



LIBERATE YOUR DATA



SMART MANUFACTURING PLATFORM



Better Information for Superior Plant Management

Freedom Smart Manufacturing Platform

Freedom is the software suite of products developed by the Freedom team. The Freedom team brings a proven suite of products, services, and solutions to industry, solely focused on increasing customers' EBIT by improving and sustaining manufacturing efficiency.

Freedom eLOG®

Freedom eLOG® - eLOG is at the heart of the Freedom IIoT platform. eLOG is cloud-based software suite that seamlessly "Connects and Collects™" production asset data to dramatically improve efficiency by providing our customers full transparency of manufacturing information, with reports and analytics for optimization of machine health, process health, and OEE from the shop floor to the top floor.

Shift Reports – Easily break down and filter data to group production results by shift and categorize data for comparisons between shifts for continuous improvement programs and promoting best practices.

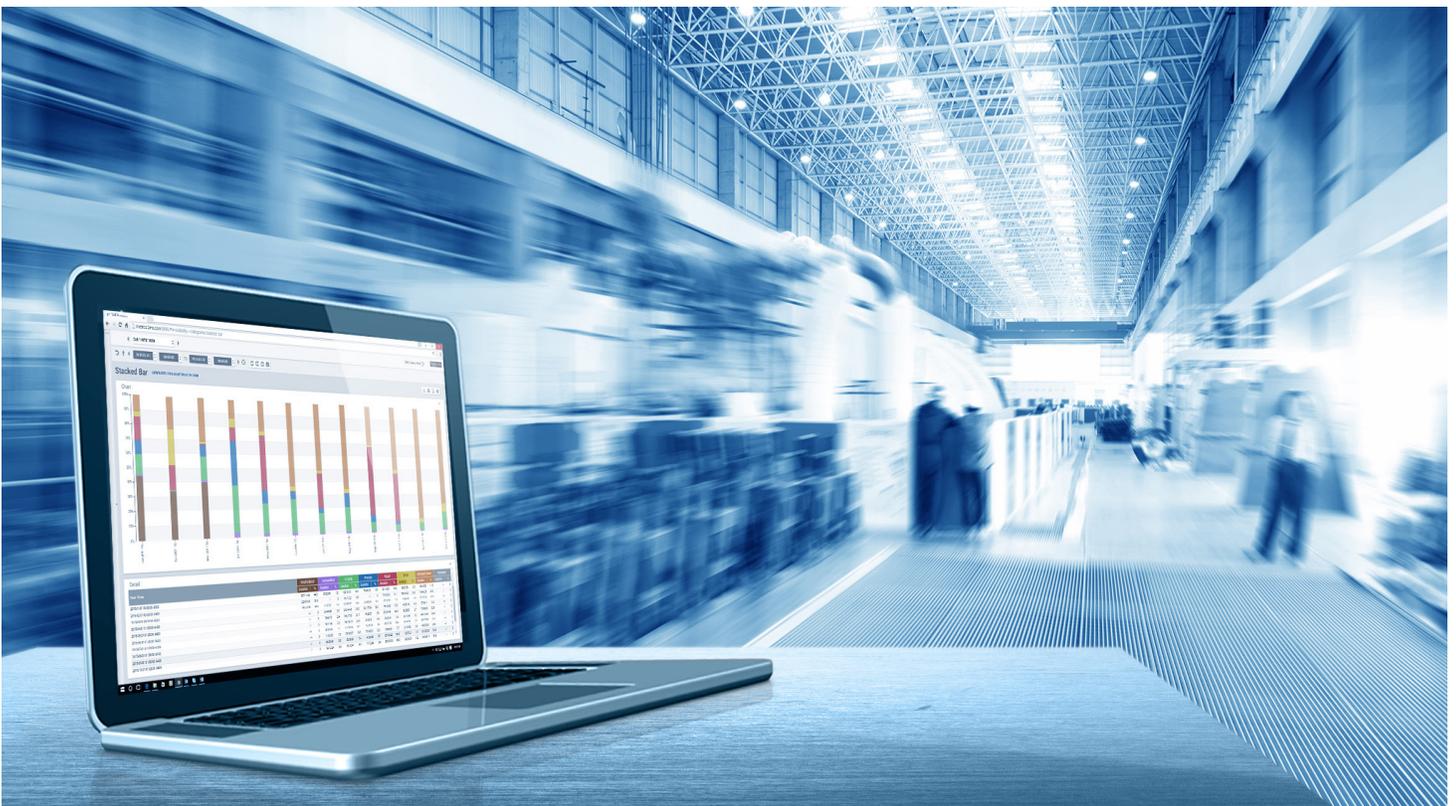
Notifications – Receive scheduled reports to your inbox and get real time push text alerts to your mobile devices for various production activities and

