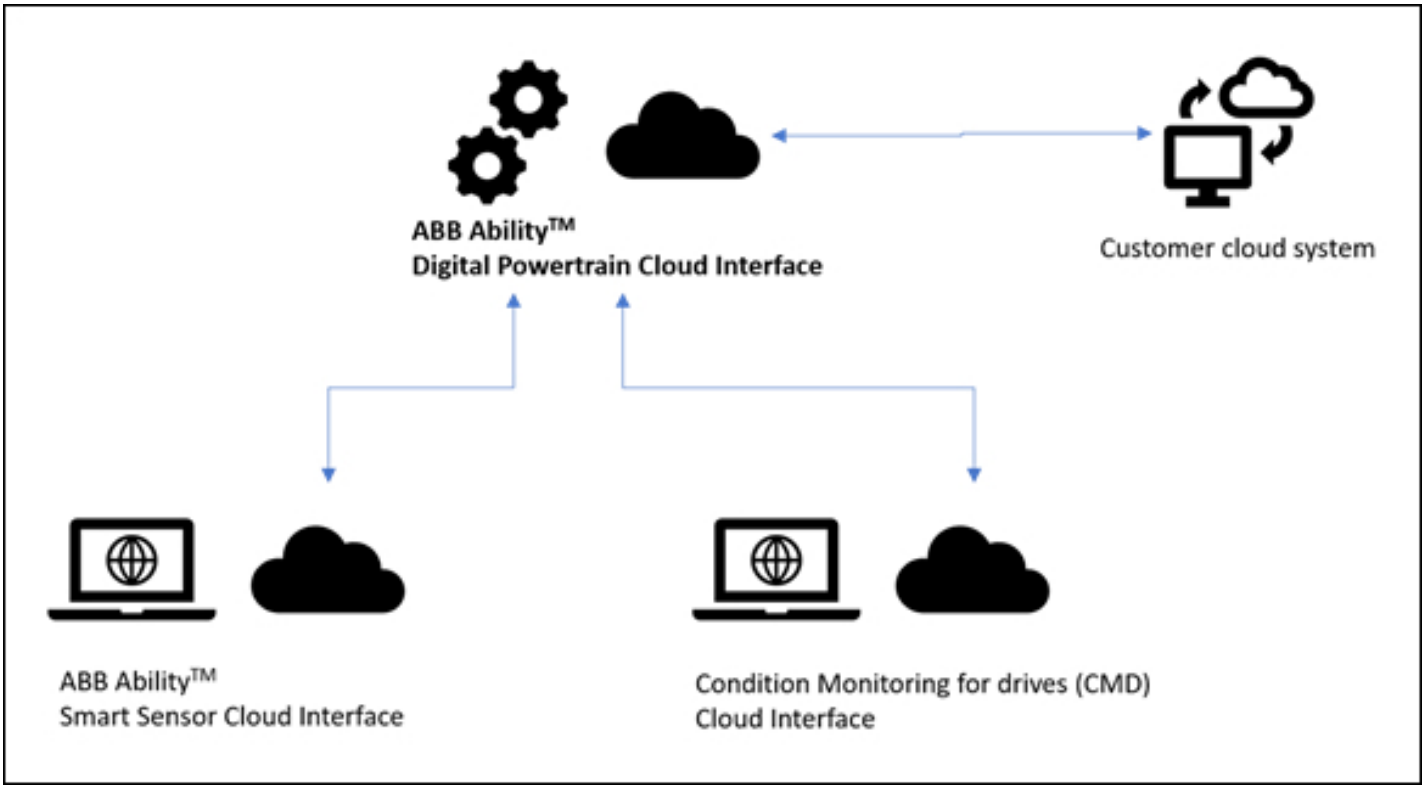
ABB DIGITAL SERVICES

Cloud Interface for ABB Ability™ Condition Monitoring for powertrains

API guide



Cloud Interface for ABB Ability™ Condition Monitoring for powertrains

API guide

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Further information

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Introduction to the guide

Contents of this chapter

This chapter provides information about the guide, such as applicability, target audience and contents of this manual.

