

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 technical interface. The background is a blurred industrial factory floor with various machines and equipment.

SIEMENS

Application description • 06/2015

Networking a SINUMERIK 828D

SINUMERIK 828D, SW 4.5 SP3

<https://support.industry.siemens.com/cs/ww/en/view/109474567>

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1 Fast Data transfer with SINUMERIK

1.1 Overview

In job shops, frequently customer parts must be post machined quickly – and the last program version cannot be found anywhere in the workshop. In this case, the archive of the SINUMERIK control must be checked as to where the actual program version is located. This must then be imported into the CNC control system using an appropriate data carrier. This involves non-productive time.

Using a networked control system, no time is wasted, as data can be quickly exchanged throughout the complete network. For example, this functions using the integrated Ethernet interface, with which the SINUMERIK 828D system can be integrated into any Windows or Linux network. The network drives are displayed in the control system program manager, and can be used as usual. This procedure is now precisely described.

Figure 1-1 Working in a networked environment at a Sinumerik control



2 Networking with SINUMERIK 828D

An external computer and SINUMERIK 828D control system are networked with one another; the network structure is of secondary importance. The SINUMERIK interface used is the X130.

A target folder must be created and shared in the Windows operating system. The "Test" target folder is created in the current example. A new user account must be created for "Advanced sharing". The user account "Control" with password "test" is used. Further, when assigning the logical drive in SINUMERIK, this data is queried in order to uniquely identify the IP address.

After the user has uniquely assigned the IP address of the computer and control system, the content of the shared "Test" target folder on the computer can be read out in the SINUMERIK control system. This is possible in the HMI menu.

Advantages of this solution

Advantages of networked control systems include:

- Programs can be accessed from every CNC control
- Short data paths, as data does not have to be transferred using a data carrier
- The most up-to-date programs are available on the server, e.g. programs from CAM systems
- CNC control data can be backed up to the server, e.g. archive
- Modified programs can be saved to the server, where they are accessible to all authorized participants
- Programs can be assigned versions and archived on the server

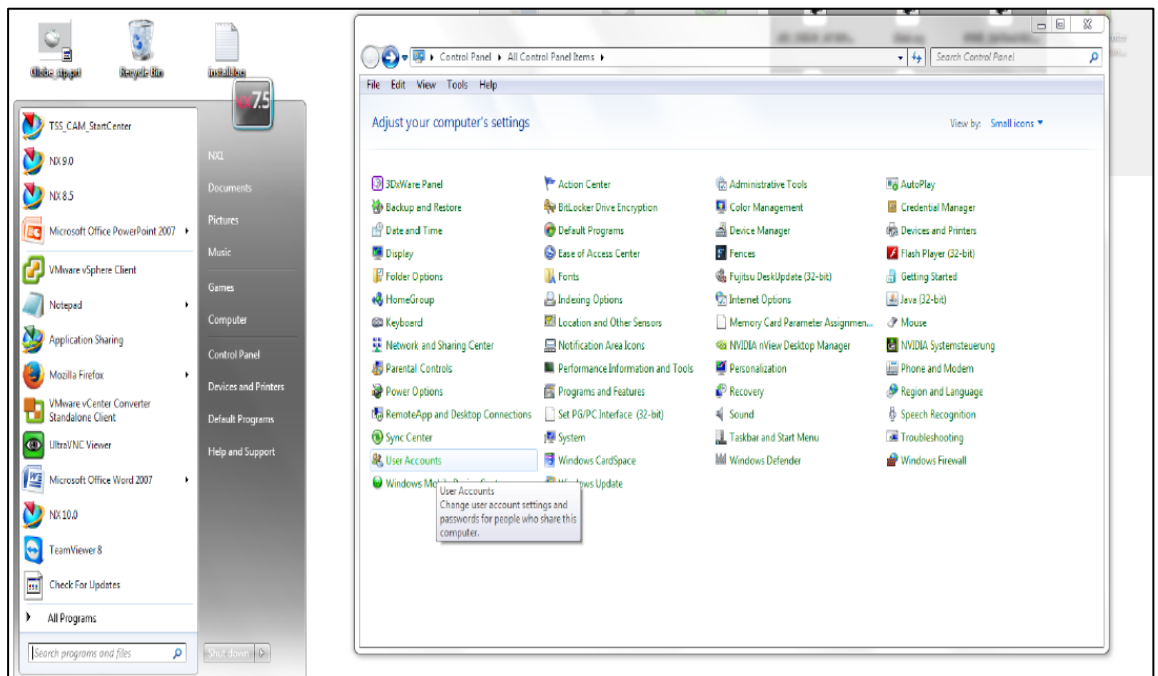
2.1 Computer network settings

The easiest way to exchange data is with the network share folders on the server. To do this, for example, a folder can be created on the Windows server, where all of the necessary programs are saved and can be accessed by the CNC machines. Using an example from Windows 7, it is shown how this functions.

2.1.1 Creating a user account

A new user account must be created under "Control panel" in the Windows operating system.

Figure 2-1 Creating a user account in the Windows operating system



The newly assigned name of the user account is "Control" (Fig. 2-2). The password "test" is assigned for the newly created account (Fig. 2-4). The password and the name of the user account are required later in the HMI configuration menu when entering into the logical drive.

