

CONFIGURATION GUIDE

How to Connect
dataFEED OPC Suite to
Siemens MindSphere



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1. Preliminary Remarks

This configuration guide describes how to configure *dataFEED OPC Suite* as *Siemens MindSphere* device and thus to transfer shopfloor data to *Siemens MindSphere*.

NOTE:

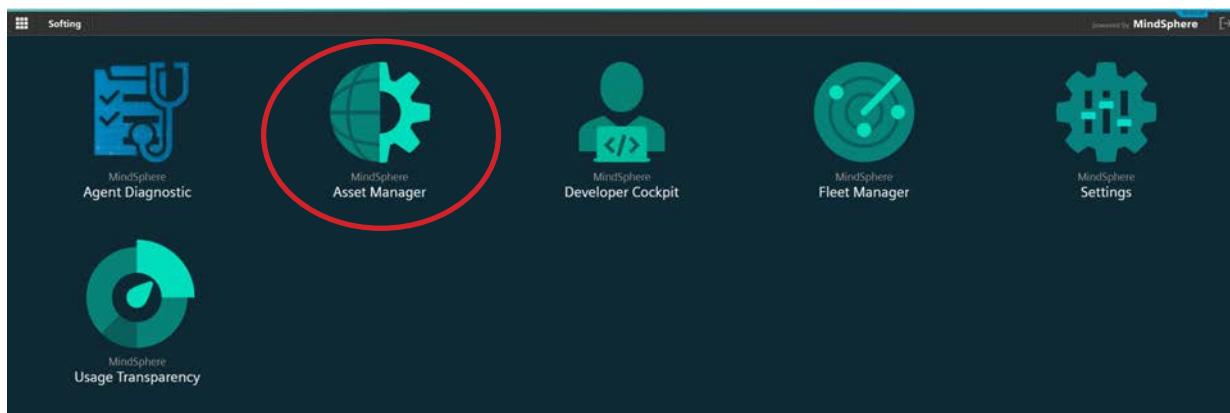
This configuration guide reflects the *Siemens MindSphere* status and operating structure as available in May 2019. Today, *Siemens MindSphere* is managed in a similar way but detailed steps have been updated since then.

NOTE:

- Additional *dataFEED OPC Suite* information can be found at the according product web pages.
dataFEED OPC UA Suite Extended: <https://industrial.softing.com/products/opc-opc-ua-software-platform/opc-server-middleware/datafeed-opc-suite-extended.html>
dataFEED OPC UA Suite Base: <https://industrial.softing.com/products/opc-opc-ua-software-platform/opc-server-middleware/datafeed-opc-suite-base.html>

2. Start *Siemens MindSphere* Configuration for Data Exchange With *dataFEED OPC Suite*

- Log in to *Siemens MindSphere* in Internet Browser using URL <https://tinyurl.com/y882czbx>



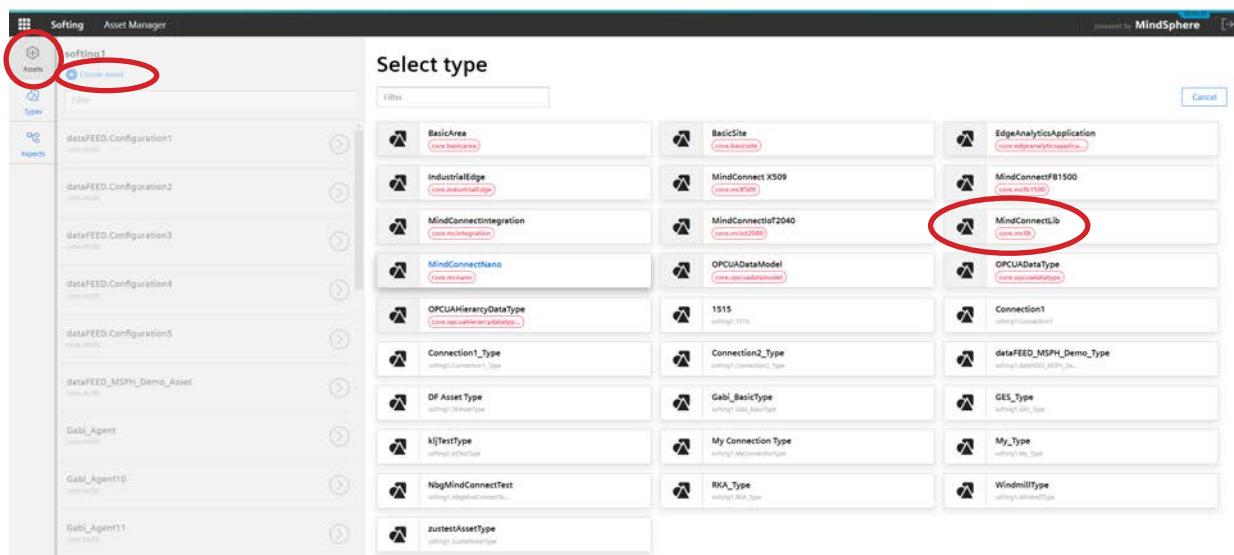
- Click Asset Manager link

The screenshot shows the 'Aspects' section of the Softing Asset Manager. On the left, there's a sidebar with navigation icons for Asset, Type, Device, and Aspects. The 'Aspects' icon is highlighted with a red circle. In the main pane, a list of aspects is shown, with 'AgentOnlineStatus' being the selected item, also highlighted with a red circle. The right side of the screen displays detailed information about 'AgentOnlineStatus', including its definition ('Online status of an agent typed asset'), variables ('onlineStatus' of type BOOLEAN), and types it's defined on ('BasicAgent' and 'BasicSiemensAsset').

- Select Aspects view
- Click *Create aspect* link for creating a new aspect

This screenshot shows the 'Create aspect' dialog. In the 'Name' field, the value 'dataFEED_OP_C_Suite_Demo_Aspect' is entered and highlighted with a red circle. Below the name, there's a 'Description' field and a note about character limits. Under 'Choose category', the 'Dynamic' option is selected. In the 'Variables' section, a single variable 'Temperature' is defined with a data type of 'INT' and a unit of 'Celsius'. A note states that variable names must be unique. At the bottom of the dialog, the 'Save' button is circled in red.

- Enter freely selectable aspect name in *Name* field
- Add all individual variables including their including their data types and units in *Add variable* section
In case of string variables also their maximum string lengths have to be defined.
- Press *Save* button



- Select Assets view
- Click *Create asset* link for creating a new asset
- Select *ModConnectLib* asset type

