

Technical Instructions for Configuring a TCP Connection

S7-300 / S7-400 Industrial Ethernet CPs

FAQ • January 2011



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Question

How do you configure a TCP connection for data exchange between S7-300 and / or S7-400 over Industrial Ethernet CPs?

Answer

The instructions and notes listed in this document provide a detailed answer to this question.

Table of Contents

1	Introduction	4
2	Configuration	5
2.1	Configuring CP343-1 and CP443-1 Advanced	5
2.1.1	Assigning IP addresses to CP343-1 and CP443-1	5
2.1.2	Entering the IP address of CP343-1 in the Hardware Configuration and downloading the configuration into the CPU.....	8
2.1.3	Entering the IP address of CP443-1 Advanced in the Hardware Configuration and downloading the configuration into the CPU	10
2.2	Configuring a TCP Connection	13
2.2.1	Configuring a specified TCP connection	13
2.2.2	Configuring an unspecified TCP connection.....	16

1 Introduction

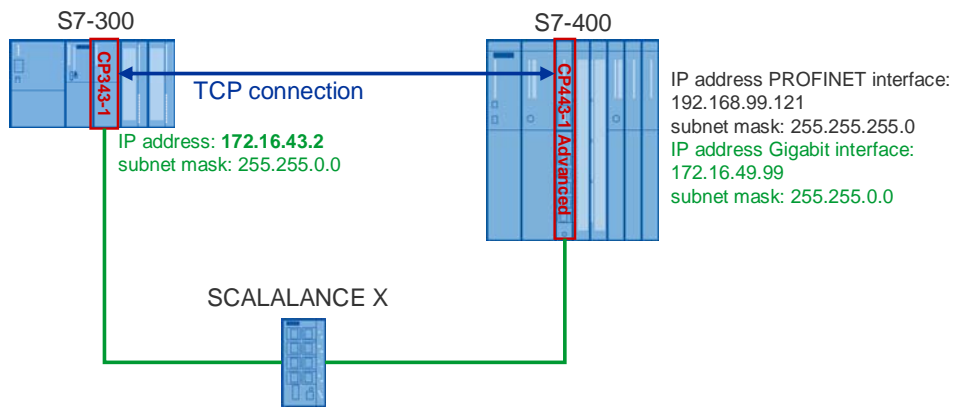
You can use the open communication through TCP connections for data exchange by way of the Industrial Ethernet CPs of S7-300 and S7-400.

In this example an S7-300 is connected over the PROFINET interface of the CP343-1 on the subnetwork 172.16.0.0. The S7-400 on the other hand is connected over the GBIT interface of the CP443-1 Advanced on the subnetwork 172.16.0.0. The PROFINET interface of the CP443-1 Advanced is connected on the subnetwork 192.168.99.0.

Configuration overview

Figure 1-1 shows an overview of the configuration.

Figure 1-1



2 Configuration

Below we describe how to configure a TCP connection for sending and receiving data by way of an Industrial Ethernet CP of S7-300 and S7-400.

2.1 Configuring CP343-1 and CP443-1 Advanced

2.1.1 Assigning IP addresses to CP343-1 and CP443-1

The following IP addresses are used in this configuration.

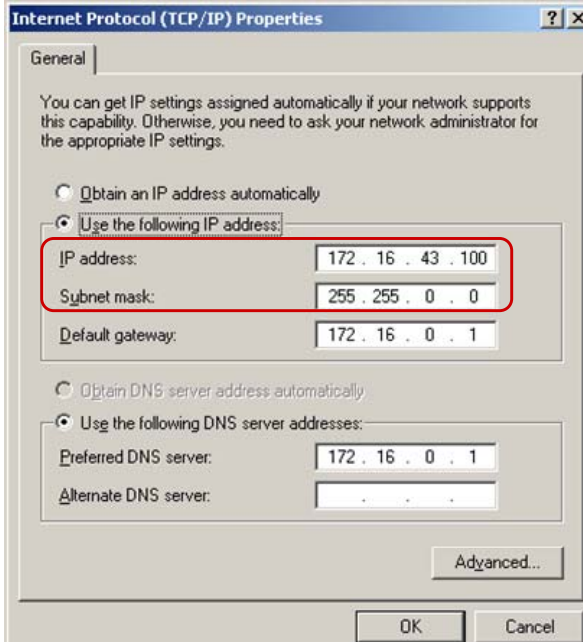
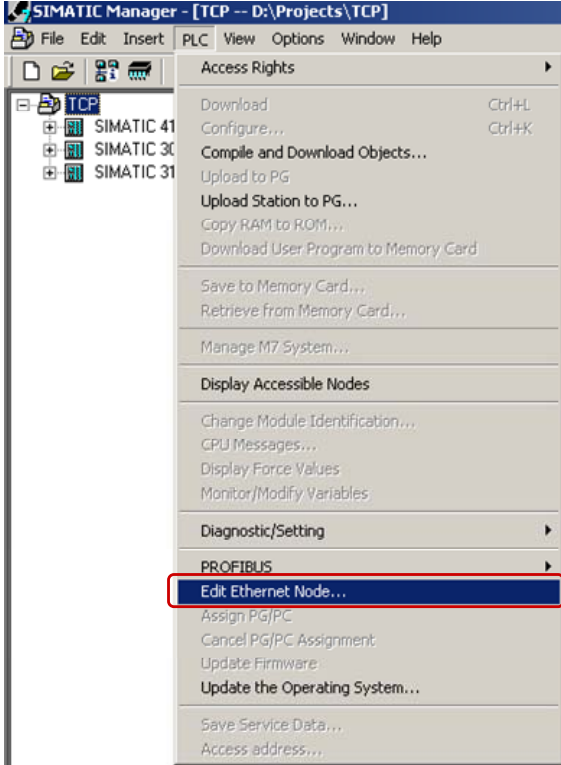
Table 2-1

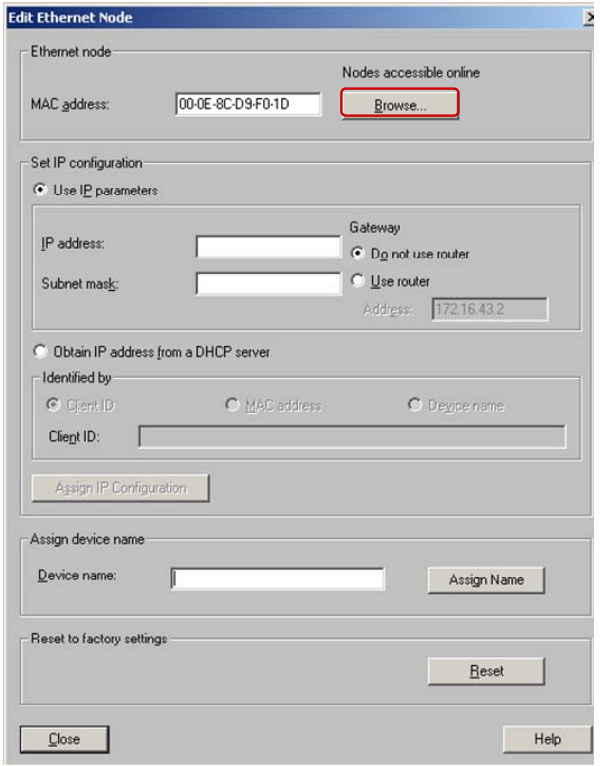
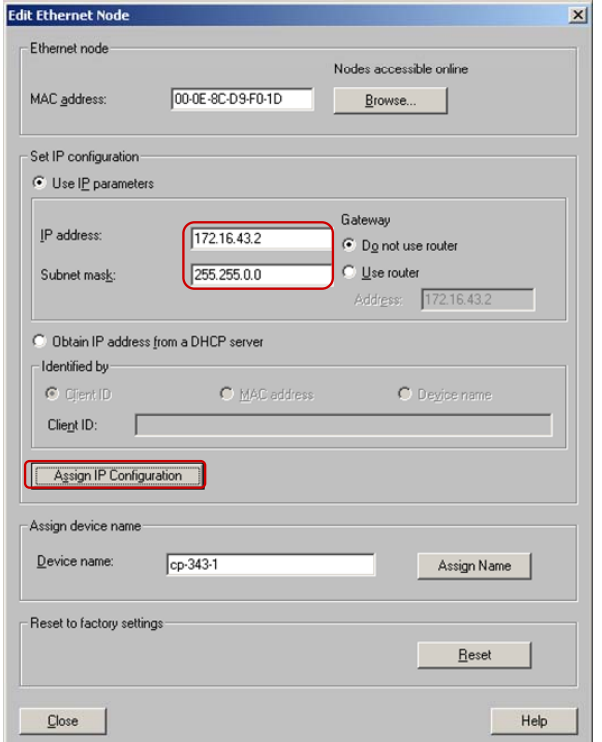
Industrial Ethernet CP	Interface	IP address	Subnet mask
CP343-1	PROFINET	172.16.43.2	255.255.0.0
CP443-1 Advanced	PROFINET	192.168.99.121	255.255.255.0
CP443-1 Advanced	GBIT	172.16.49.99	255.255.0.0

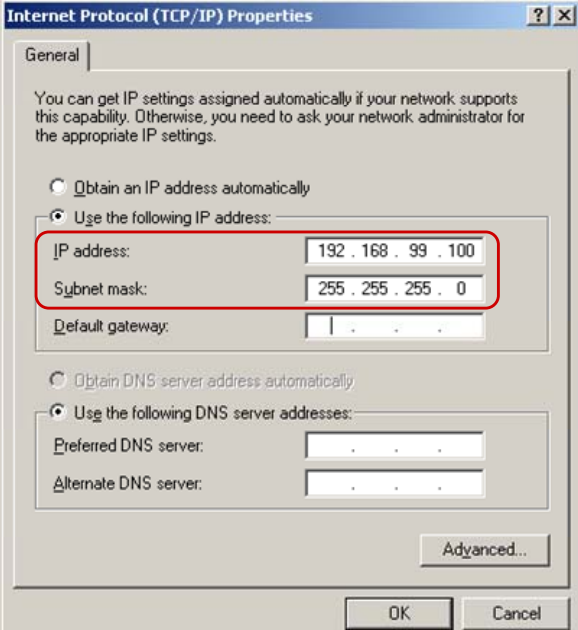
Assign the IP addresses to CP343-1 and CP443-1 Advanced.

