Your Global Automation Partner

TURCK

excom® I/O System
Integration in Honeywell Experion via PROFIBUS-DP

Integration Manual

Contents

1 About This Manual

These instructions describe the integration of the excom® system in the Honeywell Experion R500.1 control system via PROFIBUS-DP.

Read these instructions carefully before using the product. This will prevent the risk of personal injury and damage to property or equipment.

The possibilities are shown for the GSD-based integration, from the installation of the GSD right through to the handling of the I/O data and the associated diagnostics.

Other applications of the excom® system are described in addition to the general integration:
- Setting up redundancy
- Changing parameters during operation
- Changing configurations during operation

Keep these instructions safe during the service life of the product. If the product is passed on, pass on these instructions as well.

1.1 Target groups

This manual is written for specially trained personnel, and must be read carefully by anyone who is charged with the commissioning, operation or maintenance of the device.

1.2 Explanation of symbols

The following symbols are used in these instructions:

DANGER
DANGER indicates an immediate hazardous situation that, if not avoided, will result in death or serious injury.

WARNING
WARNING indicates a possible hazardous situation with the risk of death or serious injury if it is not prevented.

NOTICE
NOTICE indicates a situation that may cause possible damage to property if it is not prevented.

NOTE
NOTE indicates tips, recommendations and important information. The notes contain information, particular operating steps that facilitate work and possibly help to avoid additional work resulting from incorrect procedures.

➤ **MANDATORY ACTION**
This symbol denotes actions that the user must carry out.

➥ **RESULT OF ACTION**
This symbol denotes the relevant results of actions and procedures.

1.3 Other documents

Besides this document the following material can be found on the Internet at **www.turck.com**:
- Data sheets
- Quick start guides
- excom® manuals
- Approvals

1.4 Feedback about these instructions

We make every effort to ensure that these instructions are as informative and as clear as possible. If you have any suggestions for improving the design or if some information is missing in the document, please send your suggestions to **techdoc@turck.com**.

2 Notes on the System

2.1 System identification

This manual applies to the Turck excom® system.

2.2 Manufacturer and service

Turck supports you in your projects – from the initial analysis right through to the commissioning of your application. The Turck product database offers you several software tools for programming, configuring or commissioning, as well as data sheets and CAD files in many export formats. You can access the Product Database directly via the following address:
www.turck.de/products
For further inquiries in Germany contact the Sales and Service Team on:
Sales: +49 208 4952-380
Technical: +49 208 4952-390

For overseas inquiries contact your national Turck representative.

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Germany

3 For Your Safety

The product is designed according to state of the art technology. Residual hazards, however, still exist. Observe the following safety instructions and warnings in order to prevent danger to persons and property. Turck accepts no liability for damage caused by failure to observe these safety instructions.

3.1 Intended use

The excom® system is integrated in the Honeywell Experion R500.1 control system using GSD files.

These devices are designed solely for use in industrial areas.

The devices must only be used as described in these instructions. Any other use is not in accordance with the intended use. Turck accepts no liability for any resulting damage.

3.2 Notes on Ex Protection

- The system must only be fitted, installed, operated and maintained by trained and qualified personnel. When using devices in Ex circuits, the user must also have additional knowledge of explosion protection (EN 60079-14 etc.).
- Only use devices in Ex areas when installed in the appropriate protective enclosure.
- Only use the system in compliance with the applicable national and international regulations, standards and laws.
- Observe national and international regulations for explosion protection.
- Only use the device within the permissible operating and ambient conditions (see technical data and Ex approval specifications).
- Observe the operating instructions of the installed equipment.
- Cables and terminals with intrinsically safe circuits must be indicated – use light blue for color-coding. Separate cables and terminals from non-intrinsically safe circuits or isolate accordingly (EN 60079-14).
- Carry out a "Verification of intrinsic safety".
- Never connect equipment to intrinsically safe circuits if this equipment was previously used once in non-intrinsically safe circuits.

4 Integrating the excom® System in Honeywell Experion

The excom® system is integrated in the Honeywell Experion R500.1 control system using GSD files. The following describes all the steps required from the installation of the GSD files right through to the handling of I/O data and diagnostics.

4.1 Requirements

4.1.1 Requirements – Software

This example uses the following software:
- Honeywell Experion R500.1
- Gateway 2.3.1.0 firmware file
- GSD file V1.6.4

4.1.2 Requirements – Hardware

This example uses the following hardware:

Honeywell hardware

- CC-PCF901 control firewall
- CC-PCNT01 (C300) controller
- DP-2 CC-IP0101 PROFIBUS gateway

Turck hardware

- MT16-2G module rack
- PSD24Ex power supply unit (2 ×)
- GDP-IS gateway
- DI40Ex digital input module
- DO40Ex digital output module
- DM80Ex digital input/output module
- AIH40Ex analog input module
- AOH40Ex analog output module
- DO401Ex digital output module
- SC12Ex segment coupler (RS485-IS)

The excom® station in the following example has the following setup:

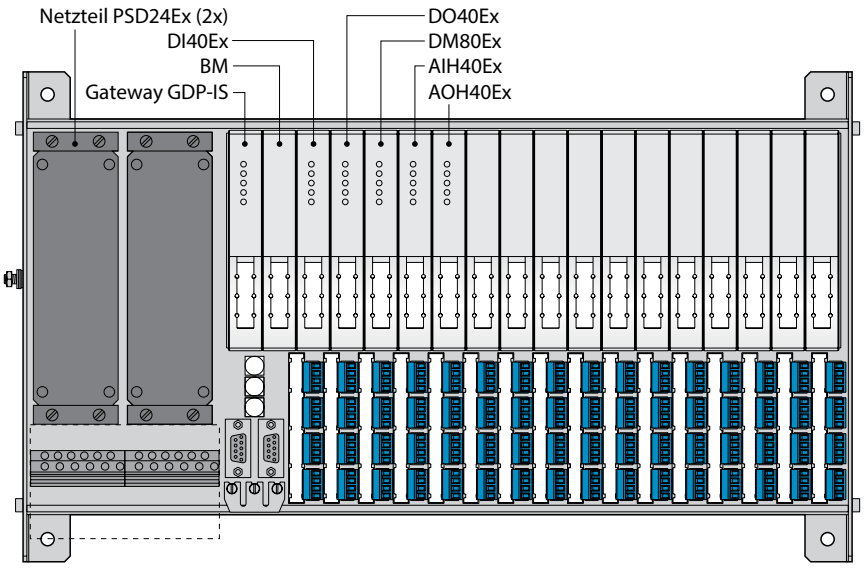

Fig. 1: excom® station (example)

4.2 Installing GSD files

The GSD file for excom® is available at www.turck.com.
➤ Download the GSD file from www.turck.com.
➤ Unpack the zip file.
The zip file required for the gateway firmware is shown in the document "GSD Version History – excom®.pdf" from the zip archive. Newer firmware versions of the gateways are compatible with configurations that are based on older GSD files. The folders of the individual GSD files contain image files to graphically illustrate the excom® station in the configuration.

➤ Save GSD file at C:\ProgramData\SYCONnet\PROFIBUS\GSD.

NOTE
In some operating systems, the GSD folder is not automatically displayed.
➤ Activate hidden elements.

➤ If a graphical display of the excom® station is required, also save the image files contained in the zip archive in the GSD folder.

Integrating a GSD file in Honeywell Experion

➤ Launch the Experion Configuration Studio.
➤ Open the PROFIBUS gateway module (PGM) via the "+" sign (here: PGM2_252).
➤ Double-click the required PB-Link (here: PBLINK_254) to open the configuration user interface.
➤ Select the PROFIBUS link (PBLINK) on which the excom® station is to be configured. The selection of the Profibus link depends on the ports of the PGM on which the PROFIBUS network is to be created. Each PGM is provided with 2 ports.
➤ Double-click to open the PROFIBUS link.
➤ Open the Field Network Configuration tab.

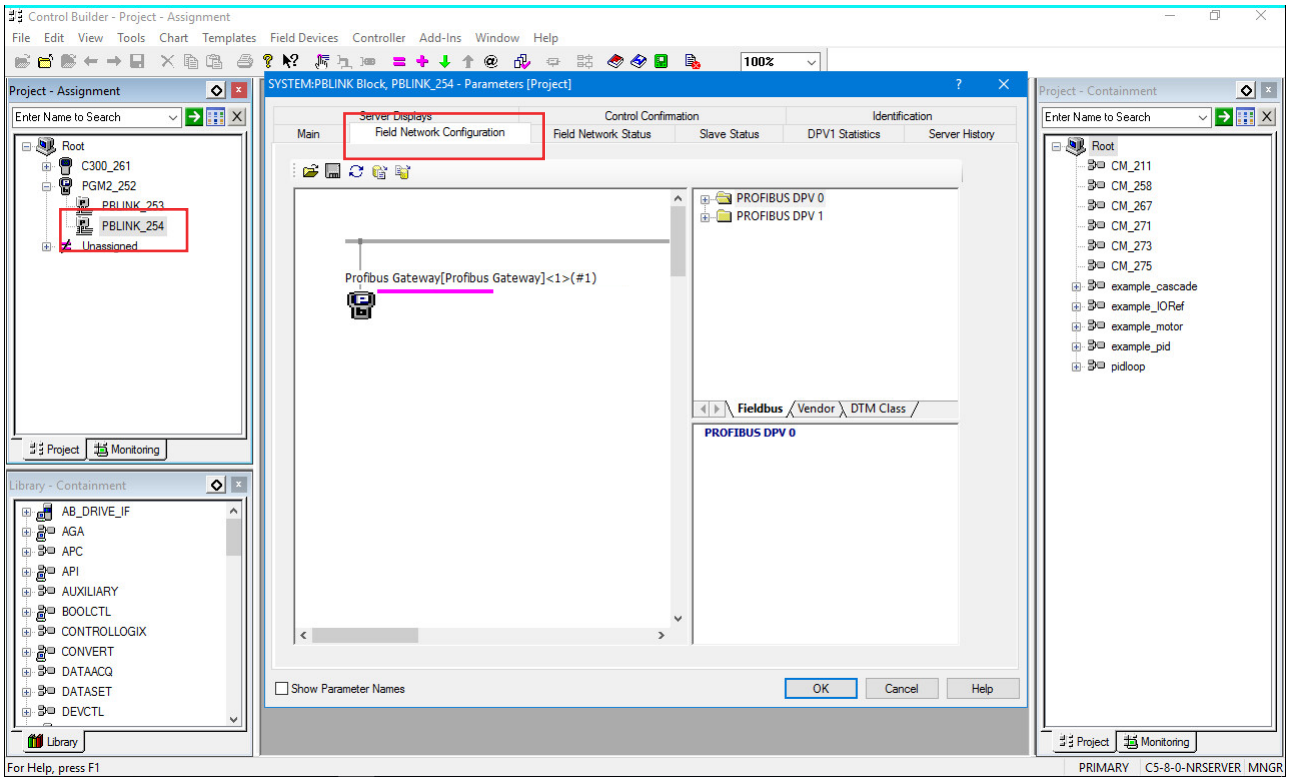

Fig. 2: Installing GSD – Selecting a PROFIBUS link

➤ Refresh the device catalog via the Reload Catalog button.
➥ The program searches the folder C:\ProgramData\SYCONnet\PROFIBUS\GSD and loads all GSD files present there into the device catalog.
➥ After the device catalog is refreshed, all available GSD files are shown in Experion in the following folder: Profibus DPV 0/1 → Master/Slave

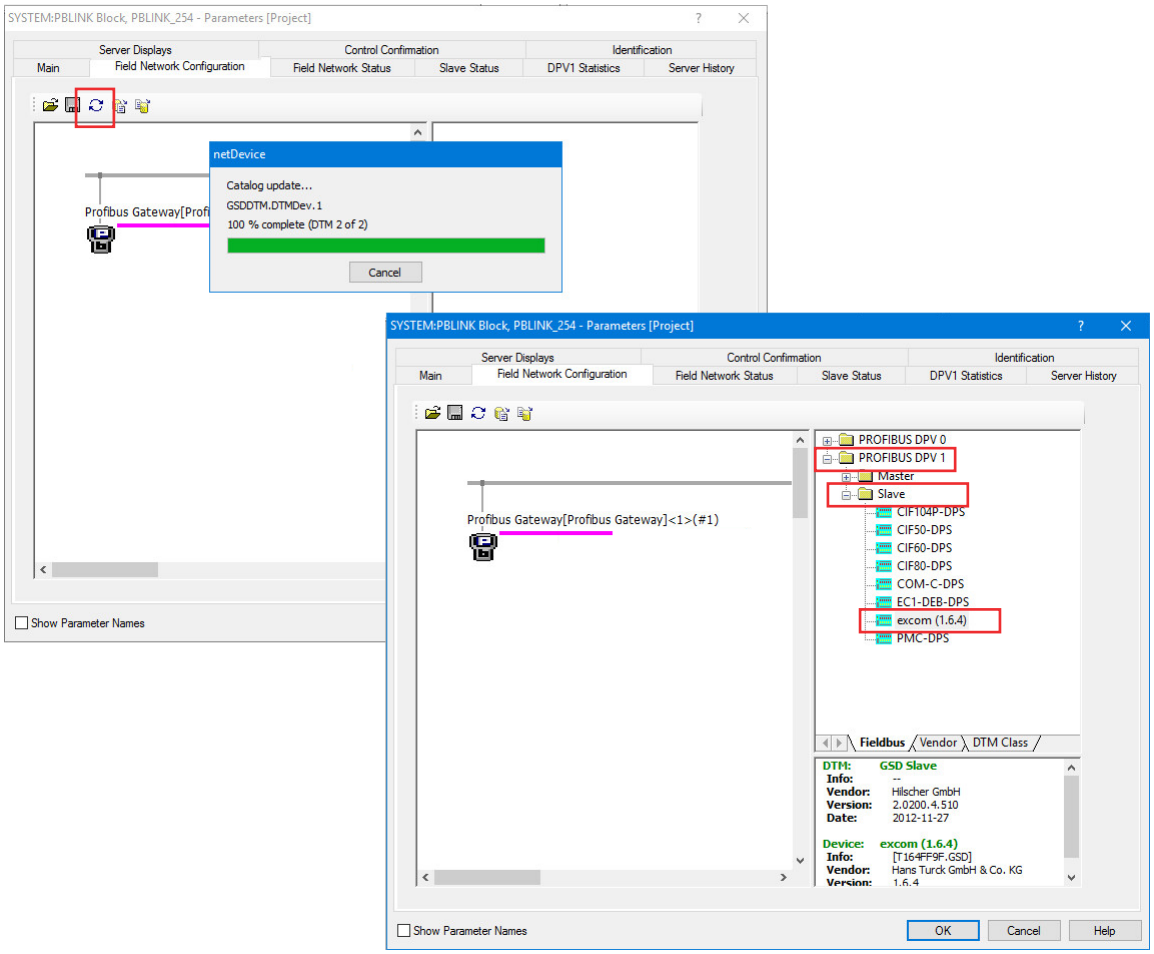

Fig. 3: Installing GSD – Selecting excom®

NOTE
An update of the GSD file for an existing slave is not possible in Experion and Sycon.net. If a different GSD file is required, the slave must be fully reconfigured.

4.3 Creating a PROFIBUS slave

➤ Open the PGM (see chapter 4.2).
➤ Double-click the PBLINK to open it.
➤ In the Field Network Configuration tab open the PROFIBUS DPV 0 or PROFIBUS DPV 1 → Slave folder.

Selecting the PROFIBUS versions (DPV 0 or DPV 1) has the following effects on the data exchange:

PROFIBUS DPV 0	PROFIBUS DPV 1
– Cyclic data exchange between master and slave – Transfer of process values incl. HART variables – Fast data exchange	– All functions of PROFIBUS DPV 0 – Acyclic data exchange (parameterization of field devices, reading of additional status messages of field devices etc.) possible – Acyclic data exchange always after exchange of the cyclic data

➤ Drag the GSD file onto the graphically displayed PROFIBUS line.

