

Freedom's Advanced Manufacturing Execution System



Error Proof[®] works as a complete advanced manufacturing execution solution (AMES) offering a suite of functions that utilize the data collected from the shop floor and is capable of working at the item level. Error Proof[®] interfaces to a wide variety of shop floor controls such as machines, programmable logic controls (PLCs), vision systems and many others to collect data from the shop floor for scheduling, error proofing, and traceability.

Error Proof® AMES Solution

Freedom Technologies delivers the most flexible and comprehensive Manufacturing Execution System (MES) in the execution market space. MESA International identified 11 functional areas of an MES. Freedom Technologies has the highest level of MES compliance among all QAD partners. Error Proof® Advance Manufacturing Execution System (AMES) is adaptable for all manufacturing environments.

Error Proof® AMES makes up-to-the minute shop floor information available companywide which allows for a swift response to conditions and requirements. Error Proof® AMES offers a foundation of real-time data and details for continuous improvement and decision support.

"Good data" is required to get good information. Error Proof® AMES supplies that "good data" by offering uninterrupted visibility into production operations, gaining a complete overall view of the shop floor.

Error Proof® AMES also provides the shop floor control and visibility needed to effectively deal with multifaceted traceability requirements. Using real-time "good data" from automated transactions collected from the shop floor, Error Proof® AMES links supplier information, lot numbers, serial numbers, time/date or other records to the appropriate finished goods, back to the work order or demand signal.

Through our partnership with Preactor®, Error Proof® AMES also provides finite scheduling to maintain the balance between demand and capacity. Error Proof® AMES supplies Preactor® the data collected from the shop floor through a simple connectivity and Preactor® maintains a production plan consisting of a sequence of operations to fulfill orders generated based on the real capacity of resources. These can be machines, operators, tooling or anything that is a constraint on the production process.

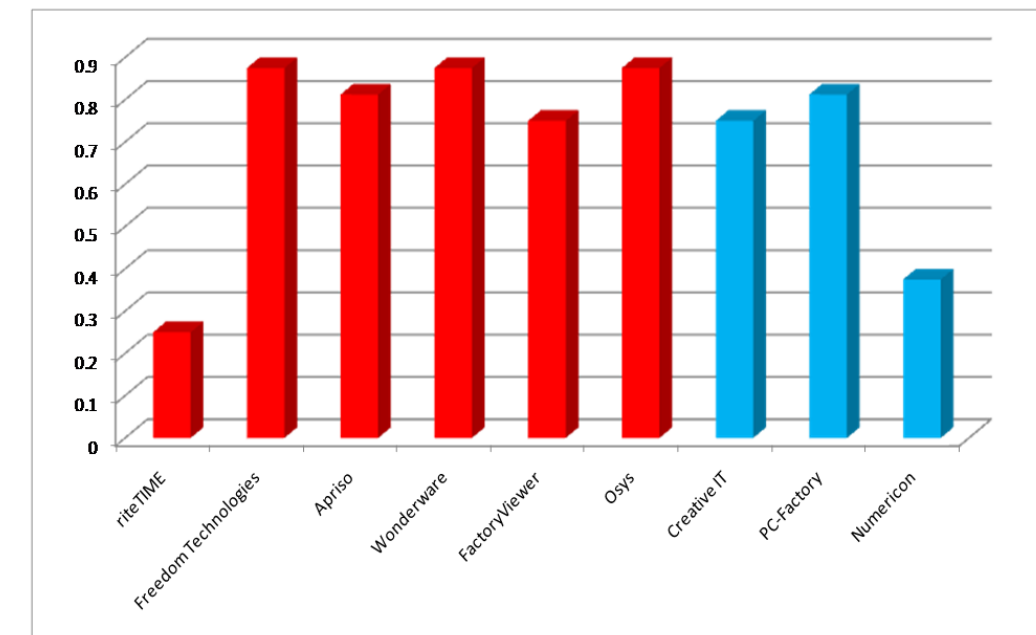
Product Tracking and Genealogy

- Visualizes work-in-progress.
- Includes status information:
 - Who is working on it.
 - Components materials by supplier, lot, serial number.
 - Current production conditions.
 - Any alarms, rework, or other exceptions.
- Tracks real time historical records.
- Records show traceability of components and usage of each end product.
- Performs component part verifications.
- Tracks part component genealogies (serial and lot traceability tied to each part).

Performance Analysis (Preactor®)

- Tracks utilization, setup, idle time by hours or %.
- Details order analysis including on time performance at order and operations level .
- Summaries schedule statistics including job counts (early, late, started, and incomplete).
- Orders completion data (maximums, minimums, averages, and aggregates).
- Tracks resource data (maximum, minimum, and average).
- Orders comparisons and net changes.
- Manages schedule compliances.
- Provides scenario comparisons.
- Proves primary and secondary resource analysis.

Error Proof® AMES Ranking Against Other Shop Floor Systems



■ North American Based Companies
■ European Based Companies

Chart Provided by Quinn & Associates, 2009.

