Anybus® X-gateway™ PROFINET

with Siemens S7-1500 PLC & TIA Portal

APPLICATION NOTE

SCM-1202-052 1.0 ENGLISH

HMS Connecting Devices™

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1 Preface

This document explains how to configure PROFINET communication between an Anybus X-gateway and a Siemens S7-1500 PLC using TIA Portal software.

More documentation and downloads can be found at www.anybus.com/support. For more info regarding the PLC and TIA Portal, please visit the manufacturer's support website.

1.1 Document History

Version	Date	Description
1.0	2017-09-25	First release

1.2 Document Conventions

Ordered lists are used for instructions that must be carried out in sequence:

1. First do this
2. Then do this

Unordered (bulleted) lists are used for:

- Itemized information
- Instructions that can be carried out in any order

...and for action-result type instructions:

► This action...

➡ leads to this result

Bold typeface indicates interactive parts such as connectors and switches on the hardware, or menus and buttons in a graphical user interface.

```
Monospaced text is used to indicate program code and other
kinds of data input/output such as configuration scripts.
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This is a cross-reference within this document: *Document Conventions, p. 3*

This is an external link (URL): www.hms-networks.com

This is additional information which may facilitate installation and/or operation.

This instruction must be followed to avoid a risk of reduced functionality and/or damage to the equipment, or to avoid a network security risk.

Caution
This instruction must be followed to avoid a risk of personal injury.

WARNING
This instruction must be followed to avoid a risk of death or serious injury.

2 General

2.1 Prerequisites

- A basic knowledge of how to use Anybus Configuration Manager - X-gateway and Siemens TIA Portal is assumed.
- The PLC must already be set up in Siemens TIA Portal.