Figure 2-2 Assigning the "Control" name for the user account

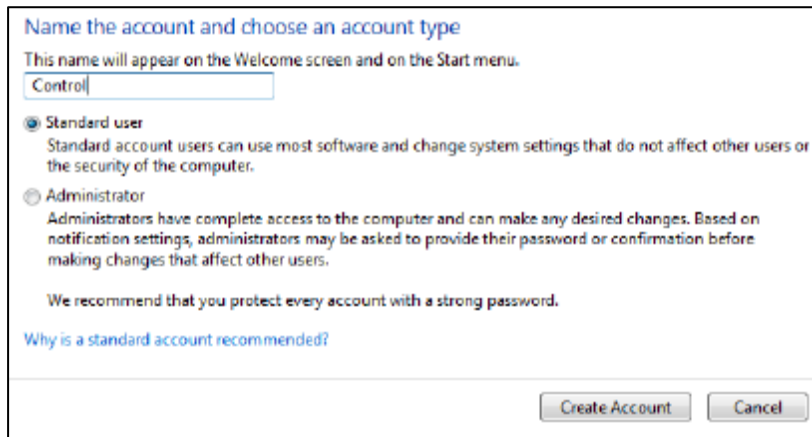
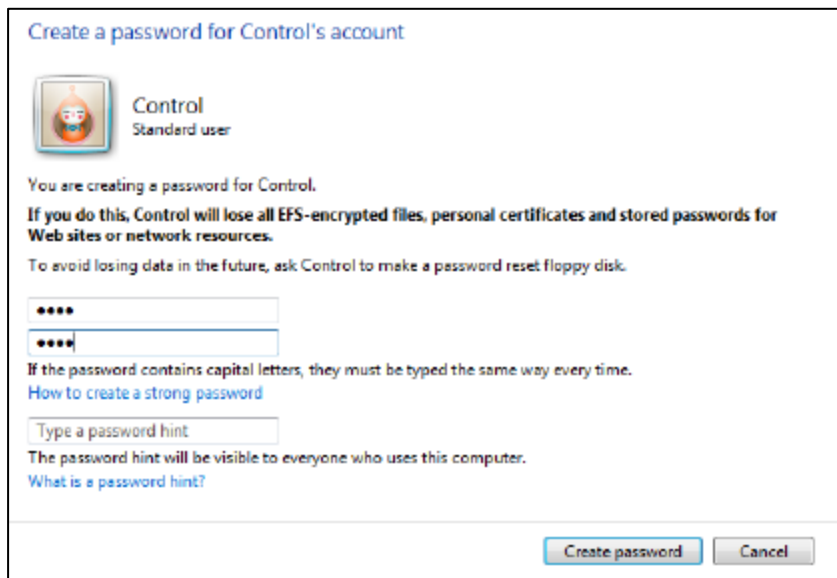


Figure 2-3 Creating a password name for the user account



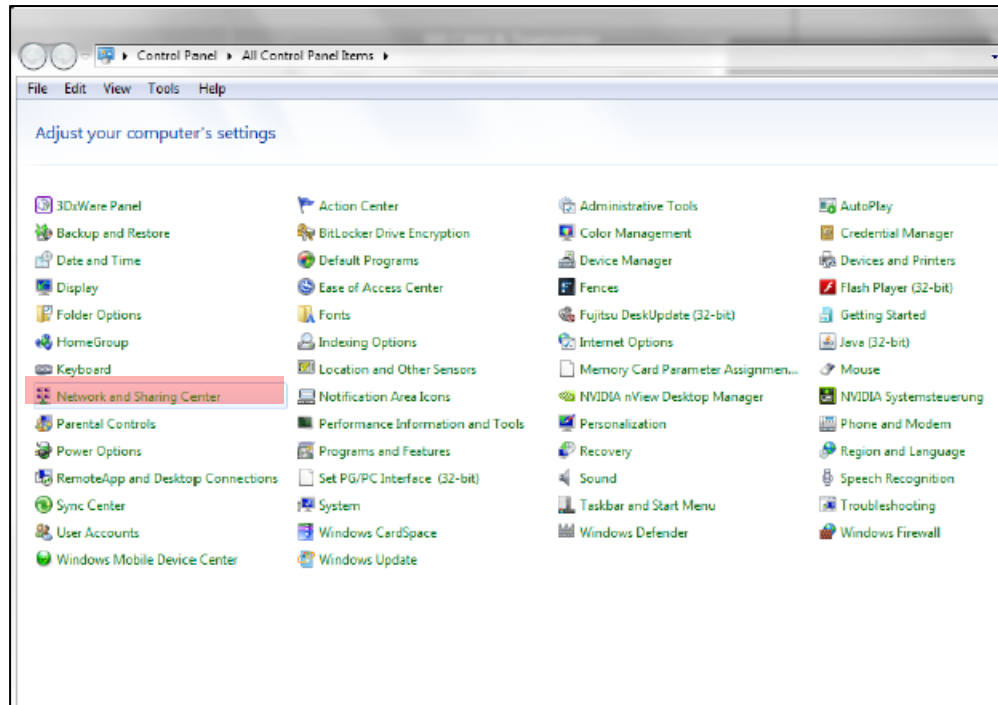
Figure 2-4 Selecting the password "test" for user account "Control"