*Freedom Technologies has the highest level of
MES compliance among all QAD partners*

Freedom's Advanced Manufacturing Execution System (AMES)

Description of how Error Proof® Meets the 11 MES Functions

Mapping of Error Proof® AMES to MESA 11 MES Functions

Based on the 11 functional areas of a MES the chart below shows how Freedom Technologies meets all 11 functions.

MES Functionality	Error Proof® (Standard)	Employee Labor	MRO	Work Order Mgmt	Traceability	Asset Mgmt	Preactor®	Machine Interface (OPC, Discrete I/O, PLC, other devices)
Resource Allocation & Status	X	X		X		X	X	
Operations/Detail Scheduling							X	
Dispatching Production Units		X		X			X	
Document Control	X			X				
Data Collection/Acquisition								X
Labor Management		X		X	X			
Quality Management	X							
Process Management	X							X
Maintenance Management			X					
Product Tracking and Genealogy	X			X	X	X		
Performance Analysis							X	

11 MES Functions as Defined by MESA International

Resource Allocation & Status

- Collects and supplies information of resources including:
 - Machines
 - Tools
 - Labor
 - Materials
- Reports real time status.
- Provides history of resources.
- Verifies equipment is properly set up.

Operations / Detail Scheduling (Preactor®)

- Maintains a production plan consisting of a sequence of operations to fulfill orders generated based on the real capacity of resources.
- Calculates in detail exact time for equipment loading and adjusts to shift patterns.
- Provides better visibility into plant operations.
- Creates accurate scheduling, enabling leaner manufacturing through better integration with the supply chain.

Dispatching Units

- Manages flow of production units.
- Dispatches information as events occur.
- Allows supervisors the ability to alter prescribed schedules on the factory floor.
- Tracks rework and scrap processes.

Document Control

- Accesses records/forms that must be maintained with the production unit.
- Sends instructions down to the operations, including providing data to operators or recipes to device controls.
- Makes available environmental, health and safety regulations documents, and ISO information.
- Stores historical data.



Data Collection / Acquisition

- Produces serialized part labels or direct part markings.
- Manages count to container verification and Earn-a-Label™ for shipping.
- Tracks data accuracy, inventory accuracy, labor cost and efficiency goals.
- Decreases number of scans required for back-flush, inventory moves, shipment picking and verification.
- Streamlines and/or automates data collection activities.
- Validates transaction data and updates QAD in real-time.
- Provides rich set of label printing.
- Tracks production.



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Labor Management

- Tracks personnel status in an up-to-the-minute time frame.
- Reports time and attendance (Optional).
- Tracks indirect activities such as material preparation or tool room work.
- Determines optimal resource allocation.
- Gathers both labor distribution and clocks in/out information.
- Allows supervisors to electronically review and correct employee's entries prior to those entries being submitted to QAD.
- Simplifies labor distribution entries for cells involving work by multiple employees, a work cell charge methodology is provided.
- Reports multiple parts simultaneously and the time charges will be allocated equally to each of the parts reported.

Quality Management

- Manages product quality control and identify problems requiring attention.
- Allows for immediate alert when a device fails, a machine or line stops.
- Allows immediate action to be taken to correct problems, including correlating the symptom, actions and results to determine the cause.
- Captures testing data.

Process Management

- Monitors production and provides support to correct and improve in-process activities.
- Activities may be intra-operational and focus specifically on machines or equipment being monitored.
- Tracks the process from one operation to the next.
- Makes necessary personnel aware of process changes which are outside acceptable tolerances.
- Interfaces with intelligent equipment.

Maintenance Management

- Schedules periodic or preventive maintenance.
- Sends alerts if problem occurs.
- Maintains history of past events or issues to aide in diagnosing problems.
- Integrates multiple tiers of alerts.
- Allows tools to be checked in/out with a scan of an ID badge.

11 MES Functions



Features of Error Proof® AMES:

- Finite scheduling
- Error proofing
- Automated production monitoring
- Automated scrap reporting
- PLC interfaces
- Automated manufacturing data retention
- Employee scheduling / qualification verification
- Workstation scheduling / monitoring
- WIP tracking including lot and item tracking automation

Benefits of Error Proof® AMES:

- Improved compliance with regulatory requirements
- Improved product quality and consistency
- Optimal assignment of resources to tasks
- Reduction of manufacturing overheads
- Improved customer service levels
- Reduced WIP, scrap, and inventory
- Improved response time to production issues
- Feedback for continuous improvement

DOWNTIME

Select the Reason Code for Downtime

01 Setup / Ch. Change	06 Quality Problem	11 Training	16 Furnace Startup
02 Electrical Problems	07 Mixed Parts Problem	12 Meetings	17 Furnace Shutdown
03 Mechanical Problems	08 P.M. Check	13 Not Manned	18 Wheel Dressing
04 Tooling Problems	09 Not Scheduled	14 Other	19 Wheel Change
05 Material Problem	10 Rework / Sort	15 Power Outage	N/A