

A man in a light blue shirt is shown from the side, holding a tablet computer. He is looking at the screen, which displays a complex interface with various data points and charts. The background is a blurred industrial factory environment with machinery and equipment.

SIEMENS

FAQ • 02/2015

Modbus/TCP Communication via IE CP

SIMATIC Modbus/TCP CP, SIMATIC S7-300/S7-400

<http://support.automation.siemens.com/WW/view/en/75312612>

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1 Introduction

The Modbus/TCP blocks for the Industrial Ethernet CPs of S7-300 and S7-400 are available for downloading in the form of a library: "Modbus_TCP_CP".

<http://support.automation.siemens.com/WW/view/en/103474603>

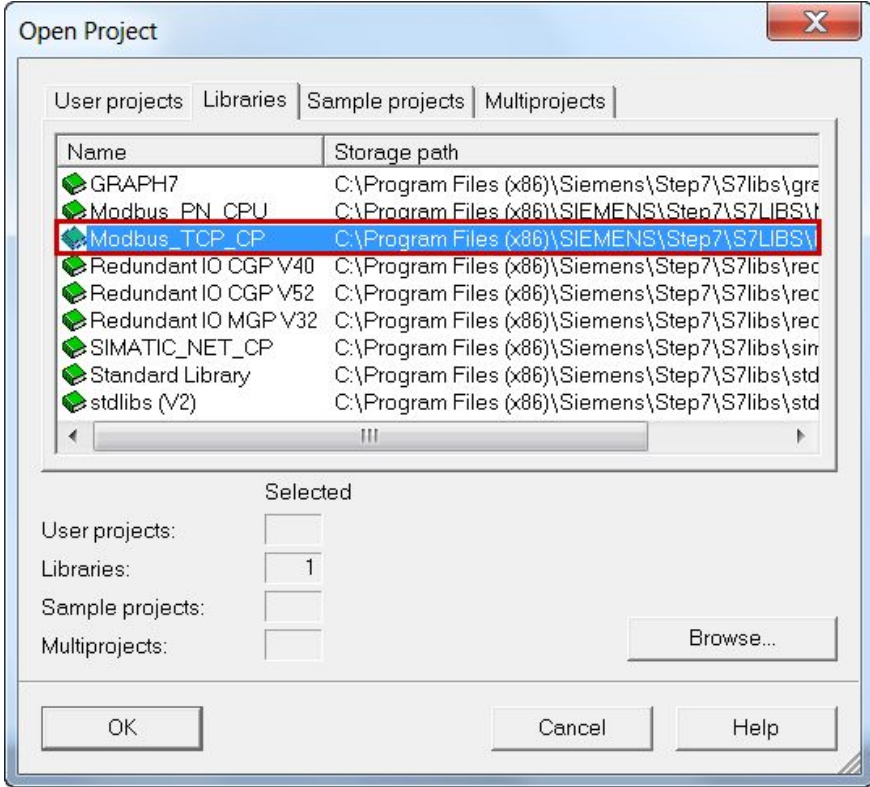
You can only install the "Modbus_TCP_CP" library on PCs on which STEP 7 V5.4 or V5.5 is already installed. In order to use the blocks of the "Modbus_TCP_CP" library in STEP 7 Professional V11/12/V13 (TIA Portal) you must migrate the blocks to the TIA Portal.

This document describes how to migrate the library blocks of "Modbus_TCP_CP" V4.3 and "Modbus_TCP_CP" V5.0.

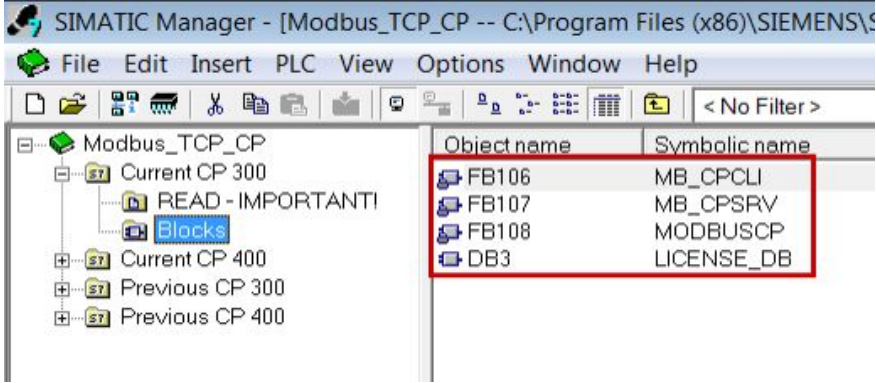
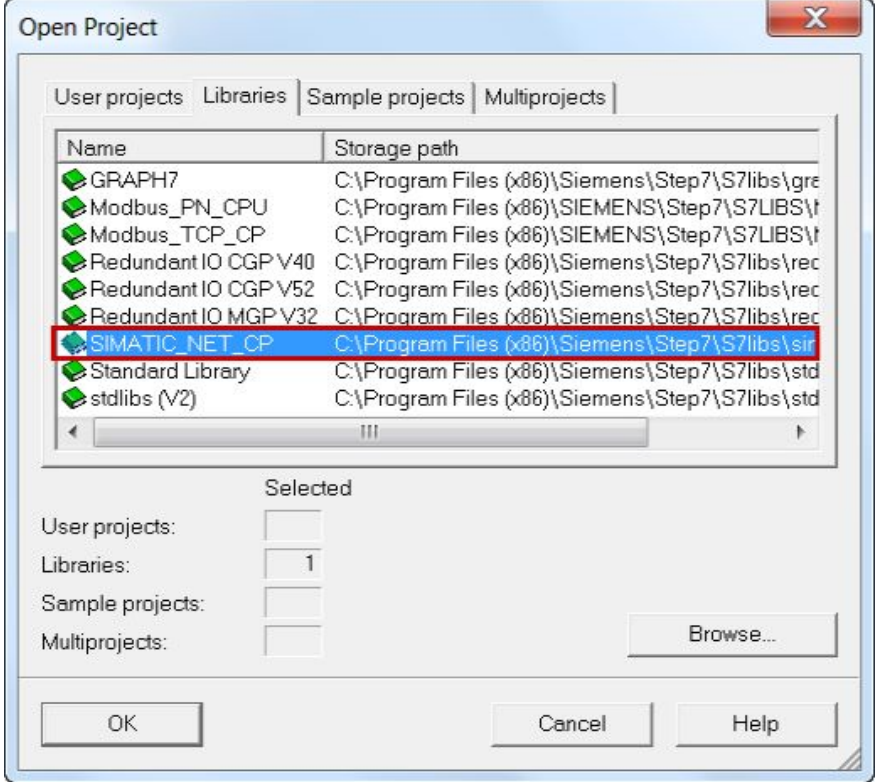
2 Migrate the "MODBUS_TCP_CP" V4.3 Library to STEP 7 V11/12/13 (TIA Portal)

The instructions below describe how to migrate the blocks of the "MODBUS_TCP_CP" V4.3 library to STEP 7 Professional V11/V12/13 (TIA Portal) to be able to use them there.

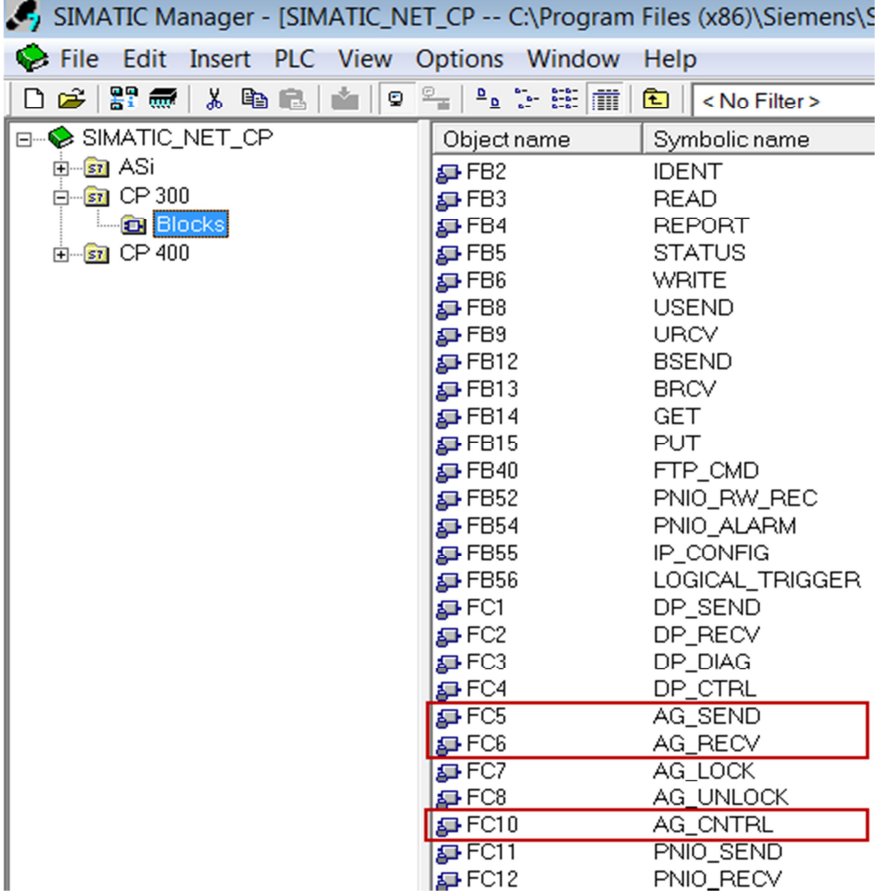
Table 2-1

No.	Procedure
1.	You can only install the "Modbus_TCP_CP" library on a PC on which STEP 7 V5.4 or V5.5 is already installed.
2.	Create a new project in STEP 7 V5.4 or STEP 7 V5.5. Configure the hardware according to your hardware setup.
3.	<p>Open the "Modbus_TCP_CP" library with the "File > Open" menu. In the "Open Project" dialog you select the "Libraries" tab. Select the "Modbus_TCP_CP" library.</p> <p>If the "Modbus_TCP_CP" library is not displayed in the "Libraries" tab of the "Open Project" dialog, click the "Browse..." button. Select the "Modbus_TCP_CP" library in the "...\SIEMENS\Step7\S7LIBS" directory.</p> 

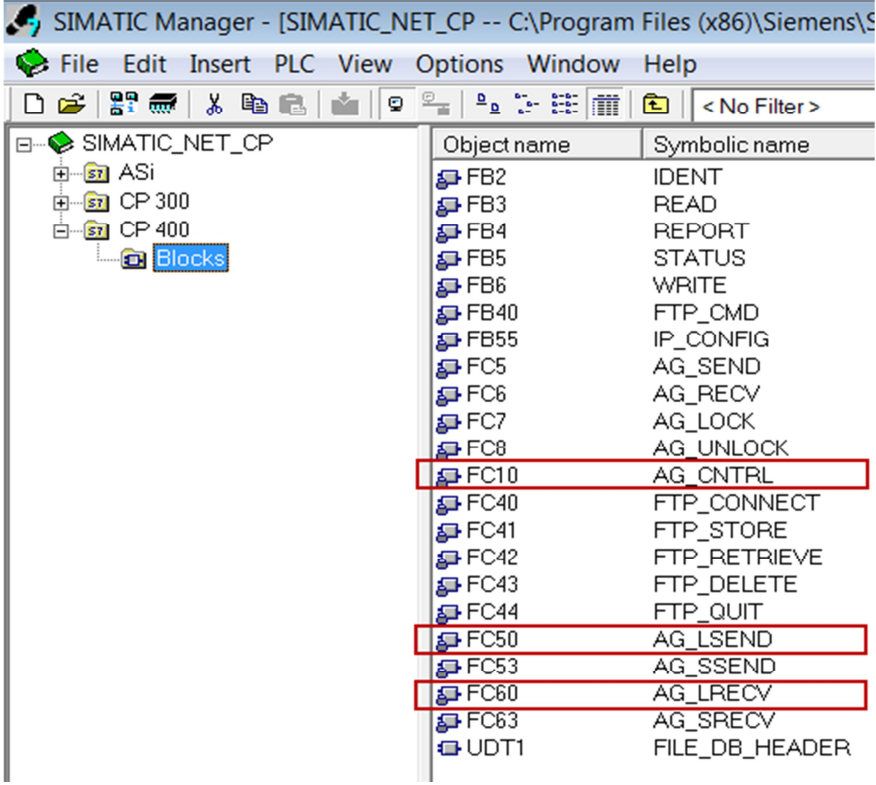
2 Migrate the "MODBUS_TCP_CP" V4.3 Library to STEP 7 V11/12/13 (TIA Portal)

