

# HONEYWELL ADVANCED PROCESS CONTROL

## PRODUCT INFORMATION NOTE

Honeywell Forge Advanced Process Control is a process control and optimization software product with lifecycle maintenance tools and real-time performance monitoring. It delivers maximized operating profitability by optimizing production tradeoffs, managing product specifications and pushing operating envelopes to constraints.

### WHAT IS ENTERPRISE PERFORMANCE MANAGEMENT?

EPM is a set of tools that collect, unify, and take action on operational data to optimize performance, sustainability, and safety at the enterprise level.

### CHALLENGES

- Operate within Safety, Quality Regulations
- Improve productivity
- Improve operational consistency across crews
- Sustain long-term benefits
- Solve plant-level process optimizations
- Reduce the gap between production and planning

### SOLUTIONS

Honeywell Forge Advanced Process Control (APC) is part of the Process Performance Management suite of industrial-focused products in Honeywell Forge, an Enterprise Performance Management tool. APC helps enterprises measure, optimize and track their operations from the edge to the cloud. APC has a layered approach involving multiple technologies and processes that optimize productivity and profitability at every stage of the lifecycle.

**Multi Variable Control** optimizes the unit operation by running closer to limits, with tangible throughput, yield and energy benefits.

**Soft Sensors** models reduce the reliance on lab-based or online analysis and improves the control and optimization of the unit operations.

**Online Modeller** increases the model accuracy, reduces the test time requirement and eases ongoing maintenance.

**Advanced Process Control Monitoring and Analytics** is cloud-enabled and monitors unit operations, acting on insights to sustain the APC benefits.

**Multi-Unit optimizer** dynamically optimizes the existing multiple APC applications and improves overall plant control.

**Plantwide optimizer** bridges the gap between planning and control, improving management of intermediate component production and reducing quality giveaways

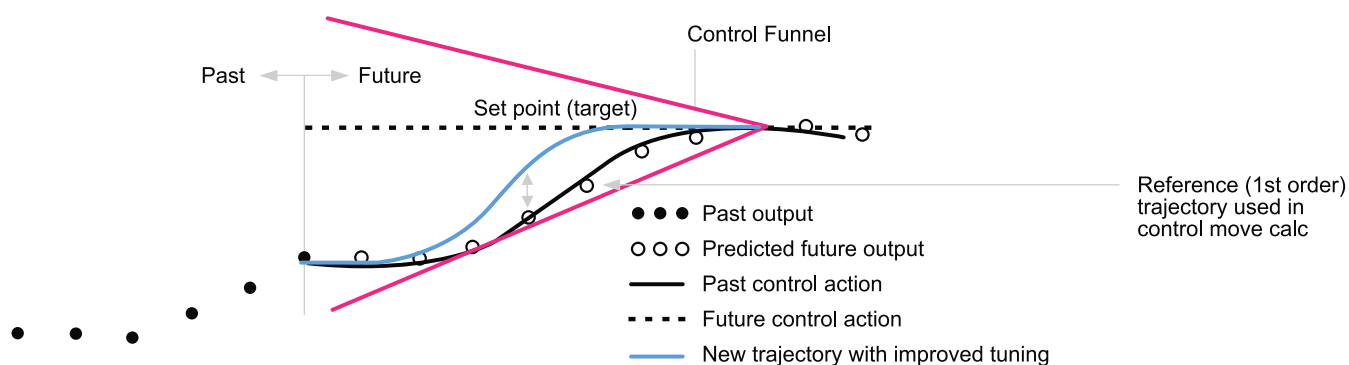


## FEATURES AND BENEFITS

| Multi Variable Control       | Soft Sensors                | Online Modeller                     | Advanced Process Control Monitoring and Analytics | Multi-Unit Optimizer                 | Plant- Wide Optimizer                           |
|------------------------------|-----------------------------|-------------------------------------|---------------------------------------------------|--------------------------------------|-------------------------------------------------|
| Robust Control technology    | Advanced Mathematical tools | Online Control Model Identification | Advanced Process Control Dashboard                | Dynamic Optimization                 | Reconciliation of Planning Model with APC model |
| Tighter Experion integration | Online integration          | Workflow integration                | Connected Solution Data Flow                      | Cooperative control and optimization | Integration to Blending                         |

### Multi Variable Control

**Robust control technology:** Patented Range Control Algorithm minimizes the effects of model uncertainty while determining the smallest process moves required to simultaneously meet control optimization objectives. The system does not require a reference trajectory but allows the controller to determine a robust and optimum response.