Purpose of this guide

This application program interface (API) guide describes the Cloud Interface for ABB Ability™ Condition Monitoring for powertrains. Note that, further in this manual "Cloud Interface for ABB Ability™ Condition Monitoring for powertrains" is referred as "Cloud Interface".

Applicability

This guide applies to Cloud Interface for ABB Ability™ Condition Monitoring for powertrains, version 2.0 or later.

Compatibility

The Cloud Interface for ABB Ability™ Condition Monitoring for powertrains supports:

- all drives visible on Condition Monitoring for Drives (CMD), version 4.0
- all assets available on ABB Ability™ Smart Sensor API, version 7.4.

Target audience

This guide is intended for people who work on the Cloud Interface.

Related documents

Document	Code (English)
Cloud Interface for ABB Ability™ Condition Monitoring for powertrains API guide	3AXD50000600670
Cloud Interface for ABB Ability™ Condition Monitoring for powertrains user guide	3AXD50000603152
Cloud Interface for ABB Ability™ Condition Monitoring for powertrains reference guide	3AXD50000614936
Cybersecurity for ABB drives Technical guide	3AXD10000492137
ABB Ability™ Smart Sensor user guide	9AKK107045A8954

Terms and abbreviations

Term	Description
API	Application Program Interface
Bearer token	Bearer token - Also called as the access token. If the client account authentication is successful, the API acknowledges with an access token, which can be used as bearer token to authorize the client and account.
ClientId	Client username used while authenticating a client account.
Cloud Interface	Application programming Interface running in the cloud.
CMD	Condition Monitoring for drives. The CMD web portal and API are used to monitor drives.
GUID	Globally Unique Identifier is a 128-bit number to identify information in computer systems.
IAM	Identity and Access Management is used to authenticate and authorize individuals access to certain systems or technology resources.
InformationModel	Context specific model of objects with their properties and relationships.
Powertrain	Structure of Drives and Smart Sensor assets (motors, pumps, bearings, etc.)
Secret	Password to authenticate the client account.
Smart Sensor	Web portal and API to monitor assets, for eg. motors, pumps, bearings using specific sensors, etc.

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Overview

Contents of this chapter

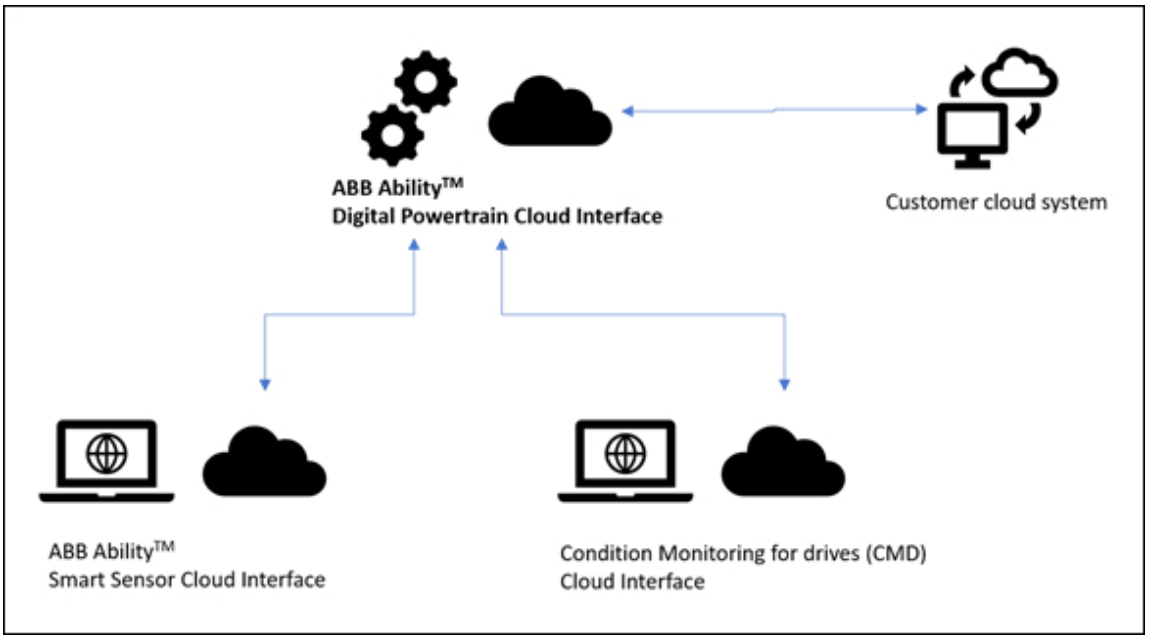
This chapter describes the Cloud Interface.

