

ABB Ability™ Smart Sensors

Cloud Interface user guide

1. What is a cloud interface for ABB Ability™ Smart Sensors?

The ABB Ability™ Cloud Interface allows users to access the data acquired by the ABB Ability™ Smart Sensors and integrate it in their own maintenance management system.

The users access the equipment data acquired by the ABB Ability™ Smart Sensor without having to use the Smart Sensor web portal through an internet browser.

The Cloud Interface uses web APIs (Application Programming Interfaces, based on HTTPS RESTful protocol), which enable secure and controlled remote access from the outside to valuable data in the cloud.

Users can benefit from the Cloud Interface for those Smart Sensors that have a valid and active condition monitoring subscription.

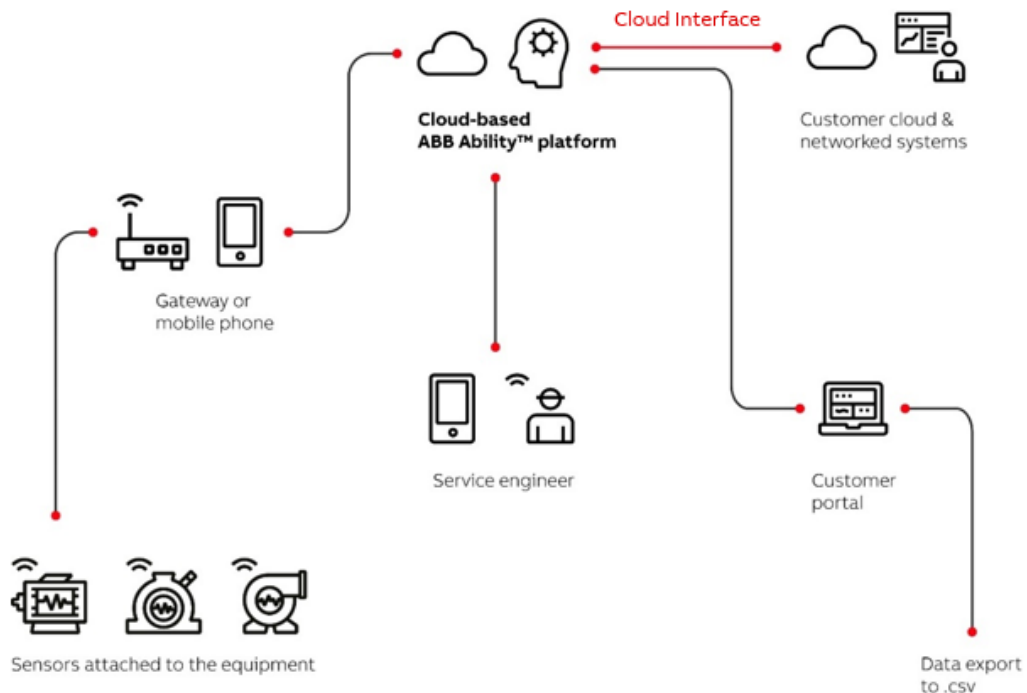


Figure 1: ABB Ability™ Smart Sensor platform diagram

2. Scope

- Information about the required steps to access the web APIs for ABB Ability™ Smart Sensors.
- Provide common use cases as a starting point for the users' own integration project(s).

3. Steps for users to start creating their own integration project

1. Study this user guide.
2. Define the design requirements for their application, such as - but not limited to - integration scope, validation and data visualization. Users can create their own use case based on the examples provided.
3. Study the detailed service specifications of the ABB Ability™ Smart Sensor Cloud Interface relevant for the users' application: <https://api.smartsensor.abb.com/swagger>
4. If more details are required, users can send an email to support.smartsensor@abb.com. The Smart Sensor support team will provide a detailed external integration guideline.
5. Users shall perform the Cloud Interface implementation to successfully integrate the data into their own system software. If users do not want to do the implementation themselves, support from a system integrator is required.

4. Use cases

Examples of use cases are described below. The use cases include several operating services for Cloud Interface API.