**Tighter Experion integration:** Integrated data interface eases the information flow and leverages native Experion server architecture, handling server redundancy. Integrated visualization, alarms and events provide superior integration with operator workflow.

### Soft Sensor

**Advanced mathematical tools for soft sensor model development:** Includes ordinary least squares (OLS), weighted least squares (WLS) and partial least squares (PLS) regression, dynamic sub space (DSS) and user-entered structure (UES) models.

**Online integration of soft sensor models:** Developed models are automatically integrated into online execution environment and supports analyzer and/or laboratory update capability, ensuring that the model accuracy and capability is effectively maintained.

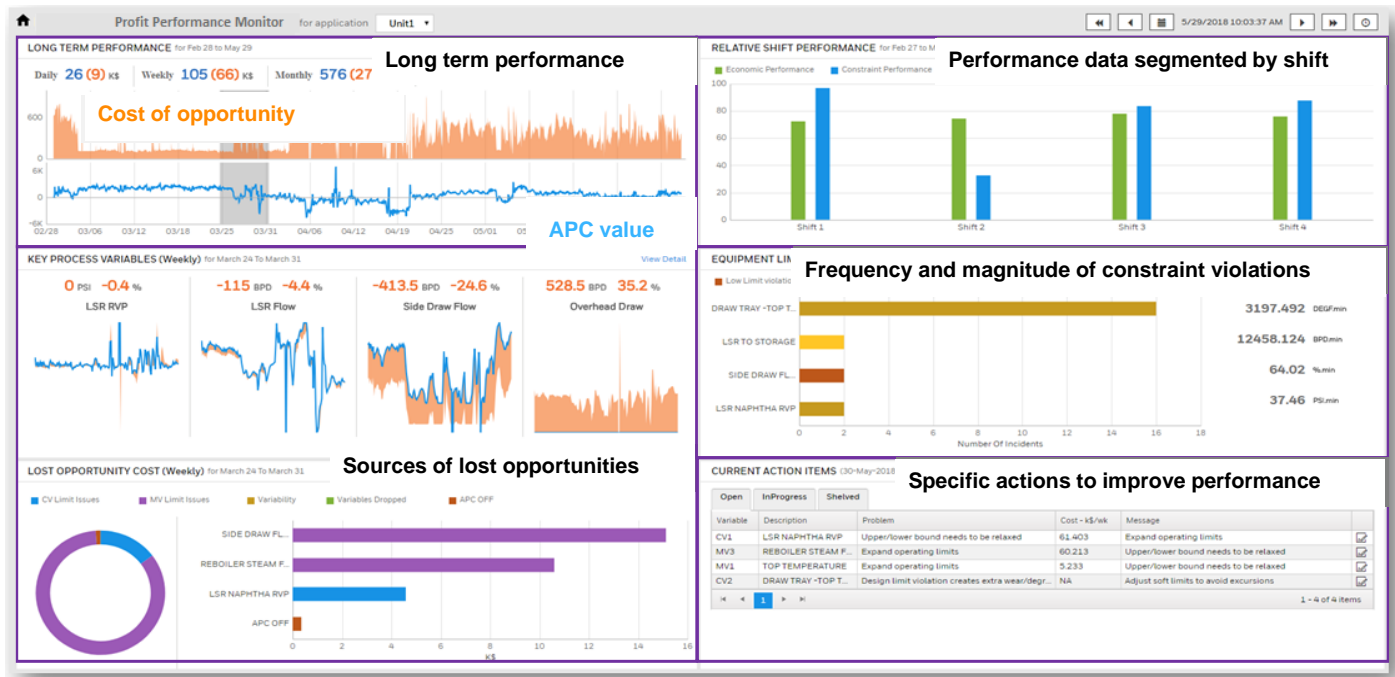
### Online Modeller

**Online control model identification:** A global, multi-stage algorithm model identification system performs online testing while managing open and/or closed loop characteristics. This identification method also directly addresses drift, noise and other unmeasured disturbance effects.

