SIEMENS

Connector for Beckhoff ADS

Operating Manual

Document Version: V1.0.1

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

<div style="text-align: right;">1</div>

1.1 About Connector for Beckhoff ADS

The Connector for Beckhoff ADS application enables Industrial Edge (IE) users to start their digitalization journey by obtaining access to Beckhoff devices that use TwinCAT 2 or TwinCAT 3.

You can communicate with Beckhoff machines and read out data via Industrial Edge. Thus, full data transparency inside the shopfloor is established. You can use the data to derive measures increasing your productivity and efficiency.

1.2 About this documentation

This publication is intended for production managers and maintenance managers who want to get insights about production and machine condition and machine tools related KPIs.

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 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.
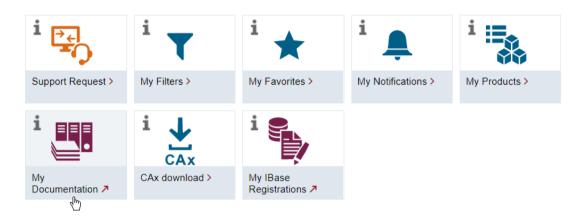
1.4   mySupport documentation

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/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 (frequently asked questions)
- 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 "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 "Industry Online Support" app is available for Apple iOS and Android.

1.6 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.

Fundamental safety instructions 2

2.1 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.

2.2 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.

2.3 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 information

3

The Connector for Beckhoff ADS application can be deployed to create a one-to-one connection from an Industrial Edge Device (IED) to a Beckhoff control.

Furthermore, the application can be configured via the Industrial Information Hub (IIH) Configurator.

3.1 Delivery package

Siemens also provides you with the software corresponding to the order data, either on a data storage medium or per download, as well as the associated Certificate of License (CoL). Siemens includes with the software an electronic form of the software documentation. Siemens provides a license key, which is documented on the CoL.

Install the software package as described in this document.

For further information on installation of the Connector for Beckhoff ADS, refer to Installing the Connector for Beckhoff ADS (Page 15).

Product information

3.1 Delivery package

Requirements 4

4.1 Specialist know-how

For professional installation and configuration, specialist know-how is required in the following areas:

- Industrial Edge applications
- Connector for Beckhoff ADS

4.2 General conditions

The Connector for Beckhoff ADS requires the following Industrial Edge applications to be deployed on the same IED:

- Registry Service
- IIH Configurator
- Connectivity Suite compatible application client (optional, required for data subscription)

For an installation and documentation of these applications, reach out to the Industrial Edge Marketplace.

Installing the Connector for Beckhoff ADS

<div style="text-align: right">

5

</div>

You can install the ADS IE Client in two steps:
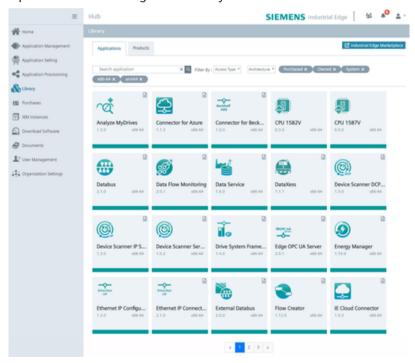
1. Import
2. Deployment

5.1 Importing the Connector for Beckhoff ADS

The Connector for Beckhoff ADS needs to be successfully purchased from the Industrial Edge Marketplace in order to be copied from the Industrial Edge Hub (IEH) Library to an Industrial Edge Manement (IEM) system. Afterwards you can deploy the app from the IEM to an Industrial Edge Device (IED)".

Procedure

1. Open the Industrial Edge Hub Library.

2. Select "Connector for Beckhoff ADS".
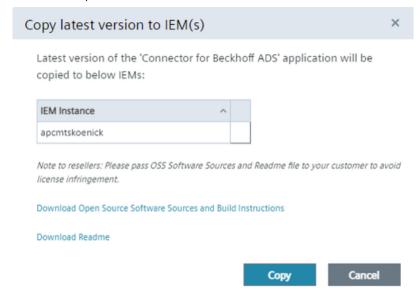
3. Select the IEM instance you connected to the HUB.

