

SINUMERIK

MindSphere application Analyze MyPerformance /OEE Monitor, Analyze MyPerformance / OEE Tuning

Function Manual

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Valid for control systems:

SINUMERIK 840D sl/ 840DE sl

SINUMERIK 828D

Software

Analyze MyPerformance /OEE Monitor, Version 01.02.02.00

Analyze MyPerformance /OEE Tuning, Version 01.00.02.00

01/2020

A5E45609856B AE

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.

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 on the Internet at the following address (<https://support.industry.siemens.com/sc/ww/en/sc/2090>) in the "Contact" area.

If you have any technical questions, use the online form in the "Support Request" area.

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Fundamental safety instructions

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 Security information

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. Siemens' products and solutions 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. firewalls and/or network segmentation) are in place.

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

<https://www.siemens.com/industrialsecurity> (<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 are available and that 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 under

<https://www.siemens.com/industrialsecurity> (<https://new.siemens.com/global/en/products/services/cert.html#Subscriptions>).

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

2.1 Overview

This document describes the following:

How you connect MindSphere to the SINUMERIK control system (machine tool).

Further information can be found at: Setting up the SINUMERIK control system for Analyze MyPerformance (Page 17).

The functionality of the MindSphere application "Analyze MyPerformance /OEE Monitor".

Further information can be found at: Working with Analyze MyPerformance /OEE Monitor, Analyze MyPerformance /OEE Tuning (Page 87).

The functionality of the MindSphere application "Analyze MyPerformance /OEE Tuning".

Further information can be found at: Analyze MyPerformance /OEE Tuning - Configuration (Page 109).

MindSphere

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

Several MindSphere-based applications, known as the MindSphere applications, are available.

MindSphere application	Description
Asset Manager	<p>Connect your tool machine (asset) with the MindSphere in the "Asset Manager" and configure the data acquisition.</p> <p>Further information can be found in the Chapter: Asset Manager (Page 53).</p> <p>Further information about the Asset Manager can be found in the MindSphere System Manual.</p>
Analyze MyPerformance /OEE Monitor	<p>Use Analyze MyPerformance /OEE Monitor to visualize, monitor and analyze the performance of all your machine tools which are connected to MindSphere.</p> <p>Further information can be found in the Chapter: Working with Analyze MyPerformance /OEE Monitor, Analyze MyPerformance /OEE Tuning (Page 87).</p>
Analyze MyPerformance /OEE Tuning	<p>Use Analyze MyPerformance /OEE Tuning to adjust the representation and visualization of all machine tools connected to MindSphere:</p> <ul style="list-style-type: none"> • Performance monitoring • Job planning • Quality monitoring <p>Further information can be found in the Chapter: Analyze MyPerformance /OEE Tuning - Configuration (Page 109).</p>

Further information

Further information about MindSphere applications can be found at: MindSphere documentation (<https://siemens.mindsphere.io/en/docs/mindaccess.html>).

As well as the manuals, you will also find data sheets and FAQs under: MindSphere (<https://support.industry.siemens.com/cs/de/en/view/109742256>).

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
2.0.11	4.5 SP4, HF 1, 2, 3	NCU 730.3 PN	Linux
2.0.12	4.5 SP5, HF 1, 3, 5	PCU 50.5	Windows 7
2.0.13	4.5 SP6, HF 3, 5, 7, 8, 10, 11, 13 14, 15, 16, 17, 18		
2.0.14	4.5 SP4, HF 4	NCU 730.3 PN	Linux
	4.5 SP6, HF 1, 12	PCU 50.5	Windows 7
	4.5 SP6, HF 2		
3.0.11	4.7 SP2, HF 1, 3, 4	NCU 730.3 PN	Linux
3.0.12	4.7 SP3, HF 1, 2, 3, 4	PCU 50.5	Windows 7
3.0.13	4.7 SP4, HF 1, 4, 6		
3.0.14	4.7 SP5, HF 1		
	4.7 SP6, HF 1, 3, 4, 5, 6, 7		
	4.7 SP7, HF 1, 3, 4		
	4.8 SP1, HF 1, 2, 3		
	4.8 SP2, HF 1, 3		
	4.8 SP3, HF 1		
	4.8 SP4, HF 1, 3, 4, 6, 8		
	4.8 SP5, HF 2, 3, 4		
	4.7 SP4, HF 3, 5	NCU 730.3 PN	Linux
	4.7 SP7, HF 2	PCU 50.5	Windows 7
	4.7 SP7, HF 5		
4.0.0	4.91 HF 1	NCU 730.3 PN	Linux
4.0.1	4.92 HF 2, 3	PCU 50.5	Windows 7

SINUMERIK 828D

SINUMERIK Integrate Client software version	Operating software SINUMERIK Operate Version	Hardware version	Operating system
2.0.11 2.0.12 2.0.13 2.0.14	4.5 SP4 4.5 SP5, HF 1, 2 4.5 SP6, HF 1, 2, 3, 4	PPU 281.3 PPU 261.3 PPU 241.4	Linux
3.0.11 3.0.12 3.0.13 3.0.14	4.7 SP2, HF1 4.7 SP3, HF1 4.7 SP4, HF1, 2 4.7 SP5 4.7 SP6, HF1, 2 4.7 SP7 HF1, 3		
3.0.11 3.0.12 3.0.13 3.0.14	4.8 SP4, HF 1, 2, 3 4.8 SP5, HF 3		

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 65.0.3325.18 (64 bit) up to the current version
- Firefox
Version 59.0.2 (64 bit) up to the current version
- Safari for tablets
iOS and Android systems are supported for the current version and 10 inch tablet size

Note

Parallel operation with SINUMERIK Integrate applications is not possible

Security notes

NOTICE

Security standards for SINUMERIK controls connected to MindSphere

The connection of SINUMERIK controls to MindSphere via TLS 1.2 /https meets 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, machines and network. Systems, machines 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: Industrial Security (<https://support.industry.siemens.com/cs/ww/en/view/108862708>).

NOTICE

Data misuse due to an unprotected Internet connection

An unrestricted Internet connection can lead to data misuse, e.g. when transferring the asset data.

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: Industrial 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, operating system patching, etc.) must be implemented on the SINUMERIK controls.

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

Note

Operating PC security

The necessary security measures (e.g. virus scanner, firewalls, operating system patching, etc.) must be implemented on the PCs that are used to visualize and configure MindSphere applications at the OEM or end customer facility.

Further information about PCs in the industrial environment can be found in the Configuration Manual: Industrial 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 contact Siemens Service and Support.

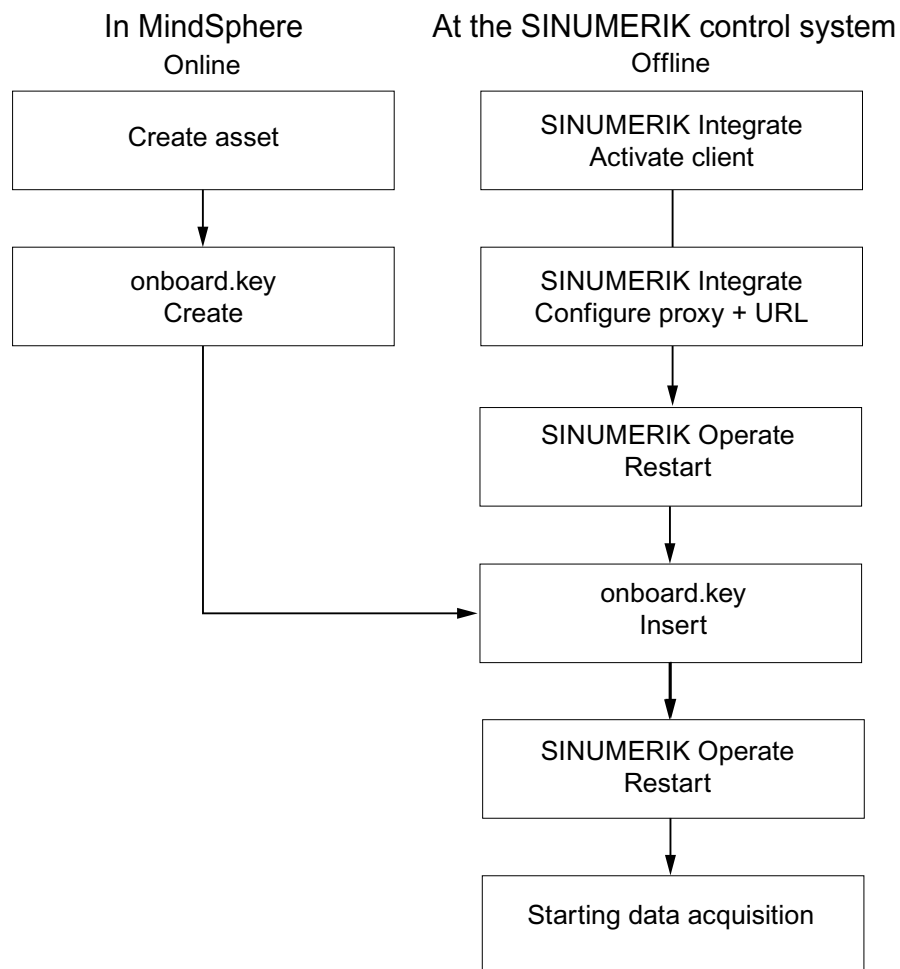
Setting up the SINUMERIK control system for Analyze MyPerformance

3

3.1 Activating the data acquisition

Overview

To use the MindSphere application you must perform various steps in MindSphere and on the SINUMERIK control system itself.



3.1 Activating the data acquisition

Procedure

In MindSphere:

1. Create the desired assets.
Further information can be found at: Asset Manager (Page 53)
Detailed information can be found at: MindSphere - Asset Manager System Manual
2. Create the "onboard.key".
Further information can be found at: Connecting the SINUMERIK control system with MindSphere (Page 59)

At the SINUMERIK control system:

1. Check the installed versions.
Further information can be found at: Displaying version data (Page 20)
 - If an appropriate SINUMERIK Integrate version is not installed, then perform a client update.
Further information can be found at: Client update under Windows (Page 23)
2. Activate the SINUMERIK Integrate client.
Further information can be found at: Activating the SINUMERIK Integrate client (Page 31)
3. Enable the use of SINUMERIK Integrate.
Further information can be found at: Activating use of SINUMERIK Integrate (Page 32)
4. Configure the URL and proxy.
 - On the SINUMERIK 840D sl control system:
Further information can be found at: Configuring the URL and proxy (Page 33)
 - OR -
 - On the SINUMERIK 828D control system:
Further information can be found at: Configuring the URL and proxy (Page 40)
5. Restart SINUMERIK Operate.
6. Insert "onboard.key".
 - On the SINUMERIK 840D sl control system:
Further information can be found at: Install the registration key on a SINUMERIK control system (Page 36)
 - OR -
 - On the SINUMERIK 828D
Further information can be found at: Install the registration key on a SINUMERIK control system (Page 42)
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 13).

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.



SIEMENS SINUMERIK OPERATE 06/11/18 10:36 AM

Version data

SINUMERIK Operate

Version: 04.08.02.00

InternalVersion: 04.08.02.00.038

Name	Actual version	Target version
Basesystem	04.08.02.00	✓
Applications	04.08.02.00	✓
3D graphics	04.08.02.00	✓
Qt	04.08.04.00	✓
ACE/TAO	6.1.2	✓
Autostart	04.08.02.00	✓
Language files	04.05.00.00	✓
Online help	04.05.00.00	✓

Logbook

Details

Save

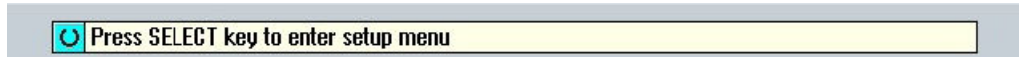
Alarm list Messages Alarm log NC/PLC variab.

Version

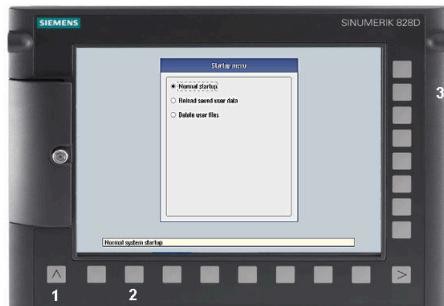
3.2 Checking and updating the versions

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)

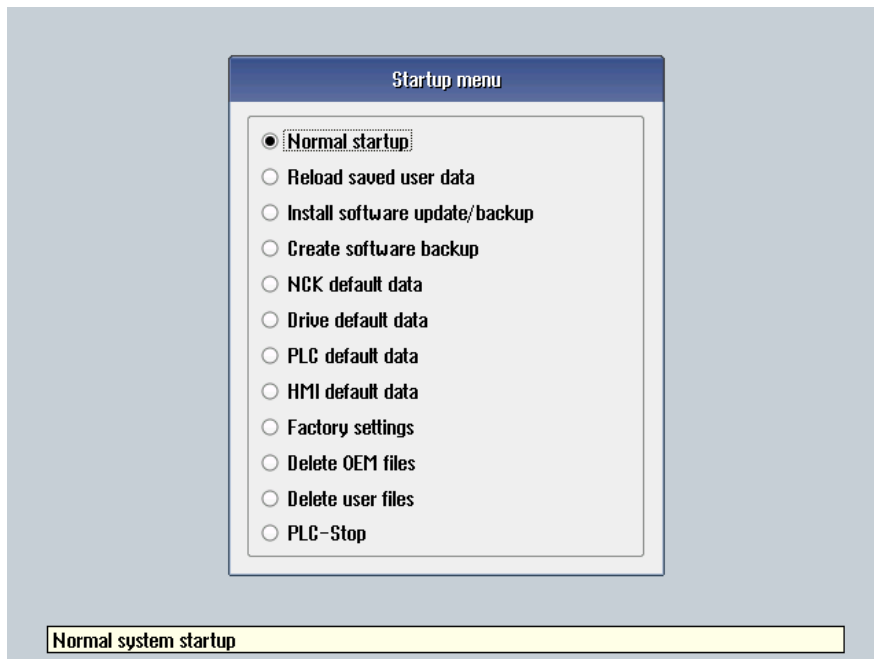


Note

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.

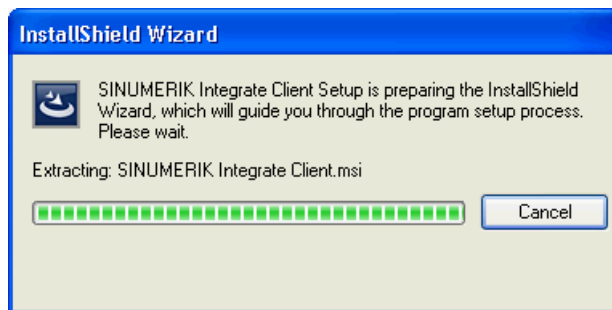
5. The following message is displayed:
"Do you want to install the software update? Either CF card or USB stick must be plugged in".
6. Insert the USB flash drive into the USB interface on the front of the operator panel and click "Yes".
7. Make sure that only individual ".tgz" files are located on the 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.

Additional information on commissioning SINUMERIK 828D can be found in the SINUMERIK 828D Commissioning Manual

3.2.3 Client update under Windows

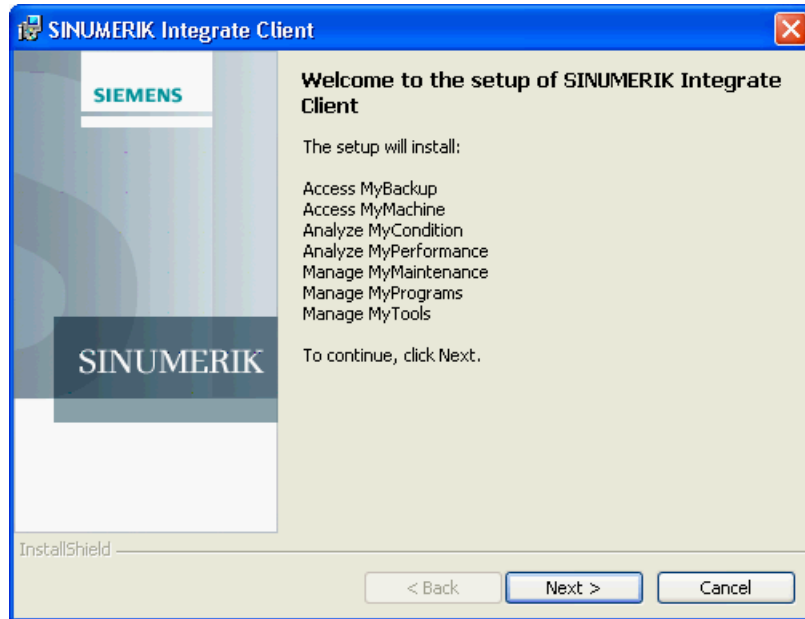
Procedure

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.



3.2 Checking and updating the versions

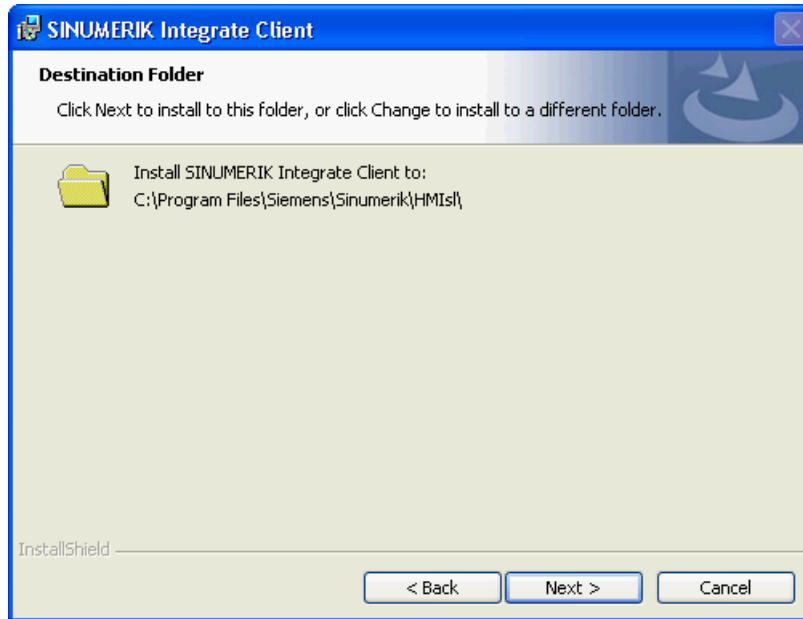
4. The welcome screen opens and shows the applications to which the update applies. Click "Next >" to start the installation preparation.



