

MindSphere Capability Packages Product Sheet



The MindSphere Capability Packages provide you with a dedicated Account in MindSphere which is required in order to use different IIoT capabilities for developers, operators and end users depending on the MindSphere Capability Package you choose.

| Prerequisites | |
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| Web browser | An HTML5 capable Internet browser is required (e.g. Mozilla Firefox or Google Chrome). The recommended screen resolution is 1024x768 or higher. Mobile devices are supported through the use of HTML5 capable Internet browsers. Screen size of the mobile device should be minimum 10". |
| MindSphere Cloud Resources | For productive use of a MindSphere Capability Package, a subscription to an IIoT Data Package (XS / S / M / L / XL) is required. In addition, some specific capabilities require additional MindSphere Cloud Resources, e.g., Semantic Data Interconnect (SDI) or Integrated Data Lake (IDL). For more information, please refer to the Product Sheet for MindSphere Cloud Resources available at https://siemens.mindsphere.io/en/docs/Product-Descriptions-Overview/MindSphere-Product-Sheets . |
| Asset Attributes | For productive use of a MindSphere Capability Package, a subscription to Asset Attributes is required. For available subscription options please refer to Chapter "MindSphere Asset Attributes Description" of this Product Sheet. |

| MindSphere Capability Packages | |
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| Access to your Account | The MindSphere Capability Packages provide you with a dedicated Account on MindSphere. An Account can have up to 4 Environments depending on the MindSphere Capability Package which serve a certain purpose. Per default, you will always receive one Productive Environment. |
| Description of MindSphere Capability Packages | Different MindSphere Capability Packages are available (Basic/Standard/Premium). You are only authorized to utilize the MindSphere Capability Package to which you hold a valid subscription. Basic, Standard and Premium differ in terms of capabilities and general functionalities included. |

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| | <p>General functionalities are underlying services, enablers and components required for the capabilities.</p> <ul style="list-style-type: none"> • Basic: <ul style="list-style-type: none"> ▪ Kick-start your IIoT journey, focusing on connecting assets to acquire IoT data, visualize and explore acquired data with simple & easy-to-use dashboard visualizations and thirdparty applications to start discovering insights. ▪ Use it for a small-scale use case or project scenarios. ▪ Develop, integrate and use applications productively within your own Account leveraging MindSphere’s APIs and prebuilt components. • Standard (additional to Basic Capability Package): <ul style="list-style-type: none"> ▪ Continue your journey by utilizing your semi-structured & unstructured data and advanced dashboard visualizations. ▪ Realize IIoT use cases globally to improve product quality, production performance and maintenance. ▪ Develop, integrate, test and use applications productively within your own Account leveraging MindSphere’s APIs and prebuilt components. ▪ Provision applications to other MindSphere customers’ Accounts and publish new applications via the Store for fast go-to-market. • Premium (additional to Basic and Standard Capability Packages): <ul style="list-style-type: none"> ▪ Discover data semantics on a large scale with full capabilities. ▪ Seamless integration into your own enterprise ecosystem. ▪ Optimize your production life cycle, product maintenance and engineering with fast set up digital twins for connected products and shop floors. <p>Select the MindSphere Capability Package that best suits your requirements and use cases.</p> |
| Upgrades for MindSphere Capability Packages | <p>The following upgrades to your existing MindSphere Capability Packages are available:</p> <ul style="list-style-type: none"> • Basic to Standard Upgrade • Standard to Premium Upgrade |

| MindSphere Capability Packages – Overview | | | |
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| Capabilities | Basic | Standard | Premium |
| Analytics Services | | | |
| Use APIs to conduct analytics | ✓ | ✓ | ✓ |
| Asset Manager & Asset Management | | | |
| Onboard, configure & manage Assets | ✓ | ✓ | ✓ |
| Closed-Loop Digital Twin Applications | | | |
| Configure connection between enterprise applications and the Platform | | | ✓ |
| Manage IoT data driven product lifecycle | | | ✓ |
| Perform monitoring and design improvement using IoT data driven system simulation | | | ✓ |

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| Optimize shopfloor operations using IoT data enabled simulations | | | ✓ |
| Connect your Things | | | |
| Connect your Assets using a PC as a gateway | ✓ | ✓ | ✓ |
| Connect your own hardware | ✓ | ✓ | ✓ |
| Use MindConnect hardware | ✓ | ✓ | ✓ |
| Zero touch onboarding with OPC UA PubSub and MindConnect MQTT | ✓ | ✓ | ✓ |
| Maintain your connected devices | ✓ | ✓ | ✓ |
| Data Sharing | | | |
| Share Asset data across Accounts and Environments | ✓ | ✓ | ✓ |
| Developer Cockpit | | | |
| Integrate applications (w/o hosting) | ✓ | ✓ | ✓ |
| Test applications in Development Environment | ✓ | ✓ | ✓ |
| Provision applications to dedicated Test Environments for testing | | ✓ | ✓ |
| Identity Provider Federation | | | |
| Bring your own Identity Provider (IdP) and integrate it with your Account | | | ✓ |
| Integrated Data Lake | | | |
| Store, organize, tag and search any kind of data | | ✓ | ✓ |
| Operations Insight | | | |
| Explore basic Dashboards | ✓ | ✓ | ✓ |
| Explore Assets | ✓ | ✓ | ✓ |
| Explore Events | ✓ | ✓ | ✓ |
| Explore Work Orders | ✓ | ✓ | ✓ |
| Analyze Time Series | ✓ | ✓ | ✓ |
| Generate Forecasts on time series data | ✓ | ✓ | ✓ |
| Generate Anomaly Detections on time series data | ✓ | ✓ | ✓ |
| Configure simple KPIs | ✓ | ✓ | ✓ |
| Configure Rules | ✓ | ✓ | ✓ |
| Operations Insight Analytics | | | |
| Explore advanced Dashboards | | ✓ | ✓ |
| Configure advanced KPIs | | ✓ | ✓ |

