SIEMENS

MindSphere

MindApp
SINUMERIK Service Assistance

Operating Manual

Introduction 1

Safety notes 2

Product overview 3

Machine Configuration in MindSphere 4

Module description 5

Troubleshooting 6

Appendix A

Valid for controls:
SINUMERIK ONE, SINUMERIK 840D sl / SINUMERIK 828D / SINUMERIK PL
SINUMERIK Service Assistance V2.5.0.4

03/2023
A5E52205493B AB

Legal information

Warning notice system

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

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

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

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

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

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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.

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Disclaimer of Liability

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

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Ⓟ 03/2023 Subject to change

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Table of contents

1 Introduction 7

1.1 About SINUMERIK Service Assistance 7

1.2 About this documentation 8

1.3 Documentation on the internet 9

1.3.1 MindSphere documentation for apps and solutions 9

1.4 Feedback on the technical documentation 12

1.5 mySupport documentation 13

1.6 Service and Support 14

1.7 OpenSSL 16

1.8 General Data Protection Regulation (GDPR) 17

2 Safety notes 19

2.1 Fundamental safety instructions 19

2.1.1 General safety instructions 19

2.1.2 Warranty and liability for application examples 19

2.1.3 Security information 19

3 Product overview 21

3.1 System concept 22

4 Machine Configuration in MindSphere 25

4.1 Aspect configuration for SSA with MMM 26

4.1.1 Overview 26

4.1.2 Initial creation of Aspects 27

4.1.3 Creating Asset Type 30

4.1.4 Creating Asset 33

4.1.5 Connecting Machine to Asset 35

4.1.6 Enabling MMM data acquisition 36

4.1.7 Enabling SSA data acquisition 37

4.1.7.1 Overview 37

4.1.7.2 Machine model and auto aspect creation and configuration 38

4.1.7.3 Configuring aspect for "time-based / cyclic trigger" acquisition 41

4.1.7.4 Configuring aspect "variable value-based trigger" acquisition 47

4.2 Aspect configuration for SSA with BFC Gateway 50

4.2.1 Overview 50

4.2.2 Requirements 51

4.2.3 Checking the current status of middleware (logic) 51

4.2.4 Creating aspects in Mindsphere 52

4.2.5 Creating the asset type "bfc_ssa_sinumerik" 52

4.2.6 Connecting a new machine to SSA 55

4.2.6.1 Creating a new asset of the type "bfc_ssa_sinumerik" 56

4.2.6.2 Generating connection information of the assets 58

4.2.6.3 Creating a MindSphere gateway for SSA ... 59
4.2.7 Configuring the BFC client data acquisition ... 65
4.2.8 Creating and saving a machine identity ... 71

5 Module description ... 73

5.1 Overview ... 73

5.2 Handling of identSNAPSHOT file ... 74
5.2.1 Overview ... 74
5.2.2 Creating identSNAPSHOT file on SINUMERIK controller ... 74
5.2.3 Uploading identSNAPSHOT file to Mindsphere ... 75
5.2.4 Limitations on file upload ... 78
5.2.5 Uploading identSNAPSHOT file via Fleet Manager ... 80

5.3 Asset Selection ... 82
5.3.1 New Asset Selection ... 84
5.3.2 Billing ... 87
5.3.2.1 Billing systems ... 87
5.3.2.2 Activation page ... 87

5.4 Machine Transparency ... 94
5.4.1 Overview ... 94
5.4.2 Basic Information ... 96
5.4.3 Hardware Components ... 96
5.4.4 GSP (Global Service Platform) ... 99
5.4.5 Logbook and Licenses ... 101
5.4.6 Software Components ... 102
5.4.7 Change Protocol ... 105

5.5 Machine Condition ... 108
5.5.1 Overview ... 108
5.5.2 Process Data ... 109
5.5.3 Security Level ... 111
5.5.4 Operating Time ... 113
5.5.5 Boot Monitoring ... 114

5.6 Machine Error Analysis ... 117
5.6.1 Machine Error Analysis for an asset with ClosedAlarms Aspect ... 117
5.6.1.1 Alarms ... 117
5.6.1.2 Triggering Alarms for Disturbances ... 125
5.6.1.3 Alarm Trend ... 126
5.6.2 Machine Error Analysis for an asset without ClosedAlarms Aspect ... 128
5.6.2.1 Overview ... 128
5.6.2.2 Current Alarms ... 129
5.6.2.3 Alarm History ... 132
5.6.2.4 Triggering Alarms for Disturbances ... 135
5.6.3 MMM & SSA Interlinking ... 138
5.6.4 Failure Analysis ... 140

6 Troubleshooting ... 143

A Appendix ... 145

A.1 Data Acquisition only in MindSphere ... 145

A.2 Data Acquisition in MMM - "Time-based / cyclic trigger" ... 147

A.3 Data Acquisition in MMM - "Variable value-based trigger" 151
A.4 Aspect configuration with MMM - minimum aspect requirements 152
A.5 Clarification of machine variable parameters 154
A.6 Supplementary documentation 155
Glossary 157
Index 159

Introduction

1

1.1 About SINUMERIK Service Assistance

SINUMERIK Service Assistance supports service experts in performing fault analysis on machine tools with SINUMERIK 828D/840D/ONE controllers. Three different options are available to individualize the level of support.

- Machine Transparency identifies all currently installed hardware components as well as firmware and software versions and their changes.
- Machine Condition enables the cyclic recording of extended status data on the control and drive technology and its selective evaluation.
- Error Analysis efficiently identifies and evaluates fault states and disturbances in machine tools based on intelligent filter options and a user-friendly interface.

1.2 About this documentation

Content

This manual describes the administration and configuration of the MindSphere application **SINUMERIK Service Assistance (SSA).**

Below information is described in detail:

- How to configure Manage MyMachine File Upload functionality to activate SSA Machine Transparency
- How to administrate / configure aspects and assets
- How to use SINUMERIK Service Assistance functionality

Target group

This publication is intended for machine operators, plant operators.

Standard scope

This documentation only describes the functionality of the standard version. This may differ from the scope of the functionality of the system that is actually supplied. Please refer to the ordering documentation only for the functionality of the supplied drive system.

It may be possible to execute other functions in the system which are not described in this documentation. This does not, however, represent an obligation to supply such functions with a new control or when servicing.

For reasons of clarity, this documentation cannot include all of the detailed information on all product types. Further, this documentation cannot take into consideration every conceivable type of installation, operation and service/maintenance.

The machine manufacturer must document any additions or modifications they make to the product themselves.

Websites of third-party companies

This document may contain hyperlinks to third-party websites. Siemens is not responsible for and shall not be liable for these websites and their content. Siemens has no control over the information which appears on these websites and is not responsible for the content and information provided there. The user bears the risk for their use.

1.3 Documentation on the internet

1.3.1 MindSphere documentation for apps and solutions

MindSphere applications provide you with the functionality needed to solve your various industrial IoT use cases. You can find an overview of documentation for all MindSphere apps and solution on the MindSphere platform.

See also

MindSphere documentation (https://siemens.mindsphere.io/en/docs/apps-and-solutions)

Comprehensive documentation about the functions provided in SINUMERIK ONE Version 6.13 and higher is provided in the Documentation overview SINUMERIK ONE (https://support.industry.siemens.com/cs/ww/en/view/109768483).

You can display documents or download them in PDF and HTML5 format.

The documentation is divided into the following categories:

- User: Operating
- User: Programming
- Manufacturer/Service: Functions
- Manufacturer/Service: Hardware
- Manufacturer/Service: Configuration/Setup
- Manufacturer/Service: Safety Integrated
- Information and training
- Manufacturer/Service: SINAMICS

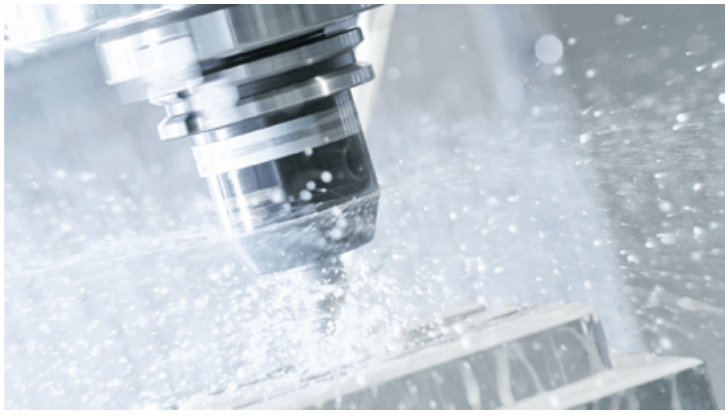
Comprehensive documentation about the functions provided in SINUMERIK 840D sl Version 4.8 SP4 and higher is provided in the Documentation overview SINUMERIK 840D sl (https://support.industry.siemens.com/cs/ww/en/view/109766213).

You can display the documents or download them in PDF and HTML5 format.

The documentation is divided into the following categories:

- User: Operating
- User: Programming
- Manufacturer/Service: Functions
- Manufacturer/Service: Hardware
- Manufacturer/Service: Configuration/Setup
- Manufacturer/Service: Safety Integrated
- Manufacturer/Service: SINUMERIK Integrate/MindApp
- Information and training
- Manufacturer/Service: SINAMICS

Comprehensive documentation about the functions provided in SINUMERIK 828D Version 4.8 SP4 and higher is provided in the 828D documentation overview (https://support.industry.siemens.com/cs/ww/en/view/109766724).



You can display documents or download them in PDF and HTML5 format.

The documentation is divided into the following categories:

- User: Operating
- User: Programming
- Manufacturer/Service: Configuring
- Manufacturer/Service: Commissioning
- Manufacturer/Service: Functions
- Manufacturer/Service: Safety Integrated
- SINUMERIK Integrate/MindApp
- Info & Training

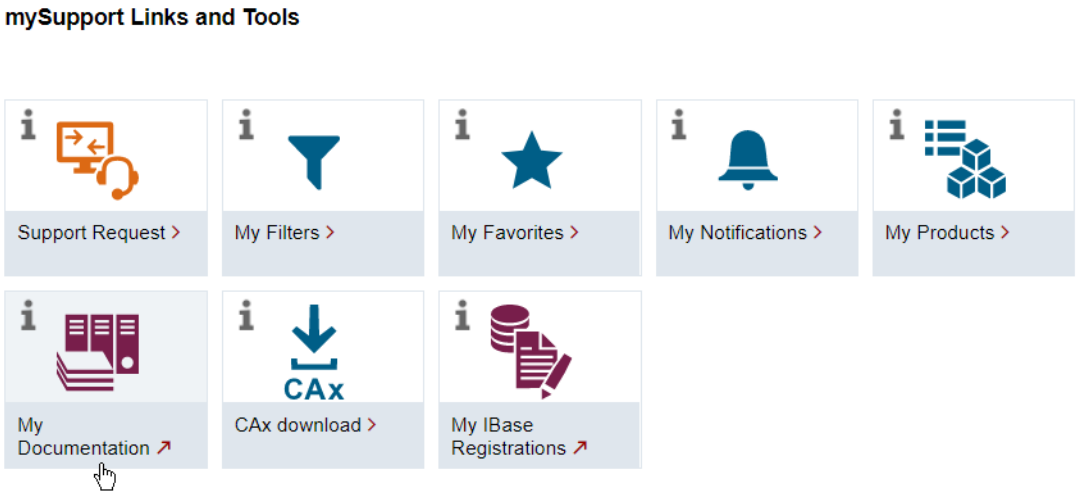
1.4 Feedback on the technical documentation

If you have any questions, suggestions or corrections regarding the technical documentation which is published in the Siemens Industry Online Support, use the link "Provide feedback" which appears at the end of the entry.

1.5 mySupport documentation

With the "mySupport documentation" web-based system you can compile your own individual documentation based on Siemens content, and adapt it for your own machine documentation.

To start the application, click on the "My Documentation" tile on the mySupport homepage (https://support.industry.siemens.com/cs/my?lc=en-WW):



The configured manual can be exported in RTF, PDF or XML format.

Note

Siemens content that supports the mySupport documentation application can be identified by the presence of the "Configure" link.

1.6 Service and Support

Product support

You can find more information about products on the internet:

Product support (https://support.industry.siemens.com/cs/ww/en/)

The following is provided at this address:

- Up-to-date product information (product announcements)
- FAQs
- Manuals
- Downloads
- Newsletters with the latest information about your products
- Global forum for information and best practice sharing between users and specialists
- Local contact persons via our Contacts at Siemens database (→ "Contact")
- Information about field services, repairs, spare parts, and much more (→ "Field Service")

Technical support

Country-specific telephone numbers for technical support are provided on the internet at address (https://support.industry.siemens.com/cs/ww/en/sc/4868) in the "Contact" area.

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

Training

You can find information on SITRAIN at the following address (https://www.siemens.com/sitrain).
SITRAIN offers training courses for automation and drives products, systems and solutions from Siemens.

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- Resolving problems when implementing a project
- Troubleshooting when faults develop
- Expanding a system or planning a new system

Furthermore, you have access to the Technical Forum and other articles from our experts:

- FAQs
- Application examples
- Manuals
- Certificates
- Product announcements and much more

The "Siemens Industry Online Support" app is available for Apple iOS and Android.

Data matrix code on the nameplate

The data matrix code on the nameplate contains the specific device data. This code can be read with a smartphone and technical information about the device displayed via the "Industry Online Support" mobile app.

1.7 OpenSSL

This product can contain the following software:

- Software developed by the OpenSSL project for use in the OpenSSL toolkit.
- Cryptographic software created by Eric Young.
- Software developed by Eric Young

You can find more information on the internet:

- OpenSSL (https://www.openssl.org/)
- Cryptsoft (https://cryptsoft.com/)

1.8 General Data Protection Regulation (GDPR)

Siemens observes standard data protection principles, in particular the data minimization rules (privacy by design).

For this product, this means:

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

Safety notes 2

2.1 Fundamental safety instructions

2.1.1 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.

2.1.2 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.

2.1.3 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.

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/cert.

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.

Product overview

3

SINUMERIK Service Assistance is a MindSphere Application which offers error analysis and troubleshootings for SINUMERIK controllers.

Based on information about the current state of the machine, as well as the record and evaluation of historical data, detailed statements can be made about the customer's situation. As a result, the service call required in the event of a fault can be carried out more efficiently, which enables a reduction in machine downtimes at customer's side.

SINUMERIK Service Assistance offers three digital services:

- Machine Transparency
- Machine Condition
- Machine Error Analysis

3.1 System concept

Boundary conditions for Manage MyMachines (MMM) based connectivity

- MindSphere applications already purchased:
  - ManageMyMachines
  - SSA
- MindSphere access exists (IoT tenant).
- Machine is connected via ManageMyMachines.
- MMM Asset Manager Variable Toggles are activated.
- Sinumerik Machine is connected via SINUMERIK Integrate Client (SI client).
- Each application (MMM, SSA) has its own variable set of standard aspects and all must be configured.

Boundary conditions for Brownfield Connectivity Services

- BFC Client and Gateway must be installed and a connection must be established.
- Tenant is available and SSA is purchased and provisioned.
- On the BFC Gateway, the middleware “SSA Service” and “Scriptlogic” are active for SSA gateway
- BFC Gateway must be connected for Mindsphere.

Boundary conditions for Manage MyMachines (MMM) based connectivity considering IOT Value Plan

- MindSphere applications already purchased:
  - ManageMyMachines
  - SSA
- MindSphere access exists (IoT tenant).
- Machine is connected via ManageMyMachines.
- MMM Asset Manager Variable Toggles are activated.
- Sinumerik Machine is connected via SINUMERIK Integrate Client (SI client).
- Each application (MMM, SSA) has its own variable set of standard aspects and all must be configured.

Boundary conditions for Manage MyMachines (MMM) based connectivity considering Package Builder Plan

- Package Builder plan for the SSA package basic is purchased.
- Package Builder plan for the SSA package upgrade for MMM is purchased for additional assets.

- ManageMyMachines application is individually purchased.
- Machine is connected via ManageMyMachines.
- MMM Asset Manager Variable Toggles are activated.
- Sinumerik Machine is connected via SINUMERIK Integrate Client (SI client).
- Each application (MMM, SSA) has its own variable set of standard aspects and all must be configured.

Boundary conditions for Brownfield Connectivity Services connectivity considering IOT Value Plan

- BFC Client and Gateway must be installed and a connection must be established.
- Tenant is available and SSA is purchased and provisioned.
- On the BFC Gateway, the middleware “SSA Service” and “Scriptlogic” are active for SSA gateway.
- BFC Gateway must be connected for Mindsphere.

Boundary conditions for Brownfield Connectivity Services connectivity considering Package Builder Plan

- Package Builder plan for the SSA package basic is purchased.
- Package Builder plan for the SSA package upgrade for BFC is purchased for additional assets.
- Tenant is available and SSA is purchased and provisioned.
- On the BFC Gateway, the middleware “SSA Service” and “Scriptlogic” are active for SSA gateway.
- BFC Gateway must be connected for Mindsphere.

Further information

You can find further information regarding the package builder plans online:SINUMERIK Service Assistance Package (https://siemens.mindsphere.io/content/dam/mindsphere/terms/pdf/App_SINUMERIKServiceAssistancePackage_ProductSheet_SpecificTerms_v1.0.pdf)

Machine Configuration in MindSphere

4

Machine Configuration in MindSphere

The following chapter describes the necessary steps for connecting a machine to the MindApp **"SINUMERIK Service Assistance (SSA)"**.

Machine connection to MindSphere

Note

For machine connection to MindSphere please refer to MMM Function Manual, Chapter 3 "Setting up the SINUMERIK control system for Manage MyMachines" (https://documentation.mindsphere.io/resources/html/manage-my-machine/en-US/index.html).

4.1 Aspect configuration for SSA with MMM

4.1.1 Overview

By Using the MindSphere Tool "Asset Manager" the following Aspects have to be initially configured:

- SINUMERIK_CSPROTECTIONLEVEL
- SINUMERIK_CSRESULTS
- SINUMERIK_CSMACHINESTATUS
- SINUMERIK_TRIGGERINGALARMS

Note

For configuration details of the Aspects see Data Acquisition only in MindSphere (Page 145).

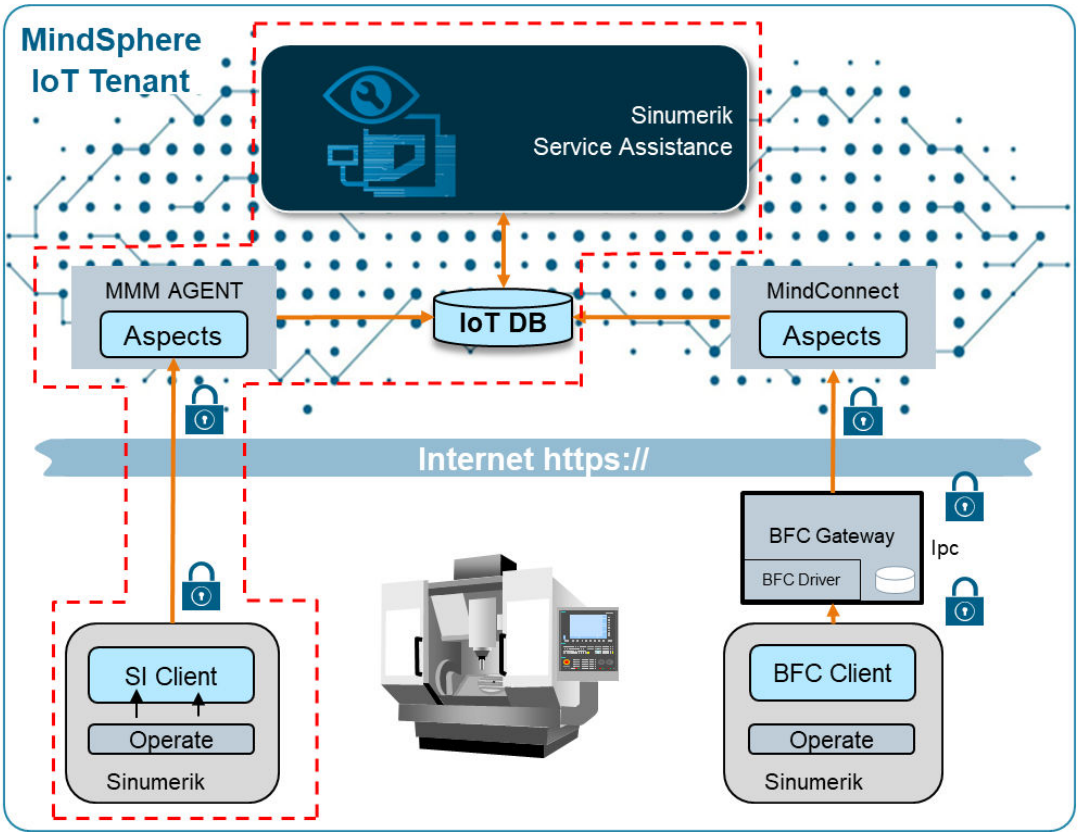


Figure 4-1 Overview aspect configuration

Aspect requirements

The minimum aspect requirements are listed following table:

Aspects	Asset Selection	Machine Transparency	Machine Condition	Machine Error Analysis
AgentOnlineStatus	Mandatory	-	Mandatory	Mandatory
Alarms	-	-	-	Mandatory
CH1_BasicConfig	Mandatory	-	Mandatory	
CH1_MachineStatus	Mandatory	-	Mandatory	Mandatory
CSM_AX01	-	-	Optional	-
CSM_AX02	-	-	Optional	-
CSM_AX03	-	-	Optional	-
CSM_AX04	-	-	Optional	-
CSM_AX05	-	-	Optional	-
CSM_General_Info	-	-	Mandatory	
CSM_SP01	-	-	Mandatory	-
MachineModel	-	-	Mandatory	-
SINUMERIK_CSALARMREACTION	-	-	-	Mandatory
SINUMERIK_CSMACHINESTATUS	-	-	Mandatory	Mandatory
SINUMERIK_CSPROTECTIONLEVEL	Mandatory	-	Mandatory	-
SINUMERIK_CSRAW	-	-	Mandatory	Mandatory
SINUMERIK_CSRESULTS	-	-	Mandatory	-
SINUMERIK_TRIGGERINGALARMS	-	-	-	Mandatory
Startup	-	-	Mandatory	Mandatory

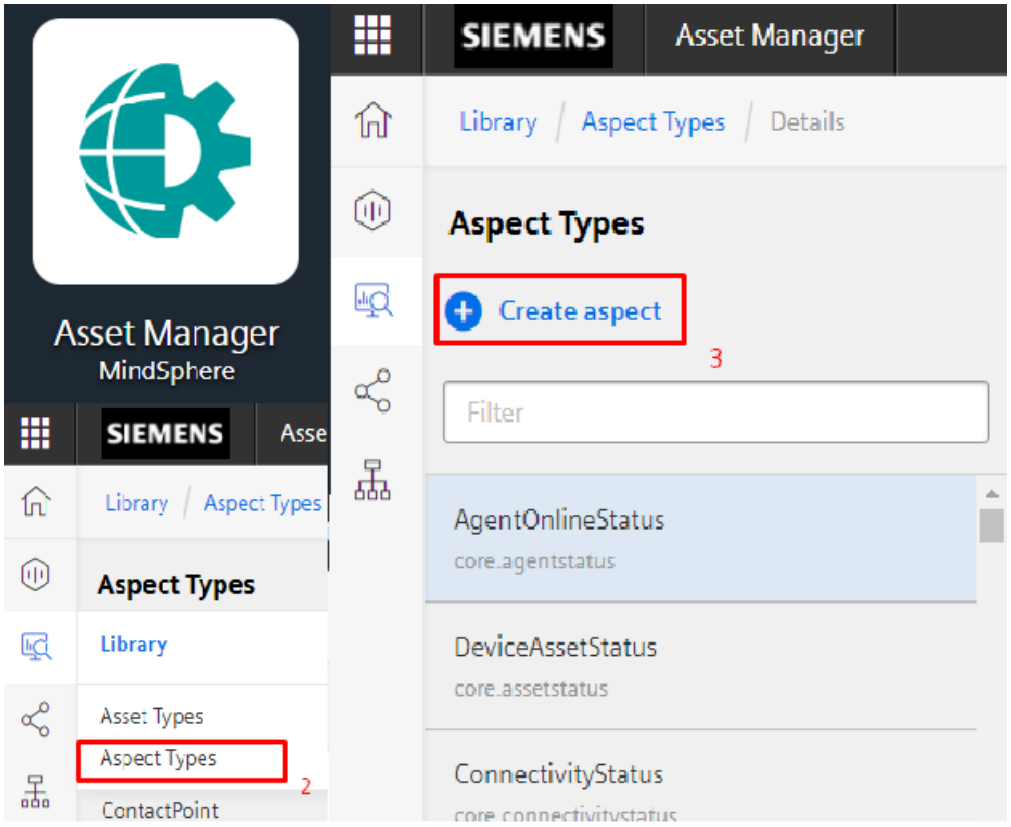
4.1.2 Initial creation of Aspects

Procedure

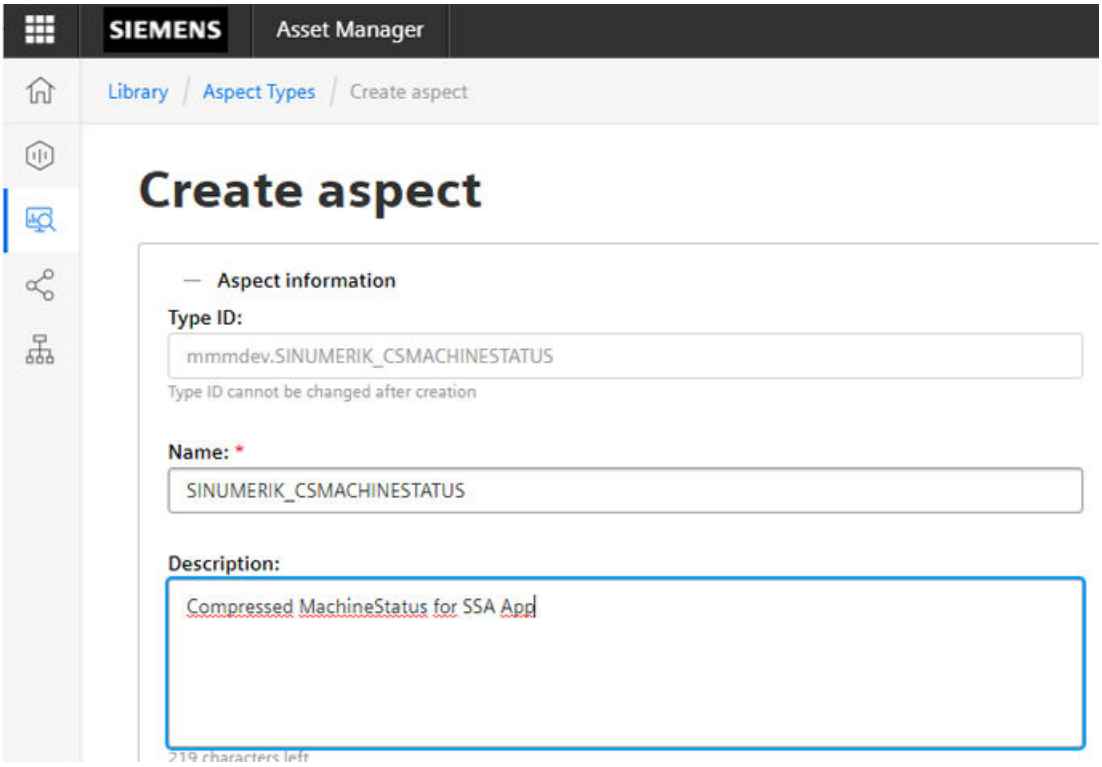
Repeat the following procedure for all aspects.

Here as an example the Aspect SINUMERIK_CSMACHINESTATUS is created.

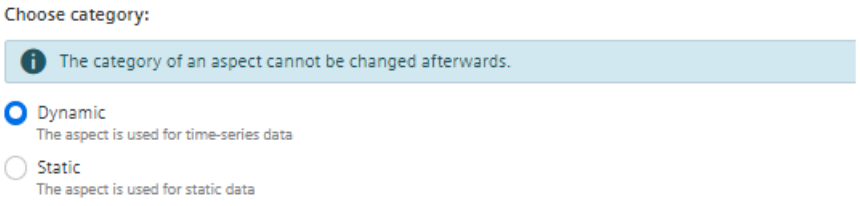
1. Load "Asset Manager", select "Aspects" and press "Create aspect".



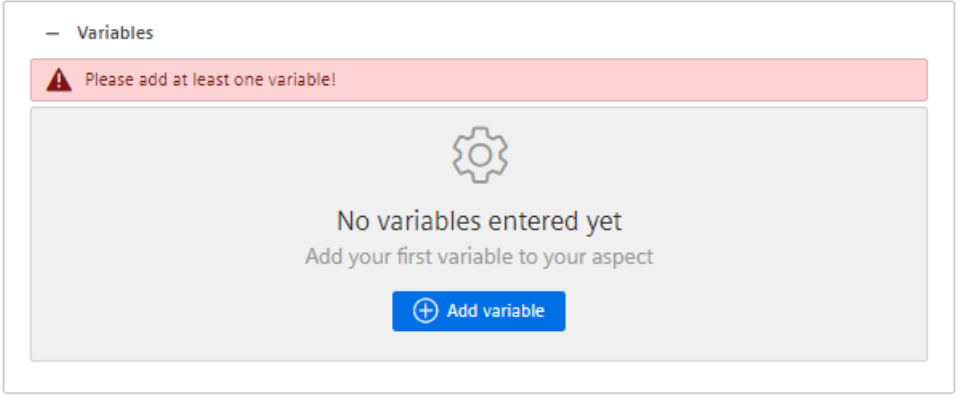
2. Edit Name and Description.



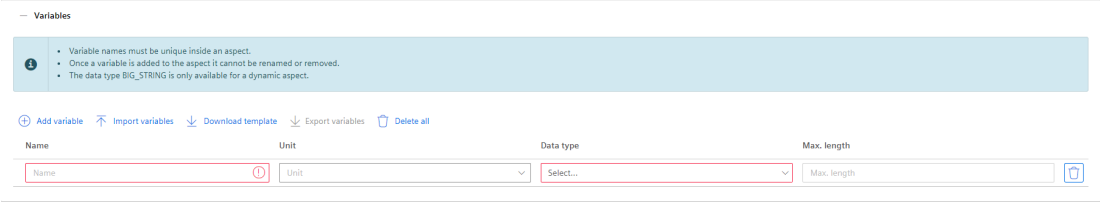
3. Choose category "Dynamic".



4. Press "Add variable".



5. Press "Add variable".



6. If required, add further variables and enter Name, Data type and Unit.

7. Press "Save".

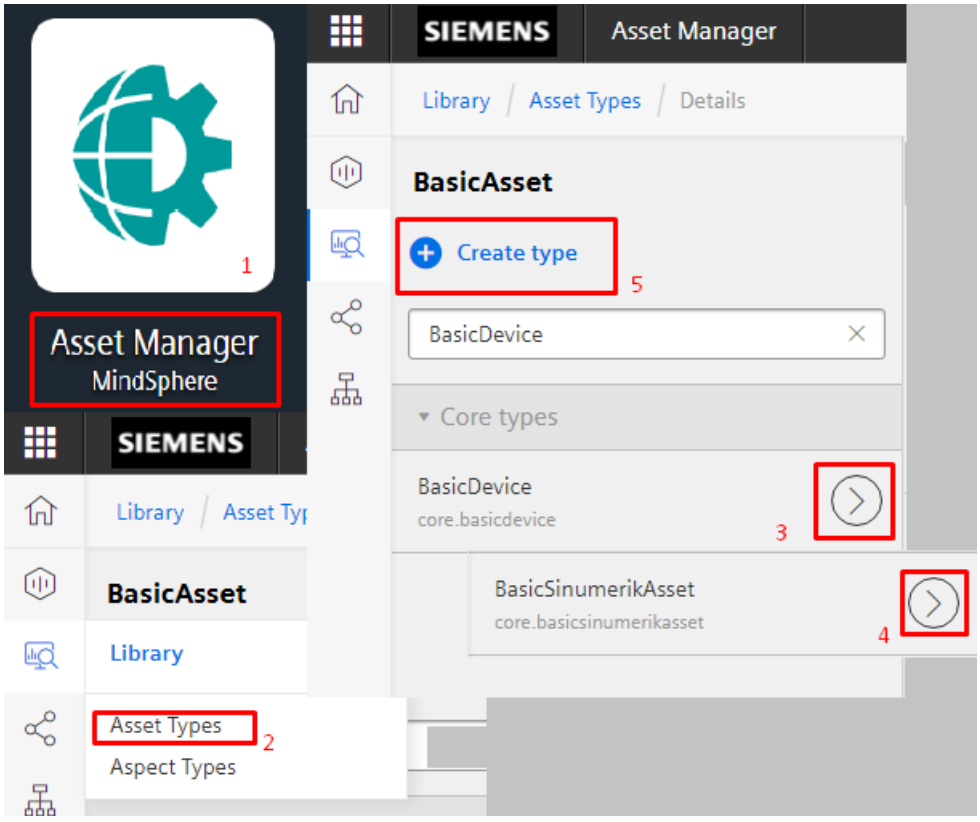
4.1.3 Creating Asset Type

Procedure

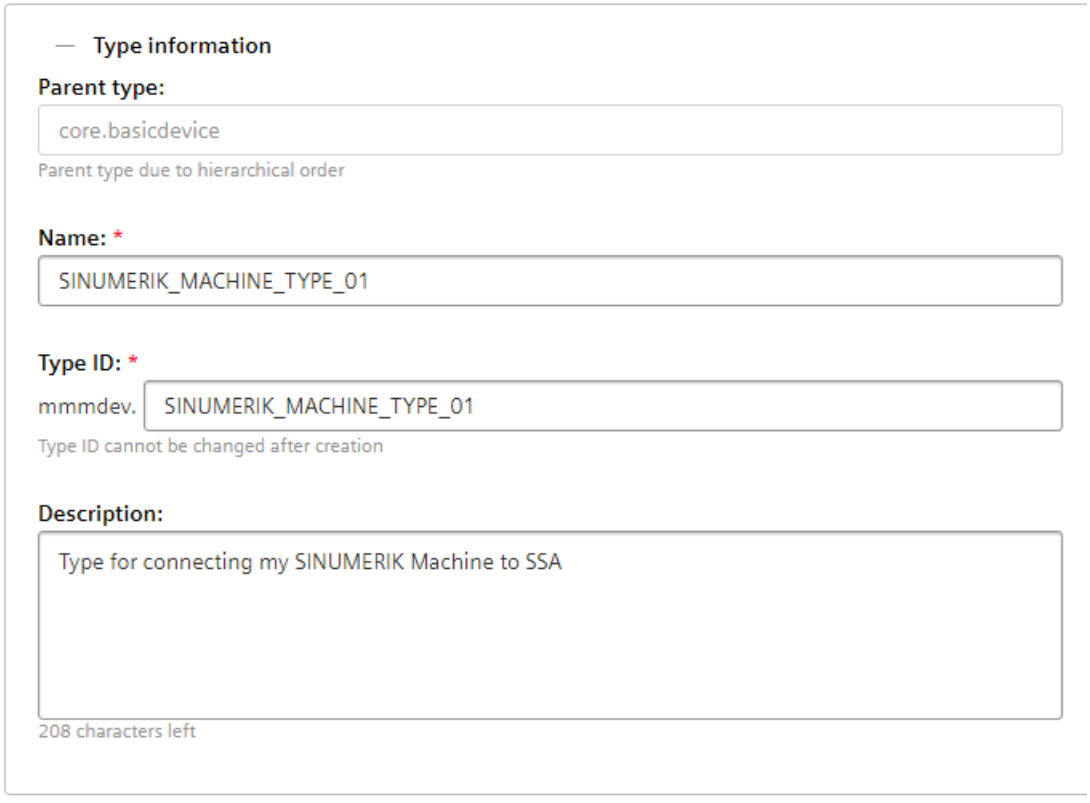
An Asset Type for every single Machine should be created.

1. Load "Asset Manager" and select "Types".
2. Expand "BasicDevice".
3. Expand "BasicSinumericAsset".

4. Press "Create type".

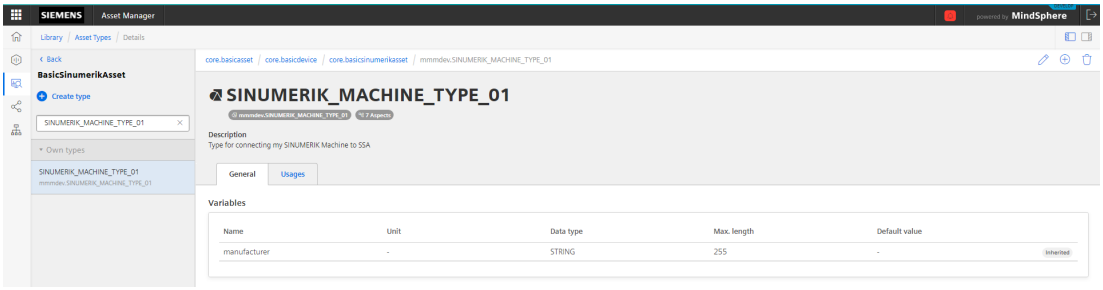


5. Edit "Name" and "Description".

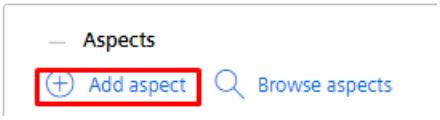


6. Press "Save".

7. Select the just created Asset Type and press "Edit type".



8. Scroll down to the Aspects and press "Add aspect".



9. Select the following Aspects from the list and add them one after the other:
   - SINUMERIK_CSPROTECTIONLEVEL
   - SINUMERIK_CSRESULTS
   - SINUMERIK_CSMACHINESTATUS
   - SINUMERIK_TRIGGERINGALARMS
10. The Name should not be changed, it will be filled automatically.

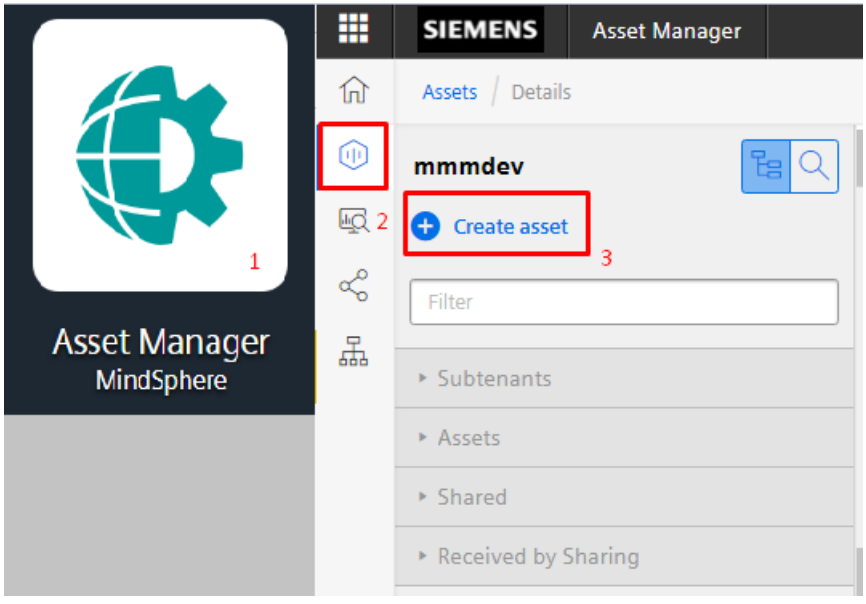
11. Press "Save".

4.1.4 Creating Asset

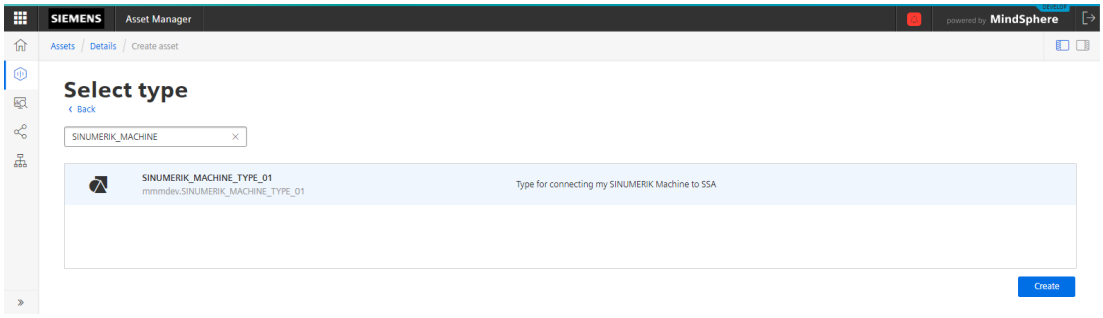
Procedure

An Asset for every single Machine should be created.

