

# SIEMENS

## SINUMERIK

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

Readme

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Valid for control systems:

SINUMERIK 840D sl / 840DE sl

SINUMERIK 828D

Software

Analyze MyPerformance /OEE Monitor, Version 01.02.02.00

Analyze MyPerformance /OEE Tuning, Version 01.00.02.00

Version 01/2020

## 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.

 <b>DANGER</b>
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indicates that death or severe personal injury <b>will</b> result if proper precautions are not taken.
--

 <b>WARNING</b>
--

indicates that death or severe personal injury <b>may</b> result if proper precautions are not taken.
---

 <b>CAUTION</b>
--

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

<b>NOTICE</b>
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indicates that property damage can result if proper precautions are not taken.
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If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

### Qualified Personnel

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

### Proper use of Siemens products

Note the following:

 <b>WARNING</b>
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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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### Trademarks

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

### Disclaimer of Liability

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

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# Fundamental safety instructions

## 1.1 General safety instructions

 <b>WARNING</b>
<b>Danger to life if the safety instructions and residual risks are not observed</b>
If the safety instructions and residual risks in the associated hardware documentation are not observed, accidents involving severe injuries or death can occur.
<ul style="list-style-type: none"><li>• Observe the safety instructions given in the hardware documentation.</li><li>• Consider the residual risks for the risk evaluation.</li></ul>

 <b>WARNING</b>
<b>Malfunctions of the machine as a result of incorrect or changed parameter settings</b>
As a result of incorrect or changed parameterization, machines can malfunction, which in turn can lead to injuries or death.
<ul style="list-style-type: none"><li>• Protect the parameterization against unauthorized access.</li><li>• Handle possible malfunctions by taking suitable measures, e.g. emergency stop or emergency off.</li></ul>

## **1.2 Warranty and liability for application examples**

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

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

## 1.3 Security information

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

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

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

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

<https://www.siemens.com/industrialsecurity> (<https://www.siemens.com/industrialsecurity>).

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

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

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

Further information is provided on the Internet:

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

### WARNING

#### Unsafe operating states resulting from software manipulation

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

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



## System requirements

### Hardware and operating software

#### SINUMERIK 840D sl

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

### SINUMERIK 828D

SINUMERIK Integrate Client software version	Operating software SINUMERIK Operate Version	Hardware version	Operating system
2.0.11	4.5 SP4	PPU 281.3	Linux
2.0.12	4.5 SP5, HF 1, 2	PPU 261.3	
2.0.13	4.5 SP6, HF 1, 2, 3, 4	PPU 241.4	
2.0.14			
3.0.11	4.7 SP2, HF1		
3.0.12	4.7 SP3, HF1		
3.0.13	4.7 SP4, HF1, 2		
3.0.14	4.7 SP5		
	4.7 SP6, HF1, 2		
	4.7 SP7 HF1, 3		
3.0.11	4.8 SP4, HF 1, 2, 3	PPU 271.4	Linux
3.0.12	4.8 SP5, HF 3		
3.0.13			
3.0.14			

### Operating PC

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

### Web browser

You can use the following web browsers:

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

#### Note

Parallel operation with SINUMERIK Integrate applications is not possible

## Security notes

### NOTICE

#### Security standards for SINUMERIK controls connected to MindSphere

The connection of SINUMERIK controls to MindSphere via TLS 1.2 /https meets the highest security standards.

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

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

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

### NOTICE

#### Data misuse due to an unprotected Internet connection

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

Before establishing a network connection, ensure your PC is exclusively connected to the Internet via a secure connection. Pay attention to the security-relevant notes.

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

### Note

#### SINUMERIK control system security

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

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

### Note

#### Operating PC security

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

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

## **Delivery form**

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

- OR -

You can contact your machine manufacturer.