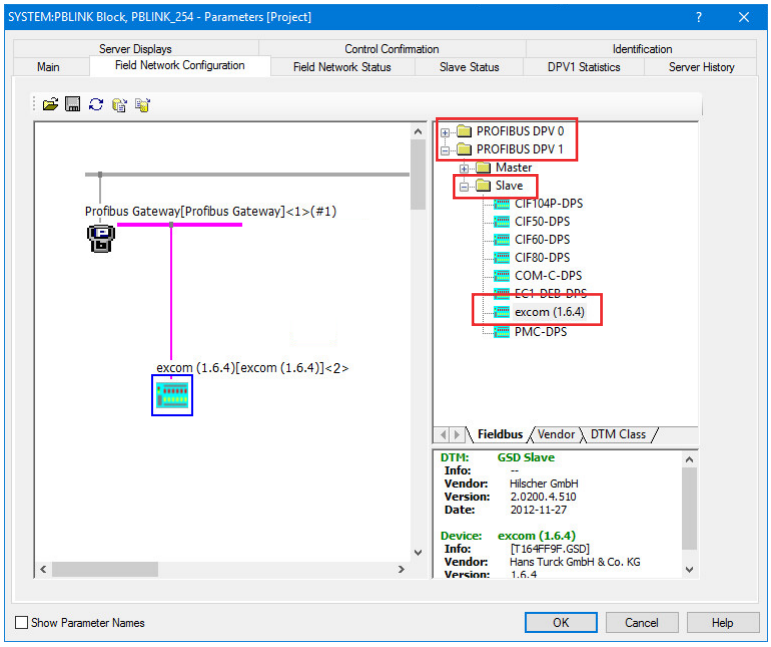

Fig. 4: Creating a PROFIBUS slave (example: PROFIBUS DPV 1)

4.4 Configuring a slave

➤ Start the configuration by double-clicking the excom® station shown in the graphic.
➥ Available and already configured excom® modules, as well as the required quantities of data are displayed in the configuration window.

No module has yet been configured in the example project. The Configured Modules area is empty.

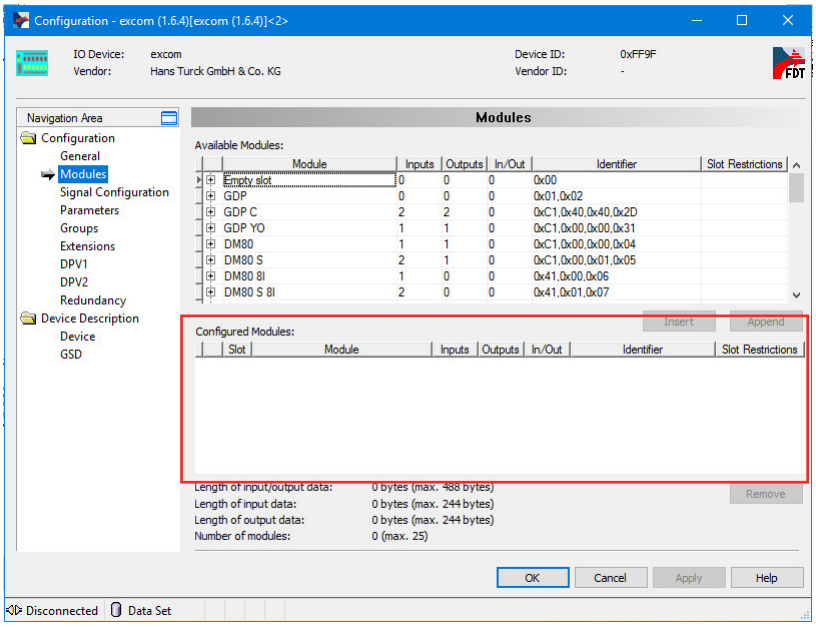

Fig. 5: Slave Configuration window

Adding excom® modules

➤ Add excom® modules according to the arrangement of the module rack:
➤ Select the excom® module in the Available Modules area.
➤ Click the Append button.
➤ Select and add other excom® modules via Append and Insert as required.
➤ When all used excom® modules are listed in the Configured Modules area click Apply.

NOTE
All unused slots must be configured with blank modules (empty slots). This does not apply to all slots after the last I/O module and redundant gateways that are not present.

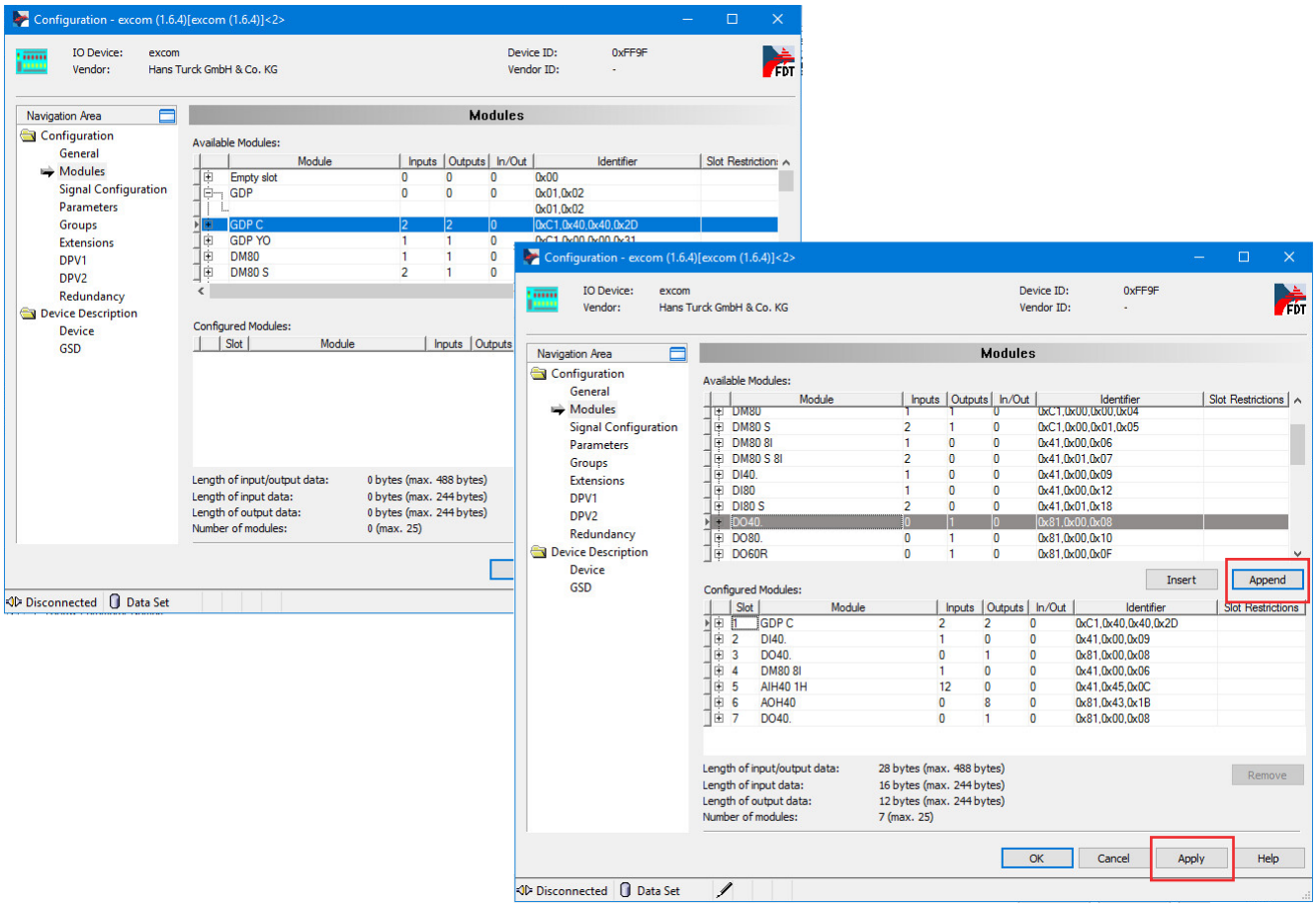

Fig. 6: Configuring an excom® station as a slave

4.5 Configuring a network

Settings must be carried out on the PROFIBUS gateway module (PGM) in order to ensure trouble-free communication between the excom® system and the Honeywell control system.

NOTE
A warning symbol indicates values that jeopardize stable bus communication.

➤ Open the PBLINK.
➤ Open the Field Network Configuration tab.
➤ Open the PGM shown in the graphic.

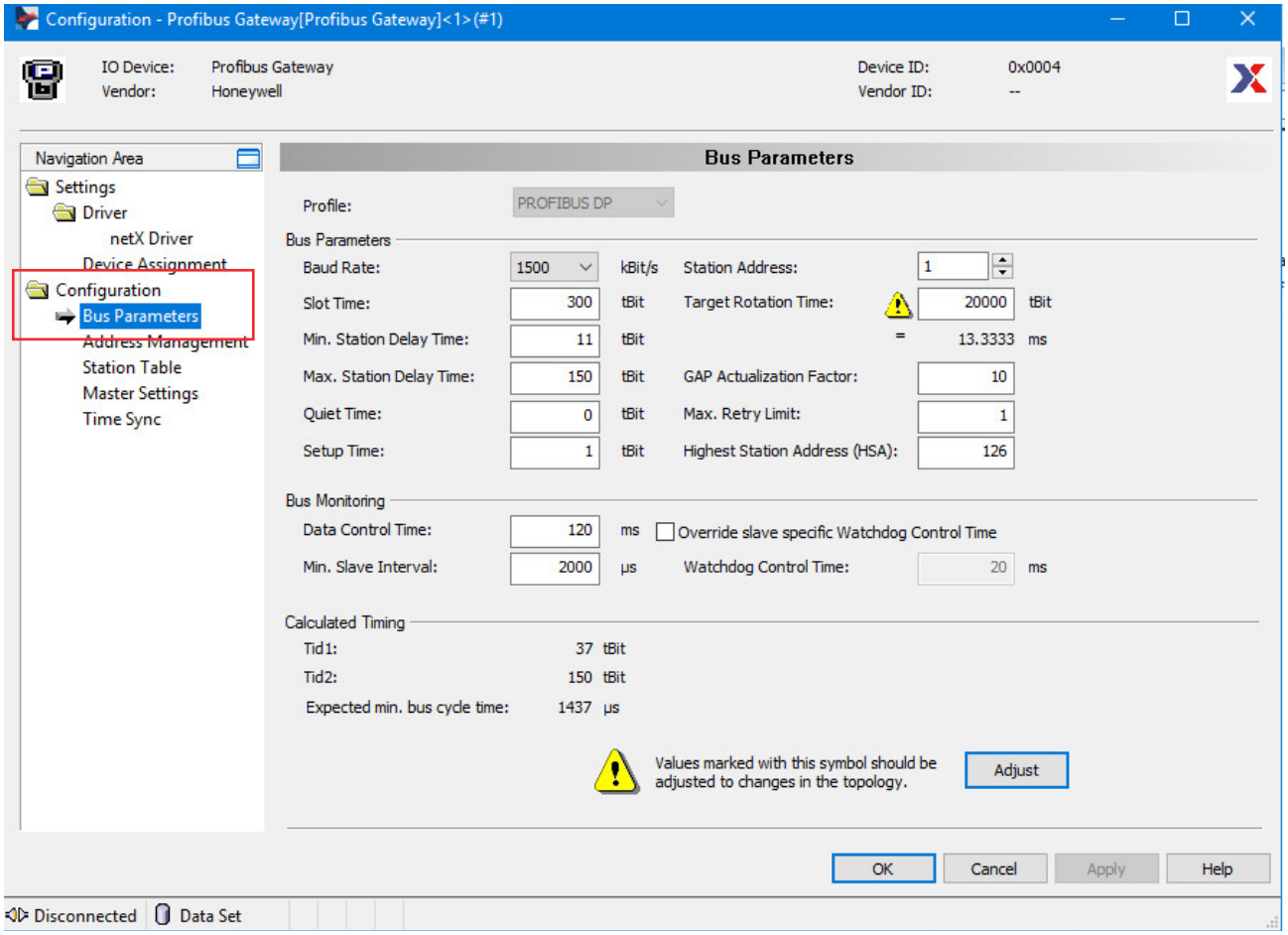

Fig. 7: Configuring a network

➤ Click Configuration → Bus Parameters.
➤ Change the parameters manually or automatically via the Adjust button.
➥ The software automatically sets the values required for the actual bus configuration.

Setting the bus cycle time

NOTE
If the bus cycle time is changed, it is not possible to carry out a hot configuration in run (HCIR), because it is a significant intervention in the communication between the master and slave.

Managing I/O signals via the Address Management

The Address Management manages all input and output signals from the slave to the PGM. The view enables you to switch between input signals and output signals.

The Address Management also displays the descriptions and data types of the modules used.

➤ Example (see figure below): Adjust the tags for subsequent processing according to the application.

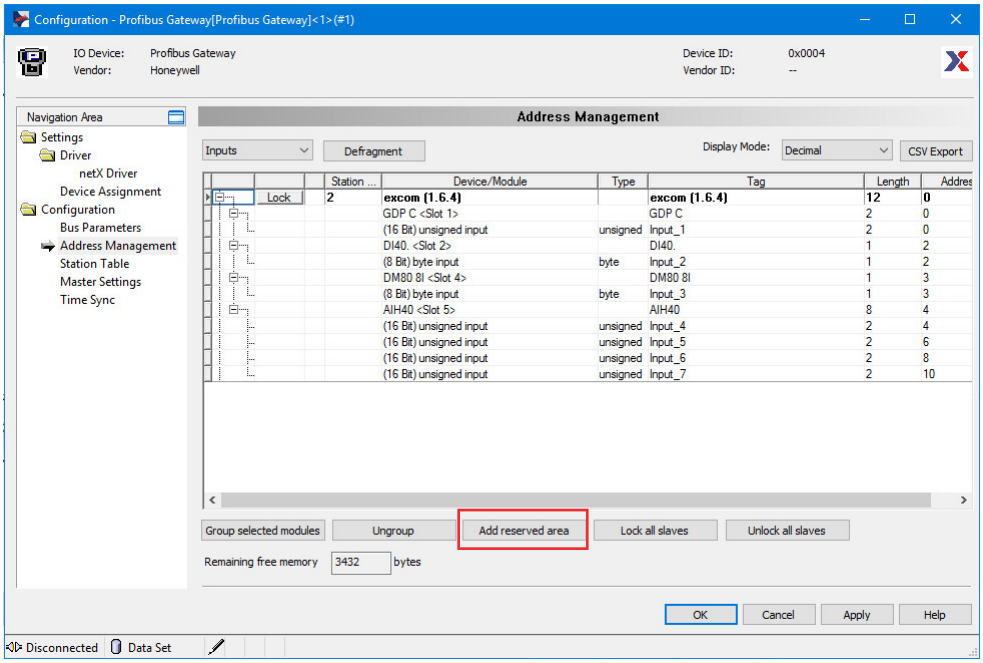

Fig. 8: Configuration – Address Management window

NOTE
The Add reserved area button (see above) enables the memory to be reserved for later use in cyclic data traffic. Other modules can be added if required at the reserved locations. If HCIR is used, the modules can also be added without interruption during operation.

Managing slave addresses via the Station Table

The Station Table enables the addresses of all configured slaves of the PROFIBUS network to be displayed and changed.

➤ Enter the address in the Station column (example: 2).

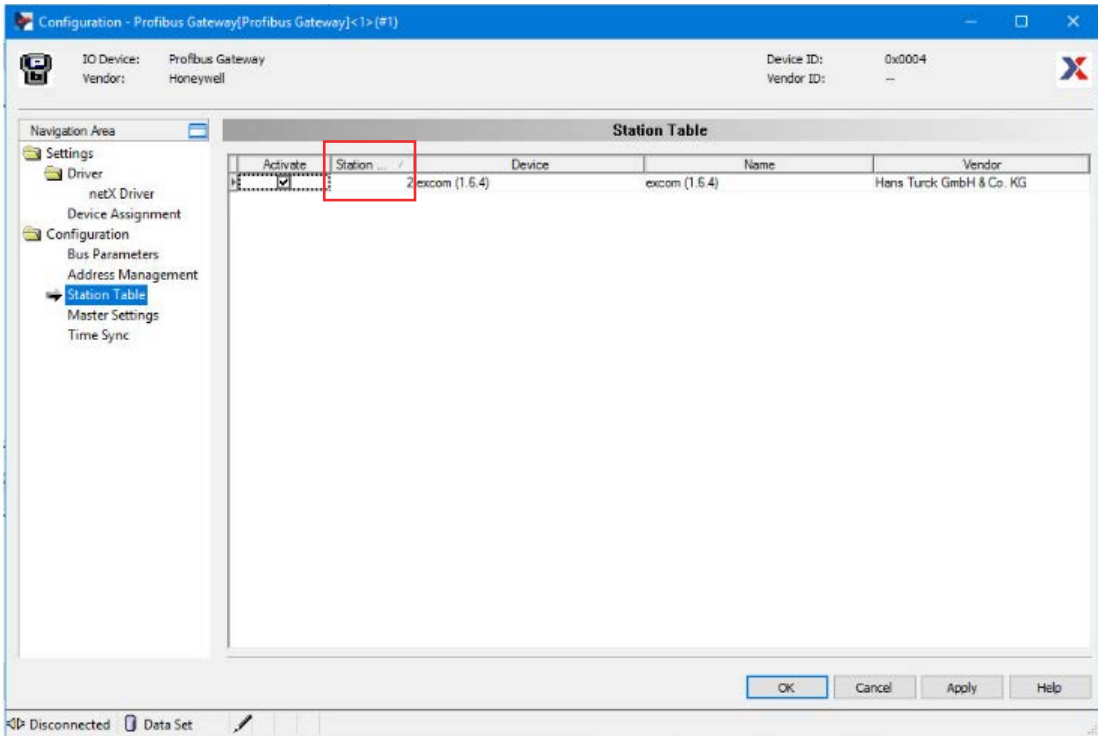

Fig. 9: Entering the slave address (example: 2)

Master settings – Setting the watchdog

The watchdog depends on the speed of the master. It is recommended that the watchdog is set at 1.5 MB to 1 s for internal redundancy switching.