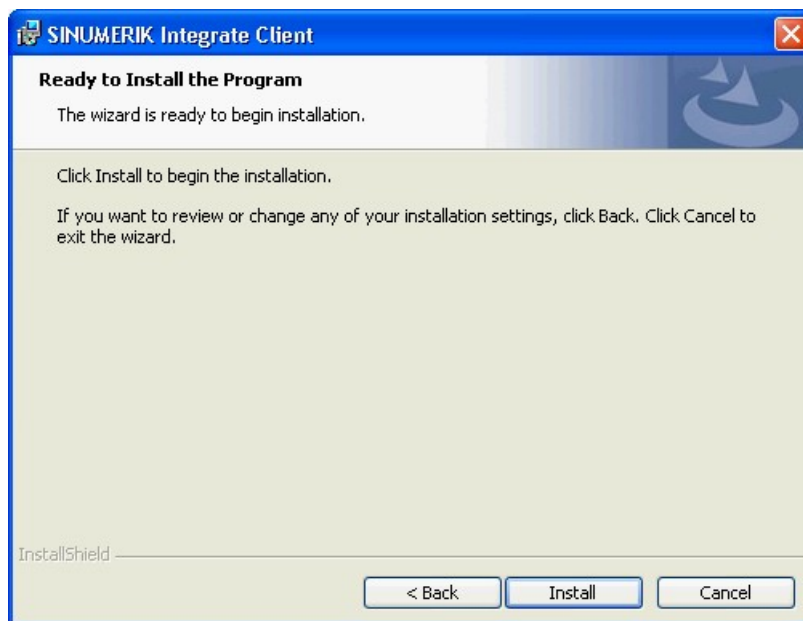
5. The "License Agreement" window opens. Read the license agreement.
 - If you want to print the terms, click "Print."
 - Then activate the "I accept the terms in the license agreement" checkbox and click "Next >".
 - OR –
 - Click "< Back" to return to the previous window.



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

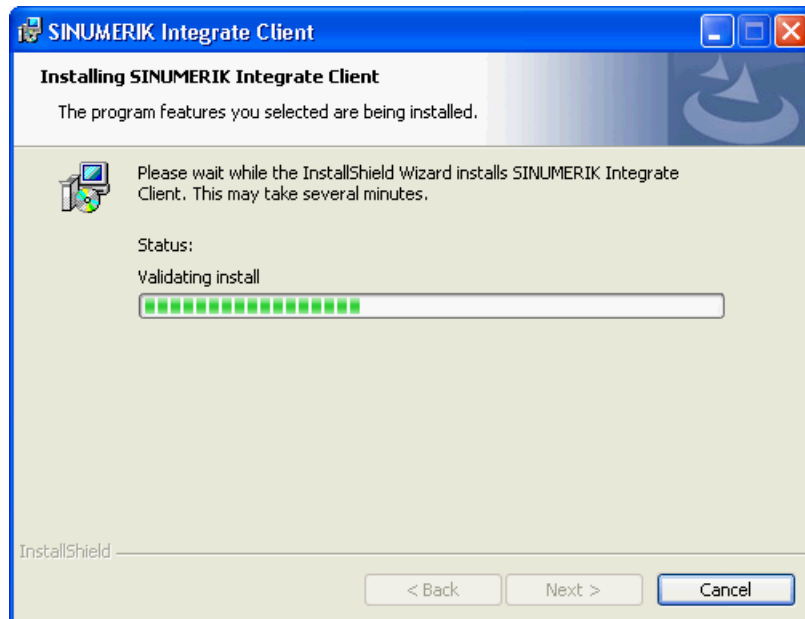


7. The Wizard is ready to start the installation. Click "Install" to start the installation.



3.2 Checking and updating the versions

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



9. Click "Finish" to complete the installation.



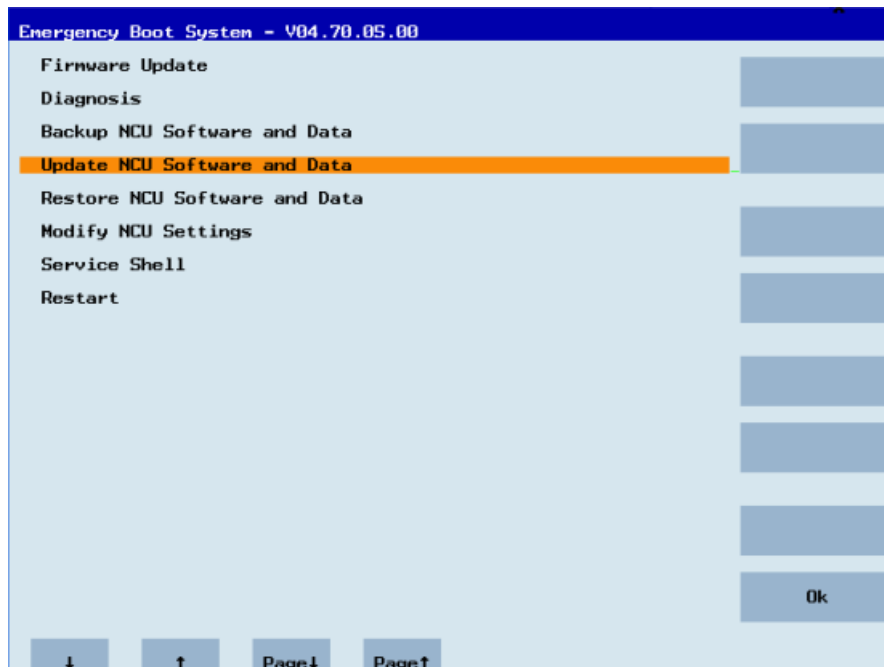
3.2.4 Client update under Linux

Requirement

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

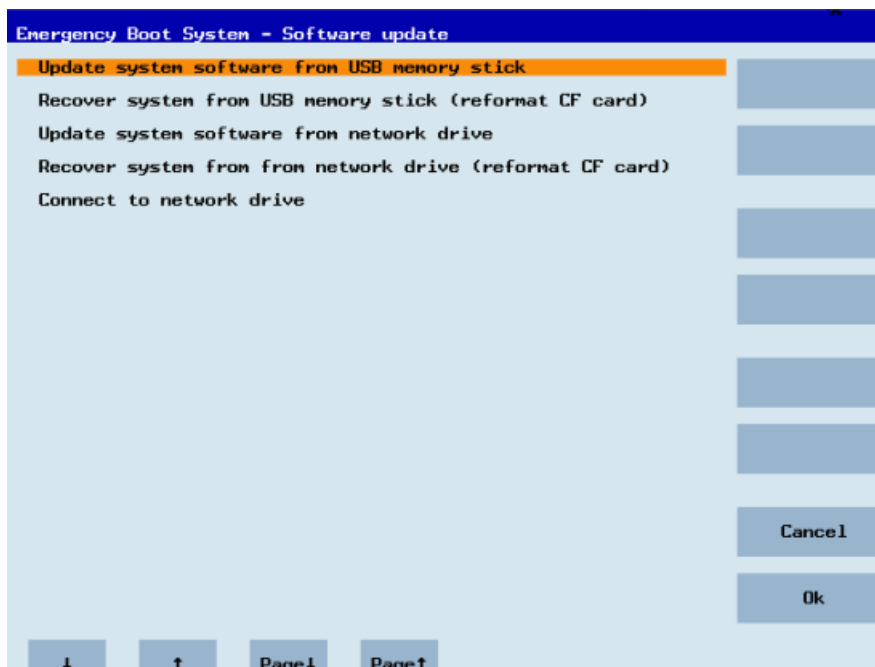
Procedure

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.

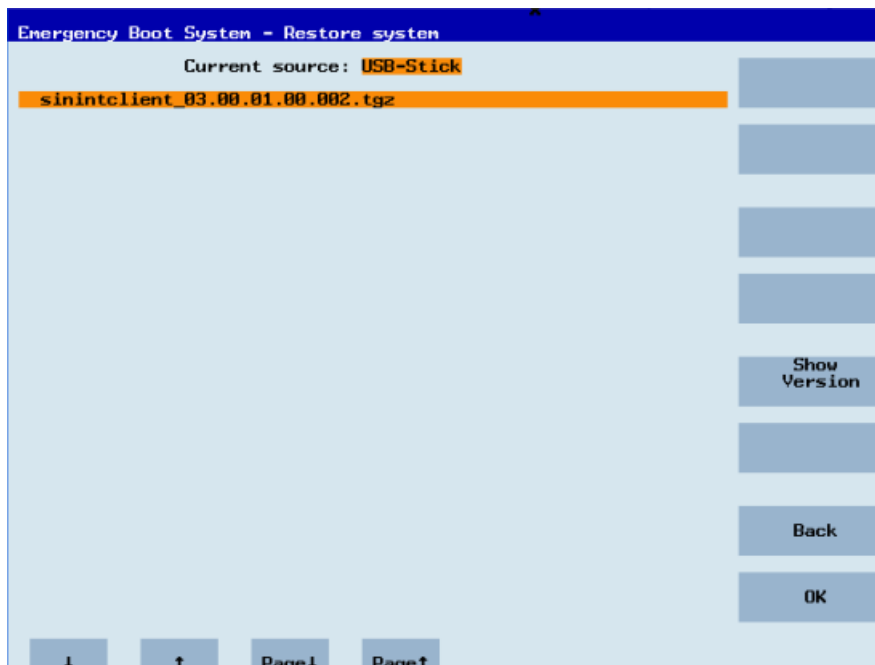


3.2 Checking and updating the versions

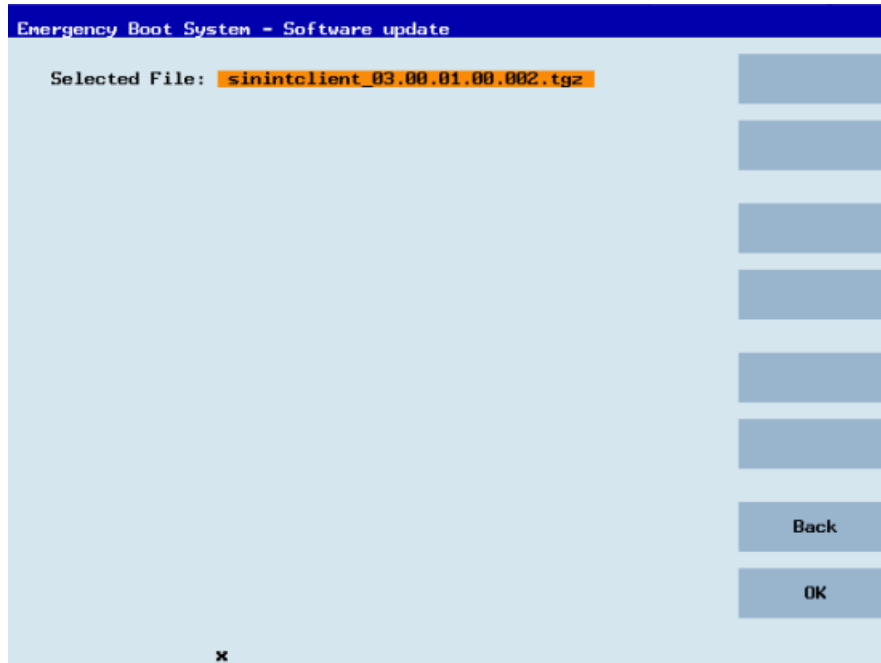
5. In the menu, select "Update system software from USB memory stick" with the cursor keys and press the "OK" softkey.



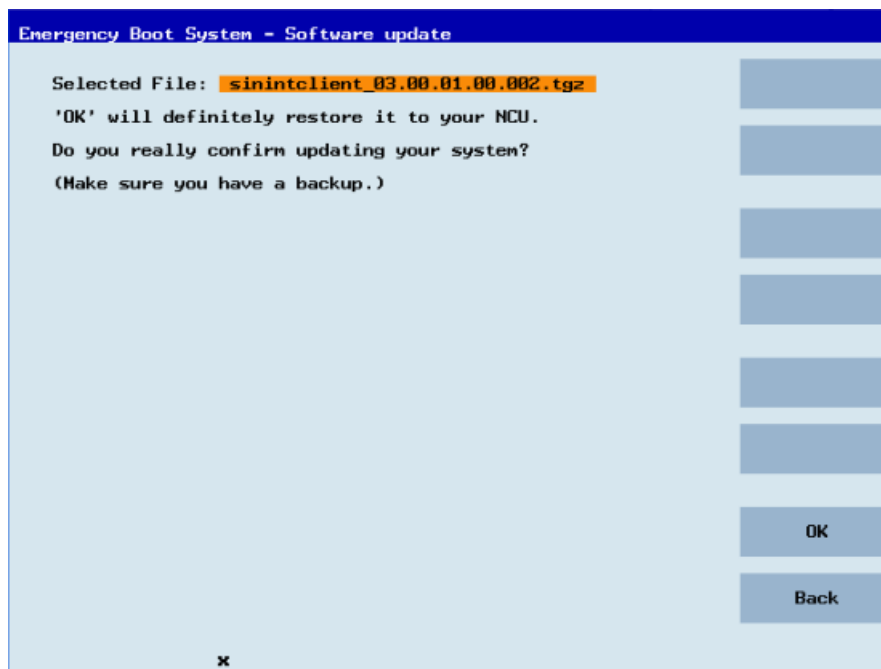
6. You receive a list with all tgz files.
Select the current file.
Press the "OK" softkey to confirm your selection.
- OR -
Press the shortcut key <Shift> + <F8> on the operator panel.



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.

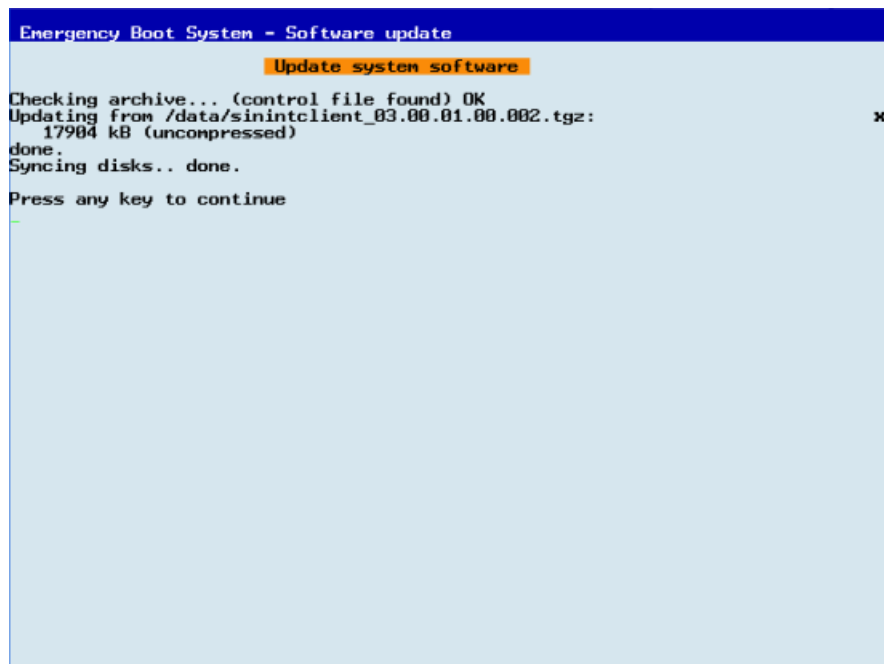


8. A confirmation prompt appears.
Press the "OK" softkey to confirm the confirmation prompt.
- OR -
Press the shortcut key <Shift> + <F7> on the operator panel.

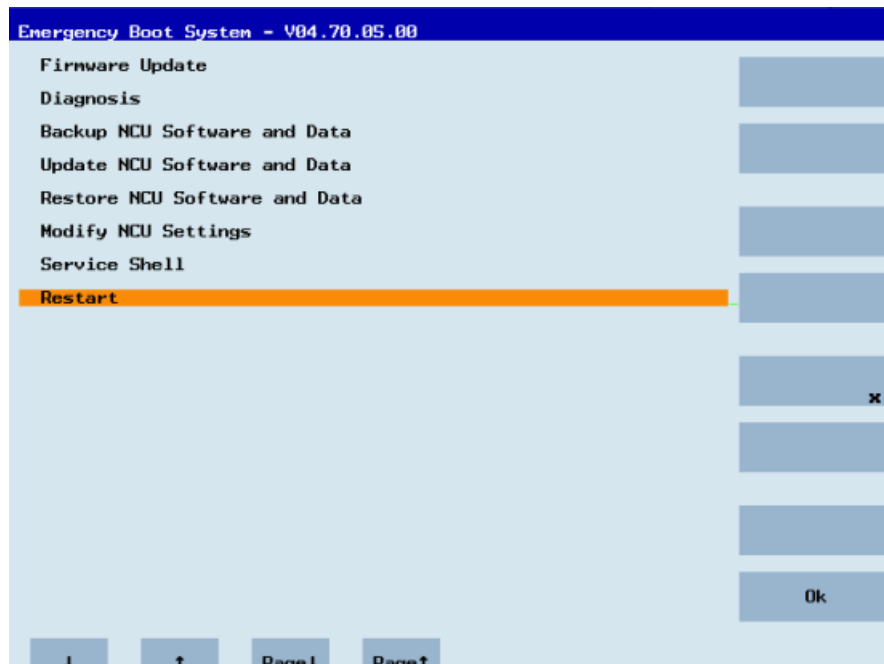


3.2 Checking and updating the versions

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.

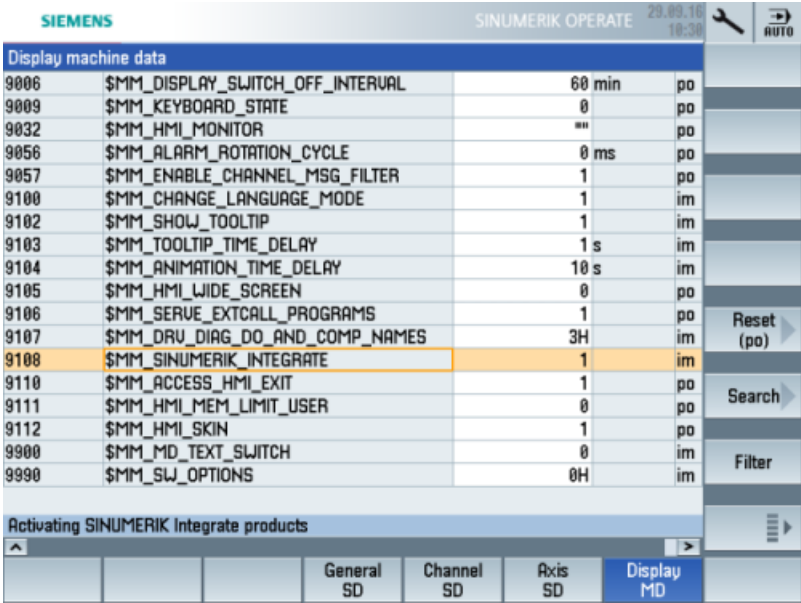


3.3 SINUMERIK Integrate

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".