- OR -

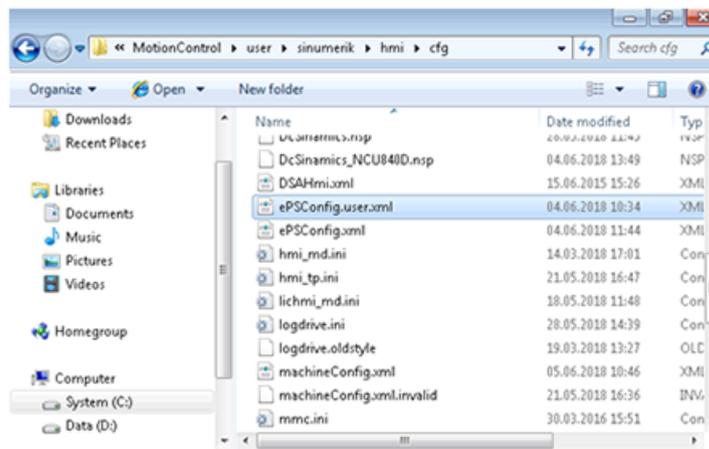
You contact Siemens Service and Support.

## Product information/technical update

### 3.1 Activating log files PCU

#### Procedure

1. Open the following directory: C:\ProgramData\Siemens\MotionControl\user\sinumerik\hmi\cfg
2. Open the file: ePSConfig.user.xml.



#### Editing parameters

You can edit the following parameters:

Parameter	Function	Default setting	Input	Maximum value
scriptLogPath	Defines where the log files are to be saved.		Storage location	-
scriptLogSeverity	Indicates the system logging level.	2	2 to 8	8 (Debug3)
uiScriptlogSeverity			1	
MaxScriptLogsize	Indicates the maximum script log size.			10000
separateScriptLog			1	

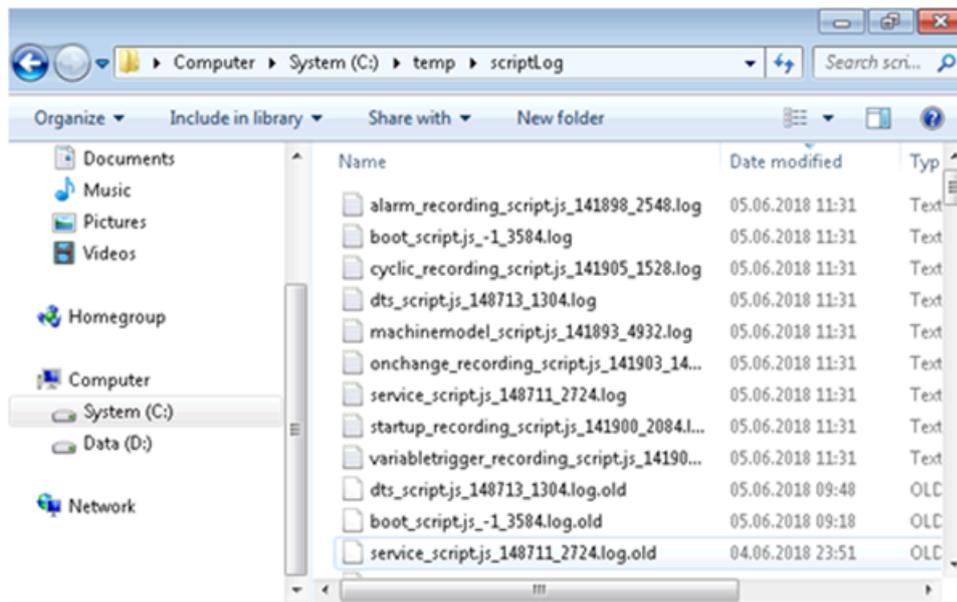
3.1 Activating log files PCU

Example:

```
<logging>  
<separateScriptLog active="1">1</separateScriptLog>  
<scriptLogPath active="1">C:\temp\scriptLog\</scriptLogPath>  
<scriptLogSeverity active="1">8</scriptLogSeverity>  
<uiScriptLogSeverity active="1">8</uiScriptLogSeverity>  
<maxScriptLogSize active="1">10000</maxScriptLogSize>  
<maxLogLifeTimeDays active="1">30</maxLogLifeTimeDays>  
</logging>
```

Checking log files

1. Open the following directory: C:\temp\scriptLog



2. Check the corresponding log files.

## Supplementary conditions

### "boot\_job" folder

If the "boot\_job" folder is not generated automatically, restart the control, and create the directory manually under: /var/tmp, or C:\temp for PCU.