2.1.2 Assigning an IP address

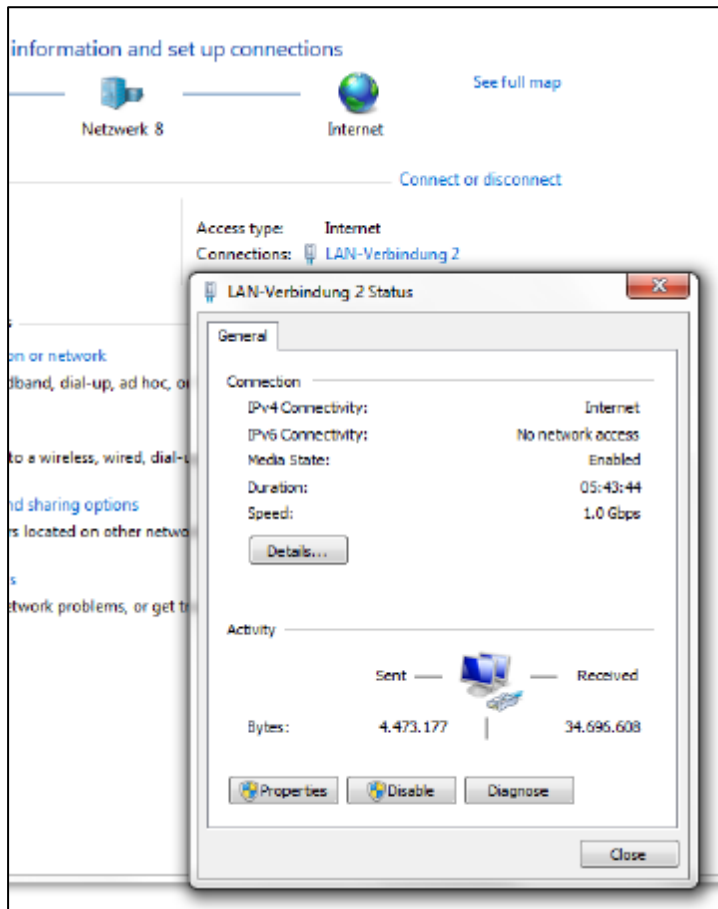
In order to integrate a control system into a network, configurations must be made directly at the control system, as well as at the network connection. An IP address must be permanently assigned at the computer and an IP address at the control in order that communication can be established. IP addresses can be automatically assigned or manually selected. In the current example, a unique IP address is manually entered. The selection is subsequently shown.

Figure 2-5 Navigation to the Network and Sharing Center



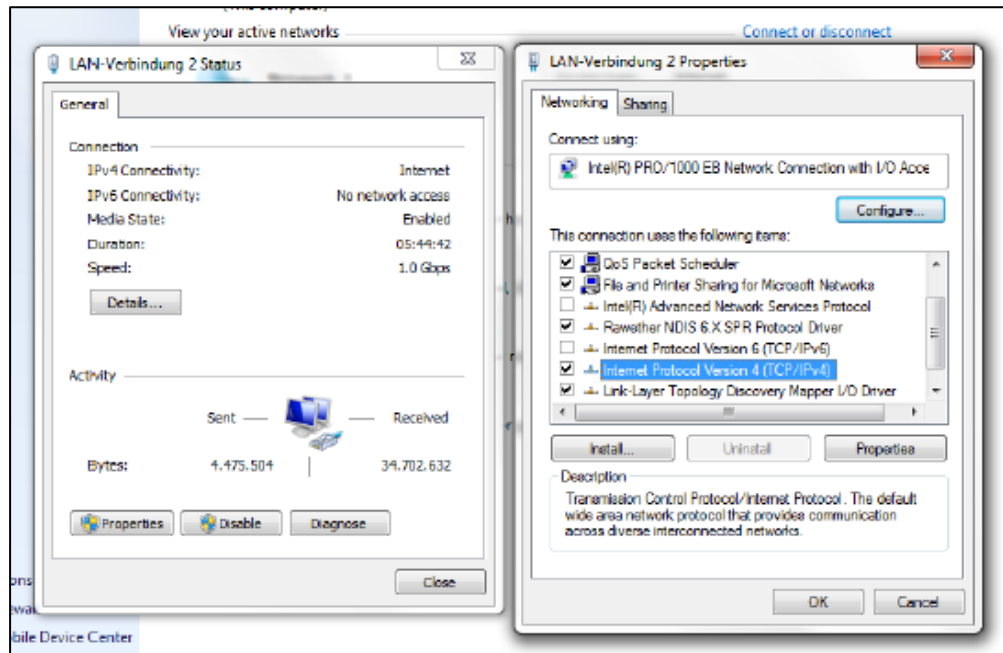
The status of "Local Area Connection" is shown in the "Network and Sharing Center" of the Windows control panel (Fig. 2-6).

Figure 2-6 Status of the Local Area Connection



Internet protocol version 4 (TCP/IPv4) can be selected under the properties of the "Local Area Connection". The IP address must be entered in the properties of the Internet protocol, version 4.