SIEMENS		SINUMERIK OPERATE		29.09.16	10:30	Wrench icon	AUTO
Display machine data							
9006	\$MM_DISPLAY_SWITCH_OFF_INTERVAL	60 min	po				
9009	\$MM_KEYBOARD_STATE	0	po				
9032	\$MM_HMI_MONITOR	"	po				
9056	\$MM_ALARM_ROTATION_CYCLE	0 ms	po				
9057	\$MM_ENABLE_CHANNEL_MSG_FILTER	1	po				
9100	\$MM_CHANGE_LANGUAGE_MODE	1	im				
9102	\$MM_SHOW_TOOLTIP	1	im				
9103	\$MM_TOOLTIP_TIME_DELAY	1 s	im				
9104	\$MM_ANIMATION_TIME_DELAY	10 s	im				
9105	\$MM_HMI_WIDE_SCREEN	0	po				
9106	\$MM_SERVE_EXTCALL_PROGRAMS	1	po			Reset (po)	
9107	\$MM_DRU_DIAG_DO_AND_COMP_NAMES	3H	im				
9108	\$MM_SINUMERIK_INTEGRATE	1	im				
9110	\$MM_ACCESS_HMI_EXIT	1	po			Search	
9111	\$MM_HMI_MEM_LIMIT_USER	0	po				
9112	\$MM_HMI_SKIN	1	po				
9900	\$MM_MD_TEXT_SWITCH	0	im			Filter	
9990	\$MM_SW_OPTIONS	0H	im				
Activating SINUMERIK Integrate products							
				General SD Channel SD Axis SD Display MD			

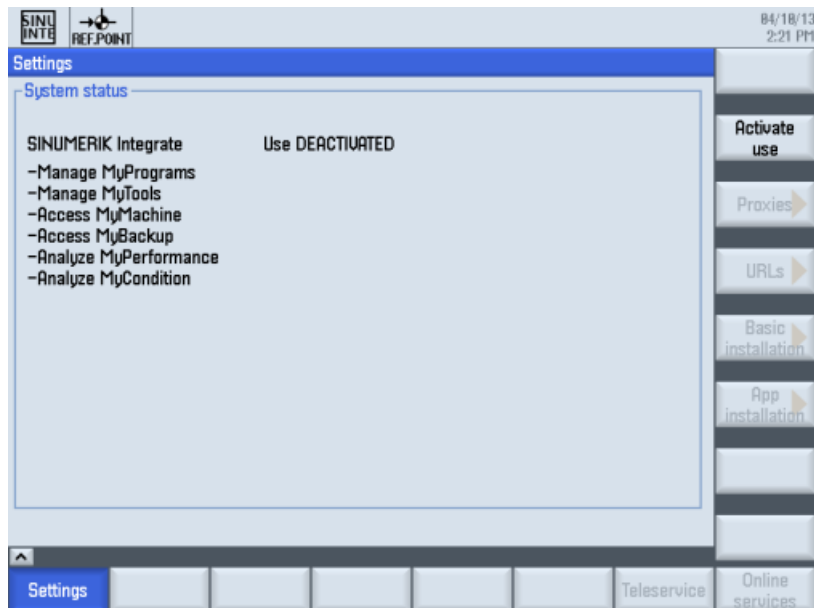
7. Press the <MENU SELECT> key followed by the menu forward key.
8. The "SINUMERIK Integrate" softkey is displayed on the extended horizontal softkey bar.



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" window 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:
 - Directory: Select the "User" entry in the "Directory" drop-down list.
 - Display home page: Select the "Overwrite here" check box.
 - RenderService: Select the "Overwrite here" check box.
 - Web service URL: Select the "Overwrite here" check box.
 - Enter the following Web service URL depending on which MindSphere system you are connected with:
MindSphere V3 Livesystem (<https://gateway.eu1.mindsphere.io/api/agentcom-mmmops/v3/ws11>)
MindSphere Alibaba (<https://gateway.cn1.mindsphere-in.cn/api/agentcom-dimcopt/v3/ws11>)
 - Enter the required value in the "Transmit timeout in seconds" input field. The default value is 200. Then select the "Overwrite here" check box.
 - Enter the required value in the "Receive timeout in seconds" input field (default value is 200), and select the "Overwrite here" check box.

The screenshot shows a settings interface with the following fields and checkboxes:

- Directories:** A dropdown menu showing "User".
- Display home page:** A text input field with a checked "Overwrite here" checkbox.
- RenderService:** A text input field with a checked "Overwrite here" checkbox.
- URL Web service:** A text input field containing the URL <https://gateway.eu1.mindsphere.io/api/agentcom-mmmops/v3/ws11> with a checked "Overwrite here" checkbox.
- Send timeout in seconds:** A text input field containing "200" with a checked "Overwrite here" checkbox.
- Reception timeout in seconds:** A text input field containing "200" with a checked "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:
 - Select the "Use fix proxy" check box.
 - Enter your proxies in the "Proxy 1" to "Proxy 3" input fields.
 - Select the "Overwrite here" check box even if you only enter one proxy in order to accept the new entry.

Directories: User

☐ Use system proxy settings ☐ Overwrite here

☐ Automatic ☐ Overwrite here

☐ Use proxy script ☐ Overwrite here

URL (proxy script)

☒ Use fix proxy ☒ Overwrite here

Proxy 1: sq4.ocimaws.net:3128

Proxy 2:

Proxy 3:

☐ Direct ☐ Overwrite here

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

Directories: User

☒ Overwrite here

Domain:

User name: mta proxy

Password:

Workstation:

☐ Overwrite here

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

Activating SINUMERIK Integrate generates the setup of the URL/proxy and the restart in the directory of the "boot_job" folder.

- Operate (PCU): C:\temp\boot_job
- Operate (NCU): /var/tmp/boot_job (accessible on the CF card via WinSCP)

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.

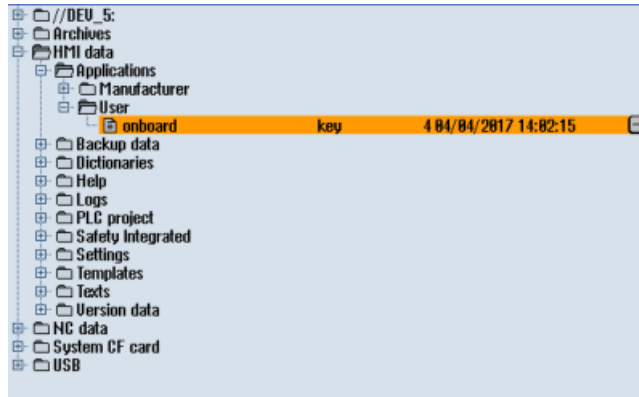
Procedure with SINUMERIK Operate (PCU 50)

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 38)
5. Select the "onboard.key" and press the "Copy" softkey.

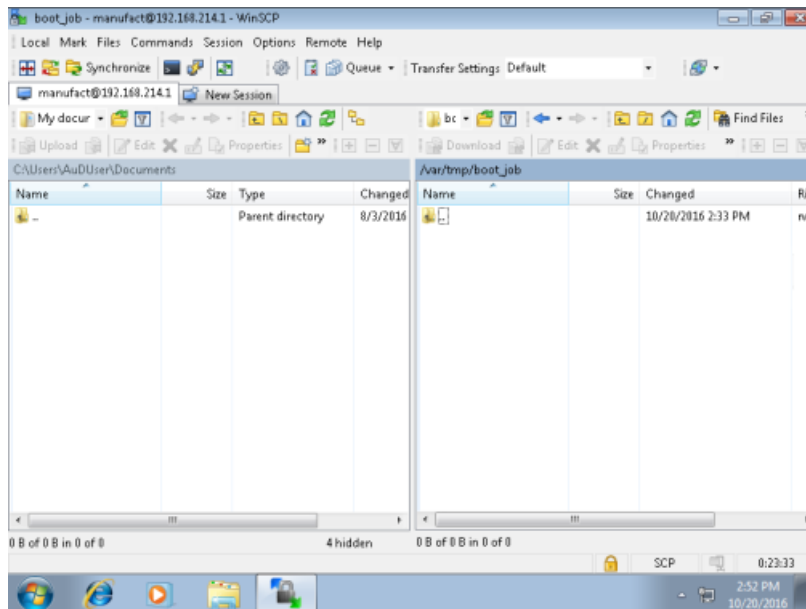
6. Navigate in the following directory: HMI data\Applications\User and press the "Paste" softkey.



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.

3.4 SINUMERIK 840D sl

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:
 - Directory: Select the "User" entry in the "Directory" drop-down list.
 - Display home page: Select the "Overwrite here" check box.
 - RenderService: Select the "Overwrite here" check box.
 - Web service URL: Select the "Overwrite here" check box.
 - Enter the following Web service URL depending on which MindSphere system you are connected with:
MindSphere V3 Livesystem (<https://gateway.eu1.mindsphere.io/api/agentcom-mmmops/v3/ws11>)
MindSphere Alibaba (<https://gateway.cn1.mindsphere-in.cn/api/agentcom-dimcopt/v3/ws11>)
 - Enter the required value in the "Transmit timeout in seconds" input field. The default value is 200. Then select the "Overwrite here" check box.
 - Enter the required value in the "Receive timeout in seconds" input field (the default value is 200), and select the "Overwrite here" check box.

The screenshot shows a settings window with the following fields and options:

- Directories:** A dropdown menu with "User" selected.
- Display home page:** A text input field with a checked "Overwrite here" checkbox.
- RenderService:** A text input field with a checked "Overwrite here" checkbox.
- URL Web service:** A text input field containing the URL <https://gateway.eu1.mindsphere.io/api/agentcom-mmmops/v3/ws11> with a checked "Overwrite here" checkbox.
- Send timeout in seconds:** A text input field with the value "200" and a checked "Overwrite here" checkbox.
- Reception timeout in seconds:** A text input field with the value "200" and a checked "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:
 - Select the "Use fix proxy" check box.
 - Enter your proxies in the "Proxy 1" to "Proxy 3" input fields.
 - Select the "Overwrite here" check box even if you only enter one proxy in order to accept the new entry.

Directories: User

☐ Use system proxy settings ☒ Overwrite here

☐ Automatic ☒ Overwrite here

☐ Use proxy script ☒ Overwrite here

URL (proxy script)

☒ Use fix proxy ☒ Overwrite here

Proxy 1: sq4.ocimaws.net:3128

Proxy 2:

Proxy 3:

☐ Direct ☒ Overwrite here

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

Directories: User

☒ Overwrite here

Domain:

User name: mta proxy

Password:

☐ Overwrite here

Workstation:

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.

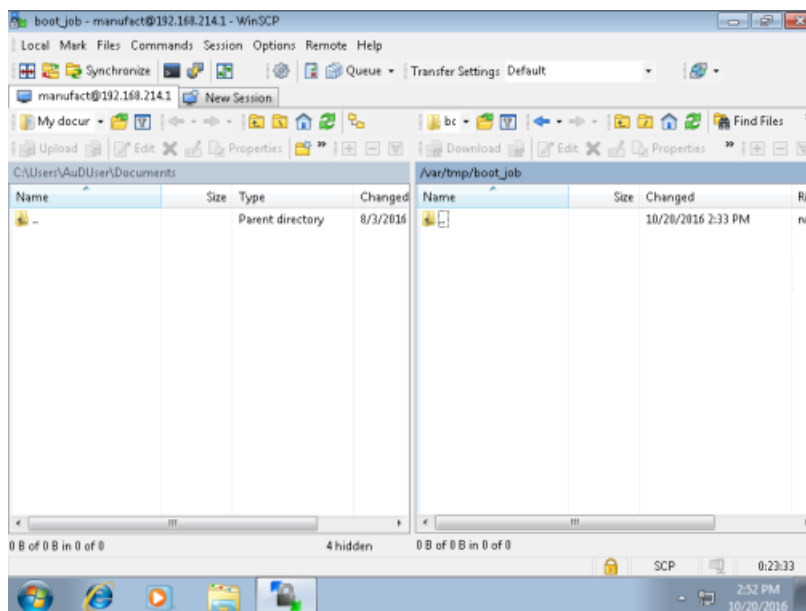
Copy the "onboard.key" to the SINUMERIK control system, e.g. using WinSCP.

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.

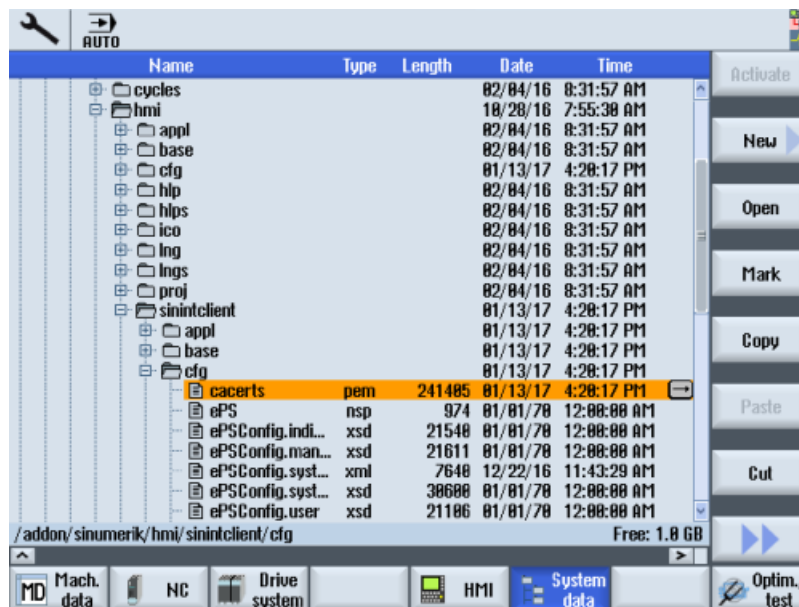
3.6 Adapting SINUMERIK Operate

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".



-
- The screenshot displays the WinSCP interface with two panes. The left pane shows the local drive D:\ with a list of files and folders. The right pane shows the remote path /addon/sinumerik/hmi/sinintclient/cfg. A context menu is open over the 'kacerts' directory in the right pane, listing various actions such as Open, Edit, Edit With, Download..., Download and Delete..., Duplicate..., Move To..., Delete, Rename, Custom Commands, File Names, and Properties.

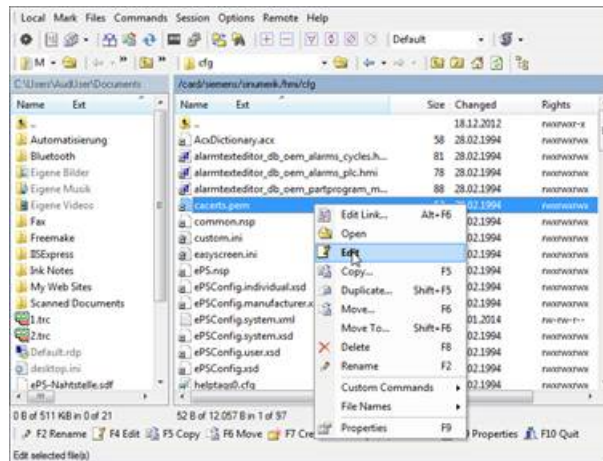
- [illegible]

- 45

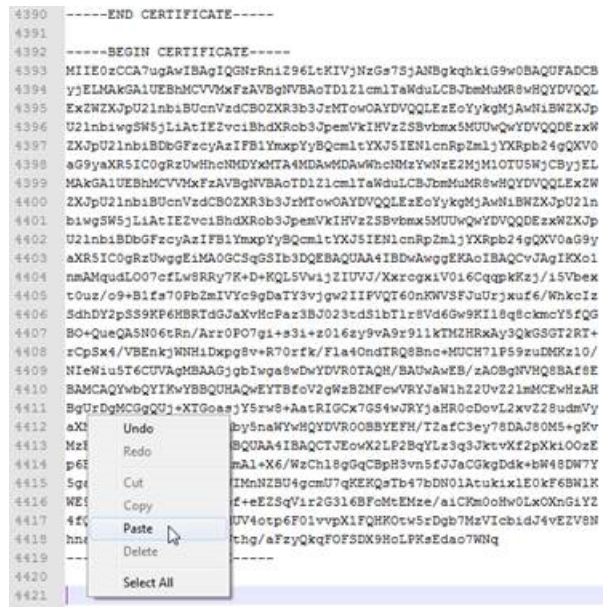
3.6 Adapting SINUMERIK Operate

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

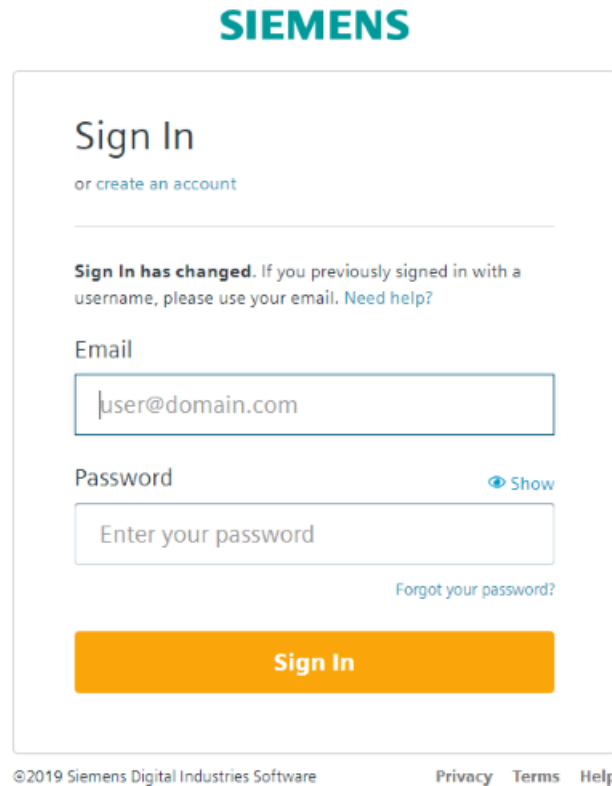
You require a MindAccess user account in MindSphere.

