

TeSys™ island

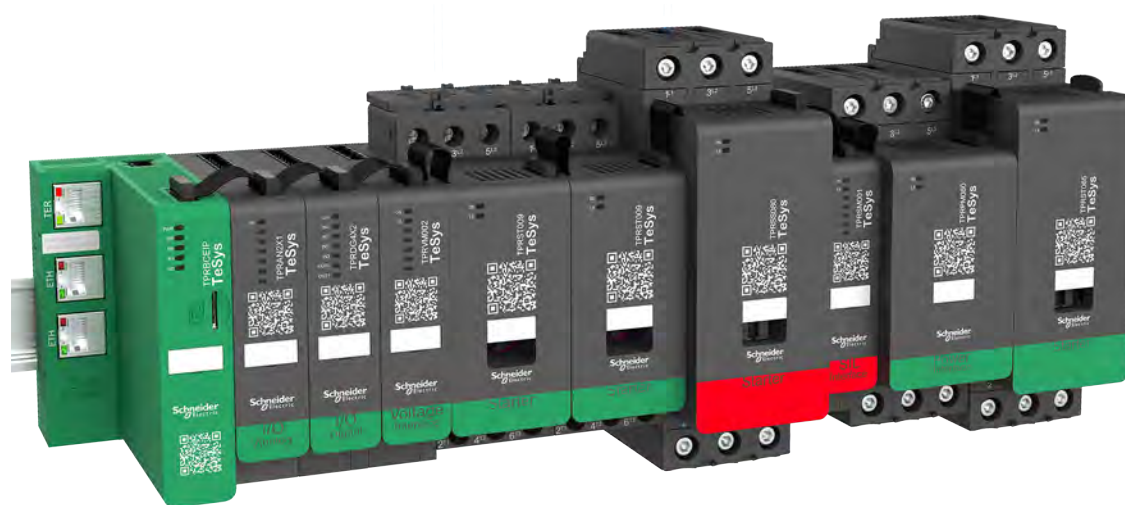
Quick Start Guide for PROFINET and PROFIBUS Applications

Instruction Bulletin

TeSys™ offers innovative and connected solutions for motor starters. This instruction bulletin describes how to configure a **TeSys** island within the Siemens® TIA Portal environment.

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Hazard Categories and Special Symbols

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this bulletin or on the equipment to warn of hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of either symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

⚠ WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

⚠ CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result in** minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.

NOTE: Provides additional information to clarify or simplify a procedure.

Please Note

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and has received safety training to recognize and avoid the hazards involved.

About the Book

Master Range: TeSys

TeSys™ is an innovative motor control and management solution from the global market leader. TeSys offers connected, efficient products and solutions for switching and protection of motors and electrical loads in compliance with all major global electrical standards.

Scope

TeSys™ island is an innovative motor control and management solution from the global market leader. TeSys offers connected, efficient products and solutions for switching and protection of motors and electrical loads in compliance with all major global electrical standards.

This user guide provides instructions for configuring a TeSys™ island device within the Siemens® Totally Integrated Automation (TIA) Portal environment. For more information regarding the TeSys™ island devices, refer to *Related Documentation*, page 6.

This document focuses on the characteristics of the Siemens SIMATIC S7–1200 CPUs and PROFINET IO as bus systems. The basic principles remain the same when using PROFIBUS DP or S7–1500 PLCs as they are for the bus systems above. The process for handling other systems can vary. This document outlines these differences.

Validity Note

This instruction bulletin is valid for all TeSys™ island configurations. The availability of some functions described in this bulletin depends on the communication protocol used and the physical modules installed on the island.

For product compliance with environmental directives such as RoHS, REACH, PEP, and EOL, go to www.se.com/green-premium.

For technical characteristics of the physical modules described in this bulletin, go to www.se.com.

The technical characteristics presented in this bulletin should be the same as those that appear online. We may revise content over time to improve clarity and accuracy. If you see a difference between the information contained in this bulletin and online information, use the online information.

Related Documentation

Table 1 - Related Documentation

Document Title	Description	Document Number
<i>TeSys™ island System Guide</i>	Introduces and describes the main functions of TeSys island	8536/B1901
<i>TeSys™ island Installation Guide</i>	Describes the mechanical installation, wiring, and commissioning of TeSys island	8536/B1902
<i>TeSys™ island Operating Guide</i>	Describes how to operate and maintain TeSys island	8536/B1903
<i>TeSys™ island Functional Safety Guide</i>	Describes the Functional Safety features of TeSys island	8536/B1904

Table 1 - Related Documentation (Continued)

Document Title	Description	Document Number
<i>TeSys™ island Third Party Function Block Guide</i>	Contains the information needed to create function blocks for third party hardware	8536IB1905
<i>TeSys™ island EtherNet/IP™ Function Block Library Guide</i>	Describes the TeSys island library used in the Rockwell Software® Studio 5000® EtherNet/IP™ environment	8536IB1914
<i>TeSys™ island EtherNet/IP™ Quick Start Guide</i>	Describes how to quickly integrate TeSys island into the Rockwell Software Studio 5000 EtherNet/IP environment	8536IB1906
<i>TeSys™ island DTM Online Help Guide</i>	Describes how to install and use various functions of TeSys island configuration software and how to configure the parameters of TeSys island	8536IB1907
<i>TeSys™ island PROFINET and PROFIBUS Function Block Library Guide</i>	Describes the TeSys island library used in the Siemens™ TIA Portal environment	8536IB1917
<i>TeSys™ island Quick Start Guide for PROFINET and PROFIBUS Applications</i>	Describes how to quickly integrate TeSys island into the Siemens™ TIA Portal environment	8536IB1916
<i>TeSys™ island Product Environmental Profile</i>	Describes constituent materials, recyclability potential, and environmental impact information for the TeSys island	ENVPEP1904009
<i>TeSys™ island Product End of Life Instructions</i>	Contains end of life instructions for the TeSys island	ENVEOLI1904009
<i>TeSys™ island Instruction Sheet, Bus Coupler, TPRBCEIP</i>	Describes how to install the TeSys island Ethernet/IP bus coupler	MFR44097
<i>TeSys™ island Instruction Sheet, Bus Coupler, TPRBCPFN</i>	Describes how to install the TeSys island PROFINET bus coupler	MFR44098
<i>TeSys™ island Instruction Sheet, Bus Coupler, TPRBCPFB</i>	Describes how to install the TeSys island PROFIBUS DP bus coupler	GDE55148
<i>TeSys™ island Instruction Sheet, Starters and Power Interface Modules, Size 1 and 2</i>	Describes how to install size 1 and 2 TeSys island starters and power interface modules	MFR77070
<i>TeSys™ island Instruction Sheet, Starters and Power Interface Modules, Size 3</i>	Describes how to install size 3 TeSys island starters and power interface modules	MFR77085
<i>TeSys™ island Instruction Sheet: Input/Output Modules</i>	Describes how to install the TeSys island analog and digital I/O modules	MFR44099
<i>TeSys™ island Instruction Sheet: SIL Interface and Voltage Interface Modules</i>	Describes how to install the TeSys island voltage interface modules and SIL ¹ interface modules	MFR44100

1. Safety Integrity Level according to standard IEC 61508.

Third Party Documentation

Table 2 - Third Party Documentation

Document Title	Description	Document download link
Siemens Totally Integrated Automation (TIA) Portal Openness: Introduction and Demo Application	Introduces and describes the TIA Openness application program interface (API) and provides instructions and requirements for installing the Siemens TIA Portal.	https://support.industry.siemens.com/cs/document/108716692/tia-portal-openness%3A-introduction-and-demo-application
Siemens Guideline on Library Handling in the TIA Portal	Describes how to import libraries into the Siemens TIA Portal.	https://support.industry.siemens.com/cs/document/109747503/guideline-on-library-handling-in-tia-portal-

Precautions

Read and understand the following precautions before performing any procedures in this guide.

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment before working on or inside this equipment.
- Use only the specified voltage when operating this equipment and any associated products.
- Always use a properly rated voltage sensing device to confirm power is off.
- Use appropriate interlocks where personnel and/or equipment hazards exist.
- Power line circuits must be wired and protected in compliance with local and national regulatory requirements.
- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices per NFPA 70E, NOM-029-STPS, or CSA Z462 or local equivalent.

Failure to follow these instructions will result in death or serious injury.

WARNING

UNINTENDED EQUIPMENT OPERATION

- For complete instructions about functional safety, refer to the *TeSys™ island Functional Safety Guide*, 8536IB1904.
- Do not disassemble, repair, or modify this equipment. There are no user serviceable parts.
- Install and operate this equipment in an enclosure appropriately rated for its intended application environment.
- Each implementation of this equipment must be individually and thoroughly tested for proper operation before being placed into service.

Failure to follow these instructions can result in death, serious injury, or equipment damage.



WARNING: This product can expose you to chemicals including Antimony oxide (Antimony trioxide), which is known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

Qualified Personnel

Only appropriately trained persons who are familiar with and understand the content of this guide and all other related product documentation are authorized to work on and with this product.

The qualified person must be able to detect possible hazards that may arise from modifying parameter values and generally from mechanical, electrical, or electronic equipment. The qualified person must be familiar with the standards, provisions, and regulations for the prevention of industrial accidents, which they must observe when designing and implementing the system.

The use and application of the information contained in this guide requires expertise in the design and programming of automated control systems. Only you,

the user, the machine builder, or the integrator, can be aware of all the conditions and factors present during installation, setup, operation, and maintenance of the machine or process, and can therefore determine the automation and associated equipment and the related safeties and interlocks which can be effectively and properly used.

When selecting automation and control equipment (and any other related equipment or software) for a particular application, you must also consider applicable local, regional, or national standards and/or regulations.

Pay particular attention to adhere to any safety information, electrical requirements, and normative standards that apply to your machine or process in the use of this equipment.

Intended Use

The products described in this instruction bulletin, together with software, accessories, and options, are starters for low-voltage electrical loads, intended for industrial use according to the instructions, directions, examples, and safety information contained in this document and other supporting documentation.

The product may only be used in compliance with all applicable safety regulations and directives, the specified requirements, and the technical data.

Before using the product, you must perform a hazard analysis and risk assessment of the planned application. Based on the results, appropriate safety-related measures must be implemented.

Since the product is used as a component of a machine or process, you must ensure the safety of persons by means of the overall system design.

Operate the product only with the specified cables and accessories. Use only genuine accessories and spare parts.

Any use other than the use explicitly permitted is prohibited and can result in unanticipated hazards.

Methodology

The integration of the TeSys™ island into Siemens® Totally Integrated Automation (TIA) Portal uses the following components:

- Device description files for TeSys island bus couplers PROFINET I/O and PROFIBUS DP
- IEC 61131–3 function block library to access the data of the TeSys island via the bus systems from within TIA Portal
- The CAx data import feature of Siemens TIA Portal to import the island composition from TeSys island Device Type Manager (DTM)
- A basic TCI integration of the TeSys island DTM into Siemens TIA Portal
- Import of a global data block containing Predictive Alarm Messages, provided by the TeSys island DTM

The prerequisites for using and installing the components are described in the following chapters.

