



Anybus[®] Communicator[™] PROFINET

with Siemens S7-1500 PLC & TIA Portal

APPLICATION NOTE

SCM-1202-046 1.1 ENGLISH

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1 Preface

This document explains how to configure PROFINET communication between an Anybus Communicator 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 Siemens support website.

1.1 Document History

Version	Date	Description
1.0	2017-09-19	First release
1.1	2017-09-25	Minor corrections

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.

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 - Communicator RS232/422/485 and Siemens TIA Portal is assumed.
- The PLC must already be set up in Siemens TIA Portal.
- The subnetwork must already be configured in the Anybus Communicator.

2.2 Data Exchange Model

The data to be exchanged between the serial subnetwork and the fieldbus or industrial Ethernet network reside in the same internal memory in the Anybus Communicator. In order to exchange data with the serial subnetwork, the fieldbus or Ethernet network reads and writes data to memory locations that have been specified in Anybus Configuration Manager - Communicator RS232/422/485. These memory locations are then exchanged on the subnetwork.

In this example, a temperature regulator in the serial subnetwork exchanges data with a PLC via the internal memory buffers in the Communicator.

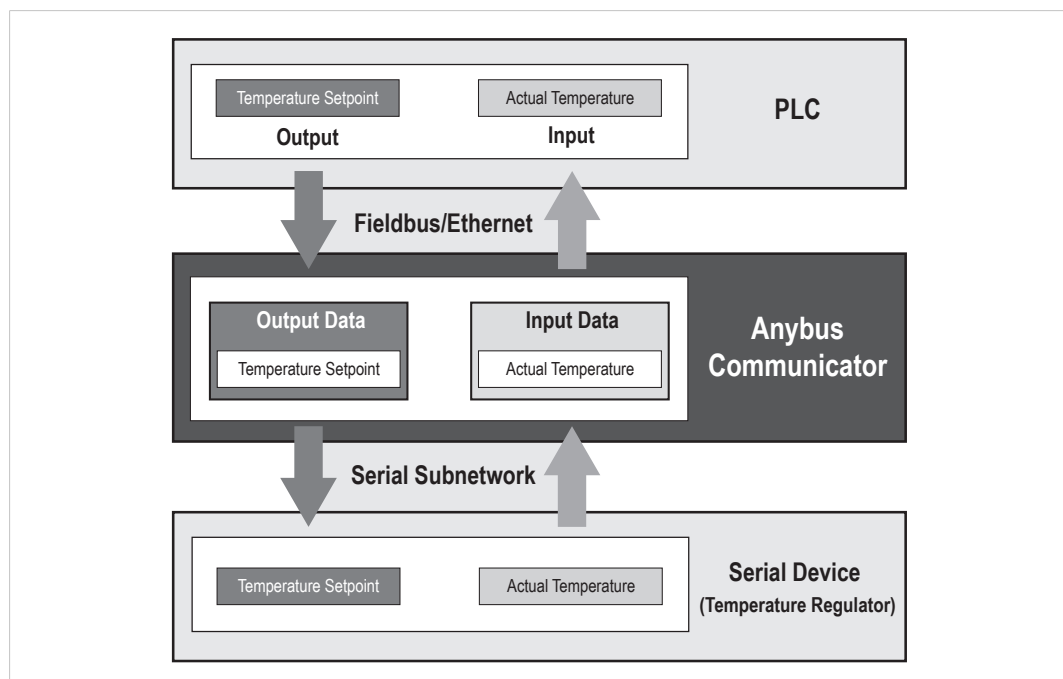


Fig. 1 Example of data exchange

See also the User Manual for the Anybus Communicator.

3 Anybus Communicator Configuration

3.1 I/O Data Sizes

The serial configuration for each application in Anybus Communicator will have a different amount of input/output data size. In this example, the application has been set up for 10 bytes of input data and 3 bytes of output data.

In Anybus Configuration Manager - Communicator RS232/422/485, right-click on **Subnetwork** and select **Subnetwork Monitor** to check the data size of the application:

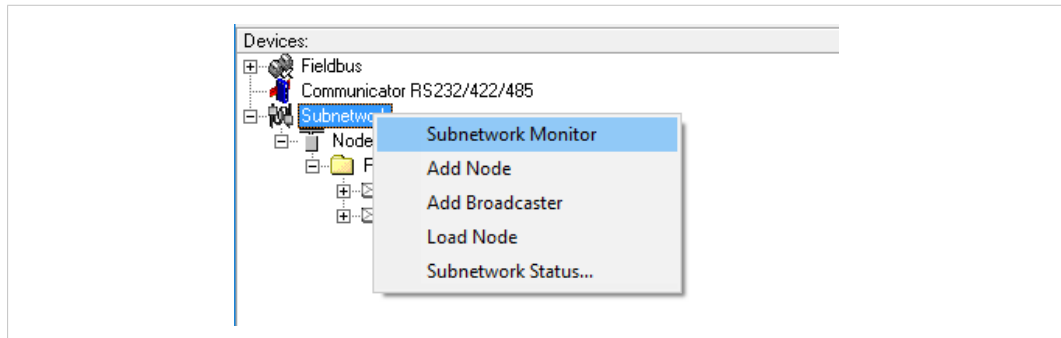


Fig. 2 Accessing the Subnetwork Monitor

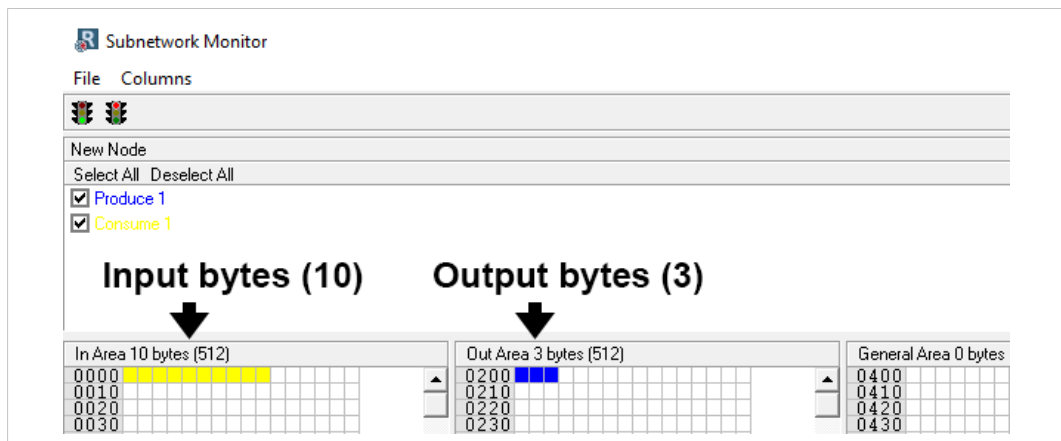


Fig. 3 Subnetwork Monitor

If no boxes are colored, the serial interface of the Anybus Communicator has not yet been configured. You must configure serial communication before proceeding.

4 Siemens TIA Portal Configuration

4.1 Adding the Anybus Device

To include the Anybus Communicator 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)**.