- Network communication must already be configured in the Anybus X-gateway.

2.2 Data Exchange Model

The data to be exchanged between the network interfaces in the Anybus X-gateway reside in the same internal memory. The networks read and write data to memory locations that have been specified in Anybus Configuration Manager - X-gateway. These memory locations are then exchanged between the networks.

The data exchange model is different depending on if the X-gateway has a master/slave or slave/slave configuration.

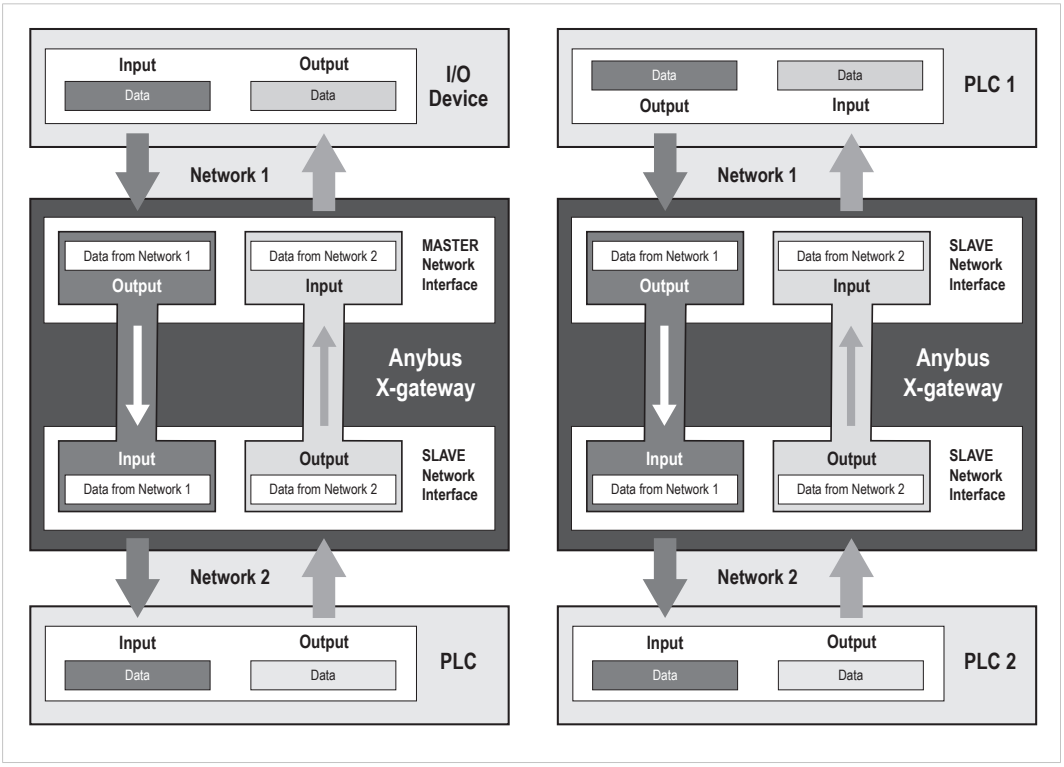

Fig. 1 Data exchange models for master/slave and slave/slave X-gateways

See also the User Manual and Network Guides for the specific Anybus X-gateway.

3 Anybus X-gateway Configuration

3.1 I/O Data Sizes

The byte sizes of input and output data in the Anybus X-gateway should be set up in Anybus Configuration Manager - X-gateway to match the application.

Setup will be slightly different depending on the network type and if using a master/slave or slave/slave configuration. See also *Data Exchange Model, p. 4*.