Add asset

General

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

Name: *

Description:
255 characters left

Location

Variables

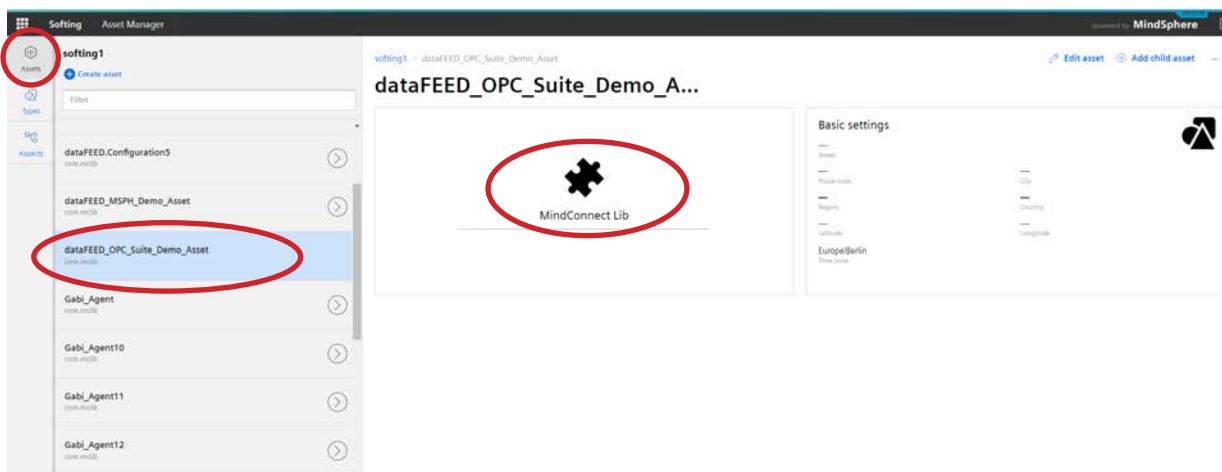
Aspects

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

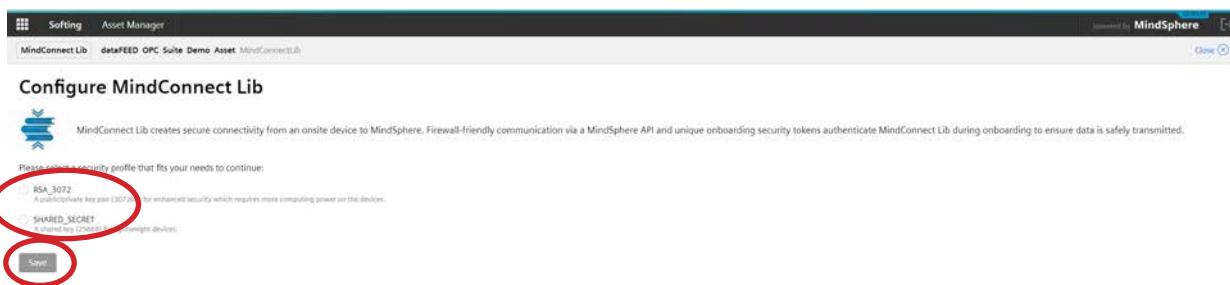
* Required input field

Save **Cancel**

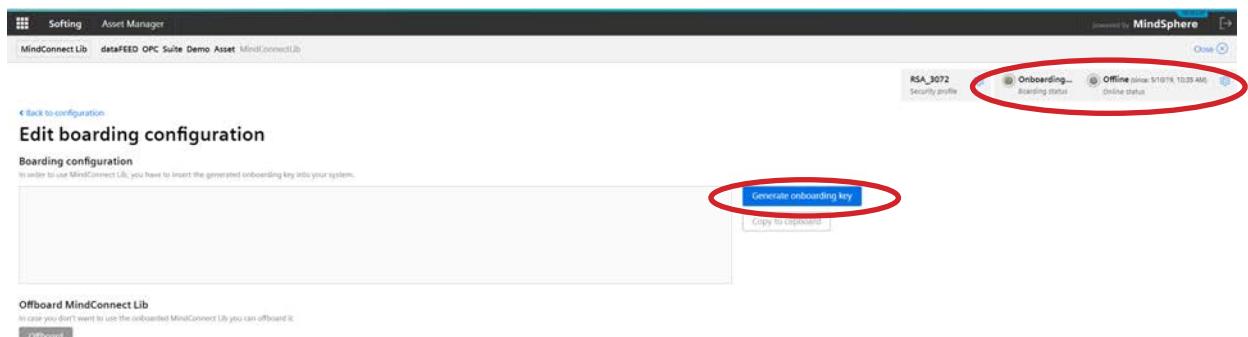
- Enter freely selectable asset name in *Name* field
- Press *Save* button



- Select Assets view
- Select previously created asset
- Click *ModConnectLib* link



- Select appropriate security profile in *Please select a security profile that fits your needs* section
- Press *Save* button

**NOTE:**

The top right section of the screen shows the *Boarding status* and *Online status* information:

At this stage the actual *Boarding status* is shown by a green blinking light and the text *Onboarding...* indicating that the **dataFEED OPC Suite** connection is in the configuration phase and not yet completed. Once the **dataFEED OPC Suite** connection has been established the *Boarding status* light is shown permanently green.

The *Online status* will change from *Offline* to *Online* as soon as data is received.

Clicking the *Setting* (gearwheel) icons at the top right of the screen allows to modify the *Security profile* respectively the *Online status* at any time.

- Press *Generate onboarding key* button

```

"content": {
  "baseURL": "https://eu1.mindsphere.io",
  "iat": "2024-01-15T10:00:00Z",
  "exp": "2024-01-15T10:00:00Z",
  "aud": "eu1.mindsphere",
  "client_id": "2faa2edc94841c5bdc1eb6d2f177970",
  "tenant": "softing"
}
  
```

Offboard MindConnect Lib
In case you don't want to use the onboarded MindConnect Lib you can offboard it.
Offboard

- Copy texts of lines *baseURL*, *iat* and *tenant* without quotation marks as part of generated onboarding key for use in **dataFEED OPC Suite** configuration in a later step

NOTE:

The *Siemens MindSphere* onboarding key is available only at this stage of *Siemens MindSphere* configuration.

NOTE:

As part of this information is needed in **dataFEED OPC Suite** configuration, *Siemens MindSphere* configuration is interrupted here and continued at a later step (see section 5.).

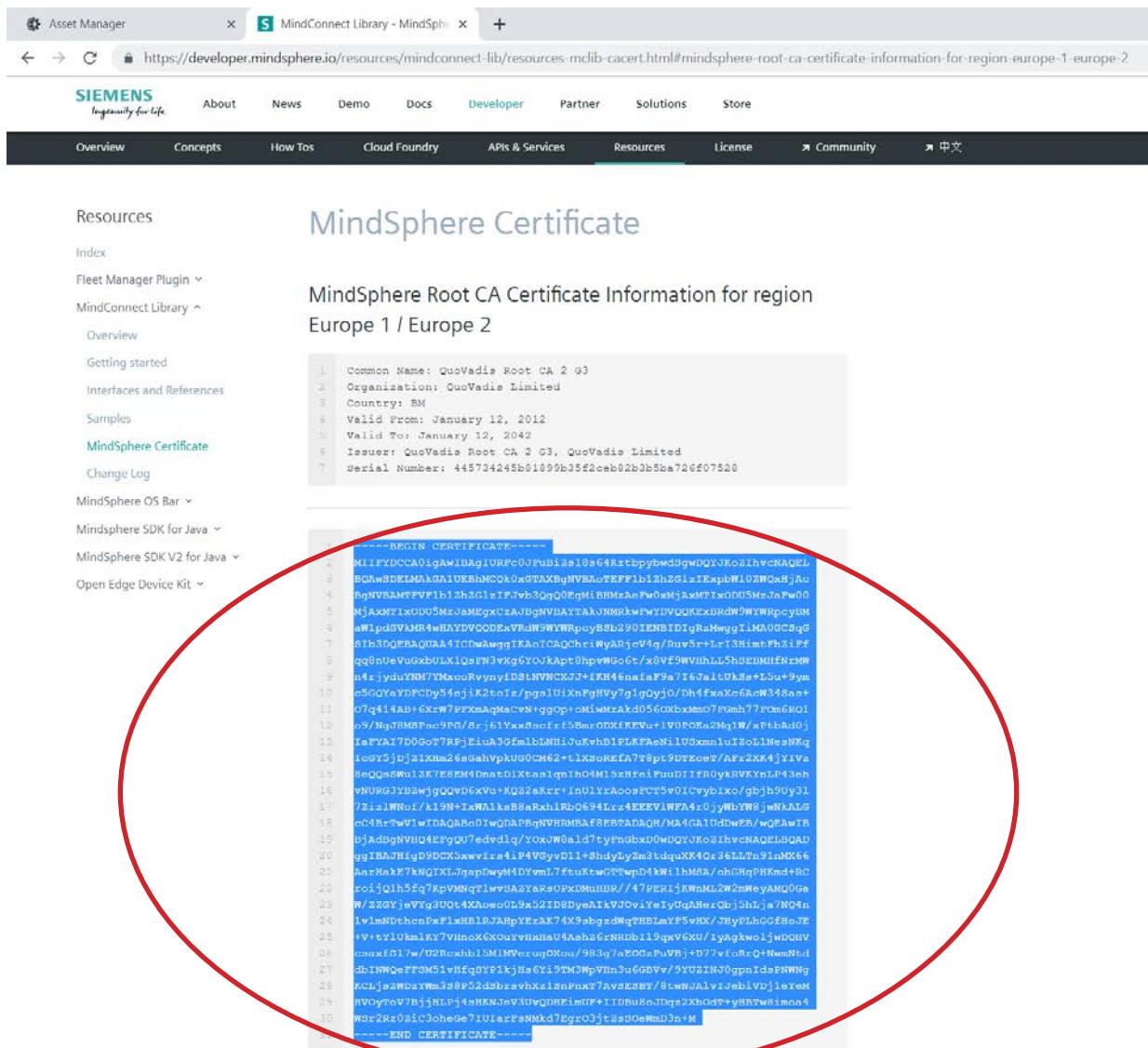
3. Create *Siemens MindSphere* Certificate File

NOTE:

A certificate file is required for the initial connection of *dataFEED OPC Suite* to *Siemens MindSphere*.