Figure 2-7 Navigation to the Internet protocol, version 4

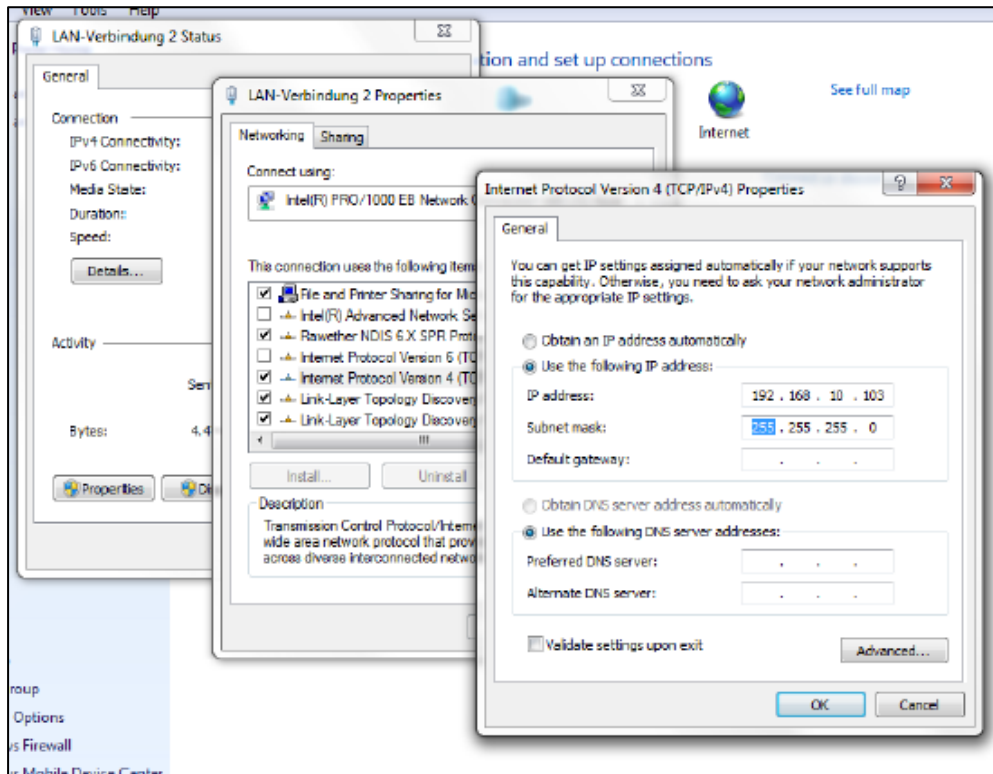


It must be ensured that a unique IP address is entered. The subnet mask must match that set at the control itself.

The following data is entered into the subnet mask.

- IP address: 192.168.10.103
- Subnet mask: 255.255.255.0

Figure 2-8 Entering the IP address and the subnet mask



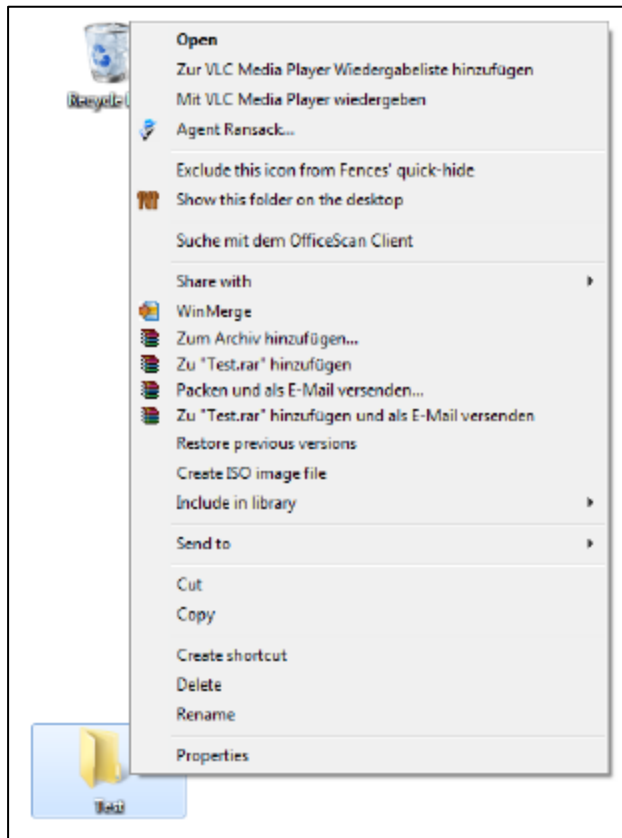
Note

It is not permissible that addresses 192.168.215.xxx and 192.168.214.xxx are used. These are reserved for the system.

2.1.3 Creating shared folders

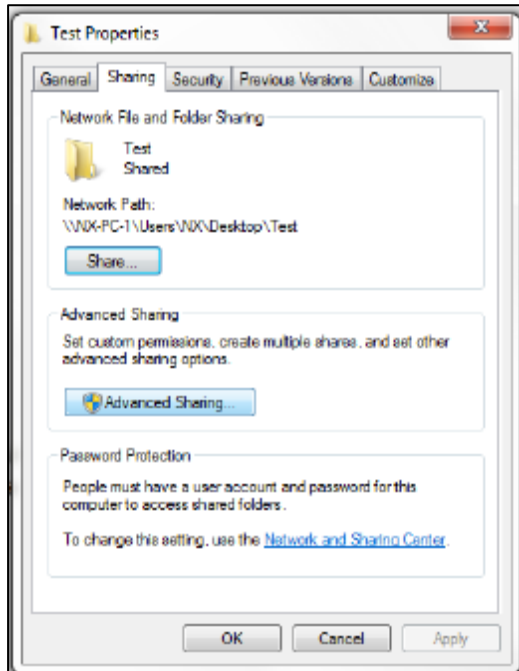
Using Windows Explorer, a new folder should be created on the local drive on the server, e.g. "Test". This can be simply generated by pressing the right-hand mouse key under "New" and "Folder". The folder is shared using the "Properties" shortcut menu.

Figure 2-9 Selecting the properties of the test folder



Click on "Share this folder" under the "Advanced Sharing" tab The folder name is displayed under "Share Name" (example "Test").

