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About Blending and Movement Automation
Blending and Movement Automation is a family of advanced applications that provide a solution for product blending and material movements at a plant site. To learn more about the Open Blend Property Control application and other Honeywell software solutions, contact your Honeywell account manager.

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1. Introduction

For reasons of operating flexibility and cost-effectiveness, refinery unit operations generate a range of intermediate streams that are blended into products. Sites that do not have an automated blend property control system must manually adjust component feed rates based on the measured property values in the blender outlet stream to attempt to meet the property specifications for the product. To make these adjustments, the operator must understand the relationships between the quantity of each component being fed into the blender and the property values in the blended product.

Operators may calculate component feed rates required to meet property targets when the relationships are simple, such as with linear average mixing models. The calculations are more complex when the relationships are not simple, such as when nonlinear mixing models apply. Adding to the complexity, changing a component feed rate can impact more than one property. Many sites also find themselves faced with an increasing number of properties specifications that need to be met, making manual accounting for these interactions more difficult.

Honeywell’s Open Blend Property Control (OpenBPC) is designed specifically for on-line blend reformulation and optimization. It controls and optimizes the operation of in-line blenders, which produce a wide variety of products such as gasoline, distillate and fuel oils. OpenBPC provides a solution to the task of model-based product property control and blend reporting, efficiently blending fuels to the required product quality specifications while optimizing the formulation of the blend components.

OpenBPC is supplied with a set of interfaces which allow it to work with the Blend Control System data from both Honeywell and non-Honeywell distributed control systems.

OpenBPC is part of the Blending and Movement Automation family of applications. When working with Honeywell’s Blending Instructions application for blending instruction management, Experion Blend Controller (EBC) for blend ratio control of petroleum blends, Inventory Monitor (IM) and Movement Automation (MA) for integrated inventory and movement control and monitoring, and other related Honeywell applications, OpenBPC forms key element of Honeywell’s Blending and Movement Automation solution.

2. Benefits

Honeywell’s OpenBPC enables operations to achieve enhanced operations efficiencies and higher productivity. It incorporates the results of years of blending systems implementation expertise ensuring best-in-class reliability and safety. Key features and benefits include:

- **Reduced Property Giveaway**
  When the users’ blending objective includes Minimum Giveaway, OpenBPC ensures that all quality requirements are met, while minimizing property giveaway for selected properties.

- **Optimal Component Use**
  When the blending objective includes Minimum Cost, OpenBPC ensures that all quality requirements are met, while optimizing the usage of components. With OpenBPC, the contribution of all components relative to each property is known, and recipe changes use component costing information to determine optimum component usage.

- **Lower Product Inventory**
  Product inventory can be significantly reduced as OpenBPC reduces the overall blend turn-around time and provides the platform to do on-line blend certification.

- **Lower Component Inventory**
  OpenBPC can react to on-line component disturbances due to swings, stratification, rundown drift or other factors. Refiners are able to blend directly from the unit rundown streams that are buffered through a tank, thereby reducing component tankage. OpenBPC provides optimal component usage for property correction and can improve the component consumption rates for low or high inventory components.
Lower Number of Touch-Ups and Reblends
OpenBPC takes full advantage of the analyzers, instrumentation and components available to help ensure that the blend is on-specification for all properties the first time.

Reporting and Maintenance Information
Reports may be generated by OpenBPC that provide blend performance statistics, as well as the deviation between the measured results and those predicted by the model. The reports can be used for blend audit trails as well as analyzer performance data, which can be used to indicate if maintenance might be required.

On-Line Blend Certification
When used in conjunction with an analyzer validation and control package, OpenBPC can allow refiners to certify blends on-line. This further reduces blend turn-around time, and can reduce demurrage charges and product inventory.

Feedforward Control for On-Site Units
Feedback gained from the on-line blend analysis can be used to update property model estimates for control to the refinery units. For example, if an overall surplus of octane is detected, it may be possible to reduce the severity of operation, thereby improving the effectiveness of the advanced control strategies employed on the process units.

Open Systems
OpenBPC is built on industry standard Microsoft® Windows® technology and communicates to other applications via OPC to any OPC-compliant Distributed Control System.