- In Internet Browser open URL

<https://developer.mindsphere.io/resources/mindconnect-lib/resources-mclib-cacert.html>



The screenshot shows a web browser window with the title "MindSphere Certificate". The URL in the address bar is <https://developer.mindsphere.io/resources/mindconnect-lib/resources-mclib-cacert.html#mindsphere-root-ca-certificate-information-for-region-europe-1-europe-2>. The page content displays "MindSphere Root CA Certificate Information for region Europe 1 / Europe 2". Below this, a large block of certificate text is shown, which is highlighted by a large red circle.

```

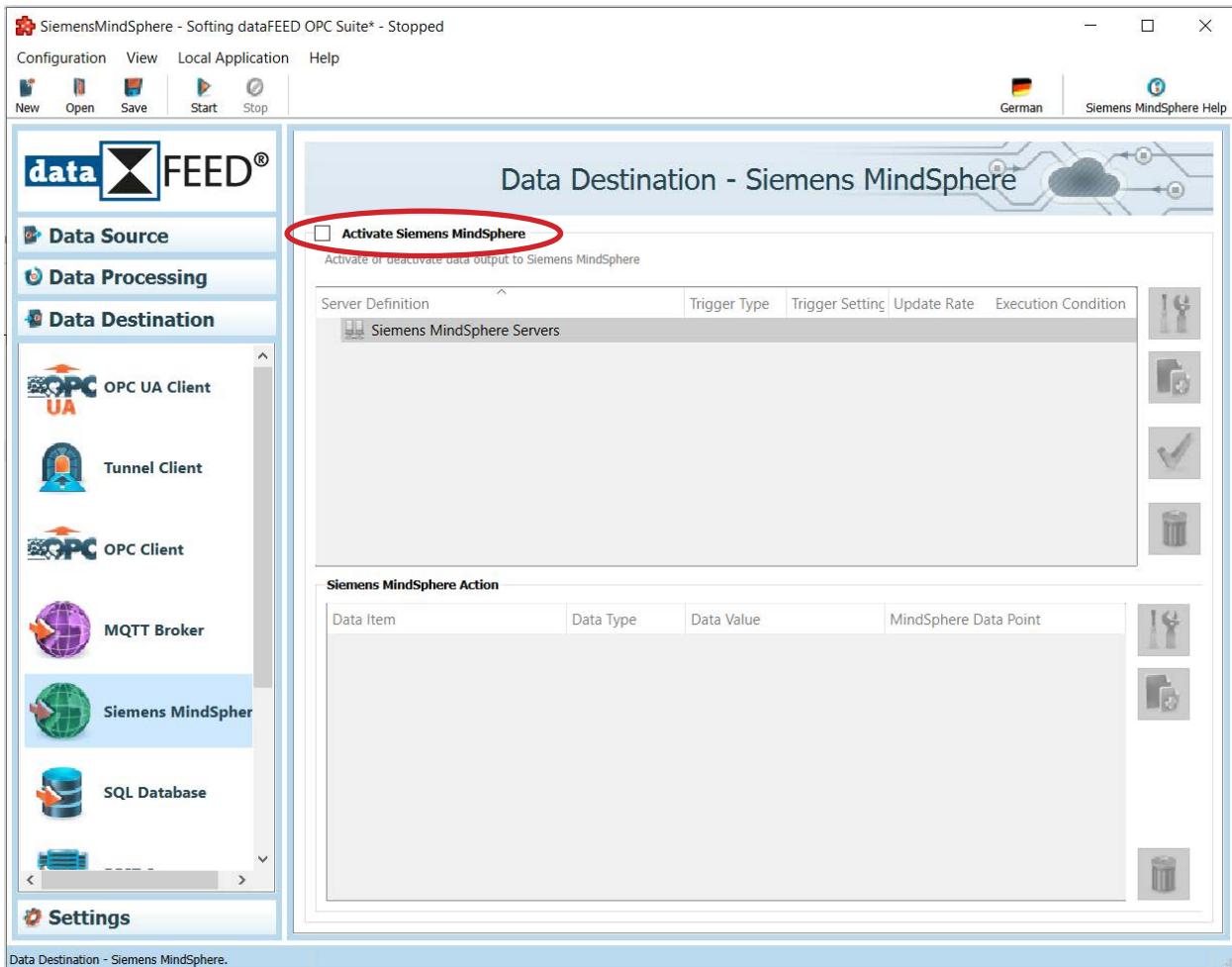
1: Common Name: QuoVadis Root CA 2 G3
2: Organization: QuoVadis Limited
3: Country: BM
4: Valid From: January 12, 2012
5: Valid To: January 12, 2042
6: Issuer: QuoVadis Root CA 2 G3, QuoVadis Limited
7: Serial Number: 445734245b01099b35f2ceb02b3b5ba726f07520
8: -----BEGIN CERTIFICATE-----
9: MIIYDCCAO1gAwIBAgIUREc0UjPuB1zla0s64Kxtbpybwed3gwDQYJKoZIhvcNAQEL
10: BOAw3DE1MGAJG1UEBhMC0k0gTAXBgNVAwTEFF1b1ZhZG1z1ExpbW10ZWQxHjAg
11: RqNV8AMTFVFB1b1ZhZG1z1FJvb3QgQ0EgqMhBRMzAeFw0uMjAxMTIxODU5MeJaFw00
12: MjAxMTIxODU5MeJaFw0uMjAxMTIxODU5MeJaFw00
13: aW1pdGVhMR4wAYDVQODExVRdW9WWRpuqyBSL290IE8NIDigRakWwg1lMA0GCSqD
14: 81h3DQFRQAA41ChDwAegqIKaoCAQChriMyArjv4Vqf/hw5r+l+r3hntPhX1FF
15: qq8nUeVuGxbUL1x1QsFnJvKgCYoJkapt0hpwGo6t/x0VE9WVhLLSh0uHmUfEnrMW
16: nfrjyduXNM7YMaeoRvny1D8tLNVNCXJ7fKH4naafF9a/162a1ttKhs+Es+Gu+9ym
17: chSGQyAyDPCDy54ejik2tnz/pgn1hixngh7v7gjgyo/0h4fxnXe6AeW348an+
18: 07q414Ab+6xrw#7PFKmaqMacCvN+iGpp+omifwazkAd056OxixMm07Pcmh77?Ycm6KO1
19: o/9/MqJ8MBPtuuSm/8,j61Yx8adefi1'sBeuODX4KPVv+i/V0pOrn2Mx1w+kThAnJ0
20: IsrXAT7D0GorTRFjElia30fm1LDHniuukvhB1PLKTAeHiiU0xmn1lIsol1ResMq
21: iogY5juj1lxm26sahvpU00CM62+1lxsoRkfA7Tepl9UTUzcew/AFz2XX4jY1va
22: ReQQm8w1zK7E8EM4mnat1xtan1mth04M1szxreiFmudITfR0yKVKyNLP4zeh
23: vMURG3YB2w)gQOvD6Xv0+Q22axrrtIn0LYAAos9CT5v0iCvybixo/gbjh9Uy3l
24: /2i1MNno/1i9N+TxWAlkaB8kh1RUQ694Lrx4KEERViWFPA4:0jyb1WwBjwXALG
25: ec45rtwV1wIDAQAB0f1wQDfBGNVRHRAfF8RVfANAQH/MA4GAIldiuwEB/wQFAwTH
26: b1AdbgNvIIQ4tzrgQ07dvd1q/YoxJW@0la47tyrnGbxit0WDQYJKoZihvvcNAQELBQA0
27: gyIBAJHfgD9DCX5awwirz4iP4VGyyD11+8hdyl2m3tdquXK40z26LTTh91nMx66
28: AarRak7%KQIXL1qepnly4DYmm7ftuvtewGTwP04wi1hMBA/ohGRqRKhmd+Rc
29: roijlh5fq7KpVNqNqrlwvAAYasrc0FxDMuHBr/47PER1jRNML2w2mweyAMQ0Ge
30: W/Z2G7jvEyYg3UOL4Xhawo0LB9x321D8dyeAtkV3OviYeyQAhExCbjsh1j7NG4n
31: lvinM0thcnfTw1xh81LRApYcrk74X9sbgrdMq7HmlayF5vtxX/JhyDlhGFrRcJF
32: v+ri10RmlxY7VinxG6ourvNdxu4Asa26frRhoB119gx6XU/luygkw1jwDQH
33: cmnxof17w/02Roshh1SMIMVrcuqDMou/983g7aEDGfMuVbj+77w+ohRzQ+NwmRtd
34: dbINWoerf7SM51vlfq0Y1kjh6X15TM3pVh3u6GDvV/9yDZINJ0gpmndzgHNNG
35: KCLjwswdxyrm38952dsbrzvhx1znnnxT7AvxkxM7/8twjAlivzeb1VUjlexEM
36: HVOYov7vJHlP4sHKNJevAUWQDFP1mUF71IDuR8J7qr2XhQDf+yHRTw8imon4
37: Wsu2r02iC3ohhe71UiarPaNmkd7EyrO3;taS3emMd3o+M
38: -----END CERTIFICATE-----