machine performance such as maintenance issues, unscheduled downtime, or any other performance that is of interest to you.

Machine Adapters – We know that manufacturers have a variety of machine types and makes of all ages. Our goal was to make it easy to connect those assets. We've developed unique software interfaces and devices for obtaining machine performance data, analyzing it, and displaying without the need for changes to the controllers or machine itself.

SmartBoards – Easily customized and configured screens that allow each user to create Real-Time dashboards relevant to their needs.

eSCORE® – Factory income statement monetizing the availability and performance losses by asset.



Integration Modules for Manufacturing and Maintenance Excellence

Optional Integration Modules for Manufacturing and Maintenance Excellence

Custom Data Module – Extract and store available data variables from the manufacturing asset's control system for analysis.

SPC Module – Intuitive and streamlined process for recording customer defined Critical Characteristics ("CCs") of in-process parts. Graphical SPC of each CC via Xbar R, Cp, Cpk.

Andon Module – Creates a visual and electronic notification system for process abnormalities, maintenance requests, or material replenishment needs by asset.

Manual Operations Module – Comprehensive eLOG reports and analytics for non-automated (manual) manufacturing operations.

Maintenance Module – Facilitates a streamlined process for asset maintenance by integrating Freedom's automated event classification with a CMMS. It provides richer information regarding the maintenance process, such as mean time to respond, time to diagnose, and time to repair.

Work Order Collaboration Module – Provides a collaborative, real-time process for communicating the priorities and status, between planning and the shop floor, for the manufacturing work orders generated by the MES per asset.



Running Smooth

For manufacturers, there's nothing more satisfying than steady, high-quality, profitable output. When your entire production system is running smooth, clean and fast. We all know how even a small event – anywhere along the production chain – can cause that system to slow down. Or worse, to stop. And yet, pinpointing and identifying the cause can be tedious, time-consuming, elusive and costly. Until now.

Information for Superior Plant Management

Freedom eLOG quickly identifies problems and improves productivity.

Freedom eLOG – Your Partner for Success – Any Machine, Any Cell, Any Control



Features:

- Interfaces to any Industrial Asset via MTConnect
- Automatic Gathering of Production Data, Alarms, and Events
- Barcode Scanning of Event Classifications
- Multiple Languages
- Export Capabilities in Spreadsheet-Friendly Format
- Automated Email Reports, Texts, and Watch List Notifications
- Connect from Anywhere – Web Based
- Conforms to AMT and VDI-3423 Standards

Benefits:

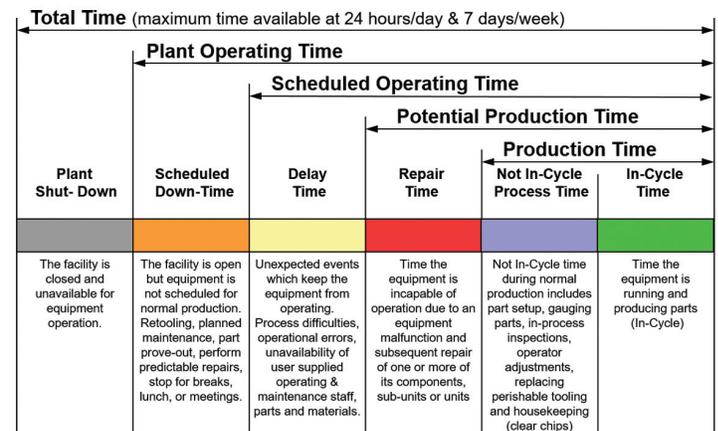
- Identify and Share “Best Shop Practices”
- Quickly Identify Problem Areas
- Take Corrective Action
- Maximize Productive (Green) Time
- Identify Process Improvement Opportunities
- Increase Throughput
- Maximize Profitability