**Workflow integration of testing:** Automates online tasks data collection and plant testing along with offline model identification, ensuring a cohesive workflow.

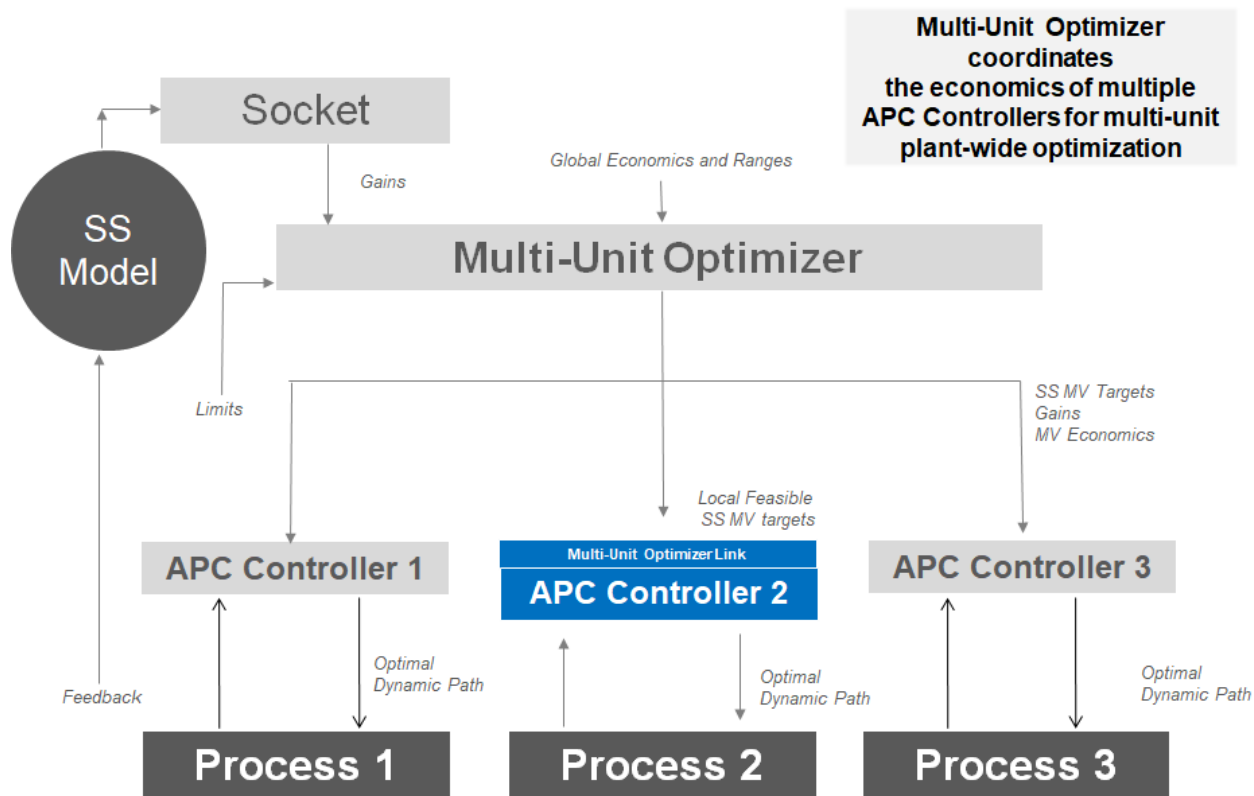
## Advanced Process Control Monitoring and Analytics

**Advanced Process Control dashboard:** Enables customers to monitor the APC's economic performance, identify issues, analyze them and deliver recommended actions via a dashboard.



**Connected solution data flow:** Process data is directly collected from the site historian through a secure cloud connector and stored in the Honeywell Forge cloud historian. Data from the cloud historian is processed and analyzed using an analytics execution engine, and the results are stored sent back into the cloud historian.