Follow the instructions below for assigning the IP addresses.

Table 2-2

No.	Configuration step	Note
1.	<p>Connect the SIMATIC Field PG on which the configuration created with STEP 7 is stored to the PROFINET interface of CP343-1.</p> <p>In Windows network settings → LAN (Local Area Network) of the SIMATIC Field PG you enter an IP address that is in the same subnetwork as that of CP343-1.</p> <p>In this example the IP address 172.16.43.100 and subnetwork mask 255.255.0.0 are used for the SIMATIC Field PG.</p>	
2.	<p>In the SIMATIC Manager you open the STEP 7 project that contains the configurations of S7-300 and S7-400 between which the data is to be exchanged over a TCP connection.</p> <p>By means of the menu PLC → Edit Ethernet Node you open the "Edit Ethernet Node" dialog.</p>	

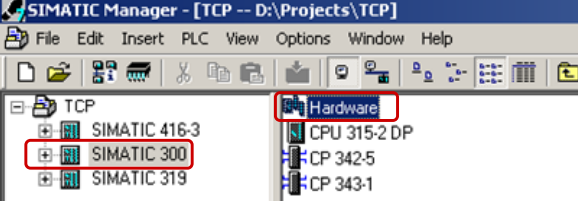
No.	Configuration step	Note
3.	In the "Edit Ethernet Node" dialog you click the "Browse..." button and select the MAC address of CP343-1.	
4.	Enter the IP address and subnet mask of CP343-1. Click the "Assign IP Configuration" button to assign the IP address entered to CP343-1. Then click the "Close" button to close the "Edit Ethernet Node" dialog.	
5.	Enter the assigned IP address in the Hardware Configuration of the S7-300 station and download the configuration into the S7-300 CPU.	See section 2.1.2.

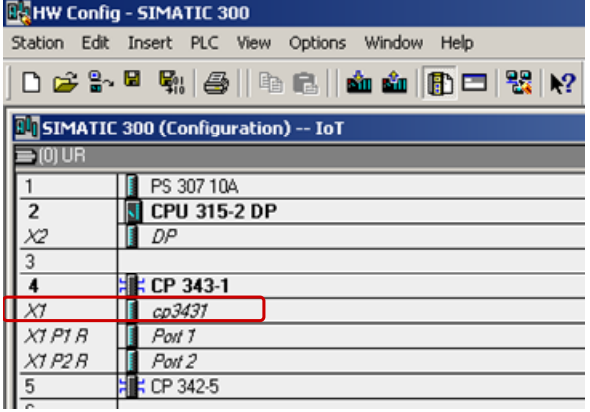
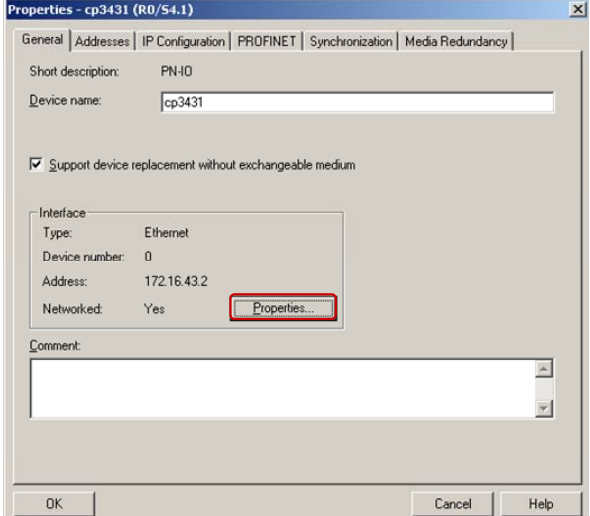
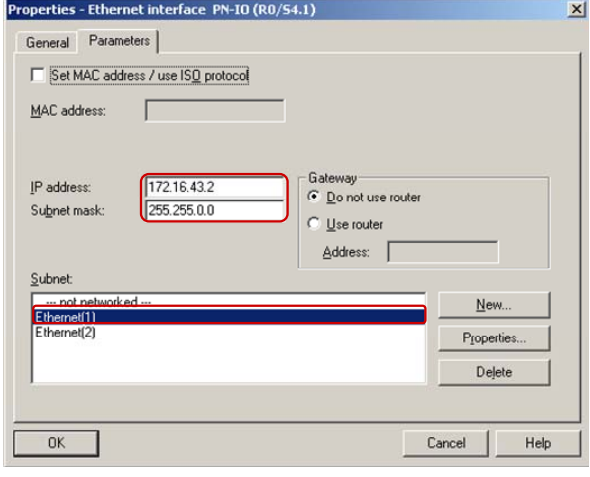
No.	Configuration step	Note
6.	<p>Connect the SIMATIC Field PG on which the configuration created with STEP 7 is stored to the PROFINET interface of CP443-1 Advanced.</p> <p>In Windows network settings → LAN (Local Area Network) of the SIMATIC Field PG you enter an IP address that is in the same subnetwork as that of CP443-1. In this example the IP address 192.168.99.100 and subnetwork mask 255.255.255.0 are used for the SIMATIC Field PG.</p>	
7.	<p>Repeat configuration steps 2 to 4 to assign the IP address 192.168.99.121 and subnet mask 255.255.255.0 to CP443-1 Advanced.</p>	
8.	<p>Enter the assigned IP address in the Hardware Configuration of the S7-400 station and download the configuration into the S7-400 CPU.</p>	<p>See section 2.1.3.</p>

2.1.2 Entering the IP address of CP343-1 in the Hardware Configuration and downloading the configuration into the CPU

After you have assigned the IP address 172.16.43.2 and subnet mask 255.255.0.0 to CP343-1 you enter the assigned IP address in the Hardware Configuration.

Table 2-3

No.	Configuration step	Note
1.	<p>In the SIMATIC Manager you mark the SIMATIC S7 300 station and double-click "Hardware" in order to open the Hardware Configuration of the S7-300 station.</p>	

No.	Configuration step	Note																		
2.	In the Hardware Configuration of S7-300 you double-click the PROFINET interface of CP343-1. The Properties dialog of the PROFINET interface opens.	 <p>The screenshot shows the 'HW Config - SIMATIC 300' window. The hardware rack is displayed with the following components:</p> <table border="1"> <tr><td>1</td><td>PS 307 10A</td></tr> <tr><td>2</td><td>CPU 315-2 DP</td></tr> <tr><td>X2</td><td>DP</td></tr> <tr><td>3</td><td></td></tr> <tr><td>4</td><td>CP 343-1</td></tr> <tr><td>X1</td><td>cp3431</td></tr> <tr><td>X1 P1 R</td><td>Port 1</td></tr> <tr><td>X1 P2 R</td><td>Port 2</td></tr> <tr><td>5</td><td>CP 342-5</td></tr> </table>	1	PS 307 10A	2	CPU 315-2 DP	X2	DP	3		4	CP 343-1	X1	cp3431	X1 P1 R	Port 1	X1 P2 R	Port 2	5	CP 342-5
1	PS 307 10A																			
2	CPU 315-2 DP																			
X2	DP																			
3																				
4	CP 343-1																			
X1	cp3431																			
X1 P1 R	Port 1																			
X1 P2 R	Port 2																			
5	CP 342-5																			
3.	In the Properties dialog of the PROFINET interface you click the "Properties..." button to open the "Properties - Ethernet interface PN-IO" dialog.	 <p>The screenshot shows the 'Properties - cp3431 (R0/S4.1)' dialog box. The 'PROFINET' tab is selected. The 'Interface' section shows:</p> <ul style="list-style-type: none"> Type: Ethernet Device number: 0 Address: 172.16.43.2 Networked: Yes <p>The 'Properties...' button is highlighted with a red box.</p>																		
4.	Enter the IP address 172.16.43.2 and subnet mask 255.255.0.0, which you have already assigned to CP343-1. Assign an existing subnet to CP343-1 or click the "New..." button to create a new subnet. Apply the settings with "OK".	 <p>The screenshot shows the 'Properties - Ethernet interface PN-IO (R0/S4.1)' dialog box. The 'Parameters' tab is selected. The 'IP address' and 'Subnet mask' fields are highlighted with red boxes:</p> <ul style="list-style-type: none"> IP address: 172.16.43.2 Subnet mask: 255.255.0.0 <p>The 'Gateway' section shows 'Do not use router' selected. The 'Subnet' list includes 'Ethernet(1)' and 'Ethernet(2)'. The 'New...' button is also visible.</p>																		