Figure 2-10 Sharing the test folder



Click on the "Allow" button (Fig. 2-11). All groups and user names are displayed there, which should be able to access the folder.

Figure 2-11 Advanced sharing of the test folder

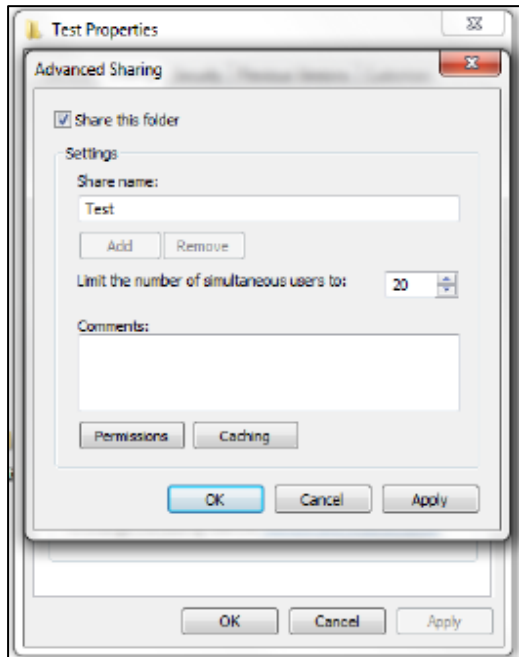
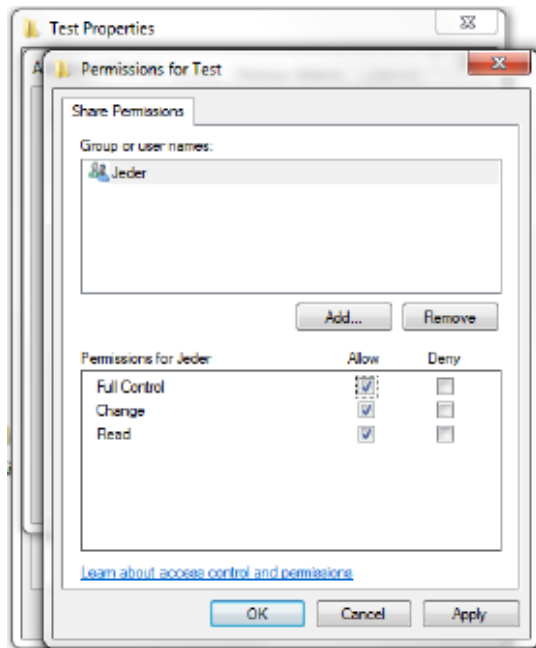


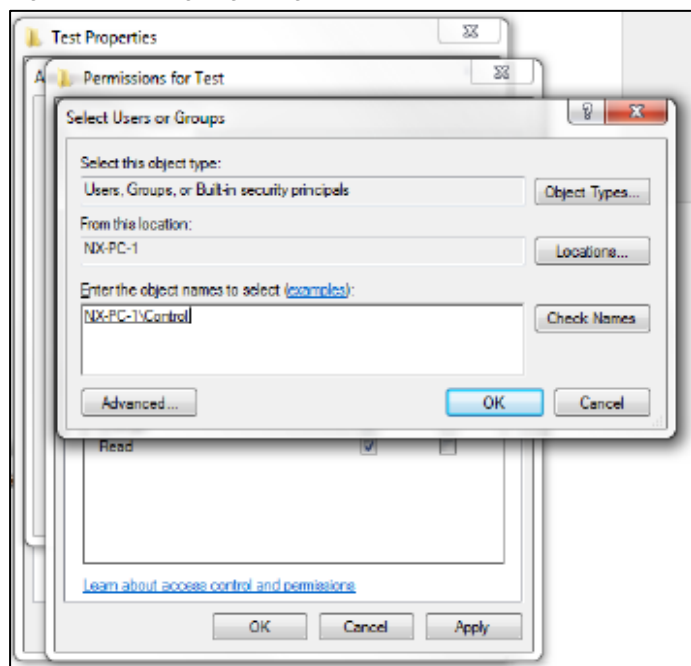
Figure 2-12 Access rights for the test folder



When the folder is shared, this can be seen in the network. Permission (privilege) must now be assigned. In the current example, the newly created user "Control" has full access rights to this folder (Fig. 2-12 & Fig. 2-13).

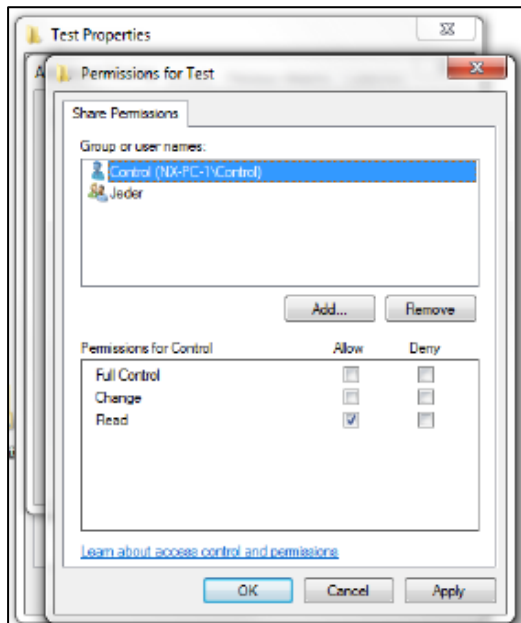
If the PC is operated in a company network, the settings must be coordinated with the network administrator; the same is true for the antivirus software and firewall settings.