Overview

The Cloud Interface for ABB Ability™ Condition Monitoring for powertrains provides access to equipment data of Condition Monitoring for drives (CMD) and Smart Sensors. The CMD and Smart Sensor are the supplying system or the base API for the Cloud Interface. You can access data, without having to connect the CMD or Smart Sensor web portals via Internet browser. See the connections shown in the below block diagram. Using the Cloud Interface, you can integrate data to own maintenance management system or transfer to a common maintenance system.

The web-based Cloud Interface uses the HTTPS RESTful protocol that provides secure and controlled remote access to the cloud data. You can access data using an active and valid subscription to the cloud platform.

Block diagram



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Managing accounts

Contents of this chapter

This chapter provides information on managing the Cloud Interface account.

General

The Cloud Interface uses either the common Identity and Access Management (IAM) solution or the user management solution. The user accounts are based on machine authentication. The account details and access rights are notified via E-mail. Note that one or more clients can inherit the user accounts and use them as customer accounts.

Note: Only an authorized client can create an account dependent operation in the Cloud Interface.

CMD and Smart Sensor user account

Each user account for CMD and Smart Sensor in the Cloud Interface are unique. The account details and access rights are notified via E-mail. The legitimacy of a user account is maintained, by allowing only Admin users to create a new account.

Client-based user account

A authorized client maintains all customer accounts and transforms the accounts to several customer machine accounts. A client account is created with a unique ID based on the context of its account. The client uses this ID to authenticate its customer accounts.

Each account may need several clients, for which, the client can depute a principal client who is authorized to create a new account. The principal client is also authorized to manage (add, update, or remove) additional clients.

Client roles

The following user roles define the authorization to the Cloud Interface:

Roles	Description
Principal client	Authorized to • create a new account • manage the account via the Cloud Interface • can add, update or delete additional clients.
APIAccess client	Authorized to access the Cloud Interface functions, but not the management functions of the account. A principal client creates this role.
Admin client	Authorized to create new accounts via the technical team (not via Cloud Interface). The technical team creates this role. **Note:** This role is intended only for support team.

Authenticating clients

Authorized clients can access the Cloud Interface using the *Client Id* (username) and *Secret* (password). The technical team shares the *Secret* value. Additionally, the authentication also needs an E-mail of the account.

If authentication is valid, the Cloud Interface acknowledges the account with an access token, also called as the bearer token. The bearer token is valid for only one hour. You can add the bearer token to the authorization header of the request form. See a sample request format in the below example.