SoMove™ software provides Automation Markup Language (AutomationML; AML) files containing the TeSys™ island topology and parts of the configuration data. These files can be imported into Siemens TIA Portal using the CAx data import feature. Using the CAx data import feature helps you avoid manually recreating the island topology in Siemens TIA Portal. You must import the appropriate device description files into Siemens TIA Portal before you import the AutomationML files.

NOTE:

- There are interdependencies between the avatars in the TeSys island (that is, the devices' topology and their representation to the bus system). Therefore, it is recommended that you maintain and change the island topology within SoMove™ only.
- By using the CAx data import feature, data can be transferred to Siemens TIA Portal and used in an Automation project.
- The Update feature of SoMove™ enables you to transfer changes to existing island configurations within the Siemens TIA Portal (see *Updating an Existing TeSys™ island Configuration in the TIA Portal*, page 28).

To avoid problems during integration, read the product release notes to make sure that the individual components in use (such as TeSys island function block library for Siemens TIA Portal, TeSys island firmware, TeSys island device description files for PROFIBUS DP and PROFINET IO, SoMove software, and TeSys island DTM library) are compatible with each other.

Software Installation

Installing the Siemens® TIA Portal

The software package for Siemens® Totally Integrated Automation (TIA) Portal Openness must be installed along with Siemens TIA Portal before the CAX data import feature of the Siemens TIA Portal is available for use. This package is available for free. Siemens TIA Portal V15.1 package is automatically installed by default.

For Siemens TIA Portal and TIA Portal Openness system requirements and detailed instructions about how to install them, refer to *Third Party Documentation*, page 8.

Installing the Device Description Files

You can download and install the General Station Description Markup Language (GSDML) or General Station Description (GSD) files for the TeSys™ island PROFINET IO and PROFIBUS DP bus couplers from the Schneider Electric website.

Download the TeSys™ island GSDML file for the PROFINET bus coupler at <https://www.se.com/ww/en/product-range-download/65746-tesys-island/>.

Download the TeSys™ island GSD file for the PROFIBUS DP bus coupler at <https://www.se.com/ww/en/product-range-download/65746-tesys-island/>.

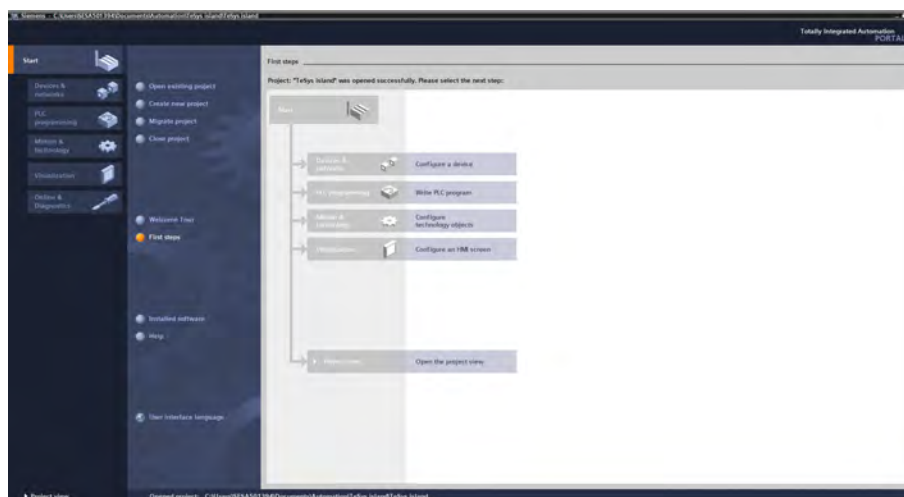
NOTE: Make sure you are using compatible versions of Device Type Manager (DTM) and GSD or GSDML.

To install the device description files in the Siemens® TIA Portal, follow these steps:

1. Launch Siemens TIA Portal and click on **Create new project**. Enter a project name, then click **Create**.

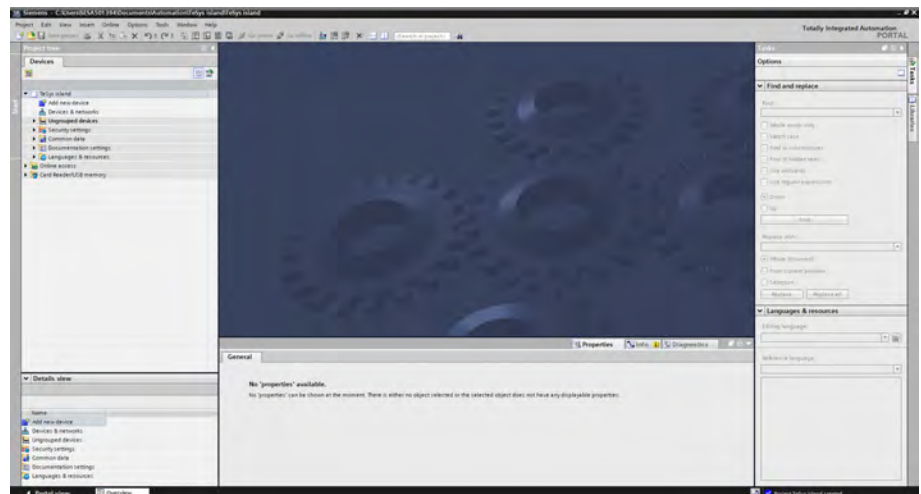
NOTE: Click on an existing project if one has already been created.

Figure 1 - Start Window



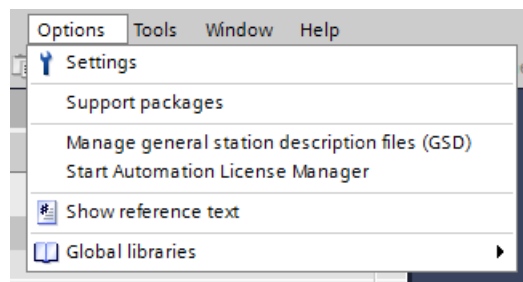
- Click on **Project view** to open the project view window.

Figure 2 - Project View



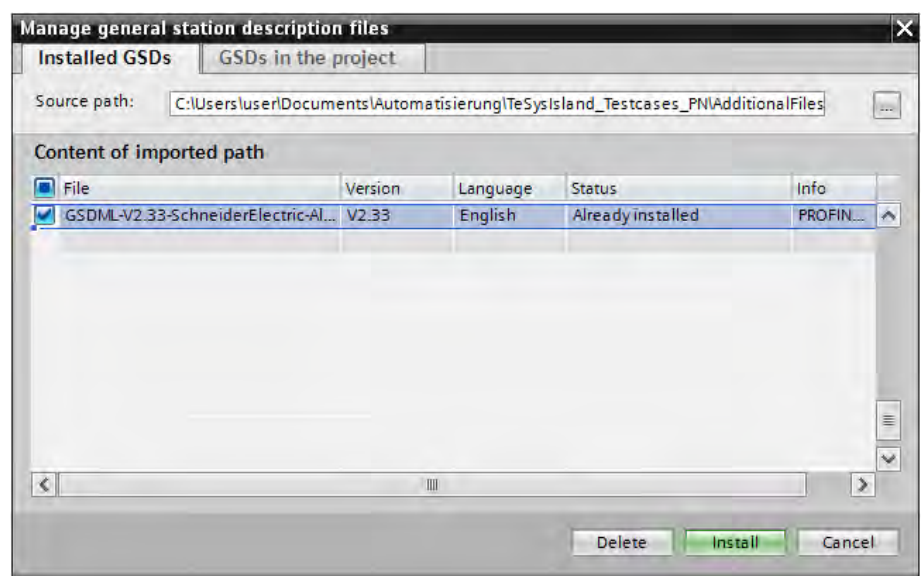
- Select **Manage general station description files (GSD)** in the Options menu, then click **OK**.

Figure 3 - Options



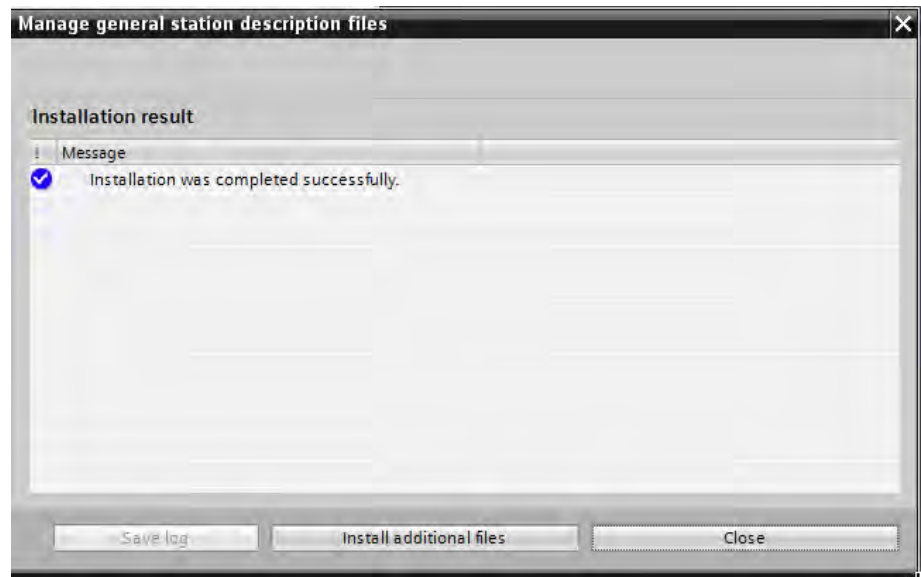
- In the **Manage general station description files** window, select the path in the **Source path** field where the device description files will be stored.

Figure 4 - Manage GSD Files



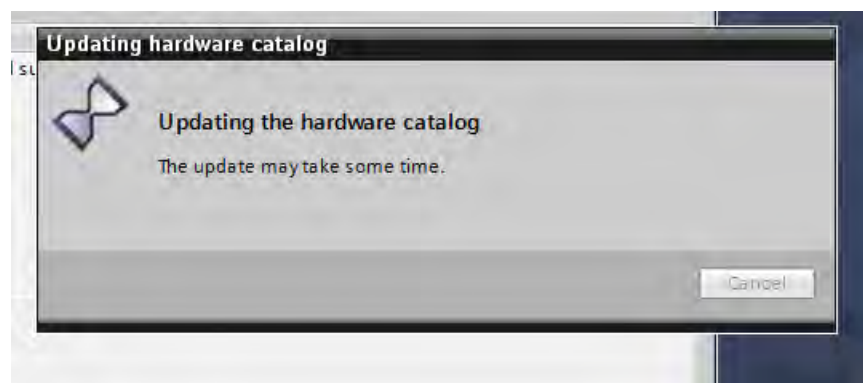
5. Select the files you want to install from the list of GSD and GSDML files, then click **Install**. The installation process begins and you will get a prompt of the results.

Figure 5 - Installation Results



6. When the files have been imported successfully, click **Close**. Siemens TIA Portal automatically updates the hardware catalog with the imported device description files.

