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TURCK

excom I/O System

Integration with ABB Control
Builder M via PROFIBUS

Integration Manual



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1 About this manual

The manual describes the integration of the excom system in the ABB Compact Control Builder M control system for AC 800M via PROFIBUS-DP.

Read this manual and the applicable documents carefully before the integration. This will prevent the risk of personal injury and damage to property. Keep this manual safe during the service life of the product. If the product is passed on, hand over this manual as well.

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

1.1 Target groups

These instructions are written for specifically trained personnel and must be read carefully by anyone entrusted with the commissioning, operation and maintenance of the system.

When using the device in Ex circuits, the user must also have an additional knowledge of explosion protection (IEC/EN 60079-14 etc.).

1.2 Explanation of symbols used

The following symbols are used in these instructions:



DANGER

DANGER indicates a dangerous situation with high risk of death or severe injury if not avoided.



WARNING

WARNING indicates a dangerous situation with medium risk of death or severe injury if not avoided.



CAUTION

CAUTION indicates a dangerous situation of medium risk which may result in minor or moderate injury if not avoided.



NOTICE

NOTICE indicates a situation which may lead to property damage if not avoided.



NOTE

NOTE indicates tips, recommendations and useful information on specific actions and facts. The notes simplify your work and help you to avoid additional work.



CALL TO ACTION

This symbol denotes actions that the user must carry out.



RESULTS OF ACTION

This symbol denotes relevant results of actions.

1.3 Other documents

Besides this document the following material can be found on the Internet at www.turck.com:

- Data sheets
- Quick start guide
- 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 following PROFIBUS DP gateways for excom:

- GDP-N...
- GDP-IS...

2.2 Turck service

Turck supports you with your projects, from initial analysis to the commissioning of your application. The Turck product database under www.turck.com contains software tools for programming, configuration or commissioning, data sheets and CAD files in numerous export formats.

The contact details of Turck subsidiaries worldwide can be found on p. [▶ 36].

3 For your safety

The product is designed according to state-of-the-art technology. However, residual risks still exist. Observe the following warnings and safety notices to prevent damage to persons and property. Turck accepts no liability for damage caused by failure to observe these warning and safety notices.

3.1 Intended use

The excom system is integrated in ABB Control Builder M via PROFIBUS-DP using a GDP file.

The devices may 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 General safety notes

- The device may only be assembled, installed, operated, parameterized and maintained by professionally-trained personnel.
- The device may only be used in accordance with applicable national and international regulations, standards and laws.
- The device meets the EMC requirements for industrial areas. When used in residential areas, take measures to avoid radio interference.

3.3 Notes on Ex protection

- Only use the device in Ex areas when installed in the appropriate protective housing.
- Observe national and international regulations for explosion protection.
- When operating the device in a hazardous area, the user must have a working knowledge of explosion protection (IEC/EN 60079-14, etc.).
- Only use the device within the permitted operating and ambient conditions (see Certification data and conditions resulting from the Ex-approval).
- Fit blank modules (BM1) on unused slots on the module rack.
- 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 (IEC/EN 60079-14).
- Complete certification of intrinsic safety.
- Never connect equipment to intrinsically safe circuits if this equipment was previously used once in non-intrinsically safe circuits.
- Please follow the instructions for use for the built-in equipment.

4 Integrating an excom system in ABB Compact Control Builder M

4.1 Requirements

4.1.1 Hardware requirements

This example uses the following hardware:

ABB hardware

- ABB AC 800M Controller

Turck hardware

- MT08-3G module rack
- PSM24-3G.1 power supply module
- GDP-IS/FW2.3 gateway
- DM80EX digital I/O module
- DO40EX digital output module
- AIH40EX analog input module
- AOH40EX analog output module
- PROFIBUS-DP cable

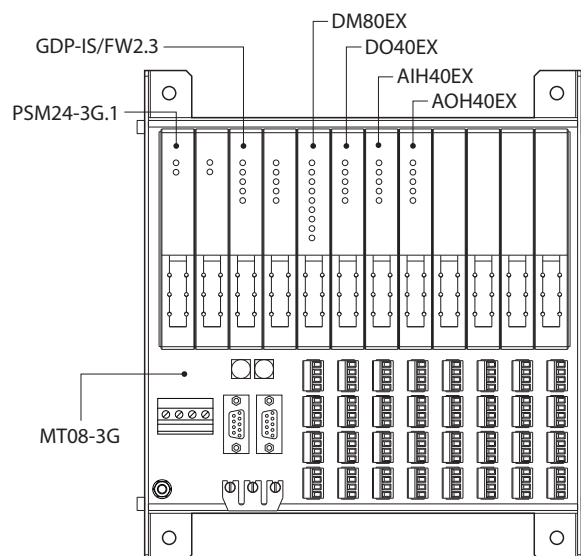


Fig. 1: Example setup of the excom station

4.1.2 Software requirements



NOTE

The GSD configuration file must be available in version 1.6.4.

This example uses the following software:

ABB software

- ABB Compact Control Builder AC 800M
- GSD communication file V1.6.4

Turck software

- Gateway firmware V2.3

4.2 Installing a GSD configuration file

The GSD file can be downloaded as a free Zip file from www.turck.com.

- ▶ Unpack the zip file.

Adding a GSD configuration file to the library

Proceed as follows to install the GSD file:

- ▶ Start **Compact Control Builder AC 800M**.
- ▶ Create a new project or use an existing project.
- ▶ Choose project (here: **Turck_Test**) → **Libraries**.
- ▶ Right-click **Hardware**.
- ▶ Click **New Library....**

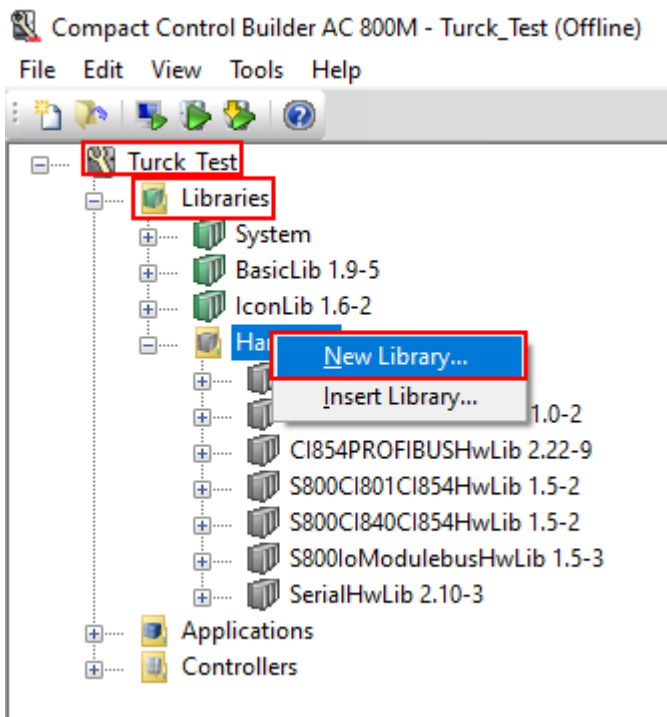


Fig. 2: Opening New Library...

- ▶ Define the name (here: **Turck_excom**) and location.
- ▶ Click **OK**.

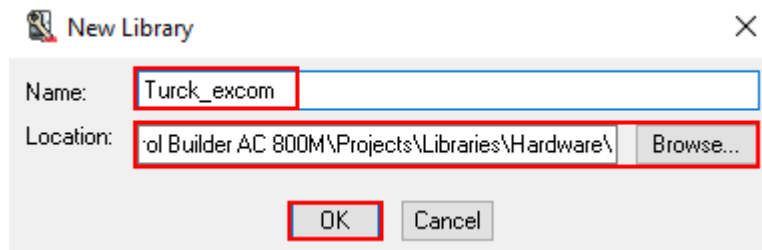


Fig. 3: Defining the file name and memory location

- ▶ Choose **Hardware** → **Turck_excom**.
- ▶ Right-click **Hardware Types**.
- ▶ Click **Insert/Replace Hardware Type(s)...**

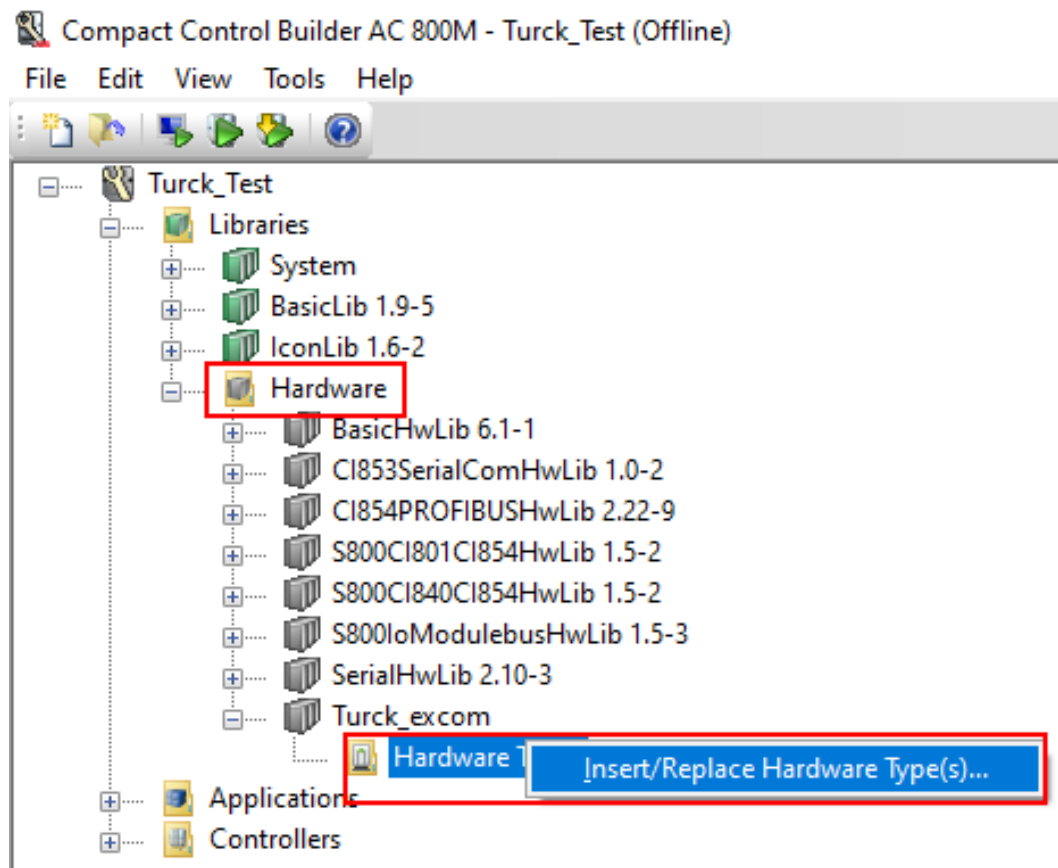


Fig. 4: **Hardware Types** – **Insert/Replace Hardware Type(s)...**

- ⇒ The **Insert Hardware Definitions** window opens.

