QUESTION:

What possibilites are there to connect online a PG/PC to a S7 control via Ethernet?

ANSWER:

When setting up an online connection between a PG/PC and a S7 control via industrial Ethernet there are some aspects to keep in mind.

Firstly in NetPro a PG/PC must be inserted that is to show the logical connection of your PG/PCs to the Ethernet bus.



Fig. 1: Inserting a PG/PC in NetPro

In properties dialog you connect the PG/PC via the interface Ethernet to the Ethernet bus and assigning a IP address, which is unambiguous to the network, to the PG/PC.

Note:

IP addresses of the PG/PCs and S7 controls in NetPro must lie in the same range of IP addresses!

Ethernet(1)	
Industrial Ethernet	
SIMATIC 300(1) CPU DP CP 315-2 343-1 DP 2 2	SIMATIC 300(2)
Properties -PG/PC	×
General Interfaces Assignment	
Name Type Address Ethernet Schnittstelle(1) Industrial Ethernet 192.80.30.2	Subnet
New Properties Generate LDB	Delete
ОК	Cancel Help

Fig. 2: Configuration in NetPro

The IP address that is set in Microsoft Windows' control panel need not match the IP address configured in NetPro!

Please mind the following three aspects when **assigning Windows IP address**:

 In Windows settings (Start > Control panel > Network Connections > Properties > Internet protocol (TCP/IP) > Properties) of the PG/PCs the same or an IP address of the same subnet is set.

General Authentication A	dvanced	
Connect using:		
Intel(R) PR0/100 VM	M Network Connection	
	Configure	
This connection uses the fo	ollowing items:	
 ✓ ➡ Client for Microsof ✓ ➡ File and Printer Sh ✓ ☞ Internet Protocol (t Networks haring for Microsoft Networks TCP/IP)	
Install	Uninstall Properties	
nternet Protocol (TCP/IP)) Properties	?
General		
O Obtain an IP address O Uptain an IP address	automatically	
□ _ Use the following IP a	address:	
IP address:	address: 192 . 80 . 30 . 2	
IP address: Subnet mask:	address: 192 . 80 . 30 . 2 255 . 255 . 255 . 0	
IP address: Subnet mask: Default gateway:	address: 192 . 80 . 30 . 2 255 . 255 . 255 . 0 	
Ose the following IP a IP address: Subnet mask: Default gateway: Obtain DNS server ad	address: 192 . 80 . 30 . 2 255 . 255 . 255 . 0 	
Ose the following IP a IP address: Subnet mask: Default gateway: O Obtain DNS server ac O Use the following DN	address: 192 . 80 . 30 . 2 255 . 255 . 255 . 0 ddress automatically S server addresses:	
Ose the following IP a IP address: Subnet mask: Default gateway: O Obtain DNS server ac O Use the following DN Preferred DNS server:	address: 192 . 80 . 30 . 2 255 . 255 . 255 . 0 ddress automatically S server addresses: 	
Ose the following IP a IP address: Subnet mask: Default gateway: Obtain DNS server ac Obtain DNS server: Alternate DNS server:	address: 192 . 80 . 30 . 2 255 . 255 . 255 . 0 ddress automatically S server addresses: 	
 Use the following IP a IP address: Subnet mask: Default gateway: Obtain DNS server at Obtain DNS server at Its the following DN Preferred DNS server: Alternate DNS server: 	address: 192 . 80 . 30 . 2 255 . 255 . 255 . 0 ddress automatically S server addresses: Advanced	

Fig. 3: Microsoft Windows Settings Possible IP Addresses for the PG/PC:

S7 Control	PG/PC				
192.80.30.1	192.80.30.4 - 192.80.30.254				
192.80.30.3	192.80.30.2				

Table 1: Possible IP Addresses of the PG



Fig. 4: Possible Configuration

2. The Windows IP address (Start > Control Panel > Network Connections > Properties > Internet protocol (TCP/IP) > Properties) of the PC lie in a different subnet than the IP address configured in NetPro.

