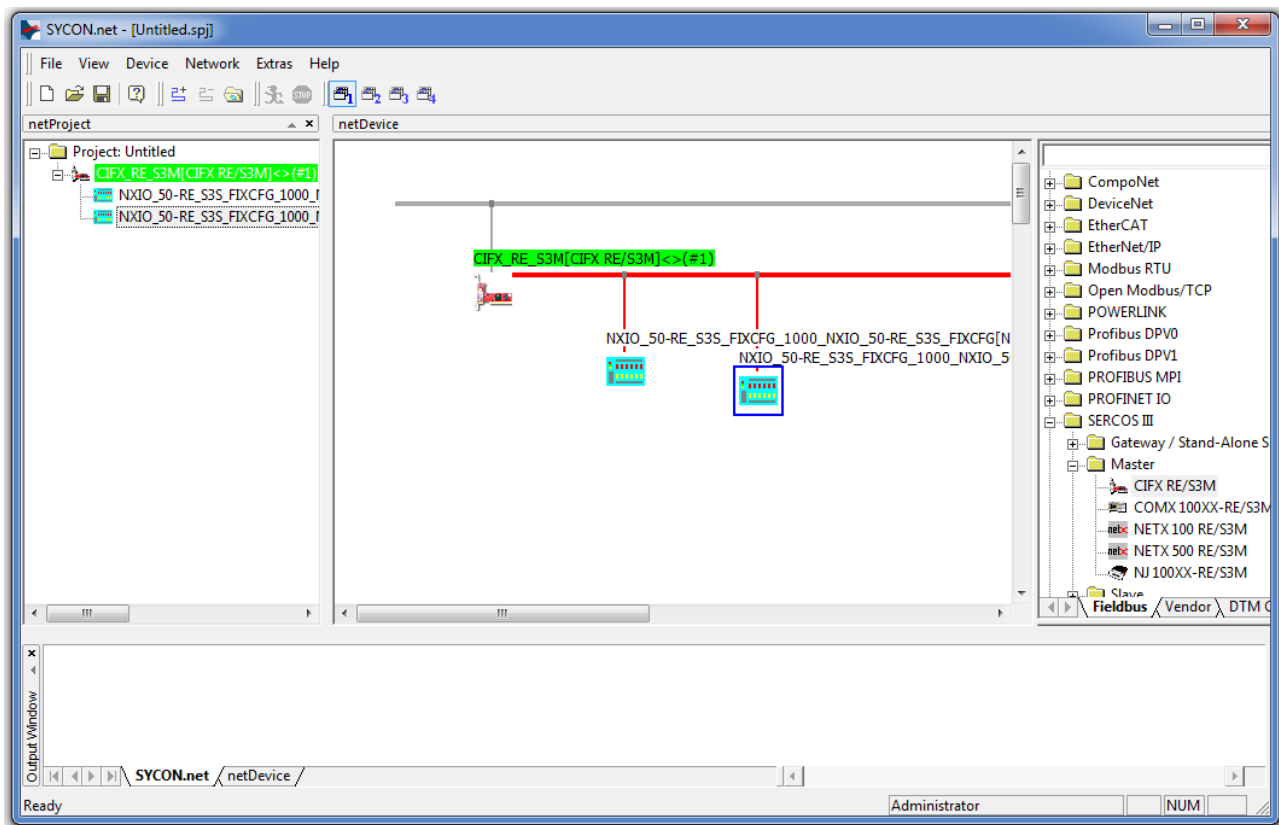


Figure 51: Created Slave Devices in the Network (Example)

6.2.5 Download to the Sercos Master Device



Adhere to the necessary safety precautions to prevent personnel injury and property damage that may occur in consequence of a communication stop or in consequence of a mismatching system configuration. For more refer to section *Safety Messages on Firmware or Configuration Download* on page 27.

4. Via the **Download** function of the Master DTM, download the current configurations of the Slave devices to the Master device.
 - In **netDevice**: right-click on the device symbol of the Sercos Master DTM.
 - Select **Download** from the context menu.

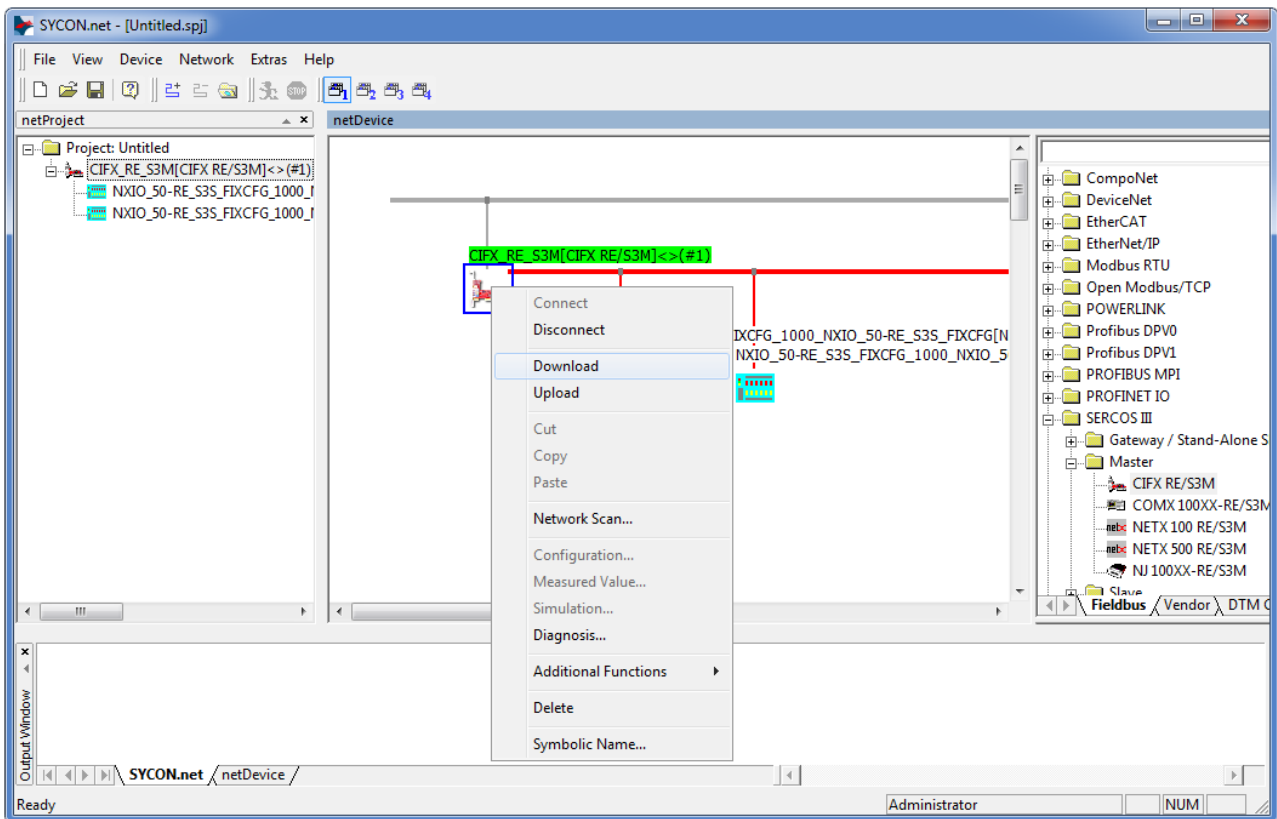


Figure 52: 'Download' current Configuration to Sercos Master (Example)

- The Dialog **netDevice - Download** appears:
 If you attempt to download during bus operation, communication between master and slaves is stopped.
 Do you really want to download?
 ➤ Click **Yes**.
- The dialog **netDevice** appears showing the progress bar **Download active, device performs initialisation...**
- The **netDevice** window shows the message (example): **Download succeeded to device CIFX_RE_S3M[CIFX RE/SEM]<>(# 1).**

6.3 Download Configuration

The device configuration is created *offline* in the DTM (application program). A download to the device is required, to transfer the configuration with the parameter data to the device.



Note: To download configuration parameter data to the Sercos Master device an online connection from the Sercos Master DTM to the Sercos Master device is required.



Further information can be found in the *Connecting/Disconnecting Device* section on page 74.

Safety Precautions

Adhere to the necessary safety precautions to prevent personnel injury and property damage that may occur in consequence of a communication stop or in consequence of a mismatching system configuration.

⚠ WARNING

Personnel Injury in Consequence of a Communication Stop

- Stop the application program before starting a configuration download.
- Make sure that your equipment operates under conditions that prevent personal injury. All network devices should be placed in a fail-safe mode before downloading a configuration.
- Unexpected equipment operation may cause personal injury.

Personnel Injury as a result of mismatching System Configuration

- Mismatching system configuration loaded into the device could result in faulty data mapping in the application program and thus unexpected equipment operation may cause personal injury.

NOTICE

Damage of Equipment and Loss of Device Parameters in Consequence of a Communication Stop

- Stop the application program before starting a configuration download.
- Make sure that your equipment operates under conditions that prevent property damage. All network devices should be placed in a fail-safe mode before downloading a configuration.
- Unexpected equipment operation may cause property damage.
- Before you initiate a configuration download make sure that your current project configuration data are saved non-volatile in order to prevent loss of configuration data.

Damage of Equipment as a result of mismatching System Configuration

- Mismatching system configuration loaded into the device could result in faulty data mapping in the application program and thus unexpected equipment operation may cause damage of equipment.

Download Steps

To transfer the configuration with the corresponding parameter data to the Sercos Master device you download the data using the frame application of the configuration software.

For netDevice the download is made via **Device > Download** or use the context menu with **Download**.

1. Select **Download** in the context menu of the device.

⇒ If the download is started as long as the Slave devices are connected to the Master device, the following message is displayed: 'If you attempt to download during bus operation, communication between Master and Slaves is stopped. Do you really want to download?'

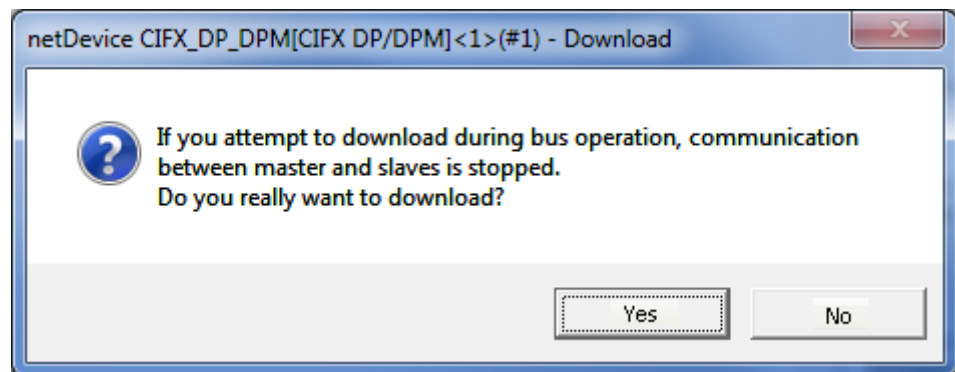


Figure 53: netDevice Message: Download



Important: If the communication between the Master and the Slave devices is stopped, the data exchange between the Master device and the Slave devices is stopped.

2. Click to **Yes** if you intend to download the configuration.

⇒ Then the current configuration in the application program is downloaded to the device.

3. Otherwise click to **No**.

6.4 Start /Stop Communication

You can manually start or stop the communication between a Sercos Master device and Sercos Slave devices.

- **Start Communication** can be enabled if the communication was stopped before or if the configuration requires this (Controlled release of communication).
- **Stop Communication** can be enabled if the communication was started.

To start or to stop the communication, proceed as follows:

- Adhere to the necessary safety precautions to prevent personnel injury and property damage that may occur in consequence of a communication stop.

WARNING

Personnel Injury in Consequence of a Communication Stop

- Make sure that your equipment operates under conditions that prevent personal injury. All network devices should be placed in a fail-safe mode before downloading a configuration.
- Unexpected equipment operation may cause personal injury.

NOTICE

Damage of Equipment and Loss of Device Parameters in Consequence of a Communication Stop

- Make sure that your equipment operates under conditions that prevent property damage. All network devices should be placed in a fail-safe mode before downloading a configuration.
- Unexpected equipment operation may cause property damage.

Start Communication

1. Connecting device:



Note: To start the communication of the device at the bus manually, an online connection from the Sercos Master DTM to the Sercos Master device is required.



Further information can be found in the *Connecting/Disconnecting Device* section on page 74.

2. Select **Additional Functions > Service > Start Communication** from the context menu (right mouse click).

➤ The device communicates at the bus.

Stop Communication

1. Select **Additional Functions > Service > Stop Communication** from the context menu (right mouse click).

➤ The communication of the device at the bus is stopped.

6.5 Set Communication Phase

You can manually set the communication phase of a Sercos Master device. The following communication phases are available:

- NRT
- CP0
- CP1
- CP2
- CP3
- CP4

For more information about the details of the Sercos communication phases and their transitions please refer to the Sercos Master Protocol API Manual available from Hilscher (reference [2]) or to the specification of Sercos in the third generation.

To set the communication phase, proceed as follows:

Set Communication Phase

1. Connect Device:



Note: To set the communication phase of the device at the bus manually, an online connection from the Sercos Master DTM to the Sercos Master device is required.



Further information can be found in the *Connecting/Disconnecting Device* section on page 74.

2. Select the correct menu entry for the desired communication phase **Additional Functions > Set Communication Phase > NRT** from the context menu (right mouse click) according to the following table:

Communication phase	Context Menu Entry
NRT	Additional Functions > Set Communication Phase > NRT
CP0	Additional Functions > Set Communication Phase > CP0
CP1	Additional Functions > Set Communication Phase > CP1
CP2	Additional Functions > Set Communication Phase > CP2
CP3	Additional Functions > Set Communication Phase > CP3
CP4	Additional Functions > Set Communication Phase > CP4

Table 26: Menu Entries for Set Communication Phase Online Functions

If menu entries are grayed out, they are currently not available.

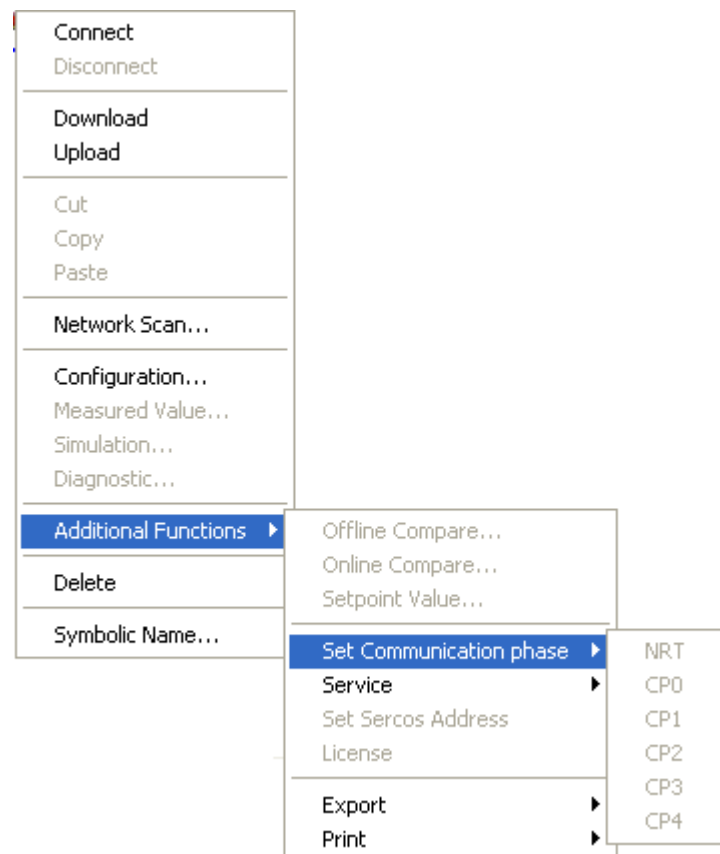


Figure 54: Menu Entry "Additional Functions -> Set Communication Phase"

- The Sercos Master device now tries to reach the desired communication phase if possible.

6.6 Set Sercos Address

You can also manually set the address of a Sercos Master device.

The following address range is allowed:

0.. 511 (according to $0x0 - 0xFF$).

For more information about the details of the Sercos addressing please refer to the Sercos Master Protocol API Manual available from Hilscher (reference [2]) or to the specification of Sercos in the third generation.

To set the Sercos Master address, proceed as follows:

Set Sercos Address

1. Connect Device:



Note: To set the address of the device manually, an online connection from the Sercos Master DTM to the Sercos Master device is required.



Further information can be found in the *Connecting/Disconnecting Device* section on page 74.

2. Select the menu entry **Additional Functions > Set Sercos Address** from the context menu (right mouse click) according to the following table:

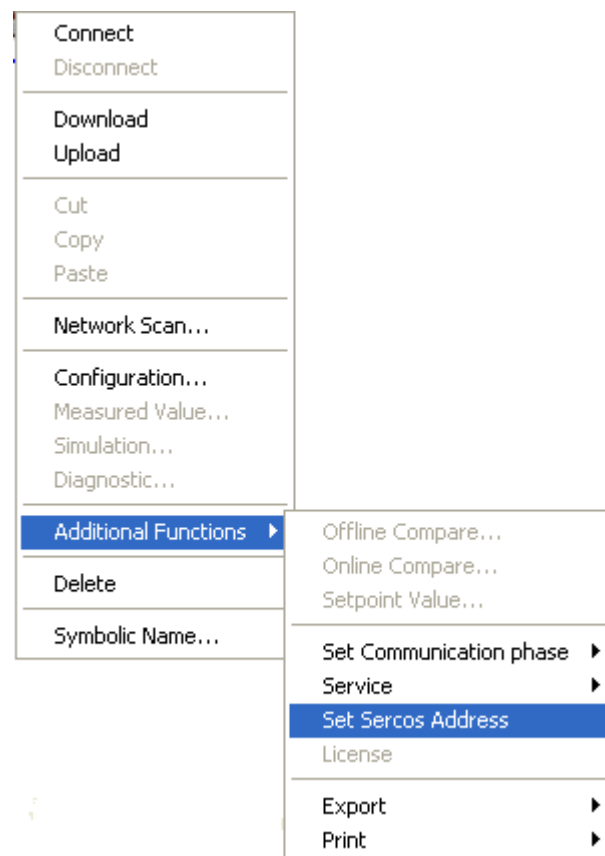


Figure 55: Menu Entry "Additional Functions -> Set Sercos Address"

➤ The following dialog appears:

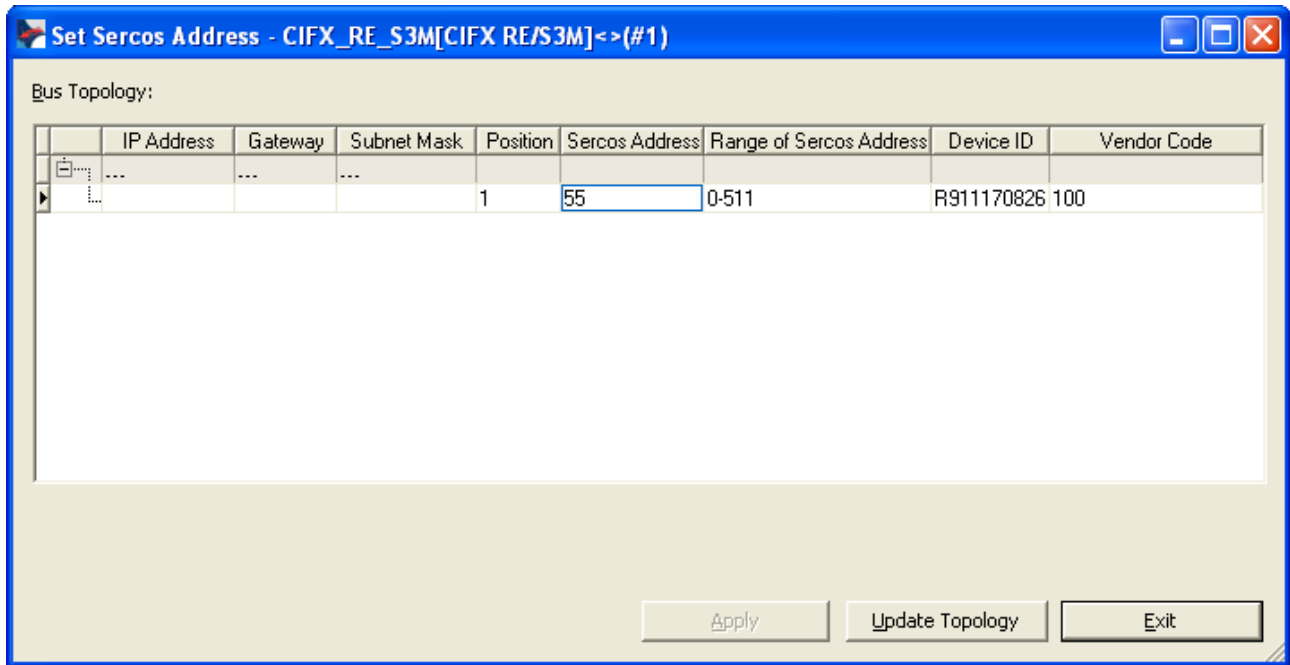


Figure 56: Setting the Sercos Address

It contains a table. Each line in this table represents a Sercos Slave device within the network

The example dialog in the picture shows a network only consisting of the Sercos Master and one single Sercos Slave device at Sercos Address 55.

The meaning of the columns in the dialog is as follows:

Column	Meaning
IP Address	This item contains the IP address of the Sercos Slave device.
Gateway	This item contains the IP address of the gateway to which the Sercos Slave device is connected.
Subnet mask	This item contains the subnet mask of the Sercos Slave device.
Position	This item is the position of the Sercos Slave device within the Sercos network, i.e. the device directly connected to the master has the position value 1, the one connected to this Sercos Slave device has the position value 2, and so on. It is also denominated as topology address.
Sercos Address	This item contains the Sercos Address to identify the Sercos Slave device within the Sercos network. It is editable.
Range of Sercos Address	The allowed range of Sercos Addresses.
Device ID	The unique device ID of the Sercos Slave device which has been assigned to the device by the manufacturer or vendor and identifies the device. The device ID is part of the electronic label of the device. It corresponds to the contents of IDN S-0-1300.x.5.
Vendor Code	The vendor code of the Sercos Slave device which has been assigned to the manufacturer or vendor by Sercos International. The vendor code is part of the electronic label of the device. It corresponds to the contents of IDN S-0-1300.x.3.

Table 27: Meaning of Columns in Table "Set Sercos Address"

- To apply changes of Sercos addresses, click at the *Apply* button.
- To analyze the network again for Sercos address information, click at the *Update Topology* button.

6.7 Licensing

Using the license dialog, you can order licenses for **Master protocols** or **Utilities** and download them to your device.

6.7.1 Open License Dialog

You first open the **License** window.



Note: You first need to assign the Controller device to the DTM. Only then the device data and the licenses already present in the device are displayed in the **License** dialog.

How to proceed:

A.) Assigning the Controller device to the DTM

1. Open the DTM configuration dialog.
 - In the FDT container **netDevice** double click to the device icon.
2. Select one or several driver/s.
 - Select **Settings > Driver**.
 - Check the driver/s.
3. Configure the driver, if necessary.
 - Select **Settings > Driver > [Name of the assigned driver]**.
 - Configure the driver settings.
4. Scan for and select the device/s.
 - Select **Settings > Device Assignment**.
 - Select **suitable only** or **all** and then **Scan**.
 - Under **Device selection** check the required device/s.
 - Select **Apply**.
5. Close the DTM configuration dialog via **OK**.



For details to the device assignment, refer to section *Overview Settings* on page 29.

B.) Open the License pane

- In the FDT container **netDevice** right click to the device icon.
- From the context menu select **Additional Functions > License**.
- The **License pane** opens.

6.7.2 License Dialog

In the **License**¹ pane you can:

- check, which licenses for Master protocols or Utilities are present in the device (Position ① in the figure below),
- order licenses (Positions ② to ⑪),
- transfer licenses to the device ⑫.

License Type

	Existing	Order
Master protocols		
One General Master License	NO	<input type="checkbox"/>
Two General Master Licenses	NO	<input type="checkbox"/>
PROFIBUS Master	YES	<input type="checkbox"/>
CANopen Master	YES	<input type="checkbox"/>
DeviceNet Master	YES	<input type="checkbox"/>
AS-Interface Master	YES	<input type="checkbox"/>
PROFINET IO RT Controller	YES	<input type="checkbox"/>

Request Form, please fill out

Name	Value
License type	User Single Device License
Manufacturer*	0x0001
Article number*	1251100
Serial number*	20007
Chiptype*	0x00000001
Step*	0x00000000
Romcode revision*	0x00000000

Fields marked with "*" are mandatory.

E-mail...
Print Fax Form...
Telephone...
Export License Request...
Download License
Close Help

Figure 57: License Pane



Note: To display further entries under **License Type**, move the scroll box ① downwards or upwards. To display further entries under **Request Form, please fill out**, move the scroll box ② downwards or upwards.

¹ The title bar contains the notation of the **device description**:
Symbolic Name [Device Description] <Station Address> (#Network ID).

6.7.3 Which Licenses are present in the Device?

Check, which licenses are present in the device.

How to proceed:

- Open the **License** pane as described under section *Open License Dialog* on page 91.