```

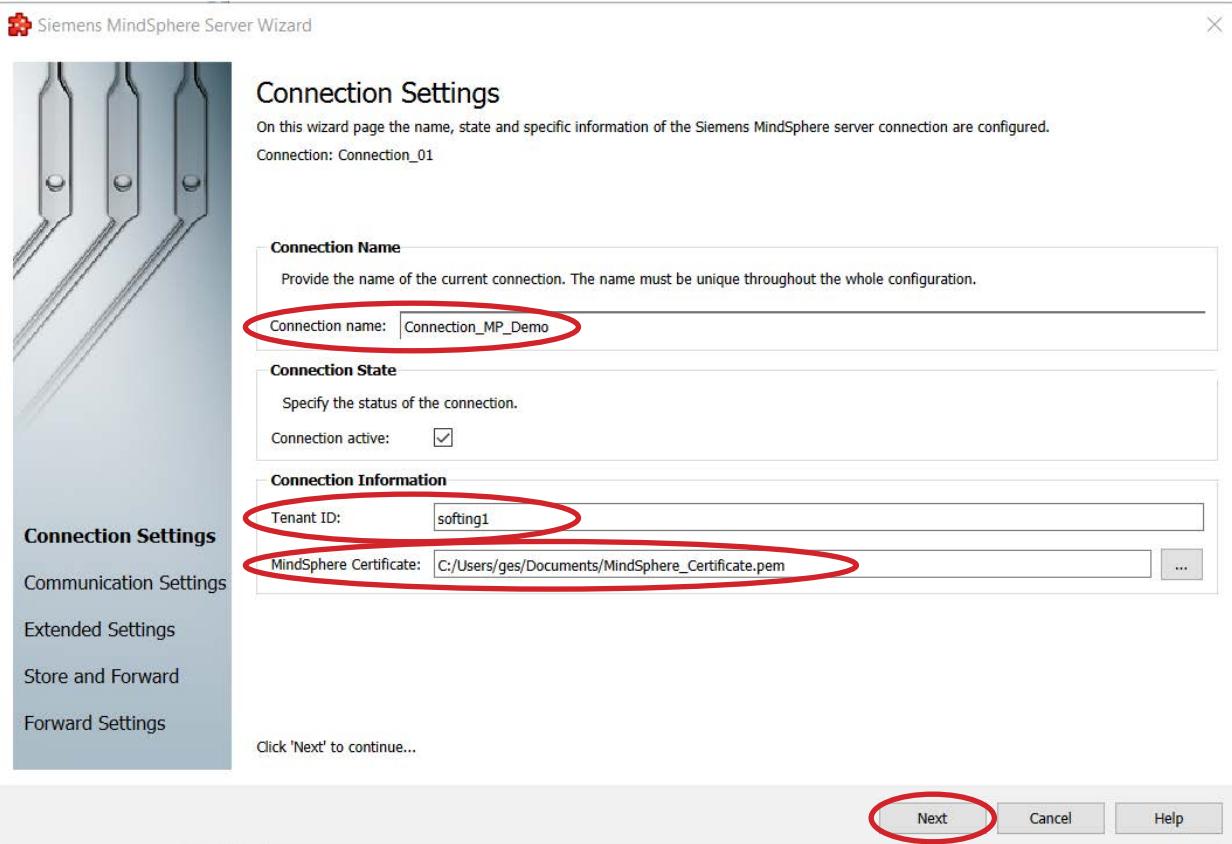
- Copy *Siemens MindSphere* certificate to clipboard
- Start text editor, paste clipboard and store *Siemens MindSphere* certificate in *.PEM* file
(If text editor doesn't support saving the certificate using the extension *.PEM*, just store the certificate to any file name and rename the file to *.PEM* file afterwards.)
-

4. Start *dataFEED OPC Suite* Configuration

- Open *dataFEED OPC Suite* configurator
- Navigate to *Data Destination/Siemens MindSphere*



- Activate *Activate Siemens MindSphere* checkbox

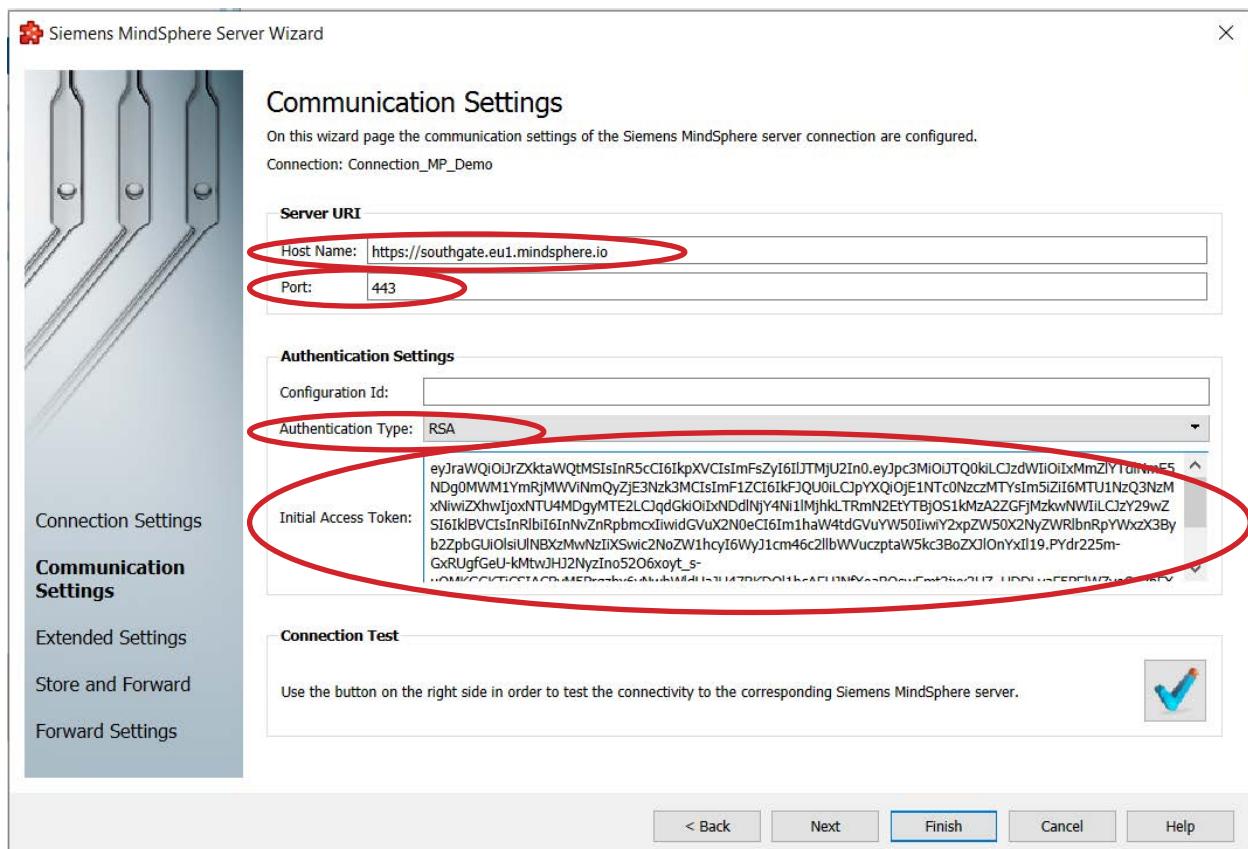


- Enter freely selectable connection name in *Connection name* field
- Enter personal tenant ID in *Tenant ID* field
Tenant ID is either defined in *Siemens MindSphere* contract or can be copied from *Siemens MindSphere* onboarding key.

NOTE:

If Tenant ID is copied from *Siemens MindSphere* onboarding key this information has to be copied without quotation marks.

- Enter name of *Siemens MindSphere* certificate file in *MindSphere Certificate* field (see section 3.)
- Press *Next* button



- Enter *baseUrl* information from *Siemens MindSphere* onboarding key in *Host Name* field (see section 2.)
- Do not change pre-defined port number in *Port* field
- Make sure the selection in *Authentification Type* field maps the security profile defined in *Siemens MindSphere*
- Enter *iat* information from *Siemens MindSphere* onboarding key in *Initial Access Token* field (see section 2.)

NOTE:

Information from the generated *Siemens MindSphere* onboarding key has to be copied without quotation marks.

NOTE:

For continuation of **dataFEED OPC Suite** configuration some more information from *Siemens MindSphere* configuration is required. Thus, **dataFEED OPC Suite configuration** is interrupted here and continued at a later step (see section 6.).

5. Continue *Siemens MindSphere* Configuration

NOTE:

This section continues section 2.

Boarding configuration

In order to use MindConnect Lib, you have to insert the generated onboarding key into your system.

```
content": {
  "baseUri": "https://southgate.eu1.mindsphere.io",
  "iat": "eyJraWQiOiJzXxtaVQtmSlmRScI6ikpXVlsmFsZyI6IUTMjU2in0eyJpc3MIQiJfQ0kiLCzdWlQixMmZlYtDlNmESNDg0MWM1YmRlMWVlNmQyZE3Nzk3MClsimF1ZC6ikfjQu0iLCjpxYXQiOjE1NTc0NzI",
  "clientCredentialProfile": [
    "RSA_3072"
  ],
  "clientId": "12fea7e6a94841c5bcd1eb6d2f177970",
  "tenant": "softing"
}
```

Generate onboarding key

Copy to clipboard

Offboard MindConnect Lib

In case you don't want to use the onboarded MindConnect Lib you can offboard it.

Offboard

- Click < Back to configuration link

Configuration

No configuration available
Please add a data source for configuration.