No.	Procedure																				
4.	<p>Copy the blocks from the "Modbus_TCP_CP" and add them to the new project.</p>  <p>The screenshot shows the SIMATIC Manager interface. On the left, a tree view displays the 'Modbus_TCP_CP' library structure, including 'Current CP 300', 'READ - IMPORTANT!', 'Blocks', 'Current CP 400', 'Previous CP 300', and 'Previous CP 400'. On the right, a table lists objects from the library:</p> <table border="1" data-bbox="927 501 1315 647"> <thead> <tr> <th>Object name</th> <th>Symbolic name</th> </tr> </thead> <tbody> <tr> <td>FB106</td> <td>MB_CPCLI</td> </tr> <tr> <td>FB107</td> <td>MB_CPSRV</td> </tr> <tr> <td>FB108</td> <td>MODBUSCP</td> </tr> <tr> <td>DB3</td> <td>LICENSE_DB</td> </tr> </tbody> </table>	Object name	Symbolic name	FB106	MB_CPCLI	FB107	MB_CPSRV	FB108	MODBUSCP	DB3	LICENSE_DB										
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5.	<p>Open the "SIMATIC_NET_CP" library with the "File > Open" menu. In the "Open Project" dialog you switch to the "Libraries" tab and select the "SIMATIC_NET_CP" library.</p>  <p>The screenshot shows the 'Open Project' dialog box. The 'Libraries' tab is selected. A list of libraries is shown with their storage paths:</p> <table border="1" data-bbox="544 1010 1334 1352"> <thead> <tr> <th>Name</th> <th>Storage path</th> </tr> </thead> <tbody> <tr> <td>GRAPH7</td> <td>C:\Program Files (x86)\Siemens\Step7\S7libs\gre</td> </tr> <tr> <td>Modbus_PN_CPU</td> <td>C:\Program Files (x86)\SIEMENS\Step7\S7LIBS\I</td> </tr> <tr> <td>Modbus_TCP_CP</td> <td>C:\Program Files (x86)\SIEMENS\Step7\S7LIBS\I</td> </tr> <tr> <td>Redundant IO CGP V40</td> <td>C:\Program Files (x86)\Siemens\Step7\S7libs\rec</td> </tr> <tr> <td>Redundant IO CGP V52</td> <td>C:\Program Files (x86)\Siemens\Step7\S7libs\rec</td> </tr> <tr> <td>Redundant IO MGP V32</td> <td>C:\Program Files (x86)\Siemens\Step7\S7libs\rec</td> </tr> <tr> <td>SIMATIC_NET_CP</td> <td>C:\Program Files (x86)\Siemens\Step7\S7libs\sr</td> </tr> <tr> <td>Standard Library</td> <td>C:\Program Files (x86)\Siemens\Step7\S7libs\std</td> </tr> <tr> <td>stdlibs (V2)</td> <td>C:\Program Files (x86)\Siemens\Step7\S7libs\std</td> </tr> </tbody> </table> <p>Below the list, the 'Selected' section shows: User projects: <input type="checkbox"/>, Libraries: <input checked="" type="checkbox"/> 1, Sample projects: <input type="checkbox"/>, Multiprojects: <input type="checkbox"/>. Buttons for 'OK', 'Cancel', 'Help', and 'Browse...' are visible at the bottom.</p>	Name	Storage path	GRAPH7	C:\Program Files (x86)\Siemens\Step7\S7libs\gre	Modbus_PN_CPU	C:\Program Files (x86)\SIEMENS\Step7\S7LIBS\I	Modbus_TCP_CP	C:\Program Files (x86)\SIEMENS\Step7\S7LIBS\I	Redundant IO CGP V40	C:\Program Files (x86)\Siemens\Step7\S7libs\rec	Redundant IO CGP V52	C:\Program Files (x86)\Siemens\Step7\S7libs\rec	Redundant IO MGP V32	C:\Program Files (x86)\Siemens\Step7\S7libs\rec	SIMATIC_NET_CP	C:\Program Files (x86)\Siemens\Step7\S7libs\sr	Standard Library	C:\Program Files (x86)\Siemens\Step7\S7libs\std	stdlibs (V2)	C:\Program Files (x86)\Siemens\Step7\S7libs\std
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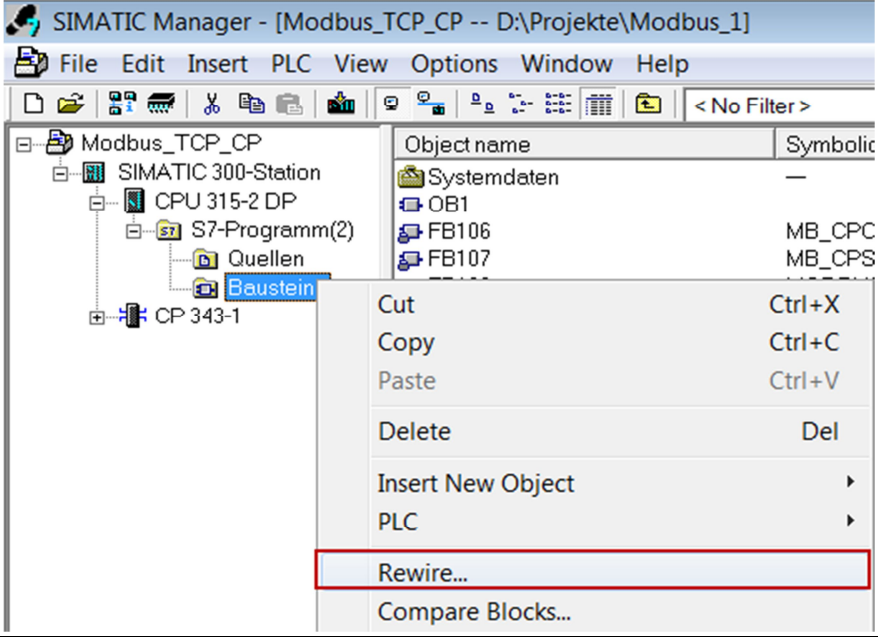
2 Migrate the "MODBUS_TCP_CP" V4.3 Library to STEP 7 V11/12/13 (TIA Portal)