Further information on creating an account can be found at:

- "MindSphere - Settings System Manual"
- "MindSphere - Asset Manager System Manual"

Procedure

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



The image shows a Siemens Sign In window. At the top is the Siemens logo. Below it is the title "Sign In" with a link "or create an account". A message states: "Sign In has changed. If you previously signed in with a username, please use your email. [Need help?](#)". There are two input fields: "Email" with the placeholder "user@domain.com" and "Password" with the placeholder "Enter your password". A "Show" link is next to the password field. A link "Forgot your password?" is below the password field. A large orange "Sign In" button is at the bottom. The footer contains "©2019 Siemens Digital Industries Software" and links for "Privacy", "Terms", and "Help".

- 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.

3.7 Integrating MindSphere

SIEMENS

Reset your password

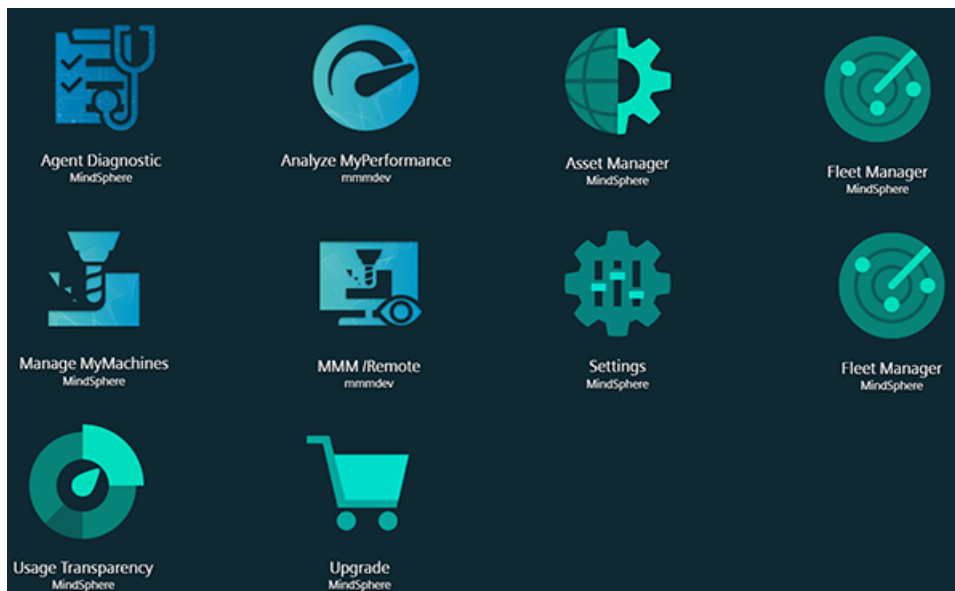
Enter your email address. We'll email you instructions to reset your password. Please check your spam folder.

Email

[Back to Sign In](#) [Submit](#)

©2019 Siemens Digital Industries Software [Privacy](#) [Terms](#) [Help](#)

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

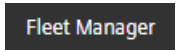





3.7.2 Icons and buttons in MindSphere

The following symbols and buttons are available.

Icon	Description
	Switches to the MindSphere Launchpad.
	Opens a menu and shows the following data: <ul style="list-style-type: none"> • Tenant name • Tenant type • Tenant location
	Opens a menu with the following information and links to the product: <ul style="list-style-type: none"> • Shows the version • Link to the MindSphere store • Link to the MindSphere status • Third-party software • MindSphere Academy • Corporate Information • Acceptable Use Policy
	Logging out of MindSphere after a security prompt.
Asset Manager	
	Opens a menu with the following information: <ul style="list-style-type: none"> • Shows the version • Copyright Siemens AG Links to the product: <ul style="list-style-type: none"> • Third-party software • Documentation - System Manual Asset Manager
	Hides the list of assets.
	Shows the list of assets again.
	Input field for free text search
	Opens the Asset search
	Switches to the hierarchical view of the assets
	Deletes the selection
	Opens a selection of Asset Manager functions, and provides the option of directly accessing the required views. <ul style="list-style-type: none"> • Share asset • Move asset • Fleet Manager • Delete asset

3.7 Integrating MindSphere

Icon	Description
Fleet Manager	
	<p>Opens a menu with the following information and links to the product:</p> <ul style="list-style-type: none"> Shows the version <p>Links to additional information:</p> <ul style="list-style-type: none"> Third-party software Documentation - Fleet Manager System Manual
	<p>Opens a window with the following information:</p> <p>Logged in as: Shows the email address</p> <p>User settings:</p> <p>The following settings are available:</p> <p>Language</p> <ul style="list-style-type: none"> English German <p>When starting</p> <ul style="list-style-type: none"> Last view: When opening, show the last view Standard default view: <p>When opening, show the standard default view</p> <p>Reset to the standard default view</p>
	<p>Opens the email program set as default, and sends the valid selection by mail, e.g. link to the actual MindSphere view.</p>
	<p>Opens a dialog box to select the following views:</p> <ul style="list-style-type: none"> Split view Asset view Extension view

3.7.3 Managing users

Create users with various rights for "Analyze MyPerformance /OEE Monitor" and "Analyze MyPerformance /OEE Tuning".

The following users are available:

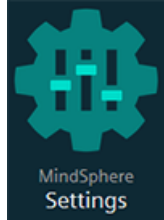
- Standard user: amp.user
- Administrator: amp.admin

Users, roles and rights are edited in the "MindSphere Settings" MindSphere application.

Additional information is provided at: MindSphere documentation (<https://siemens.mindsphere.io/en/docs/mindaccess.html>)

Procedure

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



3. Create or edit the users.
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.

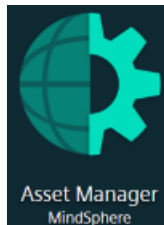
The specific functions and configuration options for the "SINUMERIK" area are discussed in the following.

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, assets transfer the aspects into the MindSphere application as time series data.

Opening the Asset Manager

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



2. The "Asset Manager" window opens and you have the following options:

- Edit assets
- Add subordinate assets

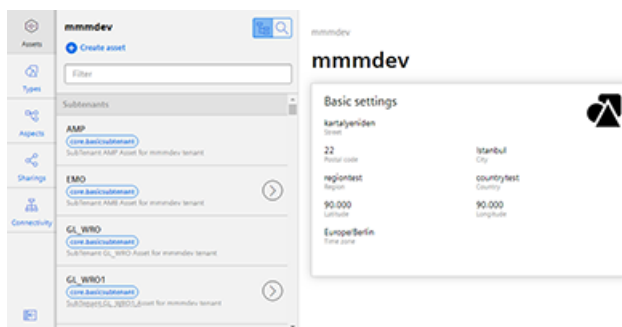
- Creating assets

Further information can be found in the following section: Creating an Asset (Page 57).

- Creating and editing asset types

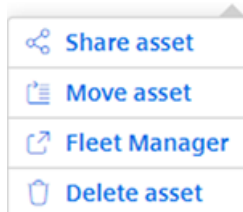
Further information can be found in the following section: Creating an asset type (Page 55)

- Creating and editing aspects



3. When you click on the three dots in the top right-hand section of the window, the following options are offered:

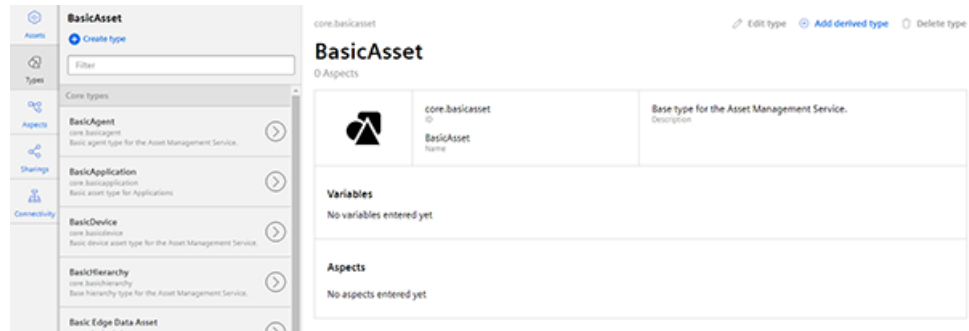
- Moving an asset
- Deleting an asset



3.7.4.2 Creating an asset type

Procedure

1. In the left window pane, click the "Types" button.
The "BasicAsset" window opens.



2. In the center window pane, select "BasicDevice" and click the small arrow (navigate to the child element).
The "BasicDevice" window opens.

3.7 Integrating MindSphere

3. Now select "BasicSinumerikAsset" in the middle pane and click the small arrow (navigate to the child element).
The "BasicSinumerikAsset" window opens.
4. In the center window pane, click "+ Create type" to create a new asset type.
The "Create type" window opens.
 - Enter a name for the new asset type.
Entering the name is mandatory and activates the "Save" button.
 - Enter a description of the new asset type.
 - Select an image with the maximum permitted size of 5 MB.

Note

Images in the working area

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

- Add your chosen variables.
- Add your chosen aspects.
- Click "Save" to create the new type.

Create type

– Type Information

Parent type:
core.basicasset
Parent type due to hierarchical order

Type ID:
mimdev.
Type ID cannot be changed after creation

Name: *
Name

Description:
Description
255 characters left

+ Image

+ Variables

+ Aspects

Save Cancel

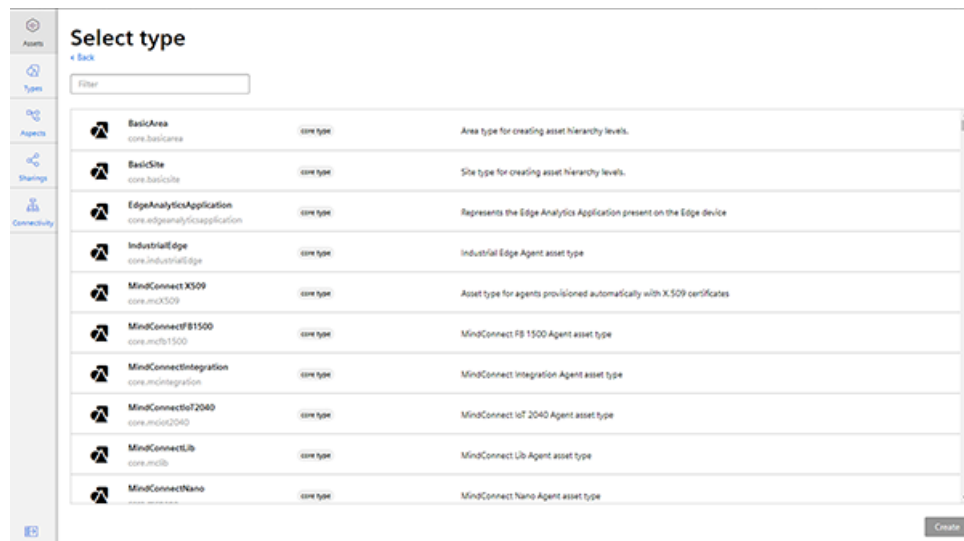
View asset type

1. Open the "Types" window.
2. In the center window pane, select "BasicDevice" > "BasicSinumerikAsset".
3. In the text box "Filter", enter the name.
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 "+ Create asset".
In the right-hand section of the window, "Select type" 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.
 - Select the corresponding time zone.
If a time zone is not selected, "Berlin" is given as the default setting.
The settings of the time zone are used for performance monitoring.

Note

Selecting the time zone

In MindSphere, do not select any time zone with 3 letters, such as PST, SST, VST, etc.
This could interfere with the functionality of Analyze MyPerformance.

- Click "Save" to save the new asset.

Add asset

General

Type ID: core.industrialEdge
Selected type of asset cannot be changed

Name:

Description:
255 characters left

Location

Variables

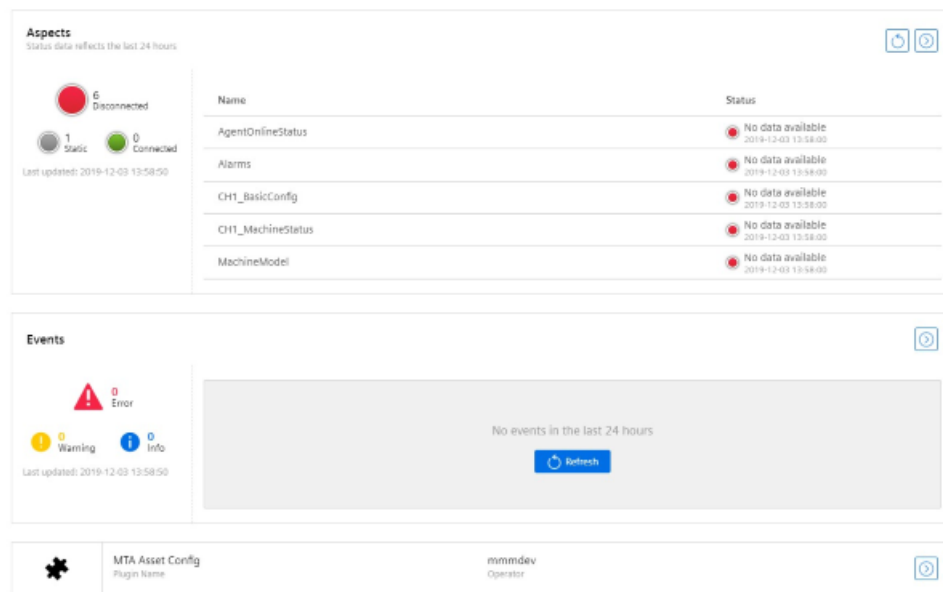
Aspects

Name	Aspect	Category
> connectivityStatus	core.connectivitystatus	Static
> firmwareStatus	core.firmwarestatus	Static
> status	core.agentstatus	Dynamic

* Required input field

Save Cancel

- 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.

Further information on roles within MindSphere and on configuring assets is provided in: MindSphere documentation (<https://siemens.mindsphere.io/en/docs/mindaccess.html>)

Requirement

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

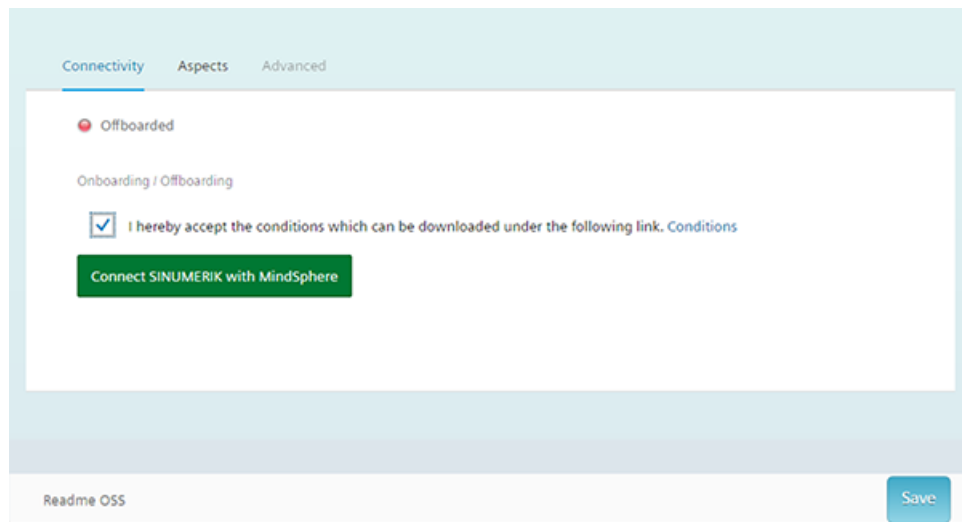
Procedure

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

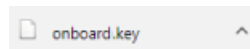


3.7 Integrating MindSphere

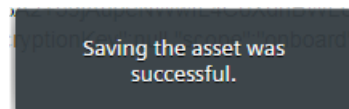
3. The "Onboarding / Offboarding" window opens, and you can see the connection status in the "Connectivity" tab, e.g. "Offboarded".
4. Select the "I hereby accept the conditions, which can be downloaded under the following link. Conditions" check box.
 - Click the "Conditions" link.
The "MindSphere Terms & 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.

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 with a slider in the "Aspects" tab:

- Addressing
- Data formats
- Sampling rate
- Physical unit

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

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

- SINUMERIK basic configuration
- Machine availability
- Advanced recording

Note

Activating pre-configured variable sets

Under "Analyze MyPerformance /OEE Monitor" and/or "Analyze MyPerformance /OEE Tuning" activate the option checkbox for license conditions, and set the corresponding slider to "ON" to activate the Variable Recording.

Note

First NC channel

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

3.7 Integrating MindSphere

Procedure

1. Click the "Asset Manager" application 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 presets" window opens.

The screenshot shows the 'SINUMERIK presets' configuration window. It has three tabs: 'Connectivity', 'Aspects' (which is selected), and 'Advanced'. The main content area is titled 'SINUMERIK presets' and contains three sections:

- Manage MyMachines:** Includes a checkbox for 'I hereby accept the terms and conditions. The pricing model can be find under following link: Pricing Model', a toggle for 'Manage MyMachines' (currently off), and a toggle for 'Variable Recording' (currently off). A note states: 'The Variable Recording is used to visualize standard aspects of a machine tool. Therefore variables such as Override, NC status will be recorded with fixed reading cycles.'
- Analyze MyPerformance IOEE-Monitor:** Includes a checkbox for 'I hereby accept the terms and conditions. The pricing model can be find under following link: Pricing Model', a toggle for 'Analyze MyPerformance IOEE-Monitor' (currently off), and a toggle for 'Variable Recording' (currently off). A note states: 'The Variable Recording is used to visualize standard aspects of a machine tool. Therefore variables such as Override, NC status will be recorded with fixed reading cycles.'
- Analyze MyPerformance IOEE-Tuning:** Includes a checked checkbox for 'I hereby accept the terms and conditions. The pricing model can be find under following link: Pricing Model', a toggle for 'Analyze MyPerformance IOEE-Tuning' (currently on), and a toggle for 'Variable Recording' (currently on). A note states: 'The Variable Recording is used to visualize standard aspects of a machine tool. Therefore variables such as Override, NC status will be recorded with fixed reading cycles.'

At the bottom of the window, there is a 'Readme OSS' link and a 'Save' button.

Note

Analyze MyPerformance /OEE Monitor and Analyze MyPerformance /OEE Tuning

If Analyze MyPerformance /OEE Tuning is activated, you cannot activate Analyze MyPerformance /OEE Monitor.

Assets that have already been activated with Analyze MyPerformance /OEE Tuning can no longer be used with Analyze MyPerformance /OEE Monitor.

If you need the assets for Analyze MyPerformance /OEE Monitor, create a new asset which can be used with Analyze MyPerformance /OEE Monitor.

Analyze MyPerformance /OEE Monitor

1. Activate the checkbox for general license conditions under "Analyze MyPerformance/OEE Monitor".
2. Set the slider for "Analyze MyPerformance /OEE Monitor" to "ON" to activate use for this asset.
3. Set the slider for "Variable Recording" to "ON" to obtain the data in "Analyze MyPerformance /OEE Monitor".
4. Click "Save" to save the settings.