4.6 Setting slave parameters

The slave parameterization makes it possible to set the gateway and the I/O modules according to the application. The used modules can be selected in the software via the Modules drop-down menu.

4.6.1 Setting slave-specific parameters

➤ Select the module.
➤ Adjust the parameters according to the application. The following table shows one example of a parameterization step:

Parameter	Selection	Meaning
Grid frequency	50 or 60 Hz	Activates a filter, that filters out transmissions of the grid frequency to the analog inputs The filter eliminates 50 Hz or 60 Hz overlays that are caused on the analog inputs by the grid frequency used.
Analog data format	LSB, MSB or no status	Specifies the location at which the status bit is mapped
Backplane	Type of module rack	Selection of the type of module rack (not absolutely necessary)
HCIR…	Various parameters	Enables a configuration during operation (hot configuration in run), see chapter 4.10 and 4.11

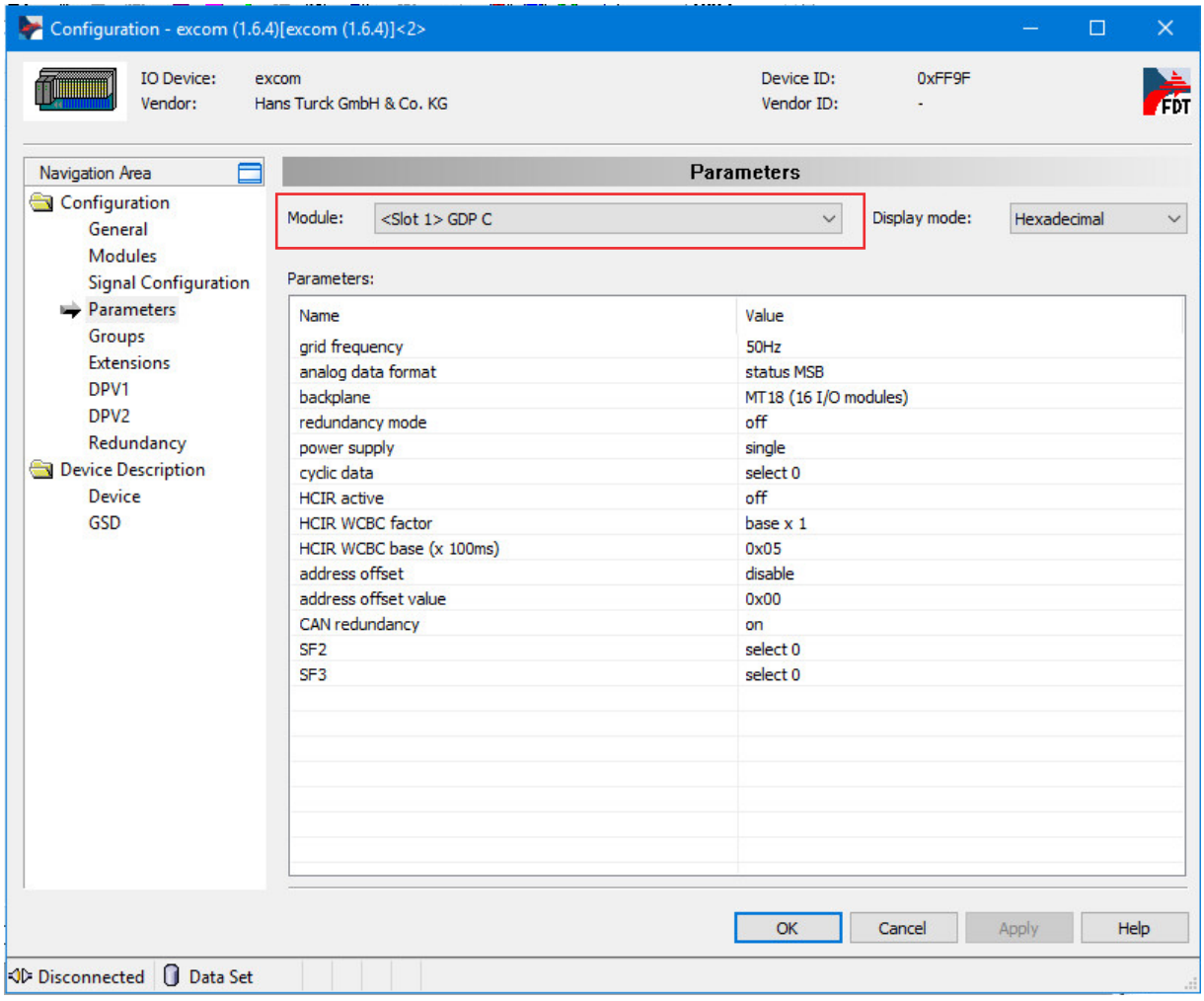

Fig. 10: Slave-specific parameters

4.6.2 Setting module-specific parameters

Module-specific parameter setting enables the settings of the I/O modules to be adjusted. The settable parameters of the I/O modules are described in the excom® manual.

Example: Setting the AIH40Ex analog input module

➤ Select Field Network Configuration.
➤ Open the menu of the excom® station.
➤ In the Configuration window select the Parameters menu item.
➤ Select the AIH40Ex I/O module from the drop-down menu.
➤ Adjust the parameters for each channel according to the application. The following table shows one example of a parameterization step:

Parameter	Selection	Description
Short circuit detection	on off	– Short circuit monitoring
Open line detection	on off	– Wire-break monitoring
Failsafe mode	minimum, maximum or last valid value	– State in which the inputs or outputs are kept in the event of serious communication faults (example: last valid process value)
HART status/range	off/0…20 mA off/4…20 mA on/4…20 mA	– Selection of the measuring range for analog modules – Activate or deactivate HART® communication – Select 4…20 mA as the measuring range to activate HART® communication.
Filter	off 0.1 s 2.6 s 29.2 s	– Example: 0.1 s

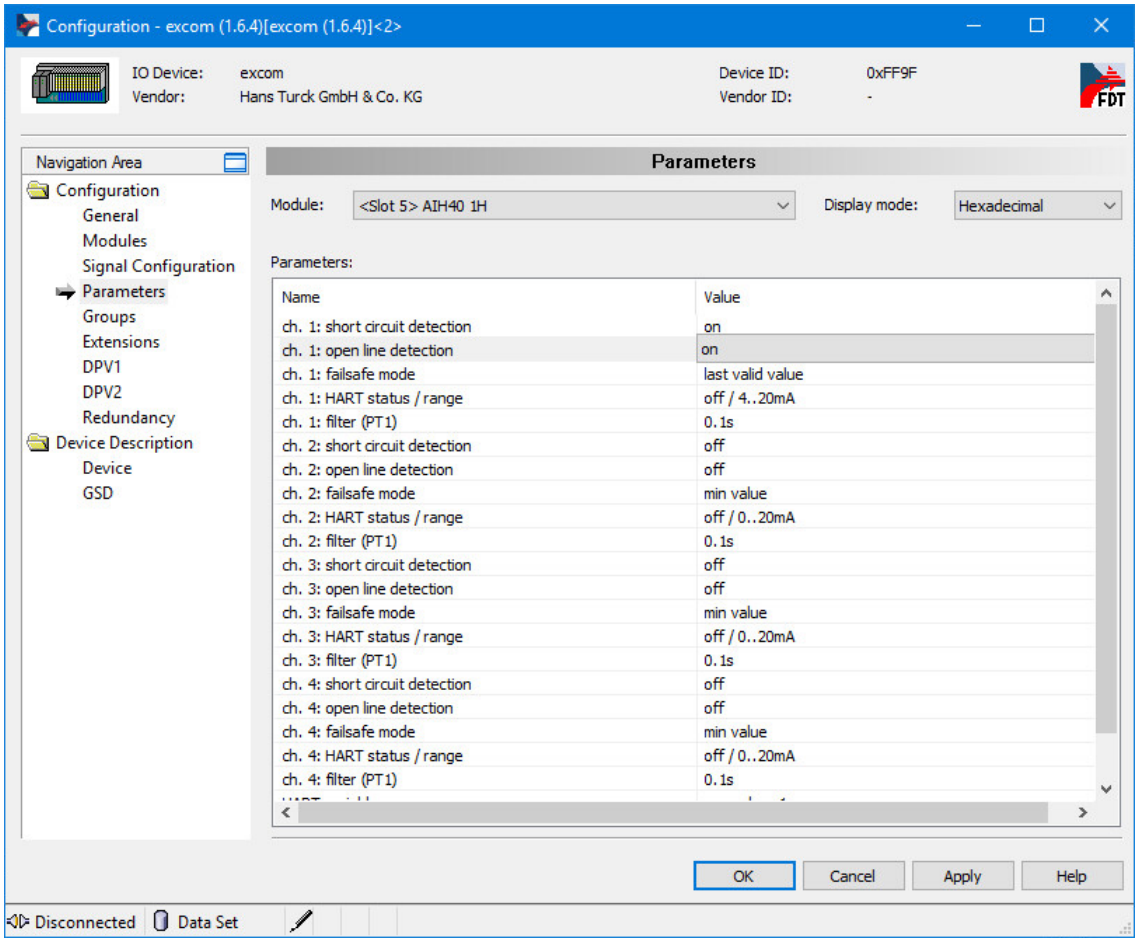

Fig. 11: Setting module-specific parameters

➤ Activate the status bit in the configuration of the gateway in order to transfer the status messages of the I/O modules to the controller level.
➤ Define the mapping of the status bit (SB) in the configuration of the gateway (MSB or LSB).

	Input word bit position (channel 1…4)															
Parameter	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Status MSB	SB	Bit position of the measured value (0…21000 corresponds to 0…21 mA)														
Status LSB	Bit position of the measured value (0…21000 corresponds to 0…21 mA)															SB
Without status	–	Bit position of the measured value (0…21000 corresponds to 0…21 mA)														

➥ The changes are indicated in Honeywell Experion with a yellow triangle next to the PBLINK.
➤ Transfer data to the controller: Right-click the PBLINK, select Load from the context menu and confirm.

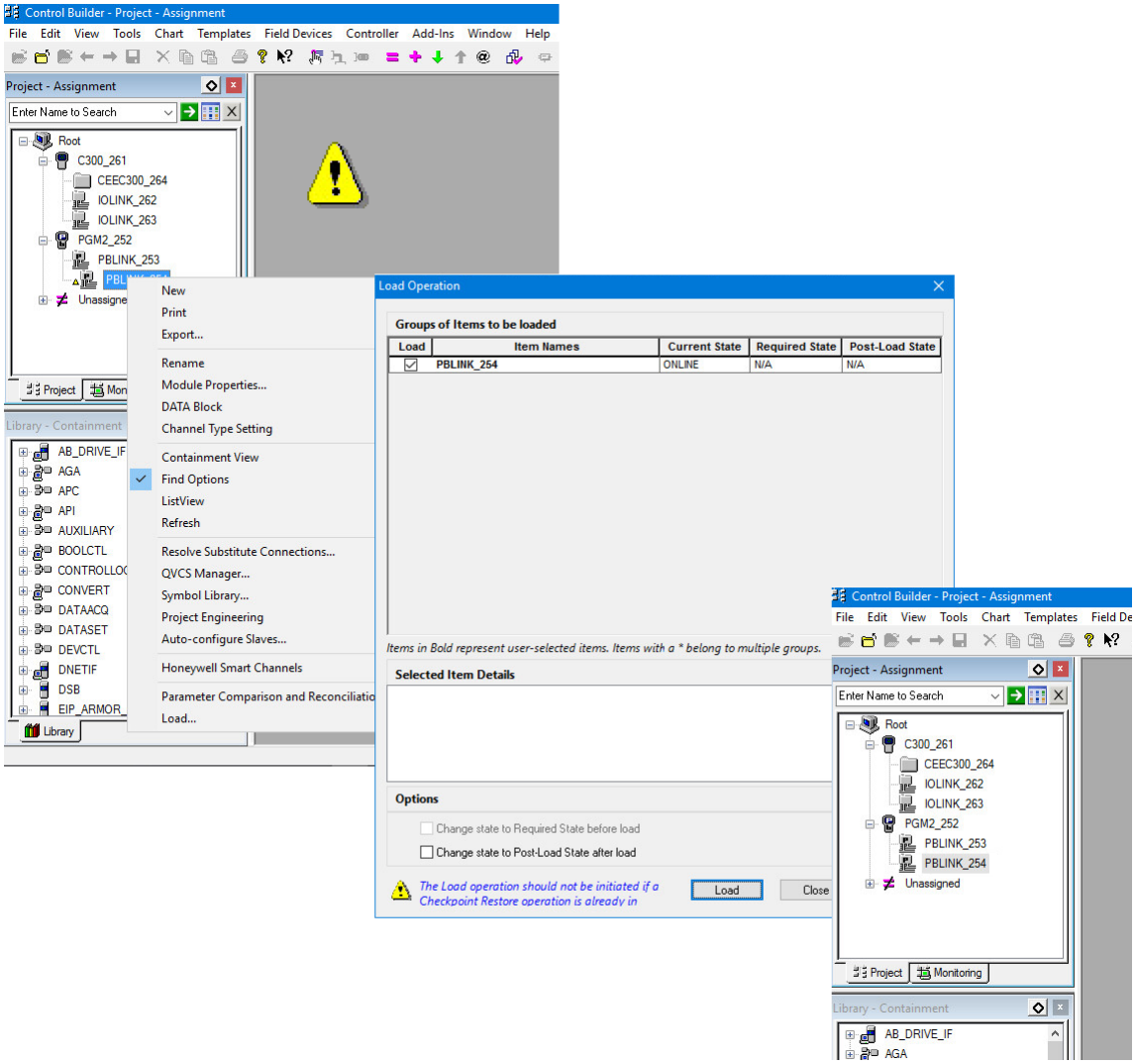

Fig. 12: Transferring parameters to the controller

4.7 Configuring I/O data

➤ Open the excom® station in the Field Network Configuration window.
➤ Open Signal Configuration.
➥ The names and data types of the excom® modules used can be set in the Signal Configuration menu. The entered name corresponds to the name of the PROFIBUS module in the Honeywell station.

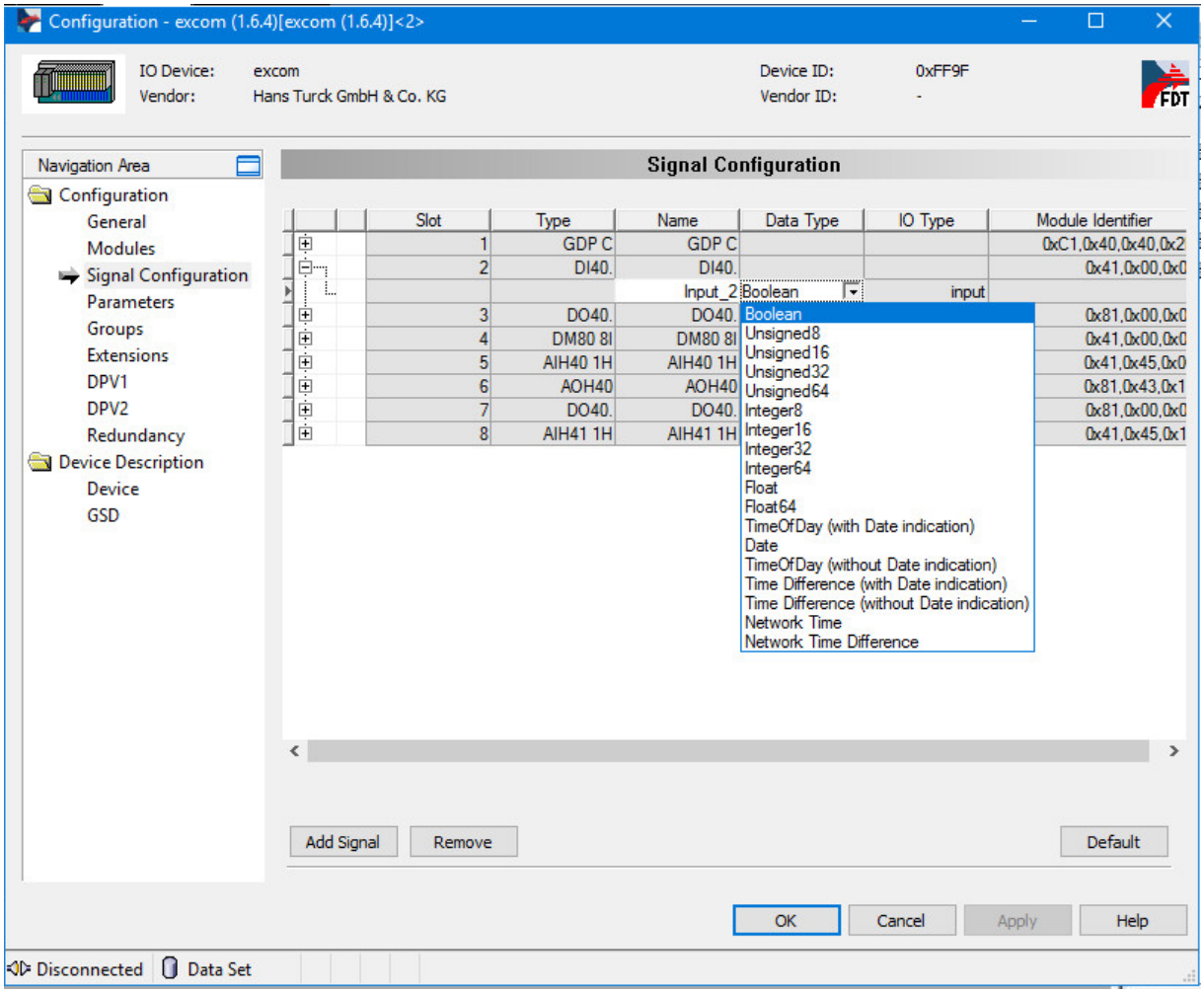

Fig. 13: Configuring I/O data – Changing the name and data type of a module

A device support block (DSB) has to be created in order to use the process values in the control system. The DSB represents the excom® station in the Experion environment.