Figure 2-13 Assigning all rights for a created user account



The process is completed by pressing "Apply" followed by "OK" (Fig. 2-14).

Figure 2-14 Acknowledging the permission (privilege) for user account "Control"



2.2 Activating the network option

2.2.1 Setting the license

The precondition to establish a network structure with the SINUMERIK control is that the "Manage Network Drives" option is activated. The navigation in the licensing dialog to set option (Fig. 2-15 & Fig. 2-16) is subsequently shown.

Figure 2-15 Navigation to activate the options



Figure 2-16 Setting the license "Manage Network Drives"

Licensing: All options			Overview
Option	Set	Licensed	
TRANSMIT and peripheral surface transformation 6FC5800-0AM27-0YB0	<input type="checkbox"/>	<input type="checkbox"/>	All options
Bidirectional compensation 6FC5800-0AM54-0YB0	<input type="checkbox"/>	<input type="checkbox"/>	Missing lic./opt.
Sag compensation, multi-dimensional 6FC5800-0AM55-0YB0	<input type="checkbox"/>	<input type="checkbox"/>	Search
ESR (drive-based) 6FC5800-0AM60-0YB0	<input type="checkbox"/>	<input type="checkbox"/>	Reset (po)
Generic Coupling 'CP-STATIC' 6FC5800-0AM75-0YB0	<input type="checkbox"/>	<input type="checkbox"/>	Exp. license requirement
Replacement tools for tool management 6FC5800-0AM78-0YB0	<input type="checkbox"/>	<input type="checkbox"/>	Set option acc. lic.
Network drive management 6FC5800-0AP01-0YB0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Back
residual material detection and machining 6FC5800-0AP13-0YB0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Extended operating functions 6FC5800-0AP16-0YB0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
ShopTurn/ShopMill 6FC5800-0AP17-0YB0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Measurement of machine kinematic 6FC5800-0AP18-0YB0	<input type="checkbox"/>	<input type="checkbox"/>	

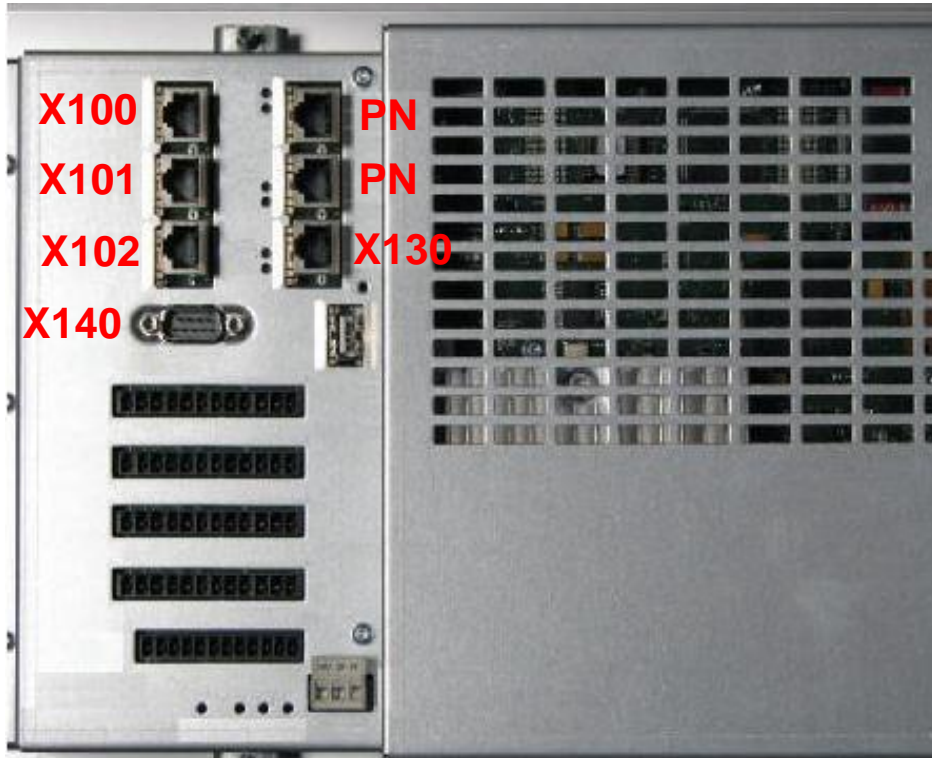
06/02/15 17:3 PM

Setup archive | Lic-enses | Net-work | Safety | Swivel data

2.2.2 Interface X130

Ethernet port X130 located at the rear of the SINUMERIK 828D. The control is connected with the network via this interface X130.

Figure 2-16 Interfaces at the rear of the SINUMERIK 828D



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2.2.3 SINUMERIK network settings

Ethernet interface X130 can be configured. This means that it can be permanently assigned an IP address, or can be automatically obtained under "Obtain an IP address automatically". Interface X130 is intended to establish a connection to company networks. Changes at this location can impact the complete network. This is the reason that all of the existing X130 settings must be documented before changes are made.

Note

It is not permissible that addresses 192.168.215.xxx and 192.168.214.xxx are used. These are reserved for the system.

There are two options for making the network settings for a SINUMERIK control. The classic approach is realized using "Diagnostics". From software release 4.5, it is possible to directly enter the IP configuration in the commissioning menu.

TCP/IP diagnostics

In the "Diagnostics" operating area, using the menu forward key, softkey "TCP/IP bus" > "TCP/IP diagnostics" > "TCP/IP config." must be pressed to set the parameters for communication via X130.