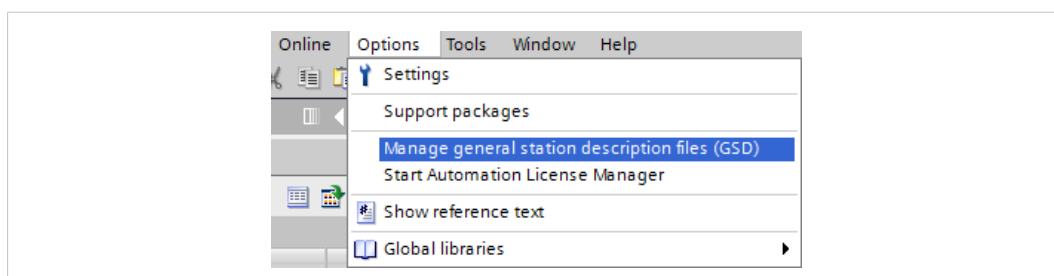


Fig. 4 Options menu

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

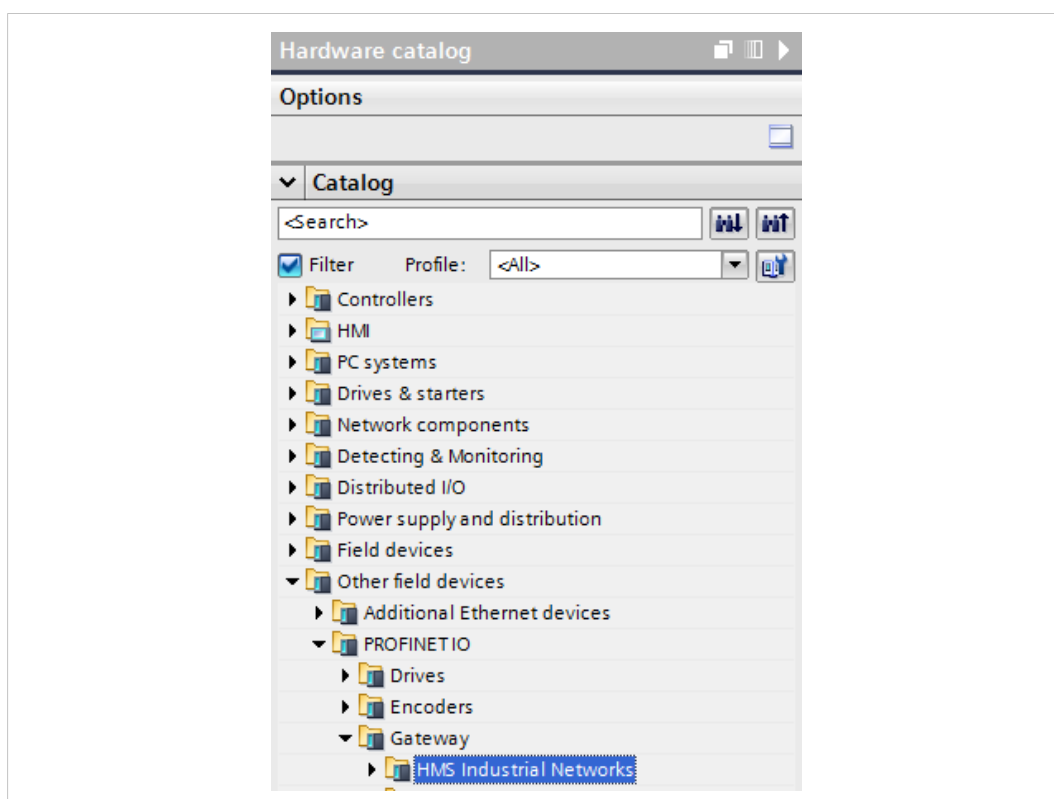


Fig. 5 Hardware catalog

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 - Communicator RS232/422/485 version 4.02 or higher

