Enabling fast and easy IoT connectivity to MindSphere with customizable connectors

Taking into account that solutions and equipment for each industry and production environment will differ, MindConnect LIB provides a software development kit that enables programming of customer or use case specific connectivity agents by interacting with MindSphere southbound APIs. These southbound APIs facilitate data transmission from assets to MindSphere, securely and efficiently. By connecting to MindSphere, customers can maximize the value of their machine data through cloud-based applications and services, providing actionable business insights.

Solving the IoT connectivity challenge
As increasingly larger and more complex production environments seek to digitalize their automation processes, having the flexibility to connect assets from both Siemens and third-party vendors is a key component of a comprehensive IoT solution. Customers benefit from a complete view of their operations from all assets communicating through different protocols.

Leveraging MindConnect LIB, developers can create connectivity functions to support numerous protocols required to connect diverse assets in a cost-effective way. Rather than investing in new infrastructure to support communications, the MindConnect LIB can be integrated into asset software, building a custom agent.

Connectivity with custom agent
With a custom agent, assets connect to MindSphere by transferring data through a secure internet protocol in order to enable cloud-based applications and services. The solution allows for industrial businesses of any scale to connect to the digital twin to draw insights on improving operational efficiency and increasing revenue.

Developed in C programming language, MindConnect LIB requires a small amount of system resources and allows for connectivity to almost every asset with a custom agent. The custom agent can be programmed for any common operating system, and the developer of a custom agent is free with regard to the selection of the hardware platform. In addition, logical workflows are included for developers to implement triggers to specify the calls that initiate data collection, integration and transfer process.

Full MindAccess functionality
A MindAccess Developer account is required to download and use MindConnect LIB, which can also be used for application development on a dedicated MindSphere tenant. With MindAccess Developer, you can test a custom agent on MindSphere designated for development and testing purposes.

Benefits
- Custom connectivity and full optimization of assets
- Support numerous protocols
- Scalable solution-to-production environment
- Comprehensive security from development to operation
- Enterprise level solution
In addition, MindAccess Developer enables users to develop, deploy and operate MindSphere applications.

The connection to MindSphere uses SSL/TLS for security purposes. Logical workflows are included for developers to implement triggers to specify calls that initiate data collection, integration and transfer processes.

Depending on each use case, data reading cycles support up to 250 data points. A data transfer cycle of every 10 seconds is also supported.

**Comprehensive security**

MindConnect LIB creates secure connectivity from an onsite device to MindSphere. Firewall-friendly communication via a MindSphere API and unique onboarding security tokens authenticate MindConnect during onboarding to ensure data is safely transmitted.

Encrypted communications with MindSphere through transport layer security (TLS) 1.2 is standard with an encryption key length between 128 and 256 bits. This protects against “man-in-the-middle” attacks. The custom agent developer using MindConnect LIB is responsible for the security of the developed agent.

Siemens developers can attend security trainings through the internal security organization, Product and Solution Security, which aims to ensure that the products, solutions and services we sell enable our customers to run their facilities in a secure environment.

**Solving real world problems with IoT and MindSphere**

A leading supplier of machining centers and flexible production systems required a condition monitoring application to provide digital services to their end customers. This large manufacturer took advantage of MindConnect LIB and MindConnect Nano boxes to connect all factory assets to MindSphere and create a tailored solution with a minimal investment.

This efficient optimization of tools allowed for business insights to be drawn from collected processed data leveraging MindConnect LIB to customize asset connectors. By having all asset information available from a wide variety of assets, this manufacturer was able to make more accurate business decisions based on a complete set of data.

**MindSphere**

MindSphere is the cloud-based, open IoT operating system from Siemens that connects real things to the digital world, and enables powerful industry applications and digital services to drive business success. MindSphere’s open Platform as a Service (PaaS) enables a rich partner ecosystem to develop and deliver new applications.