Example of request format

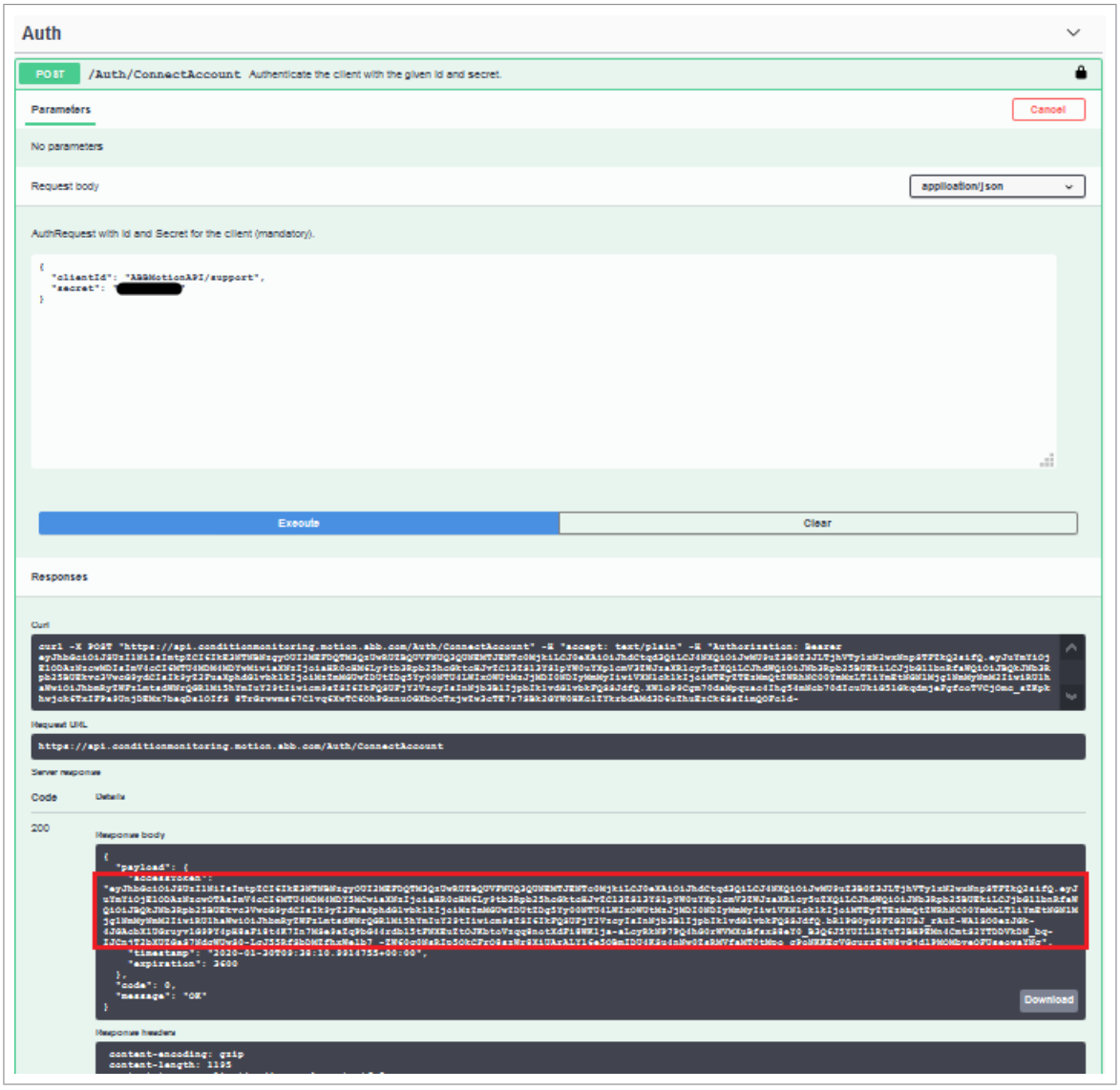
The example shows the request format intended for an Admin client.

Call	Response: POST /Auth/ConnectAccount

Body	`{`
	`"clientId": "ABBMotionAPI/support",`
	`"secret": "…"`
	`}`

Response	`{`
	`"payload": {`
	`"accessToken": "…",`
	`"timestamp": "2020-01-01T00:00:00.0000000+00:00",`
	`"expiration": 3600`
	`},`
	`"code": 0,`
	`"message": "OK"`
	`}`

In the Response column, the values returned after `accessToken` is the bearer token, which you can use in further calls. See instructions forUsing the bearer token (page 13).