World Class Domain Expertise
Honeywell’s Global Services organization is the world leader in oil movement and blending domain and systems expertise with over 180 installations and over 20 years of deployment experience. Honeywell Services ensure smooth, safe OpenBPC system startup and continued system performance for maximum return on investment.

3. Typical Uses
OpenBPC offers sophisticated property control and optimization for in-line blend formulation and optimization. It supports the refinery’s objective for operating flexibility and cost effectiveness in the production of intermediate and final products. For any given product, the choice of components, and their relative quantities, is determined by product specifications, component costs, component availability and component specifications. OpenBPC uses sophisticated optimization techniques to determine optimal component usage, allowing operations to efficiently blend fuels to the required specifications, while optimizing the blend.

OpenBPC is designed to interface to any Blend Control System. When used with Honeywell’s Experion Blend Controller (EBC) or Blend Ratio Control (BRC) applications, OpenBPC provides integration between basic component ratio control and advanced property control. It also features blend recipe management facilities, report generation and an off-line optimizer.

In its simplest form, a blending process is optimized by adjusting the quantity of each component being fed into the blend header in order to achieve a desired set of property values in the blended product.

At a plant site that doesn’t use an automated blend property control system, the operator must manually adjust the component feed rates based on the measured property values in the blender outlet stream. To make these adjustments, the operator must understand the relationships between the quantity of each component being fed into the blender and the property values in the blended product.

Where the component-property relationships are simple (e.g. linear average mixing models), the operator can easily calculate the component feed rate adjustments needed to meet the property targets. When these relationships are not simple (e.g. nonlinear mixing models), the calculations are more complex. Furthermore, changing the feed rate for one component can impact more than one property. Accounting for these interactions can be done manually but becomes more difficult as the number of controlled blend properties increases.

OpenBPC is used to complete the blend optimization calculations in a timely or efficient manner.
4. OpenBPC Functionality

The blending process is optimized by adjusting the quantity of each component being fed into the blend header to achieve a desired set of property values in the blended product while optimizing for blend objectives, such as minimized cost and minimized giveaway.

OpenBPC offers sophisticated property control and optimization for in-line blending. It is designed to interface with proprietary Blend Ratio Control Systems to provide advanced property control while optimizing for site objectives.

OpenBPC optimization executes at each OpenBPC period. The length of the OpenBPC period is configurable. Changes to OpenBPC operating or configuration settings may be made on-line to a running blend.

4.1 Blend Optimization

OpenBPC uses a non-linear optimizer (MINOS™), which executes at every control interval to adjust the blend recipe based on analyzer feedback. The problem statement for the optimizer is contained in the recipe information, which includes:

- Recipe values for each component
- Component limits (percent/volume)
- Component weighting factors
- Property limits
- Property weighting factors
- Target blend flow and volume
- Component blend values (typically lab data)

4.2 Blending Objectives

The OpenBPC blend optimization is carried out in multiple sequential stages, with each stage optimizing for one of the objectives listed below. Each succeeding stage preserves the optimum achieved in the previous stage, while using any remaining degrees of freedom to optimize for an additional objective. Blend Optimization Modes that may be specified are:

<table>
<thead>
<tr>
<th>Objective</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Property Control</td>
<td>Minimize property off-specification deviation. An Off-Spec Ratio can be used to increase the cost of off-specification properties.</td>
</tr>
<tr>
<td>Minimum Cost</td>
<td>Minimize the cost of the blend based on component costs.</td>
</tr>
<tr>
<td>Minimum Giveaway</td>
<td>Minimize property deviation from the high or low specification limit, based on property costs. (Each property’s high and low specification limits are selectable.)</td>
</tr>
<tr>
<td>Minimum Distance</td>
<td>Minimize deviation from the target recipe, or from high or low component limits. (Each component’s high and low limits are selectable.)</td>
</tr>
</tbody>
</table>

Available objective combinations are:

- Control-Giveaway
- Control-Cost
- Control-Cost-Giveaway
- Control-Giveaway-Cost
- Control-Minimum Distance
4.3 Blend Optimization Model

OpenBPC’s Blend Optimizer uses a model of the blending process to determine how to adjust the component feed recipes to meet the desired blending objectives. The blend model consists of a series of equations referred to as "blend laws". Each blend law equation is used to estimate the value of a given property in the blended product, based on the fraction of each component being fed into the blender and the "blend value" for each component-property pair. OpenBPC Optimization requires the following inputs:

<table>
<thead>
<tr>
<th>Equipment Constraints</th>
<th>Calculated constraints based on component flow limitations and status ensures the optimized recipe does not violate flow controller limitations.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Component Constraints</td>
<td>Configured and calculated constraints based on recipe limits, rate of change limits and component volume limits. These ensure the optimized recipe will be within configured volume and recipe limits.</td>
</tr>
<tr>
<td>Blend Model</td>
<td>The blend model is a linear or non-linear relationship between a component recipe and its corresponding blend property value. Non-linear relationships are implemented as blend laws in OpenBPC.</td>
</tr>
<tr>
<td>Model Offset</td>
<td>The model offset corrects the blend model so that it more closely matches the true process. Model offsets are calculated on a periodic basis by comparing the model property estimates (linear/non-linear OpenBPC blend laws with analyzer dynamics) with the analyzer readings.</td>
</tr>
</tbody>
</table>

4.4 Blend Control Modes

OpenBPC controls blend properties either in the pipeline or blend header, or in the blend destination tank:

| Instantaneous Property Control | Maintains blend qualities as close to the specified value as possible without making off-specification product. Chiefly used when blending directly into a pipeline, where it is desirable to minimize any deviation from the desired recipe. |
| Tank Property Control (TPC)    | Generally used if product is being blended to a tank, the basic goal being to create a blend tank full of product that is on-specification. This is accomplished by tracking the accumulated error for all properties then "blending off" this error over a given volume of product. Tank heel volume and properties (i.e. lab values) are used as the starting point for average calculations. |

4.5 Blend Quality

The OpenBPC Blend Quality module continuously monitors the quality of the material in each piece of equipment in the OpenBPC Blending Area. The equipment material quality is calculated from the material quality in the connected streams. For a source tank, the quality of the material in the tank is calculated based on the quality data collected in the associated rundown stream. Similarly, the quality of the material in a destination tank is determined based on the quality of the material in the blender stream which feeds it, along with any heel material in the tank. For a blend header, the blended product quality is determined using the quality of the material in the blender stream.

Stream quality data can come from one of six prioritized sources:

- Analyzers
- Lab Results
- Blending Instruction Quality
- Tank Quality Data
- Manual Entries
- Model Estimate
4.6 Average Property Calculations

OpenBPC uses linear/non-linear blend models to calculate average properties and to estimate average property values for Tank Property Control formulation.

OpenBPC’s Blend Quality module will average property values for each equipment item in the OpenBPC Blending Area. Destination tank swings during a blend cause the calculated average properties to be reset at the new heel volume and heel properties from the swing-in tank. For destination tanks not involved in a blend, a linear average of blend indices is used.

4.7 Multi-Blender Optimization

The blend feed material supplied by a rundown can be split across multiple blenders. When this happens, the quantity of rundown material fed to one blender impacts the quantity of material that is available as a feed to the other “interacting” blender.

OpenBPC supports large optimization problems such as the optimization of multiple, simultaneous, interactive blenders with rundown streams. Blenders using shared components may be jointly optimized.

Figure 4-1 – Interacting Blenders Example
4.8 Offline Optimization

Blending instructions may be checked offline before the blend is actually started using the **OpenBPC Offline Optimizer**. "What if" scenario testing makes it possible to test the blend property control tuning parameters prior to their use at the plant site. The Offline Optimizer may be used to:

- To check the feasibility of different blend operating scenarios based on existing operating and configuration data.
- To test blend property control tuning parameters.
- To test and make adjustments to blending instructions prior to their use in online OpenBPC. Updated blending instructions may be transferred back to the blending instruction database for use.

The Offline Optimizer uses a specialized Microsoft® Excel workbook with Excel add-in as the interface to the Optimizer. It may be installed on the OpenBPC Server or on a separate computer. If access is provided to the OpenBPC Server, data from OpenBPC and the BMA database may be used by the Offline Optimizer, and any adjustments to the optimization tuning or the blending instructions can be transferred for use by OpenBPC online.

