SIEMENS

SINUMERIK

Industrial Edge for Machine Tools Manage MyAI Installation

Installation Manual

Version 2.1
Valid for SINUMERIK 840D sl / 840DE sl / SINUMERIK ONE

Legal information

Warning notice system

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

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

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

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

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

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

Qualified Personnel

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

Proper use of Siemens products

Note the following:

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

Trademarks

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

Disclaimer of Liability

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

Table of contents

Introduction   1

1.1   About SINUMERIK

From simple, standardized CNC machines to premium modular machine designs – the SINUMERIK CNCs offer the right solution for all machine concepts. Whether for individual parts or mass production, simple or complex workpieces – SINUMERIK is the highly dynamic automation solution, integrated for all areas of production. From prototype construction and tool design to mold making, all the way to large-scale series production.

Visit our website for more information SINUMERIK (https://www.siemens.com/sinumerik).

1.2   About this documentation

Target group

This document addresses users of Manage MyAI.

Benefits

The Operating Manual helps users familiarize themselves with the control elements and commands. It brings users into a position where they can work with Manage MyAI.

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 Documentation overview SINUMERIK ONE

Comprehensive documentation about the functions provided in SINUMERIK ONE Version 6.13 and higher is provided in the Documentation overview SINUMERIK ONE.

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

1.3.2 Documentation overview SINUMERIK 840D sl

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

Industrial Edge User Documentation

For information about Industrial Edge, please reference to Industrial Edge User Documentation (http://industrialedge.io.code.siemens.io/developer.web/user-docu/industrialedge.html).

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.

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/ww/en/my):
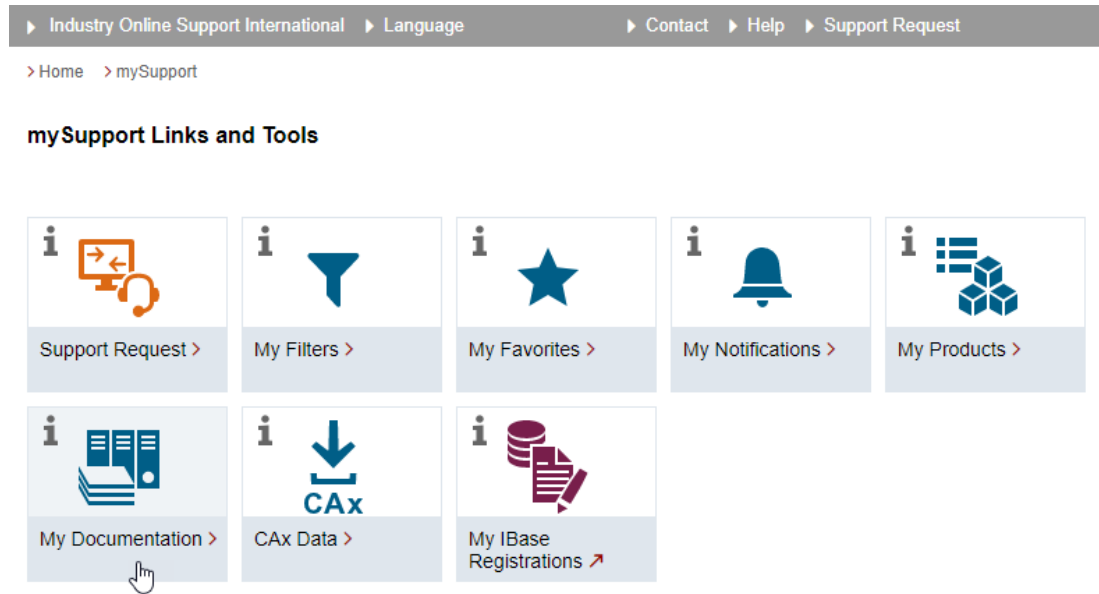
The configured manual can be exported in RTF, PDF or XML format.

Note

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

1.5 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.