The settings for NCU company network X130 are changed using the "Change" softkey. The operator must enter address type "Manual" so that the IP address of the SINUMERIK control is not automatically assigned by the DHCP server, but instead can be permanently entered. IP address and subnet mask must be entered as subsequently shown.

Figure 2-17 Configuring the network settings via the diagnostics menu

The screenshot shows the 'TCP/IP configuration' menu with the following data:

	NCU company network X130	NCU service X127
Availability	0.00%	0.00%
Cmpt. name:	-	-
DNS name	-	ncu-ibn
MAC address	00:1c:06:26:ec:d4	00:1c:06:26:ec:d5
Address type	Manually	DHCP - Server (Default)
IP address assigned	192.168.10.251	192.168.215.1
Requested	-	-
Subnet mask assigned	255.255.255.0	255.255.255.224
Requested	-	-
DHCP server	-	-
Status	-	-
DHCP server	-	-
Mode	-	-
DHCP synchron.	-	-
DNS server 1	-	-
DNS server 2	-	-

At the bottom of the screen, there is a navigation bar with icons for 'Bus TCP/IP', 'Axis diag.', 'Trace', 'Seru. planr.', 'System utiliz.', and 'Drive system'. On the right side, there are 'Cancel' and 'OK' buttons.

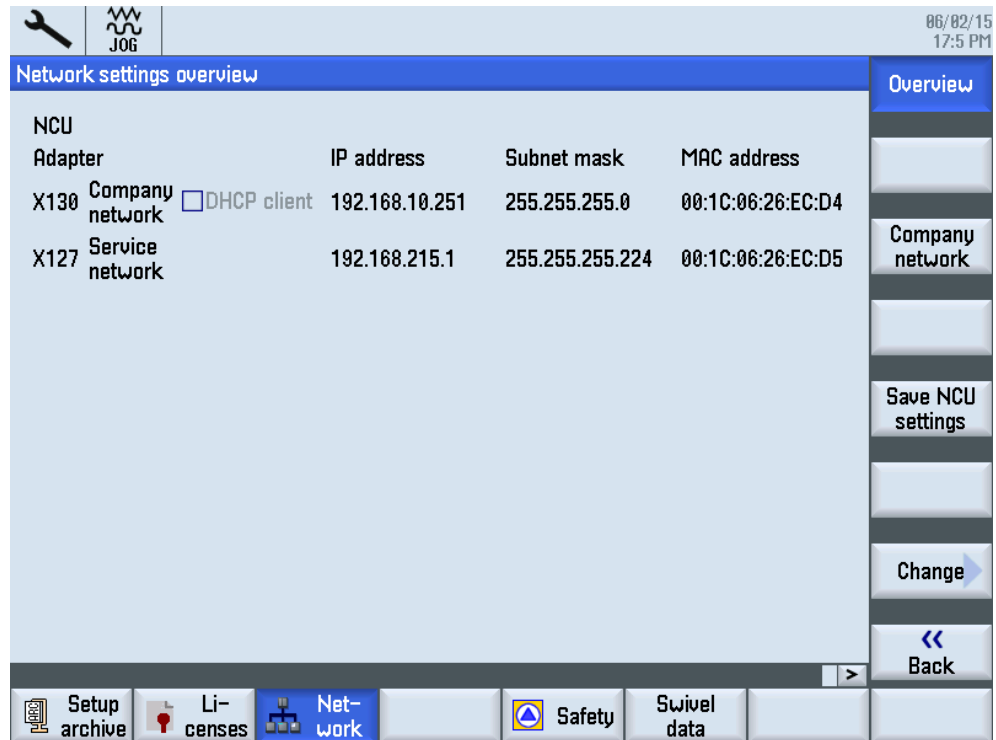
The control must be restarted so that the changes that have been made become effective.

Network

In the commissioning menu under "Network", precisely the same network settings can be made as under TCP/IP diagnostics.

It should also be ensured that the DHCP server automatically retrieves an IP address. A defined IP address is entered under Manual. The entries are confirmed with "OK". The manual entry of an IP address and the subnet mask of the current example are subsequently shown.

Figure 2-18 Configuring the network settings via the commissioning menu



After the configuration has been carried out, the control must be restarted so that the changes become effective.

2.2.4 Integrating a network drive into the SINUMERIK program manager

After the configuration has been completed, the new network drive must be integrated into the program manager.

Softkeys "HMI" > "Log. Drive" must be selected in the "Startup" operating area. In the window that is displayed, the USB interface is configured as standard at position 1; this should not be changed. The next free area is position 2. You can navigate in the screen using the cursor and select keys. The following settings must be made:

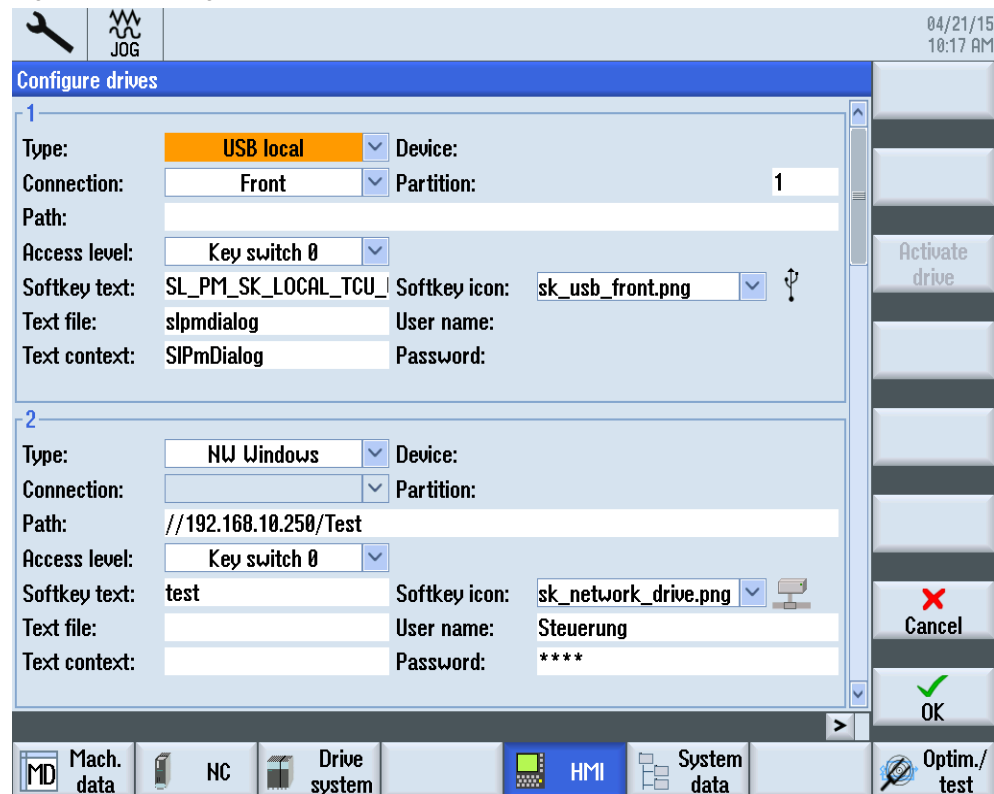
- Type: Network type, "NW Windows"
- Path: The IP address of the server and the name of the shared folder is entered in the path. It involves the same name that the operator defined when configuring under Windows, e.g. "//192.168.10.103/Test"
- Access level_ key-operated switch 0
- Softkey text and softkey icon: text and icon displayed in the program manager: test; sk_network_drive.png

User name: The user name entered under Windows
must be called → "Control"

Password: The associated password is called → "test"

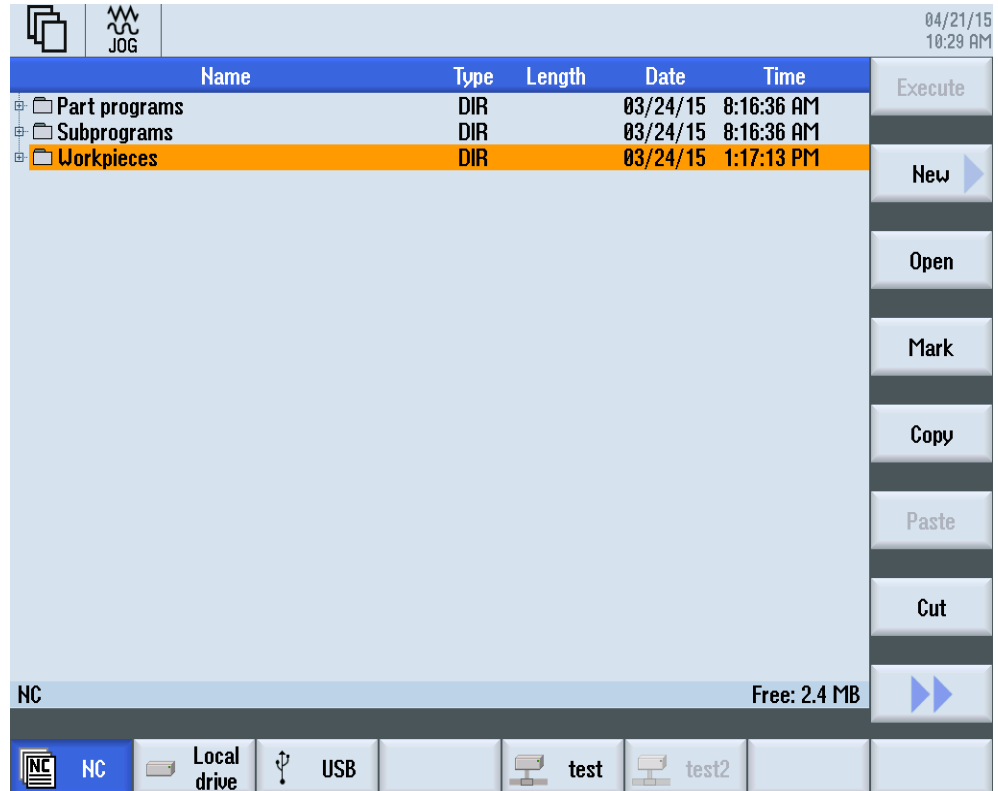
By actuating softkey "Activate drive", the drive is displayed under the "test" name in the program manager and can be used.

Figure 2-19 Setting up a drive in the HMI menu



Files can be transferred to or from the control system. This is realized using the "Copy" or "Insert" softkeys.
 The new "test" folder is displayed in the "Program manager" area. This means that it is simple to externally save files, such as archives and NC programs. A folder name can be freely selected in SINUMERIK (softkey text/ Fig. 2-19), and does not have to match the folder name selected under Windows.

Figure 2-20 System data in the commissioning menu



3 Contact

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4 History

Table 4-1

Version	Date	Modifications
V1.0	06/2015	First version