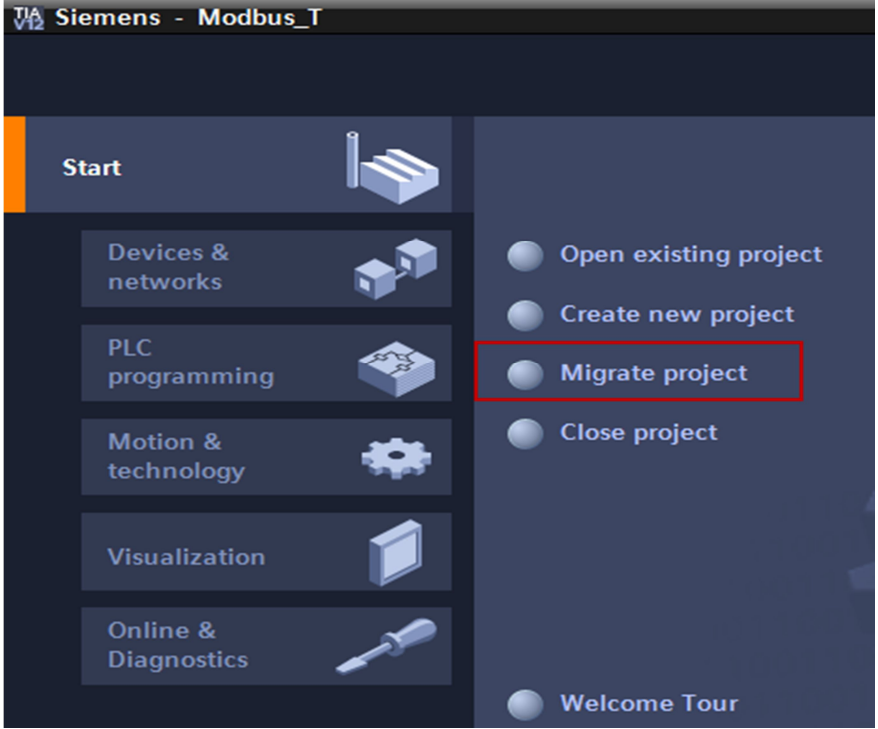
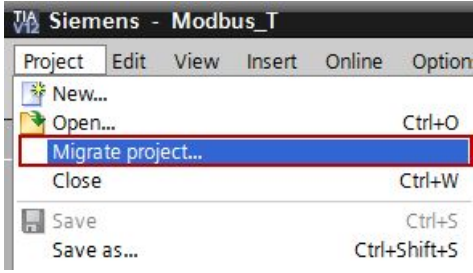
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6.	<p>If you are using a SIMATIC S7-300, then copy the following blocks from the "SIMATIC_NET_CP > CP 300 > Blocks" library and add them to the new project.</p> <ul style="list-style-type: none"> • FC5 "AG_SEND" • FC6 "AG_RECV" <p>If you are using a current station, copy the FC10 "AG_CNTRL" as well into your project.</p>																																																								
 <p>The screenshot shows the SIMATIC Manager interface. The left pane displays the project tree with 'SIMATIC_NET_CP' expanded to show 'CP 300' and its 'Blocks' folder. The right pane shows a list of objects with their names and symbolic names. The following table represents the data shown in the object list:</p> <table border="1" data-bbox="925 649 1375 1422"> <thead> <tr> <th>Object name</th> <th>Symbolic name</th> </tr> </thead> <tbody> <tr><td>FB2</td><td>IDENT</td></tr> <tr><td>FB3</td><td>READ</td></tr> <tr><td>FB4</td><td>REPORT</td></tr> <tr><td>FB5</td><td>STATUS</td></tr> <tr><td>FB6</td><td>WRITE</td></tr> <tr><td>FB8</td><td>USEND</td></tr> <tr><td>FB9</td><td>URCV</td></tr> <tr><td>FB12</td><td>BSEND</td></tr> <tr><td>FB13</td><td>BRCV</td></tr> <tr><td>FB14</td><td>GET</td></tr> <tr><td>FB15</td><td>PUT</td></tr> <tr><td>FB40</td><td>FTP_CMD</td></tr> <tr><td>FB52</td><td>PNIO_RW_REC</td></tr> <tr><td>FB54</td><td>PNIO_ALARM</td></tr> <tr><td>FB55</td><td>IP_CONFIG</td></tr> <tr><td>FB56</td><td>LOGICAL_TRIGGER</td></tr> <tr><td>FC1</td><td>DP_SEND</td></tr> <tr><td>FC2</td><td>DP_RECV</td></tr> <tr><td>FC3</td><td>DP_DIAG</td></tr> <tr><td>FC4</td><td>DP_CTRL</td></tr> <tr><td>FC5</td><td>AG_SEND</td></tr> <tr><td>FC6</td><td>AG_RECV</td></tr> <tr><td>FC7</td><td>AG_LOCK</td></tr> <tr><td>FC8</td><td>AG_UNLOCK</td></tr> <tr><td>FC10</td><td>AG_CNTRL</td></tr> <tr><td>FC11</td><td>PNIO_SEND</td></tr> <tr><td>FC12</td><td>PNIO_RECV</td></tr> </tbody> </table>		Object name	Symbolic name	FB2	IDENT	FB3	READ	FB4	REPORT	FB5	STATUS	FB6	WRITE	FB8	USEND	FB9	URCV	FB12	BSEND	FB13	BRCV	FB14	GET	FB15	PUT	FB40	FTP_CMD	FB52	PNIO_RW_REC	FB54	PNIO_ALARM	FB55	IP_CONFIG	FB56	LOGICAL_TRIGGER	FC1	DP_SEND	FC2	DP_RECV	FC3	DP_DIAG	FC4	DP_CTRL	FC5	AG_SEND	FC6	AG_RECV	FC7	AG_LOCK	FC8	AG_UNLOCK	FC10	AG_CNTRL	FC11	PNIO_SEND	FC12	PNIO_RECV
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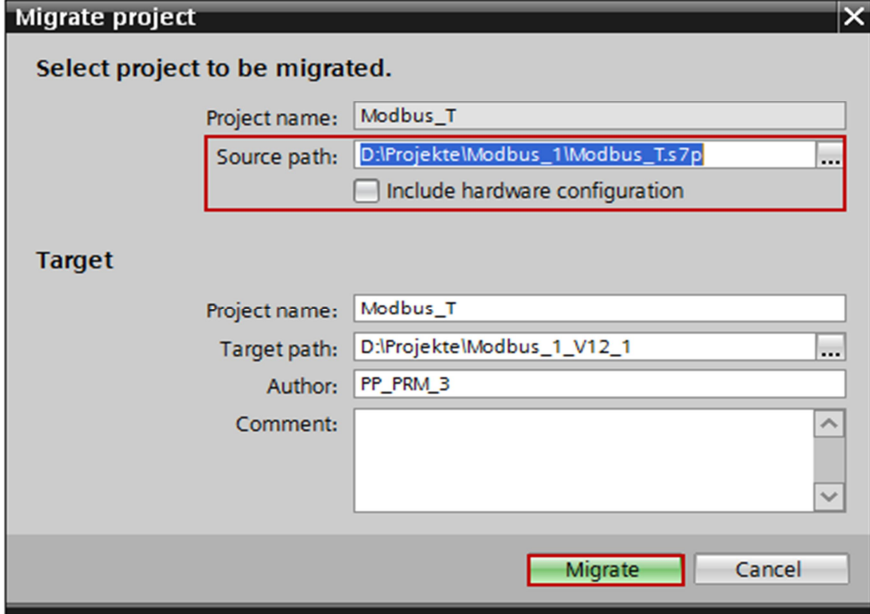
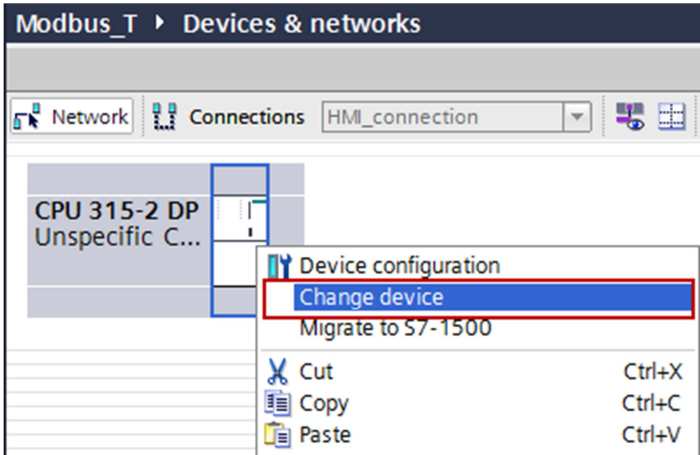
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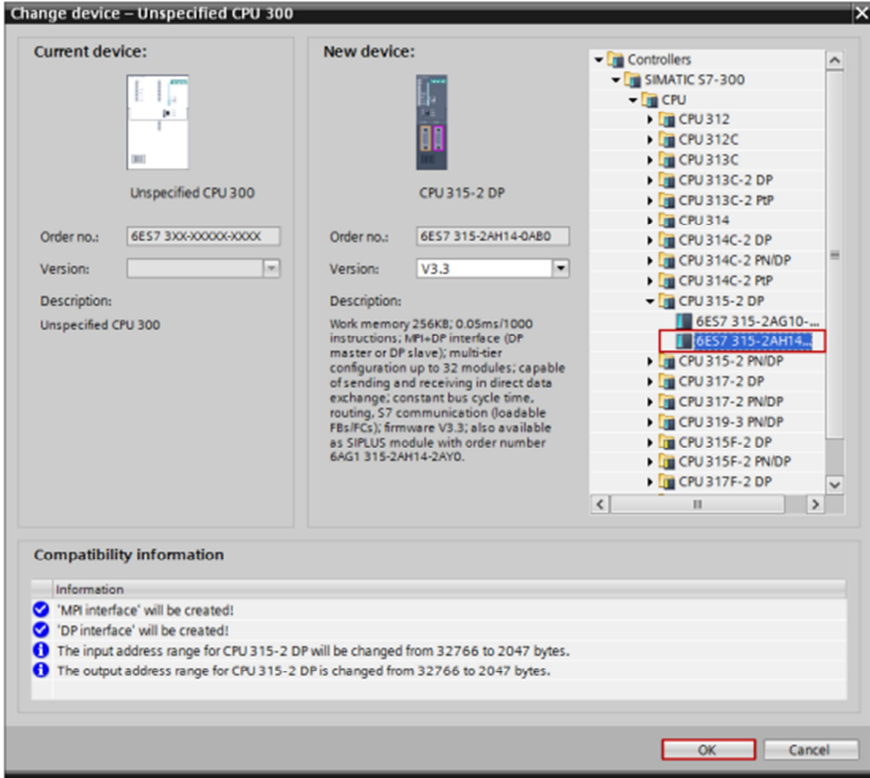
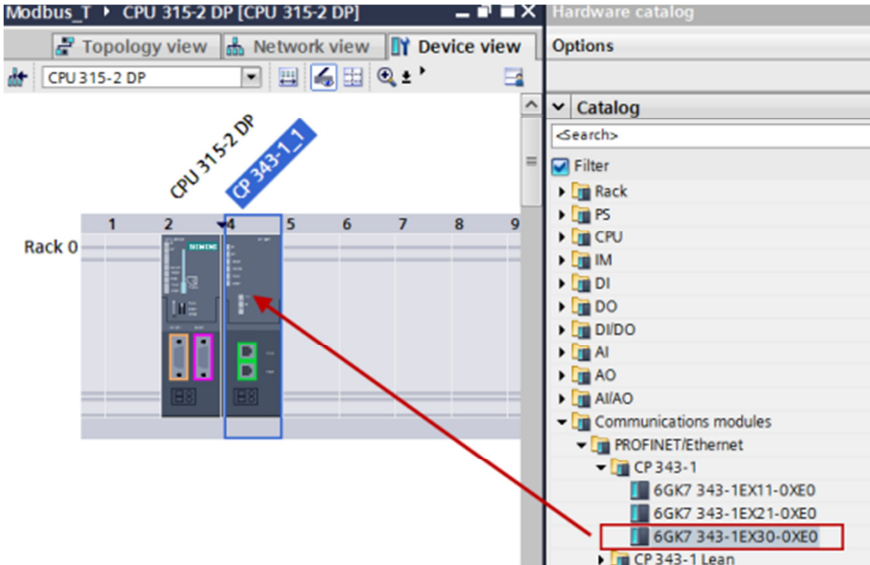
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7.	<p>If you are using a SIMATIC S7-400, then copy the following blocks from the "SIMATIC_NET_CP > CP 400 > Blocks" library and add them to the new project.</p> <ul style="list-style-type: none"> • FC50 "AG_LSEND" • FC60 "AG_LRECV" <p>If you are using a current station, copy the FC10 "AG_CNTRL" as well into your project.</p>  <p>The screenshot shows the SIMATIC Manager interface. On the left, the project tree is expanded to 'SIMATIC_NET_CP > CP 400 > Blocks'. On the right, a table lists the available function blocks:</p> <table border="1" data-bbox="927 651 1375 1310"> <thead> <tr> <th>Object name</th> <th>Symbolic name</th> </tr> </thead> <tbody> <tr><td>FB2</td><td>IDENT</td></tr> <tr><td>FB3</td><td>READ</td></tr> <tr><td>FB4</td><td>REPORT</td></tr> <tr><td>FB5</td><td>STATUS</td></tr> <tr><td>FB6</td><td>WRITE</td></tr> <tr><td>FB40</td><td>FTP_CMD</td></tr> <tr><td>FB55</td><td>IP_CONFIG</td></tr> <tr><td>FC5</td><td>AG_SEND</td></tr> <tr><td>FC6</td><td>AG_RECV</td></tr> <tr><td>FC7</td><td>AG_LOCK</td></tr> <tr><td>FC8</td><td>AG_UNLOCK</td></tr> <tr><td>FC10</td><td>AG_CNTRL</td></tr> <tr><td>FC40</td><td>FTP_CONNECT</td></tr> <tr><td>FC41</td><td>FTP_STORE</td></tr> <tr><td>FC42</td><td>FTP_RETRIEVE</td></tr> <tr><td>FC43</td><td>FTP_DELETE</td></tr> <tr><td>FC44</td><td>FTP_QUIT</td></tr> <tr><td>FC50</td><td>AG_LSEND</td></tr> <tr><td>FC53</td><td>AG_SSEND</td></tr> <tr><td>FC60</td><td>AG_LRECV</td></tr> <tr><td>FC63</td><td>AG_SRECV</td></tr> <tr><td>UDT1</td><td>FILE_DB_HEADER</td></tr> </tbody> </table>	Object name	Symbolic name	FB2	IDENT	FB3	READ	FB4	REPORT	FB5	STATUS	FB6	WRITE	FB40	FTP_CMD	FB55	IP_CONFIG	FC5	AG_SEND	FC6	AG_RECV	FC7	AG_LOCK	FC8	AG_UNLOCK	FC10	AG_CNTRL	FC40	FTP_CONNECT	FC41	FTP_STORE	FC42	FTP_RETRIEVE	FC43	FTP_DELETE	FC44	FTP_QUIT	FC50	AG_LSEND	FC53	AG_SSEND	FC60	AG_LRECV	FC63	AG_SRECV	UDT1	FILE_DB_HEADER
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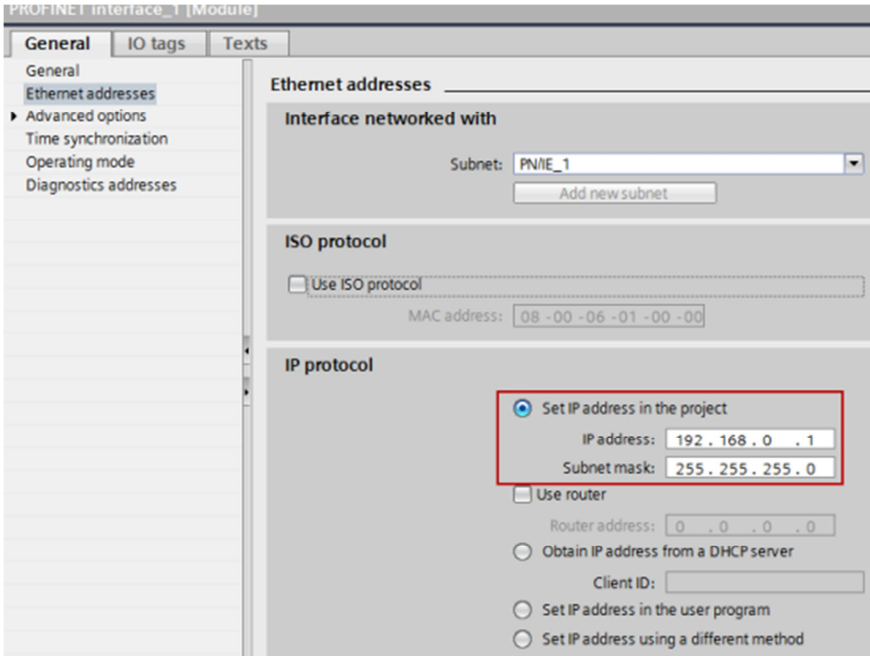
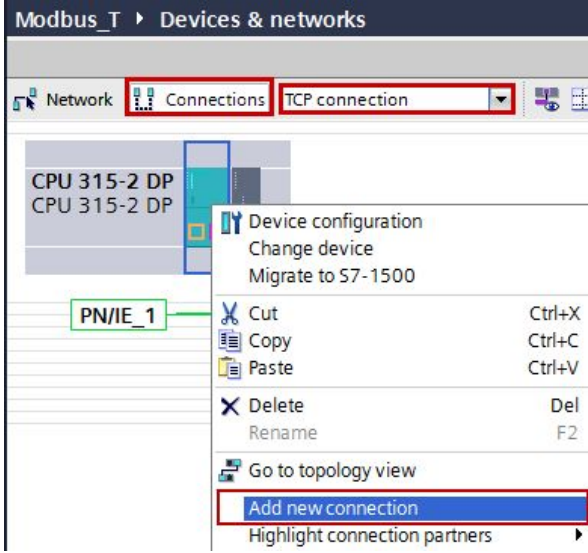
2 Migrate the "MODBUS_TCP_CP" V4.3 Library to STEP 7 V11/12/13 (TIA Portal)

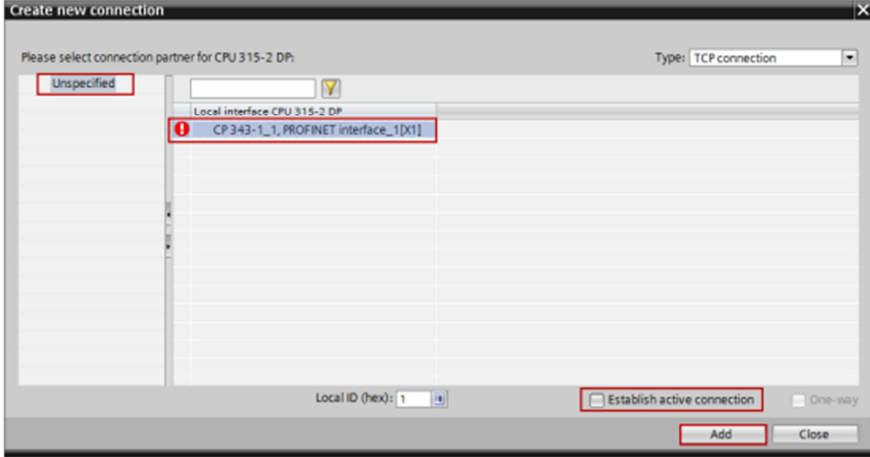
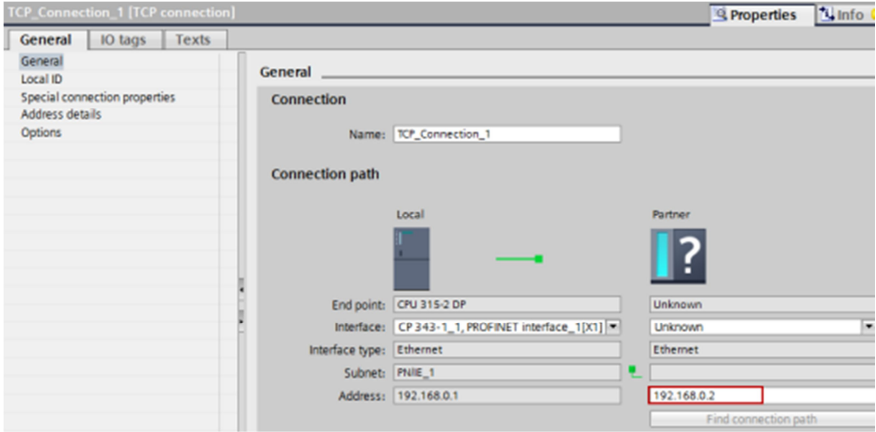
No.	Procedure
8.	<p>If you change the numbers of the function blocks, use the "Rewire" function. It is no longer possible to rewire after migration.</p> <p>Right-click the block folder in the S7 program of the CPU. In the pop-up menu you select the "Rewire" function.</p>  <p>The screenshot shows the SIMATIC Manager interface. The project tree on the left shows the hierarchy: Modbus_TCP_CP > SIMATIC 300-Station > CPU 315-2 DP > S7-Programm(2) > Baustein. The 'Baustein' folder is selected. The right pane shows a list of objects: Systemdaten, OB1, FB106 (MB_CPC), and FB107 (MB_CPS). A context menu is open over the 'Baustein' folder, listing options like Cut, Copy, Paste, Delete, Insert New Object, PLC, Rewire..., and Compare Blocks... The 'Rewire...' option is highlighted with a red border.</p>
9.	Start STEP 7 Professional V11/V12/13 (TIA Portal)

