SIEMENS

SINUMERIK

MindSphere application Manage MyMachines

Function Manual

www.pdf.support

Valid for control:
SINUMERIK 840D sl / 840DE sl
SINUMERIK 828D
Manage MyMachines, Version 01.05.00.04 (HF4)

02/2019
A5E45212179B AB

Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

⚠ DANGER
indicates that death or severe personal injury **will** result if proper precautions are not taken.

⚠ WARNING
indicates that death or severe personal injury **may** result if proper precautions are not taken.

⚠ CAUTION
indicates that minor personal injury can result if proper precautions are not taken.

NOTICE
indicates that property damage can result if proper precautions are not taken.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

⚠ WARNING
Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

Trademarks

All names identified by ® are registered trademarks of Siemens AG. The remaining trademarks in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owner.

Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

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Preface

SINUMERIK documentation

The SINUMERIK documentation is organized into the following categories:

- General documentation/catalogs
- User documentation
- Manufacturer/service documentation

Additional information

You can find information on the following topics at the following address (https://support.industry.siemens.com/cs/de/en/view/108464614):

- Ordering documentation/overview of documentation
- Additional links to download documents
- Using documentation online (find and search in manuals/information)

If you have any questions regarding the technical documentation (e.g. suggestions, corrections), please send an e-mail to the following address (mailto:docu.motioncontrol@siemens.com).

mySupport/Documentation

At the following address (https://support.industry.siemens.com/My/ww/en/documentation), you can find information on how to create your own individual documentation based on Siemens' content, and adapt it for your own machine documentation.

Training

At the following address (http://www.siemens.com/sitrain), you can find information about SITRAIN (Siemens training on products, systems and solutions for automation and drives).

FAQs

You can find Frequently Asked Questions in the Service&Support pages under Product Support (https://support.industry.siemens.com/cs/de/en/ps/faq).

SINUMERIK

You can find information about SINUMERIK at the following address (http://www.siemens.com/sinumerik).

Target group

This publication is intended for:

- Project engineers
- Technologists (from machine manufacturers)
- Commissioning engineers (systems/machines)
- Programmers
- Users

Benefits

The function manual describes the functions so that the target group knows them and can select them. It provides the target group with the information required to implement the functions.

Standard scope

This documentation describes the functionality of the standard scope. Extensions or changes made by the machine tool manufacturer are documented by the machine tool manufacturer.

Other functions not described in this documentation might be executable in the control. This does not, however, represent an obligation to supply such functions with a new control or when servicing.

Further, for the sake of simplicity, this documentation does not contain all detailed information about all types of the product and cannot cover every conceivable case of installation, operation or maintenance.

Note regarding the General Data Protection Regulation

Siemens respects the principles of data privacy, in particular the data minimization rules (privacy by design). This means the following for this product:

The product does not process or store any person-related data, only technical function data (e.g. time stamps). If the user links this data with other data (e.g. shift schedules) or if he/she stores person-related data on the same data medium (e.g. hard disk), thus personalizing this data, he/she has to ensure compliance with the applicable data protection stipulations.

Technical Support

Country-specific telephone numbers for technical support are provided in the Internet at the following address (https://support.industry.siemens.com/sc/ww/en/sc/2090) in the "Contact" area.

Table of contents

Fundamental safety instructions

1

1.1 General safety instructions

⚠ WARNING

Danger to life if the safety instructions and residual risks are not observed

If the safety instructions and residual risks in the associated hardware documentation are not observed, accidents involving severe injuries or death can occur.

- Observe the safety instructions given in the hardware documentation.
- Consider the residual risks for the risk evaluation.

⚠ WARNING

Malfunctions of the machine as a result of incorrect or changed parameter settings

As a result of incorrect or changed parameterization, machines can malfunction, which in turn can lead to injuries or death.

- Protect the parameterization against unauthorized access.
- Handle possible malfunctions by taking suitable measures, e.g. emergency stop or emergency off.

1.2 Warranty and liability for application examples

Application examples are not binding and do not claim to be complete regarding configuration, equipment or any eventuality which may arise. Application examples do not represent specific customer solutions, but are only intended to provide support for typical tasks.

As the user you yourself are responsible for ensuring that the products described are operated correctly. Application examples do not relieve you of your responsibility for safe handling when using, installing, operating and maintaining the equipment.

1.3 Industrial security

Note

Industrial security

Siemens provides products and solutions with industrial security functions that support the secure operation of plants, systems, machines and networks.

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Products and solutions from Siemens constitute one element of such a concept.

Customers are responsible for preventing unauthorized access to their plants, systems, machines and networks. Such systems, machines and components should only be connected to an enterprise network or the Internet if and to the extent such a connection is necessary and only when appropriate security measures (e.g. using firewalls and/or network segmentation) are in place.

For additional information on industrial security measures that can be implemented, please visit:

Industrial security (https://www.siemens.com/industrialsecurity)

Siemens' products and solutions undergo continuous development to make them more secure. Siemens strongly recommends that product updates are applied as soon as they become available, and that only the latest product versions are used. Use of product versions that are no longer supported, and failure to apply the latest updates may increase customer's exposure to cyber threats.

To stay informed about product updates, subscribe to the Siemens Industrial Security RSS Feed at:

Industrial security (https://www.siemens.com/industrialsecurity)

Further information is provided on the Internet:

Industrial Security Configuration Manual (https://support.industry.siemens.com/cs/ww/en/view/108862708)

⚠ WARNING

Unsafe operating states resulting from software manipulation

Software manipulations, e.g. viruses, Trojans, or worms, can cause unsafe operating states in your system that may lead to death, serious injury, and property damage.

- Keep the software up to date.
- Incorporate the automation and drive components into a holistic, state-of-the-art industrial security concept for the installation or machine.
- Make sure that you include all installed products into the holistic industrial security concept.
- Protect files stored on exchangeable storage media from malicious software by with suitable protection measures, e.g. virus scanners.
- On completion of commissioning, check all security-related settings.
- Protect the drive against unauthorized changes by activating the "Know-how protection" converter function.

Introduction 2

2.1 Overview

This document describes

- How you connect MindSphere to the machine
  Additional information is provided in Chapter: Setting up the SINUMERIK control system for Manage MyMachines (Page 15).
- The functionality of the MindSphere Application "Manage MyMachines"
  Additional information is provided in Chapter: Displaying acquired data in Manage MyMachines (Page 85)

MindSphere

MindSphere is a cloud-based, open IoT operating system from Siemens which connects your machines and physical infrastructure with the digital world. This allows you a complete overview of your data at all times.

Several MindSphere-based applications are available - the "MindSphere Applications".

References

A description of the other MindSphere applications can be found in the following reference:

- MindSphere - Getting Started
- MindSphere System Manual
- Fleet Manager System Manual

In addition to the manuals, you can also find data sheets and FAQs at the following link: MindSphere (https://support.industry.siemens.com/cs/de/en/view/109742256)

Additional information regarding the applications is available at the following link: MindSphere documentation (https://documentation.mindsphere.io/index.html#/kiosk/en)

2.2 System requirements

Hardware and operating software

SINUMERIK 840D sl

SINUMERIK Integrate Client Software Version	Operating software SINUMERIK Operate Version	Hardware version	Operating system
02.00.00.11 02.00.00.12	4.5 SP4, HF 1, 2, 3, 4, 4.5 SP5, HF 1, 3, 5 4.5 SP6, HF 3, 5, 7, 8, 10, 11, 13 14, 15	NCU 730.3 PN	Linux
		PCU 50.5	Windows 7
	4.5 SP6 HF 1, 12	NCU 730.3 PN	Linux
	4.5 SP6 HF 2	PCU 50.5	Windows 7
03.00.00.11 03.00.00.12	4.7 SP2 HF 1, 3, 4 4.7 SP3, HF 1, 2, 3, 4 4.7 SP4, HF 1, 4, 6 4.7 SP5, HF 1 4.7 SP6, HF 1, 3, 4, 5 4.8 SP1, HF 1, 2, 3 4.8 SP2, HF 1, 3 4.8 SP3, HF 1	NCU 730.3 PN	Linux
		PCU 50.5	Windows 7
	4.7 SP4 HF 3, 5	NCU 730.3 PN	Linux

SINUMERIK 828D

SINUMERIK Integrate Client Software Version	Operating software SINUMERIK Operate Version	Hardware version	Operating system
02.00.00.11 02.00.00.12	4.5 SP4 4.5 SP5, HF 1, 2 4.5 SP6, HF 1, 2, 3, 4	PPU 281.3 PPU 241.3	Linux
03.00.00.11 03.00.00.12	4.7 SP2, HF1 4.7 SP3, HF1 4.7 SP4, HF1, 2 4.7 SP5 4.7 SP6, HF1		

Operating PC

Processor	1 GHz processor
RAM (GB)	4
Free hard disk capacity (GB)	1
Operating systems	Windows 7 SP1 (x64) Professional/Enterprise/Ultimate Windows 10 (x64) Pro/Enterprise
Screen resolution	At least 1980 x 1080 pixels

Web browser

You can use the following web browsers:

- Chrome
  Version from 68.0.3440.84 (32 bit) up to the current version
- Firefox
  Version 59.9.0 (32 bit) up to the current version
- Safari for tablets
  iOS and Android systems are supported for the current version and 10 inch tablet size

Safety instructions

Note

Connecting SINUMERIK control systems to MindSphere

Connecting SINUMERIK control systems to MindSphere via TLS 1.2/https complies with the highest security standards.

SINUMERIK versions that do not meet these standards are not part of the product. For these versions, additional security measures must be taken.

You are solely responsible for preventing unauthorized access to your plants, systems, SINUMERIK control systems and the network. Systems, SINUMERIK control systems and components should only be connected to the company's network or the Internet if and to the extent necessary and with appropriate security measures (e.g. use of firewalls and network segmentation) in place.

The actions required in this regard are described in the following Configuration Manual: Industry Security (https://support.industry.siemens.com/cs/ww/en/view/108862708).

You can read about further actions in the application examples: Manage MyMachines – Installation in existing control environments.

Note

Parallel operation with SINUMERIK Integrate applications

Parallel operation with SINUMERIK Integrate applications is not possible.

NOTICE
Data misuse due to an unprotected Internet connection An unrestricted Internet connection can lead to data misuse. Before establishing a network connection, ensure your PC is exclusively connected to the Internet via a secure connection. Pay attention to the security-relevant notes. Further information about communications security can be found in the Configuration Manual: Industry Security (https://support.industry.siemens.com/cs/ww/en/view/108862708).

Note

SINUMERIK control system security

The necessary security measures (e.g. virus scanner, firewalls, OS patching, etc.) must be implemented on the SINUMERIK control system.

Further information about communications security can be found in the Configuration Manual: Industry Security (https://support.industry.siemens.com/cs/ww/en/view/108862708).

Note

Operating PC security

The necessary security measures (e.g. virus scanner, firewalls, OS patching, etc.) must be implemented on the PCs which are used to visualize and configure Manage MyMachines / Remote at the OEM or end user.

You will find further information on PCs in the industrial environment in the Configuration Manual: Industry Security (https://support.industry.siemens.com/cs/ww/en/view/108862708).

Delivery form

The updates and further information on the applications and products are stored on PridaNet and can be downloaded directly from there.

- OR -

You can contact your machine manufacturer.

- OR -

You can contact the Siemens Service & Support.

Additional references

Further information on the "SINUMERIK Operate" operating software can be found in the following reference:

- SINUMERIK Operate Commissioning Manual (IM9)
- SINUMERIK 828D Commissioning Manual, Commissioning CNC

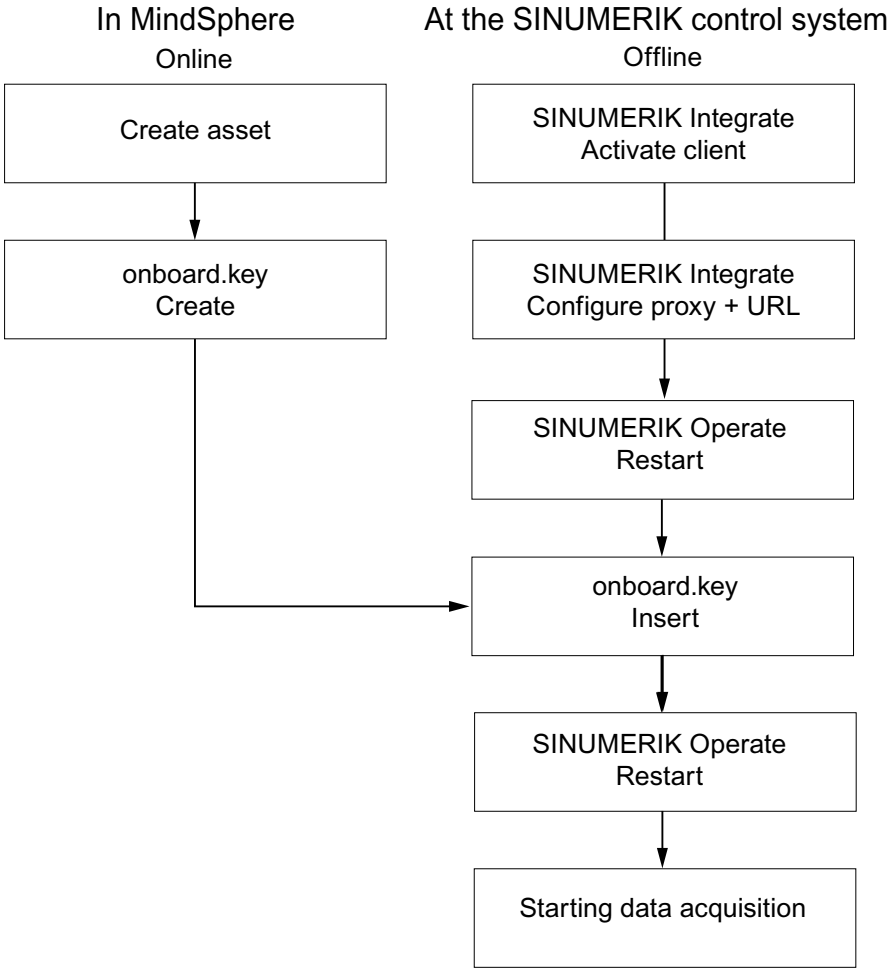
Setting up the SINUMERIK control system for Manage MyMachines

3

3.1 Sequence

Overview

To use Manage MyMachines, you must perform various steps in MindSphere as well as at the SINUMERIK control system itself.



Sequence

Proceed as follows:

In MindSphere:

1. Create the required assets.
   Additional information is provided in Chapter: Asset Manager (Page 50)
   Detailed information is provided in the System Manual: MindSphere, Section: Asset Manager
2. Create the "onboard.key".
   Additional information is provided in Chapter: Connecting the SINUMERIK control system with MindSphere (Page 56)

At the SINUMERIK control system:

1. Check the installed versions.
   Additional information is provided in Chapter: Displaying version data (Page 18)
   – If an appropriate SINUMERIK Integrate version is not installed, then perform a client update.
     Additional information is provided in Chapter: Checking and updating the versions (Page 18)
2. Activate the SINUMERIK Integrate client.
   Additional information is provided in Chapter: Activating the SINUMERIK Integrate client (Page 29)
3. Enable the use of SINUMERIK Integrate.
   Additional information is provided in Chapter: Activating use of SINUMERIK Integrate (Page 30)
4. Configure the URL and proxy
   – At the SINUMERIK 840D sl control system:
     Additional information is provided in Chapter: Configuring the URL and proxy (Page 31)

   - OR -

   – At the SINUMERIK 828D control system:
     Additional information is provided in Chapter: Configuring the URL and proxy (Page 38)
5. Restart SINUMERIK Operate.
6. Insert "onboard.key".
   – At the SINUMERIK 840D sl control system
     Additional information is provided in Chapter: Install the registration key on a SINUMERIK control system (Page 33)

   - OR -

   – At the SINUMERIK 828D
     Additional information is provided in Chapter: Install the registration key on a SINUMERIK control system (Page 40)
7. Restart SINUMERIK Operate.

Note

File "onboard.key"

The file "onboard.key" contains safety-related information for the one-time connection setup of a SINUMERIK controller with MindSphere and must therefore be stored safely - both on the terminal, on which the file is stored temporarily, and on the target controller. Only when the connection between the SINUMERIK control system and MindSphere has been completely set up is this connection setup key no longer relevant.

This file is then automatically deleted on the SINUMERIK control system.

Secure the terminals used for this accordingly, for example, using virus protection programs, firewalls, OS updates, etc.

3.2 Checking and updating the versions

3.2.1 Displaying version data

In the "Version data" window you can check whether you are using a suitable version.

Only use the versions specified in this document.
Additional information is provided in Chapter: System requirements (Page 12).

The following components with the associated version data are specified:

- SINUMERIK Operate Version
- SINUMERIK Integrate
- System software
- PLC basic program
- PLC user program
- System expansions
- OEM applications
- Hardware

Information is provided in the "Nominal version" column as to whether the versions of the components differ from the version supplied on the CompactFlash card.

Icon	Description
	The version displayed in the "Actual version" column matches the version of the CF card.
	The version displayed in the "Actual version" column does not match the version of the CF card.

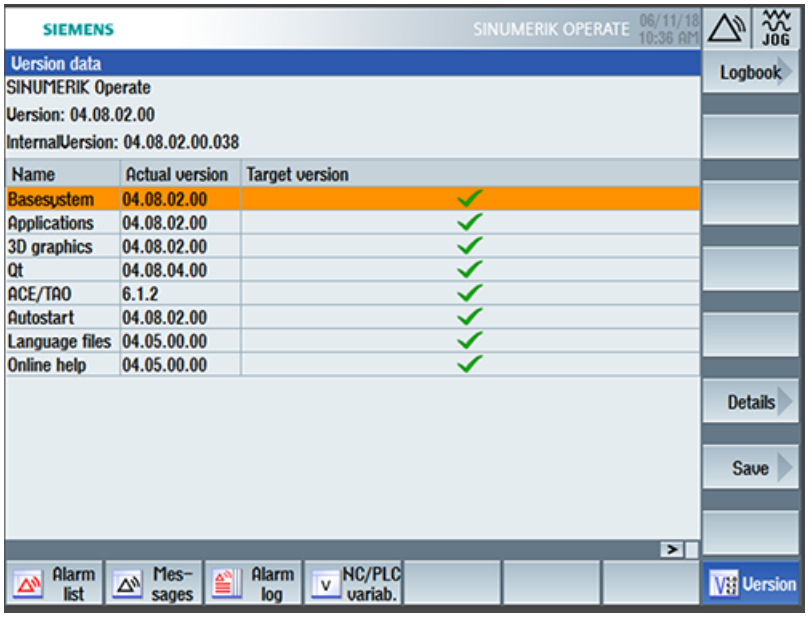
Procedure

1. Start the SINUMERIK Operate operating software on the SINUMERIK control system.
2. Press the <MENU SELECT> key.
3. 

Select the "Diagnostics" operating area.
4. 

Press the "Version" softkey.
The "Version data" window opens.
The data of the available components is displayed.
5. 
Select the component for which you would like more information.

6. Press the "Details >" softkey in order to obtain more detailed information on the components displayed.



Start a client update if you have the required SINUMERIK Integrate version on your SINUMERIK control system.

Information is provided in the following chapter as to how you perform a client update:

- Client update under Windows (Page 21)
  - OR -
- Client update under Linux (Page 25)

3.2.2 Installing a SINUMERIK 828D update

If you are not using a suitable software version on the SINUMERIK 828D control, you must install the required software update/backup.

Procedure

1. Switch the control on.
   The following is displayed during startup:

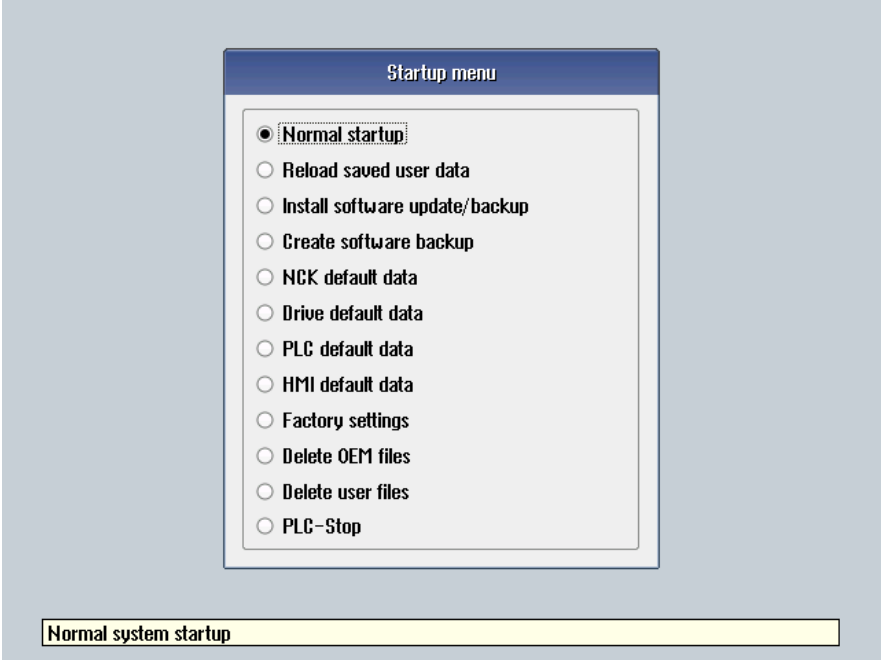
2. Press the <SELECT> key within three seconds.
   To call the "Startup menu", press the following keys in succession:
   Menu back key, **HSK2** (horizontal softkey 2), **VSK2** (vertical softkey 2)

Note

PPU with touch operation

To call the "Startup menu" during startup, there is an additional shortcut key for all PPUs: **"8" → "2" → "8"**

3. The "Startup menu" is displayed, "Normal startup" is the default setting.



4. Select the "Install software update/backup" option to install an update on the system CompactFlash card from the user CompactFlash card or USB flash drive.

5. The following message is displayed:
   "Do you want to install the software update? Either CF card or USB stick must be plugged in".
6. Insert the USB flash drive into the USB interface on the front of the operator panel and click "Yes".
7. Make sure that only individual ".tgz" files are located on the USB flash drive. Press the <INPUT> key to install the required files.
8. The installation preparation and then the installation procedure are shown on the screen.
9. At the end, the following message is displayed: "Restoring complete. Switch off and remove data medium!"
   Switch the control off and remove the storage medium.