Analyze MyPerformance /OEE Tuning

1. Activate the checkbox for general license conditions under "Analyze MyPerformance /OEE Tuning".
2. Set the slider for "Analyze MyPerformance /OEE Tuning" to "ON" to activate use for this asset.
3. Set the slider for "Variable Recording" to "ON" to obtain the data in "Analyze MyPerformance /OEE Tuning".
4. Click "Save" to save the settings.

Pricing model

A fee is charged if you set the "Analyze MyPerformance /OEE Monitor" or "Analyze MyPerformance /OEE Tuning" slider to "ON" and you save the configuration for the first time.

To view the fees, click the "Pricing Model" link under "Analyze MyPerformance /OEE Monitor" or "Analyze MyPerformance /OEE Tuning".

This opens the corresponding page containing the price information.

3.7.7 Configuring a variable

The following variables may be configured individually:

- Categories (These variables are subject to the appropriate costs.)
 - Time-based / cyclic trigger
 - Trigger based on variable values
 - Alarm-based trigger

Requirement



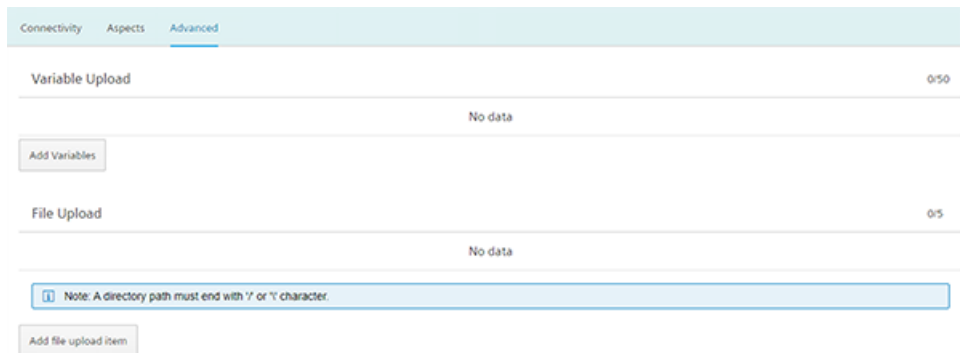
Software option

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

3.7 Integrating MindSphere

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.
4. Adding variables
 - Click on "Add variable".
A new input field is displayed.
 - Enter a title for the variable in the input field.
5. Add file upload element
 - Click on "Add file upload element"
 - In the input field, enter a name for the file upload element.



Connectivity Aspects **Advanced**

Variable Upload 0/50

No data

Add Variables

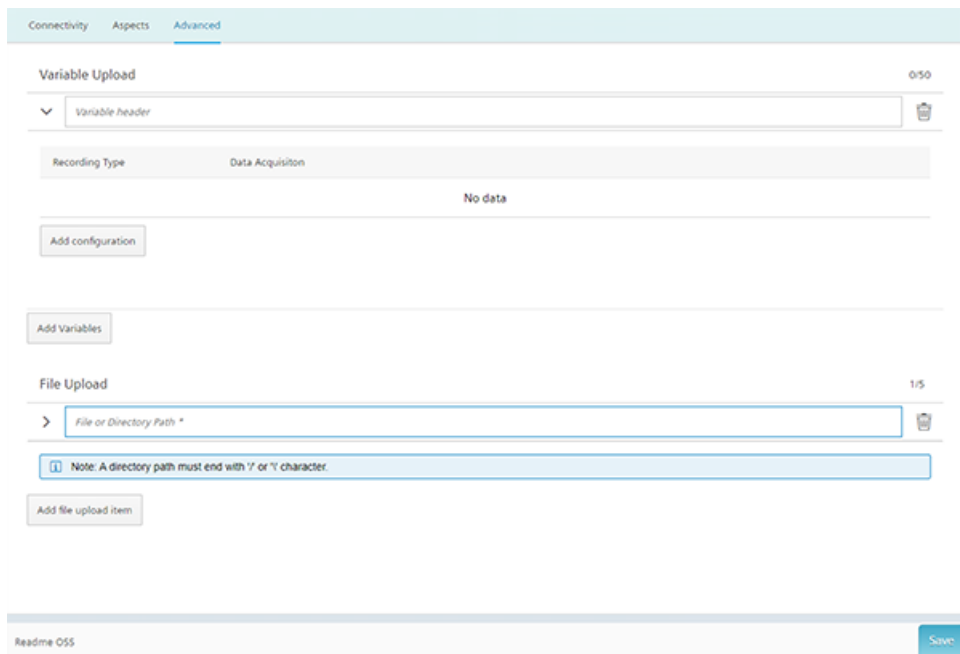
File Upload 0/5

No data

Note: A directory path must end with "/" or "\" character.

Add file upload item

6. 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.



Connectivity Aspects **Advanced**

Variable Upload 0/50

Variable header

Recording Type Data Acquisition

No data

Add configuration

Add Variables

File Upload 1/5

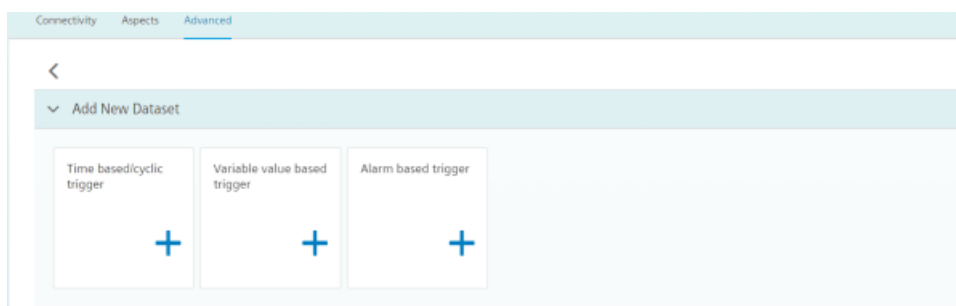
File or Directory Path *

Note: A directory path must end with "/" or "\" character.

Add file upload item

Readme OSS Save

7. Click on the "Edit" icon to create individual cycles or for systematic selection of alarms.
8. 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

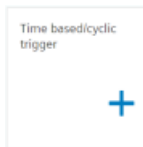
Parameters	Description
Aspect name	Enter a name to designate a common group of variables. The name must be unique and not exceed 255 characters. The following characters are not permitted: Return, °, \$, §, €, \, >, <, ß ä ö ü Ä Ö Ü
Name	In the variable set, enter a name of the variable to be sensed. 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: <ul style="list-style-type: none"> • DOUBLE • BOOLEAN • STRING Note: If values exceed the floating-point number accuracy, they are displayed with faulty decimal places.

3.7 Integrating MindSphere

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 seconds

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.

- Click the "Save" button to accept the entries.

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!

- 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	
Data acquisition name	Enter a previously created variable.
Variable address	Shows the address of the variable.
Data type	From the drop-down list select the data type of the variable. <ul style="list-style-type: none"> • DOUBLE • BOOLEAN • STRING
	From the drop-down list, select the comparison operation that is restricted to the format of the variables: <ul style="list-style-type: none"> • Greater than • Less than • Equal to • Not equal
Variable value	Enter a value.
With the following configuration	
Debounce time	Enter the debounce time
min	Select the duration of the debounce time from the drop-down list. Minimum: 30 s Maximum: 24 h

3.7 Integrating MindSphere

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" checkbox if the absolute values in relation to the comparison value is to be recorded. Retriggering to the comparison value only occurs if the actual value differed from the comparison value by more than the stated 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.
Data type	From the drop-down list select the data type of the variable: <ul style="list-style-type: none">• DOUBLE• BOOLEAN• STRING
With the following configuration	
Recording for	<div>Duration</div> <div>Enter the duration</div> <div>Minimum: 30 s</div> <div>Maximum: 24 h</div> <div>Time unit</div> <div>Select the time unit from the drop-down list.</div>
Within the cycle time	<div>Cycle</div> <div>Enter a cycle</div> <div>Minimum: 30 s</div> <div>Maximum: 24 h</div> <div>Time unit</div> <div>Select the time unit from the drop-down list.</div>

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.

▼ When the variable Cancel

Name of Data Acquisition *

Variable Address * DOUBLE ▼ Greater than ▼ Variable Value

With the following configuration

Debounce Time * min ▼

☐ Hysteresis Hysteresis ☐ Relative ☒ Absolute

▼ Then

Record following value ▼ Variable Address * DOUBLE ▼

With the following configuration

Recording for Duration SEC ▼

Within cycle time Cycle SEC ▼

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	

3.7 Integrating MindSphere

Parameters	Description
Alarm codes:	<p>Enter the alarm numbers or the alarm IDs that activate the trigger.</p> <p>The alarms are entered in the following notation:</p> <ul style="list-style-type: none"> • Separate the individual alarms through a comma, e.g. 3200, 32100, ... • Enter the alarm number ranges with a "-" character, e.g. 4000-5000 <p>The alarm list must not exceed 200 characters.</p>
Alarm intervals: Left / Right:	<p>Enter the alarm limits:</p> <ul style="list-style-type: none"> • Left: Enter the lowest alarm ID, e.g. 0 • Right: Enter the highest alarm ID, e.g. 99999 <p>All alarms between 0 and 99999 are included.</p>
EXCLUDED	
Alarm codes:	<p>Enter the alarm numbers that do not activate the trigger.</p> <p>The alarms are entered in the following notation:</p> <ul style="list-style-type: none"> • Separate the individual alarms through a comma, e.g. 3200, 32100, ... • Enter the alarm number ranges with a "-" character, e.g. 4000-5000 <p>The list of alarm numbers must not exceed 200 characters.</p>
Alarm intervals: Left / Right:	<p>Enter the alarm limits:</p> <ul style="list-style-type: none"> • Left: Enter the lowest alarm ID, e.g. 0 • Right: Enter the highest alarm ID, e.g. 99999 <p>All alarms between 0 and 99999 are included.</p>
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.

Connectivity Aspects **Advanced**

< Alarm Configurations Add Rule

Alarm Name Cancel

Alarm Acknowledge Filter

INCLUDED:

Alarm Numbers: +

Alarm Intervals: Left: Right: +

EXCLUDED:

Alarm Numbers: +

Alarm Intervals: Left: Right: +

New Alarm Filter

INCLUDED:

Alarm Numbers: +

Alarm Intervals: Left: Right: +

EXCLUDED:

Alarm Numbers: +

Alarm Intervals: Left: Right: +

Readme OSS

Further information

Further information about the NC variable can be found in the List Manual SINUMERIK 840D sl NC variables

3.7.8 Activating workpiece counters

The SINUMERIK control system can be configured such that the number of workpieces produced is automatically counted. Analyze MyPerformance /OEE Monitor and Analyze MyPerformance /OEE Tuning use these numbers.

This data is evaluated and further processed in the "Production quality" window. SINUMERIK produces and counts the workpieces, and this is then accepted as a data input in Analyze MyPerformance.

The system variable \$AC_TOTAL_PARTS in the SINUMERIK control system is used to count the number of workpieces produced.

System variable	Meaning
\$AC_TOTAL_PARTS	Total number of workpieces produced (actual workpiece total) as from start time. The value is only automatically reset to "0" when the control system runs up with default values.

Note

The counter is not reset either by a RESET or by an HMI restart of the SINUMERIK control system.

The default procedure is that the value of the \$AC_TOTAL_PARTS counter is incremented by 1 as soon as the end of the NC program is reached (M02 or M30 command). Other M commands can be configured as count pulses with the machine data.

Settings

Set the following bits of the machine data to activate and configure the workpiece counters for Analyze MyPerformance /OEE Monitor and Analyze MyPerformance /OEE Tuning.

MD27880 \$MC_PART_COUNTER		Activation of the workpiece counters
Bit 4 = 1	The counter \$AC_TOTAL_PARTS is active	
Bit 5 = 0	M02/M30 increments the \$AC_TOTAL_PARTS counter by 1	
Bit 5 = 1	The M command defined in MD27882[0] increments the \$AC_TOTAL_PARTS counter by 1	
Bit 6 = 0	\$AC_TOTAL_PARTS is also active for program test / block search	
Bit 7 = 1	A return with GOTOS increments the \$AC_TOTAL_PARTS counter by 1	

User-defined M commands for the count pulse are stored in MD27882[0].

MD27882[0] \$MC_PART_COUNTER_MCODE	Workpiece counting with user-defined M command
------------------------------------	--



1. Start the SINUMERIK Operate operating software on the controller.
2. Press the "Setup", "Mach.data" and "Channel MD" softkeys.
3. Set the machine data MD27880 to the desired value.
 - Value for activating the counter: MD27880 \$MC_PART_COUNTER ="10H"

SIEMENS

SINUMERIK OPERATE

03/26/19

9:16 AM

  JOG

Channel machine data CH1:CHAN1

26016	\$MC_PUNCH_PARTITION_TYPE	1	po
26018	\$MC_NIBBLE_PRE_START_TIME	0 s	po
26020	\$MC_NIBBLE_SIGNAL_CHECK	0	po
27100	\$MC_ABSBLOCK_FUNCTION_MASK	1H	po
27400[0]	\$MC_OEM_CHAN_INFO		po
27400[1]	\$MC_OEM_CHAN_INFO		po
27400[2]	\$MC_OEM_CHAN_INFO		po
27850	\$MC_PROG_NET_TIMER_MODE	0H	re
27860	\$MC_PROCESSTIMER_MODE	B3H	re
27880	\$MC_PART_COUNTER	10H	re
27882[0]	\$MC_PART_COUNTER_MCODE	2	po
27882[1]	\$MC_PART_COUNTER_MCODE	2	po
27882[2]	\$MC_PART_COUNTER_MCODE	2	po
27920	\$MC_TIME_LIMIT_NETTO_INT_TASK	0.005 s	po
27930	\$MC_TIME_LIMIT_NETTO_EES_TASK	0.008 s	po
28000	\$MC_MM_REORG_LOG_FILE_MEM	75	po
28010	\$MC_MM_NUM_REORG_LUD_MODULES	20	po
28020	\$MC_MM_NUM_LUD_NAMES_TOTAL	4000	po

Search

Cancel

Continue search

General
MD

Channel
MD

Axis
MD

User
views

4. If necessary, set the machine data MD27882[0] to the desired value.
5. Restart SINUMERIK Operate to activate the changes.

3.8 Disconnecting the SINUMERIK control system from MindSphere

3.8.1 Overview

Introduction

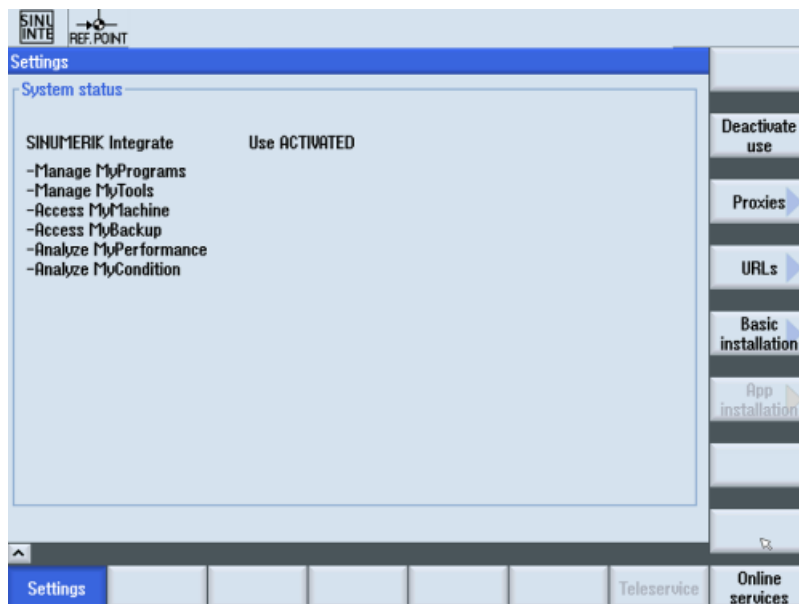
Proceed as follows if you no longer wish to use the MindSphere application on your SINUMERIK control system:

1. Lock SINUMERIK Integrate: Deactivating use of SINUMERIK Integrate (Page 75)
2. In the "Asset Manager", disconnect the machine tool system from MindSphere: Disconnecting the SINUMERIK control system from MindSphere (Page 75)

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 from MindSphere.

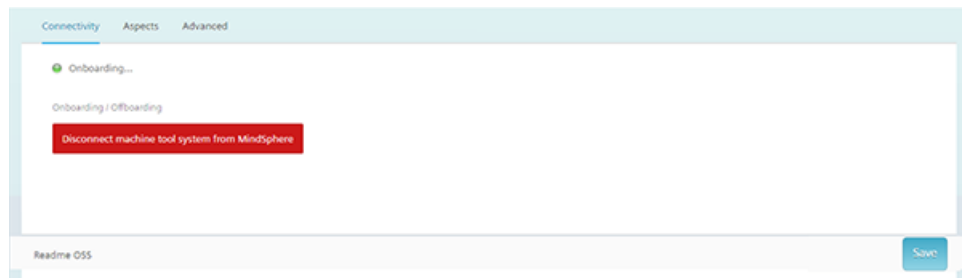
Further information on roles within MindSphere and on configuring assets is provided in: MindSphere documentation (<https://siemens.mindsphere.io/en/docs/mindaccess.html>)

Requirement

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

Procedure

1. Click the "Asset Manager" MindSphere application, and select an asset in the left-hand section of the window.
2. Click the "MTA Asset Config" icon in the right-hand section of the window.
3. Under the "Connectivity" tab, you can see the connection status, e.g. "Onboarding...".
 - Click the "Disconnect machine tool system 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

You will find the files:

- If you use PCU/IPC under: C:\temp
 - If you use NCU under: /var/tmp
-

SINUMERIK Integrate Gateway

4.1 Shopfloor AppManagement

Requirement

You need administrator rights.

Various settings are configured in SINUMERIK Integrate AMC.

NOTICE

Setting up encrypted data transmission

To ensure that no attacker can gain access to your secret key, an encrypted connection must be set up between SINUMERIK Integrate and MindSphere.

You can find further information on setting up secure communication in the SINUMERIK Integrate Installation Manual, in the Chapter "Setting up an encrypted connection".

NOTICE

Data manipulation possible

There is a risk that an attacker, within the network between SINUMERIK Integrate and MindSphere, gains access to the file system of the server or service clients. There, the hacker can read or manipulate various system components (e.g. the content of databases). As a consequence, the attacker can change tool data, NC programs, machine archives or the system structure itself, for example. This type of attack cannot be prevented by MindSphere.