## Multi-unit Optimizer

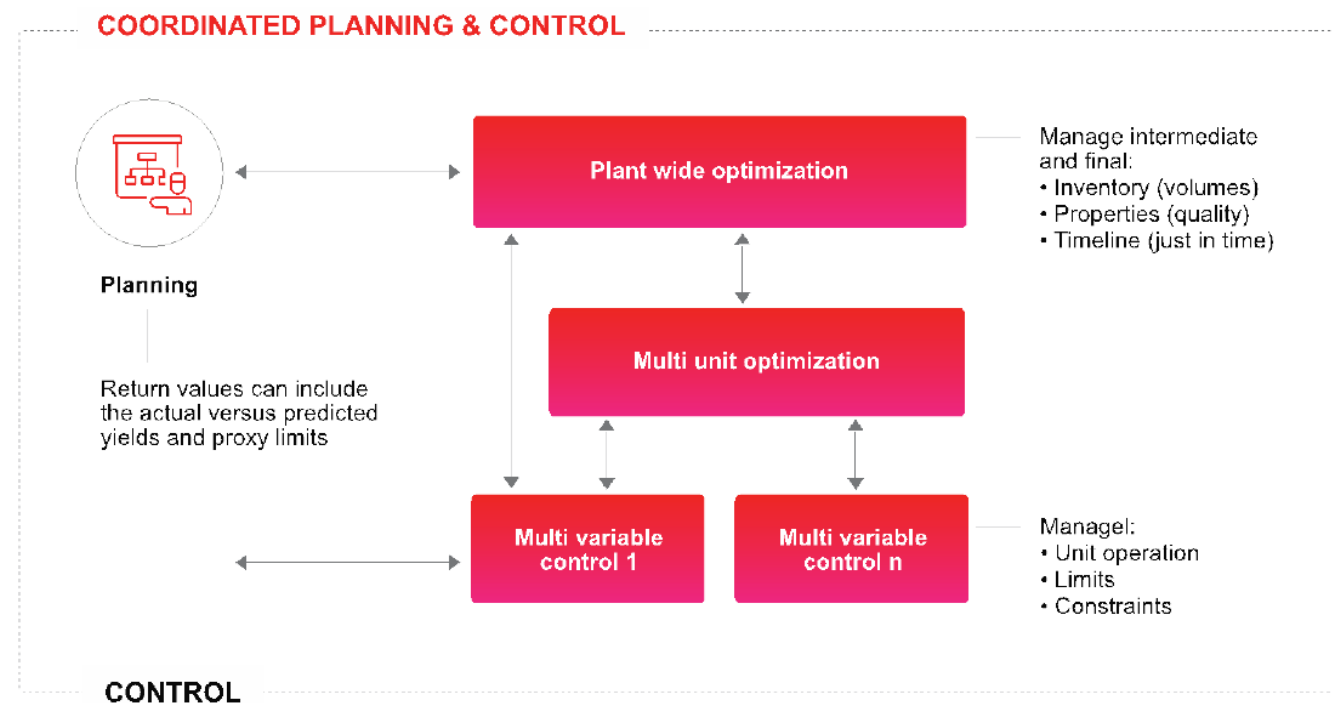


**Dynamic optimization:** Instead of relying solely on steady state, first principle-based modelling systems, Honeywell Forge Advanced Process Control uses dynamic models and fully leverages process information that resides in the underlying multivariable controller applications. Using this approach, it can reduce the dependency on simulation models, delivering the economic benefits of traditional RTO with a dramatic reduction in engineering effort.

**Cooperative control and optimization:** A dynamic quadratic programming (DQP)-based patented approach coordinates the global optimization solution across multiple multivariable controller applications to dynamically compensate for the complex disturbance relationships between the controllers.

## Plantwide Optimizer

**Reconciliation of planning model with APC model:** Can be extended to become a true plant-wide optimizer. The coordinating optimizer uses a pre-existing planning yield model to provide an initial steady-state gain matrix, and the relevant model dynamics can be fleshed out from historical operating data. It controls the product inventories, manufacturing activities, and product quality. Its embedded economic optimizer, which is furnished with the same planning model structure and economics, reproduces the offline planning optimization online, in real time.