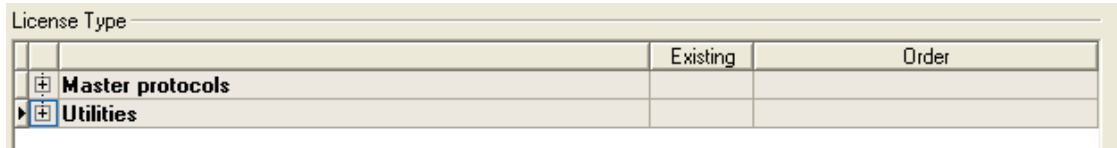


Figure 58: License Pane - License Type

- Under **License Type** click at **Master protocols**.
- The **Master protocols** overview opens:

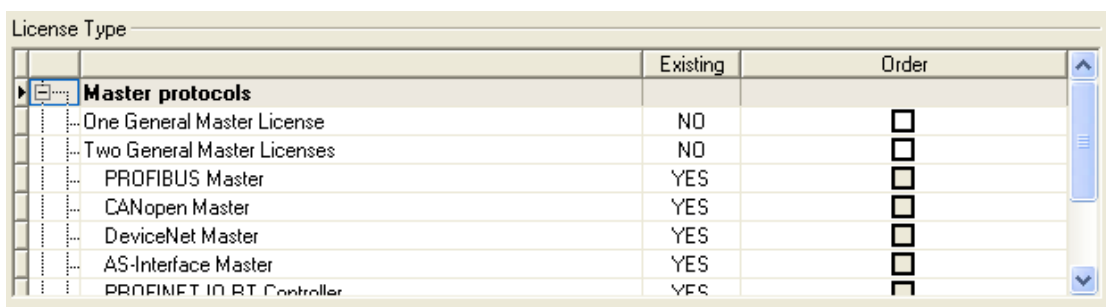


Figure 59: License Pane – License Type / Master protocols

- Or click at **Utilities**.
- The **Utilities** overview opens:

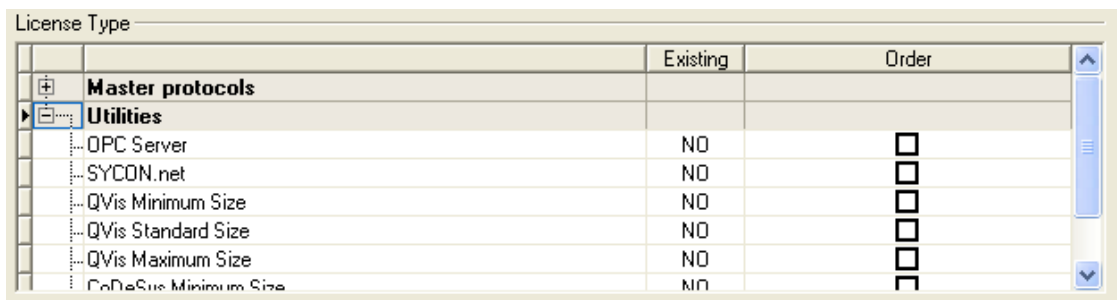


Figure 60: License Pane – License Type / Utilities

- The column **Existing** indicates which licenses are present in the device.
Yes = License is present in the device.
No = License is not present in the device.



Note: In newer versions of the present configuration software under **License Type** may be displayed additional licenses or other protocols that can be ordered later.

6.7.3.1 License for Master Protocols

One General Master License:

On the device maximally 1 communication protocol with master function can be implemented.

Two General Master Licenses:

On the device maximally 2 communication protocols with master function can be implemented.

The license includes the following Master protocols:

- AS-Interface Master
- CANopen Master
- DeviceNet Master
- EtherCat Master
- EtherNet/IP Scanner
- PROFIBUS Master
- PROFINET IO RT Controller
- Sercos Master

6.7.3.2 License for Utilities

- SYCON.net
- OPC Server
- QVis Minimum Size
- QVis Standard Size
- QVis Maximum Size
- CoDeSys Minimum Size
- CoDeSys Standard Size
- CoDeSys Maximum Size

For the utilities QVis and CoDeSys, only one license each may be chosen alternatively as:

- *Minimum Size,*
- *Standard Size or*
- *Maximum Size.*

6.7.4 How to order a License


To order a license, proceed as follows:

	<i>Refer to Section:</i>	<i>Page</i>
1. Open the license dialog.	<i>Open License Dialog</i>	91
2. Select the required licenses.	<i>Selecting License</i>	95
3. Enter the ordering data.	<i>Ordering Data</i>	96
4. Place your order.	<i>Ordering the License</i>	98


6.7.5 Selecting License(s)

You can select licenses for Master protocols and / or utilities.

1. Selecting license(s) for Master protocol(s):

- Under **License Type** click  at **Master protocols** in the **License** pane.
- Under **Order** check as many licenses must run simultaneously on your device:
One General Master License or
Two General Master Licenses.

2. And/or select license(s) for utility(utilities):

- In the **License** pane under **License Type** click  at **Utilities**.
- Under **Order** check the required utility(utilities)
(single or several)² :
 - SYCON.net
 - OPC Server
 - QVis Minimum Size*
 - QVis Standard Size*
 - QVis Maximum Size*
 - CoDeSys Minimum Size**
 - CoDeSys Standard Size**
 - CoDeSys Maximum Size**

2 For *) and **) minimum size, standard size or maximum size can be selected only as an alternative.

6.7.6 Ordering Data

1. Device Information

- The *Device Information* required for the order are read from the device and automatically filled in the order.

2. Ordering Data

Enter the *Ordering Data* into the **License** pane.

- Enter the **Data to manage the Order** (therefore refer to section *Data to manage the Order (License Information)* on page 97).

6.7.6.1 Device Information (Ordering data read from the Device)

The following ordering data are read from the device and displayed in the **License** pane:

- Manufacturer
- Device number
- Serial number
- Chiptype
- Step (chip revision)
- Romcode revision
- Checksum (checksum of the device data)

- The gray fields under **Request Form, please fill out** contain the ordering data read from the device:

Request Form, please fill out

Name	Value
Manufacturer*	0x0001
Article number*	1251100
Serial number*	20007
Chiptype*	0x00000001
Step*	0x00000000
Romcode revision*	0x00000000
Checksum*	G

Fields marked with "*" are mandatory.

Figure 61: License Pane - Request Form, please fill out / Device Information

- These ordering data read out from the device are displayed automatically from the device.

6.7.6.2 Data to manage the Order (License Information)

For your order you must enter the following data to the **License** pane:

1. License Type (User Single Device License).

Name	Value
License type	User Single Device License

Figure 62: License Pane - Request Form, please fill out / License Type

- Select the license type under **Request Form, please fill out > Value**, (for future application, currently only *User Single Device License* can be selected).
- 2. Mandatory data to the order request (editable fields):
 - First Name
 - Surname
 - E Mail (address, to which the license download link shall be send.)
 - Telephone
 - Company
 - Address
 - Country
 - City, State, Zip

Name	Value
First name*	John
Surname*	Doe
E-Mail*	License@doe.com
Telephone*	0011223344-55
Fax	0011223344-100
Customer number	123456789
Company*	Doe Example LTD

Fields marked with '*' are mandatory.

Figure 63: License Pane - Request Form, please fill out / Mandatory data

- Enter all mandatory fields under **Request Form, please fill out > Value** (marked with*).
- 3. Additional order data, not mandatory (editable fields):
 - Fax
 - Customer Number
 - Order Number
 - Value added tax identification number
- Under **Request Form, please fill out > Value** enter all fields for the additional data, which are not mandatory.

6.7.7 Ordering the License

Place your order in the **License** pane. Therefore:



Figure 64: License Pane – Selecting the Subsidiary / Ordering / Contacts

1. Select the **Subsidiary** ④, to which the order shall be send.
2. Place the order:

- | | <i>Refer to Section:</i> | <i>Page</i> |
|---|---|-------------|
| • by E-Mail ⑤, | <i>Ordering the License <u>by E Mail</u></i> | 99 |
| • or by Fax ⑥
or by Telephone ⑦, | <i>Ordering the License <u>by Fax or by Telephone</u></i> | 100 |
| • or in a File ⑧. | <i><u>Exporting License Request to a File</u></i> | 102 |
- The **Contact Data** of the selected subsidiary are displayed under Position ⑨, ⑩ and ⑪.

6.7.7.1 Ordering the License by E Mail

You can place your order by e-mail.



Figure 65: License Pane – placing the order by E-mail

- Click **E-mail...** 5.
- The order E-mail **License request** opens:

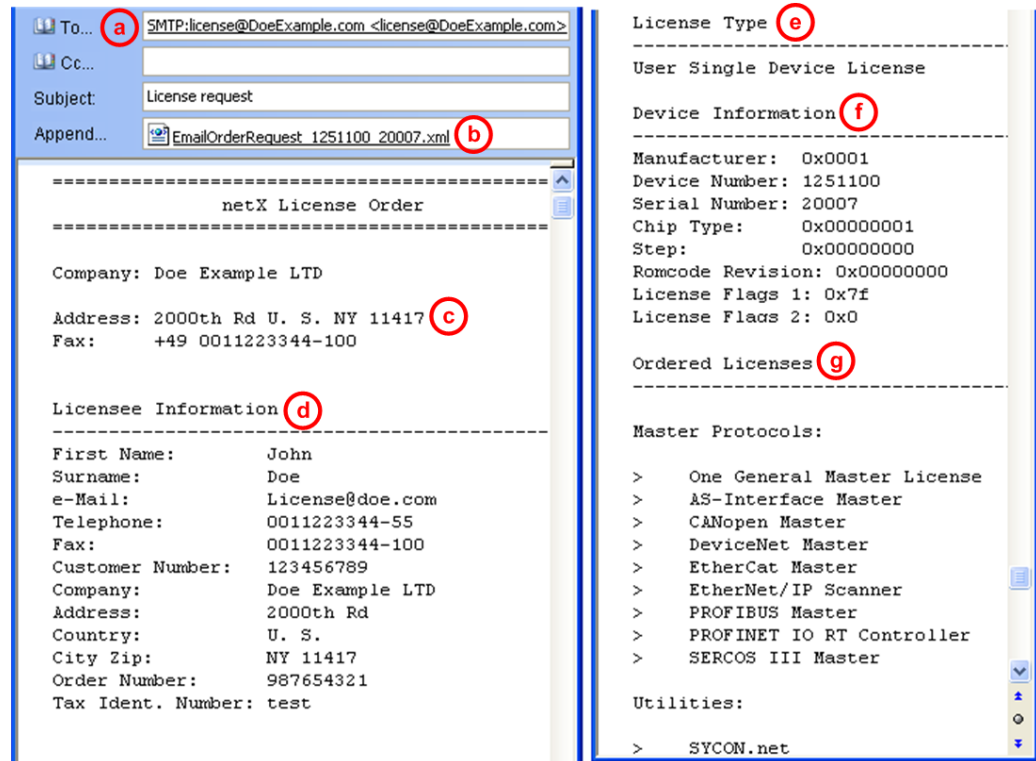


Figure 66: Example: Order E-Mail License request

- The order e-mail **License request** contains:
 - the **E-mail...** of the selected subsidiary a,
 - the automatically generated **XML file** b *EmailOrderRequest_[Devicenumbr][Serialnumber].xml* with a summary info of the **order information**,
 - the **Order Address** c,
 - the **License Information** d,
 - the **License Type** e,
 - the **Device Data** f,
 - the **ordered Licenses** g.
- Send the order e-mail **License request**.
- The order process is complete.

6.7.7.2 Ordering the License by Fax or by Telephone

You can place your order by Fax or by Telephone.



Figure 67: License Pane - placing the order by Fax or by Telephone

- Click **Print Fax Form** ⑥ or **Telephone...** ⑦.
- The summary of the ordering data *PrintOrderRequest_[Devicenum-ber]_[Serialnumber].html* is opened in a browser window.



Note: If your browser does not display the order data or the window **Move Element** or **Copy Element** are displayed, check the safety settings of your system.

netX License Order Form

Doe Example LTD
2000th Rd

NY 11417
U. S.
fax: +11223344-100

Licensee Information ④

<i>First Name:</i>	John
<i>Surname:</i>	Doe
<i>e-Mail:</i>	License@doe.com
<i>Telephone:</i>	0011223344-55
<i>Fax:</i>	0011223344-100
<i>Customer No:</i>	123456789
<i>Company:</i>	Doe Example LTD
<i>Address:</i>	2000th Rd
<i>Country:</i>	U. S.
<i>City Zip:</i>	NY 11417
<i>Order Number:</i>	987654321
<i>Tax Ident. Number:</i>	test

License Type ⑤

User Single Device License

Device Information ⑥

<i>Manufacturer:</i>	0x0001
<i>Device Number:</i>	1251100
<i>Serial Number:</i>	20007
<i>Chip Type:</i>	0x00000001
<i>Step:</i>	0x00000000
<i>Romcode Revision:</i>	0x00000000
<i>License Flags 1:</i>	0x7f
<i>License Flags 2:</i>	0x0

Ordered Licenses ⑧

Master Protocols

- One General Master License
- Sercos III Master

Utilities

- SYCON.net

Date: _____

Signature: _____

Figure 68: Example: Order Data Form *PrintOrderRequest*

- The order data form contains:
- the **Order Address** ^c,
- the **License Information** ^d,
- the **License Type** ^e,
- the **Device Data** ^f,
- the **ordered Licenses** ^g.
- Print the order data form, sign it and send it by Fax.



Figure 69: License Pane – Fax Number of the selected Subsidiary

- Use the Fax number ¹⁰, which is displayed after the subsidiary was selected in the **License** pane.

Or:

- Keep ready the order data form and communicate the order data via telephone.



Figure 70: License Pane – Telephone Number of the selected Subsidiary

- Use the telephone number ¹¹, which is displayed after the subsidiary was selected in the **License** pane.
- The order process is complete.

6.7.7.3 Exporting License Request to a File

If you are working on a process computer without an e-mail client, you can export your order information to a file, save the file to a removable disk and place your order manually via e-mail from a different PC.



Figure 71: License Pane - Ordering by exported File and E-Mail

- Click **Export License Request...** 8.
- The window **Browse For Folder** is displayed.
- Choose for or create a new folder on a removable disk.
- Save the automatically generated **XML file** *EmailOrderRequest_- [Devicenumbr]_[Serialnumber].xml* with a summary info of the **order information** to this folder.
- Send this file from a PC with an e-mail client manually via e-mail.
- Therefore use an e-mail address , which is displayed after the subsidiary was selected in the **License** pane (see Position 9 Figure *License Pane* on page 92).
- The order process is complete.

6.7.8 How to get the License and transfer it to the Device



Note: License files can only be delivered via e-mail. The e-mail contains a link to download the license file.

According to the license you ordered, you will receive an e-mail containing a **Link to download the License File**. This leads to a server PC on which the license file is provided. Using the received link you will have to save the license file on your PC and then transfer the license to your device. If your e-mail client is on another PC as your device, you must save your license file e. g. to an USB stick.

Steps how to proceed


1. Save the license file to a PC or a disk.
 - Click to the **Link to download the License File** in the e-mail.
 - Save the license file *.nxl to a PC or a removable disk.
2. Download the license file to the device.
 - Respectively connect the removable disk with the license file to the PC, which is connected to your device.
 - Click **Download License**  in the **License** pane in the configuration software.



Figure 72: License Pane - Download License

- The File selection window **Open** is displayed.
 - Therein select the license file *netX License Files (*.nxl)*.
 - Click **Open**.
 - The license file is transferred to the device.
 - After this the license is present in the device and is activated with the next device reset.
3. Activate Device Reset



Hint: To activate the license in the first device, a device reset is required.

- To check whether the license has been activated, follow the steps in section *Which Licenses are present in the Device?* on page 93.

7 Diagnosis

7.1 Overview Diagnosis

The dialog **Diagnosis** serves to diagnose the device behavior and communication errors. For diagnosis the device must reside in online state.

Diagnosis Panes

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

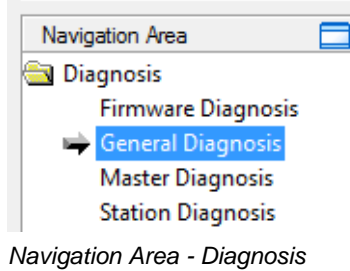
Sercos Master DTM	Folder Name / Section	Manual Page
	<i>Firmware Diagnosis</i>	109
	<i>General Diagnosis</i>	105
	<i>Master Diagnosis</i>	107
	<i>Station Diagnosis</i>	108

Table 28: Descriptions of the Diagnosis Panes

Online Connection to the Device



Note: Accessing the **Diagnosis** panes of the Sercos Master DTM requires an online connection from the Sercos Master DTM to the Sercos Master device. For further information refer to section *Connecting/Disconnecting Device* on page 127.

How to proceed

1. In the Master DTM diagnosis dialog check whether the communication is OK:

Diagnosis > General Diagnosis > Device status "Communication" must be green!

2. **"Communication"** is green: Open the **IO Monitor** and test the input or output data..
3. **"Communication"** is not green: Use **Diagnosis** and **Extended diagnosis** for troubleshooting.

Extended Diagnosis

The **Extended Diagnosis** helps to find communication and configuration errors, when default diagnosis fails. For further information refer to section *Overview Extended Diagnosis* on page 110.

7.2 General Diagnosis

Information regarding the Device State and other general diagnosis parameters are displayed in the **General Diagnosis** dialog.

General Diagnosis

Device state

- ☐ Communication
- ☒ Run
- ☐ Ready
- ☐ Error

Network state

- ☒ Operate
- ☐ Idle
- ☐ Stop
- ☐ Offline

Configuration state













- ☐ Configuration locked
- ☐ New configuration pending
- ☐ Reset required
- ☒ Bus ON

Communication error:

Watchdog time:

Error count:

Figure 73: General Diagnosis

LED	Meaning	Color	State
Device State			
Communication	Shows whether the Sercos device executes the network communication.	 (green)	In COMMUNICATION state
		 (gray)	Not in COMMUNICATION state
Run	Shows whether the Sercos device has been configured correctly.	 (green)	Configuration OK
		 (gray)	Configuration not OK
Ready	Shows whether the Sercos device has been started correctly. The Sercos device waits for a configuration.	 (yellow)	Device READY
		 (gray)	Device not READY
Error	Shows whether the Sercos device records a device status error. For further information about the error characteristics and the number of counted errors refer to the extended diagnosis.	 (red)	ERROR
		 (gray)	No ERROR
Network State			
Operate	Shows whether the Sercos device is in data exchange. In a cyclic data exchange the input data or the output data of the Sercos Master are transmitted to the Sercos Slave.	 (green)	In OPERATION state
		 (gray)	Not in OPERATION state
Idle	Shows whether the Sercos device is in idle state.	 (yellow)	In IDLE state
		 (gray)	Not in IDLE state













LED	Meaning	Color	State
Stop	Shows whether the Sercos device is in Stop state: There is no cyclic data exchange at the Sercos network. The Sercos device was stopped by the application program or it changed to the Stop state because of a bus error.	 (red)	In STOP state
		 (gray)	Not in STOP state
Offline	The Sercos Master is offline as long as it does not have a valid configuration.	 (yellow)	In OFFLINE state
		 (gray)	Not in OFFLINE state
Configuration State			
Configuration locked	Shows whether the Sercos device configuration is locked, to avoid the configuration data are typed over.	 (yellow)	Configuration LOCKED
		 (gray)	Configuration not LOCKED
New Configuration pending	Shows whether a new Sercos device configuration is available.	 (yellow)	New Configuration pending
		 (gray)	No new Configuration pending
Reset required	Shows whether a firmware reset is required as a new Sercos device configuration has been loaded into the device.	 (yellow)	RESET required
		 (gray)	No RESET required
Bus ON	Shows whether the bus communication was started or stopped. I. e., whether the device is active on the bus or no bus communication to the device is possible and no response telegrams are sent.	 (green)	Bus ON
		 (gray)	Bus OFF

Table 29: Indication General Diagnosis

Parameter	Meaning
Communication Error	Shows the name of the communication error. If the cause of error is resolved, the value will be set to zero again.
Watchdog time	Shows the watchdog time in ms.
Error Count	This field holds the total number of errors detected since power-up, respectively after reset. The protocol stack counts all sorts of errors in this field no matter whether they were network related or caused internally.

Table 30: Parameter General Diagnosis

7.3 Master Diagnosis

Information regarding the Slave State, slave errors and slaves configured, active or in diagnostic are displayed in the **Master Diagnosis** dialog.

Master Diagnosis	
Slave state	failed
Slave error log indicator	available
Configured slaves	2
Active slaves	0
Slaves with diagnostic	2

Figure 74: Master Diagnosis

Parameter	Meaning	Range of Value / Default Value
Slave state	Shows whether slave state is ok or not. The Slave state field for Master diagnosis shows whether the Master is in cyclic data exchange to all configured slaves. In case there is at least one slave missing or if the slave has a diagnostic request pending, the status will be set to FAILED. For protocols that support non-cyclic communication only, the slave state is set to OK as soon as a valid configuration is found.	UNDEFINED, OK, FAILED
Slave error log indicator	Shows whether the Slave Error Log Indicator is available. The error log indicator field holds the number of entries in the internal error log. If all entries are read from the log, the field will be set to zero.	EMPTY, AVAILABLE
Configured slaves	Shows number of configured slaves. Number of configured slaves in the network according to the slave list derived from the configuration database created by the configuration software . The list includes the slaves to which the Master has to open a connection.	
Active slaves	Shows number of active slaves. Number of slaves in data exchange mode. The list includes the slaves to which the Master has successfully opened a connection.	
Slaves with diagnostic	Shows number of slaves with diagnostic. Number of Slaves with diagnosis or error slaves.	

Table 31: Parameter Master Diagnosis

7.4 Station Diagnosis

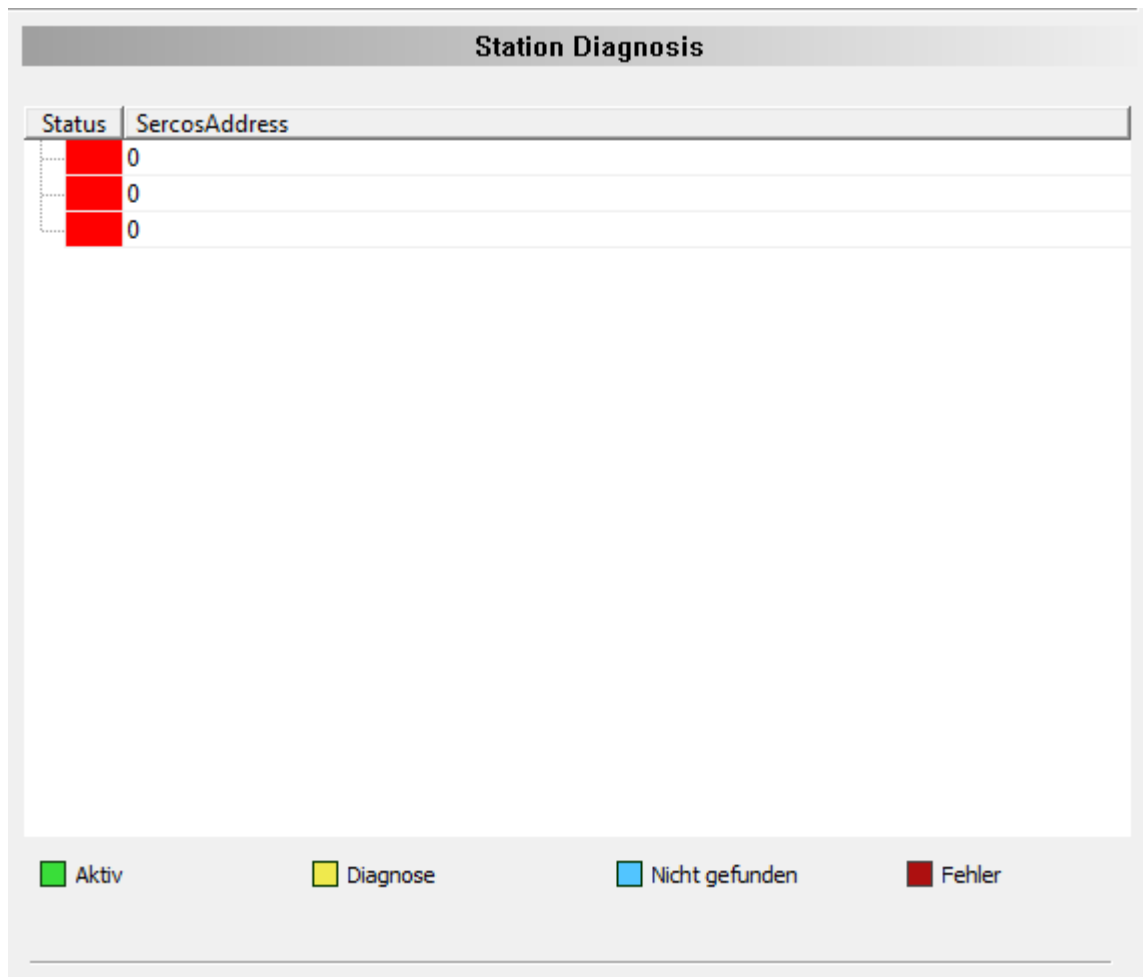


Figure 75: Station Diagnosis

The **Station Diagnosis** shows the status of the devices, which are connected to the Sercos Master DTM online. The DTM updates this display cyclically.