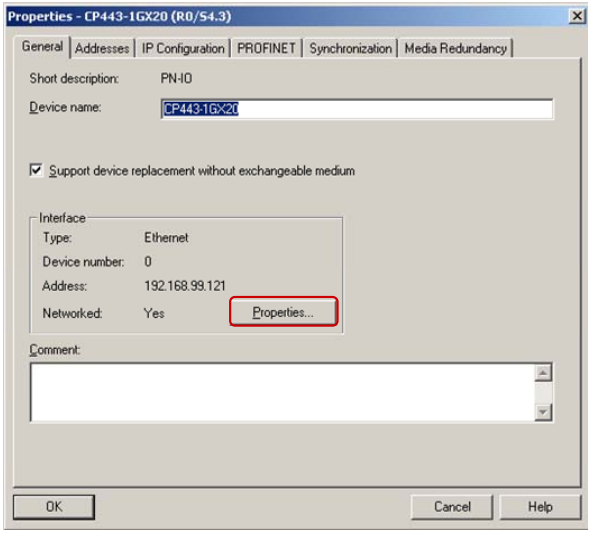
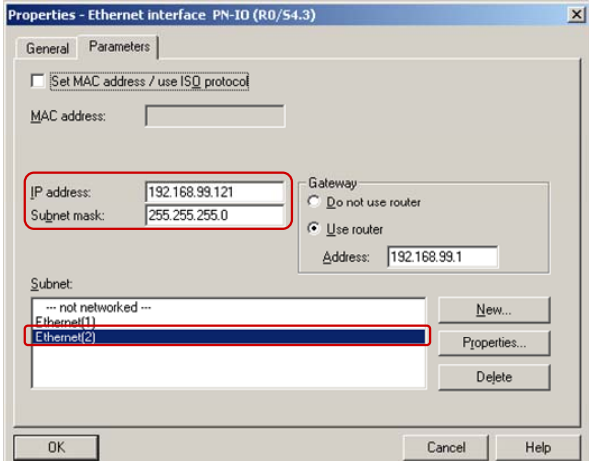
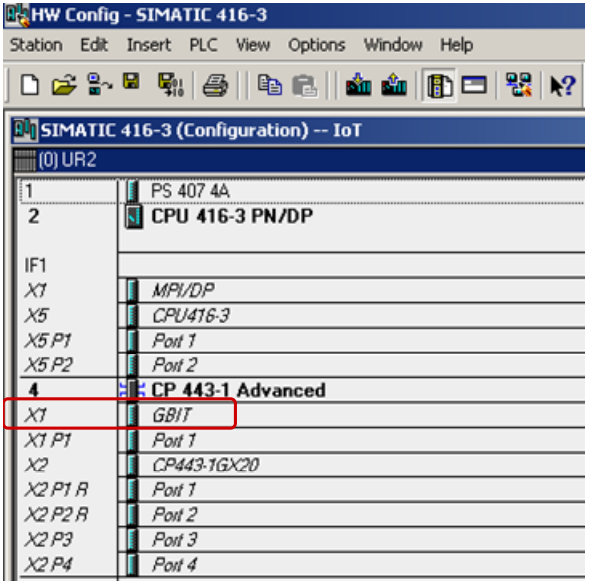
No.	Configuration step	Note
5.	Save and compile the hardware configuration of the S7-300 and then load the configuration into the S7-300 CPU.	

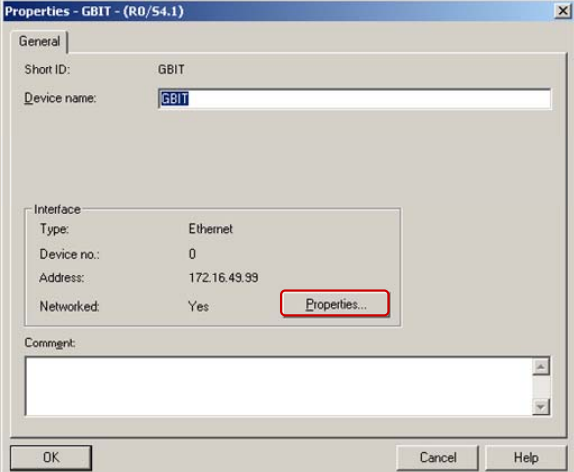
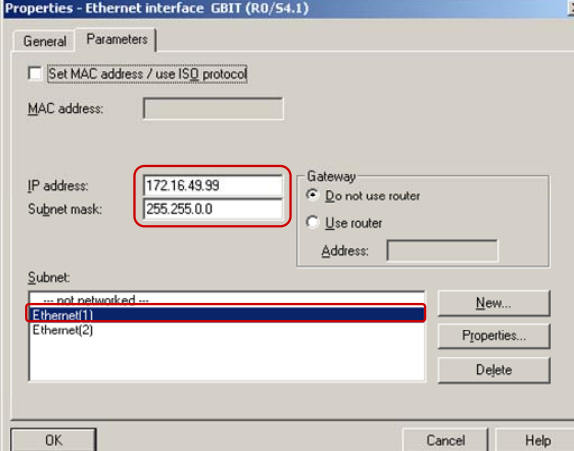
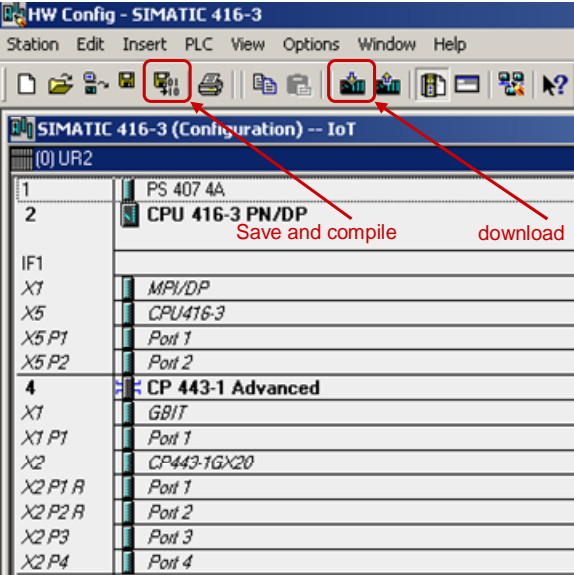
2.1.3 Entering the IP address of CP443-1 Advanced in the Hardware Configuration and downloading the configuration into the CPU

After you have assigned the IP address 192.168.99.121 and subnet mask 255.255.255.0 to CP343-1 you enter the assigned IP address in the Hardware Configuration.

Table 2-4

No.	Configuration step	Note
1.	In the SIMATIC Manager you mark the SIMATIC S7 400 station and double-click "Hardware" in order to open the Hardware Configuration of the S7-400 station.	
2.	In the Hardware Configuration of S7-400 you double-click the PROFINET interface of CP443-1 Advanced. The Properties dialog of the PROFINET interface opens.	

No.	Configuration step	Note
3.	<p>In the Properties dialog of the PROFINET interface you click the "Properties..." button to open the "Properties - Ethernet interface PN-IO" dialog.</p>	
4.	<p>Enter the IP address 192.168.99.121 and subnet mask 255.255.255.0, which you have already assigned to CP443-1 Advanced.</p> <p>Assign a subnet to the PROFINET interface of CP443-1 Advanced.</p> <p>In this example the subnet assigned to the PROFINET interface of CP443-1 Advanced is different to that assigned to the PROFINET interface of CP343-1.</p> <p>Apply the settings with "OK".</p>	
5.	<p>In the Hardware Configuration of S7-400 you double-click the GBIT interface of CP443-1 Advanced. The Properties dialog of the GBIT interface opens.</p>	

No.	Configuration step	Note																																		
6.	In the Properties dialog of the GBIT interface you click the "Properties..." button to open the "Properties - Ethernet interface GBIT" dialog.																																			
7.	Enter the IP address 172.16.49.99 and the subnet mask 255.255.0.0. Assign the same subnet to the GBIT interface of CP443-1 Advanced as to the PROFINET interface of CP343-1. Apply the settings with "OK".																																			
8.	Save and compile the hardware configuration of the S7-400 and then load the configuration into the S7-400 CPU.	 <p>Save and compile download</p> <table border="1" data-bbox="770 1422 1345 1845"> <thead> <tr> <th colspan="2">SIMATIC 416-3 (Configuration) -- IoT</th> </tr> <tr> <th colspan="2">[0] UR2</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>PS 407 4A</td> </tr> <tr> <td>2</td> <td>CPU 416-3 PN/DP</td> </tr> <tr> <td>IF1</td> <td></td> </tr> <tr> <td>X1</td> <td>MPI/DP</td> </tr> <tr> <td>X5</td> <td>CPU416-3</td> </tr> <tr> <td>X5 P1</td> <td>Port 1</td> </tr> <tr> <td>X5 P2</td> <td>Port 2</td> </tr> <tr> <td>4</td> <td>CP 443-1 Advanced</td> </tr> <tr> <td>X1</td> <td>GBIT</td> </tr> <tr> <td>X1 P1</td> <td>Port 1</td> </tr> <tr> <td>X2</td> <td>CP443-1GX20</td> </tr> <tr> <td>X2 P1 R</td> <td>Port 1</td> </tr> <tr> <td>X2 P2 R</td> <td>Port 2</td> </tr> <tr> <td>X2 P3</td> <td>Port 3</td> </tr> <tr> <td>X2 P4</td> <td>Port 4</td> </tr> </tbody> </table>	SIMATIC 416-3 (Configuration) -- IoT		[0] UR2		1	PS 407 4A	2	CPU 416-3 PN/DP	IF1		X1	MPI/DP	X5	CPU416-3	X5 P1	Port 1	X5 P2	Port 2	4	CP 443-1 Advanced	X1	GBIT	X1 P1	Port 1	X2	CP443-1GX20	X2 P1 R	Port 1	X2 P2 R	Port 2	X2 P3	Port 3	X2 P4	Port 4
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X2 P2 R	Port 2																																			
X2 P3	Port 3																																			
X2 P4	Port 4																																			

2.2 Configuring a TCP Connection

Once you have completed configuration of CP343-1 and CP443-1 Advanced and have downloaded the hardware configuration into the S7-300 CPU and the S7-400 CPU, then you configure the TCP connection for data exchange between S7-300 and S7-400 by way of Industrial Ethernet CPs. The TCP connection is configured bilaterally in the S7-300 and in the S7-400.