### Occurrence of an error message if no activity takes place for an extended period after login

#### Error description:

After an extended period of inactivity (4 hours) of the application, the authorizations for communication via the user interface expire. The message "Authentication required" appears.

#### Remedy:

Log on to MindSphere again.

### An online script update during ongoing operation can result in loss of data

#### Error description:

While the scripts that contain the execution logic on the control are being updated, it cannot be ensured that the data will be recorded continuously through periods when the scripts are stopping and restarting.

#### Remedy:

No remedy possible.

### Update of the application logic crashes SINUMERIK Operate

#### Error description:

Updating the application logic by updating the system at the server end can, in very rare cases, cause SINUMERIK Operate to crash.

#### Remedy:

Restart SINUMERIK Operate.

### Data buffering when no Internet connection is available

#### Information:

If your control has no Internet connection or if MindSphere is not accessible (e.g. due to an Internet failure), the data is buffered on the SINUMERIK controller.

The size of this buffer is limited to 50 MB.

The length of period during which data can be buffered without loss of data depends on the number and type of variables, frequency of changes, and the recording rhythms.

### Occurrence of sporadic faulty behavior on the user interface

**Error description:**

After the MindSphere or one of the components in the user interface has been updated, the user interface may behave incorrectly.

**Remedy:**

Delete your browser cache, e.g. with the key combination <Shift> + <F5>.

### Changing the "ePSConfig.user.xml" file

**Information:**

Changes to the file "ePSConfig.user.xml" may only be performed after consultation with the Hotline, Service, Development, or PM.

### No 1:n connections released to the SINUMERIK Integrate client

**Information:**

The SINUMERIK Integrate client does not support any 1:n connections. That is to say, no access to a further control is possible via the SINUMERIK Integrate client.

### The Asset Manager only supports German and English

**Error description:**

If a language other than German or English is set, the Asset Manager pages cannot be completely loaded. The Asset Manager is displayed in English.

**Remedy:**

Use only German or English as browser languages.

### Connection to MindSphere must be established via TLS 1.2

**Error description:**

For security reasons, MindSphere requests a connection that satisfies the TLS 1.2 standard. A reverse proxy that supports TLS 1.2 is required for the versions of SINUMERIK Integrate Client that do not support TLS 1.2.

The connection of SINUMERIK controls to MindSphere and Analyze MyPerformance /OEE Monitor, Analyze MyPerformance /OEE Tuning must meet the highest security standards.

### System crash when etc/host file is changed

**Error description:**

The use of the SINUMERIK Integrate client with a changed etc/host file leads to unexpected system crashes.

**Remedy:**

No remedy possible.

### There must be sufficient memory for the buffering of data

**Error description:**

If there is not sufficient memory space on the CF card, the data will no longer be written to the CF card and the entire data recording process will be stopped.

**Remedy:**

Ensure that there is sufficient memory space. If this problem arises, delete the buffer on the 2nd level.

### The SINUMERIK controller cannot be reconnected using the "cert.key" file

**Error description:**

The SINUMERIK controller can no longer establish a connection if you attempt to reconnect the SINUMERIK controller to MindSphere with the existing "cert.key" file.

**Remedy:**

If you want to connect the SINUMERIK controller to MindSphere, delete the existing "cert.key" file and insert a new "onboard.key" file.

### The file name "onboard.key" must not contain any numbers

**Error description:**

If the user downloads the file multiple times during a download process, the browser provides them with successive incremental numbers. The name of the copied "onboard.key" file on the SINUMERIK controller (/var/tmp/boot\_job) should not contain any numbers. For example: The file name should not be "onboard (1).key".

**Remedy:**

Make sure that an "onboard.key" file copied onto the SINUMERIK controller (/var/tmp/boot\_job) does not contain any numbers. Ensure that the file name is "onboard.key".