Siemens support on the go

With the award-winning "Siemens Industry Online Support" app, you can access more than 300,000 documents for Siemens Industry products – any time and from anywhere. The app can support you in areas including:

- 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.

1.6 Important product information

Using 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://www.cryptsoft.com)

Compliance with the General Data Protection Regulation

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.

Note regarding the General Data Protection Regulation

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

The products process the following personal data: User name, password, optionally name and first name. It does not involve data from the personal or private sphere. The above mentioned data is required for the access restriction function (login). The data saved is limited to the absolute minimum as this is absolutely necessary to make a differentiation between the access rights. The above-mentioned data cannot be saved with anonymity or with pseudo-anonymity as the objective of differentiating access rights would not be possible. Our products do not automatically delete the data mentioned above. If necessary, this data can be deleted in the corresponding user administration. If you have any questions, then please contact our customer support organization.

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 (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 (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.

2.2 Security Features of Industrial Edge

Please see Industrial Edge User Documentation (https://documentation.mindsphere.io/resources/html/manage-my-sinumerik-edge-app-management/en-US/user-docu/reverseproxy.html) regarding security related features to setup for Industrial Edge, in particular the chapter about reverse proxy and user management.

For more information, see also edge security (https://documentation.mindsphere.io/resources/html/manage-my-sinumerik-edge-app-management/en-US/user-docu/platform-security.html).

2.3 Safety notes for OEM and users

> ⚠ **WARNING**
>
> **Industrial security concept**
>
> The Operation PCs used to visualize and configure Manage MyAI by OEM or by customer is supposed to have security measures implemented,
> i.e. hardware is maintained according to standard IT protection mechanisms (active virus scanner, active firewall, encrypted HDD, access control etc.).
> This is in responsibility of OEM and/or customer
>
> For additional information on industrial security measures that may be implemented, please visit Industrial Security (https://www.siemens.com/industrialsecurity).

2.4 Security: Camera as external sensor on X120 of SINUMERIK

X120 of Sinumerik is designed for being used inside a cabinet

This means that the corresponding **machine network**, which is connected to X120, is

- **physically protected by a cabinet**

- **remains logically inside the cabinet**

This means in consequence that any object (cameras, sensors, etc.) which are connected to X120 of Sinumerik but which are mounted outside the cabinet have to follow these rules nevertheless.

That means for example that

- the cable outside the cabinet has to be protected physically (mechanical shields, etc.), the same way as it would be inside the cabinet.

- no logical connection to other networks outside the cabinet, the same way as it would be inside the cabinet.

Please be aware that not to follow these rules will reduce the security of all components which are connected to X120 of SINUMERIK (e.g. Security of MCP, TCU, etc.) which rely on these protection mechanisms.

Please follow these rules when connecting camera(s) for this product to X120 of SINUMERIK.

Overview

<div style="text-align:right;font-size:2em;font-weight:bold">3</div>

Manage MyAI

Manage MyAI is a MindSphere application that allows the cloud-based training of various AI models to be started and trained. Training these AI models allow Protect MyMachine /Setup and Analyze MyWorkpiece /ToolCheck Edge applications for the Industrial Edge for Machine Tools to be able to execute online visual analytics, make predictions and solve real-world problems arising from the shopfloor.

Creating AI models for visual analytics is based on 3 steps:

1. Collecting training data, in this case taking example images.

2. Training the AI model with the collected training data.

3. Perform the visual analytic by infering the AI model on new images.

Training an AI model within the visual analytics framework is a very important step in the model creation process. The model creation process starts with acquiring image data that captures the problem of interest and sending it to MindSphere using the appropriate Industrial Edge for Machine Tools application. Once the data is available on the cloud, the labeling and consequently the training processes can be started using the Manage MyAI application. Our approach utilizes state-of-art AI algorithms which are trained and specifically designed to work with image data and have optimized architecture.