1. Load "Asset Manager" and select "Assets".
2. Press "Create asset".

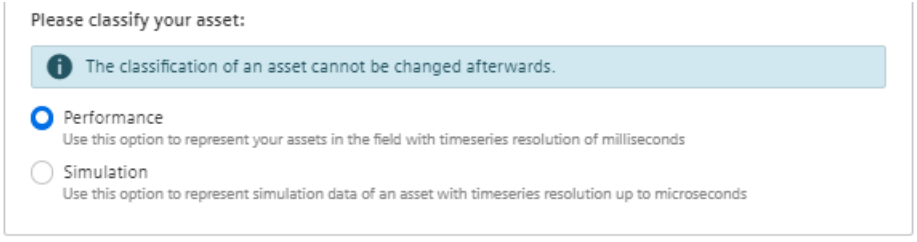


3. Select previously created Asset Type and press "Create".

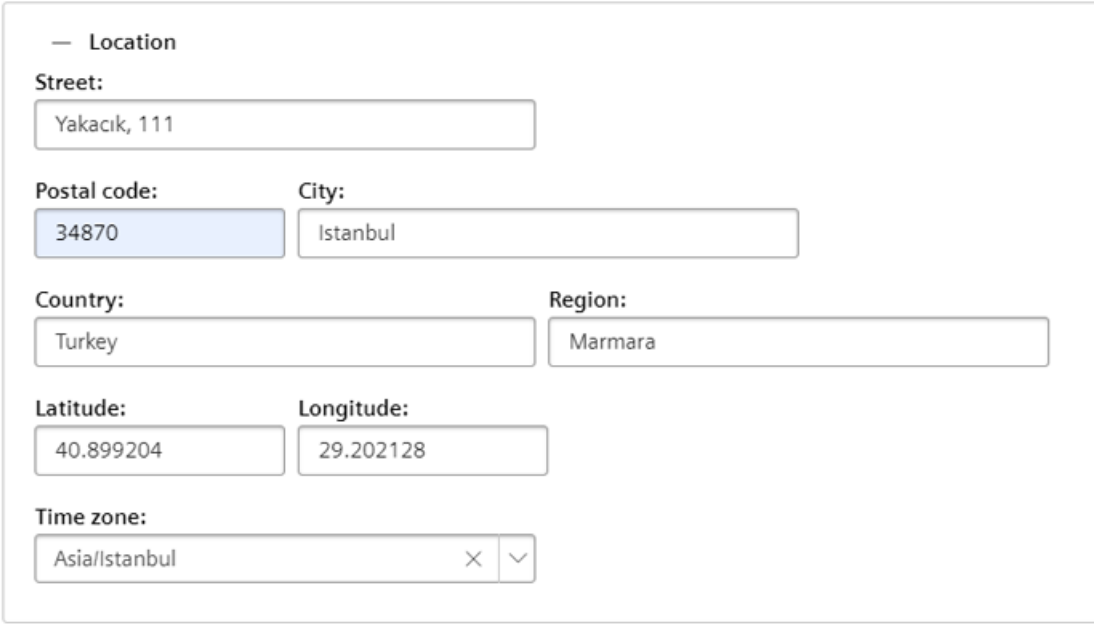


4. Edit "Name" and "Description".

5. Select "Performance" as classification.



6. Enter the location and time zone information.



7. Press "Save".

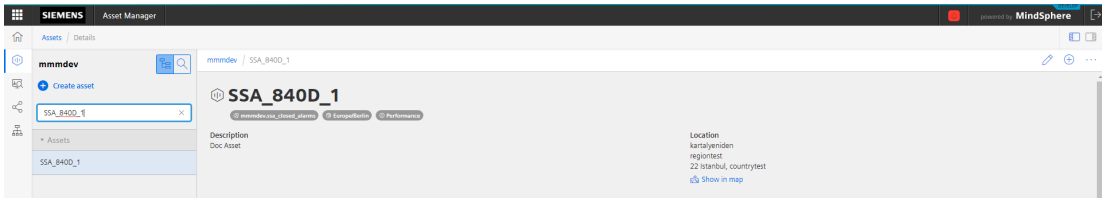
4.1.5 Connecting Machine to Asset

Procedure

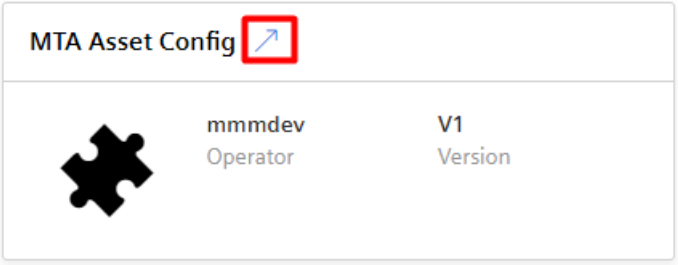
Note

You can find further information in MMM Function Manual, Chapter 3 "Setting up the SINUMERIK control system for Manage MyMachines" (https://documentation.mindsphere.io/resources/html/manage-my-machine/en-US/index.html).

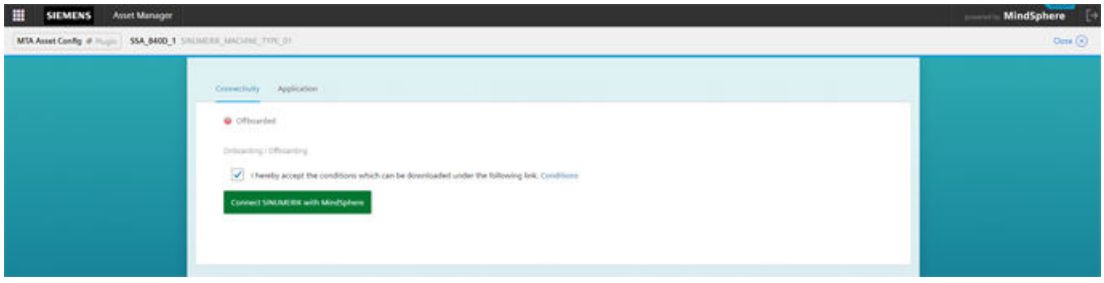
1. Load "Asset Manager" and select "Assets".
2. Select your previously created Asset.



3. Press "MTA Asset Config".

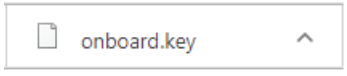


4. On the "Connectivity" tab accepts the license conditions.



5. Then press "Connect SINUMERIK with MindSphere" to onboard the Machine.

6. The file "onboard.key" will be generated and downloaded.

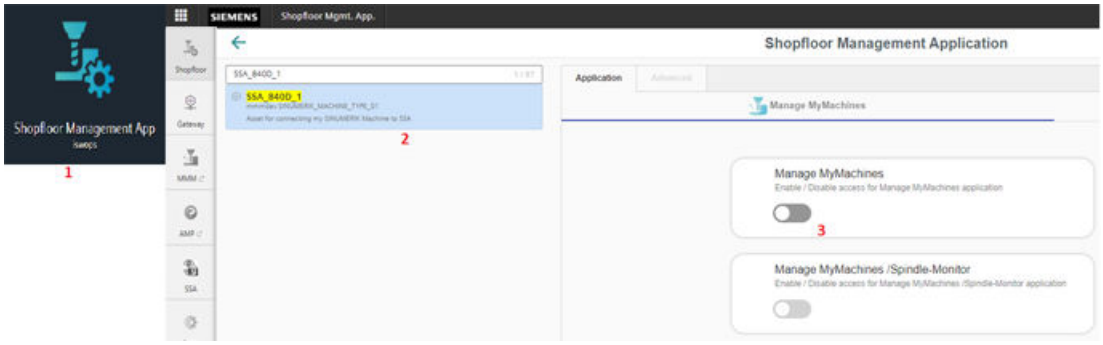


7. Please consult "MMM Function Manual" for details how to onboard your Machine.

4.1.6 Enabling MMM data acquisition

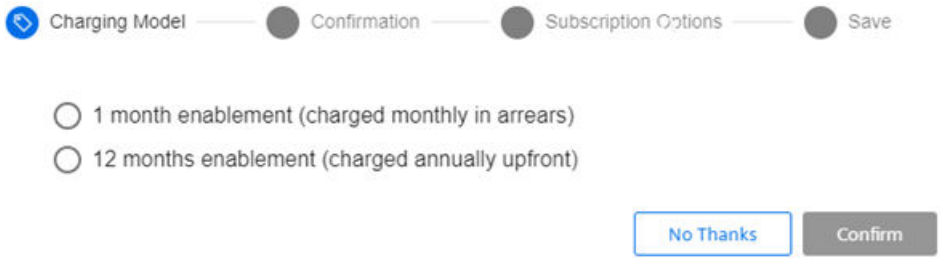
Procedure

1. Open Shopfloor Management Application from MindSphere Launchpad.



2. Search and select your previously created Asset.

3. On the Manage MyMachines tab, enable the Manage MyMachines switch.
4. Choose a Charging Model and press "Confirm".



4.1.7 Enabling SSA data acquisition

4.1.7.1 Overview

The following describes how to configure the required aspects so that SSA can successfully capture and process the machine data. Here is an example of the procedure described. Details of the configuration are listed in Data Acquisition in MMM - "Time-based / cyclic trigger" (Page 147) and Data Acquisition in MMM - "Variable value-based trigger" (Page 151).

Note

For assets created from type "basicsinumerikasset", shoopfloor aspect configuration will be automated with activation. For more detailed information, see chapter Machine model and auto aspect creation and configuration (Page 38).

The following aspects must be configured via MMM, as "Time-based / cyclic trigger":

- SINUMERIK_CSRAW
- CSM_General_Info

The following aspects for the Axes and Spindles must be configured via MMM, as "Time-based / cyclic trigger":

- CSM_AX01, CSM_AX02, ... (depending on the number of axes)
- CSM_SP01, ... (depending on the number of spindles)

The following aspects must be configured via MMM, as "Variable value-based trigger":

- SINUMERIK_CSALARMREACTION

See also

Function Manual Manage MyMachines (https://documentation.mindsphere.io/resources/html/manage-my-machine/en-US/index.html)

4.1.7.2 Machine model and auto aspect creation and configuration

Necessary aspects are created automatically depending on the machine model:

- If asset is onboarded, the machine model will be automatically detected as SINUMERIK 840D sl/SINUMERIK ONE or SINUMERIK 828D.
- If asset is not onboarded, select the machine model manually.

Note

- If machine model of the activated asset is changed after activation, change the machine model manually and save it.
- The address of some variables are different, so the machine model should be corrected to use SSA fully.

Auto aspect creation

Auto aspect creation depends on the machine model. The following aspects will be created:

Note

Condition for auto aspect creation

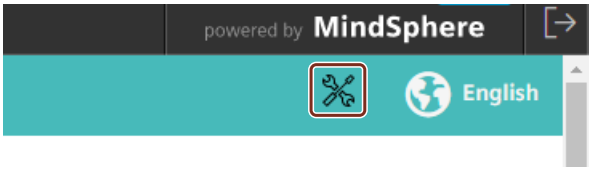
- Onboard.key downloaded and Manage MyMachine Toggle should be enabled.
- Auto aspect creation is **valid** for asset created from basicsinumerikasset type (MMM customer).
- If asset is created from the derived type from basicsinumerikasset type (e. g: basicsinumerikasset > ssa_asset_type > ssa_derived_asset_type), auto aspect creation is **invalid**.
- Aspect configuration will be sent only from active services (MC,EA).

Machine Transparency	Machine Condition	Machine Error Analysis
No aspect	• CSM_AX01, CSM_AX02, CSM_AX03, CSM_AX04, CSM_AX05 • CSM_SP01 • CSM_General_Info • SINUMERIK_CSRAW • SINUMERIK_MACHINESTATUS • SINUMERIK_CSRESULTS • SINUMERIK_CSPROTECTIONLEVEL	• SINUMERIK_CSRAW • SINUMERIK_MACHINESTATUS • SINUMERIK_CSALARMREACTION • SINUMERIK_TRIGGERINGALARMS

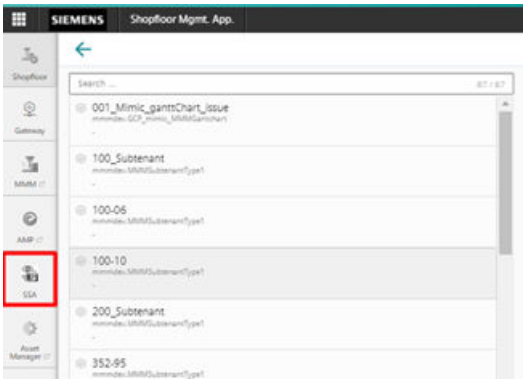
Procedure

The following procedure gives you an example how to configure an asset.

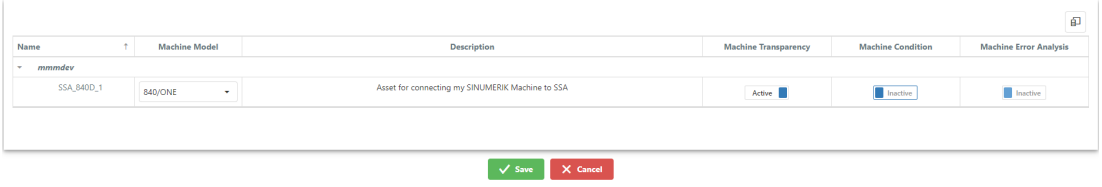
1. After downloading onboard.key and enabling MMM Toggle, choose one of the following applications:
2. EITHER Open "Sinumerik Service Assistance". Open the "Activation page" from "Asset Selection page" (only SSA admin).



- OR - Open "Shopfloor Management Application". Click the SSA tab to activation page.

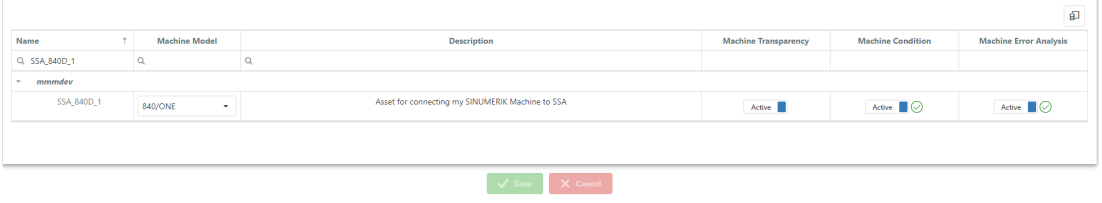


3. Search the asset, which will be purchased.



4. Select the machine model (if the asset is not onboard).

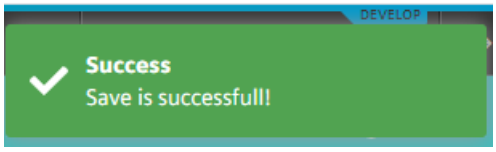
5. Activate the services.



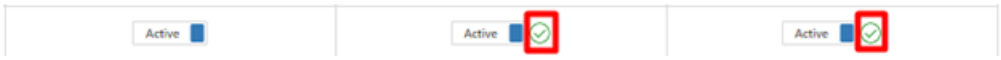
6. Press "Save".

7. Press "Activate for a fee" or "Yes I have a valid contract" (depends on billing system).

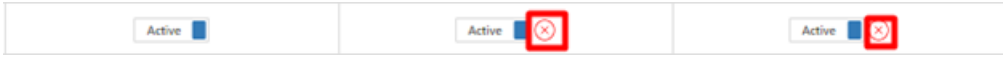
8. A notification is shown that saving is successful.



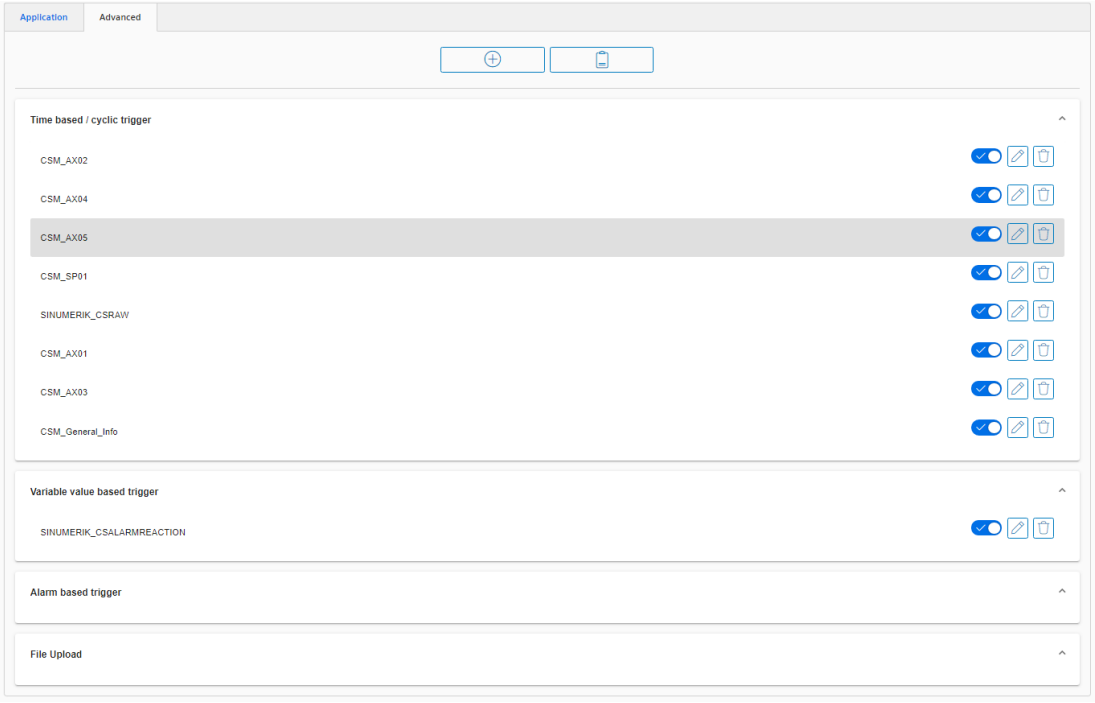
9. Wait until the end of operation.
   - If auto aspect configuration is successful, the below icon below is shown:



   - If auto aspect configuration has failed, the below icon is shown:



10. After successful configuration, aspects are be listed in the Shopfloor Management Application:



Note

If SSA toggles are enabled before MMM activation, you have to configure the assets manually . For manual aspect configuration, refer to chapter Overview (Page 37).

4.1.7.3 Configuring aspect for "time-based / cyclic trigger" acquisition

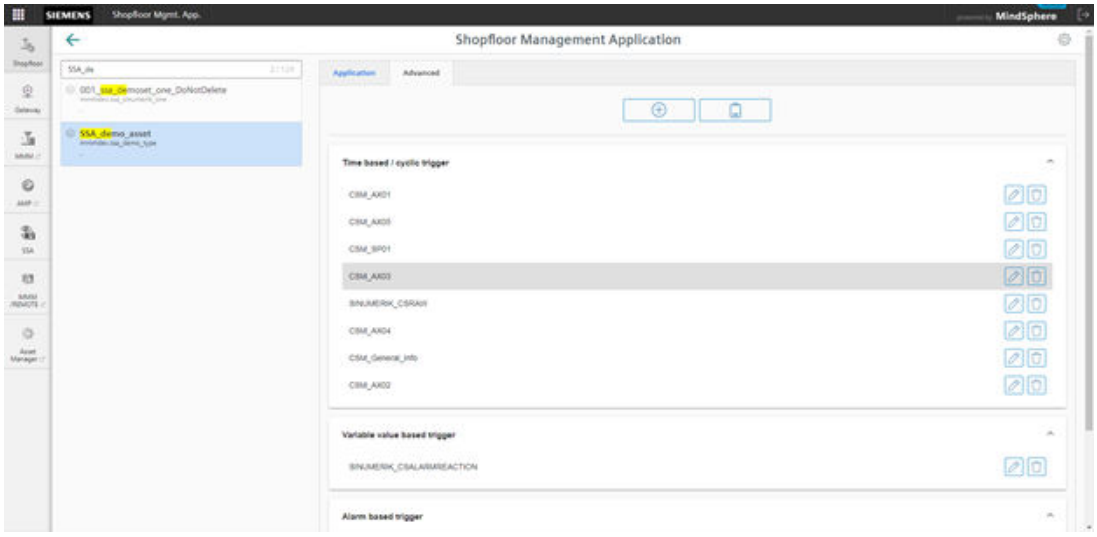
Note

If SSA toggles are enabled before MMM activation, you have to manually configure the assets . For manual asset aspect configruation, this section needs to be followed.

Procedure

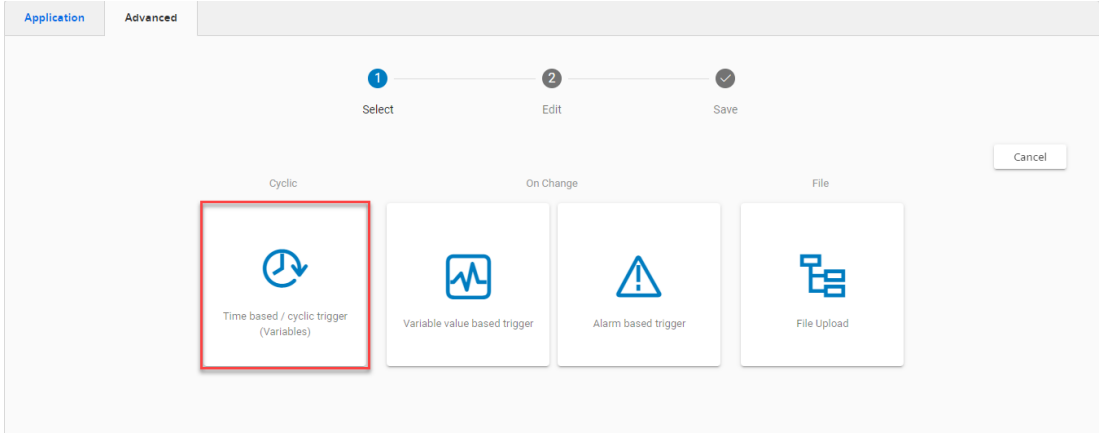
In the following, you can find an example how to configure the Aspect "SINUMERIK_CSRAW":

1. Load "Shopfloor Management Application".
2. Select your previously created Asset.
3. Press "Advanced".

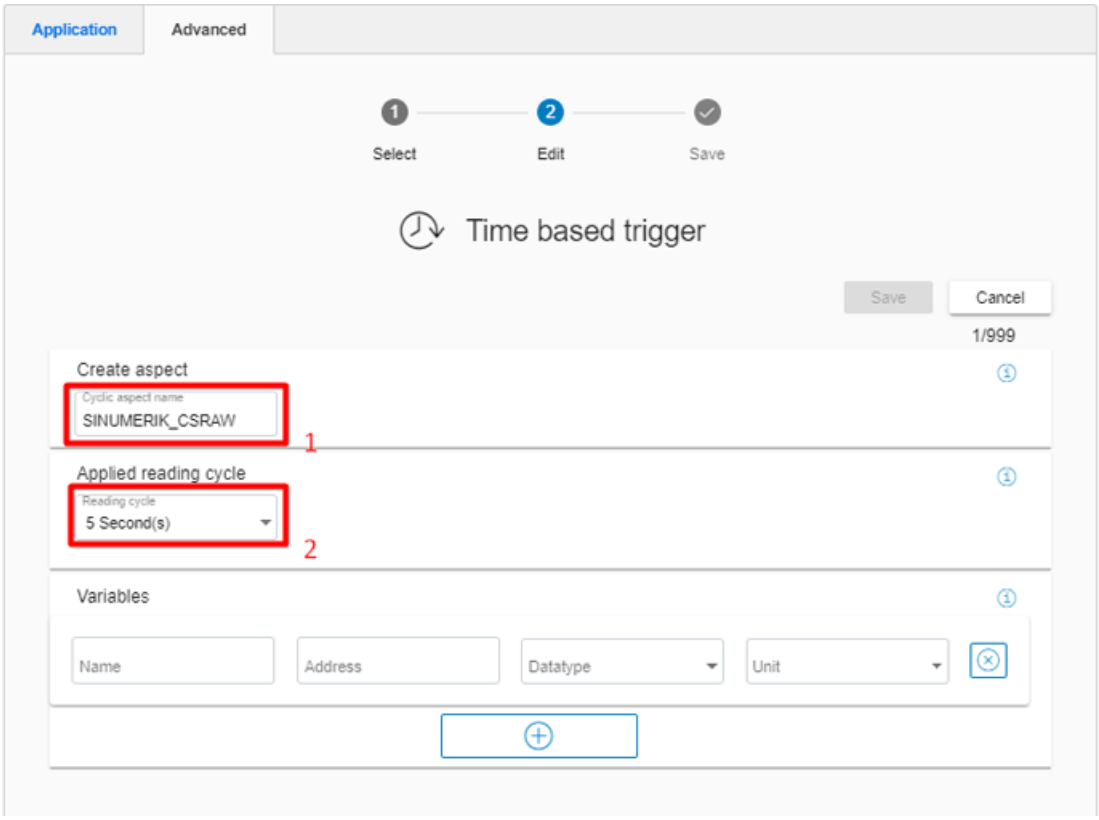


4. Press "Add".

5. Select "Time-based / cyclic trigger (Variables)".

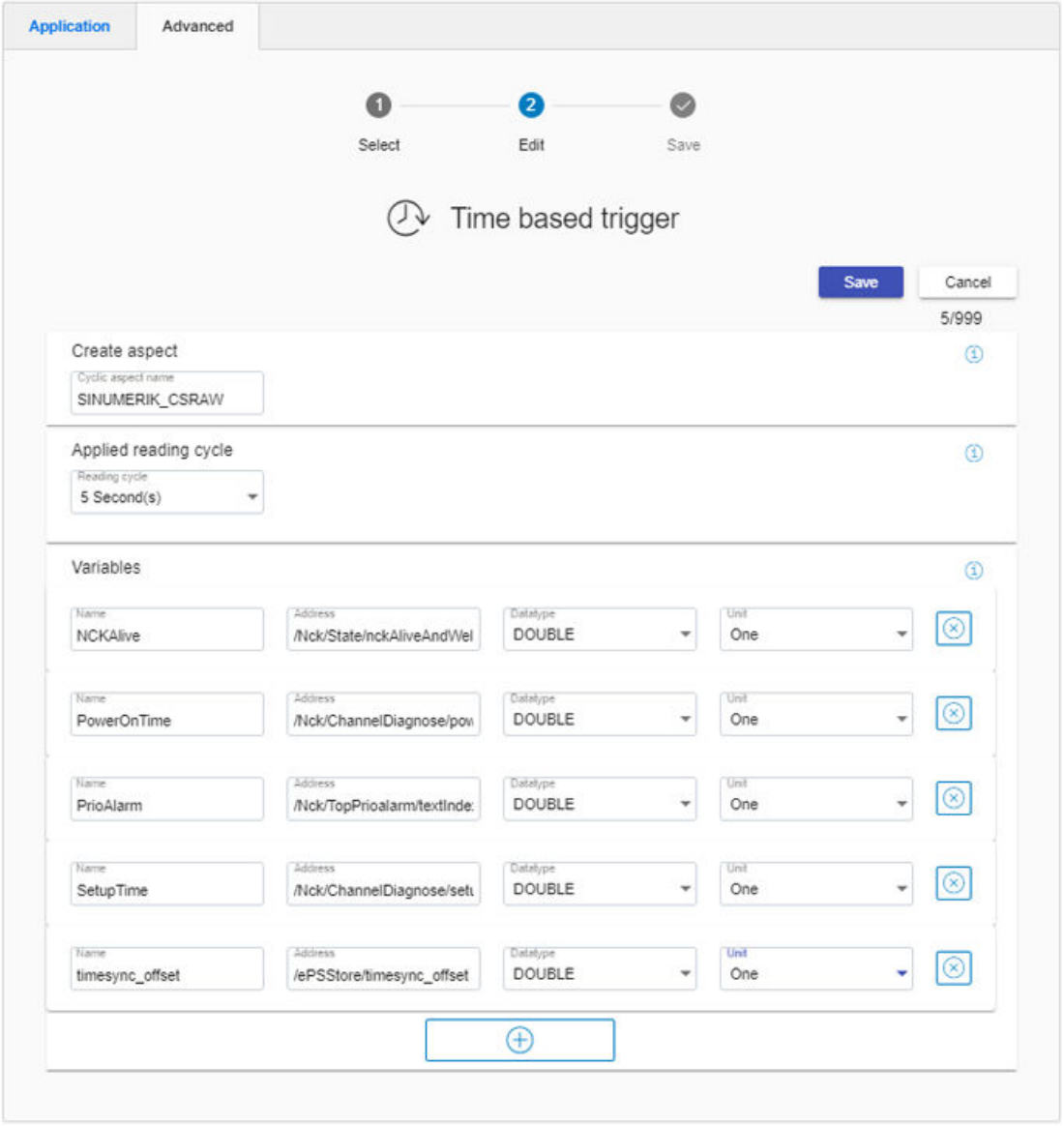


6. Type the Aspect name and select "Reading cycle" from the drop-down menu.



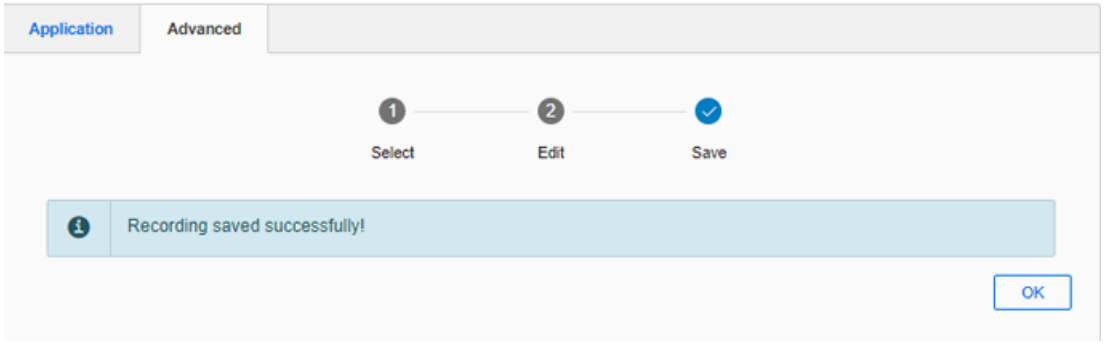
7. Press "Add" as many times as necessary to add the number of needed variables.

8. Type the "Name", "Address", "Datatype" and "Unit" of the variable to be added.

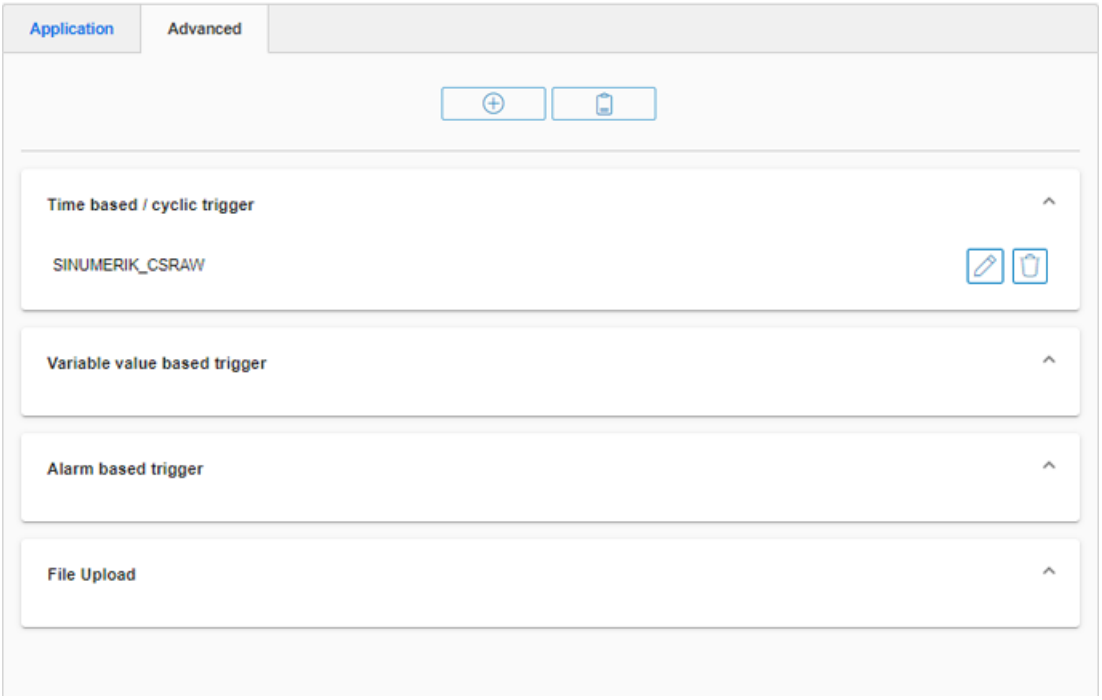


9. Press "Save".

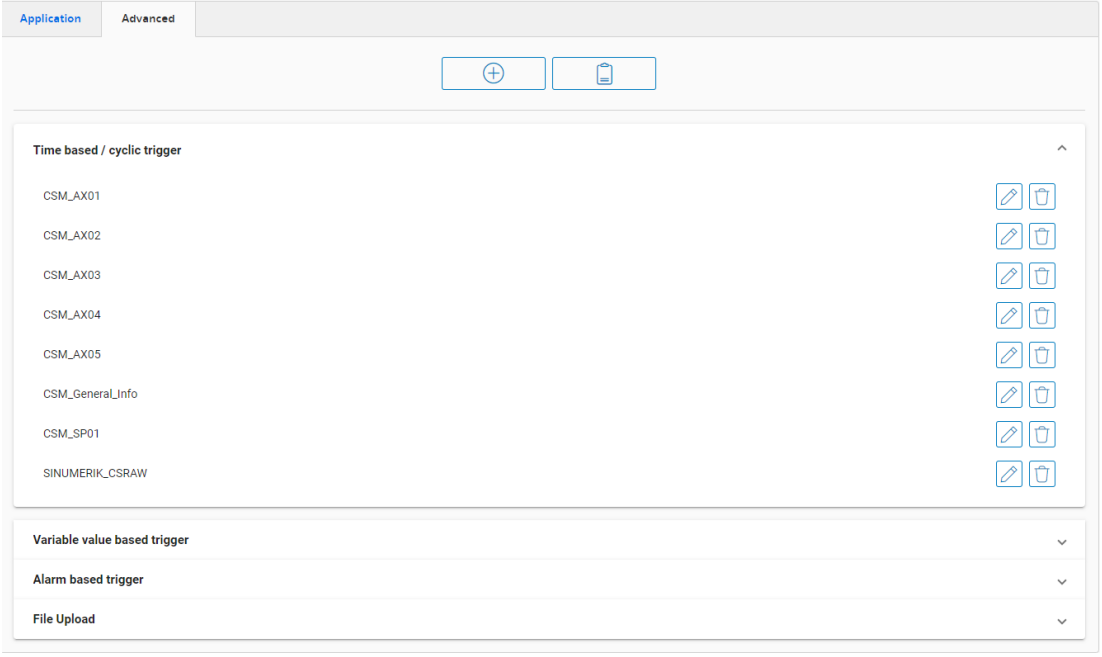
10. Wait until the response of the successful saving and press "OK".



11. Verify that the Aspect was created as expected.



12. This procedure should be repeated until all the needed "Time-based / cyclic trigger" Aspects are created. For example:

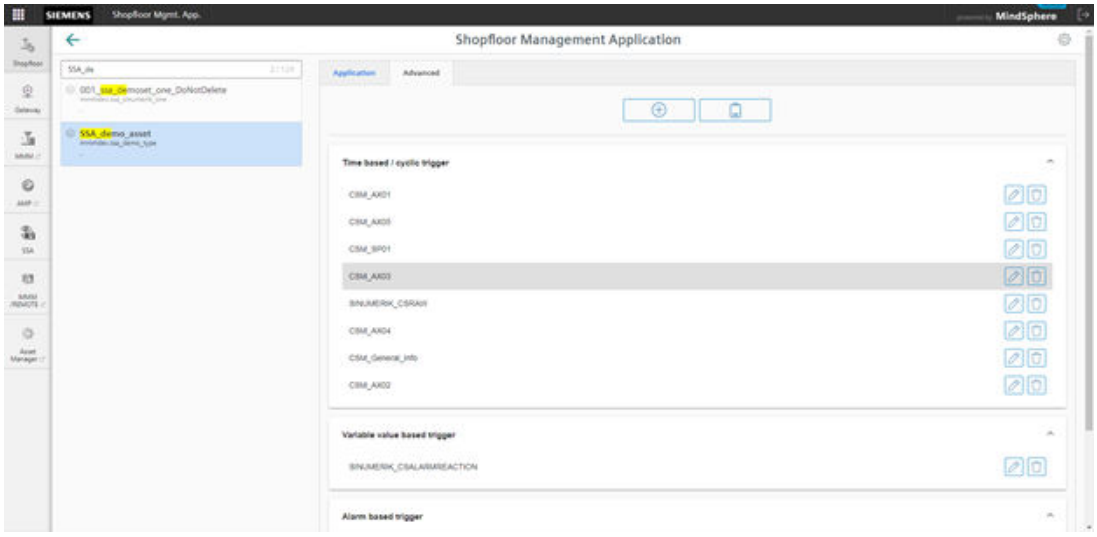


4.1.7.4 Configuring aspect "variable value-based trigger" acquisition

Procedure

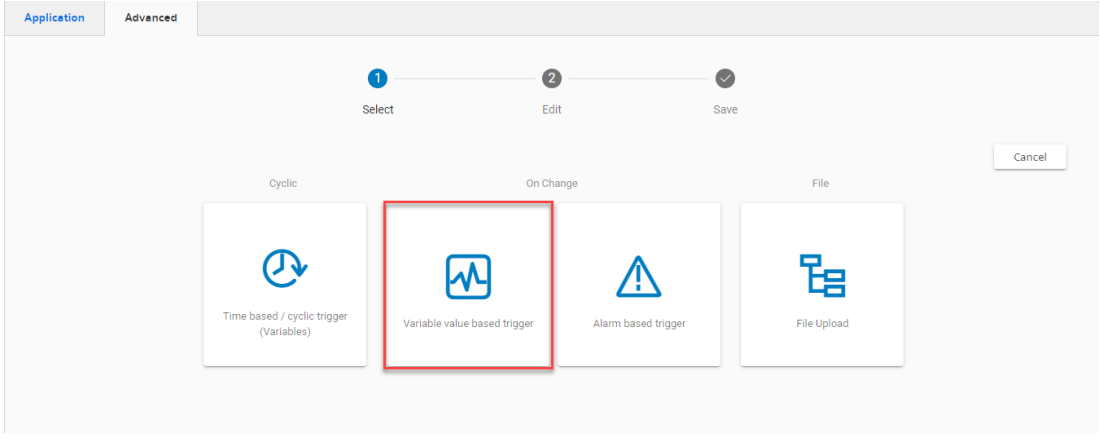
In the following you can find an example how to configure "SINUMERIK_CSALARMREACTION" trigger.