## You can only disconnect the connection after deleting cert.key

### Error description:

The existing "cert.key" file cannot be used to disconnect the SINUMERIK controller from MindSphere.

### Remedy:

Delete the cert.key file from the <TempDir>/boot\_job directory.

## Timeouts result in errors

### Error description:

A 30 minute timeout in MindSphere can lead to errors in the "Analyze MyPerformance /OEE Monitor, Analyze MyPerformance /OEE Tuning" application.

### Remedy:

A log off from MindSphere and then log on again.

## The onboard.key cannot be downloaded in Mozilla Firefox

### Error description:

If, in Mozilla Firefox, you click on "Connect SINUMERIK with MindSphere" under "MTA Asset Config" to establish a connection, then the "onboard.key" file is not downloaded.

### Remedy:

After you have clicked "Connect SINUMERIK to MindSphere", a text appears in the browser window that starts with "privateKey".

Copy the complete text to the clipboard (Ctrl+C). Then paste the copied text into a text editor, and save the file under the "onboard.key" name. You can now use the "onboard.key" file to establish a connection.

Alternatively, you can use Google Chrome to download the "onboard.key" file. Mozilla Firefox is then available once more for the "Analyze MyPerformance /OEE Monitor, Analyze MyPerformance /OEE Tuning" application.

## Performance problems with Mozilla Firefox

### Error description:

Occasionally, performance problems are encountered when using Mozilla Firefox.

### Remedy:

Use Google Chrome for "Analyze MyPerformance /OEE Monitor, Analyze MyPerformance /OEE Tuning" to achieve a higher performance.

## Performance monitoring

### **Error description:**

If the SINUMERIK controller is powered down and remains shut down for several days, then the times are not taken into account in the OEE calculation.

### **Remedy:**

No remedy possible

## User rights

### **Error description:**

If a user is created as a subtenant user, he can view all but not change the assets of the area in "Analyze MyPerformance /OEE Monitor, Analyze MyPerformance /OEE Tuning".

If the subtenant user has administrator rights and opens a product, he can view the other assets and change their machine utilization plan and the number of produced workpieces.

### **Remedy:**

Do not create the user as subtenant user.

## MindSphere/Asset Manager - several assets can be created with identical names

### **Error description:**

Possibility of using designation/names that are not unique.

Depending on MindSphere restrictions, it is possible to use identical names in subtenants and tenants.

### **Remedy:**

Use a name assignment concept that ensures that unique names are assigned.

## Analyze MyPerformance /OEE Monitor, Analyze MyPerformance /OEE Tuning - time intervals

### **Error description:**

Adapting the time interval

If the time interval is changed while editing the utilization plans, e.g. from 30 minutes to 60 minutes, any shorter time intervals cannot be appropriately adapted.

### **Remedy:**

Use short time intervals to adapt the duration of the time intervals.

## Performance monitoring

### **Error description:**

Current week is calculated up to the end of the day.

The actual Key Performance Indicators (KPI) are calculated only once a day overnight. This can result in incorrect values.

**Remedy:**

No remedy possible.

**Analyze MyPerformance /OEE Monitor, Analyze MyPerformance /OEE Tuning / MindSphere Asset Manager - correct use of the time zones**

**Error description**

If the time-zone information in the Asset Manager differs from that in the assigned shift plan, this leads to incorrect OEE calculations.

Analyze MyPerformance receives the time-zone information directly from the Asset Manager. It is no longer possible to work in Analyze MyPerformance without time-zone information. The shift plan is taken into account in the OEE calculations according to the time-zone selected in the Asset Manager.

If you have not selected a time zone when creating the asset, the time zone "Europe/Berlin" is automatically assigned.

**Remedy**

Select the right time zone when creating an asset.

Note that the time-zone selection cannot be changed after the asset has been created.

- If you are working with an asset that does not contain a time zone, make sure that the shift plan is created according to the "Europe/Berlin" time zone in Analyze MyPerformance.
- In MindSphere, do not select any time zone with 3 letters, such as PST, SST, VST, etc. The selection can have negative effects on Analyze MyPerformance /OEE Monitor, Analyze MyPerformance /OEE Tuning.

