

# APPLIED APF ACTIVITY MANAGER™

EXCEPTION MANAGEMENT AND CONTROL

A visual development environment that senses change in factory resources, executes business rules and responds to factory resources in real-time.



## Industries

- > Semiconductor wafer manufacturing
- > Semiconductor assembly and test
- > Display manufacturing

## Features

- > Central point of coordination and execution control for all CIM system components
- > Automated real-time decisions, event management and exception handling
- > Rule deployment in real-time without the need for complex programming
- > Flexible integration framework SOAP API for publishing events
- > Integration with the APF RTD® repository, CLASS MCS 5™, and a variety of MES applications

## Benefits

- > Executes and controls any level of fab automation
- > Resolves manufacturing bottlenecks
- > Improves equipment performance
- > Reduces idle time by intelligent movement/pre-staging of lots/carriers
- > Reserves and allocates resources proactively
- > Provides continuous improvement using exception handling logic

## Challenges

In today's complex manufacturing environments, many fabs operate at less than peak efficiency. Equipment can stand idle if it is not immediately released when it becomes available, creating bottlenecks. Computer integrated manufacturing (CIM) systems have helped automate many operations, but companies still struggle to improve or reach overall factory effectiveness (OFE).

In an effort to meet the needs of increasing wafer complexity and rising expenses, many fabs have expanded their CIM systems with numerous components, but it can be time consuming and require significant resources to recognize the full potential of these components. Coordination of components is difficult to achieve and requires extensive customization. Integration expenses increase over time as more components are added, and managing exception scenarios can be costly. For fab managers responsible for automating production operations and freeing up unrealized manufacturing capacity, these challenges can affect the efficient and effective response to events that is required to achieve factory goals.

## Solution Description

APF Activity Manager is a visual development environment designed to deploy decision, execution and exception logic within a fully integrated workflow automation framework. Activity Manager provides fab managers with the ability to manage and control resources, equipment, software applications and personnel to improve utilization and increase productivity. It frees up unrealized manufacturing capacity through improved "pull" scheduling (customer demand), shorter production lead-times and reduced work-in-process inventory.

**SENSE DECIDE RESPOND™.** A major advantage of Activity Manager is that it brings together all CIM system components, maximizing ROI on factory resources. It does this by sensing changes in factory resources (such as event notifications or error conditions), deciding on processes (workflow job or business rule execution) and responding to factory resources (equipment error handling).

**WORKFLOW AUTOMATION FRAMEWORK.** Activity Manager provides a powerful environment for users to quickly and easily create, modify or extend workflow-based jobs to handle delays, events or anomalies. Each job consists of a series of linked blocks, where each block is an icon that represents an individual activity (such as running a report or sending an e-mail message). By creating jobs that implement best-in-practice techniques, production managers can improve the efficiency of their facility. For example, they can create jobs to automatically move wafers from one location to another, inform an administrator when a machine goes offline or execute and deliver a standard report.



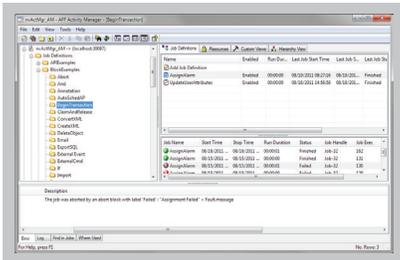
Activity Manager brings together all CIM system components; it closes the automation loop in real time, maximizing ROI of factory resources.

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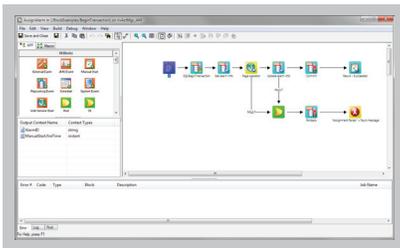
EXCEPTION MANAGEMENT AND CONTROL

# 25%

Reduction in **move delivery time** reported by one 300mm manufacturer who installed Activity Manager to manage multiple dispatch decisions, automate move requests and integrate "What Next" functionality.



From the Activity Manager Client interface, you can browse existing jobs and display a history of previous job executions, including any errors that occurred while a job was running.



Activity Manager uses an icon-based, drag and drop Job Editor for easily implementing workflow-based jobs. These jobs can be deployed in real-time without the need for complex programming or extensive recompilations, making it easy to adapt to changing conditions in a factory as they occur.



This example job uses a time-based schedule to run a report. It converts the report's output to HTML, and then saves it to a file.

## Customer Results

Activity Manager solves complex control issues and has delivered demonstrated improvements at multiple 300mm and 200mm sites. Fab productivity improvements, reported publicly by customers using Activity Manager, include:

For 300mm foundry operations

- > **85%** whitespace reduction
- > **95%** enablement of full automation moves (without human interaction)
- > **44%** operator reduction
- > **57%** reduction in lot travel time for intrabay movement
- > **46%** reduction in lot travel time for interbay movement

For 200mm operations

- > **60-70%** reduction in the number of expert operators
- > Reduced training costs
- > Increased tool availability

### Activity Manager Capabilities for Increasing Productivity

✓ <b>Workflow Control</b>	Controls and monitors process workflow, enabling fabs to optimize business processes by assigning plant resources based on capabilities and capacity. It also reduces lag-time due to workstation events and increases plant utilization and efficiency.
✓ <b>Automated Exception Management</b>	Ensures that exceptions are handled in a consistent manner by keeping production running with minimum human intervention.
✓ <b>Execution Control</b>	Monitors the sequence and time in which tasks are performed. It can invoke automation scenarios by reacting to a system event, schedule or predictive activity, which allows valuable time to be used during shift changes between operators.
✓ <b>Integration Framework</b>	Provides the capability for external systems to publish events or start an execution job through a SOAP API. It is integrated with a wide variety of MES applications, with Applied CLASS MCS 5 and with the Applied APF RTD repository to start job applications based on state changes or events such as MES transactions.

## Package Contents

Designed around best known methods for improving utilization and increasing productivity, the Activity Manager solution offers proven technology in one package that includes:

### SOFTWARE

- > Activity Manager module
- > MES Adapter (required if using repository events to initiate jobs)

### SERVICES, TRAINING AND SUPPORT

- > On-site deployment, provided by an experienced Activity Manager team
- > One year software maintenance
- > User training

**APPLIED MATERIALS EXPERTISE.** With a deep knowledge base and a rich history of providing products and solutions specifically addressed to the semiconductor and display industries, Applied Materials experts provide services to deliver turnkey solutions for enhancing manufacturing value in a timely manner. These solutions are backed by strong development and support teams who are available to ensure continuous product growth, providing customers with low cost of ownership.