Local Area Connection Prop	erties		<u>? ×</u>
General Authentication Advan	ced		
Connect using:			
Intel(R) PR0/100 VM Net	work Connectio	n	
		Configure	
This connection uses the following	ng items:		
 ✓ Silent for Microsoft Netw ✓ Ø File and Printer Sharing ✓ Thernet Protocol (TCP/I 	vorks for Microsoft Ne P)	etworks	
Install	install	Properties	
ernet Protocol (TCP/IP) Prop	perties		?
General			
 Obtain an IP address auton Use the following IP address 	natically s:		
IP address:	192.	80.31.5	;
Subnet mask:	255 . :	255.255.0	
Default gateway:			
C Obtain DMS server address	automaticallu		
○ Obtain DNS server address □ Use the following DNS server	automatically		
Obtain DNS server address Obtain DNS server Use the following DNS server: Preferred DNS server:	automatically ver addresses:-		
 Obtain DNS server address Use the following DNS server: Preferred DNS server: Alternate DNS server: 	automatically ver addresses:	· · ·	
 Obtain DNS server address Use the following DNS server Preferred DNS server: Alternate DNS server: 	automatically ver addresses:	· ·	
 Obtain DNS server address Use the following DNS server Preferred DNS server: Alternate DNS server: 	automatically ver addresses:	 Ad	vanced
 Obtain DNS server address Use the following DNS server Preferred DNS server: Alternate DNS server: 	automatically ver addresses:	 Ad	vanced

Fig. 5: Microsoft Windows Settings

In this case an online connection between the control and the PG can only be implemented via an **IP router**. The IP router can exchange data packages between different IP subnetworks by means of a routing table. In the routing table IP addresses and subnet mask of the control and of the PG must be entered in order to have the online connection setup.



Fig. 6: Connection via IP Router

3. The Windows IP address is received **automatically via a DHCP server**.

Local Area Connection Propertie	25				<u>?</u> ×	
ieneral Authentication Advanced	1					
Connect using:						
Intel(R) PRO/100 VM Network	Connec	tion				
			Conf	igure.		
This connection uses the following ite	ems:	_				
 Client for Microsoft Networks File and Printer Sharing for M Thternet Protocol (TCP/IP) 	s 1icrosoft	Netwo	orks			
Install Uninsta	1		Prop	erties		
ernet Protocol (TCP/IP) Propert	ies					?
ieneral Alternate Configuration						
Obtain an IP address automatic Use the following IP address:	ally					
IP address:						
Subnet mask:					_	
Default gateway;						
Obtain DNS server address aut	omatical	y				
C Use the following DNS server a	ddresse:	s:				
Preferred DNS server:						
Alternate DNS server:						
			J	Ad	lvanced	
			οr		C	

Fig. 7: Windows Settings

The IP address can also be received automatically via DHCP, if the assigned IP address already complies to the above described rules in point 1 and point 2.

Note:

You can test with command ping, if a connection Ethernet can be setup between the PC and the S7 control or the CP 343-1/ CP 443-1.

- For this open a MSDOS prompt ("Start > Run > cmd"). •
- Type "ping" and the IP address of the S7 control e. g. ping 192.80.30.2 ٠
- The S7 control can be reached via industrial Ethernet, if the reply telegrams are sent in • response to the ping request.

ex C:\WINNT\System32\cmd.exe	1
C:\>ping 192.80.30.2	
Pinging 192.80.30.2 with 32 bytes of data:	
Reply from 192.80.30.2: bytes=32 time<1ms TTL=128 Reply from 192.80.30.2: bytes=32 time<1ms TTL=128 Reply from 192.80.30.2: bytes=32 time<1ms TTL=128 Reply from 192.80.30.2: bytes=32 time<1ms TTL=128	
Ping statistics for 192.80.30.2: Packets: Sent = 4, Received = 4, Lost = 0 (0%) Approximate round trip times in milli-seconds: Minimum = Oms, Maximum = Oms, Average = Oms	loss),
C:\>_	

Fig. 8: PING Command to S7 Control