- ▶ Select the *.gs? file type in the drop-down menu.
- ▶ Select the T164FF9F.GSD GSD configuration file.
- ▶ Click Open.

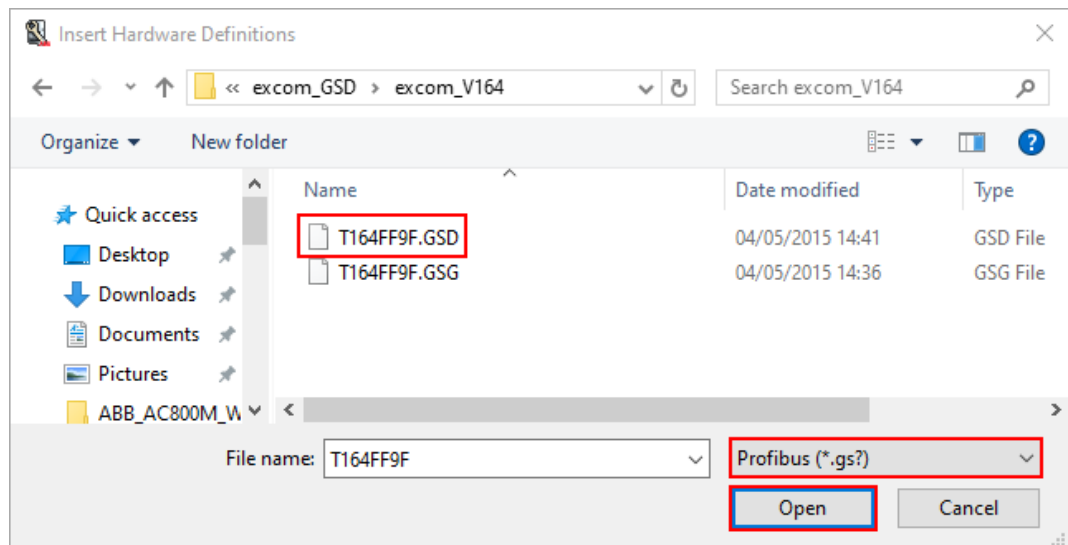


Fig. 5: Selecting the GSD configuration file

4.3 Defining the GSD signal

Once the GSD configuration file has been selected, the **Device Import Wizard** opens.

- ▶ Click Next.

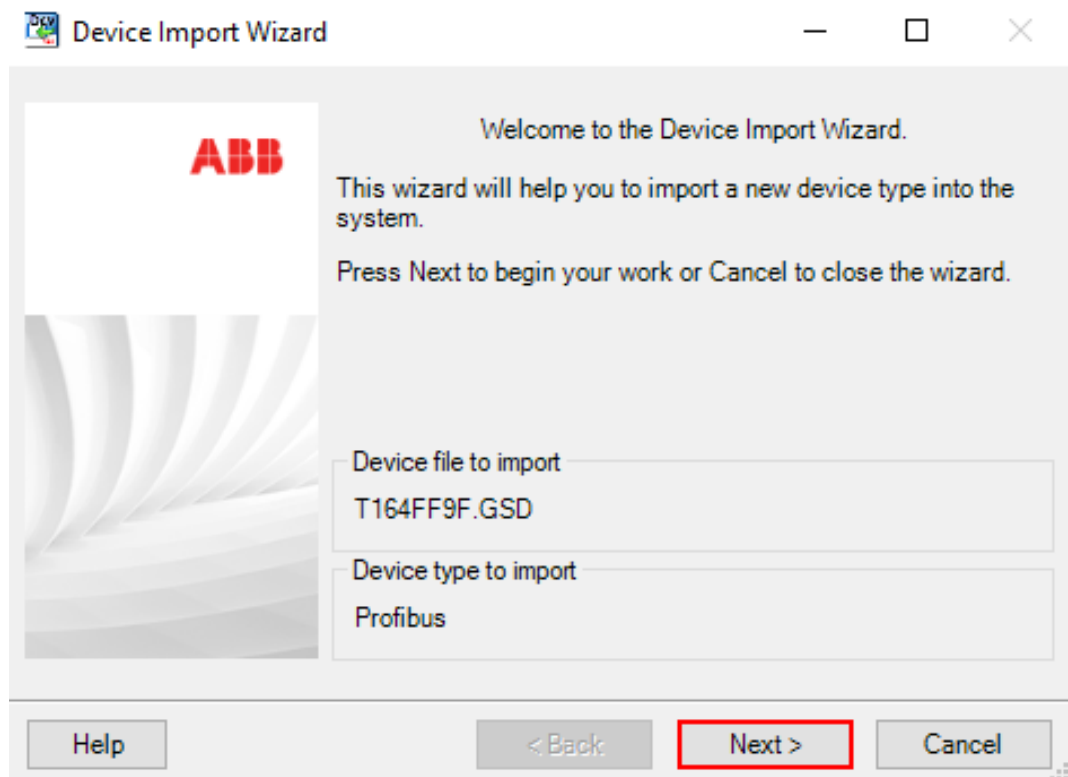


Fig. 6: Device Import Wizard window

- ▶ At to be used in the system select **DefaultIOType** in the drop-down menu.
- ▶ Click **Next**.

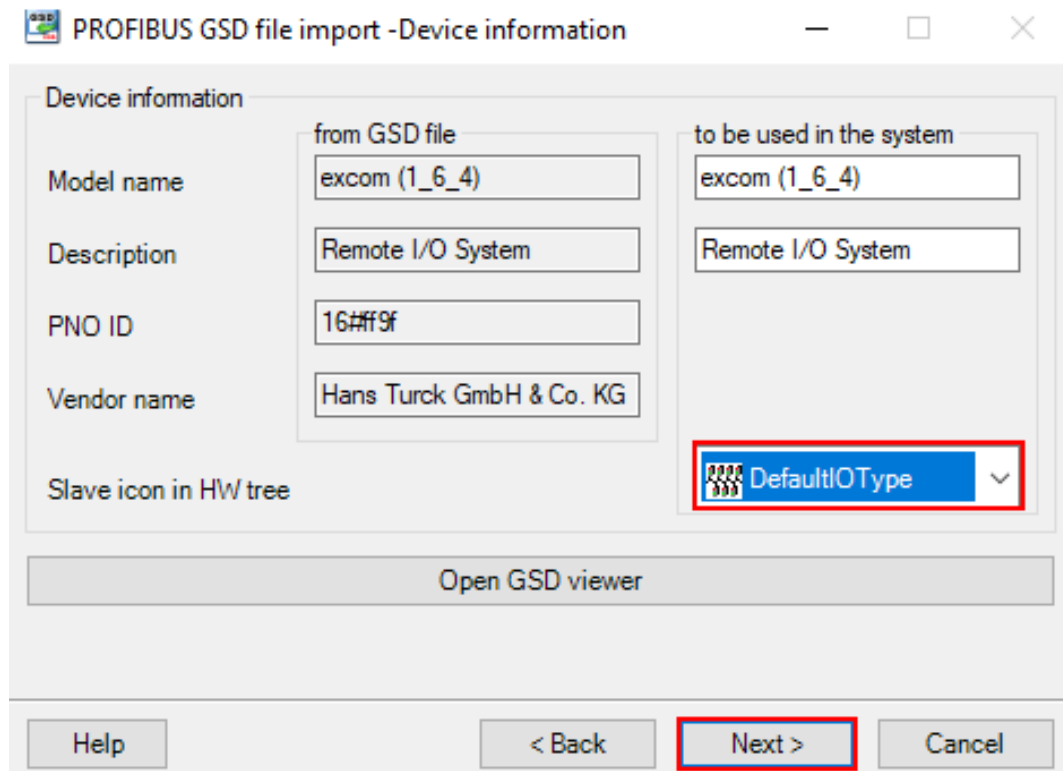


Fig. 7: Selecting the **DefaultIOType**

- ⇒ The PROFIBUS GSD file import - Module selection window opens.
- ▶ Click Select all.
- ▶ Click Next.

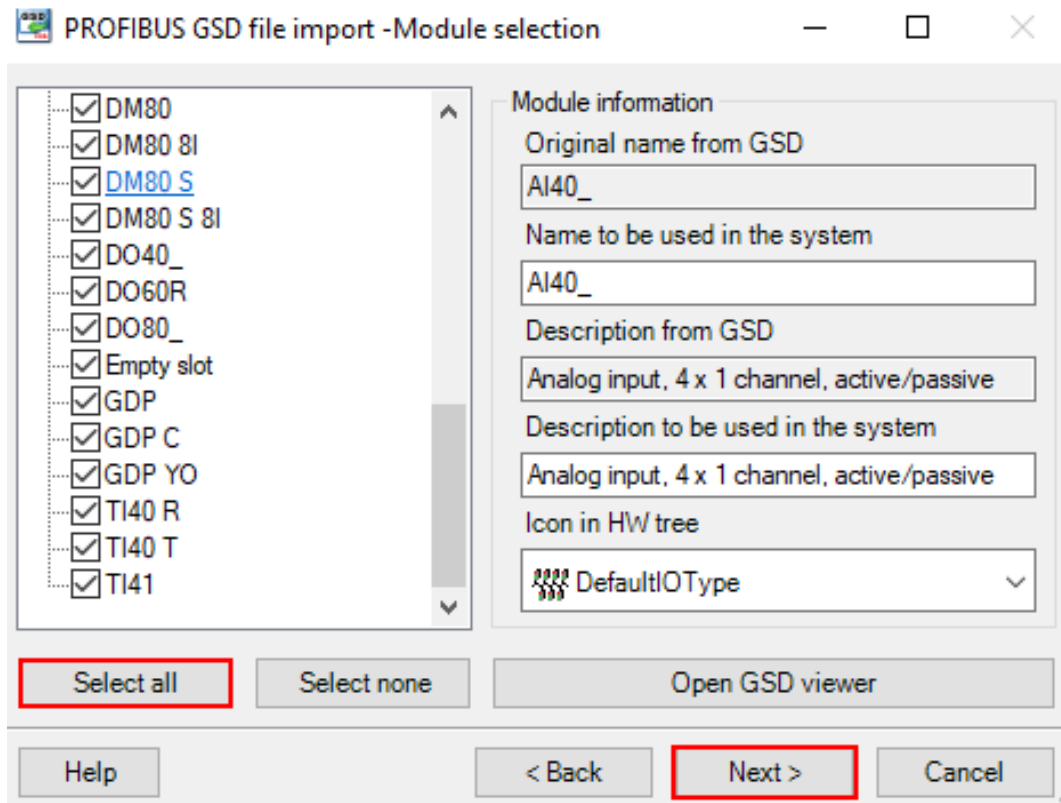


Fig. 8: PROFIBUS GSD file import - Module selection window

- ▶ In the **PROFIBUS GSD file import – Parameter settings** window check whether all modules are marked with a green tick. If one or several modules have a red tick: Check whether the parameter settings of two configurations are the same.
- ▶ Click **Next**.