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| Operator Cockpit | | | |
| Provision applications to own Environments for own productive use | ✓ | ✓ | ✓ |
| Provision applications to other MindSphere customers' Accounts for usage within different Environments | | ✓ | ✓ |
| Publish applications in Store | | ✓ | ✓ |
| Semantic Data Interconnect | | | |
| Discover schema & query physical data | | ✓ | ✓ |
| Query semantically contextualized data | | | ✓ |
| Visual Flow Creator | | | |
| Define data flows to analyze, orchestrate, interact and visualize data | ✓ | ✓ | ✓ |

Description of Capabilities

Analytics Services

Description

Analytics Services are available via their respective MindSphere APIs and provide you with a toolbox for **conducting basic and advanced analytics for time series data and events as APIs** such as Anomaly Detection, Event Analytics, KPI Calculation, Signal Calculation, Signal Spectrum Analysis, Signal Validation and Trend Prediction.

- **Anomaly Detection** aims to support the detection of unexpected behavior of processes and assets. For the training of anomaly detection, normal data is sufficient. Normal data represents the standard conditions of assets. Furthermore, clustering based on anomaly detection techniques allow human interaction and integration of domain knowledge (e.g., by labeling of new clusters and/or anomalies). A developer can build applications for process and condition monitoring, early warning functionality and detection of fault conditions without explicit definitions.
- **Event Analytics** provides a statistical analysis for visualizing the most frequent events over a period of time.
- **KPI Calculation** offers an easy way to provide various calculations for Key Performance Indicators (KPI) based on sensor data as well as sequence of events (i.e., from control/automation systems). The characteristic of these KPI calculations is related to an ISO 3977-9:1999 standard which is in fact dedicated to gas turbines. The characteristic is also applicable to other industrial applications. It is possible to provide automated annotation for time series data for many common characteristics. Additionally, the function can combine two information sources, numerical sensor data as well as events. This service can be applied for historical data as well as the automated processing of incoming new data.
- **Signal Calculation** offers commonly used missing value handling strategies, for instance, removal and interpolation. It calculates a descriptive summary of a sequence of signal values and if required, it derives new signal values by shifting, smoothing and transforming the original ones.

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| | <ul style="list-style-type: none"> • Signal Spectrum Analysis allows to detect changes in the signal spectrum, for instance noise arising in a specific frequency band or a known frequency suddenly missing in the spectrum. The User may conduct discrete Fourier transform based on audio files and then detect upper or lower frequency band violations. • Signal Validation provides functions that help to detect common issues in time series data. Signal Validation can be used for optimizing the data quality. • Trend Prediction is a forecasting framework that may be useful in the area of process and condition monitoring. Also, seasonality and trend removal are an essential tasks of data analytics pre-processing. |
| Limitations | <p>Analytics Services can be utilized in an interactive mode, direct interactive mode or batch mode, e.g., via the Visual Flow Creator (workflow tool for calling APIs) or from your applications:</p> <ul style="list-style-type: none"> • Batch mode: Allows processing of up to 1 000 000 data points using one single API call including all dimensions with a response time between 40 seconds and several hours (depending on algorithm complexity). • Interactive mode: Allows processing of up to 20 000 data points provided as input to the API request using one single API call with a response time below 10 seconds. • Direct interactive mode: Allows processing of up to 20 000 data points from the time series data storage using one single API call with a response time below 10 seconds. <p>Currently only Anomaly Detection is available in the three modes mentioned above. KPI Calculation, Trend Prediction, Signal Calculation and Signal Validation are available in an interactive and direct interactive mode. All other Analytics Services are available only in an interactive mode.</p> |
| Required MindSphere Cloud Resources | <p>The number of Analytics API Calls is limited. These limits are defined by the respective IIoT Data Package size ordered.</p> <p>For more information, please refer to the Product Sheet for MindSphere Cloud Resources.</p> |
| Documentation | <p>For further details about Analytics Services please see MindSphere Documentation available via the following weblink: https://developer.mindsphere.io/apis/index.html#analytics-services.</p> |
| Asset Manager & Asset Management | |
| Description | <p>Asset Manager is available via user interface accessible from your MindSphere Launchpad and can be used to:</p> <ul style="list-style-type: none"> • Onboard & offboard Assets to your Account. • Configure Assets and Asset Attributes. • Manage the Sharing of Assets under a Collaboration between Environments using Data Sharing capabilities. <p>Asset Management is available via its respective MindSphere APIs and allows you to create, read, update and delete Assets through an appropriate user interface developed by you.</p> |
| Third-Party Terms | <p>Third-Party Terms for Asset Manager are available under “administration tools” via the following web link: https://siemens.mindsphere.io/en/docs/Product-Descriptions-Overview/Third-Party-Terms.</p> |
| Documentation | <p>For further details about Asset Manager & Asset Management please see MindSphere Documentation available via the following weblinks: https://documentation.mindsphere.io/resources/html/asset-manager/en-US/index.html and https://developer.mindsphere.io/apis/advanced-assetmanagement/api-assetmanagement-overview.html.</p> |

Closed-Loop Digital Twin Applications

Description

Closed-Loop Digital Twin Applications enable you to define and manage the connections between virtual models (i.e. the digital representation for a physical object) and onboarded Assets. They provide interfaces for sending time series data and event information from the Platform to supported enterprise applications (i.e. applications hosted by you or a third party authorized by you outside the wide area network of the Platform) in order to simulate, analyze, visualize and optimize your products and operations.