References

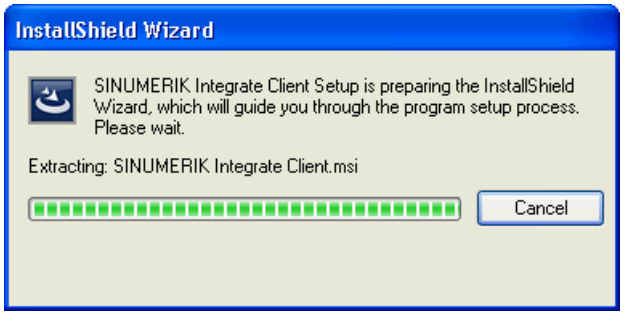
Further information on the commissioning of the SINUMERIK 828D can be found in the following Commissioning Manual:

SINUMERIK 828D, Commissioning CNC

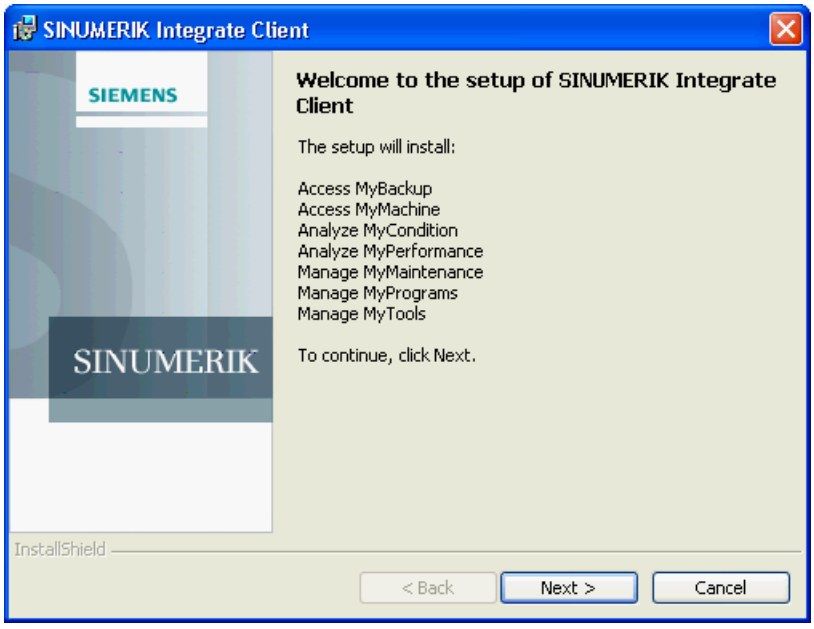
3.2.3 Client update under Windows

Procedure

1. Start the SINUMERIK control system in the Windows service mode.
2. Open the installation directory.
3. Start setup file "setup.exe" with a double-click.
   SINUMERIK Integrate Client - InstallShield Wizard opens.

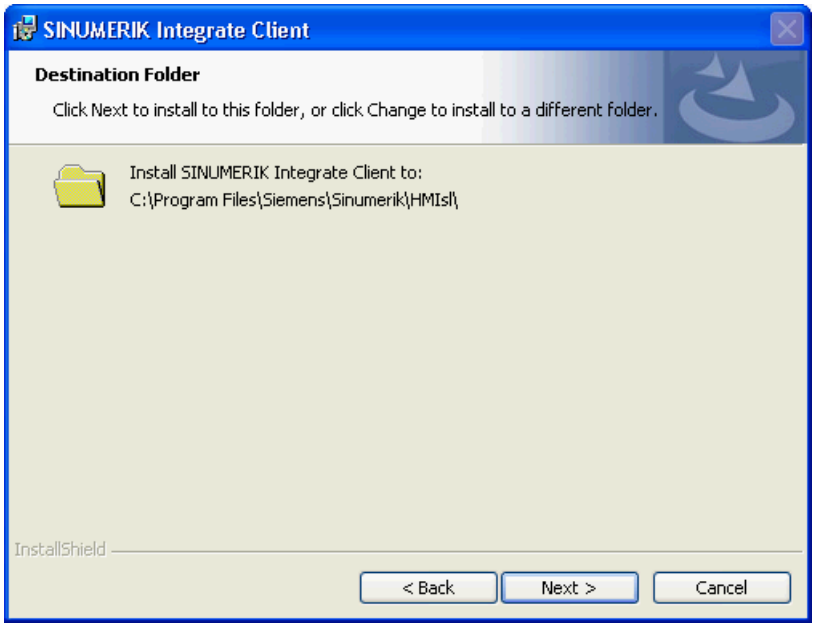


4. The welcome screen opens and shows the applications to which the update applies.
   Click "Next >" to start the installation preparation.

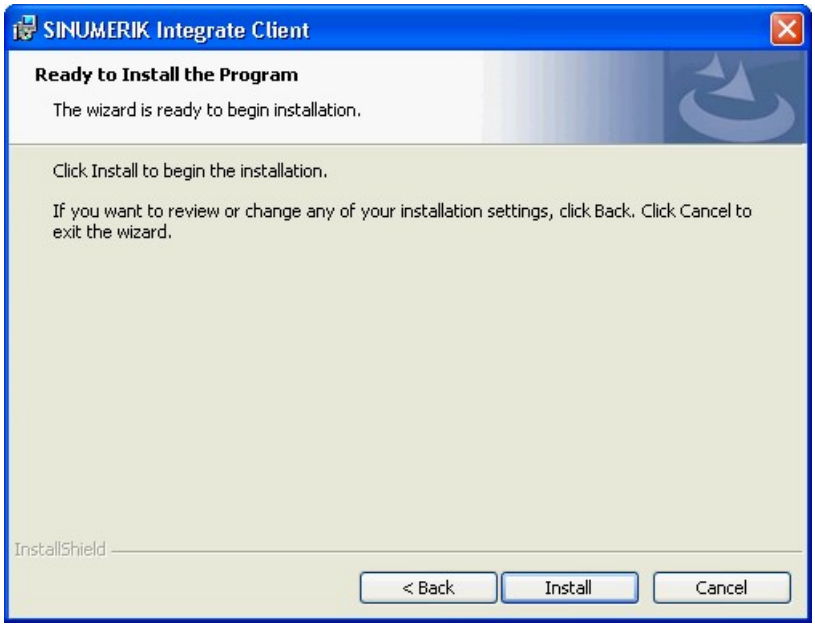


5. The "License Agreement" window opens.
   Read the license agreement.
   - If you want to print the terms, click "Print."
   - Then activate the "I accept the terms in the license agreement" checkbox and click "Next >".
     - OR -
     Click "< Back" to return to the previous window.

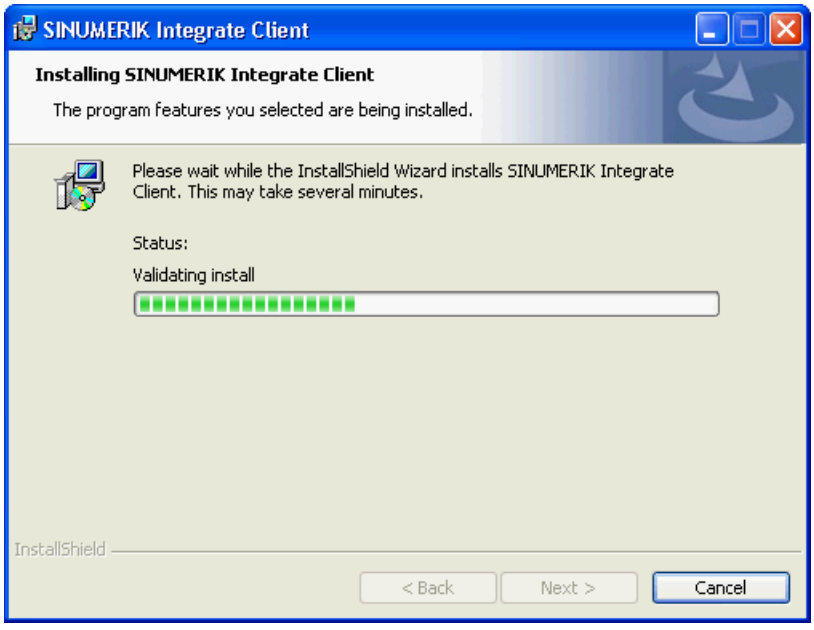
6. The next window displays the installation directory for the application.
   Click "Next >" to accept the directory suggested by the setup.



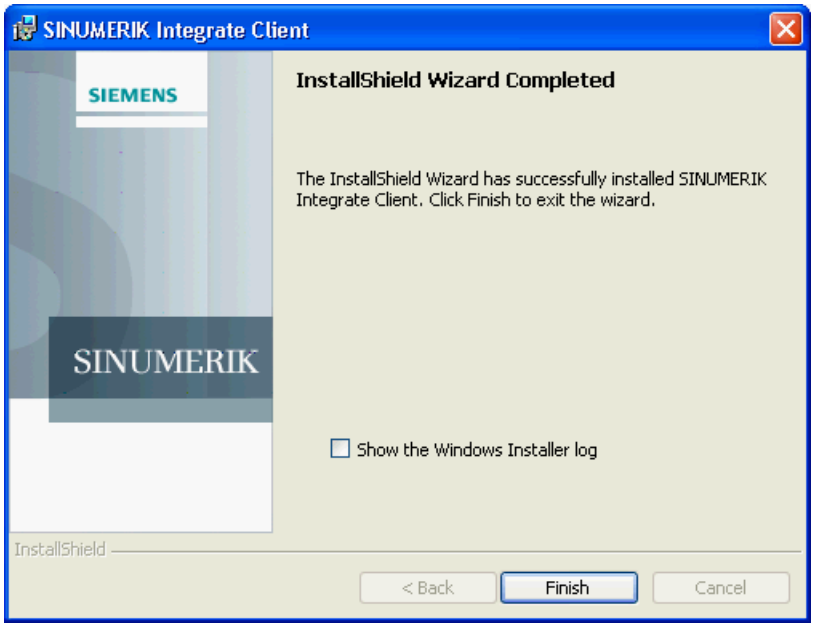
7. The Wizard is ready to start the installation.
   Click "Install" to start the installation.



8. The installation is started, and the progress is displayed with a progress bar.



9. Click "Finish" to complete the installation.



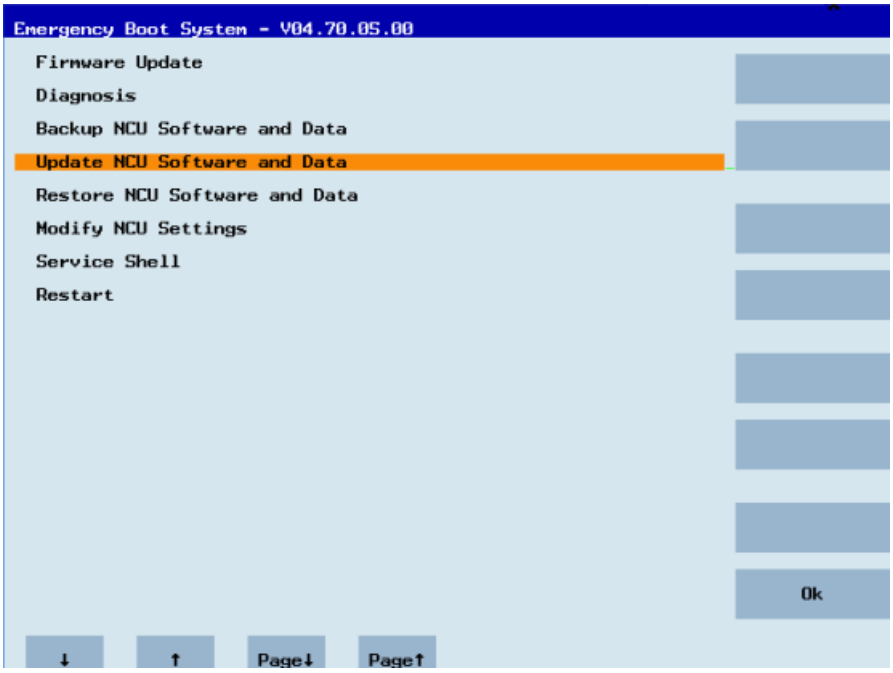
3.2.4 Client update under Linux

Prerequisite

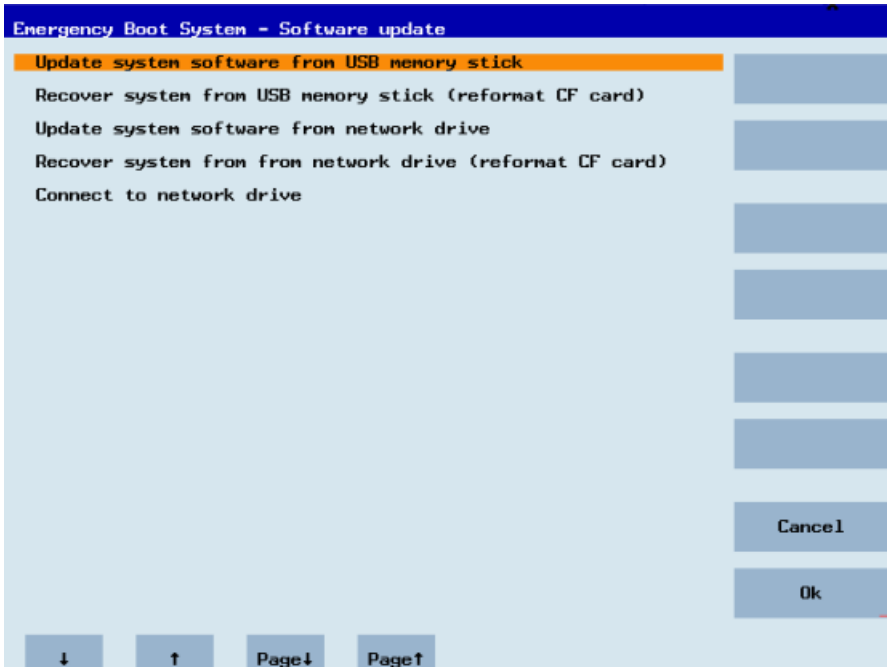
- Emergency Boot System V04.70.05.00
- SINUMERIK Operate 4.5 SP4
  - OR -
- SINUMERIK Operate 4.7 SP2

Procedure

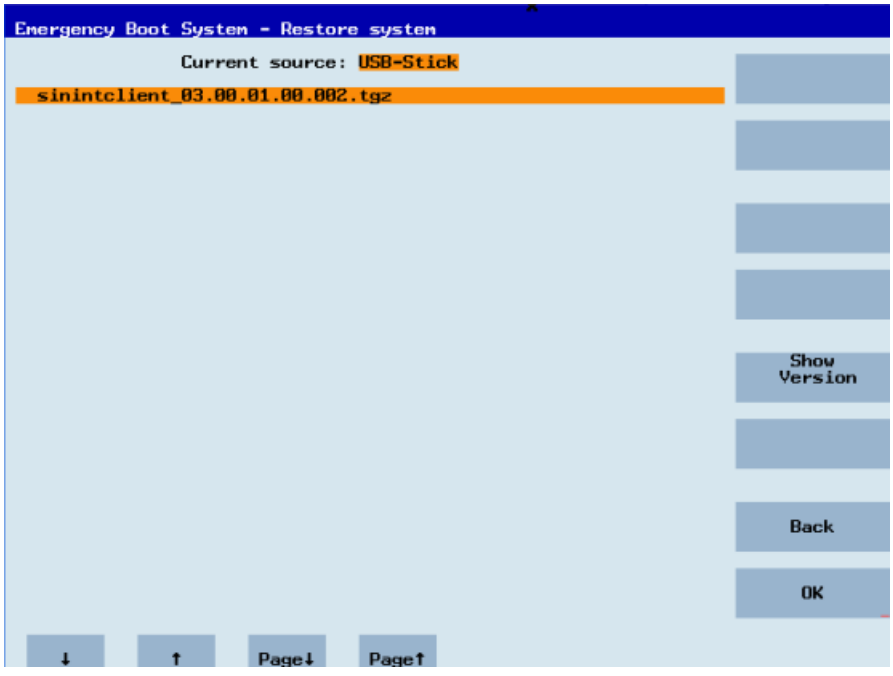
1. Copy the "sinintclient.tgz" file to the USB flash drive.
2. Insert the USB flash drive into the NCU.
3. Start the NCU.
4. In the menu, select "Update NCU Software and Data" with the cursor keys and press the "OK" softkey.



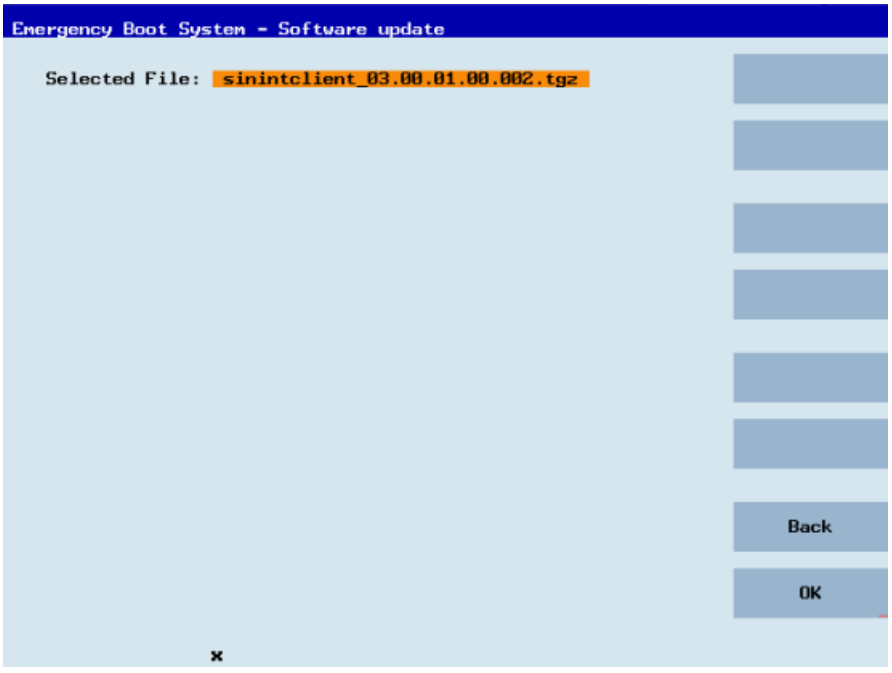
5. In the menu, select "Update system software from USB memory stick" with the cursor keys and press the "OK" softkey.



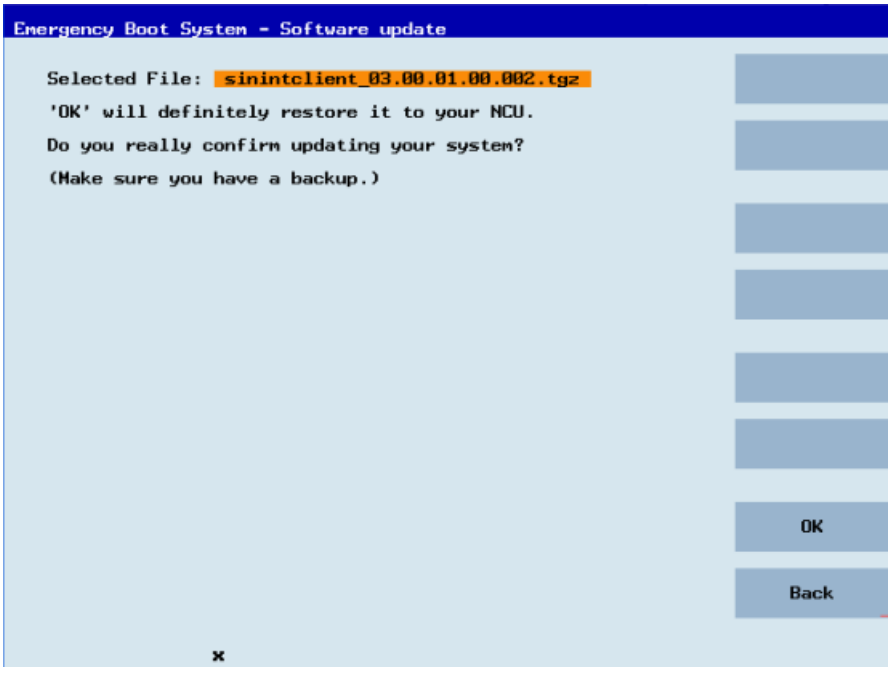
6. You receive a list with all tgz files.
   Select the current file.
   Press the "OK" softkey to confirm your selection.
   - OR -
   Press the shortcut key <Shift> + <F8> on the operator panel.



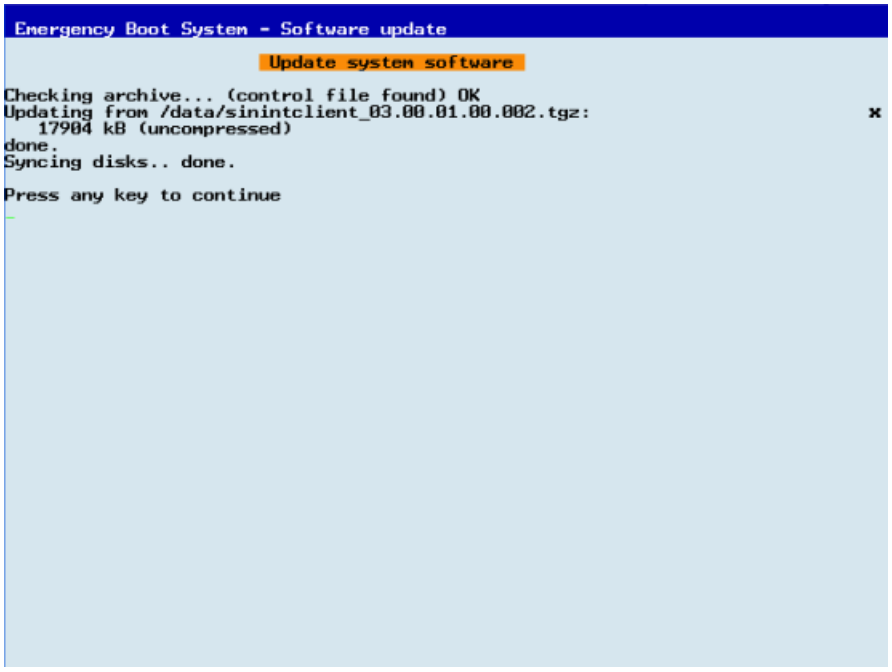
7. The selected file is displayed.
   Press the "OK" softkey to confirm your selection.
   - OR -
   Press the shortcut key <Shift> + <F8> on the operator panel.



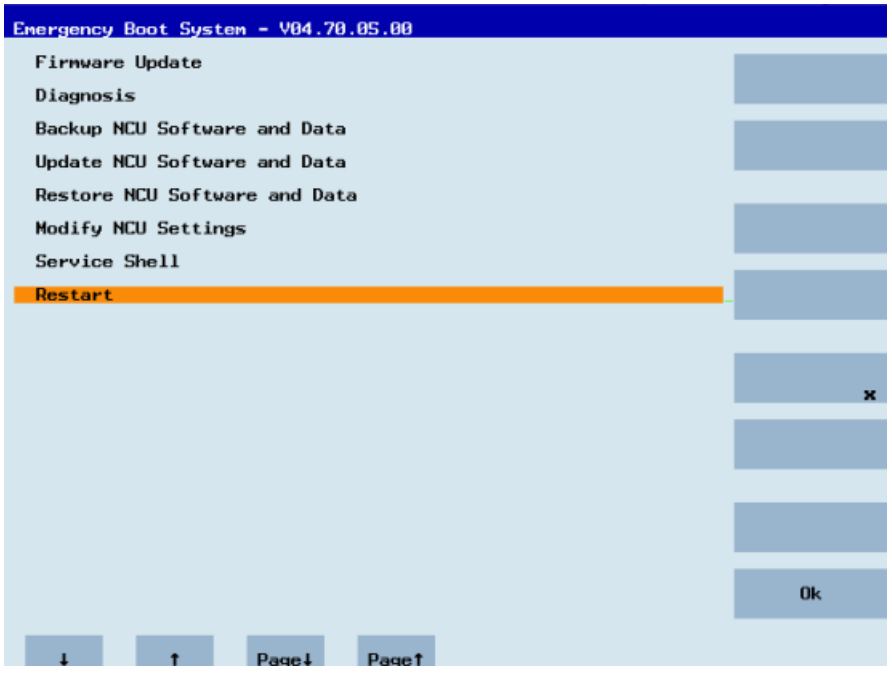
8. A confirmation prompt appears.
   Press the "OK" softkey to confirm the confirmation prompt.
   - OR -
   Press the shortcut key <Shift> + <F7> on the operator panel.



9. The installation is started.



10. When the installation has been completed, the following message appears.
    Remove the USB flash drive.
    Select "Restart" from the menu and press the "OK" softkey.