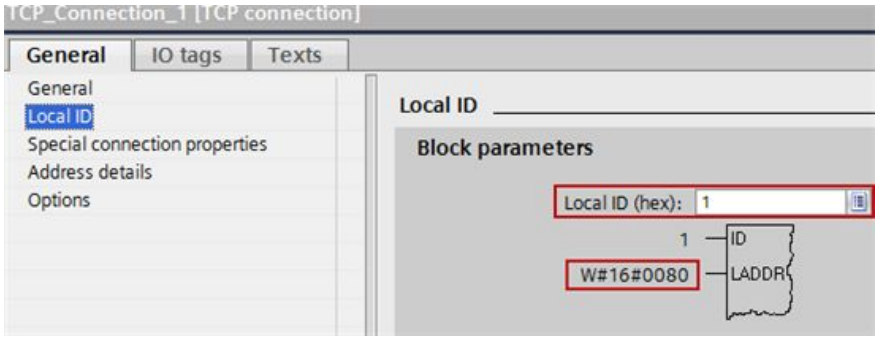
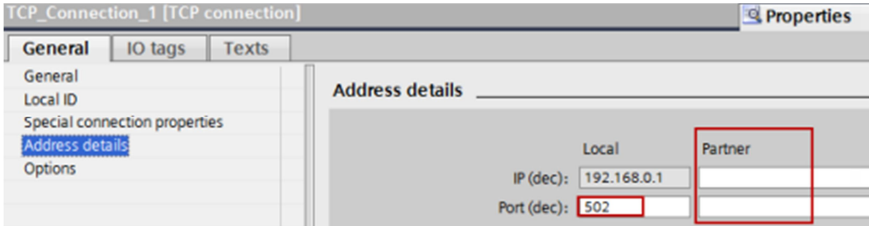
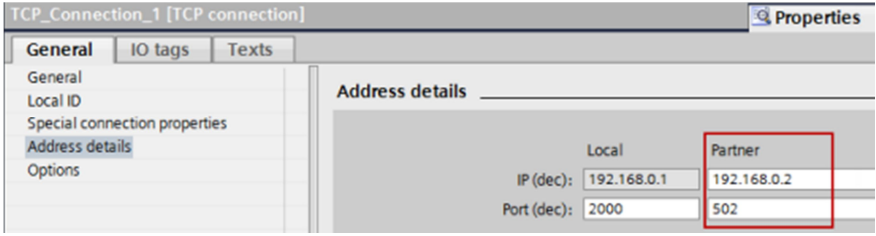
No.	Procedure
10.	<p>Select "Migrate project" in the Portal view or the "Project > Migrate project..." menu in the Project view. The "Migrate project" dialog opens.</p> <p>Portal view</p>  <p>The screenshot shows the 'Start' menu in TIA Portal. On the left, there are categories: Start, Devices & networks, PLC programming, Motion & technology, Visualization, and Online & Diagnostics. On the right, there are options: Open existing project, Create new project, Migrate project (highlighted with a red rectangle), Close project, and Welcome Tour.</p> <p>Project view</p>  <p>The screenshot shows the 'Project' menu in TIA Portal. The menu items are: New..., Open... (Ctrl+O), Migrate project... (highlighted with a red rectangle), Close (Ctrl+W), Save (Ctrl+S), and Save as... (Ctrl+Shift+S).</p>

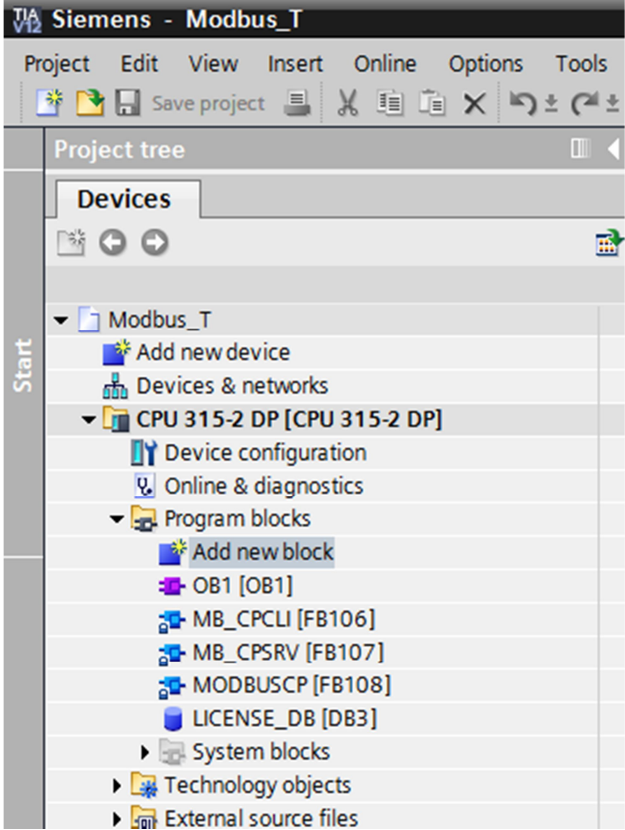
No.	Procedure
11.	<p>In the "Migrate project" dialog you select the project to be migrated. Deselect the "Include hardware configuration" option. Specify the project name and target path of the TIA Portal project. Click the "Migrate" button to execute the migration.</p> 
12.	<p>Close the "Migrate project" dialog and open the migration log. You are informed that the associated SCL sources of the blocks FB106, FB107 and FB108 are missing. You can ignore this message.</p>
13.	<p>In addition you get the message "All PLCs have been replaced by unspecified CPUs". To clear this message you switch to the Network view and there you right-click the CPU. Select "Change device" in the pop-up menu. The "Change device" dialog opens.</p> 

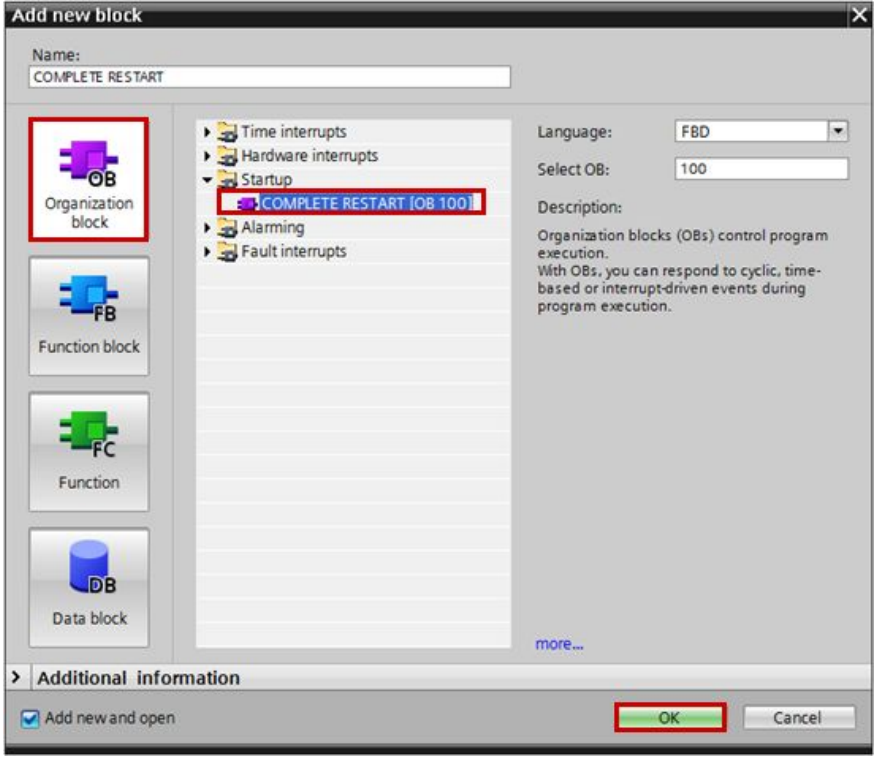
No.	Procedure
14.	<p>In the "Change device" dialog you select the correct CPU according to your hardware setup, CPU 315-2 DP, for example. Confirm the settings with "OK".</p> 
15.	<p>According to your hardware setup, in the Device view you drag-and-drop the Industrial Ethernet CP from the Hardware Catalog to the rack of the SIMATIC S7-300.</p> 

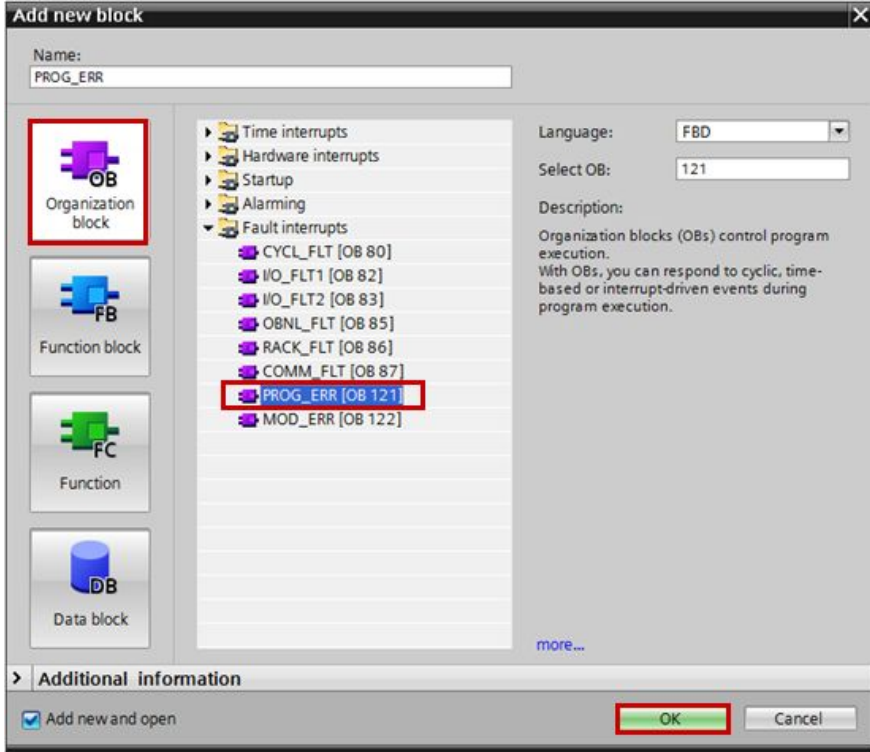
No.	Procedure
16.	<p>In the Device view you mark the PROFINET interface of the Industrial Ethernet CP.</p> <p>In the inspector window you assign a subnet to the PROFINET interface and enter the IP address and subnet mask of the Industrial Ethernet CP in "Properties > General > Ethernet addresses".</p> 
17.	<p>Insert a TCP connection for the CPU.</p> <ul style="list-style-type: none"> In the Network view you click "Connections". Select "TCP connection" as the connection type. Right-click the CPU and select "Add new connection" in the pop-up menu. The "Create new connection" dialog opens. 

No.	Procedure
18.	<p>In the "Create new connection" dialog you make the following settings.</p> <ul style="list-style-type: none"> • Select "Unspecified" as the connection partner. • Select the Industrial Ethernet CP as local interface. • Disable the "Establish active connection" function if the Modbus block is parameterized as server. • Enable the "Establish active connection" function if the Modbus block is parameterized as client. • Click "Add" and close the dialog. 
19.	<p>The TCP connection established is displayed in the table area of the Network view in the "Connections" table. The properties of the TCP connection are displayed in the TCP connection.</p> <p>In the Properties of the TCP connection you open the "General" tab.</p> <p>Navigate to and open the "General" area. Here you enter the IP address of the partner if the Modbus block is parameterized as client.</p> 

No.	Procedure
20.	<p>Navigate to and open the "Local ID" area. Enter the local ID that you parameterize for the Modbus TCP connection on the Modbus block. Note the LADDR for the parameterization of the Modbus blocks.</p> 
21.	<p>Navigate to and open the "Address details" area. If you parameterize the Modbus block as server, enter Port 502 as local port of the CPU. Do not make any specifications about the partner.</p>  <p>If you parameterize the Modbus block as client, you enter the IP address of the partner and specify Port 502 as the partner port. You can apply the default value for the local port of the CPU, 2000, for example.</p> 

No.	Procedure
22.	<p>In the project navigation you open the folder structure for the CPU 315-2 DP. Here you open the "Program blocks" folder. Double-click the "Add new block" command. The "Add new block" dialog opens.</p>  <p>The screenshot shows the TIA Portal interface with the following structure:</p> <ul style="list-style-type: none"> Siemens - Modbus_T <ul style="list-style-type: none"> Project Edit View Insert Online Options Tools Project tree <ul style="list-style-type: none"> Devices <ul style="list-style-type: none"> Modbus_T <ul style="list-style-type: none"> Add new device Devices & networks CPU 315-2 DP [CPU 315-2 DP] <ul style="list-style-type: none"> Device configuration Online & diagnostics Program blocks <ul style="list-style-type: none"> Add new block OB1 [OB1] MB_CPCLI [FB106] MB_CPSRV [FB107] MODBUSCP [FB108] LICENSE_DB [DB3] System blocks Technology objects External source files

No.	Procedure
23.	<p>In the "Add new block" dialog you click the "Organization block (OB)" button. Select the Startup OB: OB 100. Click the "OK" button to add OB100 to your project.</p>  <p>Add new block</p> <p>Name: COMPLETE RESTART</p> <p>Organization block</p> <p>Function block</p> <p>Function</p> <p>Data block</p> <ul style="list-style-type: none">Time interruptsHardware interruptsStartup<ul style="list-style-type: none">COMPLETE RESTART [OB 100]AlarmingFault interrupts <p>Language: FBD</p> <p>Select OB: 100</p> <p>Description: Organization blocks (OBs) control program execution. With OBs, you can respond to cyclic, time-based or interrupt-driven events during program execution.</p> <p>more...</p> <p>Additional information</p> <p><input checked="" type="checkbox"/> Add new and open</p> <p>OK Cancel</p>

No.	Procedure
24.	<p>Double-click the "Add new block" command again. The "Add new block" dialog opens.</p> <p>Click the "Organization block (OB)" button. Select the Fault interrupt OB: OB121. Click the "OK" button to add OB121 to your project.</p> 
25.	Add the data blocks (DBs) for the Modbus data.
26.	<p>Now you program the calls of the FB108 "MODBUSCP" block in the OB100 and in a cyclic OB, OB1, for example, as described in the manual.</p> <p>Note</p> <p>The manual for MODBUS/TCP communication over an Industrial Ethernet CP of S7-300 or S7-400 is available for downloading: http://support.automation.siemens.com/WW/view/en/103474603</p>
27.	Now compile the project. There should be no errors or warnings.