Manage MyAI allows a training process to be started as well as gives overview of the training status. Given that training AI models is a complex process that requires a decent amount of computing power as well as image data storage, Manage MyAI overcomes these requirements by utilizing cloud resources.

MindSphere application Manage MyAI

- Training of Models
  - Start of model trainings based on provided image data for corresponding model on Edge Assets, which have Industrial Edge for Machine Tools Apps "Protect MyMachine /Setup 2.1" or "Analyze MyWorkpiece /ToolCheck 1.2" installed.
  - The model is generated automatically once the training process has been approved using Manage MyAI. The generated model is then available in the corresponding Edge Asset on MindSphere.

3.1 System Requirements

Observe the following system requirements when installing "Manage MyAI".

Hardware

The following hardware components must be installed:

- IoT Value Plan Tenant for Siemens MindSphere,
  i.e., Tenant Type: User

- Industrial Edge for Machine Tools:

  – SIMATIC IPC427E Microbox with Trusted Platform Module (TPM) with access to MindSphere tenant of your organization.

- Operating PC with Internet connection to your MindSphere IoT tenant
  The following screen resolutions are supported:
  1920 x 1080

Software

- IoT Value Plan Tenant for Siemens MindSphere

  – It is strongly required that your tenant admin is enabling Multi Factor Authentication (MFA) for your tenant for security reasons. It is also possible that additional entries are required if MFA is used for your tenant.

  – MindSphere Application provisioned to your tenant:
    Manage MyAI 2.1

- Industrial Edge for Machine Tools:

  – Industrial Edge for Machine Tools Assets must be configured and onboarded properly on IoT tenant

  – At least one installed Edge Application, which is supported by Manage MyAI:
    Protect MyMachine /Setup 2.1
    Analyze MyWorkpiece /ToolCheck 1.2

  Web browser
  You can use the following web browser:

  – Google Chrome as of V106.x
    It's strongly recommended to use only stable releases of Google Chrome, i.e. either out of "Extended Stable Channel" or out of "Stable Channel" in order to get the latest security updates (Google Releases (https://support.google.com/chrome/a/answer/9027636?hl=en)).
    Discontinued releases should not be used. New releases out of Beta, Developer or Canary channel should not be used.

MindSphere

Components	Name	Version	Comment
IoT Value Plan	-	-	1 or more tenants
Asset types	Industrial Edge	Manage MySINUMERIK Edge v3.4.3	1 or more assets

Components	Name	Version	Comment
MindSphere Application	Manage MySINUMER-IK Edge	3.4.3	Provisioning to your tenant required; This application is required for configuring and onboarding Industrial Edge for Machine Tools hardware and installing Edge Applications.
MindSphere Application	Manage MyAI	2.1	Provisioning to your tenant required

The version refers to the specified and all subsequent versions in the line.

Installation

4

The scope of this chapter is Manage MyAI only.

For installation and configuration of Industrial Edge for Machine Tools please check the specific system and operating manuals for this.

For installation and configuration of Industrial Edge for Machine Tools Applications, that are supported by Manage MyAI, please check the specific installation manuals for these.

4.1 Provisioning: To be accepted by Tenant Admin

Signing in via MindSphere as Tenant Admin

1. Open the web site: `https://<tenant-name>.eu1.mindsphere.io`

2. The "Sign In" window opens, and you need to log-in with a user who has "TenantAdmin" role on your IoT Value Plan tenant.

   – Enter your email address and your password.

   – Click the "Sign In" button.

It is strongly required that your tenant admin is enabling **Multi Factor Authentication (MFA)** for your tenant for security reasons. It is also possible that additional entries are required if MFA is used for your tenant.

Installation

Manage MyAI cannot directly be installed from the user on MindSphere but needs to be provided to the user's tenant.

Note

To get Manage MyAI provisioned, please purchase it or contact your Siemens representative.

When the provisioning is available, you will receive a notification to accept the provisioning which you can do in your IoT tenant. Please accept the provision of Manage MyAI to you, which is named internally "mmai".