Examples of Master/Slave and Slave/Slave configurations

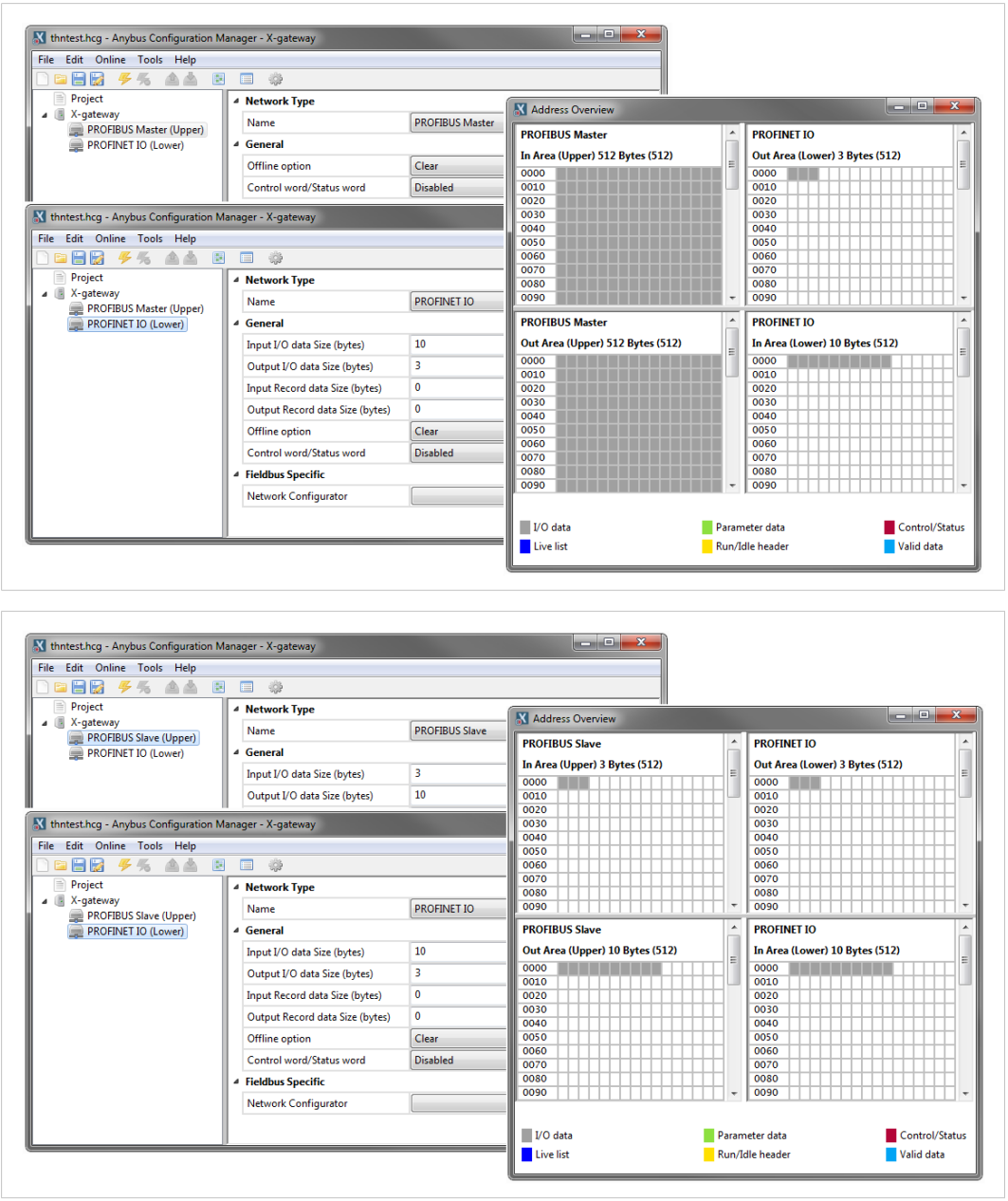

Fig. 2 Anybus Configuration Manager

See the documentation for the X-gateway and Anybus Configuration Manager - X-gateway for more information.

4 Siemens TIA Portal Configuration

This section describes how to configure the PROFINET interface of the Anybus X-gateway in Siemens TIA Portal.

4.1 Adding the Anybus Device

To include the Anybus X-gateway in the PROFINET network, a GSDML file for the device must be imported into the configuration tool. GSDML files can be downloaded from the support page for the gateway at www.anybus.com/support.

1. In the **Options** menu in TIA Portal, select **Manage general station description files (GSD)**.

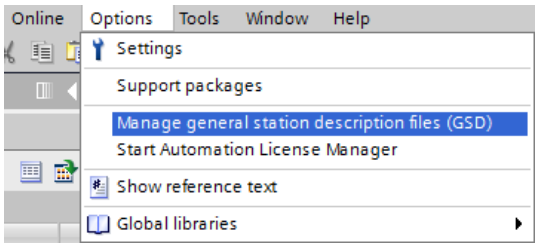

Fig. 3 Options menu

After the GSDML file has been imported into the configuration tool the Anybus X-gateway will be available in the hardware catalog.