Examples of services provided by the Cloud Interface API:

- request the list of assets (use case 1)
- request plant data (use case 1)
- request detailed asset data (use case 1)
- receive maintenance, alerts and alarm notifications (use case 2)
- request detailed event data (use case 2)
- change the threshold values for health parameters (use case 3)
- request condition indexes of the asset (use case 4)
- request historic measurement data of the asset (use case 5)

4.1. Use case 1: request asset details

The Cloud Interface allows an external system to request specific asset information, such as:

1. **Plant data:** list of the plants within an organization, plant name, plant address, plant ID, organization name, organization ID, etc.
2. **Simplified asset data:** list of the assets within an organization, asset type name (e.g. motor, pump), asset ID, asset name, asset serial number, asset description, plant ID, plant

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name, organization ID, organization name, health status, last synchronization time, sensor type, sensor identifier, etc.

3. **Detailed sensor and asset data (including last measurements) for a specific asset ID:** extended data can be requested such as asset operating characteristics (e.g. speed, voltage), last measurements (e.g. speed, skin temperature, overall vibration, operating time, number of starts, bearing condition), etc.

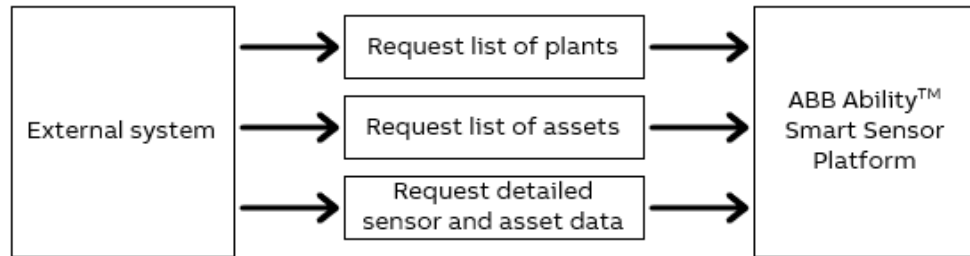


Figure 2: Use case 1 - request asset details

4.2. Use case 2: receive notifications for maintenance, alerts and alarms

Key Performance Indicators (KPIs) configured as asset health parameters have alert and alarm values specified by the users. These health parameters are used to identify the health status of the asset.

If the health parameter value of an asset exceeds an alert or alarm value, a notification is created by the ABB Ability™ Smart Sensor platform. This notification is pushed to the ABB Ability™ Smart Sensor Platform app, the Smart Sensor web portal and authorized external systems.

Additionally, maintenance events can be added from external systems to keep track of maintenance operations in the ABB Ability™ Smart Sensor Platform app.

Notification functionality from the ABB Ability™ Smart Sensor Platform is available as email and push notification to mobile devices. Notifications are sent per asset.

The Cloud Interface allows authorized users, to request alert and alarm notifications and to add maintenance events, from an external system.

- **Alert and alarm notifications:** a list of notification events for the assets that the authenticated users have access to can be obtained using the Cloud Interface.
- **Maintenance events:** comments related to a performed maintenance intervention can be added through the Cloud Interface.
- **Close an alert or/and an alarm:** a notification event can be resolved using the Cloud Interface, after the necessary countermeasures have been taken by the user.

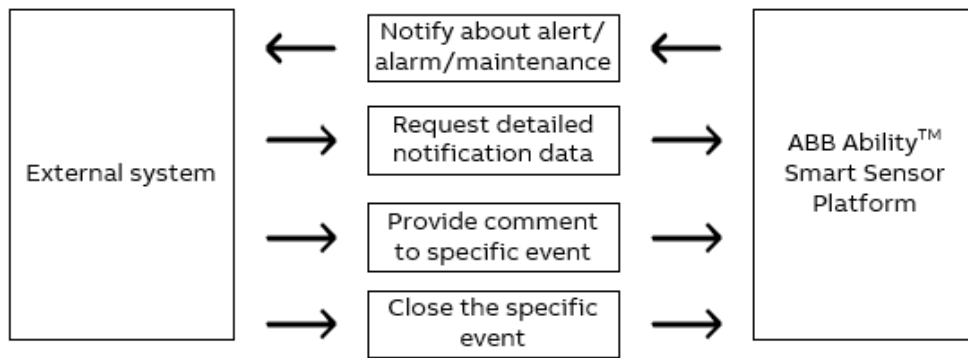


Figure 3: Use case 2 – receive maintenance, alert and alarm notification

4.3. Use case 3: change threshold values for KPIs configured as asset health parameters

The threshold values of the asset KPIs related to health parameters can be modified by the users. New health intervals will be saved for an asset.

The Cloud Interface allows users to modify health related KPIs from an external system.