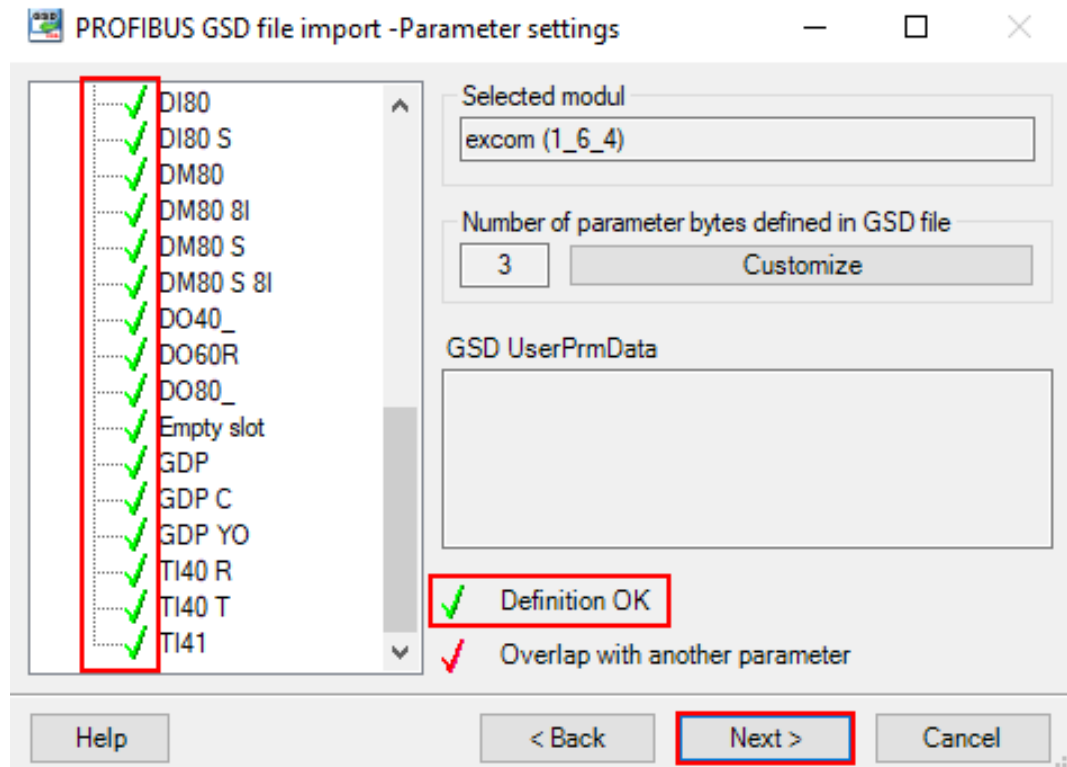


Fig. 9: All modules defined

4.3.1 Setting GSD signals for individual modules

The settings for the I/O signals of the modules are stated in the system description for the excom I/O system at www.turck.com.

Example: AIH40 1H

- ▶ In the **PROFIBUS GSD file import – I/O settings** window, select the **AIH40 1H** module in the left sidebar.
- ▶ Click **Customize input** under **Manual configuration** to manually configure the module.

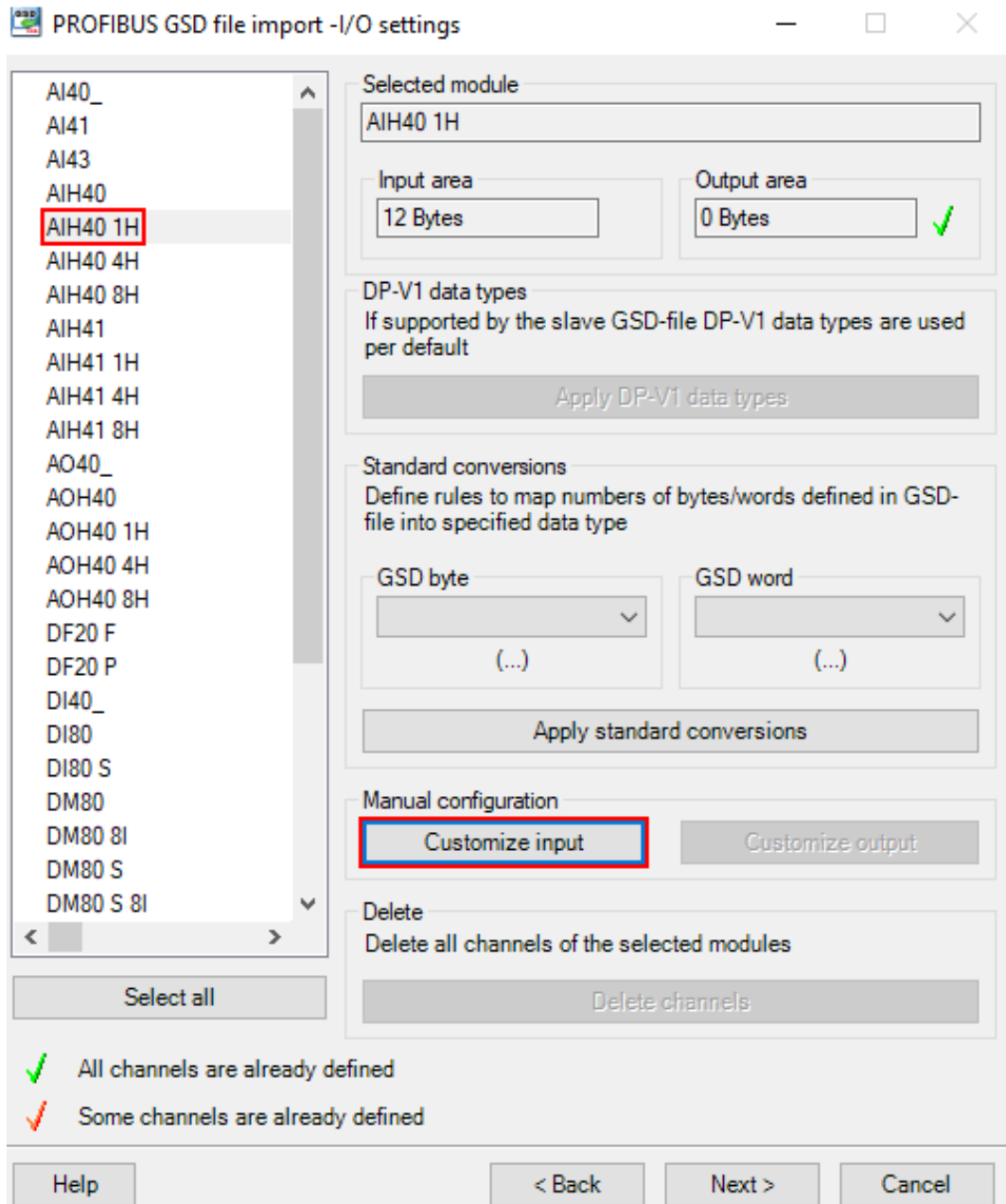


Fig. 10: Manually configuring an AIH40 1H

- ▶ Select 15 bits for channel 1 in the **PROFIBUS GSD file import** – In area of **AIH40 1H** window at **Input area**. In this example, Bit 0...6 of Byte 0 and Bit 0...7 of Byte 1.
- ▶ The drop-down menu opens automatically. Select **UInt 16=>DInt**.

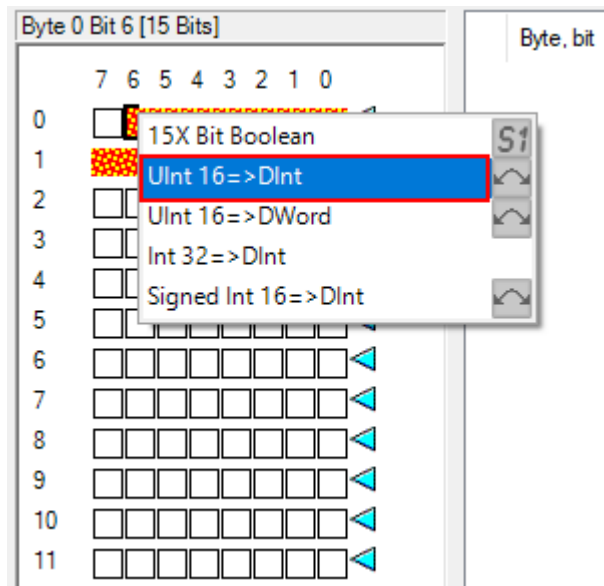


Fig. 11: Selecting **UInt 16=>DInt** in the drop-down menu

- ▶ Select Bit 7 of Byte 0 as the status bit.
- ▶ The drop-down menu opens automatically. Select **Bit Boolean =>Bool**.

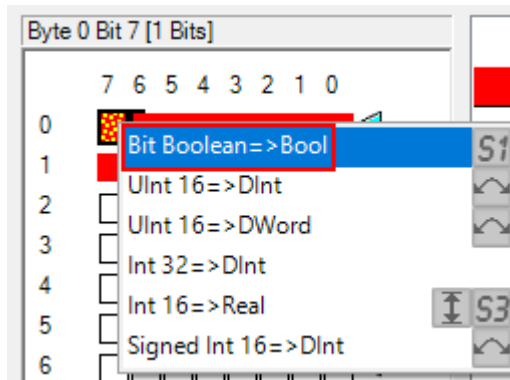


Fig. 12: Selecting **Bit Boolean =>Bool** in the drop-down menu

- ▶ Configure the other three channels with the remaining bits following the same procedure. Click OK.

The HART variable consists of Bytes 8...11.

- ▶ Select Byte 8...11 at **Input area**.
- ▶ The drop-down menu opens automatically. Select **Real 32=>Real**.

