Integration of SINUMERIK 840D sl in company network

SINUMERIK 840D sl, SW 4.5 SP3

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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 840D sl 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 840D sl

An external computer and SINUMERIK 840D sl 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

Name the account and choose an account type
This name will appear on the Welcome screen and on the Start menu.
Control

- Standard user
  Standard account users can use most software and change system settings that do not affect other users or the security of the computer.
- Administrator
  Administrators have complete access to all the computer and can make any desired changes. Based on notification settings, administrators may be asked to provide their password or confirmation before making changes that affect other users.

We recommend that you protect every account with a strong password.
Why is a standard account recommended?

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

Make changes to Control’s account
- Change the account name
- Create a password
- Change the picture
- Set up Parental Controls
- Change the account type
- Delete the account
- Manage another account

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

Create a password for Control’s account

You are creating a password for Control.

If you do this, Control will lose all USB-encrypted files, personal certificates and stored passwords for Web sites or network resources.
To avoid losing data in the future, ask Control to make a password reset floppy disk.

Type the password
If the password contains capital letters, they must be typed the same way every time.

How to create a strong password

Type a password hint
The password hint will be visible to everyone who uses this computer.
What is a password hint?
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).
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.
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”).
Click on the "Allow" button (Fig. 2-11). All groups and user names are displayed there, which should be able to access the 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.

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 Networking with SINUMERIK 840D sl

2.2 Activating the network

2.2.1 Interface X130

The control SINUMERIK 840D sl is connected with the network via the interface X130.

2.2.2 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.

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 2-16 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.
2.2.3 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 2-17 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 2-18 System data in the commissioning menu
3 Contact

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4 History

Table 4-1

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