1. Load "Shopfloor Management Application".
2. Select your previously created Asset.
3. Press "Advanced".

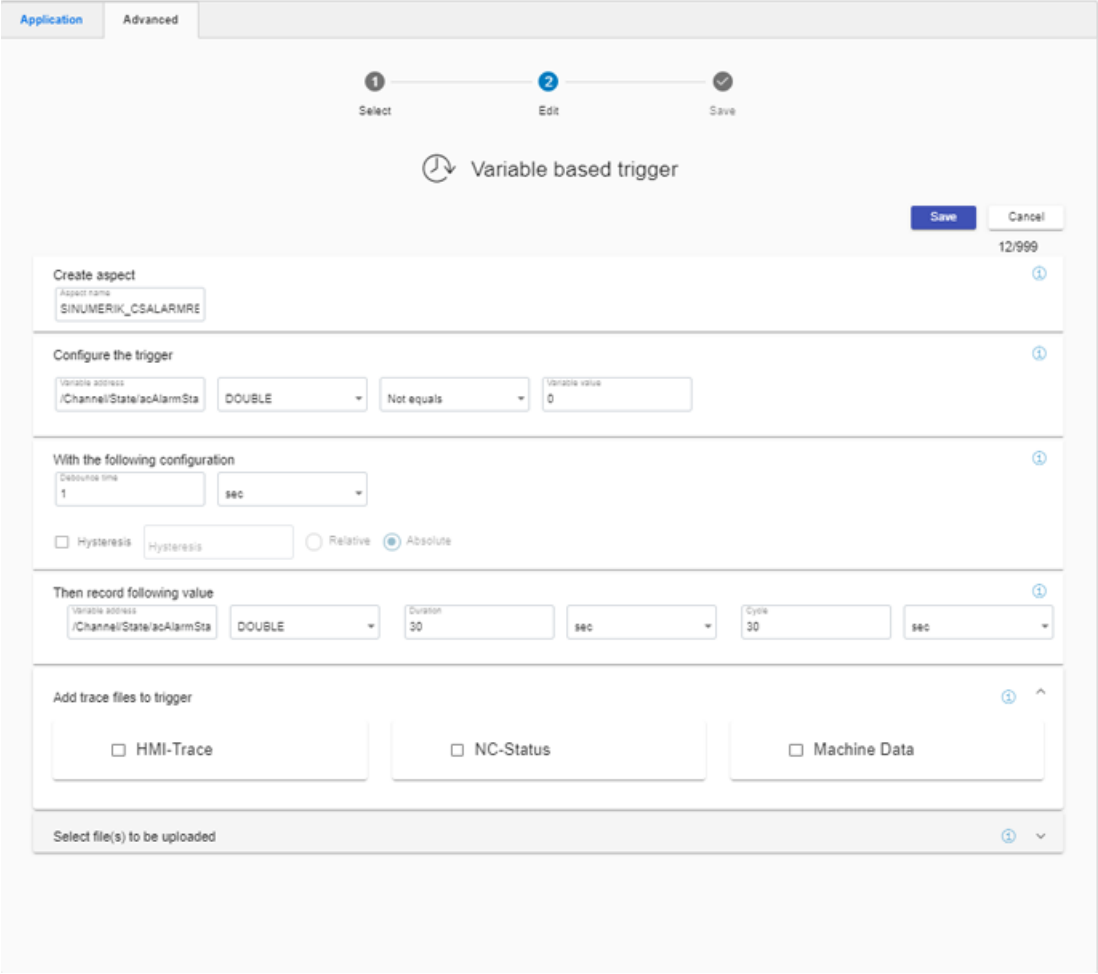


4. Press "Add".

5. Select "Variable value-based trigger".

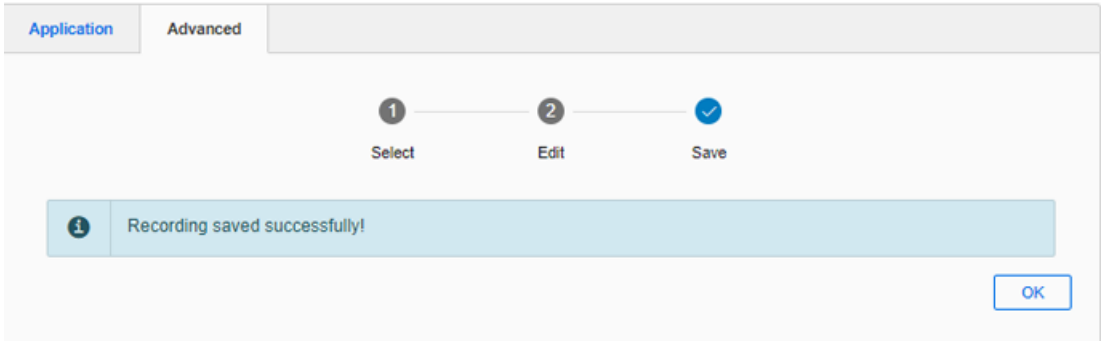


6. Fill in all the data.

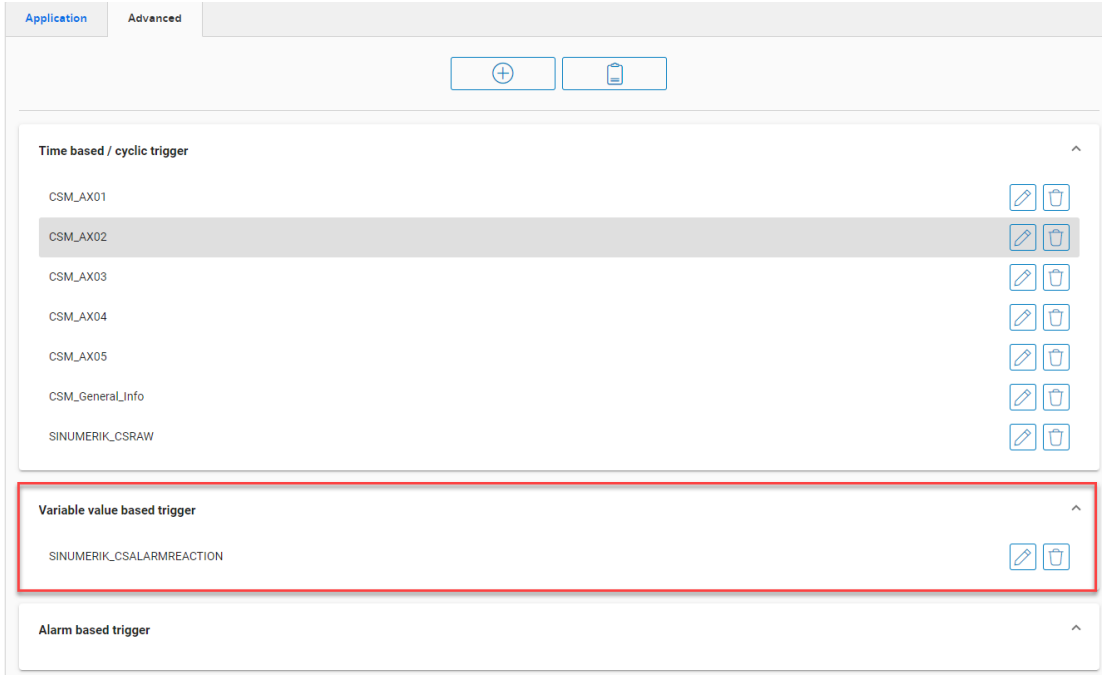


7. Press "Save".

8. Wait until the response of the successful saving and press "OK".



9. Verify that the Aspect was created as expected.



4.2 Aspect configuration for SSA with BFC Gateway

4.2.1 Overview

To connect a SINUMERIK controller to SSA via the BFC gateway, you carry out the following steps once:

- Creating the asset type "bfc_ssa_sinumerik"
- Connecting a new machine to SSA
- Configuring the BFC client data acquisition
- Creating and saving a machine identity

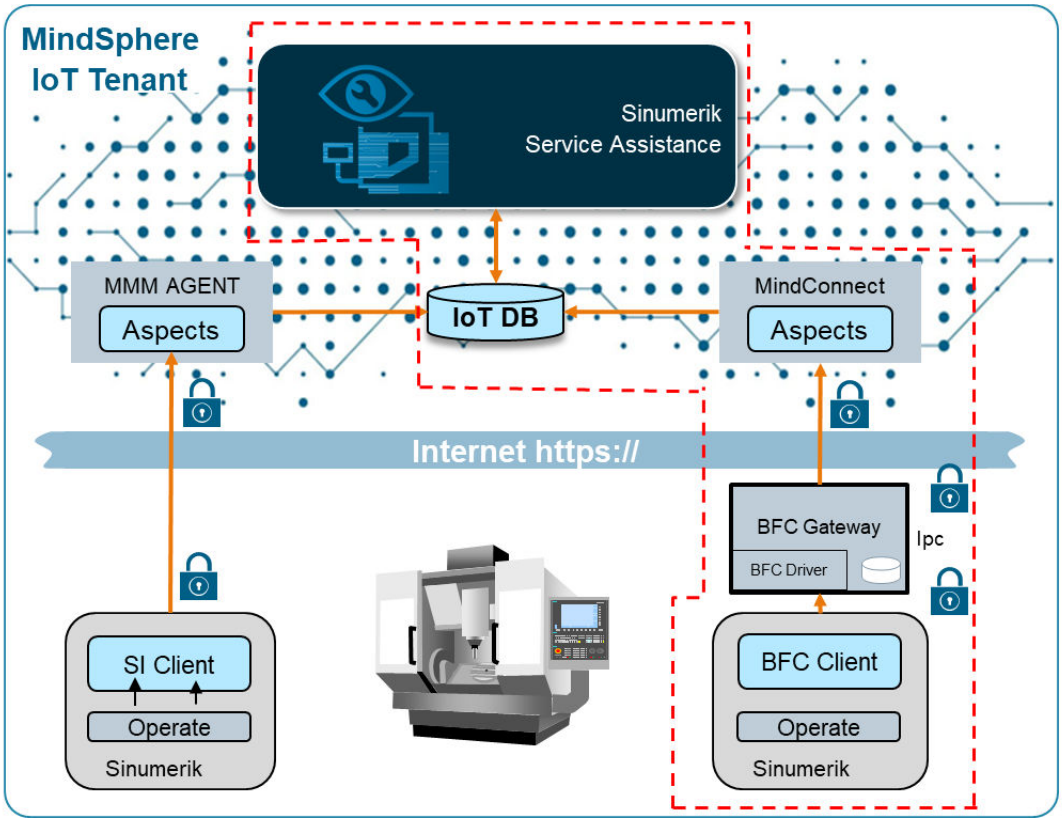


Figure 4-2 Overview aspect configuration

4.2.2 Requirements

The following preconditions must be fulfilled:

- The BFC client is connected to the BFC gateway

Note

Configuration activities for BFC client and BFC gateway are not part of this documentation. For more information about BFC client and BFC gateway, please follow this link:

Function Manual Brownfield Connectivity Services (https://support.industry.siemens.com/cs/at/en/sc/5392)

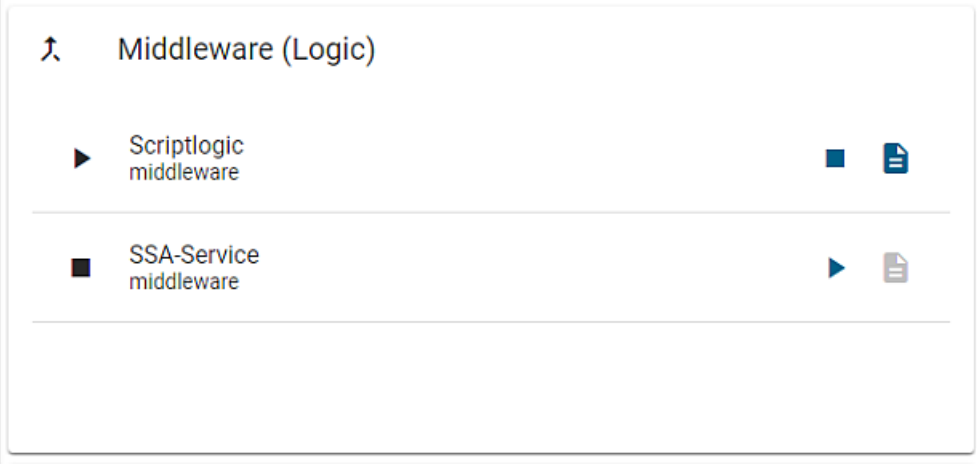
- MindSphere Tenant is available and set up with Mindsphere Application SSA activated
- The middleware "SSA Service" and "Scriptlogic" are active. More information on this topic can be found in chapter Checking the current status of middleware (logic) (Page 51).

4.2.3 Checking the current status of middleware (logic)

To check whether the middleware "SSA Service" and "Scriptlogic" are active, proceed as follows.

Procedure

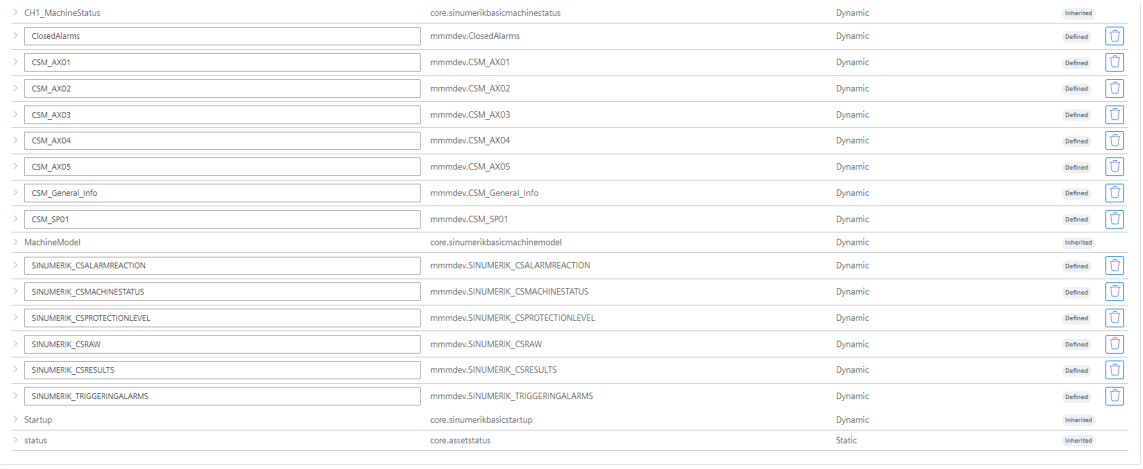
1. Open the user interface of the BFC gateway.
2. Select the "Commissioning" area.
   - In the area "Middleware (Logic)", you will find the entries "SSA-Service" and "Scriptlogic".
   - You can recognize the current status by the symbols to the left of "SSA Service" and "Scriptlogic":
     The symbol "Running" means "active".
     The symbol "Stopped" means "not active".



4.2.4 Creating aspects in Mindsphere

The following aspects must be created in Mindsphere. You can find further information in the chapter Aspect configuration for SSA with MMM (Page 26).

If the aspects listed here do not exist, you must create them.



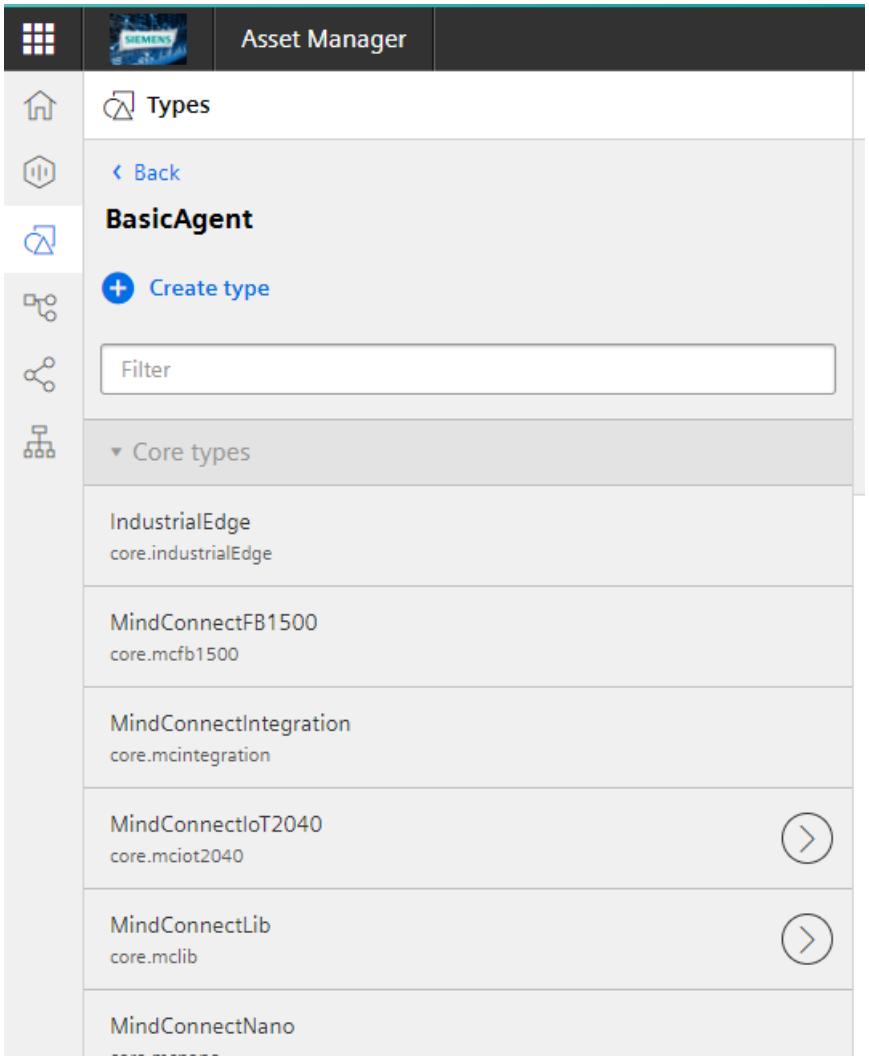
CH1_MachineStatus	core.sinumerikbasicmachinestatus	Dynamic	Inherited
ClosedAlarms	mmmdev.ClosedAlarms	Dynamic	Defined
CSM_AX01	mmmdev.CSM_AX01	Dynamic	Defined
CSM_AX02	mmmdev.CSM_AX02	Dynamic	Defined
CSM_AX03	mmmdev.CSM_AX03	Dynamic	Defined
CSM_AX04	mmmdev.CSM_AX04	Dynamic	Defined
CSM_AX05	mmmdev.CSM_AX05	Dynamic	Defined
CSM_General_Info	mmmdev.CSM_General_Info	Dynamic	Defined
CSM_SP01	mmmdev.CSM_SP01	Dynamic	Defined
MachineModel	core.sinumerikbasicmachinemodel	Dynamic	Inherited
SINUMERIK_CSALARMREACTION	mmmdev.SINUMERIK_CSALARMREACTION	Dynamic	Defined
SINUMERIK_CSMACHINESTATUS	mmmdev.SINUMERIK_CSMACHINESTATUS	Dynamic	Defined
SINUMERIK_CSPROTECTIONLEVEL	mmmdev.SINUMERIK_CSPROTECTIONLEVEL	Dynamic	Defined
SINUMERIK_CSRAW	mmmdev.SINUMERIK_CSRAW	Dynamic	Defined
SINUMERIK_CSRESULTS	mmmdev.SINUMERIK_CSRESULTS	Dynamic	Defined
SINUMERIK_TRIGGERINGALARMS	mmmdev.SINUMERIK_TRIGGERINGALARMS	Dynamic	Defined
Startup	core.sinumerikbasicstartup	Dynamic	Inherited
status	core.assetstatus	Static	Inherited

4.2.5 Creating the asset type "bfc_ssa_sinumerik"

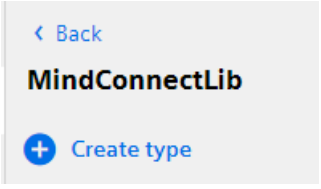
If the asset type "bfc_ssa_sinumerik" does not exist in the Asset Manager of MindSphere, you have to create it.

Procedure

1. Open the Asset Manager in MindSphere.
   - Click on "Types" in the left hand window area.
   - The "Basic Asset" Windows opens. Navigate to the "BasicAgent" area and select the type "MindConnectLib" from the list in the right-hand window area.



2. The "MindConnectLib" window opens. Click the "Create Type" button.



3. The "Create type" window opens.
   – Fill in the input fields. Enter the designation "bfc_ssa_sinumerik" in the "Name" input field.

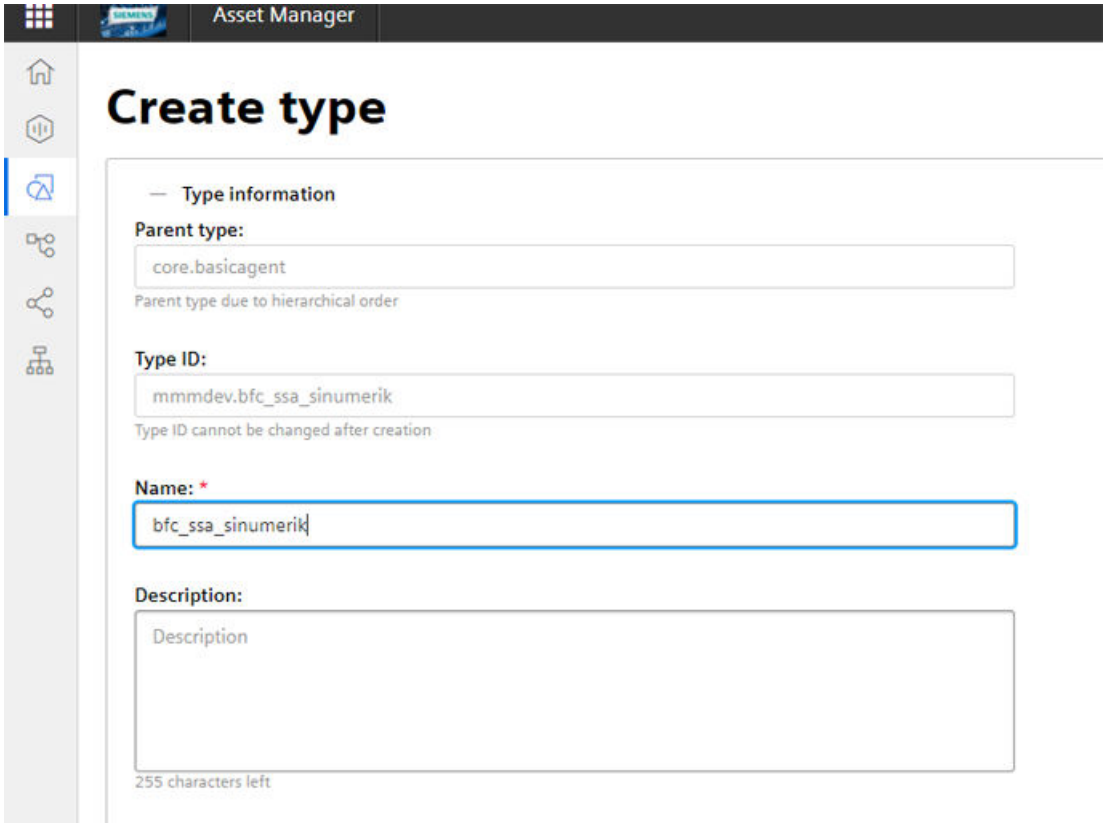
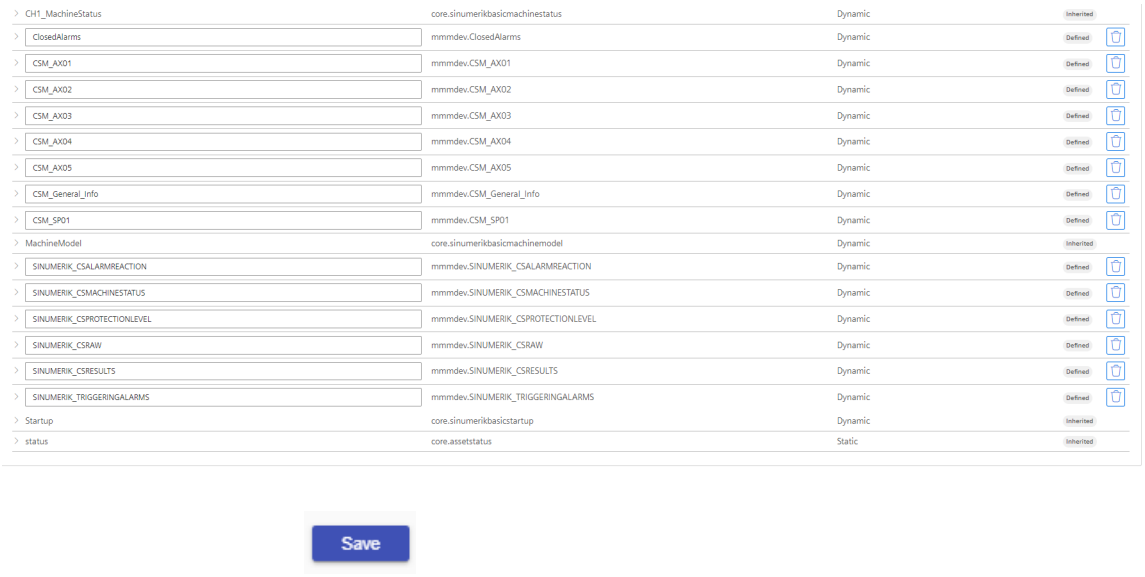


Figure 4-3 Createtype_bfcssasinumerik

4. Create the list of aspects according to the following overview.
   – Click on "Add aspect".
   – Select the aspects as shown in the following figure.

– Click the "Save" button.



CH1_MachineStatus	core.sinumerikbasicmachinestatus	Dynamic	Inherited
ClosedAlarms	mmmdev.ClosedAlarms	Dynamic	Defined
CSM_AX01	mmmdev.CSM_AX01	Dynamic	Defined
CSM_AX02	mmmdev.CSM_AX02	Dynamic	Defined
CSM_AX03	mmmdev.CSM_AX03	Dynamic	Defined
CSM_AX04	mmmdev.CSM_AX04	Dynamic	Defined
CSM_AX05	mmmdev.CSM_AX05	Dynamic	Defined
CSM_General_Info	mmmdev.CSM_General_Info	Dynamic	Defined
CSM_SP01	mmmdev.CSM_SP01	Dynamic	Defined
MachineModel	core.sinumerikbasicmachinemodel	Dynamic	Inherited
SINUMERIK_CSALARMREACTION	mmmdev.SINUMERIK_CSALARMREACTION	Dynamic	Defined
SINUMERIK_CSMACHINESTATUS	mmmdev.SINUMERIK_CSMACHINESTATUS	Dynamic	Defined
SINUMERIK_CSPROTECTIONLEVEL	mmmdev.SINUMERIK_CSPROTECTIONLEVEL	Dynamic	Defined
SINUMERIK_CSRAW	mmmdev.SINUMERIK_CSRAW	Dynamic	Defined
SINUMERIK_CSRESULTS	mmmdev.SINUMERIK_CSRESULTS	Dynamic	Defined
SINUMERIK_TRIGGERINGALARMS	mmmdev.SINUMERIK_TRIGGERINGALARMS	Dynamic	Defined
Startup	core.sinumerikbasicstartup	Dynamic	Inherited
status	core.assetstatus	Static	Inherited

4.2.6 Connecting a new machine to SSA

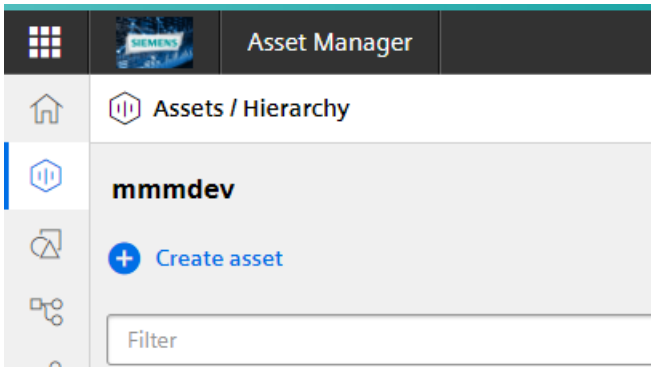
To connect a machine to MindSphere via BFC, perform the following steps:

- Creating a new asset of the type "bfc_ssa_sinumerik"
- Generating connection information of the assets
- Creating a MindSphere gateway for SSA

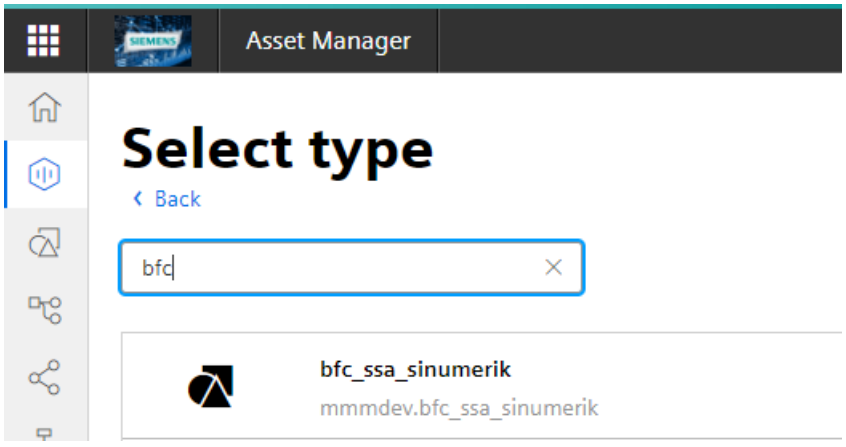
4.2.6.1 Creating a new asset of the type "bfc_ssa_sinumerik"

Procedure

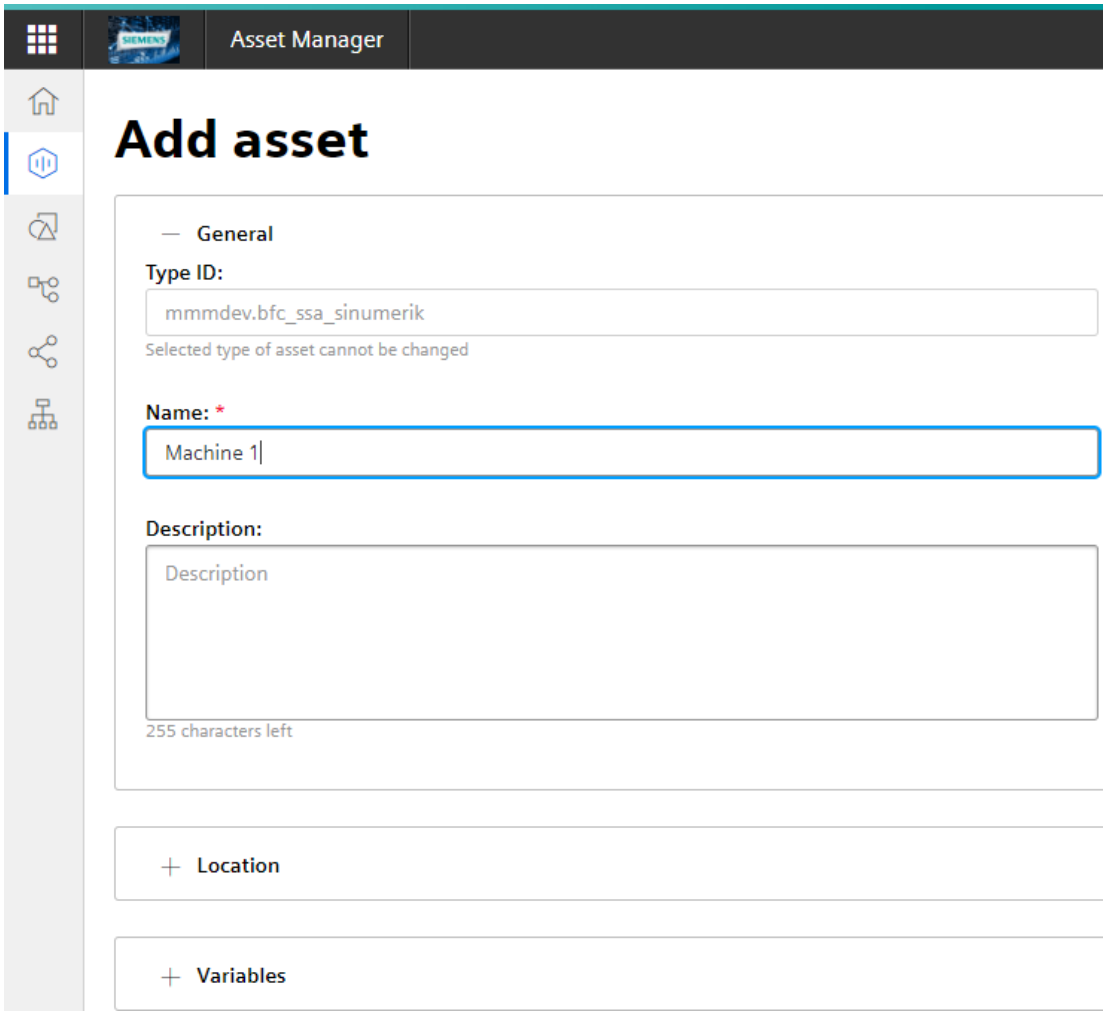
1. Open the Asset Manager in MindSphere.
   - Click on "Assets" in the left-hand window area.
   - In the right-hand window area navigate to the desired location in the asset hierarchy.
2. Click the "Add asset" button.



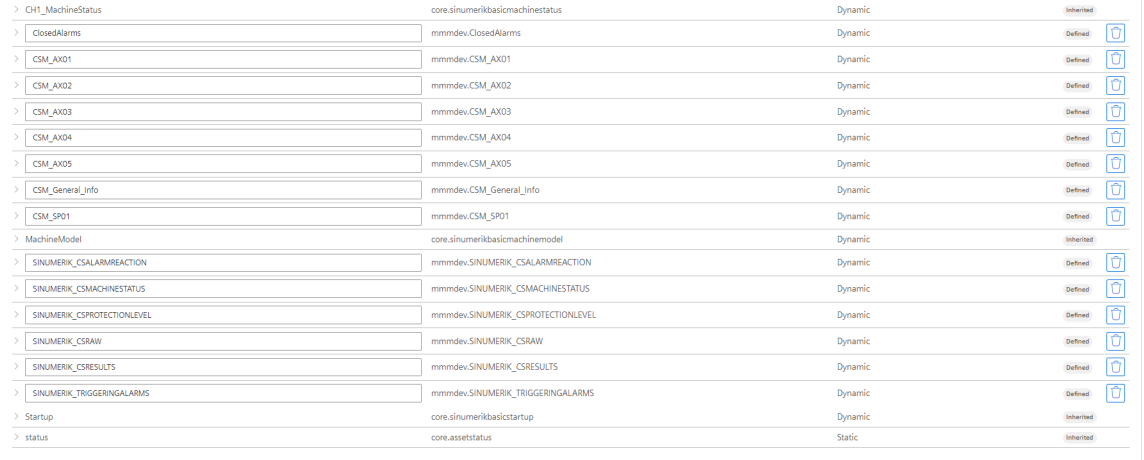
3. Select the asset type "bfc_ssa_sinumerik".



4. Assign a name, e.g. "Machine 1", to the new asset.



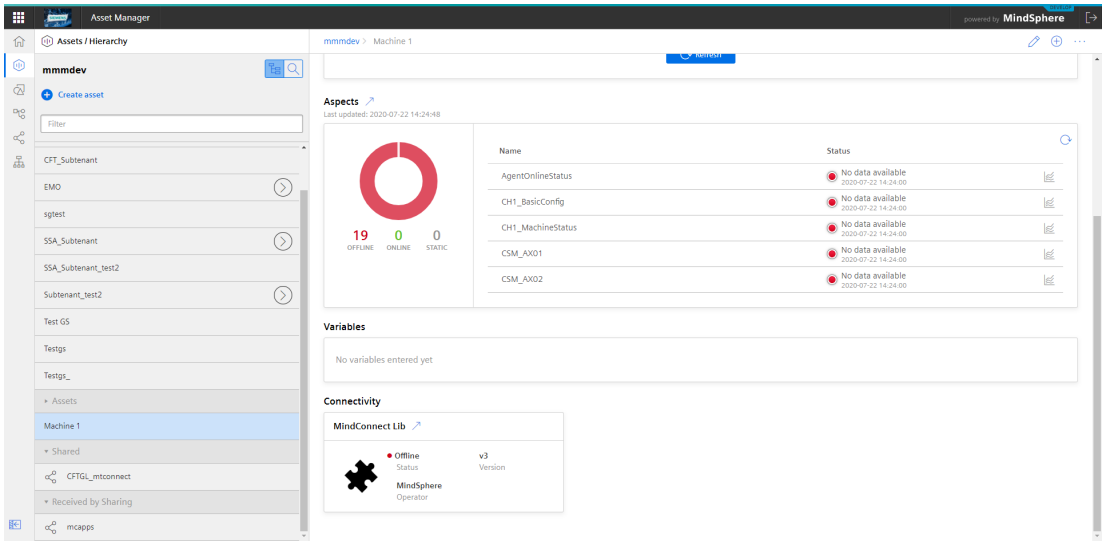
5. All required assets are listed. Click the "Save" button.



4.2.6.2 Generating connection information of the assets

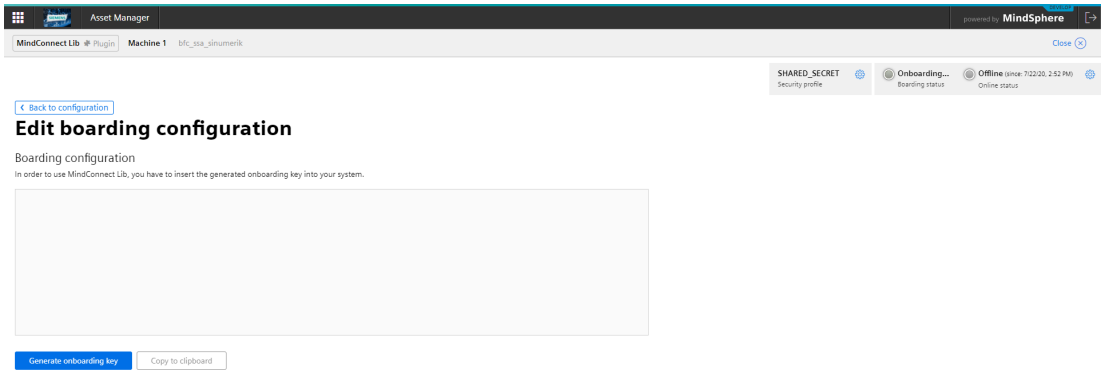
Procedure

1. Open the Asset Manager in MindSphere.
   - Click on "Assets" in the left-hand window area.
   - In the middle area of the window navigate to the BFC asset, you have just created.
   - Click on the arrow in the lower right window area "Connectivity".

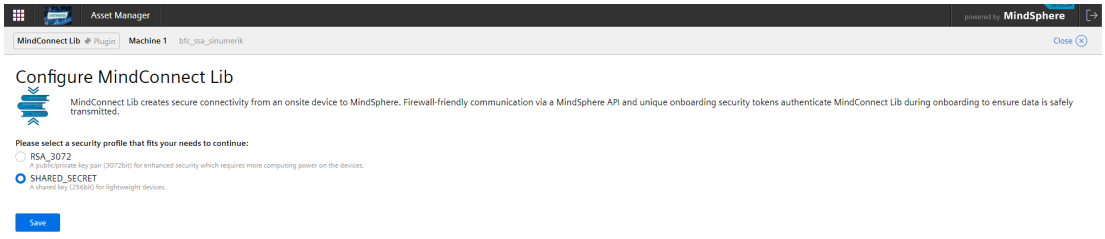


2. The "Configure MindConnect Lib" window opens.
   - Select the option field "SHARED_SECRET" for the secure data connection.
   - Click the "Save" button.

3. The "Edit boarding configuration" window opens. Click the "Generate connection key" button.



4. Copy the generated connection key to the clipboard.



4.2.6.3 Creating a MindSphere gateway for SSA

Perform the following steps to create a MindSphere gateway for SSA:

- Step 1: "Select gateway type"
- Step 2: "Define basic configuration"
- Step 3: "Define dataset configuration"
- Step 4: "Define alarm configuration"
- Step 5: "Advanced configuration"

Requirement

The "Commissioning" area is open.

Parameter

Parameter	Description
① Select gateway type	
Select target Store...*	Selection of the gateway
② Define basic configuration	
Type gateway name...*	Gateway name
Type gateway description...	Gateway description

Parameter	Description
Paste MindSphere connection info...*	Connection information Entry of the MindSphere connection string in JSON format Remark: Paste the copied connection key from the clipboard.
Type proxy address if needed...	Enter the proxy address if a proxy is required for Internet access
③ **Define dataset configuration / Optional**	
Pick a client ID	Client ID of the client, from which data is to be sent to MindSphere. Remark: All IDs of the clients, which were created under this "Plant hierarchy", are displayed.
Pick a dataset	Select the client data set that should be sent to MindSphere. Remark: All data sets of the selected client ID are displayed
- OR -	
All dataset	All client data is sent to MindSphere
④ **Define alarm configuration / Optional**	
Pick a client ID	All IDs of the clients, which were created under this "Plant hierarchy", are displayed.
⑤ **Advanced configuration / Optional** **Remark:** These fields do not require any entries, and are only populated by the hotline in the case of service.	
Type image path...*	Path to MindSphere docker image
Type username to access the image path...	Username to access the image path
Type password to access the image path...	Password to access the image path
Set message TTL (time to live) in milliseconds...*	AMQP lifetime of the data
Set queue expiration in milliseconds...*	AMQP queue execution time
Set max queue size...*	AMQP maximum queue size
Set max queue size bytes...*	AMQP maximum queue size in bytes
Select queue mode...*	AMQP queue mode
Set prefetch count...*	AMQP prefetch counter
Type alarm topic*	MQTT topic alarm event
Type new reading topic*	MQTT topic new dataset
Environment variable 1	Environment variable to store the data from "CurrentAlarms" as BIG STRING in MindSphere
Environment variable 2	Environment variable to store the data from "MachineModel" as BIG STRING in MindSphere
Environment variable 3	Note that in the variable "IOTGATEWAY_OVERRIDE" the file topic is changed to the client ID of the connected machine.
Type new environment variable*	New environment variable for the image

*: Obligatory data
The character sequence to be used for the various entries is provided in the input windows.

Procedure

1. In the "Gateway (Export)" area, click on "+" to add a new gateway.

2. Step 1: "Select gateway type"
   - From the drop-down list, select entry "MindSphere".
   - Click on "Next".

3. Step 2: "Define basic configuration"
   - Populate the fields to perform the basic configuration.
     Paste the copied connection key from the clipboard into the "Paste MindSphere connection info" input field.
   - Click on "Next".

4. Step 3: "Define dataset configuration" / Optional
   With this step, you define which data is to be sent to MindSphere.
   - Select one data set, several or all data sets.

   Note

   Several entries

   - Click on "+" to add an additional entry.

   - Click on "Next".

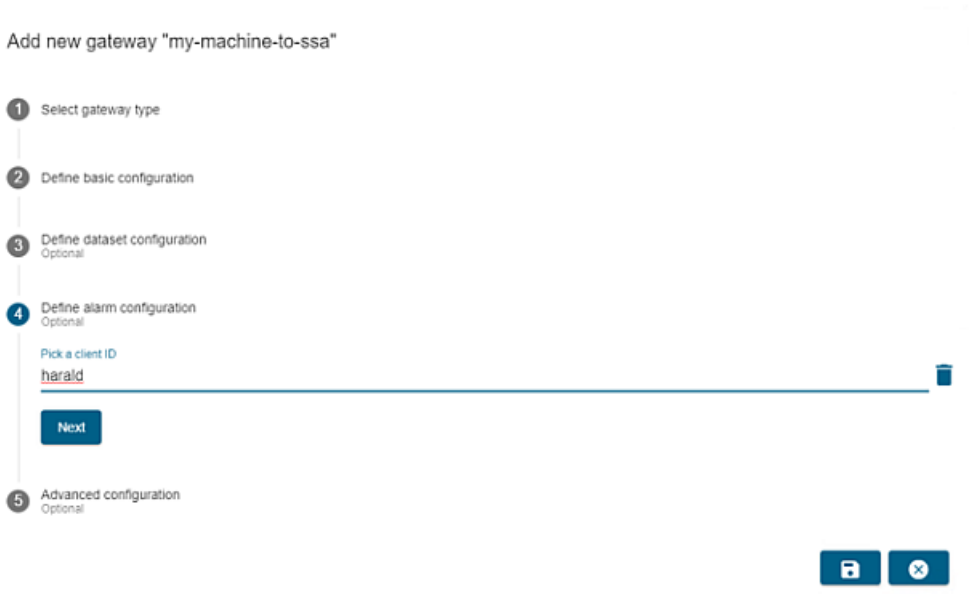
5. Step 4: "Define alarm configuration" / Optional
   With this step, you define which alarms are to be sent to MindSphere.
   – Select the alarms.