PROFIBUS GSD file import -In-area of AIH40 1H

—
□
×

Input area

	7	6	5	4	3	2	1	0
0								
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								

Configured channels

Byte, bit	Length	Name	Data type conversion	Features
0, 6	15 Bits	Input 1	UInt 16=>DInt	S
0, 7	1 Bit	Input 2	Bit Boolean=>Bool	S
2, 6	15 Bits	Input 3	UInt 16=>DInt	S
2, 7	1 Bit	Input 4	Bit Boolean=>Bool	S
4, 6	15 Bits	Input 5	UInt 16=>DInt	S
4, 7	1 Bit	Input 6	Bit Boolean=>Bool	S
6, 6	15 Bits	Input 7	UInt 16=>DInt	S
6, 7	1 Bit	Input 8	Bit Boolean=>Bool	S
8, 7	32 Bits	Input 9	Real 32=>Real	S

Fig. 13: AIH40 1H – all channels and HART variables are set

Example: AOH40

- ▶ In the **PROFIBUS GSD file import – I/O settings** window, select the **AOH40** module in the left sidebar.
- ▶ Click **Customize output** under **Manual configuration** to manually configure the module.

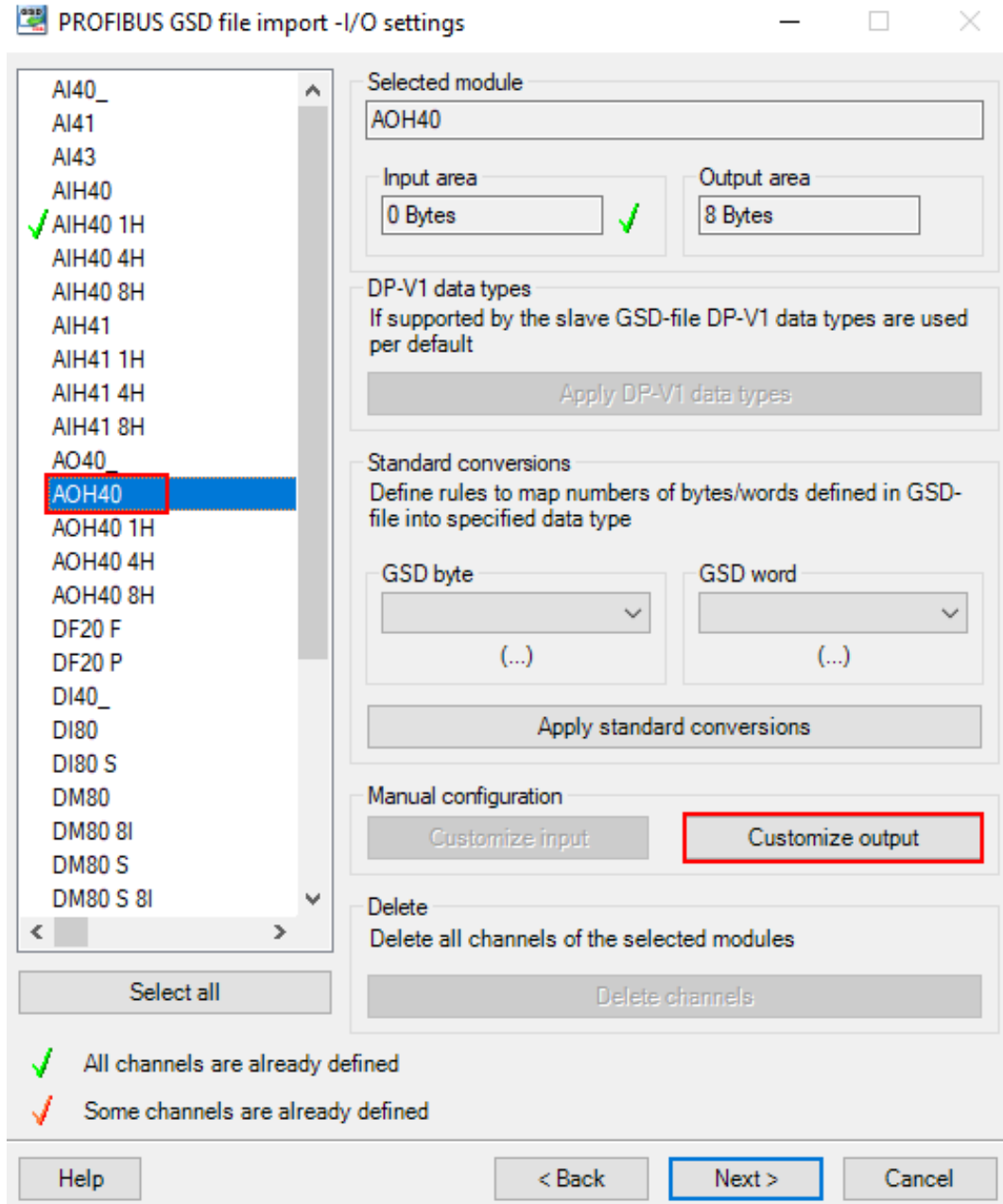


Fig. 14: Manually configuring AOH40

- ▶ Select 15 bits for channel 1 in the **PROFIBUS GSD file import – Out area of AOH40** window at **Output area**. In this example, Bit 0...6 of Byte 0 and Bit 0...7 of Byte 1.
- ▶ The drop-down menu opens automatically. Select **UInt 16=>DInt**.

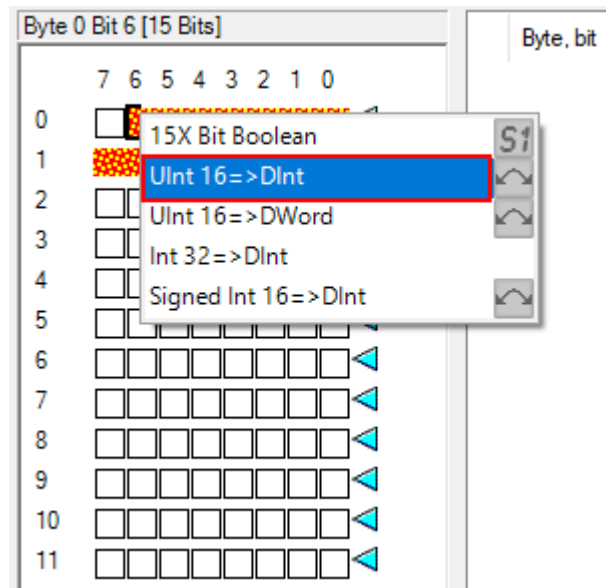


Fig. 15: Selecting **UInt 16=>DInt** in the drop-down menu

- ▶ Configure the other channels with the remaining bits following the same procedure. Click OK.

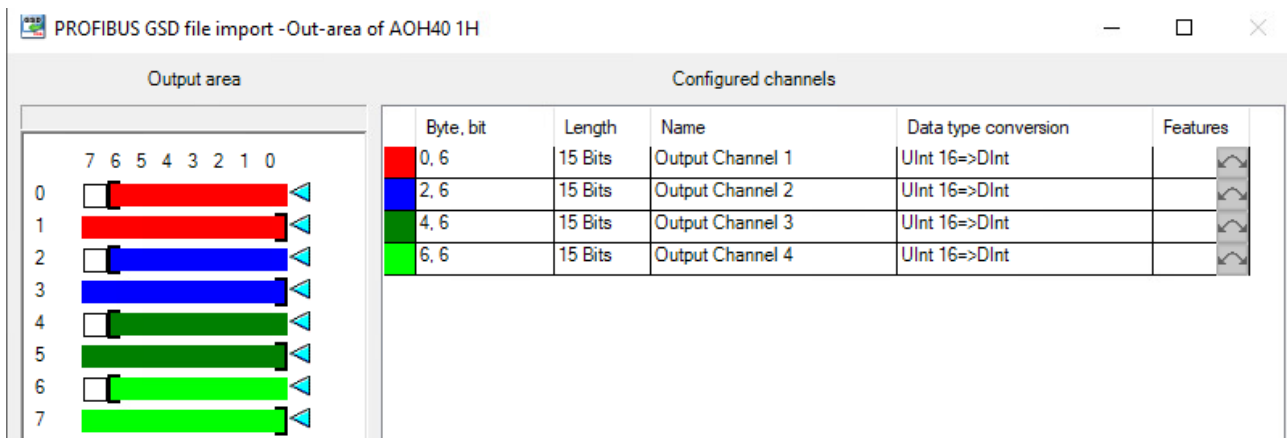


Fig. 16: AOH40 – all channels are set

Example: DM80

- ▶ In the **PROFIBUS GSD file import – I/O settings** window, select the **DM80** module in the left sidebar.
- ▶ Click **Customize input** or **Customize output** under **Manual configuration** to manually configure the module as required.

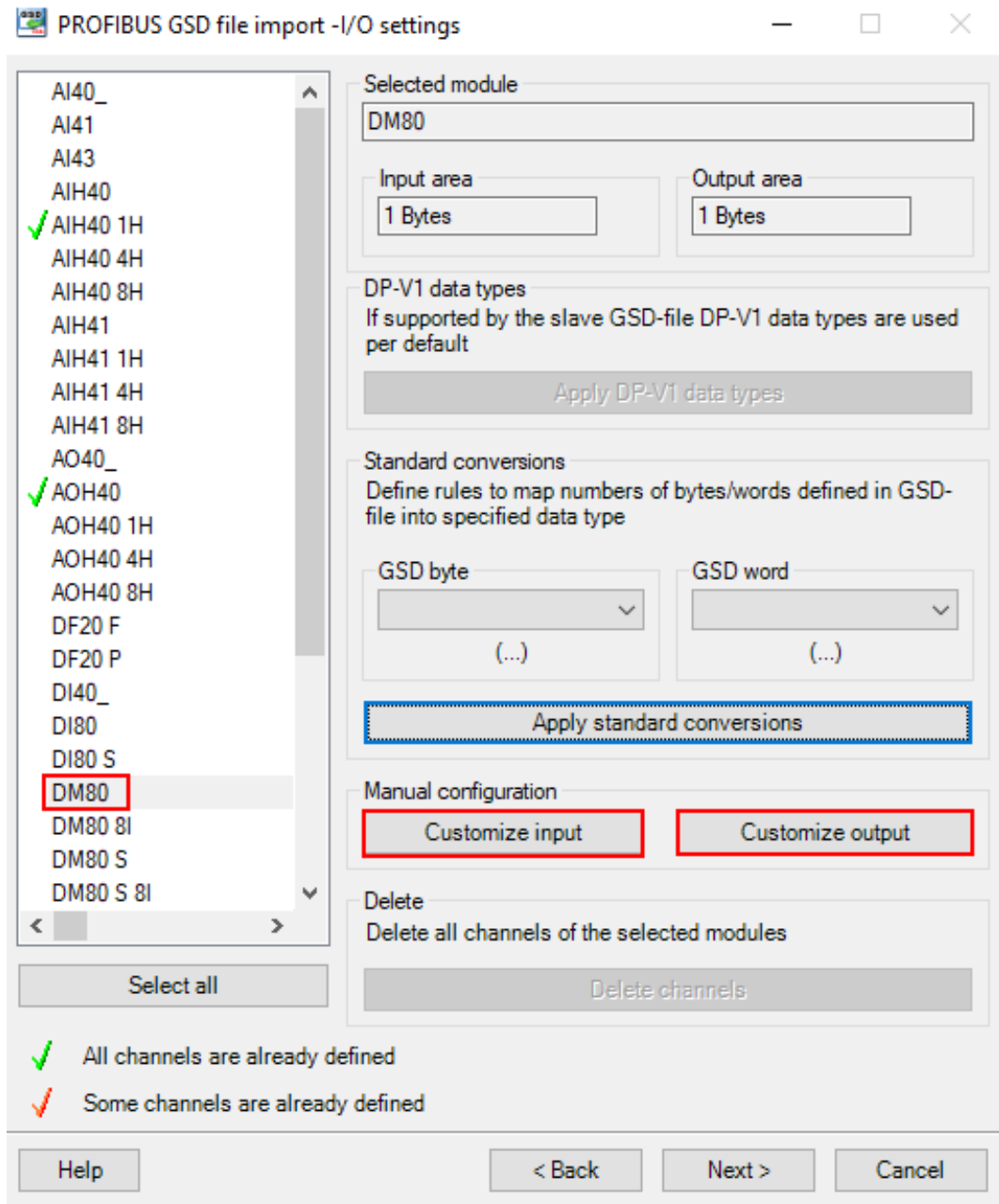


Fig. 17: Manually configuring DM80

- ▶ Select Bit 0 for channel 1.
- ▶ The drop-down menu opens automatically. Select **8X Bit Boolean**.