Note

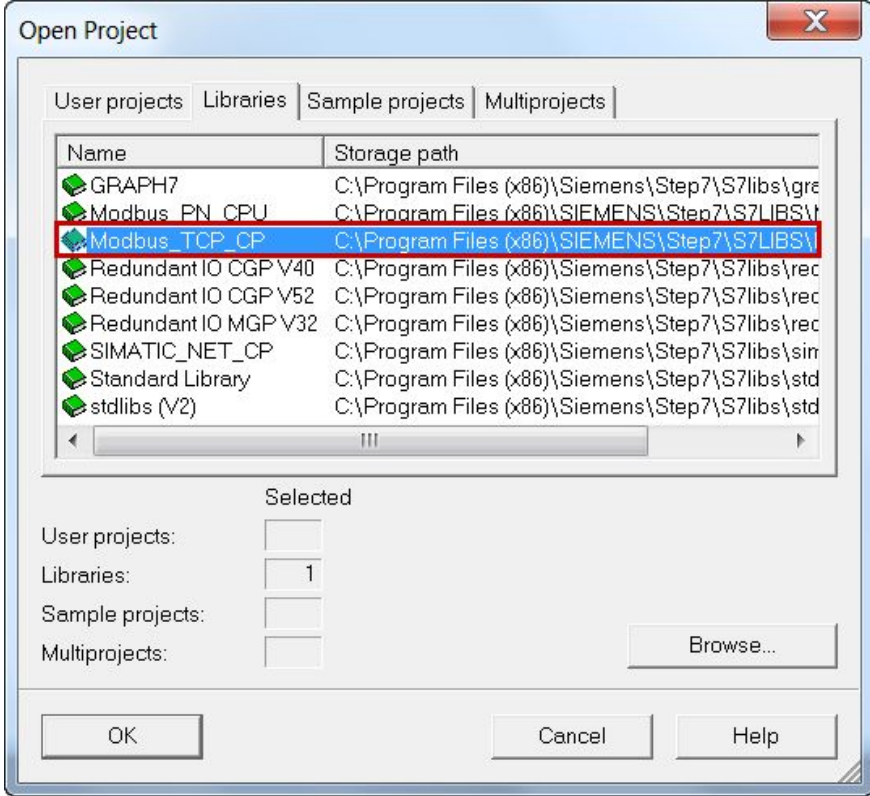
In STEP 7 V11/12/V13 (TIA Portal) it is not permitted to add migrated know-how-protected blocks to a library. If you do do this and add the library blocks to a project, this might damage the project.

It is not recommended to copy the blocks into another project, because this can lead to problems.

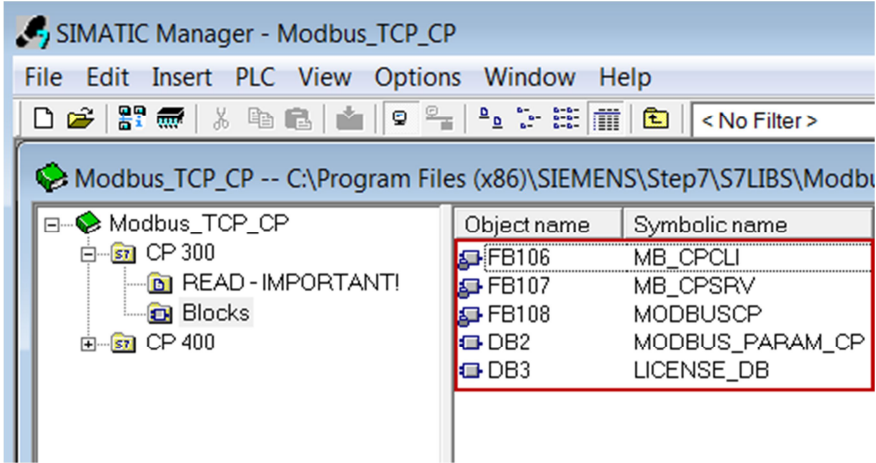
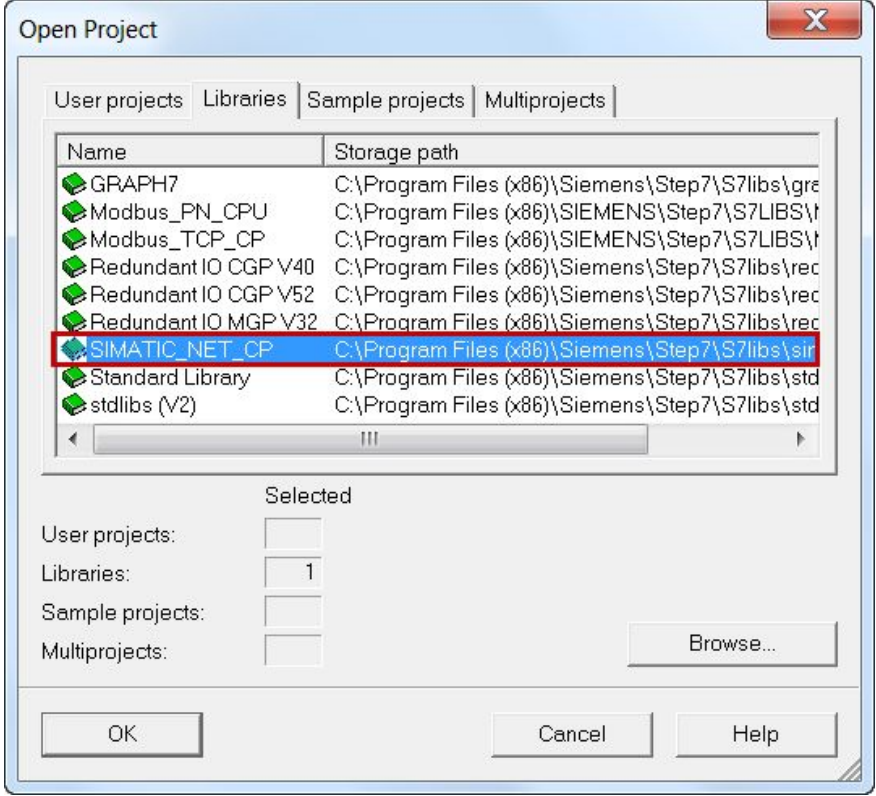
3 Migrate the "MODBUS_TCP_CP" V5.0 Library to STEP 7 V11/12/13 (TIA Portal)

The instructions below describe how to migrate the blocks of the "MODBUS_TCP_CP" V5.0 library to STEP 7 Professional V11/V12/13 (TIA Portal) to be able to use them there.

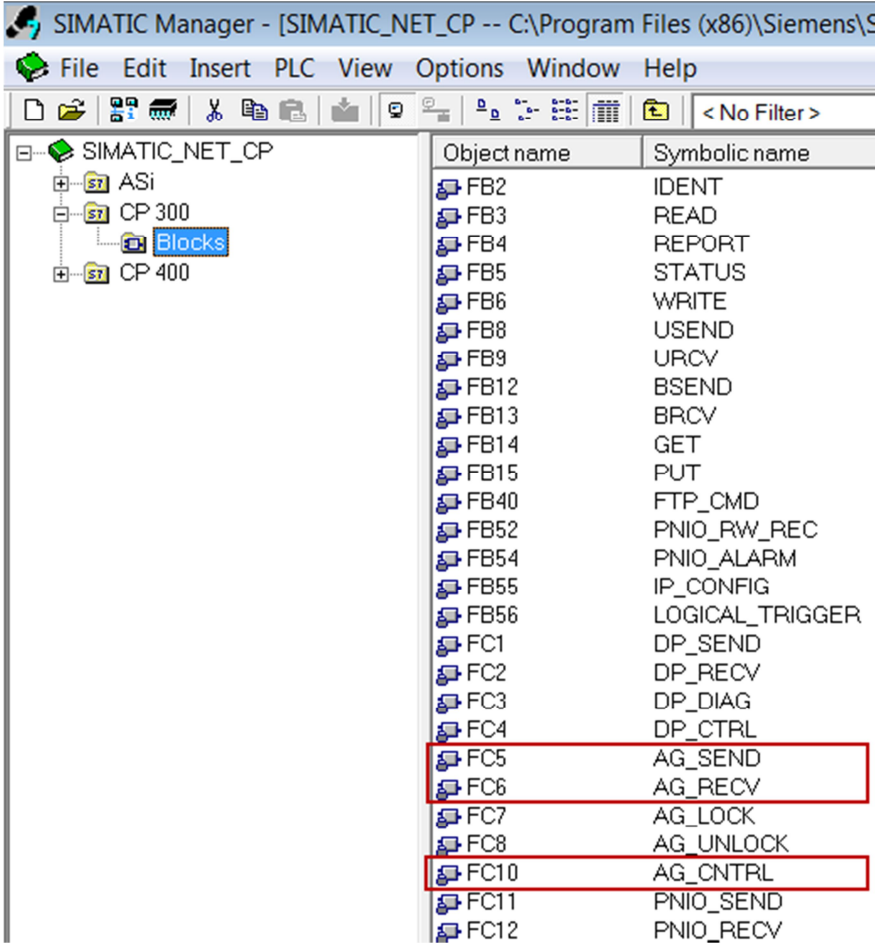
Table 3-1

No.	Procedure
1.	You can only install the "Modbus_TCP_CP" library on a PC on which STEP 7 V5.4 or V5.5 is already installed.
2.	Create a new project in STEP 7 V5.4 or STEP 7 V5.5. Configure the hardware according to your hardware setup.
3.	<p>Open the "Modbus_TCP_CP" library with the "File > Open" menu.</p> <p>In the "Open Project" dialog you select the "Libraries" tab. Select the "Modbus_TCP_CP" library.</p> <p>If the "Modbus_TCP_CP" library is not displayed in the "Libraries" tab of the "Open Project" dialog, then click the "Browse..." button. Select the "Modbus_TCP_CP" library in the "...\SIEMENS\Step7\S7LIBS" directory.</p> 

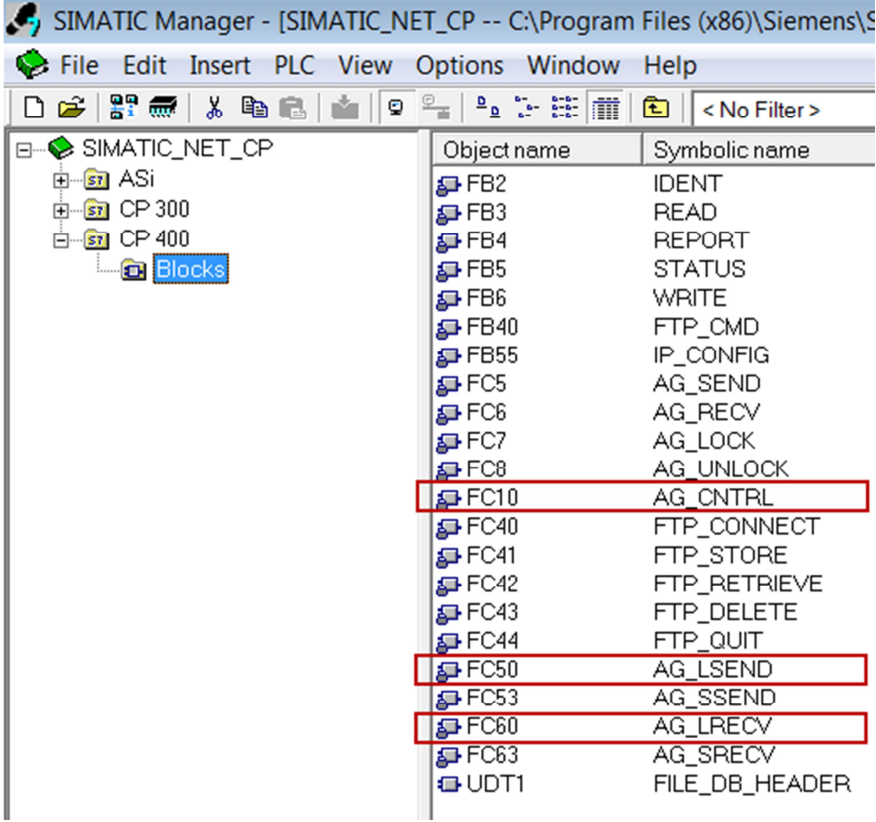
3 Migrate the "MODBUS_TCP_CP" V5.0 Library to STEP 7 V11/12/13 (TIA Portal)