NOTE
Only one DSB can be created for each excom® station.

Creating a DSB

➤ Choose File → New → Device → DSB → TURCK EXCOM.
➤ If required, enter the device name and PROFIBUS address of the excom® station.
➤ Assign a DSB: Drag a DSB from Unassigned and drop it on the required PBLINK.

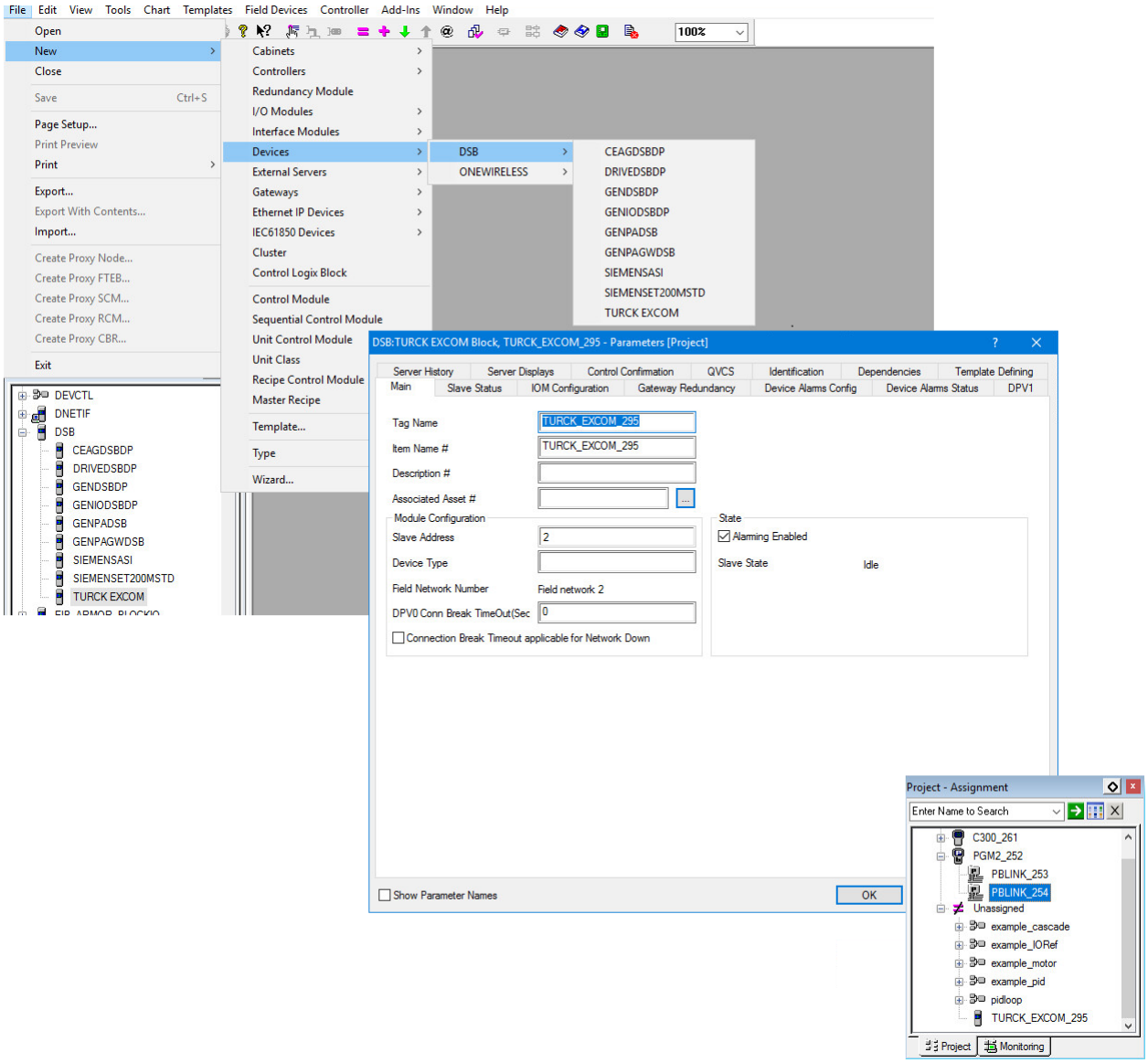

Fig. 14: Configuring I/O data – Creating a DSB

➤ Open IOM Configuration.
➤ Open the PDC (process data collection) of the I/O module to be set.

The tags from the Address Management of the PGM must be identical to the settings from the Signal Configuration window of the excom® station. Turck recommends also keeping the Names identical to avoid address conflicts.

Either inputs or outputs can be read for each PDC. In the example project, two PDCs must be created for each of the following devices:
- Inputs and outputs are parameterized for one device (e.g. DM80…).
- The gateway is configured as a GDP-C gateway and has two input bytes for status messages and 2 output bytes for controlling the redundancy behavior.

The number of inputs and outputs must often be corrected if HART® modules were configured. Configuration Studio here selects the maximum number of channels automatically.
➤ Set the number of channels in the Number of channels area.

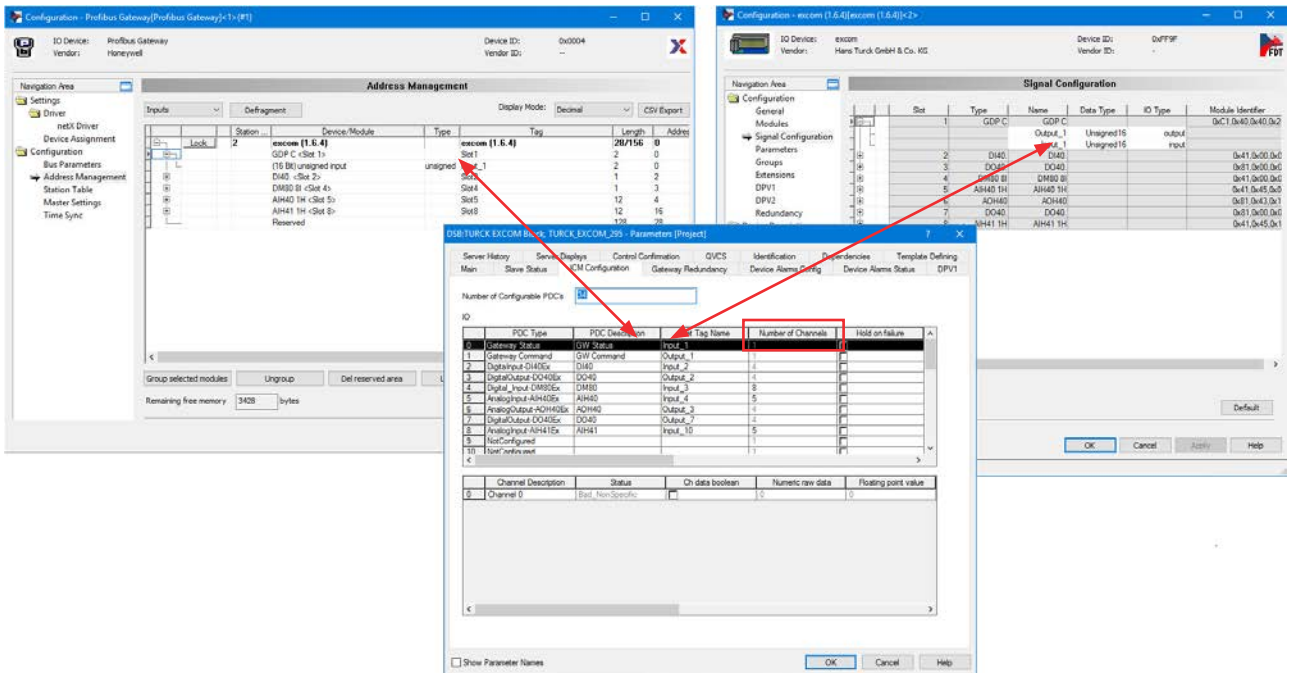

Fig. 15: Configuring I/O data – Creating a PDC

Linking data with Honeywell Experion – Creating a PIOMB function block

A PROFIBUS I/O module block (PIOMB) is used as the interface between the individual PDCs and the controller.

➤ Select PIOMB via the library and append on the controller by drag and drop.

➤ Add by confirming with Finish.

➤ If necessary change the name of the PIOMB: Click the appropriate line and assign the new name.

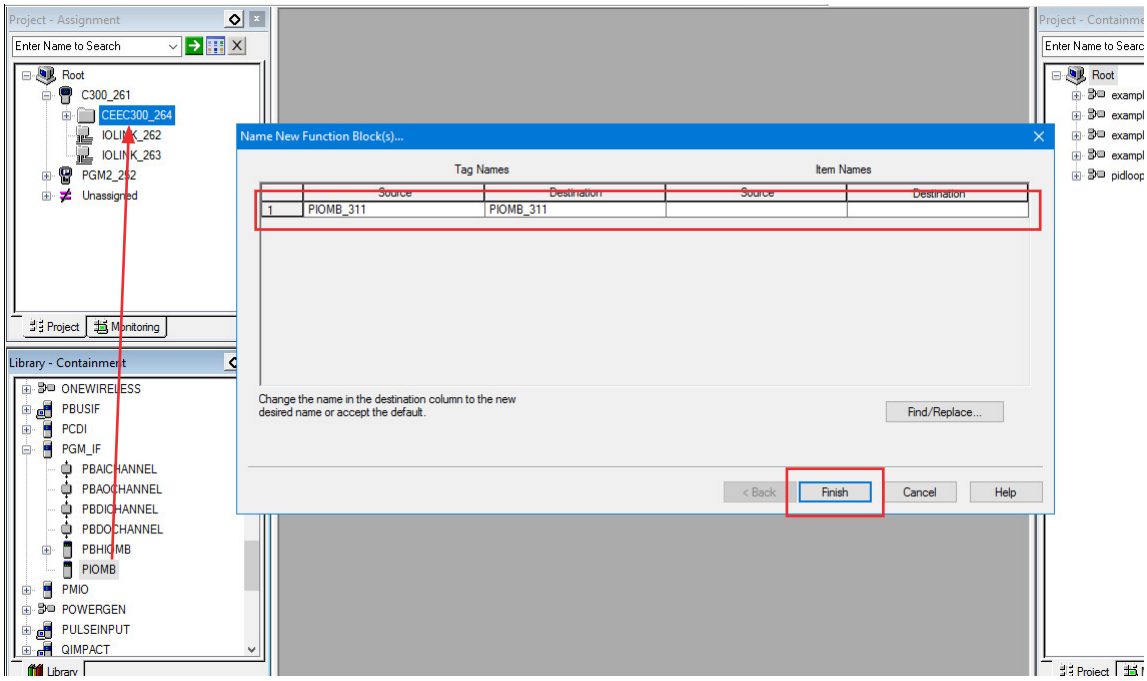

Fig. 16: Creating the PIOMB function block

➤ Open the PIOMB.
➤ Open the PDC Name Reference menu item.
➤ Select the required PDC.
➤ PDC number and description depend on the values entered in the IOM Configuration.

NOTE
In larger networks, Turck recommends assigning unique names for the PIOMBs in the Tag Name menu item.

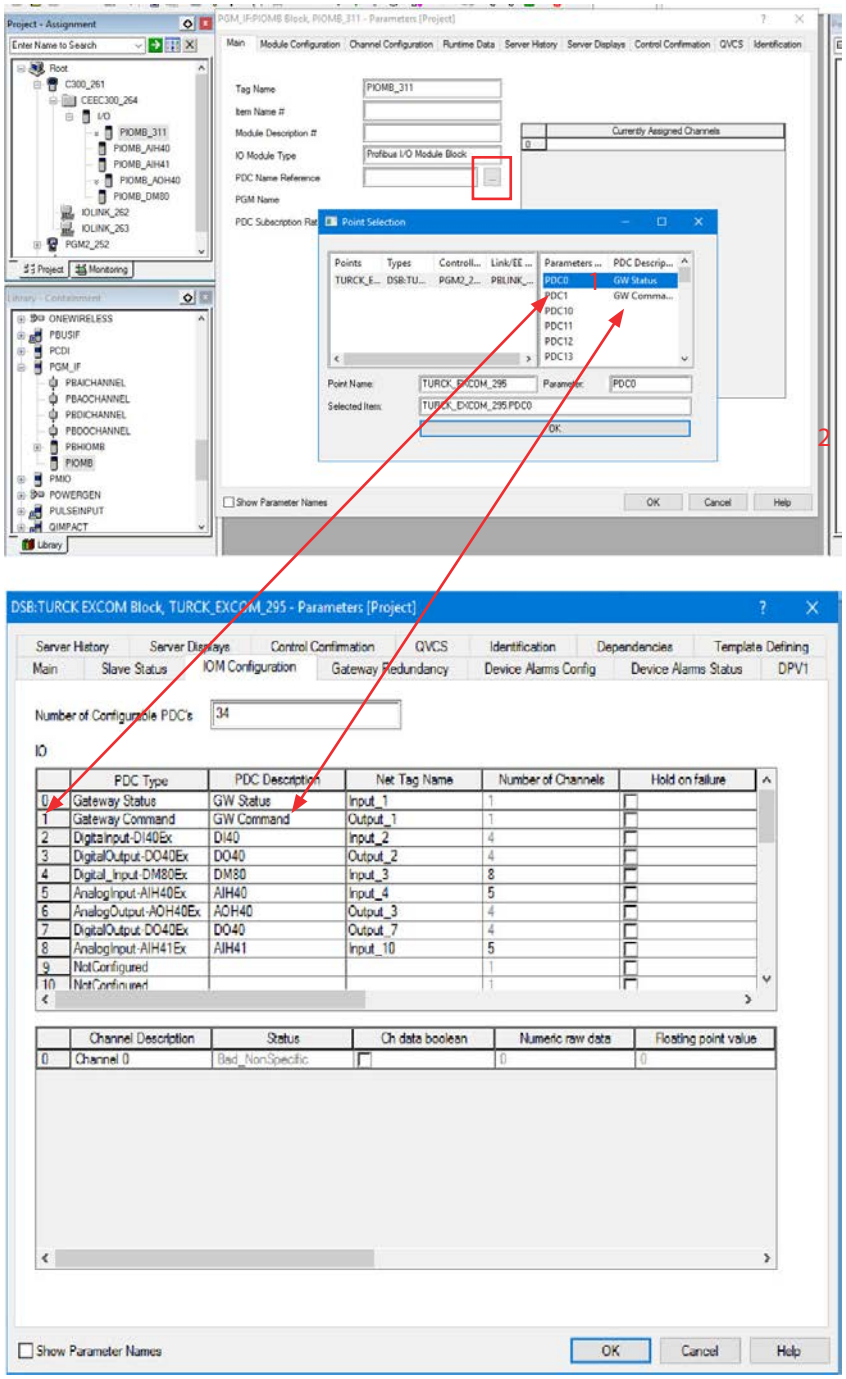

Fig. 17: Editing PIOMBs

Linking data with Honeywell Experion – Adding a PROFIBUS channel

A PROFIBUS channel block must be created in order to process a signal.