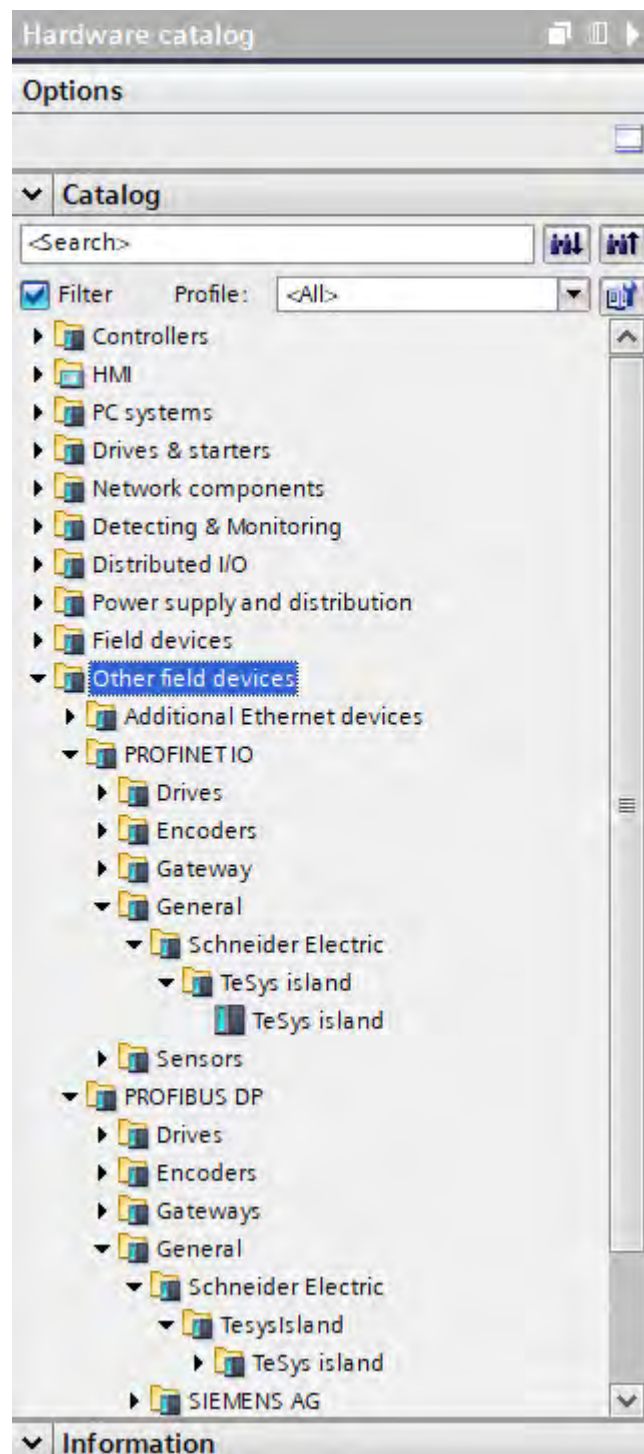
Figure 6 - Updating Hardware Catalog



7. Under Project tree, click on **Devices & networks**. The Hardware catalog task view window opens on the right of the screen.

The installed TeSys™ island bus coupler device is now located in the hardware catalog under **Other field devices** → **PROFINET IO/PROFIBUS DP** → **General** → **Schneider Electric** → **TeSys island**.

Figure 7 - Hardware Catalog



Integrating the Function Block Library

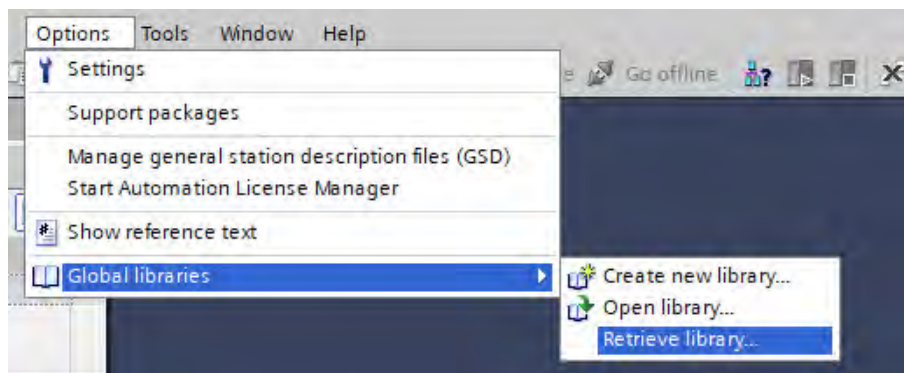
To integrate the IEC 61131-3 function block library file for the TeSys™ island PROFINET IO and PROFIBUS DP bus couplers, download the file from <https://www.se.com/ww/en/product-range-download/65746-tesys-island/>.

Use the following steps to install the file in Siemens® Totally Integrated Automation (TIA) Portal after you download the file:

1. Launch Siemens TIA Portal, then click **Project View**.

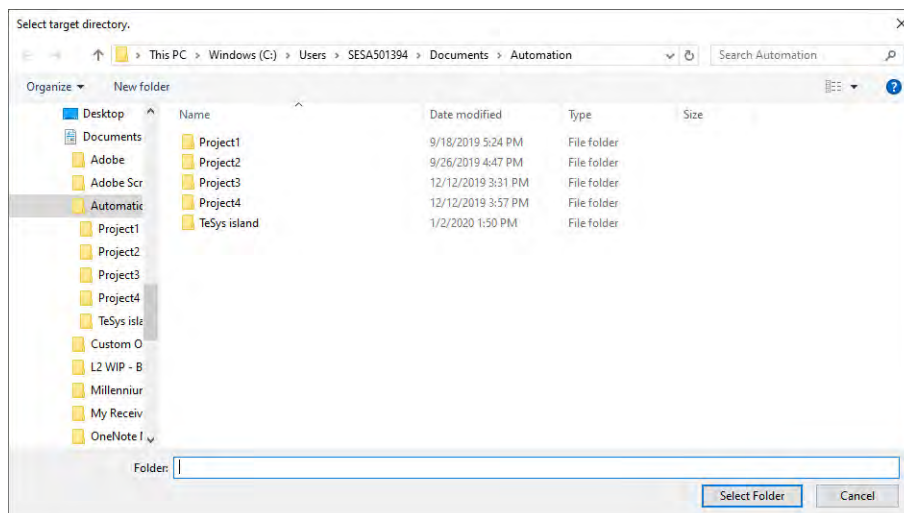
2. Select **Global libraries** → **Retrieve library** in the Options menu, then click **Ok**.

Figure 8 - Retrieve Library



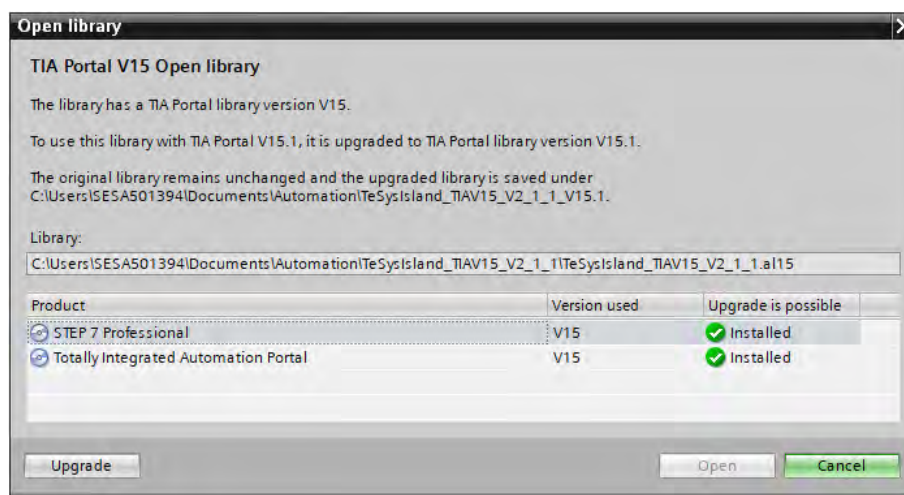
3. Select the archive file of the function block library you downloaded.
4. Click **Open**, then select the **Automation** directory as the target directory.
5. Click **OK**.

Figure 9 - Automation Directory



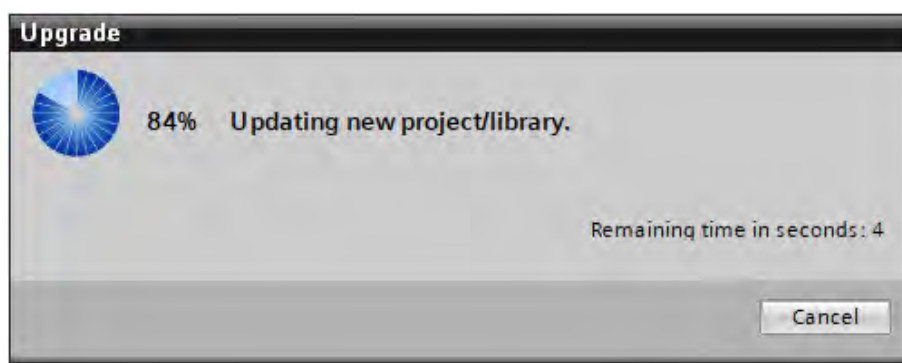
6. The following Open library window might display prompting you that the library version will be upgraded to version 15.1, depending on the version of TIA Portal that you are using.

Figure 10 - Open Library



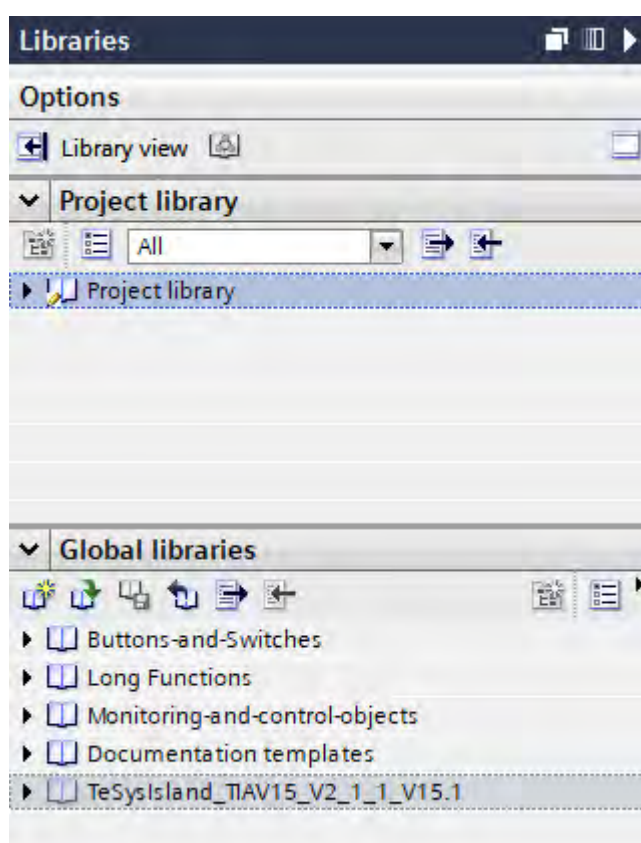
- Click **Upgrade** in the Open library window and the Library Upgrade progress window displays.