2.2.1 Configuring a specified TCP connection

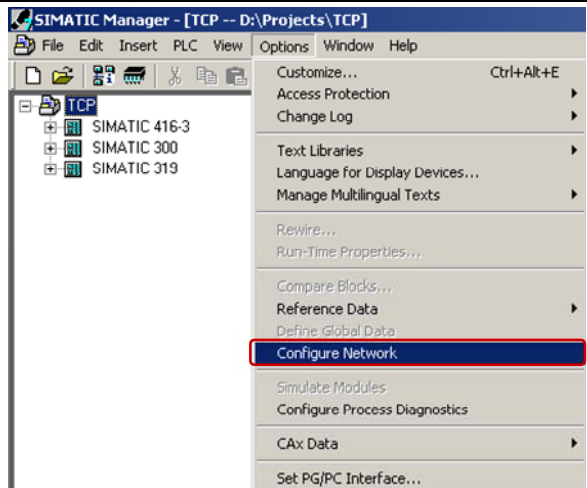
If the S7-300 and S7-400 between which there is data exchange are configured in the same STEP 7 project, then you configure a specified TCP connection.

Below we describe how to configure a specified TCP connection for data exchange between an S7-300 and S7-400 by way of Industrial Ethernet CPs using the connection parameters below.

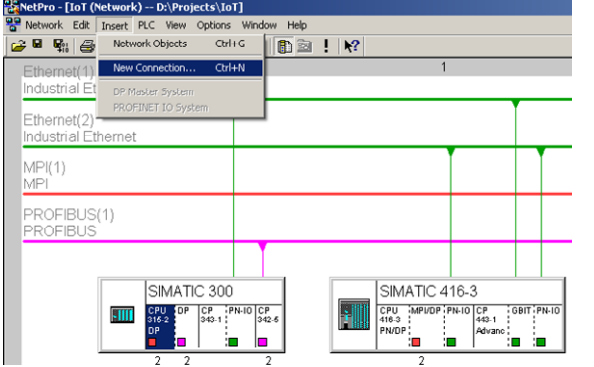
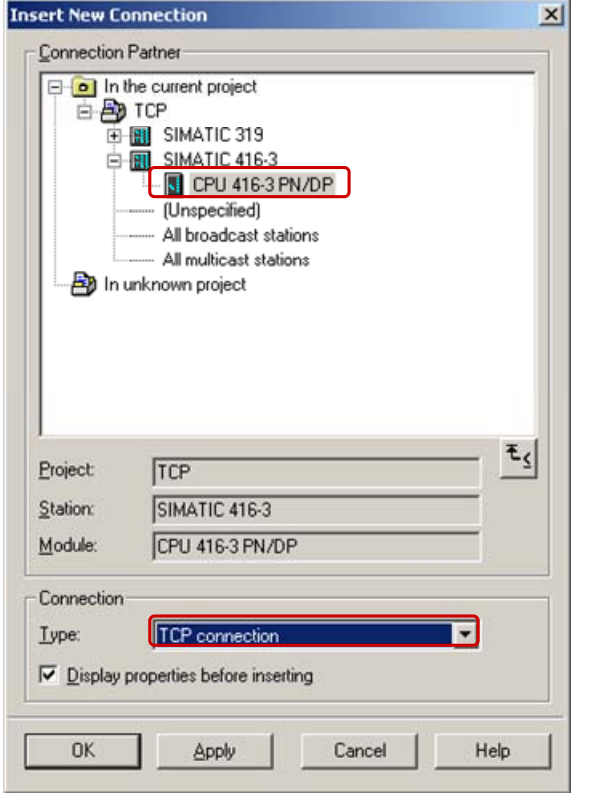

Table 2-5

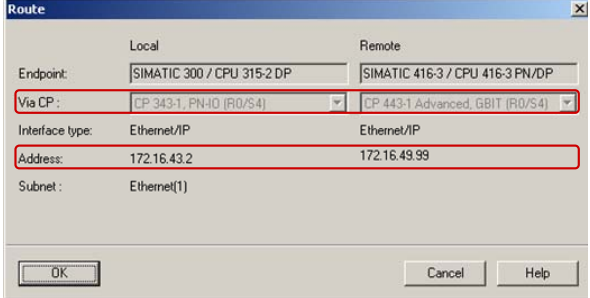
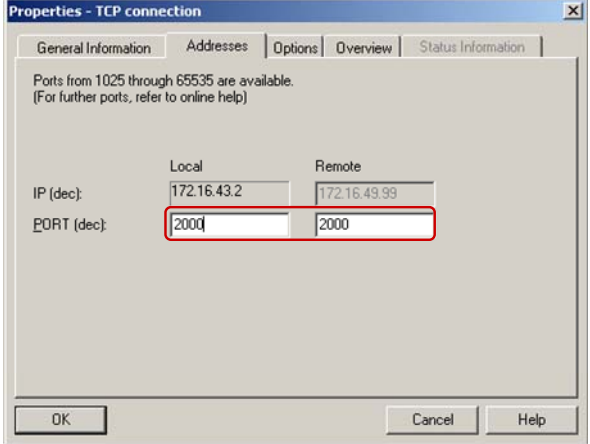
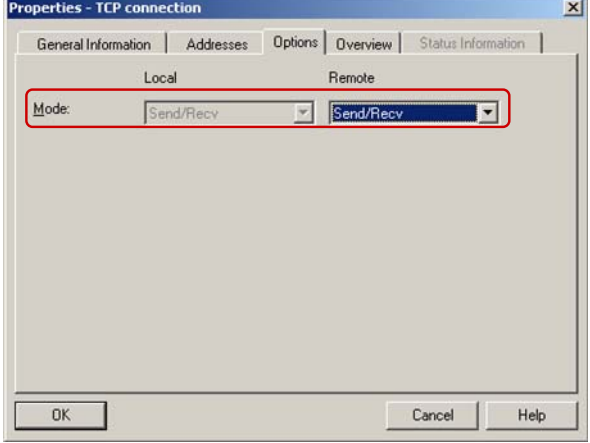
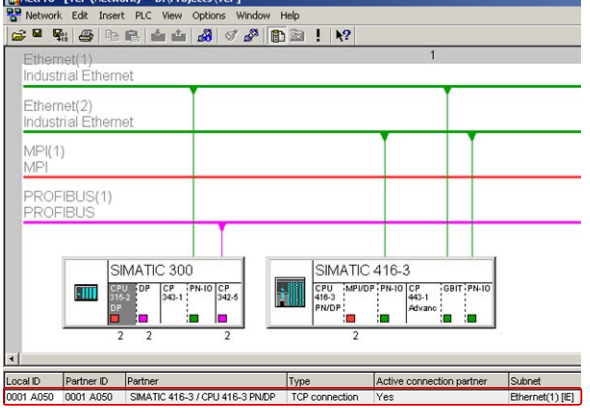
Connection parameters	S7-300	S7-400
Connection partners	S7-400 CPU	S7-300 CPU
Connection type	TCP connection	TCP connection
Local IP address	172.16.43.2	172.16.49.99
Partner IP address	172.16.49.99	172.16.43.2
Connection setup	Active	Passive
ID (connection number)	1	1
LADDR (module start address)	W#16#0100	W#16#3FFA
Local port	2000	2000
Partner TSAP port	2000	2000

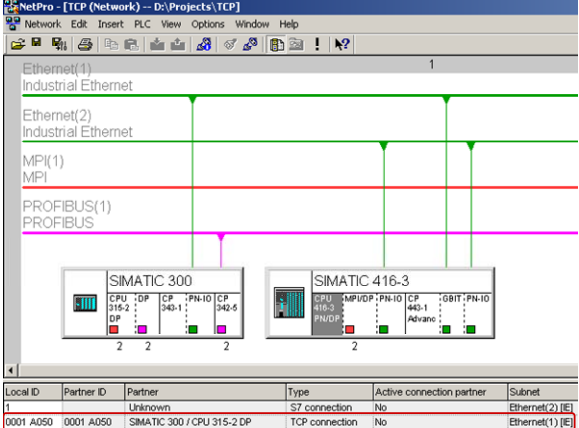
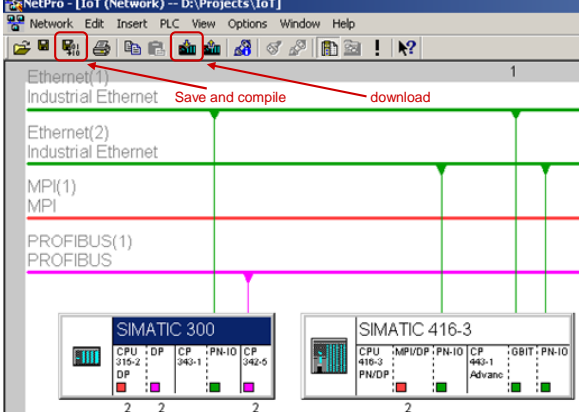
Table 2-6