Add data source

- Press Add data source button

Add data source

Name: dataFEED_OPC_Suite_Demo_Datasource

Description:

* required input field

Accept

- Enter freely selectable data source name in Name field
- Click Accept button



- Copy *Configuration ID* to clipboard for further use in *dataFEED OPC Suite* configuration
- Press *Save* button

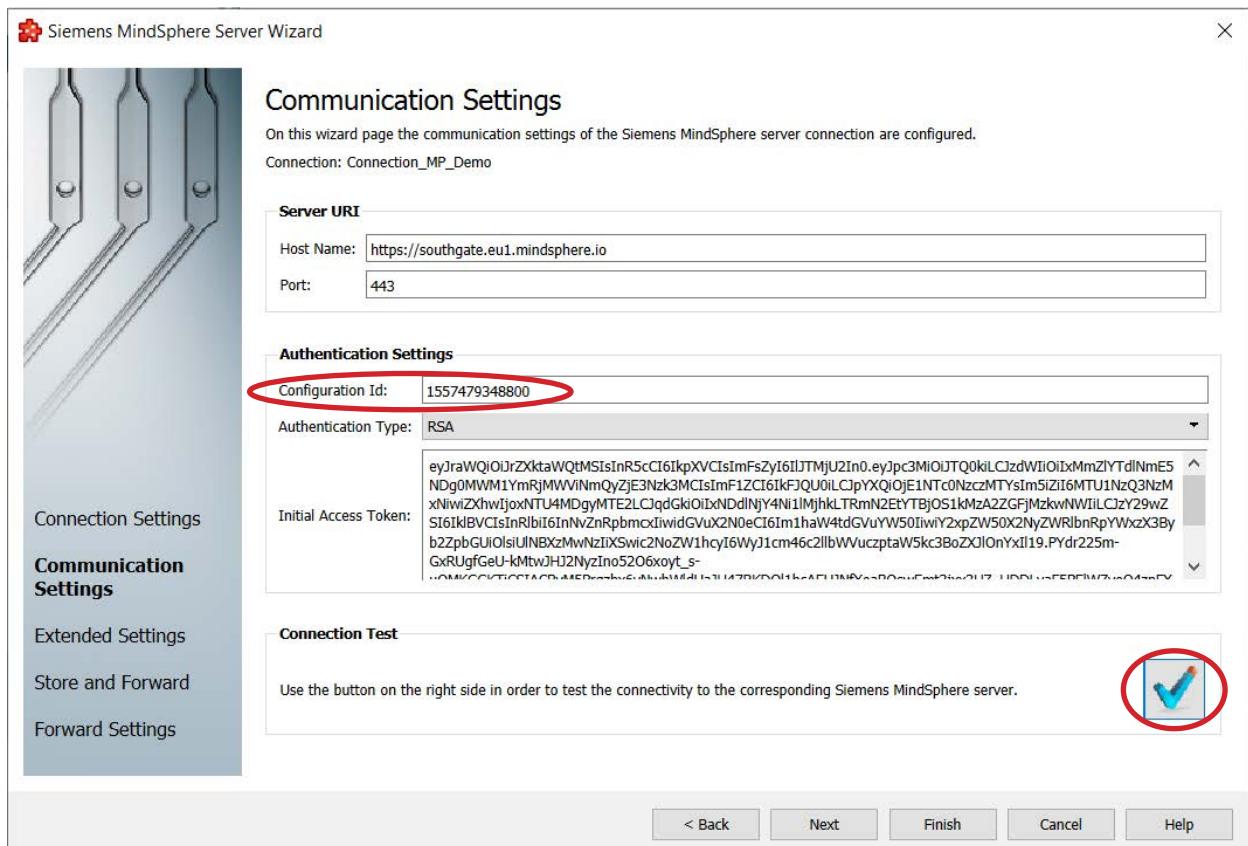
NOTE:

For continuing the *Siemens MindSphere* configuration the successful establishment of the connection to *dataFEED OPC Suite* is required. Therefore, the *Siemens MindSphere* configuration is interrupted here and continued at a later step (see section 7.).

6. Continue *dataFEED OPC Suite* Configuration

NOTE:

This section continues section 4.



- Enter copied configuration ID in *Configuration Id* field
- Click (*Connection test for the selected data source*) button for testing the connection between *dataFEED OPC Suite* and *Siemens MindSphere*

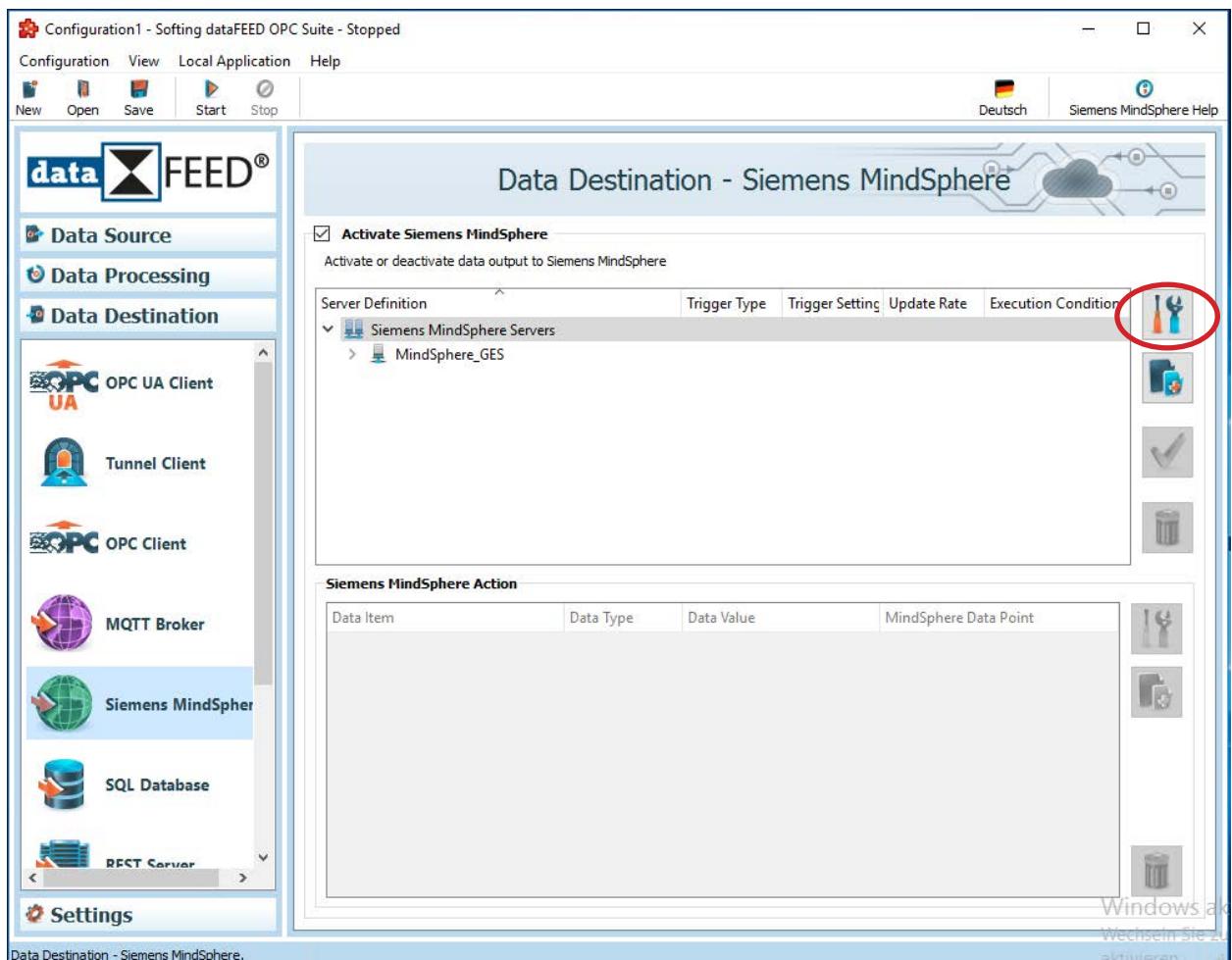
NOTE:

Continue with section 7., if connection between *dataFEED OPC Suite* and *Siemens MindSphere* has been established successfully.