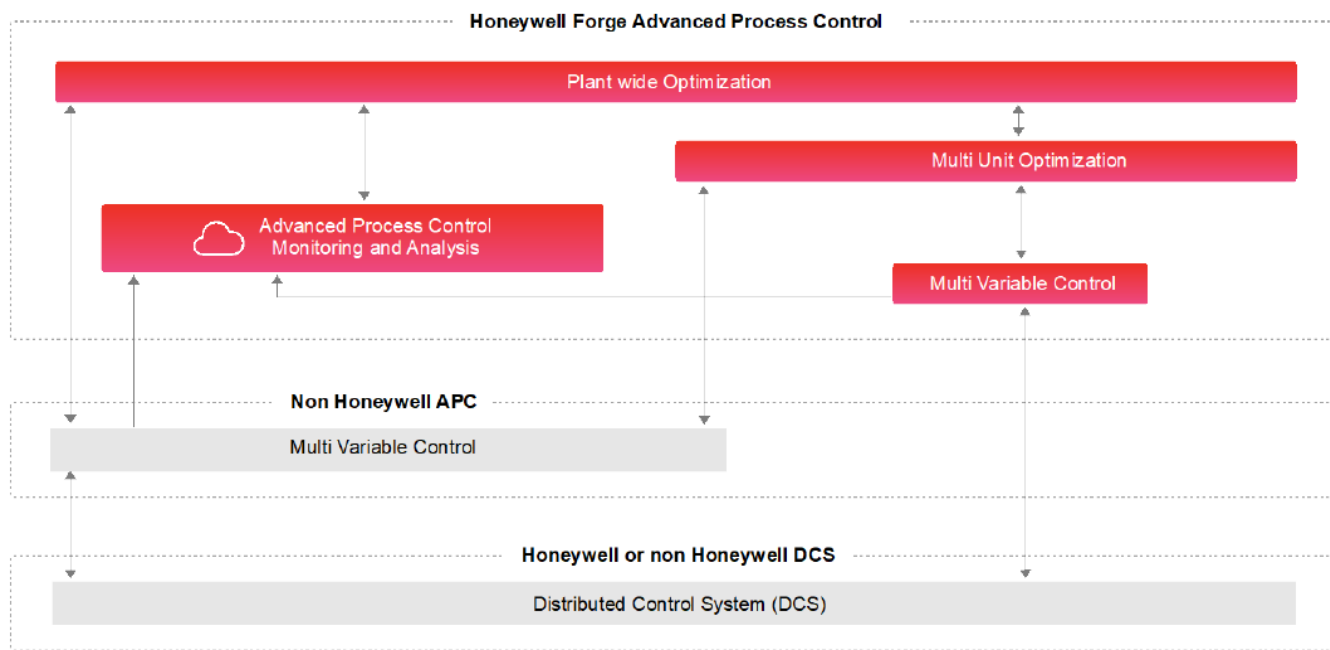


### Integration to blending:

**Online control model identification:** Integrates with Honeywell Forge Blend Optimizer to complete the gate-to-gate plant optimization. Optimal blend recipes account for upstream production and component inventories, allowing for greater utilization of components. In-line product analyzers provide continuous property feedback allowing online biasing of the gate-to-gate model. Plantwide optimizer works with both rundown blending and batch blending applications

### Vendor Agnostic Architecture:

Honeywell Forge Advanced Process Control can be integrated with APC applications from a range of vendors. The APC dashboard can monitor any unit level APCs, and the multi-unit and plantwide optimizers can cascade to any unit level APCs. Monitoring and analytics functions are cloud-based while the real-time optimizer functions are hosted on-premise.



## Results:

- Maximized production
- Maximized energy savings
- Maximized yield of high-value products
- Optimized intermediate component production

## Honeywell Forge APC Support Services

This product comes with worldwide, premium support services through our Benefits Guardianship Program (BGP). BGP is designed to help customers improve and extend application use and associated benefits.

Honeywell provides a complete portfolio of service offerings to extend the life of your plant and provide a cost-effective path forward to the latest application technology. Honeywell services include:

- Software installation services
- On-site engineering services
- Migration services
- Scope expansion services
- Assessment services
- Performance baseline and tuning services
- Customized training

## For More Information

Learn more about how Honeywell Forge Advanced Process Control Visit [Advanced Process Control](#) or contact your Honeywell Account Manager.

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## Honeywell Connected Enterprise

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