No.	Configuration step	Note
1.	In the SIMATIC Manager you open the STEP 7 project that contains the configurations of S7-300 and/or S7-400 between which the data is to be exchanged over a TCP connection. By means of the menu Options → Configure Network you open NetPro where you configure the TCP connection.	 <p>The screenshot shows the SIMATIC Manager interface with the 'Options' menu open. The 'Configure Network' option is highlighted with a red box. The background shows a project tree with SIMATIC 416-3, SIMATIC 300, and SIMATIC 319.</p>

2 Configuration

No.	Configuration step	Note
2.	<p>Mark the CPU of the SIMATIC 300 station and create a new connection by means of the menu Insert → New Connection....</p>	
3.	<p>In the "Insert New Connection" dialog you select the S7-400 CPU as connection partner. Select "TCP connection" as the connection type. Then click the "Apply" button to open the Properties dialog of the TCP connection.</p>	
4.	<p>In the Properties dialog of the TCP connection → "General" tab you determine the connection number and module start address of CP343-1 via the block parameters "ID" and "LADDR". You specify the values at the input parameters "ID" and "LADDR" when you call the functions FC5 "AG_SEND" and FC6 "AG_RECV". These functions are called in the user program of the CPU and are for sending and receiving data. Activate the function "Active connection establishment" because the S7-300 actively establishes the TCP connection. Double-click the "Route..." button.</p>	

No.	Configuration step	Note												
5.	<p>In the "Route" dialog you see that the TCP connection is established between the IP addresses 172.16.43.2 and 172.16.49.99, i.e. the data is exchanged between S7-300 and S7-400 via CP343-1 and the GBIT interface of CP443-1.</p> <p>Close the dialog with "OK" and switch to the "Addresses" tab in the Properties dialog of the TCP connection.</p>													
6.	<p>In the Properties dialog of the TCP connection → "Addresses" tab you enter the local port and the partner port by way of which the data is to be sent and received.</p> <p>In the Properties dialog of the TCP connection you switch to the "Options" tab.</p>													
7.	<p>In the Properties dialog of the TCP connection → "Options" tab you select the "Send/Recv" mode locally in the S7-300 and in the communication partner.</p> <p>Apply the settings with "OK".</p>													
8.	<p>Mark the CPU of the SIMATIC 300 station. The configured TCP connection is now displayed in the connection table.</p>	 <table border="1" data-bbox="767 1939 1358 1984"> <thead> <tr> <th>Local ID</th> <th>Partner ID</th> <th>Partner</th> <th>Type</th> <th>Active connection partner</th> <th>Subnet</th> </tr> </thead> <tbody> <tr> <td>0001 A050</td> <td>0001 A050</td> <td>SIMATIC 416-3 / CPU 416-3 PN/DP</td> <td>TCP connection</td> <td>Yes</td> <td>Ethernet(1) [E]</td> </tr> </tbody> </table>	Local ID	Partner ID	Partner	Type	Active connection partner	Subnet	0001 A050	0001 A050	SIMATIC 416-3 / CPU 416-3 PN/DP	TCP connection	Yes	Ethernet(1) [E]
Local ID	Partner ID	Partner	Type	Active connection partner	Subnet									
0001 A050	0001 A050	SIMATIC 416-3 / CPU 416-3 PN/DP	TCP connection	Yes	Ethernet(1) [E]									

No.	Configuration step	Note																		
9.	Mark the CPU of the SIMATIC 400 station. The configured TCP connection is now displayed in the connection table.	 <table border="1" data-bbox="767 683 1347 734"> <thead> <tr> <th>Local ID</th> <th>Partner ID</th> <th>Partner</th> <th>Type</th> <th>Active connection partner</th> <th>Subnet</th> </tr> </thead> <tbody> <tr> <td>1</td> <td></td> <td>Unknown</td> <td>S7 connection</td> <td>No</td> <td>Ethernet(2) IE</td> </tr> <tr> <td>0001 A050</td> <td>0001 A050</td> <td>SIMATIC 300 / CPU 315-2 DP</td> <td>TCP connection</td> <td>No</td> <td>Ethernet(1) IE</td> </tr> </tbody> </table>	Local ID	Partner ID	Partner	Type	Active connection partner	Subnet	1		Unknown	S7 connection	No	Ethernet(2) IE	0001 A050	0001 A050	SIMATIC 300 / CPU 315-2 DP	TCP connection	No	Ethernet(1) IE
Local ID	Partner ID	Partner	Type	Active connection partner	Subnet															
1		Unknown	S7 connection	No	Ethernet(2) IE															
0001 A050	0001 A050	SIMATIC 300 / CPU 315-2 DP	TCP connection	No	Ethernet(1) IE															
10.	<p>When you have finished configuring the connection, you save and compile the configuration.</p> <p>Mark the SIMATIC 300 station and download the configuration into the S7-300 CPU.</p> <p>Then mark the SIMATIC 400 station and download the configuration into the S7-400 CPU.</p>																			
11.	In the user program of the S7-300 you call the functions FC5 "AG_SEND" and FC6 "AG_RECV".	<p>You will find the functions FC5 "AG_SEND" and FC6 "AG_RECV" in the library "SIMATIC_NET_CP → CP 300 → Blocks".</p> <p>At the link below is a sample program with the call of the functions FC5 "AG_SEND" and FC6 "AG_RECV" for the S7-300.</p> <p>http://support.automation.siemens.com/WW/view/de/17853532</p>																		
12.	In the user program of the S7-400 you call the functions FC50 "AG_LSEND" and FC60 "AG_LRECV".	<p>You will find the functions FC50 "AG_LSEND" and FC60 "AG_LRECV" in the library "SIMATIC_NET_CP → CP 400 → Blocks".</p> <p>At the link below is a sample program with the call of the functions FC50 "AG_LSEND" and FC60 "AG_LRECV" for the S7-400.</p> <p>http://support.automation.siemens.com/WW/view/de/24693800</p>																		

2.2.2 Configuring an unspecified TCP connection

If the S7-300 and S7-400 between which there is data exchange are configured in different STEP 7 projects, then you configure an unspecified TCP connection.

Below we describe how to configure an **unspecified** TCP connection for data exchange between an S7-300 and S7-400 by way of Industrial Ethernet CPs using the connection parameters below.

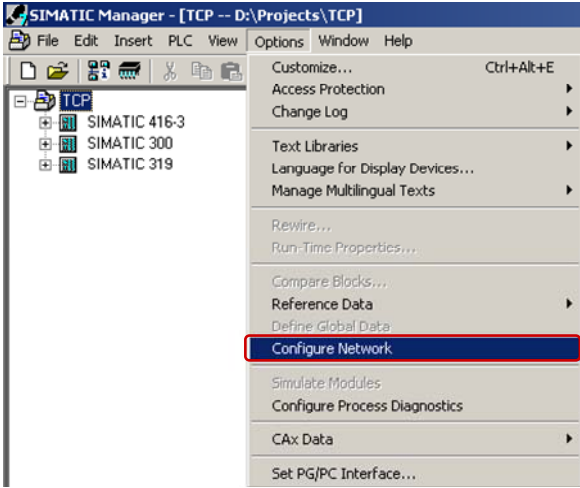
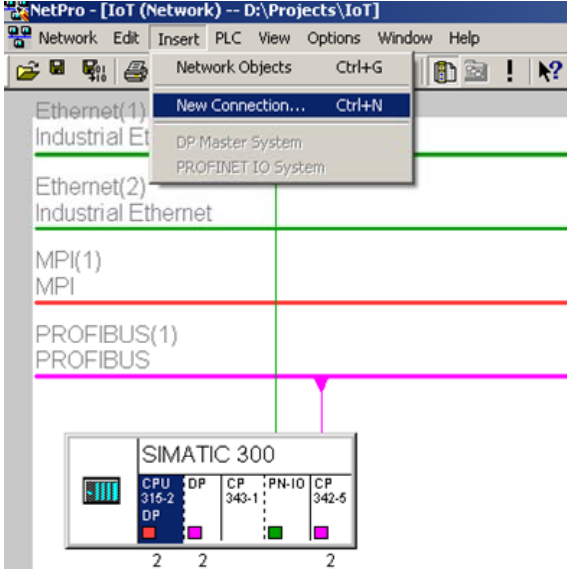
Table 2-7