**Installation with the 3rd PartyController**

**Requirement**

Uninstall the previous FANUC version before making an installation with the 3rd PartyController.

**Deleted SINUMERIK Integrate Gateway Assets are not restored**

**Error description**

There is no function in MindSphere that allows deleted assets to be restored.

**Remedy**

Do not delete any SINUMERIK Integrate Gateway Assets, as these can no longer be restored.

### The machine model is not loaded via SINUMERIK Integrate Gateway

The machine model is not uploaded via SINUMERIK Integrate Gateway, which means that certain information is not available, for example online status, version information.

**Remedy:**

No remedy possible.

### MindSphere Alibaba does not support any spindles with Sensor Module SMI24

MindSphere Alibaba does not support the display of spindles with Sensor Modul SMI24

**Remedy:**

No remedy possible.

### Determining the address of a spindle with Sensor Module SMI24

You can read off the position of the spindle in the SINAMICS topology on the title bar of the drive parameter.

The information is displayed as follows:

<number of machine axis>:<name of machine axis>/<identifier of machine axis>

The <identifier of machine axis> comprises:

<character string>\_<bus number>.<slave number>:<DO number>

1. Note down the "Bus number" and "Slave number" of the spindle.
2. In the "SINUMERIK presets" window of the Asset Manager, you require both of these values as well as the drive number from the "Machine Configuration" list.

**Additional information** to address the spindle using the SMI24 Sensor Module is provided in:

Function Manual MindSphere Application Manage MyMachines, Manage MyMachines / Spindle Monitor

### Configuring the spindle with Sensor Module SMI24-variable

Make the following configuration, if you wish to capture the data of an SMI24 module with SINUMERIK Integrate Gateway in MindSphere:

1. Create a variable monitor with the name "SpindleMonitorConfig".  
**You can find additional information** on "Aspects" in:  
 Function Manual MindSphere Application Manage MyMachines, Manage MyMachines / Spindle Monitor
2. For example, take the following variables and a time-based trigger, which sends data to MindSphere at a rate of 1 minute.  
 Address 14,4,3 changes as a function of the machine configuration.

Variable name	Address	Data source	AMC data type	Mind-Sphere data type	Mind-Sphere unit
ActualClampingTimeWithoutTool	5049[1], 14,4,3	Sinamics Drive	FLOAT	DOUBLE	ms
ClampingTime	5049[0], 14,4,3	Sinamics Drive	FLOAT	DOUBLE	ms
FaultKTY2TempExcNum	5061[4], 14,4,3	Sinamics Drive	FLOAT	DOUBLE	-
FaultKTY2TempLastTime	5063[4], 14,4,3	Sinamics Drive	FLOAT	DOUBLE	-
FaultKTY2TempTotTime	5062[4], 14,4,3	Sinamics Drive	FLOAT	DOUBLE	s
FaultMotorTempExcNum	5061[2], 14,4,3	Sinamics Drive	FLOAT	DOUBLE	-
FaultMotorTempLastTime	5063[2], 14,4,3	Sinamics Drive	FLOAT	DOUBLE	-
FaultMotorTempTotTime	5062[2], 14,4,3	Sinamics Drive	FLOAT	DOUBLE	s
MatrixOpsHours_0	5088[0], 14,4,3	Sinamics Drive	FLOAT	DOUBLE	s
MatrixOpsHours_1	5088[1], 14,4,3	Sinamics Drive	FLOAT	DOUBLE	s
MatrixOpsHours_10	5088[10], 14,4,3	Sinamics Drive	FLOAT	DOUBLE	s
MatrixOpsHours_11	5088[11], 14,4,3	Sinamics Drive	FLOAT	DOUBLE	s
MatrixOpsHours_12	5088[12], 14,4,3	Sinamics Drive	FLOAT	DOUBLE	s
MatrixOpsHours_13	5088[13], 14,4,3	Sinamics Drive	FLOAT	DOUBLE	s
MatrixOpsHours_14	5088[14], 14,4,3	Sinamics Drive	FLOAT	DOUBLE	s
MatrixOpsHours_15	5088[15], 14,4,3	Sinamics Drive	FLOAT	DOUBLE	s
MatrixOpsHours_16	5088[16], 14,4,3	Sinamics Drive	FLOAT	DOUBLE	s