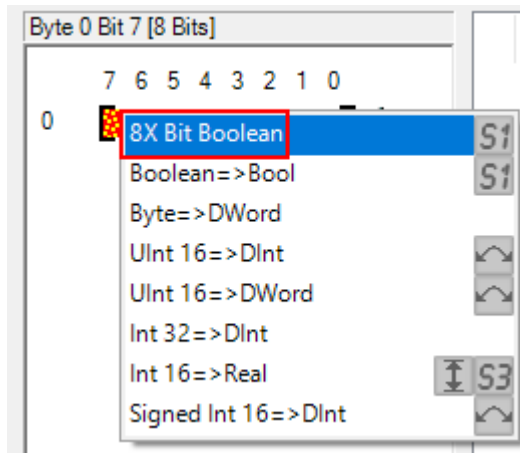


Fig. 18: Selecting **8X Bit Boolean** in the drop-down menu

- ▶ Each bit can be set as an individual channel. The DM80 S module is provided with an additional status bit for each channel.

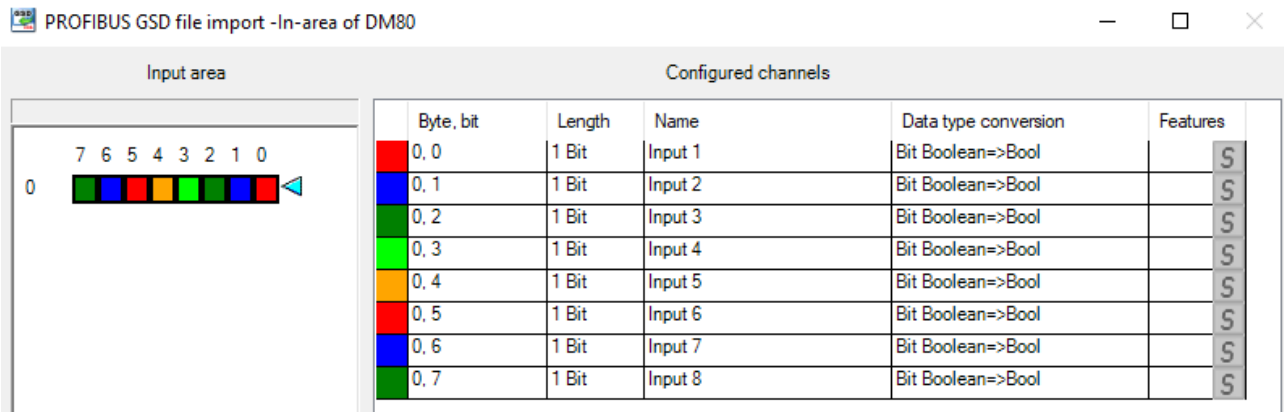


Fig. 19: DM80 – all channels are set

Example: DO40

- ▶ In the **PROFIBUS GSD file import – I/O settings** window, select the **DO40_** module in the left sidebar.
- ▶ Click **Customize output** under **Manual configuration** to manually configure the module.

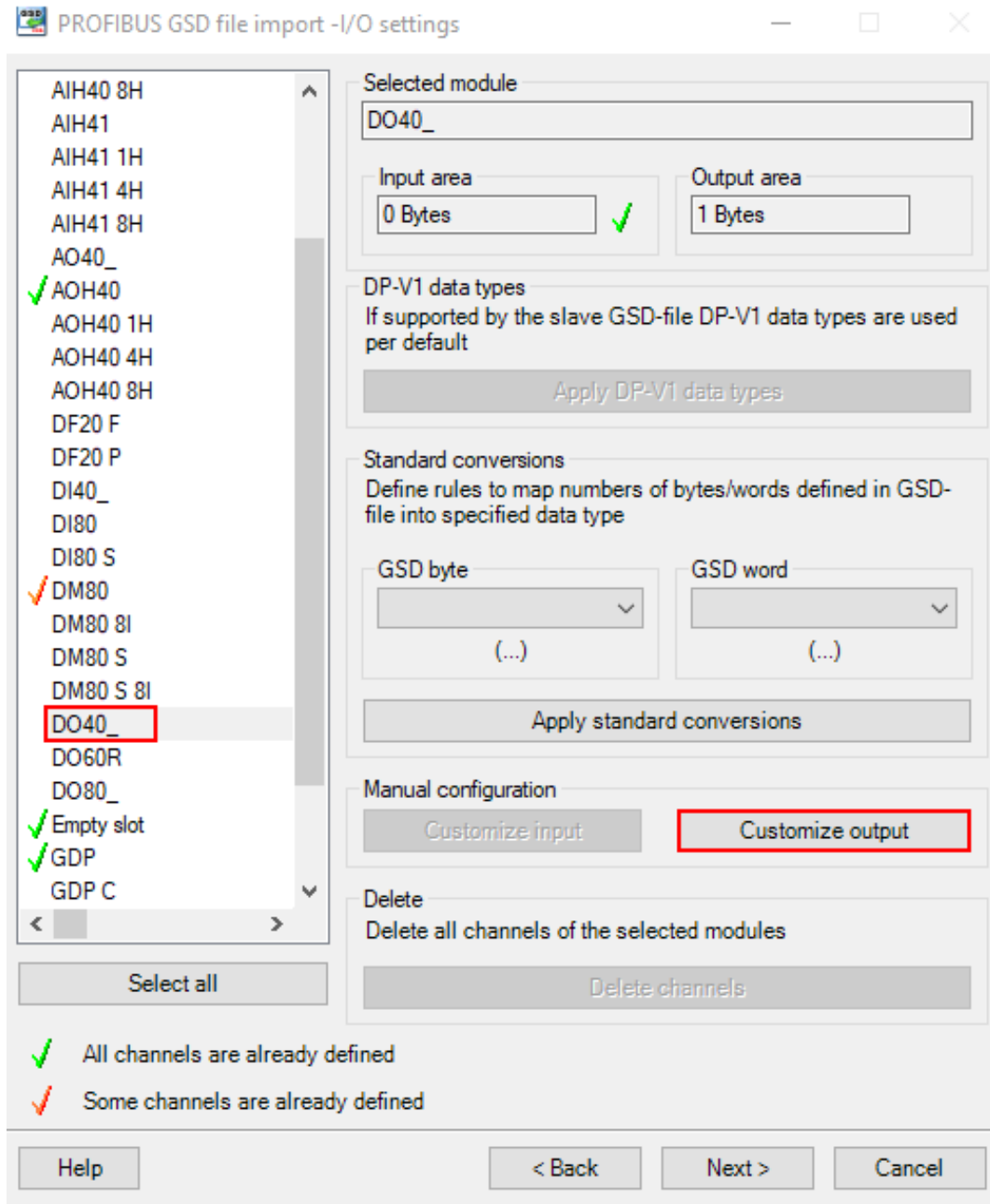


Fig. 20: Manually configuring DO40

- ▶ Select Bit 0...3.
- ▶ The drop-down menu opens automatically. Select **4X Bit Boolean**.

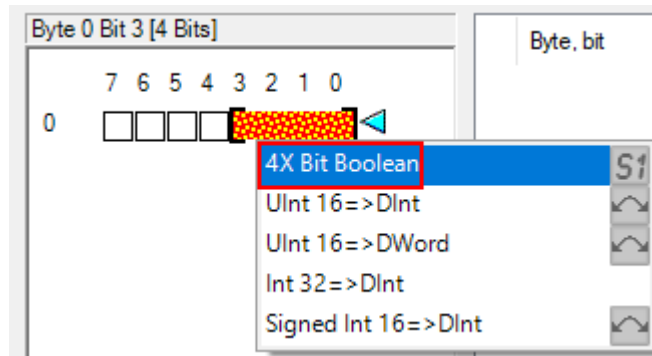


Fig. 21: Selecting **4X Bit Boolean** in the drop-down menu

⇒ Each bit can be set as an individual channel.

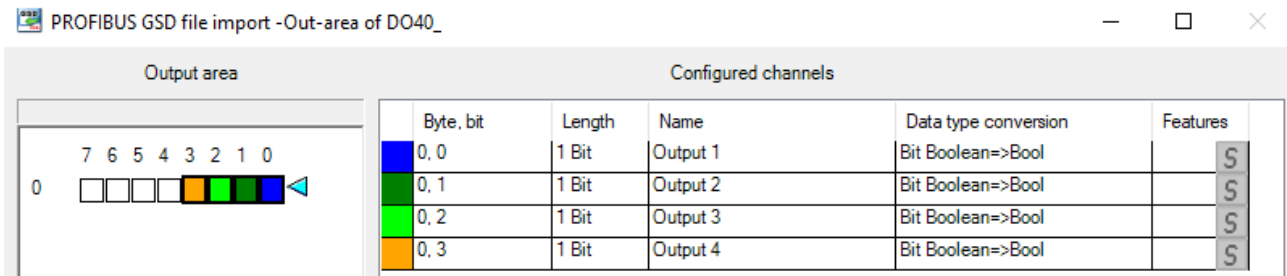


Fig. 22: DO40 – all channels are set

4.3.2 GSD signals – setting diagnostics

- ▶ Select **ChannelDiagCommon** in the left sidebar in **PROFIBUS GSD file import – Diagnostics settings** window at **excom (1_6_4)**.
- ▶ Tick **Enable diagnostics**, **Use identifier area for module diagnostics** and **Map device related diagnostics to module diagnostics** on the right.
- ▶ If the **Diagnostics pattern confirmation/edit** appears, use the default settings and click **OK**.