Figure 11 - Library Upgrade



The function block library opens and is located in the Global Libraries pane of the Siemens TIA Portal.

Figure 12 - Global Libraries



For additional information, refer to the Siemens TIA Portal information and *Third Party Documentation*, page 8.

Library Compatibility: The function block library for accessing the TeSys™ island via PROFIBUS DP and PROFINET IO bus couplers are compatible with Siemens TIA Portal V15. All function blocks and data blocks included in the library are compiled for non-optimized access. For execution, the function blocks in the library require the availability of certain System Function Blocks on the SIMATIC PLCs. For a detailed description of these dependencies, see the *TeSys™ island PROFINET and PROFIBUS Function Block Library Guide*, document number 8536IB1917.

Installing SoMove™ Software and TeSys™ island DTM

To generate the AML configuration files for import into the Siemens® TIA Portal, you must install SoMove™ software and the TeSys™ island Device Type Manager (DTM). These tools provide the necessary features to configure the TeSys™ island and download the configuration to the bus coupler.

To download the SoMove software, go to <https://www.se.com/us/en/product-range-download/2714-somove/#/software-firmware-tab>.

To download the TeSys island DTM library, go to <https://www.se.com/us/en/product-range-download/65746-tesys-island/#/software-firmware-tab>.

For detailed instructions on the installation and usage of these tools, refer to the *TeSys™ island DTM Online Help Guide*, document number 8536IB1907.

PROFIBUS DP and PROFINET IO Differences

The instructions in this document apply to both PROFIBUS DP and PROFINET IO. Siemens® TIA Portal and SoMove™ software use the same mechanisms for PROFIBUS DP and PROFINET IO bus coupler systems. However, there are minor differences in how devices are addressed between the two bus systems.

In general, most of the differences are addressed by SoMove™ software. SoMove™ software will create the appropriate structures in the exported AML file for each of the bus systems. You might still need to manually set some parameters for the function blocks in the Siemens TIA Portal.

PROFIBUS DP uses a Numeric node ID for addressing. PROFINET IO uses an IP address or a PROFINET name for addressing. If the addresses are assigned in SoMove software, the addresses are automatically transferred in the AML file. Otherwise, the Siemens TIA Portal automatically assigns default addresses.

Integration Procedure

Prerequisites

The integration procedure assumes that you have done the following:

- Set up a TeSys™ island device using SoMove™ software according to the *TeSys™ island Operating Guide* document number 8536IB1903, including the relevant fieldbus parameters

NOTE:

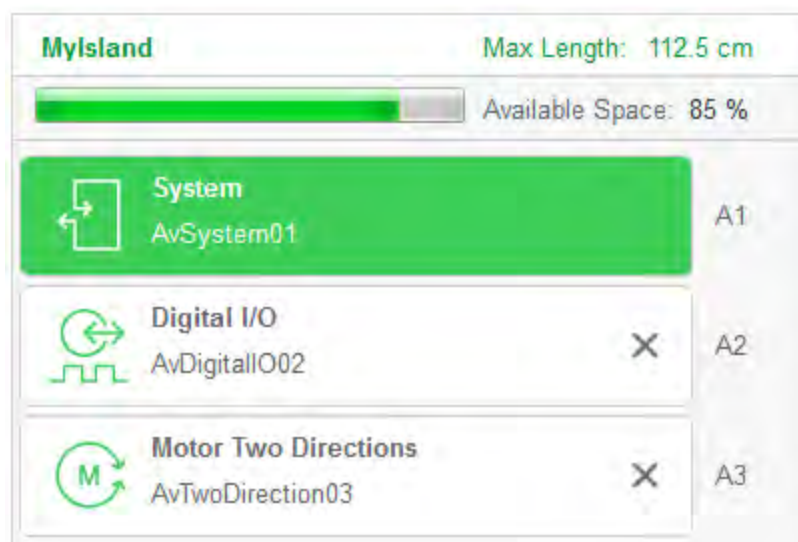
- For PROFINET, establish an IPv4 address for the device (which applies to both the terminal and fieldbus ports), then configure the island.
- For PROFIBUS, establish an IPv4 address for the terminal port for configuration, then set a PROFIBUS Node ID in the DTM to establish an address on the PROFIBUS network.
- Installed the appropriate version of Siemens® Totally Integrated Automation (TIA) Portal software and TIA Portal Openness as described in *Installing the Siemens® TIA Portal*, page 12
- Set up a project in the Siemens TIA Portal with a PLC as bus controller for the designated bus system (not covered in this document)
- Imported the device description files for the TeSys island and the appropriate function block library into TIA Portal as described in *Installing the Device Description Files*, page 12 and *Integrating the Function Block Library*, page 15

Example Items

The TeSys™ island configuration used in this example includes the following items, as shown in the figure below.

- Digital I/O avatar
- Motor Two Directions avatar

Figure 13 - Avatar View



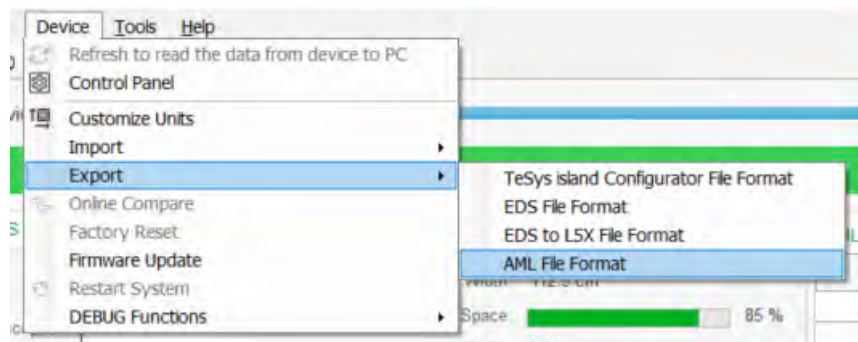
NOTE: The procedures described here refer to a project with a Siemens SIMATIC S7-1200 CPU and PROFINET IO as the bus system. The basic steps remain the same when using a SIMATIC S7-1500 CPU or PROFIBUS DP as a bus system. The notable differences in the handling of PROFIBUS DP are outlined in *PROFIBUS DP and PROFINET IO Differences*, page 18.

Import the TeSys™ island Configuration to Siemens® TIA Portal

To import the TeSys™ island configuration setup using SoMove™ software, follow these steps:

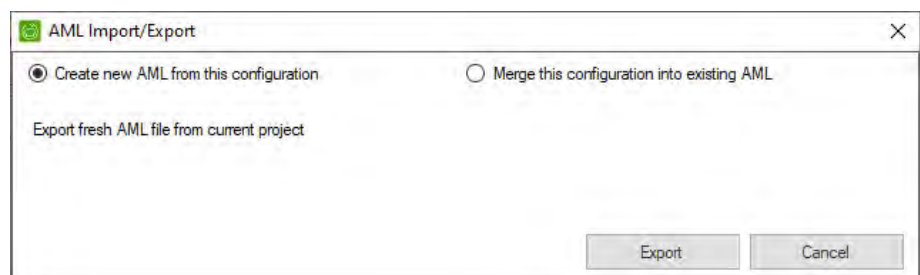
1. Launch SoMove™ software and open the project you are working on.
2. Launch Siemens® TIA Portal and open the project.
3. Select **Export – AML File Format** within the SoMove software Device menu to export the TeSys™ island configuration.

Figure 14 - Export AML File



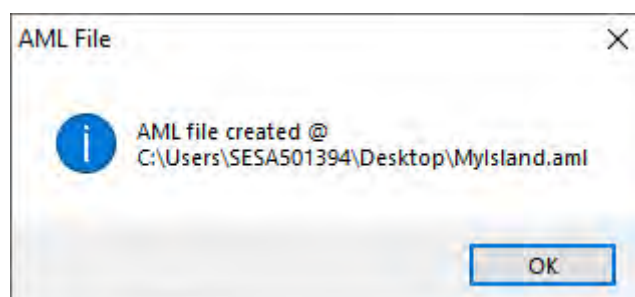
4. Select **Create new AML from this configuration** in the AML Import/Export window and click **Export**.

Figure 15 - AML Export



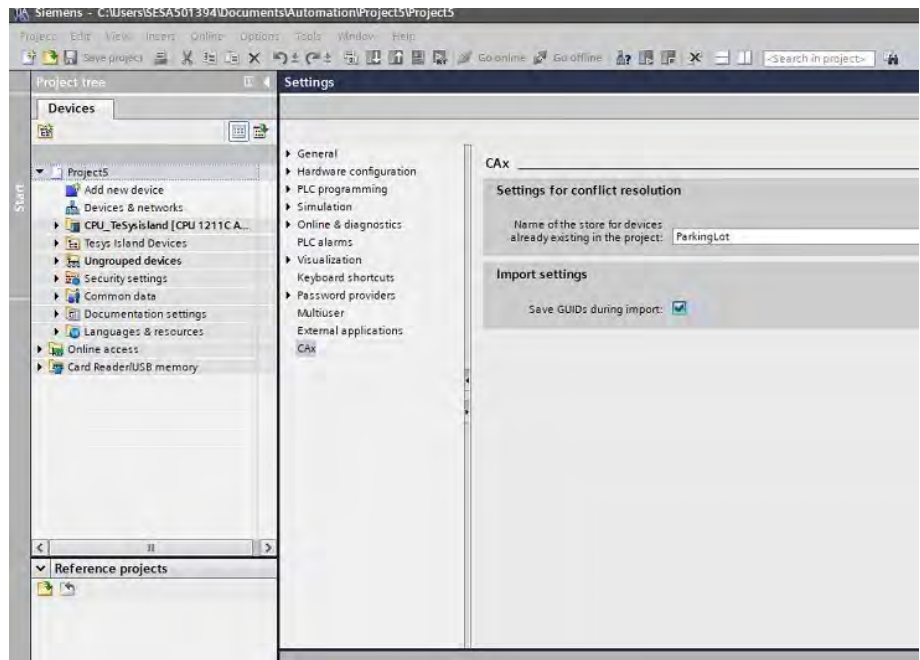
5. Select the path where you want to store the file and assign a unique file name for the file.
6. Click **Save**. The AML file will be created at the designated location.
7. Click **OK** in the AML File Export window.

Figure 16 - AML File Created



8. Switch to the Siemens TIA Portal software.
9. Select **Setting** in the Options menu within the Siemens TIA Portal project to modify the CAx settings.
10. Select **CAx** from the menu in the Settings window (on the left).