Using the bearer token

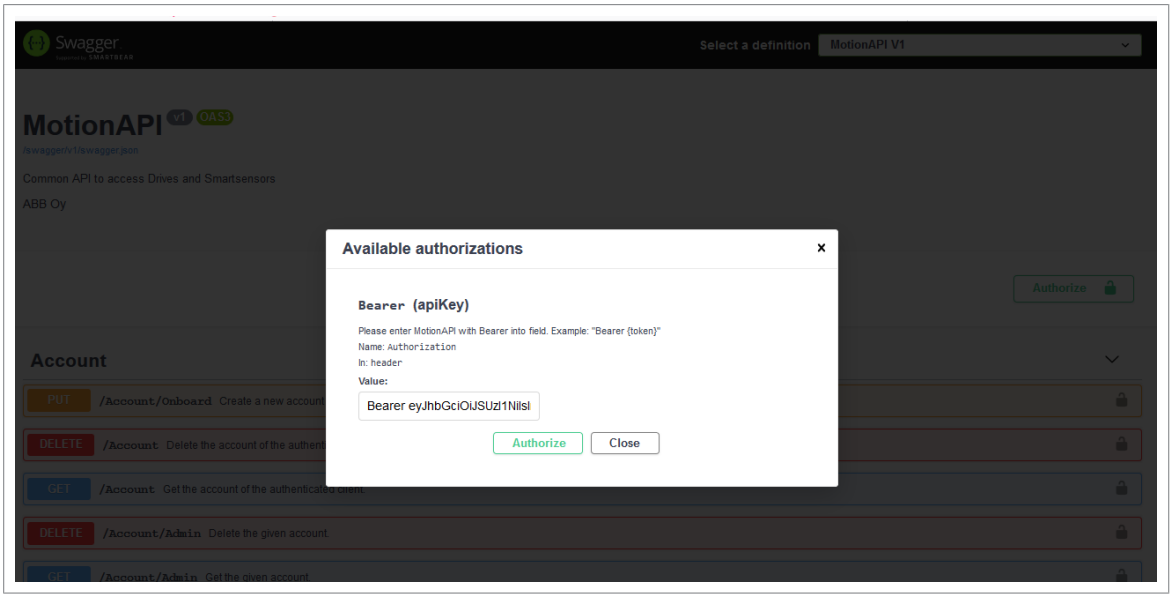
To use the bearer token for all further calls,

1. On the top right of the Swagger page, select **Authorize**.
2. In the popup window, type **Bearer** followed by the value you copied from the accessToken field in the authentication step.

   Note: Prepend “Bearer” followed by a space character.
3. If you selected **Authorize** followed by “Close” in the popup window, the bearer token will apply for all further calls. This defines the used client and its assigned role.

Note:

- The bearer token is valid for only one hour. To receive a new token, you must authenticate again and use the new token.
- If you prefer to change the client, authorize the new client, **Logout** from the popup window and then enter the new bearer token.



MotionAsset

An asset in the Cloud Interface is referred as `MotionAsset`. This asset is different from the CMD and Smart Sensor asset, e.g., a CMD and Smart Sensor asset is identified by its serial number, where as a `MotionAsset` is identified by its Globally Unique Identifier (GUID).

An authorized client can access all assets of its account. The access can be revoked or invoked via the Cloud Interface.

Response codes and format

The Cloud Interface uses the following HTTP status and response message codes:

HTTP status codes

Code	Indicates that ...
200	call was successful
400	an error occurred. See below listed Response message codes (page 14).
401	user is not authorized
404	data was not found for the requested parameters
500	error was not handled

Response message codes

Every response message contains three parts: a code, a message and the payload of the response.

Code	Message	Indicates ...
0	OK	availability of requested data
1	Not Found	non-availability of requested data
11	InvalidAuthentication	invalid `ClientId` and/or `Secret`
12	InvalidAuthorization	user is not allowed to access the requested data

Code	Message	Indicates ...
13	InvalidParameter	malfunction of certain requested parameters
41	AccessLimitReached	actual requested data is more than 20GB of the measured data for the actual user and asset in the last month
91	ApiException	certain Cloud Interface functions are not accessible
98	OrganizationException	certain organization functions are not accessible
99	GeneralException	general or not specified functions are not accessible

The payload contains the requested data only for an OK message. Otherwise the message contains a description of the problem.

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Working with Swagger Page

Contents of this chapter

This chapter provides information on the Swagger tool used for documentation of the Cloud Interface.

Accessing the Swagger tool

To access the Cloud Interface, go to https://api.conditionmonitoring.motion.abb.com.

The documentation and testing of Cloud Interface is maintained in the Swagger tool. Go to https://api.conditionmonitoring.motion.abb.com/swagger.