   Note

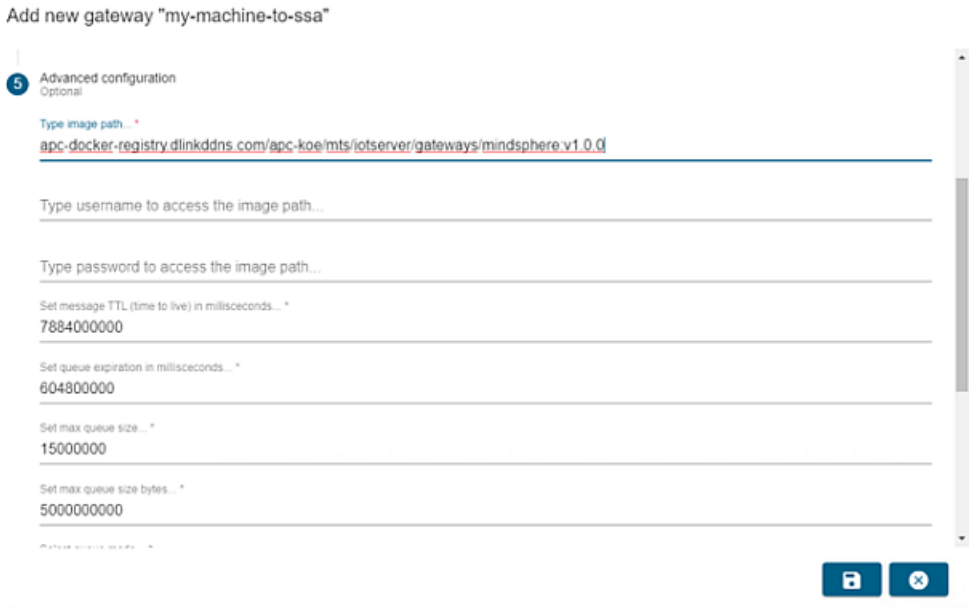
   Several entries

   • Click on "+" to add an additional entry.

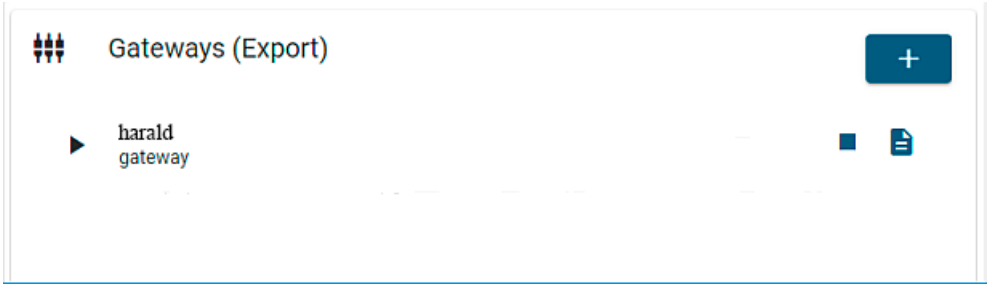
   – Click on "Next"



6. Step 5: "Advanced configuration" / Optional
   - Add the environment variables.
     Replace the exemplary designation "harald" with the ID of your machine.
   - Click on "Save" to save the MindSphere gateway.



7. The MindSphere gateway was successfully created, and is shown in the overview in the "Gateways (Export)" area.

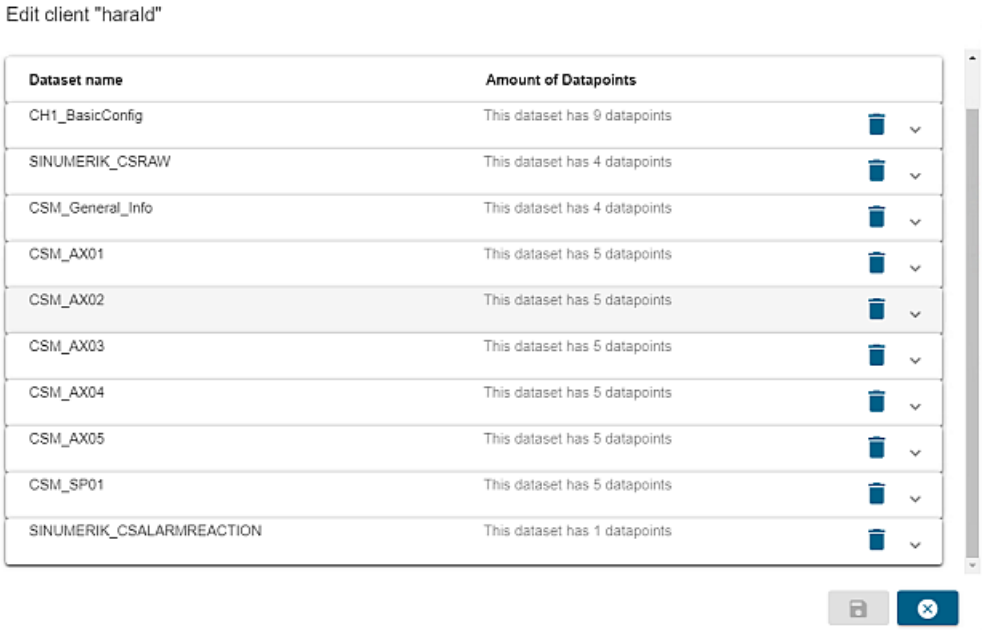


4.2.7 Configuring the BFC client data acquisition

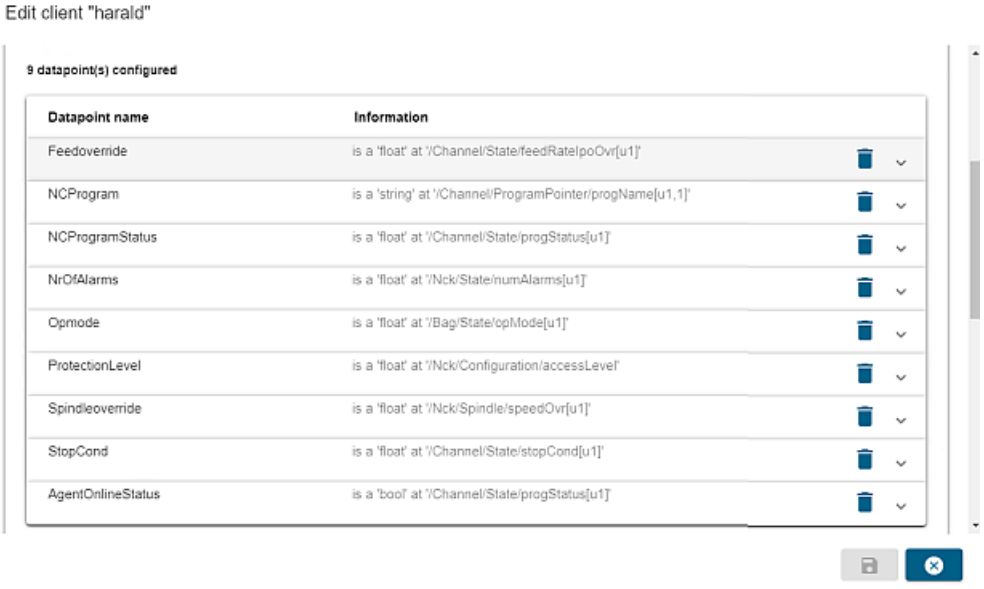
You can use the BFC client to record certain "data sets". To do this, you must configure selected variables.

Procedure

Configure the variables shown in the following figures.



Edit client "harald"
CH1_BasicConfig
This dataset has 9 datapoints
Type dataset name... *
CH1_BasicConfig
Supported input:letters, numbers, _ (must start with letter) 15 / 50
Select reading mode... *
On Change
Set debounce time in milliseconds... *
2000
Range: 200-86400000
9 datapoint(s) configured
Datapoint name
Information
Feedoverride
is a 'float' at '/Channel/State/feedRateIpoOvr[u1]'
NCProgram
is a 'string' at '/Channel/ProgramPointer/progName[u1,1]'
NCProgramStatus
is a 'float' at '/Channel/State/progStatus[u1]'
NrOfAlarms
is a 'float' at '/Nck/State/numAlarms[u1]'


Edit client "harald"
9 datapoint(s) configured
Datapoint name
Information
Feedoverride
is a 'float' at '/Channel/State/feedRateIpoOvr[u1]'
NCProgram
is a 'string' at '/Channel/ProgramPointer/progName[u1,1]'
NCProgramStatus
is a 'float' at '/Channel/State/progStatus[u1]'
NrOfAlarms
is a 'float' at '/Nck/State/numAlarms[u1]'
Opmode
is a 'float' at '/Bag/State/opMode[u1]'
ProtectionLevel
is a 'float' at '/Nck/Configuration/accessLevel'
Spindleoverride
is a 'float' at '/Nck/Spindle/speedOvr[u1]'
StopCond
is a 'float' at '/Channel/State/stopCond[u1]'
AgentOnlineStatus
is a 'bool' at '/Channel/State/progStatus[u1]'

Edit client "harald"
SINUMERIK_CSRAW
This dataset has 4 datapoints
Type dataset name... *
SINUMERIK_CSRAW
Supported input:letters, numbers, _ (must start with letter) 15 / 50
Select reading mode... *
Interval
Set interval time in milliseconds... *
5000
Range: 200-86400000
4 datapoint(s) configured
Datapoint name
Information
NCKAlive
is a 'float' at '/Nck/State/nckAliveAndWell'
PowerOnTime
is a 'float' at '/Nck/TopPrioalarm/textIndex[1]'
PrioAlarm
is a 'float' at '/Nck/TopPrioalarm/textIndex[1]'
SetupTime
is a 'float' at '/Nck/ChannelDiagnose/setupTime'

Edit client "harald"
CSM_General_Info
This dataset has 4 datapoints
Type dataset name... *
CSM_General_Info
Supported input:letters, numbers, _ (must start with letter) 16 / 50
Select reading mode... *
Interval
Set interval time in milliseconds... *
30000
Range: 200-86400000
4 datapoint(s) configured
Datapoint name
Information
NUM_AXES_IN_SYSTEM
is a 'float' at '/Nck/ChannelDiagnose/dpAxisCfgNumAxes'
NC_CPU_Ready
is a 'float' at '/Plc/DataBlock/Bit[c10,104.7]'
Variable_Group1
is a 'float' at '/Plc/DataBlock/Byte[c10,108]'
Variable_Group2
is a 'float' at '/Plc/DataBlock/Byte[c10,109]'

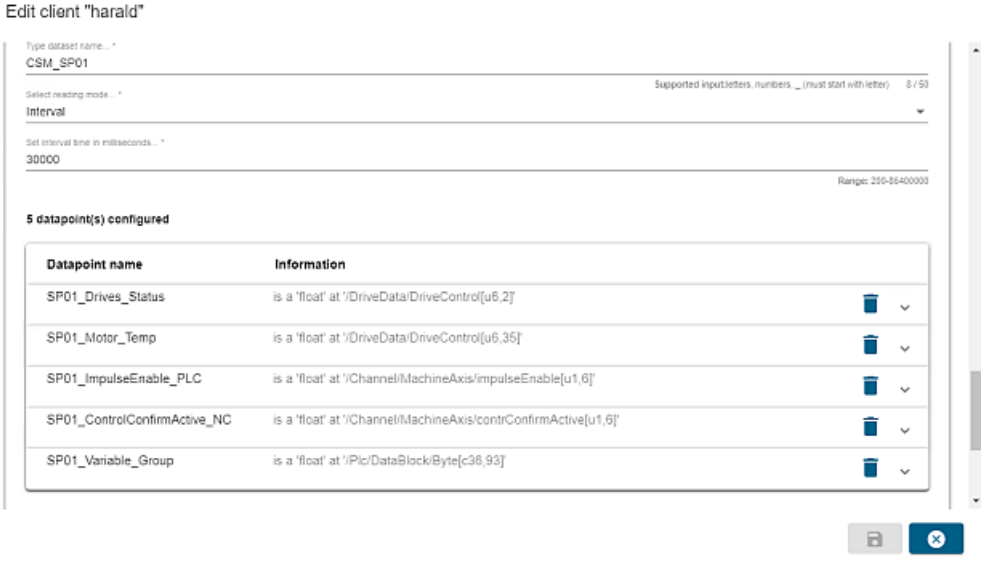
Edit client "harald"
Type dataset name... *
CSM_AX01
Supported input:letters, numbers, _ (must start with letter) 8 / 50
Select reading mode... *
Interval
Set interval time in milliseconds... *
30000
Range: 200-86400000
5 datapoint(s) configured
Datapoint name
Information
AX01_Drives_Status
is a 'float' at '/DriveData/DriveControl[u1,2]'
AX01_Motor_Temp
is a 'float' at '/DriveData/DriveControl[u1,35]'
AX01_ImpulseEnable_PLC
is a 'float' at '/Channel/MachineAxis/impulseEnable[u1,1]'
AX01_ControlConfirmActive_NC
is a 'float' at '/Channel/MachineAxis/contrConfirmActive[u1,1]'
AX01_Variable_Group
is a 'float' at '/Plc/DataBlock/Byte[c31,93]'

Edit client "harald"
Type dataset name... *
CSM_AX02
Supported input:letters, numbers, _ (must start with letter) 8 / 50
Select reading mode... *
Interval
Set interval time in milliseconds... *
30000
Range: 200-86400000
5 datapoint(s) configured
Datapoint name
Information
AX02_Drives_Status
is a 'float' at '/DriveData/DriveControl[u2,2]'
AX02_Motor_Temp
is a 'float' at '/DriveData/DriveControl[u2,35]'
AX02_ImpulseEnable_PLC
is a 'float' at '/Channel/MachineAxis/impulseEnable[u1,2]'
AX02_ControlConfirmActive_NC
is a 'float' at '/Channel/MachineAxis/contrConfirmActive[u1,2]'
AX02_Variable_Group
is a 'float' at '/Plc/DataBlock/Byte[c32,93]'

Edit client "harald"
Type dataset name... *
CSM_AX03
Supported input:letters, numbers, _ (must start with letter) 8 / 50
Select reading mode... *
Interval
Set interval time in milliseconds... *
30000
Range: 200-86400000
5 datapoint(s) configured
Datapoint name
Information
AX03_Drives_Status
is a 'float' at '/DriveData/DriveControl[u3,2]'
AX03_Motor_Temp
is a 'float' at '/DriveData/DriveControl[u3,35]'
AX03_ImpulseEnable_PLC
is a 'float' at '/Channel/MachineAxis/impulseEnable[u1,3]'
AX03_ControlConfirmActive_NC
is a 'float' at '/Channel/MachineAxis/contrConfirmActive[u1,3]'
AX03_Variable_Group
is a 'float' at '/Plc/DataBlock/Byte[c33,93]'

Edit client "harald"
Type dataset name... *
CSM_AX04
Supported input:letters, numbers, _ (must start with letter) 8 / 50
Select reading mode... *
Interval
Set interval time in milliseconds... *
30000
Range: 200-86400000
5 datapoint(s) configured
Datapoint name
Information
AX04_Drives_Status
is a 'float' at '/DriveData/DriveControl[u4,2]'
AX04_Motor_Temp
is a 'float' at '/DriveData/DriveControl[u4,35]'
AX04_ImpulseEnable_PLC
is a 'float' at '/Channel/MachineAxis/impulseEnable[u1,4]'
AX04_ControlConfirmActive_NC
is a 'float' at '/Channel/MachineAxis/contrConfirmActive[u1,4]'
AX04_Variable_Group
is a 'float' at '/Plc/DataBlock/Byte[c34,93]'

Edit client "harald"
Type dataset name... *
CSM_AX05
Supported input:letters, numbers, _ (must start with letter) 8 / 50
Select reading mode... *
Interval
Set interval time in milliseconds... *
30000
Range: 200-86400000
5 datapoint(s) configured
Datapoint name
Information
AX05_Drives_Status
is a 'float' at '/DriveData/DriveControl[u5,2]'
AX05_Motor_Temp
is a 'float' at '/DriveData/DriveControl[u5,35]'
AX05_ImpulseEnable_PLC
is a 'float' at '/Channel/MachineAxis/impulseEnable[u1,5]'
AX05_ControlConfirmActive_NC
is a 'float' at '/Channel/MachineAxis/contrConfirmActive[u1,5]'
AX05_Variable_Group
is a 'float' at '/Plc/DataBlock/Byte[c35,93]'


Edit client "harald"
Type dataset name... *
CSM_SP01
Supported input:letters, numbers, _ (must start with letter) 8 / 50
Select reading mode... *
Interval
Set interval time in milliseconds... *
30000
Range: 200-86400000
5 datapoint(s) configured
Datapoint name
Information
SP01_Drives_Status
is a 'float' at '/DriveData/DriveControl[u6,2]'
SP01_Motor_Temp
is a 'float' at '/DriveData/DriveControl[u6,35]'
SP01_ImpulseEnable_PLC
is a 'float' at '/Channel/MachineAxis/impulseEnable[u1,6]'
SP01_ControlConfirmActive_NC
is a 'float' at '/Channel/MachineAxis/contrConfirmActive[u1,6]'
SP01_Variable_Group
is a 'float' at '/Plc/DataBlock/Byte[c36,93]'

4.2.8 Creating and saving a machine identity

You can store important information such as machine information and address information for each machine using an identSNAPSHOT.xml file.

The creation of an identSNAPSHOT.xml file only applies to SINUMERIK Operate. You can find further information in the chapter Creating identSNAPSHOT file on SINUMERIK controller (Page 74).

Module description

5

5.1 Overview

The service app **SINUMERIK Service Assistance** is modular and consists of three independent service packages, which can be combined with each other in a customer-specific manner:

- Machine Transparency (Page 94) enables the automated acquisition of information about hardware components and software versions that are used within the machine tool with a SINUMERIK control system. With the help of transparency regarding the components installed at the customer, it is possible for the expert to provide advice on hardware and software handling. Furthermore the Change Protocol page offers information for detecting the changes which are important for experts or any user who cares the machines current state.
  Machine Transparency is the base of SINUMERIK Service Assistance (SSA), which means in every combination, Machine Transparency is used.
- Machine Condition (Page 108) enables the cyclic acquisition of advanced state data via the control and drive technology and their targeted evaluation with the help of intelligent analysis methods. Within a MindSphere application, the basic system information such as the SINUMERIK version or the number of axes, the machine accesses with information about the respective protection level as well as the boot events and their causes are recorded and visualized.
- Machine Error Analysis (Page 117)enables the identification and evaluation of error states that occur on the machine tool with SINUMERIK control. For this purpose, the error messages of the machine tool are continuously documented via a MindSphere application. Based on the collected information, a data analysis can be performed to identify the original cause of the error as well as existing causal relationships between the errors that occurred.

5.2 Handling of identSNAPSHOT file

5.2.1 Overview

All the information in the service Machine Transparency is generated from a single xml file of the controller, called identSNAPSHOT. This file is imported into the app SINUMERIK Service Assistance after creating the identSNAPSHOT file manually on the controller.

Creating and uploading the identSNAPSHOT file is described in this chapter. Furthermore limitations on file upload are listed.

Note

The identSNAPSHOT file needs to be created manually with the instructions below every time there is a change (software or/and hardware) on the machine.

5.2.2 Creating identSNAPSHOT file on SINUMERIK controller

Procedure

1. Open SINUMERIK Operate and select the "Diagnostics" operating area.

2. Press the "Version" softkey.
   It takes some time to call the version display. While the version data is being determined a progress message box and the appropriate text are displayed in the dialog line.

3. Press the "Save" softkey.
   The "Save version information: Select Archive" window opens. The following storage locations are offered depending on the configuration:
   - Local drive
   - Network drives
   - USB
   - Version data (archive: Data tree in the "HMI data" directory)

4. Then press the "New directory" softkey if you wish to create your own directory.

5. Press the "OK" softkey. The directory is created.

6. Press the "OK" softkey again to confirm the storage location.
   The "Save version information: Name" window opens.
7. Specify the desired settings.

- "Name:" input field
  the file name is pre-assigned with <Machine name/no.>+<CF-card number>. "_config.xml" or "_version.txt" is automatically attached to the file names.
- "Comment:" input field
  You can enter a comment that is stored with the configuration data.
- Version data (.TXT)
  Deactivate the checkbox.
- Configuration data (.XML)
  Activate the checkbox.

8. Press the "OK" softkey to start the data transfer.

Stadard paths for identSNAPSHOT file on NCU/PCU

NCU	/user/sinumerik/hmi/data/version/
PCU	C:\Program Files (x86)\Siemens\MotionControl\user\sinumerik\hmi\data\version\

Result

After the process is completed, the identSNAPSHOT file should appear under the path "/user/sinumerik/hmi/data/version".

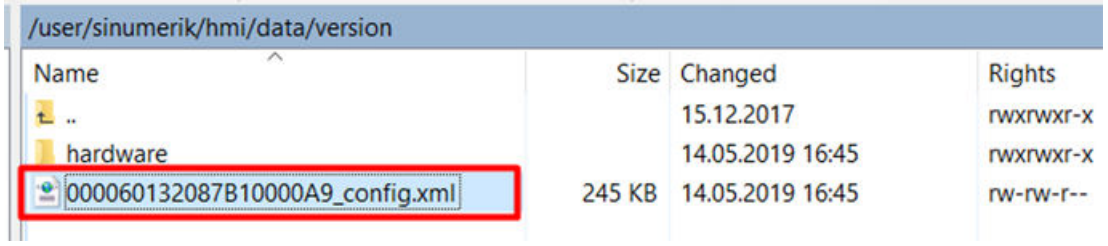


Figure 5-1 Path identSNAPTSHOT

The standard paths for

5.2.3 Uploading identSNAPSHOT file to Mindsphere

Procedure

1. Connect to Mindsphere and go to "Shopfloor Management" app.
2. Select your asset name.

3. On "Manage MyMachines" tab, make sure you have enabled the following options:

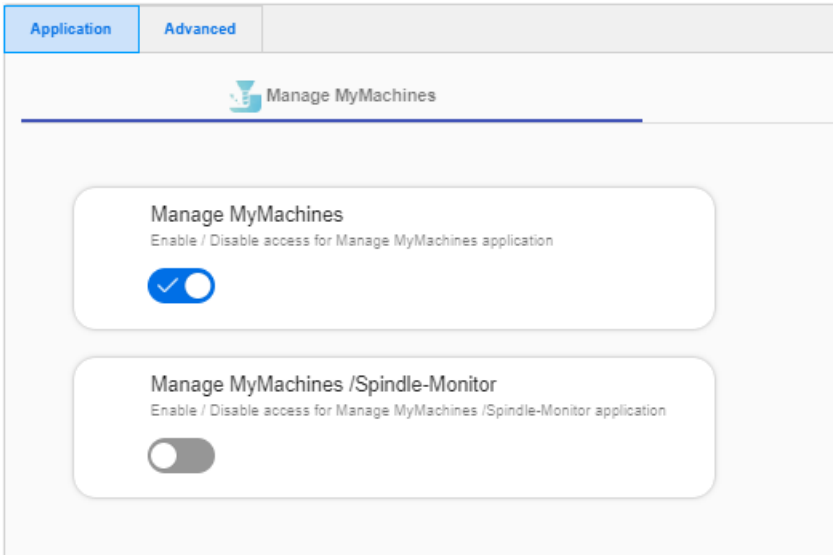
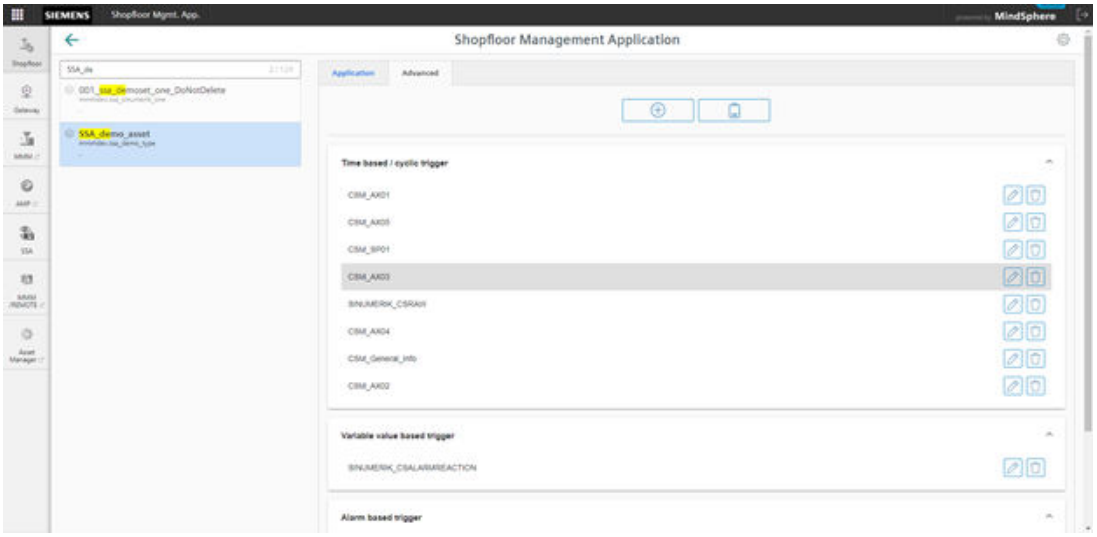


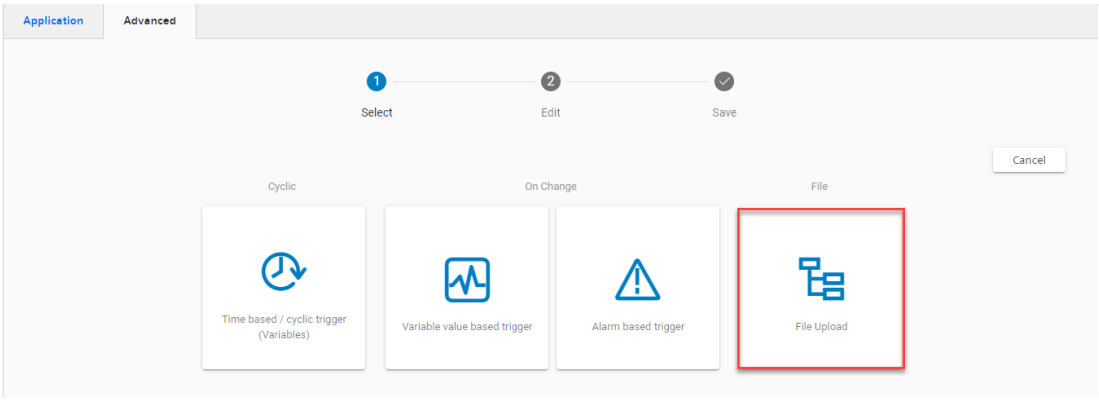
Figure 5-2 Shopfloor Management Application - options

4. Press "Advanced".

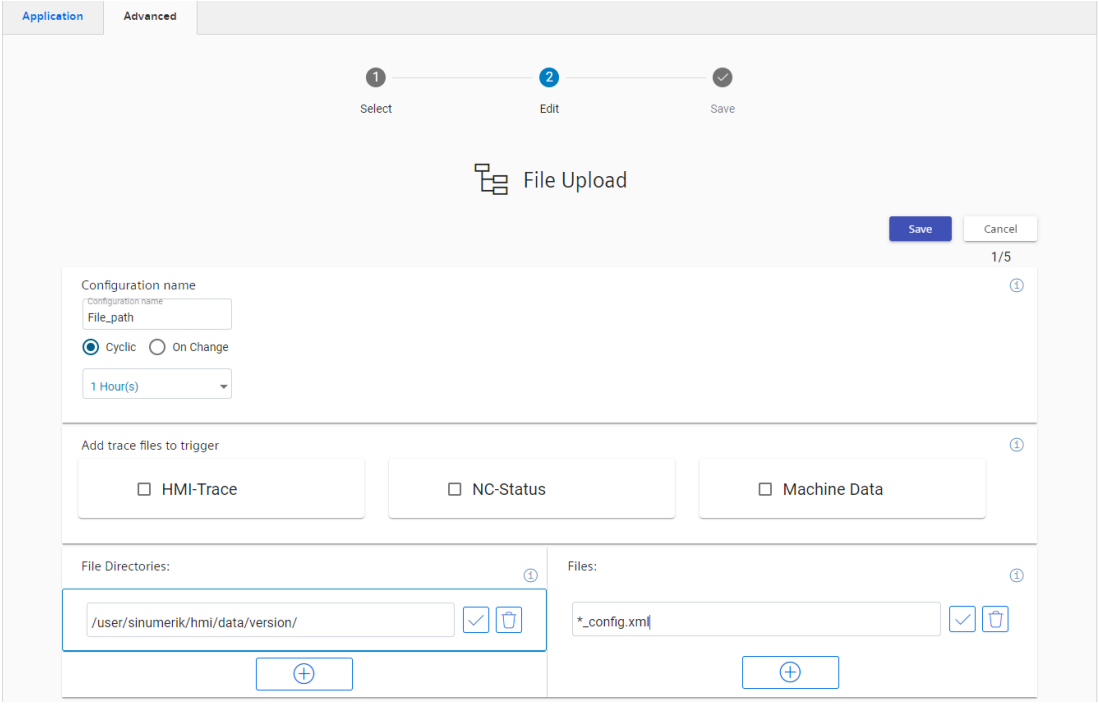


5. Press "Add".

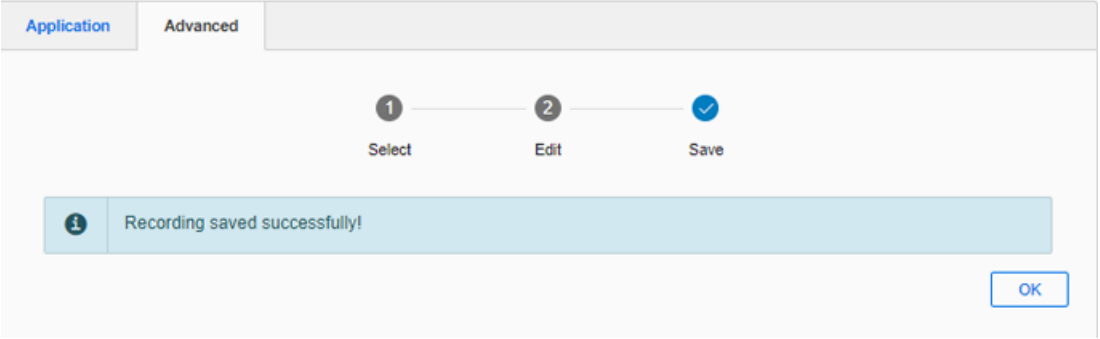
6. Select "File Upload".



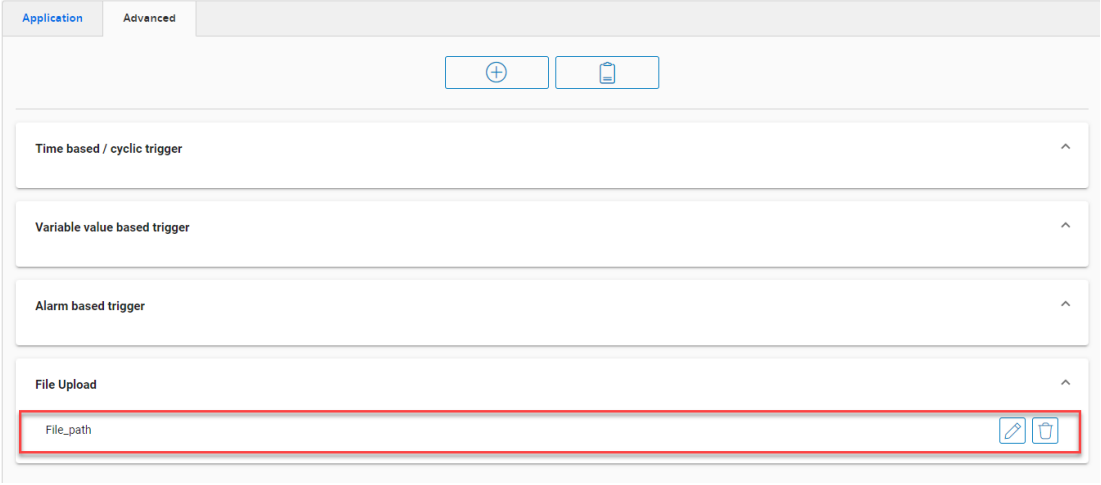
7. Press "Add file upload item".
8. Enter path of identSNAPSHOT file in the input box of "File Directories".
   - Enter a file name or a term like "*_config.xml" (it uploads all _config.xml files) in the input box of "Files".
   - Select "On Change" (recomended) or "Cyclic".
   - Type in any configuration name and press "Save".



9. Wait until the response of the successful saving and press "OK".



10. Verify that the path was entered as expected.



5.2.4 Limitations on file upload

The following file upload feature limitations come from Manage MyMachine (MMM) project:

Note

File Upload Limitations

For file upload limitations , please check MMM readme documentation (https://documentation.mindsphere.io/resources/html/manage-my-machine-readme/en-US/index.html).

Supported directories and folders

To ensure secure file upload, a white list is defined, which limits the configured path of a file upload item. A file upload item's path must follow the limitation rules which are presented below:

Directories for BFC Gateway

Below directory list is supported for fileupload operation and SSA. You cannot upload files from other directories and use it in SSA:

- C:\temp\files\
  On the PCU
- C:\temp\datatransfer\
  On the PCU
- /var/temp/datatransfer/
  On the NCU
- /var/tmp/
  On the NCU
- /user/sinumerik/hmi/data/version/
  On the NCU

Directories for MMM

All MMM directories are supported by SSA.

Special directory: C:/temp/files

For the C:/temp/files, it must be configured as <temp>/files in the MTA Asset Config.

Note

Epsconfig.xml : temp file is C:/temp for PCU

Directory of <temp> comes from epsconfig.xml. Don't change this path and epsConfig tempdir must not end with /.

File Extensions

Only .xml extension is supported by SSA.

Note

Name of identSNAPSHOT

The name of identSNAPSHOT must be like one of these below:

- <filename>_config.xml
  i.e: SPG2019052401933_config.xml
- <file_name>_config_<DD-MM-YYYY_HH-MM-SS-SSS>.xml
  i.e:000060161897FC000014_config_01-04-2020_21-39-58-101.xml

---

Sending the correct files or adding the files under the specific file upload directories belongs to user's own responsibility.

Note

Because of Fanuc File Transfer driver not implemented yet, file upload functionality on Fanuc machines is currently not supported.

5.2.5 Uploading identSNAPSHOT file via Fleet Manager

Procedure

1. Extract the identSNAPSHOT file from the controller.
2. Connect to MindSphere and go to "Fleet Manager" app.

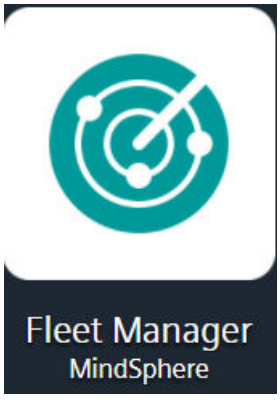


Figure 5-3 Logo Fleet Manager

3. Search and select your asset name.
4. Select files tab.

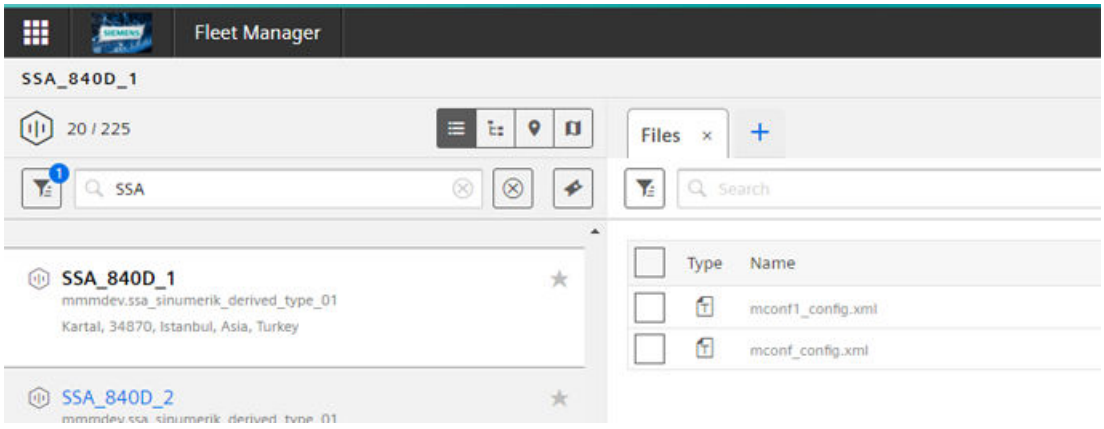


Figure 5-4 Fleet Manager files tab

5. Press "Upload".
6. Select your identSNAPSHOT.
7. Press "Open".

Note

Name of identSNAPSHOT

The name of identSNAPSHOT must be like one of these below:

- <filename>_config.xml
  i.e: SPG2019052401933_config.xml
- <file_name>_config_<DD-MM-YYYY_HH-MM-SS-SSS>.xml
  i.e:000060161897FC000014_config_01-04-2020_21-39-58-101.xml

5.3 Asset Selection

The Asset Selection page is the main page of the app SINUMERIK Service Assistance. It offers an overview over all the connected controllers.

Note

Select one of the assets in the table, before choosing one of the main services of the app:

- Machine Transparency
- Machine Condition
- Machine Error Analysis

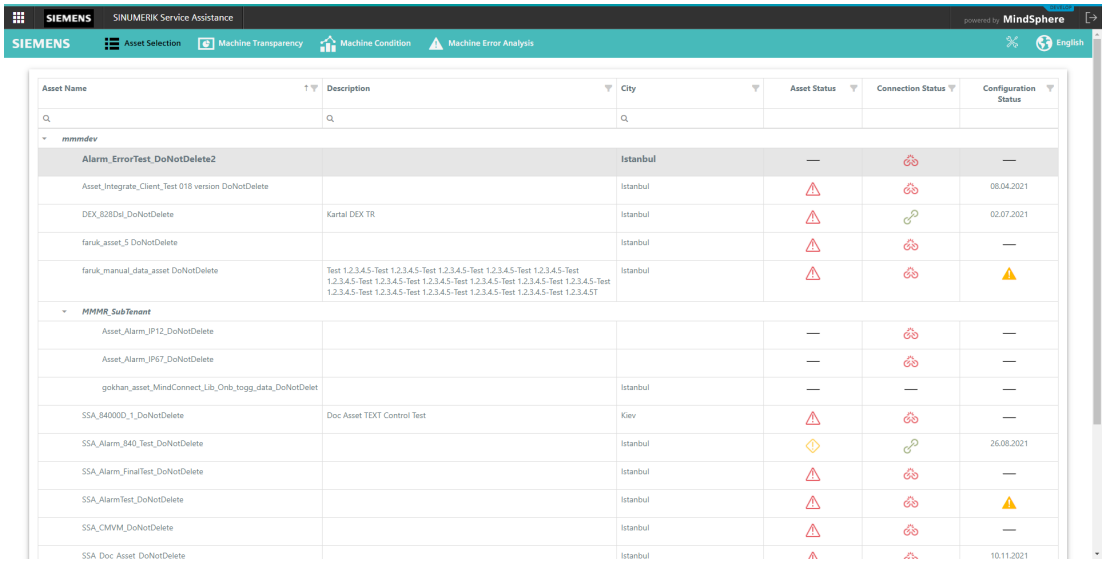


Figure 5-5 Asset Selection

The following values are shown in a table:

- Asset Name
- Description
- City
- Asset Status
- Connection Status
- Configuration Status

You can search or filter the table after certain values.

Asset Status

Symbol	Meaning
	A Warning has occurred when there is an organizational disturbance or the controller is used in a user (service) or service (commissioning engineer) access level
	An Error has occurred when there is a technical disturbance or the controller is used in a manufacturer (development) or Siemens access level.
	Everything is okay when there is no disturbance and the controller is used in a key-switch access level.
—	If CH1_MachineStatus/ SINUMERIK_CSPROTECTIONLEVEL is not configured, this symbol appears.

Connection Status

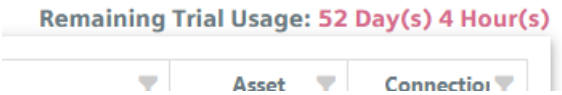
Symbol	Meaning
	Controller is connected
	Controller is disconnected
—	If AgentOnlineStatus is not configured, this symbol appears.