4.9 Calculated Properties

OpenBPC uses its blend model to calculate property values and makes them available for use and display on the analyzer list. OpenBPC also estimates property values in the event of analyzer failure.

4.10 Optimization Summary

At each Blend Optimizer execution cycle, Optimization Summary information is generated for the current blend for use in the Blend Monitor Operation display and Optimization Report view. The **OpenBPC Optimization Summary** carries out the following:

- Notifies the operator if the blend is predicted to be off-specification, and identifies the affected properties.
- Identifies components that are constraining the blend, allowing the operator to use judgment in relaxing component limits.
- For single-blender optimization, displays the names of unused components that, if added to the blend, could solve the blend off-specification problem.
- Offers blend operation suggestions and recommendations.

4.11 Continuous Rundown Blends

OpenBPC supports the use of component streams coming directly from process units.

Blend feed materials are often supplied by upstream process units which are outside OpenBPC’s Blend Area. In this case, the incoming material flow rate often fluctuates and the blending unit is responsible for dealing with all the material that is transferred to it from the upstream process. OpenBPC handles this by using the rundown material quality and flow rate information in the blend optimization calculations.

OpenBPC can also optimize continuous rundown blends that are split across multiple blenders by using the quantity of rundown material fed to one blender to affects the quantity of material available as a feed to the other interacting blenders. OpenBPC also supports optimization with inlet premixing and the use of segregation tanks.
4.12 Blend Historization

OpenBPC may be configured to store the data used and calculated in the BMA database whenever one of the following events occurs:

- Blend Start
- Blend Stop
- Destination Tank Swing
- Each Blend Optimization Cycle

Users may choose to collect history data for some or all of these events. The blend history data which is collected, and how long it is stored, is also configurable.
4.13 Blend Reports

**OpenBPC** provides reports that are useful for analyzing blend results.

<table>
<thead>
<tr>
<th>Report Type</th>
<th>Description</th>
</tr>
</thead>
</table>
| Optimization Report | Displays blend optimization summary information for the current blend. Optimization summary information is displayed for all of the blenders in the OpenBPC area.  
Provides an indication of whether the blend properties are predicted to be on or off-specification.  
Displays the names of unused components that, if added to the blend, could solve blend off-specification problems. (For single blender optimization only.) |
| Blend Report        | Provides a comprehensive report of all of the OpenBPC configuration and blending instruction settings used by OpenBPC for the blend, along with the blend optimization calculation results for each Blend Optimizer execution cycle.  
Blend reports are displayed for all of the blenders in the OpenBPC area.  
The view may be used to review Blend Reports from previous blends. |
| Cycle Report        | Displays the component, additive and property data from the last Blend Optimizer execution cycle. It includes the data used in the blend optimization calculation, along with the calculation results. |

In addition to the above reports, the Blend Monitor and Blend Quality log files may also be used for troubleshooting.

4.14 Viewing Blend Information

**OpenBPC Blend Monitor Operation display** - Access is provided to the following:

<table>
<thead>
<tr>
<th>View Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blend Monitor Summary</td>
<td>Displays a subset of the blend settings for all of the blenders assigned to a Blend Monitor application instance together in a single display.</td>
</tr>
<tr>
<td>Optimization Report View</td>
<td>Displays the Optimization Report described above.</td>
</tr>
<tr>
<td>Blend Report View</td>
<td>Provides the view of the Blend Report described above.</td>
</tr>
<tr>
<td>Cycle Report View</td>
<td>Provides the view of the Cycle Report described above.</td>
</tr>
<tr>
<td>Active Blend View</td>
<td>Displays the current component, additive, property and overall blend settings. Blend settings and adjustments to the blend optimization calculation parameters may be made from this view.</td>
</tr>
<tr>
<td>Blend Value View</td>
<td>Displays the blend values used in the blend optimization calculations to define the interrelationships between the components and properties.</td>
</tr>
<tr>
<td>Rundown View</td>
<td>Displays the current rundown and segregation flow settings. (Available if rundowns have been configured.)</td>
</tr>
<tr>
<td>Blend Instruction View</td>
<td>Displays the list of available blending instructions and may be used to load a new blending instruction. This includes the blending instructions created for the current blender and those that are not assigned to a specific blender. The Blending Instructions application is used to manage the set of blending instructions prior to their use in OpenBPC.</td>
</tr>
<tr>
<td>Messages View</td>
<td>Displays the latest OpenBPC operator messages generated by the Blend Monitor application.</td>
</tr>
<tr>
<td>Application Log View</td>
<td>Displays all of the messages displayed in the Messages view, plus system level error messages generated by the Blend Monitor application. These messages are intended to help technical support personnel to solve software problems.</td>
</tr>
<tr>
<td>Admin View</td>
<td>Displays OpenBPC status information. This view is intended to be used by OpenBPC administrators and engineers to monitor and control the Blend Monitor application operation at runtime.</td>
</tr>
</tbody>
</table>
OpenBPC Blend Quality Operation display - Access is provided to the following:

<table>
<thead>
<tr>
<th>Operation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blend Quality Operation</td>
<td>Provides control of the Blend Quality application. Allows user to monitor the status of the analyzers in the OpenBPC Blending Area, monitor the quality values for the material in each equipment item and stream in the OpenBPC Blending Area, and maintain source and destination equipment assignments for streams that are not directly connected to a blender.</td>
</tr>
<tr>
<td>Analyzer View</td>
<td>Displays the status of the analyzers monitored by the Blend Quality application, along with their associated configuration settings. Analyzers are used to measure a single property in the material passing through a given stream.</td>
</tr>
<tr>
<td>Equipment Summary View</td>
<td>Displays the current status of most of the equipment for which Blend Quality is providing quality information. It also shows the input and output streams currently assigned to each equipment item.</td>
</tr>
<tr>
<td>Equipment Detail View</td>
<td>Displays the status and equipment quality information for a single equipment item.</td>
</tr>
<tr>
<td>Junction Summary View</td>
<td>A junction is a pseudo equipment item used to support material premixing calculations. This view displays the status of the junctions that Blend Quality is providing quality information (if configured in OpenBPC). It also shows the input and output streams currently assigned to each junction.</td>
</tr>
<tr>
<td>Junction Detail View</td>
<td>Displays the current status and quality information for a single junction (if junctions have been configured in OpenBPC).</td>
</tr>
<tr>
<td>Stream Summary View</td>
<td>Displays the current flow rate for the streams monitored by Blend Quality, along with their stream type. Used to assign source or destination equipment to streams that are not directly connected to a blender.</td>
</tr>
<tr>
<td>Stream Detail View</td>
<td>Displays the current flow rate and stream quality for a single stream. May be used to assign source or destination equipment to streams that are not directly connected to a blender.</td>
</tr>
<tr>
<td>Messages View</td>
<td>Displays the latest OpenBPC operator messages generated by the Blend Quality module.</td>
</tr>
<tr>
<td>Application Log View</td>
<td>Displays all of the messages displayed in the Messages view, plus system level error messages generated by the Blend Quality module. These messages are intended to help technical support personnel to solve software problems.</td>
</tr>
<tr>
<td>Admin View</td>
<td>Displays Blend Quality status information. This view is intended to be used by OpenBPC administrators and engineers to monitor and control the Blend Quality application operation at runtime.</td>
</tr>
</tbody>
</table>

4.15 Blend Order Configuration

Honeywell’s Blending Instructions application provides an interface between OpenBPC, Experion Blend Controller and BMA’s Blend Management Application. Blending Instructions is a mandatory prerequisite for OpenBPC and is included with the OpenBPC installation package.

4.16 OPC Compliant

OpenBPC operates in conjunction with any industry standard OPC compliant control system. OpenBPC interfaces to other third party applications, such as blend planning applications, via industry standard XML files. This minimizes or eliminates the need to modify an existing Blend Control System.

4.17 Production Browser

The Production Browser (Figure 4-3) is a generic user interface container used to view and configure the Blending and Movement Automation. It provides a common user interface for these applications running in a Microsoft Windows® environment and is designed to support both real time and information system applications.
The Production Browser provides display access security and display configuration facilities which are common to all supported applications. Each computer used to access the Blending and Movement Automation operating or configuration displays must have the Production Browser Client software installed on it.