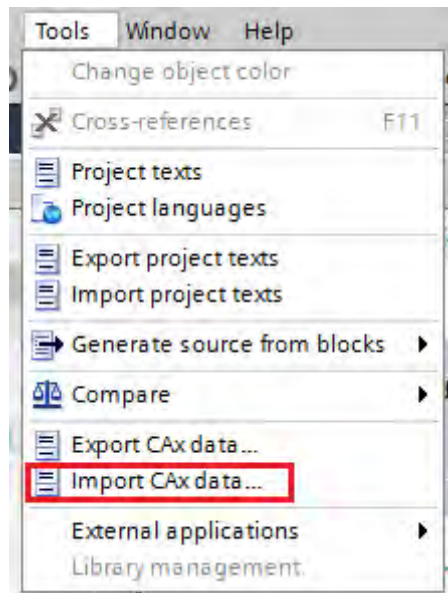
Figure 17 - CAx Settings



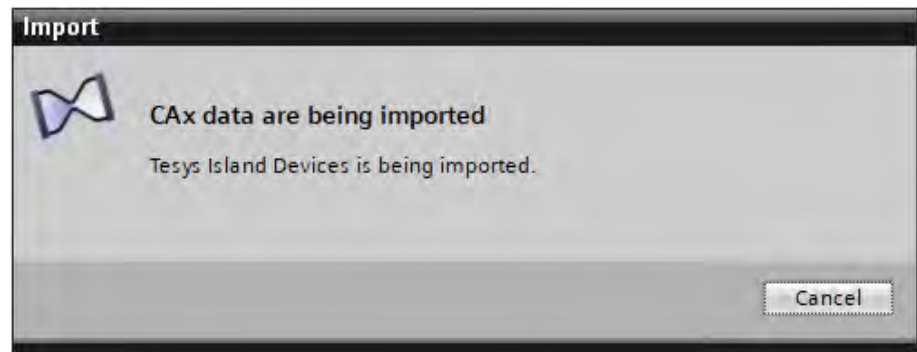
11. Check the check-box **Save GUIDs during import**: under Import settings.
12. Select **Import CAx data...** in the Tools menu within the Siemens TIA Portal project to import the TeSys™ island configuration.

NOTE: If you receive the message prompt “The CAx operation cannot be started. Check if you are logged on as a member of the Siemens TIA Openness group and restart the process.”, the software package for Siemens® TIA Portal Openness must be installed. You might also need to perform the procedure in *How to Add a User to Siemens® TIA Openness*, page 32.

Figure 18 - Import CAx Data



13. Select the source path and the AML file you previously created.
14. Click **Open**. The Siemens TIA Portal imports the TeSys island configuration data from the AML file.

Figure 19 - CAx File Importing

The TeSys™ island configuration is listed within the Project tree under TeSys Island Devices and in the Networks & Devices view of Siemens TIA Portal.

NOTE:

- If you have already imported a TeSys Island configuration to the Siemens TIA Portal and you need to make changes to it, using the procedure above might lead to loss of the configuration done in Siemens TIA Portal after the first import. The result might be that the device is no longer associated with the PLC, that the I and Q addresses or network addresses of the modules are reset to their default values, or that the device is moved to the “TeSys Island devices” folder again. To avoid these kinds of reversions, use the procedure described in *Updating an Existing TeSys™ island Configuration in the TIA Portal*, page 28.

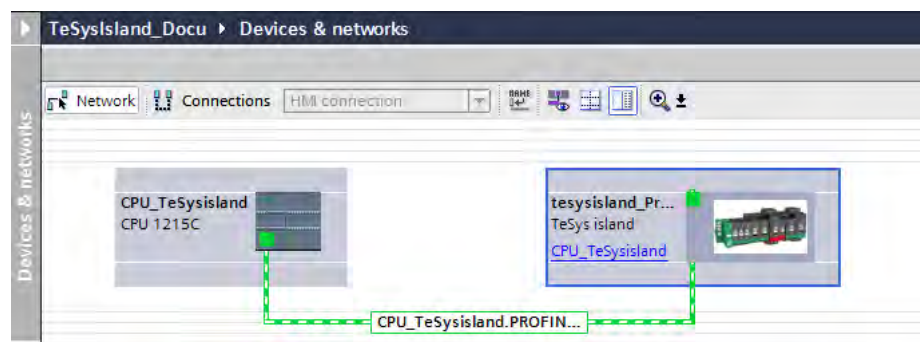
Configure TeSys™ island as a Bus Device

The TeSys™ island bus coupler must be configured before it can be used as a bus device in combination with a Siemens® CPU. The following procedures describe the steps necessary to configure the TeSys island as a bus device.

Assign the TeSys™ island Bus Coupler to a CPU

1. Open the Network view using the Devices & networks entry in the project navigation pane.
2. Left click on the Ethernet interface of the TeSys island bus coupler, then drag it to the Ethernet interface of the CPU.

When you release the left mouse button, the device is assigned to the PLC. Alternatively, you can click on Not assigned on the TeSys island device and select the appropriate PLC and interface in the dialog box that opens.

Figure 20 - TeSysIsland Devices & networks

3. While assigning the device to the PLC, Siemens® TIA Portal automatically assigns I and Q addresses to the TeSys™ island modules. If the I and Q addresses need to be edited, change to the device view of the bus coupler and enter the desired addresses.

Assign the PROFINET Device Name

The PROFINET IO Controller (in this case, the PLC) requires the PROFINET name of the device to ensure that the PROFINET IO device can be located on the network. To verify whether the name in the Siemens® TIA Portal matches the setting in SoMove™ software, use the following procedure.

1. In SoMove™ software, look for the network name for the bus coupler in the System Avatar settings under **FIELD BUS** → **START-UP** → **Network Name**. This is the device's default PROFINET name.
2. In the Siemens® TIA Portal, look for the PROFINET name for the bus coupler in the PROFINET interface settings of the TeSys™ island bus coupler.
3. If the names are not the same, the PROFINET name must be changed by doing one of the following:
 - a. In the Siemens TIA Portal, uncheck the check-box **Generate PROFINET device name automatically** and replace the PROFINET device name with the PROFINET name in use on the TeSys™ island bus coupler.
 - b. Assign the PROFINET name used in the Siemens TIA Portal to the TeSys™ island either by using SoMove™ software or the Operation and Maintenance Tool of the TeSys™ island.
 - c. Assign the PROFINET name to the TeSys island via PROFINET Discovery and Configuration Protocol (DCP) commands using the built-in Assign PROFINET name functionality of the Siemens TIA Portal (see Siemens TIA Portal information system for more details). The configuration of the TeSys™ island should be read in SoMove™ software once the name has been assigned to ensure it is not overwritten if the SoMove™ project is deployed to the TeSys island again.

Figure 21 - PROFINET Device Name

For information on how to access the System Avatar settings, see the *TeSys™ island DTM Online Help Guide*, document number 8536IB1907. For information on how to access the PROFINET device properties, see the Siemens TIA Portal information system.

NOTE: The network address configured in the TeSys™ island configuration of SoMove™ is transferred with the AML export feature and automatically imported into the Siemens TIA Portal with the AML import feature. However, if no valid network address has been assigned in SoMove (because Dynamic Host Configuration Protocol (DHCP) is used), the TIA Portal automatically assigns a default network address. In this case, ensure that the IP address in Siemens TIA Portal matches the one actually used by the device. For information about where you can check and edit the IP address in the TIA Portal, see the Siemens TIA Portal information system.

Create Function Block Instances for the Avatars

The TeSys™ island library for Siemens® Totally Integrated Automation (TIA) Portal provides several proxy function blocks as well as user defined datatypes (UDTs) to control the avatars with the Siemens CPU and to view status information. The function blocks need to be imported into the project from the TeSys island library. Once the function blocks are in the PLC program, the function block parameters must be created to access the TeSys™ island data.

A dedicated function block controls each type of avatar from within the PLC project. Additionally, there are function blocks that access supplemental information (energy or diagnostic data) with a common interface for all avatars. A third group of function blocks provides access to the System Avatar functions.

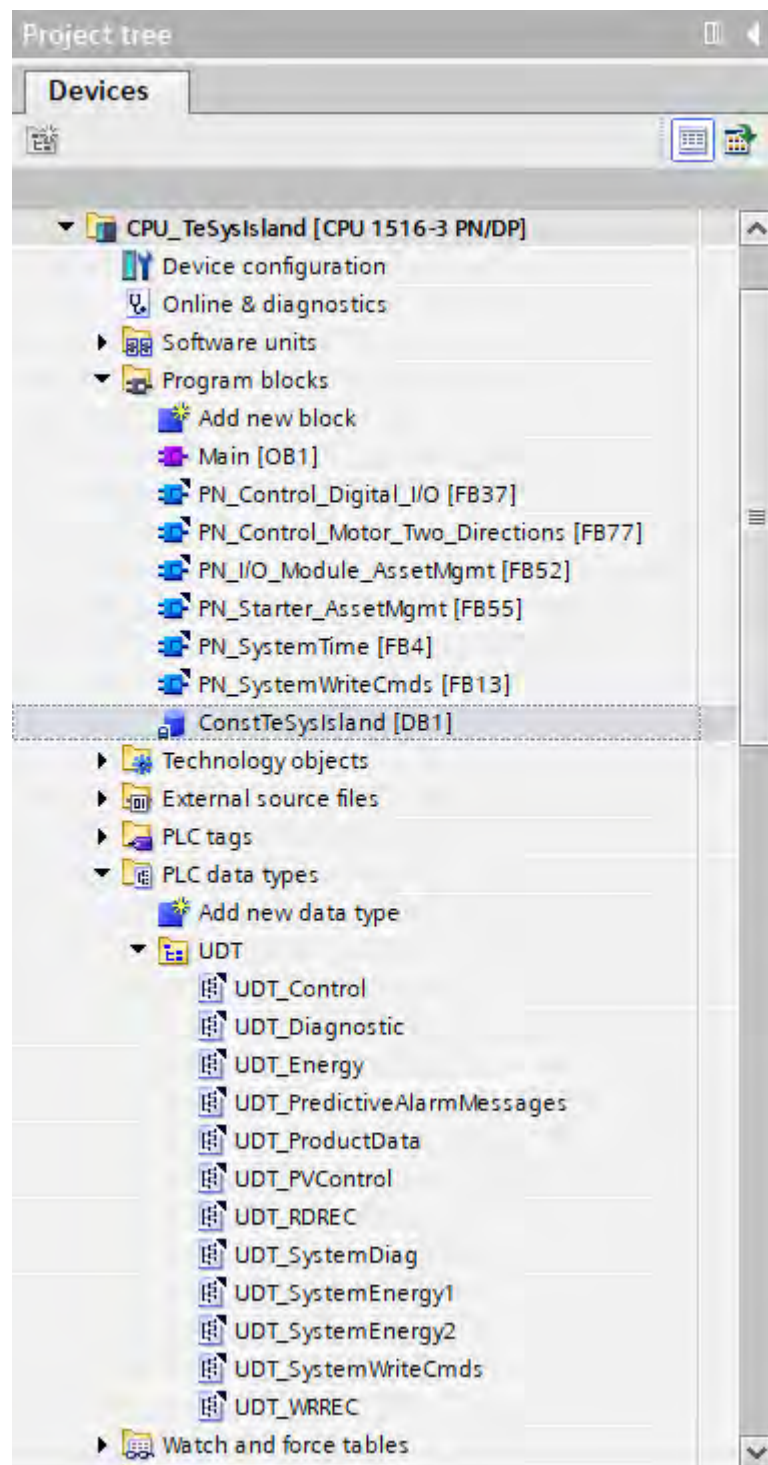
For detailed information about the library function block parameters and their usage, see the *TeSys™ island PROFINET and PROFIBUS Function Block Library Guide*, document number 8536IB1917.