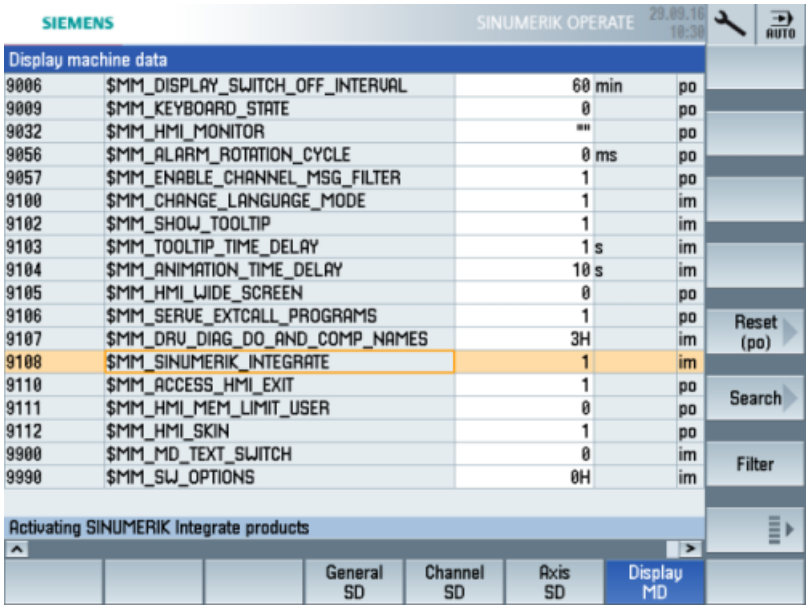


3.3 SINUMERIK Integrate

3.3.1 Activating the SINUMERIK Integrate client

Procedure

1. Start the SINUMERIK Operate operating software on the control.
2. Press the "Setup" and "Mach. data" softkeys.
3. Press the "Password" softkey.
4. The "Set password" window opens.
5. Enter the password for "Manufacture" and press the "OK" softkey.
6. Press the menu forward key and the "Display MD" softkey.
   - Set the machine data
     MD9108 $MM_SINUMERIK_INTEGRATE to "1".

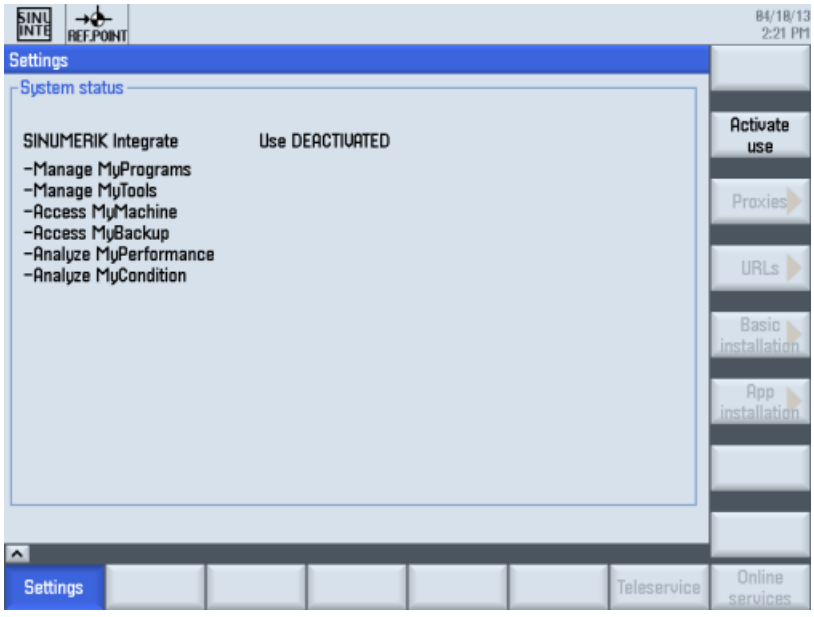


7. Press the <MENU SELECT> key followed by the menu forward key.
8. The "SINUMERIK Integrate" softkey is displayed on the extended horizontal softkey bar.

3.3.2 Activating use of SINUMERIK Integrate

Procedure

1. Press the "SINUMERIK Integrate" softkey.
   The "SINUMERIK Integrate" welcome window opens.
2. Press the "Settings" softkey.
   The "Settings" window opens displaying the system status "Use DEACTIVATED".
   – Press the "Activate use" softkey.



3. The confirmation prompt "Do you want to activate the use of SINUMERIK Integrate applications?" is displayed.
   – Press the "OK" softkey to confirm the prompt.
   The use of SINUMERIK Integrate applications is enabled.

3.4 SINUMERIK 840D sl

3.4.1 Configuring the URL and proxy

Note

Transferring SINUMERIK data on the MindSphere platform

The following steps allow you to transfer the SINUMERIK data to the MindSphere platform.

By performing the steps described below, in particular through input and confirmation of the Web service URL, processes are performed automatically in which software scripts are loaded to the SINUMERIK control.

Requirement

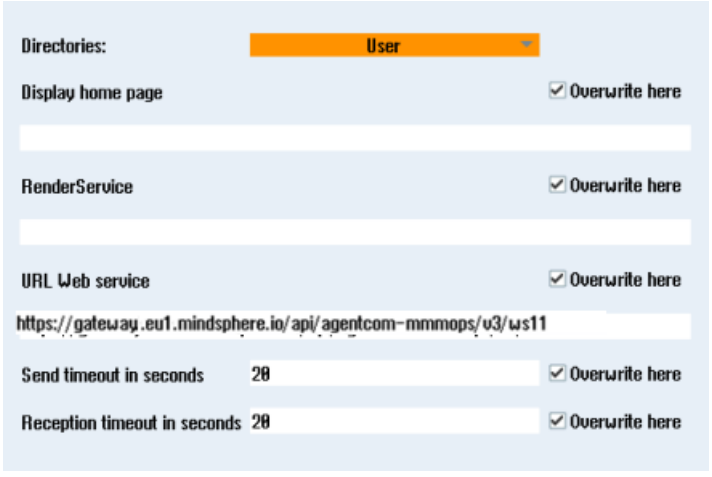
The use of SINUMERIK Integrate has been activated.

Check whether the Internet connection is available and activated:

- TCU:
  Press the "Online Services" softkey. The login screen to the SINUMERIK Integrate server is opened.
  If this is not the case, check the connected Internet connection.
- PCU:
  Start the control in service mode, and call up an Internet page using the Web browser, for example, "www.siemens.com".

Procedure

1. The "Settings" window is open.
   Press the "URLs >" softkey.
2. Press the "Edit" softkey and select the following settings:
   - Directories: Select the "User" entry in the "Directories" drop-down list.
   - Display home page: Activate the "Overwrite here" checkbox.
   - RenderService: Activate the "Overwrite here" checkbox.
   - URL Web service: Activate the "Overwrite here" checkbox.
   - Enter the following WebService URL.
     If, for example, you are connected to the LIVE system:
     https://gateway.eu1.mindsphere.io/api/agentcom-mmmops/v3/ws11
   - Enter the required value in the "Transmit timeout ms" input field, e.g. "20" (default value is 200) and activate the "Overwrite here" checkbox.
   - Enter the required value in the "Receive timeout ms" input field, e.g. "20" (default value is 200) and activate the "Overwrite here" checkbox.

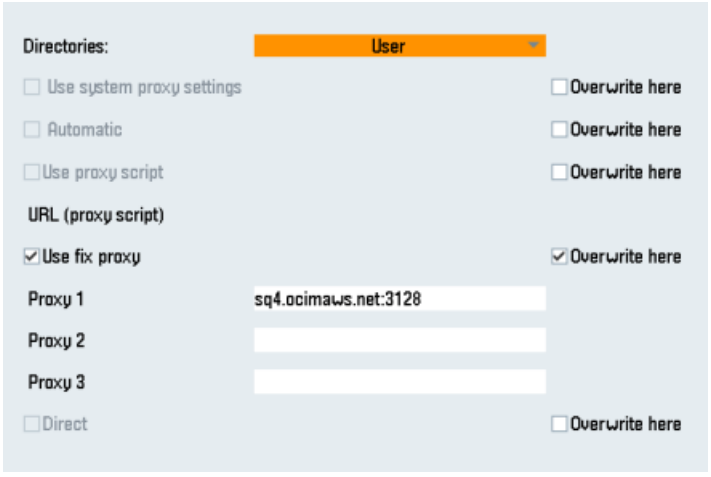


3. Press the "OK" softkey.
   A syntax check is performed and the access data is saved.
   Usually, the settings are now complete. If further adaptations need be made within your company network, read the following paragraph:

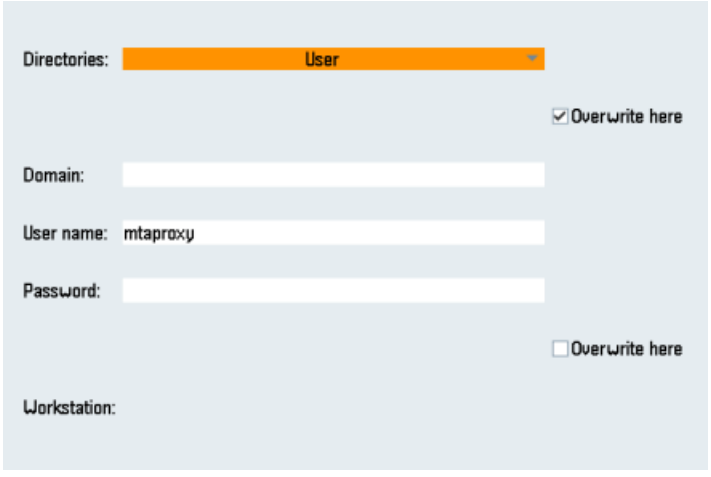
Proxy adaptations (optional)

1. Clarify with your network administrator whether the Proxy settings have to be adjusted for the connection to Cloud mode.
   If this is necessary, proceed as follows:
2. Press the "Proxys >" softkey.
   The stored settings are displayed.

3. Press the "Edit" softkey and select the following settings:
   - Activate the "Use fix proxy" checkbox.
   - Enter your proxies in the "Proxy 1" to "Proxy 3" input fields.
   - Activate the "Overwrite here" checkbox even if you only enter one proxy in order to accept the new entry.



4. Press the "OK" softkey to save the settings.
5. If an authentication is required for the proxy, press the "Authorization" softkey.
   - Activate the "Overwrite here" checkbox to accept the new entry.
   - Enter the user data in the "Domain", "User name" and "Password" input fields.



6. Press the "OK" softkey to save the settings.
7. Restart the control so that the access data can take effect.

3.4.2 Install the registration key on a SINUMERIK control system

The activation of SINUMERIK Integrate, the setting up of the URL/proxy and the restart creates the "boot_job" folder in the /var/tmp/ directory.

If the folder was not set up, then create the folder manually.

There are 2 ways to copy the "onboard.key" to the SINUMERIK control system:

- Via the SINUMERIK Operate user interface
- With the aid of WinSCP

Requirement

- The "onboard.key" has been generated.
- The "boot_job" folder is created on the SINUMERIK control system, e.g. at C:\
- The time on the control system has been synchronized with the current time.
- The Internet connection has been checked and is established.

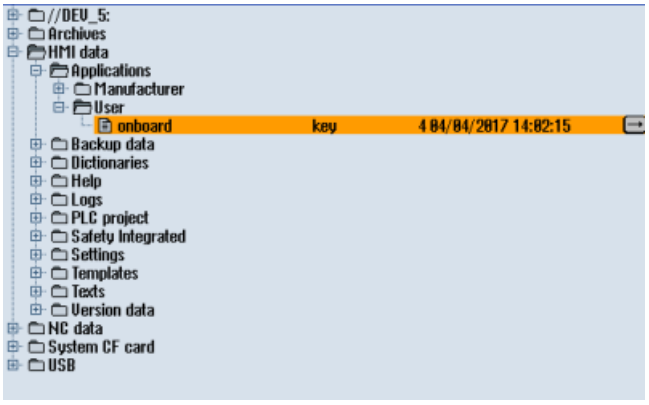
Procedure with SINUMERIK Operate (PCU 50)

1. At the SINUMERIK control system, start the SINUMERIK Operate operating software in the service mode.
2. Insert the USB flash drive with the "onboard.key" file into the PCU.
   The USB flash drive is shown in the directory tree.
3. Copy the file "onboard.key" into the following directory: C:\temp\boot_job.
4. Check the PCU configuration.

Procedure with SINUMERIK Operate (NCU)

1. At the SINUMERIK control system, start the SINUMERIK Operate operating software.
2. Press the "Setup" softkey.
3. Press the "System data" softkey.
   The directory tree is displayed.
4. Insert the USB flash drive with the "onboard.key" file into the NCU.
   The USB flash drive is displayed in the directory tree.
   If the USB flash drive is not detected by SINUMERIK Operate, you must change to a different USB port or configure a logical drive.
   Additional information is provided in Chapter: Create drive (Page 36)
5. Select the "onboard.key" and press the "Copy" softkey.

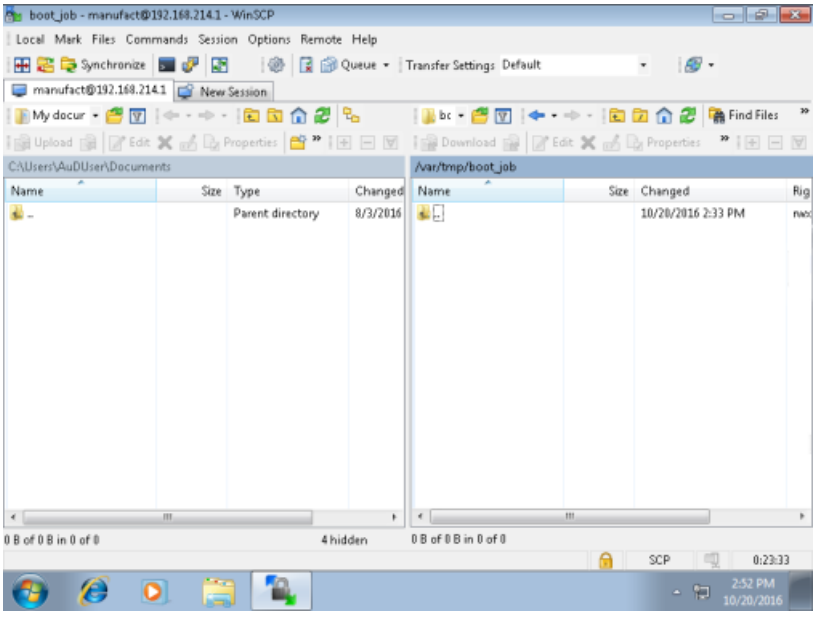
6. Navigate in the following directory: HMI data\Applications\User and press the "Paste" softkey.



7. Then restart.

Procedure with, e.g. WinSCP (NCU)

1. Copy the generated "onboard.key" file using a suitable tool, e.g. using WinSCP via the network to the control system.
2. Start the SINUMERIK control system and open the directory, e.g./var/tmp/boot_job.



3. Insert the "onboard.key" file into the "boot_job" folder.
   Alternatively, you can also insert the "onboard.key" file into the following directory: /user/sinumerik/hmi/appl.
   If there is already a "cert.key" file in the /var/tmp/boot_job folder, the control was already connected to MindSphere. If you want to establish a new connection, then delete the existing file and insert the new "onboard.key" file.

4. Then start the SINUMERIK Operate operating software.
   When the connection to the server is successful, the "cert.key" file is created.
5. The onboarding process is completed. The "onboard.key" is no longer displayed in the directory.

3.4.3 Create drive

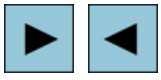
Parameters

Entry		Meaning
Connection	Front	USB interface that is located at the front of the operator panel.
	X203/X204	USB interface X203/X204 that is located at the rear of the operator panel.
	X212/X213	TCU20.2/20.3
Symbolic		Symbolic name of the drive

Procedure

1. Select the "Start-up" operating area.

2. Press the "HMI" and "Log. drive" softkeys.
   The "Set up drives" window opens.



3. Select the softkey that you want to configure.

4. To configure softkeys 9 to 16 or softkeys 17 to 24, click the ">> Level" softkey.

5. To allow input fields to be edited, press the "Change" softkey.
6. Select the data for the appropriate drive or enter the required data.

7. Press the "Details" softkey if you want to enter additional parameters.
   Press the "Details" softkey to return to the "Set up drives" window.

8. Press the "OK" softkey.

   The entries are checked.

   A window with a prompt opens if the data is incomplete or incorrect. Acknowledge the prompt with the "OK" softkey.

   The drive, e.g. "usb-NEU" is shown in the directory tree.

3.5 SINUMERIK 828D

3.5.1 Configuring the URL and proxy

Note

Transferring SINUMERIK data on the MindSphere platform

The following steps allow you to transfer the SINUMERIK data to the MindSphere platform.

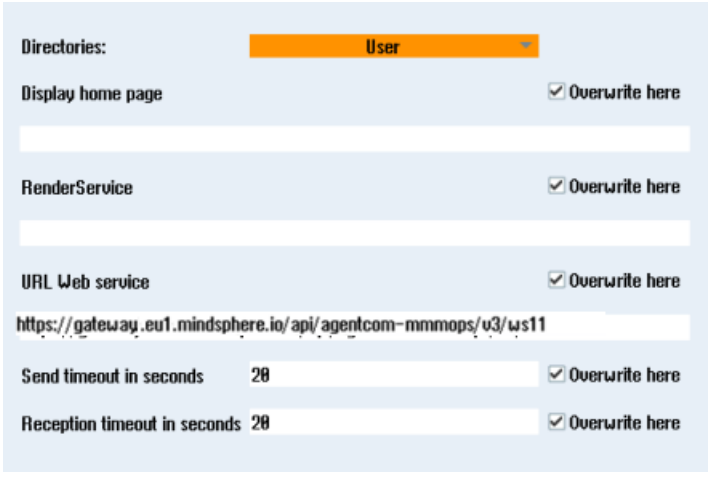
By performing the steps described below, in particular through input and confirmation of the Web service URL, processes are performed automatically in which software scripts are loaded to the SINUMERIK control.

Requirement

The use of SINUMERIK Integrate has been activated.

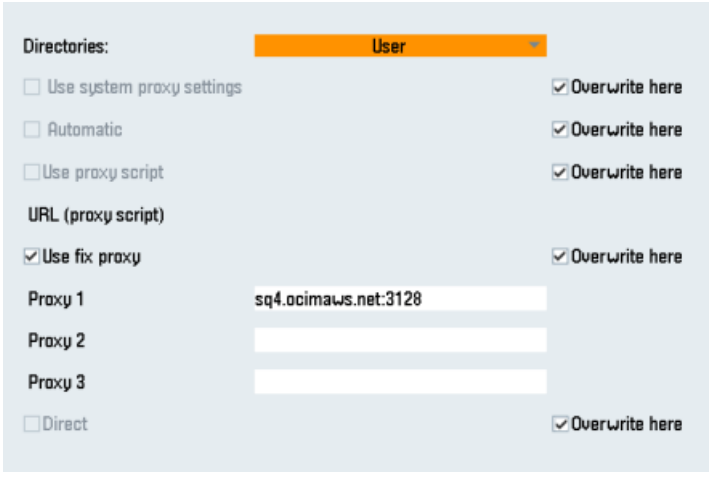
Procedure

1. The "Settings" window is open.
   Press the "URLs >" softkey.
2. Press the "Edit" softkey and select the following settings:
   - Directories: Select the "User" entry in the "Directories" drop-down list.
   - Display home page: Activate the "Overwrite here" checkbox.
   - RenderService: Activate the "Overwrite here" checkbox.
   - URL Web service: Activate the "Overwrite here" checkbox.
   - Enter the following WebService URL.
     If, for example, you are connected to the LIVE system:
     https://gateway.eu1.mindsphere.io/api/agentcom-mmmops/v3/ws11
     Enter the required value in the "Send timeout in ms" input field, e.g. "20" (default value is 200) and activate the "Overwrite here" checkbox.
   - Enter the required value in the "Receive timeout ms" input field, e.g. "20" (default value is 200) and activate the "Overwrite here" checkbox.

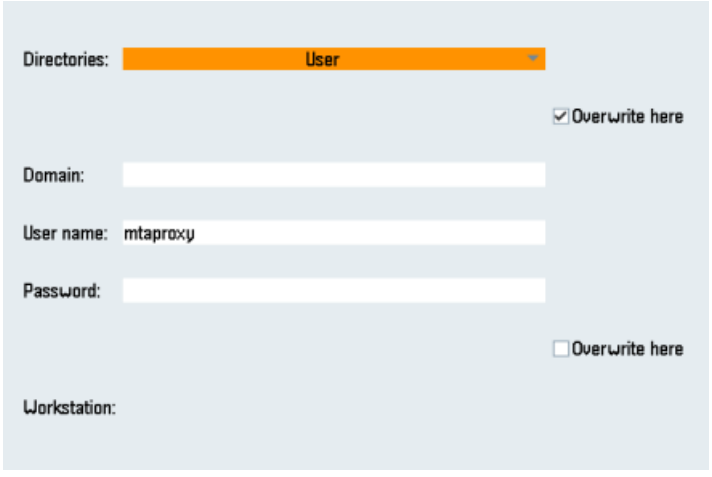


3. Press the "OK" softkey.
   A syntax check is performed and the access data is saved.
4. In order to establish a connection from the customer network, you must adapt the proxy settings.
   Press the "Proxys >" softkey.
   The stored settings are displayed.

5. Press the "Edit" softkey and select the following settings:
   - Activate the "Use fix proxy" checkbox.
   - Enter your proxies in the "Proxy 1" to "Proxy 3" input fields.
   - Activate the "Overwrite here" checkbox even if you only enter one proxy in order to accept the new entry.



6. Press the "OK" softkey to save the settings.
7. If an authentication is required for the proxy, press the "Authorization" softkey.
   - Activate the "Overwrite here" checkbox to accept the new entry.
   - Enter the user data in the "Domain", "User name" and "Password" input fields.



8. Press the "OK" softkey to save the settings.
9. Restart the control so that the access data can take effect.

3.5.2 Install the registration key on a SINUMERIK control system

The activation of SINUMERIK Integrate, the setting up of the URL/proxy and the restart creates the "boot_job" folder in the /var/tmp/ directory.

If the folder was not set up, then create the folder manually.

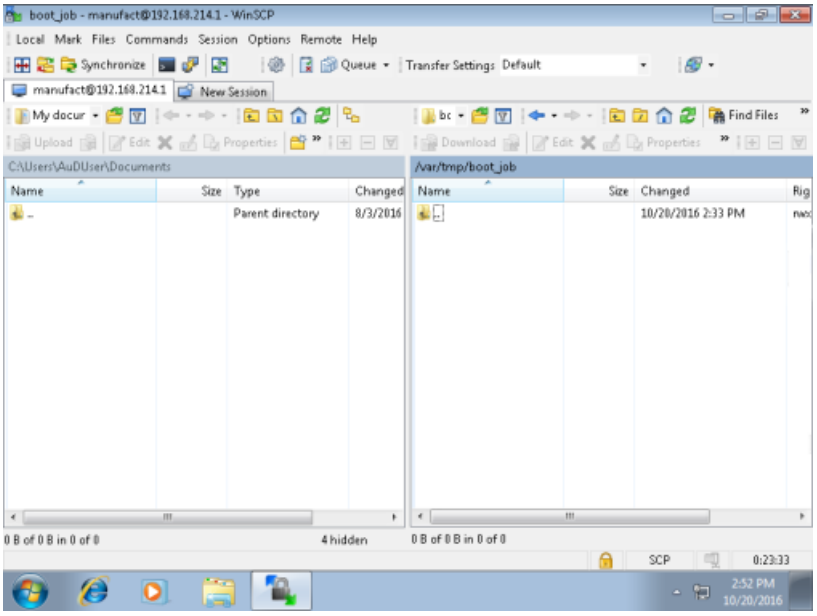
Copy the "onboard.key" to the SINUMERIK control system, e.g. using WinSCP.