- As the person responsible for the machine network, take measures to ensure the industrial security of the production/machine network.

Siemens AG does not accept any liability in this regard.

Further information

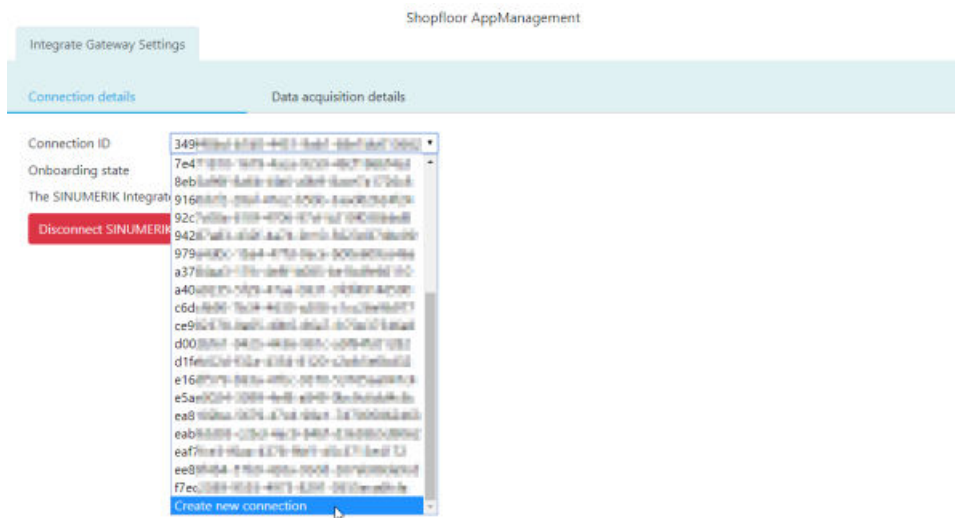
You can find additional information on configuring MindSphere in:
Installation Manual "SINUMERIK Integrate MMP, MMT, AMC, AMP, AMM/E, AMD"

Procedure

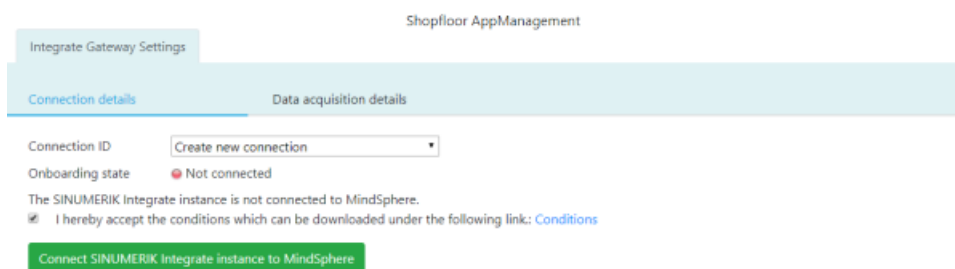
1. Click on the "Shopfloor AppManagement" icon.



2. The "Shopfloor AppManagement" > "Integrate Gateway Settings" window opens.
 - Open the "Connection details" tab
 - Choose "Create new connection".



3. Click the "License conditions" link and read the conditions. Then select the check box "I hereby accept the license conditions, which can be downloaded under the following link. Conditions" check box.
 - Click on "Connect SINUMERIK Integrate Gateway to MindSphere" to connect MindSphere with SINUMERIK Integrate Analyze MyCondition.



4. The "onboard.key" is generated and is available for the connection to MindSphere.

[illegible]

5. Now configure the "onboard key" in SINUMERIK Integrate Analyze MyCondition. You will find further information in Function Manual "Analyze MyCondition".
6. From the drop-down menu "Connection ID", select the connection ID that you configured in SINUMERIK Integrate Analyze MyCondition. The connection is established.

Shopfloor AppManagement

Integrate Gateway Settings

Connection details

Data acquisition details

Connection ID

d1feb52d-f32a-4354-8120-c2afc5e0bd32

Onboarding state

Connected

The SINUMERIK Integrate instance is connected to MindSphere.

Disconnect SINUMERIK Integrate instance from MindSphere

7. Then open tab "Data acquisition details".
Additional information can be found in the following Chapter: Activating the variable monitor for Analyze MyPerformance (Page 80).

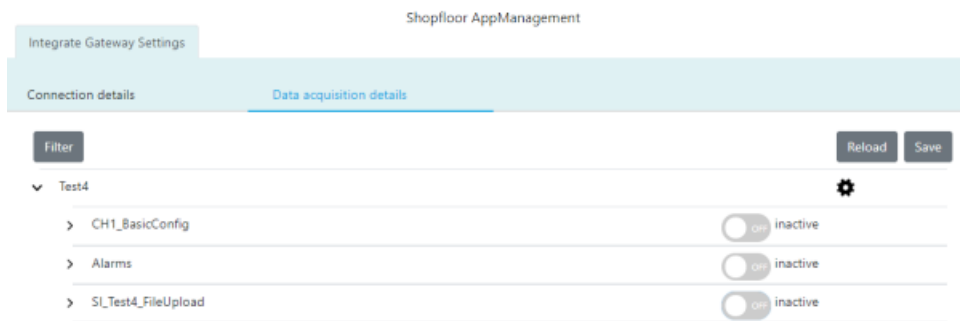
4.2 Activating the variable monitor for Analyze MyPerformance

Requirement

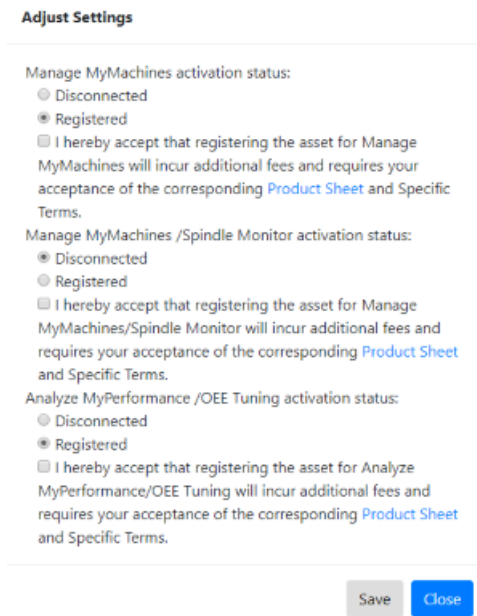
In SINUMERIK Integrate Analyze MyCondition, the check box "Activated on MSP" is selected under tab "Set up functions" > "Variable monitors".

Procedure

1. Open the "Data acquisition details" tab.
 - Click the "Filter" button to specifically filter for "Machine / Assets" and "Variables Monitor / Aspect".
 - Click the "Load New" button if you have moved the slide for a function to "ON".
 - To save your settings, click "Save".



2. Click the cogwheel icon to get information about the settings of the functionalities. Select the check box "I hereby accept, ..." and click "Save".



3. Using the slides, activate and/or deactivate functions to receive the relevant information. If you change a stored data selection, the status "changed" is displayed.



4. Click the "Save" button to save the settings.
- OR -
Click "Reload" to restore the default setting.

Logging onto/logging out of Analyze MyPerformance

Requirement

The access authorization for Analyze MyPerformance has been set up.

Procedure

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

SIEMENS

Sign In

[or create an account](#)

Sign In has changed. If you previously signed in with a username, please use your email. [Need help?](#)

Email

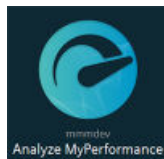
Password [Show](#)

[Forgot your password?](#)

Sign In

©2019 Siemens Digital Industries Software [Privacy](#) [Terms](#) [Help](#)

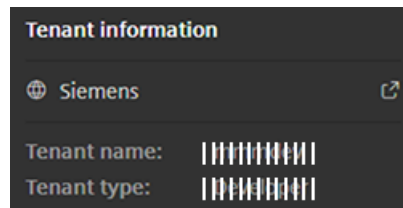
3. The launchpad opens and you have access to the individual applications.
Click on the "Analyze MyPerformance" application.



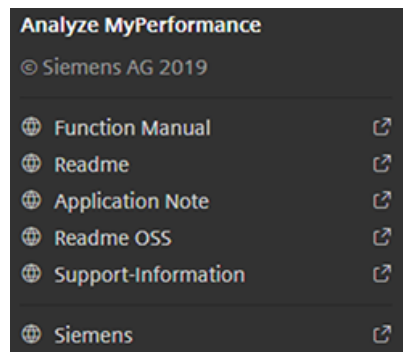
4. The "Overview" window opens and lists the following functions:
 - Performance monitoring (Page 88)
 - Utilization planning (Page 97)
 - Production quality (Page 105)
 - Analyze MyPerformance /OEE Tuning - Configuration (Page 109)
The "Configuration" button is only visible if you have purchased "Analyze MyPerformance /OEE Tuning".



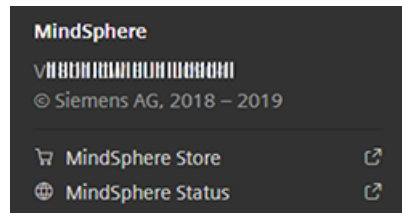
5. Click the tenant name in the header line for information about the tenant.



6. Click the header line of "Analyze MyPerformance" for information about Analyze MyPerformance:
 - Creation date
 - Function Manual: Link to this manual
 - Readme: Link to readme for users
 - Application example: Link to user documentation "Application Note"
 - Readme OSS: Opens the "Siemens Third-Party Software disclosure document". You will also find the OSS licenses and license conditions on this page.
 - Support information: You open Siemens Industry Online Support



7. Click the header line of "MindSphere" for information about MindSphere.
 - Version number
 - Creation date
 - MindSphere store: You open the MindSphere store.
 - MindSphere status: You open the MindSphere maintenance information.



8. In the footer, you see the products ordered for the tenant with the corresponding version numbers.
In the figure, these are "Analyze MyPerformance /OEE Tuning" and "Analyze MyPerformance /OEE Monitor".

Analyze MyPerformance /OEE-Tuning 01.00.00.00-119 & Analyze MyPerformance /OEE-Monitor 01.02.00.00-119

Exiting Analyze MyPerformance /OEE Monitor, /OEE Tuning

To exit Analyze MyPerformance /OEE Monitor, /OEE Tuning, click the "Launchpad" button at the top left in the header line.



Analyze MyPerformance /OEE Monitor, /OEE Tuning closes and the launch pad is displayed.

Logging out MindSphere

1. Click the "Logout" button at the top right in the header line.



A confirmation prompt appears.

Logout

Do you really want to logout?
For security reasons it is recommended to close the browser after logging out. This is especially important if you use MindSphere on a public device.

Cancel

Logout

2. Click on "Logout".
Analyze MyPerformance /OEE Monitor, /OEE Tuning is closed.

Working with Analyze MyPerformance /OEE Monitor, Analyze MyPerformance /OEE Tuning

6

Overview

Analyze MyPerformance calculates the overall equipment efficiency (OEE) and provides important indicators for measures to increase efficiency. Through the automatic recording of machine data and states as well as a user dialog for the manual state detection by the operator, Analyze MyPerformance provides all the data required for optimizing production.

Analyze MyPerformance /OEE Monitor

Analyze MyPerformance /OEE Monitor provides you with the following functions:

- Performance monitoring (Page 88)
- Utilization planning (Page 97)
- Production quality (Page 105)

Analyze MyPerformance /OEE Tuning

Analyze MyPerformance /OEE Tuning provides you with the following functions:

- Performance monitoring (Page 88)
The functionality is identical to the functionality of the Analyze MyPerformance /OEE Monitor. The display and calculation of the KPIs can be adjusted using the configuration.
- Utilization planning (Page 97)
The functionality is identical to the functionality of the Analyze MyPerformance /OEE Monitor.
- Production quality (Page 105)
The functionality is identical to the functionality of the Analyze MyPerformance /OEE Monitor.
- Configuration (Page 109)

6.1 Performance monitoring

6.1.1 Overview

You can check the performance of the machines using the performance monitoring function.

All of the integrated machines are displayed as selections.

The following monitoring intervals are available:

- Today
- Current week
- Current month
- Current quarter
- Current year
- Custom date

The following criteria are available on the machine side:

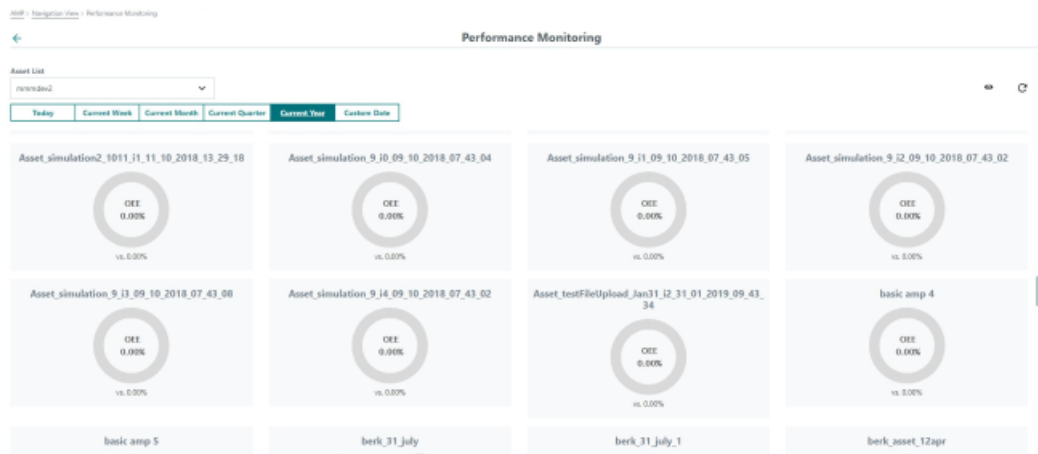
- OEE (Overall Equipment Efficiency)
- Availability
- Performance
- Quality

Procedure

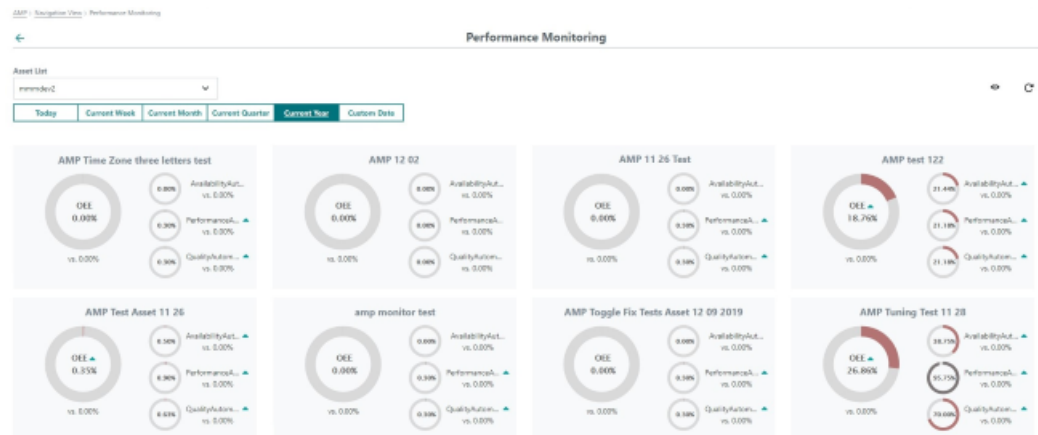
1. Click the "PERFORMANCE MONITORING" button in the "Overview" window.



2. The "Performance Monitoring" window opens.
The display differs depending on whether you use Analyze MyPerformance /OEE Monitor or whether you have edited the configuration with Analyze MyPerformance /OEE Tuning.
Analyze MyPerformance /OEE monitor



Analyze MyPerformance /OEE Tuning



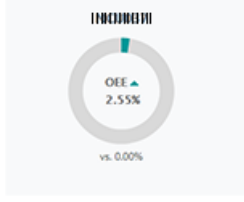








6.1 Performance monitoring

6.1.2 Buttons and elements

Parameters/elements in the "Performance Monitoring" window

The following parameters and elements are available for editing:

Parameter/element	Function
Drop-down lists	
Asset List	Clicking on the small arrow opens the drop-down list for selecting the machine.
Buttons	
	Clicking on the "Screenshot" button generates a screenshot of the current window.
	You update the opened window by clicking on the "Refresh" button.
	Clicking on the "Machine" button opens the "Machine Details" window for the corresponding machine.
Time buttons	
	Clicking on "Today", in window "Machine Details" you can see the OEE and KPI values for the current day, taking into account the time of day.
	Clicking on "Current week", you can see the OEE and KPI values for the current week. Starts on Monday and ends on the current workday.
	Clicking on "Current month", you can see the OEE and KPI values for the current month. Starts on the 1st day of the month and ends on the current workday.
	Clicking on "Current quarter", you can see the OEE and KPI values for the current quarter. Starts on the 1st day of the current quarter and ends on the current workday.
	Clicking on "Current year", you can see the OEE and KPI values for the current year. Starts on January 1 and ends on the current workday.
	Clicking on "Custom Date", you open a window to select a range of dates (time interval). After selection, this time interval is displayed on the button. Additional information is provided in the following Chapter: Defining the custom date (Page 94)

6.1.3 Performance monitoring

KPI development

The "Key Performance Indicator (KPI)" and the "Overall Equipment Efficiency (OEE)" are refreshed in the following time intervals:

- If predefined time intervals (e.g. "Today" or "Current Month") are selected, then the KPI/OEE results are always refreshed 10' and 40' after the full hour. Predefined time intervals also include the data of the current workday.
- If a user-defined time interval is selected, then the requested data is immediately calculated. If the user-defined time interval includes the current workday, then data is refreshed 10' and 40' after the full hour.

The OEE formula for "Analyze MyPerformance /OEE Monitor" has the following composition:

OEE Formula	
Availability	$A = \frac{\text{productiontime}}{\text{plannedtime}}$
Performance	$P = \frac{\text{totalpiece} * \text{targetcycletime}}{\text{productiontime}}$
Quality	$Q = \frac{\text{goodpiece}}{\text{totalpiece}}$
OEE	$A * P * Q = \frac{\text{productiontime}}{\text{plannedtime}} * \frac{\text{totalpiece} * \text{targetcycletime}}{\text{productiontime}} * \frac{\text{goodpiece}}{\text{totalpiece}}$

If you have activated "Analyze MyPerformance /OEE Tuning", the formula that you set under "Configuration" for the Analyze MyPerformance /OEE Tuning Assets is used.

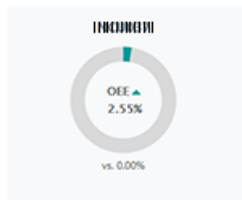
You will find **further information** on processing the KPI calculation under: Editing the KPI calculation (Page 112).