Column	Meaning
Status	The current status of the device associated to the Sercos address displayed, see <i>Table 33: Possible Values for the Status</i> .
SercosAddress	Sercos address, to which the device is assigned (Possible range of values: 1 .. 511).

Table 32: Columns of Table 'Station Diagnosis'

The legend below describes the possible values of the state of a device assigned to a station address.

Color	Name	Meaning
green	Running	The device associated with this station address is running.
yellow	Diagnosis	Diagnosis is available for the device associated with this station address.
blue	Not found	The device associated with this station address was parameterized, but not found.
red	Error	An error message is available for the device associated with this station address.

Table 33: Possible Values for the Status

7.5 Firmware Diagnosis

In the dialog **Firmware Diagnosis** the current task information of the firmware is displayed.

Under **Firmware** or **Version** the name of the firmware and version (including the date) are indicated.

Task	Name of task	Version	Prio...	Description	State
0	RX_IDLE	1.0	63	RX IDLE Task.	Task Status ok. (0x00000000)
1	RX_TIMER	1.0	1	rcX Timer.	Task Status ok. (0x00000000)
2	RX_SYSTEM	1.16	8	Middleware Syst...	Task Status ok. (0x00000000)
3	DPM_COM...	1.0	50	TLR-Router DPM.	Task Status ok. (0x00000000)
4	DPM_COM...	1.0	51	TLR-Router DPM.	Task Status ok. (0x00000000)
5	S3M_SVC	2.0	18	Sercos III Servic...	Task Status ok. (0x00000000)
6	S3M_CP	2.0	17	Sercos III Comm...	Task Status ok. (0x00000000)
7	S3M_AP	2.0	19	Sercos III DPM A...	Task Status ok. (0x00000000)

Figure 76: Firmware Diagnosis (* The Name of the Firmware appears.)

Task Information:

The table **Task Information** is listing the task information of the single firmware tasks.

Column	Meaning
Task	Task number
Name of task	Name of the task
Version	Version number of the task
Prio	Priority of the task
Description	Description of the task
Status	Current status of the task

Table 34: Description Table Task Information

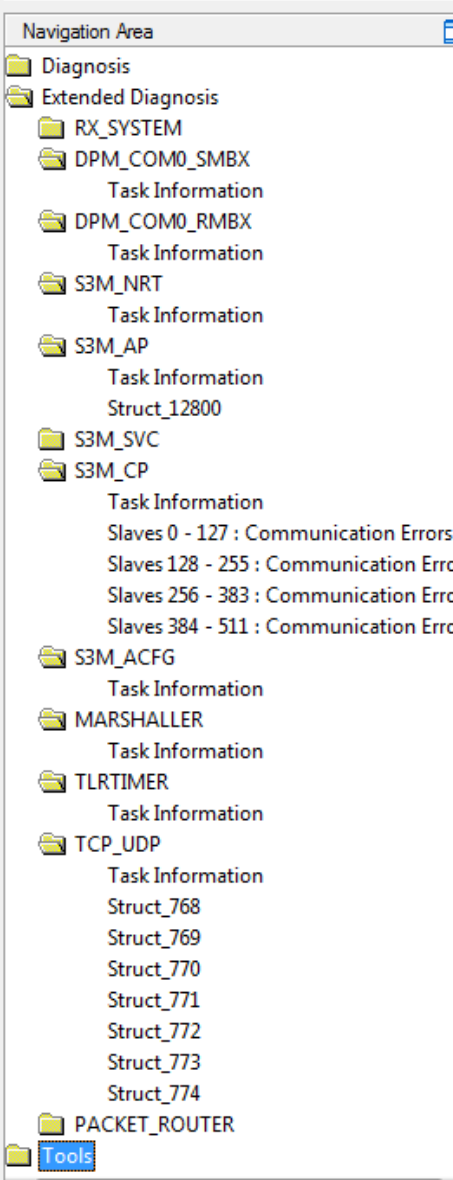
8 Extended Diagnosis

8.1 Overview Extended Diagnosis

The **Extended Diagnosis** of the Sercos Master DTM helps to find communication and configuration errors. Therefore it contains a list of diagnosis structures as online counter, states and parameters.

Dialog Panes “Extended Diagnosis”

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

Sercos Master DTM	Folder Name in the Navigation Area	Dialog Pane	Manual Page
	RX-SYSTEM	Task Information	112
		IniBatch Status	113
	DPM_COM0_SMBX	Task Information	112
	DPM_COM0_RMBX	Task Information	112
	MARSHALLER	Task Information	112
	S3M_NRT	Task Information	112
	S3M_SVC	Task Information	112
	S3M_AP	Task Information	112
	S3M_CP	Task Information	112
		Slaves <XXX>-<YYY>: Communication Errors	114
	S3M_ACFG	Task Information	112
	TLRTIMER	Task Information	112
	TCP_UDP	Task Information	112
		IP-Information	117
		IP Packet Counter	119
		IP Code Diagnosis	120
		TCP_UDP Information	121
		TCP_UDP Code Diagnosis	122
	PACKET_ROUTER	Task Information	112

Navigation Area - Extended Diagnosis

Table 35: Descriptions of the Dialog Panes Extended Diagnosis

Online Connection to the Device



Note: Accessing the **Extended Diagnosis** dialog panes of the Sercos Master DTM requires an online connection from the Sercos Master DTM to the Sercos Master device. For further information refer to section *Connecting/Disconnecting Device* on page 74.

8.2 Task Information

Task Information	
Task states	
Name	Value
Identifier	
Major version	<i>[The displayed values depend from the corresponding task]</i>
Minor version	
Maximum Packet size	
Default Que	
Unique identifier	
Init result	

Figure 77: Extended Diagnosis > [Folder Name] > Task Information Example Display

Name	Description
Identifier	Identification number of the task
Major version	Task version, contains incompatible changes
Minor version	Task version, contains compatible changes
Maximum packet size	Maximum packet size, which the task sends
Default Queue	Queue handle, which is accessible via DPM by mailbox.
UUID	Unique user ID, 16 Byte indicator used for task identification and its affiliation e. g. to a stack (therein different identification data are coded in).
Init result	Error Code, 0= no Error The description of the error codes can be found in this manual or in the corresponding software reference manuals.

Table 36: Extended Diagnosis > [Folder Name] > Task Information

8.3 IniBatch Status

IniBatch-Status	
Task states	
Name	Value
Communication Channel	0
Current State	Error
IniBatch Result	No DBM file
OpenDbm Result	24975
SendPacket Result	0
Confirmation Result	0
Last Packet Number	0
Last Packet Command	0
Last Packet Length	0
Last Packet Destination	0

Figure 78: Extended Diagnosis > [Folder Name] > IniBatch Status Example Display

Name	Description
Communication Channel	Number of the communication channel used by the device.
Current State	0 = Idle; 1 = IniBatch packets in progress; 2 = Retrying to send last packet; 3 = Error
IniBatch Result	0 = Ok; 1 = No DBM file; 2 = No Packet table; 3 = No data set available; 4 = Data set is shorter than packet length; 5 = Packet Buffer is shorter than Packet length; 6 = Invalid packet destination; 7 = Logical queue not defined 8 = Send packet failed; 9 = Too many retries; 10 = Error in confirmation packet status
OpenDbm Result	Error when opening the IniBatch data base Under "OpenDbm Result" the error code is typed in, when "IniBatch Result" == "No DBM file" (1) is.
SendPacket Result	Error when sending a packet Under "SendPacket Result" the error code is typed in, when "IniBatch Result" == "send packet failed" (8) is.
Confirmation Result	Confirmation error when sending packets Under "Confirmation Result" the packet specific error code from the ulSta is typed in, when "IniBatch Result" == "Error in confirmation packet status" (10) is.
Last Packet Number	Value depends by the communication system.
Last Packet Command	Value depends by the communication system.
Last Packet Length	Value depends by the communication system.
Last Packet Destination	Value depends by the communication system.

Table 37: Extended Diagnosis > [Folder Name] > IniBatch Status

The task status "Confirmation Result" is bus specific. The other task statuses are rcx-related error codes.

8.4 Slaves <XXX>-<YYY>: Communication Errors

This dialog pane may appear for four different ranges of slave numbers. The following table shows the possible ranges for slave numbers whose communication errors are listed on these panes.

XXX	YYY
0	127
128	255
256	383
384	511

Table 38: Possible Ranges of Slave Numbers

Pane for range 0 to 127 (not all slave entries displayed as all entries look similarly):

Slaves 0 - 127 : Communication Errors	
Task states	
Name	Value
Slave 1: Communication Error	None
Slave 2: Communication Error	None
Slave 3: Communication Error	None
Slave 4: Communication Error	None
Slave 5: Communication Error	None
Slave 6: Communication Error	None
Slave 7: Communication Error	None
Slave 8: Communication Error	None
Slave 9: Communication Error	None
Slave 10: Communication Error	None
Slave 11: Communication Error	None
Slave 12: Communication Error	None
Slave 13: Communication Error	None
Slave 14: Communication Error	None
Slave 15: Communication Error	None
Slave 16: Communication Error	None
Slave 17: Communication Error	None
Slave 18: Communication Error	None
Slave 19: Communication Error	None
Slave 20: Communication Error	None
Slave 21: Communication Error	None
Slave 22: Communication Error	None
Slave 23: Communication Error	None
Slave 24: Communication Error	None
Slave 25: Communication Error	None
Slave 26: Communication Error	None
Slave 27: Communication Error	None
Slave 28: Communication Error	None
Slave 29: Communication Error	None
Slave 30: Communication Error	None

Figure 79: Extended Diagnosis > S3M_CP > Slaves 0 - 127: Communication Errors

Pane for range 128 to 255 (not all slave entries displayed as all entries look similarly):

Slaves 128 - 255 : Communication Errors	
Task states	
Name	Value
Slave 128: Communication Error	None
Slave 129: Communication Error	None
Slave 130: Communication Error	None
Slave 131: Communication Error	None
Slave 132: Communication Error	None
Slave 133: Communication Error	None
Slave 134: Communication Error	None
Slave 135: Communication Error	None

Figure 80: Extended Diagnosis > S3M_CP > Slaves 128 - 255: Communication Errors

Pane for range 256 to 383 (not all slave entries displayed as all entries look similarly):

Slaves 256 - 383 : Communication Errors	
Task states	
Name	Value
Slave 256: Communication Error	None
Slave 257: Communication Error	None
Slave 258: Communication Error	None
Slave 259: Communication Error	None
Slave 260: Communication Error	None
Slave 261: Communication Error	None
Slave 262: Communication Error	None
Slave 263: Communication Error	None

Figure 81: Extended Diagnosis > S3M_CP > Slaves 256 - 383: Communication Errors

Pane for range 384 to 511 (not all slave entries displayed as all entries look similarly):

Slaves 384 - 511 : Communication Errors	
Task states	
Name	Value
Slave 384: Communication Error	None
Slave 385: Communication Error	None
Slave 386: Communication Error	None
Slave 387: Communication Error	None
Slave 388: Communication Error	None
Slave 389: Communication Error	None
Slave 390: Communication Error	None
Slave 391: Communication Error	None
...	..

Figure 82. Extended Diagnosis > S3M_CP > Slaves 384 - 511: Communication Errors

Name	Description
Slave <XXX>: Communication Error	Either "None" or description of occurred error.

Table 39: Extended Diagnosis > S3M_CP > Slaves <XXX> - <YYY>: Communication Errors

[illegible]

Name	Description
Task State	State of TCP_UDP Task
Error Counter	Counter for number of errors having occurred
Last Error	Code of last error having occurred
IP Address	Actual IP Address of device
Net Mask	Actual Net Mask of device
Gateway	Actual Gateway of device
Flags (Value from Database)	Flags
IP Address (Value from Database)	IP Address of device
Net Mask (Value from Database)	Net Mask of device
Gateway (Value from Database)	Gateway of device
IP Config source	IP configuration source 0: None 1: DHCP server 2: BOOTP server 3: Database, Warmstart packet 4: ICMP (Ping) 255: Hilscher NetIdent Protocol

Table 40: Extended Diagnosis > TCP_UDP > IP-Information

8.6 IP Packet Counter

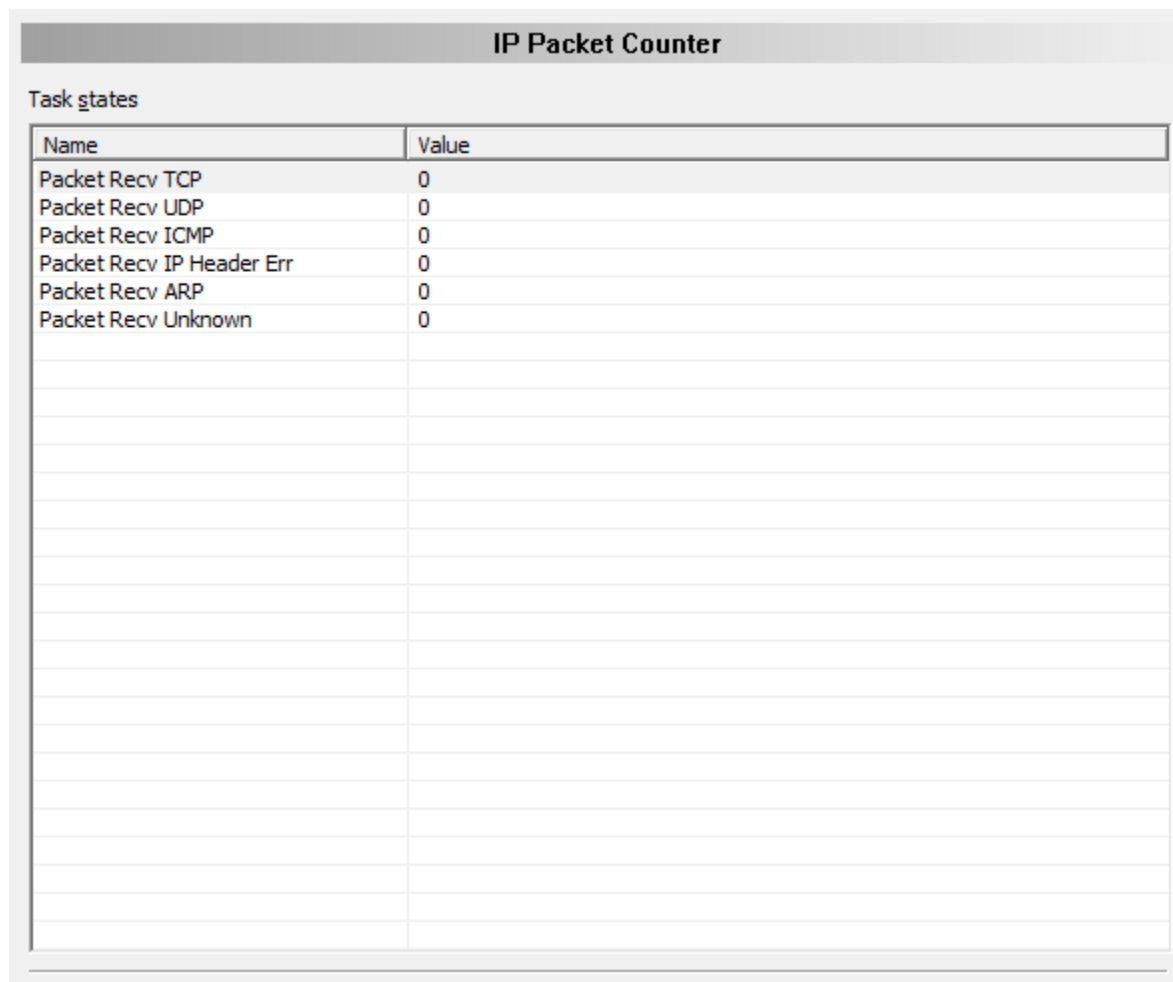


Figure 84: Extended Diagnosis > TCP_UDP > IP Packet Counter

Name	Description
Packet Recv TCP	Number of received TCP packets
Packet Recv UDP	Number of received UDP packets
Packet Recv ICMP	Number of received ICMP packets
Packet Recv IP Header Err	Number of IP Header errors having occurred
Packet Recv ARP	Number of received ARP packets
Packet Recv Unknown	Number of received unknown packets

Table 41: Extended Diagnosis > TCP_UDP > IP Packet Counter

8.7 IP Code Diagnosis

[illegible]

Figure 85: Extended Diagnosis > TCP_UDP > IP Code Diagnosis

Name	Description
Information Counter	Counter for informational messages
Warning Counter	Counter for warning messages
Error Counter	Counter for error messages
Severity Level	Severity Level of last occurred error 0: None 1: Information 2: Warning 3: Error 4: Fatal Error
Code	Error code of last occurred message
Parameter	Parameter
Module	Module where error occurred
Line Number	Line Number of last occurred message

Table 42: Extended Diagnosis > TCP_UDP > IP Code Diagnosis

8.8 TCP_UDP Information

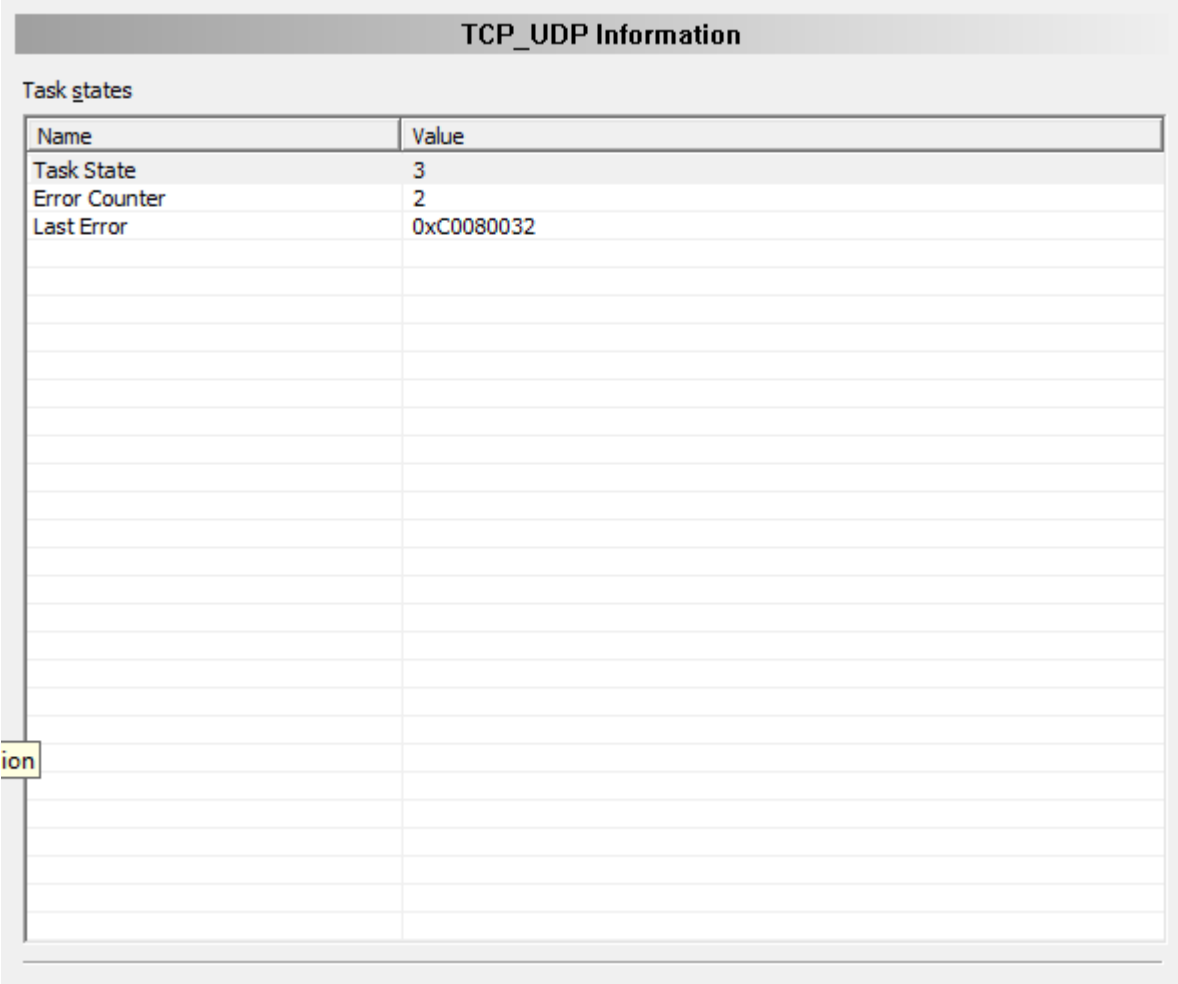


Figure 86: Extended Diagnosis > TCP_UDP > TCP_UDP Information

Name	Description
Task State	State of TCP_UDP Task
Error Counter	Counter for number of errors having occurred
Last Error	Code of last error having occurred

Table 43: Extended Diagnosis > TCP_UDP > TCP_UDP Information

8.9 TCP_UDP Code Diagnosis

[illegible]

Figure 87: Extended Diagnosis > TCP_UDP Code Diagnosis

Name	Description
Information Counter	Counter for informational messages
Warning Counter	Counter for warning messages
Error Counter	Counter for error messages
Severity Level	Severity Level of last occurred error 0: None 1: Information 2: Warning 3: Error 4: Fatal Error
Code	Error code of last occurred message
Parameter	Parameter
Module	Module where error occurred
Line Number	Line Number of last occurred message

Table 44: Extended Diagnosis > TCP_UDP Code Diagnosis

9 Tools

9.1 Overview Tools

Under **Tools** the Packet Monitor and the IO Monitor are provided for test and diagnosis purposes.

Tools Panes

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

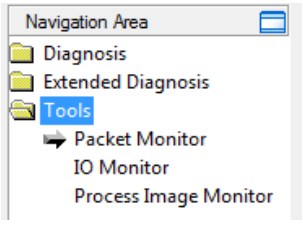
Sercos Master DTM	Folder Name / Section	Manual Page
 <p>Navigation Area - Tools</p>	Packet Monitor	124
	IO Monitor	127
	Process Image Monitor	128

Table 45: Descriptions of the Diagnosis Panes

Online Connection to the Device



Note: Accessing the **Tools** dialog panes of the Sercos Master DTM requires an online connection from the Sercos Master DTM to the Sercos Master device. For further information refer to section *Connecting/Disconnecting Device* on page 127.

9.2 Packet Monitor

The **Packet Monitor** serves for test and diagnosis purposes.

Data packets, i. e. messages are self-contained blocks of defined data length. The packets are used to communicate with the firmware and they are exchanged between the application (configuration software) and the firmware in the device. Packets can be sent once or cyclically to the connected device controlled by the user and packets received can be displayed.

Data packets comprise from a **Packet Header** and the **Send Data** or from a **Packet Header** and the **Receive Data**. The packet header can be evaluated by the receiver of the packet and contain the sender and receiver address, the data length, an ID number, status and error messages and the command or response code. The minimum packet size amounts 40 Byte for the packet header. The sending and receiving data are added.



For further information to the packet description refer to the *Protocol API Manual*.

- Open the **Packet Monitor** via **Tools > Packet Monitor**.

Figure 88: Packet Monitor

Display Mode switches the representation of the send and reception data between decimal and hexadecimal.

- Select **Reset Counter** to reset the packet counter.

9.2.1 Sending Packet

The screenshot shows the 'Send' window with the following details:

- Packet header:**
 - Dest: 00000001
 - Src: 00000000, State: 00000000
 - Dest ID: 00000000, Cmd: 00002F00
 - Src ID: 00000000, Ext: 00000000
 - Len: 00000012, Rout: 00000000
 - ID: 00000001, Auto Increment ID: ☒
- Send data:** A grid with columns 0-9 and rows 0-60. The 'Counter' is 0.
- Buttons:** 'Put cyclic' and 'Put packet'.

Figure 89: Send > Packet Header and Send Data

Packet Header

Under **Send > Packet Header** the elements of the packet header of the sending packet are displayed, which is transmitted from the application (configuration software) to the device. The packet header of the sending packets contain the elements described in the following table.

Element		Description
Dest	Destination Queue Handle	Contains the identifier of the receiver for the packet (destination task queue of the firmware).
Src	Source Queue Handle	Contains the identifier of the sender of the packet (sending task).
Dest ID	Destination Queue Reference	Contains an identifier for the receiver of unsolicited sent packets from the firmware to the application (configuration software).
Src ID	Source Queue Reference	Contains an identifier of the sender.
Len	Packet Data Length (in Bytes)	Length of the send respectively receive data.
ID	Packet Identification As Unique Number	Identifies identical data packets among each other.
State	Status / Error Code	Transmits status or error codes to the packet sender.
Cmd	Command / Response Code	Command or respond code.
Ext	Extension	Field for extensions (reserved).
Rout	Routing Information	Internal value of the firmware.

Table 46: Descriptions Packet Header

- Under **Dest** select the receiver (*destination task queue*).
- Under **Cmd** select the command identification (*Request*).

Auto Increment ID is an increment for the identifier of the data packets and increments the ID by 1 for each newly sent packet.

Send Data

- Under **Send > Send data** enter the send data of the packet, which shall be transmitted from the application (configuration software) to the mailbox of the device. The meaning of the transmitted data depends on the command or response code.

Sending Packets once or cyclic

- To send packet once, select **Put packet**.
- To send packet cyclic, select **Put cyclic**.