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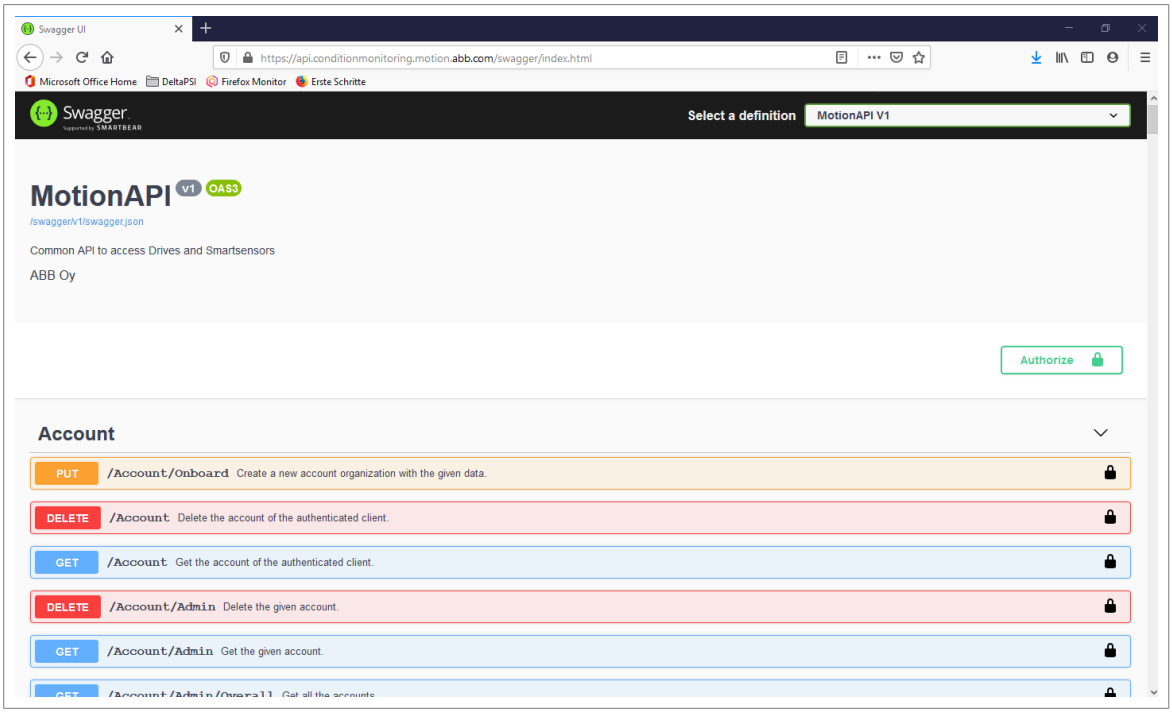

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Cloud Interface codes

Contents of this chapter

This chapter describes the codes used in the Cloud Interface.

GET

For a detailed description of the endpoints, functions, parameters and responses, and information model (structure of the payload of the responses), see the Swagger page. See Working with Swagger Page (page 17).

Get AssetTypes

Code	Description
(Get /AssetType)	Returns the available asset types.

Get Installed Base List

Code	Description
(GET /InstalledBase)	Returns information from the Drive Installed Base (DIB)
(GET /InstalledBase/Type)	Returns the DIB information for MotionAssets based on the following requested type: • All MotionAssets assigned to the requesting Client. The time to retrieve the information depends on the number of assets linked to the account. • One MotionAsset identified by its `motionAssetId`. • Specific asset type. The time to retrieve the information depends on the number of assets.

The data from DIB is fetched from the supplying system and transformed into the information model of the Cloud Interface.

Get Measurements

Code	Description
(GET /Measurement)	Returns a list of Measurements (with start time and end time) for the specified MotionAsset ID and measurement type. **Note:** • The requested data (start time and end time) is limited to maximum 24 hours. • Only raw data given by the supplying system can be requested. No aggregated data is allowed. • The requested data for user and MotionAssets is limited to 20 GB per month.