Closed-Loop Digital Twin Application suite (consisting of Product Twin and Factory Twin applications) provides you with the following capabilities:

- **Configure connection between enterprise applications and the Platform** using either **Factory Twin** or **Product Twin** applications depending on the enterprise application that you wish to connect to the Platform. Both applications enable physical and virtual model mapping and connection to supported enterprise applications with the Platform. It also allows to configure the model for simulation and run it using operational data of an Asset. These applications provide a communication channel between the Platform and enterprise applications.
- **Manage IoT data driven product lifecycle** with **Product Twin** which enables tractability between product variants and Asset events and helps to diagnose a problem by providing field feedback to the product. This application allows you to connect specific product configurations to onboarded Assets, view operational events and related product defects for a specific configuration and to create new product defects for unaddressed events. It can also show you a summary of operational events generated for all product configurations. It allows you to view the complete design of a product with variant information, manage the summary of events from the fleet of Assets of different product variants and to perform an analysis of events occurring on multiple Assets which use a single design object.
- **Perform monitoring and design improvements using IoT data driven system simulation** with **Product Twin** which allows you to create, manage and run simulations between onboarded Assets and their system models. With this application, you can build a connection between an onboarded Asset and its corresponding system model. This application leverages the connection to provide onboarded Asset IoT data as input to the system model. Simulations can be performed on the system model using this application. Simulation results are saved back into the Platform.
- **Optimize shopfloor operations using IoT data enabled simulations** with **Factory Twin** which allows you to create, manage and run simulations between physical Assets and their discrete event models. With this application, you can build a connection between Assets and their corresponding discrete event simulation models. This application leverages the connection to provide physical Asset IoT data as an input into the discrete events simulation model.

Limitations

Enterprise Applications. Enterprise applications are not part of our Offering. It is your responsibility to procure and maintain appropriate licenses for such enterprise applications. Such enterprise applications are solely operated by you. Enterprise applications currently supported are listed below (subject to change and for informational purposes only; please verify with your MindSphere sales representative):

| | Closed-Loop Digital Twin application: | Supported enterprise application: | Supported connectors: |
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| | Product Twin | Simcenter Amesim, Teamcenter | Closed-Loop Connector for Amesim, Closed-Loop Connector for Teamcenter |
| | Factory Twin | Tecnomatix Plant Simulation | Closed-Loop Connector for Plant Simulation |
| | <p><u>Connector packages.</u> The connection of supported enterprise applications to Product Twin or Factory Twin on the Platform requires the local installation of corresponding supported connector packages listed above which contain connector software and associated Deployment and Development Guides. The connector packages will be made available for download via the Siemens Support Center portal ("Support Center").</p> <p><u>Own custom connector.</u> If you wish to develop and create your own custom connector (e.g. to connect further enterprise applications to a Closed-Loop Digital Twin application), you are solely responsible for (i) developing such custom connector in accordance with the Closed-Loop Connector Development Guide, (ii) properly installing, configuring and using it, (iii) properly connecting it to the Platform, (iv) deploying it in accordance with the relevant Deployment Guide (if applicable), and (iv) regularly monitoring the content, integrity, security, accuracy and timeliness of the data transmission (e.g. by monitoring such transmission over the Platform). Such custom connectors are not part of our Offering.</p> | | |
| Export Control Regulations | The connector software provided by us as part of the connector packages is classified as AL = 5D002C1A, ECCN = 5D002ENCB1. | | |
| Third-Party Terms | <p>Third-Party Terms for Product Twin, Factory Twin, Closed-Loop Connector for Amesim, Closed-Loop Connector for Teamcenter and Closed-Loop Connector for Plant Simulation are available under "Closed-Loop Digital Twin Applications" via the following web link:</p> <p>https://siemens.mindsphere.io/en/docs/Product-Descriptions-Overview/Third-Party-Terms.</p> | | |
| Documentation | <p>For further details about Closed-Loop Digital Twin applications please see MindSphere Documentation available via the following weblinks:</p> <p>https://documentation.mindsphere.io/resources/html/product-twin/en-US/index.html;</p> <p>https://documentation.mindsphere.io/resources/html/factory-twin/en-US/index.html.</p> | | |
| Connect your Things | | | |
| Description | <p>Connect your Things provides you with the following connectivity capabilities:</p> <ul style="list-style-type: none"> • Connect your assets using your PC as a gateway with MindConnect Software Agent, • Connect your individual hardware using MindConnect API Services, MindConnect MQTT Services, MindConnect OPC UA PubSub Services and MindConnect Library, • Use MindConnect Hardware (e.g. MindConnect Nano, MindConnect IoT2040), • Zero touch onboarding using MindConnect OPC UA PubSub Services and MindConnect MQTT Services, • Maintain connected devices by using MindConnect Device Management Services. | | |