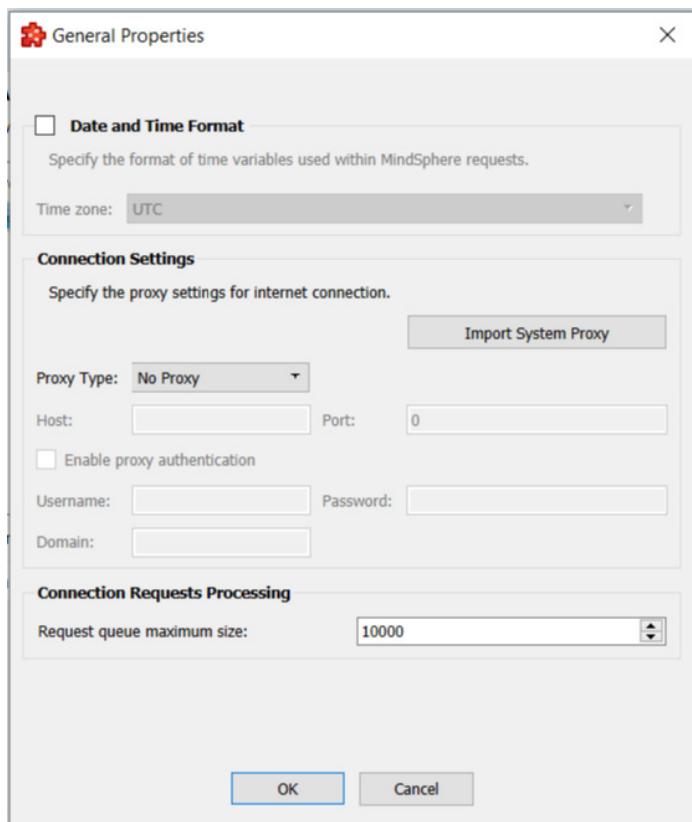
NOTE:

Correct proxy settings in ***dataFEED OPC Suite*** configuration as long as connection between ***dataFEED OPC Suite*** and ***Siemens MindSphere*** has not been established successfully.

- Navigate to *Data Destination/Siemens MindSphere*



- Press (*Properties*) button



- Check and correct individual Proxy settings until connection between ***dataFEED OPC Suite*** and ***Siemens MindSphere*** can been established successfully.

NOTE:

For continuation of ***dataFEED OPC Suite*** configuration some more information from ***Siemens MindSphere*** configuration is required. Thus, ***dataFEED OPC Suite configuration*** is interrupted here and continued at a later step (see section 8.).

7. Finalize *Siemens MindSphere* Configuration

NOTE:

This section continues section 5.

NOTE:

Upon successful establishment of connection between ***dataFEED OPC Suite*** and ***Siemens MindSphere*** the *Boarding status* light in the top right section of the screen is shown permanently green.



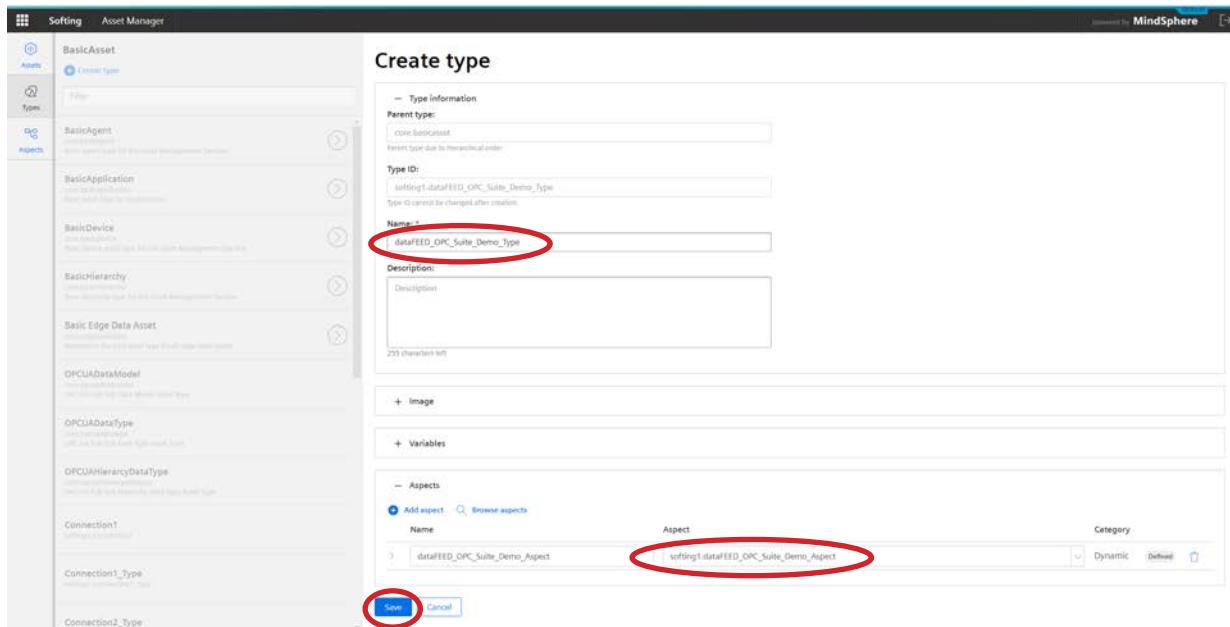
NOTE:

For assigning the previously defined variables to assets In *Siemens MindSphere*, a type has to be created first, which then has to be connected to the aspect and finally to the asset.

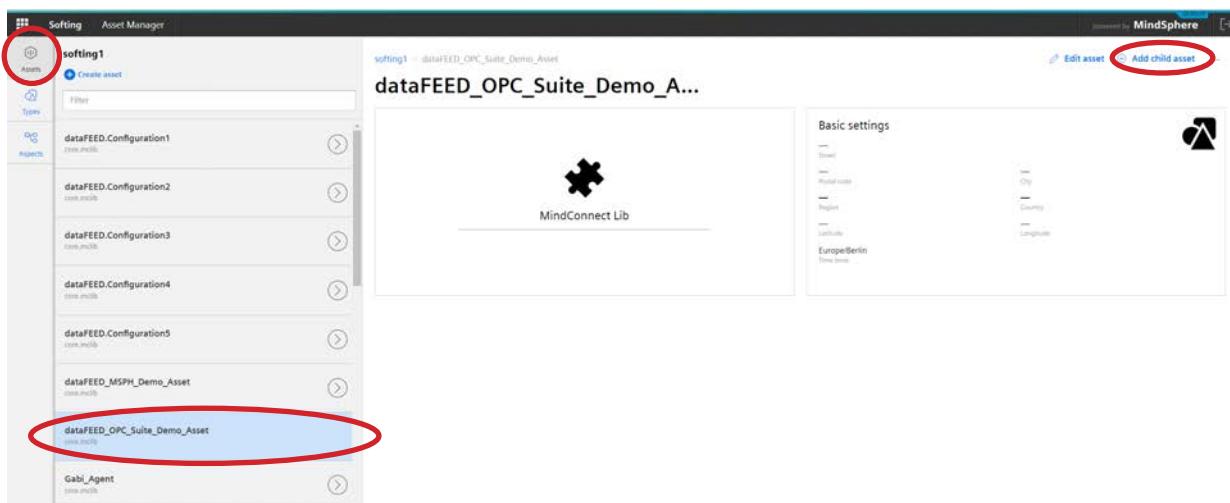
- At *Siemens MindSphere* configuration home page select Asset Manager

The screenshot shows the Siemens MindSphere Asset Manager interface. On the left, there's a sidebar with 'Softing Asset Manager' and tabs for 'Assets', 'Types', and 'Aspects'. The 'Types' tab is selected. In the main area, there's a list of asset types: 'BasicAsset', 'BasicAgent', 'BasicApplication', 'BasicDevice', 'BasicHierarchy', and 'Basic Edge Data Asset'. The 'BasicAsset' item is highlighted with a red circle around its 'Create type' link. To the right, there's a detailed view of the 'BasicAsset' type, showing its core basicasset icon, name 'BasicAsset', and description 'Base type for the Asset Management Service'. It also shows sections for 'Variables' (no variables entered yet) and 'Aspects' (no aspects entered yet).

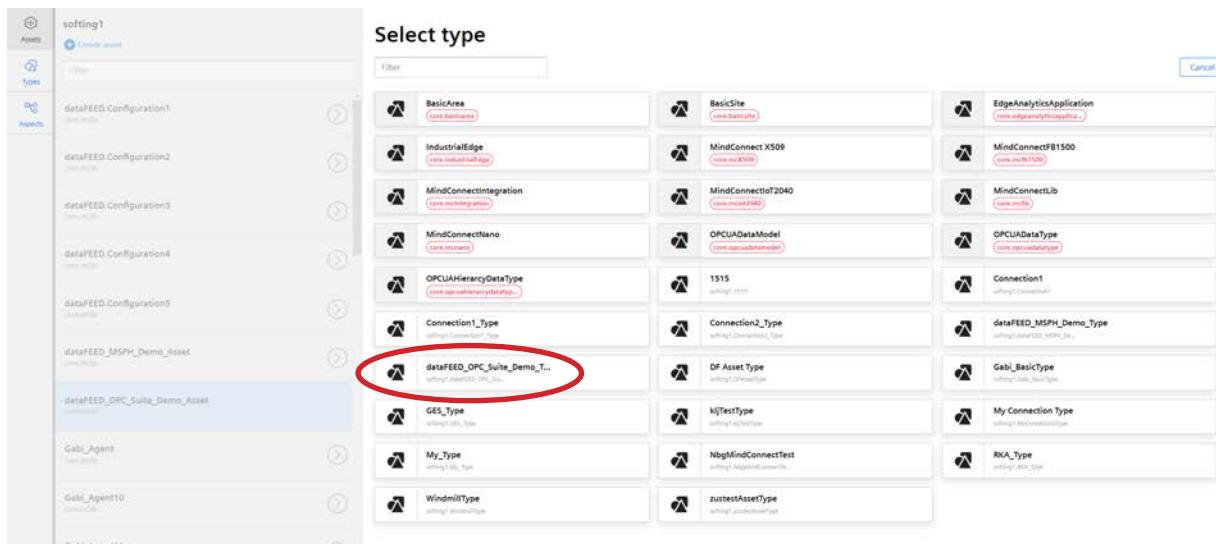
- Select *Types* view
- Click *Create type* link for creating a new type