Variable name	Address	Data source	AMC data type	Mind-Sphere data type	Mind-Sphere unit
MatrixOpsHours_17	5088[17],14,4,3	Sinamics Drive	FLOAT	DOUBLE	s
MatrixOpsHours_18	5088[18],14,4,3	Sinamics Drive	FLOAT	DOUBLE	s
MatrixOpsHours_19	5088[19],14,4,3	Sinamics Drive	FLOAT	DOUBLE	s
MatrixOpsHours_2	5088[2],14,4,3	Sinamics Drive	FLOAT	DOUBLE	s
MatrixOpsHours_20	5088[20],14,4,3	Sinamics Drive	FLOAT	DOUBLE	s
MatrixOpsHours_21	5088[21],14,4,3	Sinamics Drive	FLOAT	DOUBLE	s
MatrixOpsHours_22	5088[22],14,4,3	Sinamics Drive	FLOAT	DOUBLE	s
MatrixOpsHours_23	5088[23],14,4,3	Sinamics Drive	FLOAT	DOUBLE	s
MatrixOpsHours_24	5088[24],14,4,3	Sinamics Drive	FLOAT	DOUBLE	s
MatrixOpsHours_25	5088[25],14,4,3	Sinamics Drive	FLOAT	DOUBLE	s
MatrixOpsHours_26	5088[26],14,4,3	Sinamics Drive	FLOAT	DOUBLE	s
MatrixOpsHours_27	5088[27],14,4,3	Sinamics Drive	FLOAT	DOUBLE	s
MatrixOpsHours_28	5088[28],14,4,3	Sinamics Drive	FLOAT	DOUBLE	s
MatrixOpsHours_29	5088[29],14,4,3	Sinamics Drive	FLOAT	DOUBLE	s
MatrixOpsHours_3	5088[3],14,4,3	Sinamics Drive	FLOAT	DOUBLE	s
MatrixOpsHours_30	5088[30],14,4,3	Sinamics Drive	FLOAT	DOUBLE	s
MatrixOpsHours_31	5088[31],14,4,3	Sinamics Drive	FLOAT	DOUBLE	s
MatrixOpsHours_32	5088[32],14,4,3	Sinamics Drive	FLOAT	DOUBLE	s
MatrixOpsHours_33	5088[33],14,4,3	Sinamics Drive	FLOAT	DOUBLE	s
MatrixOpsHours_34	5088[34],14,4,3	Sinamics Drive	FLOAT	DOUBLE	s
MatrixOpsHours_35	5088[35],14,4,3	Sinamics Drive	FLOAT	DOUBLE	s
MatrixOpsHours_4	5088[4],14,4,3	Sinamics Drive	FLOAT	DOUBLE	s
MatrixOpsHours_5	5088[5],14,4,3	Sinamics Drive	FLOAT	DOUBLE	s