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| Description of MindConnect Software Agent | <p>MindConnect Software Agent is a software that allows you to connect supported third party devices to your Account on the Platform. It also allows you to collect data from industrial devices using supported field protocols such as S7, OPC-UA, EtherNet/IP and Modbus TCP and to transfer the collected data to your Account via an established connection.</p> <p>The software will be made available for download on the Platform and must only be used on supported third-party hardware devices. For further information as to which hardware devices are currently or will be supported, please verify with your MindSphere sales representative.</p> <p>Hardware devices are not part of your subscription to a MindSphere Capability Package and are solely operated by you. It is your responsibility to procure such hardware devices. We grant you a Perpetual license to use the MindConnect Software Agent.</p> |
| Description of MindConnect API Services and MindConnect Library | <p>MindConnect API Services are available via their respective MindSphere API and allow you to transfer data between your Account on the Platform and on-premise hardware devices or on-premise connectivity software from Siemens or from third parties, provided such hardware or connectivity software is compatible with the MindConnect API Services. MindConnect Library provides a Software Development Kit (SDK) that enables programming of customer specific or use case specific agents. This SDK uses MindConnect API Services.</p> |
| Description of MindConnect MQTT Services | <p>MindConnect MQTT Services are available via their respective MindSphere API and allow you to transfer data between your Account on the Platform and on-premise hardware devices or on-premise connectivity software from Siemens or from third parties, provided such hardware or connectivity software is compatible with the MindConnect MQTT Services.</p> |
| Description of MindConnect OPC UA PubSub Services | <p>MindConnect OPC UA PubSub Services are available via their respective MindSphere API and allows you to transfer data between your Account on the Platform and on-premise hardware devices or on-premise connectivity software from Siemens or from third parties, provided such hardware or connectivity software is compatible with the MindConnect OPC UA PubSub Service.</p> |
| Description of MindConnect Hardware | <p>MindConnect Nano and MindConnect IoT2040 are pre-configured devices which allow connectivity to MindSphere. The devices support the transmission of data encrypted through a secured internet connection to Platform.</p> <p>These hardware devices are not part of your subscription to a MindSphere Capability Package and are solely operated by you. It is your responsibility to procure such hardware devices.</p> <p>For more information, please refer to the Product Sheets for MindConnect Nano and MindConnect IoT2040 available at https://siemens.mindsphere.io/en/docs/Product-Descriptions-Overview/MindSphere-Product-Sheets.</p> |
| Description of MindConnect Device Management Services | <p>MindConnect Device Management Services provide backend services to configure, maintain and update your connected devices. The services are available via their respective MindSphere APIs. It covers the following services:</p> <ul style="list-style-type: none"> • Device Management allows to maintain an inventory of all connected devices as well as to manage the lifecycle of device types. The device type is used when determining which software (especially firmware) can be installed on which device instance. A device can only be onboarded to the Platform via an Agent. Credentials for accessing the Platform are tied to Agents created by using Agent Management Service. • Deployment Workflow allows to deploy software packages or configuration files to devices. You can model the deployment operations as a workflow state |

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| | <p>machine according to your needs, while deploying artifacts or configuration to your devices.</p> <ul style="list-style-type: none"> • Device Configuration allows to (re-)configure devices. This service uses Deployment Workflow for controlling the update process and for tracking the result of the update with a predefined deployment model. It also allows to store, manage and version configuration files. • Device Status allows to monitor the health status (e.g., online/offline) of devices on the Platform. • Firmware Deployment allows to initiate jobs for deploying firmware releases on devices. This service initiates a job instance on Deployment Workflow to download firmware artifacts onto devices by using a predefined deployment model. It generates a URL for devices to download the artifacts files. Those generated pre-signed URLs may only be used to manage firmware releases to connected edge devices. |
| Documentation | <p>For further details about connectivity capabilities please see MindSphere Documentation available via the following weblinks:</p> <p>https://developer.mindsphere.io/apis/connectivity-mindconnect/api-mindconnect-overview.html</p> <p>https://developer.mindsphere.io/resources/mindconnect-lib-v4/resources-mclib-overview.html</p> <p>https://documentation.mindsphere.io/resources/html/getting-connected/en-US/index.html</p> <p>https://developer.mindsphere.io/apis/connectivity-opcuapubsub/api-opcuapubsub-overview.html</p> <p>https://developer.mindsphere.io/apis/connectivity-mindconnect-async/api-mindconnect-async-overview.html.</p> |
| Data Sharing | |
| Description | <p>Data Sharing enables you to share Asset data across Environments within the same Account or with Environments of other Accounts. It enables customers to grant other Environments access to certain Customer Content (read) under a collaboration (“Collaboration”). Once the Collaboration is established, the sharing Environment will be able to share selected Customer Content with the receiving Environment (“Sharing”). Collaboration and individual Sharing require prior approval of the involved Environment.</p> |
| Limitations | <p>Data Sharing allows 1 000 Collaborations per Environment and the Sharing of 250 Assets per Collaboration. One Asset can be shared with up to 10 different receiving Environments.</p> |
| Documentation | <p>For further details about Data Sharing please see MindSphere Documentation available via the following weblink:</p> <p>https://developer.mindsphere.io/concepts/concept-cross-tenancy.html.</p> |
| Developer Cockpit | |
| Description | <p>Developer Cockpit brings along collaborative low-code, no-code and codeful application integration and supports the application lifecycle. Please note: This covers the integration of self-hosted applications. It does not include access to a hosting environment (e.g. Cloud Foundry).</p> <p>Use Developer Cockpit to:</p> <ul style="list-style-type: none"> • Integrate a new application with MindSphere APIs. • Provision applications to Test Environments during development phase (only for Standard/Premium). |

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| | <ul style="list-style-type: none"> • Make your application visible in the Development Environment e.g., for testing purposes. • Manage versions of your applications. • Decide which application you want to make available for productive deployment by uploading it together with additional information to an intermediate repository. <p>For detailed information on the individual process steps, please refer to the MindSphere DevOps Guide available at https://siemens.mindsphere.io/en/docs/Product-Descriptions-Overview.</p> |
| Third-Party Terms | Third-Party Terms for Developer Cockpit are available via the following web link: https://siemens.mindsphere.io/en/docs/Product-Descriptions-Overview/Third-Party-Terms . |
| Documentation | For further details about Developer Cockpit please see MindSphere Documentation available via the following weblink: https://documentation.mindsphere.io/resources/html/developer-cockpit/en-US/index.html . |
| Identity Provider Federation | |
| Description | <p>We offer you the possibility to bring your own Identity Provider and federate it with your Account using Security Assertion Markup Language (SAML) or Open ID Connect protocol. Once the federation is established, you can achieve a Single Sign-On (SSO) access to the Platform from your Identity Provider.</p> <p>Use Identity Provider Federation to:</p> <ul style="list-style-type: none"> • Configure & federate your Identity Provider with the Platform. • Manage all your Identity Providers from a single user interface. • Activate the Identity Provider of your choice. |
| Third-Party Terms | Third-Party Terms for Identity Provider Federation are available via the following web link: https://siemens.mindsphere.io/en/docs/Product-Descriptions-Overview/Third-Party-Terms . |
| Documentation | For further details about Identity Provider Federation please see MindSphere Documentation available via the following weblink: https://documentation.mindsphere.io/resources/html/settings/en-US/index.html . |
| Integrated Data Lake (IDL) | |
| Description | <p>Integrated Data Lake allows you to store, organize, tag and search any kind of data (structured, semi structured and unstructured) as objects, bring together data from different sources and use it with applications and tools. You can organize data in different folders, associate it with metadata tags, search and delete objects.</p> <p>Seamlessly integrate with your existing subscribed MindSphere Offerings and work with big data tools of your choice from various cloud service providers.</p> |
| Required MindSphere Cloud Resources | For productive use, additional MindSphere Cloud Resources (Integrated Data Lake) are required. For more information, please refer to the Product Sheet for MindSphere Cloud Resources. |
| Third-Party Terms | Third-Party Terms for Integrated Data Lake are available via the following web link: https://siemens.mindsphere.io/en/docs/Product-Descriptions-Overview/Third-Party-Terms . |
| Documentation | For further details about Integrated Data Lake please see MindSphere Documentation available via the following weblinks: https://documentation.mindsphere.io/resources/html/integrated-data-lake/en-US/index.html and https://developer.mindsphere.io/apis/iot-integrated-data-lake/api-integrated-data-lake-overview.html . |