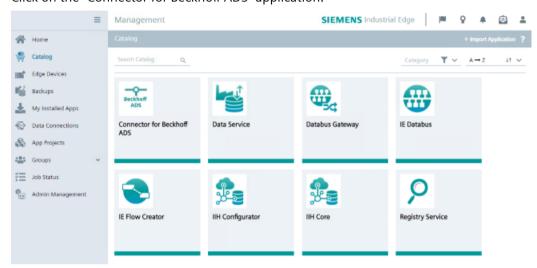4. Copy latest version to the IEM.

5. Confirm the process.

6. Watch for the completion notification.

The application has been copied to the IEM instance you selected above. You can now deploy the "Connector for Beckhoff ADS" to your Industrial Edge Devices (IEDs) using the IEM.
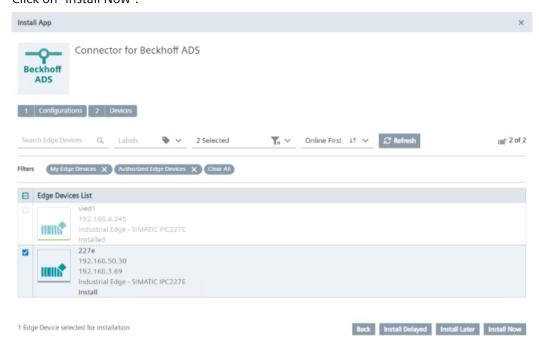
5.2 Deploying the Connector for Beckhoff ADS

Procedure

1. Open the IEM web interface and click on "Catalog".
   The "Catalog" window opens.
   Click on the "Connector for Beckhoff ADS" application.

2. Click on "Install" in the right window area.

3. The "Install App" window opens.
   Click on "Install Now".

4. The "Install Connector for Beckhoff ADS" window opens and shows the following warning:

   – "Application is not signed."

   Click on "Install".

5. The Connector for Beckhoff ADS is deployed.

Configuring the Connector for Beckhoff ADS

<div style="text-align: right;">

6

</div>

You can configure the Connector for Beckhoff ADS in the IIH Configurator in three steps:

1. Connector endpoint
2. Variables and addresses
3. Configuration deployment

The configured variables are announced as available via the Connectivity Suite standard when requested by a client application.

6.1 Configuring the connector endpoint

Note

Single remote endpoint per connector

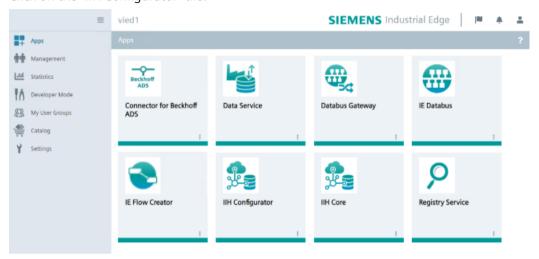Currently only a single remote endpoint is supported per connector instance.

Parameters

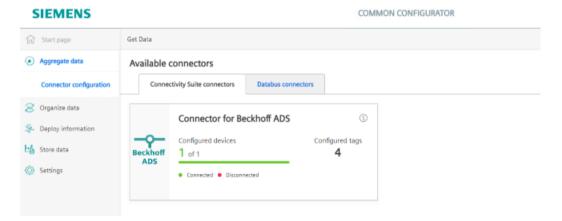| Symbol	Description
Aggregate data	Opens a window with the available connectors.
Add data source	Adds a new data source to the connector.
Delete selected	Deletes the selected data source from the connector.

Procedure

1. Open the IED interface and click on "Apps".
   A window with all available applications opens.
   Click on the "IIH Configurator" tile.

2. The "COMMON CONFIGURATOR" window opens.
   Click on "Connector Configuration" in the "Aggregate data" menu.
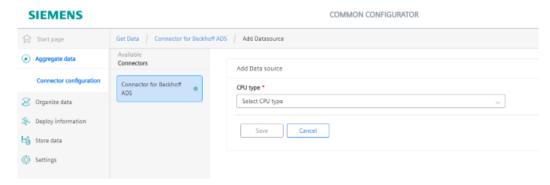   The available connectors are displayed.

3. Select the "Connector for Beckhoff ADS".
   Click on the "Tags" tab and click on "+ Add data source" in the right window area.

4. Select the CPU type "Config" from the drop-down menu.

5. Enter a remote configuration name in the "Name" field.
    Replace the corresponding fields in the following JSON file and insert the content into the "Remote Config" field.