- ➤ Create a control module via File → New → Control Module.
- ➤ Drag the control module from Unassigned to the required controller (example: CEEC300_264).
- ➤ Select the required channel from the library.
- ➤ Drag the channel onto the control module.

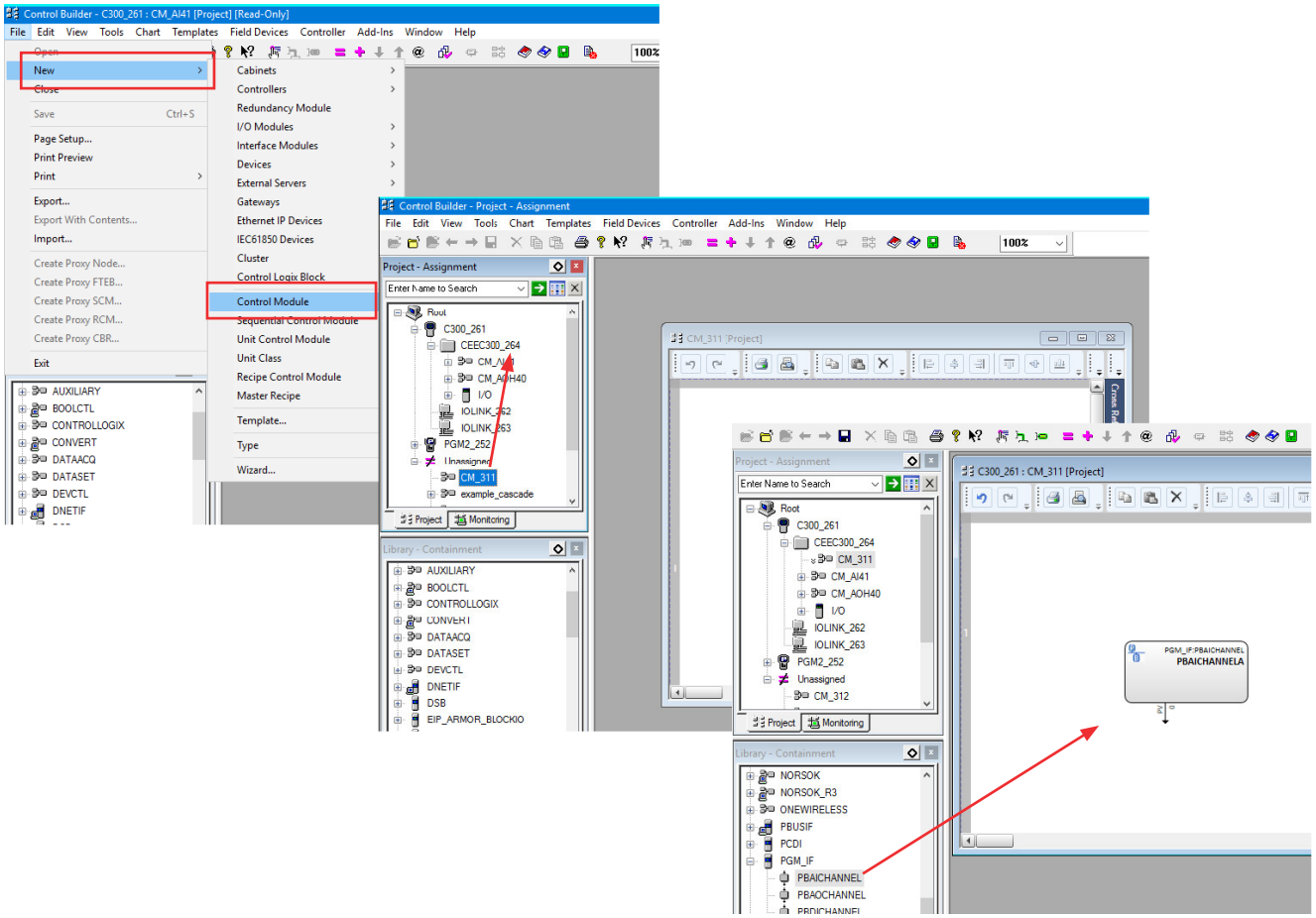

Fig. 18: Creating a PROFIBUS channel block (example: PBAICHANNEL – PROFIBUS analog input channel)

To complete the configuration of a PROFIBUS channel, the channel must be assigned to a PIOMB.

➤ Double-click the required I/O module to select it (here: PIOMB_5_AI41).
➤ The program automatically shows the appropriate PIOMBs for the selected module.
➤ Select the channel and the POIMB via Assign Channel Block.

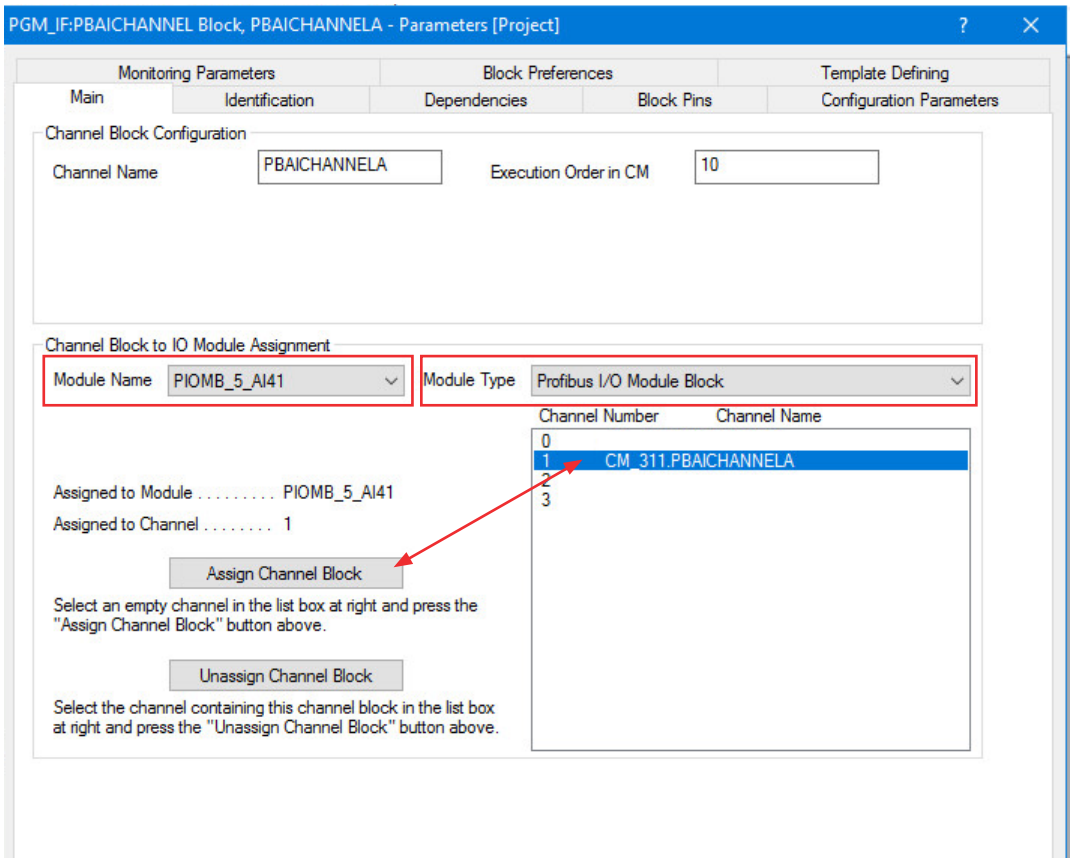

Fig. 19: Assigning a PROFIBUS channel

Linking data with Honeywell Experion – Loading settings in the project

Modules with settings that have to be loaded in the project are indicated in the project tree. These are marked with two arrows or a yellow triangle.

➤ Right-click the marked components.
➤ Select the Load option from the context menu.
➤ Repeat these steps until there are no more marked components present in the project tree.
or
➤ Select all marked components and load them at the same time.

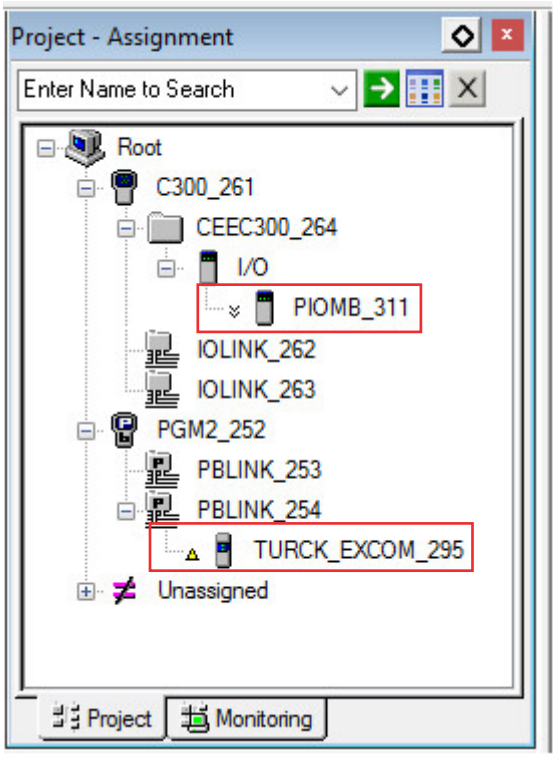

Fig. 20: Marked components in the project tree

Observing online data in the Monitoring view

The actual process data is displayed in the Monitoring view.

➤ Open the PIOMB in the Monitoring view.

➤ The actual process data of the selected PIOMB is displayed in the Runtime Data tab (example: Analog Channel Data).

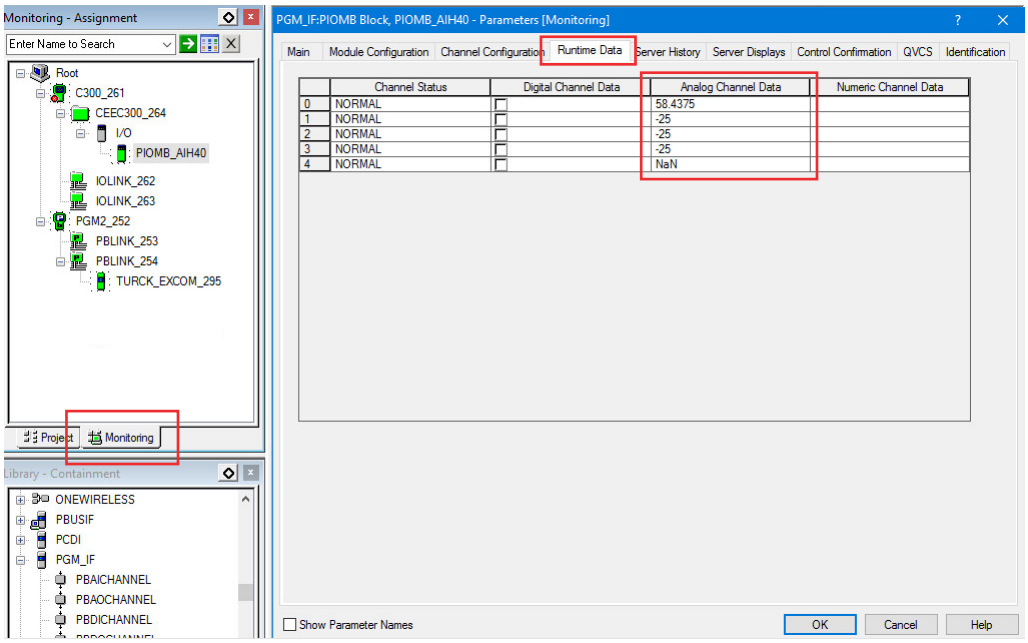

Fig. 21: Example: Process data for AIH40, 1st channel actively supplied

Monitoring online data via the DSB

The actual process of a DSB is displayed in the Monitoring view.

➤ Call the IOM Configuration of the DSB in Monitoring mode.

➤ Select the PDC.

➥ The process data is displayed in the lower area of the window (example: Floating point value).

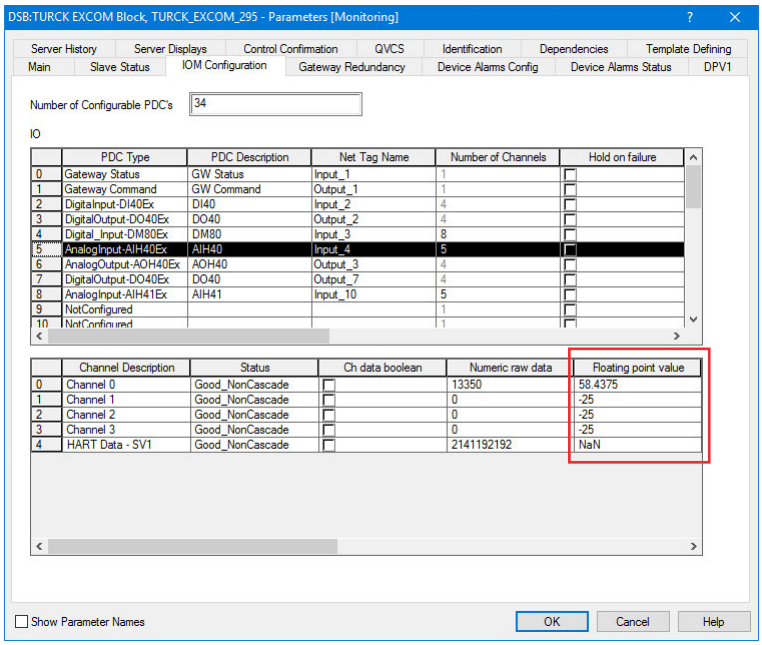

Fig. 22: Example: Process data of a DSB

4.8 Showing and using PROFIBUS diagnostics

In order to use the PROFIBUS diagnostics, a connection must be established between the host PC and the excom® station.

➤ Open Field Network Configuration.
➤ Right-click the excom® station.
➤ Select the Connect option in the context menu.
➤ Open the excom® station.
➤ Click Diagnosis.

Example: The red dot in front of Extended diagnosis indicates that extended diagnostics are present (e.g. channel fault).

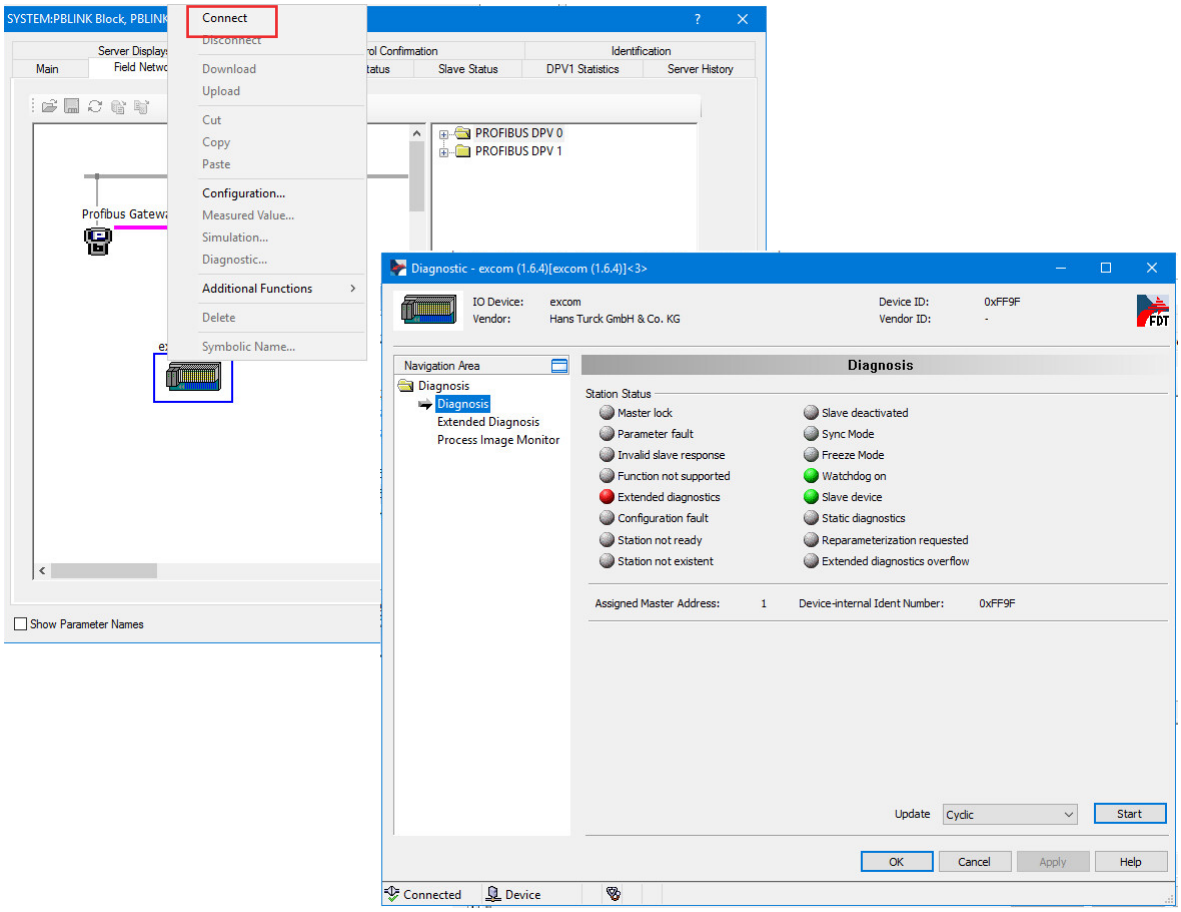

Fig. 23: Standard PROFIBUS diagnostics (listed according to significance)

Example: Using extended diagnostics

The extended diagnostics provides detailed information on the status of the excom® system. The diagnostic message transmitted from the excom® module is shown in the top line in hexadecimal format. The diagnostics are shown in the other lines broken down in channel-specific faults.