No.	Procedure																				
4.	<p>Copy the blocks from the "Modbus_TCP_CP" and add them to the new project.</p>  <p>The screenshot shows the SIMATIC Manager interface for the 'Modbus_TCP_CP' library. The left pane displays a tree view with folders for 'CP 300', 'READ - IMPORTANT!', 'Blocks', and 'CP 400'. The right pane shows a table of objects:</p> <table border="1" data-bbox="951 577 1375 763"> <thead> <tr> <th>Object name</th> <th>Symbolic name</th> </tr> </thead> <tbody> <tr> <td>FB106</td> <td>MB_CPCLI</td> </tr> <tr> <td>FB107</td> <td>MB_CPSRV</td> </tr> <tr> <td>FB108</td> <td>MODBUSCP</td> </tr> <tr> <td>DB2</td> <td>MODBUS_PARAM_CP</td> </tr> <tr> <td>DB3</td> <td>LICENSE_DB</td> </tr> </tbody> </table>	Object name	Symbolic name	FB106	MB_CPCLI	FB107	MB_CPSRV	FB108	MODBUSCP	DB2	MODBUS_PARAM_CP	DB3	LICENSE_DB								
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5.	<p>Open the "SIMATIC_NET_CP" library with the "File > Open" menu. In the "Open Project" dialog you switch to the "Libraries" tab and select the "SIMATIC_NET_CP" library.</p>  <p>The screenshot shows the 'Open Project' dialog box. The 'Libraries' tab is selected. A list of libraries is shown with their names and storage paths. 'SIMATIC_NET_CP' is highlighted with a red box. Below the list, the 'Selected' section shows 'Libraries: 1'. At the bottom, there are 'OK', 'Cancel', and 'Help' buttons.</p> <table border="1" data-bbox="544 1099 1334 1435"> <thead> <tr> <th>Name</th> <th>Storage path</th> </tr> </thead> <tbody> <tr> <td>GRAPH7</td> <td>C:\Program Files (x86)\Siemens\Step7\S7libs\gra</td> </tr> <tr> <td>Modbus_PN_CPU</td> <td>C:\Program Files (x86)\SIEMENS\Step7\S7LIBS\I</td> </tr> <tr> <td>Modbus_TCP_CP</td> <td>C:\Program Files (x86)\SIEMENS\Step7\S7LIBS\I</td> </tr> <tr> <td>Redundant IO CGP V40</td> <td>C:\Program Files (x86)\Siemens\Step7\S7libs\rec</td> </tr> <tr> <td>Redundant IO CGP V52</td> <td>C:\Program Files (x86)\Siemens\Step7\S7libs\rec</td> </tr> <tr> <td>Redundant IO MGP V32</td> <td>C:\Program Files (x86)\Siemens\Step7\S7libs\rec</td> </tr> <tr> <td>SIMATIC_NET_CP</td> <td>C:\Program Files (x86)\Siemens\Step7\S7libs\si</td> </tr> <tr> <td>Standard Library</td> <td>C:\Program Files (x86)\Siemens\Step7\S7libs\std</td> </tr> <tr> <td>stdlibs (V2)</td> <td>C:\Program Files (x86)\Siemens\Step7\S7libs\std</td> </tr> </tbody> </table>	Name	Storage path	GRAPH7	C:\Program Files (x86)\Siemens\Step7\S7libs\gra	Modbus_PN_CPU	C:\Program Files (x86)\SIEMENS\Step7\S7LIBS\I	Modbus_TCP_CP	C:\Program Files (x86)\SIEMENS\Step7\S7LIBS\I	Redundant IO CGP V40	C:\Program Files (x86)\Siemens\Step7\S7libs\rec	Redundant IO CGP V52	C:\Program Files (x86)\Siemens\Step7\S7libs\rec	Redundant IO MGP V32	C:\Program Files (x86)\Siemens\Step7\S7libs\rec	SIMATIC_NET_CP	C:\Program Files (x86)\Siemens\Step7\S7libs\si	Standard Library	C:\Program Files (x86)\Siemens\Step7\S7libs\std	stdlibs (V2)	C:\Program Files (x86)\Siemens\Step7\S7libs\std
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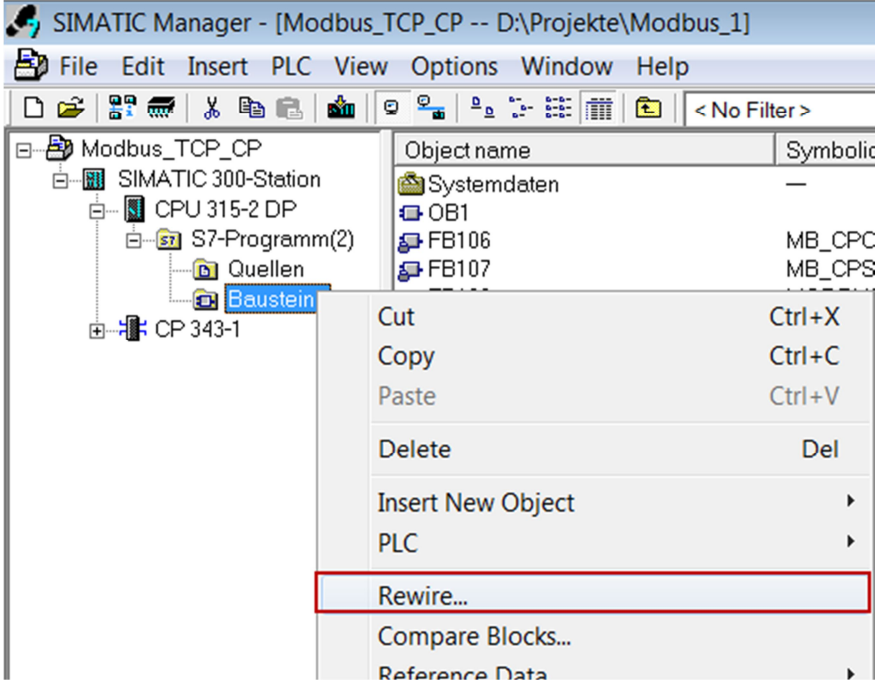
3 Migrate the "MODBUS_TCP_CP" V5.0 Library to STEP 7 V11/12/13 (TIA Portal)

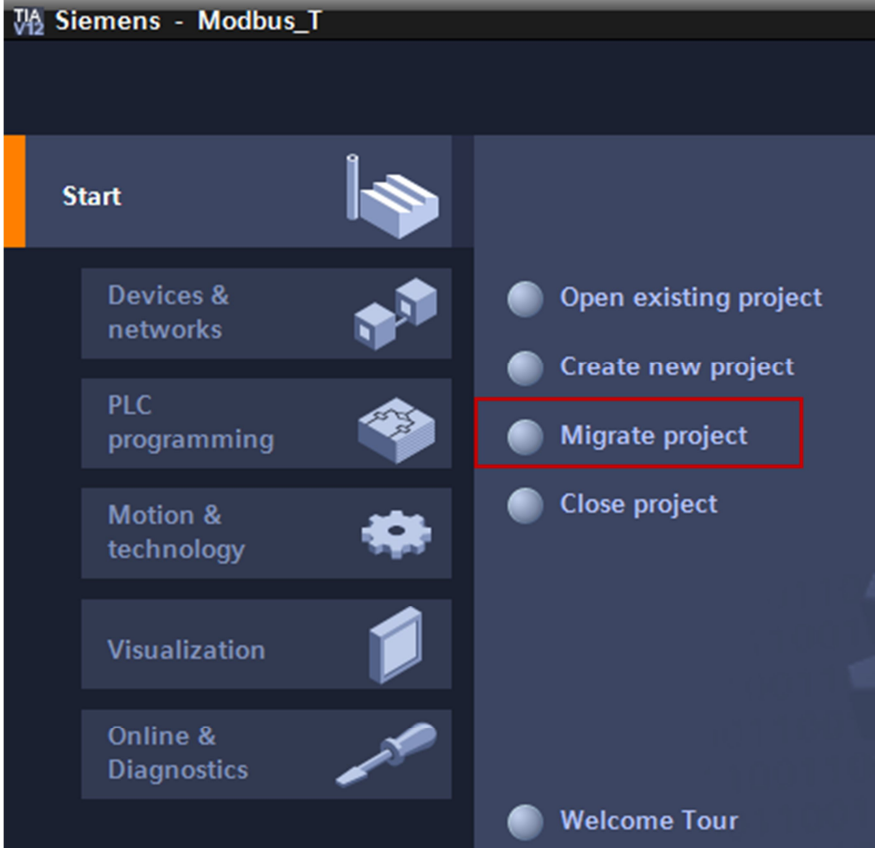
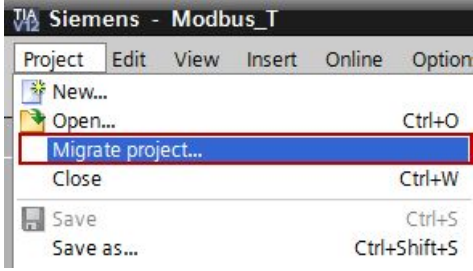
No.	Procedure								
6.	<p>If you are using a SIMATIC S7-300, then copy the following blocks from the "SIMATIC_NET_CP > CP 300 > Blocks" library and add them to the new project.</p> <ul style="list-style-type: none"> • FC5 "AG_SEND" • FC6 "AG_RECV" • FC10 "AG_CNTRL"  <p>The screenshot shows the SIMATIC Manager interface. The left pane displays the project tree with 'SIMATIC_NET_CP' expanded to show 'CP 300' and 'Blocks' (highlighted). The right pane shows a list of function blocks with their object and symbolic names. The following blocks are highlighted with red boxes:</p> <table border="1"> <thead> <tr> <th>Object name</th> <th>Symbolic name</th> </tr> </thead> <tbody> <tr><td>FC5</td><td>AG_SEND</td></tr> <tr><td>FC6</td><td>AG_RECV</td></tr> <tr><td>FC10</td><td>AG_CNTRL</td></tr> </tbody> </table>	Object name	Symbolic name	FC5	AG_SEND	FC6	AG_RECV	FC10	AG_CNTRL
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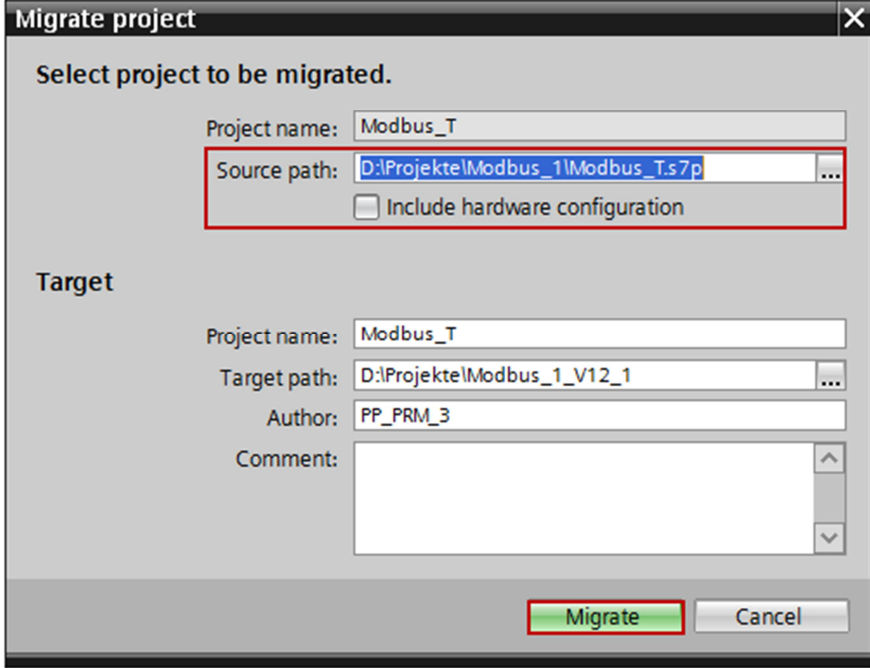
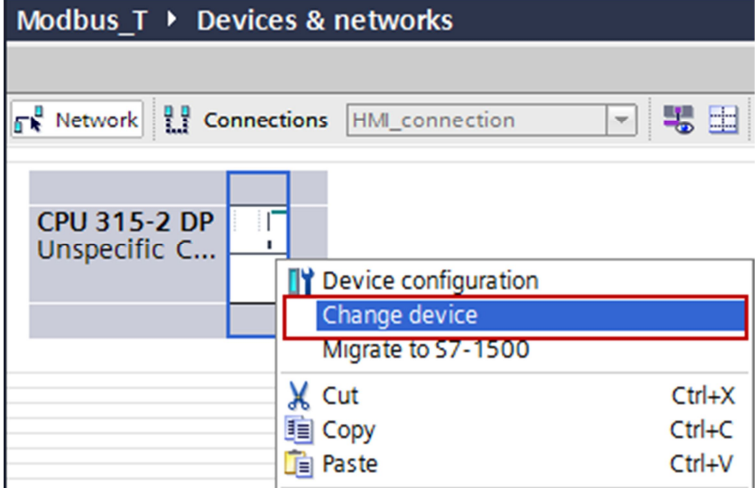
3 Migrate the "MODBUS_TCP_CP" V5.0 Library to STEP 7 V11/12/13 (TIA Portal)