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

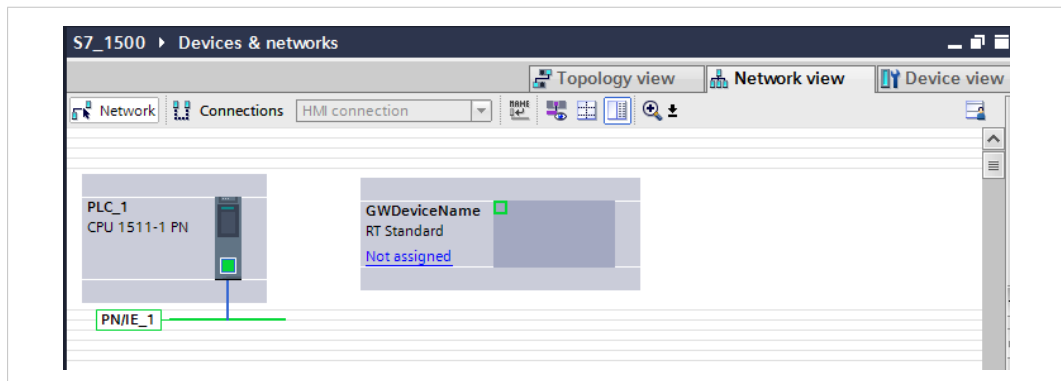


Fig. 6 Network view

4. Double-click on the Anybus Communicator 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**.

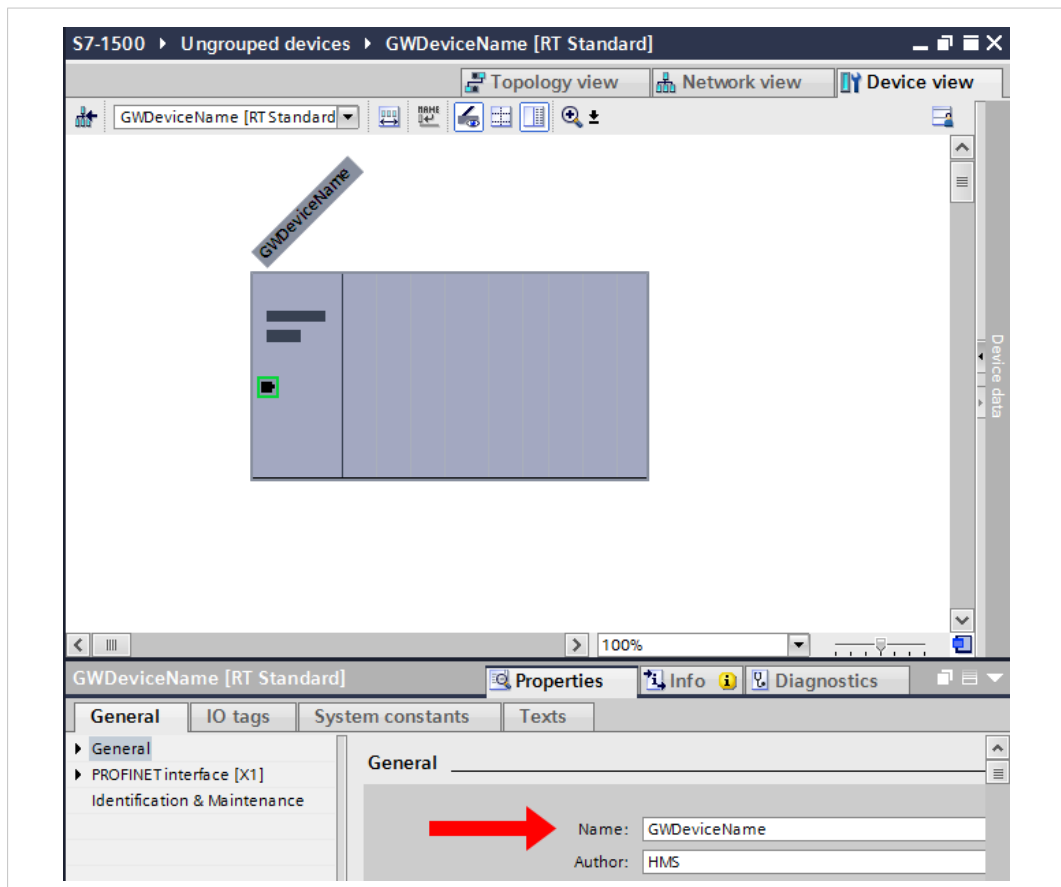


Fig. 7 Properties tab

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

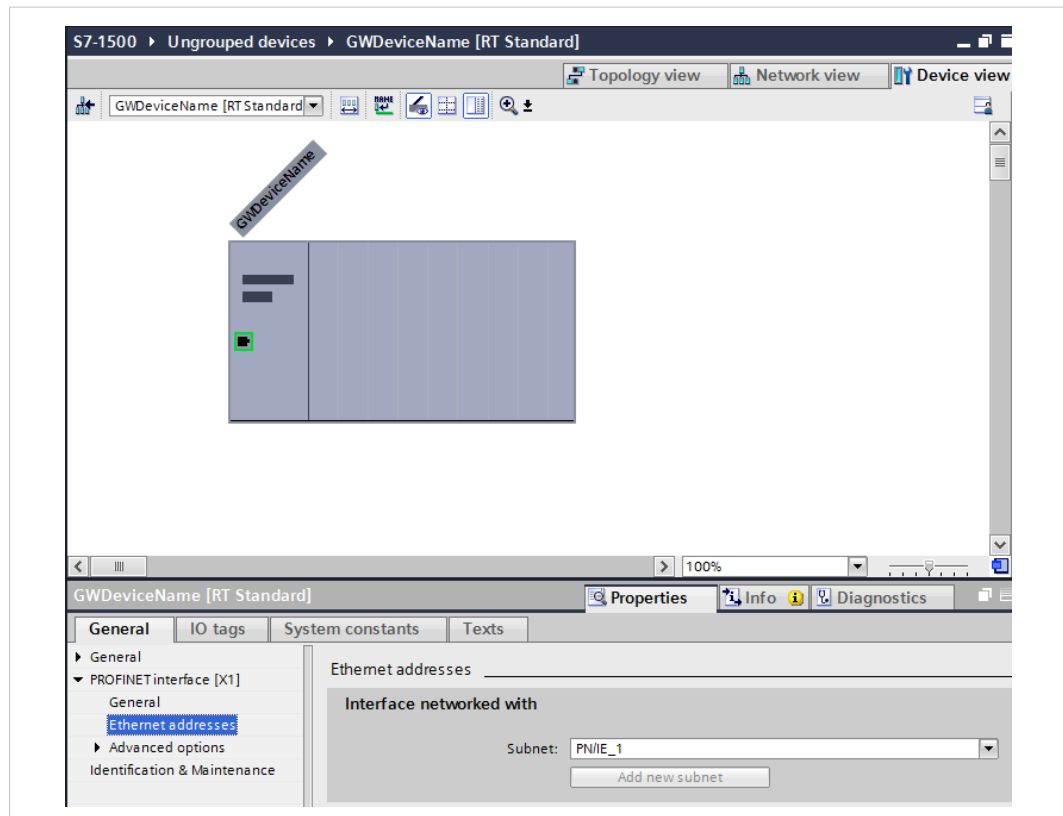


Fig. 8 Add module to network

6. Input and Output modules can now be added from the hardware catalog to match the data sizes set in Anybus Communicator — 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.