NOTE: Starting with version 2.2.0, the function block library also includes master copies of a global data block that defines common constants that the function blocks use (for example, common error and status codes). For the function blocks to work, you must copy this data block to the project. For more information, see the *TeSys™ island PROFINET and PROFIBUS Function Block Library Guide*, document number 8536IB1917

Import a Library Function Block into a TIA Portal Project

To import a TeSys™ island library function block, follow these steps:

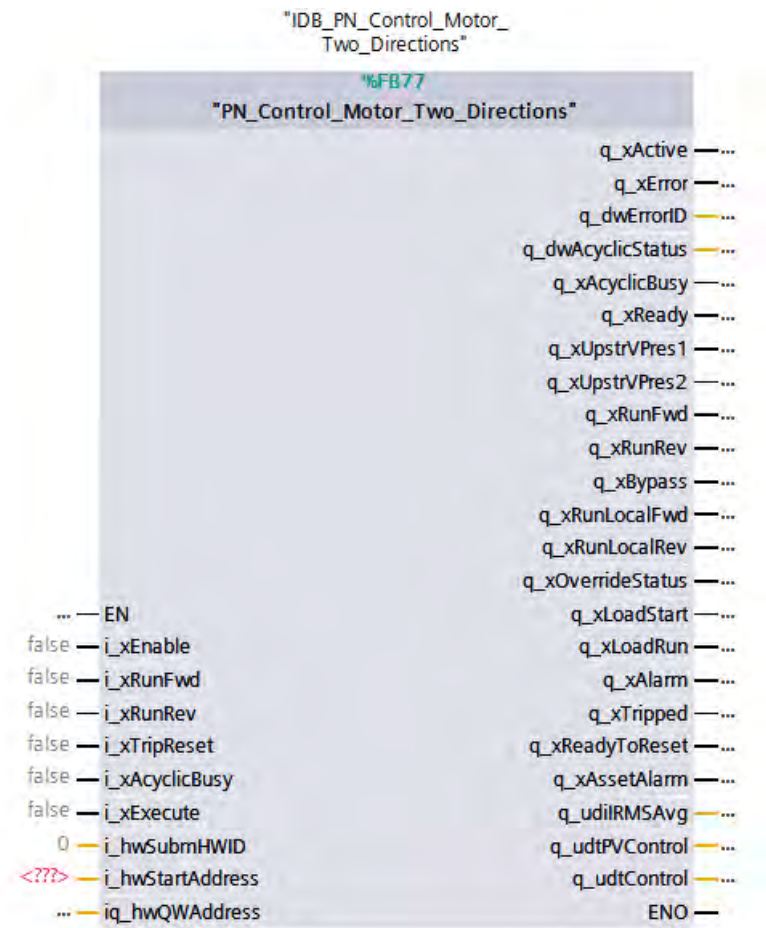
- Open the Siemens® TIA Portal project where you want to import the function blocks.
- In the Library pane of Siemens TIA Portal, locate the TeSys™ island function block library and click **Open**.
- From **Master Copies**, select the subfolder appropriate for the PLC type you are using (“DBs S7-1200” for Siemens SIMATIC S7-1200 PLCs, “DBs S7-1500” for Siemens SIMATIC S7-1500 PLCs) and drag the data block “**ConstTeSysIsland**” contained in it to the **Program Blocks** folder in the project tree. The global data block (DB) with constants relevant to the TeSys™ island function blocks is created in the project.
- From **Types**, select the **UDT** folder and drag the contents to the **PLC data types** folder in the Project tree . The UDTs are imported into the project.
- Select any function block types required for the avatars and the functionality you want for your project in the **Types** folder. Drag and drop the function blocks to the **Program blocks** folder in the Project tree. You can also import complete folders of function blocks.
- The imported items should now be listed in the Project tree as shown in the illustration below.

Figure 22 - Project tree

Assign the Function Block Parameters

1. Create a call for the function block (within the main object block (OB1)).
2. Assign a name for the function block's instance data block (DB).
3. The function block call is created.

Figure 23 - Function Block Instance DB



4. For the acyclic data call, the parameter `i_hwSubmHWID` is required. This parameter refers to the Acyclic sub-module of an avatar or a device. The hardware ID for the acyclic sub-module is located under Properties in the System constants pane in the Device overview of the sub-module.

Figure 24 - Acyclic Sub-module

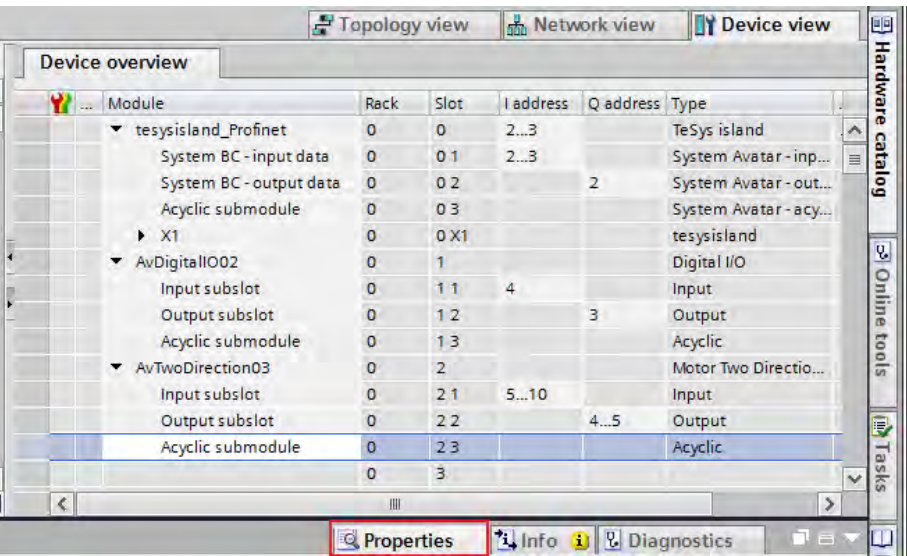


Figure 25 - Hardware Identifier

Acyclic submodule [Acyclic submodule]						Properties
General						
IO tags						
System constants						
Texts						
Show hardware system constant						
Name	Type	Hardware identi.	Used by	Comment		
tesysisland_Profinet-AvTwoDirection03-Acyclic_submodule	Hw_SubModule	272	CPU_TeSysisland			

The Siemens® TIA Portal automatically generates names for the hardware IDs of each sub-module. Type the **bus coupler name** → **module name** → **submodule name** in the interface of the function block (in this example, `tesysisland_Profinet~AvTwoDirection03~Acyclic_submodule`). Alternatively, the Hardware Identification (HWID) can be assigned to a user defined variable and provided to the function block.

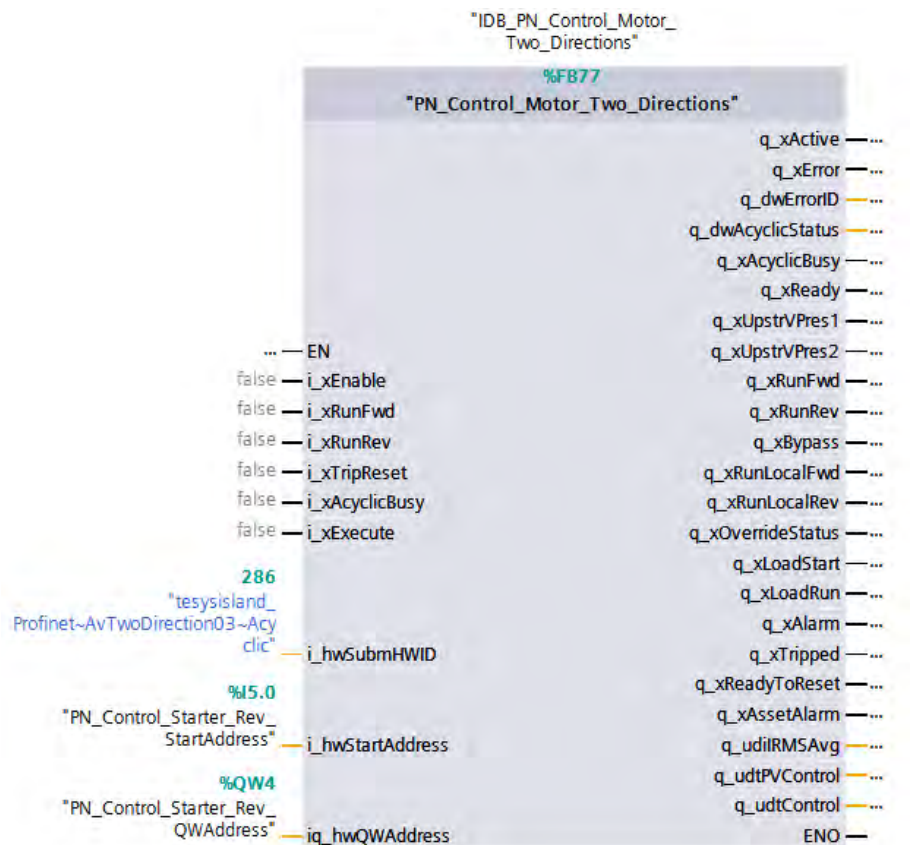
- For the cyclic data call, the parameters `i_hwStartAddress` and `iq_hwQWAddress` are required. The `StartAddress` parameter is needed for the function block to find the input data associated with the avatar. To create the `i_hwStartAddress` parameter, configure a PLC tag (a Boolean data type) with an address at the beginning of the I address range of the cyclic input sub-module and assign it to the interface of the function block.

Figure 26 - Assign Function Block Addresses

	Name	Data type	Address	Retain	Access...	Write...	Visibl...	Comment
1	PN_Control_Starter_Rev_StartAddress	Bool	%I5.0		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
2	PN_Control_Starter_Rev_QWAddress	Word	%QW4		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
3	<Add new>				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

- The `QWAddress` is associated with the Q address of the cyclic output sub-module. To create the `i_hwQWAddress` parameter, configure a word-sized PLC tag with the address of the cyclic output sub-module and assign it to the interface of the function block.
- All parameters for data transfer are configured. The other parameters can be assigned as needed to the control logic of your PLC program.