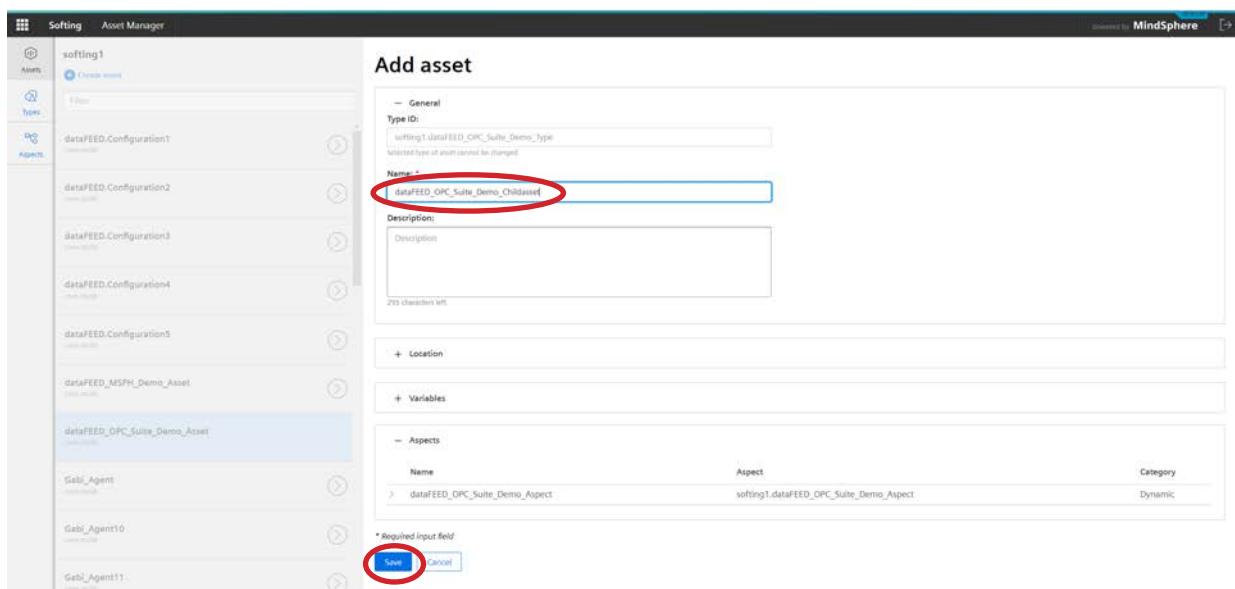
- Enter freely selectable asset name in *Name* field
- Select previously created aspect from *Aspect* dropdown list
- Press *Save* button



- Select *Assets* view
- Select previously created asset
- Click *Add child asset* link



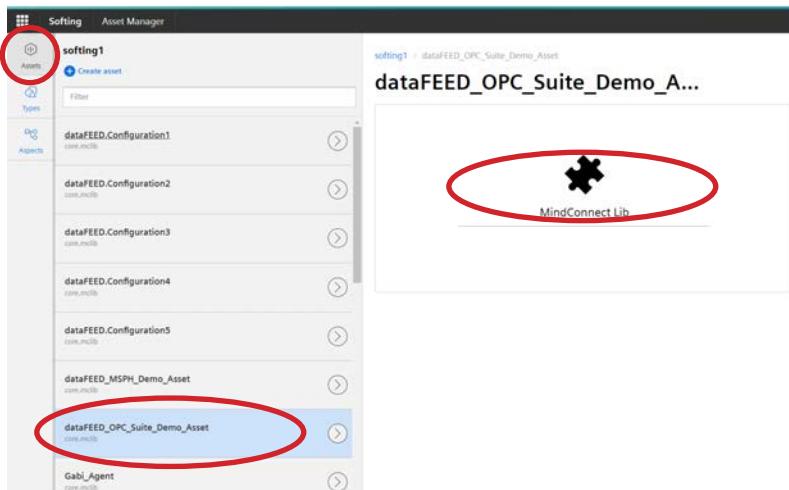
- Click link of previously created type



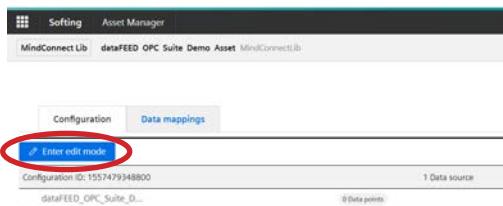
- Enter freely selectable asset name in *Name* field
- Press *Save* button

NOTE:

For connecting the created aspect variables with asset it is essential to create the individual variables as asset variables using the identical data type and unit.



- Select Assets view
- Select previously created asset
- Click *ModConnectLib* link



- Press *Enter edit mode* button



- Click *Add data point* link
- Add all individual aspect variables as asset variables
- Press *Save* button



- Select *Data mappings* tab

- Click *Link variable* link

A window is shown at the right side allowing to click the created child asset and afterwards to assign the appropriate variable.

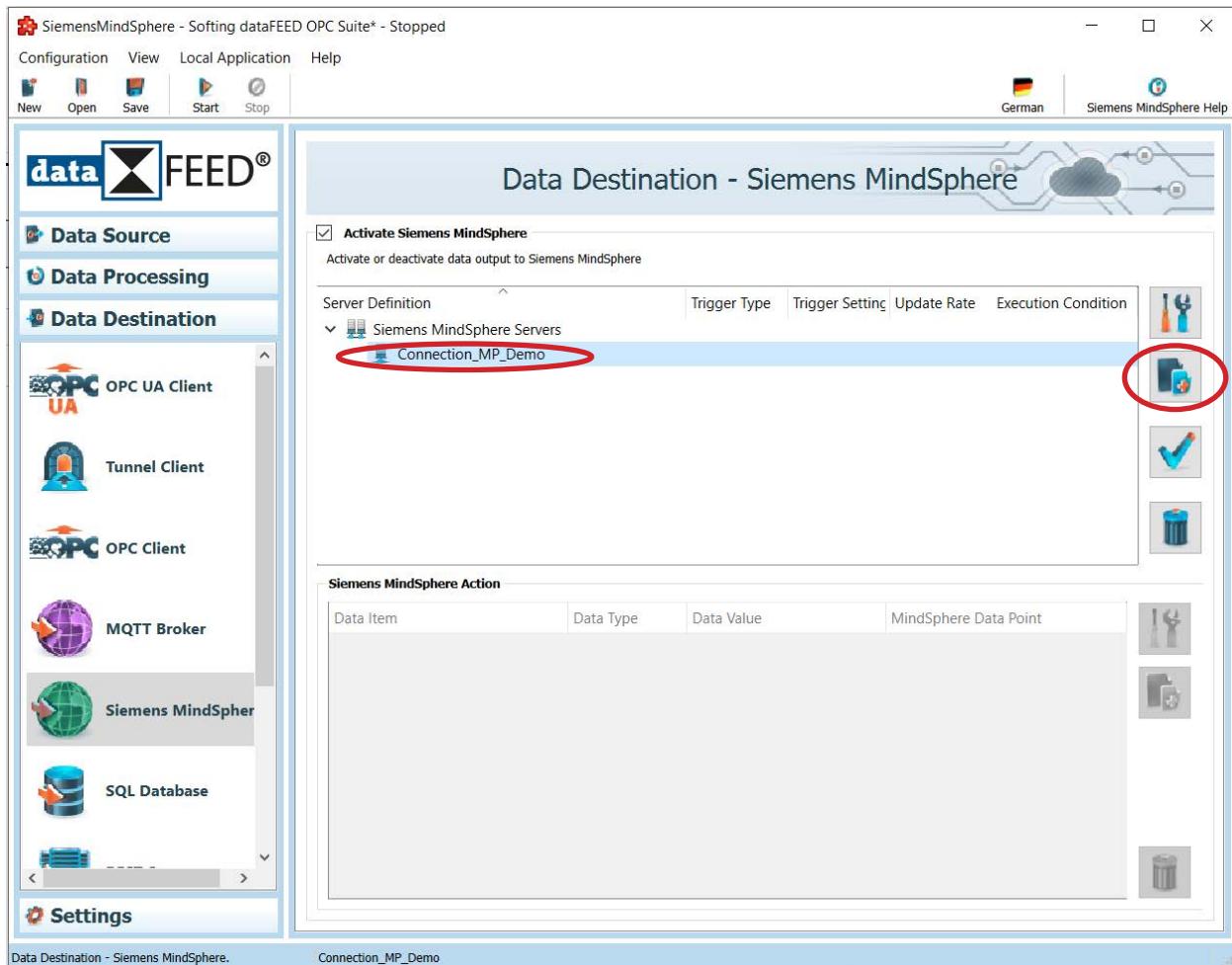
At the end *Siemens MindSphere* shows the assigned variables.