9.2.2 Receiving Packet

The screenshot shows a software interface for receiving packets. On the left, under the 'Receive' tab, is the 'Packet header' section with the following fields:

- Dest: 00000001
- Src: 00000000
- Dest ID: 00000000
- Src ID: 00000000
- Len: 00000012
- ID: 0000003E
- State: 00000000
- Cmd: 00002F01
- Ext: 00000000
- Rout: 00000000

On the right, under the 'Receive data' section, there is a 'Counter: 0' and a table of data bytes. The table has columns for indices 0 through 9 and a 'Counter' column. The data is as follows:

	0	1	2	3	4	5	6	7	8	9	Counter
0	00	00	00	00	00	00	00	00	00	04	
10	00	00	01	00	01	00	00	00			
20											
30											
40											
50											
60											

Figure 90: Packet Header and Receive Data

Packet Header

Under **Receive > Packet Header** the elements of the packet header of the receiving packet are displayed, which are transmitted back from the device to the application (configuration software). The packet header of the receiving packets contain the elements described in the following table.

Element		Description
Dest	Destination Queue Handle	Contains the identifier of the receiver for the packet (destination task queue of the firmware).
Src	Source Queue Handle	Contains the identifier of the sender of the packet (sending task).
Dest ID	Destination Queue Reference	Contains an identifier for the receiver of unsolicited sent packets from the firmware to the application (configuration software).
Src ID	Source Queue Reference	Contains an identifier of the sender.
Len	Packet Data Length (in Bytes)	Length of the send respectively receive data.
ID	Packet Identification As Unique Number	Identifies identical data packets among each other.
State	Status / Error Code	Transmits status or error codes to the packet sender.
Cmd	Command / Response Code	Command or respond code.
Ext	Extension	Field for extensions (reserved).
Rout	Routing Information	Internal value of the firmware.

Table 47: Descriptions Packet Header

Receive Data

Under **Receive > Receive Data** the receiving data of the packet, which is transmitted back from the device to the application (configuration software) are displayed.

9.3 IO Monitor

The **IO Monitor** serves for test and diagnosis purposes. It provides to view data of the process data image and to change output data easily. The display is always in a Byte manner.



Note: Only change and write output data if you know that no plant disturbances are caused by this. All output data written by the IO Monitor are transmitted at the bus and have effect on subordinate drives, IO etc.

IO Monitor

Columns: 10 Display mode: Decimal

Input data

Offset: 0 Go

	0	1	2	3	4	5	6	7	8	9
0	227	207	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
60	n	n	n	n	n	n	n	n	n	n

Output data

Offset: 0 Go

	0	1	2	3	4	5	6	7	8	9
0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
60	n	n	n	n	n	n	n	n	n	n

Update

Figure 91: IO Monitor

Columns switches the number of columns.

Display mode switches the representation of the input and output data between decimal and hexadecimal.

Offset / Go moves the indication of the data to the entered offset value.

➤ Enter the output value and select **Update**.

⚠ Always the data of the process image are displayed, also when these Bytes have not been reserved by the configuration.

Be aware of this fact: The process image contains not only process data, but also Connection Control, Device Control and Device Status.

9.4 Process Image Monitor

The window **Process Image Monitor** lists the Slave devices connected to the Master, as well as the configured modules or input or output signals of the devices. This makes visible the fieldbus structure and the data structure of the device's input and output data transmitted at the bus. Furthermore the values of the signal data provided to the OPC server are displayed here.

➤ Open **Tools > Process Image Monitor**.

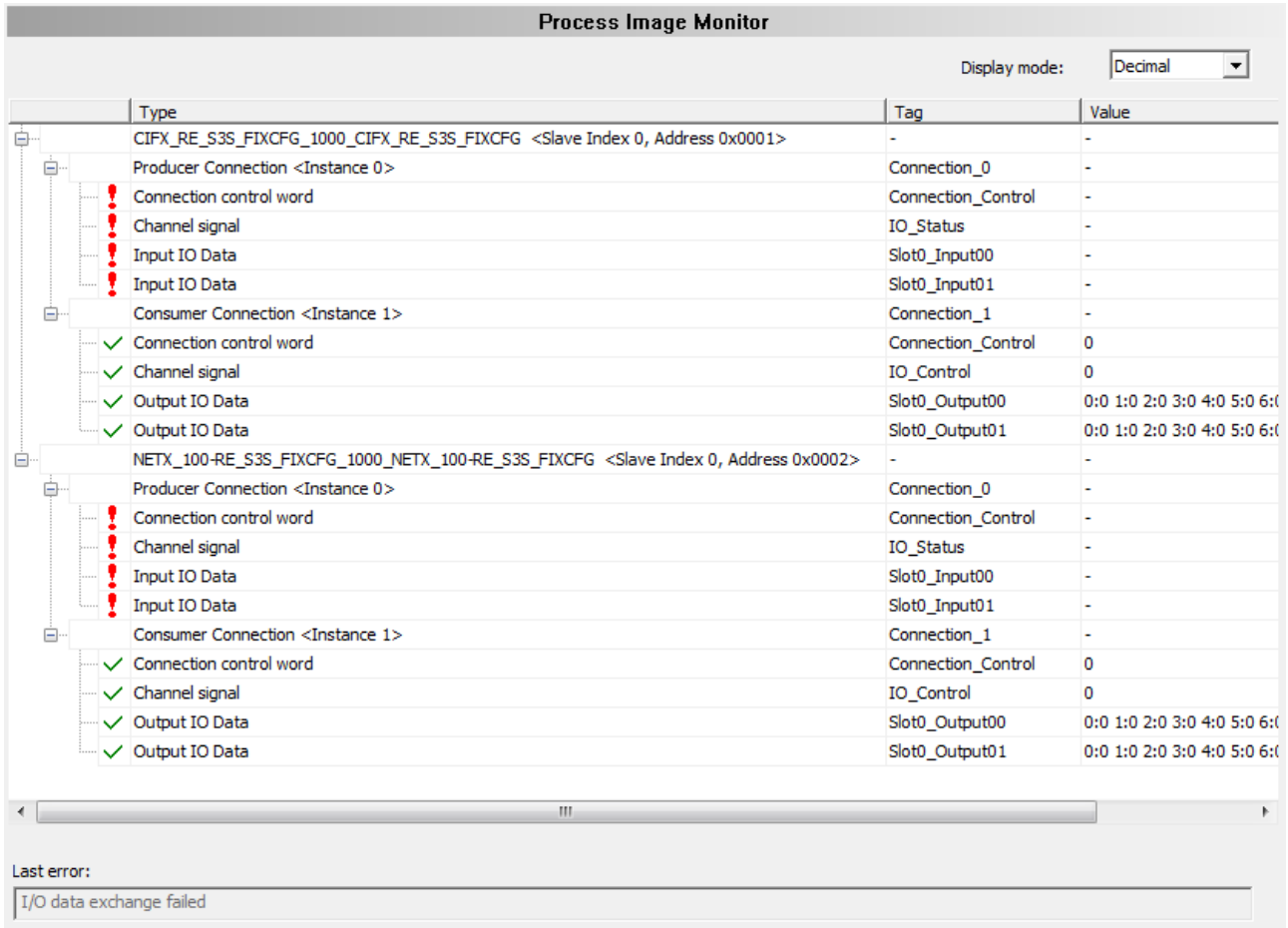


Figure 92: Window 'Process Image Monitor'

Parameter	Meaning	Range of Value / Value
Display Mode	Display of the values in the column Value in decimal or hexadecimal mode.	Decimal (Default), Hexadecimal
	The tree shows the structure of the devices (1), modules (2) and the input data (3) and output data (4).	
	Display when the input and output data are not completely read and analyzed.	
	Display when the input and output data are not valid.	
	Display when the input and output data are valid.	
Typ	Device labeling provided by the hardware: Also description of the modules or input or output signals configured to the device.	

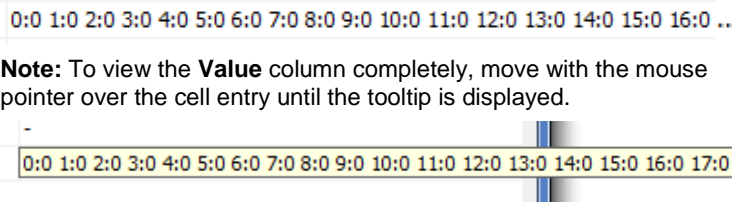
Parameter	Meaning	Range of Value / Value
TAG	Device name provided by the hardware (not changeable in the FDT container) or symbolic name for the modules configured to the device or for the input or output signals (changeable in the window Configuration > Process Data).	
Value	<p>Display of the valid input and output data values.</p> <p>Left value: numbering of every module or signal data byte</p> <p>Right value: value of the respective module or signal data byte</p> <p>Example:</p>  <p>Note: To view the Value column completely, move with the mouse pointer over the cell entry until the tooltip is displayed.</p> <p>Or you can enlarge the width of the column by double clicking on the table cell and using the scroll bar below.</p>	
Last Error	Last occurred error (Description see appropriate Application Programming Manual)	

Table 48: Notes to the Window 'Process Image Monitor'

10 Error Codes

10.1 Error Code Definition

For COM based application, like the ODM Server and ODM drivers, a common error definition is used, similar to the Microsoft Windows® HRESULT definition.

Error Code Structure:

COM Errors are HRESULTs, which are 32 bit values using the following layout:

```

3 3 2 2 2 2 2 2 2 2 2 2 1 1 1 1 1 1 1 1 1 1
1 0 9 8 7 6 5 4 3 2 1 0 9 8 7 6 5 4 3 2 1 0
+---+---+---+---+---+---+---+---+---+---+
|Sev|C|R|      Facility      |      Code      |
+---+---+---+---+---+---+---+---+---+---+

```

where

Sev - is the severity code:

00 - Success

01 - Informational

10 - Warning

11 - Error

C - is the Customer code flag

R - is a reserved bit

Facility - is the facility code

Code - is the facility's status code

In this common error definition, several error code regions are already reserved by Windows® itself, the ODM and some other modules.

10.2 Overview Error Codes

Overview Error Codes	Range
General Hardware Errors RCX Operating System	<i>RCX General Task:</i> 0xC02B0001 to 0xC02B4D52
	<i>RCX Common Status & Errors Codes:</i> 0x00000000 to 0xC002000C
	<i>RCX Status & Error Codes:</i> 0x00000000 to 0xC0000008
Sercos Master Status/Error Codes	<i>Status/Error Codes of the Sercos Master CP Task:</i> 0xC0700001 to 0xC070008E
	<i>Status/Error Codes of the Sercos Master SVC Task:</i> 0xC0710001 to 0xC0710023
	<i>Status/Error Codes of the Sercos Master AP Task:</i> 0xC0720001 to 0xC0720023, 0xC0724000 to 0xC0724078 (XML structure related messages)
	<i>Status/Error Codes of the Sercos Master NRT Task:</i> 0xC0790001 to 0xC0790003
ODM Server	<i>General ODM Error Codes:</i> 0x8004C700 to 0x8004C761
	<i>General ODM Driver Error Codes:</i> 0x8004C7A0 to 0x8004C7C2
ODM Drivers	<i>cifX Driver Specific ODM Error:</i> 0x8004C001 to 0x8004C0A4
cifX Device Driver and netX Driver	<i>Generic Error:</i> 0x800A0001 to 0x800A0017
	<i>Generic Driver Error:</i> 0x800B0001 to 0x800B0042
	<i>Generic Device Error:</i> 0x800C0010 to 0x800C0041
netX Driver	<i>CIFX API Transport:</i> 0x800D0001 to 0x800D0013
	<i>CIFX API Transport Header State Error:</i> 0x800E0001 to 0x800E000B
DBM	<i>ODM Error Codes:</i> 0xC004C810 to 0xC004C878

Table 49: Overview Error Codes and Ranges



Further fieldbus specific error codes are described in the manuals of the corresponding protocol tasks.

10.3 General Hardware Error Codes

10.3.1 RCX General Task Errors

Error Code (Definition)	Value	Description
RCX_E_QUE_UNKNOWN	0xC02B0001	Unknown Queue
RCX_E_QUE_INDEX_UNKNOWN	0xC02B0002	Unknown Queue Index
RCX_E_TASK_UNKNOWN	0xC02B0003	Unknown Task
RCX_E_TASK_INDEX_UNKNOWN	0xC02B0004	Unknown Task Index
RCX_E_TASK_HANDLE_INVALID	0xC02B0005	Invalid Task Handle
RCX_E_TASK_INFO_IDX_UNKNOWN	0xC02B0006	Unknown Index
RCX_E_FILE_XFR_TYPE_INVALID	0xC02B0007	Invalid Transfer Type
RCX_E_FILE_REQUEST_INCORRECT	0xC02B0008	Invalid File Request
RCX_E_TASK_INVALID	0xC02B000E	Invalid Task
RCX_E_SEC_FAILED	0xC02B001D	Security EEPROM Access Failed
RCX_E_EEPROM_DISABLED	0xC02B001E	EEPROM Disabled
RCX_E_INVALID_EXT	0xC02B001F	Invalid Extension
RCX_E_SIZE_OUT_OF_RANGE	0xC02B0020	Block Size Out Of Range
RCX_E_INVALID_CHANNEL	0xC02B0021	Invalid Channel
RCX_E_INVALID_FILE_LEN	0xC02B0022	Invalid File Length
RCX_E_INVALID_CHAR_FOUND	0xC02B0023	Invalid Character Found
RCX_E_PACKET_OUT_OF_SEQ	0xC02B0024	Packet Out Of Sequence
RCX_E_SEC_NOT_ALLOWED	0xC02B0025	Not Allowed In Current State
RCX_E_SEC_INVALID_ZONE	0xC02B0026	Security EEPROM Invalid Zone
RCX_E_SEC_EEPROM_NOT_AVAIL	0xC02B0028	Security EEPROM Eeprom Not Available
RCX_E_SEC_INVALID_CHECKSUM	0xC02B0029	Security EEPROM Invalid Checksum
RCX_E_SEC_ZONE_NOT_WRITEABLE	0xC02B002A	Security EEPROM Zone Not Writeable
RCX_E_SEC_READ_FAILED	0xC02B002B	Security EEPROM Read Failed
RCX_E_SEC_WRITE_FAILED	0xC02B002C	Security EEPROM Write Failed
RCX_E_SEC_ACCESS_DENIED	0xC02B002D	Security EEPROM Access Denied
RCX_E_SEC_EEPROM_EMULATED	0xC02B002E	Security EEPROM Emulated
RCX_E_INVALID_BLOCK	0xC02B0038	Invalid Block
RCX_E_INVALID_STRUCT_NUMBER	0xC02B0039	Invalid Structure Number
RCX_E_INVALID_CHECKSUM	0xC02B4352	Invalid Checksum
RCX_E_CONFIG_LOCKED	0xC02B4B54	Configuration Locked
RCX_E_SEC_ZONE_NOT_READABLE	0xC02B4D52	Security EEPROM Zone Not Readable

Table 50: RCX General Task Errors

10.3.2 RCX Common Status & Errors Codes

Error Code (Definition)	Value	Description
RCX_S_OK	0x00000000	Success, Status Okay
RCX_E_FAIL	0xC0000001	Fail
RCX_E_UNEXPECTED	0xC0000002	Unexpected
RCX_E_OUTOFMEMORY	0xC0000003	Out Of Memory
RCX_E_UNKNOWN_COMMAND	0xC0000004	Unknown Command
RCX_E_UNKNOWN_DESTINATION	0xC0000005	Unknown Destination
RCX_E_UNKNOWN_DESTINATION_ID	0xC0000006	Unknown Destination ID
RCX_E_INVALID_PACKET_LEN	0xC0000007	Invalid Packet Length
RCX_E_INVALID_EXTENSION	0xC0000008	Invalid Extension
RCX_E_INVALID_PARAMETER	0xC0000009	Invalid Parameter
RCX_E_WATCHDOG_TIMEOUT	0xC000000C	Watchdog Timeout
RCX_E_INVALID_LIST_TYPE	0xC000000D	Invalid List Type
RCX_E_UNKNOWN_HANDLE	0xC000000E	Unknown Handle
RCX_E_PACKET_OUT_OF_SEQ	0xC000000F	Out Of Sequence
RCX_E_PACKET_OUT_OF_MEMORY	0xC0000010	Out Of Memory
RCX_E_QUE_PACKETDONE	0xC0000011	Queue Packet Done
RCX_E_QUE_SENDPACKET	0xC0000012	Queue Send Packet
RCX_E_POOL_PACKET_GET	0xC0000013	Pool Packet Get
RCX_E_POOL_GET_LOAD	0xC0000015	Pool Get Load
RCX_E_REQUEST_RUNNING	0xC000001A	Request Already Running
RCX_E_INIT_FAULT	0xC0000100	Initialization Fault
RCX_E_DATABASE_ACCESS_FAILED	0xC0000101	Database Access Failed
RCX_E_NOT_CONFIGURED	0xC0000119	Not Configured
RCX_E_CONFIGURATION_FAULT	0xC0000120	Configuration Fault
RCX_E_INCONSISTENT_DATA_SET	0xC0000121	Inconsistent Data Set
RCX_E_DATA_SET_MISMATCH	0xC0000122	Data Set Mismatch
RCX_E_INSUFFICIENT_LICENSE	0xC0000123	Insufficient License
RCX_E_PARAMETER_ERROR	0xC0000124	Parameter Error
RCX_E_INVALID_NETWORK_ADDRESS	0xC0000125	Invalid Network Address
RCX_E_NO_SECURITY_MEMORY	0xC0000126	No Security Memory
RCX_E_NETWORK_FAULT	0xC0000140	Network Fault
RCX_E_CONNECTION_CLOSED	0xC0000141	Connection Closed
RCX_E_CONNECTION_TIMEOUT	0xC0000142	Connection Timeout
RCX_E_LONELY_NETWORK	0xC0000143	Lonely Network
RCX_E_DUPLICATE_NODE	0xC0000144	Duplicate Node
RCX_E_CABLE_DISCONNECT	0xC0000145	Cable Disconnected
RCX_E_BUS_OFF	0xC0000180	Network Node Bus Off
RCX_E_CONFIG_LOCKED	0xC0000181	Configuration Locked
RCX_E_APPLICATION_NOT_READY	0xC0000182	Application Not Ready
RCX_E_TIMER_APPL_PACKET_SENT	0xC002000C	Timer App Packet Sent

Table 51: RCX Common Status & Errors Codes

10.3.3 RCX Status & Error Codes

Error Code (Definition)	Value	Description
RCX_S_OK	0x00000000	SUCCESS, STATUS OKAY
RCX_S_QUE_UNKNOWN	0xC02B0001	UNKNOWN QUEUE
RCX_S_QUE_INDEX_UNKNOWN	0xC02B0002	UNKNOWN QUEUE INDEX
RCX_S_TASK_UNKNOWN	0xC02B0003	UNKNOWN TASK
RCX_S_TASK_INDEX_UNKNOWN	0xC02B0004	UNKNOWN TASK INDEX
RCX_S_TASK_HANDLE_INVALID	0xC02B0005	INVALID TASK HANDLE
RCX_S_TASK_INFO_IDX_UNKNOWN	0xC02B0006	UNKNOWN INDEX
RCX_S_FILE_XFR_TYPE_INVALID	0xC02B0007	INVALID TRANSFER TYPE
RCX_S_FILE_REQUEST_INCORRECT	0xC02B0008	INVALID FILE REQUEST
RCX_S_UNKNOWN_DESTINATION	0xC0000005	UNKNOWN DESTINATION
RCX_S_UNKNOWN_DESTINATION_ID	0xC0000006	UNKNOWN DESTINATION ID
RCX_S_INVALID_LENGTH	0xC0000007	INVALID LENGTH
RCX_S_UNKNOWN_COMMAND	0xC0000004	UNKNOWN COMMAND
RCX_S_INVALID_EXTENSION	0xC0000008	INVALID EXTENSION

Table 52: RCX Status & Error Codes

10.3.3.1 RCX Status & Error Codes Slave State

Error Code (Definition)	Value	Description
RCX_SLAVE_STATE_UNDEFINED	0x00000000	UNDEFINED
RCX_SLAVE_STATE_OK	0x00000001	OK
RCX_SLAVE_STATE_FAILED	0x00000002	FAILED (at least one slave)

Table 53: RCX Status & Error Codes Slave State

10.4 Sercos Master Status/Error Codes

10.4.1 Status/Error Codes of the Sercos Master CP Task

Status/Error Codes of the Sercos Master CP Task		
Error Code (Definition)	Value	Description
TLR_E_SIII_MA_CP_COMMAND_INVALID	0xC0700001	Invalid command value.
TLR_E_SIII_MA_CP_INVALID_STARTUP_PARAMETER	0xC0700002	Invalid Startup parameter.
TLR_E_SIII_MA_CP_WAITING_FOR_TOPOLOGY_DETECT	0xC0700003	Waiting for Topology Detect (CP0).
TLR_E_SIII_MA_CP_LLD_NOT_STARTED	0xC0700004	LLD not started.
TLR_E_SIII_MA_CP_INIT_CALLBACK_HP_FAILED	0xC0700005	Initialization of HP Callback Failed.
TLR_E_SIII_MA_CP_INIT_CALLBACK_DEVSTATUS_FAILED	0xC0700006	Initialization of DevStatus Callback Failed.
TLR_E_SIII_MA_CP_INIT_CALLBACK_TOPOLOGY_DETECT_FAILED	0xC0700007	Initialization of Topology Detect Callback Failed.
TLR_E_SIII_MA_CP_CONFIGURATION_BUFFER_ALREADY_OPEN	0xC0700008	Configuration Buffer is already open.
TLR_E_SIII_MA_CP_CONFIGURATION_BUFFER_IS_NOT_OPEN	0xC0700009	Configuration Buffer is not open.
TLR_E_SIII_MA_CP_INVALID_SLAVE_ADDRESSES	0xC070000A	Invalid slave address.
TLR_E_SIII_MA_CP_TELEGRAM_OFFSET_CANNOT_BE_IN_MDT_TELEGRAM	0xC070000B	Telegram offset cannot be set to MDT telegram.
TLR_E_SIII_MA_CP_TELEGRAM_OFFSET_CANNOT_BE_IN_AT_TELEGRAM	0xC070000C	Telegram offset cannot be set to AT telegram.
TLR_E_SIII_MA_CP_TELEGRAM_OFFSET_HAS_INVALID_TELEGRAM_NO	0xC070000D	Telegram offset has invalid telegram number.
TLR_E_SIII_MA_CP_TELEGRAM_OFFSET_HAS_INVALID_OFFSET	0xC070000E	Telegram offset has invalid offset in frame.
TLR_E_SIII_MA_CP_MDT_SVCH_TELEGRAM_OFFSET_CANNOT_BE_IN_AT_TELEGRAM	0xC070000F	MDT ServiceChannel Telegram offset cannot be set to AT telegram.
TLR_E_SIII_MA_CP_MDT_SVCH_TELEGRAM_OFFSET_HAS_INVALID_TELEGRAM_NO	0xC0700010	MDT ServiceChannel Telegram offset has invalid telegram number.
TLR_E_SIII_MA_CP_MDT_SVCH_TELEGRAM_OFFSET_HAS_INVALID_OFFSET	0xC0700011	MDT ServiceChannel Telegram offset has invalid offset in frame.
TLR_E_SIII_MA_CP_AT_SVCH_TELEGRAM_OFFSET_CANNOT_BE_IN_MDT_TELEGRAM	0xC0700012	AT ServiceChannel Telegram offset cannot be set to MDT telegram.
TLR_E_SIII_MA_CP_AT_SVCH_TELEGRAM_OFFSET_HAS_INVALID_TELEGRAM_NO	0xC0700013	AT ServiceChannel Telegram offset has invalid telegram number.
TLR_E_SIII_MA_CP_AT_SVCH_TELEGRAM_OFFSET_HAS_INVALID_OFFSET	0xC0700014	AT ServiceChannel Telegram offset has invalid offset in frame.
TLR_E_SIII_MA_CP_DEV_CTRL_TELEGRAM_OFFSET_CANNOT_BE_IN_AT_TELEGRAM	0xC0700015	DeviceControl Telegram offset cannot be set to AT telegram.
TLR_E_SIII_MA_CP_DEV_CTRL_TELEGRAM_OFFSET_HAS_INVALID_TELEGRAM_NO	0xC0700016	DeviceControl Telegram offset has invalid telegram number.
TLR_E_SIII_MA_CP_DEV_CTRL_TELEGRAM_OFFSET_HAS_INVALID_OFFSET	0xC0700017	Device Control Telegram offset has invalid offset in frame.
TLR_E_SIII_MA_CP_DEV_STATUS_TELEGRAM_OFFSET_CANNOT_BE_IN_MDT_TELEGRAM	0xC0700018	DeviceControl Telegram offset cannot be set to MDT telegram.
TLR_E_SIII_MA_CP_DEV_STATUS_TELEGRAM_OFFSET_HAS_INVALID_TELEGRAM_NO	0xC0700019	DeviceStatus Telegram offset has invalid telegram number.