Variable name	Address	Data source	AMC data type	Mind-Sphere data type	Mind-Sphere unit
MatrixOpsHours_6	5088[6],14,4,3	Sinamics Drive	FLOAT	DOUBLE	s
MatrixOpsHours_7	5088[7],14,4,3	Sinamics Drive	FLOAT	DOUBLE	s
MatrixOpsHours_8	5088[8],14,4,3	Sinamics Drive	FLOAT	DOUBLE	s
MatrixOpsHours_9	5088[9],14,4,3	Sinamics Drive	FLOAT	DOUBLE	s
MatrixSpeedThreshold-Number	5082,14,4,3	Sinamics Drive	FLOAT	DOUBLE	-
MatrixSpeedThrs_0	5084[0],14,4,3	Sinamics Drive	FLOAT	DOUBLE	-
MatrixSpeedThrs_1	5084[1],14,4,3	Sinamics Drive	FLOAT	DOUBLE	-
MatrixSpeedThrs_2	5084[2],14,4,3	Sinamics Drive	FLOAT	DOUBLE	-
MatrixSpeedThrs_3	5084[3],14,4,3	Sinamics Drive	FLOAT	DOUBLE	-
MatrixSpeedThrs_4	5084[4],14,4,3	Sinamics Drive	FLOAT	DOUBLE	-
MatrixSpeedThrs_5	5084[5],14,4,3	Sinamics Drive	FLOAT	DOUBLE	-
MatrixSpeedThrs_6	5084[6],14,4,3	Sinamics Drive	FLOAT	DOUBLE	-
MatrixSpeedThrs_7	5084[7],14,4,3	Sinamics Drive	FLOAT	DOUBLE	-
MatrixSpeedThrs_8	5084[8],14,4,3	Sinamics Drive	FLOAT	DOUBLE	-
MatrixTorqueThreshold-Number	5083,14,4,3	Sinamics Drive	FLOAT	DOUBLE	-
MatrixTorqueThrs_0	5085[0],14,4,3	Sinamics Drive	FLOAT	DOUBLE	nm
MatrixTorqueThrs_1	5085[1],14,4,3	Sinamics Drive	FLOAT	DOUBLE	nm
MatrixTorqueThrs_2	5085[2],14,4,3	Sinamics Drive	FLOAT	DOUBLE	nm
MatrixTorqueThrs_3	5085[3],14,4,3	Sinamics Drive	FLOAT	DOUBLE	nm
MatrixTorqueThrs_4	5085[4],14,4,3	Sinamics Drive	FLOAT	DOUBLE	nm
MatrixTorqueThrs_5	5085[5],14,4,3	Sinamics Drive	FLOAT	DOUBLE	nm
MatrixTorqueThrs_6	5085[6],14,4,3	Sinamics Drive	FLOAT	DOUBLE	nm
MatrixTorqueThrs_7	5085[7],14,4,3	Sinamics Drive	FLOAT	DOUBLE	nm

Variable name	Address	Data source	AMC data type	Mind-Sphere data type	Mind-Sphere unit
MatrixTorqueThrs_8	5085[8],14,4,3	Sinamics Drive	FLOAT	DOUBLE	nm
Motor_temp	35,14,4,3	Sinamics Drive	FLOAT	DOUBLE	°C
NumOfClamping	5045[0],14,4,3	Sinamics Drive	FLOAT	DOUBLE	-
NumOfClampingOpsOutOfTol	5045[4],14,4,3	Sinamics Drive	FLOAT	DOUBLE	-
NumOfClampingOpsWithTol	5045[3],14,4,3	Sinamics Drive	FLOAT	DOUBLE	-
NumOfFaultClamping	5045[1],14,4,3	Sinamics Drive	FLOAT	DOUBLE	-
OpHoursControl	5052,14,4,3	Sinamics Drive	FLOAT	DOUBLE	s
OpHoursSpeed	5051,14,4,3	Sinamics Drive	FLOAT	DOUBLE	s
OrderNumber_0	5021[0],14,4,3	Sinamics Drive	FLOAT	DOUBLE	-
OrderNumber_1	5021[1],14,4,3	Sinamics Drive	FLOAT	DOUBLE	-
OrderNumber_10	5021[10],14,4,3	Sinamics Drive	FLOAT	DOUBLE	-
OrderNumber_11	5021[11],14,4,3	Sinamics Drive	FLOAT	DOUBLE	-
OrderNumber_12	5021[12],14,4,3	Sinamics Drive	FLOAT	DOUBLE	-
OrderNumber_13	5021[13],14,4,3	Sinamics Drive	FLOAT	DOUBLE	-
OrderNumber_14	5021[14],14,4,3	Sinamics Drive	FLOAT	DOUBLE	-
OrderNumber_15	5021[15],14,4,3	Sinamics Drive	FLOAT	DOUBLE	-
OrderNumber_16	5021[16],14,4,3	Sinamics Drive	FLOAT	DOUBLE	-
OrderNumber_17	5021[17],14,4,3	Sinamics Drive	FLOAT	DOUBLE	-
OrderNumber_2	5021[2],14,4,3	Sinamics Drive	FLOAT	DOUBLE	-
OrderNumber_3	5021[3],14,4,3	Sinamics Drive	FLOAT	DOUBLE	-
OrderNumber_4	5021[4],14,4,3	Sinamics Drive	FLOAT	DOUBLE	-
OrderNumber_5	5021[5],14,4,3	Sinamics Drive	FLOAT	DOUBLE	-
OrderNumber_6	5021[6],14,4,3	Sinamics Drive	FLOAT	DOUBLE	-