### Figure 4-3 – Production Browser Display for OpenBPC

![Production Browser Display](image_url)

#### 4.18 OpenBPC Roles and Access

OpenBPC uses Production Browser roles and user interface functions to determine access rights to configuration and operating displays and to configuration parameters.

The Production Browser role, and user interface function configuration, permits a great deal of flexibility in determining what user interface functions are assigned to each role. Default roles include:

- **OpenBPC Administrator**
- **OpenBPC Engineer**
- **OpenBPC Supervisor**
- **OpenBPC Operator**

Each role provides a different configurable level-of-access to the OpenBPC configuration displays, parameters and functions. By default all of the OpenBPC functions are assigned to the OpenBPC Administrator role with an increasingly restricted subset made available to the lower level roles. The OpenBPC Operator typically has the fewest functions assigned to it.
5. Interfacing With Other Applications

5.1 Honeywell Applications

The relationships between OpenBPC, the Blending and Movement Automation Suite, of which OpenBPC is a key component, and other Business FLEX applications are shown below.

**BLEND** - OpenBPC accepts recipes in XML file from Honeywell’s BLEND multi-period blend planning and scheduling application. OpenBPC provides optimized blend recipes to a Blend Control System such as Honeywell’s Experion Blend Controller or TPS-based Blend Ratio Control.

**Blending Instructions** – Blending Instructions provides facilities for creating, editing, copying and deleting blending instructions which are, in turn, used by other applications. The application typically specifies how a blending operation is to proceed in the field. Blending Instructions may be used by Experion Blend Controller and OpenBPC users to ensure that the settings used by EBC or OpenBPC match the physical blending process in the field, and also by the Production Scheduler to define blending operation requirements for OpenBPC.

**Blend Management** – An interface is provided for OpenBPC to send target and actual result data to Blend Management for archiving and analysis. Blend Management provides an integrated information environment that supports the collection, storage, and analysis of blended product information. This integrated information environment is required to improve the blend planning, stock use, performance monitoring, and finished product release functions. Data transferred includes recipe information, component data, additive data, and property data. Target quantities and limits, as well as heel data, are transferred.

**Experion Blend Controller** – Experion Blend Controller (EBC) executes blend ratio control including the mixing of blending components to satisfy either flow ratio or volume ratio specifications, or to satisfy property specifications. Properties are controlled on the basis of the cumulative average qualities in the product tank, or the properties measured at the blend header. EBC issues flow controller setpoints and pump commands to start and stop a blend and, while a blend is running, maintains a specified blend flow profile.

Figure 5-1 – Blending and Movement Automation Suite Functional Integration
6. System Specifications

6.1 OpenBPC Product Specifications

OpenBPC supports up to:

- 10 Blenders
- 20 Components per Blender
- 20 Component Streams per Blender
- 20 Additives per Blender
- 100 Properties per Blender
- 100 Analyzers per Blender
- 10 Grades per Blender
- 500 Master List properties
- 1 Input Stream and 10 Output Streams per source or destination tank
- 1 Output Stream and 10 Input Streams per junction
- 1 Input Stream and 10 Output Streams per rundown
- 10 Interacting Blenders

These values may be subject to system memory and processing limitations.

6.2 OpenBPC System Specifications

6.2.1 Typical Network Topology

Figure 6-1 shows a typical OpenBPC system that is integrated with Experion.

Figure 6-2 shows an OpenBPC system with a legacy or third party Blend Control system in two linked networks:

- Distributed Control System
- Process Control Network (PCN)

Figure 6-1 – Recommended OpenBPC Architecture for Experion Systems
An OpenBPC system must include the following hardware components:

<table>
<thead>
<tr>
<th>Component</th>
<th>Specification</th>
</tr>
</thead>
</table>
| **OpenBPC Server**               | The OpenBPC Server houses the OpenBPC software components and SQL Server database tables. The OpenBPC Server software components include:  
- Blend Monitor (which includes the Blend Optimizer)  
- Blend Quality  
- Production Browser Server and Client  
- BMA database (AmmDB)  
- IS Execution Scheduler  
- Background Process Monitor  
OpenBPC must have OPC connection-based access to whichever platform is hosting the Blend Control System.  
For systems with a large number of blenders, OpenBPC can support more than one OpenBPC Server. Special configuration is required in this case. Contact Honeywell for details. |
| **Blending Instructions (BI)**   | Honeywell's Blending Instructions application, which is used to manage the blending instructions for OpenBPC, is an OpenBPC prerequisite.  
If Blending Instructions is going to be used with OpenBPC only, the Blending Instructions application software will normally be installed on the OpenBPC Server. |
| **Production Browser Clients**   | For remote access to the OpenBPC operating and configuration displays, any computer with network access to the OpenBPC Server may be configured as a Browser Client. |
| **Blend Control System Operator Station** | Since OpenBPC does not directly control the blending operations (e.g. blend start and stop commands), an operator station which has access to the Blend Control System is required.  
Honeywell’s Experion Blend Controller (EBC) application can act as the Blend Control System for OpenBPC, as can Honeywell’s TPS-based Blend Ratio Control.  
If Honeywell’s Experion PKS system is used as the BCS, as it is in EBC, the operator station would be an Experion Station. If Honeywell’s TPS system is used as the BCS, the operator station would be a GUS node. |
6.2.2 OpenBPC Server Requirements

System Configuration
The same general hardware and software requirements apply to all BMA servers including the OpenBPC Server. A summary is shown below, while details are supplied in the BMA Software Change Notice.

<table>
<thead>
<tr>
<th>System Configuration</th>
<th>Specification</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>Intel Xeon X5560 2.8 GHz Quad-Core or Faster</td>
<td></td>
</tr>
<tr>
<td>RAM</td>
<td>4 GB</td>
<td></td>
</tr>
<tr>
<td>Video Resolution</td>
<td>1280 X 1024 65K colors</td>
<td></td>
</tr>
<tr>
<td>Hard Drive</td>
<td>5 x 146 GB RAID5 Configuration</td>
<td>The RAID5 configuration provides a total of 438 GB data storage (3 x 146 GB), since 2 of the 5 disk drives are part of the redundancy scheme. The RAID5 configuration recommended for Experion Servers should be used.</td>
</tr>
<tr>
<td>Video RAM</td>
<td>512 MB (minimum)</td>
<td></td>
</tr>
<tr>
<td>Operating System</td>
<td>Microsoft Windows Server 2003 SP2 (32-bit) Standard Edition</td>
<td>English Language Version required. Note: If OpenBPC is being set up with Experion, only the Windows operating system versions supported by Experion can be used.</td>
</tr>
<tr>
<td>Uninterruptible Power Supply</td>
<td>Mandatory</td>
<td></td>
</tr>
</tbody>
</table>

Software

<table>
<thead>
<tr>
<th>Software Component</th>
<th>Number Required</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experion® PKS Infrastructure</td>
<td>Experion Station Client</td>
<td>1</td>
</tr>
<tr>
<td>Office</td>
<td>Microsoft Office 2007 or Microsoft Office 2003</td>
<td>1</td>
</tr>
<tr>
<td>Software Component</td>
<td>Number Required</td>
<td>Comments</td>
</tr>
<tr>
<td>--------------------</td>
<td>----------------</td>
<td>----------</td>
</tr>
<tr>
<td>Database Microsoft SQL Server 2005 SP3 Standard Edition</td>
<td>1</td>
<td>In general, BMA customers are not required to purchase SQL Server separately. This is because the SQL Server software and licenses are supplied with Experion. For customers who are ordering Blending Instructions and OpenBPC only, without any of the other BMA applications, SQL Server 2005 must be purchased separately. In this case customers may order the SQL Server software and the SQL Server Client Access Licenses from Honeywell or may choose to purchase this licensing through other sources.</td>
</tr>
<tr>
<td>Data Access OPC Data Access Server, per connection</td>
<td>1</td>
<td>Optional for the OpenBPC Server unless users are writing their own applications which make use of Experion OPC data access.</td>
</tr>
</tbody>
</table>

For specific Honeywell computer platforms and supported software that meet these requirements, please contact your Honeywell representative.

Users that intend to modify the User Interface graphics supplied with the Blending and Movement Automation applications, or to develop plug-ins for these graphics, will also require additional software components. Contact Honeywell for additional information.