The following example shows the display of the extended diagnostics:

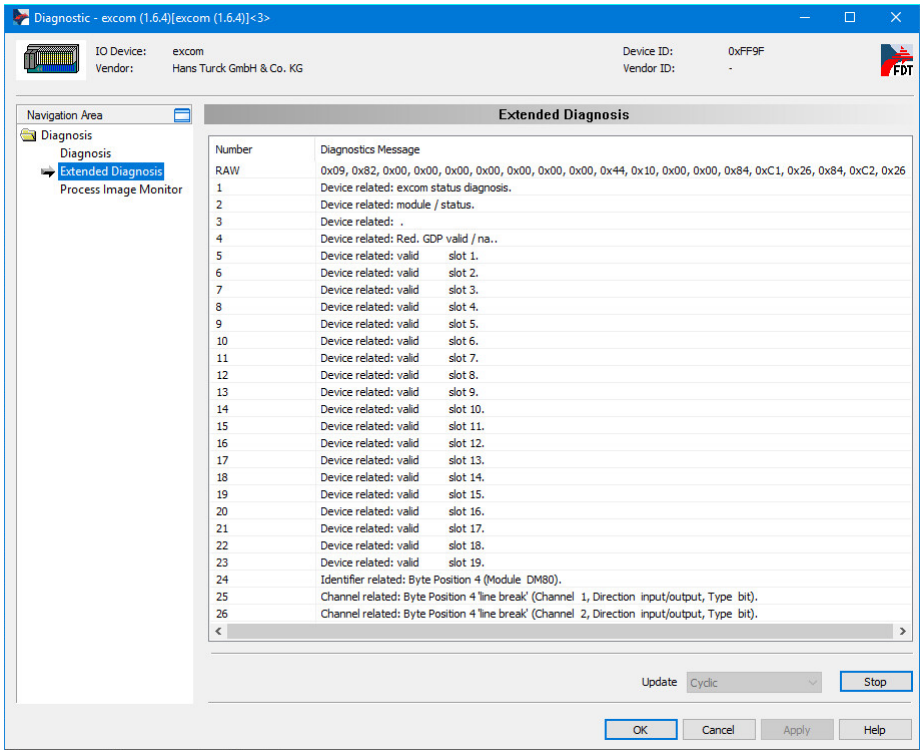

Fig. 24: Extended diagnostics

Using PROFIBUS diagnostics

The diagnostics functions of the PROFIBUS gateway module are provided for a general Profibus diagnostics.

➤ Open Field Network Configuration.
➤ Right-click the PROFIBUS gateway module.
➤ Select the Connect option in the context menu.
➤ Open the PROFIBUS gateway module.
➥ The following diagnostics can be called:
- General Diagnosis: General overview via the PROFIBUS network
- Master Diagnosis: Overview over all slaves (number of the configured and active slaves, number of the slaves with diagnostics)
- Bus Diagnosis: Overview of the communication via PROFIBUS
- Station Diagnosis: Overview of all PROFIBUS stations (not configured, error-free, with diagnostics, not found, with errors)
- Firmware Diagnosis: Honeywell-internal diagnostic display

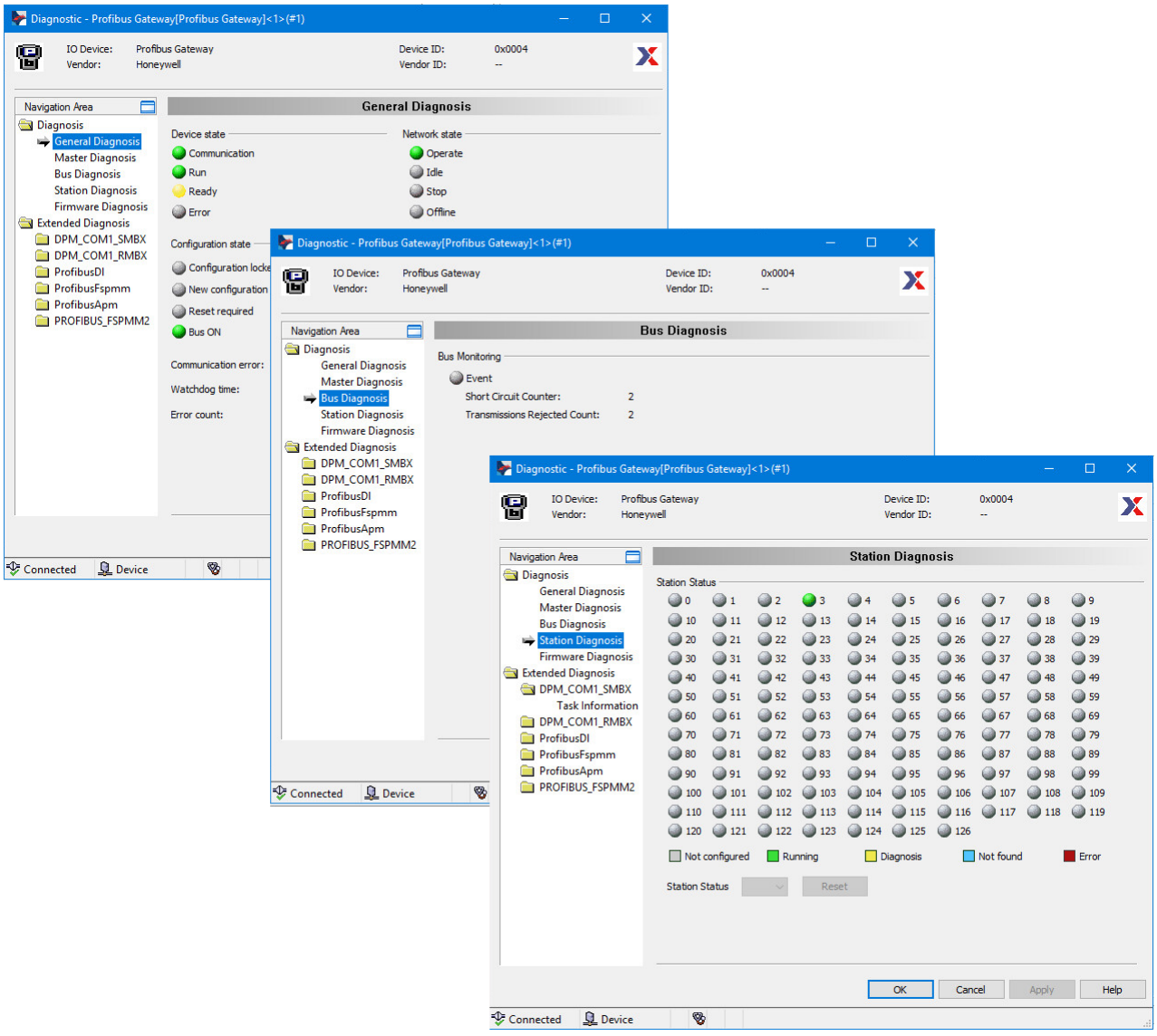

Fig. 25: PROFIBUS diagnostics

4.9 Setting redundancy

The Honeywell Experion control system supports line redundancy. This line redundancy can be implemented with one or two masters (e.g. for hot standby).

The GDP-… gateway provides in the GDP-C configuration one input word and output word each, by which status messages can be transmitted. The status messages can be used for example to switch to the second gateway if redundancy is active.

Only one gateway is always active in redundant operation. The redundant gateway is in standby mode. The redundant gateway sends status messages on request by the master. If both gateways are restarted (e.g. after a power failure), the gateway located on the left on the module rack always starts up first.

Line redundancy can be implemented with one or two segment couplers (e.g. SC12Ex). When only one segment coupler is deployed, the entire communication is aborted if the segment coupler fails.

4.9.1 Redundancy with one master – Creating a topology

When redundancy is implemented with one master (PGM), the bus line is split shortly after the master and connected to the one or two segment couplers. The bus lines are fed from the segment coupler to the gateway terminals on the module racks.

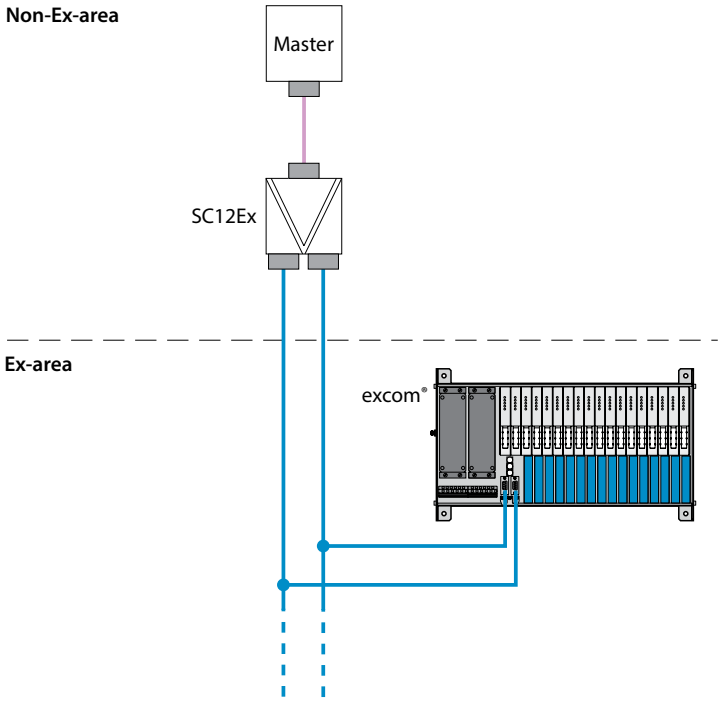

Fig. 26: Redundant setup with one master and one segment coupler (example)

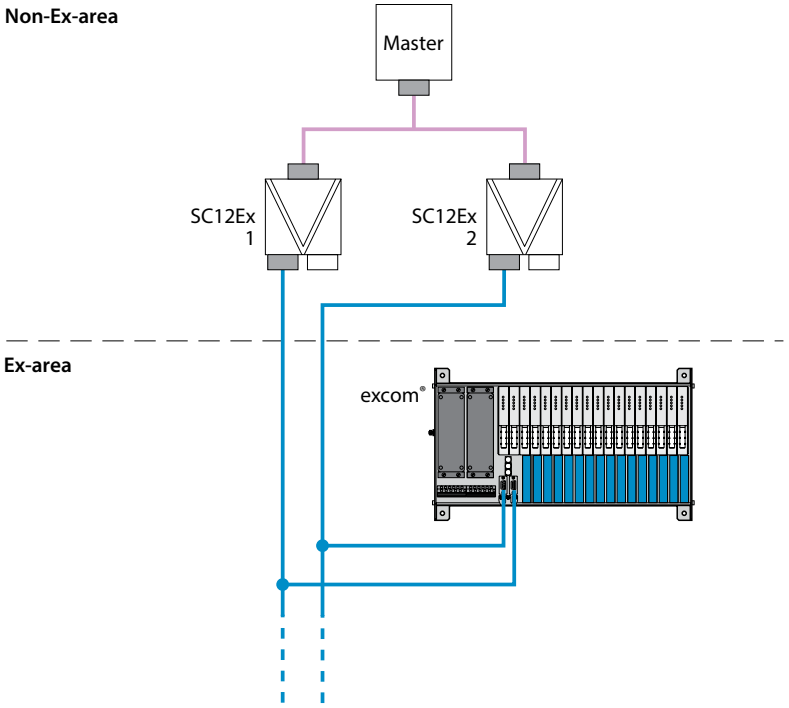

Fig. 27: Redundant setup with one master and 2 segment couplers (example)

4.9.2 Redundancy with two masters – Creating a topology

With redundancy featuring 2 masters (PGM), the active master communicates with the excom® station. The second master and the redundant gateway of the excom® station is in standby mode. The redundant line takes over the communication as soon as there is a fault in the data exchange between master 1 and gateway 1. For this a redundancy link module (RLM) must be switched after the two masters. This controls the data traffic inside the network.

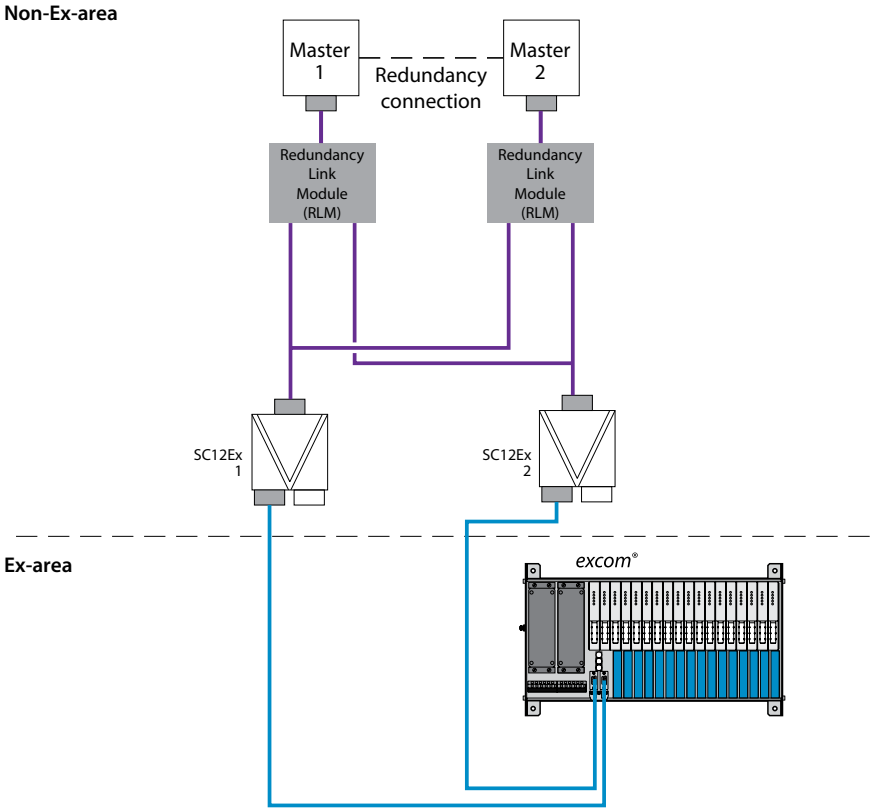

Fig. 28: Redundant setup with 2 masters and 2 segment couplers (example)

4.9.3 Configuring and parameterizing redundancy

The gateway parameter setting enables the redundancy to be activated and configured independently of the topologies illustrated in Ch. 4.9.1 and Ch. 4.9.2 .

➤ Open the excom® station.
➤ Select in the Parameters window the gateway from the drop-down list.
➤ Set the "redundancy mode" parameter to "line redundancy".
➤ Set the "address offset" parameter to "enable".
➤ Set the "address offset value" to a value ≠ 0.

A virtual PROFIBUS address must be set for the redundant gateway. The virtual PROFIBUS address consists of the PROFIBUS DP address of the excom® station set on the module rack + the set "address offset" value.

➤ Activate virtual addressing via the "address offset" gateway parameter.
➤ Set via the "address offset value" parameter the value that is added to the set hardware address.

NOTE
Each virtual PROFIBUS address and each real PROFIBUS address must only occur once in a network.

The PROFIBUS master sends regular polling messages via the FDL telegram. The passive gateway responds to the FDL telegram and sends a receipt confirmation to the master. By receiving the FDL telegram, the gateway cyclically checks the communication readiness of the master.

NOTE
If the excom® system is set up in a topology for line redundancy and the "redundancy mode" parameter is deactivated, the excom® system operates despite this via the line redundancy. However, the communication between master and passive gateway is not checked. If the redundant gateway or the network connection is faulty, no diagnosis is supplied to the master.