Operations Insight

Description

With Operations Insight it is possible to explore the performance and condition of Assets, products, or lines in real time, get full and harmonized transparency and root causes from the data of your connected Assets, calculate KPIs, assign work orders within your team and automatically receive notifications when thresholds are exceeded. Operations Insight offers the following capabilities in the categories "explore", "analyze" and "configure":

- **Explore basic Dashboards** can be used to visualize time series data and other information (e.g., text, images) on one page with few simple & easy-to-use dashboard visualizations. Within Operations Insight basic Grafana visualization panels will be available for you.
- **Explore Assets** provides an overview of Assets configured in the respective Environment, allows to search and filter for relevant Assets based on various criteria, and displays measured data and information from Assets.
- **Explore Events** shows time series events of different severities and allows you to acknowledge events, start work orders and explore Assets.
- **Explore Work Orders** is used to investigate issues and ongoing maintenance activities within your own production and Assets, and it allows you to change status, priority, and assignee of a work order (in which case a message will be sent to the assignee).
- **Analyze Time Series** is a basic analytics application for time series data.
- **Generate Forecasts** based on our AI for Everyone framework to enable predictions of KPIs based on time-series data.
- **Generate Anomaly Detections** based on our AI for Everyone framework to find anomaly spots from existing time-series data.
- **Configure simple KPIs** is used to define and calculate KPIs on time series data by visually selecting input and output variables and writing the calculation formula using JavaScript language.
- **Configure Rules** is used to monitor one or more variables of the respective Assets and define resulting actions such as sending notifications or setting a status indication after the occurrence of an event set, e.g., if the data relating to a certain asset exceeds a threshold defined.

Description of Artificial Intelligence (AI) for Everyone framework

The **AI for Everyone framework** is accessible from the "Analyze" tab-category of **Operations Insight**. It offers end-to-end, out-of-the-box model building that identifies relevant features and generates a unique GAM (Generalized Additive Model) for each time series forecasting or anomaly detections use case, which allows you to

- forecast your future time series data values with assigned prediction horizon, validation dataset, confidence interval, etc.
- detect anomaly spots from your existing time series data values based on different perspectives, normal behaviors configuration, etc.

With the user interface of AI for Everyone, you can start from "Use Case" and "Dataset" where your Forecast and Anomaly Detection models can be associated, built, and executed. You can make easy configuration of parameters for model building and leverage visualized execution results for further leveraging in your own use cases.

For further details about AI for Everyone framework please see MindSphere Documentation available via the following weblink:

<https://documentation.mindsphere.io/resources/html/operations-insight/en-US/155197424523.html>.

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| Limitations | AI for Everyone is available for customers from either Basic, Standard or Premium Capability Package and by default offers 20 forecasts and 20 anomaly detections per month for free. Customers could purchase AI for Everyone Forecast/ Anomaly Detection Quota Upgrade add-on for additional executions. Please note that depending on your dashboard usage, certain technical limitations may apply. For more information, please refer to https://siemens.mindsphere.io/en/docs/Product-Descriptions-Overview/technical-limitations . |
| Required MindSphere Cloud Resources | The number of (simple) KPIs and Rules you can (concurrently) use for Operations Insight as well as the number of Forecast Executions is limited. These limits are defined by the respective IIoT Data Package size ordered. For more information, please refer to the Product Sheet for MindSphere Cloud Resources. |
| Third-Party Terms | Third-Party Terms for Operation Insight, Explore Dashboards, Explore Assets, Explore Events, Analyze Time Series, Configure Rules, Explore Work Orders, Configure simple KPIs and Generate Forecasts and Generate Anomaly Detections based on AI for Everyone framework are available under "Operations Insight" via the following link: https://siemens.mindsphere.io/en/docs/Product-Descriptions-Overview/Third-Party-Terms . |
| Documentation | For further details about Operations Insight please see MindSphere Documentation available via the following weblink: https://documentation.mindsphere.io/resources/html/operations-insight/en-US/index.html . |