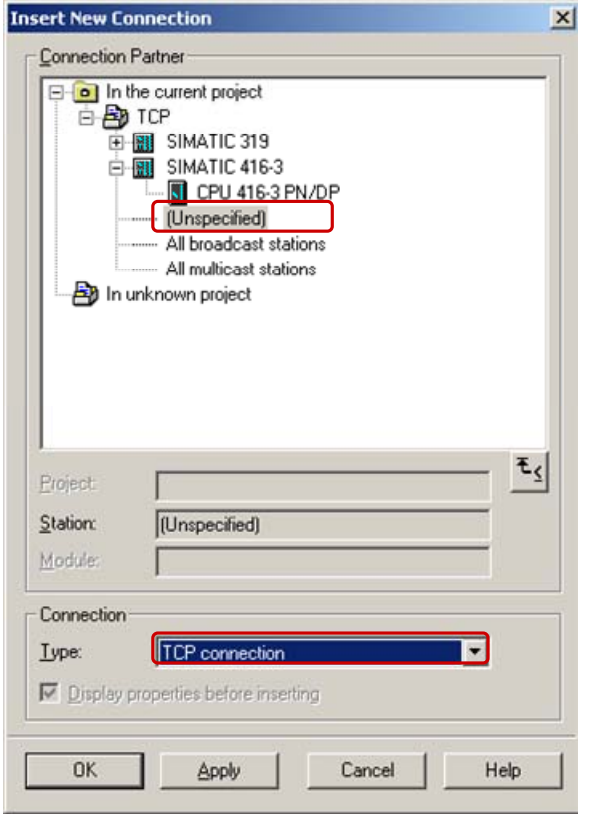
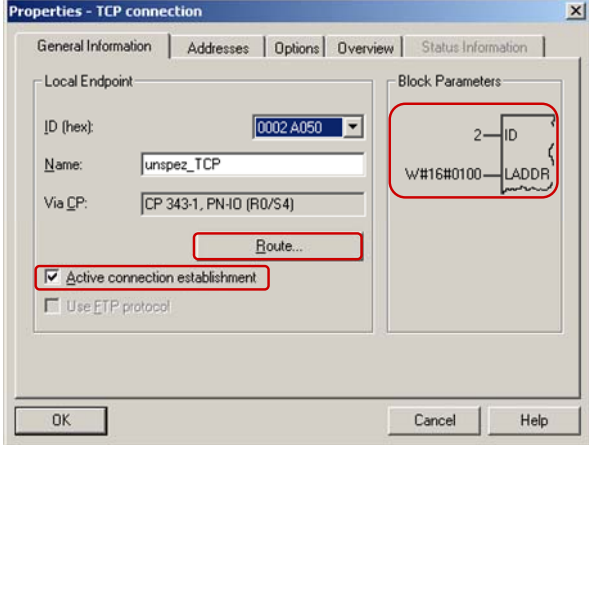
Connection parameters	S7-300	S7-400
Connection partners	S7-400 CPU	S7-300 CPU
Connection type	TCP connection	TCP connection
Local IP address	172.16.43.2	172.16.49.99
Partner IP address	172.16.49.99	-
Connection setup	Active	Passive
ID (connection number)	2	2
LADDR (module start address)	W#16#0100	W#16#3FFA
Local port	2001	2002
Partner port	2002	-

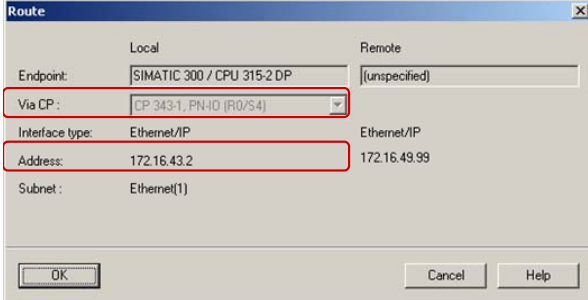
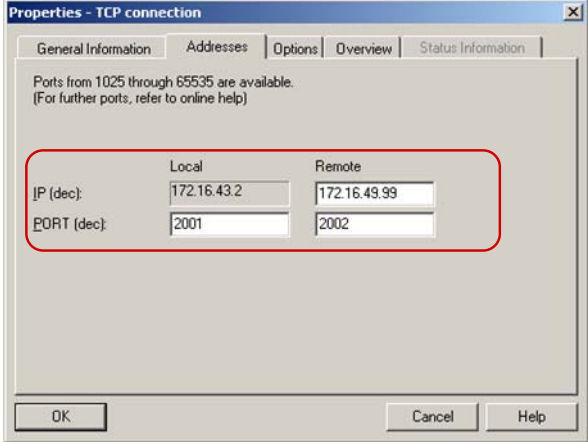
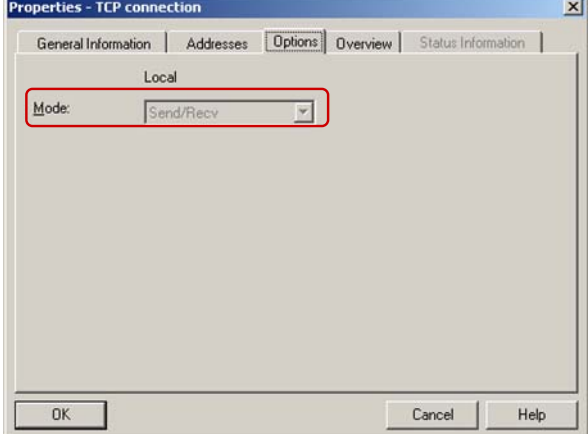
Configuring an unspecified TCP connection for the S7-300

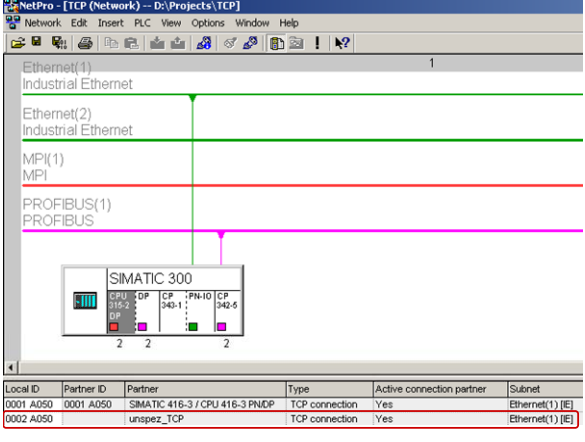
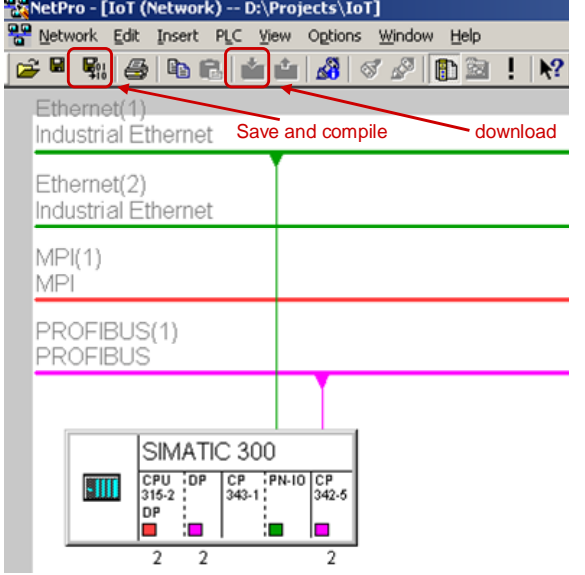
Follow the instructions below to configure an unspecified TCP connection for the S7-300.

Table 2-8

No.	Configuration step	Note
13.	<p>In the SIMATIC Manager you open the STEP 7 project that contains the configuration of S7-300 which is to send and receive the data over a TCP connection.</p> <p>By means of the menu Options → Configure Network you open NetPro where you configure the TCP connection.</p>	 <p>The screenshot shows the SIMATIC Manager interface with the 'Options' menu open. The 'Configure Network' option is highlighted with a red box. The project tree on the left shows a 'TCP' folder containing SIMATIC 416-3, SIMATIC 300, and SIMATIC 319.</p>
14.	<p>Mark the CPU of the SIMATIC 300 station and create a new connection by means of the menu Insert → New Connection....</p>	 <p>The screenshot shows the NetPro interface with the 'Insert' menu open and 'New Connection...' selected. The network diagram shows a SIMATIC 300 station with a CPU 315-2 DP, CP 343-1, and CP 342-5. A new connection is being established between the station and the network.</p>

No.	Configuration step	Note
15.	<p>In the "Insert New Connection" dialog you select the item "unspecified" as connection partner.</p> <p>Select "TCP connection" as the connection type.</p> <p>Then click the "Apply" button to open the Properties dialog of the TCP connection.</p>	 <p>The screenshot shows the 'Insert New Connection' dialog. Under 'Connection Partner', the tree structure includes 'In the current project' with sub-items 'TCP', 'SIMATIC 319', 'SIMATIC 416-3', and 'CPU 416-3 PN/DP (Unspecified)'. The 'Unspecified' item is selected. Below the tree, the 'Project' field is empty, 'Station' is '(Unspecified)', and 'Module' is empty. The 'Connection Type' dropdown is set to 'TCP connection'. The 'Display properties before inserting' checkbox is checked. The 'Apply' button is highlighted with a red box.</p>
16.	<p>In the Properties dialog of the TCP connection → "General" tab you determine the block parameters "ID" and "LADDR". The block parameter ID provides the connection number. The block parameter LADDR provides the module start address of CP343-1.</p> <p>You specify the connection number and the module start address at the input parameters "ID" and "LADDR" respectively when you call the functions FC5 "AG_SEND" and FC6 "AG_RECV". These functions are called in the user program of the CPU and are for sending and receiving data.</p> <p>Activate the function "Active connection establishment" because the S7-300 actively establishes the TCP connection.</p> <p>Double-click the "Route..." button.</p>	 <p>The screenshot shows the 'Properties - TCP connection' dialog, General Information tab. Under 'Local Endpoint', 'ID (hex)' is '0002 A050', 'Name' is 'unspec_TCP', and 'Via CP' is 'CP 343-1, PN-IO (R0/S4)'. The 'Route...' button is highlighted. Under 'Block Parameters', 'ID' is '2' and 'LADDR' is 'W#16#0100'. The 'Active connection establishment' checkbox is checked. The 'Use ETP protocol' checkbox is unchecked. The 'OK' button is highlighted.</p>