Status/Error Codes of the Sercos Master CP Task		
Error Code (Definition)	Value	Description
TLR_E_SIII_MA_CP_DEV_STATUS_TELEGRAM_OFFSET_HAS_INVALID_OFFSET	0xC070001A	DeviceStatus Telegram offset has invalid offset in frame.
TLR_E_SIII_MA_CP_SLAVE_ALREADY_IN_CONFIGURATION	0xC070001B	Slave already in configuration.
TLR_E_SIII_MA_CP_SLAVE_NOT_IN_CONFIGURATION	0xC070001C	Slave is not in configuration.
TLR_E_SIII_MA_CP_INITCMD_SEGMENT_DOES_NOT_MATCH_FIRST_PACKET	0xC070001D	InitCmd Segment does not match the first packet.
TLR_E_SIII_MA_CP_LLD_TO_BE_IMPLEMENTED	0xC070001E	Unimplemented function detected.
TLR_E_SIII_MA_CP_LLD_UNKNOWN_ERROR	0xC070001F	Unknown Error.
TLR_E_SIII_MA_CP_LLD_OUT_OF_MEMORY	0xC0700020	Out of memory.
TLR_E_SIII_MA_CP_LLD_INVALID_SERVICE_CHANNEL	0xC0700021	Invalid Service Channel Number.
TLR_E_SIII_MA_CP_LLD_INVALID_DEVICE	0xC0700022	Invalid Slave Address.
TLR_E_SIII_MA_CP_LLD_INVALID_PHASE_TRANSITION	0xC0700023	Invalid Phase transition.
TLR_E_SIII_MA_CP_LLD_NO_CONFIGURATION_DATA_FOR_CP3_4	0xC0700024	No Configuration data for CP3/CP4 available.
TLR_E_SIII_MA_CP_LLD_INVALID_MDT0_SIZE	0xC0700025	Invalid MDT0 length.
TLR_E_SIII_MA_CP_LLD_INVALID_MDT1_SIZE	0xC0700026	Invalid MDT1 length.
TLR_E_SIII_MA_CP_LLD_INVALID_MDT2_SIZE	0xC0700027	Invalid MDT2 length.
TLR_E_SIII_MA_CP_LLD_INVALID_MDT3_SIZE	0xC0700028	Invalid MDT3 length.
TLR_E_SIII_MA_CP_LLD_INVALID_AT0_SIZE	0xC0700029	Invalid AT0 length.
TLR_E_SIII_MA_CP_LLD_INVALID_AT1_SIZE	0xC070002A	Invalid AT1 length.
TLR_E_SIII_MA_CP_LLD_INVALID_AT2_SIZE	0xC070002B	Invalid AT2 length.
TLR_E_SIII_MA_CP_LLD_INVALID_AT3_SIZE	0xC070002C	Invalid AT3 length.
TLR_E_SIII_MA_CP_LLD_INVALID_DEVICE_CONTROL_OFFSET_TEL_TYPE	0xC070002D	Device Control Offset cannot be placed into AT telegram.
TLR_E_SIII_MA_CP_LLD_INVALID_DEVICE_CONTROL_OFFSET_TEL_NO	0xC070002E	Telegram Number in Device Control Offset is invalid.
TLR_E_SIII_MA_CP_LLD_INVALID_DEVICE_CONTROL_OFFSET_OFS_TOO_LOW	0xC070002F	Frame Offset in Device Control Offset is too low.
TLR_E_SIII_MA_CP_LLD_INVALID_DEVICE_CONTROL_OFFSET_OFS_TOO_HIGH	0xC0700030	Frame Offset in Device Control Offset is too high.
TLR_E_SIII_MA_CP_LLD_INVALID_DEVICE_CONTROL_OFFSET_OFS_NOT_EVEN	0xC0700031	Frame Offset in Device Control Offset is not word-aligned (16bit word).
TLR_E_SIII_MA_CP_LLD_INVALID_DEVICE_STATUS_OFFSET_TEL_TYPE	0xC0700032	Device Status Offset cannot be placed into MDT telegram.
TLR_E_SIII_MA_CP_LLD_INVALID_DEVICE_STATUS_OFFSET_TEL_NO	0xC0700033	Telegram Number in Device Status Offset is invalid.
TLR_E_SIII_MA_CP_LLD_INVALID_DEVICE_STATUS_OFFSET_OFS_TOO_LOW	0xC0700034	Frame Offset in Device Status Offset is too low.
TLR_E_SIII_MA_CP_LLD_INVALID_DEVICE_STATUS_OFFSET_OFS_TOO_HIGH	0xC0700035	Frame Offset in Device Status Offset is too high.
TLR_E_SIII_MA_CP_LLD_INVALID_DEVICE_STATUS_OFFSET_OFS_NOT_EVEN	0xC0700036	Frame Offset in Device Status Offset is not word-aligned (16bit word).
TLR_E_SIII_MA_CP_LLD_INVALID_MDT_SERVICE_CHANNEL_OFFSET_TEL_TYPE	0xC0700037	MDT Service Channel Offset cannot be placed into AT telegram.
TLR_E_SIII_MA_CP_LLD_INVALID_MDT_SERVICE_CHANNEL_OFFSET_TEL_NO	0xC0700038	Telegram Number in MDT Service Channel Offset is invalid.

Status/Error Codes of the Sercos Master CP Task		
Error Code (Definition)	Value	Description
TLR_E_SIII_MA_CP_LLD_INVALID_MDT_SVC_CHANNEL_OFFSET_OFS_TOO_LOW	0xC0700039	Frame Offset in MTD Service Channel Offset is too low.
TLR_E_SIII_MA_CP_LLD_INVALID_MDT_SVC_CHANNEL_OFFSET_OFS_TOO_HIGH	0xC070003A	Frame Offset in MDT Service Channel Offset is too high.
TLR_E_SIII_MA_CP_LLD_INVALID_MDT_SVC_CHANNEL_OFFSET_OFS_NOT_EVEN	0xC070003B	Frame Offset in MDT Service Channel Offset is not word-aligned (16bit word).
TLR_E_SIII_MA_CP_LLD_INVALID_AT_SVC_CHANNEL_OFFSET_TEL_TYPE	0xC070003C	AT Service Channel Offset cannot be placed into MDT telegram.
TLR_E_SIII_MA_CP_LLD_INVALID_AT_SVC_CHANNEL_OFFSET_TEL_NO	0xC070003D	Telegram Number in AT Service Channel Offset is invalid.
TLR_E_SIII_MA_CP_LLD_INVALID_AT_SVC_CHANNEL_OFFSET_OFS_TOO_LOW	0xC070003E	Frame Offset in AT Service Channel Offset is too low.
TLR_E_SIII_MA_CP_LLD_INVALID_AT_SVC_CHANNEL_OFFSET_OFS_TOO_HIGH	0xC070003F	Frame Offset in AT Service Channel Offset is too high.
TLR_E_SIII_MA_CP_LLD_INVALID_AT_SVC_CHANNEL_OFFSET_OFS_NOT_EVEN	0xC0700040	Frame Offset in AT Service Channel Offset is not word-aligned (16bit word).
TLR_E_SIII_MA_CP_LLD_INVALID_MDT_RTDATA_OFFSET_TEL_TYPE	0xC0700041	MDT Connection Offset cannot be placed into AT telegram.
TLR_E_SIII_MA_CP_LLD_INVALID_MDT_RTDATA_OFFSET_TEL_NO	0xC0700042	Telegram Number in MDT Connection Offset is invalid.
TLR_E_SIII_MA_CP_LLD_INVALID_MDT_RTDATA_OFFSET_OFS_TOO_LOW	0xC0700043	Frame Offset in MDT Connection Offset is too low.
TLR_E_SIII_MA_CP_LLD_INVALID_MDT_RTDATA_OFFSET_OFS_TOO_HIGH	0xC0700044	Frame Offset in MDT Connection Offset is too high.
TLR_E_SIII_MA_CP_LLD_INVALID_MDT_RTDATA_OFFSET_OFS_NOT_EVEN	0xC0700045	Frame Offset in AT Connection Offset is not word-aligned (16bit word).
TLR_E_SIII_MA_CP_LLD_INVALID_AT_RTDATA_OFFSET_TEL_TYPE	0xC0700046	AT Connection Offset cannot be placed into MDT telegram.
TLR_E_SIII_MA_CP_LLD_INVALID_AT_RTDATA_OFFSET_TEL_NO	0xC0700047	Telegram Number in AT Connection Offset is invalid.
TLR_E_SIII_MA_CP_LLD_INVALID_AT_RTDATA_OFFSET_OFS_TOO_LOW	0xC0700048	Frame Offset in AT Connection Offset is too low.
TLR_E_SIII_MA_CP_LLD_INVALID_AT_RTDATA_OFFSET_OFS_TOO_HIGH	0xC0700049	Frame Offset in AT Connection Offset is too high.
TLR_E_SIII_MA_CP_LLD_INVALID_AT_RTDATA_OFFSET_OFS_NOT_EVEN	0xC070004A	Frame Offset in MTD Connection Offset is not word-aligned (16bit word).
TLR_E_SIII_MA_CP_LLD_OVERLAPPING_REGIONS_DETECTED_IN_MDT_FRAMES	0xC070004B	Overlapping regions detected within MDT frames.
TLR_E_SIII_MA_CP_LLD_OVERLAPPING_REGIONS_DETECTED_IN_AT_FRAMES	0xC070004C	Overlapping regions detected within AT frames.
TLR_E_SIII_MA_CP_LLD_INVALID_SLAVE_ADDRESS_IN_CP3_4_CONFIG	0xC070004D	Invalid Slave Address in CP3/CP4 configuration data.
TLR_E_SIII_MA_CP_LLD_CONFIGURE_NOT_ALLOWED_IN_CURRENT_STATE	0xC070004E	Configuring CP3/CP4 not allowed in current state.
TLR_E_SIII_MA_CP_LLD_BUILDING_COPY_ROUTINES_FAILED	0xC070004F	Building of copy routines failed.
TLR_E_SIII_MA_CP_LLD_INVALID_MDT_CONNECTION_PROCESS_IMAGE_OFFSET	0xC0700050	Invalid MDT Connection Control Process Image Offset.
TLR_E_SIII_MA_CP_LLD_INVALID_MDT_RTDATA_PROCESS_IMAGE_OFFSET	0xC0700051	Invalid MDT RtData Process Image Offset.
TLR_E_SIII_MA_CP_LLD_INVALID_AT_CONNECTION_CONTROL_PROCESS_IMAGE_OFFSET	0xC0700052	Invalid AT Connection Control Process Image Offset.
TLR_E_SIII_MA_CP_LLD_INVALID_AT_RTDATA_CONTROL_PROCESS_IMAGE_OFFSET	0xC0700053	Invalid AT RtData Control Process Image Offset.

Status/Error Codes of the Sercos Master CP Task		
Error Code (Definition)	Value	Description
TLR_E_SIII_MA_CP_CONFIGURATION_NOT_POSSIBLE_IN_CURRENT_STATE	0xC0700054	Configuration not possible in current master state.
TLR_E_SIII_MA_CP_PHASE_CHANGE_IN_PROGRESS	0xC0700055	Phase Change is in progress.
TLR_E_SIII_MA_CP_REQUESTED_PHASE_IS_ALREADY_CURRENT_PHASE	0xC0700056	Requested Phase is already current phase.
TLR_E_SIII_MA_CP_FINISH_CONFIGURATION_DOWNLOAD_FIRST	0xC0700057	Finish configuration download first.
TLR_E_SIII_MA_CP_NO_CONFIGURATION_FOR_CP3_AVAILABLE	0xC0700058	No configuration for CP3 available.
TLR_E_SIII_MA_CP_NO_CONFIGURATION_FOR_CP4_AVAILABLE	0xC0700059	No configuration for CP4 available.
TLR_E_SIII_MA_CP_INCOMPLETE_INITCMD_DOWNLOAD	0xC070005A	Incomplete InitCmd Download detected.
TLR_E_SIII_MA_CP_INVALID_TRANSITION_FLAGS	0xC070005B	Invalid transition flags specified in InitCmd download.
TLR_E_SIII_MA_CP_INVALID_INITCMD_LENGTH	0xC070005C	Invalid length specified in InitCmd download.
TLR_E_SIII_MA_CP_PHASE_INDS_RECEIVER_LIST_IS_FULL	0xC070005D	Phase Indication Receiver List is full.
TLR_E_SIII_MA_CP_APP_NOT_REGISTERED	0xC070005E	Application queue is not registered.
TLR_E_SIII_MA_CP_APP_REGISTERED_ALREADY	0xC070005F	Application queue is registered already.
TLR_I_SIII_MA_CP_BUS_IS_OFF	0x40700060	Please issue the BusOn command, since the bus is off.
TLR_E_SIII_MA_CP_NO_DIAG_ENTRY_AVAILABLE	0xC0700061	No further diagnostic entries currently available.
TLR_E_SIII_MA_CP_LOCKED_DUE_TO_ERROR_IN_PREVIOUS_PHASE_SWITCH	0xC0700062	Locked due to error in previous phase switch.
TLR_E_SIII_MA_CP_LOCKED_DUE_TO_DPM_WATCHDOG_ERROR	0xC0700063	Locked due to error on DPM watchdog.
TLR_E_SIII_MA_CP_BUS_SCAN_NOT_POSSIBLE_WITHOUT_BUS_ON	0xC0700064	Bus Scan not possible without Bus On.
TLR_E_SIII_MA_CP_ELECTRONIC_LABEL_NOT_READABLE	0xC0700065	Electronic Label could not be read.
TLR_E_SIII_MA_CP_BUS_SCAN_ALREADY_ACTIVE	0xC0700066	Bus Scan already active.
TLR_E_SIII_MA_CP_BUS_SCAN_ABORTED	0xC0700067	Bus Scan aborted.
TLR_E_SIII_MA_CP_TIMING_PARAMETER_NRT_CHANNEL_EXCEEDS_CYCLE_TIME	0xC0700068	Channel exceeds cycle time.
TLR_E_SIII_MA_CP_TIMING_PARAMETER_END_OF_MDT_IS_LATER_THAN_START_OF_AT	0xC0700069	End of MDT is later than Start Of AT.
TLR_E_SIII_MA_CP_TIMING_PARAMETER_END_OF_MDT_EXCEEDS_CYCLE_TIME	0xC070006A	End of MDT exceeds Cycle Time.
TLR_E_SIII_MA_CP_TIMING_PARAMETER_START_OF_AT_EXCEEDS_CYCLE_TIME	0xC070006B	Start Of AT exceeds Cycle Time.
TLR_E_SIII_MA_CP_TIMING_PARAMETER_END_OF_AT_EXCEEDS_CYCLE_TIME	0xC070006C	End Of AT exceeds Cycle Time.
TLR_E_SIII_MA_CP_TIMING_PARAMETER_END_OF_NRT_IS_LATER_THAN_START_OF_NRT	0xC070006D	End Of NRT is later than Start Of NRT.

Status/Error Codes of the Sercos Master CP Task		
Error Code (Definition)	Value	Description
TLR_E_SIII_MA_CP_TIMING_PARAMETER_NRT_CHANNEL_OVERLAPS_MDT_TRANSMISSION	0xC070006E	NRT Channel overlaps MDT Transmission.
TLR_E_SIII_MA_CP_TIMING_PARAMETER_NRT_CHANNEL_OVERLAPS_AT_TRANSMISSION	0xC070006F	NRT Channel overlaps AT Transmission.
TLR_E_SIII_MA_CP_TIMING_PARAMETER_START_OF_AT_IS_EARLIER_THAN_START_OF_MDT	0xC0700070	Start Of AT is earlier than Start Of MDT.
TLR_E_SIII_MA_CP_LOCKED_DUE_PREVIOUS_FATAL_ERROR	0xC0700071	Locked due to previous fatal error.
TLR_E_SIII_MA_CP_TOPOLOGY_INFO_NOT_VALID_AT_THE_MOMENT	0xC0700072	Topology Info not valid at the moment.
TLR_E_SIII_MA_CP_AT_TRANSMISSION_START_TIME_EXCEEDS_CYCLE_TIME	0xC0700073	AT Transmission Start Time exceeds cycle time.
TLR_E_SIII_MA_CP_NRT_START_TIME_EXCEEDS_CYCLE_TIME	0xC0700074	NRT Start Time exceeds cycle time.
TLR_E_SIII_MA_CP_NRT_END_TIME_EXCEEDS_CYCLE_TIME	0xC0700075	NRT End Time exceeds cycle time.
TLR_E_SIII_MA_CP_NRT_START_TIME_IS_GREATER_THAN_NRT_END_TIME	0xC0700076	NRT End Time is greater than NRT Start Time.
TLR_E_SIII_MA_CP_TOPOLOGY_REQUEST_ABORTED_DUE_NRT	0xC0700077	Topology Request aborted due NRT phase.
TLR_E_SIII_MA_CP_TOPOLOGY_REQUEST_ABORTED_DUE_CP0	0xC0700078	Topology Request aborted due CP0 phase.
TLR_E_SIII_MA_CP_TOPOLOGY_REQUEST_ABORTED_DUE_TIMEOUT	0xC0700079	Topology Request aborted due timeout.
TLR_E_SIII_MA_CP_TOPOLOGY_REQUEST_ABORTED_DUE_UNRELATED_SLAVE_TOPOLOGY_CHANGE	0xC070007A	Topology Request aborted other unrelated slave changed topology state.
TLR_E_SIII_MA_CP_TOPOLOGY_REQUEST_ABORTED_DUE_SLAVE_DENIED_TOPOLOGY_CHANGE	0xC070007B	Topology Request aborted due to slave denying topology state change.
TLR_E_SIII_MA_CP_TOPOLOGY_NOT_ALLOWED_CURRENTLY	0xC070007C	Topology Request not allowed currently due to topology status.
TLR_E_SIII_MA_CP_SLAVE_NOT_IN_TOPOLOGY	0xC070007D	Slave not in topology.
TLR_E_SIII_MA_CP_ANOTHER_TOPOLOGY_REQUEST_IN_PROGRESS	0xC070007E	Another Topology Request in progress.
TLR_E_SIII_MA_CP_SLAVE_CONFIGURATION_FLAGS_INVALID	0xC070007F	Invalid slave configuration flags.
TLR_E_SIII_MA_CP_SLAVE_INVALID_ELEMENT_ID_IN_ADD_INITCMD	0xC0700080	Invalid element id in Add InitCmd.
TLR_E_SIII_MA_CP_SLAVE_INVALID_ACTION_IN_ADD_INITCMD	0xC0700081	Invalid action in Add InitCmd.
TLR_E_SIII_MA_CP_BUS_SCAN_NOT_ACTIVE	0xC0700082	Bus Scan not active.
TLR_E_SIII_MA_CP_SLAVE_NOT_IN_BUS_COMMUNICATION	0xC0700083	Slave not in bus communication.
TLR_E_SIII_MA_CP_HOTPLUG_SLAVE_NOT_IN_BUS_COMMUNICATION	0xC0700084	Hotplug Slave not in bus communication.
TLR_E_SIII_MA_CP_C1D_DIAGNOSTIC_ERROR	0xC0700085	C1D-Diagnostic Error.
TLR_E_SIII_MA_CP_SVC_MHS_AHS_TIMEOUT	0xC0700086	SVC: MHS-AHS Timeout.
TLR_E_SIII_MA_CP_SVC_BUSY_TIMEOUT	0xC0700087	SVC: Busy Timeout.
TLR_E_SIII_MA_CP_S_0_99_COMMAND_ERROR	0xC0700088	S-0-99 Command execution ended with

Status/Error Codes of the Sercos Master CP Task		
Error Code (Definition)	Value	Description
R		error.
TLR_E_SIII_MA_CP_MDT_NRT_AT_CONFIGURATION_NOT_SUPPORTED	0xC0700089	MDT/NRT/AT order not supported.
TLR_E_SIII_MA_CP_INITCMD_SVCH_ERROR	0xC070008A	InitCmd FSM did not succeed processing configured IDN parameters due to Service channel error.
TLR_E_SIII_MA_CP_INITCMD_COMPARE_FAILED	0xC070008B	InitCmd FSM did not succeed processing configured IDN parameters due mismatch during compare.
TLR_E_SIII_MA_CP_INITCMD_PROCCMD_FAILED	0xC070008C	InitCmd FSM did not succeed processing a configured procedure.
TLR_E_SIII_MA_CP_INITCMD_SVCH_TASK_ERROR	0xC070008D	InitCmd FSM did not succeed due to Service Channel Task error.
TLR_E_SIII_MA_CP_NOT_AVAILABLE_IN_CONFIGURATION	0xC070008E	Not available in configuration.

Table 54: Status/Error Codes of the Sercos Master CP Task

10.4.2 Status/Error Codes of the Sercos Master SVC Task

Error Code (Definition)	Value	Description
TLR_E_sercosIIIMASTER_SVC_COMMAND_INVALID	0xC0710001	Invalid command value.
TLR_E_sercosIIIMASTER_SVC_SLAVE_HS_TIMEOUT	0xC0710002	Slave SVC Handshake Timeout.
TLR_E_sercosIIIMASTER_SVC_SLAVE_BUSY_TIMEOUT	0xC0710003	Slave SVC Busy Timeout.
TLR_E_sercosIIIMASTER_SVC_SLAVE_ERROR	0xC0710004	Slave SVC Error.
TLR_E_sercosIIIMASTER_SVC_TRANSFER_ABORTED	0xC0710005	SVC-Transfer aborted.
TLR_E_sercosIIIMASTER_SVC_INTERNAL_LOCKED	0xC0710006	Service Channels internally locked.
TLR_E_sercosIIIMASTER_SVC_SLAVE_VALID_TIMEOUT	0xC0710015	SVC valid timeout.
TLR_E_sercosIIIMASTER_SVC_MACRO_STEP_OPENIDN_FAILED	0xC0710010	SVC Macro FSM: OpenIdn Failed.
TLR_E_sercosIIIMASTER_SVC_MACRO_STEP_READATTR_FAILED	0xC0710011	SVC Macro FSM: ReadAttribute Failed.
TLR_E_sercosIIIMASTER_SVC_MACRO_STEP_GETLL_FAILED	0xC0710012	SVC Macro FSM: Get ListLength Failed.
TLR_E_sercosIIIMASTER_SVC_MACRO_STEP_ACCESSDATA_FAILED	0xC0710013	SVC Macro FSM: Data access failed.
TLR_E_sercosIIIMASTER_SVC_INTERNAL_ERROR	0xC0710014	Internal Error.
TLR_E_sercosIIIMASTER_SVC_INVALID_SENDER	0xC0710016	Invalid Sender.
TLR_E_sercosIIIMASTER_SVC_ABORT_ALREADY_RUNNING	0xC0710017	Abort Already Running.
TLR_E_sercosIIIMASTER_SVC_INVALID_ELEMENT	0xC0710018	The parameter element is wrong.
TLR_E_sercosIIIMASTER_SVC_INVALID_SLAVE_ADDRESS	0xC0710019	The parameter slave address is wrong.
TLR_E_sercosIIIMASTER_SVC_ATOMIC_TRANSFER_IN_USE	0xC071001A	Atomic transfer in use.
TLR_E_sercosIIIMASTER_SVC_ABORT_NOT_POSSIBLE	0xC071001B	Abort not possible.
TLR_E_sercosIIIMASTER_SVC_DESTID_UNEXPECTED	0xC071001C	Unexpected DestId.
TLR_E_sercosIIIMASTER_SVC_SEQUENCE_UNEXPECTED	0xC071001D	Unexpected SVC sequence.
TLR_E_sercosIIIMASTER_SVC_CLOSED	0xC071001E	SVC is closed.
TLR_E_sercosIIIMASTER_SVC_PARAMETER_UNEXPECTED	0xC071001F	SVC parameter is unexpected.
TLR_E_sercosIIIMASTER_SVC_INVALID_PRIORITY	0xC0710020	Invalid priority.
TLR_E_sercosIIIMASTER_SVC_INVALID_ISLIST	0xC0710021	IsList parameter is wrong.
TLR_E_sercosIIIMASTER_SVC_MACRO_TRANSFER_IN_USE	0xC0710022	A macro transfer is already started.
TLR_E_SIII_MA_SVC_INVALID_CP	0xC0710023	Access the SVC is currently not allowed (wrong CP).