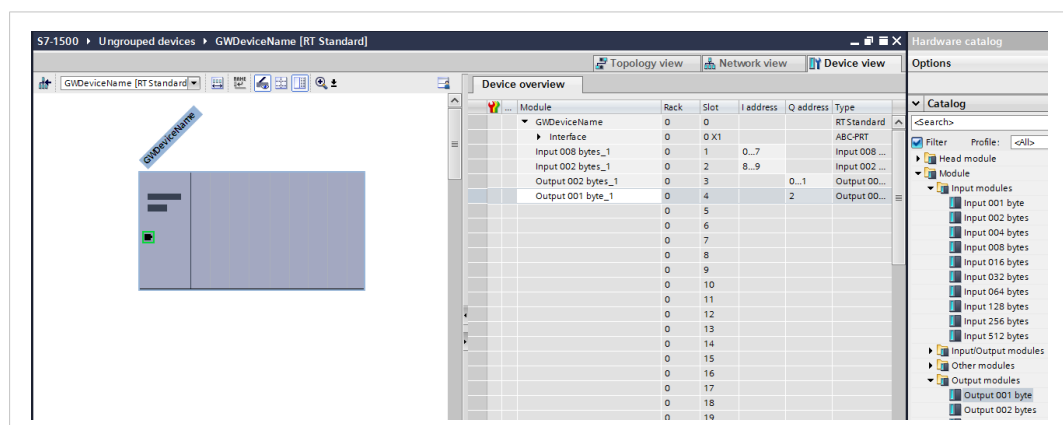


Fig. 9 Adding modules



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**.

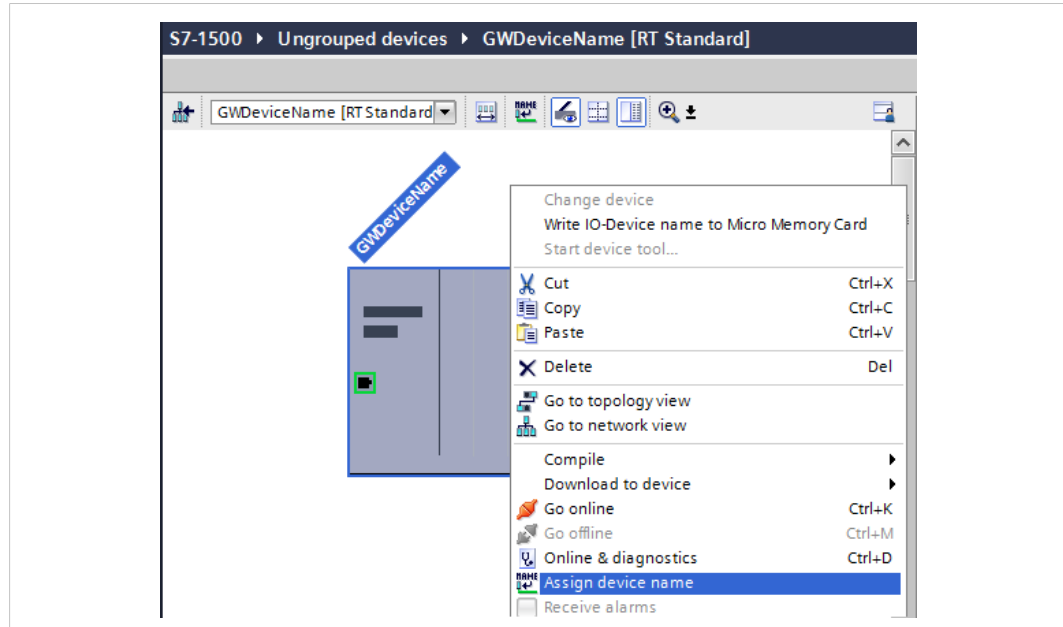


Fig. 10 Device view

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 Communicator.