Configuration Status

Symbol	Meaning
	Upload date of the last acknowledged IdentSNAPSHOT file
	Acknowledged IdentSNAPSHOT file in New Asset Selection (Page 84)
	Symbolizes a change in the configuration.
—	No configuration

Remaining Trial Usage

With this feature you can see the remaining days and hours during the trial period. This line is only visible if you have activated trial usage.



Interlinking to Change Protocol

By clicking the warning symbol on the configuration column, you will be directed to the Change Protocol page.

5.3.1 New Asset Selection

The "New Asset Selection" menu offers the opportunity to change the asset during the activation of a certain page. Also, It offers an overview over all the controllers.

The New Asset Selection menu is available for the following pages:

- Machine Error Analysis > Alarms
- Machine Error Analysis > Triggering Alarms for Disturbances

You can pop up the "New Asset Selection" menu by clicking on the arrow on the left hand side of the page. You can also collapse the "New Asset Selection" menu to reach full screen mode again.

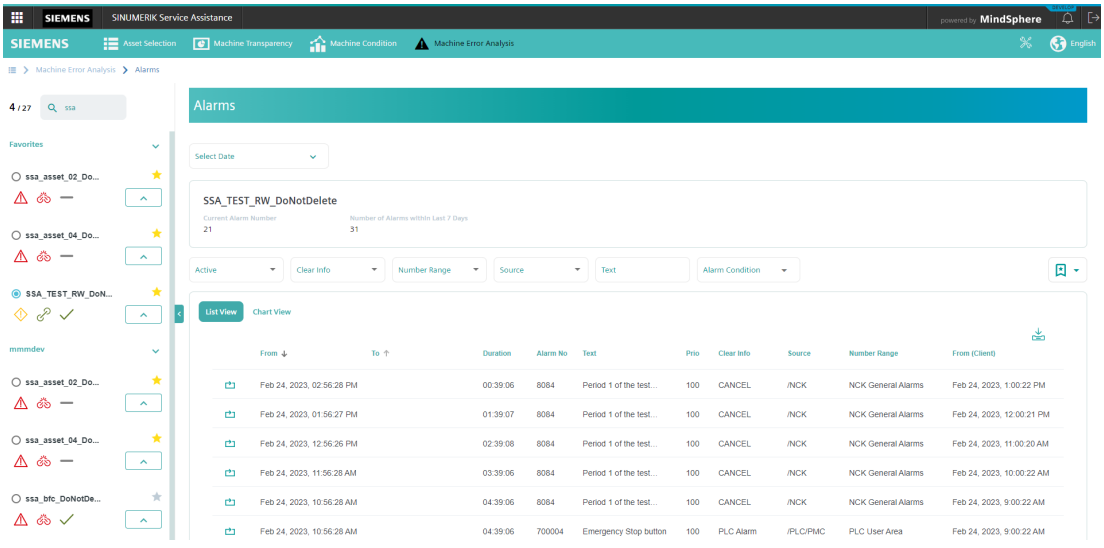


Figure 5-6 Alarms with new asset selection menu

The following values are shown:

- Asset Name
- Location
- Description

Information about asset numbers

Filtered asset numbers and total asset numbers are shown on the left side of the search area:

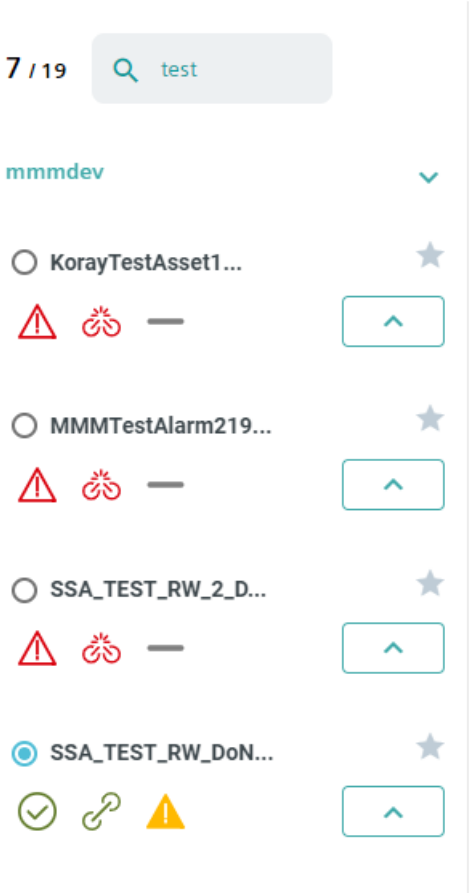
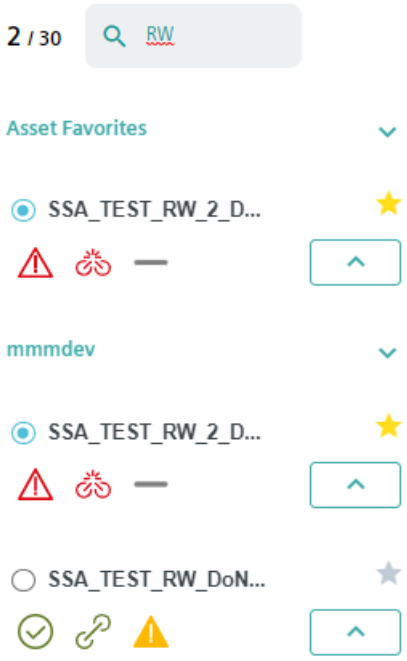


Figure 5-7 Asset numbers

Favorite assets

You can select favorite assets to make distinguishing easier for preferred assets:

1. In the upper right corner of the asset list, the outline of a quick favorite link (star) can be seen.
2. Click on the favorite link of the asset you like to make a favorite of.



The star is highlighted and the item has been chosen as a favorite.

Note

Deleting a favorite

If you want to remove a favorite, click on the favorite link (star) again.

Note

Browser cache

Please be aware that favorite assets are stored in the browser cache. If you delete your browser cache favorite assets will be lost.

5.3.2 Billing

5.3.2.1 Billing systems

After the SSA application is purchased and registration is done, it is required to activate billing toggles of SSA assets. By that way, SSA components (Machine Transparency, Machine Condition and Machine Error Analysis) are going to be enabled. Each component has a different pricing. Please check the product sheet from the Activation Page pop up, before enabling it:

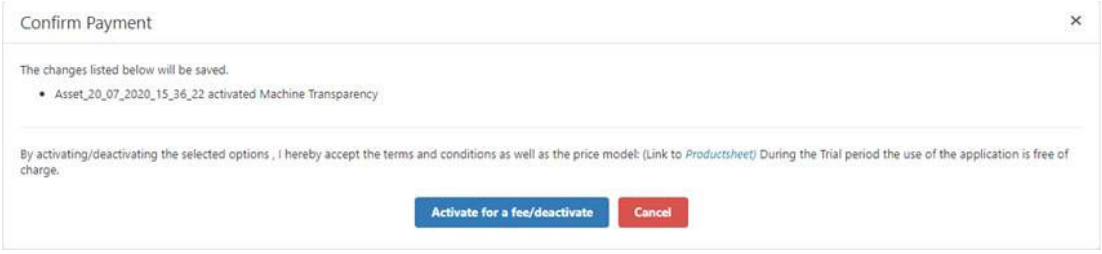


Figure 5-8 Pop up Activation page - confirm payment

5.3.2.2 Activation page

The activation page can either be accessed from Shopfloor Management Application or from the settings icon of the SINUMERIK Service Assistance. On the activation page it is possible to activate/deactivate services and see the summary of activated assets. You can search for assets and add or delete columns with the “Column Chooser.”

Note

Please keep in mind that Activation Page can be used by SSA admins only.

Note

Only assets created from MindConnectLib or BasicSinumerikAsset type are shown on the activation page.

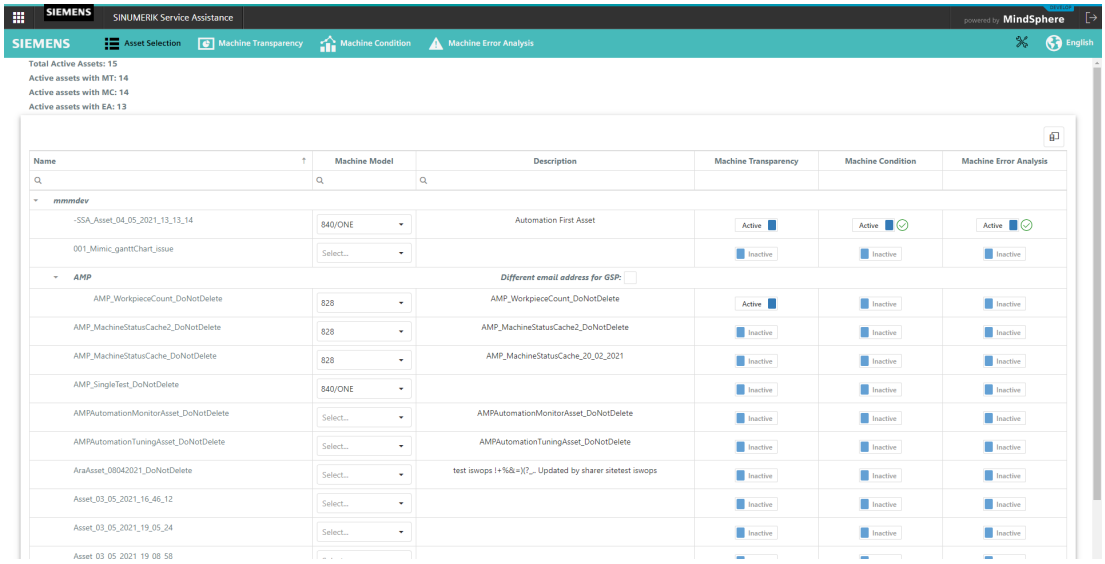


Figure 5-9 Activation page

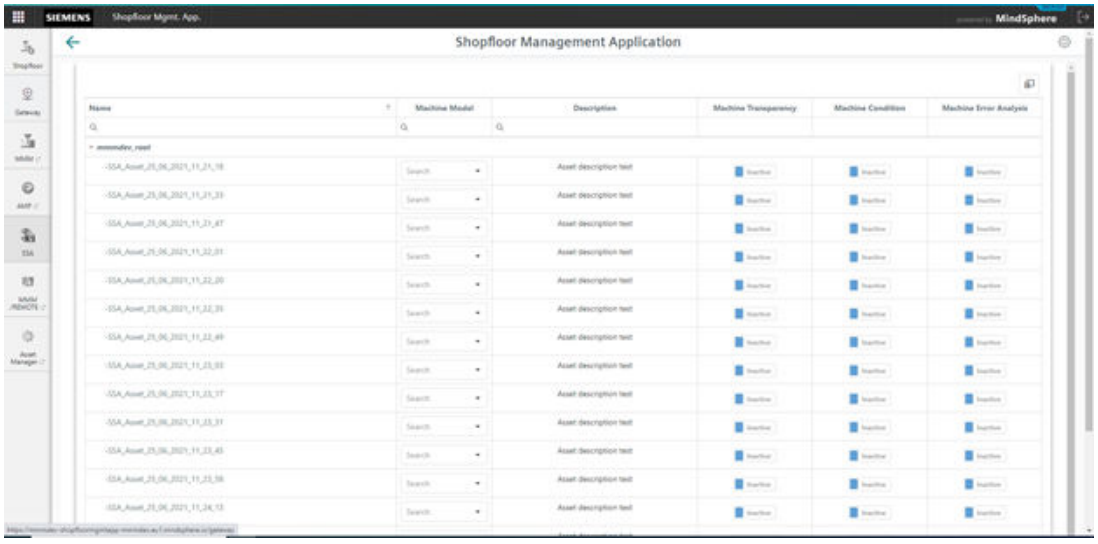


Figure 5-10 Shopfloor Management Software: Activation page view

Note

Please keep in mind that if SSA admin right are missing, the user will see an empty page in Shopfloor Management View.

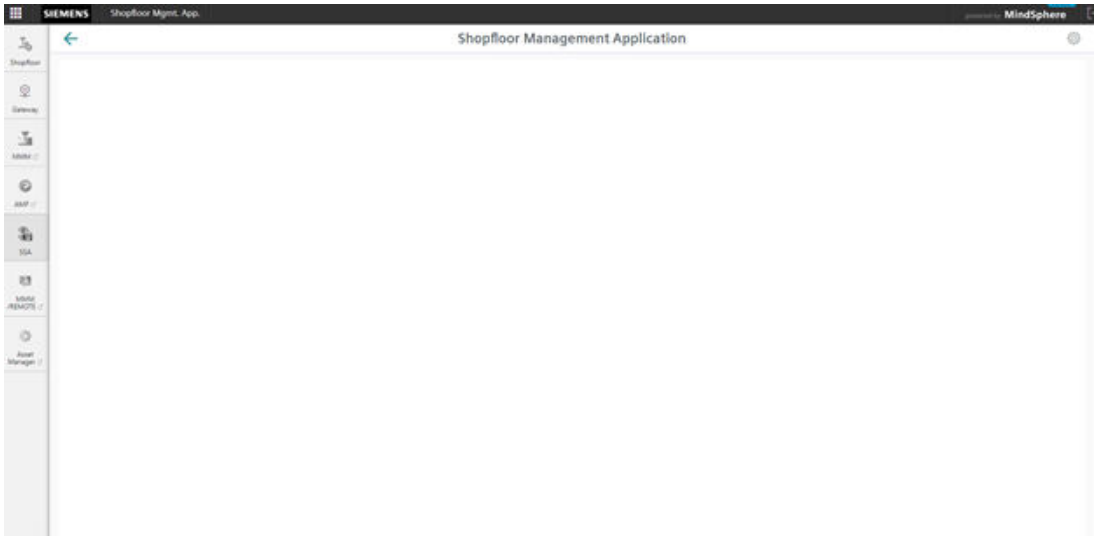


Figure 5-11 Shopfloor Management Software: Activation page view with no admin rights

Choosing machine model

In the table of the activation page it is also possible to choose a valid machine model for the listed assets. You can select a valid machine model by choosing a control in drop down menu.

Adding extra column from Column Chooser

1. Press "Column Chooser".

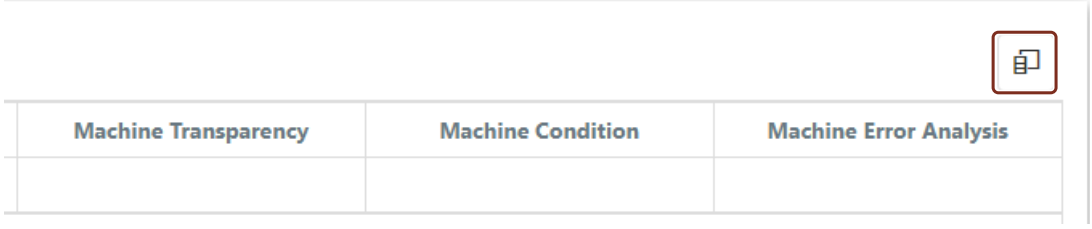


Figure 5-12 Column Chooser

2. Select checkbox to add the desired column.
3. Close the "Column Chooser".

Showing active assets as a count

With this feature, you can learn how many assets are active and active with MT(Machine Transparency), MC(Machine Condition) and EA(Machine Error Analysis). It is located on the left side of the top.

Note

Only assets which have prior been activated and saved, are counted as active in the counter.

Activating billing toggles of assets

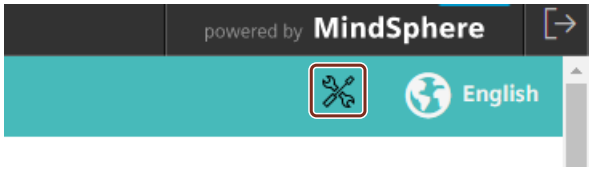
Note

Activation from Shoopfloor Management Application

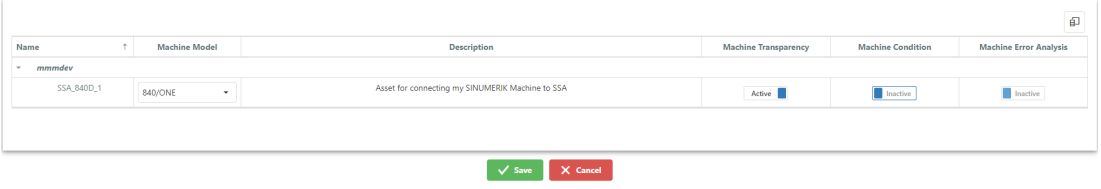
Activation operations also can be executed from the Shoopfloor Manangement Application by SSA admin. Only SSA admin will see the SSA button on the Shoopfloor Manangement Application.

Repeat the following procedure for all activations. In this example Machine Condition and Machine Error Analysis are activated for one asset.

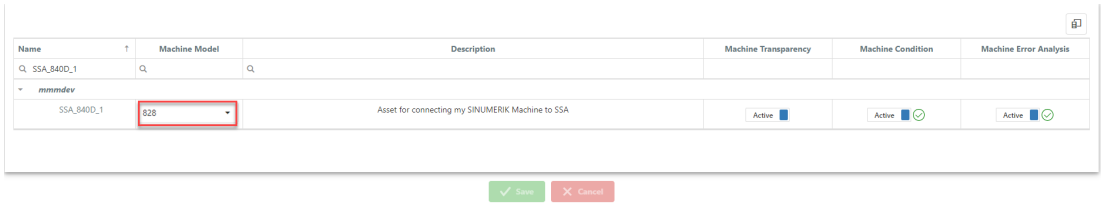
1. Open the "Activation page" from "Asset Selection page" (only SSA admin).



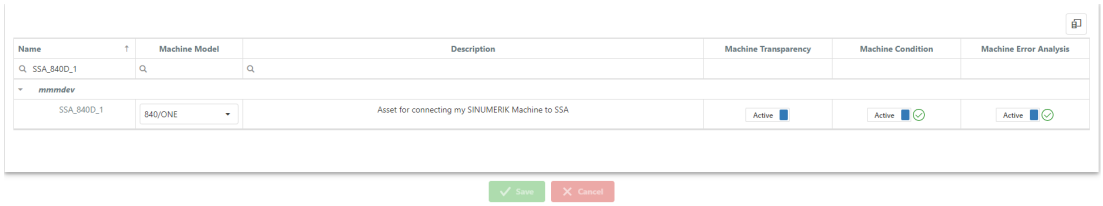
2. Search the asset, which will be purchased.



3. Select the Machine Model, if the asset is not onboarded ever.



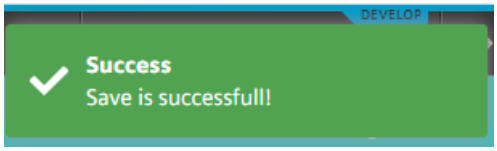
4. Change toggles to "Activate".



5. Press "Save".

6. Press "Activate for a fee" or "Yes, I have a valid contract" (depends on billing system).

7. A notification is shown that saving is successful. After the configuration is saved, you can see new icons (configured / not configured) next to the toggles.



8. Click "Asset Selection". You will see the assets in a list.

9. Services will be open for 1 minute. If the service didn't activate, you will see the following warnings:

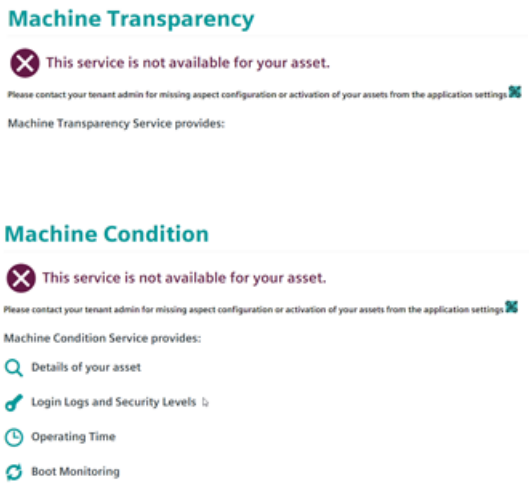


Figure 5-13 Error message - Machine Condition

Figure 5-14 Error message - Machine Error Analysis

Rules of purchase

Note

During trial period, you can access all services of an active asset, which is correctly configured.

- All activation will start immediately.
- All deactivation will start at the beginning of the next month.
- All services which are enabled after the last day of the month at 13:00 will be charged for the next month.
- Service usages will be calculated based on total usages days of service, after that it will be divided into days in the month. The result will be rounded to the upper digit.

Asset not found

If you try to get data of an asset, which does not exist in MindSphere (e. g: Asset not found (https://mmmdev-ssa-mmmdev.eu1.mindsphere.io/#/Transparency/Overview?assetId=aa// XmlEditor.InternalXmlClipboard:abffb0ad-8731-a519-d192-1743afd82a03)), you will see the following screen:

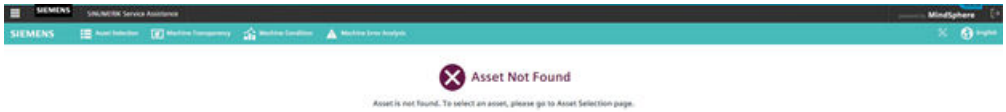


Figure 5-15 Asset not found

Page not found

If you try to go to a meaningless page by editing the URL (e. g: Meaningless URL (https://mmmdev-ssa-mmmdev.eu1.mindsphere.io/#/Transparency/meaninglessUrl)), you will see the following screen:

Figure 5-16 Page not found

5.4 Machine Transparency

5.4.1 Overview

The overview page for Machine Transparency service shows all clusters for this service. Each cluster shows a summary information for the subservice. By clicking on a specific cluster the page of this service will open.

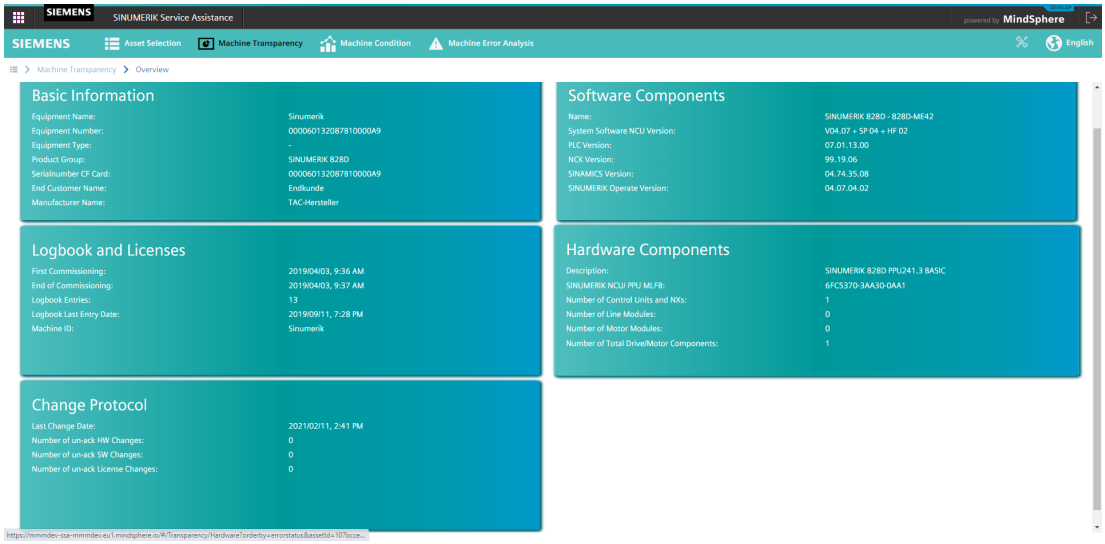


Figure 5-17 Overview Machine Transparency

The following values are shown for each cluster:

- **Basic Information**:
  - Equipment Name
  - Equipment Number
  - Equipment Type
  - Product Group
  - Serialnumber CF Card
  - End Customer Name
  - Manufacturer Name
- **Logbook and Licenses**:
  - First Commissioning
  - End of Commissioning
  - Logbook Entries
  - Logbook Last Entry Date
  - Machine ID

- **Change Protocol:**
  - Last Change Date
  - Number of un-ack HW Changes
  - Number of un-ack SW Changes
  - Number of un-ack License Changes
- **Software Components**:
  - Name
  - System Software NCU Version
  - PLC Version
  - NCK Version
  - SINAMICS Version
  - SINUMERIK Operate Version
- **Hardware Components**:
  - Description
  - SINUMERIK NCU/PPU MLFB
  - Number of Control Units and NXs
  - Number of Line Modules
  - Number of Motor Modules
  - Number of Total Drive/Motor Components

5.4.2 Basic Information

The Basic Information page shows information on the controller and customer. The customer data is divided in three main groups:

- **User** data: this section contains information of the end customer/buyer of the controller
- **Manufacturer** data: this section contains important information on the manufacturer of the controller
- **Dealer** data: this section contains information on the OEM/dealer of the controller

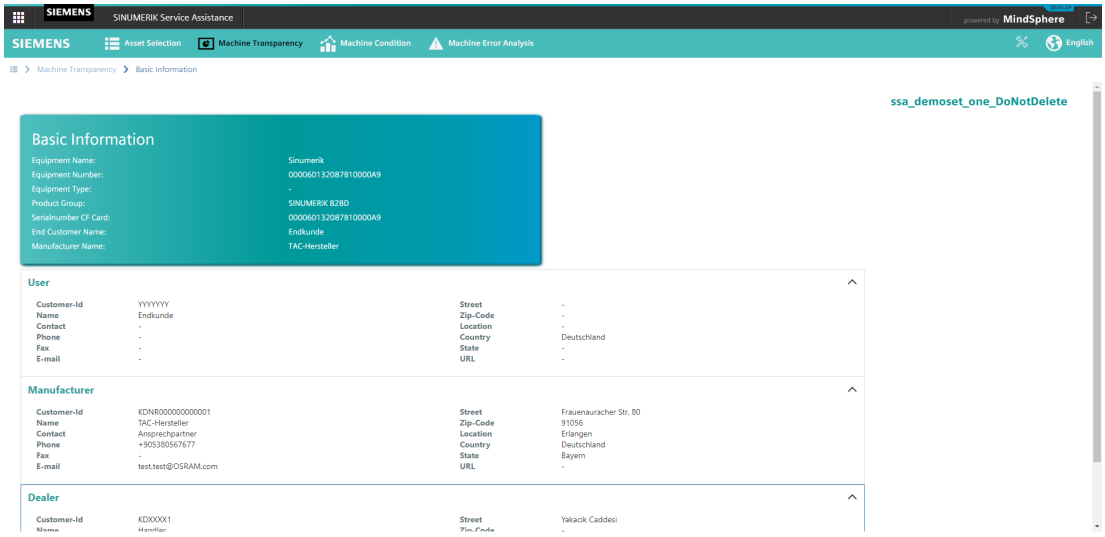


Figure 5-18 Basic Information

5.4.3 Hardware Components

The Hardware Components page shows information on the hardware of the controller. You can choose one of the following views:

- Tree View
- List View

Tree View

The tree view in the Hardware Components page shows all the information in a hierarchichal form. You can choose one hardware component in the tree, i.e. NCU, and can see the relevant data on the right hand side.

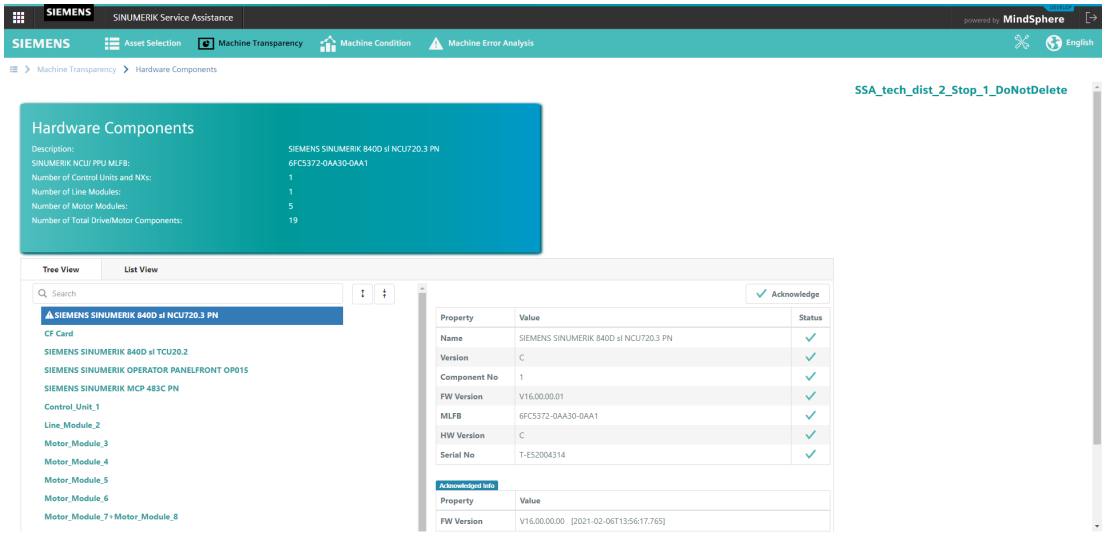


Figure 5-19 Hardware Components Tree View

List View

The List View in the Hardware Components page shows all relevant data of all hardware components in one table. You can filter the table and search for certain values. Furthermore it is possible to export the table to an excel file (*.xls) by clicking the button "Export to XLS".

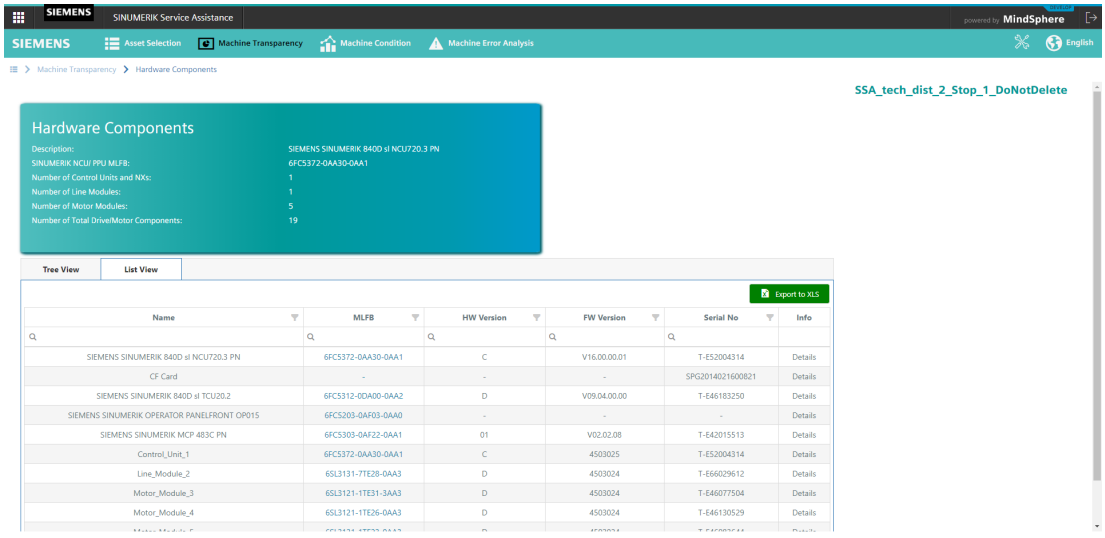


Figure 5-20 Hardware Components List View

Note

Exported hardware components

Please note, that the .xls file is downloaded to default file location, which is set from browser settings.

Note

SIOS link

By clicking on the MLFB number you can directly open the Siemens Industry Online Support (SIOS) page. This way you can find related user manuals, handbooks or engineering manuals for the hardware components.

Acknowledgment feature

The SINUMERIK Service Assistance application provides an acknowledgment feature for detecting the changes which may harm the machine or enlightening some crucial changes on machine side. With this feature, system can detect the following hardware changes:

- which hardware components have been replaced with new ones
- which hardware components have been removed or are missing

When an identSNAPSHOT file is uploaded to an asset for the first time, there is no warning about it. But when another identSNAPSHOT file is uploaded to the asset and if there are any changes between current and previous file, you will be warned with an unacknowledged sign on the component name and corresponding items' status section. Additionally, the differences between the current value and last acknowledged value of the components' items are shown.

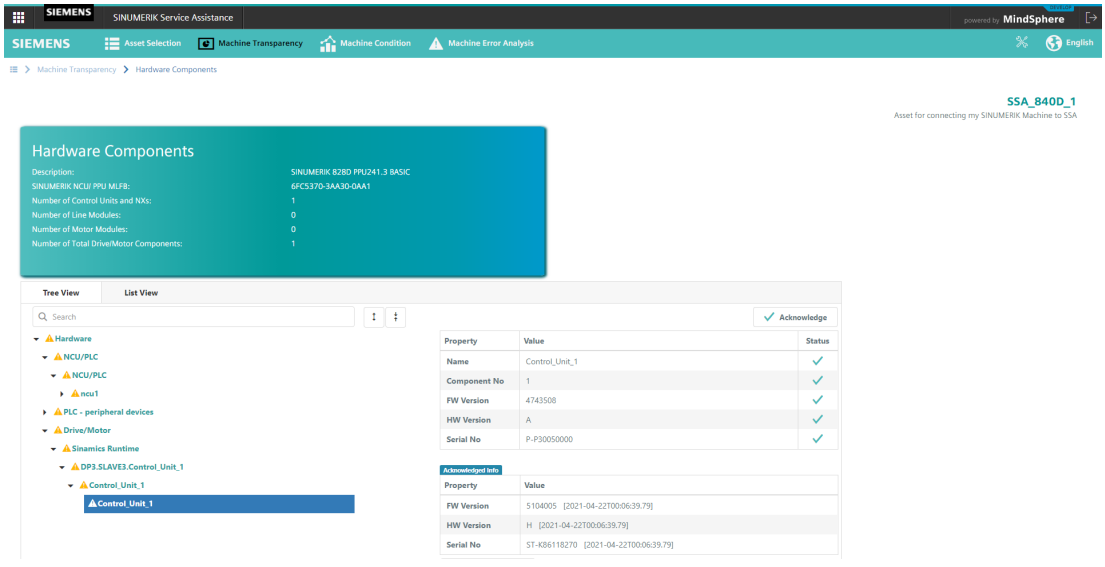


Figure 5-21 Acknowledgment Hardware Components

To acknowledge a component select the component in the tree view and click the acknowledge button.

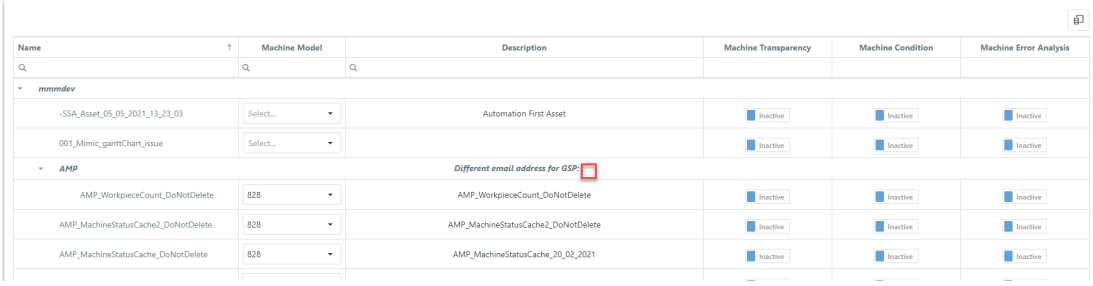
You can directly navigate to the Change Protocol page by pressing the Change Protocol button.

5.4.4 GSP (Global Service Platform)

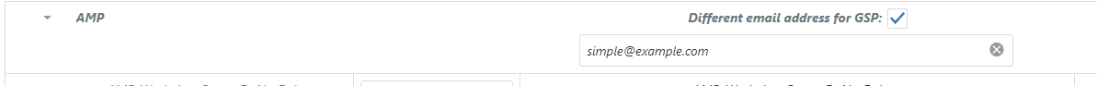
To give a better support to Siemens customers, Hardware components will be registered to the Global Service Platform (GSP) automatically by checking identSNAPSHOT file daily. If you have a new or updated identSNAPSHOT file, tenant admin or specified subtenant user will get a notification email after the ion of the component.

Registering subtenant user for email notification

1. Check the checkbox.



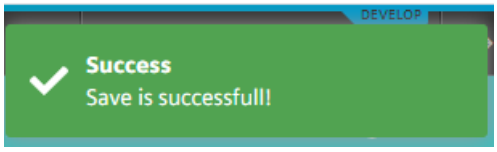
2. Insert the email address.



3. Press "Save".

4. Press "Activate for a fee" or "Yes, I have a valid contract" (depends on the billing system).

5. A notification is shown that saving is successful.



Note

If subtenant user isn't determined, the tenant admin of the host tenant will get the notification.

Example of email notification

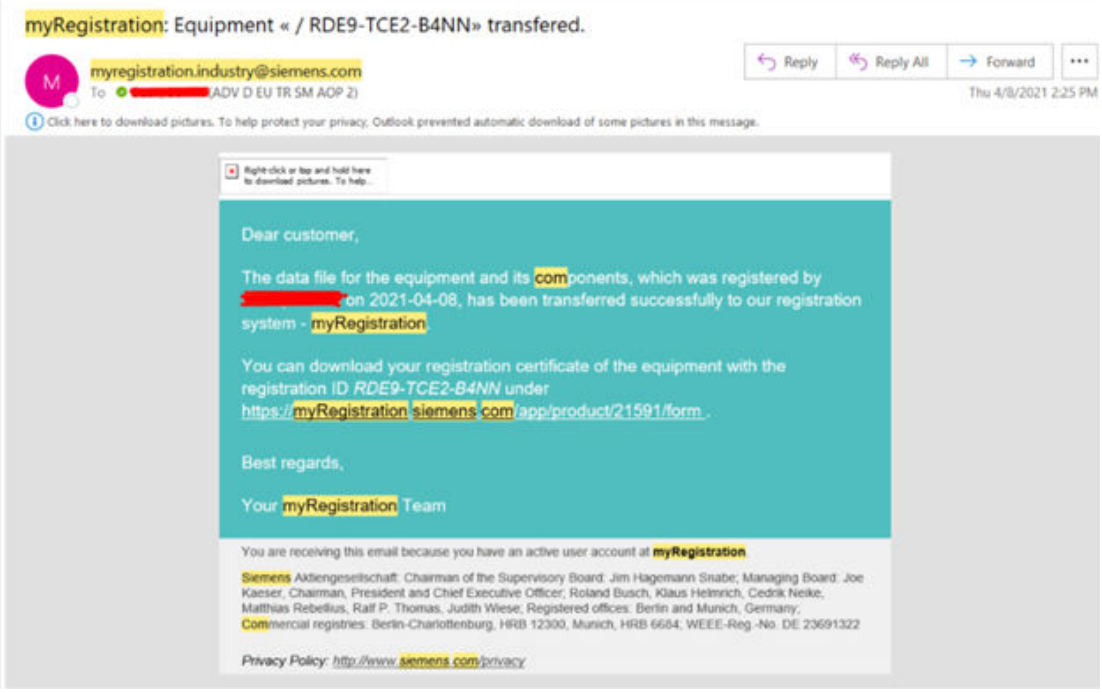


Figure 5-22 GSP registration email

Checking the registration on the Myregistration website

- You can either go to the link (https://myregistration.siemens.com/app/my-registrations) directly or from the email.
- Registration certificate can be downloaded by clicking the button below.

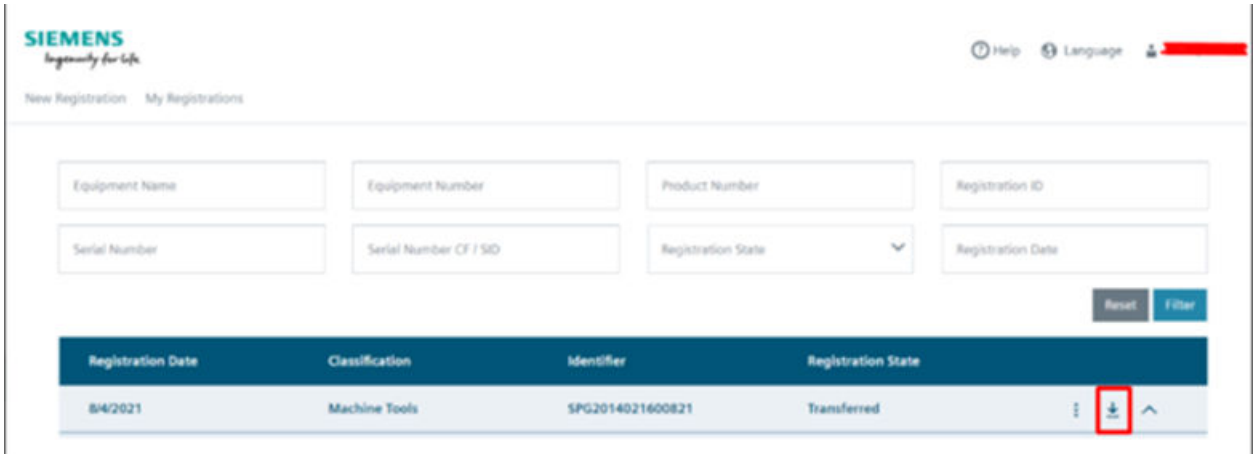


Figure 5-23 SIEMENS MyRegistration website

Note

If you have no account for the registration website yet, it will be created and you will get an email to complete account registration.