Table 55: Status/Error Codes of the Sercos Master SVC Task

10.4.3 Status/Error Codes of the Sercos Master AP Task

Status/Error Codes of the Sercos Master AP Task		
Error Code (Definition)	Value	Description
TLR_E_SIII_MA_AP_COMMAND_INVALID	0xC0720001	Invalid command value.
TLR_E_SIII_MA_AP_INVALID_STARTUP_PARAMETER	0xC0720002	Invalid Startup parameter.
TLR_E_SIII_MA_AP_MDT_PROCESS_DATA_IMAGE_SIZE_NOT_POSSIBLE	0xC0720003	Output Process Data Image Size not possible (MDT).
TLR_E_SIII_MA_AP_AT_PROCESS_DATA_IMAGE_SIZE_NOT_POSSIBLE	0xC0720004	Input Process Data Image Size not possible (AT).
TLR_E_SIII_MA_AP_LLD_NOT_STARTED	0xC0720005	Sercos LLD not started.
TLR_E_SIII_MA_AP_SET_PHASE_NOT_ALLOWED_DURING_CFG_LOADING	0xC0720006	Set Phase command not allowed during configuration loading.
TLR_E_SIII_MA_AP_PACKET_CFG_INTERFACE_NOT_AVAILABLE_DURING_CFG_LOADING	0xC0720007	Configuration via packets is not available during configuration loading.
TLR_E_SIII_MA_AP_C1D_DIAGNOSIS_ERROR	0xC0720008	C1D Diagnosis Error.
TLR_E_SIII_MA_AP_BUS_SYNC_ERROR_THRESHOLD	0xC0720009	Bus Sync Error Threshold reached.
TLR_E_SIII_MA_AP_CHANNEL_INIT	0xC072000A	Channel-Init detected.
TLR_E_SIII_MA_AP_CPX_CP0_DEV_STATUS_INVALID_TIMEOUT	0xC072000B	CPx -> CP0 Dev Status Invalid Timeout.
TLR_E_SIII_MA_AP_CP1_CP2_DEV_STATUS_INVALID_TIMEOUT	0xC072000C	CP1 -> CP2 Dev Status Invalid Timeout.
TLR_E_SIII_MA_AP_CP2_CP3_DEV_STATUS_INVALID_TIMEOUT	0xC072000D	CP2 -> CP3 Dev Status Invalid Timeout.
TLR_E_SIII_MA_AP_CP3_CP4_DEV_STATUS_INVALID_TIMEOUT	0xC072000E	CP3 -> CP4 Dev Status Invalid Timeout.
TLR_E_SIII_MA_AP_CP1_DEV_STATUS_VALID_TIMEOUT	0xC072000F	CP1 Dev Status Valid Timeout.
TLR_E_SIII_MA_AP_CP2_DEV_STATUS_VALID_TIMEOUT	0xC0720010	CP2 Dev Status Valid Timeout.
TLR_E_SIII_MA_AP_CP3_DEV_STATUS_VALID_TIMEOUT	0xC0720011	CP3 Dev Status Valid Timeout.
TLR_E_SIII_MA_AP_CP4_DEV_STATUS_VALID_TIMEOUT	0xC0720012	CP4 Dev Status Valid Timeout.
TLR_E_SIII_MA_AP_CP3_TIMING_CONFIGURATION_ERROR	0xC0720013	CP3 Timing Configuration Error.
TLR_E_SIII_MA_AP_CP0_CP1_TOPO_ADDR_INVALID_TIMEOUT	0xC0720014	CP0 -> CP1 Topology Address Invalid Timeout.
TLR_E_SIII_MA_AP_UNKNOWN_STATE_CHG_STOPPED_REASON	0xC0720015	Unknown State Chg Stopped Reason.
TLR_E_SIII_MA_AP_INITCMD_ERROR	0xC0720016	Service channel access failed.
TLR_E_SIII_MA_AP_CONN_LENGTH_ERROR	0xC0720017	Connection Length mismatch.
TLR_E_SIII_MA_AP_S_0_127_COMMAND_ERROR	0xC0720018	S-0-127 Command execution ended with error.
TLR_E_SIII_MA_AP_S_0_128_COMMAND_ERROR	0xC0720019	S-0-128 Command execution ended with error.
TLR_E_SIII_MA_AP_S_0_1024_COMMAND_ERROR	0xC072001A	S-0-1024 Command execution ended with error.
TLR_E_SIII_MA_AP_MDT_NOT_EXCHANGED	0xC072001B	MDT not exchanged.
TLR_E_SIII_MA_AP_AT_NOT_EXCHANGED	0xC072001C	AT not exchanged.

Status/Error Codes of the Sercos Master AP Task		
Error Code (Definition)	Value	Description
TLR_E_SIII_MA_AP_FRAME_LOSS	0xC072001D	Frame loss.
TLR_E_SIII_MA_AP_EXT_TRIGGER_TIMEOUT	0xC072001E	No signal on External Trigger input within timeout.
TLR_E_SIII_MA_AP_EXT_TRIGGER_LOSS	0xC072001F	Signal lost on External Trigger input.
TLR_E_SIII_MA_AP_ALL_SLAVES_LOST	0xC0720020	All slaves lost.
TLR_E_SIII_MA_AP_BUS_SCAN_TIMEOUT	0xC0720021	Bus Scan Timeout.
TLR_E_SIII_MA_AP_INTERNAL_ERROR	0xC0720022	Internal Error detected.
TLR_E_SIII_MA_AP_S_0_1050_X_5_CONN_LEN_GTH_READ_ERROR	0xC0720023	Connection Length could not be read due to incorrect configuration.
TLR_E_SIII_MA_AP_XML_CLOSING_TAG_DOES_NOT_MATCH_OPENING_TAG	0xC0724000	XML structure: Closing Tag does not match opening tag.
TLR_E_SIII_MA_AP_XML_UNEXPECTED_OPENING_TAG_IN_NUMBER_FIELD	0xC0724001	XML structure: Unexpected opening tag in number field.
TLR_E_SIII_MA_AP_XML_UNEXPECTED_SINGLE_TAG_IN_NUMBER_FIELD	0xC0724002	XML structure: Unexpected single tag in number field.
TLR_E_SIII_MA_AP_XML_CLOSING_TAG_DOES_NOT_MATCH_NUMBER_FIELD_TAG	0xC0724003	XML structure: Closing tag does not match number field tag.
TLR_E_SIII_MA_AP_XML_NUMBER_FIELD_IS_INVALID	0xC0724004	XML structure: Number Field is invalid.
TLR_E_SIII_MA_AP_XML_UNEXPECTED_OPENING_TAG_IN_STRING_FIELD	0xC0724005	XML structure: Unexpected opening tag in string field.
TLR_E_SIII_MA_AP_XML_UNEXPECTED_SINGLE_TAG_IN_STRING_FIELD	0xC0724006	XML structure: Unexpected single tag in string field.
TLR_E_SIII_MA_AP_XML_CLOSING_TAG_DOES_NOT_MATCH_STRING_FIELD_TAG	0xC0724007	XML structure: Closing tag does not match string field tag.
TLR_E_SIII_MA_AP_XML_UNEXPECTED_OPENING_TAG_IN_DATA_FIELD	0xC0724008	XML structure: Unexpected opening tag in data field.
TLR_E_SIII_MA_AP_XML_UNEXPECTED_SINGLE_TAG_IN_DATA_FIELD	0xC0724009	XML structure: Unexpected single tag in data field.
TLR_E_SIII_MA_AP_XML_CLOSING_TAG_DOES_NOT_MATCH_DATA_FIELD_TAG	0xC072400A	XML structure: Closing tag does not match data field tag.
TLR_E_SIII_MA_AP_XML_DATA_FIELD_IS_NOT_A_HEX_STRING	0xC072400B	XML structure: Data field is not a hex string.
TLR_E_SIII_MA_AP_XML_UNEXPECTED_OPENING_TAG_IN_SIIICFG_BLOCK	0xC072400C	XML structure: Unexpected opening tag in SIIICfg block.
TLR_E_SIII_MA_AP_XML_UNEXPECTED_SINGLE_TAG_IN_SIIICFG_BLOCK	0xC072400D	XML structure: Unexpected tag in SIIICfg block.
TLR_E_SIII_MA_AP_XML_UNEXPECTED_CLOSING_TAG_IN_SIIICFG_BLOCK	0xC072400E	XML structure: Unexpected closing tag in SIIICfg block.
TLR_E_SIII_MA_AP_XML_UNEXPECTED_OPENING_TAG_TAG_IN_SIIICFG_BLOCK_SLAVE_PART	0xC072400F	XML structure: Unexpected closing tag in SIIICfg block (Slave Part).
TLR_E_SIII_MA_AP_XML_CLOSING_TAG_DOES_NOT_MATCH_SIIICFG_TAG	0xC0724010	XML structure: Closing tag does not match SIIICfg tag.
TLR_E_SIII_MA_AP_XML_FILE_IS_NOT_A_SIIICFG_XML	0xC0724011	XML structure: XML file does not contain a SIIICfg xml.
TLR_E_SIII_MA_AP_XML_UNEXPECTED_SINGLE_TAG_IN_STD_PARAMS_MASTER_BLOCK	0xC0724012	XML structure: Unexpected tag in std_params_master block.
TLR_E_SIII_MA_AP_XML_STD_PARAMS_MASTER_BLOCK_IS_INCOMPLETE	0xC0724013	XML structure: Incomplete std_params_master block.
TLR_E_SIII_MA_AP_XML_DUPLICATE_TAG_IN_STD_PARAMS_MASTER_BLOCK	0xC0724014	XML structure: Duplicate tag in std_params_master block.

Status/Error Codes of the Sercos Master AP Task		
Error Code (Definition)	Value	Description
TLR_E_SIII_MA_AP_XML_CLOSING_TAG_DOES_NOT_MATCH_STD_PARAMS_MASTER_TAG	0xC0724015	XML structure: Closing tag does not match std_params_master tag.
TLR_E_SIII_MA_AP_XML_UNEXPECTED_SINGLE_TAG_IN_PARAMS_MASTER_BLOCK	0xC0724016	XML structure: Unexpected single tag in params_master block.
TLR_E_SIII_MA_AP_XML_DUPLICATE_TAG_IN_PARAMS_MASTER_BLOCK	0xC0724017	XML structure: Duplicate tag in params_master block.
TLR_E_SIII_MA_AP_XML_UNEXPECTED_OPENING_TAG_IN_PARAMS_MASTER_BLOCK	0xC0724018	XML structure: Unexpected opening tag in params_master block.
TLR_E_SIII_MA_AP_XML_CLOSING_TAG_DOES_NOT_MATCH_PARAMS_MASTER_TAG	0xC0724019	XML structure: Closing tag does not match params_master tag.
TLR_E_SIII_MA_AP_XML_PARAMS_MASTER_BLOCK_IS_INCOMPLETE	0xC072401A	XML structure: Incomplete params_master block.
TLR_E_SIII_MA_AP_XML_UNEXPECTED_OPENING_TAG_IN_SYS_IDN_ENTRY_BLOCK	0xC072401B	XML structure: Unexpected opening tag in sys_idn_entry block.
TLR_E_SIII_MA_AP_XML_DUPLICATE_TAG_IN_SYS_IDN_ENTRY_BLOCK	0xC072401C	XML structure: Duplicate tag in sys_idn_entry block.
TLR_E_SIII_MA_AP_XML_UNEXPECTED_SINGLE_TAG_IN_SYS_IDN_ENTRY_BLOCK	0xC072401D	XML structure: Unexpected single tag in sys_idn_entry block.
TLR_E_SIII_MA_AP_XML_CLOSING_TAG_DOES_NOT_MATCH_SYS_IDN_ENTRY_TAG	0xC072401E	XML structure: Closing tag does not match sys_idn_entry tag.
TLR_E_SIII_MA_AP_XML_SYS_IDN_ENTRY_BLOCK_IS_INCOMPLETE	0xC072401F	XML structure: Incomplete sys_idn_entry block.
TLR_E_SIII_MA_AP_XML_UNEXPECTED_OPENING_TAG_IN_SYS_GLOBAL_IDNS_BLOCK	0xC0724020	XML structure: Unexpected opening tag in sys_global_idns block.
TLR_E_SIII_MA_AP_XML_UNEXPECTED_SINGLE_TAG_IN_SYS_GLOBAL_IDNS_BLOCK	0xC0724021	XML structure: Unexpected single tag in sys_global_idns block.
TLR_E_SIII_MA_AP_XML_CLOSING_TAG_DOES_NOT_MATCH_SYS_GLOBAL_IDNS_TAG	0xC0724022	XML structure: Closing tag does not match sys_global_idns tag.
TLR_E_SIII_MA_AP_XML_SYS_GLOBAL_IDNS_BLOCK_IS_INCOMPLETE	0xC0724023	XML structure: Incomplete sys_global_idns block.
TLR_E_SIII_MA_AP_XML_UNEXPECTED_OPENING_TAG_IN_MASTER_BLOCK	0xC0724024	XML structure: Unexpected opening tag in master block.
TLR_E_SIII_MA_AP_XML_UNEXPECTED_SINGLE_TAG_IN_MASTER_BLOCK	0xC0724025	XML structure: Unexpected single tag in master block.
TLR_E_SIII_MA_AP_XML_CLOSING_TAG_DOES_NOT_MATCH_MASTER_TAG	0xC0724026	XML structure: Closing tag does not match master tag.
TLR_E_SIII_MA_AP_XML_MASTER_BLOCK_IS_INCOMPLETE	0xC0724027	XML structure: Incomplete master block.
TLR_E_SIII_MA_AP_XML_DUPLICATE_TAG_IN_MASTER_BLOCK	0xC0724028	XML structure: Duplicate tag in master block.
TLR_E_SIII_MA_AP_XML_UNEXPECTED_SINGLE_TAG_IN_TELEGRAM_ASSIGNMENT_BLOCK	0xC0724029	XML structure: Unexpected single tag in telegram assignment block.
TLR_E_SIII_MA_AP_XML_UNEXPECTED_OPENING_TAG_IN_TELEGRAM_ASSIGNMENT_BLOCK	0xC072402A	XML structure: Unexpected opening tag in telegram assignment block.
TLR_E_SIII_MA_AP_XML_DUPLICATE_TAG_IN_TELEGRAM_ASSIGNMENT_BLOCK	0xC072402B	XML structure: Duplicate tag in telegram assignment block.
TLR_E_SIII_MA_AP_XML_CLOSING_TAG_DOES_NOT_MATCH_TELEGRAM_ASSIGNMENT_TAG	0xC072402C	XML structure: Closing tag does not match telegram assignment tag.
TLR_E_SIII_MA_AP_XML_TELEGRAM_ASSIGNMENT_IS_INCOMPLETE	0xC072402D	XML structure: telegram assignment block is incomplete.
TLR_E_SIII_MA_AP_XML_UNEXPECTED_SINGLE_TAG_IN_STD_PARAMS_SLAVE_BLOCK	0xC072402E	XML structure: Unexpected single tag in std_params_slave block.

Status/Error Codes of the Sercos Master AP Task		
Error Code (Definition)	Value	Description
TLR_E_SIII_MA_AP_XML_UNEXPECTED_OPENING_TAG_IN_STD_PARAMS_SLAVE_BLOCK	0xC072402F	XML structure: Unexpected opening tag in std_params_slave block.
TLR_E_SIII_MA_AP_XML_DUPLICATE_TAG_IN_STD_PARAMS_SLAVE_BLOCK	0xC0724030	XML structure: Duplicate tag in std_params_slave block.
TLR_E_SIII_MA_AP_XML_CLOSING_TAG_DOES_NOT_MATCH_STD_PARAMS_SLAVE_TAG	0xC0724031	XML structure: Closing tag does not match std_params_slave tag.
TLR_E_SIII_MA_AP_XML_STD_PARAMS_SLAVE_BLOCK_IS_INCOMPLETE	0xC0724032	XML structure: std_params_slave block is incomplete.
TLR_E_SIII_MA_AP_XML_UNEXPECTED_SINGLE_TAG_IN_PARAMS_SLAVE_BLOCK	0xC0724033	XML structure: Unexpected single tag in params_slave block.
TLR_E_SIII_MA_AP_XML_UNEXPECTED_OPENING_TAG_IN_PARAMS_SLAVE_BLOCK	0xC0724034	XML structure: Unexpected opening tag in params_slave block.
TLR_E_SIII_MA_AP_XML_DUPLICATE_TAG_IN_PARAMS_SLAVE_BLOCK	0xC0724035	XML structure: Duplicate tag in params_slave block.
TLR_E_SIII_MA_AP_XML_CLOSING_TAG_DOES_NOT_MATCH_PARAMS_SLAVE_TAG	0xC0724036	XML structure: Closing tag does not match params_slave tag.
TLR_E_SIII_MA_AP_XML_PARAMS_SLAVE_BLOCK_IS_INCOMPLETE	0xC0724037	XML structure: params_slave block is incomplete.
TLR_E_SIII_MA_AP_XML_UNEXPECTED_SINGLE_TAG_IN_SLAVE_BLOCK	0xC0724038	XML structure: Unexpected single tag in slave block.
TLR_E_SIII_MA_AP_XML_UNEXPECTED_OPENING_TAG_IN_SLAVE_BLOCK	0xC0724039	XML structure: Unexpected opening tag in slave block.
TLR_E_SIII_MA_AP_XML_DUPLICATE_TAG_IN_SLAVE_BLOCK	0xC072403A	XML structure: Duplicate tag in slave block.
TLR_E_SIII_MA_AP_XML_CLOSING_TAG_DOES_NOT_MATCH_SLAVE_TAG	0xC072403B	XML structure: Closing tag does not match slave tag.
TLR_E_SIII_MA_AP_XML_SLAVE_BLOCK_IS_INCOMPLETE	0xC072403C	XML structure: slave block is incomplete.
TLR_E_SIII_MA_AP_XML_UNEXPECTED_SINGLE_TAG_IN_IDN_ENTRY_DATA_BLOCK	0xC072403D	XML structure: Unexpected single tag in idn_entry block.
TLR_E_SIII_MA_AP_XML_UNEXPECTED_OPENING_TAG_IN_IDN_ENTRY_DATA_BLOCK	0xC072403E	XML structure: Unexpected opening tag in idn_entry block.
TLR_E_SIII_MA_AP_XML_DUPLICATE_TAG_IN_IDN_ENTRY_DATA_BLOCK	0xC072403F	XML structure: Duplicate tag in idn_entry block.
TLR_E_SIII_MA_AP_XML_CLOSING_TAG_DOES_NOT_MATCH_IDN_ENTRY_DATA_TAG	0xC0724040	XML structure: Closing tag does not match idn_entry tag.
TLR_E_SIII_MA_AP_XML_IDN_ENTRY_BLOCK_DATA_IS_INCOMPLETE	0xC0724041	XML structure: idn_entry block is incomplete.
TLR_E_SIII_MA_AP_XML_IDN_ENTRY_BLOCK_HAS_INVALID_ATTRIBUTE	0xC0724042	XML structure: idn_entry block has invalid attribute.
TLR_E_SIII_MA_AP_XML_IDN_ENTRY_DATA_BLOCK_HAS_INVALID_DATA	0xC0724043	XML structure: idn_entry block has invalid data.
TLR_E_SIII_MA_AP_XML_IDN_ENTRY_DATA_BLOCK_CONTAINS_NON_HEX_DIGIT_CHARACTERS	0xC0724044	XML structure: idn_entry block contains non-hex digit characters.
TLR_E_SIII_MA_AP_XML_UNEXPECTED_SINGLE_TAG_IN_IDN_ENTRY_BLOCK	0xC0724045	XML structure: Unexpected single tag in idn_entry block.
TLR_E_SIII_MA_AP_XML_UNEXPECTED_OPENING_TAG_IN_IDN_ENTRY_BLOCK	0xC0724046	XML structure: Unexpected opening tag in idn_entry block.
TLR_E_SIII_MA_AP_XML_DUPLICATE_TAG_IN_IDN_ENTRY_BLOCK	0xC0724047	XML structure: Duplicate tag in idn_entry block.
TLR_E_SIII_MA_AP_XML_CLOSING_TAG_DOES_NOT_MATCH_IDN_ENTRY_TAG	0xC0724048	XML structure: Closing tag does not match idn_entry tag.

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Error Code (Definition)	Value	Description
TLR_E_SIII_MA_AP_XML_IDN_ENTRY_BLOCK_IS_INCOMPLETE	0xC0724049	XML structure: idn_entry block is incomplete.
TLR_E_SIII_MA_AP_XML_UNEXPECTED_SEQUENCE_OF_TAGS_IN_IDN_ENTRY_BLOCK	0xC072404A	XML structure: Unexpected sequence of tags in idn_entry block.
TLR_E_SIII_MA_AP_XML_UNEXPECTED_SINGLE_TAG_IN_IDN_CONFIG_BLOCK	0xC072404B	XML structure: Unexpected single tag in idn_config block.
TLR_E_SIII_MA_AP_XML_UNEXPECTED_OPENING_TAG_IN_IDN_CONFIG_BLOCK	0xC072404C	XML structure: Unexpected opening tag in idn_config block.
TLR_E_SIII_MA_AP_XML_CLOSING_TAG_DOES_NOT_MATCH_IDN_CONFIG_TAG	0xC072404D	XML structure: Closing tag does not match idn_config tag.
TLR_E_SIII_MA_AP_XML_UNEXPECTED_SINGLE_TAG_IN_CONNECTION_ENTRY_BLOCK	0xC072404E	XML structure: Unexpected single tag in connection_entry block.
TLR_E_SIII_MA_AP_XML_UNEXPECTED_OPENING_TAG_IN_CONNECTION_ENTRY_BLOCK	0xC072404F	XML structure: Unexpected opening tag in connection_entry block.
TLR_E_SIII_MA_AP_XML_DUPLICATE_TAG_IN_CONNECTION_ENTRY_BLOCK	0xC0724050	XML structure: Duplicate tag in connection_entry block.
TLR_E_SIII_MA_AP_XML_CLOSING_TAG_DOES_NOT_MATCH_CONNECTION_ENTRY_TAG	0xC0724051	XML structure: Closing tag does not match connection_entry tag.
TLR_E_SIII_MA_AP_XML_CONNECTION_ENTRY_BLOCK_IS_INCOMPLETE	0xC0724052	XML structure: connection_entry block is incomplete.
TLR_E_SIII_MA_AP_XML_UNEXPECTED_SINGLE_TAG_IN_CONNECTIONS_BLOCK	0xC0724053	XML structure: Unexpected single tag in connections block.
TLR_E_SIII_MA_AP_XML_UNEXPECTED_OPENING_TAG_IN_CONNECTIONS_BLOCK	0xC0724054	XML structure: Unexpected opening tag in connections block.
TLR_E_SIII_MA_AP_XML_CLOSING_TAG_DOES_NOT_MATCH_CONNECTIONS_TAG	0xC0724055	XML structure: Closing tag does not match connections tag.
TLR_E_SIII_MA_AP_XML_UNEXPECTED_SINGLE_TAG_IN_CONFIG_BLOCK	0xC0724056	XML structure: Unexpected single tag in config block.
TLR_E_SIII_MA_AP_XML_UNEXPECTED_OPENING_TAG_IN_CONFIG_BLOCK	0xC0724057	XML structure: Unexpected opening tag in config block.
TLR_E_SIII_MA_AP_XML_DUPLICATE_TAG_IN_CONFIG_BLOCK	0xC0724058	XML structure: Duplicate tag in config block.
TLR_E_SIII_MA_AP_XML_CLOSING_TAG_DOES_NOT_MATCH_CONFIG_TAG	0xC0724059	XML structure: Closing tag does not match config tag.
TLR_E_SIII_MA_AP_XML_CONFIG_BLOCK_IS_INCOMPLETE	0xC072405A	XML structure: config block is incomplete.
TLR_E_SIII_MA_AP_XML_UNEXPECTED_SEQUENCE_OF_TAGS_IN_CONFIG_BLOCK	0xC072405B	XML structure: Unexpected sequence of tags in config block.
TLR_E_SIII_MA_AP_XML_INVALID_DATA_LENGTH_OF_SYS_IDN_ENTRY	0xC072405C	XML structure: Invalid Data Length of Sys Idn Entry.
TLR_E_SIII_MA_AP_XML_DUPLICATE_TAG_IN_SYS_GLOBAL_IDNS_BLOCK	0xC072405D	XML structure: Duplicate tag in sys_global_idns block.
TLR_E_SIII_MA_AP_XML_UNSUPPORTED_IDN_IN_SYS_GLOBAL_IDNS_BLOCK	0xC072405E	XML structure: Unsupported IDN in sys_global_idns block.
TLR_E_SIII_MA_AP_XML_INVALID_IDN_DATA_IN_SYS_GLOBAL_IDNS_BLOCK	0xC072405F	XML structure: Invalid IDN data in sys_global_idns block.
TLR_E_SIII_MA_AP_XML_INVALID_TELEGRAM_NUMBER_IN_TELEGRAM_ASSIGNMENT	0xC0724060	XML structure: Invalid Telegram Number in Telegram Assignment.
TLR_E_SIII_MA_AP_XML_INVALID_TELEGRAM_OFFSET_IN_TELEGRAM_ASSIGNMENT	0xC0724061	XML structure: Invalid Telegram Offset in Telegram Assignment.
TLR_E_SIII_MA_AP_XML_INVALID_VALUE_IN_ACTIVE_FIELD	0xC0724062	XML structure: Invalid Value in Active Field.
TLR_E_SIII_MA_AP_XML_INVALID_sercos_ADD	0xC0724063	XML structure: Invalid Sercos Address in

Status/Error Codes of the Sercos Master AP Task		
Error Code (Definition)	Value	Description
RESS		Configuration.
TLR_E_SIII_MA_AP_XML_INVALID_VALUE_IN_HOTPLUG_FIELD	0xC0724064	XML structure: Invalid Value in Hot Plug Field.
TLR_E_SIII_MA_AP_XML_INVALID_VALUE_IN_NRT_SUPPORT_FIELD	0xC0724065	XML structure: Invalid Value in NRT Support Field.
TLR_E_SIII_MA_AP_XML_IDN_DATA_LENGTH_INVALID	0xC0724066	XML structure: IDN Data Length invalid.
TLR_E_SIII_MA_AP_XML_IDN_PHASE_TRANSITION_INVALID	0xC0724067	XML structure: IDN Phase Transition invalid.
TLR_E_SIII_MA_AP_XML_IDN_ELEMENT_INVALID	0xC0724068	XML structure: IDN Element invalid.
TLR_E_SIII_MA_AP_XML_CONNECTION_NUMBER_INVALID	0xC0724069	XML structure: Connection Number invalid.
TLR_E_SIII_MA_AP_XML_CONNECTION_TELEGRAM_OFFSET_INVALID	0xC072406A	XML structure: Connection Telegram Offset invalid.
TLR_E_SIII_MA_AP_XML_CONNECTION_TELEGRAM_NUMBER_INVALID	0xC072406B	XML structure: Connection Telegram Number invalid.
TLR_E_SIII_MA_AP_XML_CONNECTION_TELEGRAM_TYPE_INVALID	0xC072406C	XML structure: Connection Telegram Type invalid.
TLR_E_SIII_MA_AP_XML_CONNECTION_LENGTH_INVALID	0xC072406D	XML structure: Connection Length invalid.
TLR_E_SIII_MA_AP_XML_CONNECTION_RTDATA_DPM_OFFSET_INVALID	0xC072406E	XML structure: Connection RtData DPM Offset invalid.
TLR_E_SIII_MA_AP_XML_CONNECTION_CTRL_DPM_OFFSET_INVALID	0xC072406F	XML structure: Connection CCtrl DPM Offset invalid.
TLR_E_SIII_MA_AP_XML_INVALID_SEQUENCE_OF_TAGS_IN_SIIICFG_BLOCK	0xC0724070	XML structure: Invalid sequence of tags in SIIICfg Block.
TLR_E_SIII_MA_AP_AT_LEAST_ONE_SLAVE_MISSING	0xC0724071	At least one slave is missing.
TLR_E_SIII_MA_AP_BUS_IS_SPLIT_IN_TWO_LINES	0xC0724072	Bus is split in two lines.
TLR_E_SIII_MA_AP_NO_SLAVES_CONNECTED	0xC0724073	No slaves connected.
TLR_E_SIII_MA_AP_UNCONFIGURED_SLAVE_DETECTED	0xC0724074	At least one unconfigured slave detected.
TLR_E_SIII_MA_AP_DUPLICATE_sercos_ADDRESS	0xC0724075	Duplicate Sercos address detected.
TLR_E_SIII_MA_AP_INVALID_sercos_ADDRESS_DETECTED	0xC0724076	Invalid Sercos address detected.
TLR_E_SIII_MA_AP_SVCH_ERROR_ON_SLAVE	0xC0724077	Service channel access on one slave ended with error.
TLR_E_SIII_MA_AP_INVALID_CP0_BUS_STATUSES	0xC0724078	Invalid CP0 Bus Status.