Requirement

- The "onboard key" has been generated.
- The "boot_job" folder is created on the SINUMERIK control system, e.g. at C:\
- The time on the control system has been synchronized with the current time.
- The Internet connection has been checked and is established.

Procedure

1. Copy the generated "onboard.key" file using WinSCP for example via the network to the SINUMERIK control system.
2. Start the SINUMERIK control system and open the directory, e.g. /var/tmp/boot_job.
   If the "boot_job" folder does not exist, then create the folder manually.



3. Open the "boot_job" folder.
   If there is already a "cert.key" file in the /var/tmp/boot_job folder, the control was already connected to MindSphere. If you want to establish a new connection, then delete the existing file and insert the new "onboard.key" file.
4. Then start the SINUMERIK Operate operating software.
   When the connection to the server has been successfully established, then the "cert.key" file is created.
5. The onboarding is completed and the "onboard.key" is no longer displayed in the directory.

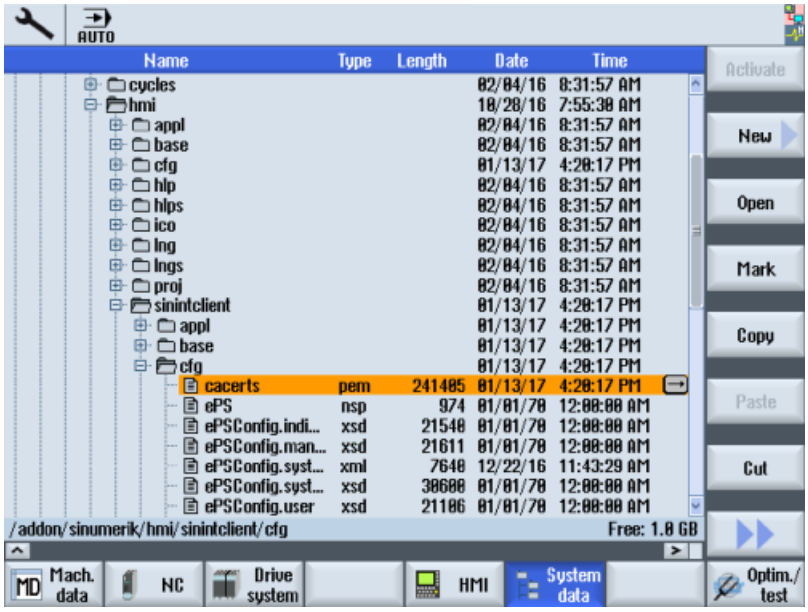
3.6 Adapting SINUMERIK Operate

3.6.1 Exchanging a certificate (optional)

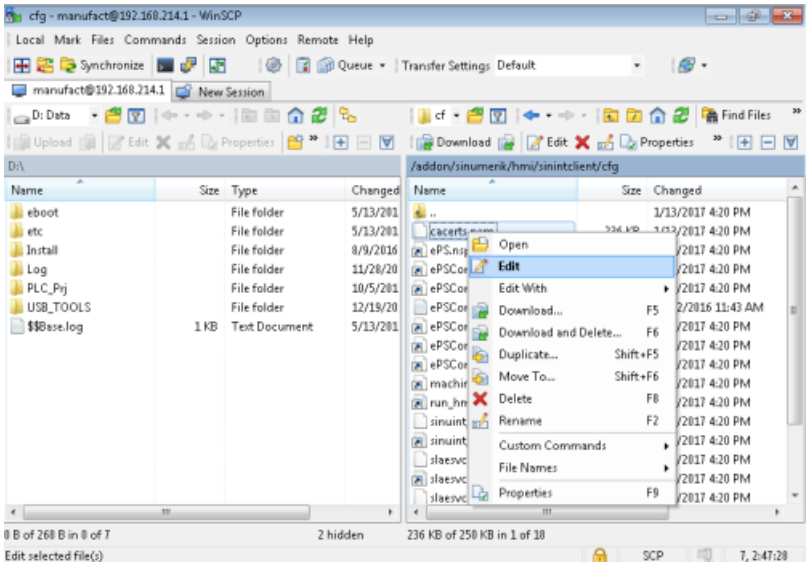
In order to achieve comprehensive security, it is necessary to update the certificate "cacert.pem". The following manual steps are required for this purpose.

SINUMERIK Operate with SINUMERIK Integrate client under Linux

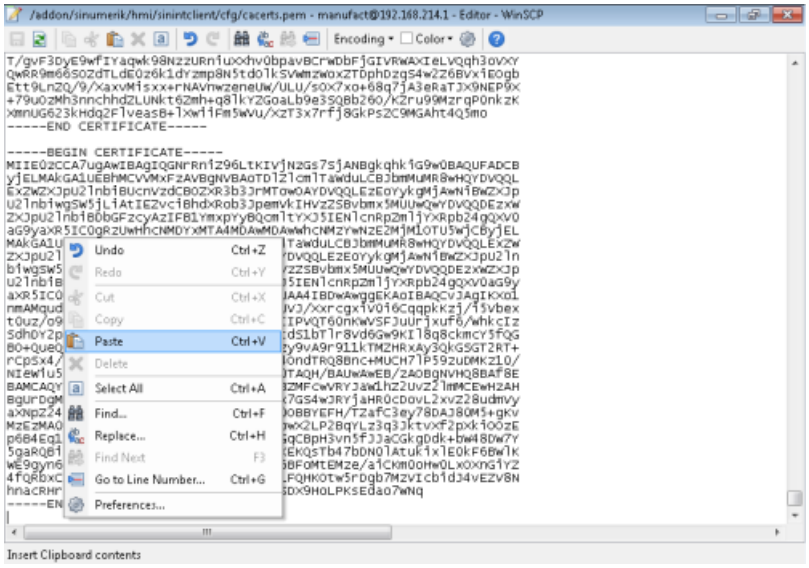
1. Open the directory: card/addon/sinumerik/hmi/sinintclient/cfg
2. Select "cacerts.pem".



3. Use WinSCP, for example, to open "cacerts.pem" in the editor.



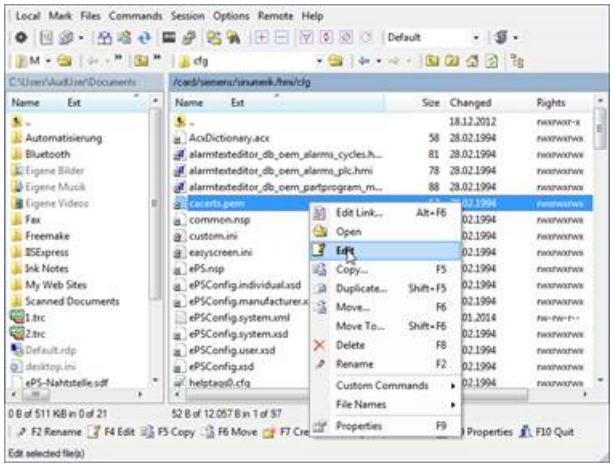
4. Insert the content of "Customer Root CA" at the end of "cacerts.pem".



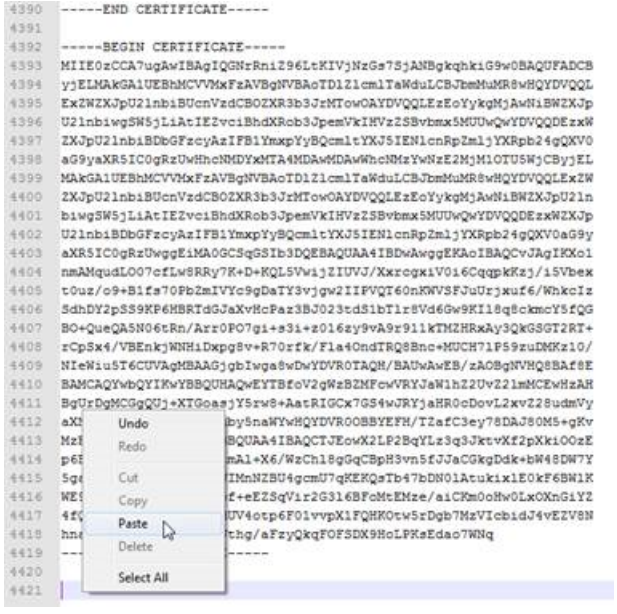
5. Close the file to save the certificate.
6. Perform a restart.

SINUMERIK Operate under Windows

1. Open the "Customer Root CA" file in the editor and copy the entire content to the clipboard.
2. Use WinSCP, for example, to open "cacerts.pem" in the editor.
   C:\ProgramData\Siemens\MotionControl\addon\sinumerik\hmi\sinintclient\cfg\cacerts.pem



3. Insert the content of "Customer Root CA" at the end of "cacerts.pem".



4. Close the file to save the certificate.
5. Store the adapted file in the same directory again:
   C:\ProgramData\Siemens\MotionControl\addon\sinumerik\hmi\sinintclient\cfg
6. Perform a restart.

3.6.2 Activating logs for troubleshooting

At the SINUMERIK control system, activate the logs in the "ePSConfig.user.xml" file for troubleshooting.

Procedure

1. Press the "System data" softkey.
2. Navigate in the following directory: System CF card/user/sinumerik/hmi/cfg.
3. Open file "ePSConfig.user.xml".
4. Make the following setting:

```
<logging>
<separateScriptLog active="1">1</separateScriptLog>
<scriptLogPath active="1">/var/tmp/scriptLog</scriptLogPath>
<scriptLogSeverity active="1">8</scriptLogSeverity>
<uiScriptLogSeverity active="0">2</uiScriptLogSeverity>
<maxScriptLogSize active="1">10000</maxScriptLogSize>
<maxLogLifeTimeDays active="0">30</maxLogLifeTimeDays>
</logging>
```

5. Restart the SINUMERIK control system and have the log files sent to you.

3.7 Integrating MindSphere

3.7.1 Logging in to MindSphere

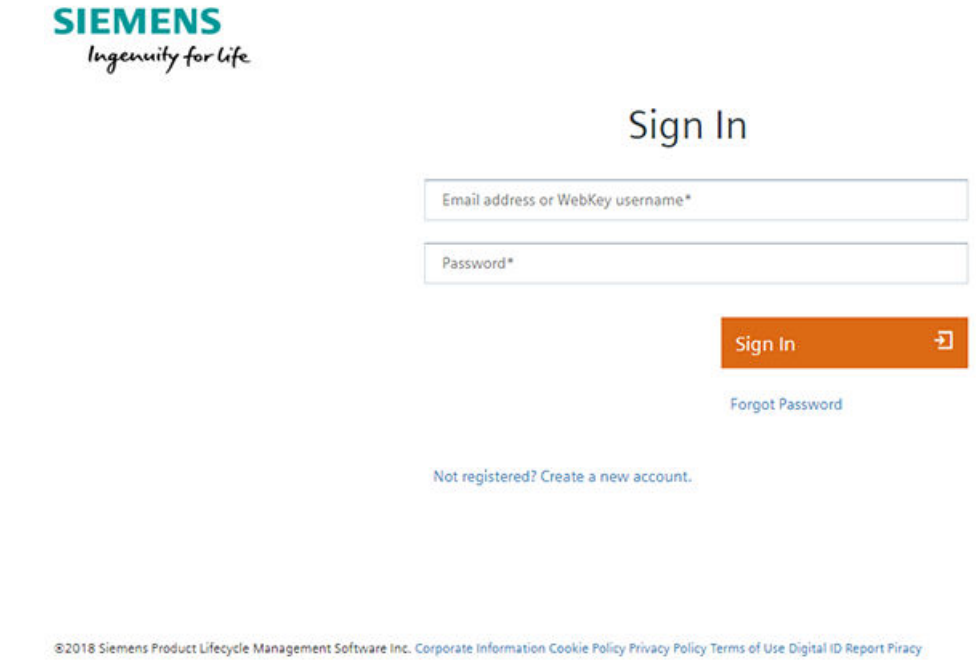
Requirement

You require a MindAccess user account in MindSphere.

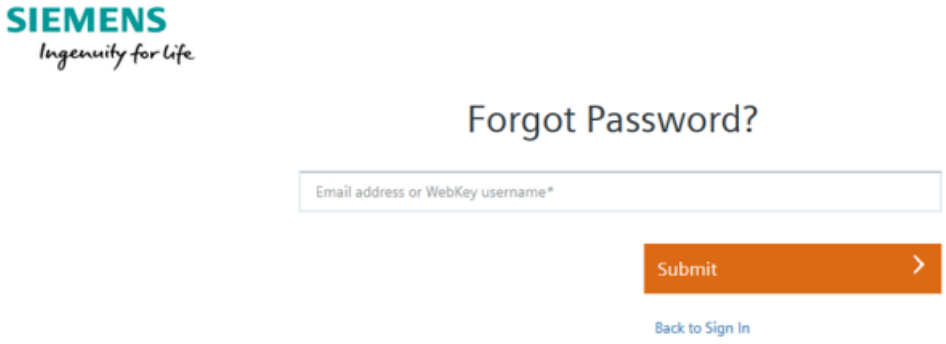
Information on how to create an account is provided in the following documentation:
MindSphere - Getting Started Adjustments, Section: Create an OEM user and a customer user

Procedure

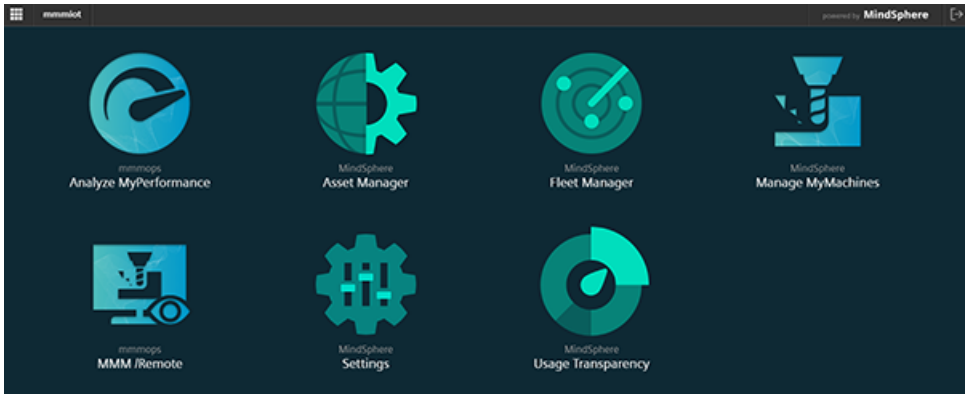
1. Click the link provided by email from Siemens AG.
   The website is displayed: https://<your-account-name>.eu1.mindsphere.io
2. The "Sign In" window opens.
   - Enter your e-mail address and your password.
   - Click the "Sign In" button.



   - OR -
   If you have forgotten your password, click "Forgot Password?".
   The "Forgot Password" window opens.
   Enter your e-mail address and click the "Submit" button.
   Your password is reset and you are informed of this via e-mail.

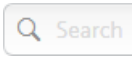


3. The launch pad opens. You can access the individual applications via this user interface.



3.7.2 Description of the icons/buttons

The following symbols and buttons are available.

Icon	Description
	Exit MindSphere
	Opens a menu with the following search and sorting options: • Country • Type • Status • Sorting • Show
	Input field for free text search
	Displays assets in an overview
	Displays assets in a map view
	Displays assets in a hierarchic view
	Displays assets in an area view
	Displays a possible extension
	Displays or hides the filters and their number
	Opens a menu with the following user information: • E-mail address of the user • User state • Language selection • Button for logging out

Icon	Description
	Opens the email program set as default, and sends the valid selection by mail, e.g. link to the actual MindSphere view
	Opens a dialog box to select the view
	Resets the zoom range
	Shows support information: • Online Support Website • Online Request Website • Call Center • MindSphere Services

3.7.3 User administration

For "Manage MyMachines", you create users with different rights.

The following users are available:

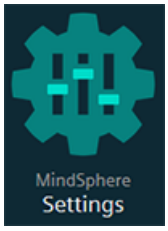
- Standard users
  - mmmalarms.user
  - mmmdashboard.user
  - mmmoverview.user
- Administrator
  - mmmalarms.admin
  - mmmdashboard.admin
  - mmmoverview.admin

You process/edit users, roles and rights in the MindSphere application "MindSphere Settings".

You can find further information at: MindSphere documentation (https://documentation.mindsphere.io/index.html#/kiosk/en)

Procedure

1. The launchpad is open.
2. Click the MindSphere application "MindSphere Settings".



   The page opens and offers you user administration for editing/processing.
3. Create or edit the user.
4. Assign the corresponding roles.

3.7.4 Asset Manager

3.7.4.1 Overview

Functions

"Asset Manager" is a MindSphere application belonging to the Industrial IoT platform of Siemens. In the "Asset Manager", using assets, you model the structure of an industrial process within MindSphere.

In the "Asset Manager", connect your machine tool, the asset, with the MindSphere application and configure the data acquisition.

The specific functions and configuration options for the "SINUMERIK" area are discussed in the following.

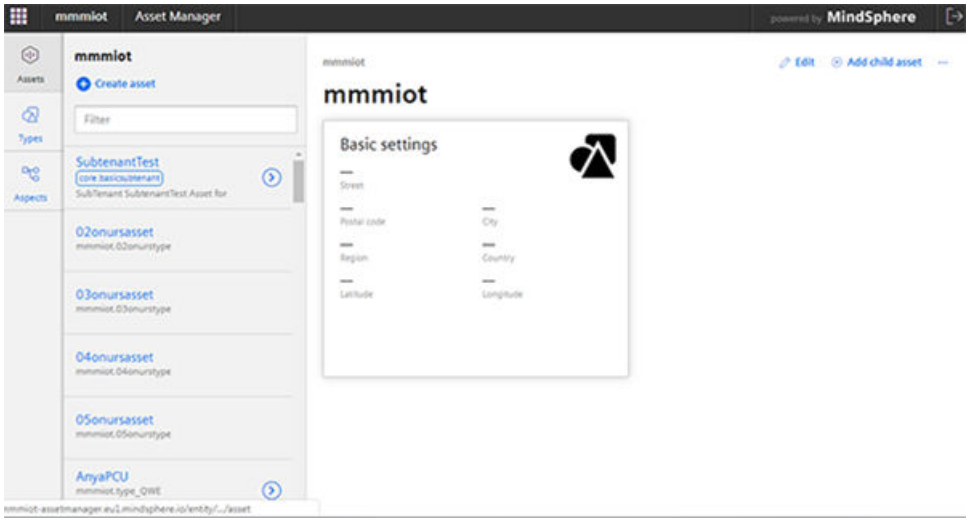
Using an asset type, you can define which aspects should be integrated into the template. Using asset types, you have the option of creating a template – e.g. for several devices – and linking this with your aspects. When creating a new asset, you can access the template or the type.

Aspects are combined, preconfigured data and form the context for evaluating industrial processes. An aspect can comprise several variables. Within an industrial process, the assets transfer the aspects in the MindSphere application as time series data.

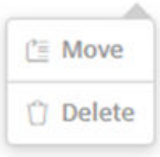
Opening the Asset Manager

1. Click on the "MindSphere Asset Manager" icon.

2. The Asset Manager is opened with the "Assets" window.



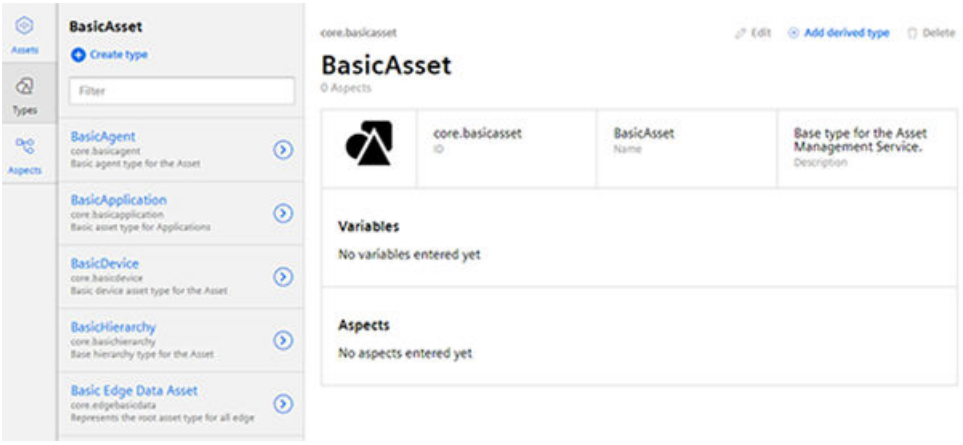
3. For additional options, click on the 3 small points at the upper right-hand edge of the screen.



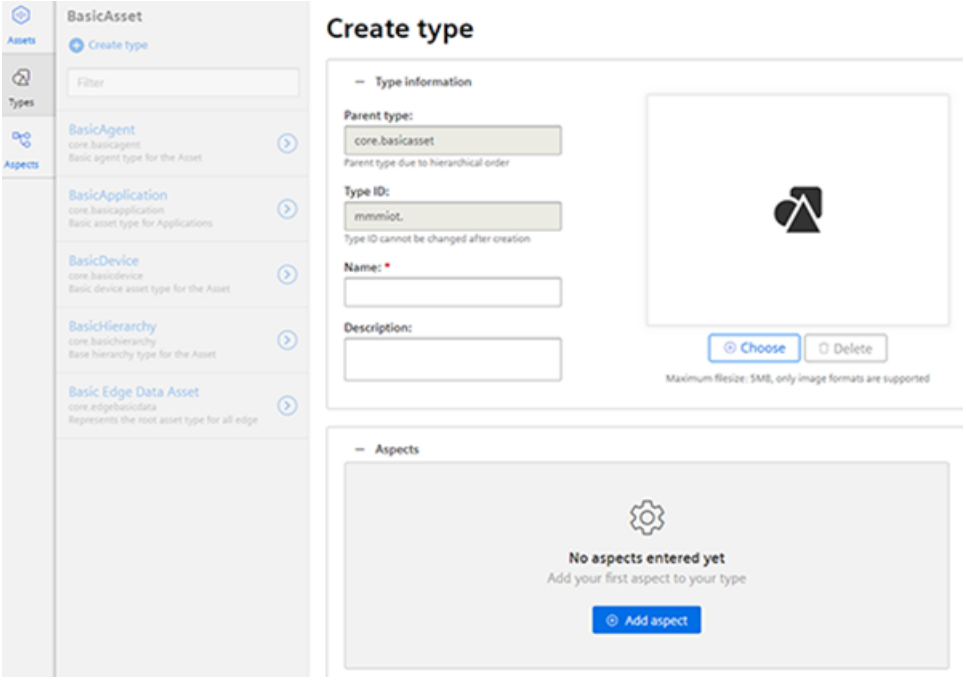
3.7.4.2 Creating an asset type

Procedure

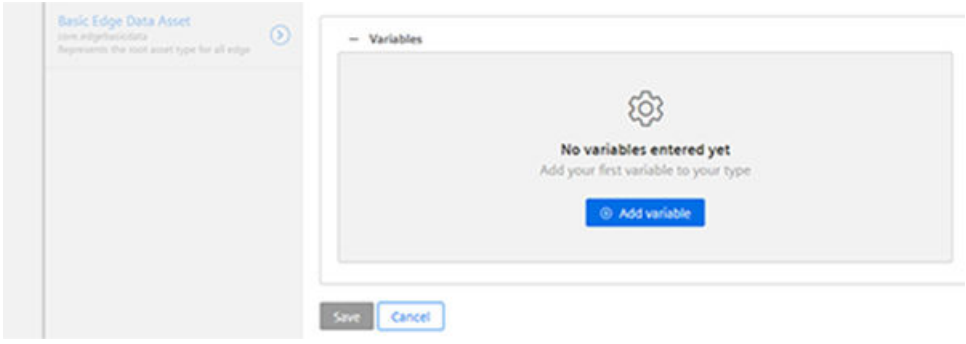
1. In the left-hand section of the window, click on "Types".
   The "Types" window opens.