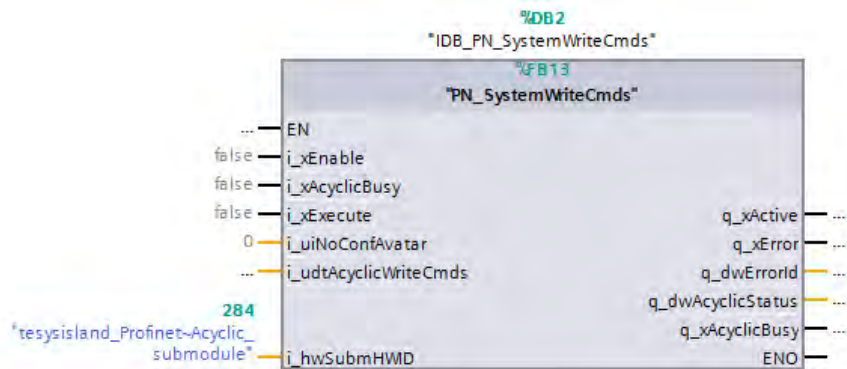
Figure 27 - Function Block Control Logic



- Function blocks with the functionality to acyclically write data have an input parameter to specify the data to be written. For example, the System Write commands function block has the input `i_udtAcyclicWriteCmds` parameter

that, in conjunction with `i_uiNoConfAvatar` parameter, can be used to specify the data to be transferred to the bus coupler.

Figure 28 - SystemWrite Function Block



Updating an Existing TeSys™ island Configuration in the TIA Portal

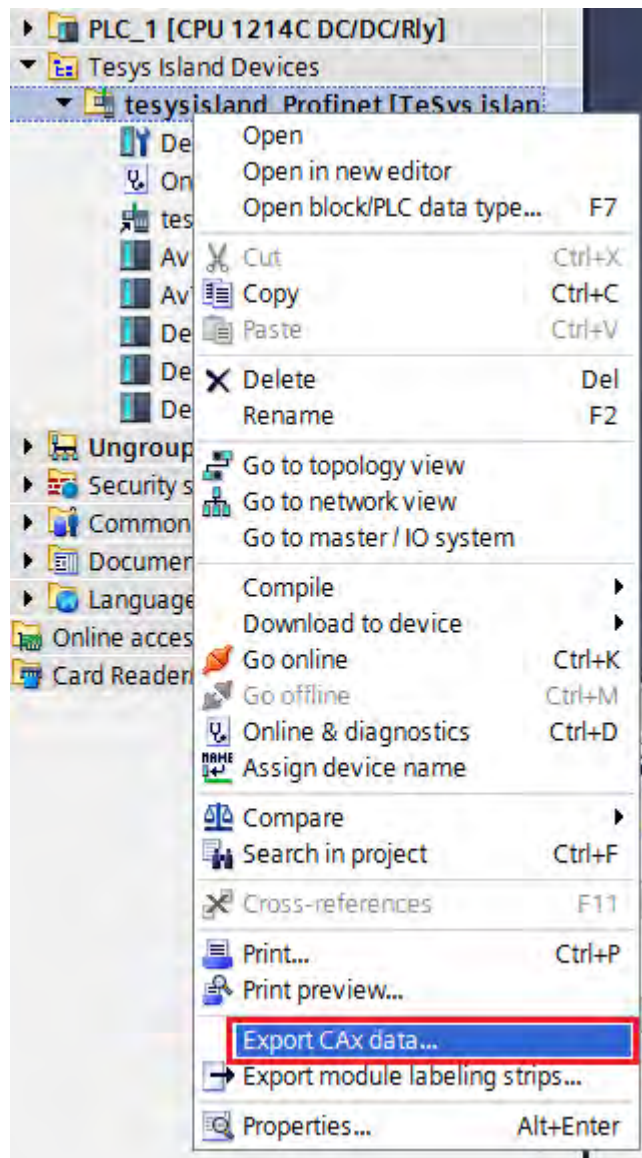
If it is necessary to update an existing TeSys™ island configuration with new avatars or changed avatar positions in TIA Portal, you must import an updated AML file into the TIA Portal and re-configure it. Instead of exporting a new AML file from SoMove™ directly, you can use an AML file merge functionality to preserve data such as I and Q addresses already set in the Siemens® TIA Portal.

This process might revert some of the configuration already done in the TIA Portal after the import. Therefore, it is recommended that you reconfirm all parameters that had been configured for that island in the TIA Portal after the re-import.

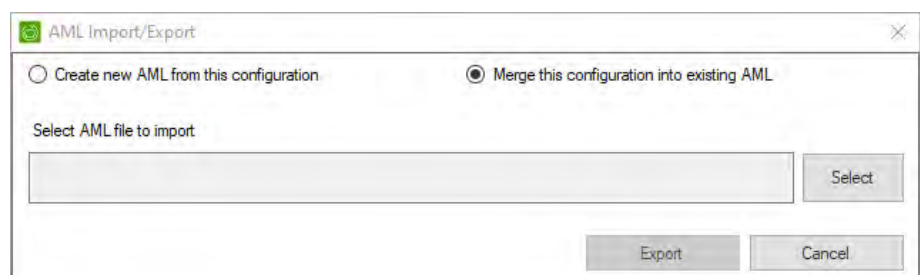
NOTE: Not all configuration changes in SoMove™ software will require an update of the TIA Portal project. The main reason an update would be required is if parameters are changed that also affect the PLC (that is, the bus addresses), or the topology of the TeSys island changes (such as, new or changed avatars or devices).

To update the TeSys island configuration in the Siemens TIA Portal, follow these steps:

1. Open the project in Siemens TIA Portal that contains the TeSys™ island in which the configuration was updated in SoMove™ software.
2. Locate the TeSys island in the Project tree and right-click on it. From the context menu, select **Export CAX data...**

Figure 29 - Export CAx Data

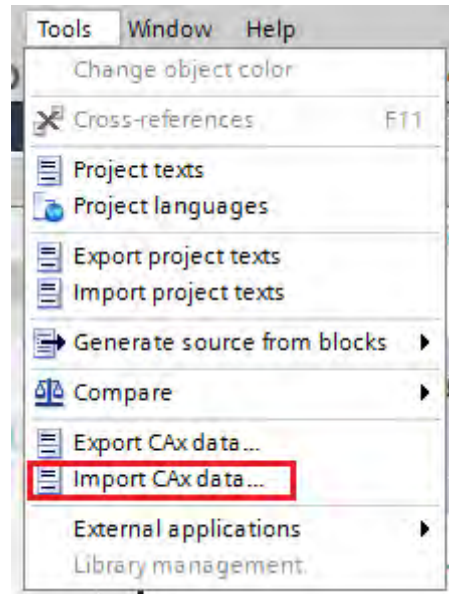
3. Give the file a name and a location to store the file, then click **Save**. The Siemens TIA Portal exports the current configuration of the selected TeSys™ island to that file.
4. Switch to SoMove™ software and open the SoMove project that contains the updated TeSys island configuration.
5. Select **Export** → **AML File Format** from the Device menu.
6. Select the **Merge this configuration into existing AML** option, then click **Export**.

Figure 30 - Merge AML File

7. Select the file you exported from the TIA Portal, then click **Open**. SoMove™ software scans the AML file and identifies the device in the AML file that is being modified.

8. Select the appropriate device and click **Update**. SoMove™ software integrates the changes into the selected AML file, then saves the file.
9. In the Siemens TIA Portal, select **Import CAx data...**

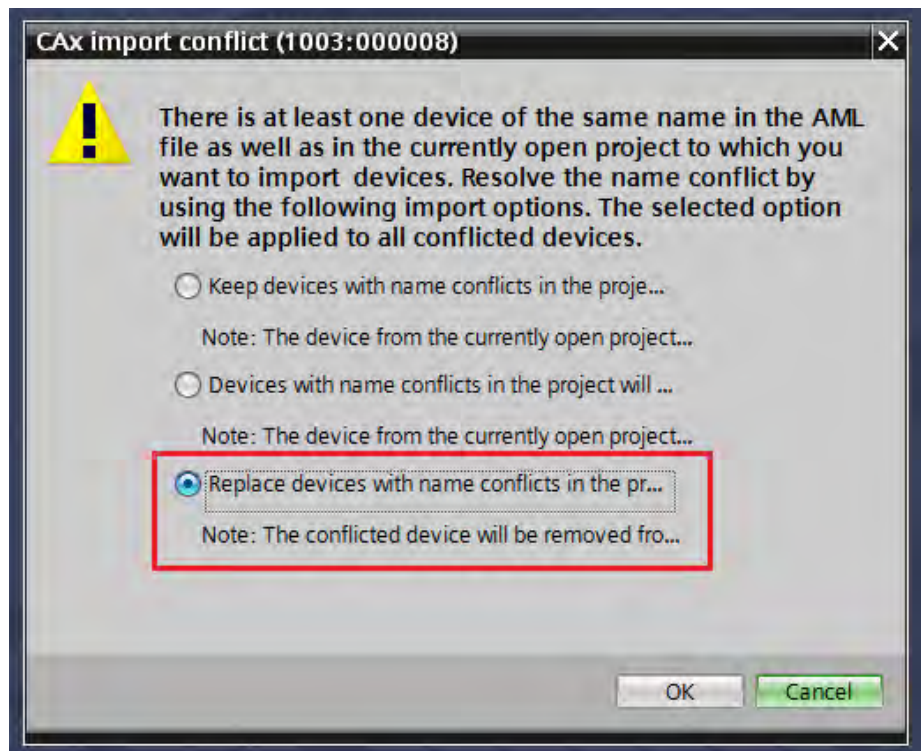
Figure 31 - Import CAx Data



10. Double-click the updated AML file and open it.
11. If you are importing AML files in a project that has existing devices, the TIA Portal will issue a conflict message (such as the message shown below) before importing the devices.

When updating the TeSys™ island configuration, you can replace the devices in the SoMove™ project directly as long as only one TeSys™ island was exported (see notes below for more information). However, it is recommended that you import the changed device into a separate folder in the TIA Portal and verify the information for the updated device before importing it into the project. Once you have verified the update, click **OK**. The Siemens TIA Portal proceeds to import the updated configuration into the project.

Figure 32 - CAx Import Conflict

**NOTE:**

- The Siemens TIA Portal also provides an option to export the complete hardware configuration of the TIA Portal project, including all devices (Tools → Export CAx data...). However, due to limitations of the TIA Portal AML import function, re-importing a file that also contains a PLC and directly replacing all devices, will cause the loss of the PLC program.

If you choose to use the export all functionality to export the project, care needs to be taken when re-integrating the AML file into the TIA Portal. It is recommended that you import the updated versions along with the existing devices, then manually select the devices you want to keep. When you are done, keep all of the devices needed for configuration of the TeSys™ island and import the changes.

- SoMove™ software will retain from the TIA Portal AML file as much information as possible about the updated TeSys™ island. However, the contents of the SoMove™ project will take precedence over changes in the TIA Portal.

For example, names of various elements such as the avatars, the bus address settings, and the island topology. It is recommended that you maintain these elements in SoMove and update the TIA Portal accordingly. For more information, refer to the *TeSys™ island DTM Online Help Guide*, document number 8536IB1907

- If you have overridden the automatically generated PROFINET name in the Siemens® TIA Portal to match it with the PROFINET name of the TeSys™ island as described in *Configure TeSys™ island as a Bus Device*, page 22, the TIA Portal will not reflect this in the exported AML file. You must ensure that the name matches the PROFINET name of the TeSys™ island after the updated AML file has been re-imported.