Procedure

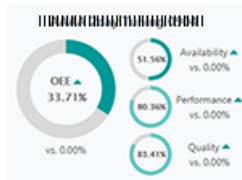
1. The "Performance Monitoring" window is open.
2. Clicking on the small arrow opens the drop-down "Asset List".
The list of available machines is displayed.

6.1 Performance monitoring

3. Select the required control system (machine) using the mouse.
The machine is displayed in the input field and as machine button together with the following data.
 - Name
 - Machine type
 - Location
 - SINUMERIK version
 - Machine status: The following data are displayed:
Machine offline
Unknown
Production
Technical disturbance
Organizational disturbance
Disturbance without technical or organizational reasons
4. Press the button of the corresponding asset.
Analyze MyPerformance /OEE Monitor Asset



Analyze MyPerformance /OEE Tuning Asset



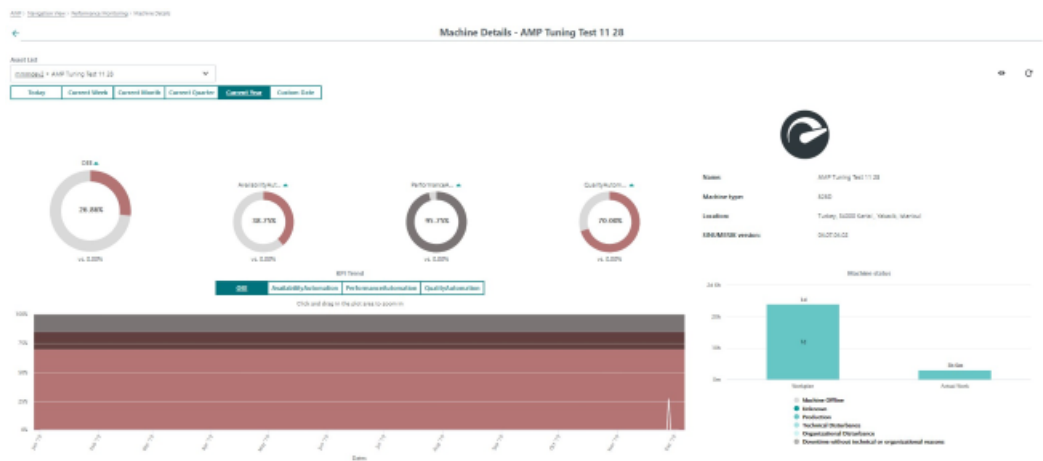
5. Window "Machine Details" opens.
Press the button for the desired time interval. The KPI value for the selected time interval is displayed.
 - You can see the KPI value as a percentage in the circles.
 - The KPI value is graphically shown in the "KPI trend diagram".
- Select the required monitoring parameter in order to display the KPI trend:
- OEE
 - Availability
 - Performance
 - Quality

You can edit the designations of the KPI labels "Availability", "Performance" and "Quality" with Analyze MyPerformance /OEE Tuning.

Further information on this can be found under: Editing the display (Page 113).

[illegible]

The color of the display in the figure has been edited with Analyze MyPerformance /OEE Tuning.

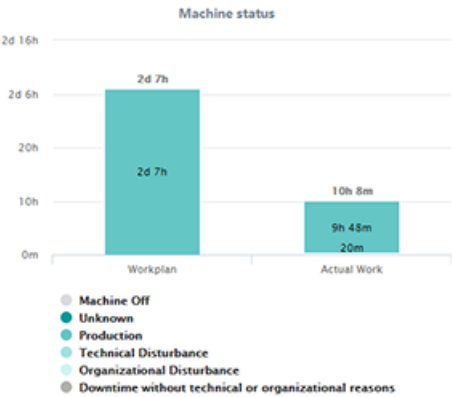


6.1 Performance monitoring

Machine status

The duration of the planned machine status (work plan) and the duration of the actual machine status (actual work) are shown juxtaposed in the machine status. You have the option of displaying and hiding an individual machine status.

- 1. Click on the machine status below the bar diagram.
The selected machine status is displayed or hidden in the overview.



6.1.4 Defining the custom date

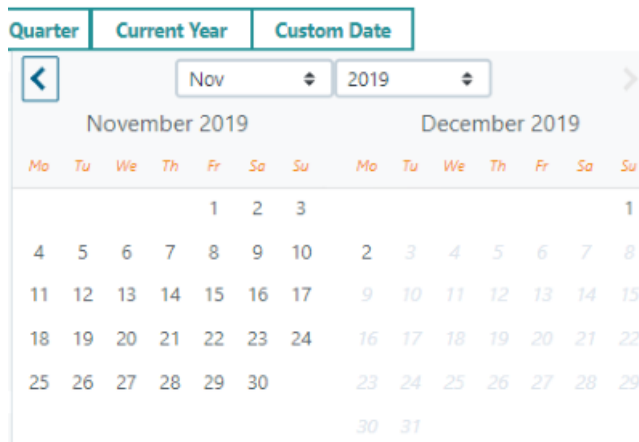
To display the performance results of the resource, in addition to the predefined date, you can also define a user-defined range of dates in the "Performance Monitoring" and "Machine Details" windows.

Button

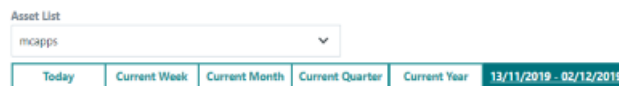
Button	Function
<div>Custom Date</div>	Clicking on "Custom Date", you open a window to select a range of dates (time interval). After selection, this time interval is displayed on the button.

Procedure

1. Click on "Custom Date".
2. The calendar opens.
Click on the start date followed by the end date.

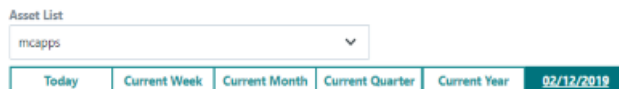


3. The component is automatically closed.
 - The selected time interval is displayed on the button instead of text "Custom Date".
 - The results are automatically refreshed on the page.



- OR -

If you only select a day, then the date is displayed on the button and the result is refreshed on the page.



Note

Restrictions in the individual selected date

You can select a maximum period of 2 years.

You cannot select any days that are in the future.

Effects

You can see the results (OEE / KPI) for each displayed asset – corresponding to the date selected – in window "Performance Monitoring".

The average OEE result of all subordinate (lower level) values is displayed for the higher-level assets.

6.1 Performance monitoring

You can view the performance (OEE / KPI) and the machine status data of the asset corresponding to the data that you selected in window "Machine Details" of an asset.

If you select "Today" or a specific single day, then the OEE / KPI results for each shift of the selected day are displayed.

If an individual day is not selected, then the KPI trend diagram displays the aggregated OEE / KPI results for each day in the selected time interval.

Note

Comparison function is available for OEE / KPI results

The comparison function for the OEE / KPI results is only available for the predefined selected date.

The comparison function is not available if you select a range of custom dates.

Example:

In the following example, you see the comparison function for the currently selected week, which compares the results with the previous week.



6.2 Utilization planning

6.2.1 Overview

You have the option of defining the utilization plans for the individual control systems in the "Utilization Planning" window.

The following tabs are available in the "Utilization Planning" window:

- **Applied Plan:** (Page 99)
Under this tab you can see the assigned utilization plans for the control systems.
- **Edit Plans** (Page 100)
Under this tab you can create and delete machine utilization plans.
- **Assign Plan** (Page 103)
Under this tab you can assign the required assets to the machine utilization plans that have been created.

Procedure

1. Click the "UTILIZATION PLANNING" button in the "Overview" window.



2. The "Utilization Planning" window is opened with the "Applied Plan" tab.

AMP > Utilization Planning

Utilization Planning

Applied Plan Edit Plans Assign Plan

Asset List

Select a machine ▼

Select Week

2018-10-01 - 2018-10-07 🕒

Time Interval (min)

60 ▼

Utilization Plan

WORKING
BREAK
FREETIME
MAINTENANCE

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
06:00							
07:00							
08:00							
09:00							
10:00							
11:00							
12:00							
13:00							
14:00							
15:00							
16:00							
17:00							
18:00							
19:00							
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04:00							
05:00							


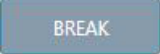


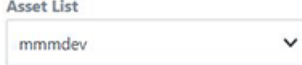
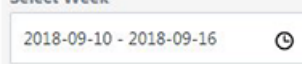
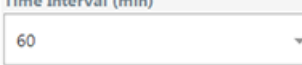
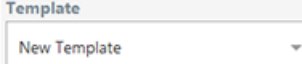

6.2 Utilization planning



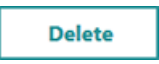


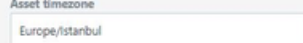

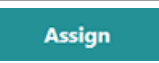
6.2.2 Buttons and elements

The following buttons and elements are available in the tabs of the "Utilization Planning" window for editing.

Parameters/elements in the "Utilization Planning" window

The following parameters and elements are available for editing:

Parameter/element	Function
Utilization plan buttons	
	Identifies the corresponding times as working times.
	Identifies the corresponding times as break times.
	Identifies the corresponding times as free time.
	Identifies the corresponding times as maintenance time.
"Applied Plan" tab	
Asset List 	Clicking on the small arrow opens the drop-down list for selecting a machine.
Select Week 	Clicking on the clock icon opens the calendar for defining the time period.
Time Interval (min) 	Clicking on the small arrow opens the drop-down list to select the available time interval in minutes. <ul style="list-style-type: none"> • 60 • 30 • 15 • 5 The utilization plan is displayed with the selected time intervals.
"Edit Plans" tab	
Template 	Clicking on the small arrow opens the drop-down list for selecting the templates that have been created.
Template Name 	Enter the required name for the new template.

Parameter/element	Function
Time Interval (min) 	Clicking on the small arrow opens the drop-down list to select the available time interval in minutes. <ul style="list-style-type: none"> • 60 • 30 • 15 • 5 The utilization plan is displayed with the selected time intervals.
Day Start Time 	Clicking on the small arrow opens the drop-down list for selecting the available start times of the day.
	Click on "Delete" to delete the selected utilization plan template.
	Click on "Save" to save the selected utilization plan template.
"Assignment" tab	
Template 	Clicking on the small arrow opens the list of the available utilization plan templates.
Asset timezone 	Displays the time zone that is assigned to the asset in the MindSphere Asset Manager.
Assignment Start Date 	Clicking on the clock icon opens the calendar to assign the start date.
	Click on "Assign" to assign the created utilization plan template to the required asset.

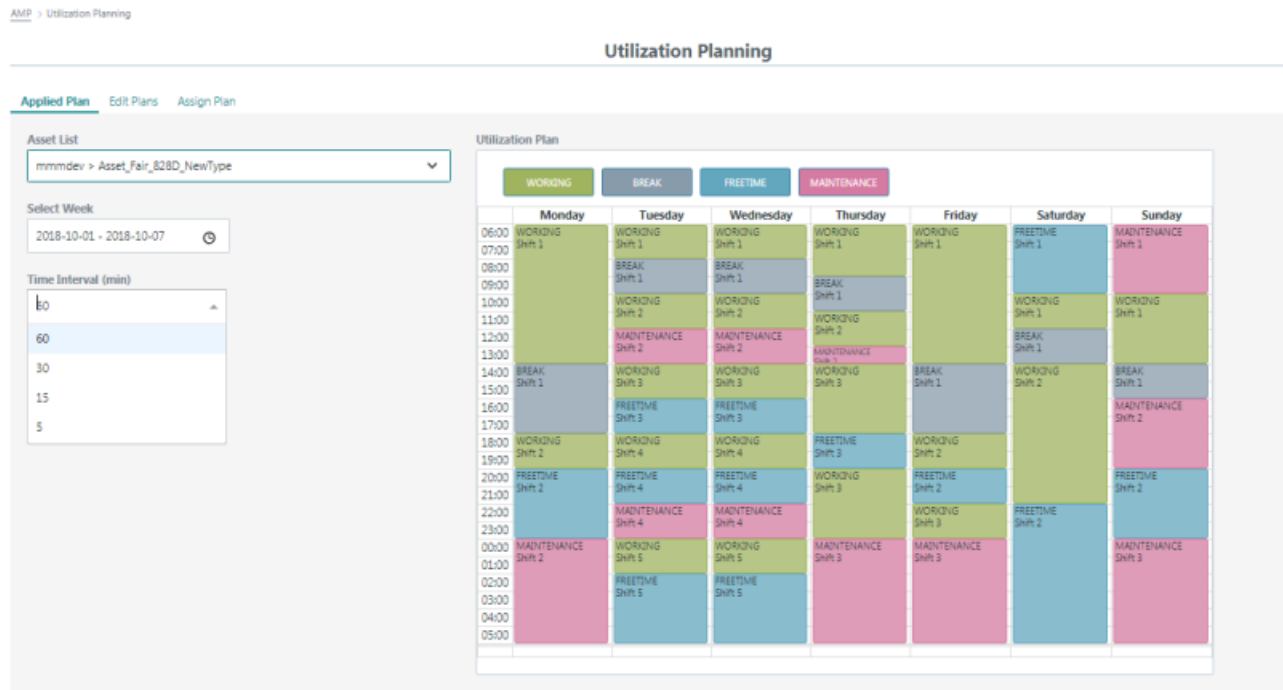
6.2.3 The "Applied Plan" tab

Procedure

1. In the "Utilization Planning" window, open the "Applied Plan" tab.
2. Open the drop-down "Asset List".
The list of available machines is displayed.
Select the required control system (machine) using the mouse.

6.2 Utilization planning

- Click on the clock icon in the "Select Week" selection box.
The "Select Week" calendar is opened.
Click to select the required week.
- In the drop-down list "Time Interval (min)", select the required interval.
The machine utilization plan is displayed for the selected time period.



6.2.4 The "Edit Plans" tab

In the "Edit Plans" tab, you have the following options:

- Creating utilization plans
- Deleting utilization plans

Creating a utilization plan

- In the "Utilization Planning" window, open the "Edit Plans" tab.
- Open the drop-down list "Template".
You can select the following:
 - Click "New Template" if you want to create a new utilization plan.
 - Click a previously created template that you wish to edit and save as the new machine utilization plan.
- Enter the name of the new machine utilization plan in the "Template name" input field.
- Open the "Time interval (min.)" drop-down list.
Choose the required time interval by clicking on it.

5. Open the drop-down list "Day start time".
Select the desired start time for the day with a mouse click.
6. Enter the desired times in the machine utilization plan as follows:
 - Click one of the buttons above the weekly plan (e.g. BREAK), and drag the button to the required position in the machine utilization plan.
 - Then position the cursor at the upper or lower edge of the button in such a way that the cursor becomes a double arrow. Drag the button to the required start or end time.
7. Double-click the positioned button in the machine utilization plan.
The "Edit status" window opens.
8. Select the desired shift number from the "Shift" drop-down list.
Note the following:
 - Each day, the shift numbering starts with "1".
 - Several entries can be assigned to the same shift.
 - The shift number may only be incremented by "1" for each entry.
9. If necessary, select a new status from the "Status" drop-down list.
10. Click "Save" to save the status.
 - OR -
 - Click "Delete" to delete this status from the machine utilization plan.
 - OR -
 - Click "Cancel" to reject the changes.

Edit status

Shift

Shift 1 ▼

Status

Maintenance ▼

Cancel Delete Save

11. Click "Save" to save the machine utilization plan.

Applied Plan: Edit Plans Assign Plan

Template: Fa/Templat4

Delete

Template Name: Fa/Templat4

Time Interval (min): 60

Day Start Time: 08:00

Utilization Plan

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
08:00	WORKING Shift 1	WORKING Shift 1	WORKING Shift 1	WORKING Shift 1	WORKING Shift 1	WORKING Shift 1	MAINTENANCE Shift 1
09:00							
12:00							
13:00	MAINTENANCE Shift 1	MAINTENANCE Shift 1	MAINTENANCE Shift 1	MAINTENANCE Shift 1	MAINTENANCE Shift 1	MAINTENANCE Shift 1	
14:00	WORKING Shift 2	WORKING Shift 2	WORKING Shift 2	WORKING Shift 2	WORKING Shift 2	WORKING Shift 2	
15:00							
16:00	WORKING Shift 3	WORKING Shift 3	WORKING Shift 3	WORKING Shift 3	WORKING Shift 3	WORKING Shift 3	WORKING Shift 2
17:00							
18:00	WORKING Shift 3	MAINTENANCE Shift 2	MAINTENANCE Shift 2	MAINTENANCE Shift 2	WORKING Shift 3	MAINTENANCE Shift 2	
19:00							
20:00	WORKING Shift 3	WORKING Shift 4	WORKING Shift 3	MAINTENANCE Shift 2	MAINTENANCE Shift 2	MAINTENANCE Shift 2	
21:00							
22:00	WORKING Shift 4	WORKING Shift 1		WORKING Shift 3	WORKING Shift 3	WORKING Shift 3	
23:00							
00:00							
01:00							
02:00	WORKING Shift 1	WORKING Shift 6	FREETIME Shift 1	WORKING Shift 4	WORKING Shift 6	WORKING Shift 4	WORKING Shift 3
03:00							
04:00	WORKING Shift 1		WORKING Shift 4				
05:00	WORKING Shift 6						
06:00							
07:00							

Save

12. The "Save template as..." window opens.
To save the new template, click on the "Save" button.
- OR -
To cancel the operation, click on the "Cancel" button.

Save template as...

Are you sure you want to save the template?

Cancel

Save

Deleting a utilization plan

You have the option of deleting a utilization plan.

1. Clicking on the small arrow opens the drop-down list "Templates".
Select the template that you wish to delete using the mouse.
2. Click "Delete".
The "Warning" window opens.
To delete the template, click "Delete".
- OR -
To cancel the operation, click "Cancel".

Warning

Are you sure you want to delete the template?

Cancel

Delete


6.2.5 The "Assign Plan" tab

Proceed as follows to assign a utilization plan.

Procedure

1. In the "Utilization Planning" window, open the "Assign Plan" tab.
2. Open the drop-down "Asset List".
The list of available machines is displayed.
Use the cursor to select the required control system.
3. Open the drop-down list "Template".
Select the required template.
The machine utilization plan of the template is displayed.
4. Open the "Assignment Start Date" calendar by clicking on the clock icon.
Select the required start date. The next day is the earliest start date.
If you have not selected the correct date or the day, an error message is displayed.