Table 56: Status/Error Codes of the Sercos Master AP Task

10.4.4 Status/Error Codes of the Sercos Master NRT Task

Error Code (Definition)	Value	Description
TLR_E_SIII_MA_NRT_INVALID_STARTUP_PARAMETER	0xC0790001	Invalid Startup parameter.
TLR_E_SIII_MA_NRT_S3FRAMES_NOT_ALLOWED	0xC0790002	Sercos frames not allowed.
TLR_E_SIII_MA_NRT_LLD_NOT_STARTED	0xC0790003	LLD not started.

Table 57: Status/Error Codes of the Sercos Master NRT Task

10.5 ODM Error Codes

10.5.1 General ODM Error Codes

Error Code (Definition)	Value	Description
CODM3_E_INTERNALERROR	0x8004C700	Internal ODM Error
ODM3_E_DESCRIPTION_NOTFOUND	0x8004C701	Description not found in ODM database
CODM3_E_WRITEREGISTRY	0x8004C710	Error writing to the registry
CODM3_E_BAD_REGULAR_EXPRESSION	0x8004C711	Invalid regular expression
CODM3_E_COMCATEGORIE_MANAGER_FAILED	0x8004C712	Component Category Manager could not be instantiated
CODM3_E_COMCATEGORIE_ENUMERATION_FAILED	0x8004C713	Driver could not be enumerated by the Category Manager
CODM3_E_CREATE_LOCAL_BUFFER	0x8004C714	Error creating local buffers
CODM3_E_UNKNOWNHANDLE	0x8004C715	Unknown handle
CODM3_E_QUEUE_LIMIT_REACHED	0x8004C717	Queue size limit for connection reached
CODM3_E_DATASIZE_ZERO	0x8004C718	Zero data length passed
CODM3_E_INVALID_DATA	0x8004C719	Invalid data content
CODM3_E_INVALID_MODE	0x8004C71A	Invalid mode
CODM3_E_DATABASE_READ	0x8004C71B	Error reading database
CODM3_E_CREATE_DEVICE_THREAD	0x8004C750	Error creating device thread
CODM3_E_CREATE_DEVICE_THREAD_STOP_EVENT	0x8004C751	Error creating device thread stop event
CODM3_E_CLIENT_NOT_REGISTERED	0x8004C752	Client is not registered at the ODM
CODM3_E_NO_MORE_CLIENTS	0x8004C753	Maximum number of clients reached
CODM3_E_MAX_CLIENT_CONNECTIONS_REACHED	0x8004C754	Maximum number of client connections reached
CODM3_E_ENTRY_NOT_FOUND	0x8004C755	Driver/device not found
CODM3_E_DRIVER_NOT_FOUND	0x8004C757	The requested driver is unknown to the ODM
CODM3_E_DEVICE_ALREADY_LOCKED	0x8004C758	Device is locked by another process
CODM3_E_DEVICE_UNLOCKED_FAILED	0x8004C759	Device could not be unlocked, lock was set by another process
CODM3_E_DEVICE_LOCK_NECESSARY	0x8004C75A	Operation requires a device lock to be set
CODM3_E_DEVICE_SUBSCRIPTIONLIMIT	0x8004C75B	Maximum number of servers registered for this device reached
CODM3_E_DEVICE_NOTSUBSCRIBED	0x8004C75C	Process is not registered as a server on this device
CODM3_E_DEVICE_NO_MESSAGE	0x8004C75D	No message available
CODM3_E_TRANSFERTIMEOUT	0x8004C760	Message transfer timeout
CODM3_E_MESSAGE_INSERVICE	0x8004C761	Message in service

Table 58: ODM Error Codes - General ODM Error Codes

10.5.2 General ODM Driver Error Codes

Error Code (Definition)	Value	Description
CODM3_E_DRV_OPEN_DEVICE	0x8004C7A0	Packet type unsupported by driver
CODM3_E_DRV_INVALID_IDENTIFIER	0x8004C7A1	Invalid device identifier
CODM3_E_DRV_DEVICE_PARAMETERS_MISMATCH	0x8004C7A3	Parameters differ from requested device
CODM3_E_DRV_BROWSE_NO_DEVICES	0x8004C7A4	No devices found
CODM3_E_DRV_CREATE_DEVICE_INST	0x8004C7A5	Device instance could not be created
CODM3_E_DRV_DEVICE_NOMORE_TX	0x8004C7A6	Device connection limit reached
CODM3_E_DRV_DEVICE_DUPLICATE_TX	0x8004C7A7	Duplicate transmitter ID
CODM3_E_DRV_DEVICE_NOT_CONFIGURED	0x8004C7A8	Device is not configured
CODM3_E_DRV_DEVICE_COMMUNICATION	0x8004C7A9	Device communication error
CODM3_E_DRV_DEVICE_NO_MESSAGE	0x8004C7AA	No message available
CODM3_E_DRV_DEVICE_NOT_READY	0x8004C7AB	Device not ready
CODM3_E_DRV_INVALIDCONFIGURATION	0x8004C7AC	Invalid driver configuration
CODM3_E_DRV_DLINVALIDMODE	0x8004C7C0	Invalid download mode
CODM3_E_DRV_DLINPROGRESS	0x8004C7C1	Download is active
CODM3_E_DRV_ULINPROGRESS	0x8004C7C2	Upload is active

Table 59: ODM Error Codes - General ODM Driver Error Codes

10.5.3 cifX Driver Specific ODM Error Codes

cifX Driver Specific ODM Error Codes		
Error Code (Definition)	Value	Description
DRV_E_BOARD_NOT_INITIALIZED	0x8004C001	DRIVER Board not initialized
DRV_E_INIT_STATE_ERROR	0x8004C002	DRIVER Error in internal init state
DRV_E_READ_STATE_ERROR	0x8004C003	DRIVER Error in internal read state
DRV_E_CMD_ACTIVE	0x8004C004	DRIVER Command on this channel is active
DRV_E_PARAMETER_UNKNOWN	0x8004C005	DRIVER Unknown parameter in function
DRV_E_WRONG_DRIVER_VERSION	0x8004C006	DRIVER Version is incompatible with DLL
DRV_E_PCI_SET_CONFIG_MODE	0x8004C007	DRIVER Error during PCI set configuration mode
DRV_E_PCI_READ_DPM_LENGTH	0x8004C008	DRIVER Could not read PCI dual port memory length
DRV_E_PCI_SET_RUN_MODE	0x8004C009	DRIVER Error during PCI set run mode
DRV_E_DEV_DPM_ACCESS_ERROR	0x8004C00A	DEVICE Dual port ram not accessible(board not found)
DRV_E_DEV_NOT_READY	0x8004C00B	DEVICE Not ready (ready flag failed)
DRV_E_DEV_NOT_RUNNING	0x8004C00C	DEVICE Not running (running flag failed)
DRV_E_DEV_WATCHDOG_FAILED	0x8004C00D	DEVICE Watchdog test failed
DRV_E_DEV_OS_VERSION_ERROR	0x8004C00E	DEVICE Signals wrong OS version
DRV_E_DEV_SYSERR	0x8004C00F	DEVICE Error in dual port flags
DRV_E_DEV_MAILBOX_FULL	0x8004C010	DEVICE Send mailbox is full
DRV_E_DEV_PUT_TIMEOUT	0x8004C011	DEVICE PutMessage timeout
DRV_E_DEV_GET_TIMEOUT	0x8004C012	DEVICE GetMessage timeout
DRV_E_DEV_GET_NO_MESSAGE	0x8004C013	DEVICE No message available
DRV_E_DEV_RESET_TIMEOUT	0x8004C014	DEVICE RESET command timeout
DRV_E_DEV_NO_COM_FLAG	0x8004C015	DEVICE COM-flag not set. Check if Bus is running
DRV_E_DEV_EXCHANGE_FAILED	0x8004C016	DEVICE I/O data exchange failed
DRV_E_DEV_EXCHANGE_TIMEOUT	0x8004C017	DEVICE I/O data exchange timeout
DRV_E_DEV_COM_MODE_UNKNOWN	0x8004C018	DEVICE I/O data mode unknown
DRV_E_DEV_FUNCTION_FAILED	0x8004C019	DEVICE Function call failed
DRV_E_DEV_DPMSIZE_MISMATCH	0x8004C01A	DEVICE DPM size differs from configuration
DRV_E_DEV_STATE_MODE_UNKNOWN	0x8004C01B	DEVICE State mode unknown
DRV_E_DEV_HW_PORT_IS_USED	0x8004C01C	DEVICE Output port already in use
DRV_E_USR_OPEN_ERROR	0x8004C01E	USER Driver not opened (device driver not loaded)
DRV_E_USR_INIT_DRV_ERROR	0x8004C01F	USER Can't connect to device
DRV_E_USR_NOT_INITIALIZED	0x8004C020	USER Board not initialized (DevInitBoard not called)
DRV_E_USR_COMM_ERR	0x8004C021	USER IOCTL function failed
DRV_E_USR_DEV_NUMBER_INVALID	0x8004C022	USER Parameter DeviceNumber invalid
DRV_E_USR_INFO_AREA_INVALID	0x8004C023	USER Parameter InfoArea unknown
DRV_E_USR_NUMBER_INVALID	0x8004C024	USER Parameter Number invalid
DRV_E_USR_MODE_INVALID	0x8004C025	USER Parameter Mode invalid
DRV_E_USR_MSG_BUF_NULL_PTR	0x8004C026	USER NULL pointer assignment
DRV_E_USR_MSG_BUF_TOO_SHORT	0x8004C027	USER Message buffer too small

cifX Driver Specific ODM Error Codes		
Error Code (Definition)	Value	Description
DRV_E_USR_SIZE_INVALID	0x8004C028	USER Parameter Size invalid
DRV_E_USR_SIZE_ZERO	0x8004C02A	USER Parameter Size with zero length
DRV_E_USR_SIZE_TOO_LONG	0x8004C02B	USER Parameter Size too long
DRV_E_USR_DEV_PTR_NULL	0x8004C02C	USER Device address null pointer
DRV_E_USR_BUF_PTR_NULL	0x8004C02D	USER Pointer to buffer is a null pointer
DRV_E_USR_SENDSIZE_TOO_LONG	0x8004C02E	USER Parameter SendSize too large
DRV_E_USR_RECVSIZE_TOO_LONG	0x8004C02F	USER Parameter ReceiveSize too large
DRV_E_USR_SENDBUF_PTR_NULL	0x8004C030	USER Pointer to send buffer is a null pointer
DRV_E_USR_RECVBUF_PTR_NULL	0x8004C031	USER Pointer to receive buffer is a null pointer
DRV_E_DMA_INSUFF_MEM	0x8004C032	DMA Memory allocation error
DRV_E_DMA_TIMEOUT_CH4	0x8004C033	DMA Read I/O timeout
DRV_E_DMA_TIMEOUT_CH5	0x8004C034	DMA Write I/O timeout
DRV_E_DMA_TIMEOUT_CH6	0x8004C035	DMA PCI transfer timeout
DRV_E_DMA_TIMEOUT_CH7	0x8004C036	DMA Download timeout
DRV_E_DMA_DB_DOWN_FAIL	0x8004C037	DMA Database download failed
DRV_E_DMA_FW_DOWN_FAIL	0x8004C038	DMA Firmware download failed
DRV_E_CLEAR_DB_FAIL	0x8004C039	DMA Clear database on the device failed
DRV_E_DEV_NO_VIRTUAL_MEM	0x8004C03C	DMA USER Virtual memory not available
DRV_E_DEV_UNMAP_VIRTUAL_MEM	0x8004C03D	DMA USER Unmap virtual memory failed
DRV_E_GENERAL_ERROR	0x8004C046	DRIVER General error
DRV_E_DMA_ERROR	0x8004C047	DRIVER General DMA error
DRV_E_WDG_IO_ERROR	0x8004C048	DRIVER I/O WatchDog failed
DRV_E_WDG_DEV_ERROR	0x8004C049	DRIVER Device Watchdog failed
DRV_E_USR_DRIVER_UNKNOWN	0x8004C050	USER Driver unknown
DRV_E_USR_DEVICE_NAME_INVALID	0x8004C051	USER Device name invalid
DRV_E_USR_DEVICE_NAME_UNKNOWN	0x8004C052	USER Device name unknown
DRV_E_USR_DEVICE_FUNC_NOTIMPL	0x8004C053	USER Device function not implemented
DRV_E_USR_FILE_OPEN_FAILED	0x8004C064	USER File could not be opened
DRV_E_USR_FILE_SIZE_ZERO	0x8004C065	USER File size zero
DRV_E_USR_FILE_NO_MEMORY	0x8004C066	USER Not enough memory to load file
DRV_E_USR_FILE_READ_FAILED	0x8004C067	USER File read failed
DRV_E_USR_INVALID_FILETYPE	0x8004C068	USER File type invalid
DRV_E_USR_FILENAME_INVALID	0x8004C069	USER Invalid filename
DRV_E_FW_FILE_OPEN_FAILED	0x8004C06E	USER Firmware file could not be opened
DRV_E_FW_FILE_SIZE_ZERO	0x8004C06F	USER Not enough memory to load firmware file
DRV_E_FW_FILE_NO_MEMORY	0x8004C070	USER Not enough memory to load firmware file
DRV_E_FW_FILE_READ_FAILED	0x8004C071	USER Firmware file read failed
DRV_E_FW_INVALID_FILETYPE	0x8004C072	USER Firmware file type invalid
DRV_E_FW_FILENAME_INVALID	0x8004C073	USER Firmware file name not valid
DRV_E_FW_DOWNLOAD_ERROR	0x8004C074	USER Firmware file download error
DRV_E_FW_FILENAME_NOT_FOUND	0x8004C075	USER Firmware file not found in the internal table
DRV_E_FW_BOOTLOADER_ACTIVE	0x8004C076	USER Firmware file BOOTLOADER active

cifX Driver Specific ODM Error Codes		
Error Code (Definition)	Value	Description
DRV_E_FW_NO_FILE_PATH	0x8004C077	USER Firmware file no file path
DRV_E_CF_FILE_OPEN_FAILED	0x8004C078	USER Configuration file could not be opened
DRV_E_CF_FILE_SIZE_ZERO	0x8004C079	USER Configuration file size zero
DRV_E_CF_FILE_NO_MEMORY	0x8004C07A	USER Not enough memory to load configuration file
DRV_E_CF_FILE_READ_FAILED	0x8004C07B	USER Configuration file read failed
DRV_E_CF_INVALID_FILETYPE	0x8004C07C	USER Configuration file type invalid
DRV_E_CF_FILENAME_INVALID	0x8004C07D	USER Configuration file name not valid
DRV_E_CF_DOWNLOAD_ERROR	0x8004C07E	USER Configuration file download error
DRV_E_CF_FILE_NO_SEGMENT	0x8004C07F	USER No flash segment in the configuration file
DRV_E_CF_DIFFERS_FROM_DBM	0x8004C080	USER Configuration file differs from database
DRV_E_DBM_SIZE_ZERO	0x8004C083	USER Database size zero
DRV_E_DBM_NO_MEMORY	0x8004C084	USER Not enough memory to upload database
DRV_E_DBM_READ_FAILED	0x8004C085	USER Database read failed
DRV_E_DBM_NO_FLASH_SEGMENT	0x8004C086	USER Database segment unknown
DEV_E_CF_INVALID_DESCRIPTOR_VERSION	0x8004C096	CONFIG Version of the descriptor table invalid
DEV_E_CF_INVALID_INPUT_OFFSET	0x8004C097	CONFIG Input offset is invalid
DEV_E_CF_NO_INPUT_SIZE	0x8004C098	CONFIG Input size is 0
DEV_E_CF_MISMATCH_INPUT_SIZE	0x8004C099	CONFIG Input size does not match configuration
DEV_E_CF_INVALID_OUTPUT_OFFSET	0x8004C09A	CONFIG Invalid output offset
DEV_E_CF_NO_OUTPUT_SIZE	0x8004C09B	CONFIG Output size is 0
DEV_E_CF_MISMATCH_OUTPUT_SIZE	0x8004C09C	CONFIG Output size does not match configuration
DEV_E_CF_STN_NOT_CONFIGURED	0x8004C09D	CONFIG Station not configured
DEV_E_CF_CANNOT_GET_STN_CONFIG	0x8004C09E	CONFIG Cannot get the Station configuration
DEV_E_CF_MODULE_DEF_MISSING	0x8004C09F	CONFIG Module definition is missing
DEV_E_CF_MISMATCH_EMPTY_SLOT	0x8004C0A0	CONFIG Empty slot mismatch
DEV_E_CF_MISMATCH_INPUT_OFFSET	0x8004C0A1	CONFIG Input offset mismatch
DEV_E_CF_MISMATCH_OUTPUT_OFFSET	0x8004C0A2	CONFIG Output offset mismatch
DEV_E_CF_MISMATCH_DATA_TYPE	0x8004C0A3	CONFIG Data type mismatch
DEV_E_CF_MODULE_DEF_MISSING_NO_SI	0x8004C0A4	CONFIG Module definition is missing,(no Slot/Idx)

Table 60: cifX Driver Specific ODM Error Codes

10.6 Error Codes cifX Device Driver and netX Driver

10.6.1 Generic Error Codes

Error Code (Definition)	Value	Description
CIFX_INVALID_POINTER	0x800A0001L	Invalid pointer (NULL) passed to driver
CIFX_INVALID_BOARD	0x800A0002L	No board with the given nameindex available
CIFX_INVALID_CHANNEL	0x800A0003L	No channel with the given index available
CIFX_INVALID_HANDLE	0x800A0004L	Invalid handle passed to driver
CIFX_INVALID_PARAMETER	0x800A0005L	Invalid parameter
CIFX_INVALID_COMMAND	0x800A0006L	Invalid command
CIFX_INVALID_BUFFERSIZE	0x800A0007L	Invalid buffer size
CIFX_INVALID_ACCESS_SIZE	0x800A0008L	Invalid access size
CIFX_FUNCTION_FAILED	0x800A0009L	Function failed
CIFX_FILE_OPEN_FAILED	0x800A000AL	File could not be opened
CIFX_FILE_SIZE_ZERO	0x800A000BL	File size is zero
CIFX_FILE_LOAD_INSUFF_MEM	0x800A000CL	Insufficient memory to load file
CIFX_FILE_CHECKSUM_ERROR	0x800A000DL	File checksum compare failed
CIFX_FILE_READ_ERROR	0x800A000EL	Error reading from file
CIFX_FILE_TYPE_INVALID	0x800A000FL	Invalid file type
CIFX_FILE_NAME_INVALID	0x800A0010L	Invalid file name
CIFX_FUNCTION_NOT_AVAILABLE	0x800A0011L	Driver function not available
CIFX_BUFFER_TOO_SHORT	0x800A0012L	Given buffer is too short
CIFX_MEMORY_MAPPING_FAILED	0x800A0013L	Failed to map the memory
CIFX_NO_MORE_ENTRIES	0x800A0014L	No more entries available
CIFX_CALLBACK_MODE_UNKNOWN	0x800A0015L	Unkown callback handling mode
CIFX_CALLBACK_CREATE_EVENT_FAILED	0x800A0016L	Failed to create callback events
CIFX_CALLBACK_CREATE_RECV_BUFFER	0x800A0017L	Failed to create callback receive buffer

Table 61: Generic Error Codes

10.6.2 Generic Driver Error Codes

Error Code (Definition)	Value	Description
CIFX_DRV_NOT_INITIALIZED	0x800B0001L	Driver not initialized
CIFX_DRV_INIT_STATE_ERROR	0x800B0002L	Driver init state error
CIFX_DRV_READ_STATE_ERROR	0x800B0003L	Driver read state error
CIFX_DRV_CMD_ACTIVE	0x800B0004L	Command is active on device
CIFX_DRV_DOWNLOAD_FAILED	0x800B0005L	General error during download
CIFX_DRV_WRONG_DRIVER_VERSION	0x800B0006L	Wrong driver version
CIFX_DRV_DRIVER_NOT_LOADED	0x800B0030L	CIFx driver is not running
CIFX_DRV_INIT_ERROR	0x800B0031L	Failed to initialize the device
CIFX_DRV_CHANNEL_NOT_INITIALIZED	0x800B0032L	Channel not initialized (xOpenChannel not called)
CIFX_DRV_IO_CONTROL_FAILED	0x800B0033L	IOControl call failed
CIFX_DRV_NOT_OPENED(0x800B0034L	Driver was not opened
CIFX_DRV_DOWNLOAD_STORAGE_UNKN OWN	0x800B0040L	Unknown download storage type (RAMFLASH based) found
CIFX_DRV_DOWNLOAD_FW_WRONG_CHA NNEL	0x800B0041L	Channel number for a firmware download not supported
CIFX_DRV_DOWNLOAD_MODULE_NO_BAS EOS	0x800B0042L	Modules are not allowed without a Base OS firmware

Table 62: Generic Driver Error Codes

10.6.3 Generic Device Error Codes

Error Code (Definition)	Value	Description
CIFX_DEV_DPM_ACCESS_ERROR	0x800C0010L	Dual port memory not accessible (board not found)
CIFX_DEV_NOT_READY	0x800C0011L	Device not ready (ready flag failed)
CIFX_DEV_NOT_RUNNING	0x800C0012L	Device not running (running flag failed)
CIFX_DEV_WATCHDOG_FAILED	0x800C0013L	Watchdog test failed
CIFX_DEV_SYSERR	0x800C0015L	Error in handshake flags
CIFX_DEV_MAILBOX_FULL	0x800C0016L	Send mailbox is full
CIFX_DEV_PUT_TIMEOUT	0x800C0017L	Send packet timeout
CIFX_DEV_GET_TIMEOUT	0x800C0018L	Receive packet timeout
CIFX_DEV_GET_NO_PACKET	0x800C0019L	No packet available
CIFX_DEV_MAILBOX_TOO_SHORT	0x800C001AL	Mailbox too short
CIFX_DEV_RESET_TIMEOUT	0x800C0020L	Reset command timeout
CIFX_DEV_NO_COM_FLAG	0x800C0021L	COM-flag not set
CIFX_DEV_EXCHANGE_FAILED	0x800C0022L	IO data exchange failed
CIFX_DEV_EXCHANGE_TIMEOUT	0x800C0023L	IO data exchange timeout
CIFX_DEV_COM_MODE_UNKNOWN	0x800C0024L	Unknown IO exchange mode
CIFX_DEV_FUNCTION_FAILED	0x800C0025L	Device function failed
CIFX_DEV_DPMSIZE_MISMATCH	0x800C0026L	DPM size differs from configuration
CIFX_DEV_STATE_MODE_UNKNOWN	0x800C0027L	Unknown state mode
CIFX_DEV_HW_PORT_IS_USED	0x800C0028L	Device is still accessed
CIFX_DEV_CONFIG_LOCK_TIMEOUT	0x800C0029L	Configuration locking timeout
CIFX_DEV_CONFIG_UNLOCK_TIMEOUT	0x800C002AL	Configuration unlocking timeout
CIFX_DEV_HOST_STATE_SET_TIMEOUT	0x800C002BL	Set HOST state timeout
CIFX_DEV_HOST_STATE_CLEAR_TIMEOUT	0x800C002CL	Clear HOST state timeout
CIFX_DEV_INITIALIZATION_TIMEOUT	0x800C002DL	Timeout during channel initialization
CIFX_DEV_BUS_STATE_ON_TIMEOUT	0x800C002EL	Set Bus ON Timeout
CIFX_DEV_BUS_STATE_OFF_TIMEOUT	0x800C002FL	Set Bus OFF Timeout
CIFX_DEV_MODULE_ALREADY_RUNNING	0x800C0040L	Module already running
CIFX_DEV_MODULE_ALREADY_EXISTS	0x800C0041L	Module already exists