5.4.5 Logbook and Licenses

The Logbook and Licenses page shows information on the Logbook of the controller and the installed and active licenses. You can choose one of the following views:

- Logbook
- Licenses

Logbook view

The logbook view shows all relevant information about the logbooks of the controller:

- **First Commissioning**: Date, when the controller was commissioned at the machine builder's site.
- **End of Commissioning**: Date, when the controller was running at the customer's site.
- **Logbook Entries**: Number of Entries in the logbook
- **Logbook Last Entry Date**: last date, when an entry was added to the logbook
- **Machine ID**: machine ID of the controller

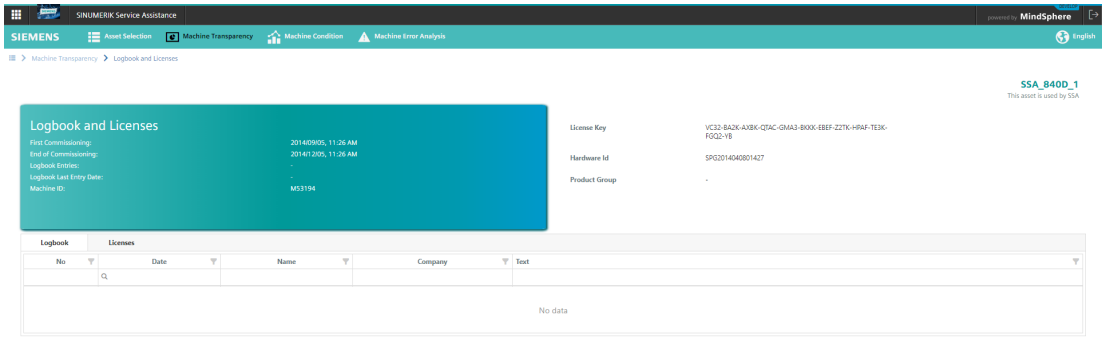


Figure 5-24 Logbook

Note

Changing logbook

If you change a logbook manually on the controller, be aware to save the identSNAPSHOT file. Otherwise the changes will not be visible in the Logbook view.

Licenses view

The licenses view shows all relevant information about the active and installed licenses of the machine in one table. You can filter the table and search for certain values. Furthmore it is possible to export the table to an excel file (*.xls) by clicking the button "Export to XLS".

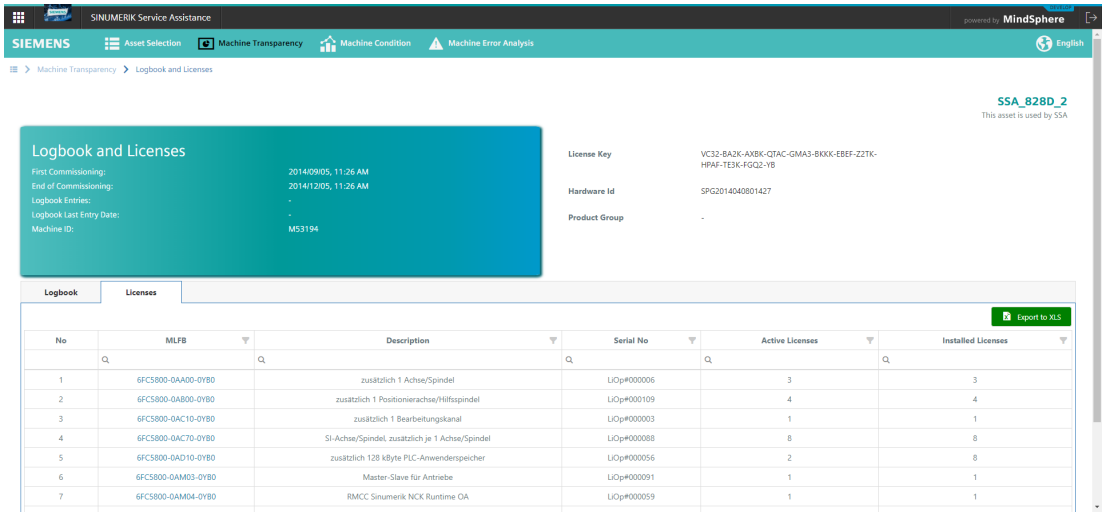


Figure 5-25 Licenses

Note

SIOS link

By clicking on the MLFB number you can directly open the Siemens Industry Online Support (SIOS) page. This way you can find related user manuals, handbooks or engineering manuals for the installed licenses.

5.4.6 Software Components

The Software Components page shows information on the installed software of the controller. You can choose one of the following views:

- Tree View
- List View

Tree View

The tree view in the Software Components page shows all the information in a hierarchichal form. You can choose one software component in the tree, i. e., and can see the relevant data on the right hand side.

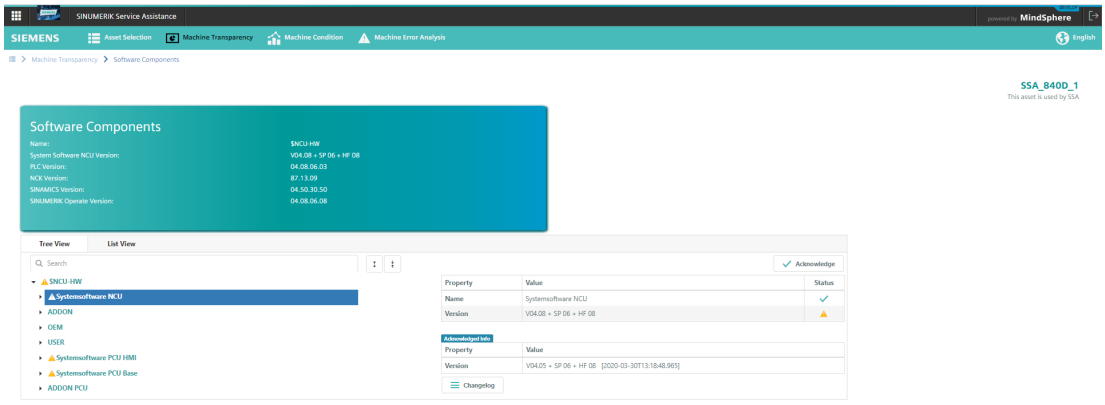


Figure 5-26 Software Components Tree View

List View

The List View in the Software Components page shows all relevant data of all software components in one table. You can filter the table and search for certain values. Furthermore it is possible to export the table to an excel file (*.xls) by clicking the button "Export to XLS".

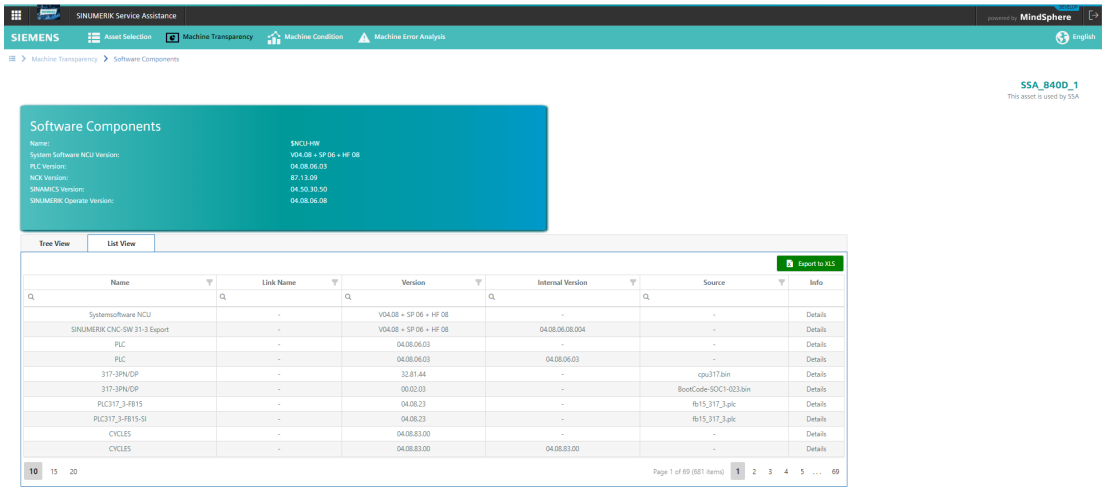


Figure 5-27 Software Components List View

Note

Exported software components

Please note, that the .xls file is downloaded to default file location, which is set from browser settings.

Acknowledgment feature

The SINUMERIK Service Assistance application provides an acknowledgment feature for detecting the changes which may harm the machine or enlightening some crucial changes on machine side. With this feature, system can detect the following software changes:

- which softwares at the machine is upgraded/downgraded
- which new softwares are added/removed

When an identSNAPSHOT file is uploaded to an asset for the first time, there is no warning about it. But when another identSNAPSHOT file is uploaded to the asset, you will be warned with an unacknowledged sign on the component name and corresponding items' status section. Additionally, the differences between the current value and last acknowledged value of the components' items are shown.

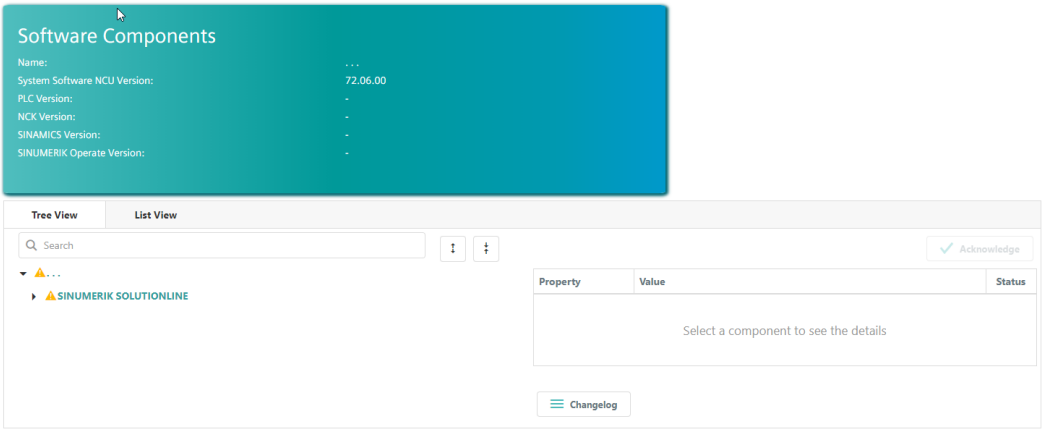


Figure 5-28 Acknowledgment Software Components

To acknowledge a component select the component in the tree view and click the acknowledge button.

You can directly navigate to the Change Protocol page by pressing the Change Protocol button.

5.4.7 Change Protocol

The Change Protocol page offers information for detecting the changes which are important for experts or any user who cares the machines current state. With this feature, system can list the following changes:

- **Software changes**
  - which softwares at the machine is upgraded/downgraded
  - which new softwares are added/removed
- **Hardware changes**
  - which new hardware added
  - which hardware is removed or missing.
- **License changes**
  - which licenses are newly added
  - which licenses are missing

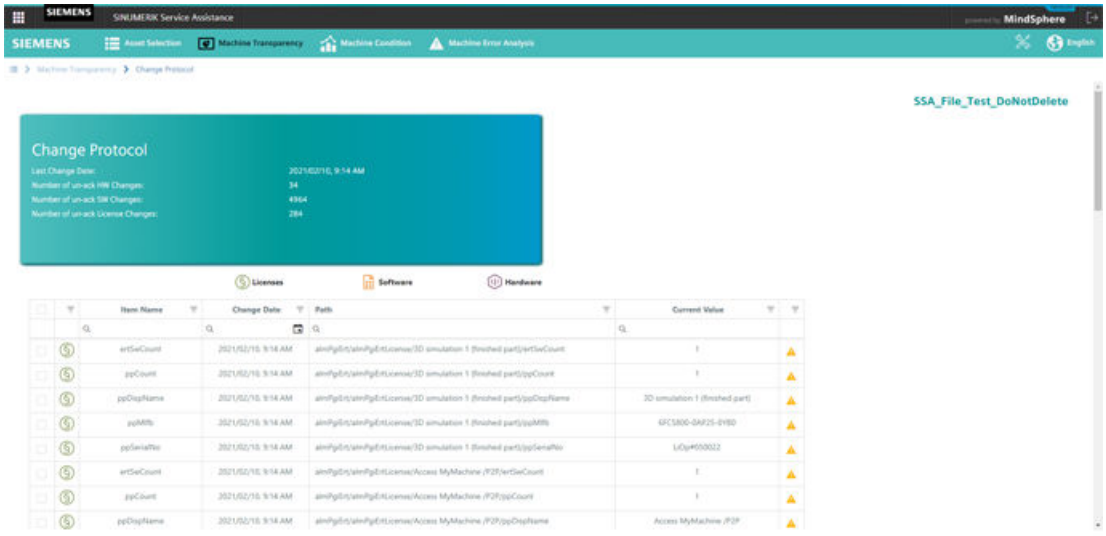


Figure 5-29 Change Protocol

The Change Protocol page displays all software, hardware and license changes that are coming from differences of each identSNAPSHOT file. Change Protocol items are labeled with hardware, software and licenses tags. The Change Protocol table can be filtered by “Item Name”, “Change Date”, “Path”, “Current Value” and "Acknowledge status". You can search items by name, change date, path and current value.

Changed Item History

You can see the detailed history of each component item by clicking on the list. On the right hand side of the list the "Changed Item History" with details is displayed.

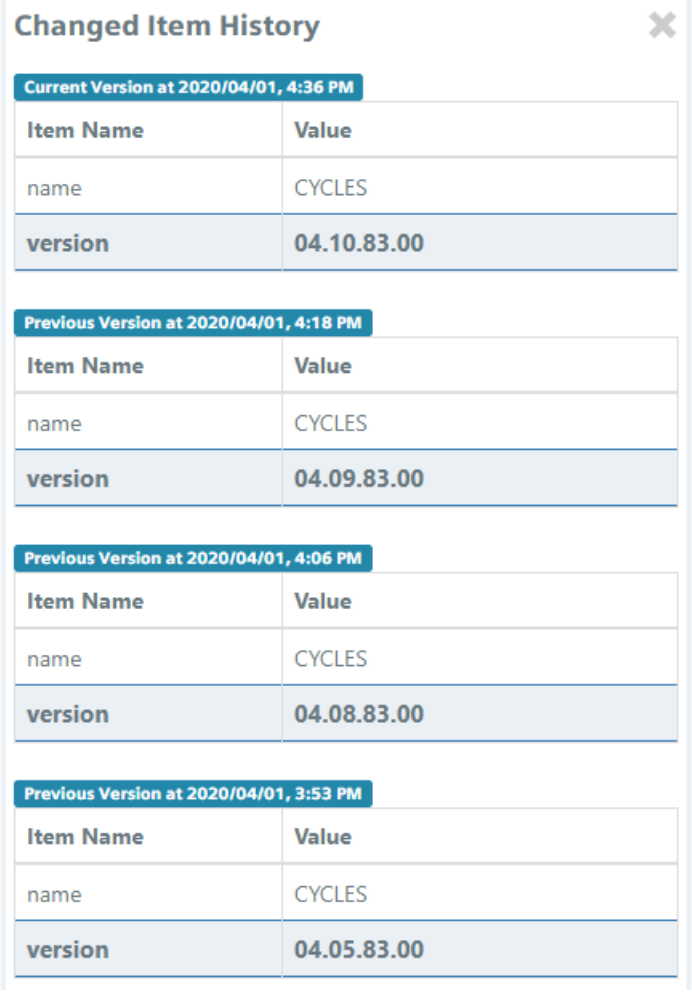


Figure 5-30 Changed Item History

Acknowledge changed items

The page summary window displays the last date, when the identSNAPSHOT file was uploaded, the number of unacknowledged hardware, software and Licenses changes as a summary.

1. Select the unacknowledged entries you would like to acknowledge. All unacknowledged items are marked with the following symbol:

   ⚠

2. Active the checkbox in the left column of the table.

3. Press the button "Acklowlege Changes".
4. Confirm the acknowledgment by pressing the button "Confirm"

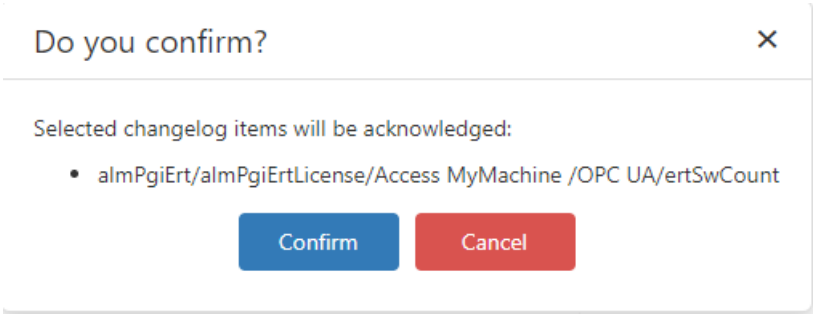


Figure 5-31 Confirmation acknowledgment

The selected entries are now marked as acknowledged.

It is also possible to acknowledge all items at once by pressing the button “Acknowledge All Changes” without selecting any item.

5.5 Machine Condition

5.5.1 Overview

The overview page for Machine Condition service shows all clusters for this service. Each cluster shows a summary information for the subservice. By clicking on a specific cluster the page of this service will open.

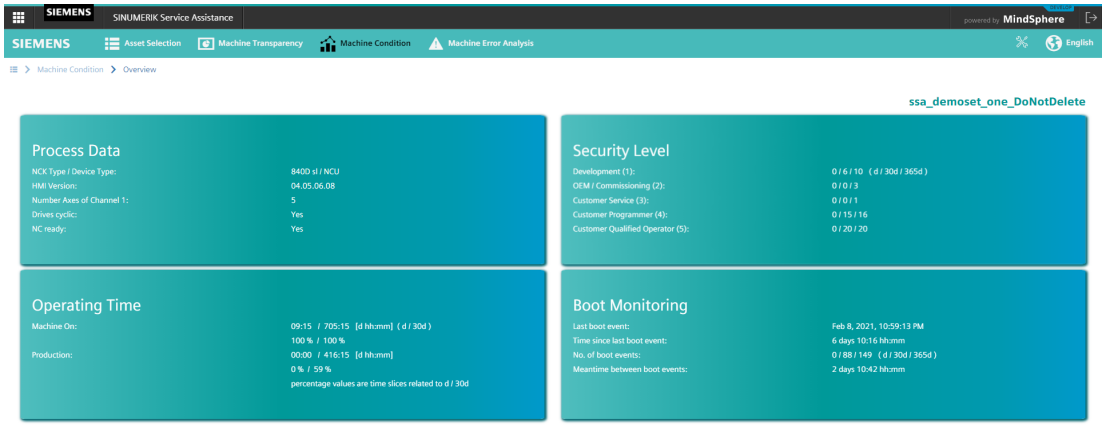


Figure 5-32 Overview Machine Condition

The following values are shown for each cluster:

- **Process Data**:
  - NCK Type/Device Type
  - HMI Version
  - Number Axes of Channel 1
  - Drives cyclic
  - NC ready
- **Security Level**:
  - Development
  - OEM/Commissioning
  - Customer Service
  - Customer Programmer
  - Customer Qualified Operator

- **Operating Time:**
  - Machine On
  - Production
- **Boot Monitoring**:
  - Last boot event
  - Time since last boot event
  - No. of boot events
  - Meantime between boot events

5.5.2 Process Data

The Process Data page offers a graphical view of variables of the controller over a certain period.

Setting up a graph

To set up a graph proceed as follows:

1. Select a time range in the drop down menu "Selected Time Range".

   Note

   Restriction on time range

   Please note, that if you select 30 days as time range, there will be a note to use a smaller date range (max. 7 days).

2. Select one or several units (maximum three units).
3. Select one or several Aspects. One Aspect may consist of several variables itself.

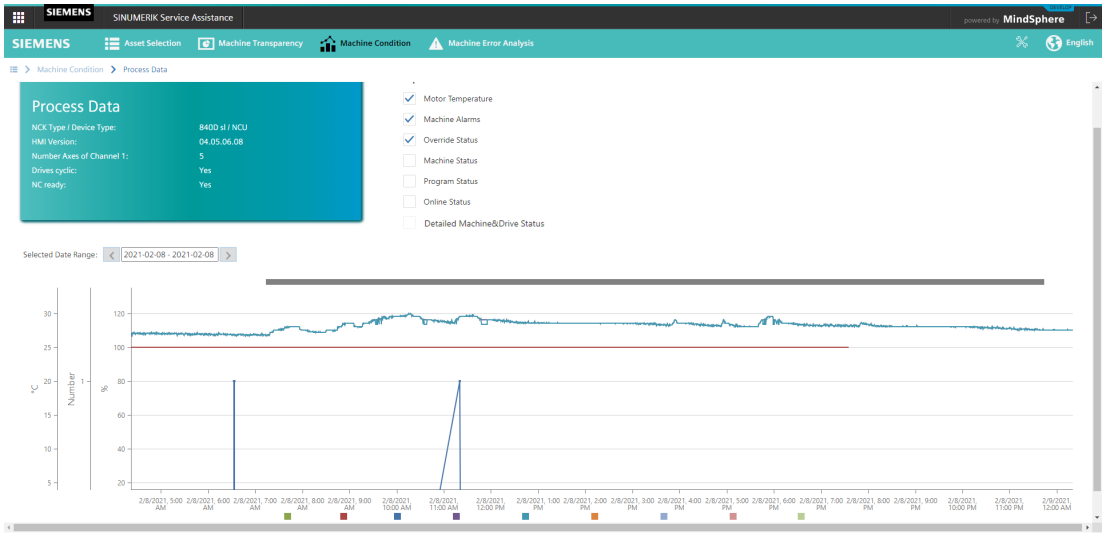


Figure 5-33 Process Data

The constructed graph shows the change of the variables over the selected time range. You can zoom in and out of the graph by marking a rectangular area with the mouse.

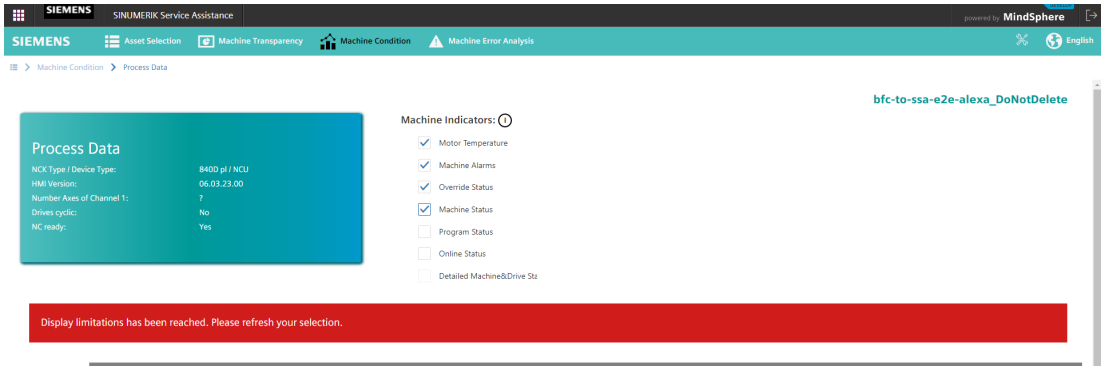
Machine indicators

Note

To learn more about the meaning of variables, click on the trademark symbol (i button).

Indicators	Variables
Motor Temperature	AX01_Motor_Temp.....SP01_Motor_Temp
Machine Alarms	NrOfAlarms
Override Status	Feedoverride
	Spindleoverride
Machine Status	MachineStatus
Program Status	NCProgramStatus
	OpMode
	ProtectionLevel
	StopCond
Online Status	OnlineStatus

If you reach the limitation of indicator selection, you will see the following warning:



Units of aspects

The units of aspects are listed the following table:

Aspects	Variables	Units
Basic Configuration	Feedoverride	%
	Spindleoverride	%
	NCProgramStatus	One
	Opmode	One
	ProtectionLevel	One
	StopCond	One
	NrOfAlarms	Number
Machine Status	MachineStatus	One
Online Status	onlineStatus	boolean
CSM_General_Info	All variables	One
CSM_AX/SP	Drives_Status	One
	Motor_Temp	°C
	ImpulseEnable_PLC	One
	ControlConfirmActive_NC	One

5.5.3 Security Level

The Security Level page offers an overview of users of the machine with different access levels. If there is a problem with the control, the service technician can monitor which person was working at the control at what time.

Setting up a graph

To set up a graph proceed as follows:

1. Click on the graph icon, if it's not already activated.

2. Select a time range in the drop down menu "Selected Time Range".
   A graph shows how many times a user with a certain access level has used the control.

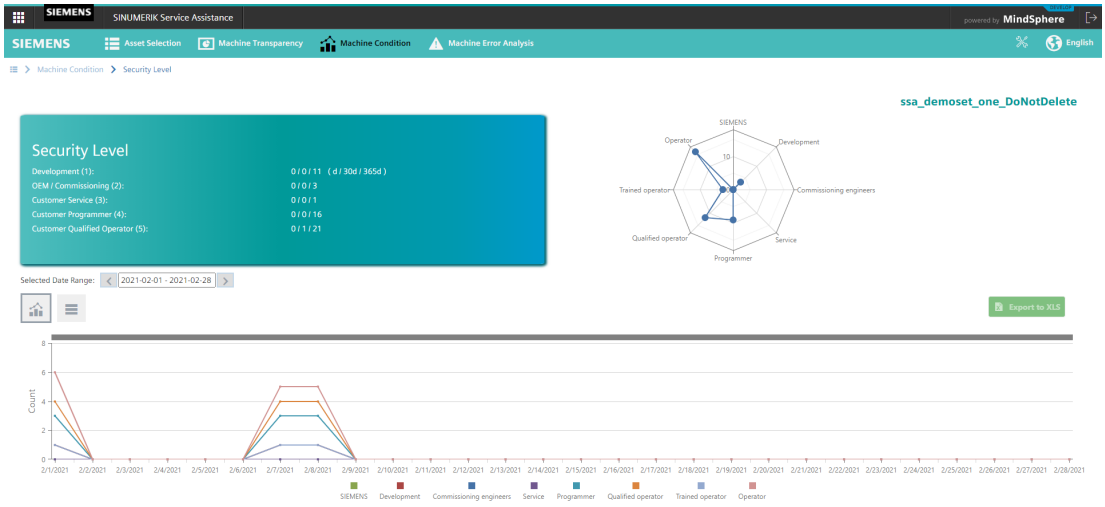


Figure 5-34 Security Level Graph

Table of values

1. Click on the table icon, if it's not already activated.

A table shows start time and end time of usage, the duration and the access level of the user. It is possible to search for values in the search box above the table. Furthermore it is possible to export the table to an excel file (*.xls) by clicking the button "Export to XLS".

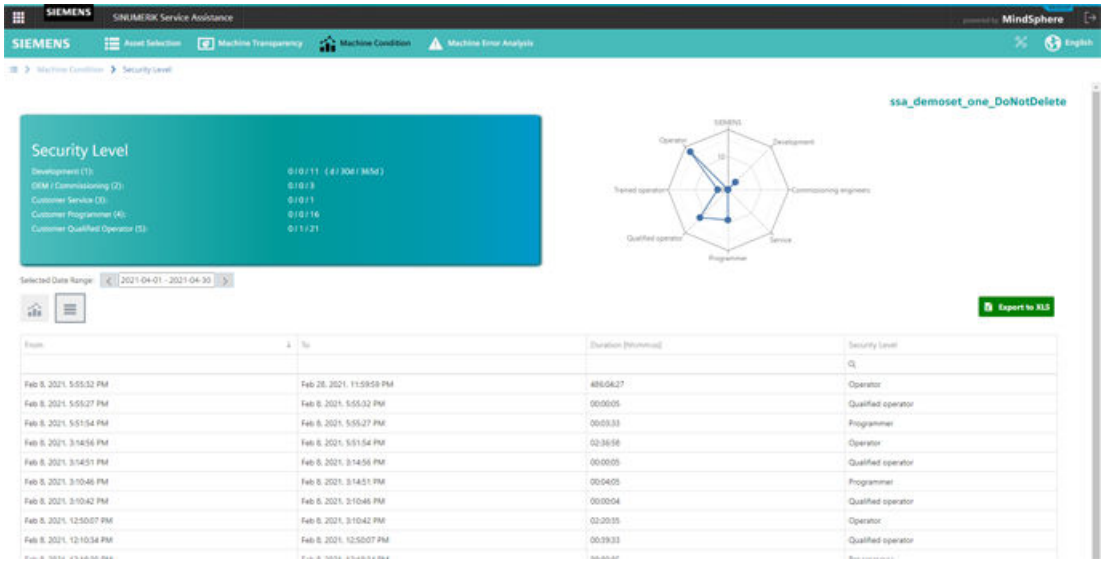


Figure 5-35 Security Level Table

5.5.4 Operating Time

The Operating Time page offers a graphical and a list view of power on, power off and operating time of the controller over a certain period.

Setting up a graph

To set up a graph proceed as follows:

1. Click on the graph icon, if not already activated.

2. Select a time range in the drop down menu "Selected Time Range".
   A graph shows how many times a user with a certain access level has used the control.

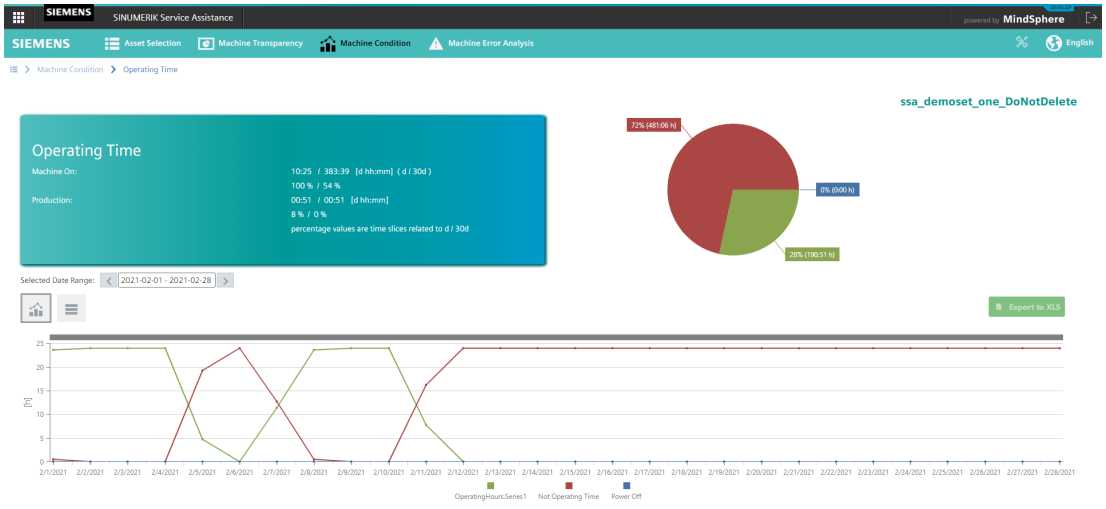


Figure 5-36 Operating Time Graph

You can zoom in and out of the graph by marking a rectangular area with the mouse.

Table of values

1. Click on the table icon, if not already activated.

   The table below shows the start and the end times for power on, power off and operating time of the controller. Furthermore the duration and the machine status are shown. It is possible to search for values in the search box above the table. Furthermore it is possible to export the table to an excel file (*.xls) by clicking the button "Export to XLS".

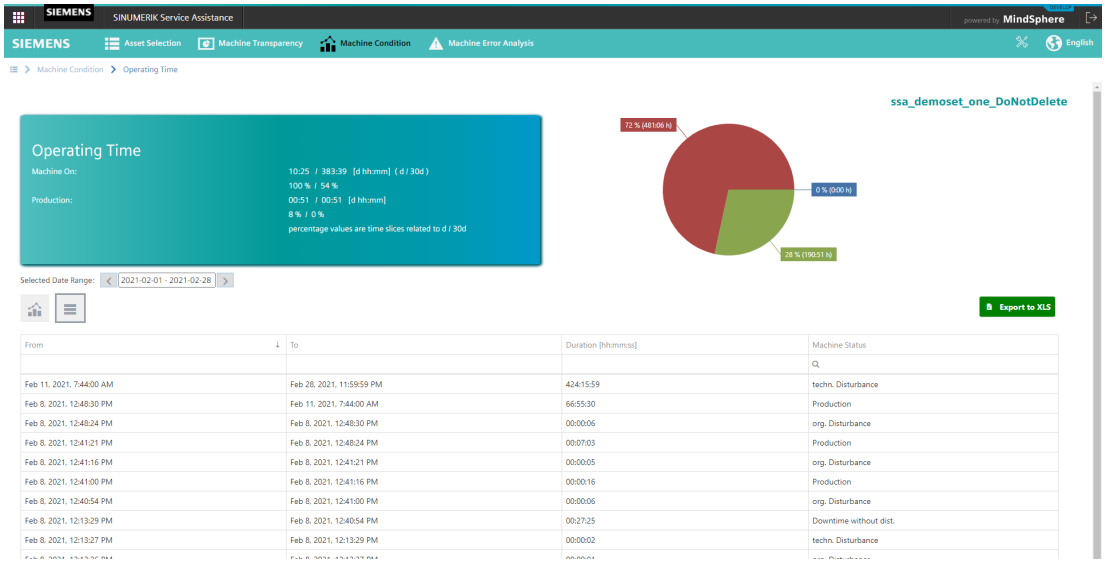


Figure 5-37 Operating Time Table

5.5.5 Boot Monitoring

The Boot Monitoring page offers a graphical and a list overview of boot events over a certain period.

Setting up a graph

To set up a graph proceed as follows:

1. Click on the graph icon, if not already activated.

2. Select a time range in the drop down menu "Selected Time Range".
   A graph shows how many times a certain boot event has occurred at the control.

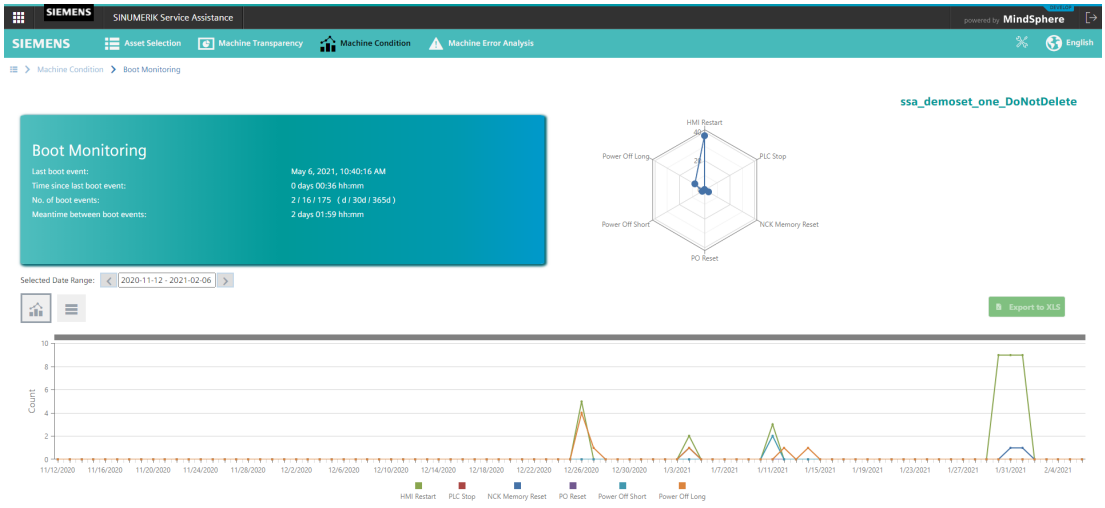


Figure 5-38 Boot Monitoring Graph

Table of values

1. Click on the table icon, if not already activated.

   A table shows the exact date and time, when a certain boot event occurred at the control. It is possible to search for values in the search box above the table. Furthermore it is possible to export the table to an excel file (*.xls) by clicking the button "Export to XLS".

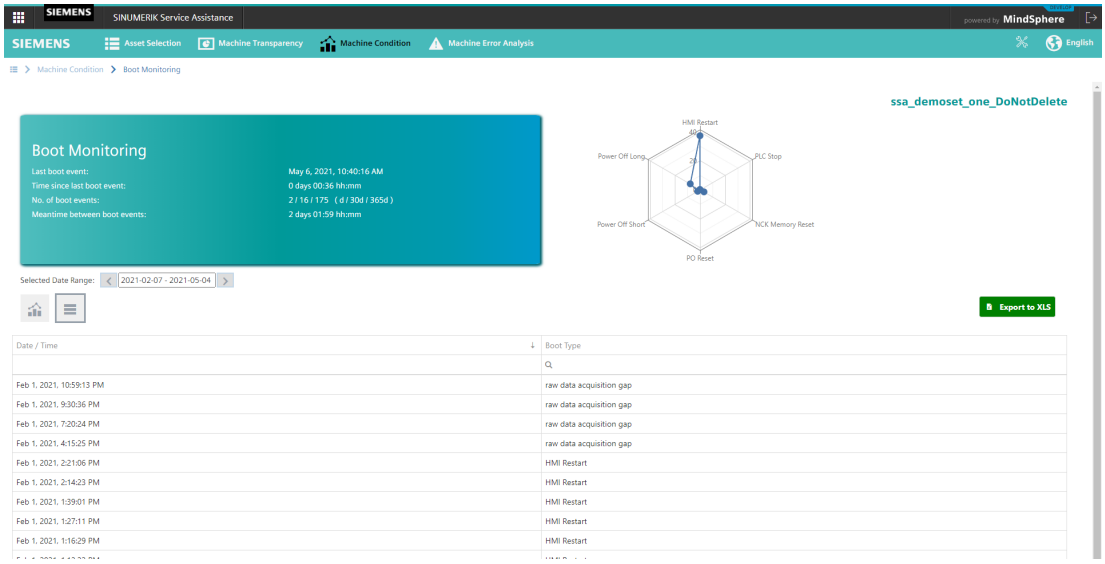


Figure 5-39 Boot Monitoring Table

5.6 Machine Error Analysis

Depending on the including closed alarm, there are two different user interfaces of "Error Analysis" page. If asset includes ClosedAlarms Aspect, new user interface is shown. Otherwise, old user interface is shown.

Warning messages for asset without ClosedAlarms Aspect in the new user interface

Within the new user interface, when you select asset which does not have ClosedAlarms Aspect, the following warning message will be shown:

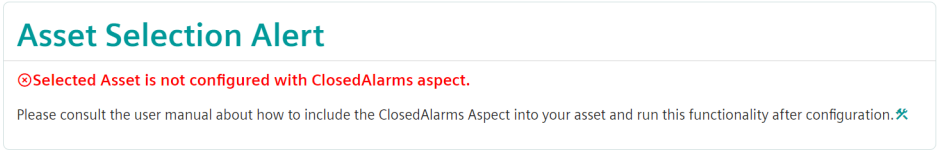


Figure 5-40 Error Message: There is no ClosedAlarms Aspect

Note

You can see the Error Analyses Page of the asset which does not have ClosedAlarms Aspect via SSA main page Asset Selection (Page 82).

Within the new user interface, when you select an asset without permission for Error Analysis, the following warning message will be shown:

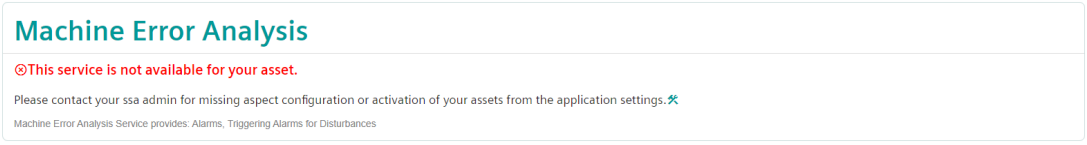


Figure 5-41 Error Message: No Permission

5.6.1 Machine Error Analysis for an asset with ClosedAlarms Aspect

Note

There is no Overview page for asset which has ClosedAlarms Aspect.

5.6.1.1 Alarms

The Alarms page offers a graphical and a list view of alarms provided by machines. This page is able to show alarms by filtering values, i.e. date range, source etc. Therefore this alarm monitoring page offers a quick and detailed communication between end user and system.