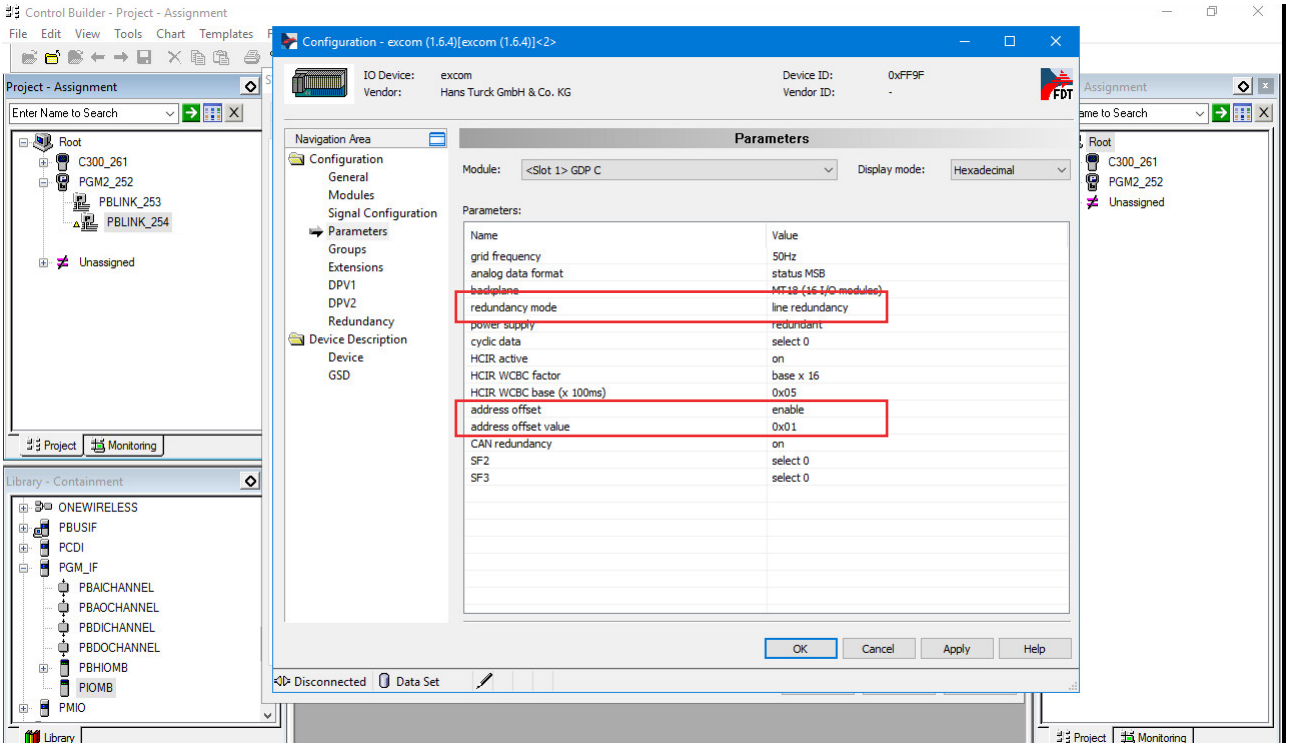

Fig. 29: Configuring and parameterizing redundancy

NOTE
To distinguish between the virtual and physical PROFIBUS addresses, Turck recommends providing all active stations with odd addresses and setting an "address offset" of 1. This represents physical PROFIBUS addresses with odd numbers and virtual PROFIBUS addresses with even numbers.

4.9.4 Redundancy handling

Calculating the virtual PROFIBUS address of the excom® station (example)

- A virtual PROFIBUS address is required for operation with line redundancy.
- The excom station has PROFIBUS address 3. 0x01 was selected as "address offset" (=1_{dec}). The virtual PROFIBUS address is 4 (3+1). Virtual address 4 must not be used by any other device in the same network.

Graphically displaying the PROFIBUS address

The PROFIBUS address can be graphically displayed via the diagnostics functions.

➤ Establish a connection between PROFIBUS master and excom® station via the Field Network Configuration.
➤ Right-click the PROFIBUS master.
➤ Select Additional Functions → LifeList in the context menu.
➥ All visible stations of the PROFIBUS network are displayed in the following window.

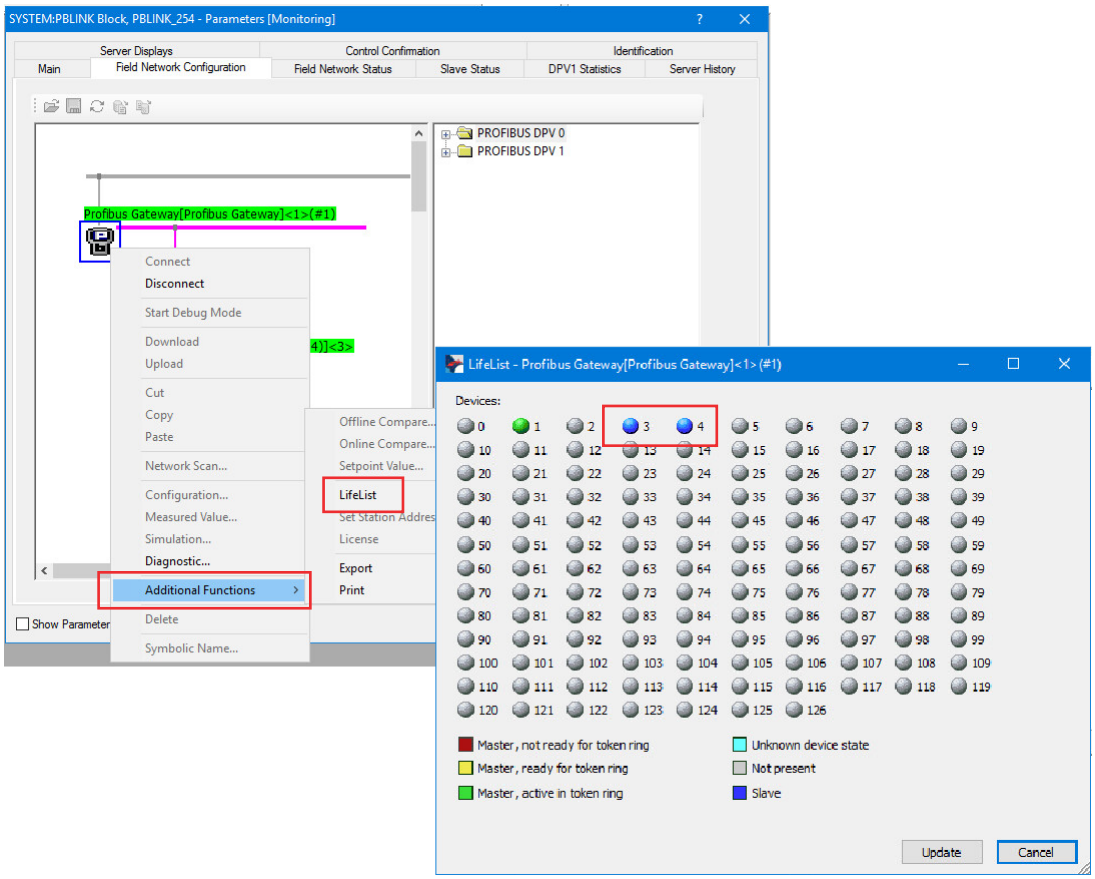

Fig. 30: Overview of the PROFIBUS stations in the LifeList

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Setting the Highest Station Address

The Highest Station Address (HSA) defines the highest possible address of the station (e.g. an excom® station) that can be polled by the master. The highest possible address is by default 126.

If the virtual address of the excom® station is higher than the HSA, no FDL communication to the master can be established and no virtual address can be accessed. The excom® Profibus diagnostics show "Red. GDP no DP comm".

➤ Open the configuration of the PROFIBUS master.
➤ Select Bus Parameters.
➤ Select an HSA so that no slave has a higher address than the HSA.

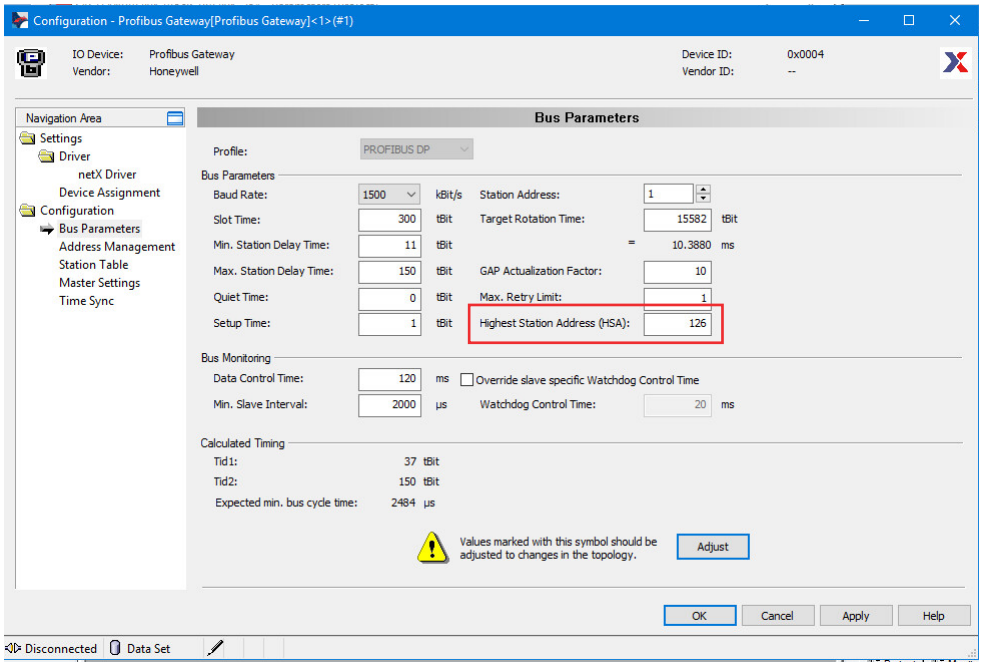

Fig. 31: Highest station address (example)

NOTE
In order to replace the gateway in redundancy operation, the firmware version and hardware version of both gateways must be identical.

If the active gateway has to be replaced, it is possible to switch to the redundant gateway via the controller.

- ➤ Call DSB in Monitoring mode.
- ➤ Choose the Gateway Redundancy tab.
- ➤ Click the Switch over Gateway button.
- ➥ When the indication of the PRIO LED switches to the redundant gateway, the required gateway can be replaced.

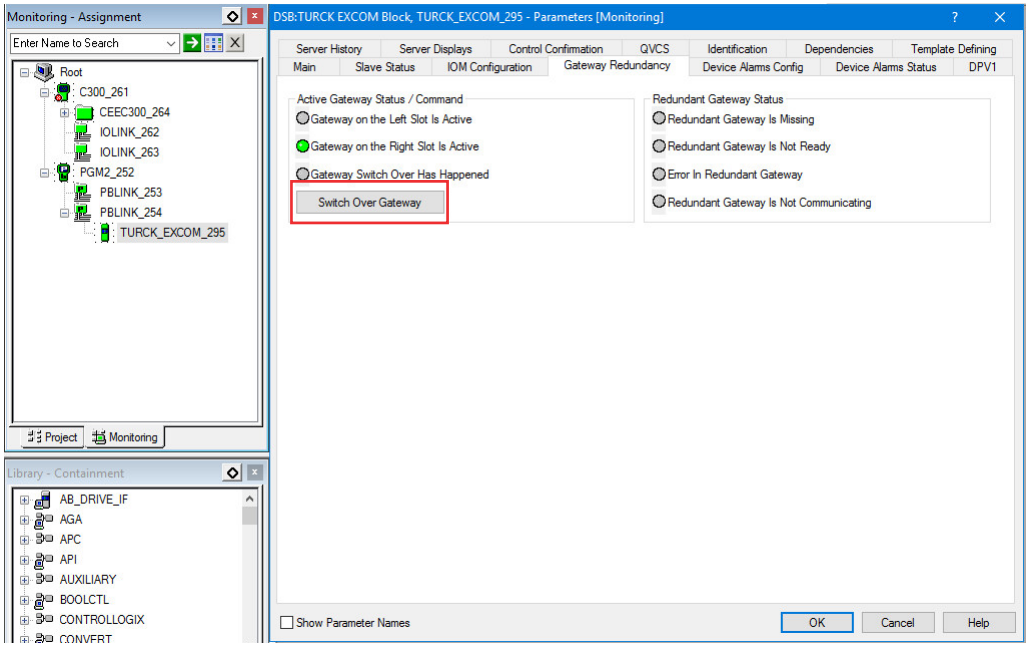

Fig. 32: Switch over Gateway button

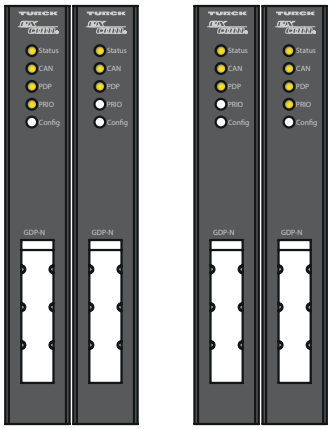

Fig. 33: LED behavior of the gateway before switchover (left) and after switchover (right)

4.10 Changing the configuration and/or parameters during operation (HCIR)

Hot configuration in run (HCIR) enables parameters and configurations to be changed during operation without having to interrupt the ongoing application. HCIR makes it possible to change wire break or failsafe strategies during operation and add new modules.

Setting HCIR

➤ Open the excom® module.
➤ Set the "HCIR active" parameter to "on".
➤ Set the "HCIR WCBC base" and "HCIR WCBC factor" parameters as follows in order to obtain an HCIR timer of 1 s:

Parameters	Setting
HCIR WCBC base (× 100 ms)	0x0A (10_{dec})
HCIR WCBC factor	base × 1

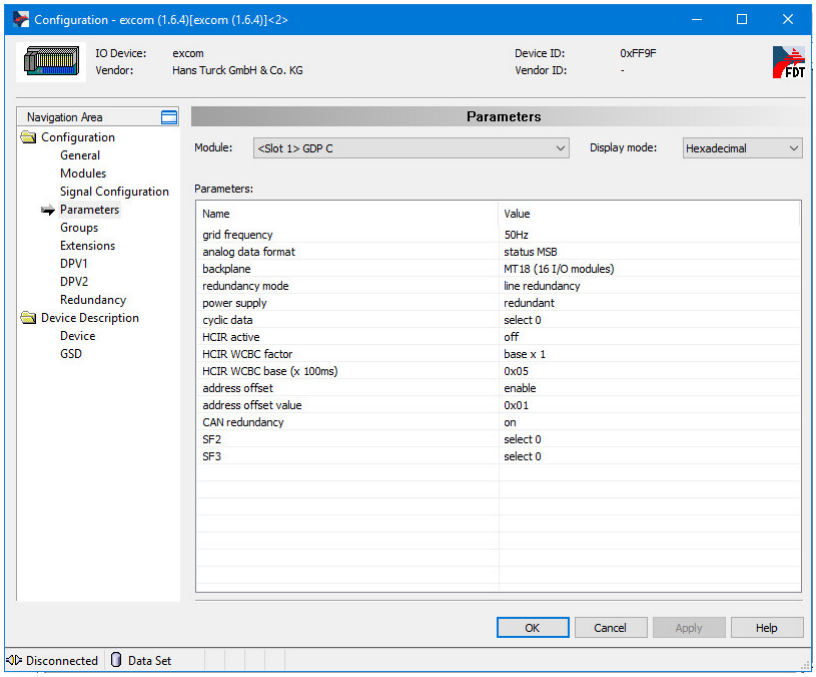

Fig. 34: Setting HCIR

The watchdog time defines the time in which the slave expects to be polled again by the master. If the polling signal does not reach the excom® station, the excom® modules switch to the defined failsafe mode.

➤ Open the configuration of the PROFIBUS master.
➤ Open Master Settings.
➤ Enter the Watchdog time.

