



eR2R

Equipment Run-to-Run Process Control

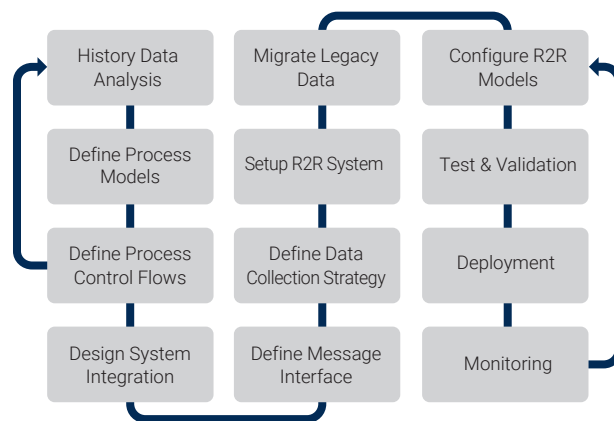
DETECT
 ANALYZE
 PREDICT
 ADAPT

eR2R for Improved Yield and Process Control

For semiconductor and FPD manufacturing engineers, the ability to adjust and calculate recipe values is one key to ensuring stable process control and higher yield in manufacturing. Manually adjusting recipe values to maintain stable system control is extremely difficult and time consuming. To ensure the best possible outcome, automating this task is critical to providing the greatest operational value. BISTel eR2R solution built on the proven PeakPerformance™ framework effectively utilizes process and measurement data of earlier runs to observe and calculate values of recipes significant to ensuring tight process control. eR2R is proven solution with installations in a variety of industries, including semiconductor wafer manufacturing, LCD, PDP, LED, OLED manufacturing. With eR2R, yield rate and product quality are optimized, at the same time reducing costly process rework and adjustments are minimized.

A Framework-based Solution for Fab-wide Operational Efficiency

Besides offering stable process control and higher yield, eR2R integrates easily with enterprise systems such as MES, EAP to facilitate data collection and to perform recipe changes. eR2R is also designed to work seamlessly with other Equipment Engineering Systems, including eFDC, eRMS and others to enable the best possible process management capabilities on the market.



Seamless Integration with other EES Applications

Intelligent Manufacturing

BISTel's intelligent manufacturing solutions are shaping the factory of the future, improving costs, operational efficiencies, and quality across factories by connecting the manufacturing ecosystem to better detect, analyze, predict, and adapt real-time to changing manufacturing conditions. BISTel solutions collect, manage, and analyze data, monitor the health of machines and equipment, optimize process flows, and identify root cause failures to mitigate risk in manufacturing. The release of BISTel's intelligent manufacturing solution includes advanced machine learning, industry leading analytics, predictive, and continuous improvement applications that accelerate the road to smart manufacturing.

Markets Served

Semiconductor Manufacturing
 Flat Panel Display Manufacturing
 Semiconductor Equipment Manufacturers
 LED Manufacturing
 PCB/SMT

Key Benefits

- **Easy Fab-wide Configurations**
 Easy edits or replicates operations of existing eR2R control models, linking control models, target processes, and equipment to facilitate fab-wide eR2R model expansion
- **Multiple Model Execution**
 Ability to create and compare the execution logic of multiple process control models

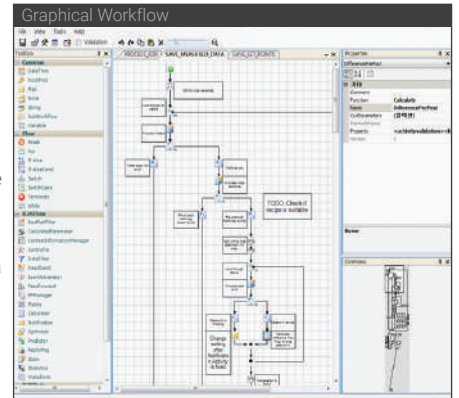
Key Features

- **Graphical Modeling** - Graphical Workflow Designer provides an intuitive environment for design and management of eR2R control logic
- **High-reliability** - Deployed in multiple installations globally, providing value in process and product quality optimization
- **Open Architecture** - Custom components can be integrated with existing process applications to fit the needs of any production and industry

Graphical Workflow-based Process Control

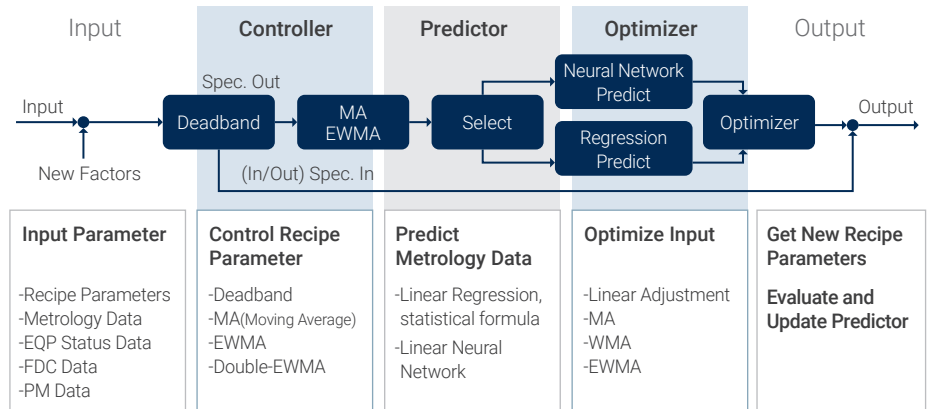
- Users can use Graphical Workflow objects to create custom process control workflow and logic
- Manage process control logic without writing code
- Express formula for statistical operations and handle various exceptions within a process
- Example of the Graphical Workflow components

- 🔧 **Controller** For smoothing function of process drift/shift to modify recipe value
- 📄 **State** Stores status information to maintain continuity of eR2R model
- 📊 **Calculator** Defines mathematical expression to optimize process
- 🛑 **Deadband** For process monitoring about stable range
- 🔍 **DataFilter** For data filtering of process and measurement
- 📈 **Statistics** Calculates various statistics of input data
- 🔮 **Predictor** Predicts values by process data
- 🔗 **If-else-then** Performs conditional sentences in logic
- 🔄 **For/While** Repeats in logic
- 📢 **Notification** Notices various information



Dynamic Model Deployment

- Dynamically upload new process control models without shutting down the system



MA: Moving Average / EWMA: Exponentially Weighted Moving Average

Integration with Virtual DOE

- Simulation of eR2R control models using historical dataset



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