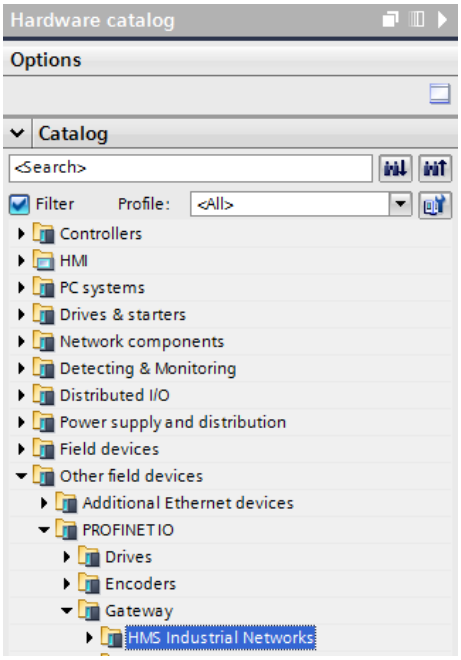

Fig. 4 Hardware catalog

RT Standard	Use with newer PLC hardware such as S7-1200 and S7-1500
RT Migration	Use with older PLC hardware such as S7-300
RT Migration (FW>=4.02)	Use with older PLC hardware such as S7-300 in combination with Anybus Configuration Manager - X-gateway version 4.02 or higher

2. Open the **Network View** tab to show the PROFINET network.
3. Drag the Anybus X-gateway module from the hardware catalog into the network view.

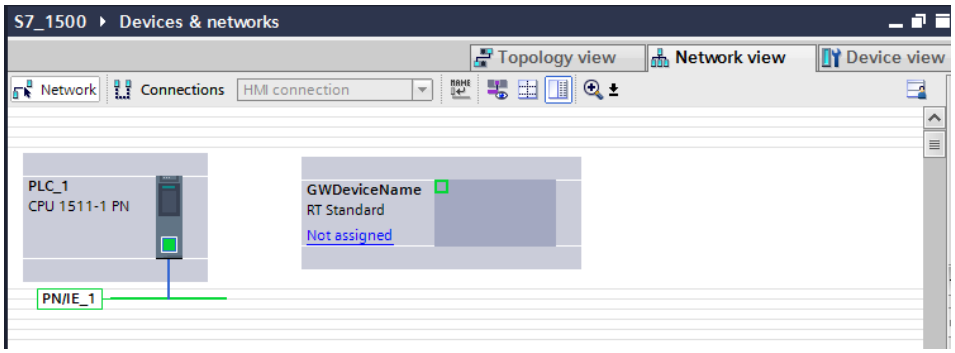

Fig. 5 Network view

4. Double-click on the Anybus X-gateway in the Network View to open the **Device View**.

   The device can be given a name in the **General** section of the **Properties** tab. In this example the device is named **GWDeviceName**.

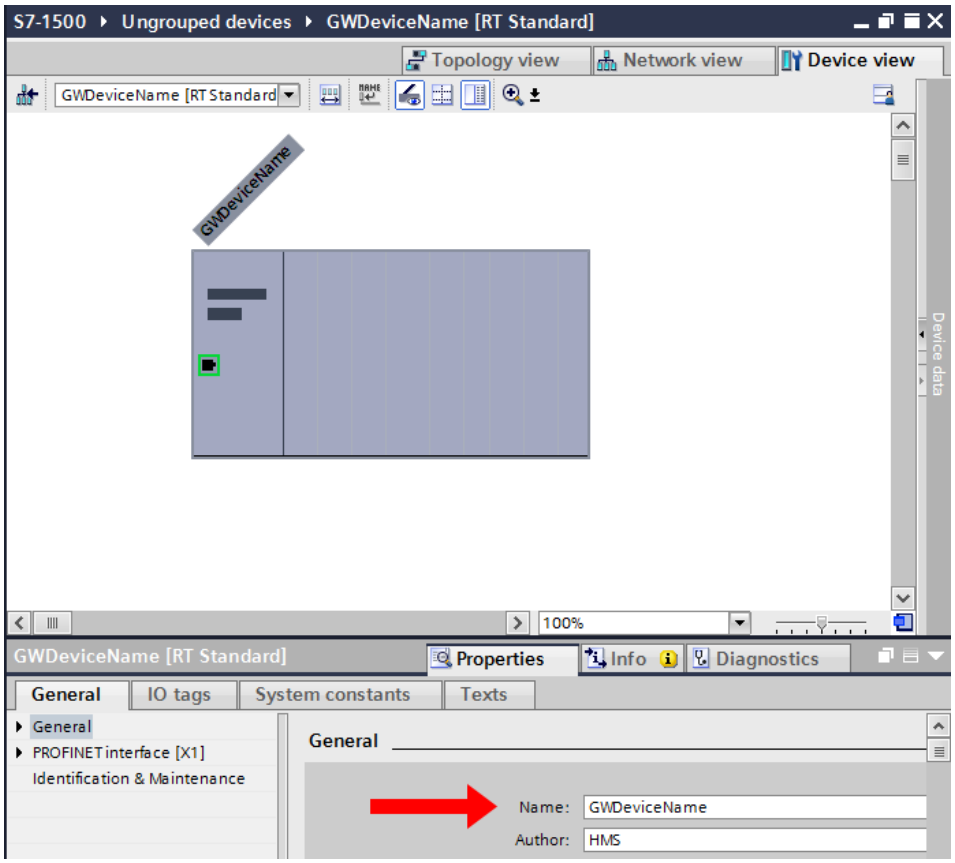

Fig. 6 Properties tab

5. In the **PROFINET interface** section, select **PN/IE_1** as the subnet.

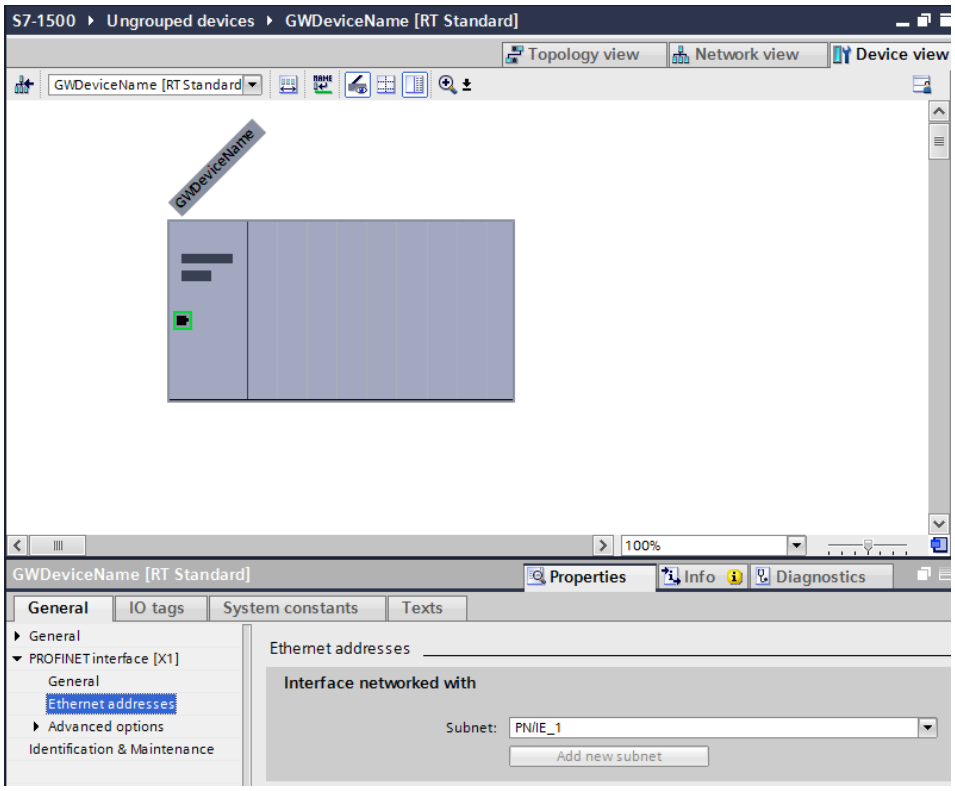

Fig. 7 Add module to network