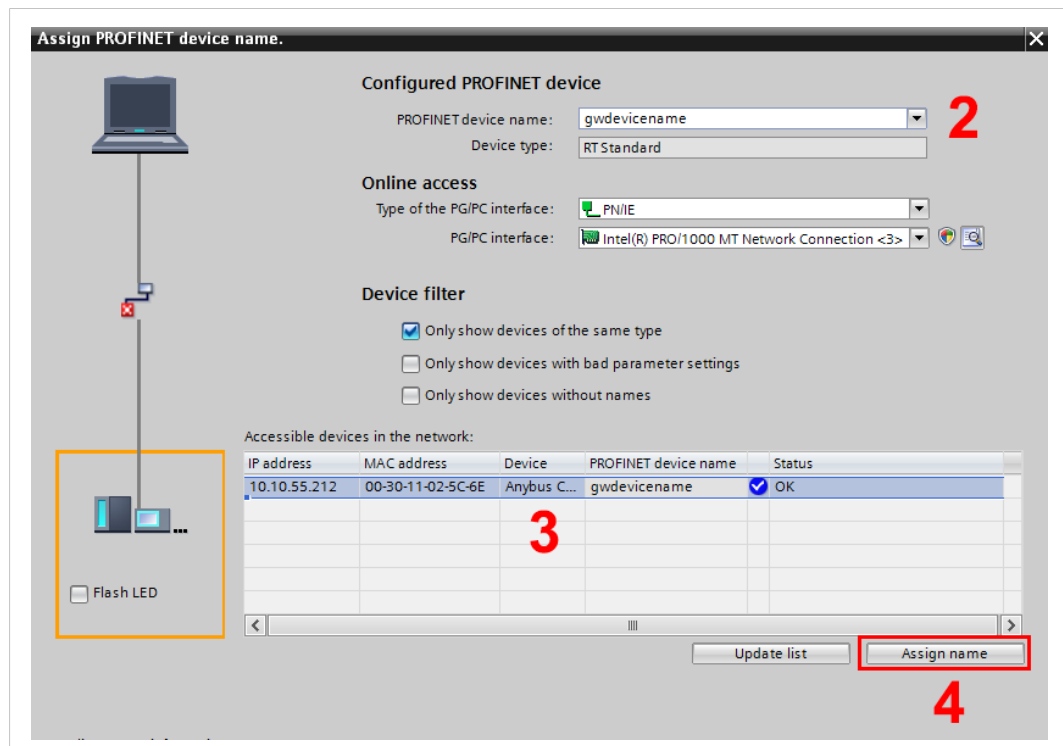


Fig. 11 Assigning a device name

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**.

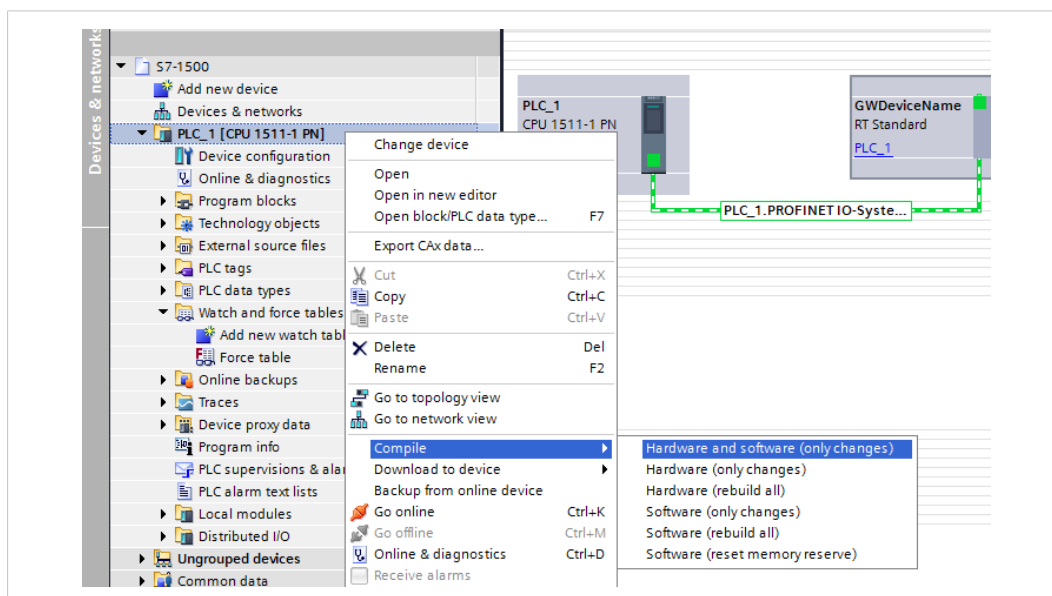


Fig. 12 Compiling

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**.