Table 63: Generic Device Error Codes

10.7 Error Codes netX Driver

10.7.1 CIFS API Transport Error Codes

Error Code (Definition)	Value	Description
CIFS_TRANSPORT_SEND_TIMEOUT	0x800D0001L	Time out while sending data
CIFS_TRANSPORT_RECV_TIMEOUT	0x800D0002L	Time out waiting for incoming data
CIFS_TRANSPORT_CONNECT	0x800D0003L	Unable to communicate to the device no answer
CIFS_TRANSPORT_ABORTED	0x800D0004L	Transfer has been aborted due to keep alive timeout or interface detachment
CIFS_CONNECTOR_FUNCTIONS_READ_ERROR	0x800D0010L	Error reading the connector functions from the DLL
CIFS_CONNECTOR_IDENTIFIER_TOO_LONG	0x800D0011L	Connector delivers an identifier longer than 6 characters
CIFS_CONNECTOR_IDENTIFIER_EMPTY	0x800D0012L	Connector delivers an empty identifier
CIFS_CONNECTOR_DUPLICATE_IDENTIFIER	0x800D0013L	Connector identifier already used

Table 64: CIFS API Transport Error Codes

10.7.2 CIFS API Transport Header State Error Codes

Error Code (Definition)	Value	Description
CIFS_TRANSPORT_ERROR_UNKNOWN	0x800E0001L	Unknown error code in transport header
CIFS_TRANSPORT_CHECKSUM_ERROR	0x800E0002L	CRC16 checksum failed
CIFS_TRANSPORT_LENGTH_INCOMPLETE	0x800E0003L	Transaction with incomplete length detected
CIFS_TRANSPORT_DATA_TYPE_UNKNOWN	0x800E0004L	Device does not support requested data type
CIFS_TRANSPORT_DEVICE_UNKNOWN	0x800E0005L	Device not available unknown
CIFS_TRANSPORT_CHANNEL_UNKNOWN	0x800E0006L	Channel not available unknown
CIFS_TRANSPORT_SEQUENCE	0x800E0007L	Sequence error detected
CIFS_TRANSPORT_BUFFER_OVERFLOW	0x800E0008L	Buffer overflow detected
CIFS_TRANSPORT_RESOURCE	0x800E0009L	Device signals out of resources
CIFS_TRANSPORT_KEEPALIVE	0x800E000AL	Device connection monitoring error (Keep alive)
CIFS_TRANSPORT_DATA_TOO_SHORT	0x800E000BL	Received transaction data too short

Table 65: CIFS API Transport Header State Error Codes

10.8 ODM Error Codes DBM V4

ODM Error Codes DBM V4		
Error Code (Definition)	Value	Description
CDBM_E_MD5_INVALID	0XC004C810	Checksum invalid
CDBM_E_INTERNALERROR	0XC004C811	Internal Error
CDBM_W_WRITEREGISTRY	0X8004C812	Error writing to the registry
CDBM_E_UNEXPECTED_VALUE_ IN_OLD_HEADER_FORMAT	0XC004C813	Error in a file containing the old DBM Header format.
CDBM_E_CHECKSUM_INVALID	0XC004C814	The Checksum of the old Header is invalid
CDBM_E_DB_ALREADY_LOADED_ FORMAT	0XC004C815	A database is already loaded
CDBM_E_NO_VALID_TRANSACTION	0XC004C816	No valid transaction handle given
CDBM_E_STD_STRUCT_ERROR	0XC004C817	An error occurred during validation of data
CDBM_E_UNSUPPORTED_ DATA_TYPE_FORMAT	0XC004C818	Unsupported DataType
CDBM_W_CLASS_DELETED_ FORMAT	0X8004C819 (Warning)	Using an Object which is marked as deleted
CDBM_W_CLIENT_DISCONNECTED	0X8004C81A (Warning)	A Client has already an outstanding connection to a Table. The connection is now destroyed.
CDBM_E_STRUCTURE_DEFINITION_ INVALID	0XC004C81B	A structure definition of an Element in a Table is invalid
CDBM_E_NO_DATA_AVAILABLE	0XC004C81C	No data available for this operation
CDBM_E_NO_VALID_STRUCTURE	0XC004C81D	No valid structure available for this operation
CDBM_E_NO_TOGGLE_STRING_ FOUND	0XC004C81E	No Toggle string found for this number
CDBM_E_ELEMENT_OUT_OF_RANGE	0XC004C81F	An element wasn't found in the Record of a Table
CDBM_E_ELEMENT_NOT_IN_ TABLE	0XC004C820	The element is not part of the Table
CDBM_E_CANNOT_CONVERT_ INTO_CLIENT_TYPE	0XC004C821	The data can't be converted into the Client type
CDBM_E_TRANSACTION_ ALREADY_OPEN	0XC004C822	A transaction is already open. Please close this one first before opening a new one.
CDBM_I_OLD_WITHOUT_HEADER	0X4004C823 (Informational)	Use of an old DBM file Format without Header
CDBM_E_HR_FROM	0XC004C824	An HRESULT was received from a Subroutine
CDBM_E_PARAMETER	0XC004C825	A Parameter is invalid
CDBM_E_NOTIMPL	0XC004C826	Method is currently not implemented
CDBM_E_OUTOFMEMORY	0XC004C827	Out of memory
CDBM_E_NO_OPEN_TRANSACTION	0XC004C828	No transaction open
CDBM_E_NO_CONTENTS	0XC004C829	No contents available
CDBM_REC_NO_NOT_FOUND	0XC004C82A	Record not found
CDBM_STRUCTURE_ELEMENT_ NOT_FOUND	0XC004C82B	Element of the Structure not found
CDBM_E_NO_MORE_RECORDS_ IN_TABTYPE	0XC004C82C	Table type 3 can contain only one record
CDBM_E_WRITE	0XC004C82D	The data in the VARIANT must be given in a SafeArray
CDBM_E_WRITE_NO_PARRAY	0XC004C82E	The VARIANT contains no valid [parray] element

ODM Error Codes DBM V4		
Error Code (Definition)	Value	Description
CDBM_E_WRITE_CANT_ACCESS_DATA	0XC004C82F	Unable to access SafeArray Data in the VARIANT
CDBM_E_WRITE_DATA	0XC004C830	To write the data of this Element it must be given as a BSTR, or as an Array of VT_UI1/VT_I1
CDBM_E_WRITE_BSTR_E1	0XC004C831	The BSTR string must have an even length.
CDBM_E_WRITE_BSTR_E2	0XC004C832	The BSTR string must contain only hex digits (0..9 and a/A..f/F).
CDBM_E_WRITE_CANT_INTERPRET_ARRAY	0XC004C833	Unable to interpret data in the SafeArray.
CDBM_E_WRITE_VT_ERROR	0XC004C834	Data type in the SafeArray is not VT_UI1 or VT_I1.
CDBM_E_WRITE_LENGTH	0XC004C835	Data length is invalid for write operation of this type.
CDBM_WRITE_ELEMENT	0XC004C836	Element not found in the Record of the Table
CDBM_MIN_MAX_ERROR	0XC004C837	Can't write data because of min underflow or max overflow
CDBM_TABLE_EXIST	0XC004C838	Table already exist in the database
CDBM_MIN_MAX_INVALID	0XC004C839	The Min value is greater than the Max Value
CDBM_DEF_MIN_MAX_INVALID	0XC004C83A	The Default Value is not in the range between the Min value and the Max Value
CDBM_CANT_CHANGE_STRUCTURE_WHILE_RECORDS_EXIST	0XC004C83B	It's not allowed to change the structure while Records exist in the Table
CDBM_NEW_STRUCT_NEEDS_TYPE	0XC004C83C	In a newly added structure the data type must be set also
CDBM_VALUE_ERROR	0XC004C83D	Range error while validating a value
CDBM_DATATYPE_UNSUPPORTED_IN_RCS	0XC004C83E	The data type is unsupported in the RCS file format
CDBM_I_COUNT_OF_TABLES_EXCEEDS_RCS_RANGE	0X4004C83F (Informational)	The count of Tables exceeds the RCS range of Tables. This can cause problems if the file is downloaded to RCS Systems
CDBM_I_COUNT_OF_TABLES_EXCEEDS_OLDDBM_RANGE	0X4004C840 (Informational)	The count of Tables exceeds the DBM32.DLL range of Tables. This can cause problems if the file is used with older Tools using the DBM32.DLL
CDBM_UNSUPPORTED_DATATYPE_IN_RCS_MODE	0XC004C841	The Data type is not compatible with the old database format
CDBM_WRITE_UNSTRUCTURED_1	0XC004C842	The data of an unstructured record can only be written with the 'Write' Method not with 'WriteElement'.
CDBM_READ_UNSTRUCTURED_1	0XC004C843	The data of an unstructured record can only be read with the 'Read' Method not with 'ReadElement'
CDBM_WRITE_DATA_LENGTH_INVALID	0XC004C844	The given data length doesn't correspond with the expected data length.
CDBM_UNKNOWN_VIEW_MODE	0XC004C845	The View Mode is unknown.
CDBM_E_DIAG_TABLE	0XC004C846	It doesn't make much sense to add or delete records from a diagnostic table because those changes are never saved.

ODM Error Codes DBM V4		
Error Code (Definition)	Value	Description
CDBM_E_ADR_STRING_ERROR	0XC004C847	The given Address string doesn't fit the required format of this type where all address bytes must be in the range between 0 and FF
CDBM_ERROR_FROM_VAR_CHANGE_TYPE	0XC004C848	Function VariantChangeType return an error when trying to convert the Parameter
CDBM_E_MINERROR	0XC004C849	Error while comparing the Value with the lower range
CDBM_E_MAXERROR	0XC004C84A	Error while comparing the Value with the upper range
CDBM_E_RANGE_ERROR	0XC004C84B	Value out of Range
CDBM_E_TABLE_TYPE1	0XC004C84C	Table type 1 doesn't have a unique record length over all records
CDBM_E_TABLE_TYPE3_ADDREC	0XC004C84D	Table type 3 doesn't allow to insert more than one Record
CDBM_E_TABTYPE1	0XC004C84E	It's not allowed to insert more Records than structure definitions in Table Type 1
CDBM_E_TOGGLE_NOT_FOUND	0XC004C84F	Could not find the string for this value in the list of valid toggle strings
CDBM_E_TOGGLE_VALUE_IS_EMPTY_STRING	0XC004C850	The toggle string for this value is empty.
CDBM_VARIANT2BYTEARRAY_ERROR	0XC004C851	Error during conversion of Variant to byte array
CDBM_E_SET_ELEM_PROP_DEPENDENCY	0XC004C852	The Toggle Type needs also the additional string and the additional number entries in the Method
CDBM_E_TABTYPE1_REC_DOESNT_CORRESPOND_WITH_ELEMENT	0XC004C853	When reading the records of Table type 1 elementwise the record number must correspond with the element number
CDBM_TABTYPE1_NO_DATA_FOUND_FOR_RECORD	0XC004C854	When reading the records of Table type 1 and structure definitions are present it's assumed that for each structure element a corresponding record must exist
CDBM_E_TABTYPE1_WRITE_ELEMENT_NE_RECORD	0XC004C855	When writing the records of Table type 1 elementwise and structure definitions are present it's only allowed to write the corresponding element number in each record
CDBM_E_TABTYPE1_WRITE_ELEMENT_NOT_FOUND	0XC004C856	When writing the records of Table type 1 with an array and structure definitions are present it's assumed that a corresponding element number of this record exist
CDBM_I_TABLE_NAME_EXCEEDS_RCS_RANGE	0X4004C857 (Informational)	The Table name exceeds the maximum length of RCS compatible Table names
CDBM_W_CUT_STRING	0X8004C858 (Warning)	The string exceeds the maximum length and will be limited to the maximum length
CDBM_I_STRING_TOO_SHORT	0X4004C859 (Informational)	The string is below the minimum length. The minimum length will be reduced.
CDBM_I_STRING_TOO_LONG	0X4004C85A (Informational)	The string is exceeding the maximum. The maximum length will be extended.
CDBM_E_STRING_TOO_SHORT	0XC004C85B (Error)	The string is below the minimum length.
CDBM_E_STRING_TOO_LONG	0XC004C85C (Error)	The string is exceeding the maximum length

ODM Error Codes DBM V4		
Error Code (Definition)	Value	Description
CDBM_E_WRONG_TYPE_FOR_WRITE	0XC004C85D	Writing on the Element type with the given Data type is not implemented
CDBM_E_NO_APPEND_IN_STRUCTURED_RECORDS	0XC004C85E	Method IDbmRecord::AppendData is not allowed for structured records
CDBM_E_DATA_UNAVAILABLE	0XC004C85F	No data available
CDBM_E_CANT_CONVERT_INTO	0XC004C860	Unable to convert the value into the Element type
CDBM_E_DBM_FILE_OVERFLOW	0XC004C861	You try to write a RCS like database which needs too much bytes
CDBM_E_PW_ERROR	0XC004C862	Password not correct
CDBM_E_FILELENGTH_CORRUPT	0XC004C863	The file length doesn't correspond to the length given in the Header.
CDBM_E_STRUCT_TYPE	0XC004C864	Error in the file.
CDBM_E_MD5SUM_INVALID	0XC004C865	MD5 sum invalid
CDBM_E_STRUCT_LENGTH	0XC004C866	Error in the expected and given structure length at a specific offset in the file.
CDBM_E_APPEND	0XC004C867	Append of data is only allowed if the Record contains only one data field and the field type will support this
CDBM_APPEND_NOT_SUPPORTED	0XC004C868	Append of Data not supported by this filed type
CDBM_DATA_TYPE_APPEND_ERROR	0XC004C869	Can't append Data of this type.
CDBM_E_UNSTRUCTURED_TABLE_DOESNT_SUPPORT_LENGTH	0XC004C86A	A Table without structure information doesn't support a record length
CDBM_E_DISABLED_WHILE_TRANSACTION_IS_OPEN	0XC004C86B	The Method is disabled while a transaction is open. Please close this one first and call the Method again.
CDBM_E_UNABLE_TO_CALL_READ_ON_LINKED_LIST	0XC004C86C	The Method is disabled on a LinkedList type. Please use the IRecordCollection on this type.
CDBM_E_ELEMENT_HAS_NO_SUBSTRUCTURE	0XC004C86D	An Element from a Table has no substructure
CDBM_STRUCT_ERROR_FROM_VAR_CHANGE_TYPE	0XC004C86E	Error from calling VariantChangeType
CDBM_E_FOREIGNKEY_DEF	0XC004C86F	The definition of a FOREIGNKEY must contain the name of the related Table in the description and this Table must exist at this time
CDBM_E_FOREIGNKEY_REF_TAB	0XC004C870	The description of a FOREIGNKEY must refer to a Table of type 'eDbmTableTypeLinkedList'
CDBM_E_KEY	0XC004C871	To create a Record Collection with a KEY it's necessary to have the data type KEY at the first position in all Records of the searched Table
CDBM_E_KEY_TABLE_TYPE	0XC004C872	This Method needs a Table of type 'eDbmTableTypeLinkedList'
CDBM_DATATYPE_NOT_IMPLEMENTED	0XC004C873	This data type is currently not implemented
CDBM_INSERT_POS_NOT_FOUND	0XC004C874	The position of the Record where the new one should be inserted wasn't found
CDBM_E_INSERT_REC_QI	0XC004C875	Error during insertion of a Record
CDBM_E_TAB_PROP	0XC004C876	Invalid Property in Table
CDBM_E_KEY_NOT_FOUND	0XC004C877	The KEY wasn't found in the Table

ODM Error Codes DBM V4		
Error Code (Definition)	Value	Description
CDBM_E_KEY_INVALID	0XC004C878	The KEY is invalid for this operation

Table 66: ODM Error Codes DBM V4

11 Appendix

11.1 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 **Settings**, **Configuration** and **Diagnosis** panes of the Sercos Master DTM you do not need special user rights. Also all users can select the decimal or hexadecimal Display mode or sort table entries.



Note: To edit, set or configure the parameters of the **Settings** and **Configuration** 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.

11.1.1 Settings

	Observer	Operator	Maintenance	Planning Engineer	Administrator
<i>Driver</i>	D	D	X	X	X
<i>Verify or adapt Driver Settings</i>	-	-	X	X	X
<i>Configuring netX Driver</i>	-	-	X	X	X
<i>Device Assignment</i>	D	D	X	X	X
<i>Scanning for Devices</i>	-	-	X	X	X
<i>Selecting the Device (with or without firmware)</i>	-	-	X	X	X
<i>Selecting the Device once more (with Firmware)</i>	-	-	X	X	X
<i>Firmware Download</i>	D	D	X	X	X

Table 67: Settings (D = Displaying, X = Editing, Configuring)

11.1.2 Configuration

	Observer	Operator	Maintenance	Planning Engineer	Administrator
<i>General Settings</i>	D	D	X	X	X
<i>Master Settings</i>	D	D	X	X	X
<i>Slave Table</i>	D	D	X	X	X
<i>Process Data</i>	D	D	X	X	X
<i>Address Table</i>	D	D	X	X	X

Table 68: Configuration (D = Displaying, X = Editing, Configuring)

11.2 References

- [1] Device Type Manager (DTM) Style Guide, Version 1.0 ; FDT-JIG - Order No. <0001-0008-000>
- [2] Sercos Master Protocol API Manual, Revision 11, Hilscher GmbH 2013 (Hilscher Document ID: DOC081103API10EN)
- [3] Sercos Communication_V1.3-1.9, Sercos International 2012

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11.5 Glossary

Address Table

The Address Table within the Hilscher Sercos Master DTM provides a list of all addresses used within the process image. The displayed addresses always relate to the Sercos Master currently in use.

The following data are displayed:

- the device name of the Sercos slave device
- the station address of the Sercos slave device
- the slave index
- the connection instance
- the signal name
- the type of input and output data
- the length of the input and output data
- and the address of the input and output data as offset address within the process data image of the Sercos Master

AT

Acknowledge Telegram

(originally *Antriebstelegramm* which is the German expression for “*Drive Telegram*”))

The Acknowledge Telegram (AT) is a special telegram used for transmission of real-time data from the slaves to the master and to other slave devices (if cross communication is used). The format of the AT is predefined within the Sercos specification.

AT0 Transmission Starting Time

This parameter describes the nominal time interval between the end of MST and begin of AT0. The master sends its AT0 based on the MST in CP3 and CP4.

In the Sercos specification this value is denominated as t_1 . This item corresponds to IDN S-0-1006.

The AT0 Transmission Starting Time t_1 is represented by an unsigned decimal value with 3 places after the decimal point. It is specified in units of microseconds. The minimum value is 0, the maximum value t_{scyc} , see section “Communication Cycle Time” above.

BOOTP

Boot Protocol

A protocol for automatic assignment of IP addresses to devices in a network.

Command Value Valid Time

This parameter describes the command value valid time. According to the Sercos specification, this time indicates the duration after which the slave can access the new values from the MDT related to the synchronization time.

This value is often denominated as t_3 . It corresponds to IDN S-0-1008.

Communication Cycle Time

Communication cycle time of Sercos network. This parameter describes the basic cycle time for communication.

The communication cycle time (t_{scyc}) defines the intervals during which the configured real-time data (MDTs, ATs) and non real-time data shall be transferred by the master to all present slaves. It is relevant for communication phases CP3 and CP4. It corresponds to IDN S-0-1002 as described in the Sercos specification.

Communication Mode

The communication mode decides between free running operation (independently from bus-cycles) or bus synchronous operation.

Communication Phase

During getting operational, a Sercos device runs through various phases. These are called communication phases.

For a detailed description see references [3] and [4].

CP

See *Communication Phase*

DHCP

Dynamic Host Configuration Protocol

A protocol for automatic assignment of IP addresses to devices in a network.

DTM

Device Type Manager

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

Electronic Label

For each Sercos device an electronic label holds device-related information. It can be accessed via IDN S-0-1300. The following items may be stored in the electronic label:

S-0-1300.x.01 Component Name

S-0-1300.x.02 Vendor Name

S-0-1300.x.03 Vendor Code

S-0-1300.x.04 Device Name

S-0-1300.x.05 Vendor Device ID

S-0-1300.x.06 Connected to sub-device

S-0-1300.x.07 Function revision

S-0-1300.x.08 Hardware Revision

S-0-1300.x.09 Software Revision

S-0-1300.x.10 Firmware Loader Revision

S-0-1300.x.11 Order number
 S-0-1300.x.12 Serial Number
 S-0-1300.x.13 Manufacturing Date
 S-0-1300.x.14 QS Date
 S-0-1300.x.20 Operational Hours
 S-0-1300.x.21 Service Date
 S-0-1300.x.22 Calibration Date
 S-0-1300.x.23 Calibration Due Date

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.

Feedback Acquisition Time

This parameter determines the time duration between the end of the MST and the feedback acquisition capture point.

In the Sercos specification this value is denominated as t_4 . This item corresponds to IDN S-0-1007.

The synchronization time is represented by an unsigned decimal value with 3 places after the decimal point. It is specified in units of microseconds. The minimum value is 0, the maximum value is t_{sync} .

Hot plug

Hot plug means the ability of a Sercos slave device to be removed from a running Sercos network or to be inserted into a running Sercos network during operation without any failure or limitation in the communication of the other network participants.

IP Address

An IP address is an address identifying a device or a computer within a network using the IP protocol. IP addresses are defined as a 32 bit number. Usually, for ease of notation the IP address is divided into four 8 bit numbers which are represented in decimal notation and separated by points:

a.b.c.d

where a . b . c . d are each integer values between 0 and 255.

Example: 192.168.30.15

However, not all combinations are allowed, some are reserved for special purposes.

The IP address 0.0.0.0 is defined as invalid.

Master

Sercos Master devices initiate the data traffic on the bus. In the Sercos protocol Master devices are called active participants. A master may send messages without external request.

MDT**Master Data Telegram**

The Master Data Telegram (MDT) is a special telegram used for transmission of real-time data from the master to the slaves. The format of the MDT is predefined within the Sercos specification.

MST**Master Service Telegram****NRT Channel**

A channel for the transmission of non-real time data (Standard Ethernet) in Sercos.

NRT Transmission Time

These parameters determine the start and the end of the transmission time window of the NRT (Non-real-time) transmission.

In the specification of Sercos in the third generation these values are denominated as t_6 and t_7 . These items are stored within IDN S-0-1017.

The NRT Transmission Times t_6 and t_7 are represented each by an unsigned decimal value with 3 places after the decimal point. It is specified in units of microseconds (μs). The minimum value is 0, the maximum value t_{Scyc} , see section “*Communication Cycle Time*” above.

The difference between t_7 and t_6 must not be smaller than 20 μs (minimum allowed length of NRT time slot).

If both values t_7 and t_6 have the same value, the NRT channel is completely switched off.

ODMV3

The Online-Data-Manager Version 3 (ODMV3) is an application interface. The ODMV3 works as a server, which can be run as an out-proc server or system service. Its task is to provide different applications (e. g. SYCON.net), access to multiple devices and even share one device amongst several applications.

OPC**OLE for Process Control**

Standard für Interoperabilität zwischen Komponenten, Bus-Systemen und Protokollen in der Automatisierungstechnik. Dieser wurde festgelegt von der OPC Task Force (heute OPC Foundation, <http://www.opcfoundation.org/>), einer Organisation, der mehr als 400 Unternehmen im Bereich der Automatisierungstechnik angehören.

Für weitere einführende Informationen zu OPC siehe:

http://de.wikipedia.org/wiki/OLE_for_Process_Control

http://www.opcfoundation.org/Default.aspx/01_about/01_what_is.asp?MID=AboutOPC

OPC Server**Server for OPC**

SDDML

Sercos Device Description Markup Language

A language based on XML to be used for writing device dewscription files for Sercos devices.

Sercos address

A Sercos address is a numerical value in the range between 0 and 511, which is used for unique identification of a device within the Sercos network.

Slave

Slave devices are peripheral devices, like for example I/O devices or drives. Slave devices are also called passive participants. They do not receive the bus access authorization. That means, they may only accept received messages from the Master or send a message to the Master after enquiry of the Master.

Slave Table

The Slave Table within the Hilscher Sercos Master DTM provides an overview page about the most important data of the Sercos slave devices connected to the Hilscher Sercos Master device.

For instance, it displays the following data:

- the device name
- the address
- the manufacturer/vendor information
- and a descriptive text on each of the connected Sercos slaves.

t₁

See AT0 Transmission Starting Time

t₃

See Command Value Valid Time

t₄

See Feedback Acquisition Time

t₆

See NRT Transmission Time

t₇

See NRT Transmission Time

t_{scyc}

See Communication Cycle Time

Topology address

Address in the physical order within the network. May differ from Sercos addresses which are assigned to the network participants.

Watchdog Timer

A watchdog timer provides an internal supervision mechanism of a communication system. It supervises that an important event happens within a given timeframe (the watchdog time which can be adjusted accordingly, for instance by a parameter in the “Set Configuration” message) and causes an alarm otherwise (usually this is accomplished by changing the operational state of the communication system to a more safe state).

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