6. Input and Output modules can now be added from the hardware catalog to match the data sizes set in Anybus X-gateway — in this example, 10 bytes input and 3 bytes output.

   Drag an **Input 008 bytes** and an **Input 002 bytes** module from the hardware catalog into the **Device overview** list to configure 8+2 = 10 input bytes.

   Drag an **Output 002 bytes** and an **Output 001 bytes** module into the **Device overview** list to configure 2+1 = 3 output bytes.

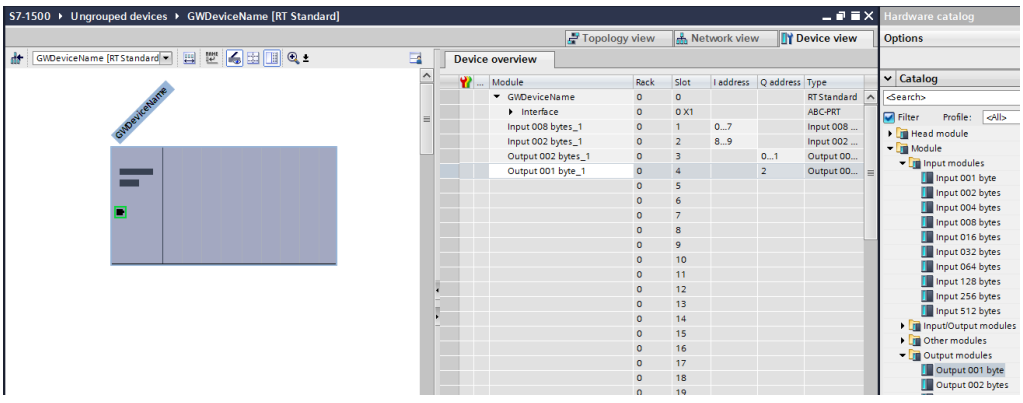

Fig. 8 Adding modules

> **!** Make sure that the module addresses are within the process image of the PLC.

4.2 Assigning a Device Name

A **Device Name** must be assigned to each configured device before downloading the PLC hardware configuration.

1. Right-click on the device in the **Device View** and select **Assign device name**.

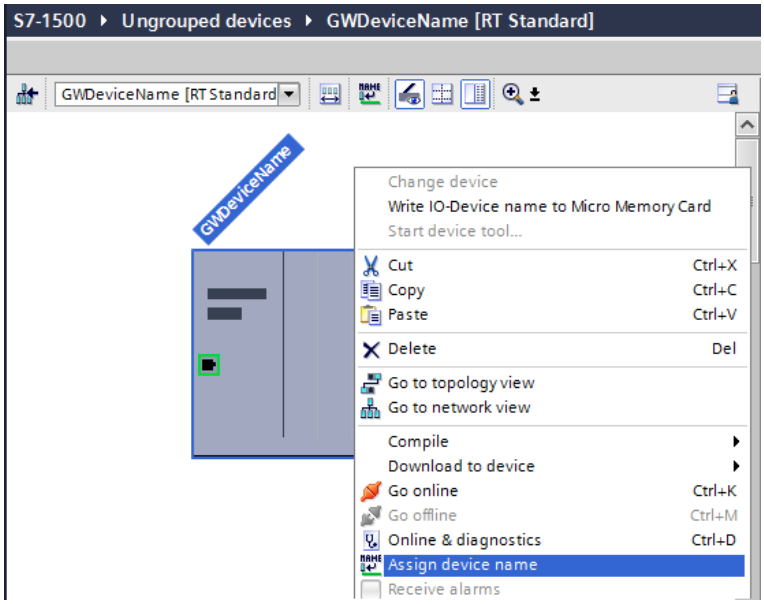

Fig. 9 Device view

2. Set **PROFINET device name** to **gwdevicename**.
3. In the device table, select **gwdevicename**.