2. In the center window section, click "+ Add type" to create a new asset type.
   The "Create type" window opens.



– Scroll down to view the lower window section.



3. Enter a name for the new asset type.
   Entering the name is mandatory and activates the "Save" button.
4. Enter a description of the new asset type.
5. Select an image.

   Note

   Images in the working area

   Ensure that the name of the image in your working area is unique.

6. Insert a variable.
7. Click "Save" to save the asset type.

View asset type

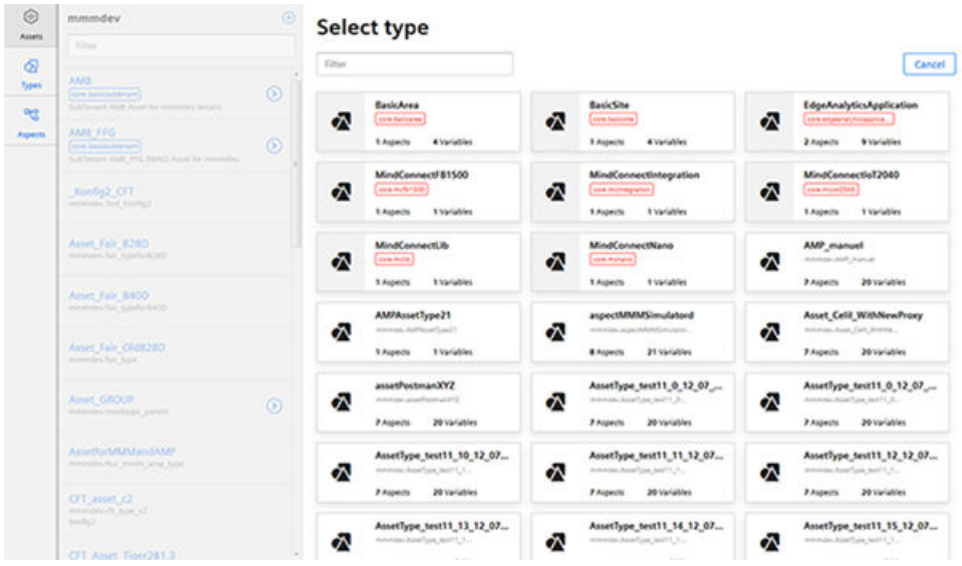
1. Open the "Types" window.
2. In the left-hand area, click on the small arrow to the right next to the required asset type.
   The corresponding data is displayed in the right-hand window area

3.7.4.3 Creating an Asset

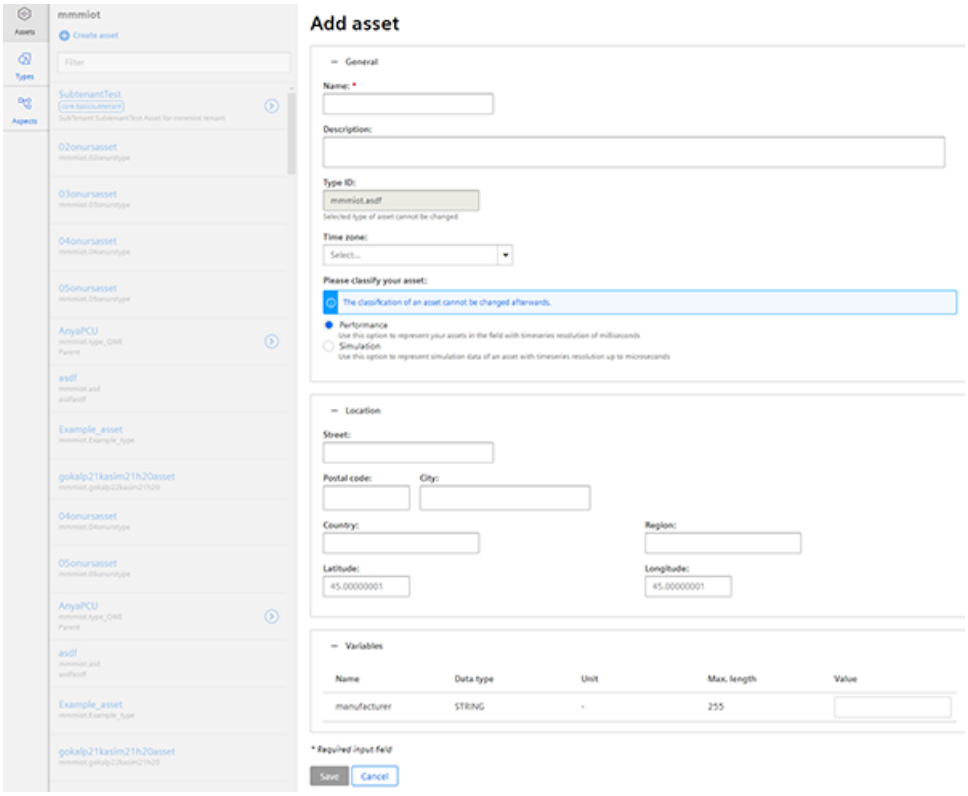
Procedure

1. Click "Assets" into the left-hand section of the window.
2. In the center window section, click "+ Add asset".
   In the right-hand section of the window the "Select type" page is displayed.

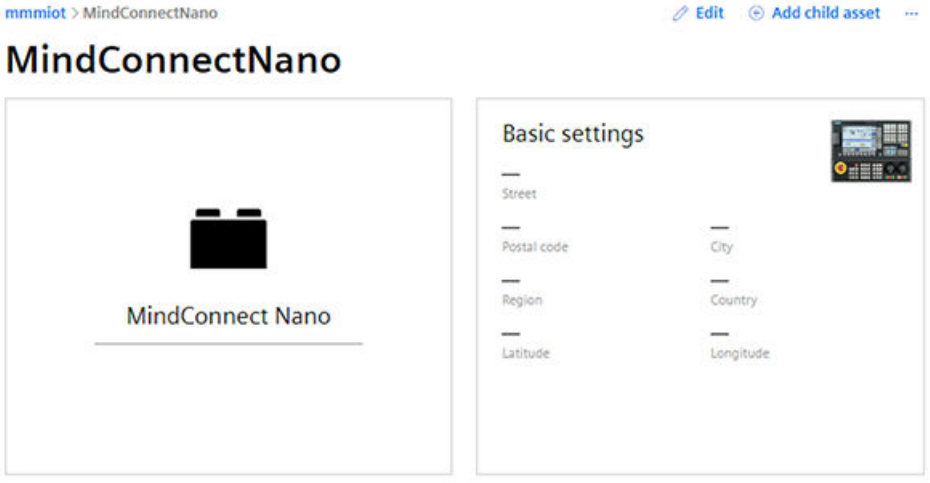
3. Enter the name of the required asset type or select the previously generated type from the list.



4. The "New asset" window opens.
   - Populate the fields in the "General" and "Location" areas.
     The "Save" button is activated.
   - Click "Save" to save the new asset.



5. The new asset is displayed.



3.7.5 Connecting the SINUMERIK control system with MindSphere

Using the MindSphere application "Asset Manager", connect the SINUMERIK control systems with MindSphere.

References

Additional information on this is provided in the MindSphere System Manual:

- Chapter: Roles within MindSphere
- Chapter: Configuring assets

Requirement

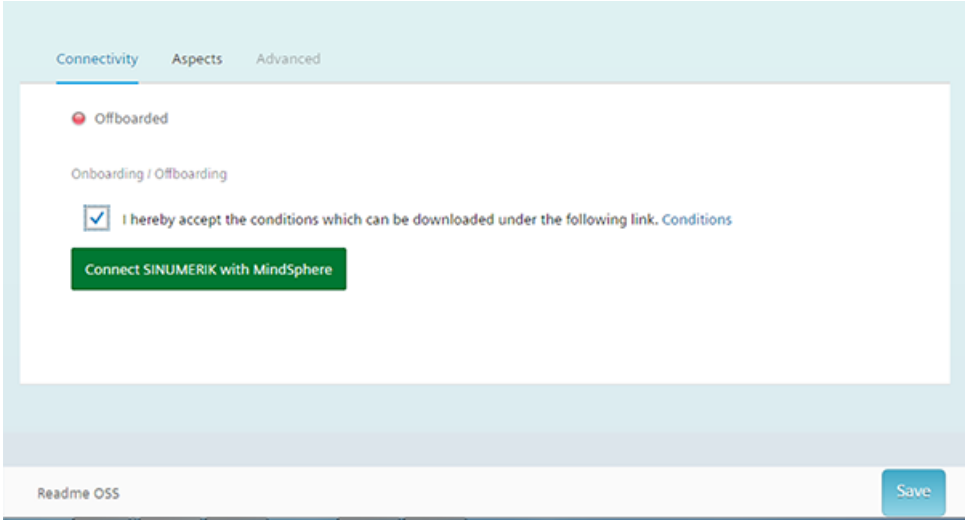
- You require the "MindAccess User" role in MindSphere to do this.
- The configuration must have been saved.

Procedure

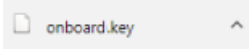
1. Click the "Asset Manager" MindSphere application, and select the required asset in the left-hand side of the window.
2. Click the "MTA Asset Config" icon in the right-hand side of the window.

3. The "Onboarding / Offboarding" window opens, and you can see the connection status in the "Connectivity" tab, e.g. "Offboarded".

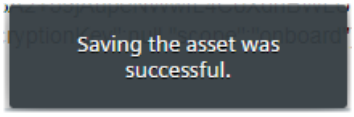
4. Activate the "I hereby accept the conditions, which can be downloaded under the following link. Conditions" checkbox.
   - Click the "Conditions" link.
     The "MindSphere Terms & Conditions" window opens.
   - Click on your region.
   - From the list, select the appropriate Terms & Conditions.
   - Read the Terms & Conditions.
     - OR -
     Download the Terms & Conditions.
     - OR -
     Print the Terms & Conditions.
   - Close the window.
     The "Connectivity" window is displayed again.
5. Click the "Connect SINUMERIK with MindSphere" button to connect the asset with MindSphere.



6. The "onboard.key" is generated and shown below the status bar.
   Please note that you neither change the name nor content of the file.



7. Click the "Save" button to accept the entries and save a consistent version of the configuration.
   Wait for confirmation that the asset was successfully saved.



8. Then copy the "onboard.key" to the control system, see Section.

3.7.6 Activating the data acquisition

The "Asset Manager" MindSphere application allows you to configure the assets, and you activate data acquisition for the following data points under the "Aspects" tab using a slider:

- Addressing
- Data formats
- Sampling rate
- Physical unit

The data points can be connected either as already preconfigured data sets, or configured separately in the form of variable sets via the SINUMERIK variable configurator.

The following preconfigured variable sets exist for assets with SINUMERIK control:

- SINUMERIK basic configuration
- Machine availability
- Advanced recording

Note

The preconfigured variable sets can only be selected if you enable the terms and conditions checkbox and set the "Manage MyMachines" slider to "ON" under "Manage MyMachines".

Note

First channel

The preconfigured "SINUMERIK basic configuration" and "Machine availability" data only refers to data from the first NC channel.

Parameters of preconfigured SINUMERIK data sets

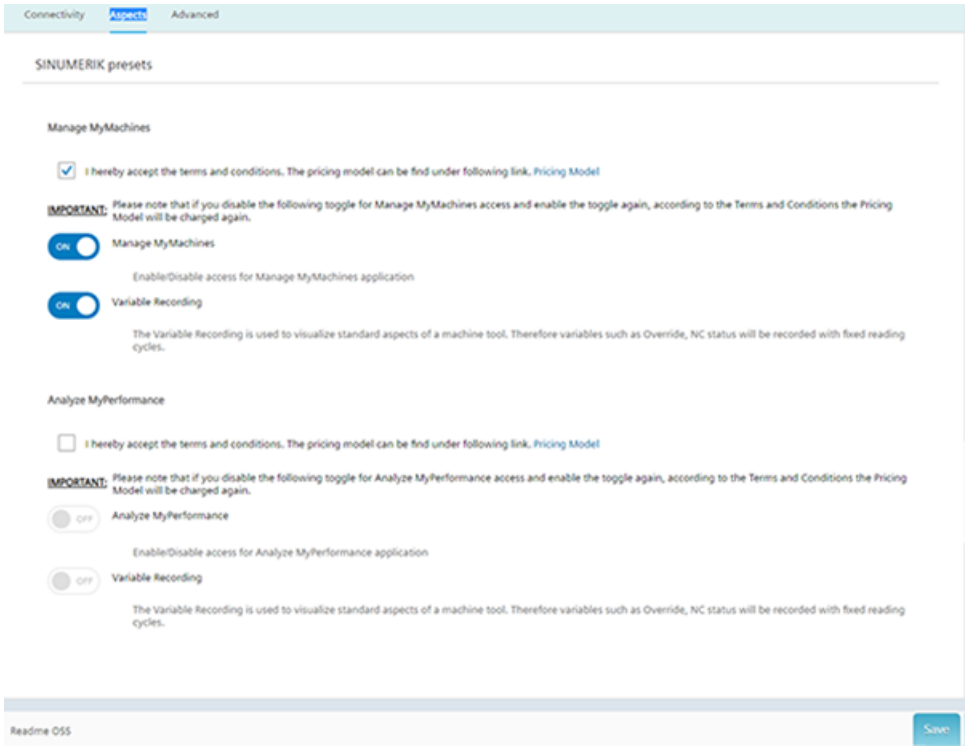
Display	Description
Preconfigured SINUMERIK data sets	
SINUMERIK basic configuration	The basic SINUMERIK configuration is used to visualize standard aspects of the machine tool. For this purpose, variables of the first machining channel are acquired with fixed recording rhythms. You can switch the data acquisition on or off with a slider. In "Manage MyMachines", the data is displayed at "CH1_Basic-Config".

Display	Description
Machine availability	Standard variables of the first machining channel are acquired for calculating the machine availability. You can switch the data acquisition on or off with a slider. In "Manage MyMachines", the data is displayed at "CH1_MachineStatus".
Advanced recording	The advanced recording configuration allows the following selections to be made: • Time-based / cyclic trigger • Variable value-based trigger • Alarm-based trigger • Uploaded files

Procedure: Activating the presets

1. Click "Asset Manager" and select the required asset in the left-hand side of the window.
2. Click the "MTA Asset Config" icon.
   The "Onboarding / Offboarding" window opens.
3. Click the "Aspects" tab.
   The "SINUMERIK default settings" window opens.
4. Check the terms and conditions checkbox under "Manage MyMachines".
5. Set the slider for "Manage MyMachines" to "ON" to activate Manage MyMachines usage for this asset and to enable the "Generic configuration" sliders.

6. Position the "Variable Recording" to "ON" in order to obtain the data for "Manage MyMachines" under the "Aspects" tab and in the MMM dashboard.

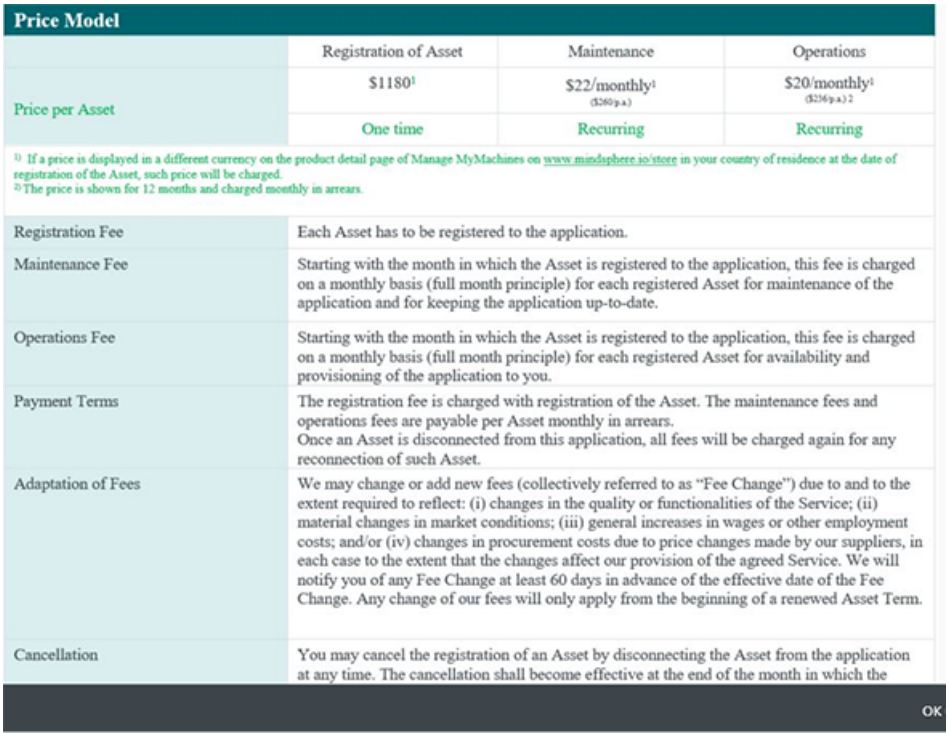


7. Click "Save" to save the settings.

Pricing model

Fees are incurred each time you set the "Manage MyMachines" slider to "ON".

- To view the fees, click on the "Price Model" link below "Manage MyMachine". Information about the pricing model is displayed.



Price Model

	Registration of Asset	Maintenance	Operations
Price per Asset	$1180[1]	$22/monthly[1] ($260 p.a.)	$20/monthly[1] ($256 p.a.) [2]
	One time	Recurring	Recurring

[1] If a price is displayed in a different currency on the product detail page of Manage MyMachines on www.mindsphere.io/store in your country of residence at the date of registration of the Asset, such price will be charged.
[2] The price is shown for 12 months and charged monthly in arrears.

Registration Fee	Each Asset has to be registered to the application.
Maintenance Fee	Starting with the month in which the Asset is registered to the application, this fee is charged on a monthly basis (full month principle) for each registered Asset for maintenance of the application and for keeping the application up-to-date.
Operations Fee	Starting with the month in which the Asset is registered to the application, this fee is charged on a monthly basis (full month principle) for each registered Asset for availability and provisioning of the application to you.
Payment Terms	The registration fee is charged with registration of the Asset. The maintenance fees and operations fees are payable per Asset monthly in arrears. Once an Asset is disconnected from this application, all fees will be charged again for any reconnection of such Asset.
Adaptation of Fees	We may change or add new fees (collectively referred to as "Fee Change") due to and to the extent required to reflect: (i) changes in the quality or functionalities of the Service; (ii) material changes in market conditions; (iii) general increases in wages or other employment costs; and/or (iv) changes in procurement costs due to price changes made by our suppliers, in each case to the extent that the changes affect our provision of the agreed Service. We will notify you of any Fee Change at least 60 days in advance of the effective date of the Fee Change. Any change of our fees will only apply from the beginning of a renewed Asset Term.
Cancellation	You may cancel the registration of an Asset by disconnecting the Asset from the application at any time. The cancellation shall become effective at the end of the month in which the

OK

3.7.7 Configuring a variable

The following variables may be configured individually:

- Time-based / cyclic trigger
- Trigger based on variable values
- Alarm-based trigger

These variables are subject to the appropriate costs.

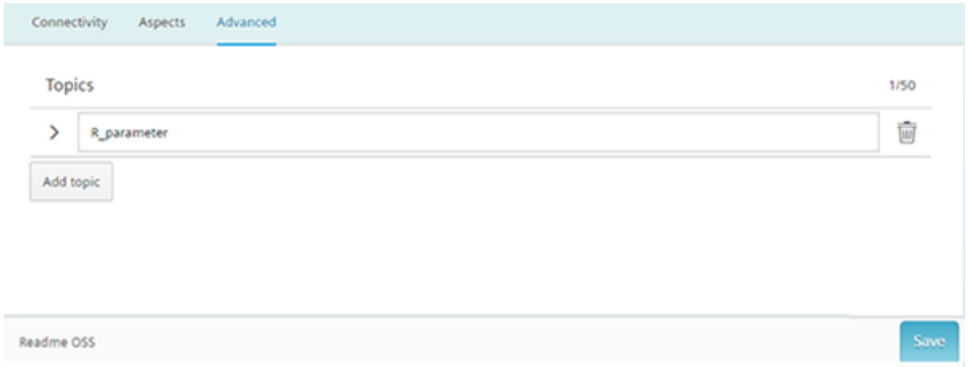
Requirement

Software option

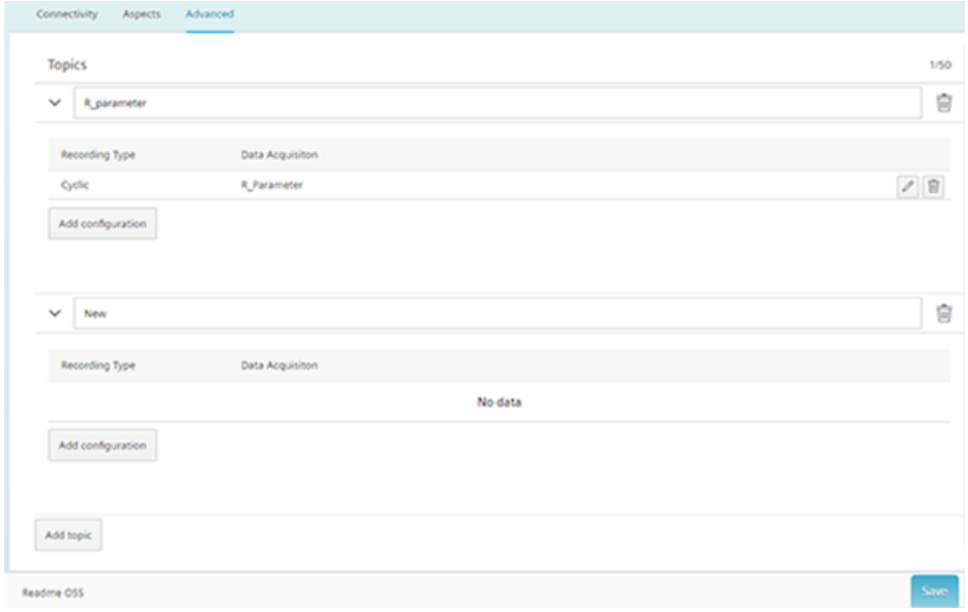
In order to use the variable data, you need the "Path length evaluation" software option (6FC5800-0AM53-0YB0).

Procedure

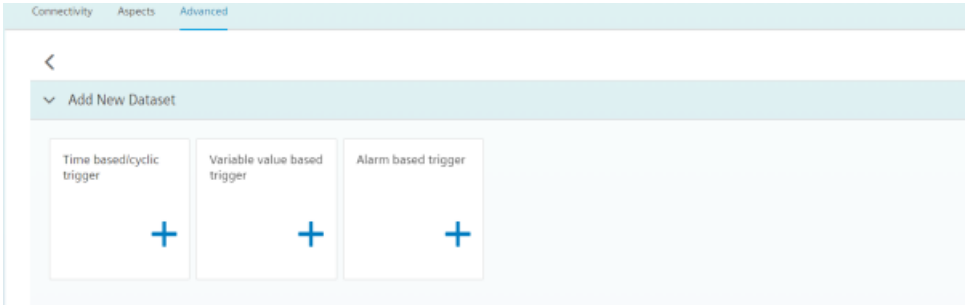
1. In the launchpad, click "Asset Manager" and select the required asset in the left-hand side of the window.
2. Click the "MTA Asset Config" icon.
3. Open the "Advanced" tab.
   The "Topics" window opens.
   - Click "Add topic".
     You obtain a new input field.
   - Enter a name for the topic in the input field.



4. Click on the arrow to the left of the input field to perform additional settings.
   Recording type and data acquisition of the cyclic trigger and alarm trigger are available.