Afterwards you will get a confirmation looking like this:
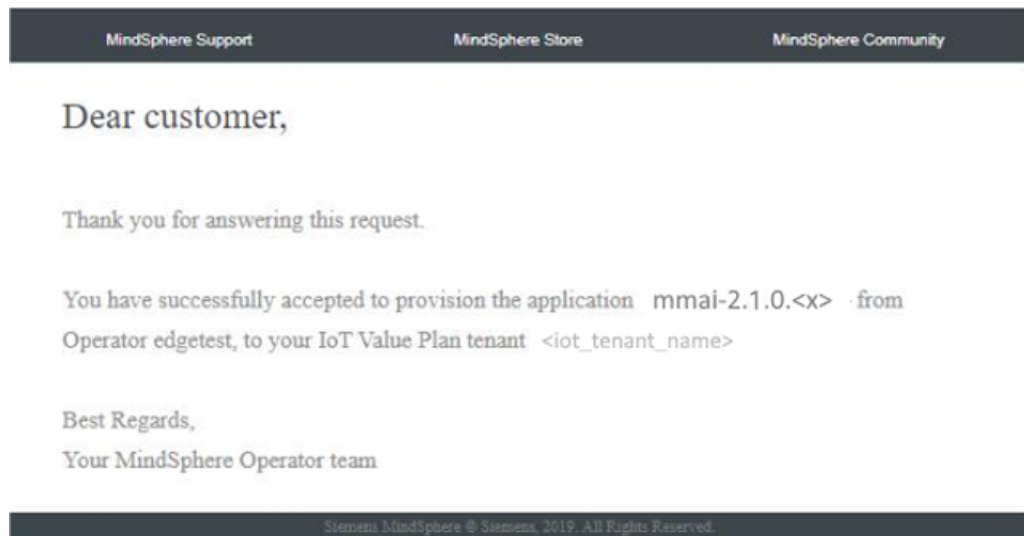
Figure 4-1   After confirmation

NOTICE
Accept provisioning request missing
If you don't get this request to accept provisioning, please contact your Siemens Key Account.
Please tell him explicitly the name of your IoT tenant, as this information is required by him for provisioning Manage MyAI and its services to you.

Note

If you have already accepted provisioning of Manage MyAI before, you won't need to accept provisioning again, as you should also not be requested again for this.

See also

Settings in mindsphere user documentation (https://documentation.mindsphere.io/resources/html/settings/en-US/index.html)
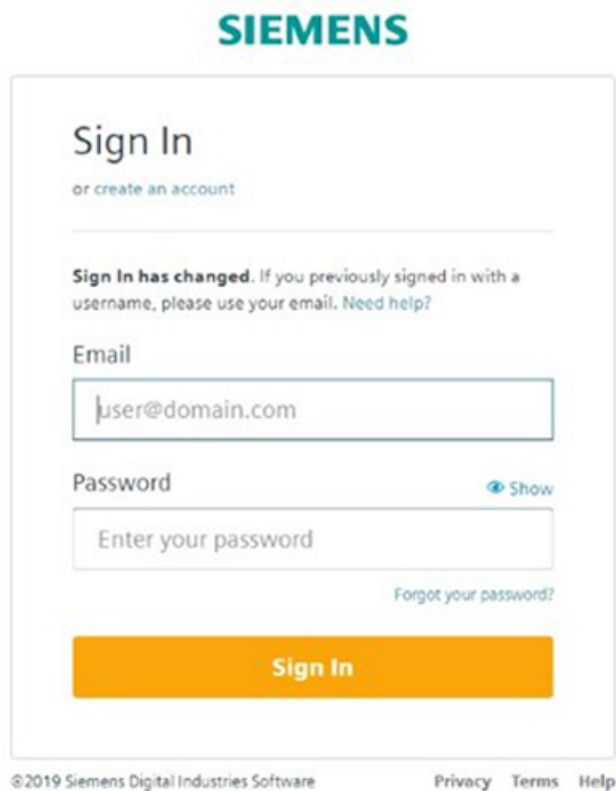
4.2 Assigning User Roles for Manage MyAI by Tenant Admin

Signing in via MindSphere as user with user roles for mmai

1. Open the web site: `https://<tenant-name>.eu1.mindsphere.io`

2. The "Sign In" window opens, and you need to log-in with a user who has "mmai" user roles assigned on your IoT Value Plan tenant.