Quickly Identify Problems and Improve Productivity

Freedom eLOG gives you the data you need to better manage your industrial automation investment, and maximize your productivity. An affordable, intuitive and easy-to-integrate application, it collects and reports the performance data of your entire plant's production assets. It addresses the need to communicate and understand industrial asset availability, utilization, and performance, as a basis for objective corrective action. By providing intuitive data mining capabilities and automated functions, Freedom eLOG allows you to recognize patterns and trends, enabling you to better manage the operation of your equipment, increase your productivity, and maximize your profitability.



Freedom eLOG's reporting structure is based upon the span-time category definitions outlined in AMT's Production Equipment Availability guideline.



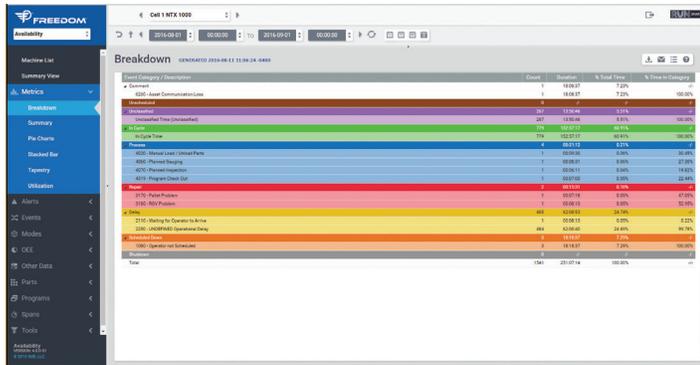
Better Information for Superior Plant Management

Improve Your Productivity with Easy-To-Use Freedom eLOG

Freedom eLOG brings manufacturers an intuitive, concise picture of their assets' performance – up-time, down-time, OEE, and contributing factors – that allows quick and relevant improvements in system productivity.

Easy to Navigate Drill Down Reporting

Web based reports are available to the entire manufacturing team. This information can be used to optimize equipment, programs, and schedules for around-the-clock operation. Easy-to-read charts and graphs are supported by detailed information. Users can set up automated reports and instant notification of critical events via e-mail or text messages. Clicking on any element of a chart reveals the events that produced that element; clicking on any event reveals yet more detail. The intuitive user interface makes it easy to mine down to whatever level of detail is needed.



Deployment Options

The Freedom Server is a Linux-based system that hosts the Freedom software. In an effort to leverage the latest technologies and create unique value for our customers, the Freedom team has created Freedom for the Industrial Cloud. It is available in two options:

- A Public Industrial Cloud Managed by 5ME
- A Private Industrial Cloud Managed by the Customer

The Benefits of Freedom in the Industrial Cloud Are:

- Eliminates the Need for Dedicated or Virtual Servers and the IT Staff to Maintain them
- Lowers the Cost of Entry
- Multi-Tenant – Your Enterprise on the Same Platform
- All Plants on the Same Upgrade Path and on the Same Release of Software

Freedom Software Adapter

Freedom Software Adapters exist for many of the current standard CNC, PLC and Robot controls that are used on the majority of industrial assets. This interface is installed directly on the asset's industrial controller. Freedom Software Adapters communicate directly with the industrial controller via open architecture tools supplied by the control vendors. No PLC programming, asset configuration, or NC programming is required. The Freedom Software Adapter is extremely simple to install taking only a few minutes to configure and when connected to a Freedom Server, communicates the real-time status of the industrial asset via MTConnect. Freedom Software Adapters are available for all types of controllers on all types of machines. Examples include but not limited to:

- CNC's (Fanuc, Siemens, Heidenhain, Bosch, Mazak, Okuma, etc)
- PLC's (A-B, Siemens, Modicon, etc)
- Robots (FANUC, KUKA, ABB, etc.)
- Any Controllers with OPC-UA