Setting up a list

To set up a list proceed as follows:

1. Click on “List View”, if not already clicked.

   List View

Then the List View of data will be displayed as shown below:

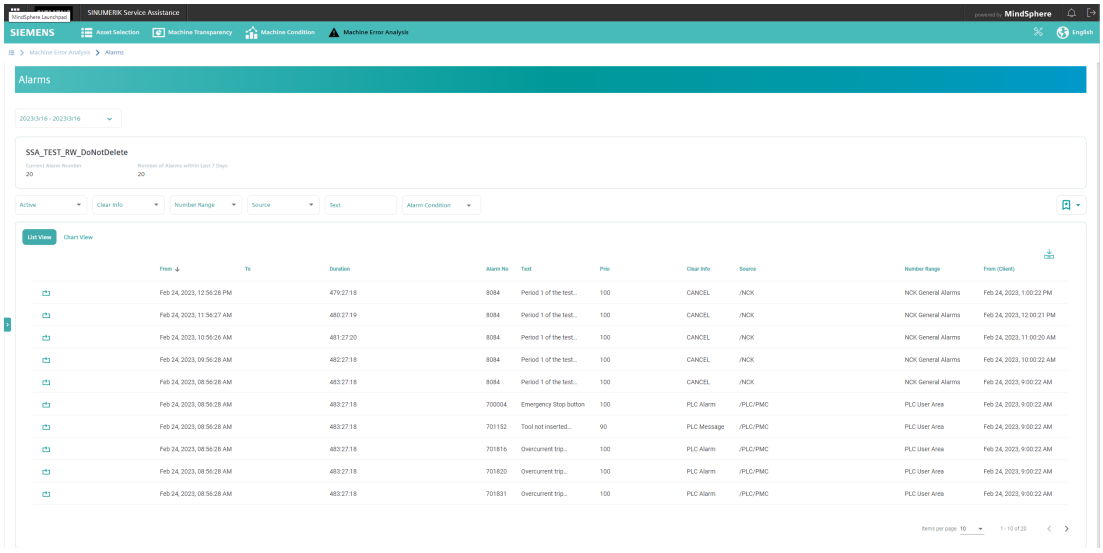


Figure 5-42 Alarms: List view

Setting up a graph

To set up a graph proceed as follows:

1. Click on “Chart View”, if not already clicked.

   Chart View

Then the Chart View of data will be displayed as shown below. Additionally the Chart View has two sorting options:

- Occurrence
- Duration

Sorting by Occurrence

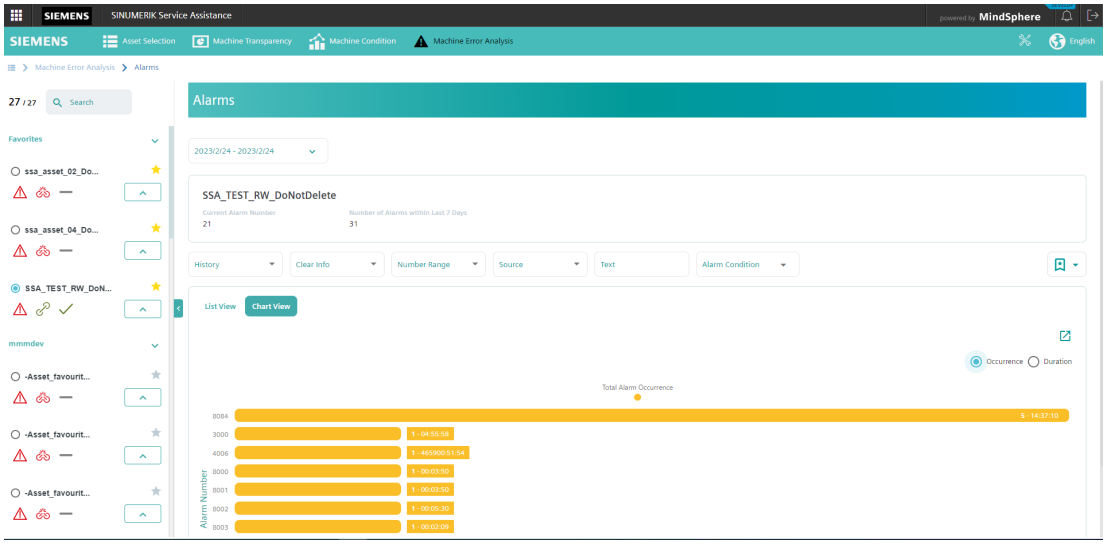


Figure 5-43 Alarms: Chart View: Occurrence

Sorting by Duration

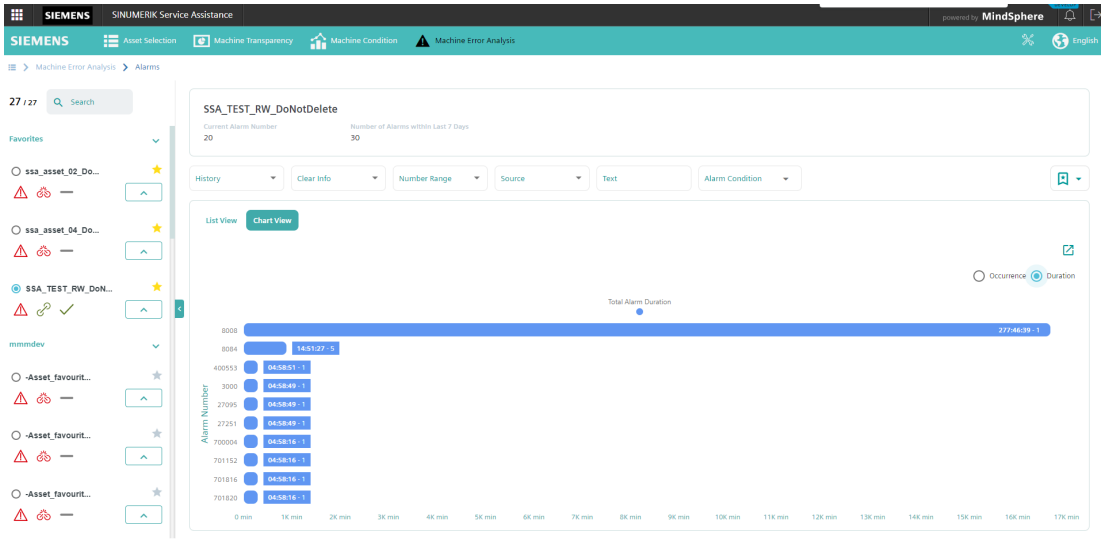


Figure 5-44 Alarms: Chart View: Duration

Export functionality

It is possible to export an excel file (*.xls).This button will be active, when there is data on a table. Additionally, export functionality works by considering filtered data.

Data export

To perform a data export proceed as follows:

1. Click on “Export” button in the List View.

	A	B	C	D	E	F	G	H	I	J
1	From	To	Duration	Alarm No	Text	Prio	Clear Info	Source	Number Range	From(Client)
2	Nov 30, 2021, 02:00:01 AM	Dec 9, 2021, 02:59:55 AM	216:59:54	53192	1 53192 <no text available>	100	Hardware-Reset NCU	/NCK	NCK Functional Alarms	Nov 30, 2021, 2:00:01 AM
3	Nov 30, 2021, 01:00:01 AM	Dec 9, 2021, 02:59:55 AM	217:59:54	53193	1 53193 <no text available>	100	Hardware-Reset NCU	/NCK	NCK Functional Alarms	Nov 30, 2021, 1:00:01 AM
4	Nov 30, 2021, 12:00:01 AM	Dec 9, 2021, 02:59:55 AM	218:59:54	53194	1 53194 <no text available>	100	Hardware-Reset NCU	/NCK	NCK Functional Alarms	Nov 30, 2021, 12:00:01 AM
5	Nov 29, 2021, 11:00:01 PM	Dec 9, 2021, 02:59:55 AM	219:59:54	53195	1 53195 <no text available>	100	Hardware-Reset NCU	/NCK	NCK Functional Alarms	Nov 29, 2021, 11:00:01 PM
6	Nov 29, 2021, 10:00:01 PM	Dec 9, 2021, 02:59:55 AM	220:59:54	53196	1 53196 <no text available>	100	Hardware-Reset NCU	/NCK	NCK Functional Alarms	Nov 29, 2021, 10:00:01 PM
7	Nov 29, 2021, 09:00:01 PM	Dec 9, 2021, 02:59:55 AM	221:59:54	53197	1 53197 <no text available>	100	Hardware-Reset NCU	/NCK	NCK Functional Alarms	Nov 29, 2021, 9:00:01 PM
8	Nov 29, 2021, 08:00:01 PM	Dec 9, 2021, 02:59:55 AM	222:59:54	53198	1 53198 <no text available>	100	Hardware-Reset NCU	/NCK	NCK Functional Alarms	Nov 29, 2021, 8:00:01 PM
9	Nov 29, 2021, 07:00:01 PM	Dec 9, 2021, 02:59:55 AM	223:59:54	53199	1 53199 <no text available>	100	Hardware-Reset NCU	/NCK	NCK Functional Alarms	Nov 29, 2021, 7:00:01 PM
10	Nov 29, 2021, 06:00:01 PM	Dec 9, 2021, 02:59:55 AM	224:59:54	53200	1 53200 <no text available>	100	Hardware-Reset NCU	/NCK	NCK Functional Alarms	Nov 29, 2021, 6:00:01 PM
11	Nov 29, 2021, 05:00:01 PM	Dec 9, 2021, 02:59:55 AM	225:59:54	53201	1 53201 <no text available>	100	Hardware-Reset NCU	/NCK	NCK Functional Alarms	Nov 29, 2021, 5:00:01 PM
12	Nov 29, 2021, 04:00:01 PM	Dec 9, 2021, 02:59:55 AM	226:59:54	53202	1 53202 <no text available>	100	Hardware-Reset NCU	/NCK	NCK Functional Alarms	Nov 29, 2021, 4:00:01 PM
13	Nov 29, 2021, 03:00:01 PM	Dec 9, 2021, 02:59:55 AM	227:59:54	53203	1 53203 <no text available>	100	Hardware-Reset NCU	/NCK	NCK Functional Alarms	Nov 29, 2021, 3:00:01 PM

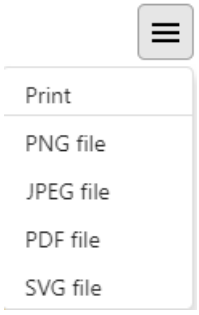
Figure 5-45 Excel export

Graphic export

It is also possible to print and export PNG, JPEG, PDF and SVG files for charts. Additionally, export and print functionality works by considering filtered data.

To perform a graphic export proceed as follows:

1. Click on below button in the Chart View.



Filtering for an alarm

The Alarm page has 6 filter mechanisms, working dynamically. These are listed below:

- Select Date
- Active/History
- Clear Info
- Number Range
- Source
- Text
- Alarm Condition

Select Date

The system can have data in different time range. To show related data in different time range, "Select Date" is used. "Select Date" has two main sections such as "UTC" or "Browser".

If you select UTC, a query is triggered for UTC+0. Otherwise, a query is triggered for UTC+TimeZoneOffset.

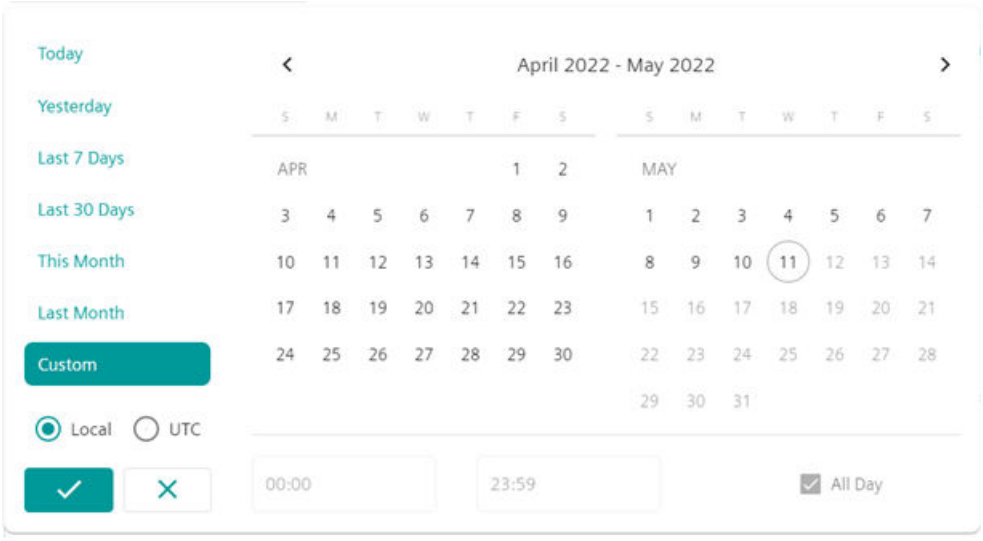
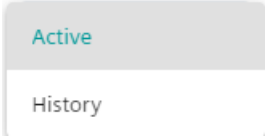


Figure 5-46 Select Date

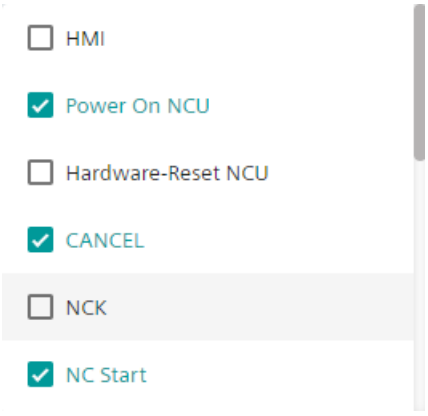
Active/History

The system can have closed or pending alarms. To show these alarms, Active/History is used. To list both alarms, click on "History". To list pending alarms, click on "Active".



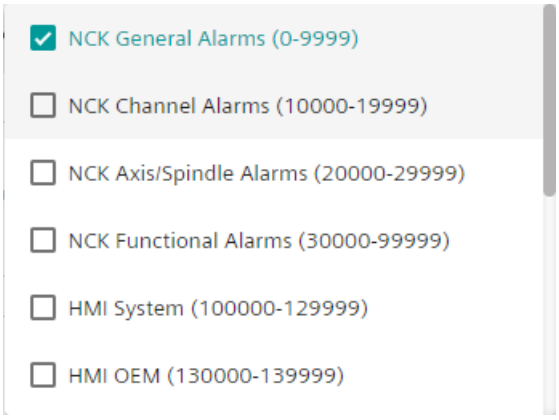
Clear Info

The system can have a variety of data for clearing info to show related alarms. "Clear Info" is used for this purpose has a multi selection combo box.



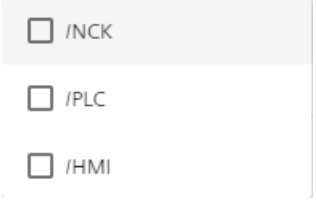
Number Range

The system can have a variety of data for number range and alarm number. To show related alarms, "Number Range" is used, which has a multi selection combo box.



Source

The system can have a variety of data for source. To show data with each unique source, "Source" is used, which has a multi selection combo box.

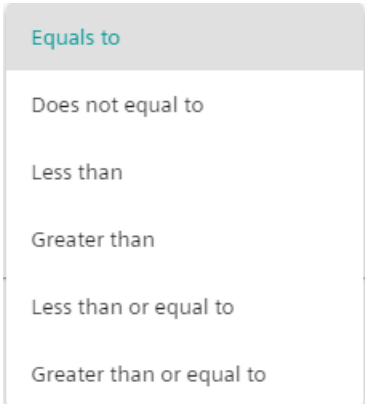


Text

All alarms have an unique text. You can filter the list by the given text.

Alarm Condition

Alarm condition includes 6 options to search for data. This search mechanism works by checking “Alarm No” on data.

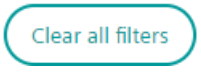


For example, if you want to filter data which has alarm number 6020<x<6060.

- Select “less than” and give value: 6060
- Select “greater than” and give value: 6020

Clear all filters

After selecting one of the combo boxes of filter parameters, “Clear all filters” will appear and will be active. To reset all filters, click the “clear all filters” button. After cleaning filters, the button will disappear.



Creating favorites for filtered alarms

For filtered alarms, you can create favorites to make it more easy to distinguish preferred alarms. You can create your own user-defined alarm filters to monitor specific alarms.

1. In upper right corner of the alarms page, the outline of a quick favorite link (star) can be seen.
2. Select any filter, for example "Clear Info", "Number Range", "Source", "Text" and/or "Alarm Condition".
3. Click on the quick favourite icon and then on “Add to favorites”
4. Give a filter name and confirm.

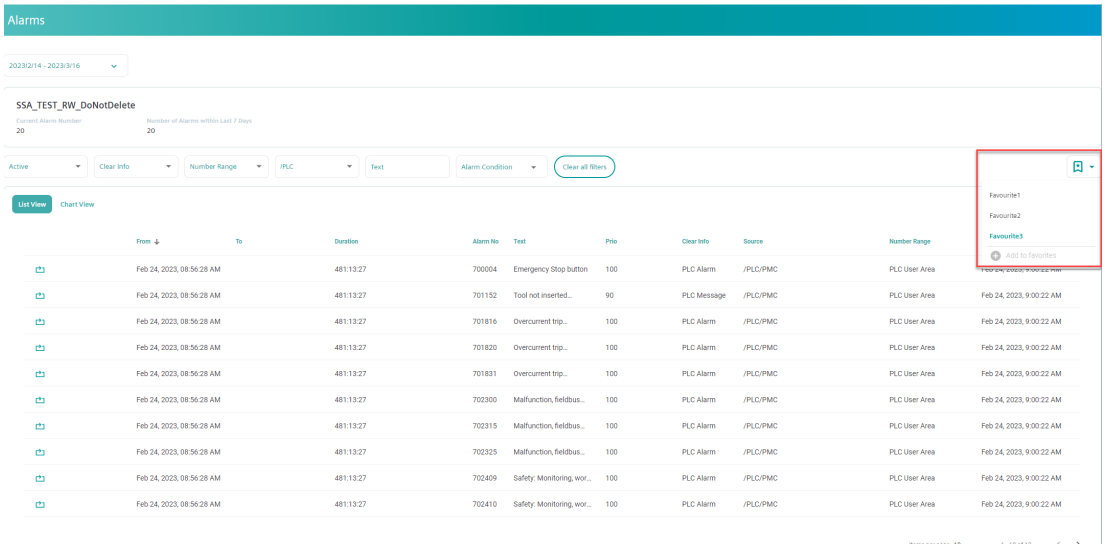


Figure 5-47 Favourites for filtered alarms

After confirmation selected filter has been highlighted, and the item has been chosen as a favorite.

Note

Deleting a fovourite

If you want to remove a favourite from the list of favourites, click on the garbage icon.

Note

Browser cache

Please be aware that favorites for filtered alarms are stored in the browser cache. If you delete your browser cache favorites for filtered alarms will be lost.

Restrictions for best usage for asset with ClosedAlarms Aspect

Please consider the following restrictions, in order to work with Machine Error Analysis with high quality:

- There should be max 400 active alarms.
- There should be max 100000 closed alarms.
- There should be max 1000 multiday alarms.

Active Alarms: Alarms are started but not finished.

Closed Alarms: Alarms are started and resolved in the same day. (UTC+0)

Multiday Alarms: Alarms are started and resolved in the different day. (UTC+0)

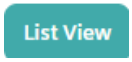
5.6.1.2 Triggering Alarms for Disturbances

The "Triggering Alarms for Disturbances" page offers a graphical and a list view of technical disturbances or Alarm Reaction / NC stop. Alarms within +/- 60 seconds are listed for that technical disturbances or Alarm Reaction / NC stop

Setting up a list

To set up a list proceed as follows:

1. Click on "List View", if not already clicked.



Then the List View of data will be displayed as shown below:

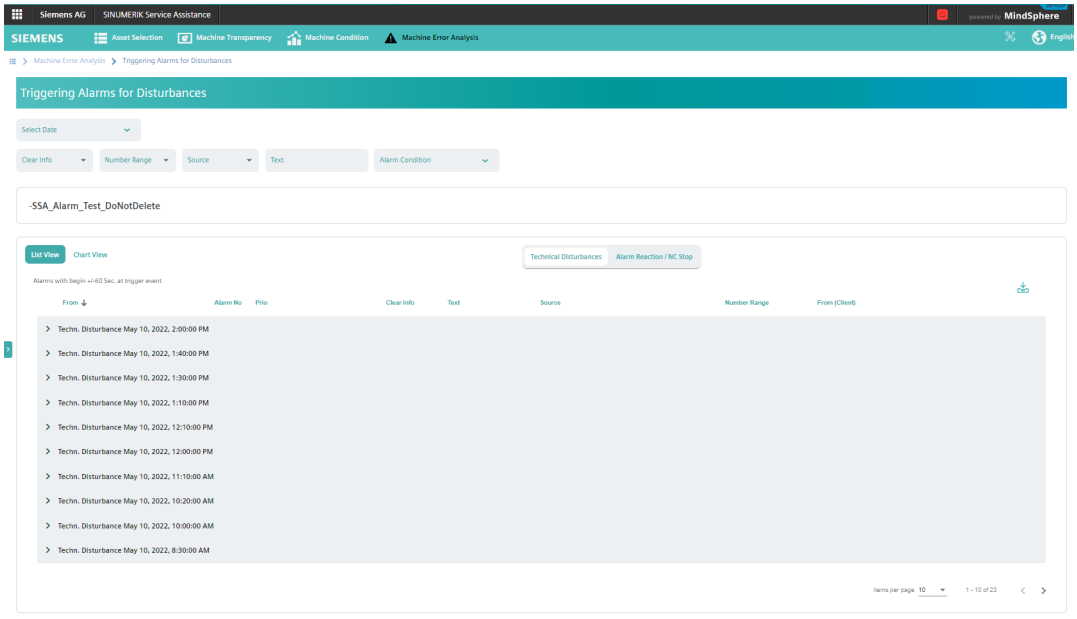


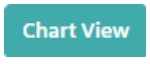
Figure 5-48 Triggering Alarms for Disturbances, Technical Disturbances, List View

You can switch between "Technical Disturbances" view and "Alarm Reaction/NC Stop" view.

Setting up a graph

To set up a graph proceed as follows:

1. Click on “Chart View”, if not already clicked.



Then the Chart View of data will be displayed as shown below.

This graph has additional feature to improve performance. This feature is pagination functionality.

You can navigate between pages of the graph.

Figure 5-49 Triggering Alarms for Disturbances, Technical Disturbances, Chart View

You can switch between "Technical Disturbances" view and "Alarm Reaction/NC Stop" view.

Export functionality

It is possible to export an excel file(*.xls).This button will be active, when there is data on a table. Additionally, export functionality works by considering filtered data.

To perform a data export proceed as follows:

1. Click on “Export” button in the List View.

Filtering for an alarm

The "Triggering Alarms for Disturbances" page has 6 filters mechanisms working dynamically. "Triggering Alarms for Disturbances" page has same logic as "Alarms" page. For a detailed description, see Alarms (Page 117).

Creating favorites for filtered alarms

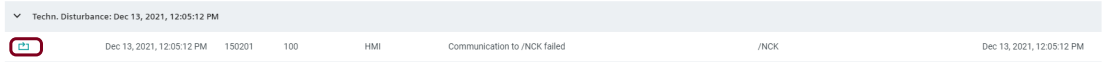
"Triggering Alarms for Disturbances" page has same logic as "Alarms" page. You can also create favorites for filtered alarms. For a detailed description, see Alarms (Page 117).

5.6.1.3 Alarm Trend

The "Alarms Trend" page offers a list view of trends of selected alarms in the selected date range. Alarm Trend data can be filtered as Active or History.

Activating Alarm Trend

1. Click on the Alarm Trend icon, which exists on the pages "Triggering Alarms for Disturbances" and "Alarms".



Alarms with the same numbers will be listed in the selected date range.

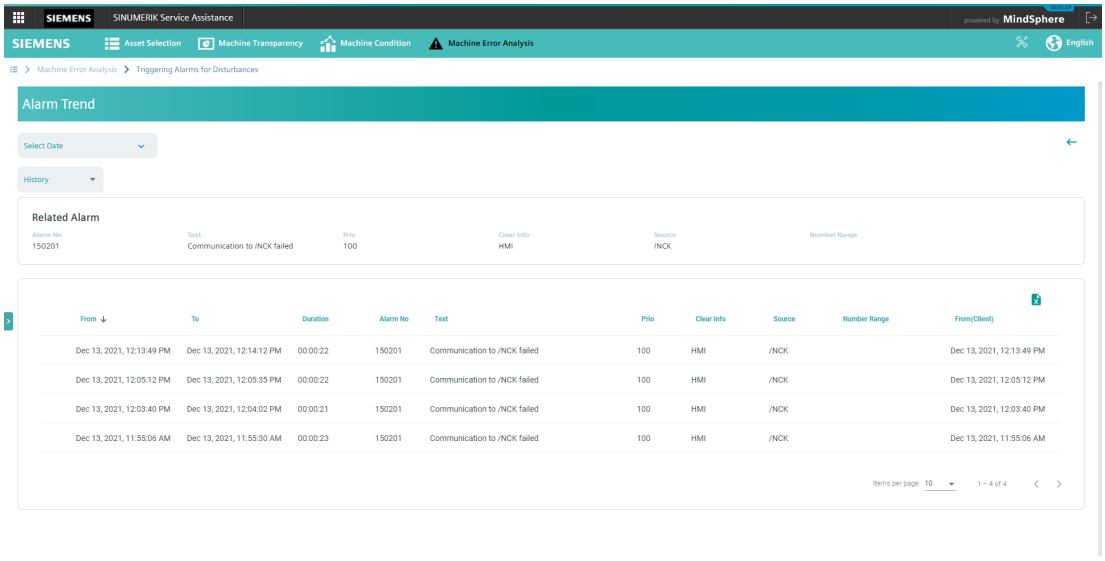


Figure 5-50 Alarm Trend

Export functionality

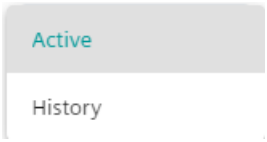
It is possible to export an excel file(*.xls).This button will be active, when there is data on a table. Additionally, export functionality works by considering filtered data.

To perform a data export proceed as follows:

1. Click on “Export” button in the List View.

Active/History

The system can have closed or continuing alarms on "Alarms Trend" page. To show these alarms, Active/History is used. To list both alarms, click on "History". To list pending alarms, click on "Active".



5.6.2 Machine Error Analysis for an asset without ClosedAlarms Aspect

5.6.2.1 Overview

The overview page for Machine Error Analysis service shows all clusters for this service. Each cluster shows a summary information for the subservice. By clicking on a specific cluster the page of this service will open.

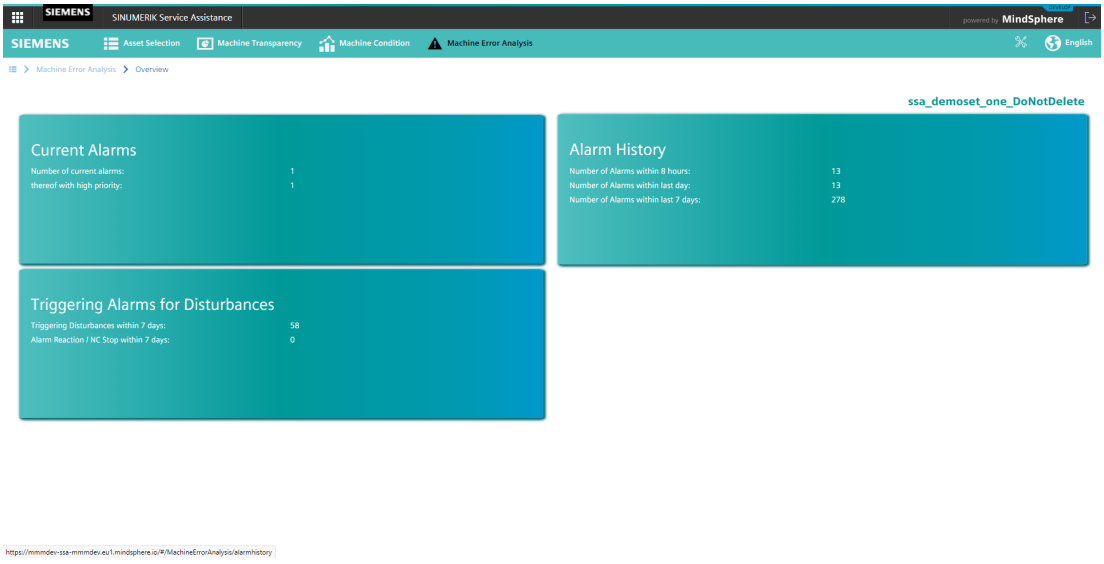


Figure 5-51 Machine Error Analysis

The following values are shown for each cluster:

- **Current Alarms**:
  - Number of current alarms
  - thereof with high priority
- **Alarm History**:
  - Number of alarms within 8 hours
  - Number of alarms within last day
  - Number of alarms within last 7 days
- **Triggering Alarms for Disturbances:**
  - Triggering Disturbances within 7 days
  - Alarm reaction / NC Stop within 7 days

Note

Restrictions for best usage for an asset, which does not have ClosedAlarms Aspect

Please consider the following restrictions, in order to work with Machine Error Analysis with high quality:

- There should be max 10 current alarms.
- There should be max 1000 alarms in alarm history.

5.6.2.2 Current Alarms

The Current Alarms page offers a graphical and a list view of current alarms, which are active at the control over the period of one day.

Setting up a graph

To set up a graph proceed as follows:

1. Click on the graph icon, if not already activated.

   A graph shows which alarms occurred at what time at the control.

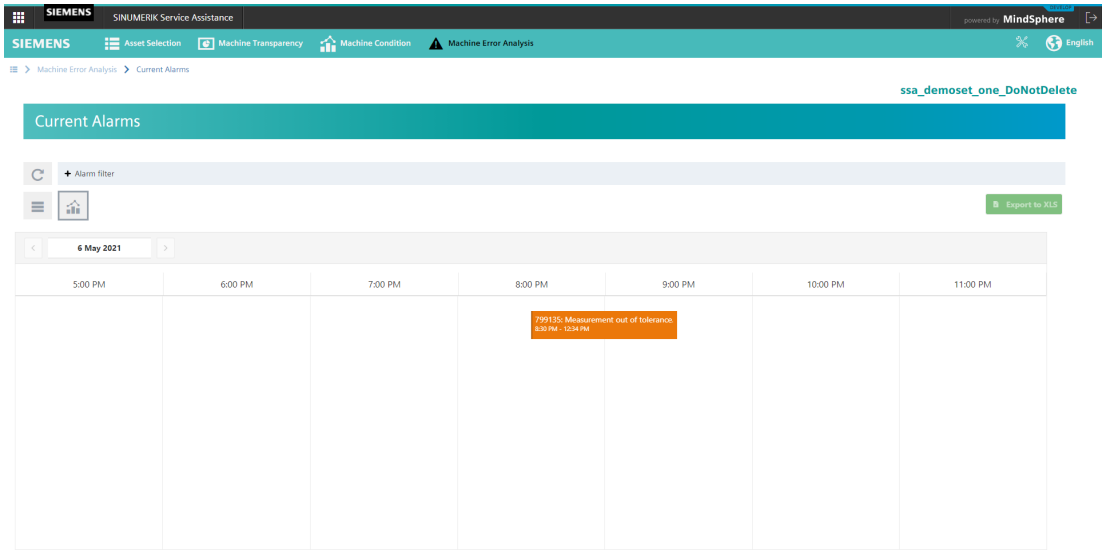


Figure 5-52 Current Alarms Graph

You can zoom in and out of the graph by marking a rectangular area with the mouse.

Table of values

1. Click on the table icon, if not already activated.

   A table shows detailed information on the current alarms. Furthermore it is possible to export the table to an excel file (*.xls) by clicking the button "Export to XLS".

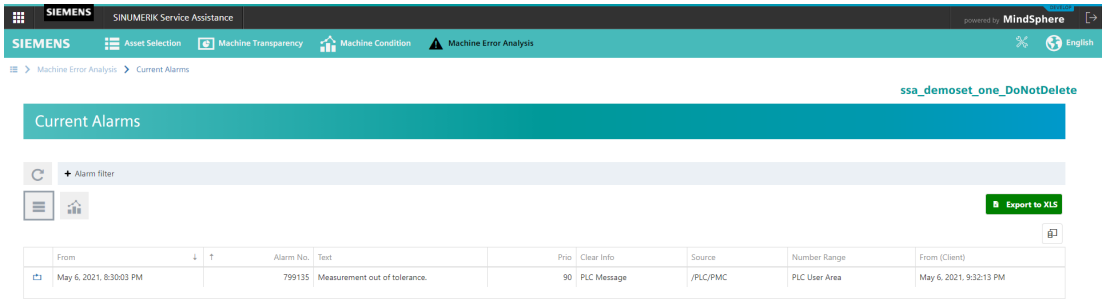


Figure 5-53 Current Alarms Table

Filtering for an alarm

1. Click on button "Alarm Filter".
2. Select a source for the alarm.

3. Type in a search parameter either for "Number Range", "Clear Info", "Text" or "Alarm Number".
4. Click on "Execute Filter".

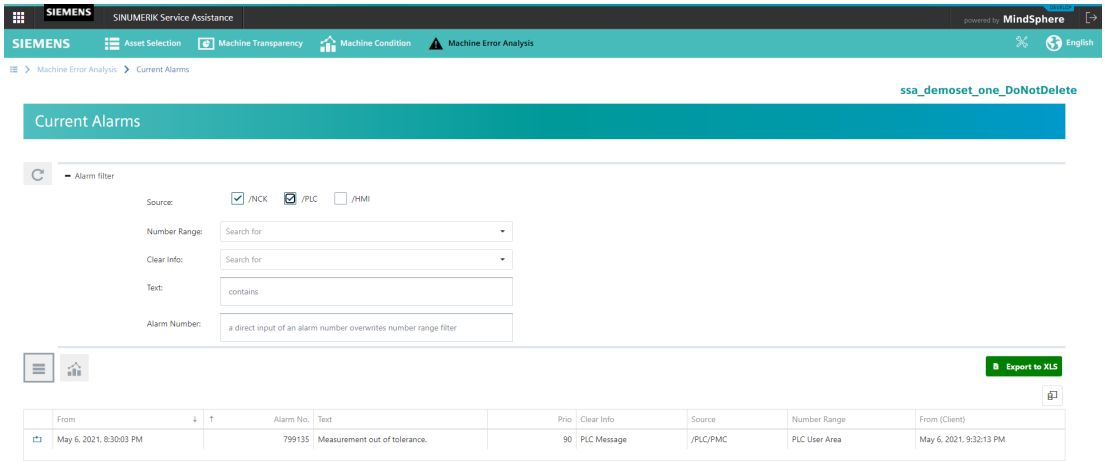


Figure 5-54 Filtering for alarms

5.6.2.3 Alarm History

The Alarms History page offers a graphical and a list view of historical alarms, which were active or closed at the control over a period of time.

Setting up a graph

To set up a graph proceed as follows:

1. Click on the graph icon, if not already activated.

A graph shows which alarms occurred at what time at the control.

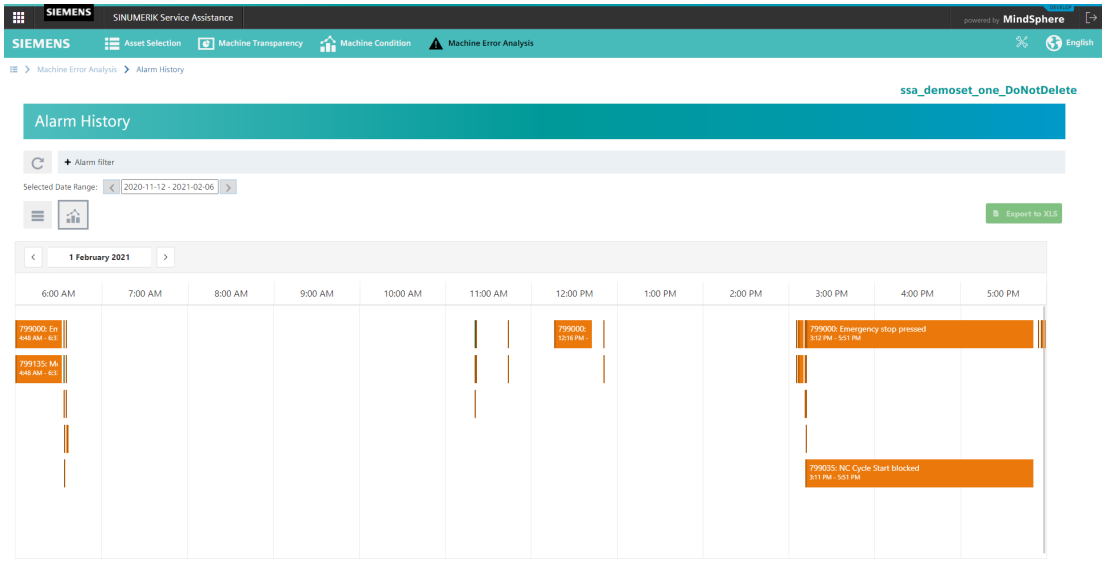


Figure 5-55 Alarm History Graph

2. Select a time range in the drop down menu "Selected Time Range".

You can zoom in and out of the graph by marking a rectangular area with the mouse.

Table of values

1. Click on the table icon, if not already activated.

   The table below shows detailed information on the historic alarms. Furthermore it is possible to export the table to an excel file (*.xls) by clicking the button "Export to XLS".

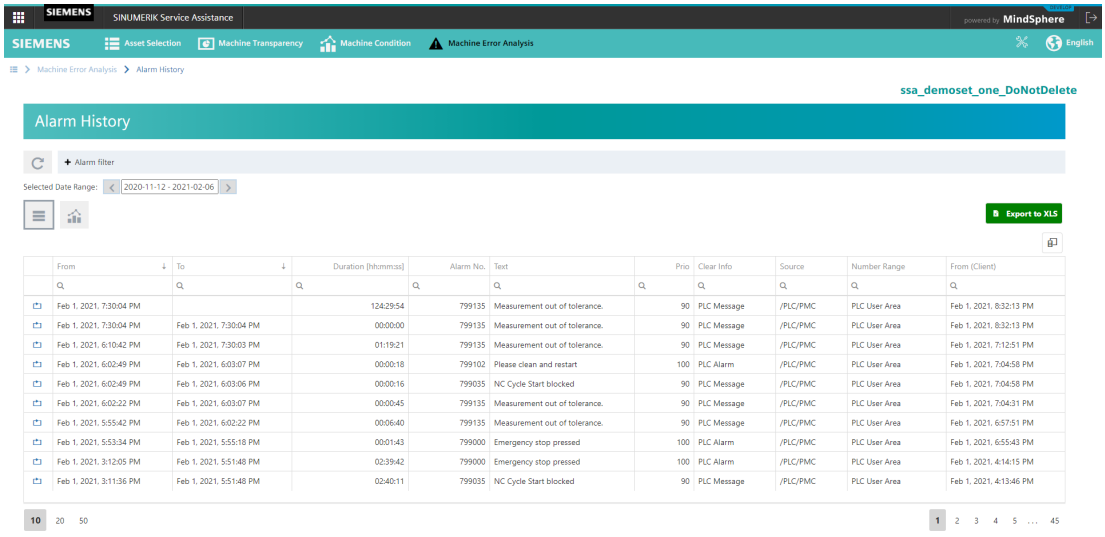


Figure 5-56 Alarm History Table

Filtering for an alarm

1. Click on button "Alarm Filter".
2. Select a source for the alarm.
3. Type in a search parameter either for "Number Range", "Clear Info", "Text" or "Alarm Number".
4. Click on "Execute Filter".

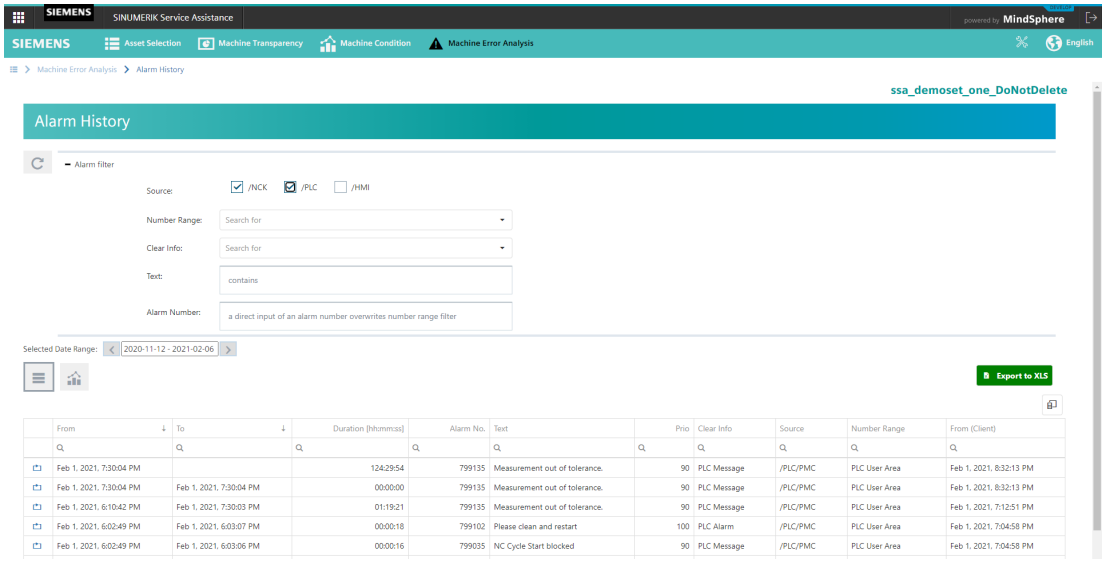


Figure 5-57 Alarm History Filter

5.6.2.4 Triggering Alarms for Disturbances

The Triggering Alarms for Disturbances page offers a graphical and a list view of technical disturbances and NC stops, which occurred at the control 60 seconds ago and lasted for antother 60 seconds.

Setting up a graph

To set up a graph proceed as follows:

1. Click on the graph icon, if not already activated.

2. Select a date range in the drop down menu "Selected Date Range".
3. Select either tab "Techn. Disturbances" or "Alarm Reaction / NC Stop".

A graph shows which technical disturbances or NC stops occurred at the control in the selected date range.