    ```
    {
        "remoteUrl": "<Beckhoff control IP>",
        "data": {
            "localRoute": "<IED IP>",
            "maxBuffer": 1024,
            "timeout": 30000
        }
    }
    ```
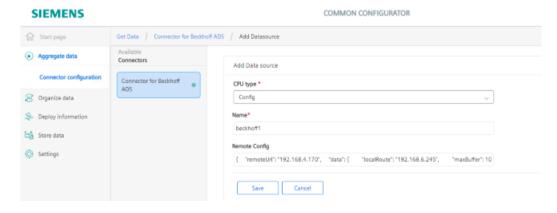
    Note

    "IED IP" in the JSON file

    "IED IP" is the IP address of the IED on which the client was deployed.

    Click on "Save" to save the configuration.
    - OR -
    Click on "Cancel" to cancel the process.

6. The connector endpoint is configured.

6.2 Configuring variables

Note

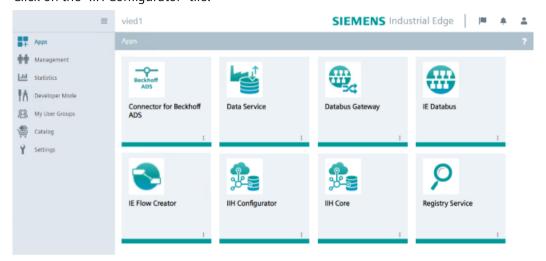In the IIH Configurator, variables are called tags.

Prerequisite

- You have configured a connector endpoint.
  Additional information is provided in Chapter: Configuring the connector endpoint (Page 21).
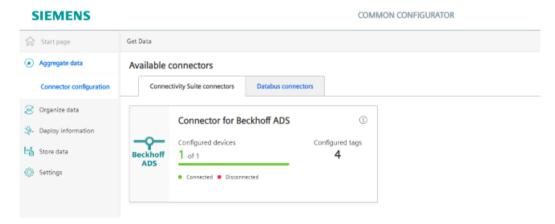
Parameters

Symbol	Description
(add tags icon)	Opens a drop-down menu with the following options: • Add tag • Edit data source • Delete data source
⊕ Add tag	Adds a new variable to the data source.
✎ Edit data source	Opens the menu to edit the data source.
🗑 Delete data source	Deletes the selected data source.

Procedure

1. Open the IED interface and click on "Apps".
   A window with all available applications opens.
   Click on the "IIH Configurator" tile.

2. The "COMMON CONFIGURATOR" window opens.
   Click on "Connector Configuration" in the "Aggregate data" menu.
   The available connectors are displayed.

3. Select the "Connector for Beckhoff ADS".
   Click on the "Tags" tab and click on the ⊞ icon of the configured connector endpoint row.
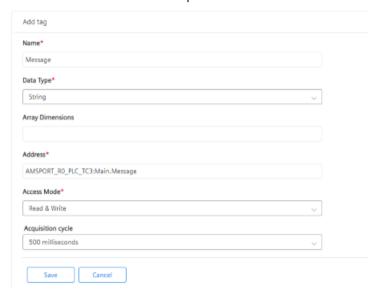   Click on "Add tag".

4. The "Add tag" window opens. Configure the following fields:

Field	Description
Name	Freely chosen name describing the address
Data Type	Data type of the variable For the Connector for Beckhoff ADS, it is one of the following: • Bool • Integer • Float • String
Array Dimensions	Always empty
Address	The address string
Access Mode	Whether the variable can be accessed for reading, writing or both
Acquisition cycle	Cycle with which data is sent to the IE Databus

Click on "Save" to save the configuration.
- OR -
Click on "Cancel" to cancel the process.

5. The variables are configured.

6.3 Configuring addresses

Beckhoff addresses are split into two parts:

• Port

• Variable

Port and variable are separated by a colon (`:`). The port may be specified as integer or string.

Additional information on Beckhoff addresses is provided in the Beckhoff documentation (https://www.beckhoff.com/en-en/).

6.4 Deploying the configuration

Prerequisite

- You have configured a connector endpoint and variables associated with that endpoint. Additional information is provided in the following Chapters:
  - Configuring the connector endpoint (Page 21)
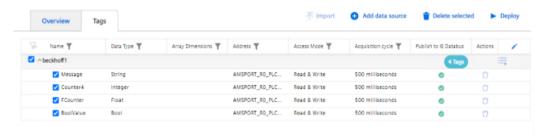 - Configuring variables (Page 24)

Parameters

Symbol	Description
✓ Deploy	Indicates that the configuration has successfully been deployed.
⊗ Deploy	Indicates that the configuration has not successfully been deployed.