Operations Insight Analytics

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| Description | <p>Operations Insight Analytics is an extension of Operations Insight and adds the following capabilities:</p> <ul style="list-style-type: none"> • Configure advanced KPIs allows you to create KPIs with a graphical editor and also analyze KPIs live, as well as start a root cause analysis. <p>Explore advanced Dashboards offers you advanced dashboard visualizations as well as refresh features and added "KPI Analysis" widget to do KPI analytics right in the dashboard. Advanced Grafana visualization panels will be available for you either within Operations Insight or will be accessible from the MindSphere Launchpad via Dashboard Designer. With Operations Insight Analytics it is possible to create advanced KPIs and Dashboards on time series data as well as on non-time series data from MindSphere IDL and further do drill-down analysis. IDL is enabled in "Configure KPIs" and "Explore Dashboards" UIs to allow scanning for files that are already uploaded in IDL.</p> |
| Required MindSphere Cloud Resources | The number of advanced KPIs using aggregated time series data and the volume of processed data using IDL you can use is limited. These limits are defined by the respective IIoT Data Package size ordered. For more information, please refer to the Product Sheet for MindSphere Cloud Resources. |
| Limitations | Please note that depending on your dashboard usage, certain technical limitations may apply. For more information, please refer to https://siemens.mindsphere.io/en/docs/Product-Descriptions-Overview/technical-limitations . |
| Third-Party Terms | Please note the Third-Party Terms set out above for Operations Insight. Additionally, Third-Party Terms for Configure advanced KPIs are available under "Operations Insight Analytics" via the following web link: https://siemens.mindsphere.io/en/docs/Product-Descriptions-Overview/Third-Party-Terms . |

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| Documentation | <p>For further details about Operations Insight Analytics please see MindSphere Documentation available via the following weblink: https://documentation.mindsphere.io/resources/html/operations-Insight/en-US/index.html.</p> |
| Operator Cockpit | |
| Description | <p>The Operator Cockpit enables you to control which applications you want to productively use / commercially offer or publish in the Store. It provides furthermore the capabilities to check health status of all your productive applications and receive notifications concerning your applications.</p> <p>Use Operator Cockpit to:</p> <ul style="list-style-type: none"> • Provision applications to your own Environments. • Provision applications to other MindSphere customers' Accounts (only for Standard/Premium). • Control which applications you want to offer and publish new applications to the Store. • Get information on usage and traffic. • Check health status of all your applications. • Receive system messages and application requests. <p>Get informed if your own applications published in the Store have been promoted/purchased.</p> |
| Documentation | <p>For further details about Operator Cockpit please see MindSphere Documentation available via the following weblink: https://documentation.mindsphere.io/resources/html/operator-cockpit/en-US/index.html.</p> |
| Semantic Data Interconnect | |
| Description | <p>Semantic Data Interconnect (SDI) is available via its respective MindSphere APIs. It is a contextualized data integration framework that allows you to maximize the value of enterprise data from disparate sources along with IoT data. SDI enables you to infer relationships between various data points and to correlate design, financial and manufacturing data with operational data from physical assets. SDI provides a complete workflow to register, ingest and search data and associated metadata from external data, build semantic models and finally query to consume correlated data.</p> <p>SDI is available as:</p> <ul style="list-style-type: none"> • SDI Discovery enabling schema discovery and query execution on physical data sources. • SDI Essential enabling schema discovery, semantic model building, contextualization of multiple data sources and query execution on semantic models and on physical data sources. <p>SDI capabilities are delivered through following APIs:</p> |

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| | <ul style="list-style-type: none"> • Data Registry Service provides the functionality of data source, data lake and custom data type registration. Currently only IDL is supported for data lake registration. • Data Ingest Service is used post registration to ingest files from various systems and trigger the data ingestion process. It allows application developers to integrate source systems. After the data ingestion is completed, SDI triggers automatic-schema discovery process and provides schema for ingested data into SDI. • Semantic Model Service provides end-to-end capability to create, store, update or delete semantic models. • Data Query Service enables you to create, store, update, and get results for semantic business queries and physical queries. |
| Required MindSphere Cloud Resources | <p>For productive use, additional MindSphere Cloud Resources (Semantic Data Interconnect) are required.</p> <p>For more information, please refer to the Product Sheet for MindSphere Cloud Resources.</p> |
| Third-Party Terms | <p>Third-Party Terms for Semantic Data Interconnect are available via the following web link: https://siemens.mindsphere.io/en/docs/Product-Descriptions-Overview/Third-Party-Terms.</p> |
| Documentation | <p>For further details about SDI please see MindSphere Documentation available via the following weblink: https://developer.mindsphere.io/apis/sdi-datamanagement/api-sdidatamanagement-overview.html, https://developer.mindsphere.io/apis/sdi-dataquery/api-sdidataquery-overview.html and https://developer.mindsphere.io/apis/sdi-semantic-modelling/api-sdisemanticmodel-overview.html.</p> |
| Visual Flow Creator | |
| Description | <p>Visual Flow Creator enables you to define data flows to analyze, orchestrate, interact and visualize data and design your own workflows via a drag and drop functionality to develop graphic depiction of workflows. You can choose from a variety of pre-configured nodes provided by Siemens or you can deploy your own nodes to Visual Flow Creator for use in your workflows. Create the workflows with the web-based editor to analyze and generate new virtual data points or deliver the formatted data for reporting tools. The workflows can be triggered manually, time-based or via RESTful call. You can calculate KPIs or trigger actions.</p> |
| Limitations | <p>The number of worksheets is limited to 10 per User. The number of nodes for one sheet is limited to 100. The amount of data stored in the context of function node is limited to 128 KB and only one context variable is allowed. The file size is limited to 1 MB for read and write and 100 file transfers per day. Only 2 000 values can be processed per time series request. The calculation duration of a flow must be less than 30 seconds. The number of node context variables in a function node is limited to 5 per node per User. The number of flow context variables in a function node is limited to 20 per node per User. The number of global context variables in a function node is limited to 100 per node per User. It is your responsibility to procure and maintain appropriate licenses for any nodes you deploy to Visual Flow Creator.</p> <p>All created workflows are visible for all Users of your Environment.</p> |
| Required MindSphere Cloud Resources | <p>Executing workflows requires compute hours which are based on execution time. The IIoT Data Packages include Visual Flow Creator compute hours which are limited depending on the size you subscribed to.</p> |