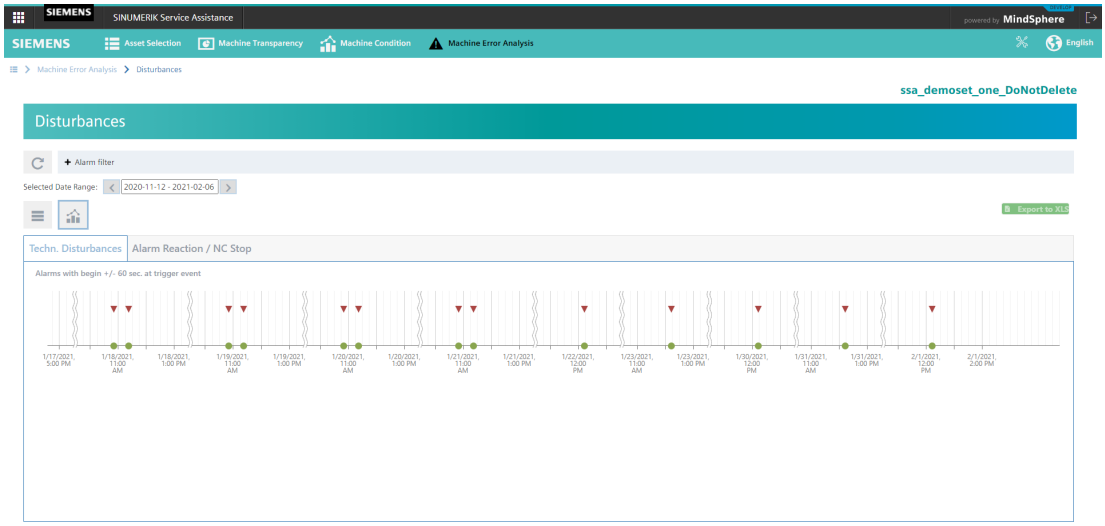


Figure 5-58 Disturbances Graph

You can zoom in and out of the graph by marking a rectangular area with the mouse.

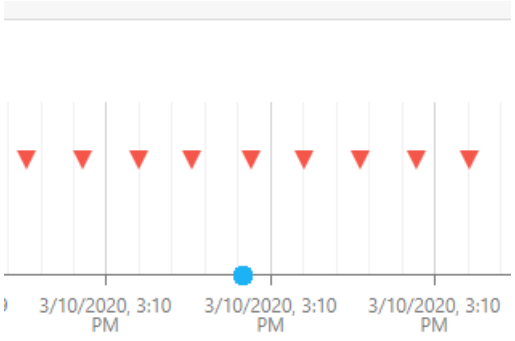


Table of values

1. Click on the table icon, if not already activated.

   A table shows detailed information on the technical disturbances or NC stops, i.e. alarm number or source. Furthermore it is possible to export the table to an excel file (*.xls) by clicking the button "Export to XLS".

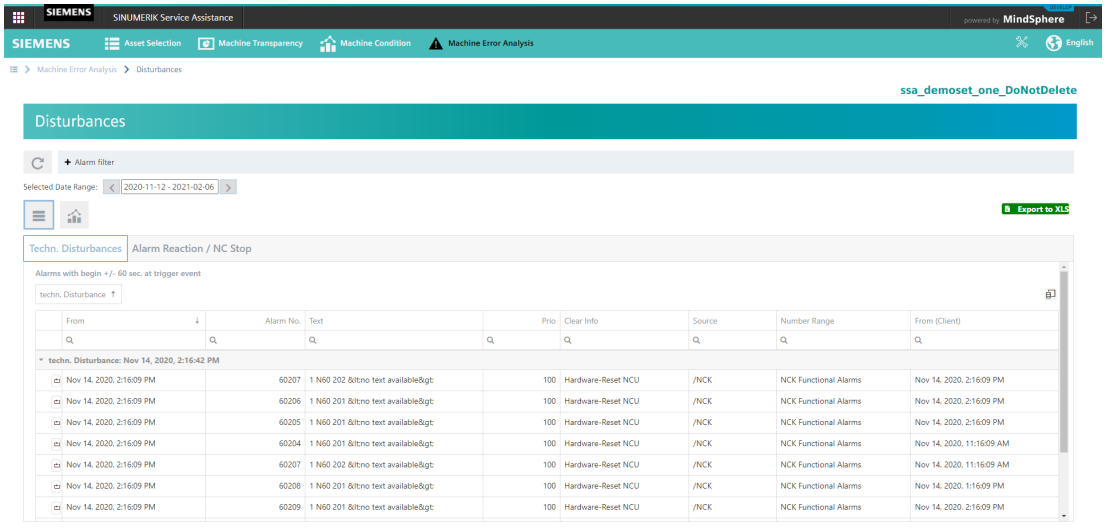


Figure 5-59 Disturbances List

Filtering for disturbances

1. Click on button "Alarm Filter".
2. Select a source for the alarm.
3. Type in a search parameter either for "Number Range", "Clear Info", "Text" or "Alarm Number".
4. Click on "Execute Filter".

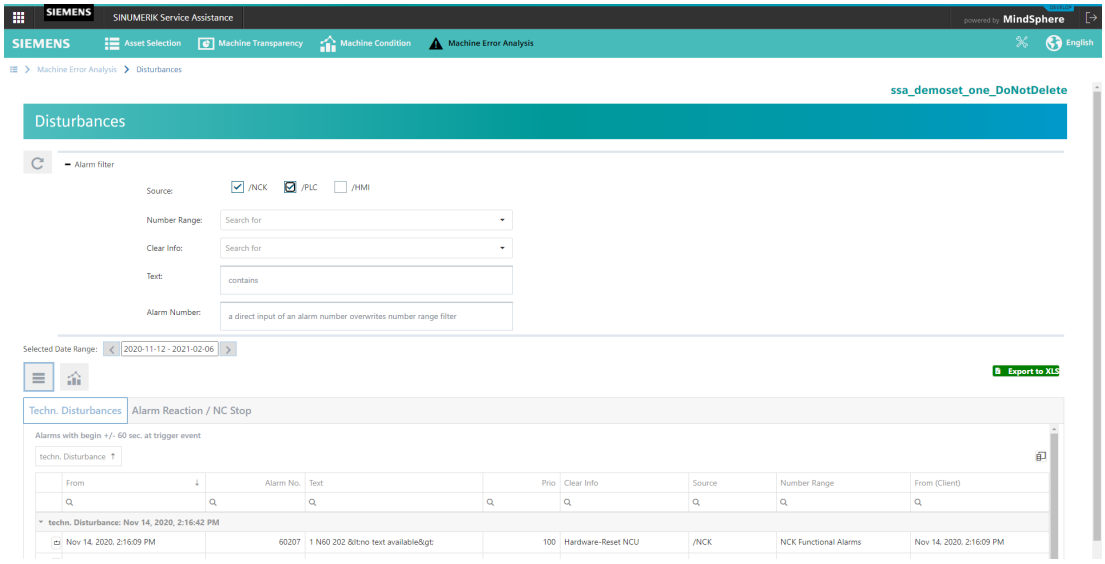


Figure 5-60 Disturbances Filter

5.6.3 MMM & SSA Interlinking

If both MMM and SSA application are registered to the tenant and SSA user rights are granted, SSA Error Analysis page can also be reached from MMM screens.

MMM Overview

Reaching SSA Error Analysis Page from MMM Overview:

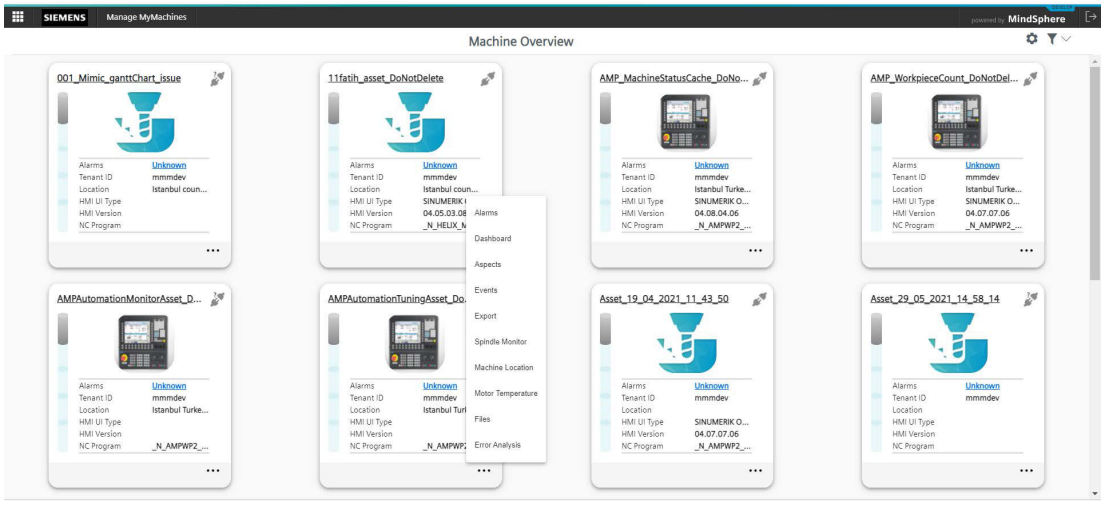


Figure 5-61 Machine Overview

MMM Dashboard

Reaching SSA Error Analysis Page from MMM Dashboard:

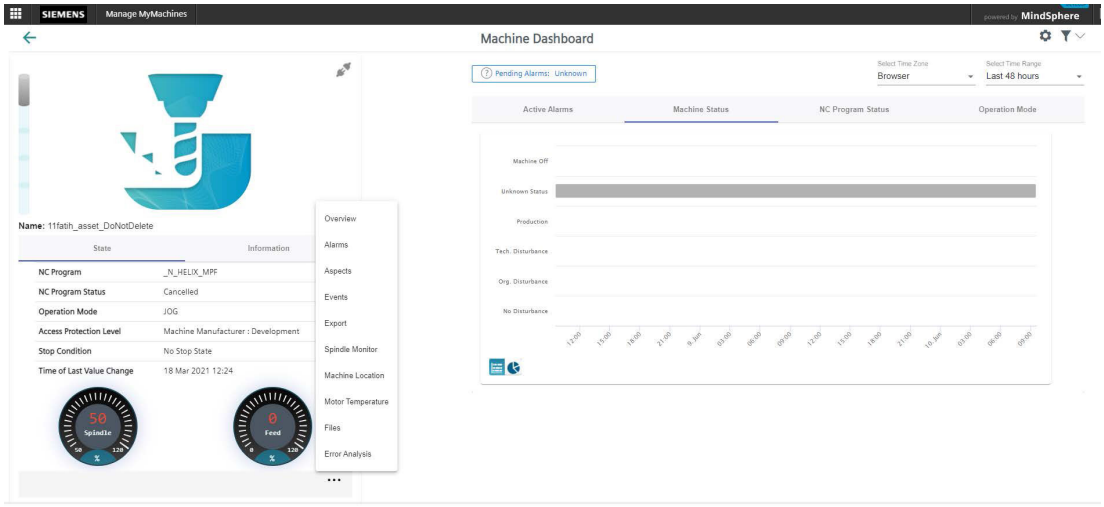


Figure 5-62 MMM Dashboard

Other MMM pages

Reaching SSA Error Analysis Page at from other MMM pages:

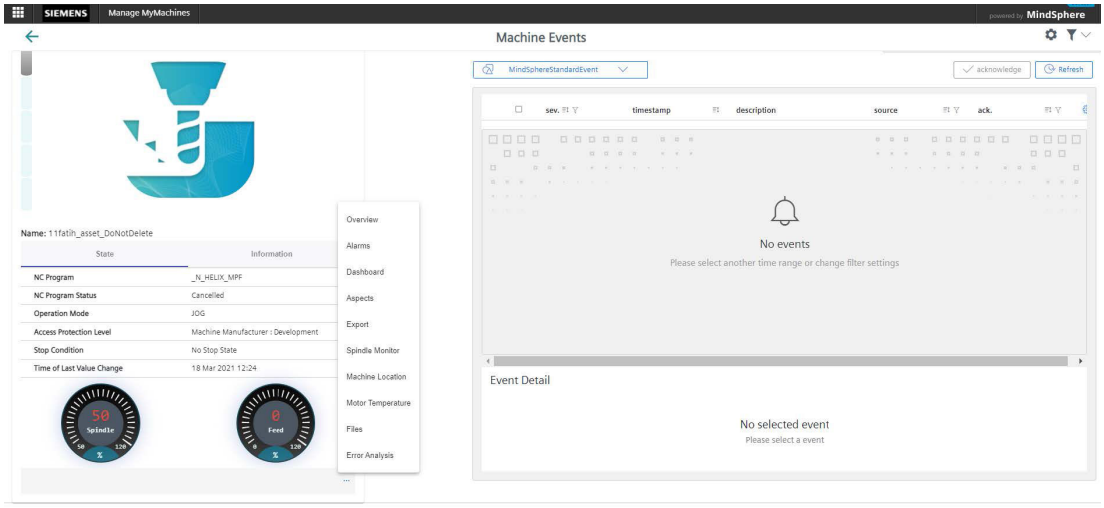


Figure 5-63 MMM other pages

5.6.4 Failure Analysis

Overview

Machine failure analysis, in terms of technical disturbances and NC stops, are important for the user to determine the critical problems within the machine and indicate main causes of downtimes.

It is important to see and interact with these failures with a combination of dashboard containing "Machine Status", "NC Program Status", and "Operation Mode", so that the user can define the root-cause and prevent the triggering of these disturbances.

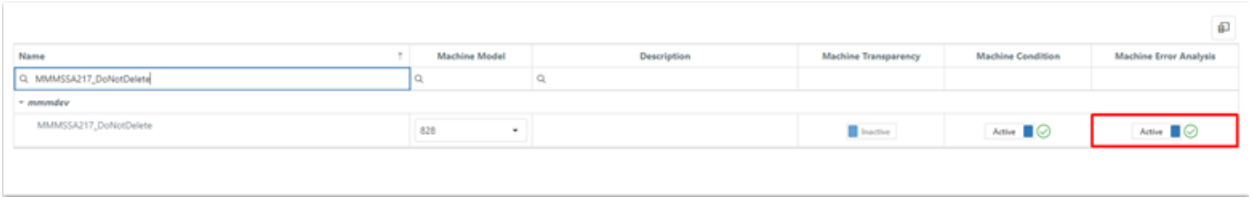
All states which are available for the user refer to the "Machine Status", "NC Program Status", and "Operation Mode". The states are listed below and have to be presented to the user with a list of technical disturbances within the "Failure Analysis" functionality:

- **General Status:** Machine Off, Unknown
- **Machine Status:** Production, Technical Disturbance, Organizational Disturbance, no Disturbance
- **NC Program Status:** Stopped, suspended, running, waiting, aborted
- **Operating Mode:** JOG, MDA, AUTO

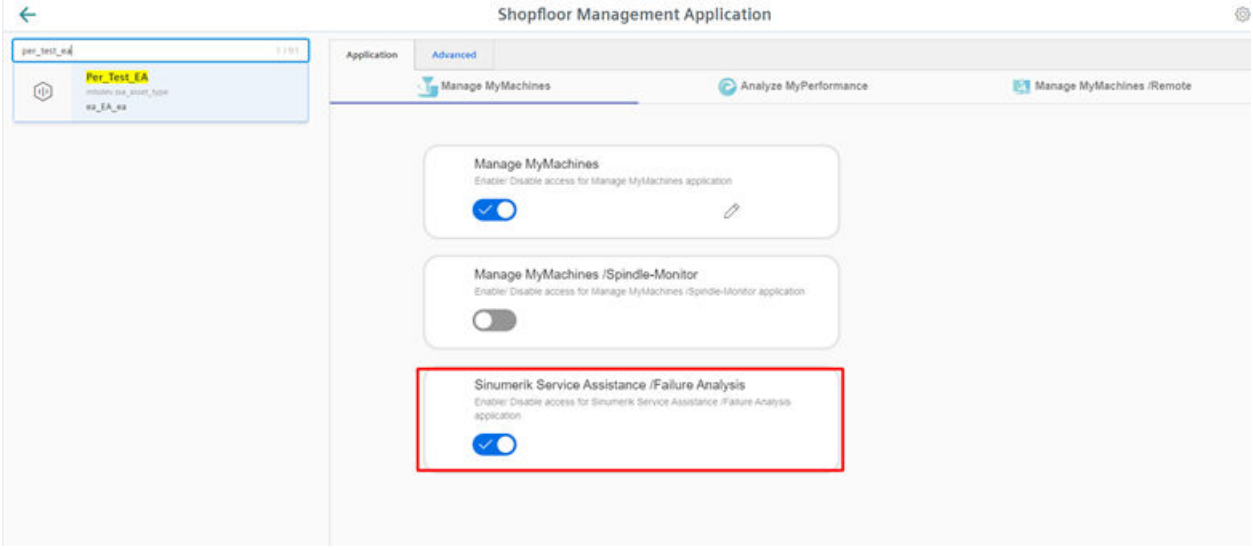
To reach this state of functionality, MMM connectivity will be used.

The following requirements have to be fulfilled:

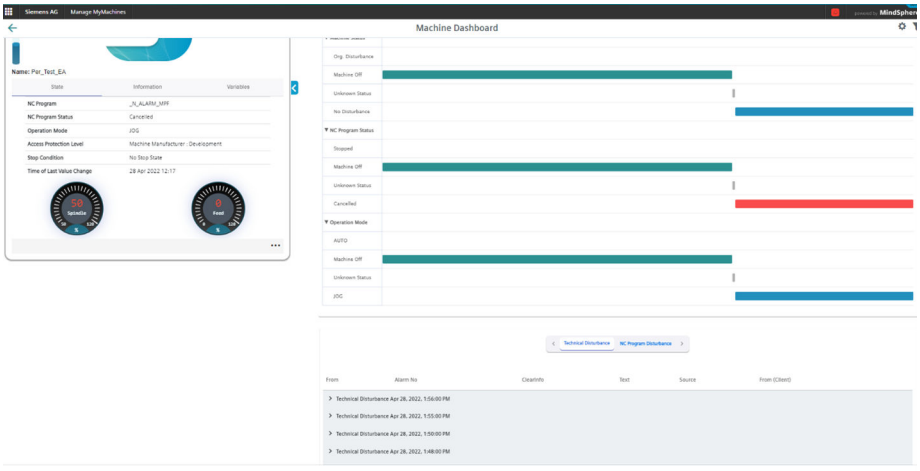
- Purchasing SSA and MMM: "Failure Analysis" is a feature of SSA and an add-on for MMM.
- Purchasing Error Analysis Service (complete for related Asset): Failure Analysis works depending on Tech Disturbance.
  You have to activate the toggle for "Machine Error Analysis".



- Activating "Failure Analysis" Service on Shopfloor Management Application.
  For activation of the "Failure Analysis" service, admin rights are required.



After completing the described process, Failure Analysis will be ready to use.



Troubleshooting

6

Problem	Solution
Machine connection to MindSphere	In case of problems with the machine connection, the latest MMM documentation should be consulted.

Appendix

A

A.1 Data Acquisition only in MindSphere

Data Acquisition only in MindSphere

SINUMERIK Service Assistance - Data Acquisition only in MindSphere									
Aspect	**Category**	**Description**	**# Vars**	**Variable**	**Data type MMM**	**Unit MMM**	**Data type MindSphere**	**Unit MindSphere**	**Maximum length**
SINUMERIK_CSPROTECTIONLEVEL	Dynamic	Compressed ProtectionLevel for SSA App	1	ProtectionLevel	-	-	DOUBLE	ONE	-
			2	ProtectionLevel0	-	-	DOUBLE	ONE	-
			3	ProtectionLevel1	-	-	DOUBLE	ONE	-
			4	ProtectionLevel2	-	-	DOUBLE	ONE	-
			5	ProtectionLevel3	-	-	DOUBLE	ONE	-
			6	ProtectionLevel4	-	-	DOUBLE	ONE	-
			7	ProtectionLevel5	-	-	DOUBLE	ONE	-
			8	ProtectionLevel6	-	-	DOUBLE	ONE	-
			9	ProtectionLevel7	-	-	DOUBLE	ONE	-
SINUMERIK_CSRESULTS	Dynamic	Result Values for SSA App	1	BootStatus	-	-	INT	ONE	-
SINUMERIK_CSMACHINESTATUS	Dynamic	Compressed MaschineStatus for SSA App	1	MachineStatus	-	-	DOUBLE	ONE	-

ClosedAlarms	Dynamic	-	1	alarmNo	-	-	STRING	-	255
			2	alarmText	-	-	STRING	-	255
			3	clearInfo	-	-	INT	-	-
			4	ctDuration	-	-	STRING	ms	255
			5	ctEndTime	-	-	STRING	-	255
			6	ctStartTime	-	-	STRING	-	255
			7	priority	-	-	INT	-	-
			8	source	-	-	STRING	-	255
			9	stDuration	-	-	STRING	ms	255
			10	stEndTime	-	-	STRING	-	255
			11	stStartTime	-	-	STRING	-	255
			12	text	-	-	STRING	-	255
SINUMERIK_TRIGGERINGALARMS	Dynamic	-	1	alarms	-	-	BIG_STRING	-	99985
			2	triggerType	-	-	STRING	-	15

A.2 Data Acquisition in MMM - "Time-based / cyclic trigger"

Data Acquisition in MMM - “Time-based / cyclic trigger”

SINUMERIK Service Assistance - Data acquisition in MMM - “Time-based / cyclic trigger” (max. 50 variables, of which #5 in 5 sec. reading cycle)									
Aspect/ Configuration	**Reading cycle**	**# Vars**	**Variable**	**Address SIN840 / SINUMERIK ONE**	**Adress SIN828**	**Data type MMM**	**Unit MMM**	**Data type MindSphere**	**Unit MindSphere**
SINUMERIK_CSRAW	5 sec.	1	NCKAlive	/Nck/State/nckAliveAndWell	/Nck/State/nckAliveAndWell	DOUBLE	One	DOUBLE	ONE
		2	PowerOnTime	/Nck/ChannelDiagnose/poweronTime	/Nck/ChannelDiagnose/poweronTime	DOUBLE	One	DOUBLE	ONE
		3	PrioAlarm	/NCK/TopPrioalarm/textIndex[1]	/Nck/TopPrioalarm/textIndex[1]	DOUBLE	One	DOUBLE	ONE
		4	SetupTime	/Nck/ChannelDiagnose/setupTime	/Nck/ChannelDiagnose/setupTime	DOUBLE	One	DOUBLE	ONE
		5	timesync_offset	/ePSStore/timesync_offset	/ePSStore/timesync_offset	DOUBLE	One	DOUBLE	ONE
CSM_General_Info	30 sec.	1	NUM_AXES_IN_SYSTEM	/Nck/ChannelDiagnose/dpAxisCfgNumAxes	/Nck/ChannelDiagnose/dpAxisCfgNumAxes	DOUBLE	One	DOUBLE	ONE
		2	NC_CPU_Ready	/Plc/DataBlock/Bit[c10,104.7]	n/a	DOUBLE	One	DOUBLE	ONE
		3	Variable_Group1 [1)]	/Plc/DataBlock/Byte[c10,108]	/Plc/DataBlock/Byte[c2700,2]	DOUBLE	One	DOUBLE	ONE
		4				DOUBLE	One	DOUBLE	ONE
		5				DOUBLE	One	DOUBLE	ONE
		6	Variable_Group2 [2)]	/Plc/DataBlock/Byte[c10,109]	/Plc/DataBlock/Byte[c2700,3]	DOUBLE	One	DOUBLE	ONE
		7				DOUBLE	One	DOUBLE	ONE
		8				DOUBLE	One	DOUBLE	ONE
		9				DOUBLE	One	DOUBLE	ONE
		10				DOUBLE	One	DOUBLE	ONE

CSM_AX01	30 sec.	1	AX01_Drives_Status	2,3,1	2,3,1	DOUBLE	One	DOUBLE	ONE
		2	AX01_Motor_Temp	35,3,1	35,3,1	DOUBLE	°C	DOUBLE	°C
		3	AX01_ImpulseEnable_PLC	/Channel/MachineAxis/impulseEnable[u1,1]	/Channel/MachineAxis/impulseEnable[u1,1]	DOUBLE	One	DOUBLE	ONE
		4	AX01_ControlConfirmActive_NC	/Channel/MachineAxis/contrConfirmActive[u1,1]	/Channel/MachineAxis/contrConfirmActive[u1,1]	DOUBLE	One	DOUBLE	ONE
		5	AX01_Variable_Group [3)]	/Plc/DataBlock/Byte[c31,93]	/Plc/DataBlock/Byte[c3900,4001]	DOUBLE	One	DOUBLE	ONE
		6				DOUBLE	One	DOUBLE	ONE
CSM_AX02	30 sec.	1	AX02_Drives_Status	2,3,2	2,3,2	DOUBLE	One	DOUBLE	ONE
		2	AX02_Motor_Temp	35,3,2	35,3,2	DOUBLE	°C	DOUBLE	°C
		3	AX02_ImpulseEnable_PLC	/Channel/MachineAxis/impulseEnable[u1,2]	/Channel/MachineAxis/impulseEnable[u1,2]	DOUBLE	One	DOUBLE	ONE
		4	AX02_ControlConfirmActive_NC	/Channel/MachineAxis/contrConfirmActive[u1,2]	/Channel/MachineAxis/contrConfirmActive[u1,2]	DOUBLE	One	DOUBLE	ONE
		5	AX02_Variable_Group [3)]	/Plc/DataBlock/Byte[c32,93]	/Plc/DataBlock/Byte[c3901,4001]	DOUBLE	One	DOUBLE	ONE
		6				DOUBLE	One	DOUBLE	ONE
CSM_AX03	30 sec.	1	AX03_Drives_Status	2,3,3	2,3,3	DOUBLE	One	DOUBLE	ONE
		2	AX03_Motor_Temp	35,3,3	35,3,3	DOUBLE	°C	DOUBLE	°C
		3	AX03_ImpulseEnable_PLC	/Channel/MachineAxis/impulseEnable[u1,3]	/Channel/MachineAxis/impulseEnable[u1,3]	DOUBLE	One	DOUBLE	ONE
		4	AX03_ControlConfirmActive_NC	/Channel/MachineAxis/contrConfirmActive[u1,3]	/Channel/MachineAxis/contrConfirmActive[u1,3]	DOUBLE	One	DOUBLE	ONE
		5	AX03_Variable_Group [3)]	/Plc/DataBlock/Byte[c33,93]	/Plc/DataBlock/Byte[c3902,4001]	DOUBLE	One	DOUBLE	ONE
		6				DOUBLE	One	DOUBLE	ONE

CSM_AX04	30 sec.	1	AX04_Drives_Status	2,3,4	2,3,4	DOUBLE	One	DOUBLE	ONE
		2	AX04_Motor_Temp	35,3,4	35,3,4	DOUBLE	°C	DOUBLE	°C
		3	AX04_ImpulseEnable_PLC	/Channel/MachineAxis/impulseEnable[u1,4]	/Channel/MachineAxis/impulseEnable[u1,4]	DOUBLE	One	DOUBLE	ONE
		4	AX04_ControlConfirmActive_NC	/Channel/MachineAxis/contrConfirmActive[u1,4]	/Channel/MachineAxis/contrConfirmActive[u1,4]	DOUBLE	One	DOUBLE	ONE
		5	AX04_Variable_Group [3)]	/Plc/DataBlock/Byte[c34,93]	/Plc/DataBlock/Byte[c3903,4001]	DOUBLE	One	DOUBLE	ONE
		6				DOUBLE	One	DOUBLE	ONE
CSM_AX05	30 sec.	1	AX05_Drives_Status	2,3,5	2,3,5	DOUBLE	One	DOUBLE	ONE
		2	AX05_Motor_Temp	35,3,5	35,3,5	DOUBLE	°C	DOUBLE	°C
		3	AX05_ImpulseEnable_PLC	/Channel/MachineAxis/impulseEnable[u1,5]	/Channel/MachineAxis/impulseEnable[u1,5]	DOUBLE	One	DOUBLE	ONE
		4	AX05_ControlConfirmActive_NC	/Channel/MachineAxis/contrConfirmActive[u1,5]	/Channel/MachineAxis/contrConfirmActive[u1,5]	DOUBLE	One	DOUBLE	ONE
		5	AX05_Variable_Group [3)]	/Plc/DataBlock/Byte[c35,93]	/Plc/DataBlock/Byte[c3904,4001]	DOUBLE	One	DOUBLE	ONE
		6				DOUBLE	One	DOUBLE	ONE
CSM_SP01	30 sec.	1	SP01_Drives_Status	2,3,6	2,3,6	DOUBLE	One	DOUBLE	ONE
		2	SP01_Motor_Temp	35,3,6	35,3,6	DOUBLE	°C	DOUBLE	°C
		3	SP01_ImpulseEnable_PLC	/Channel/MachineAxis/impulseEnable[u1,6]	/Channel/MachineAxis/impulseEnable[u1,6]	DOUBLE	One	DOUBLE	ONE
		4	SP01_ControlConfirmActive_NC	/Channel/MachineAxis/contrConfirmActive[u1,6]	/Channel/MachineAxis/contrConfirmActive[u1,6]	DOUBLE	One	DOUBLE	ONE
		5	SP01_Variable_Group [4)]	/Plc/DataBlock/Byte[c36,93]	/Plc/DataBlock/Byte[c3905,4001]	DOUBLE	One	DOUBLE	ONE
		6				DOUBLE	One	DOUBLE	ONE

1) Variable_Group1 contains these three variables: "NC_Ready", "Drives_Cyclic" and "Panel_BTSS_Ready" variables.

2) Variable_Group2 contains these five variables: "NC_Battery_Alarm", "AirTemp_Alarm", "Cooling_Temp_Alarm_NCU", "PC_System_Error" "and NC_Alarm_Pending".

3) AX*_Variable_Group contains these two variables: "AX*_Enable_Impulse" and "AX*_Drive_Ready".

4) SP*_Variable_Group contains these two variables: "SP*_Enable_Impulse" and "SP*_Drive_Ready".

See also

Clarification of machine variable parameters (Page 154)

A.3 Data Acquisition in MMM - "Variable value-based trigger"

Data Acquisition in MMM - "Variable value-based trigger"

SINUMERIK Service Assistance - Data acquisition in MMM - “Variable value-based trigger”										
WHEN the variable								THEN		
Name of Data Acquisitíon	Variable Address	Data type MMM	Unit MMM	Operator	Variable Value	Debounce Time	Hystersis	Variable Address	Recording for	Within cycle time
SINUMERIK_CSA-LARMREACTION	/Channel/State/acAlarmStat[u1,1]	DOUBLE	One	Not equals	0	1 sec	-	/Channel/State/acAlarmStat[u1,1]	30 sec	30 sec

A.4 Aspect configuration with MMM - minimum aspect requirements

Note

Precondition

Please keep in mind that at least one aspect should be configured which starts with "CSM_AX".

Aspects	Asset Selection	Machine Transparency	Machine Condition	Machine Error Analysis
AgentOnlineStatus	Mandatory	-	Mandatory	Mandatory
Alarms	-	-	-	Mandatory
CH1_BasicConfig	Mandatory	-	Mandatory	
CH1_MachineStatus	Mandatory	-	Mandatory	Mandatory
ClosedAlarms	-	-	-	Mandatory
CSM_AX01	-	-	Optional	-
CSM_AX02	-	-	Optional	-
CSM_AX03	-	-	Optional	-
CSM_AX04	-	-	Optional	-
CSM_AX05	-	-	Optional	-
CSM_General_Info	-	-	Mandatory	
CSM_SP01	-	-	Mandatory	-
MachineModel	-	-	Mandatory	-
SINUMERIK_CSALARMREACTION	-	-	-	Mandatory
SINUMERIK_CSMACHINESTATUS	-	-	Mandatory	Mandatory
SINUMERIK_CSPROTECTIONLEVEL	Mandatory	-	Mandatory	-
SINUMERIK_CSRAW	-	-	Mandatory	Mandatory
SINUMERIK_CSRESULTS	-	-	Mandatory	-
SINUMERIK_TRIGGERINGALARMS	-	-	-	Mandatory
Startup	-	-	Mandatory	Mandatory

Naming of aspects

The naming of these aspects do not have to be named as stated above. The naming might still be different, i.e. for optional axes. Here is an example of the axes defined in another tenant. As shown, the naming "CSM_AX_W_Achse" differs from the ones stated above.

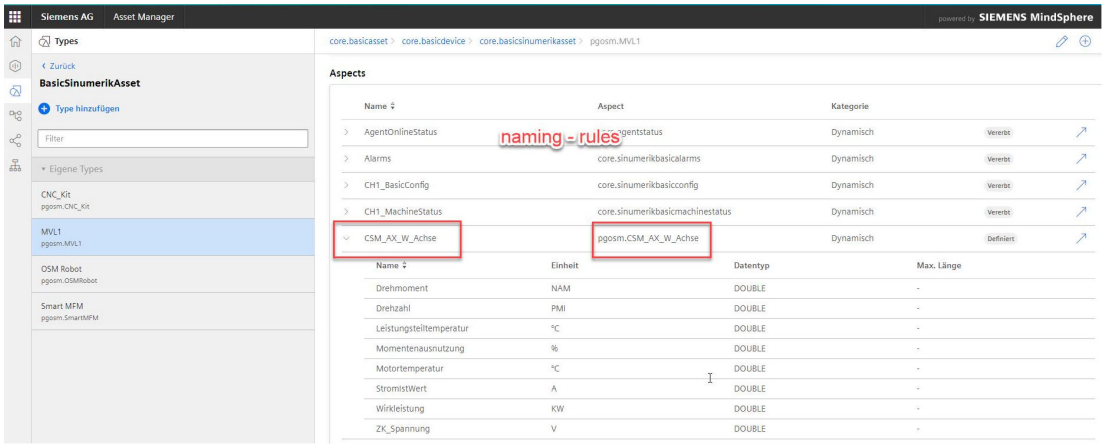


Figure A-1 Example for different spindle name

A.5 Clarification of machine variable parameters

In chapter Data Acquisition in MMM - "Time-based / cyclic trigger" (Page 147) the variables for the aspect configuration are listed. There are specific variables assigned to the controller like "param", "slave number", "drive number", "io system nr". These variables are coded in parameter numbers, i.e. "35,3,4". This example describes how these variables are observed and determined.

Variable and parameter numbers

The following screen in SINUMERIK Operate shows the connection between variables and parameter numbers:

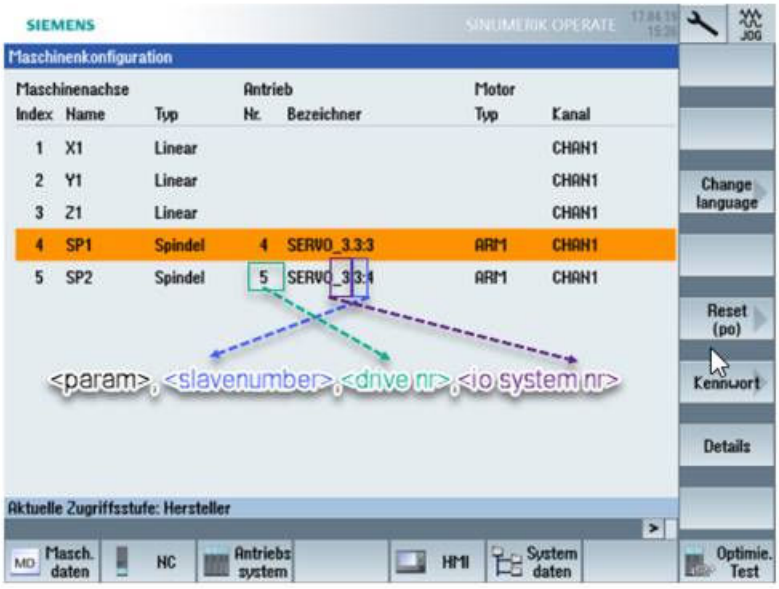


Figure A-2 Variables and parameter numbers

A.6 Supplementary documentation

This manual describes only the advanced administration tasks for using **SINUMERIK Service Assistance Mindsphere Application**. The instructions for the machine connection to MindSphere via **Manage MyMachines** are not part of this manual.

If you need support to connect your machine via Manage MyMachines to MindSphere, use the links below:

- Function Manual Manage MyMachines (https://documentation.mindsphere.io/resources/html/manage-my-machine/en-US/index.html)
- Readme Manage MyMachines (https://documentation.mindsphere.io/resources/html/manage-my-machine-readme/en-US/index.html)

For further information on installation of Brownfield Connectivity Services (BFC) please refer to Function Manual. (https://support.industry.siemens.com/cs/at/en/sc/5392)

Glossary

Asset

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

Manage MyMachines

MindApp that displays the operational and plant-specific data of machine tools configured in MindSphere.

MindSphere

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

Index

A

Aarm History
  graph, 133
Acknowledgement, 98
  Hardware Components, 98
Activation
  Components, 87
  Machine Condition, 87
  Machine Error Analysis, 87
  Machine Transparency, 87
Activation page, 87
Active assets, 90
Add column
  Column Chooser, 89
Alarm History, 129
  Filtering, 134
  table of values, 134
Alarm reaction / NC Stop within 7 days, 129
Aspects
  Configuration, 26
  Creating, 27
Asset
  Creating, 33
Asset Selection, 82
Asset status
  error, 82
  Okay, 82
  warning, 82
Asset Type
  Creating, 30

B

Basic Information, 94, 96
Billing, 87
Boot Monitoring, 109
  graph, 115
  table of values, 116

C

Change Protocol, 95, 105
  Acknowledgement, 106
  Changed Item History, 106
Column Chooser, 89
  Add column, 89
Components
  Activation, 87
  prices, 87
Configuration change
  Configuration status, 82
Configuration status
  Configuration change, 82
  Not configured, 82
  Upload date, 82
Configuring aspect
  time-based / cyclic trigger acquisition, 42
  Variable value-based trigger acquisition, 47
Connected
  Connection status, 82
Connecting
  Machine to asset, 35
Connection status
  Connected, 82
  Disconnected, 82
Creating
  Aspects, 27
  Asset, 33
  Asset Type, 30
  identSNAPSHOT file, 74
Current alarms
  table of values, 131
Current Alarms, 129
  Filtering, 131
  graph, 130
Customer Programmer, 108
Customer Qualified Operator, 108
Customer Service, 108

D

Data acquisition
  Mindsphere, 145
  MMM, 147, 151
  time-based / cyclic trigger, 147
  Variable value-based trigger, 151
Definition
  Machine Condition, 73
  Machine Error Analysis, 73
  Machine Transparency, 73
Description, 95
Details
  graph, 109
Development, 108

Disconnected
Connection status, 82
Disturbances
Filtering, 137
graph, 135
table of values, 137
Zooming, 136
Drives cyclic, 108

E

Enabling
MMM data aquisition, 36
End Customer Name, 94
End of Commissioning, 94
Equipment Name, 94
Equipment Number, 94
Equipment Type, 94
Error
Asset status, 82

F

FAQ, 143
First Commissioning, 94
Fleet Manager
identSHNAPSHOT file, 80

H

Hardware Components, 95, 96, 98
List View, 97
Tree View, 97
HMI Version, 108

I

identSNAPSHOT file
Creating, 74
Fleet Manager, 80
Uploading, 75

L

Last boot event, 109
Last Change Date, 95
Licenses, 102
Logbook, 101
Logbook and Licenses, 94
Logbook Entries, 94
Logbook Last Entry Date, 94

M

Machine Condition
Activation, 87
Definition, 73
Machine connection
MMM Function Manual, 25
Machine Error Analysis, 129
Activation, 87
Definition, 73
Restrictions, 129
Machine ID, 94
Machine On, 109
Machine to asset
Connecting, 35
Machine Transparency
Activation, 87
definition, 73
Manufacturer Name, 94
Meantime between boot events, 109
Mindsphere
Data acquisition, 145
MMM
Data acquisition, 147, 151
MMM data aquisition
Enabling, 36
MMM Function Manual
Machine connection, 25
modules, 73

N

Name, 95
NC ready, 108
NCK Type/Device Type, 108
NCK Version, 95
No. of boot events, 109
Not configured
Configuration status, 82
Number Axes of Channel 1, 108
Number of alarms within 8 hours, 129
Number of alarms within last 7 days, 129
Number of alarms within last day, 129
Number of Control Units and NXs, 95
Number of current alarms, 129
Number of Line Modules, 95
Number of Motor Modules, 95
Number of Total Drive/Motor Components, 95
Number of un-ack HW Changes, 95

Number of un-ack License Changes, 95
Number of un-ack SW Changes, 95

O

OEM/Commissioning, 108
Okay
    Asset status, 82
Operating Time, 109
    graph, 113
    table of vaues, 114

P

PLC Version, 95
Prices
    Components, 87
Pricing sheet, 87
Process Data, 108
Product Group, 94
Production, 109
Purchasing rules, 92

R

Restrictions
    Machine Error Analysis, 129
Rules of purchase, 92

S

Security Level, 108
    table of values, 112
Securty Level
    graph, 111
Serialnumber CF Card, 94
service packages, 73
SINAMICS Version, 95
SINUMERIK NCU/PPU MLFB, 95
SINUMERIK Operate Version, 95
SINUMERIK_CSMACHINESTATUS, 26
SINUMERIK_CSPROTECTIONLEVEL, 26
SINUMERIK_CSRESULTS, 26
SINUMERIK_TRIGGERINGALARMS, 26
Software Components, 95, 102
    Acknowledgement, 104
    List View, 103
    Tree View, 103
System Software NCU Version, 95

T

thereof with high priority, 129
Time since last boot event, 109
Time-based / cyclic trigger acquisition
    Configuring aspect, 42
Triggering Alarms for Disturbances, 129
Triggering Disturbances within 7 days, 129
Troubleshooting, 143

U

Upload date
    Configuration status, 82
Uploading
    identSNAPSHOT file, 75

V

Variable value-based trigger acquisition, 47

W

Warning
    Asset status, 82