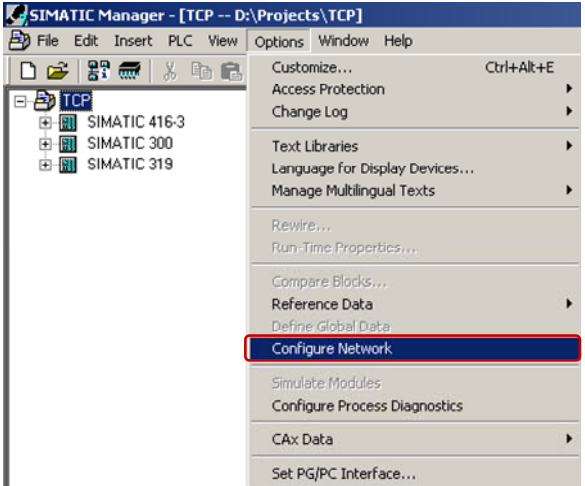
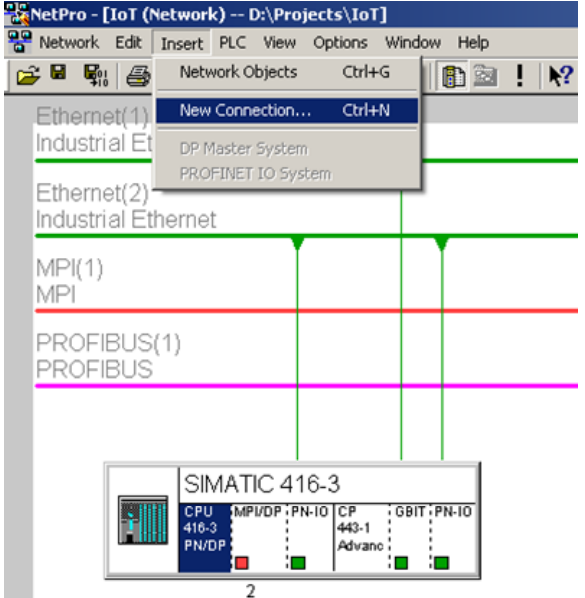
No.	Configuration step	Note
17.	<p>In the "Route" dialog you see that the TCP connection to the communication partner is established by way of the IP address 172.16.43.2, i.e. the data is exchanged with the communication partner by way of the CP343-1.</p> <p>Close the dialog with "OK" and switch to the "Addresses" tab in the Properties dialog of the TCP connection.</p>	
18.	<p>In the Properties dialog of the TCP connection → "Addresses" tab you enter the IP address of the communication partner, i.e. in this example you enter the IP address 172.16.49.99 of CP443-1 Advanced.</p> <p>You then enter the local port and the partner port by way of which the data is to be sent and received.</p> <p>In the Properties dialog of the TCP connection you switch to the "Options" tab.</p> <p>Note: In the SIMATIC 300 station you enter the local port of the SIMATIC S7-400 as the partner port.</p>	
19.	<p>In the Properties dialog of the TCP connection → "Options" tab you select the "Send/Recv" mode.</p> <p>Apply the settings with "OK".</p>	

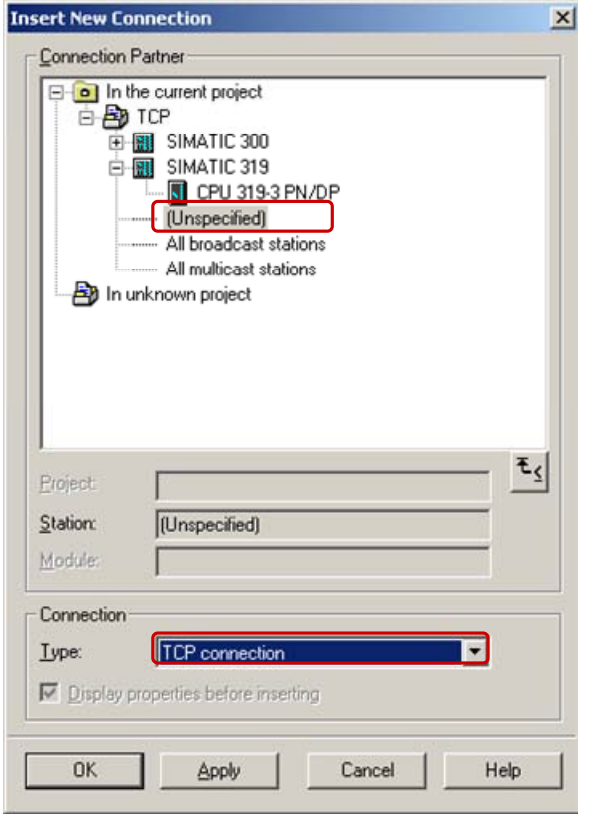
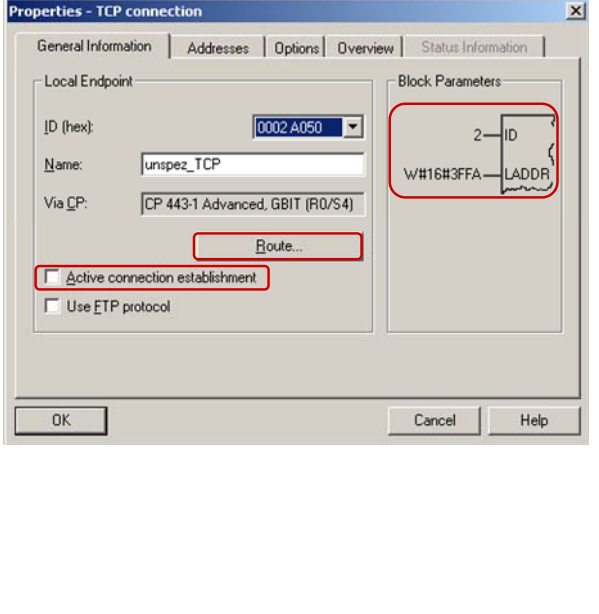
No.	Configuration step	Note																		
20.	Mark the CPU of the SIMATIC 300 station. The configured TCP connection is now displayed in the connection table.	 <table border="1" data-bbox="767 685 1353 748"> <thead> <tr> <th>Local ID</th> <th>Partner ID</th> <th>Partner</th> <th>Type</th> <th>Active connection partner</th> <th>Subnet</th> </tr> </thead> <tbody> <tr> <td>0001 A050</td> <td>0001 A050</td> <td>SIMATIC 416-3 / CPU 416-3 PN/DP</td> <td>TCP connection</td> <td>Yes</td> <td>Ethernet(1) [IE]</td> </tr> <tr> <td>0002 A050</td> <td></td> <td>unspez_TCP</td> <td>TCP connection</td> <td>Yes</td> <td>Ethernet(1) [IE]</td> </tr> </tbody> </table>	Local ID	Partner ID	Partner	Type	Active connection partner	Subnet	0001 A050	0001 A050	SIMATIC 416-3 / CPU 416-3 PN/DP	TCP connection	Yes	Ethernet(1) [IE]	0002 A050		unspez_TCP	TCP connection	Yes	Ethernet(1) [IE]
Local ID	Partner ID	Partner	Type	Active connection partner	Subnet															
0001 A050	0001 A050	SIMATIC 416-3 / CPU 416-3 PN/DP	TCP connection	Yes	Ethernet(1) [IE]															
0002 A050		unspez_TCP	TCP connection	Yes	Ethernet(1) [IE]															
21.	Once you have completed the connection configuration, you save and compile the configuration. Mark the SIMATIC 300 station and download the configuration into the S7-300 CPU.																			
22.	In the user program of the S7-300 you call the functions FC5 "AG_SEND" and FC6 "AG_RECV".	<p>You will find the functions FC5 "AG_SEND" and FC6 "AG_RECV" in the library "SIMATIC_NET_CP → CP 300 → Blocks".</p> <p>At the link below is a sample program with the call of the functions FC5 "AG_SEND" and FC6 "AG_RECV" for the S7-300.</p> <p>http://support.automation.siemens.com/WW/view/de/17853532</p>																		