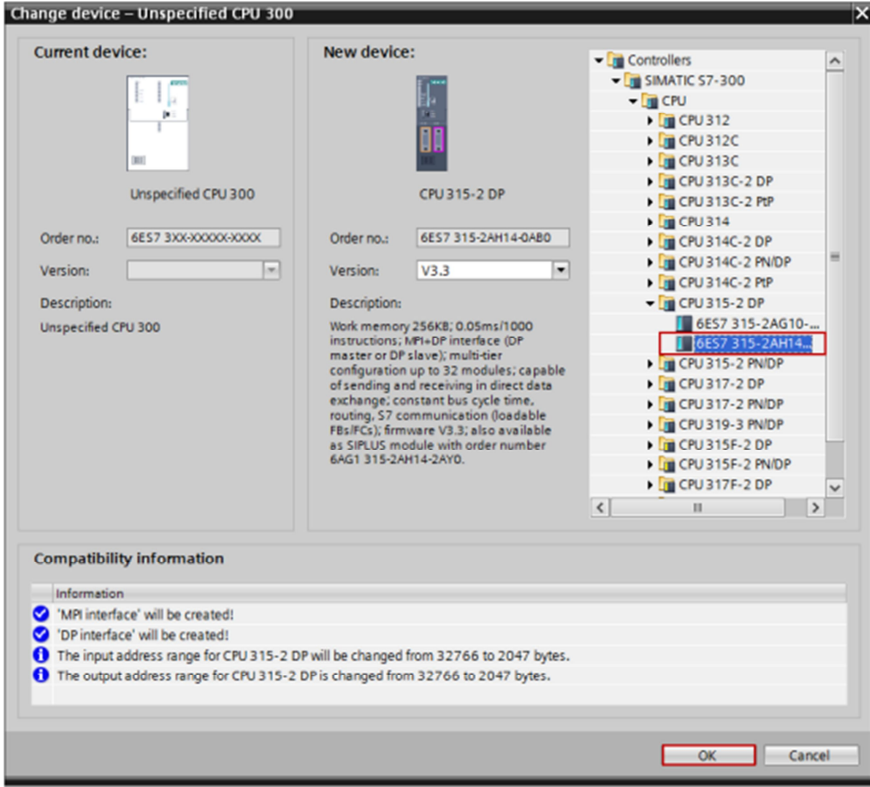
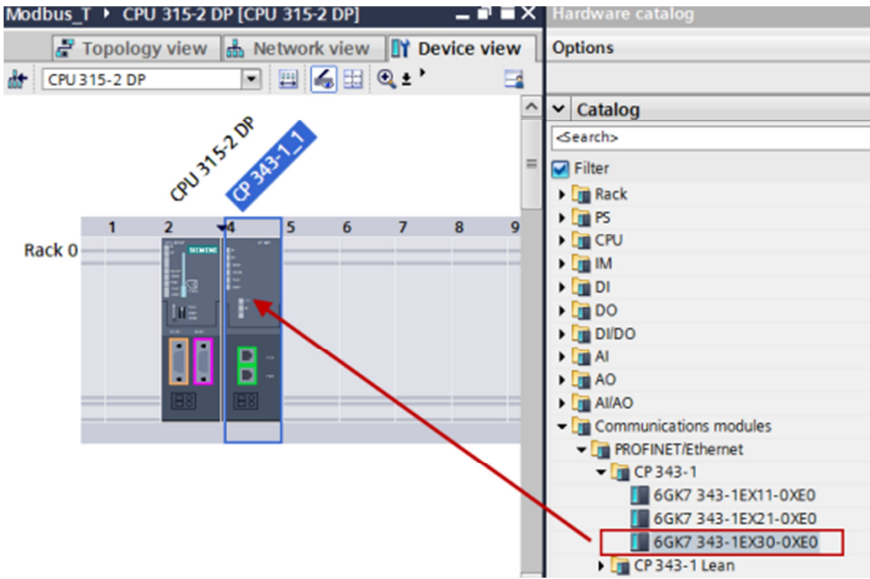
No.	Procedure																																														
7.	<p>If you are using a SIMATIC S7-400, then copy the following blocks from the "SIMATIC_NET_CP > CP 400 > Blocks" library and add them to the new project.</p> <ul style="list-style-type: none"> • FC50 "AG_LSEND" • FC60 "AG_LRECV" • FC10 "AG_CNTRL" 																																														
 <p>The screenshot shows the SIMATIC Manager interface. The left pane displays the project tree with 'SIMATIC_NET_CP' expanded to show 'CP 400' and its 'Blocks' subfolder. The right pane shows a list of function blocks with their object and symbolic names. The following blocks are highlighted with red boxes:</p> <table border="1" data-bbox="917 638 1375 1323"> <thead> <tr> <th>Object name</th> <th>Symbolic name</th> </tr> </thead> <tbody> <tr><td>FB2</td><td>IDENT</td></tr> <tr><td>FB3</td><td>READ</td></tr> <tr><td>FB4</td><td>REPORT</td></tr> <tr><td>FB5</td><td>STATUS</td></tr> <tr><td>FB6</td><td>WRITE</td></tr> <tr><td>FB40</td><td>FTP_CMD</td></tr> <tr><td>FB55</td><td>IP_CONFIG</td></tr> <tr><td>FC5</td><td>AG_SEND</td></tr> <tr><td>FC6</td><td>AG_RECV</td></tr> <tr><td>FC7</td><td>AG_LOCK</td></tr> <tr><td>FC8</td><td>AG_UNLOCK</td></tr> <tr><td>FC10</td><td>AG_CNTRL</td></tr> <tr><td>FC40</td><td>FTP_CONNECT</td></tr> <tr><td>FC41</td><td>FTP_STORE</td></tr> <tr><td>FC42</td><td>FTP_RETRIEVE</td></tr> <tr><td>FC43</td><td>FTP_DELETE</td></tr> <tr><td>FC44</td><td>FTP_QUIT</td></tr> <tr><td>FC50</td><td>AG_LSEND</td></tr> <tr><td>FC53</td><td>AG_SSEND</td></tr> <tr><td>FC60</td><td>AG_LRECV</td></tr> <tr><td>FC63</td><td>AG_SRECV</td></tr> <tr><td>UDT1</td><td>FILE_DB_HEADER</td></tr> </tbody> </table>		Object name	Symbolic name	FB2	IDENT	FB3	READ	FB4	REPORT	FB5	STATUS	FB6	WRITE	FB40	FTP_CMD	FB55	IP_CONFIG	FC5	AG_SEND	FC6	AG_RECV	FC7	AG_LOCK	FC8	AG_UNLOCK	FC10	AG_CNTRL	FC40	FTP_CONNECT	FC41	FTP_STORE	FC42	FTP_RETRIEVE	FC43	FTP_DELETE	FC44	FTP_QUIT	FC50	AG_LSEND	FC53	AG_SSEND	FC60	AG_LRECV	FC63	AG_SRECV	UDT1	FILE_DB_HEADER
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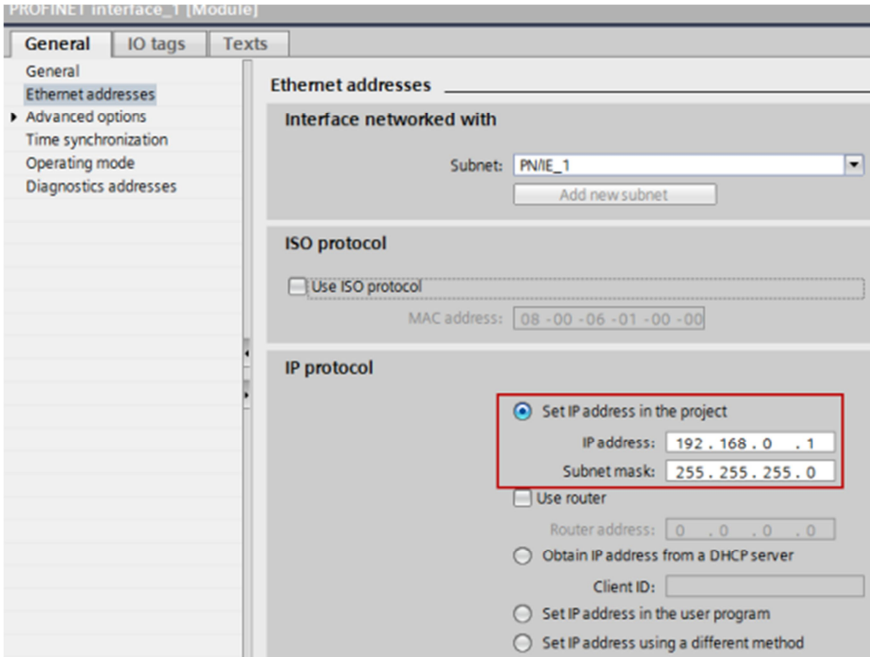
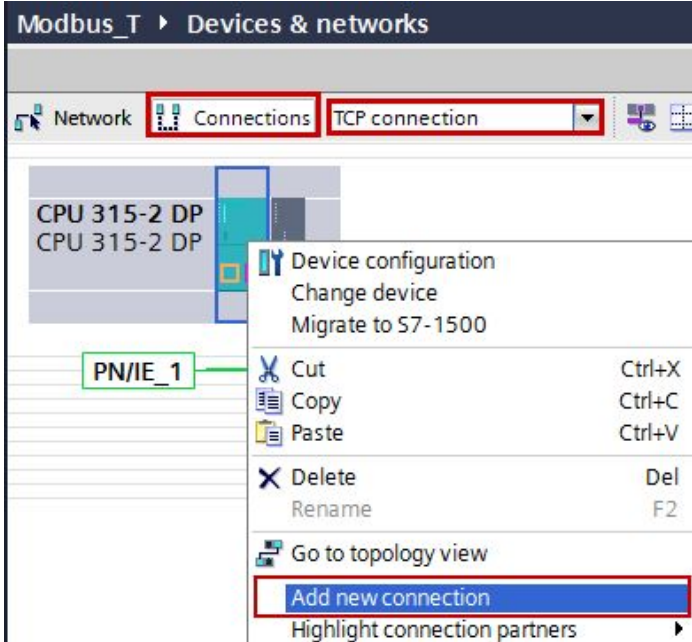
3 Migrate the "MODBUS_TCP_CP" V5.0 Library to STEP 7 V11/12/13 (TIA Portal)

No.	Procedure
8.	<p>If you change the numbers of the function blocks, use the "Rewire" function. It is no longer possible to rewire after migration.</p> <p>Right-click the block folder in the S7 program of the CPU. In the pop-up menu you select the "Rewire" function.</p>  <p>The screenshot shows the SIMATIC Manager interface. The project tree on the left shows the hierarchy: Modbus_TCP_CP > SIMATIC 300-Station > CPU 315-2 DP > S7-Programm(2) > Baustein. The 'Baustein' folder is selected, and a context menu is displayed over it. The menu items include Cut (Ctrl+X), Copy (Ctrl+C), Paste (Ctrl+V), Delete (Del), Insert New Object, PLC, Rewire... (highlighted with a red box), Compare Blocks..., and Reference Data. The Object name table on the right shows Systemdaten, OB1, FB106 (MB_CPC), and FB107 (MB_CPS).</p>
9.	<p>Create the Parameter DB using the Modbus/TCP-CP Wizard. The Modbus/TCP-CP Wizard is available for downloading at this link: https://support.industry.siemens.com/cs/ww/en/view/60735352</p> <p>Note The Modbus/TCP-CP Wizard is not available for TIA Portal projects. If you do not create the parameter DB before migration, you have to create it manually in the TIA Portal.</p>
10.	Start STEP 7 Professional V11/V12/13 (TIA Portal)

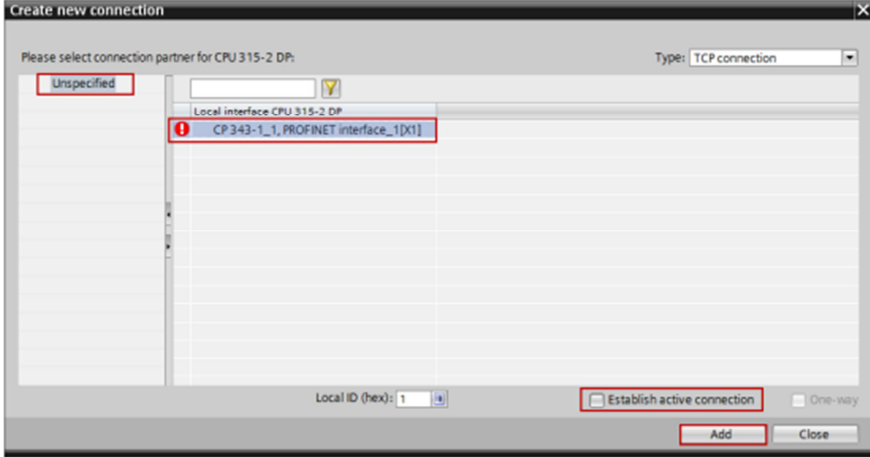
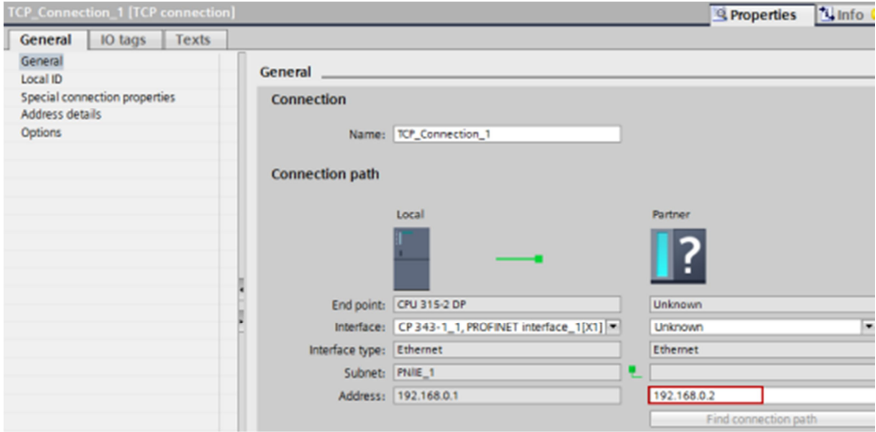
No.	Procedure
11.	<p>Select "Migrate project" in the Portal view or the "Project > Migrate project..." menu in the Project view. The "Migrate project" dialog opens.</p> <p>Portal view</p>  <p>The screenshot shows the TIA Portal Start screen. On the left, there are several categories: Start, Devices & networks, PLC programming, Motion & technology, Visualization, and Online & Diagnostics. On the right, there are four main options: Open existing project, Create new project, Migrate project (highlighted with a red box), and Close project. At the bottom right, there is a 'Welcome Tour' option.</p> <p>Project view</p>  <p>The screenshot shows the Project menu in the TIA Portal. The menu items are: New..., Open... (Ctrl+O), Migrate project... (highlighted with a red box), Close (Ctrl+W), Save (Ctrl+S), and Save as... (Ctrl+Shift+S).</p>