Frequently Asked Questions (FAQs)

How to Add a User to Siemens® TIA Openness

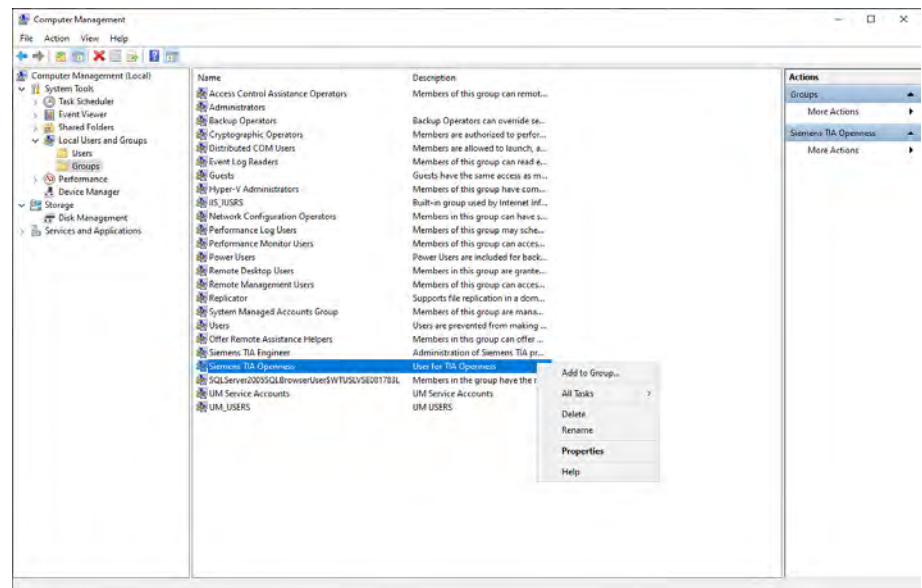
If you receive an error when trying to import the CAx file that you need to be a user of the Siemens® TIA Openness group, do the following:

1. Right click on the Windows **Start**, then select **Computer Management**..

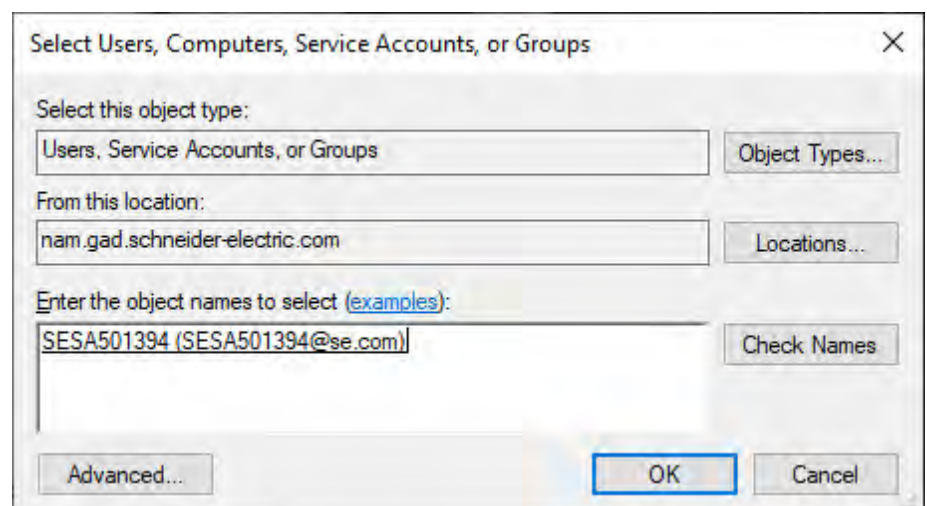
Figure 33 - Windows Start



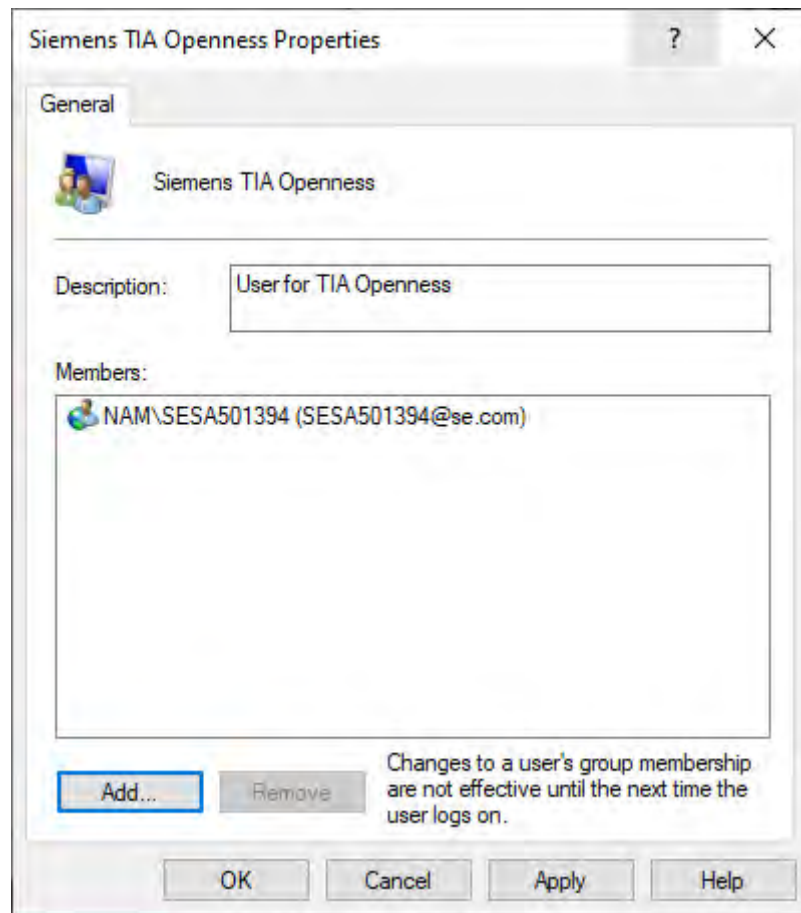
2. In the Computer Management window, click **Local Users and Groups** → **Groups**. Right click on **Siemens TIA Openness**, then select **Add to Group....**

Figure 34 - Computer Management

3. In the Siemens TIA Openness Properties window, click **Add....** Type the object name to select (username) in the **Enter the object name to select** field, then click **Check Names** to locate the user name.

Figure 35 - Add User

4. After the user is found, click OK.

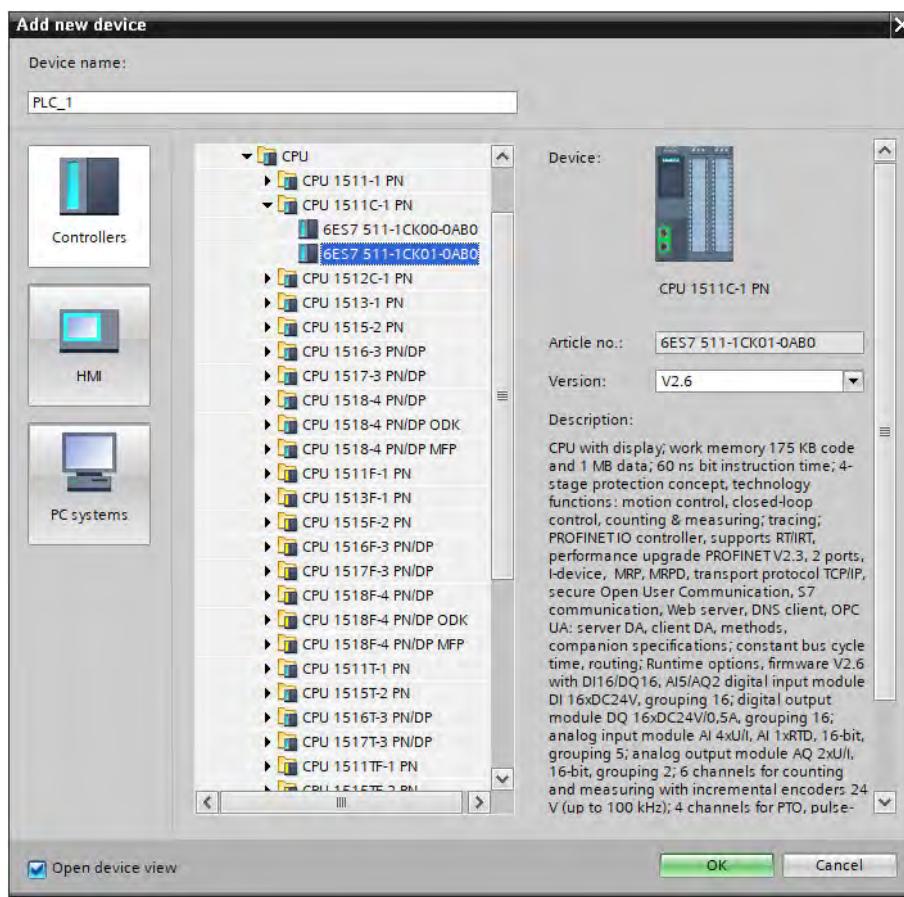
Figure 36 - Siemens TIA Openness Properties

5. The user is added as a member for Siemens TIA Openness. Click **Apply**, then click **OK**.
6. Close the TIA Portal software application.
7. Log off your computer and then log back onto the computer.
8. Reopen your project, then import the CAX file.

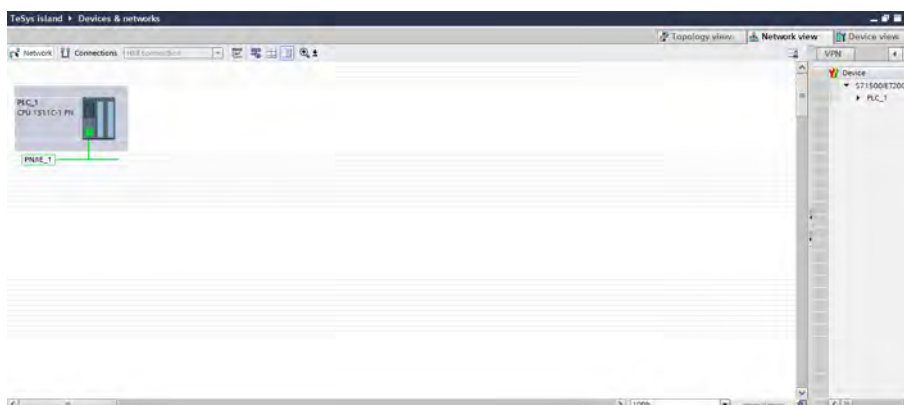
How to Add a New PLC

To add a new PLC to your project, follow these steps:

1. Open an existing project.
2. Click **Add new device**. Click **Controllers** and navigate to your PLC, then select **OK**.

Figure 37 - Add New Device

3. The new PLC appears in the Topology view. Select the **Network View** to view and assign the TeSys™ island device.

Figure 38 - Network View

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<https://www.se.com>

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