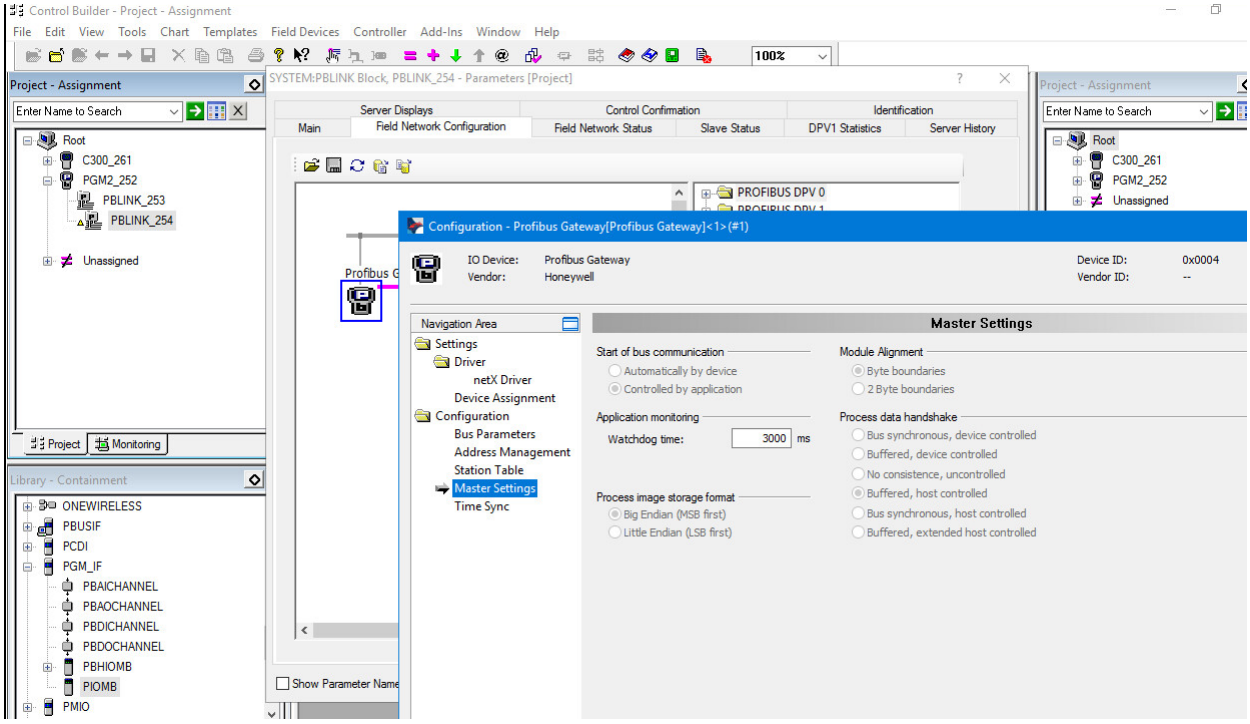

Fig. 35: Setting the watchdog

NOTE
Turck recommends setting the HCiR timer to 500 ms and the factor to basex16. The Watchdog time depends on the speed of the master. A Watchdog time of 1 s for 1.5 MB is recommended for internal redundancy switching.

Expanding memory for excom® modules

The memory can be expanded for the modules to be added in order to change the configuration of the excom® stations or add additional modules. 128 bytes are reserved by default.

➤ Open the Address Management of the PROFIBUS master.
➤ Click the Add reserved area button.
➤ Click the Lock button.
➥ The reserve memory for other excom® modules is created.
➤ Repeat the procedure for all inputs and outputs required.

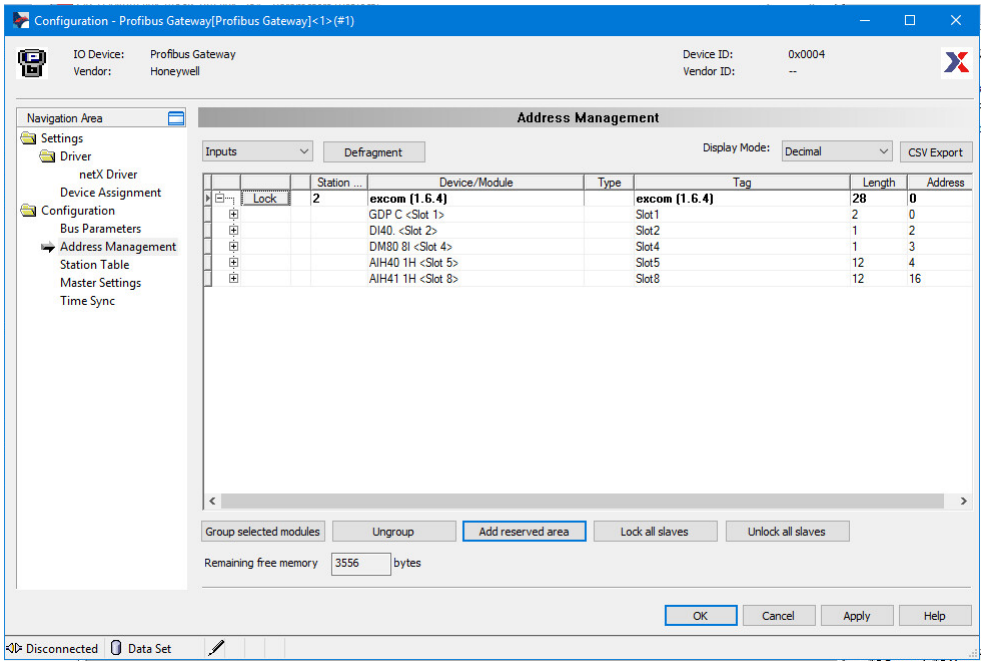

Fig. 36: Expanding the memory for excom® modules

Adjusting the bus cycle time

➤ Open the configuration of the PROFIBUS master (PGM).
➤ Adjust the bus cycle time.
➤ Click the Adjust button to accept the bus cycle time calculated by the system.
➤ Optional: Double the bus cycle time to calculate the buffer time for the safe completion of the HCIR.

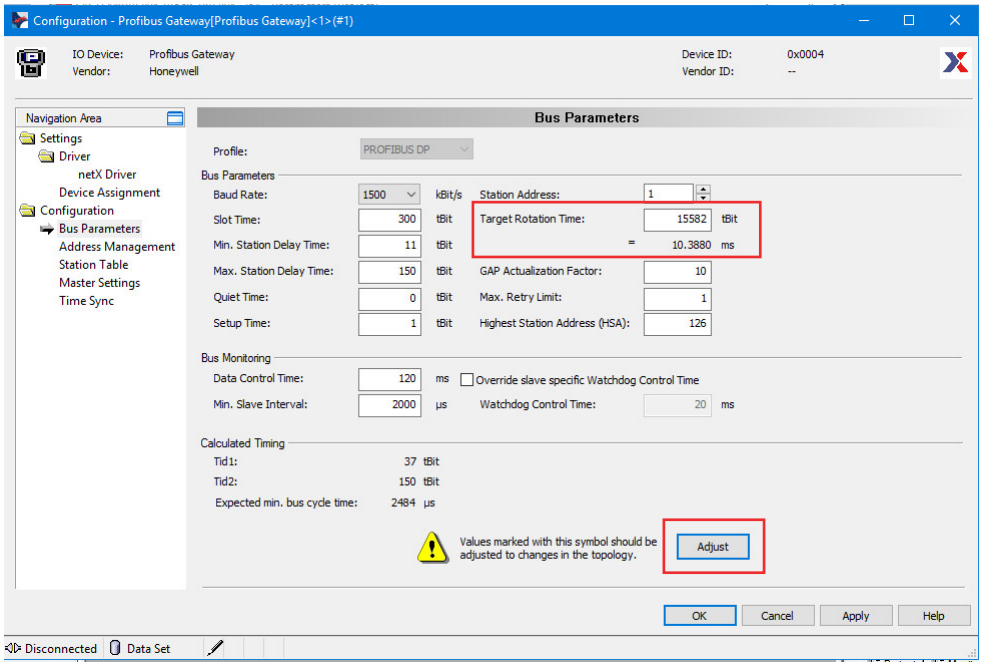

Fig. 37: Adjusting the bus cycle time

4.11 Transferring HART® variables to the control system (HART® over PROFIBUS)

HART® variables can also be used to read process data from HART®-capable field devices. PROFIBUS makes it possible to transfer the following HART® secondary variables to the control system:

- Measured values (digitized)
- Device temperature
- Percentage value
- Contamination of the sensor
- etc.

The HART® secondary variables are mapped cyclically to PROFIBUS as floating-point values.

HART®-capable I/O modules (e.g. AIH40…) and HART®-capable field devices enable a maximum of 8 HART® variables per module to be transferred to the control system (max. 4 per channel). The data is exchanged with the cyclic process data.

Adding HART® variables

➤ Open the excom® station in the Field Network Configuration.
➤ Click Modules.
➤ Select and add the required input module (e.g. AIH40-4H).

NOTE
The AIH40 input module can be selected with 1, 4 or 8 HART® secondary variables. The HART® variables can be divided up in the parameter setting between the individual channels.

The HART® secondary values are supplied to the control system as floating point values. A 2 word memory is required for each variable.

The 4H configuration in the AIH40 input module has the following data volume:

- Analog data: 4 × 1 word = 4 words
- HART® variables: 4 × 2 words = 8 words
- Total data volume: 12 words

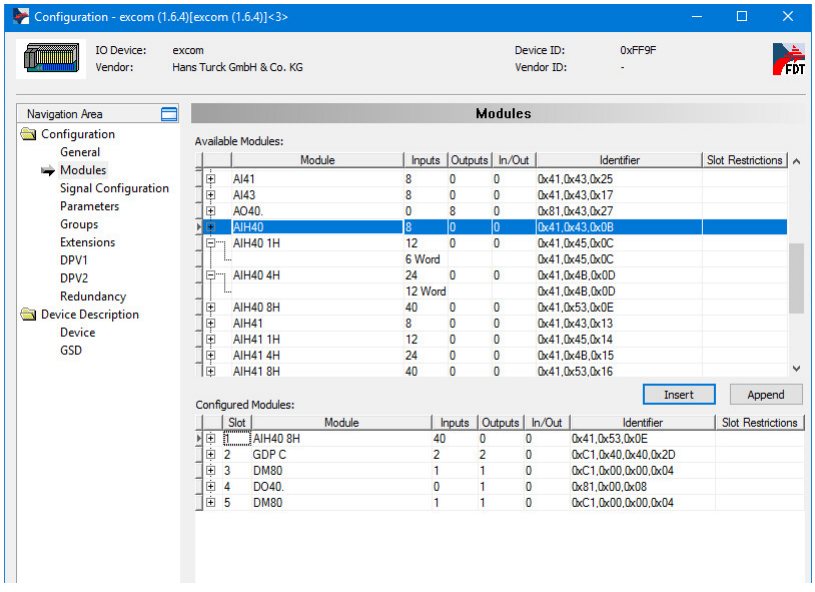

Fig. 38: Adding HART® variables

NOTE
All HART® secondary variables activated in the parameter setting take up one space in the mapped input data, even if no HART®-capable device is connected at the corresponding channel.

Example: An AIH40 analog input module has the configuration 4H. If all HART® variables are set at the channels 1 and 2, only the first four HART® variables from channel 1 are nevertheless mapped.

Setting I/O modules for HART® variables

- ➤ Open the excom® station.
- ➤ Select the required module (e.g. AIH40 4H).
- ➤ Select channels for HART® communication via the parameters SV1 to SV4 for each channel.
- ➥ Example (see below): 4 HART® secondary variables from channel 4 are polled cyclically and then mapped to the cyclic data exchange.

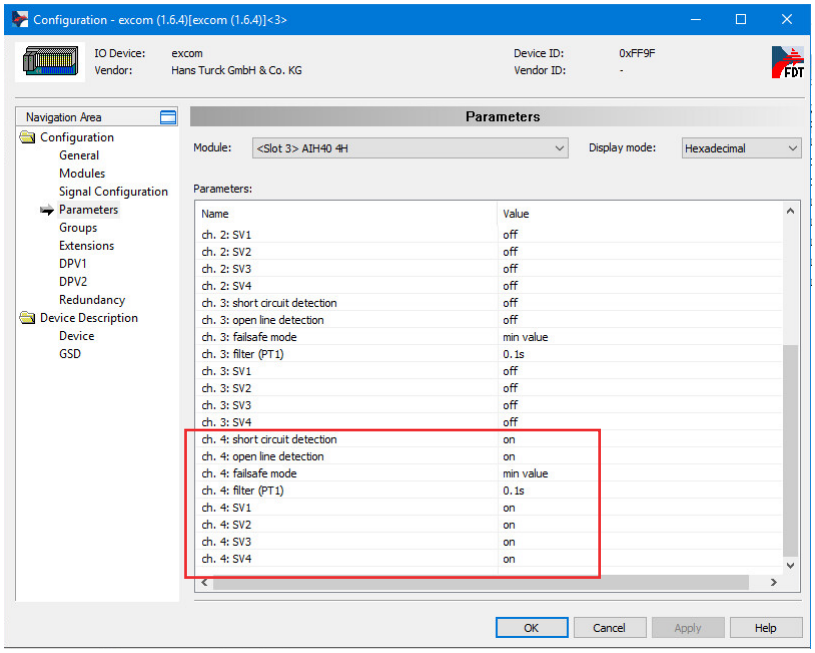

Fig. 39: Setting HART® communication for AIH40-4H with level sensor on channel 4

Example: Observing HART® communication

The values transferred via the HART® communication can be viewed in Monitoring mode.

The following figure shows the measured values for a sensor that is connected to channel 3 of an AIH40Ex analog input module.

Channel description	Meaning
HART data – CH3 SV1	Digitized measured value (%)
HART data – CH3 SV2	Internal temperature of field device (°C)
HART data – CH3 SV3	Measuring accuracy
HART data – CH3 SV4	Measured value (m)

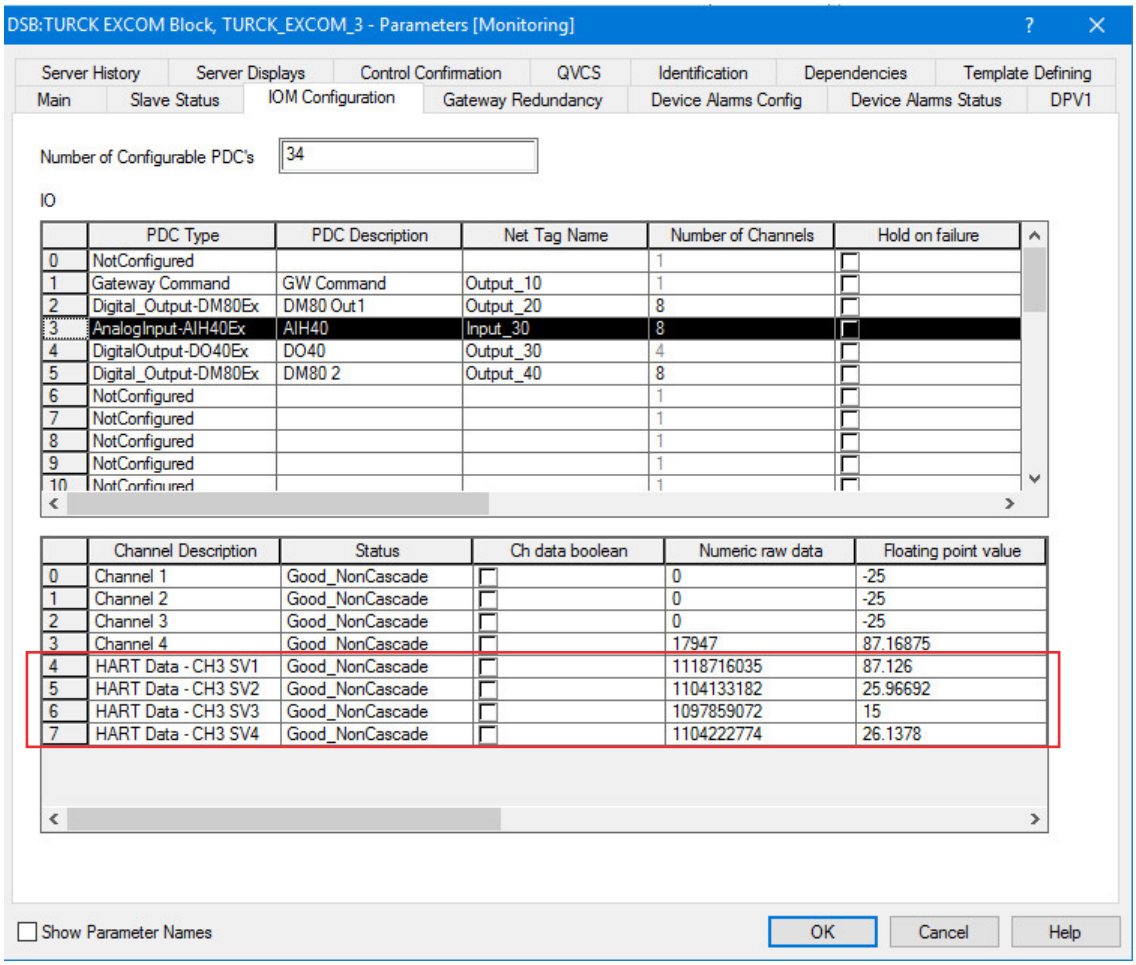

Fig. 40: Observing HART® communication

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