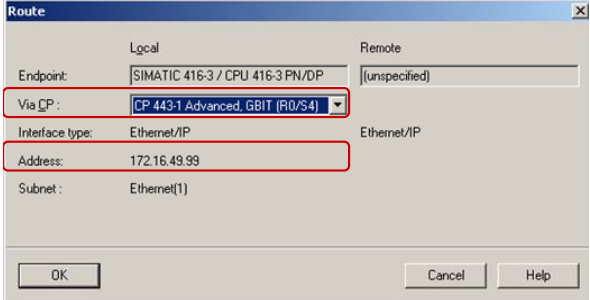
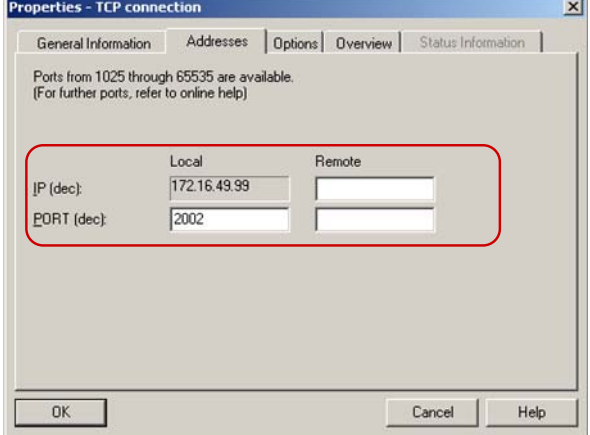
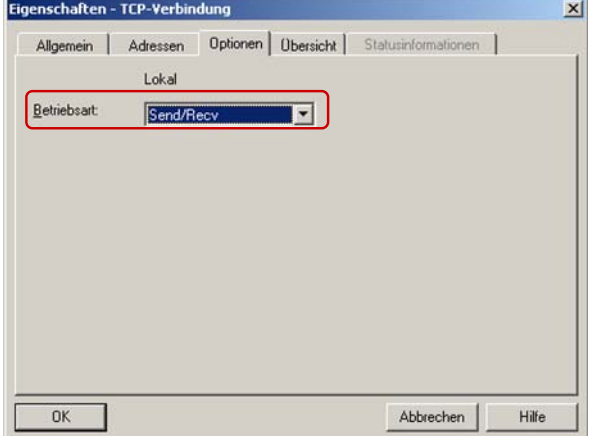
Configuring an unspecified TCP connection for the S7-400

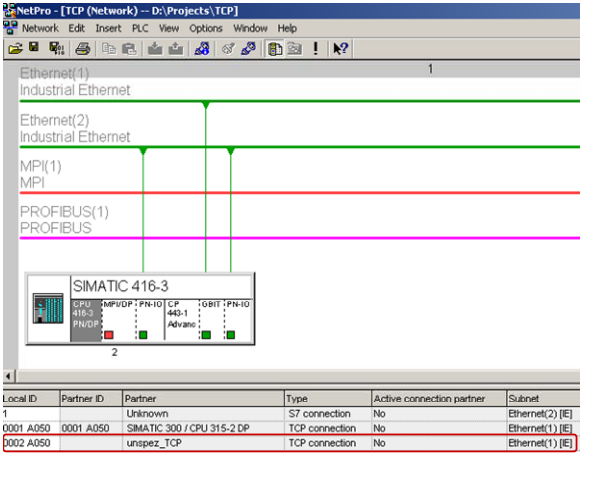
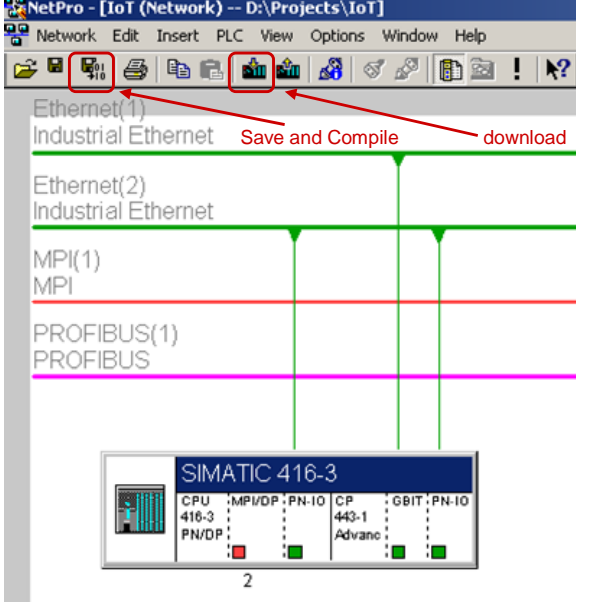
Follow the instructions below to configure an unspecified TCP connection for the S7-400.

Table 2-9

No.	Configuration step	Note
1.	<p>In the SIMATIC Manager you open the STEP 7 project that contains the configuration of S7-400 which is to send and receive the data over a TCP connection.</p> <p>By means of the menu Options → Configure Network you open NetPro where you configure the TCP connection.</p>	 <p>The screenshot shows the SIMATIC Manager interface with the 'Options' menu open. The 'Configure Network' option is highlighted with a red box. The project tree on the left shows a 'TCP' folder containing SIMATIC 416-3, SIMATIC 300, and SIMATIC 319.</p>
2.	<p>Mark the CPU of the SIMATIC 400 station and create a new connection by means of the menu Insert → New Connection...</p>	 <p>The screenshot shows the NetPro interface for an IoT network. A context menu is open over the SIMATIC 416-3 station, with 'New Connection...' selected. The menu also shows options for 'DP Master System' and 'PROFINET IO System'. The station's hardware rack is visible at the bottom, showing a CPU 416-3 with various modules.</p>

No.	Configuration step	Note
3.	<p>In the "Insert New Connection" dialog you select the item "unspecified" as connection partner.</p> <p>Select "TCP connection" as the connection type.</p> <p>Then click the "Apply" button to open the Properties dialog of the TCP connection.</p>	 <p>The screenshot shows the 'Insert New Connection' dialog. Under 'In the current project', the 'TCP' folder is expanded, and 'CPU 319-3 PN/DP (Unspecified)' is selected. The 'Connection Type' is set to 'TCP connection'. The 'Apply' button is highlighted.</p>
4.	<p>In the Properties dialog of the TCP connection → "General" tab you determine the block parameters "ID" and "LADDR". The block parameter ID provides the connection number. The block parameter LADDR provides the module start address of CP443-1 Advanced.</p> <p>You specify the connection number and the module start address at the input parameters "ID" and "LADDR" respectively when you call the functions FC50 "AG_LSEND" and FC60 "AG_LRECV". These functions are called in the user program of the CPU and are for sending and receiving data.</p> <p>Deactivate the function "Active connection establishment" because the S7-400 is passively involved in establishing the TCP connection.</p> <p>Double-click the "Route..." button.</p>	 <p>The screenshot shows the 'Properties - TCP connection' dialog, General Information tab. The 'ID (hex)' is '0002A050', 'Name' is 'unspez_TCP', and 'Via CP' is 'CP 443-1 Advanced, GBIT (R0/S4)'. The 'Route...' button is highlighted. In the 'Block Parameters' section, 'ID' and 'LADDR' (W#16#3FFA) are highlighted.</p>

No.	Configuration step	Note
5.	<p>In the "Route" dialog you select the GBIT interface of CP443-1 Advanced. The TCP connection to the communication partner is established by way of the IP address 172.16.49.99, i.e. the data is exchanged with the communication partner by way of the GBIT interface of CP443-1 Advanced.</p> <p>Close the dialog with "OK" and switch to the "Addresses" tab in the Properties dialog of the TCP connection.</p>	
6.	<p>In the Properties dialog of the TCP connection → "Addresses" tab you enter the local port by way of which the data is to be sent and received. The partner IP address and partner port are not specified.</p> <p>In the Properties dialog of the TCP connection you switch to the "Options" tab.</p> <p>Note: In the SIMATIC 400 station you enter as local port the partner port you defined in the SIMATIC S7-300.</p>	
7.	<p>In the Properties dialog of the TCP connection → "Options" tab you select the "Send/Recv" mode. Apply the settings with "OK".</p>	

No.	Configuration step	Note																								
8.	Mark the CPU of the SIMATIC 400 station. The configured TCP connection is now displayed in the connection table.	 <table border="1" data-bbox="767 683 1367 779"> <thead> <tr> <th>Local ID</th> <th>Partner ID</th> <th>Partner</th> <th>Type</th> <th>Active connection partner</th> <th>Subnet</th> </tr> </thead> <tbody> <tr> <td>1</td> <td></td> <td>Unknown</td> <td>S7 connection</td> <td>No</td> <td>Ethernet(2) [IE]</td> </tr> <tr> <td>0001 A050</td> <td>0001 A050</td> <td>SIMATIC 300 / CPU 315-2 DP</td> <td>TCP connection</td> <td>No</td> <td>Ethernet(1) [IE]</td> </tr> <tr> <td>0002 A050</td> <td></td> <td>unspez_TCP</td> <td>TCP connection</td> <td>No</td> <td>Ethernet(1) [IE]</td> </tr> </tbody> </table>	Local ID	Partner ID	Partner	Type	Active connection partner	Subnet	1		Unknown	S7 connection	No	Ethernet(2) [IE]	0001 A050	0001 A050	SIMATIC 300 / CPU 315-2 DP	TCP connection	No	Ethernet(1) [IE]	0002 A050		unspez_TCP	TCP connection	No	Ethernet(1) [IE]
Local ID	Partner ID	Partner	Type	Active connection partner	Subnet																					
1		Unknown	S7 connection	No	Ethernet(2) [IE]																					
0001 A050	0001 A050	SIMATIC 300 / CPU 315-2 DP	TCP connection	No	Ethernet(1) [IE]																					
0002 A050		unspez_TCP	TCP connection	No	Ethernet(1) [IE]																					
9.	Once you have completed the connection configuration, you save and compile the configuration. Mark the SIMATIC 400 station and download the configuration into the S7-400 CPU.																									
10.	In the user program of the S7-400 you call the functions FC50 "AG_LSEND" and FC60 "AG_LRECV".	<p>You will find the functions FC50 "AG_LSEND" and FC60 "AG_LRECV" in the library "SIMATIC_NET_CP → CP 400 → Blocks".</p> <p>At the link below is a sample program with the call of the functions FC50 "AG_LSEND" and FC60 "AG_LRECV" for the S7-400.</p> <p>http://support.automation.siemens.com/WW/view/de/24693800</p>																								