Get Measurement Types

Code	Description
(GET /Measurement/Types)	Returns a list of available measurement types for a specified MotionAsset ID.

Get Condition Index Types

Code	Description
(GET /ConditionIndex/Types)	Returns the condition index types.
(GET /ConditionIndex/TypesByAPI)	Returns the condition index type for the specified MotionAsset ID and `BaseAPI`. The `BaseAPI` differentiates from the rest of the indexes, because the index is same for all assets of a supplying system.

Get Condition Indices

Code	Description
(GET /ConditionIndex)	Returns the condition index for the specified MotionAsset ID. The list includes only the recent indexes. No historical values are available.

Get Events

Code	Description
(GET /Event)	Returns the list of available events for the specified MotionAsset ID and time span.

Get Account, Client, MotionAsset

Code	Description
(GET /Account)	
(GET /Account/Clients)	
(GET /Account/MotionAssets)	Shows the account data of the current client. The function is accessible only for Principal client, so all clients and MotionAssets are shown.

Get Condition-Based Maintenance Summary

Note: Only available for specific drives.

Code	Description
(GET /CBM/Summary)	Shows the commissioning date, end date of expected lifetime, and preventive maintenance date per component for the MotionAssets in the list.

Get Condition-Based Maintenance Daily Impact

Note: Only available for specific drives.

Code	Description
(GET /CBM/DailyStatus)	Returns a list of impacted components on the expected lifetime for the last 30 days of the MotionAssets in the list. The numeric values indicate three levels – high, medium or low impact.

Get Gateways

Code	Description
(GET /Gateway)	Returns a list of connected gateways. **Note:** Currently, Cloud Interface does not support any topology for connected sensors.

Get Sensor

Code	Description
(GET /Sensor)	Returns a list of sensors connected to MotionAssets. **Note:** Currently, only Smartsensors are supported.

Get Sensor Types

Code	Description
(GET /SensorType)	Returns a list of available sensor types. **Note:** Currently, only Smartsensors are supported.

Get Sites

Code	Description
(GET /Site)	Returns a list of connected sites and plants.

Get Feature Subscriptions

Code	Description
(GET /Subscription)	Returns a list of purchased feature subscriptions for a MotionAsset.

Get Powertrains

Code	Description
(GET /Powertrain)	Returns a list of connected powertrains and details of installed components.

Code	Description
(GET /Powertrain/ConditionIndexes)	Returns a list of powertrain condition indexes for a given MotionAsset. The condition indexes include: • Availability • Environment • Reliability • Stress.

PUT

Create Client

A new account can be created using the Cloud Interface, by defining the E-mail of the account and the client access type. In the account the client can be defined as Principal client to allow certain administrative operations of the account.

Code	Description
(PUT /Account/Client)	Creates a client account with the ClientId (username) and Secret (password). The ClientId is unique for the account, which also makes it unique when combined with the account E-mail. The client can access the Cloud Interface using the E-mail, ClientId and Secret. Each client has access to the Cloud Interface (`APIAccess`) and may optionally have the Principal client access.

Create MotionAsset

Code	Description
(PUT /Account/MotionAsset)	Creates MotionAsset for Smart Sensor and CMD. The supplying system (Smart Sensor or CMD) can be the `BaseAPI` in this context and an identifier can be provided, such as Smart Sensor ID or the CMD Serialnumber. The Cloud Interface checks if the identifier exists in the Smart Sensor and CMD. Some general information such as (`AssetType` and `Serialnumber` for Smart Sensor) are stored in the MotionAsset.

When creating a new account, Cloud Interface automatically creates MotionAssets for all the assets that the E-mail has access. Additionally, the MotionAssets list is synchronized whenever the list of MotionAssets (or `InstalledBase`) is requested, but at most once per hour.

POST

Assign/Resign MotionAsset to/from Client

Code	Description
(POST /Account/AssignMotionAssetToClient)	Assigns/resigns a MotionAsset to/from client. • Assign means the client is authorized to access the data of the MotionAsset using the Cloud Interface. • Resign means the client is not allowed to access the asset, even if the authorization depends on the E-mail of the account. It is possible to define granular assignments, than those given by the accounts E-mail. By default, all MotionAssets that the clients account has access to via E-mail are assigned to each client.