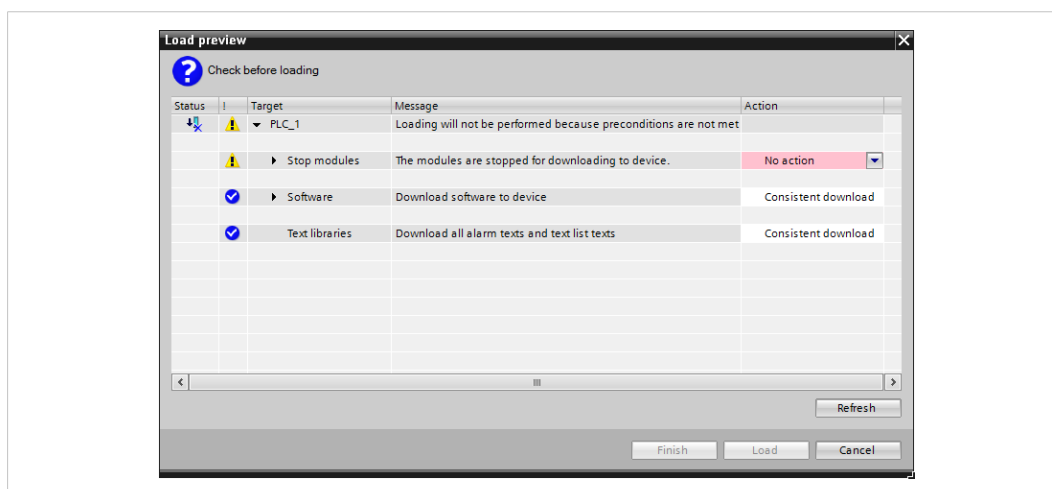


Fig. 13 Load preview

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**.

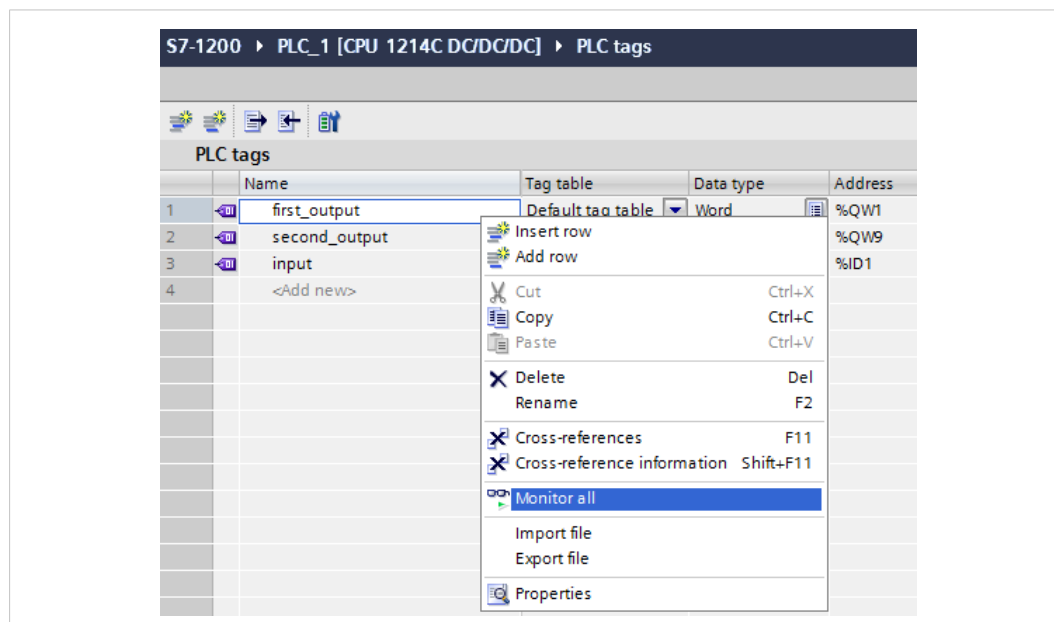


Fig. 14 PLC tags table

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.

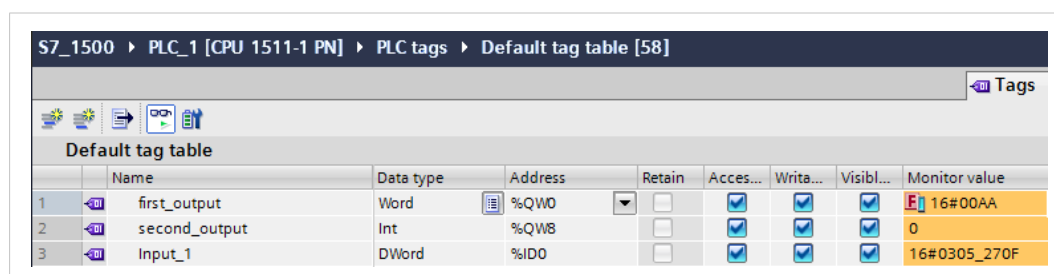


Fig. 15 Monitoring PLC tags

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.