   – Enter your email address and your password.

   – Click the "Sign In" button

   SIEMENS

   Sign In
   or create an account

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

   Email

   user@domain.com

   Password   👁 Show

   Enter your password

   Forgot your password?

   Sign In

   ©2019 Siemens Digital Industries Software   Privacy   Terms   Help

3. Click on the "Settings" application to assign user roles to your users.

4. In "Settings" select the user that you want to provide access to "Manage MyAI", go to direct assignments and enter "mmai" in the filter field to see the corresponding user roles:
    The following roles are available for Manage MyAI:

    – Standard users
       mmai

    – Administrator
       mmai

5. Check both user roles for "mmai", both for "admin" and "user".

6. Click "Next" and "Save.
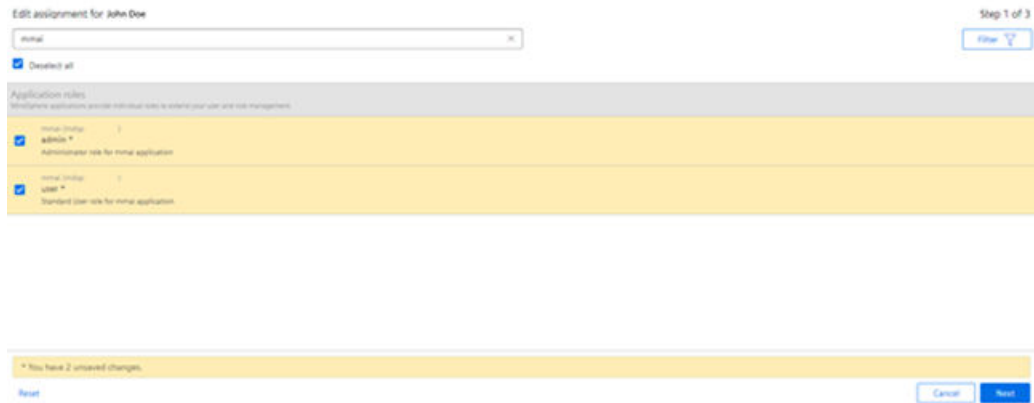
Figure 4-2   userroles

General information about "Settings" in MindSphere you can find under "Settings" at Settings in mindsphere user documentation (https://documentation.mindsphere.io/resources/html/settings/en-US/index.html)

4.3   Opening Manage MyAI as user

Procedure

Signing in via MindSphere as user with user roles for mmai.

1. Open the web site: `https://<tenant-name>.eu1.mindsphere.io`

2. The "Sign In" window opens, and you need to log-in with a user who has "mmai" user roles assigned on your IoT Value Plan tenant.