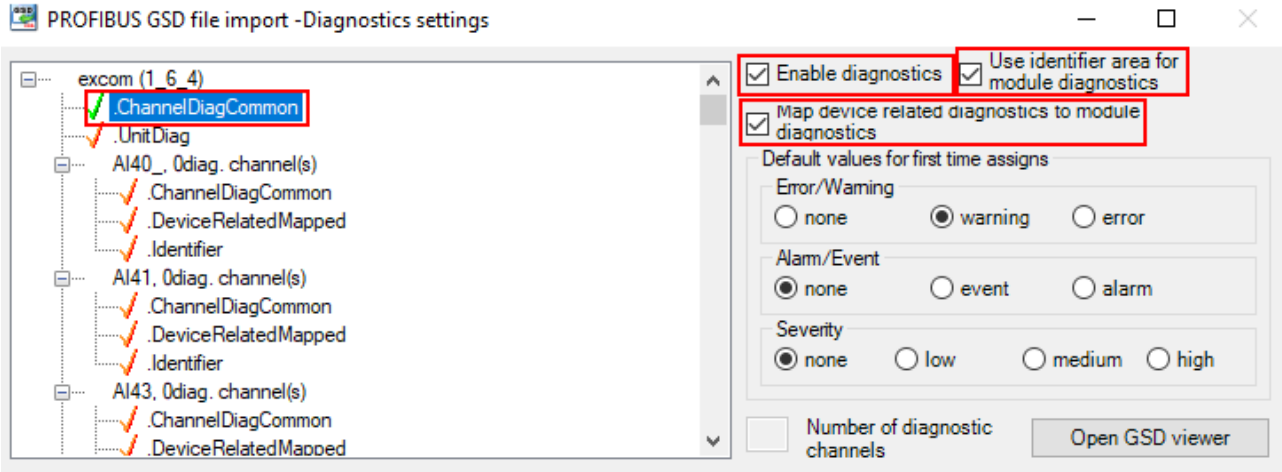


Fig. 23: PROFIBUS GSD file import – Diagnostics settings

- ▶ In the **PROFIBUS GSD file import – Diagnostics settings** window, select the module in the left sidebar.
- ▶ Under the required module select (here: **AIH40 1H**) **ChannelDiagCommon**.
- ⇒ The different diagnostics data is shown in the **Text** column. The diagnostics are assigned to a variable in the **Status bit** column.

PROFIBUS GSD file import -Diagnostics settings

Enable diagnostics Use identifier area for module diagnostics
 Map device related diagnostics to module diagnostics

Default values for first time assigns

Error/Warning: none warning error
 Alarm/Event: none event alarm
 Severity: none low medium high

9 Number of diagnostic channels

ID	Text	Statusbit	Error/Warning	Alarm/Event	Severity
1	Short circuit	DeviceSpecific01	warning	alam	medium
2	Undervoltage	none	none	none	none
3	Overvoltage	none	none	none	none
4	Overload	none	none	none	none
5	Overtemperature	none	none	none	none
6	Line break	DeviceSpecific02	warning	alam	medium
7	Upper limit value excee...	DeviceSpecific03	warning	alam	medium
8	Lower limit value excee...	DeviceSpecific04	warning	alam	medium
9	Error	none	none	none	none
16	Line error	none	none	none	none
17	Error 17	none	none	none	none
18	Internal address conflict	none	none	none	none
19	Unknown module confi...	none	none	none	none
20	Unknown module dete...	none	none	none	none
21	Ext. power supply missing	none	none	none	none
22	Parameter inconsistent	none	none	none	none
23	Error 23	none	none	none	none
24	Error 24	none	none	none	none

All diagnostics or all status bits are already in use
 More diagnostics can be configured here

Fig. 24: AIH40 1H – setting diagnostics

To set the diagnostics settings for all modules:

- ▶ Right-click the configured **ChannelDiagCommon**.
- ▶ Click **Apply to all**.

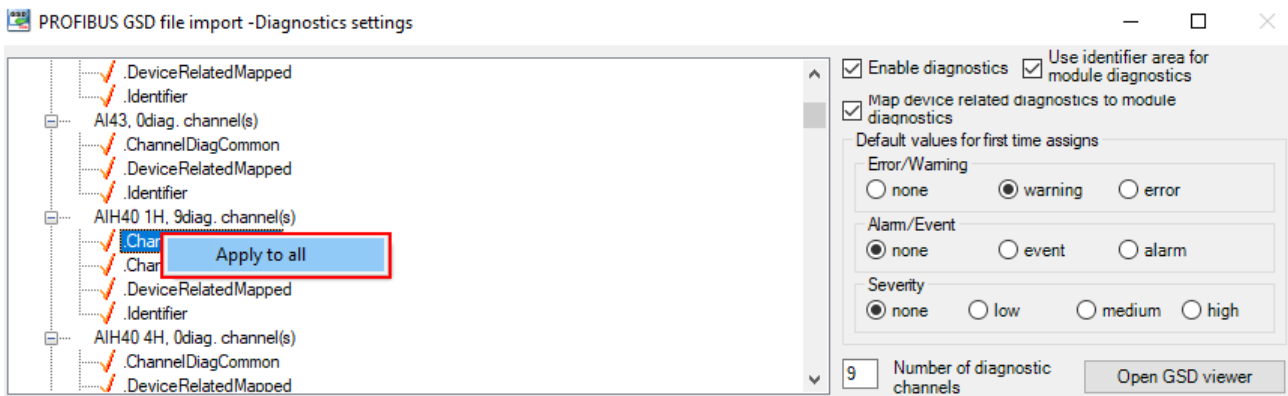


Fig. 25: Applying the diagnostics settings to all modules

- ⇒ The diagnostics settings are applied to all modules.
- ▶ In the system description for the excom I/O system check which diagnostics information is transferred.

4.4 Adding excom I/O modules to the AC 800M

Inserting the GSD configuration file in the AC 800M

- ▶ Right-click the PROFIBUS controller (here: **NEWTON CI854**) in **ABB Compact Control Builder AC 800M**.
- ⇒ The **Insert UNIT for CI854** window opens.
- ▶ Right-click **excom (1_6_4)**.
- ▶ Click **Insert**.

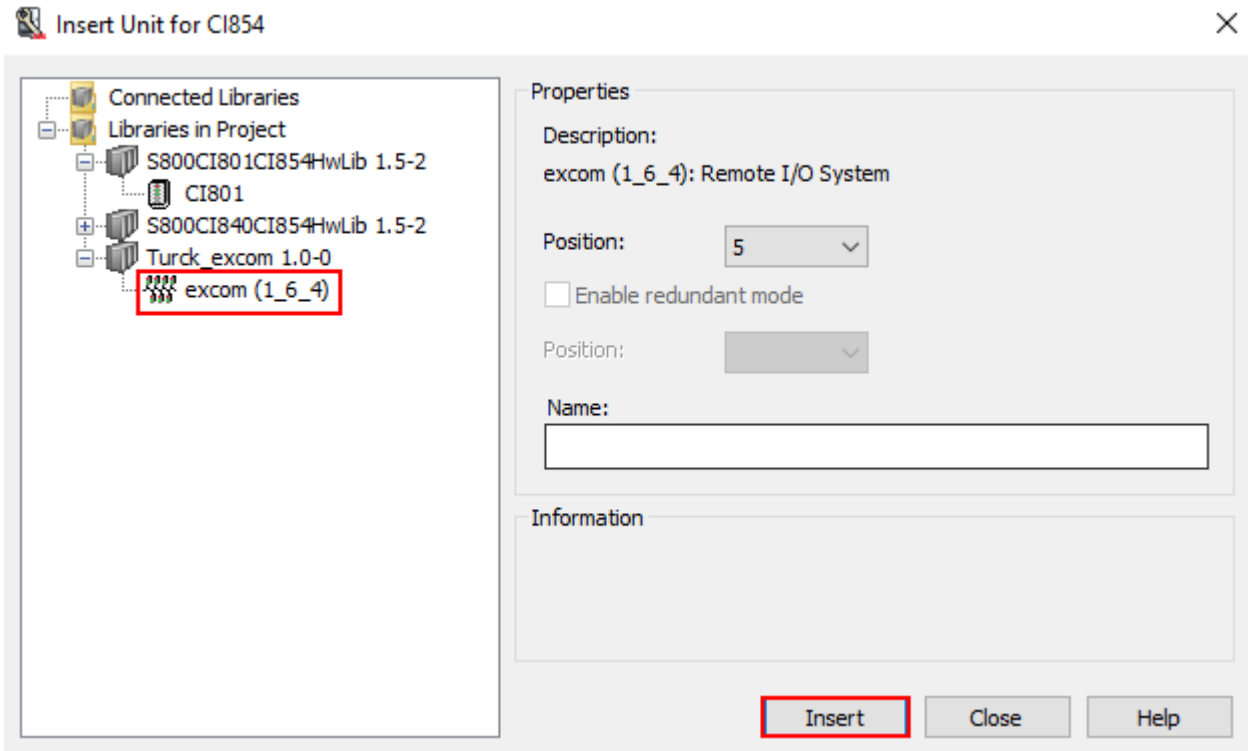


Fig. 26: Insert UNIT for CI854 window

- ▶ Confirm the query window with **Yes**.

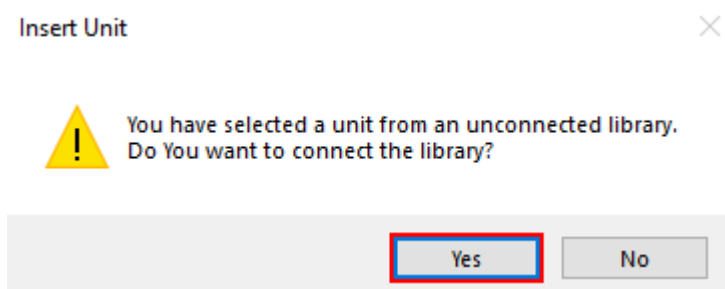


Fig. 27: Query window – Insert Unit

- ▶ Select the modules fitted in the rack in the left sidebar.
- ▶ Set up the excom station according to the physical setup. Note the corresponding position on the rack (here: **GDP C – Position: 0**).
- ▶ Click **Insert**.