Freedom Hosting Appliance

For those assets with an industrial controller that does not support open architecture, we offer a hosting appliance. This DIN-rail mounted industrial PC provides a Windows platform on which the Freedom Software Adapter resides. The Hosting Appliance offers:

- 2 x RS-232/422/485 Ports with Automatic Flow Control
- 3 x 10/100/1000Base-T RJ-45 Ports with Teaming Function Support
- 4 x External USB
- PC/104+ Expansion Slots Option
- 1 x Mini PCIe slot for WLAN and Fieldbus Cards
- Windows® Platform



Freedom Sensor Adapter

We offer a Freedom Sensor Adapter for deploying additional sensors to any type of industrial asset but also for connecting to legacy assets whose only option for communication is through discrete I/O. This off-the-shelf, self-contained, DIN-rail mounted electronic appliance mounts in the industrial asset's power panel and is connected to I/O signals from the asset as well as from external sensors. The Freedom Sensor Adapter has MTConnect on-board and connects directly to the Freedom Server. It does not require PLC programming, asset configuration, or NC programming. This adapter is expandable offering a variety of signal monitoring capabilities such as:

- Digital (proximity, pressure, power, etc.)
- Analog (temperature, current, concentration, etc.)
- Vibration (velocity RMS, bearing SPM)
- Power (3-phase Watts)



Freedom Gateway™ and Freedom eDGE™

Freedom Gateway and Freedom eDGE

Freedom Gateway and Freedom eDGE provide the “edge analytics”, visualization, and secure network connection (to the asset monitoring client) as the foundation for an a la cart machine monitoring device that can scale to an enterprise machine monitoring solution. They allow you to transform any industrial asset into a Smart IIoT asset.

Freedom Gateway is an industrially hardened IIoT edge appliance installed in the electrical cabinet of the manufacturing asset acting as a host for the Freedom eDGE software package. Additionally, it provides I/O interfaces for legacy machines, supports external sensor implementation / aggregation, and delivers both wired and wireless connectivity for ancillary devices.

Freedom Gateway is Configurable to Meet any Manufacturing Asset Monitoring Situation

- Flexible Network Configuration and Firewall Rules. Allows Creation of Isolated and Bonded Networks
- Provides a Secure Gateway Between IIoT Connected Industrial Assets and Factory Networks
- Hosts Freedom's Communication Software Enabling the Machine Control to Interface with Asset Monitoring Systems via MTConnect
- Provides I/O Interfaces for Legacy Machines that do not have Newer Technology Machine Controllers
- Hosts Freedom's eDGE Software Providing Analytics and Visualization Local to the Asset
- Displays Manufacturing Metrics Locally on Operator Stations and Andon Boards Connected to the Freedom Gateway
- Accesses Manufacturing Metrics Wirelessly via Mobile Devices

Freedom eDGE: Your Solution for Edge Analytics

Freedom eDGE is a web-based system that can be accessed from any device connected to the Freedom Gateway with a standard web browser.

Features Include:

- Real-Time and Historical Manufacturing OEE Analytics
- Unlimited Custom Dashboards and Andon Views
- Intuitive Graphical User Interface
- Point and Click
- Drill Down Capability
- Comprehensive Standard Reports
- Email and Text Notification



Hardware Features Include:

- Intel® Core™ i3 Processor
- 4 x GbE (RJ45), 4 x USB 2.0/3.0, 1 x RS-232, 2 x RS-422/485, 1 x VGA, 1 x DP, Audio
- WiFi 802.11 a/b/g/n, Bluetooth 4.0
- Isolated Digital I/O (4 Channel DI, 4 Channel DO)
- Slots for Expansion Modules