**Offline Optimizer**

OpenBPC's Offline Optimizer may be installed locally on the OpenBPC Server or it may be set up on a totally separate computer. For remote installations, the OpenBPC Offline Optimizer must be installed on a computer running either Microsoft Windows Server 2003 SP2 or Windows XP SP3. A local copy of Microsoft Excel available with Microsoft Office 2007 or Office 2003 must be present on the target computer.

### 6.2.3 Browser Client Requirements

Any computer which has network access to the OpenBPC Server may be used as a Browser Client.

**Hardware**

OpenBPC clients must meet the meet the following minimum specifications.

<table>
<thead>
<tr>
<th>System Configuration</th>
<th>Specification</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>Intel Xeon E5570, 2.93 GHz Quad-Core or Faster</td>
<td></td>
</tr>
<tr>
<td>RAM</td>
<td>3 GB</td>
<td></td>
</tr>
<tr>
<td>Networking</td>
<td>100 Mbps Ethernet or FTE</td>
<td>10 Mbps Ethernet Network between servers and Stations is not officially supported, although it may perform acceptably on small systems.</td>
</tr>
</tbody>
</table>
## System Configuration

<table>
<thead>
<tr>
<th>Specification</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Video Resolution</td>
<td></td>
</tr>
<tr>
<td>1280 X 1024</td>
<td></td>
</tr>
<tr>
<td>65K colors</td>
<td></td>
</tr>
<tr>
<td>Hard Drive</td>
<td></td>
</tr>
<tr>
<td>2 x 160 GB RAID1 Configuration</td>
<td></td>
</tr>
<tr>
<td>Video RAM</td>
<td></td>
</tr>
<tr>
<td>512 MB</td>
<td>Needed to support performant graphics.</td>
</tr>
<tr>
<td>Operating System</td>
<td></td>
</tr>
<tr>
<td>Windows XP SP3 Professional (32-bit)</td>
<td></td>
</tr>
</tbody>
</table>

## Software

<table>
<thead>
<tr>
<th>Software Component</th>
<th>Description</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experion® PKS</td>
<td>Experion Station Client</td>
<td>Optional - Only required if the Blend Control System is an Experion-based application (e.g. Experion Blend Controller) and the Browser Client computer will be used to access Blend Control System displays.</td>
</tr>
<tr>
<td>Infrastructure</td>
<td></td>
<td>An Experion Station is required if the Movement Automation, Inventory Monitor and/or Experion Blend Controller applications will be present.</td>
</tr>
<tr>
<td>Office</td>
<td>(no requirement)</td>
<td></td>
</tr>
<tr>
<td>Adobe</td>
<td>Adobe Reader Version 8.x or older</td>
<td></td>
</tr>
<tr>
<td>Database Access</td>
<td>Microsoft SQL Server 2005 Runtime Client Access License (CAL)</td>
<td>If the Browser client software is installed on a machine that does not have Experion Station software installed on it, then a separate CAL is required. If the Browser client software is installed on a machine that does have Experion Station software installed on it, then a separate CAL is not required.</td>
</tr>
</tbody>
</table>
7. More Information

The following documentation is available to support **Open Blend Property Control** and related applications:

<table>
<thead>
<tr>
<th>Document Title</th>
<th>Document</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production Browser Installation Guide</td>
<td>BR-INS-340</td>
</tr>
<tr>
<td>Production Browser User Guide</td>
<td>BR-USR-340</td>
</tr>
<tr>
<td>OpenBPC Installation Guide</td>
<td>OB-INS-340</td>
</tr>
<tr>
<td>OpenBPC Configuration Guide</td>
<td>OB-CFG-340</td>
</tr>
<tr>
<td>OpenBPC User Guide</td>
<td>OB-USR-340</td>
</tr>
<tr>
<td>OpenBPC Offline Optimizer Reference Guide</td>
<td>OB-REF-340</td>
</tr>
<tr>
<td>Blending Instructions Configuration Guide</td>
<td>BI-CFG-340</td>
</tr>
<tr>
<td>Blending Instructions Installation Guide</td>
<td>BI-INS-340</td>
</tr>
<tr>
<td>Blending Instructions User Guide</td>
<td>BI-USR-340</td>
</tr>
</tbody>
</table>

8. Contact Information

For more information, please visit:


For E-Mail: support@honeywell.com

or call 1-800-822-7673