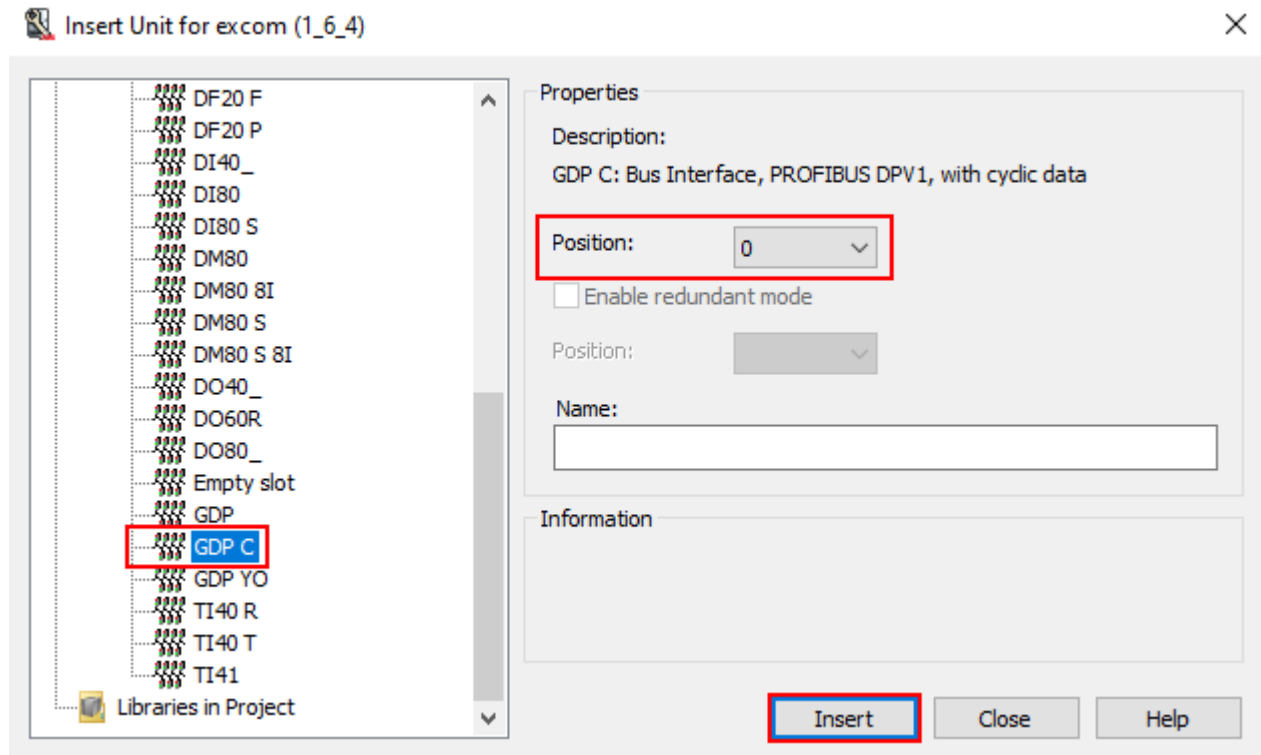
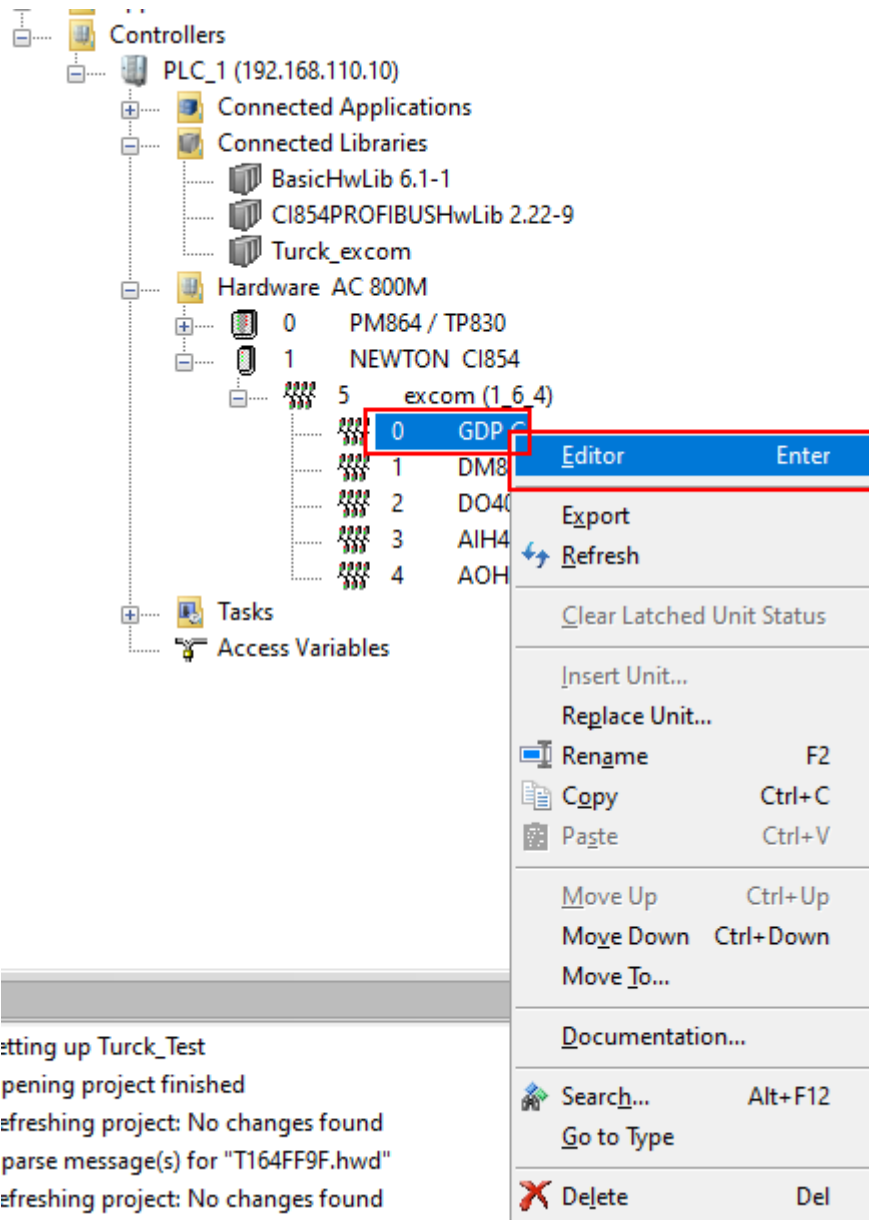


Fig. 28: Example: GDP C – position 0

4.5 Setting excom I/O module parameters

- ▶ In Control Builder AC 800M at **Controllers** → **excom (1_6_4)** select the module (here: **GDP C**).
- ▶ Right-click the module.
- ▶ Click **Editor**.
- ⇒ The **Hardware – PLC_1.1.5.0** window opens.



```

Setting up Turck_Test
Opening project finished
Refreshing project: No changes found
Parse message(s) for "T164FF9F.hwd"
Refreshing project: No changes found

```

Fig. 29: Selecting a module

- ▶ Click the **Settings** tab.
- ⇒ The different parameters can be viewed in the **Parameter** column. The values of the parameters can be set at **Value**.

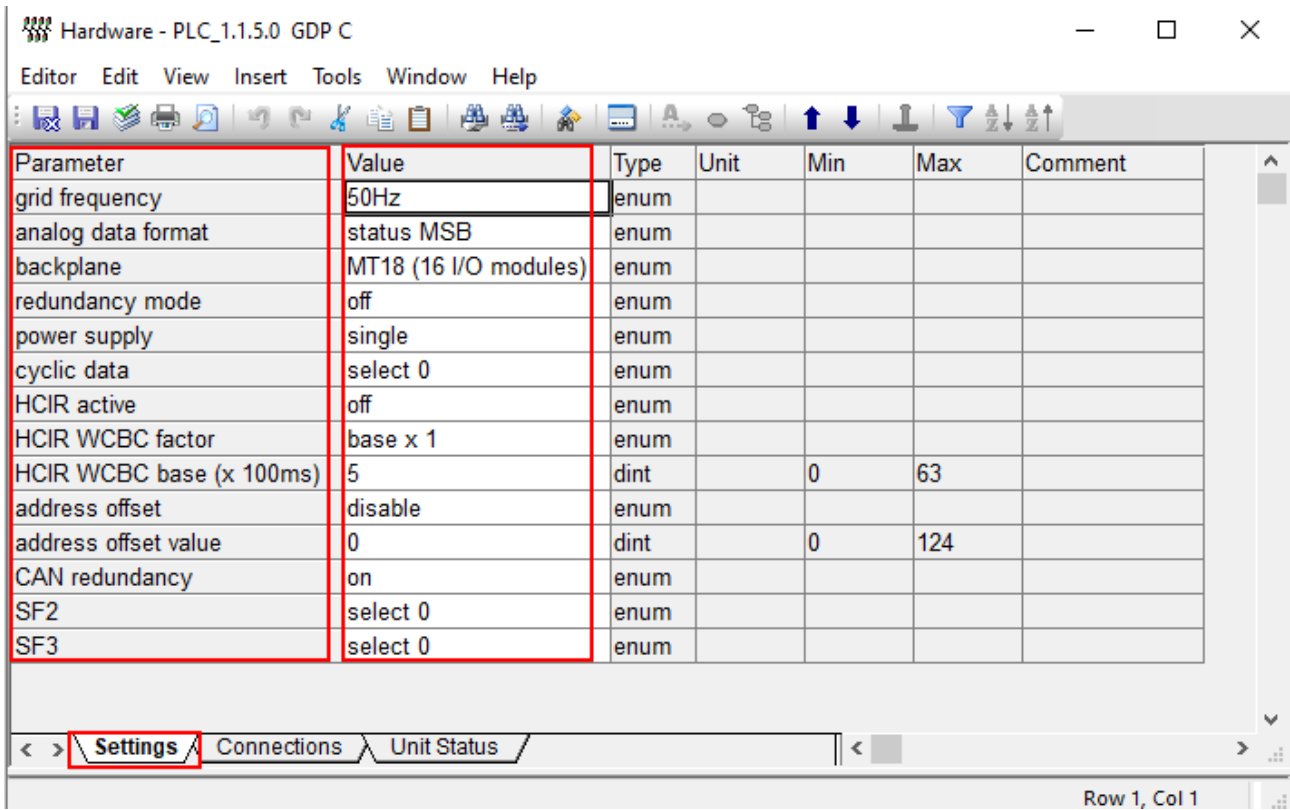


Fig. 30: Example setting of gateway parameters

4.6 Configuring I/O data

- ▶ Choose **Turck_Test** → **Applications**.
- ▶ Right-click **Diagrams** at **Application_1 – (PLC_1.Normal)**.
- ▶ Click **New Diagram...**

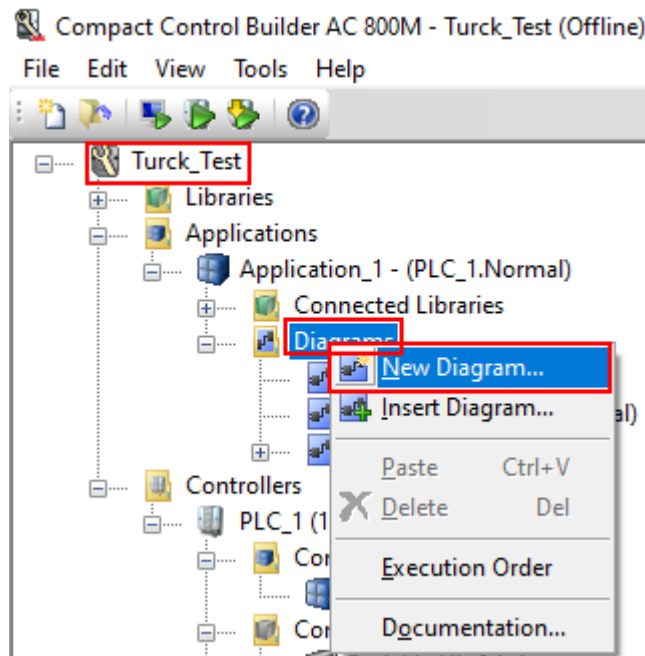


Fig. 31: Diagrams – New Diagram...