5. Click on the "Edit" icon to create individual cycles or for systematic selection of alarms.
6. Click on the "Add configuration" button to add a new data set.
   The following selection is available:
   - Time-based / cyclic trigger
   - Trigger based on variable values
   - Alarm-based trigger



Time-based / cyclic trigger

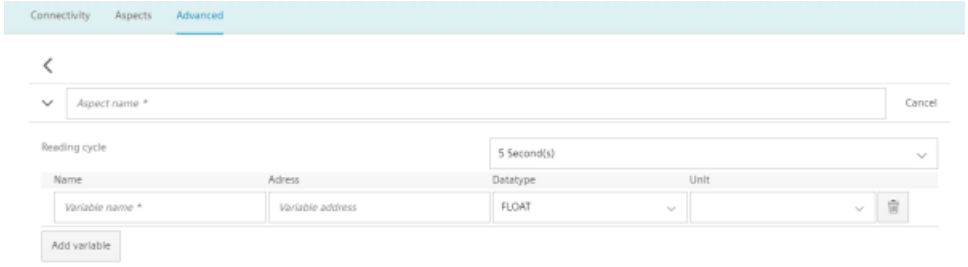
Parameters	Description	
Aspect name	Enter a name to designate a common group of variables. The name must be unique and not exceed 255 characters. The following characters are not permitted: Return, °, $, §, €, \, >, <, ß ä ö ü Ä Ö Ü	
Name	In the variable set, enter a name of the variable to be sensed. Example: Jerk_MA_MX The variable name must have at least three characters. The first character must not be a number or an underscore. Do not use square brackets in the notation of a variable! Do not use any umlauts (special German characters), e.g. "ä", "ö", "ü"!	
Address	Enter the address or the path of a variable. Examples:	
	Axis data:	/Nck/MachineAxis/AATRAVELCOUNT[1] /Nck/MachineAxis/AATRAVELDIST[2]
	Channel data:	/Channel/ChannelDiagnose/CuttingTime[u1] /Channel/ChannelDiagnose/OperatingTime[u1]
	Machine operating mode:	/Bag/State/opMode[u1]
Data type	From the drop-down list select the data type of the variable: • FLOAT • BOOLEAN • STRING **Note:** If values exceed the floating-point number accuracy, they are displayed with faulty decimal places.	

Parameters	Description
Unit	From the drop-down list, select the physical unit of the variable. Example: m/s^3
A reading cycle	The sampling rate of the data acquisition is specified with this value. From the drop-down list select the time period. Example: 5 second(s)

Procedure

1. Click on the "Time-based / cyclic trigger" function.

2. Enter a name in the "Aspect name" input field and click the ">" arrow to the left of the input field.
   Further input fields and drop-down lists open.



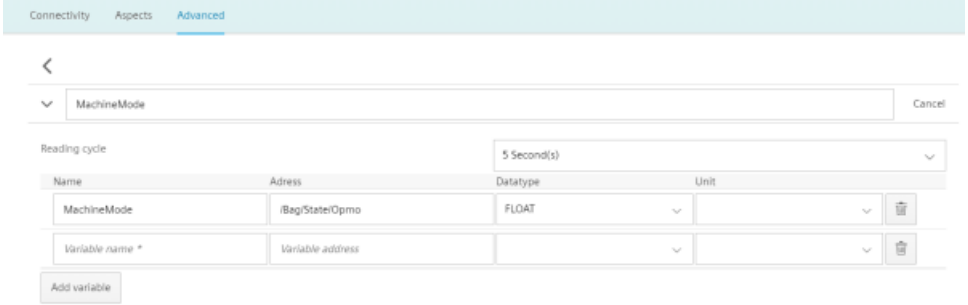
3. Enter the variables in the input fields as in the following example.
   - Click the "Add variable" button to add a new variable.
     If necessary, repeat this step.

     Note
     Limiting the number of variables

     A read cycle time selection of 5 seconds allows the creation of a maximum of 5 variables.

     Otherwise, up to 50 variables can be created.

   - Click the "Delete" icon to delete individual variables.
   - Click on the "Cancel" button to reset the entries.



4. Click the "Save" button to accept the entries.
   – A confirmation prompt is displayed along with the costs.
   – Click the "Accept settings" button to save the values and, at the same time, to accept the costs for the additional variables.
   - OR -
   Click the "Cancel" button to not accept the values.

   Note

   Changing saved variable sets

   After saving, you can only change the following properties of the variable set:
   - Address of a variable
   - Query cycle of the variable set

   If you want to change further properties, you must delete the variable set and create a new one. The previously acquired data is lost!

5. Click the "Exit" button to close the property window without saving the entries.
   You return to the overview of the assets.

Trigger based on variable values

Any variables for which a communication mechanism exists can be linked logically with the variable trigger.

For this you have the following options:

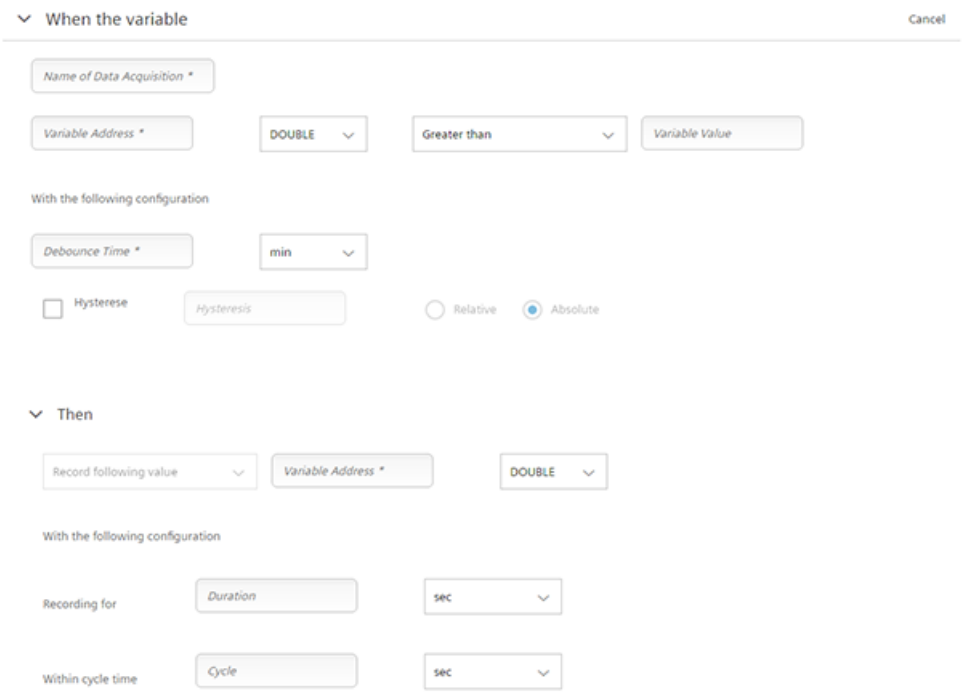
Parameters	Description
When the variable	
Variable name	Enter an already created variable.
Variable address	Shows the address of the variable.
Data type	From the drop-down list select the data type of the variable.
	From the drop-down list, select the comparison operation that is restricted to the format of the variables: • Equal to • Not equal to • Less than • Less than or equal to • Greater than or equal to • in: In the range between two values • out: Outside of a range of two values
Value	Enter a value.
With the following configuration	
Value	Enter a time value
Unit	Select the time unit from the drop-down list.

Parameters	Description
Hysteresis	Activate the checkbox if you want to include hysteresis.
	Activate the "Relative" option button if the relative value in relation to the comparison value is to be recorded. Activate the "Absolute" option button if the absolute value in relation to the comparison value is to be recorded. A new trigger on the comparison value is only performed when the actual value differs from the comparison value by more than the specified hysteresis. Enter a comparison value. This is restricted depending on the selection of the address format.
Then	
Record the subsequent value	Select the value from the drop-down list.
Variable address	Shows the address of the variable.
	From the drop-down list select the data type of the variable: • FLOAT • BOOLEAN • STRING
With the following configuration	
Recording for	Activate the "Recording for" checkbox and enter the duration.
Unit	Select the time unit from the drop-down list.
Within cycle time	Enter the time duration within the cycle.
Unit	Select the time unit from the drop-down list.

Procedure

1. Click on the "Trigger based on variable values" function to define dependencies.

2. Select a variable and open further input fields and drop-down lists with the arrow.
3. Enter the dependencies.
   Click the "Save" button to save the variable trigger.



Alarm-based trigger

The alarm-based trigger reacts to all alarms programmed in the control.

These alarms also contain the user range of alarm numbers that are assigned the machine functions for the machine diagnostics. If machine diagnostics are not performed on the basis of alarm numbers, these error messages cannot be integrated. The alarm numbers that are triggered can be entered individually, in groups, or in series. It is also possible to remove individual alarms or groups from a selection. You can link conditions that themselves do not activate a trigger.

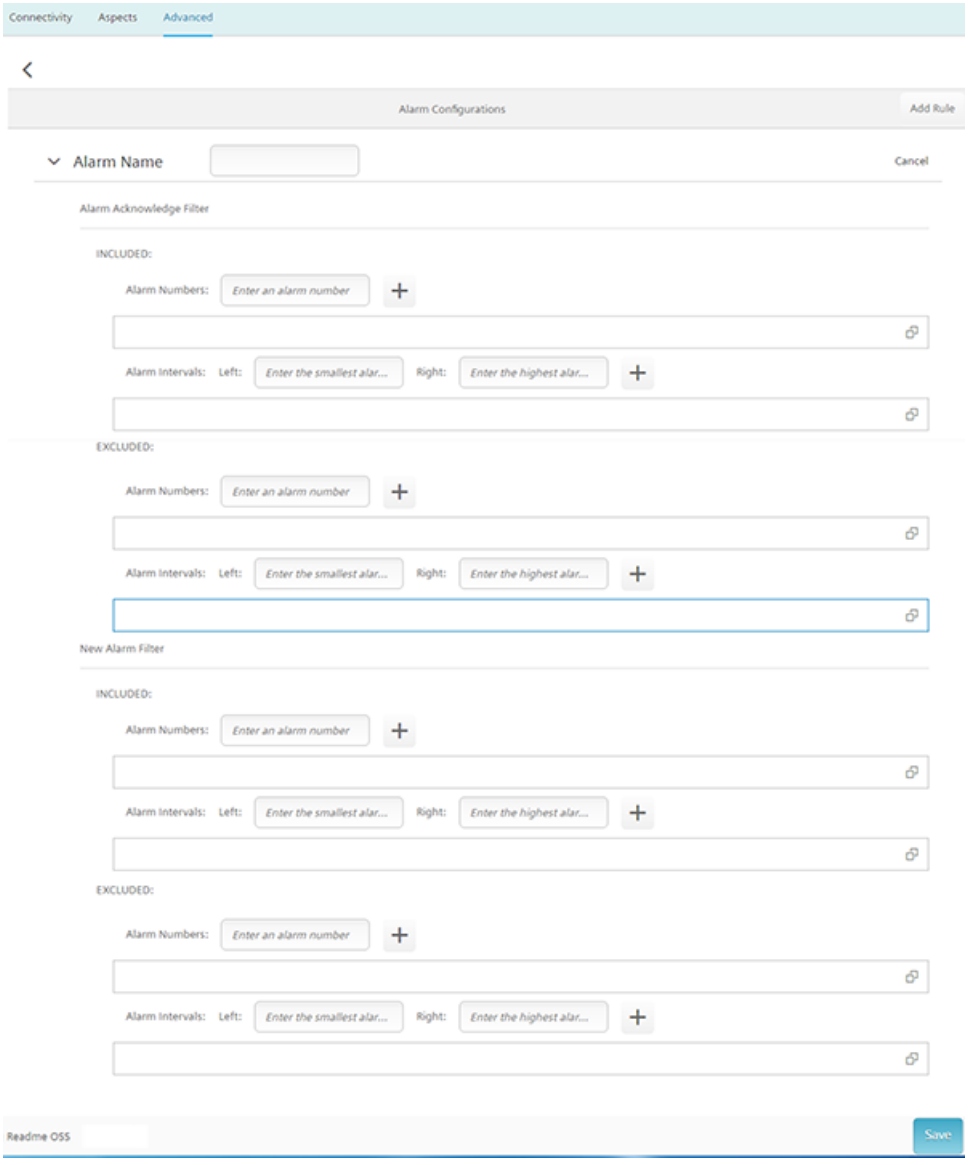
Parameters	Description
Alarm name	Enter a descriptive name for the alarm.
Alarm acknowledgement filter	
INCLUDED	

Parameters	Description
Alarm codes:	Enter the alarm numbers or the alarm IDs that activate the trigger. The alarms are entered in the following notation: • Separate the individual alarms through a comma, e.g. 3200, 32100, ... • Enter the alarm number ranges with a "-" character, e.g. 4000-5000 The alarm list must not exceed 200 characters.
Alarm intervals: Left / Right:	Enter the alarm limits: • Left: Enter the lowest alarm ID, e.g. 0 • Right: Enter the highest alarm ID, e.g. 99999 All alarms between 0 and 99999 are included.
EXCLUDED	
Alarm codes:	Enter the alarm numbers that do not activate the trigger. The alarms are entered in the following notation: • Separate the individual alarms through a comma, e.g. 3200, 32100, ... • Enter the alarm number ranges with a "-" character, e.g. 4000-5000 The list of alarm numbers must not exceed 200 characters.
Alarm intervals: Left / Right:	Enter the alarm limits: • Left: Enter the lowest alarm ID, e.g. 0 • Right: Enter the highest alarm ID, e.g. 99999 All alarms between 0 and 99999 are included.
New alarm filter	
INCLUDED	All fields, the same as under "Alarm Acknowledge Filter" - "INCLUDED"
EXCLUDED	All fields, the same as under "Alarm Acknowledge Filter" - "EXCLUDED"

Procedure

1. Click the "Alarm based trigger" function to define alarm properties, e.g. when an alarm should be displayed.

2. Enter a name for the alarm and specify the properties.
   Click the "Save" button to save the alarm based trigger.



References

Further variables can be found in the following List Manual: SINUMERIK 840D sl, NC Variables and Interface Signals

3.8 Disconnecting the SINUMERIK control system from MindSphere

3.8.1 Overview

Introduction

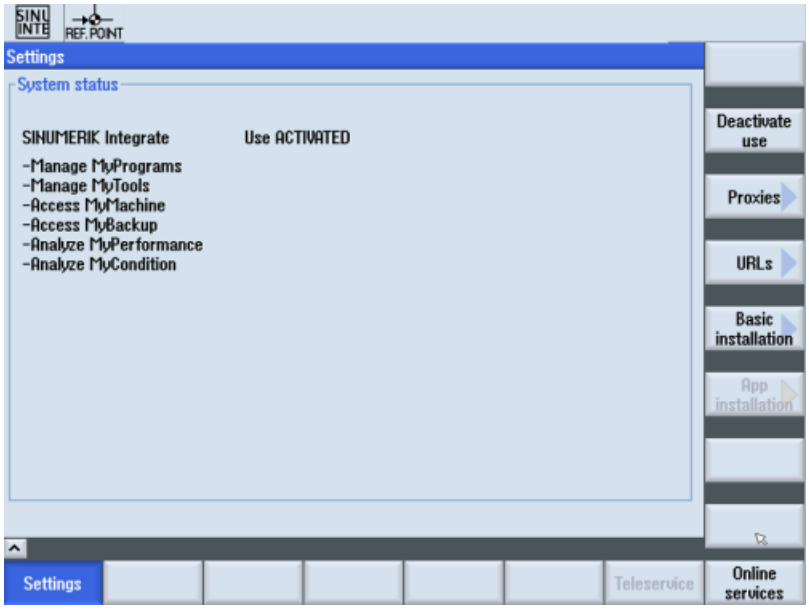
If you no longer wish to use the MindSphere application "Manage MyMachines" on your SINUMERIK control system, then proceed as follows:

1. Lock SINUMERIK Integrate: Deactivating use of SINUMERIK Integrate (Page 72)
2. In the "Asset Manager", disconnect the machine tool system from MindSphere: Disconnecting the SINUMERIK control system from MindSphere (Page 72)

3.8.2 Deactivating use of SINUMERIK Integrate

Procedure

1. Press the "SINUMERIK Integrate" softkey.
   The "SINUMERIK Integrate" welcome window opens.
2. Press the "Settings" softkey.
   The "Settings" window opens displaying the system status "Use ACTIVATED".
   – Press the "Deactivate use" softkey.



3. You obtain the confirmation prompt "Do you really want to deactivate the use of the SINUMERIK Integrate applications?".
   – Press the "OK" softkey to confirm the prompt.
   The use of SINUMERIK Integrate applications is deactivated.

3.8.3 Disconnecting the SINUMERIK control system from MindSphere

Using the MindSphere application "Asset Manager", disconnect the SINUMERIK control systems from MindSphere.

References

Additional information on this is provided in the MindSphere System Manual:

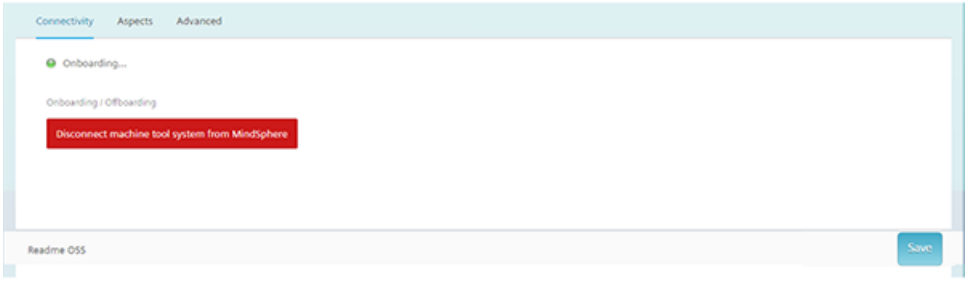
- Chapter: Roles within MindSphere
- Chapter: Configuring assets

Requirement

You require the "MindAccess User" role in MindSphere to do this.

Procedure

1. Click the "Asset Manager" MindSphere application, and select the required asset in the left-hand side of the window.
2. Click the "MTA Asset Config" icon in the right-hand side of the window.
3. Under the "Connectivity" tab, you can see the connection status, e.g. "Onboarding...".
   - Click the "Disconnect machine tool from MindSphere" button to disconnect the asset from MindSphere.
   - Click "Save" to save the setting.



Note

After MindSphere and the machine tool have been disconnected, we recommend deleting the following files from your SINUMERIK control system:

- All files in the "boot_job" folder
- All files in the "cache" folder
- All files in the "service_job" folder

Setting up MindConnect Nano for Manage MyMachines

4

4.1 Overview

Note

Using the defense-in-depth concept

To protect industrial plants and systems comprehensively against cyber attacks, measures must be applied simultaneously at all levels. From the operational level up to the field level – from access control to copy protection. Therefore, apply the "Defense-in-depth" protection concept to avoid security risks in your environment before setting up the OPC UA server.

Note that, in particular, the company network must not be connected to the Internet without suitable protective measures.

Further information on the defense-in-depth concept, protective measures and general Industrial Security can be found in the Industrial Security Configuration Manual (https://support.industry.siemens.com/cs/ww/en/view/108862708).

Requirement

The setup is always performed with the SINUMERIK Operate operating software.

Software option

You require the following option in order to use this function: SINUMERIK Integrate for Engineering "Access MyMachine / OPC UA".

Introduction

The following steps are required to set up MindConnect Nano:

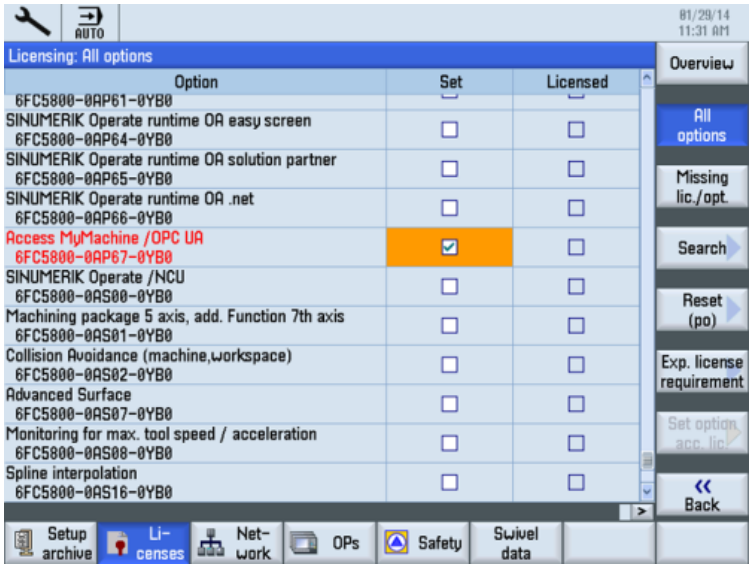
1. For example, at the SINUMERIK control system, activate the "Access MyMachine / OPC UA" software option.
2. For example, at the SINUMERIK control system, configure the network.
3. In MindSphere, create Aspects.
4. In MindSphere, create Asset type.
5. In MindSphere, create Asset.
6. In MindSphere, assign variable.
7. In MindSphere Onboarding.
8. In MindSphere, capture data.

4.2 Setting up at the control system

4.2.1 Setting the license

Procedure

1. Open the "Setup" operating area.
2. Press the "Licenses" softkey and activate the "Access MyMachine / OPC UA" option.



3. Restart SINUMERIK Operate to activate the license.

4.2.2 Configuring the network

Requirement

Settings of the OPC UA configuration dialog

Setting	Description
IP address	The IPv4 address of the target system. This is determined automatically. Check the following: • NCU and PCU: -X130 • PCU 50: Local Area Connection 2
Port	TCP port via which the OPC UA communicates. This is added to the firewall exceptions for NCU and PPU. (Standard for the OPC UA communication is the TCP port 4840)
Admin User	Name of the administrator with which you can add or delete other users and assign or delete user rights.

Setting	Description
Password	Administrator password You can change the password at a later point in time using the "ChangeMyPassword" OPC UA method.
Activate OPC UA	Activate the checkbox to activate OPC UA.

Note

Security risk through no or weak encryption

If no message encryption has been set up to the client, there is a risk of data manipulation. It is therefore strongly recommended that you set up a message encryption to the client.

Use the highest possible encryption standard (256 bit) to ensure secure message transmission.