System Overview

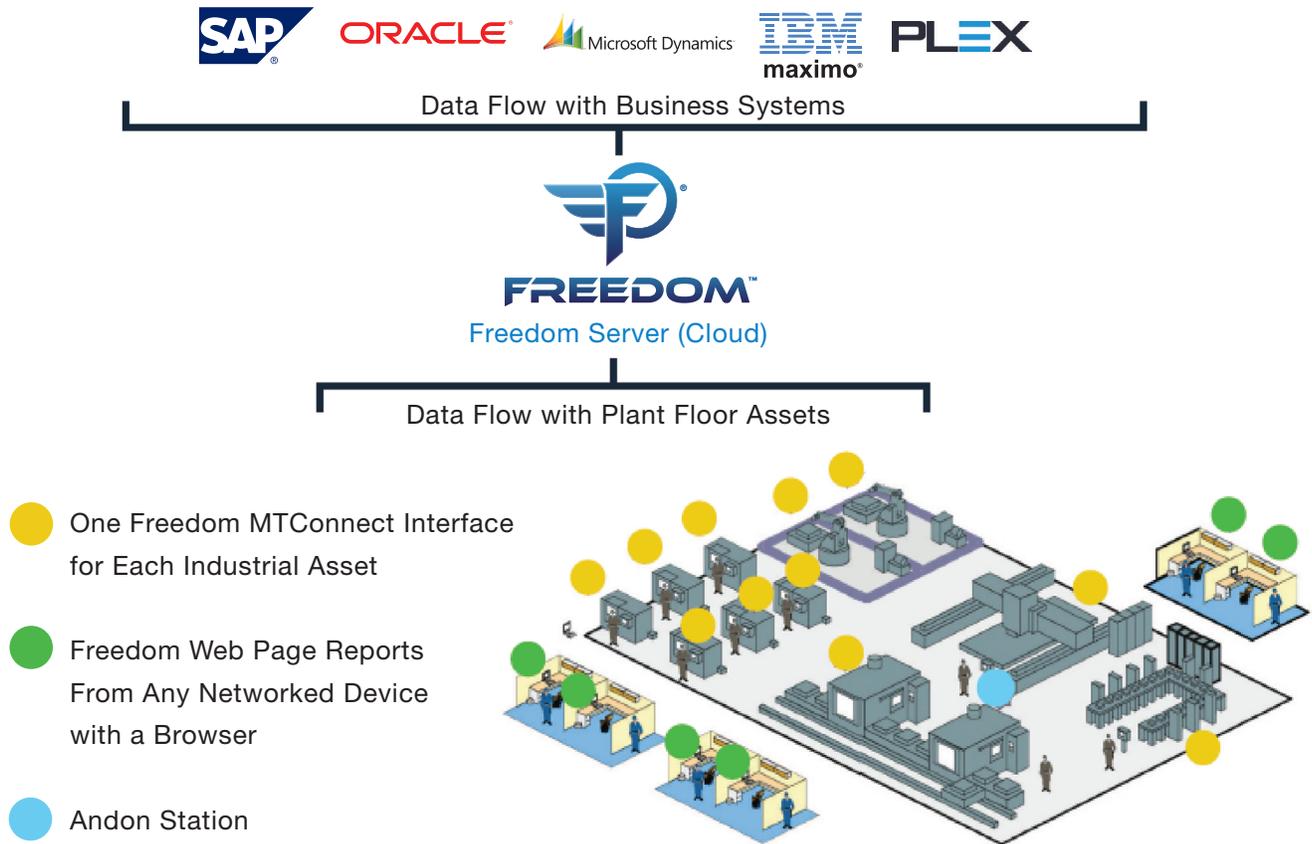
A typical Freedom system installation consists of one Freedom Server, which communicates via Ethernet with industrial assets on the factory floor, each of which is equipped with a Freedom MTConnect Interface.

The Freedom system illustrated below depicts all of the components used to collect data from industrial assets (Freedom MTConnect Interface for each industrial asset), store the collected data (Freedom Server) and view reports (view Freedom web-page reports from any networked device with a browser).

Freedom Operator and Andon stations can be installed at each industrial asset, providing access for the specific classification of delays, repairs, or processes, and to add comments for further clarification.

As a means of driving true enterprise transparency, Freedom can also be interfaced to existing ERP, MES, and CMMS systems. This facilitates improved operational intelligence based on real time data exchange.

Remote system support via VPN is also available for real-time support by the Freedom support team.



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