Variable name	Address	Data source	AMC data type	Mind-Sphere data type	Mind-Sphere unit
OrderNumber_7	5021[7],14,4,3	Sinamics Drive	FLOAT	DOUBLE	-
OrderNumber_8	5021[8],14,4,3	Sinamics Drive	FLOAT	DOUBLE	-
OrderNumber_9	5021[9],14,4,3	Sinamics Drive	FLOAT	DOUBLE	-
ProdDate	5023,14,4,3	Sinamics Drive		STRING	-
PTCMotorTempExcNum	5061[0],14,4,3	Sinamics Drive	FLOAT	DOUBLE	-
PTCMotorTempLastTime	5063[0],14,4,3	Sinamics Drive	FLOAT	DOUBLE	-
PTCMotorTempTotTime	5062[0],14,4,3	Sinamics Drive	FLOAT	DOUBLE	s
RefClampingTimeAvg	5046[2],14,4,3	Sinamics Drive	FLOAT	DOUBLE	ms
RefClampingTimeMax	5046[1],14,4,3	Sinamics Drive	FLOAT	DOUBLE	ms
RefClampingTimeMin	5046[0],14,4,3	Sinamics Drive	FLOAT	DOUBLE	ms
ReferenceClampingTime-WithoutTool	5042[1],14,4,3	Sinamics Drive	FLOAT	DOUBLE	ms
SerialNumber_0	5022[0],14,4,3	Sinamics Drive	FLOAT	DOUBLE	-
SerialNumber_1	5022[1],14,4,3	Sinamics Drive	FLOAT	DOUBLE	-
SerialNumber_2	5022[2],14,4,3	Sinamics Drive	FLOAT	DOUBLE	-
SerialNumber_3	5022[3],14,4,3	Sinamics Drive	FLOAT	DOUBLE	-
SpindleSuppTemp	4105,14,4,3	Sinamics Drive	FLOAT	DOUBLE	°C
SuppTempLabel	4107[0],14,4,3	Sinamics Drive	FLOAT	DOUBLE	-
TrendClampingTime24	5046[3],14,4,3	Sinamics Drive	FLOAT	DOUBLE	ms
TrendClampingTime240	5046[4],14,4,3	Sinamics Drive	FLOAT	DOUBLE	ms
TrendClampingTime2400	5046[5],14,4,3	Sinamics Drive	FLOAT	DOUBLE	ms
WarningKTY2TempExc-Num	5061[3],14,4,3	Sinamics Drive	FLOAT	DOUBLE	-
WarningKTY2TempLast-Time	5063[3],14,4,3	Sinamics Drive	FLOAT	DOUBLE	-
WarningKTY2TempTot-Time	5062[3],14,4,3	Sinamics Drive	FLOAT	DOUBLE	s

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Variable name	Address	Data source	AMC data type	Mind-Sphere data type	Mind-Sphere unit
WarningMotorTempExc-Num	5061[1],14,4,3	Sinamics Drive	FLOAT	DOUBLE	-
WarningMotorTempLast-Time	5063[1],14,4,3	Sinamics Drive	FLOAT	DOUBLE	-
WarningMotorTempTot-Time	5062[1],14,4,3	Sinamics Drive	FLOAT	DOUBLE	s