4. Click on **Assign Name** to assign this device name to the X-gateway.

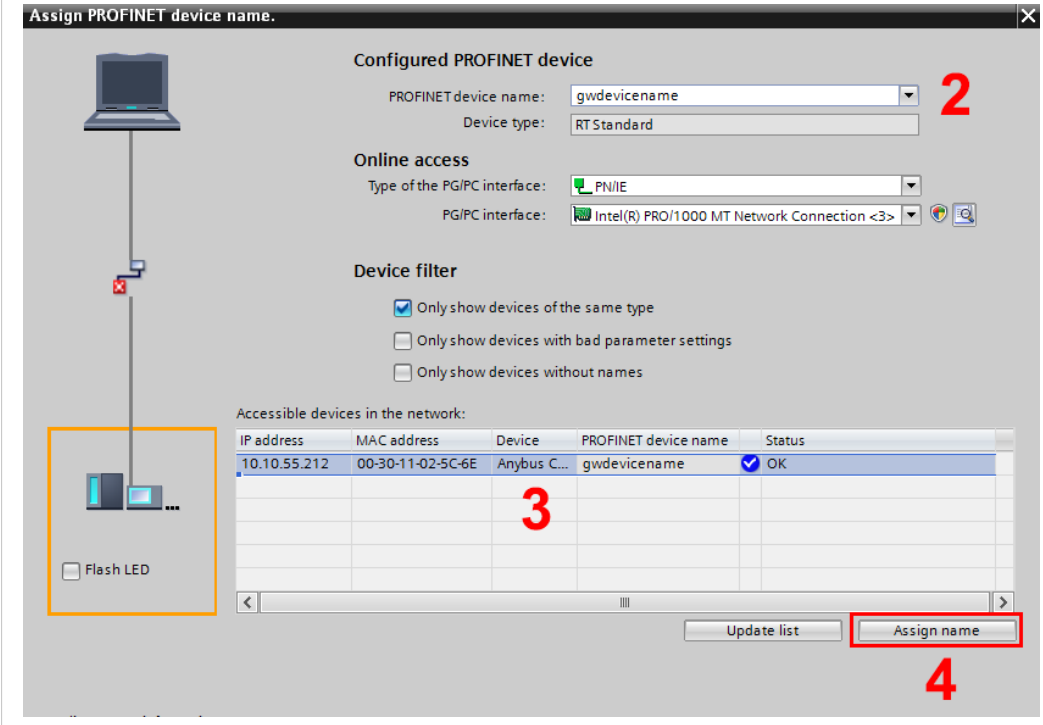

Fig. 10 Assigning a device name

4.3 Compile and Download

The project should now be saved and compiled for downloading and testing.

1. Save the project.
2. Right-click on the PLC and select **Compile ► Hardware and software**.

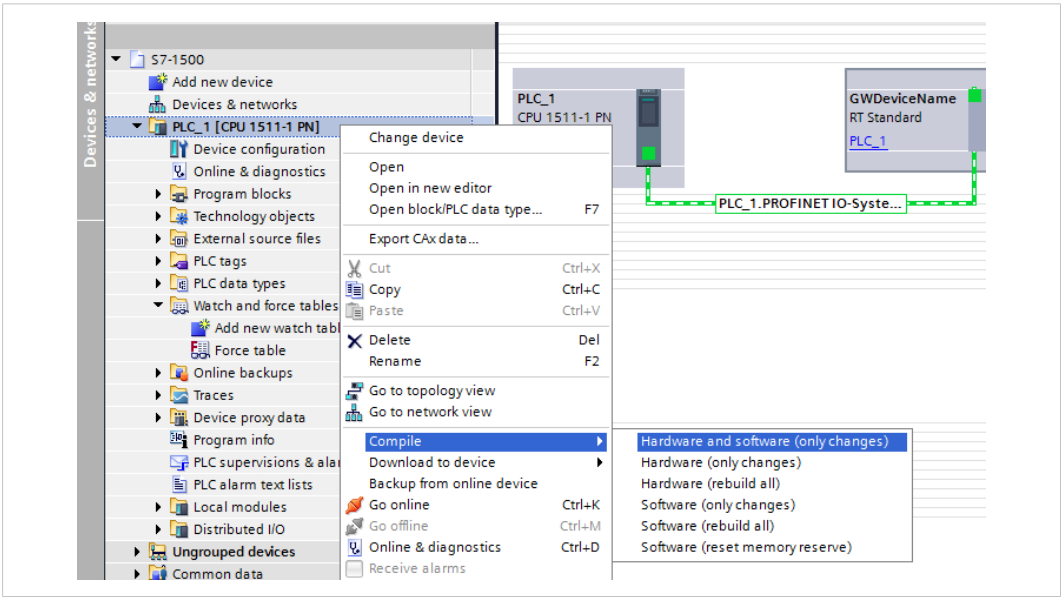

Fig. 11 Compiling

3. When the project has been compiled, right-click on the PLC again and select **Download to device ► Hardware and software**
4. In the next dialog, change **No action** to **Stop all** to enable downloading, then click on **Load**.

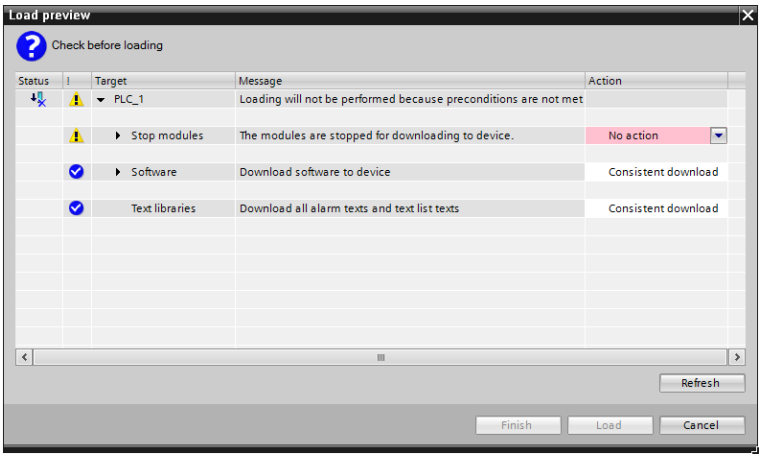

Fig. 12 Load preview

4.4 Go Online

1. Right-click on the PLC in the project tree and select **Go online** to bring the project online (additional steps may be required depending on your actual setup).
2. When online, go to the **PLC tags** table. Right-click on a tag and select **Monitor all**.