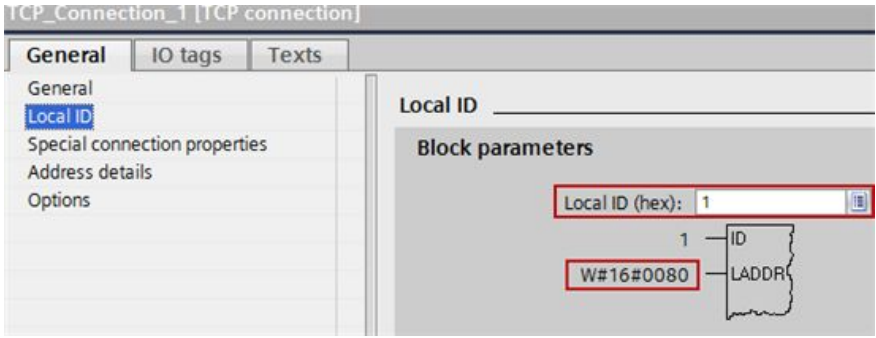
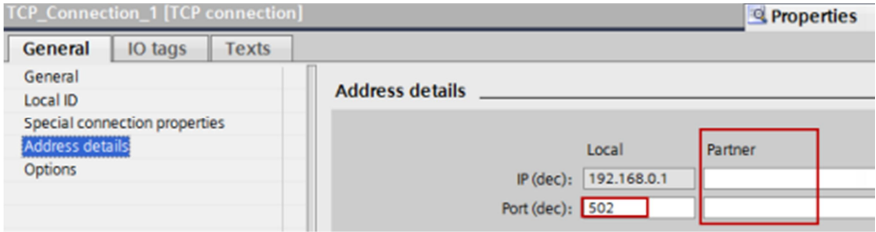
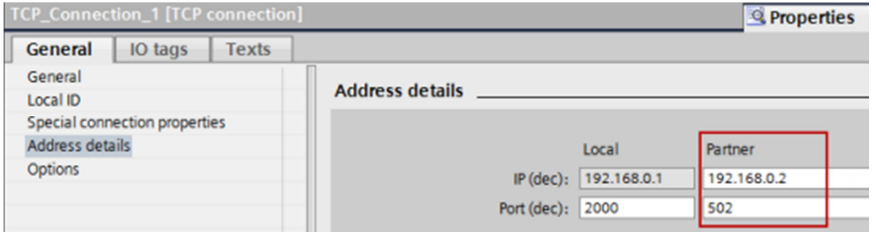
No.	Procedure
12.	<p>In the "Migrate project" dialog you select the project to be migrated. Deselect the "Include hardware configuration" option. Specify the project name and target path of the TIA Portal project. Click the "Migrate" button to execute the migration.</p> 
13.	<p>Close the "Migrate project" dialog and open the migration log. You are informed that the associated SCL sources of the blocks FB106, FB107 and FB108 are missing. You can ignore this message.</p>
14.	<p>In addition you get the message "All PLCs have been replaced by unspecified CPUs". To clear this message you switch to the Network view and there you right-click the CPU. Select "Change device" in the pop-up menu. The "Change device" dialog opens.</p> 

No.	Procedure
15.	<p>In the "Change device" dialog you select the correct CPU according to your hardware setup, CPU 315-2 DP, for example. Confirm the settings with "OK".</p> 
16.	<p>According to your hardware setup, in the Device view you drag-and-drop the Industrial Ethernet CP from the Hardware Catalog to the rack of the SIMATIC S7-300.</p> 

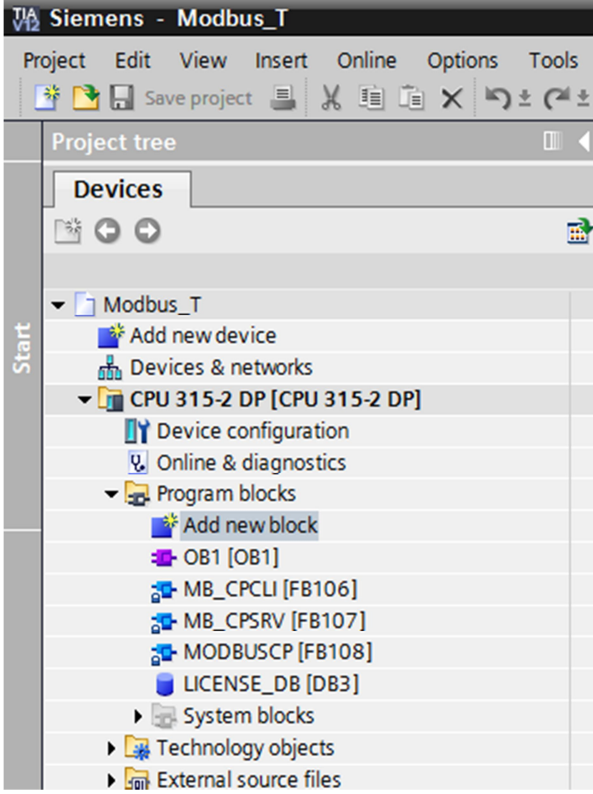
No.	Procedure
17.	<p>In the Device view you mark the PROFINET interface of the Industrial Ethernet CP.</p> <p>In the inspector window you assign a subnet to the PROFINET interface and enter the IP address and subnet mask of the Industrial Ethernet CP in "Properties > General > Ethernet addresses".</p> 
18.	<p>Insert a TCP connection for the CPU.</p> <ul style="list-style-type: none"> In the Network view you click "Connections". Select "TCP connection" as the connection type. Right-click the CPU and select "Add new connection" in the pop-up menu. The "Create new connection" dialog opens. 

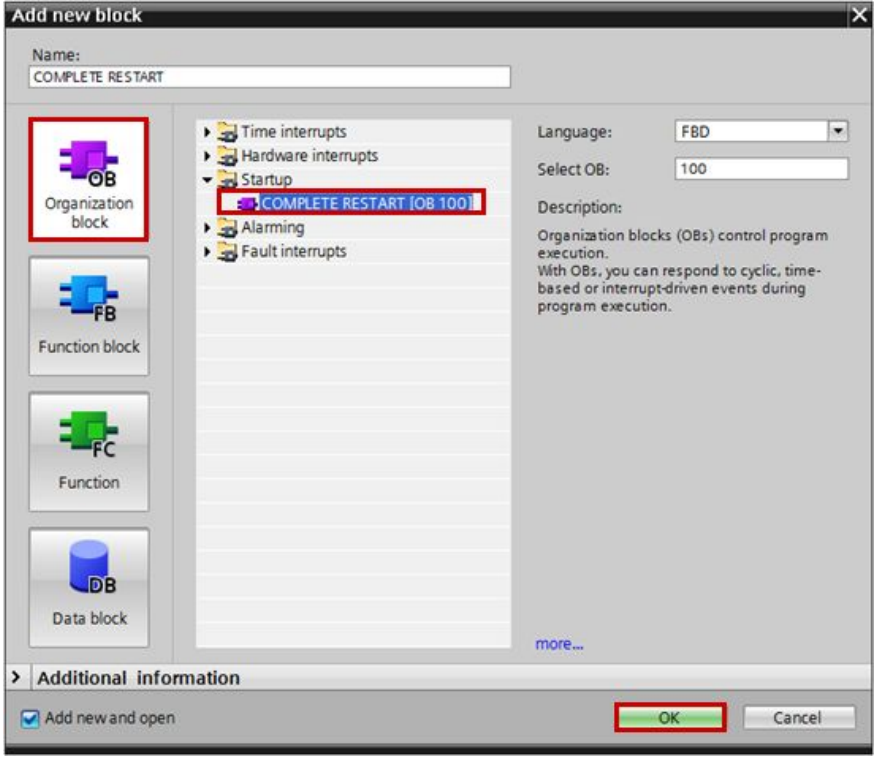
3 Migrate the "MODBUS_TCP_CP" V5.0 Library to STEP 7 V11/12/13 (TIA Portal)

No.	Procedure
19.	<p>In the "Create new connection" dialog you make the following settings.</p> <ul style="list-style-type: none"> • Select "Unspecified" as the connection partner. • Select the Industrial Ethernet CP as local interface. • Disable the "Establish active connection" function if the Modbus block is parameterized as server. • Enable the "Establish active connection" function if the Modbus block is parameterized as client. • Click "Add" and close the dialog. 
20.	<p>The TCP connection established is displayed in the table area of the Network view in the "Connections" table. The properties of the TCP connection are displayed in the TCP connection.</p> <p>In the Properties of the TCP connection you open the "General" tab.</p> <p>Navigate to and open the "General" area. Here you enter the IP address of the partner if the Modbus block is parameterized as client.</p> 

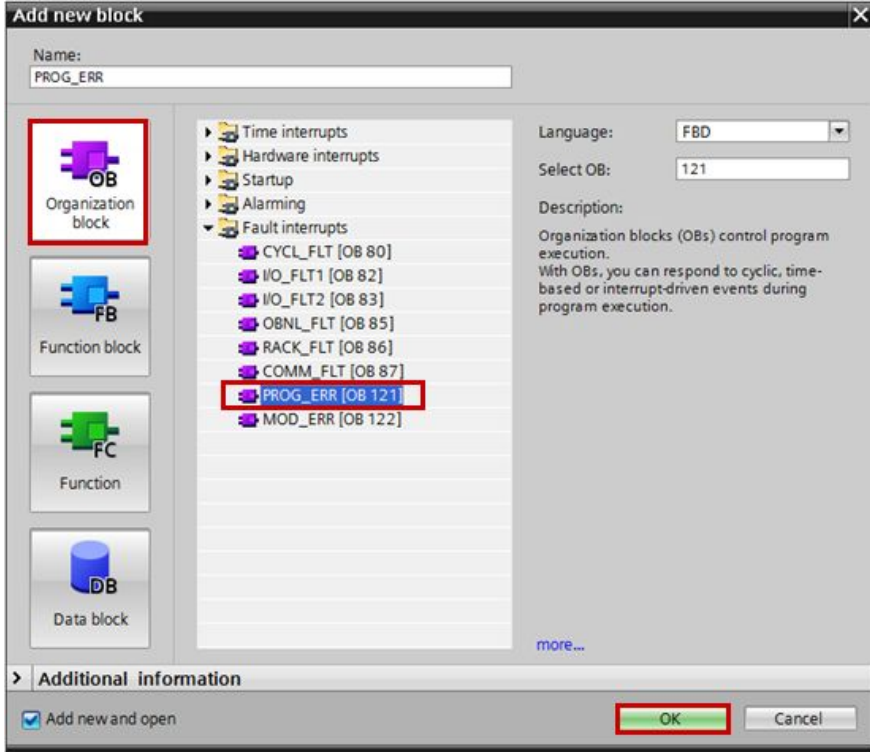
No.	Procedure
21.	<p>Navigate to and open the "Local ID" area. Enter the local ID that you parameterize for the Modbus TCP connection on the Modbus block. Note the LADDR for the parameterization of the Modbus blocks.</p> 
22.	<p>Navigate to and open the "Address details" area. If you parameterize the Modbus block as server, enter Port 502 as local port of the CPU. Do not make any specifications about the partner.</p>  <p>If you parameterize the Modbus block as client, you enter the IP address of the partner and specify Port 502 as the partner port. You can apply the default value for the local port of the CPU, 2000, for example.</p> 

3 Migrate the "MODBUS_TCP_CP" V5.0 Library to STEP 7 V11/12/13 (TIA Portal)

No.	Procedure
23.	<p>In the project navigation you open the folder structure for the CPU 315-2 DP. Here you open the "Program blocks" folder. Double-click the "Add new block" command. The "Add new block" dialog opens.</p>  <p>The screenshot shows the 'Project tree' window in Siemens TIA Portal. The title bar reads 'Siemens - Modbus_T'. The menu bar includes 'Project', 'Edit', 'View', 'Insert', 'Online', 'Options', and 'Tools'. Below the menu bar is a toolbar with icons for 'Save project', 'Cut', 'Copy', 'Paste', 'Close', 'Undo', and 'Redo'. The 'Project tree' pane shows a hierarchy: 'Start' (vertical label) -> 'Devices' -> 'Modbus_T' -> 'CPU 315-2 DP [CPU 315-2 DP]' -> 'Program blocks'. Under 'Program blocks', the 'Add new block' option is highlighted. Other options include 'OB1 [OB1]', 'MB_CPCLI [FB106]', 'MB_CPSRV [FB107]', 'MODBUSCP [FB108]', 'LICENSE_DB [DB3]', 'System blocks', 'Technology objects', and 'External source files'.</p>

No.	Procedure
24.	<p>In the "Add new block" dialog you click the "Organization block (OB)" button. Select the Startup OB: OB 100. Click the "OK" button to add OB100 to your project.</p>  <p>Add new block</p> <p>Name: COMPLETE RESTART</p> <p>Organization block</p> <p>Function block</p> <p>Function</p> <p>Data block</p> <ul style="list-style-type: none">Time interruptsHardware interruptsStartup<ul style="list-style-type: none">COMPLETE RESTART [OB 100]AlarmingFault interrupts <p>Language: FBD</p> <p>Select OB: 100</p> <p>Description: Organization blocks (OBs) control program execution. With OBs, you can respond to cyclic, time-based or interrupt-driven events during program execution.</p> <p>more...</p> <p>Additional information</p> <p><input checked="" type="checkbox"/> Add new and open</p> <p>OK Cancel</p>

3 Migrate the "MODBUS_TCP_CP" V5.0 Library to STEP 7 V11/12/13 (TIA Portal)

No.	Procedure
25.	<p>Double-click the "Add new block" command again. The "Add new block" dialog opens.</p> <p>Click the "Organization block (OB)" button. Select the Fault interrupt OB: OB121. Click the "OK" button to add OB121 to your project.</p> 
26.	Add the data blocks (DBs) for the Modbus data.
27.	<p>Now you program the calls of the FB108 "MODBUSCP" block in the OB100 and in a cyclic OB, OB1, for example, as described in the manual.</p> <p>Note</p> <p>The manual for MODBUS/TCP communication over an Industrial Ethernet CP of S7-300 or S7-400 is available for downloading: http://support.automation.siemens.com/WW/view/en/103474603</p>
28.	Now compile the project. There should be no errors or warnings.

Note

In STEP 7 V11/12/V13 (TIA Portal) it is not permitted to add migrated know-how-protected blocks to a library. If you do do this and add the library blocks to a project, this might damage the project.

It is not recommended to copy the blocks into another project, because this can lead to problems.