Procedure

1. The "Connector for Beckhoff ADS" is selected in the "COMMON CONFIGURATOR" window. In the "Tags" tab below the configured connector endpoint row, you have the following options:

   - In the "Name" column, select the check boxes of the variables that should be available for subscription on the device.

   - In the "Publish to IE Databus" column, select the check boxes of the variables that should be subscribed by the Connectivity Suite Databus Gateway and published on the Industrial Edge Databus.
     For availablility and configuration of the Connectivity Suite Databus Gateway, reach out to the Industrial Edge Marketplace.

   Click on "Deploy" in the upper right window area.

2. The configuration is successfully deployed when a green checkmark appears next to "Deploy".
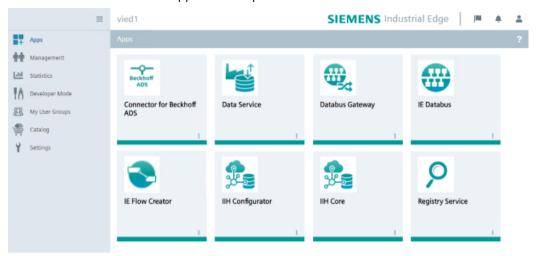
Downloading logfiles

7

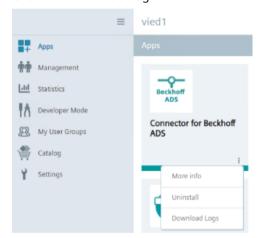**Parameters**

Symbol	Description
⋮	Opens a drop-down menu with the following options: • More info • Uninstall • Download Logs

Procedure

1. Open the IED interface and click on "Apps".
   A window with all available applications opens.

2. Click on the three dots icon in the "Connector for Beckhoff ADS" tile.
   A drop-down menu opens.
   Click on "Download Logs".

3. The logfiles are downloaded.

Uninstalling the Connector for Beckhoff ADS

8

You can uninstall the Connector for Beckhoff ADS either from the IED itself or from the IEM.
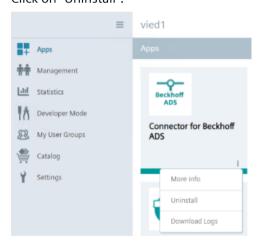
Parameters

Symbol	Description
IED interface	
⋮	Opens a drop-down menu with the following options: • More info • Uninstall • Download Logs
IEM interface	
My Installed Apps	Opens a window with all installed applications.
Uninstall	Uninstalls the selected application.

Uninstalling the Connector from the IED

1. Open the IED interface and click on "Apps".
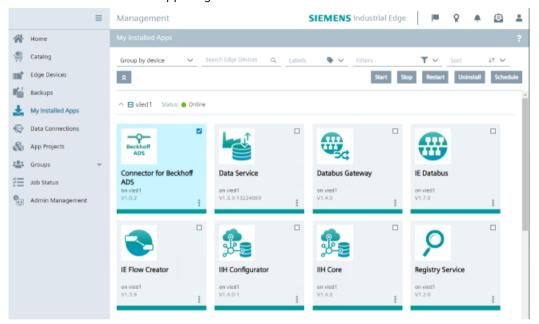   A window with all available applications opens.

2. Click on the three dots icon in the "Connector for Beckhoff ADS" tile.
   A drop-down menu opens.
   Click on "Uninstall".

3. The Connector for Beckhoff ADS is uninstalled.

Uninstalling the Connector from the IEM

1. Open the IEM web interface and click on "My Installed Apps".
   The "My Installed Apps" window opens.
   Select the check box of the "Connector for Beckhoff ADS" tile.
   Click on "Uninstall" in the upper right window area.

2. The Connector for Beckhoff ADS is uninstalled.

Appendix

<div align="right">

A
</div>

A.1 List of abbreviations

The following table explains the abbreviations used in this document.

ADS	Automation Device Specification
IED	Industrial Edge Device
IEM	Industrial Edge Management
IIH	Industrial Information Hub
JSON	Java Script Object Notation