Note

Assigning secure passwords

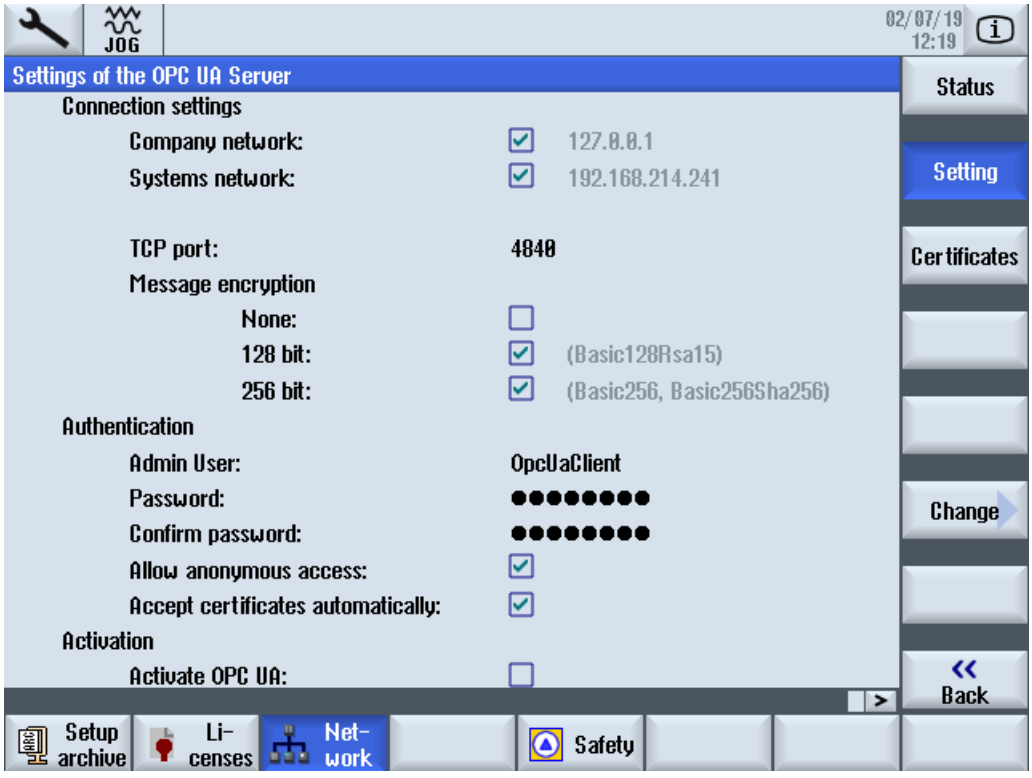
Observe the following rules when creating new passwords:

- Note that when assigning new passwords you should never assign passwords that can be easily guessed, such as simple words, easy to guess key sequences on the keyboard, etc.
- Passwords must always contain a combination of upper- and lower-case letters as well as numbers and special characters. Passwords must comprise at least 8 characters. PINs must comprise an arbitrary sequence of digits.
- Wherever possible and where it is supported by the IT systems and the software, a password must always have a character sequence as complex as possible.

Procedure

1. Open the "Setup" operating area.
2. Press the "Network" softkey.
3. Make the required settings for the connection, authentication and activation.

4. Press the "OK" softkey.



5. Perform a hardware reset on the NCU and PPU target systems.
   Restart the operating software on the PCU.

References

You can find a detailed description here: Access MyMachine / OPC UA Commissioning Manual.

4.3 Configuring Manage MyMachine functions in MindSphere

Configure the MindConnect Nano Aspects so that these can be displayed on the MMM dashboard.

Reference

A detailed description of the Asset Manager can be found at the following link: MindSphere documentation (https://documentation.mindsphere.io/index.html#/kiosk/de), "Asset Manager" System Manual.

Variable/data point

Use the variables/data points with exactly this name:

Name	Data type	Unit	Max. length	Data point address (SINUMERIK example address)
Feedoverride	Double	%		ns=2;s=/Channel/State/feedRateIpoOvr[u1]
Opmode	Double	%		ns=2;s=/Bag/State/opMode[u1]
Spindleoverride	Double	%		ns=2;s=/Channel/Spindle/speedOvr[u1,1]
NCProgramStatus	Double	%		ns=2;s=/Channel/State/progStatus
StopCond	Double	%		ns=2;s=/Channel/State/stopCond[u1]
ProtectionLevel	Double	%		ns=2;s=/Nck/Configuration/accessLevel
NrOfAlarms	Double	%		ns=2;s=/Nck/State/numAlarms
NCProgram	String	%	255	ns=2;s=/Channel/ProgramPointer/progName[u1,1]
CurrentAlarms	Double	%		ns=2;s=/current

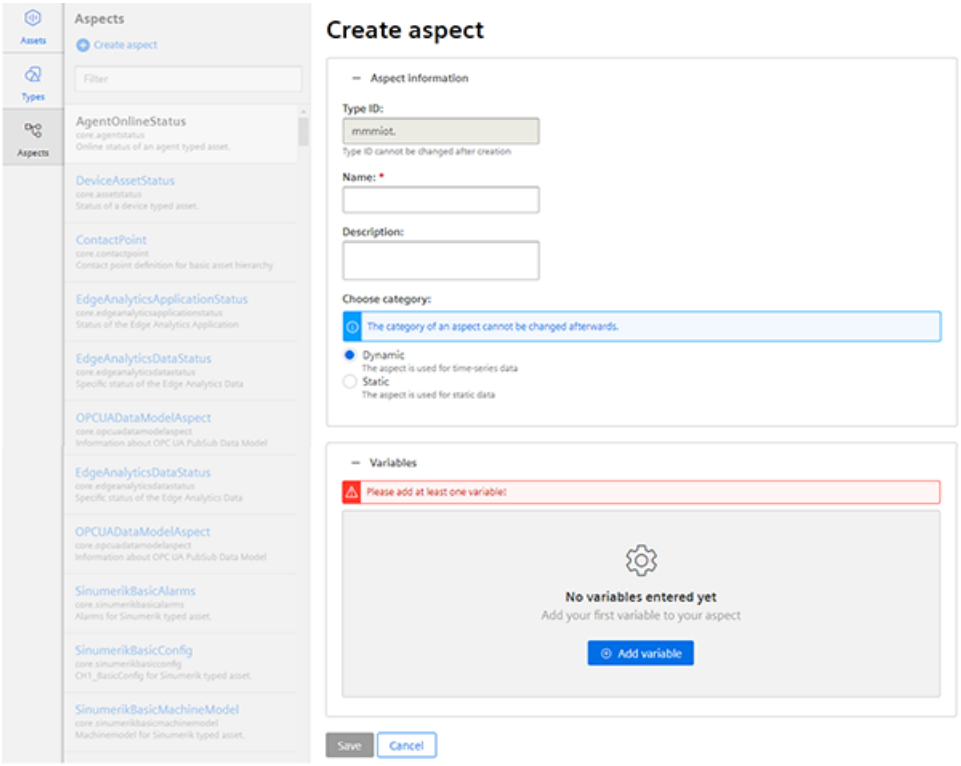
Note

Unit designation for variables

The variables listed above always require a unit. The unit can either be % or a space.

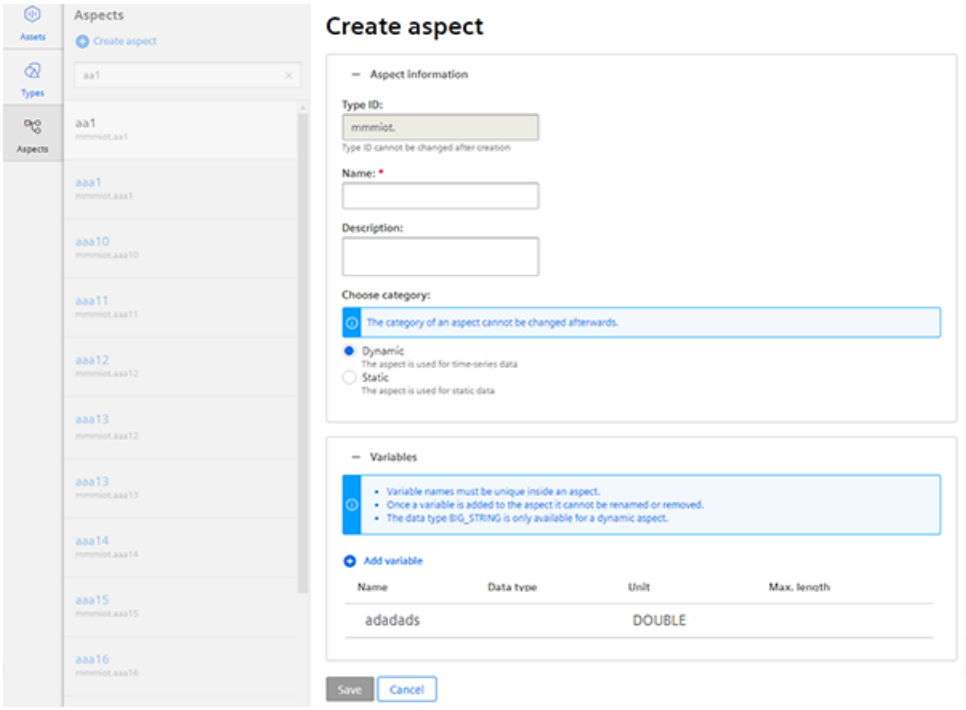
Procedure

1. In MindSphere, open "Asset Manager" and select "Aspects" in the left-hand side of the window.
   The following window is displayed if you have still not created any variables:

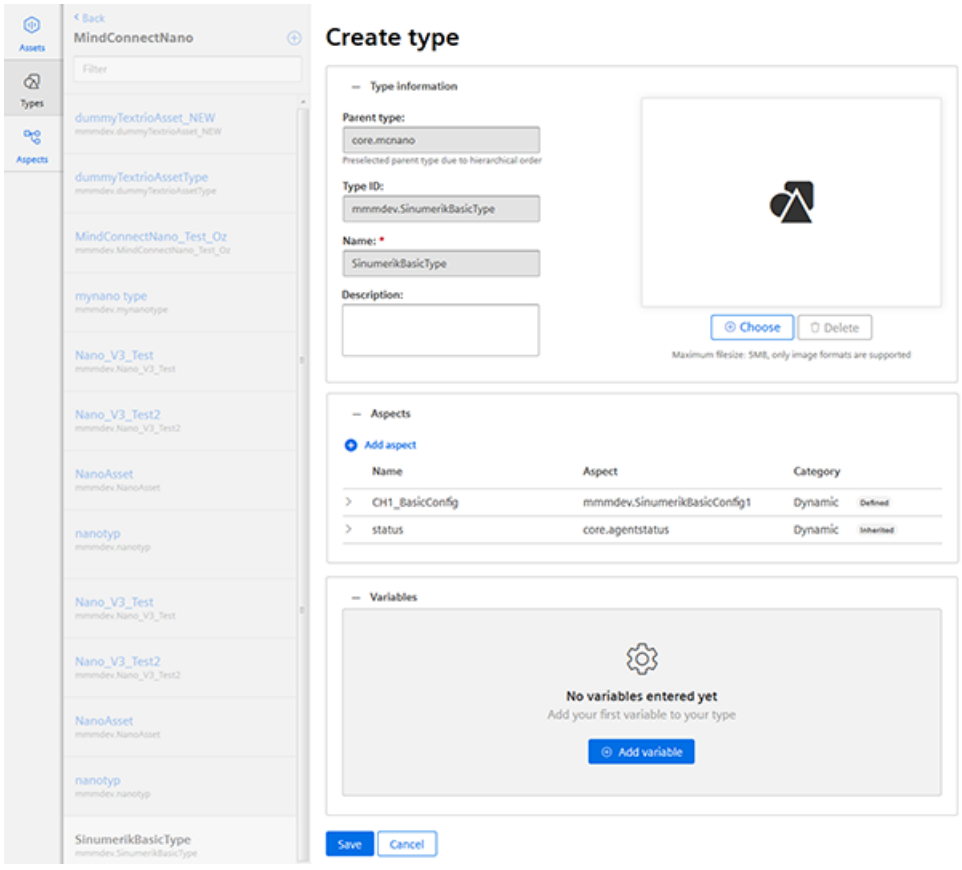


   Additional information on creating variables is provided in Chapter: Configuring a variable (Page 61).

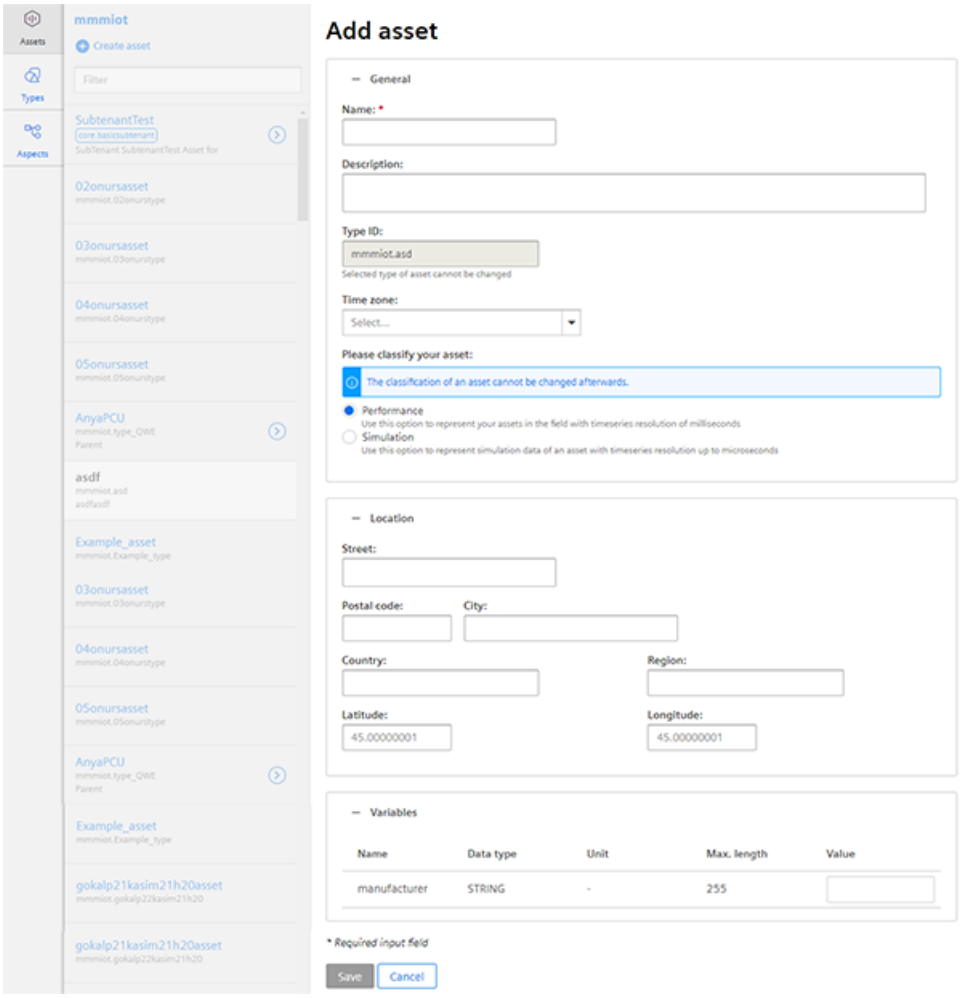
2. Create the new Aspect "SinumerikBasicConfig" in the "Dynamic" category with the variables listed, **without** specifying the data point address.


Assets
Types
Aspects
Aspects
Create aspect
aa1
aa1
mmmiot.aa1
aaa1
mmmiot.aaa1
aaa10
mmmiot.aaa10
aaa11
mmmiot.aaa11
aaa12
mmmiot.aaa12
aaa13
mmmiot.aaa12
aaa13
mmmiot.aaa13
aaa14
mmmiot.aaa14
aaa15
mmmiot.aaa15
aaa16
mmmiot.aaa16
Create aspect
Aspect information
Type ID:
mmmiot.
Type ID cannot be changed after creation
Name: *
Description:
Choose category:
The category of an aspect cannot be changed afterwards.
Dynamic
The aspect is used for time-series data
Static
The aspect is used for static data
Variables
Variable names must be unique inside an aspect.
Once a variable is added to the aspect it cannot be renamed or removed.
The data type BIG_STRING is only available for a dynamic aspect.
Add variable
Name
Data type
Unit
Max. length
adadads
DOUBLE
Save
Cancel

3. Create a new Type under "Types" > "Basic Agent" > "MindConnect Nano" with the Aspect type "<TenantName>.SinumerikBasicConfig" with the Aspect name "CH1_BasicConfig". You have the option of continuing to define variables in the new Type.



4. Create a new Asset based on the Type previously created.



5. To connect to MindConnect Nano, click on "MindConnect Nano" in the asset.
   Enter the device ID of MindConnect Nano.
6. Configure the MindConnect Nano network settings to the machine and/or MindSphere by clicking on the gear icon.
   Once configuration is complete, click "Download connection key."
   Transfer the connection key to MindConnect Nano via a USB stick.
7. Click "Add new data source" and configure the connection to your OPC UA server.
8. Click "Start edit mode."
   Add new data points, corresponding to the values in the table above, with the data point address (SINUMERIK example address).
9. To establish a relationship between data points and variables, click "Show links."
   To link a data point, click "Link variable".
   Select the appropriate variable in the dialog.

Displaying acquired data in Manage MyMachines 5

5.1 Overview

Introduction

"Manage MyMachines" visualizes numerous operating and system-specific data of machine tools or individual machine components for production, service and maintenance. This increases the transparency of the machine tools connected in MindSphere.

The following functions are possible:

- Administration and display of machines distributed around the world
- Visualization of relevant information in the overview page
- Intuitive creation of rules and queries
- Simple installation using the integrated SINUMERIK Integrate client
- Critical machine data can be combined to provide an informative analysis
- You can create your own digital service portfolio based on the MindSphere application

The data that you provide is exclusively variables from the NC, the PLC or from the drives. This data enables conclusions to be drawn with regard to:

- Availability
- Operating times
- Operating state, state duration
- Maintenance, wait times
- Technical state

The corresponding data is either preconfigured or can be defined centrally by the user and configured with appropriate warning limits. It is also possible to identify trends with the aid of measuring series.

The data processing and visualization is performed on the MindSphere platform.

Overview

"Manage MyMachines" visualizes the data that you have transferred and offers the following:

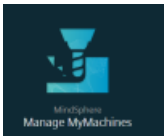
- Display of information about the created asset
  You can find additional information under: MindSphere documentation (https://documentation.mindsphere.io/index.html#/kiosk/en) - Fleet Manager, using extensions
- Overview of the operating data of an asset
  Additional information is provided in Chapter: MMM Dashboard (Page 89)
- Display/logging of previously defined machine events
  Additional information is provided in Chapter: Events (Page 94)

- Export of data points of an Aspect
  Additional information is provided in Chapter: Export (Page 96)
- Create and change rules
  You can find additional information under: MindSphere documentation (https://documentation.mindsphere.io/index.html#/kiosk/en) - Fleet Manager, using extensions
- Analyses based on Aspects defined by the user and critical machine data
  Additional information is provided in Chapter: Aspects (Page 98)
- Filter and display alarms
  Additional information is provided in Chapter: MMM Alarms (Page 103)
- Upload files
  You can find additional information under: MindSphere documentation (https://documentation.mindsphere.io/index.html#/kiosk/en) - Fleet Manager, using extensions

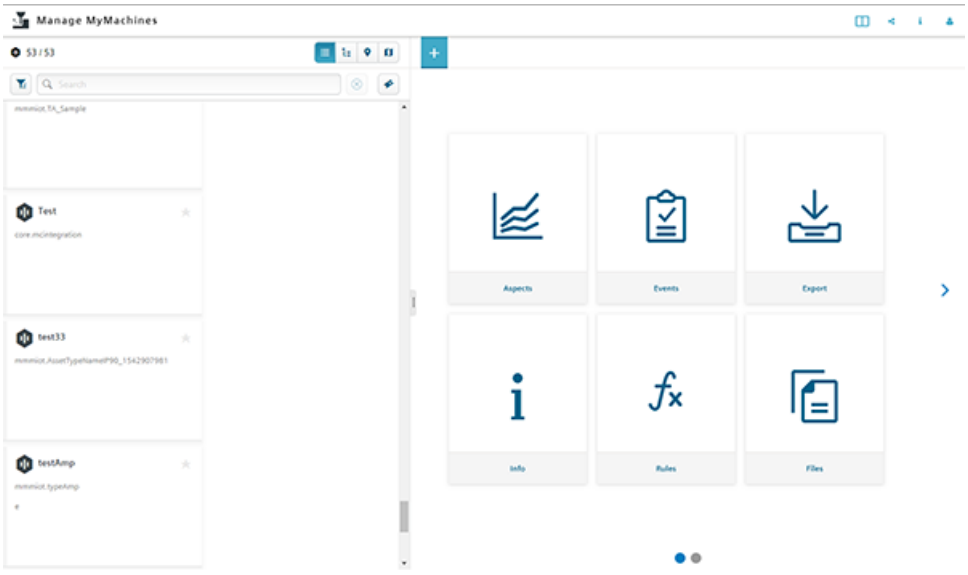
5.2 Opening Manage MyMachines

Procedure

1. Click the "Manage MyMachines" tile.



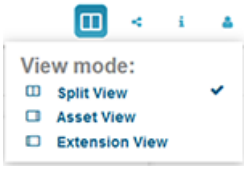
2. The left window area shows the assets already created.
   The individual functions are displayed in the right-hand side of the window.



Select view

You can select the view.

1. Click on the "Actual view mode" symbol at the top right.
   A dialog window opens to set the view.
2. Select the required view.

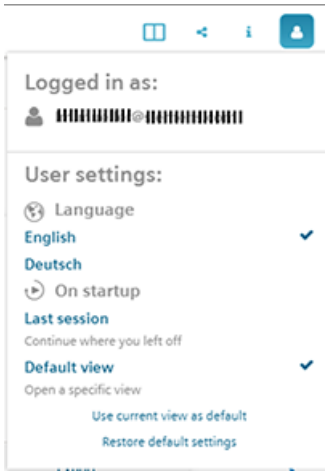


User settings

You can see the registered email address in the user settings.

Your change the following settings using the mouse:

- Language
  - English
  - German
- When starting
  - Last view
  - Standard view



5.3 MMM Dashboard

The "MMM Dashboard" view provides a summary of the SINUMERIK basic configuration and machine availability for the selected machine.

The "MMM dashboard" view is updated every 30 seconds.

Requirement

To obtain the view of the machine overview, the slider must be switched on in the asset for the following data acquisition:

- SINUMERIK basic configuration
- Machine availability

To see how you activate data acquisition, read in Chapter: Activating the data acquisition (Page 58).

Note

No data display

If no data is displayed to you, switch the slider "OFF" and then "ON" again to reload the data.

Parameters

Selection/display	Description
UTC	Select the time difference between the machine location and the location of the user from the drop-down list.
Diagram	Select the time period of all diagrams in the view from the drop-down list: • Last hour • Last 30 minutes • Last 4 hours • Last 8 hours • Last 24 hours • Today • Last 48 hours
Connection status	Displays the connection status of the machine tool: • Online since: Date and time • Offline since: Date and time

Displaying machine data

Parameters	Description
Connection status	Displays the connection states: • Online • Offline
Feed override	Displays the last value of the feed override in percent.

Parameters	Description		
Spindle override	Displays the last value of the spindle override in percent.		
NC program status	Displays the last value of the NC program status:		You can display the chronological history as a block diagram or pie chart in the right-hand side of the window.
	• Interrupted	The NC program has been suspended and will be restarted by the operator.	
	• Stopped	The NC program has been stopped and will be exited by the operator.	
	• Running	The NC program is currently running.	
	• Waiting	The NC program is waiting. For example, the program is waiting for the execution of an NC program in a different channel or the operator is changing a tool.	
	• Cancelled	The NC program has been cancelled by the operator on the machine.	
Operating mode	Displays the last value of the machine tool operating modes: • MDA • JOG • AUTO • Machine off		You can display the chronological history as a block diagram or pie chart in the right-hand side of the window.
Access protection level	The access to functions and data areas is controlled via the access rights. Access levels 0 to 7 are available, where 0 represents the highest level and 7 the lowest level. Access levels 0 to 3 are locked via a password and access levels 4 to 7 via a keyswitch. • 1 = Password - Machine manufacturer: Development • 2 = Password - Machine manufacturer: Commissioning engineer • 3 = Password - End user Service • 4 = Keyswitch position 3 - Programmer, machine setter • 5 = Keyswitch position 2 - Qualified operator • 6 = Keyswitch position 1 - Trained operator • 7 = Keyswitch position 0 - Trainee operator		
Alarms pending	Displays the number of pending alarms.		You can display the pending alarms with the following information in the right-hand side of the window: • The icon displays the alarm strength • Time of the event • Alarm ID • Alarm information • Alarm location
Stop condition	Displays the "StopCondition" NC variable which describes the cause of the NC program stop in more detail.		