8. Finalize *dataFEED OPC Suite* Configuration

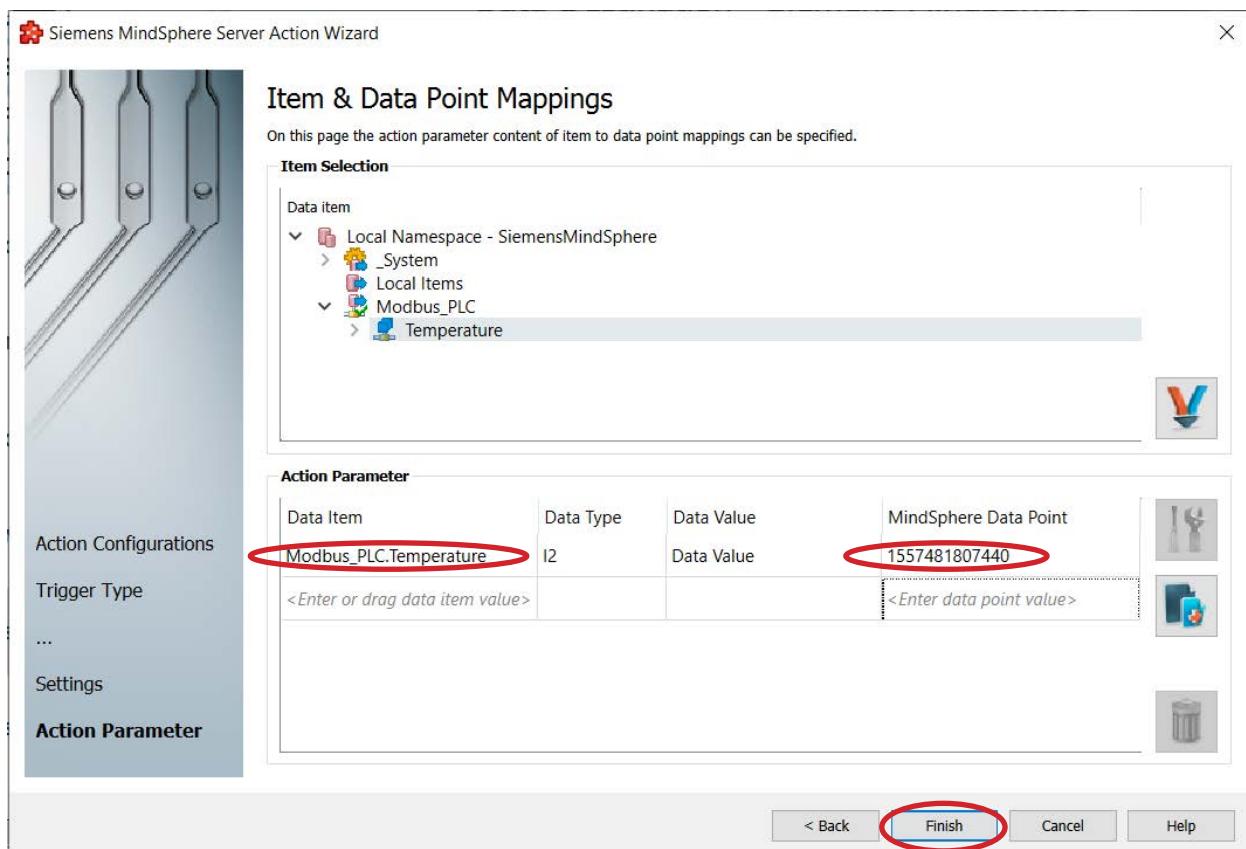
NOTE:

This section continues section 6.

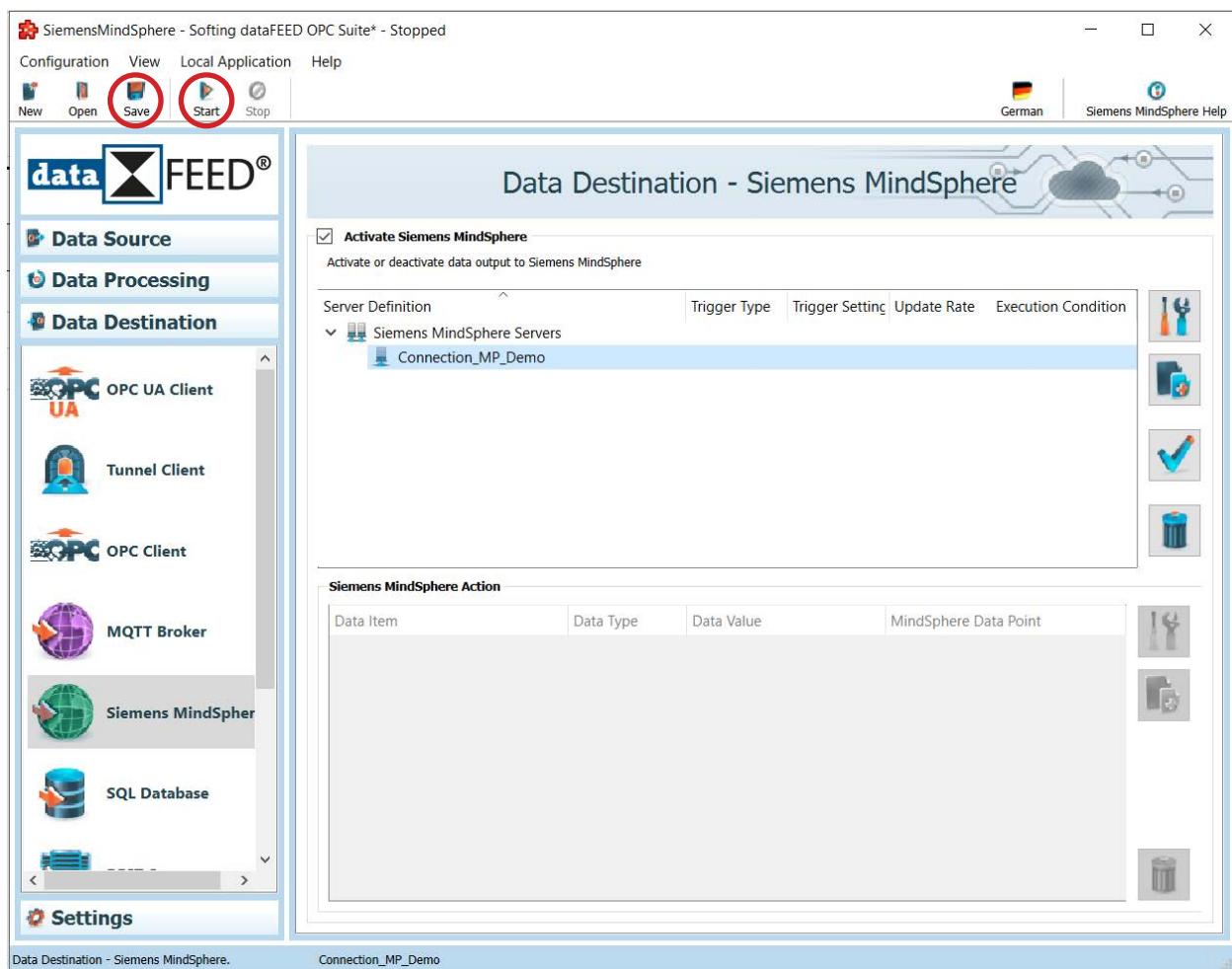


- Select created connection
- Click (*Add a Siemens MindSphere Server action*) button
An action with a freely selectable action name plus an associated trigger is defined.

In a last step of the **dataFEED OPC Suite** action configuration the *Item & Data Point Mappings* page is shown.



- Select individual **dataFEED OPC Suite** data item in *Item Selection* section and drag-and-drop it to field marked *<Enter or drag data item value>* in *Data Item* column of table in *Action Parameter* section
- Enter configuration ID from *Siemens MindSphere* configuration in according field of *MindSphere Data Point* column of table in *Action Parameter* section
- Press *Finish* button



- Press **(Save)** button to store ***dataFEED OPC Suite*** configuration
- Press **(Start)** button to start ***dataFEED OPC Suite***

Now the connection between ***dataFEED OPC Suite*** and ***Siemens Mindsphere*** is configured.

- Click *Fleet Manager* link at *Siemens MindSphere* home page to define a visualization application.

NOTE:

The given URLs have last been checked on Feb 04, 2022.