Assignment Start Date

2019-03-01 

Assignment date cannot be today or in the past


5. Click "Assign".
You receive the success message "Assignment completed successfully".

Applied Plan Edit Plans **Assign Plan**

Asset List
mmmdev > Asset_Fair_B40D_NewType

Asset timezone
Europe/Istanbul

Template
FairTemplated

Assignment Start Date
2018-10-12 

Utilization Plan

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
08:00	WORKING Shift 1	WORKING Shift 1	WORKING Shift 1	WORKING Shift 1	WORKING Shift 1	WORKING Shift 1	MAINTENANCE Shift 1
09:00							
10:00							
11:00							
12:00		MAINTENANCE Shift 1	MAINTENANCE Shift 1	MAINTENANCE Shift 1	MAINTENANCE Shift 1	MAINTENANCE Shift 1	
13:00	MAINTENANCE Shift 1	WORKING Shift 2	WORKING Shift 2	MAINTENANCE Shift 1	MAINTENANCE Shift 1	MAINTENANCE Shift 1	
14:00	WORKING Shift 2						
15:00							
16:00		WORKING Shift 3		WORKING Shift 2	WORKING Shift 2	WORKING Shift 2	WORKING Shift 2
17:00							
18:00		MAINTENANCE Shift 1	MAINTENANCE Shift 2	MAINTENANCE Shift 2	WORKING Shift 3	MAINTENANCE Shift 2	
19:00	WORKING Shift 3	WORKING Shift 4	WORKING Shift 3	MAINTENANCE Shift 2	WORKING Shift 3		
20:00					MAINTENANCE Shift 1		
21:00					WORKING Shift 4		
22:00					MAINTENANCE Shift 1		
23:00	WORKING Shift 4	WORKING Shift 5			WORKING Shift 6		
00:00							
01:00				WORKING Shift 3		WORKING Shift 3	
02:00	WORKING Shift 5	WORKING Shift 6	FREETIME Shift 3	WORKING Shift 4	WORKING Shift 6	WORKING Shift 4	WORKING Shift 3
03:00							
04:00			WORKING Shift 4				
05:00	WORKING Shift 6						
06:00							
07:00							

Assign

6.2 Utilization planning

Note

Assignment takes place from the next day

You cannot assign the utilization plan until the next day or one of the next days.

6.3 Production quality

6.3.1 Overview

Check the quality of your production in the "Production quality" window.

Procedure

1. Click on the "PRODUCTION QUALITY" icon in the "Overview" window.



2. The "Production Quality" window opens.

Shift	Start Time	End Time	Total Pieces	Scrap Pieces	Target Pieces	Target Cycle Time	Cycle Time Unit
1	04:00	13:00	100	20	100	10	SEC
2	13:00	14:00	0	0	1	0	SEC
3	14:00	15:00	0	0	1	1	SEC
4	15:00	16:00	10	0	1	1	SEC
5	16:00	17:00	100	10	100	1	SEC
6	17:00	04:00	0	0	1	1	SEC
6 Total							


6.3.2 Buttons and elements

Parameters/elements in the "Production Quality" window

The following parameters and elements are available for editing:

Parameter/element	Function
Asset List <input type="text" value="mmmdev"/>	Clicking on the arrow opens the drop-down list "Asset List" for selecting the control system (machine).
Date <input type="text" value="yyyy-mm-dd"/>	Clicking on the clock icon opens the calendar to select the date.

6.3 Production quality

Parameter/element	Function
	Click the "Save" button to save the current events.
Columns in the "Workpieces" table	
Shift	Displays the number of the work shift
Start time	Displays the start time of the shift
End time	Displays the end time of the shift
Total pieces	Displays the number produced parts
Scrap pieces	Displays the number of parts produced with error
Target pieces	Displays the number of parts that are to be produced in a shift
Target cycle time	Displays the targeted cycle time for a piece to be produced
Cycle Time unit	Drop-down list to select the following time unit. <ul style="list-style-type: none"> • sec = seconds • min = minutes • h = hours

6.3.3 Checking production quality

To check the production quality of a machine, proceed as follows.

Procedure

1. In the "Production Quality " window, open the "Workpieces" tab.
2. Clicking on the small arrow opens the drop-down "Asset List".
The list of available machines is displayed.
Select the required control system (machine) using the mouse.

- Click on the clock icon to open the "Date" calendar.
Select the required day.
You can see the required production data in the "Workpieces" table.

← Production Quality

Workpieces Action required

Asset List: Date:

Shift	Start Time	End Time	Total Pieces	Scrap Pieces	Target Pieces	Target Cycle Time	Cycle Time Unit
1	04:00	13:00	<input type="text" value="100"/>	<input type="text" value="20"/>	<input type="text" value="100"/>	<input type="text" value="10"/>	<input type="text" value="SEC"/>
2	13:00	14:00	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="1"/>	<input type="text" value="0"/>	<input type="text" value="SEC"/>
3	14:00	15:00	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="SEC"/>
4	15:00	16:00	<input type="text" value="10"/>	<input type="text" value="0"/>	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="SEC"/>
5	16:00	17:00	<input type="text" value="100"/>	<input type="text" value="10"/>	<input type="text" value="100"/>	<input type="text" value="1"/>	<input type="text" value="SEC"/>
6	17:00	04:00	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="SEC"/>
6 Total							

Save

Note**Enter target values**

Note that the target values can be entered for all shifts of the previous days and the current day.

- Click "Save" to save the data.
"Workpieces are saved successfully" is displayed the right-hand upper part of the window to show that the operation was successfully completed.

Workpieces are saved successfully ✓

Note**Rule for the production time**

The following rule applies to the production time:

Production time \geq Target cycle time * Target pieces

6.3.4 The "Action required" tab

To find out the missing workpiece of a machine, proceed as follows.

6.3 Production quality

Procedure

1. Open the "Action required" tab in the "Production Quality" window.
2. Clicking on the small arrow opens the drop-down "Asset List".
The list of available machines is displayed.
Select the required control system (machine) using the mouse.
3. The "Missing days" table shows the corresponding data.
You can use this information to enter the missing input data for the corresponding shifts and days in the "Workpieces" tab.

← **Production Quality**

Workpieces Action Required

Asset List
mmmdev > AMPAssetParent 03 07 > AMPAssetChild 03 07 > AMPAssetGrandChild 03 07 ▼

Missing Days

Date	Shifts
2019-03-22	1
2019-03-21	1,2,3,4,5,6
2019-03-18	1,2,3,4
2019-03-17	1,2,3,4,5
2019-03-16	1,2,3,4
2019-03-15	1,2,3,4,5,6
2019-03-14	1,2,3,4,5,6
2019-03-13	1,2,3,4,5

13 Total

1 2

6.4 Analyze MyPerformance /OEE Tuning - Configuration

6.4.1 Overview

Analyze MyPerformance /OEE Tuning

You can configure OEE Tuning Assets with Analyze MyPerformance /OEE Tuning.

The changes you make here affect all OEE Tuning assets in your tenant

Note

Button configuration

The "Configuration" button in the navigation view is activated if Analyze MyPerformance /OEE Tuning has been purchased for the tenant. However, only users with the "Admin" authorization can change the configuration on this page. Standard users can only display the configuration.

The "Configuration" window contains the following tabs:

- KPI calculation
To adapt customized formulas for "Availability", "Performance" and "Quality" - or the KPI names defined in the "Display" tab.
- Display
To adapt the display of KPI colors, KPI ranges and KPI names

KPI calculation tab

Click the "Configuration" button in the Navigation overview.

The "Configuration" window with the "KPI calculation" tab opens.

Configuration

KPI Calculation Display

OEE = $\frac{\text{Production Time}}{\text{Planned Production Time}} \times \frac{\text{Total Pieces} \times \text{Target Cycle Time}}{\text{Production Time}} \times \frac{\text{Good Pieces}}{\text{Total Pieces}}$

Availability

1. $\frac{\text{Production Time}}{\text{Planned Production Time}}$ Description: Production Time: This is the total duration when the machine is in production while at the same time planned production time was configured in the utilization plan.
2. $\frac{\text{Production Time}}{\text{Shift Length}}$ Description: Planned Production Time: This is the total duration of the production time configured in the utilization plan.
3. $\frac{\text{Planned Production Time}}{50\%}$

Performance

1. $\frac{\text{Total Pieces} \times \text{Target Cycle Time}}{\text{Production Time}}$ Description: Total Pieces: This is the total number of the produced workpieces in the shift (including the scrap pieces). Please see the Production Quality page to view or manually enter this value. This value can be automatically received from the machine. (Please see the function manual for the necessary configuration).
2. $\frac{\text{Good Pieces} \times \text{Target Cycle Time}}{\text{Production Time}}$ Description: Target Cycle Time: This is the targeted duration to execute one cycle of the loaded NC-Program. This value can be set manually for each shift on Production Quality page.
3. $\frac{\text{Good Pieces}}{\text{Target Pieces}}$ Description: Production Time: This is the total duration when the machine is in production while at the same time planned production time was configured in the utilization plan.
4. $\frac{\text{Total Pieces}}{\text{Target Pieces}}$
5. $\frac{\text{Planned Production Time}}{50\%}$

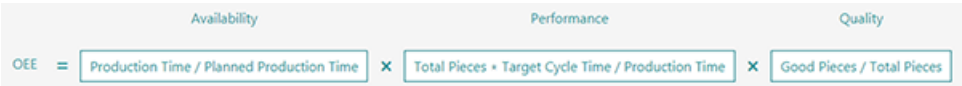
Quality

1. $\frac{\text{Good Pieces}}{\text{Total Pieces}}$ Description: Good Pieces: This is the number of the produced good workpieces in the shift (Good Pieces = Total Pieces - Scrap Pieces).
2. $\frac{\text{Good Pieces}}{\text{Target Pieces}}$ Description: Total Pieces: This is the total number of the produced workpieces in the shift (including the scrap pieces). Please see the Production Quality page to view or manually enter this value. This value can be automatically received from the machine. (Please see the function manual for the necessary configuration).
3. $\frac{\text{Planned Production Time}}{50\%}$

Reset Save

6.4 Analyze MyPerformance /OEE Tuning - Configuration

You see the currently active OEE formula in the uppermost area.



Below, you can see the areas for processing the formula.
On the left, select a formula or a fixed value; to the right you can see an explanation of the parameters used.

• Availability

Availability

1.

2.

3.

Description

Production Time: This is the total duration when the machine is in production while at the same time planned production time was configured in the utilization plan.

Planned Production Time: This is the total duration of the production time configured in the utilization plan.

• Performance

Performance

1.

2.

3.

4.

5.

Description

Total Pieces: This is the total number of the produced workpieces in the shift (including the scrap pieces). Please see the Production Quality page to view or manually enter this value. This value can be automatically received from the machine. (Please see the function manual for the necessary configuration) Quality page.

Target Cycle Time: This is the targeted duration to execute one cycle of the loaded NC-Program. This value can be set manually for each shift on Production Quality page.

Production Time: This is the total duration when the machine is in production while at the same time planned production time was configured in the utilization plan.

• Quality

Quality

1.

2.

3.

Description

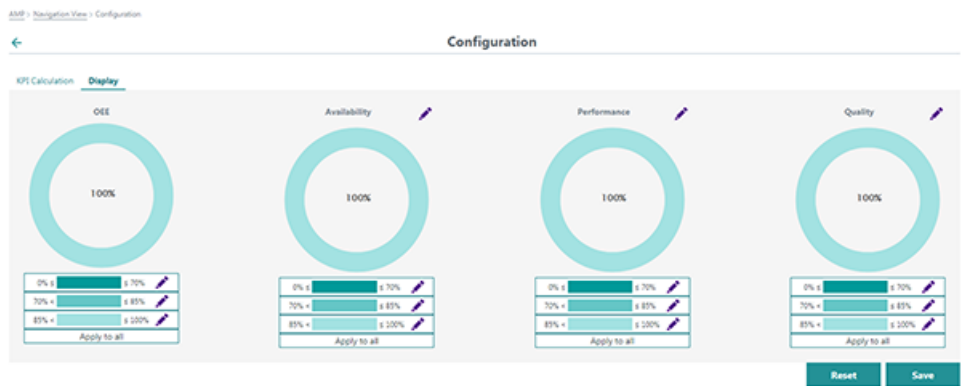
Good Pieces: This is the number of the produced good workpieces in the shift (Good Pieces = Total Pieces - Scrap Pieces).

Total Pieces: This is the total number of the produced workpieces in the shift (including the scrap pieces). Please see the Production Quality page to view or manually enter this value. This value can be automatically received from the machine. (Please see the function manual for the necessary configuration)

Display tab


Click the "Display" tab.

In this tab, you can change the names of the KPI, the ranges of the KPI and the color in which they are displayed.



Buttons

The following buttons are available:

Button	Function
	The "Edit" button opens the color selection of the display.
Save	The "Save" button saves the processed KPI configuration.
Reset	The "Reset" button resets all KPIs to their default settings. The default setting corresponds to the setting of Analyze MyPerformance /OEE Monitor.

6.4.2 The variables

Overview

You can see the following variables in the "Configuration" window.

Variable	Description
Production time	This is the total time during which the machine is operational, while at the same time the planned production time was configured in the utilization plan.
Planned production time	This is the total time of the production time configured in the utilization plan.
Shift length	Total time of the shift
Constant value as a %	If you wish to enter a constant value for this KPI, select the value in this control system. Set this value to 100% if you do not wish to take into account this KPI for the OEE calculation.
Total pieces:	This is the total number of workpieces produced in the shift (including reject parts). This value can be accepted automatically by the machine. For a manual entry, you can see the value in the "Production quality (Page 105)" window.
Target cycle time	This is the planned time for executing a cycle of the loaded NC program. This value can be set manually for each shift in the "Production quality (Page 105)" window.
Good pieces	This is the number of the produced good workpieces in the shift (Good Pieces = Total Pieces – Scrap Pieces)
Target pieces	This is the planned number of good pieces to be produced. You can see this value in window "Production quality (Page 105)".

6.4 Analyze MyPerformance /OEE Tuning - Configuration

6.4.3 Editing the KPI calculation

Procedure

1. Click the "Configuration" button in the Navigation overview.
The "Configuration" window with the "KPI calculation" tab opens.
You see the actual calculation formula in the top area.
You have the option of changing the formula in the "Availability", "Performance" and "Quality" areas.

Configuration

KPI Calculation Display

OEE = $\text{Production Time} / \text{Planned Production Time}$ × $\text{Total Pieces} \times \text{Target Cycle Time} / \text{Production Time}$ × $\text{Good Pieces} / \text{Total Pieces}$

Availability

1. $\text{Production Time} / \text{Planned Production Time}$

Description

Production Time: This is the total duration when the machine is in production while at the same time planned production time was configured in the utilization plan.

Planned Production Time: This is the total duration of the production time configured in the utilization plan.
2. $\text{Production Time} / \text{Shift Length}$
3. $\text{Production Time} / \text{Shift Length}$ 50%

Performance

1. $\text{Total Pieces} \times \text{Target Cycle Time} / \text{Production Time}$

Description

Total Pieces: This is the total number of the produced workpieces in the shift (including the scrap pieces). Please see the Production Quality page to view or manually enter this value. This value can be automatically received from the machine. (Please see the function manual for the necessary configuration)

Target Cycle Time: This is the targeted duration to execute one cycle of the loaded NC-Program. This value can be set manually for each shift on Production Quality page.

Production Time: This is the total duration when the machine is in production while at the same time planned production time was configured in the utilization plan.
2. $\text{Good Pieces} \times \text{Target Cycle Time} / \text{Production Time}$
3. $\text{Good Pieces} / \text{Target Pieces}$
4. $\text{Total Pieces} / \text{Target Pieces}$
5. $\text{Total Pieces} / \text{Target Pieces}$ 50%

Quality

1. $\text{Good Pieces} / \text{Total Pieces}$

Description

Good Pieces: This is the number of the produced good workpieces in the shift ($\text{Good Pieces} = \text{Total Pieces} - \text{Scrap Pieces}$).

Total Pieces: This is the total number of the produced workpieces in the shift (including the scrap pieces). Please see the Production Quality page to view or manually enter this value. This value can be automatically received from the machine. (Please see the function manual for the necessary configuration)
2. $\text{Good Pieces} / \text{Target Pieces}$
3. $\text{Good Pieces} / \text{Target Pieces}$ 50%

Reset Save

2. Click to select the area in the corresponding line you want to change.
You see the corresponding formula in the top area.
3. If you select a constant value for the KPI, use the slider to define the required percentage.
4. Click the "Save" button to save the configuration.
You see the note that the new calculation will be active starting with the next shift for all OEE Tuning assets.

Please note that the new calculation will be active starting from the next shift of all OEE-Tuning assets. ✓

Reset settings

1. Click the "Reset" button.
You see the warning notice that the calculation settings will be reset to default settings for all OEE Tuning assets.

Warning

Please note that the KPI calculation selections will be reset to default settings for all OEE-Tuning assets. Do you want to continue?



2. Click the "Reset" button.
All KPI calculations are reset to the default settings.

6.4.4 Editing the display

Selecting the color for KPI values

You have the option of selecting a maximum of 3 different colors to display each KPI value.

The selected color is applied to:

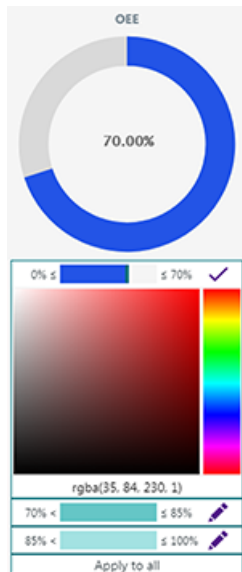
- The circular display
- The graphic representation

Procedure

1. Open the "Display" tab.
2. Click the "Edit" button in the line you want to edit.
3. Select the desired color from the color column on the left.
4. Click the desired color intensity in the color selection.

6.4 Analyze MyPerformance /OEE Tuning - Configuration


- Click the check mark above the color selection.



- Clicking the "Apply to all" button sets the settings for all KPIs.
- Click the "Save" button.
You see the note that the change is applied to all OEE Tuning assets.

Please note that the new display settings are now active for all OEE-Tuning assets. ✓

Changing KPI names

- Click the "Edit" button alongside the name of the KPI.
The name is opened for editing.

- Enter a new name.
- Click the check mark next to the name.
The change is accepted.
- Click the "Save" button.
You see the note that the change is applied to all OEE Tuning assets.

Reset settings

1. Click the "Reset" button.

You see the warning notice that the color settings and KPI names are reset for all OEE Tuning assets.

Warning

Please note that the color settings and the KPI names will be reset to default for all OEE-Tuning assets. Do you want to continue?

Cancel

Reset

2. Click the "Reset" button.

The color settings and KPI names are reset to their default settings.

Appendix

A.1 List of abbreviations

Admin	Administrator (user role)
AMC	Analyze MyCondition
AMP	Analyze MyPerformance
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
IPC	Industrial PC
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

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