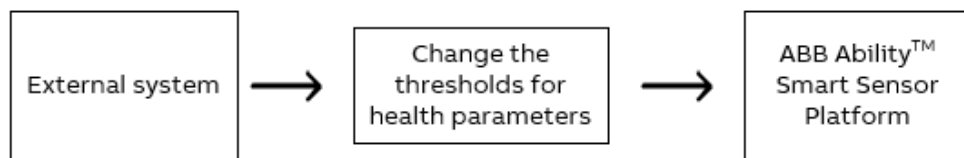


Figure 4: Use case 3 - change the thresholds for health parameters

4.4. Use case 4: request condition indexes of an asset

The Cloud Interface allows users to request condition indexes of the asset, which represent the health status of the asset, from an external system. Four types of condition indexes are available, independent of the asset type (e.g. motor, pump):

- **Availability:** KPI indicates the quality of the asset and its ability to be used on demand to perform its required function.
- **Environment:** KPI indicates the impact of external and internal environmental parameters on the operation of the asset (e.g. the internal and / or external temperature and the humidity in relation to the asset).
- **Reliability:** KPI indicates the ability to perform its intended or required function consistently without degradation or failure (e.g. asset maintenance advice, number of asset failures in the past operating period).
- **Stress:** KPI indicates the load and performance of the asset regarding the main functionality in relation to the asset type specific maximum value of the load (e.g. the current power of the motor in relation to the maximum power).

Every condition index has a value between 0 and 1. A value of 0 represents the unhealthiest status, 1 the healthiest status. Additionally, every condition index value is transformed into a “traffic light” status representing the values: poor, tolerable and ok.



Figure 5: Use case 4 – requesting condition indexes of the asset

4.5. Use case 5: request historic measurement data of an asset

The Cloud Interface allows users to request historical data and analytics from an external system. This request is based on the different measurement types provided by the ABB Ability™ Smart Sensor Platform (speed, skin temperature, overall vibration, etc.).

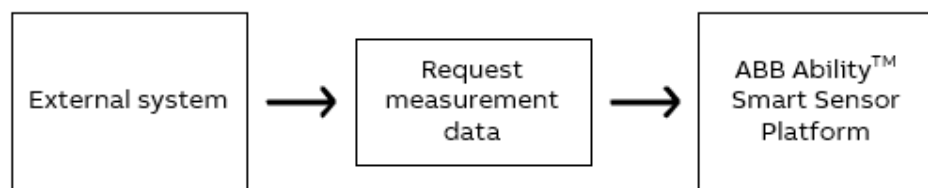


Figure 6: Use case 5 – requesting historic measurements

4.6. Commands

The following table summarizes the commands needed to deploy the use cases mentioned in this user guide.

Some commands require an additional feature code to request the appropriate service provided by the Cloud Interface API. This feature code correlates with the use cases of the external system integration scenario.

Command and feature code	Purpose
GET /Plant	Request plant data
GET /Asset/List FeatureCode: EXT_ViewAssetDetails	Request simplified asset data
GET /Asset/{id} FeatureCode: EXT_ViewAssetDetails	Request detailed sensor and asset data (including last measurements)
GET /EventLog FeatureCode: EXT_AssetEventLog	Request alert and alarm notifications
POST /EventLog/Comment Service FeatureCode: EXT_AssetEventLog	Add comments related to a performed maintenance intervention
PUT /EventLog/Close FeatureCode: EXT_AssetEventLog	Close an alert or/and an alarm after the necessary countermeasures were provided.

PUT /Measurement/HealthInterval/{id}	Modify the health related KPIs
FeatureCode: EXT_ConfigureAssetHealth	
GET /ConditionIndex	Request all the condition indexes of one or more assets
FeatureCode: EXT_AssetConditionIndex	
GET /ConditionIndex/{id}	Request one specific condition index of one or more assets
FeatureCode: EXT_AssetConditionIndex	
GET /Measurement/Value	Get all historical measurement data for the specified Asset ID for one or more measurement types
FeatureCode: EXT_AssetTrendData	

5. Access authentication

For authentication, the users can use the same login credentials as for the Smart Sensor web portal or request a dedicated API Key in the Smart Sensor web portal. The API Key can be requested by the users under their profile, going to API Keys and selecting the function “add new”. The users will receive the API Key via email.

Visit the Smart Sensor [FAQ section](#) for more information regarding access authentication and user management.

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