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| | <p>Please consider that the available workflow execution is based upon a 30% Asset coverage which can be increased by ordering additional workflow execution time quota. The execution time of all workflows for one Account could be limited depending on the application and Platform load.</p> <p>For more information, please refer to the Product Sheet for MindSphere Cloud Resources.</p> |
| Third-Party Terms | <p>Third-Party Terms for Visual Flow Creator are available via the following web link: https://siemens.mindsphere.io/en/docs/Product-Descriptions-Overview/Third-Party-Terms.</p> |
| Documentation | <p>For further details about Visual Flow Creator please see MindSphere Documentation available via the following weblink: https://siemens.mindsphere.io/en/docs/Visual-Flow-Creator.</p> |

Description of General Functionalities

Agent Management

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| Description | <p>Agent Management is a service made available via its respective MindSphere APIs. This service can be used e.g., to create, update, request status or delete an Agent, and allows you to onboard or offboard an Agent.</p> |
| Documentation | <p>For further details about Agent Management please see MindSphere Documentation available via the following weblink: https://developer.mindsphere.io/apis/connectivity-agentmanagement/api-agentmanagement-overview.html.</p> |

Environment Management

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| Description | <p>The MindSphere Capability Packages provide you with a dedicated MindSphere Account. One Account can have up to 4 Environments depending on the MindSphere Capability Package which serve a certain purpose:</p> <ul style="list-style-type: none"> • Productive Environment: is intended to be used for production-like scenarios e.g., for global connection of Assets, application usage, etc. • Development Environment: is intended to be used for application development / integration and its operation. <p>Test Environments: are intended to be used for testing of developed applications.</p> <p>The total number of Environments included in different MindSphere Capability Packages:</p> <ul style="list-style-type: none"> • MindSphere Capability Package Basic: 2 • MindSphere Capability Package Standard: 4 • MindSphere Capability Package Premium: 4 <p>Per default, you will always receive a Productive Environment.</p> <p>The creation of a Development Environment (for Basic/Standard/Premium) and 2 additional Test Environments (for Standard/Premium) is optional. For creation of optional Environments, please contact MindSphere Support.</p> |
| | <p>You must at least have one Development Environment created, if you would like to:</p> <ul style="list-style-type: none"> • Develop, test and use own applications productively in own Accounts. • Provision applications to other MindSphere customers' Accounts and publish your applications via the Store. <p>If you would like to test own applications in a separate Environment, you must create additional Test Environments (only for Standard/Premium).</p> |

| Event Management | |
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| Description | Event Management is a service available via its respective MindSphere APIs. This service is used to manage standardized and customized events. Events, alarms, warnings can be received from the field or other applications and be used to inform a User. |
| Documentation | For further details about Event Management please see MindSphere Documentation available via the following weblink: https://developer.mindsphere.io/apis/advanced-eventmanagement/api-eventmanagement-overview.html . |
| IoT and Storage Services | |
| Description | <p>IoT & Storage Services are services available via their respective MindSphere APIs. They cover Aggregate Service, File Service, Time Series Service and Time Series Bulk Service:</p> <ul style="list-style-type: none"> • Aggregate Service is used to read aggregated time series values. Retrieve the following aggregated values per interval: Count, Sum, Average, Minimum, Maximum, First Value, Last Value and Standard Deviation. • Aggregate Services use pre-calculated intervals to enhance performance upon retrieval. Performing queries that require on-the-fly calculations might perform slower than queries that make use of pre-calculated aggregates. Aggregates are pre-calculated based on incoming raw data with a slight delay. Therefore, it might be possible that the latest time series values are not available when reading aggregates. • File Service is used to read, write, delete, upload and update files associated to assets, store metadata information, and search for files by metadata. Since files are always related to an Asset, the instance of an Asset must have been created by you beforehand. • Time Series Service can be used to create, read, update and delete dynamic data. Since time series data are always related to an Asset, the instance of an Asset must have been created by you beforehand. • Time Series Bulk Service can be used to upload historic time series data using files. |
| Required MindSphere Cloud Resources | <p>The time series data ingest rate, time series data storage and file storage you can use is limited. These limits are defined by the respective IIoT Data Package size ordered.</p> <p>For more information, please refer to the Product Sheet for MindSphere Cloud Resources.</p> |
| Documentation | <p>For further details about IoT and Storage Services please see MindSphere Documentation available via the following weblinks:</p> <p>https://developer.mindsphere.io/apis/iot-iotfile/api-iotfile-overview.html https://developer.mindsphere.io/apis/iot-iottimeseries/api-iottimeseries-overview.html https://developer.mindsphere.io/apis/iot-iottsaggregates/api-iottsaggregates-overview.html.</p> |
| Notification Service | |
| Description | Notification Service is available via its respective MindSphere APIs. This service enables you to (i) send emails, mobile push notifications and if available in your region also SMS in relation to certain events defined by you, or (ii) send email notifications to (a group of) individual recipients. We may use a third party service provider to provide you with Notification Service. |