Update Secret, MotionAsset

Code	Description
(POST /Account/Secret)	
(POST /Account/MotionAsset).	For updating the same prerequisites as for creation apply (Uniqueness).

DELETE

Delete Client, MotionAsset

Code	Description
(DELETE /Account/Client).	Deletes a client account.
(DELETE /Account/MotionAsset).	Deletes a client or MotionAsset in the Cloud Interface. The function also deletes all the assignments they are involved. Data in the supplying systems are not deleted.

Delete Account

Code	Description
(DELETE /Account)	Deletes all clients and MotionAssets that were created in the context of the account. Data in the supplying systems are not deleted.

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Sample Application

Contents of this chapter

This chapter provides a sample application to understand the Cloud Interface.

Sample application

A sample application is provided to demonstrate the usage of the Cloud Interface. For support, you can use the sample file in *zip* format, available on the Internet at www.abb.com/drives/documents. You can then run the application, if you installed Microsoft Visual Studio.

Disclaimers

Generic disclaimer

The manufacturer shall have no obligation hereunder with respect to any product which (i) has been improperly repaired or altered; (ii) has been subjected to misuse, negligence or accident; (iii) has been used in a manner contrary to the Manufacturer"s instructions; or (iv) has failed as a result of ordinary wear and tear. All material in this manual is subject to change without a further notice. The manual is intended as non-contractual document.

Cybersecurity disclaimer

This product can be connected to and communicate information and data via a network interface. The HTTP protocol, which is used between the commissioning tool (Drive Composer) and the product, is an unsecured protocol. For independent and continuous operation of product such connection via network to commissioning tool is not necessary. However it is Customer's sole responsibility to provide and continuously ensure a secure connection between the product and Customer network or any other network (as the case may be). Customer shall establish and maintain any appropriate

measures (such as but not limited to the installation of firewalls, prevention of physical access, application of authentication measures, encryption of data, installation of anti-virus programs, etc.) to protect the product, the network, its system and the interface against any kind of security breaches, unauthorized access, interference, intrusion, leakage and/or theft of data or information.

Notwithstanding any other provision to the contrary and regardless of whether the contract is terminated or not, ABB and its affiliates are under no circumstances liable for damages and/or losses related to such security breaches, any unauthorized access, interference, intrusion, leakage and/or theft of data or information.

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FAQ

Contents of this chapter

This chapter provides some FAQs while using the Cloud Interface.

FAQ 1: How do I access data in the Cloud Interface?

For accessing the Cloud Interface, you need an user account. Contact ABB support (Follow-the-sun) team. Share your E-mail Id to receive a principal *clientId* (username) and a *secret* (password) for accessing the Cloud Interface.

FAQ 2: What is the principal clientId intended for?

Using the principal *clientId* you can manage (create, update, delete) additional clients.

FAQ 3: Why are additional clients needed?

The Cloud Interface is intended for machine accounts. If you are an authorized client, you can allow access to many other applications by defining clients, based on your account for each access.

Note that the clients may access all the assets your account is allowed to, however you can restrict the access for some assets, if needed.

FAQ 4: Why do I get an unauthorized error for some endpoints of the Cloud Interface?

Some endpoints (mainly from the Account/... contextd) are available only for principal (or other administrative) clients. If you are not a principal client, you may be authorized to access only the data delivering endpoints (e.g. InstalledBase, Events, ConditionIndex, Measurements, etc.) for the assets that their clientId is assigned.

Further information

Product and service inquiries

Address any inquiries about the product to your local ABB representative, quoting the type designation and serial number of the unit in question. A listing of ABB sales, support and service contacts can be found by navigating to www.abb.com/searchchannels.

Product training

For information on ABB product training, navigate to new.abb.com/service/training.

Providing feedback on ABB manuals

Your comments on our manuals are welcome. Navigate to new.abb.com/drives/manuals-feedback-form.

Document library on the Internet

You can find manuals and other product documents in PDF format on the Internet at www.abb.com/drives/documents.

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