Parameters	Description	
NC program status	Displays the program currently running: • Machine off • Interrupted • Stopped • Running • Waiting • Cancelled	
Machine status	Displays the last value of the following machine status: • Machine off • No fault • Unknown status • Production • Technical disturbance • Organizational disturbance	You can display the chronological history as a block diagram or pie chart in the right-hand side of the window.
Last value recording	Displays the date and time of the last recording.	

Note

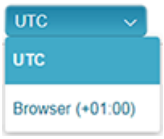
UTC time definition

All variables are displayed with a UTC time stamp.

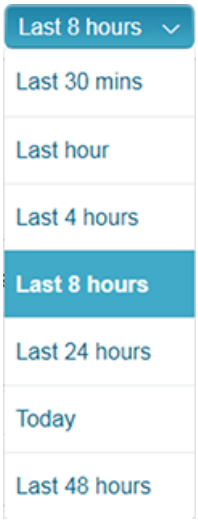
Procedure

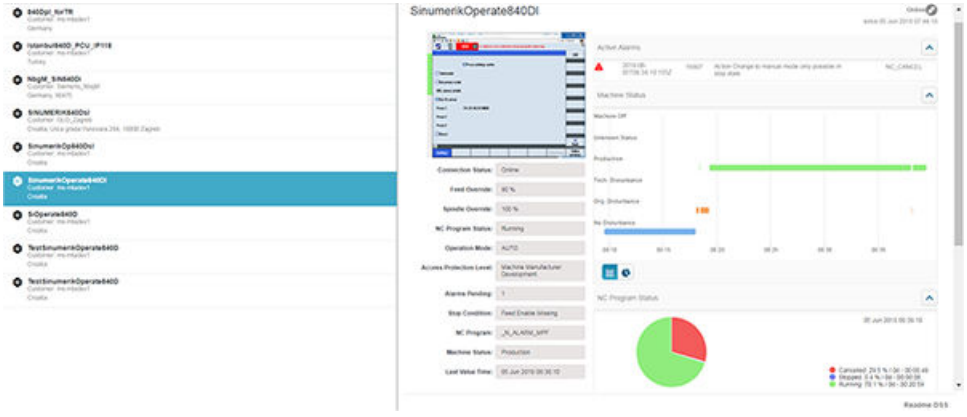
1. The required asset has been selected in the left-hand side of the window.
2. Click "+".
   The available extensions are displayed.
3. Click the "MMM Dashboard" function.
   The data is displayed.

4. If required, set the time difference in the "UTC" drop-down list.



5. Select the required period from the drop-down list.





Switching between full-screen mode and display

If you click the "Full-screen mode" icon, the left-hand side of the window is hidden and only the "MMM Dashboard" is shown on the screen.

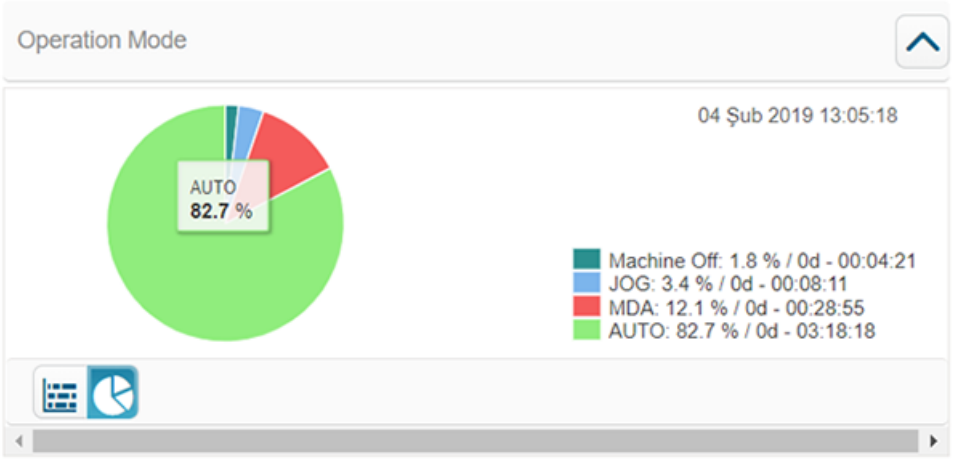
You can also view the following values more closely:

- Alarms pending
- Machine status
- NC program status
- Operating mode

Procedure

1. Click "Arrow" to open the view, e.g. operating mode.
2. Click the "Block diagram" icon to view the history of the operating modes.

3. Click the "Pie chart" icon to change the display.



5.4 Events

With events you log all machine incidents based on your predefined rules.

You can create purely manual event as well as events for the regular acquisition of measured quantities with measuring series.

All events are displayed in an overview and you can influence the view through different filter criteria.

You can also assign a specific status to the event.

You can monitor the variables based on your predefined rules. If an alarm is triggered on SINUMERIK, you will receive an e-mail. To configure this function, you must set up the following:

- Define the alarm-based triggers
- Define the rules for affected alarms with the correct e-mail address

References

How to create an event is described in the following documentation: MindSphere - Getting Started Adjustments, Section: Configure Events

Requirement

Events are already available.

Filter & sort

The following filter and sorting options are available.

Filter option	Further sorting
Status	The following selection is offered: • Open • In progress • Closed
Priority	The following selection is offered: • Urgent • Important • Information
Sorting	The following selection is offered: • None (latest events) • Oldest events

Procedure

1. The required asset has been selected in the left-hand side of the window.
2. Click "+".
   The available extensions are displayed.
3. Click the "Events" function.
   The data is displayed.
4. Reduce the display through specific filtering.
   Click the "Filter & sort +" button to limit the display of the events.
   The "Filter & sort" window opens.
   - Activate the corresponding criteria option button:
   - Click the "Close" button to close the window.
5. Activate the checkbox of an event and mark the event accordingly:
   - Click the "In progress" button if the machining has not been completed.
   - Click the "Closed" button if the machining has been completed.

5.5 Export

You can export data points of an aspect.

You can export data of a specific period and select between two export methods.

Note

Configuring the target directory for the download

The exported data is stored in several files depending on the data volume.

Make sure that a target directory for the download has been configured in your browser.

Parameters

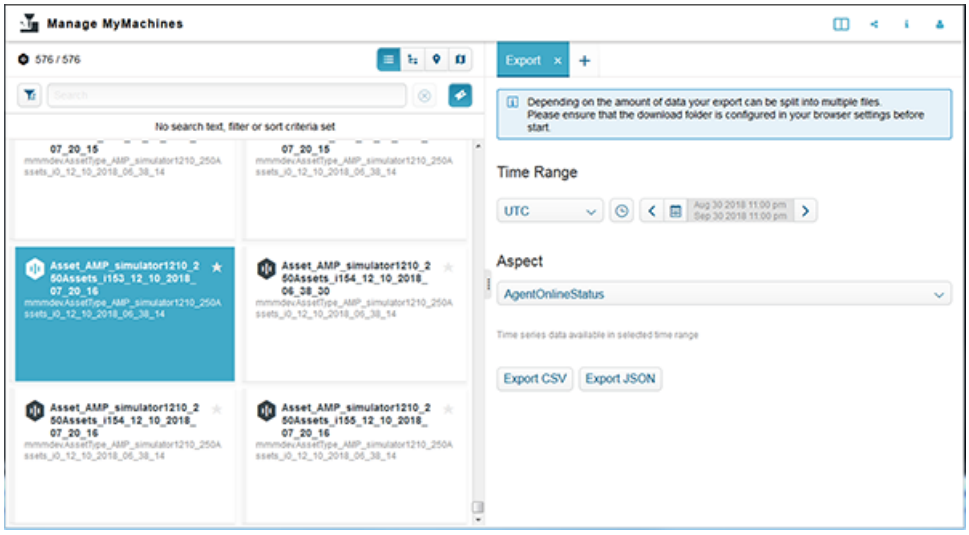
The following export parameters are available.

Parameters	Description
Interval	Select the desired period via the calendar function. - AND / OR - Select the desired period from the drop-down list: • Day • Week • Month • Quarter • Year • 0 <days> All data is exported in UTC.
Export CSV	Data export in CSV format
Export JSON	Data export in JSON format

Procedure

1. The required asset has been selected in the left-hand side of the window.
2. Click "+".
   The available extensions are displayed.
3. Click the "Export" function.
4. Select the desired period.

5. Select the desired aspect from the drop-down list.
6. Click the button of the desired export.
   The export is started. The exported data is stored in several files depending on the data volume.



5.6 Aspects

User-defined aspects combine your selected data for a meaningful analysis.

All aspects are displayed in an overview. You can influence the view through different filter criteria.

For the individual parameters of an asset, you can create queries manually or controlled by variables.

Requirement

To activate the data acquisition, the slider must be switched on in the asset.
Additional information is provided in Chapter: Activating the data acquisition (Page 58)

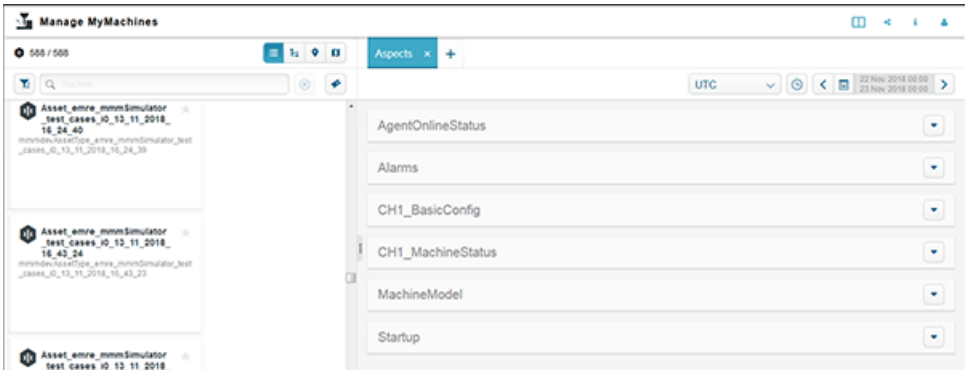
Parameters

Parameters	Description	
CH1_BasicConfig	SINUMERIK basic configuration When "%" is selected, the following data is acquired: • Feed override • Spindle override When "None" is selected, the following data is acquired: • NCProgramStatus • Opmode • ProtectionLevel • NrOfAlarms • StopCond When the pie chart is selected, the following data is acquired: • NC program status	
CH1_MachineStatus	Machine status The machine status is displayed numerically:	
	0	Unknown status
	1	Production
	2	Technical disturbance
	3	Organizational disturbance
	4	No fault
	-1	Machine off
MindConnect status	Connection status	

Parameters	Description
Additional parameters ...	You can set up additional parameters individually, e.g. x_axis.
Period	Select the desired period via the calendar function. - AND / OR - Select the desired period from the drop-down list: • Day • Week • Month • Quarter • Year • 0 <days> All data points are displayed in UTC.

Procedure

1. The required asset has been selected in the left-hand side of the window.
2. Click "+".
   The available extensions are displayed.
3. Click the "Aspects" function.
   The data is displayed.
4. Select the desired period.
5. Click the ▽ button on the right to display the data recording.



Switching the display

1. Click the button on the right to open the view, e.g. CH1_BasisConfig.
   The data is displayed in a coordinate system, i.e. in a line chart.
   Select the unit from the drop-down list, e.g. "%". The data from Feed override and Spindle override is displayed.
2. Select the unit, e.g. "None", from the drop-down list to display the data that does not have any unit.
3. Click the "Pie chart" icon to view the history of the NC program in the pie display.

You can create a manual or an automatic request using the icons in the right-hand side of the window.

References

How to create a query is described in the following documentation: MindSphere - Getting Started Adjustments, Section: Configure requests

5.7 MMM Overview

The "MMM Overview" view shows you information about already created assets.

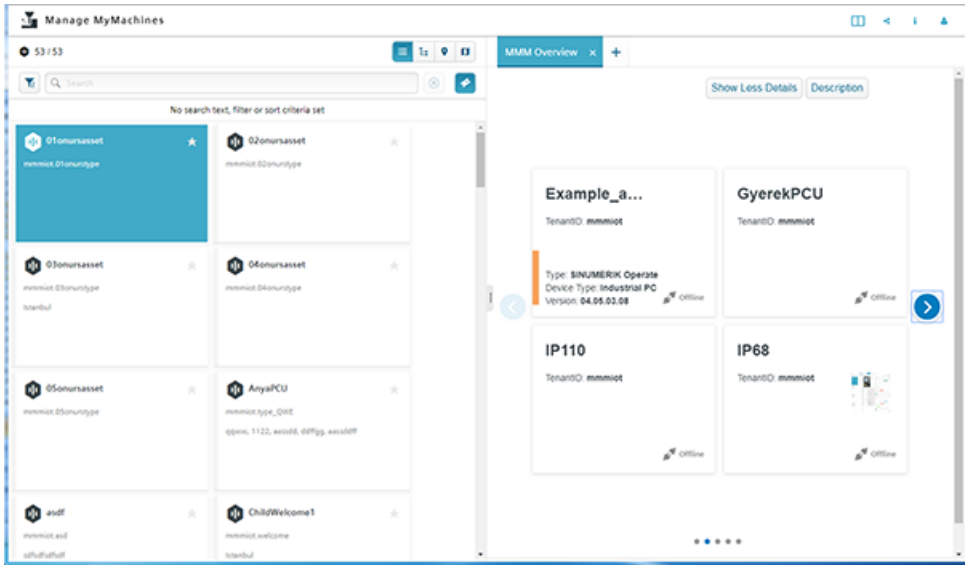
Information

Information	Description
Asset name	Displays the machine name and customer
Location and floor	Displays the location of the machine: City and floor
Version	Displays the version of the operating software.
Type	Displays the operating software: • HMI-Advanced • SINUMERIK Operate • HMI Base
Device type	Displays the device type: • Industrial PC • PCU 50 • NCU
Status	Displays the connection status: • Online • Offline

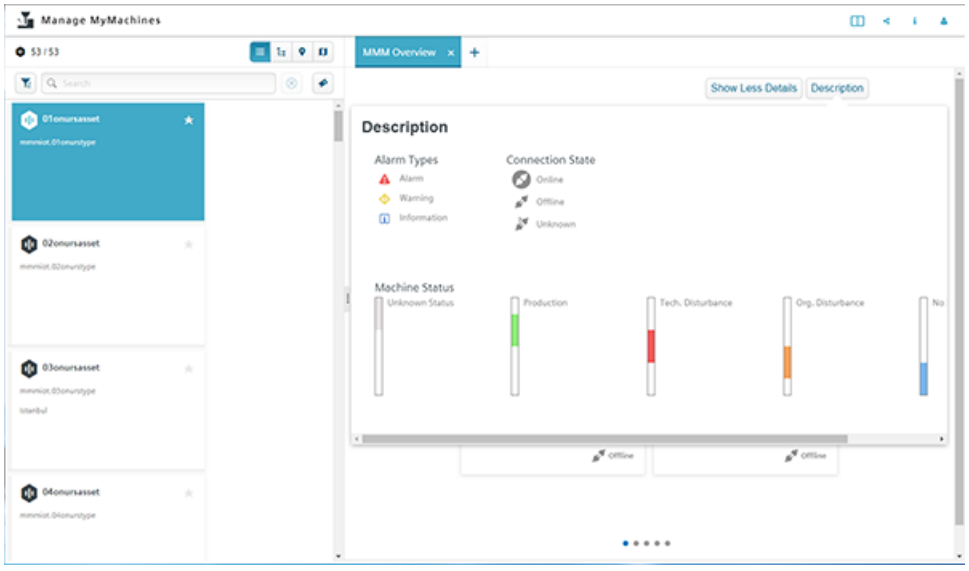
Procedure

1. Click "Manage MyMachines".
2. Select the created asset in the left-hand side of the window.
3. Click "+".
   The available extensions are displayed.

4. Click on the "MMM Overview" function to open the overview.



5. Click the "Description" button to display detailed information about a specific asset.



6. Click on the "Show less Details" button to hide the information.

5.8 MMM Alarms

5.8.1 Displaying alarms

You can display specific alarms using the "MMM Alarms" function.

Procedure

1. Click "Manage MyMachines".
2. Select the created asset in the left-hand side of the window.
3. Click "+".
   The available extensions are displayed.
4. Click on the "MMM Alarms" function to open the alarm page.
   You have various options for displaying alarms.
   Additional information is provided in Chapter: Filtering and displaying alarms (Page 103)

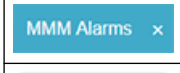
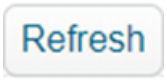
5.8.2 Filtering and displaying alarms

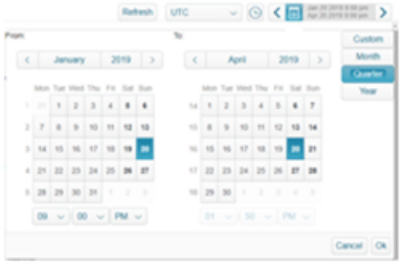
The alarms can be displayed in various filter views:

- Selection of alarms using buttons
- Displaying alarms in machine lists
- Displaying alarms in diagrams
- Displaying alarms in lists

Button

The buttons and icons allow you a specific selection of alarms that are to be displayed.

Button	Description
	If the "MMM Alarms" button is active, the button is displayed in the upper section of the window.
	You update the data that is located in the time interval by pressing the "Refresh" button.

Button	Description
	Define the time difference between the machine location and the location of the user. The "UTC" setting is selected as standard.
Interval	Select the desired time period via the calendar function with start date "From" and end date "To". - AND / OR - Select the desired period from the drop-down list: • Custom • Month • Quarter • Year 

Asset list

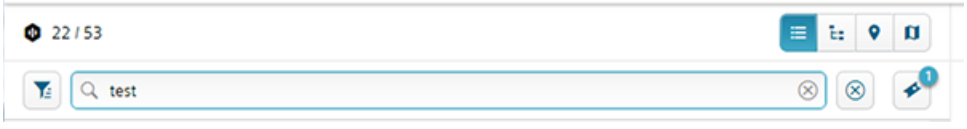
If you want the alarms to be displayed for specific machines, select the assets using the Asset Navigation.

The navigation offers the following possibilities:

- Search for, filter and sort assets
- Select assets via the map view on the world map

Search for, filter and sort assets

If the name of the asset is known, enter the name directly into the "Search" entry field.



If you want to filter and sort in accordance with various criteria, click on the "Filter & Sort" icon, and click on the appropriate list entry.

Click on the "List" button to obtain a display of all assets on the same level.

Click on the "Hierarchy" button to obtain a display of the assets with the following structure:

- Customer
- Area, e.g. floor plan
- Asset

Click on the "Map view" button to view the locations of your assets on the world map. You can zoom in or out of the map view using the "+" and "-" buttons.

Refer to the following manual to obtain additional information regarding selection of a machine: Fleet Manager System Manual.

Alarm display

Alarm diagrams

You can see the alarm results in 3 different pie charts in the upper section of the window on the right-hand side.

Alarm display	Description
Occurrence of an alarm	Indicates the frequency of the alarms within a defined period in a pie chart. All alarms have individual alarm identifiers which are indicated by different colors. In addition to the pie chart, the alarm identifiers and their frequency are indicated by way of a color code.
Alarm duration	Indicates the duration of the alarms within the defined period in a pie chart. In addition to the pie chart, the alarm identifier, as well as duration of the alarm is specified as a percentage, and in days, hours, minutes and seconds.
Machines	Shows the machines for which the alarm was activated within a defined time period. Each machine is identified here with its own individual color. In addition to the pie chart, the machines and the frequency of the activated alarms are indicated.

Note
Alarm display

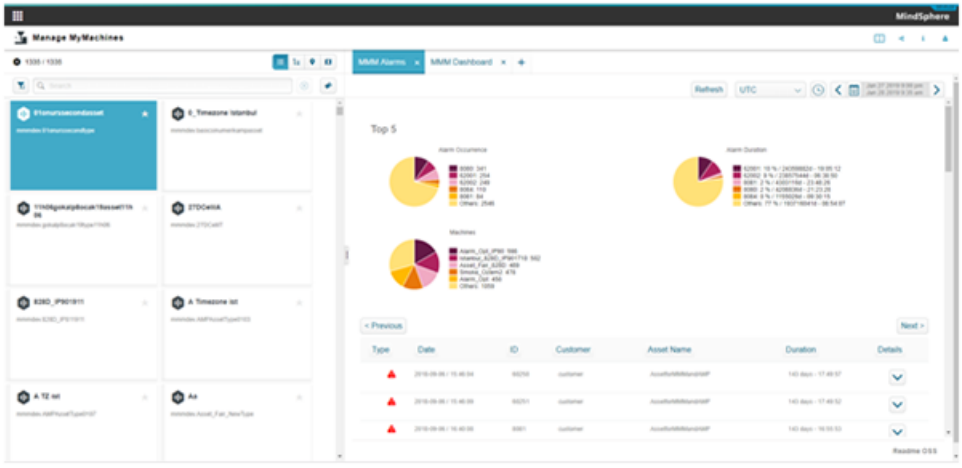
Only 5 of the alarms activated most regularly are displayed.

All other alarms are indicated under "Other".

Alarm list

The list of alarms is shown below the diagrams.
50 alarms are displayed; if the alarm list is longer, then click on the "Next" button.

Parameters	Description	
Type	Shows the following icons:	
		Notice
		Note
Date	Shows the date and time of the alarm	
ID	Displays the alarm identifier	
Customer	Shows the customer name	
Asset name	Shows the asset name of the machine	
Duration	Displays the time duration in days, hours, minutes and seconds	
Details 	Additional information may be obtained with this icon: • Alarm text • Machine type • Sender • Type	
Buttons		
	Displays the following alarms	
	Displays the previous alarms	



Appendix

A

A.1 List of abbreviations

Admin	Administrator (user role)
CNC	Computerized Numerical Control
COM	Communication
DIR	Directory
FAQ	Frequently Asked Questions
h	Hour
HTTP	Hypertext Transfer Protocol
HTTPS	HyperText Transfer Protocol Secure
IB	Commissioning engineer (user role)
ID	Identification number
IE	Internet Explorer
IFC	Interface Client
IoT	Internet of Things
KPI	Key Performance Indicator
MB	Megabyte
MLFB	Machine-Readable Product Code
MMM	Manage MyMachines
MSTT	Machine control panel
NC	Numerical Control
NCU	Numerical Control Unit, NC hardware unit
OEE	Overall Equipment Efficiency
OEM	Original Equipment Manufacturer
OP	Operation Panel
OSS	Open Source Software
PC	Personal Computer
PCU	PC Unit, computing unit
PLC	Programmable Logic Control: PLC
SI	SINUMERIK Integrate
SK	Softkey
SW	Software
URL	Uniform Resource Locator
UTC	Universal Time Coordinated, coordinated global time

Glossary

Aspects

Aspects or variable sets are a group of the same data points / variables and describe the context of the imported data, e.g. wear.

Asset

For MindSphere, an asset is each connected element that provides data. This can be a machine or an individual component. In conjunction with this documentation, an "asset" is a machine tool with SINUMERIK 840D sl.

Asset Manager

The "Asset Manager" is a MindSphere application. The assets of a machine are created and configured in the "Asset Manager". The application is also used for the management of customers, users and shop floors.

Data points or variables

For "Manage MyMachines", data points or variables are all the values that can be acquired from the NC, the PLC and from the drives, e.g. sampling rate, temperature, jerk. They must be defined and configured in the asset configuration as data points. The data is combined into aspects. The captured values are then displayed as time series in "Manage MyMachines" under "Aspects". There are also preconfigured data sets, such as the SINUMERIK basic configuration and the machine availability. Details can be found in the relevant sections.

MindSphere - Industrial IoT ecosystem from Siemens

MindSphere – the open cloud platform from Siemens – is the core component of a high-performance IoT operating system. It offers data analysis, comprehensive connectivity, tools for developers, applications and services. MindSphere supports you in the analysis and utilization of your data in order to obtain new insights. In this way, you can optimize your resources for maximum availability.

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