- ▶ Choose the **Variables** tab.
- ▶ In the **Data Type** column set the data type that was selected at the GSD signal import.

Diagram - Application_1.Turck_Test

Editor Edit View Insert Tools Window Help

	Name	Data Type	Start Attribute	Attributes
1	AIH40_CH1	dint	retain	hidden
2	AIH40_CH2	dint	retain	hidden
3	AIH40_CH3	dint	retain	hidden
4	AIH40_CH4	dint	retain	hidden
5	DM80_CH1	bool	retain	hidden
6	DM80_CH2	bool	retain	hidden
7	DM80_CH3	bool	retain	hidden
8	DM80_CH4	bool	retain	hidden
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				

< > Variables Communication Variables Signals Functi

Fig. 32: Variables – setting a data type

Module editor

- ▶ In **ABB Compact Control Builder AC 800M** at **Controllers** → **excom (1_6_4)** select the module (here: **AIH40 1H**).
- ▶ Right-click the module.
- ▶ Click **Editor**.
- ⇒ The **Hardware – PLC_1.1.5.0** window opens.
- ▶ Click the **Connections** tab.
- ▶ Select the required variable via the **Insert Path from Tree** icon and assign it to the channel.

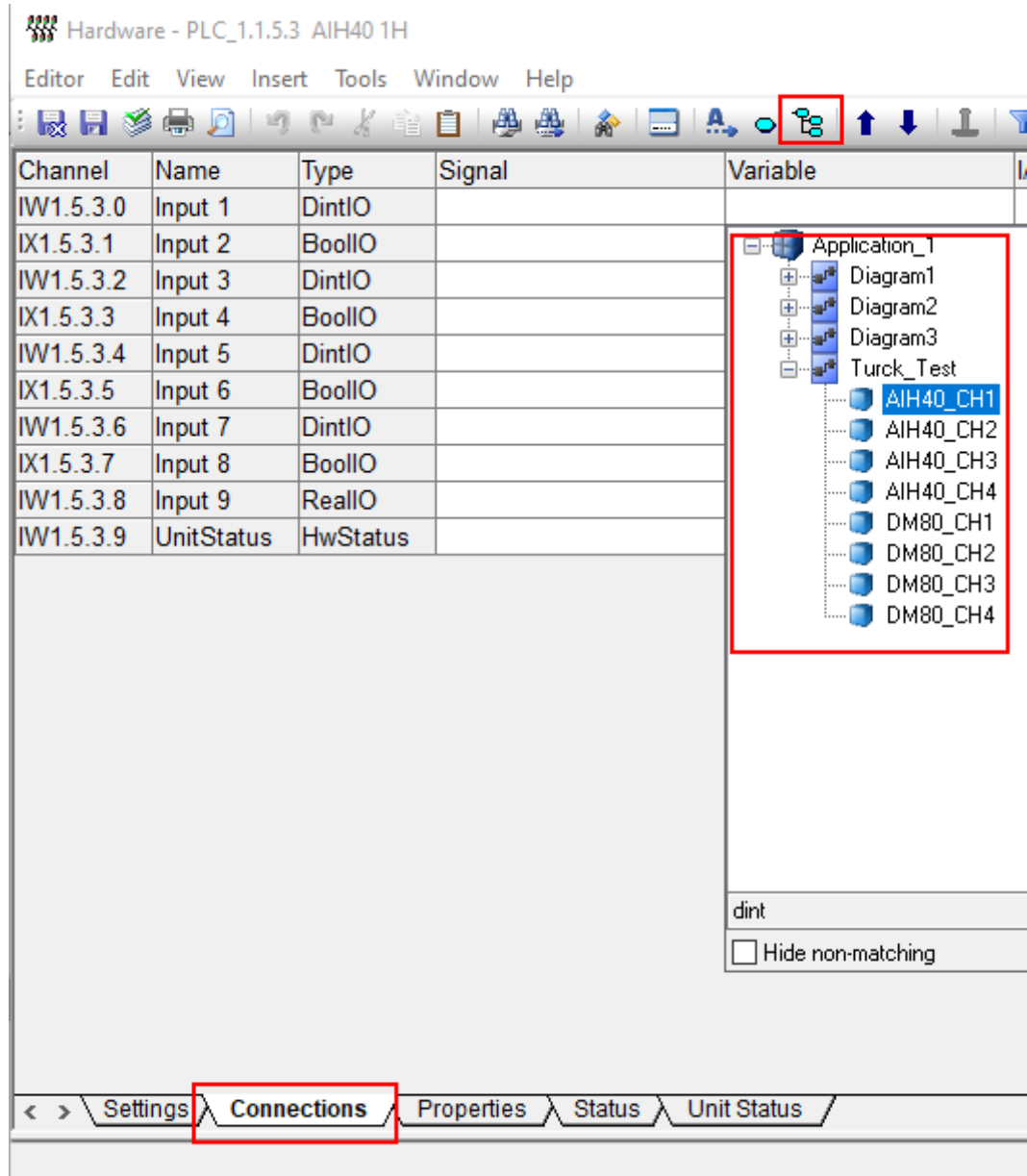


Fig. 33: Assigning a variable to the channel

4.7 Loading the current configuration into the AC 800M

After the excom system is configured and parameterized, the current configuration must be loaded in the system controller. The system outputs an error message if the set variables are not used in the application.

- ▶ Click the **Download Project and Go Online** icon in the menu bar.

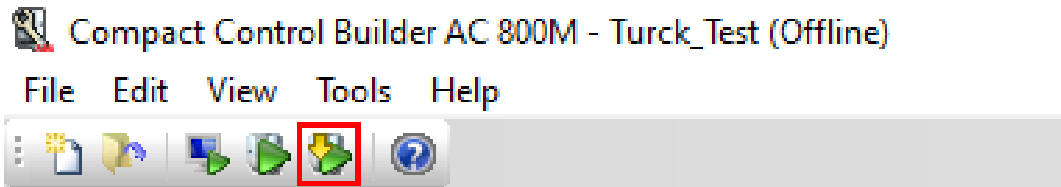


Fig. 34: Menu bar – XY

- ⇒ The **Compact Control Builder AC 800M - Turck_Test (Online)** window opens.

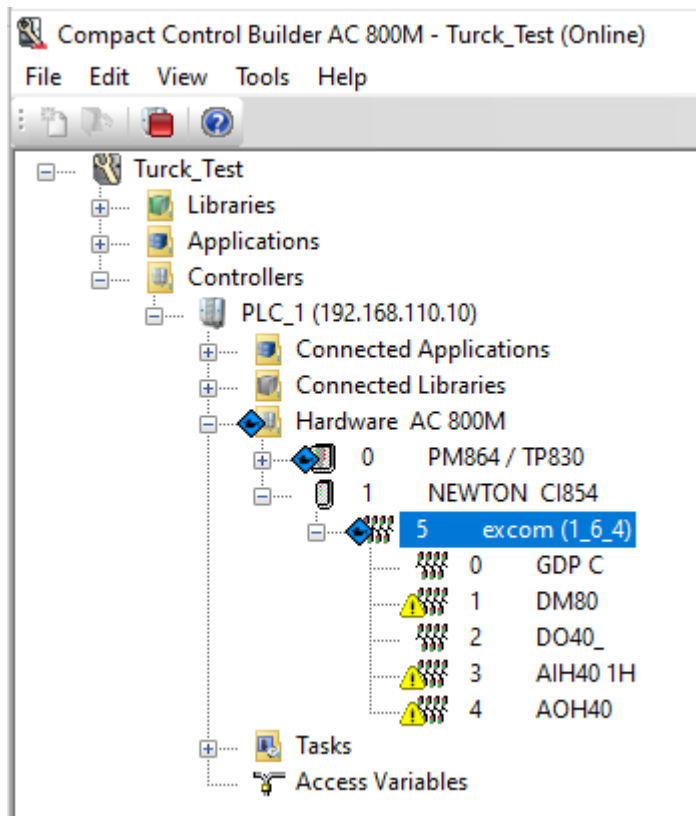


Fig. 35: Compact Control Builder AC 800M - Turck_Test (Online) window

4.8 Online mode

After the download, the view switches to Online mode.

In Online mode, the diagnostics information and read data can be read in the modules used.

In this example **Input 1**, **Input 3**, **Input 5** and **Input 7** represent the measured input current. **Input 1** and **Input 3** also represent the substitute value. **Input 9** represents the HART variable.

Channel	Name	Channel Value	Forced	Variable Value	Signal	Variable
IW1.5.3.0	Input 1	3600	<input checked="" type="checkbox"/>	3600	AIH40_Channel_1	Application_1.Turck_Test.AI40_CH1
IX1.5.3.1	Input 2		<input type="checkbox"/>			
IW1.5.3.2	Input 3	3600	<input type="checkbox"/>	3600	AIH40_Channel_2	Application_1.Turck_Test.AI40_CH2
IX1.5.3.3	Input 4		<input type="checkbox"/>			
IW1.5.3.4	Input 5	5174	<input type="checkbox"/>	5174	AIH40_Channel_3	Application_1.Turck_Test.AI40_CH3
IX1.5.3.5	Input 6		<input type="checkbox"/>			
IW1.5.3.6	Input 7	6924	<input type="checkbox"/>	6924	AIH40_Channel_4	Application_1.Turck_Test.AI40_CH4
IX1.5.3.7	Input 8		<input type="checkbox"/>			
IW1.5.3.8	Input 9	7.3	<input type="checkbox"/>	7.3	HART_Variable_1	Application_1.Turck_Test.AI40_HV1

Fig. 36: Reading out diagnostics information and data in Online mode

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