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| Required MindSphere Cloud Resources | The number of notifications you can use is limited. These limits for SMS, emails and mobile push notifications are defined by the respective IIoT Data Package size ordered. For more information, please refer to the Product Sheet for MindSphere Cloud Resources. |
| Documentation | For further details about Notification Service please see MindSphere Documentation available via the following weblink: https://developer.mindsphere.io/apis/advanced-notification/api-notification-overview.html . |
| Upgrade Tool | |
| Description | Use Upgrade tool to: <ul style="list-style-type: none"> • Order available upgrades (incl. add-ons) to your subscribed Offerings. • Get an overview of your requested and completed upgrades. • Manage pending upgrade requests (authorized Users only). |
| Third-Party Terms | Third-Party Terms for Upgrade are available under “administration tools” via the following web link: https://siemens.mindsphere.io/en/docs/Product-Descriptions-Overview/Third-Party-Terms . |
| Usage Transparency & Usage Transparency Services | |
| Description | Usage Transparency Service is a service available via its respective MindSphere APIs and via user interface “Usage Transparency” accessible from your MindSphere Launchpad. Usage Transparency Service provides transparency for both application operators and application customers to verify daily and monthly aggregated usage for applications. It supports the application operators to monetize their application usage for ‘pay-per-use/usage-based’ billing. This service offers insight on your consumption of certain resources and corresponding limits of your MindSphere Cloud Resources and other subscribed Offerings, e.g., API calls, time series data ingest rate. Moreover, you can define metrics within this service so that consumption can be tracked. |
| Third-Party Terms | Third-Party Terms for Usage Transparency are available under “administration tools” via the following web link: https://siemens.mindsphere.io/en/docs/Product-Descriptions-Overview/Third-Party-Terms . |
| Documentation | For further details about Usage Transparency Services please see MindSphere Documentation available via the following weblinks: https://documentation.mindsphere.io/resources/html/usage-transparency-service/en-US/index.html and https://developer.mindsphere.io/apis/core-usagetransparency/api-usagetransparency-overview.html . |
| Settings & Identity and Access Management | |
| Description | Settings allow managing Users, permissions, rights, roles, groups, access policies, Collaborations and Environment provider information. For every User, an individual login is required. Access policies are available only upon request. Please contact your MindSphere sales representative or MindSphere Support to enable use of access policies. Identity and Access Management are services available via their respective MindSphere APIs. These services are used to manage users, customers, roles and scopes. |

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| Third-Party Terms | Third-Party Terms for Settings are available under “administration tools” via the following web link: https://siemens.mindsphere.io/en/docs/Product-Descriptions-Overview/Third-Party-Terms . |
| Documentation | For further details about Identity and Access Management please see MindSphere Documentation available via the following weblinks: https://documentation.mindsphere.io/resources/html/settings/en-US/index.html and https://developer.mindsphere.io/apis/core-identitymanagement/api-identitymanagement-overview.html and https://developer.mindsphere.io/apis/core-resourceaccessmanagement/api-resourceaccessmanagement-overview.html . |
| Token Manager Services | |
| Description | Token Manager Service is available via its respective MindSphere APIs. This service is necessary if your applications shall access data without user interaction from other Accounts and/or Environments by issuing access tokens. Before an application can issue access tokens for an Account and/or Environment, the application must be provisioned to this Account and/or Environment and explicit approval for the data access must be obtained by you from the application customer. We will provide technical means for you to obtain such approval via a standard process and template as currently described in more detail in the user documentation for the Operator Cockpit available via the following web link: https://documentation.mindsphere.io/resources/html/operator-cockpit/en-US/index.html . |
| Documentation | For further details about Token Manager Services please see MindSphere Documentation available via the following weblink: https://developer.mindsphere.io/apis/exchange-tokenmanager/api-tokenmanager-overview.html . |

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| MindSphere Asset Attributes Description | |
| Description | Asset Attributes are properties of Assets. An Asset Attribute represents individual data such as temperature, pressure or speed. They can be static, e.g. a serial number or dynamic like temperature where historical data is desired. An Asset comprises of at least one Asset Attribute but can contain more, if required. Asset Attributes created by you are counted independently of their purpose such as monitoring, alarming or structuring. |
| Required subscription | In order to use the MindSphere Capability Packages you have to subscribe to Asset Attributes. Asset Attributes are not included in your MindSphere Capability Package subscription. Subscriptions to Asset Attributes are available in different sizes (0 (Pay-Per-Use)/500/1 000/ 2 500/5 000/10 000/25 000/50 000/500 000 Asset Attributes): <ul style="list-style-type: none"> • When using your Asset Attributes Pay-Per-Use subscription no Asset Attributes are included. In such case, a usage-based fee will be charged for each Asset Attribute in use on a monthly basis as set forth in the Price List for Offerings with Usage-based Fees available at https://siemens.mindsphere.io/en/docs/Product-Descriptions-Overview/usage-based. • When using your 500 Asset Attributes/1 000 Asset Attributes/2 500 Asset Attributes/5 000 Asset Attributes/10 000 Asset Attributes/ 25 000 Asset Attributes/50 000 Asset Attributes/ 500 000 Asset Attributes subscriptions, a usage-based fee will be charged on a monthly basis as set forth in the Price List for Offerings with Usage-based Fees available at |

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| | https://siemens.mindsphere.io/en/docs/Product-Descriptions-Overview/usage-based should the actual usage exceed the applicable limits. |
| Calculation method for usage-based fees | <p>The usage-based fee for Asset Attributes is charged monthly in arrears based on the average of maximum daily usage of Asset Attributes over a month in the same Account.</p> <p>Example: You have subscribed to 500 Asset Attributes per month. In the first month on each of the first 10 days you have reached a maximum daily usage of 500 Asset Attributes. On each day during the next 5 days, you have reached a maximum daily usage of 650 Asset Attributes. On each day during the next 7 days, you have reached a maximum daily usage of 550 Asset Attributes. And on each day during the last 8 days, you have reached a maximum daily usage of 740 Asset Attributes. In this case the average monthly usage would be $(10 \cdot 500 + 5 \cdot 650 + 7 \cdot 550 + 8 \cdot 740) / 30 = 600,7$. Since 500 Asset Attributes are already included in your subscription, a usage-based fee for a total number of 100,7 Asset Attributes would be charged.</p> |

Export Control Regulations

The services described in this Product Sheet have the following export control classification, unless expressly set out otherwise herein:

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| AL | N |
| ECCN | N/EAR99 |

Security Information

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| General | In order to protect plants, systems, machines and networks against cyber threats, it is necessary that you implement and continuously maintain a holistic, state-of-the-art industrial security concept. |
| Secure communication | Data transmission will be done via HTTPS protocol from Asset to your Environment. |

Definitions

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| General | Unless otherwise indicated, capitalized terms used in this document shall have the meaning given to them in this document or elsewhere in the Agreement. You may also want to check our Glossary . |
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