	Name	Address	Display format	Monitor value	Modify value	
1	Input_1	%ID0	Hex	16#0305_270F		<input type="checkbox"/>
2	first_output	%QW0	Hex	16#00AA	16#00AA	<input checked="" type="checkbox"/>
3	test_1	%QB2	Hex	16#00		<input type="checkbox"/>
4	<Add new>					<input type="checkbox"/>

Fig. 16 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 Communicator.

	Name	Address	Display format	Monitor value	Force value	
1	"first_output":P	%QW0:P	Hex		16#00AA	<input checked="" type="checkbox"/>
2	<Add new>					<input type="checkbox"/>

Fig. 17 Force table

5 Verification

5.1 Node Monitor

The *Node Monitor* in Anybus Configuration Manager - Communicator RS232/422/485 shows the current input and output data in the Anybus Communicator, and can be used to verify that data communication is working.

- When online, right-click on the node in Anybus Configuration Manager - Communicator RS232/422/485 and select **Node Monitor**.

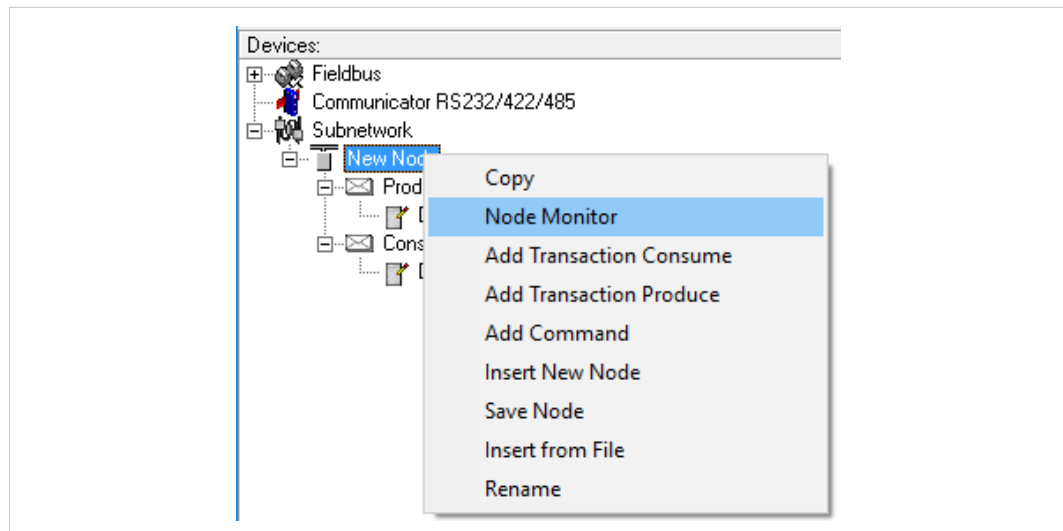


Fig. 18 Open the node monitor

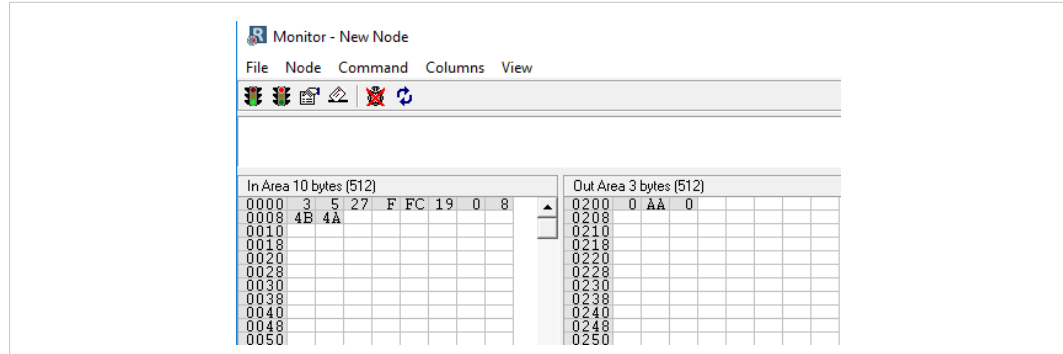


Fig. 19 Node monitor

The input and output bytes are represented as grey boxes in the Node Monitor. The values shown inside the boxes are the actual data values in Anybus Communicator. This also matches the data in the **Monitor column** of TIA Portal.

The force value from the PLC (00AA) can here be seen in the **Out Area**.