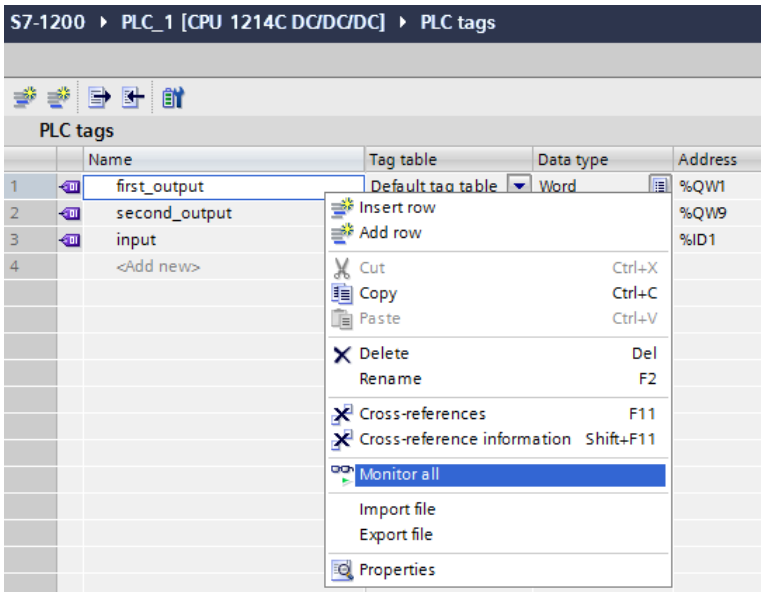

Fig. 13 PLC tags table

3. The **input_1** tag will now show the first input double word value from the gateway.

   The **first_output** tag will write the (force) value #00AA to the output table of the gateway.

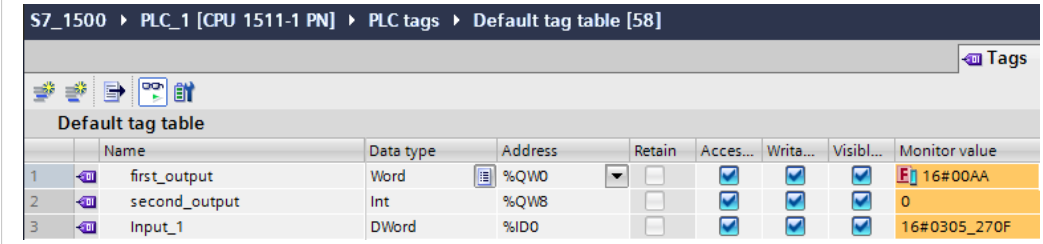

Fig. 14 Monitoring PLC tags

See also *Watch and Force Tables, p. 12*.

4.5 Watch and Force Tables

The **Watch table** can contain input and output tags for viewing data. The tag must contain a name and a data type. For the address field, refer to the addresses configured in the PLC hardware configuration.

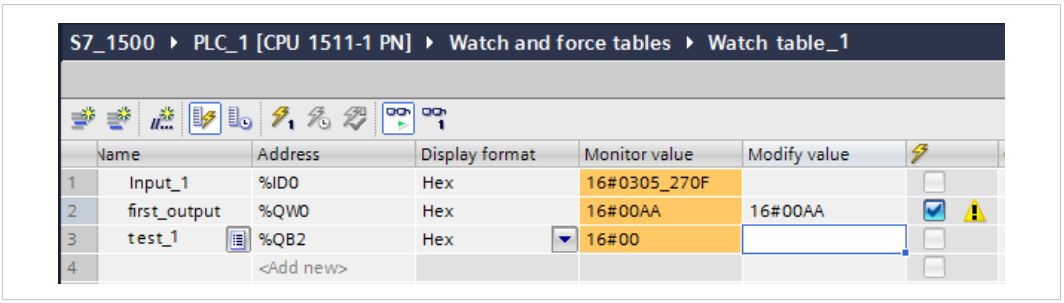

Fig. 15 Watch table

Output tags can also be added to the **Force table**. In this example a tag **first_output** has been added, which contains the force value **#00AA** and references the first output address of the Anybus X-gateway.

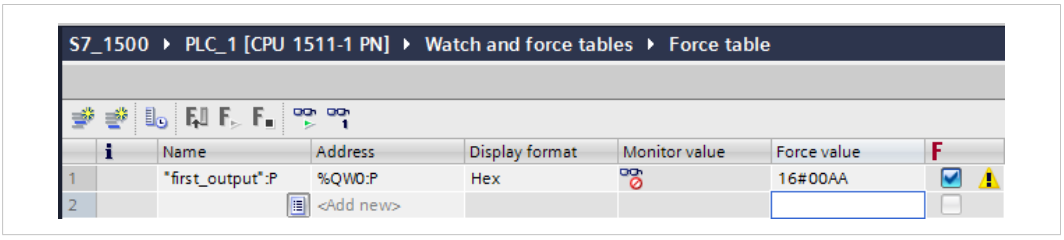

Fig. 16 Force table

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