3. Enter your email address and your password.

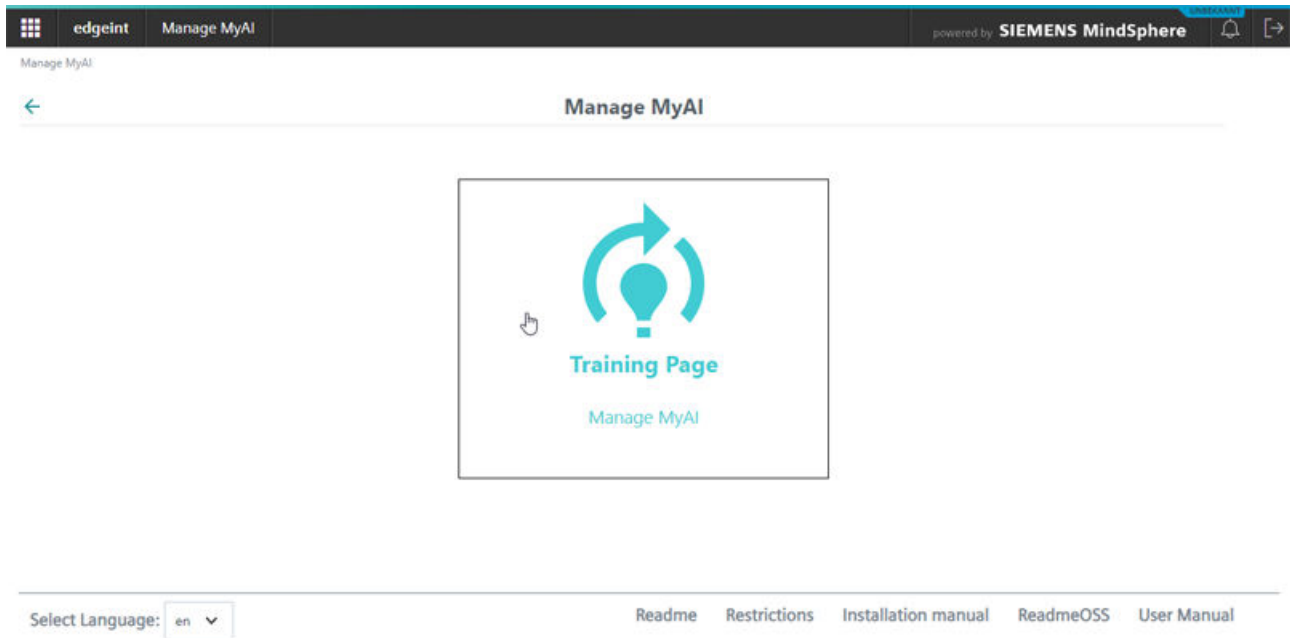4. Click the "Sign In" button.

5. The launchpad of the user in MindSphere opens, and the user should see Manage MyAI as new icon there:
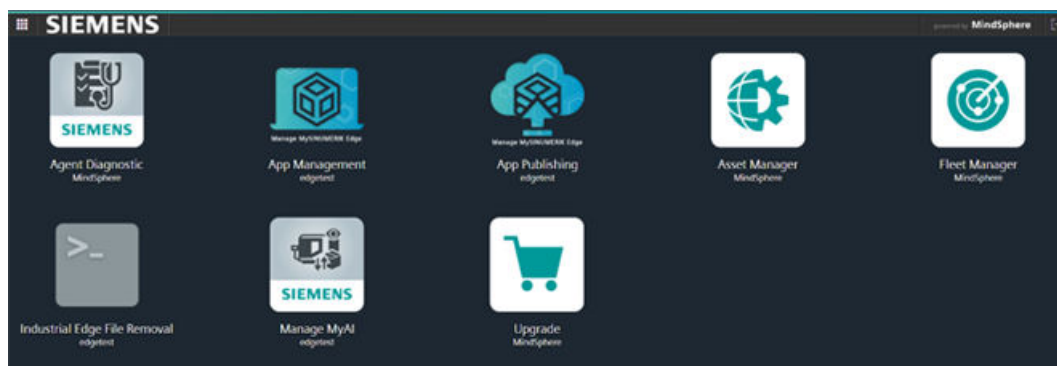
6. Click the new icon for Manage MyAI.

7. The following home page opens

6. Please see the "Operating Manual" of Manage MyAI to learn about how to use Manage MyAI.

Appendix A

A

A.1 Abbreviations

List of abbreviations

Abbreviation	Meaning
UI	User Interface
Edge App	Industrial Edge for Machine Tools Application
MindApp	MindSphere Application

Index