FabGuard® FDC

Fabwide Fault Detection and Classification
FABGUARD FDC GOES FAR BEYOND TRADITIONAL FDC

FabGuard FDC combines real-time fault detection and classification with flexible sensor integration and powerful analytical tools. This allows fab engineers to analyze virtually any aspect of process and equipment behavior. No other system provides equivalent capability to protect against wafer loss, reduce and predict unscheduled tool downtime and improve overall yield.

Regardless of wafer size or product geometry, timely information is key to maximizing fab productivity and competitiveness. Escalating pressure to reduce costs makes it critical to reduce the number of scrapped wafers and increase equipment utilization. FabGuard meets these challenges by integrating tool and sensor data and then performing automated analysis using your team’s collective expertise, so you can maintain fab productivity at cutting-edge levels.

REDEFINING FDC: FABGUARD DETECTION AND CLASSIFICATION

FabGuard FDC enables FDC engineering at all levels—from detailed, hands-on, chamber-specific knowledge to fab-wide statistical process control and data mining.

FEATURES AT A GLANCE

- SPC, Multivariate Analyses (PCA, PLS, etc.), Expert System programmability
- Single user interface for collecting and analyzing fab, tool and sensor data
- Real-time fault detection and tool interdiction improves wafer yield
- Add on to a legacy system to enhance existing FDC capability or deploy as primary fabwide FDC system
- Add sensors to existing FDC or APC systems, including high speed data collection up to 1 MHz
- View the health of the entire fab or zoom in to a specific process step on any chamber of any tool

FabGuard FDC is the only system that combines comprehensive fabwide FDC functionality with tool-specific data analysis to improve process engineering and equipment troubleshooting. Established fab statistical process control (SPC) methods can be easily programmed into FabGuard FDC with the added advantage of real-time tool interdiction. FabGuard FDC can react instantaneously to stop problem tools as soon as an out-of-control condition is detected, dramatically reducing wafer scrap.

FABGUARD FDC EXPERT SYSTEM LEARNS YOUR PROCESS AND RECOGNIZES PROBLEMS

SPC rules are frequently employed as a first line of defense to prevent product loss. FabGuard FDC offers an additional level of protection—an FDC Expert System builder that lets process and equipment engineers train FabGuard FDC to recognize new problems as they appear and automatically detect them when they occur again. It’s like building the problem-solving know-how of your best people into the recipes for every process step on every tool. As a result, FabGuard FDC can recognize problems that SPC-only methods might miss. This unique combination of real-time SPC and FabGuard FDC Expert System makes FabGuard FDC the most powerful system available for wafer protection and fault identification.
FROM ONE TOOL TO THE FAB — SCALEABLE. SUSTAINABLE.

FabGuard FDC can be easily scaled from one tool to many hundreds of tools for real-time FDC on all process equipment. Data is archived and analysis results are stored in a Microsoft® SQL, Oracle or PostGreSQL database. By having access to all the data, FabGuard FDC is able to provide new insights and identify relationships—a significant advantage for fine-tuning or troubleshooting tools or processes.

A common user interface allows engineers to display, sort and analyze equipment and process data from every tool with extreme flexibility and ease. The consistent display format improves the learning curve and facilitates the sharing of information among different fab groups.

- Fab managers get both equipment and substrate health summary information, including summary reporting tools to access the overall health of the fab at a glance.

- Process engineers can readily determine relationships between equipment state and wafer outcome.

- Equipment engineers can quickly diagnose tool problems to reduce unscheduled downtime. Process chambers can be compared and matched.

The readily accessible data provided by FabGuard FDC makes it easier to match tools for consistent processing and to track process performance across multiple tools. Transferring FDC recipes and models between fabs is also possible, insuring better control on similar processes.

Alarming, reporting and tool interdiction can be configured to the specific needs of user groups and equipment circumstances. Optional system configuration templates and Best Known Methods, based upon INFICON’s worldwide experience in leading fabs, can pay for themselves as quickly as they are deployed.

FabGuard IPM is part of the FabGuard Suite of products, designed to work with you as your data gathering, sensor integration, and analysis needs continue to grow.
classifies the fault by labeling the analysis, thereby creating a tool-specific or process-specific library of faults which can be linked to factory Out-of-Control Action Plans. This minimizes downtime by helping maintenance personnel locate and correct the problem faster. The FabGuard FDC system’s comprehensive database also provides an overview of the health of the tool and the process, keeping maintenance personnel in tune with tool performance and reducing unscheduled tool downtime.

UNMATCHED EXPERIENCE AND SUPPORT MAKE INFICON THE RIGHT CHOICE

INFICON residual gas analyzers, optical sensors, thin film monitors/controllers, vacuum gauges, helium leak detectors, and software are used in fabs throughout the world to make processes more precise, productive and reliable. Our experience in developing both leading-edge sensors and software puts us in a strong position to integrate various data sources and use the data in much more powerful ways than can be achieved by handling the data from each source separately.

The highly trained people in our global network of sales and service offices will be with you at each step, from helping you determine how FabGuard FDC can best meet your needs, through installation, to providing responsive, ongoing support.

The FabGuard and Equipment Alarm Pareto report provides concise information on tool performance and makes it easy to identify the most common problems or use the density reports to track alarms over time.

FABGUARD TIGHTENS PROCESS CONTROL WITH INTEGRATED PROCESS MONITORING

Semiconductor manufacturing is becoming increasingly dependent on in situ sensors to help maintain tighter process control. These sensors provide a wealth of process-specific information that correlates very strongly with wafer outcome and complements the tool’s own data. INFICON pioneered the use of sensors as integrated process monitors (IPM) in microelectronic production.

FabGuard IPM is the only system designed to integrate multiple types of process sensors (RGA, in situ particle monitors, RF sensors, arc detectors and multiple third party sensors and gauges) in a single platform, automatically controlling all sensors and analyzing their complex data. That brings the benefits of in situ sensors to FDC without requiring additional user expertise. It also eliminates multiple hardware boxes and software systems and their high support costs.

PINPOINT PROBLEMS TO MINIMIZE WAFER LOSS AND TOOL DOWNTIME

If a process excursion does occur, FabGuard can immediately activate an alarm or alert the appropriate person, then shut down the tool before additional wafers are misprocessed. FabGuard also