Honeywell’s Experion Ratio Controller (ERC) is Experion®-based software that controls the basic operation of in-line blenders typically for fuel oil, crude, bitumen and chemical blending applications. ERC ensures components are blended in accordance with blend recipe specifications by controlling pumps and flow controllers associated with the blending application.

**Benefits include:**

- **Increased consistency of the blend results** through in-line blending.
- **Reduced blending setup and execution time and increased blender throughput** by automatic equipment sequencing and control.
- **Fewer reblends, and reduced inventory** through accurate control of the component ratios according to the blend recipe.

Experion Ratio Controller is integrated with Honeywell’s Experion® PKS control system for accurate ratio control of in-line blending.

**Key Capabilities**

Experion Ratio Controller is part of Honeywell’s Blending Suite within the Blending and Movement Management Solution. ERC provides the following key capabilities to support basic in-line blending processes which add several streams together in a common header at a ratio specified by the blend recipe:

- Automatic startup, operation and shutdown of the blender and associated equipment
- Master flow rate setpoint flow control
- Blend flow rate and volume control

**Blend Equipment and Flow Control**

Once the blend recipe is validated and an operator chooses to start a blend, ERC starts the component and additive pumps in a configured sequence, and manages the opening of the flow controllers. Component and additive flow rates are manipulated to ensure accurate volumetric blending during both steady state and transient ramping conditions.

The total flow rate is held at an initial hold rate during startup to allow the analyzer signals to stabilize. Once analyzer stability is achieved, ERC slowly ramps the flow to the steady state target flow rate. The flow controller setpoints are based on a master flow rate setpoint.

When the total accumulated volume is within the shutdown volume of the target volume, the flow rates are ramped down by...
ERC. Once the target volume is reached, ERC shuts down the pumps and controllers.

Prior to the completion of a blend, the blend may be shutdown and restarted, either manually, or under emergency or error conditions.

ERC controls blends according to a configurable blender flow rate profile

**Pacing**

Pacing occurs when one of the flow controllers indicates that it cannot sustain its requested flow. Pacing can be caused by one of the following conditions:

<table>
<thead>
<tr>
<th>Condition</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output High</td>
<td>The requested output of a flow controller is higher than the configured maximum.</td>
</tr>
<tr>
<td>Deviation Low</td>
<td>The difference between the flow controller’s SP and PV is greater than a configured percentage.</td>
</tr>
<tr>
<td>Setpoint High</td>
<td>The flow controller’s setpoint is higher than the configured maximum.</td>
</tr>
</tbody>
</table>

**Blender Header Pressure Control**

The blend header may be equipped with a pressure controller. This controller is used to maintain stable blend pressure, resulting in fewer deviations in component flow.

ERC supports specification of header pressure for each blend state. Normally, the pressure controller controls header pressure to its setpoint. During the start of the blend, ERC controls the output of the pressure controller directly. The operator can manually override this and adjust the output.

**Property Analyzer Interface**

ERC provides an interface to on-line property analyzers with functions that include analyzer signal validation, instantaneous property values, average property calculation (header and tank property averages), analyzer status monitoring and property error calculations. Analyzer signal validation is provided by standard control block input checking and includes low rate of change, high rate of change and analyzer range.

**Blend Report Generation**

ERC automatically generates a new blend report each time a blend is started or closed, and whenever the blend destination is changed in a running blend (i.e. on a destination swing). Blend reports can also be generated on demand and are usually customized for each site. Separate reports are maintained for each blender configured in ERC.

Typical blend report generated by Experion Ratio Controller or Experion Blend Controller

Each report contains the values for a predefined list of parameters at the time of the report. The data collected normally includes:

- General blender information
- Component and additive data
- Property data

**ERC on the Experion Platform**

Experion Ratio Controller is designed to run on the Experion PKS architecture for distributed control of the field equipment used in the blending and movement operations. Experion graphics are used as the basis for ERC user interface.

Experion Ratio Controller makes use of standard Honeywell Experion PKS functions such as control algorithms, messages, logging, as well as alarming and event journaling.

Running on C300 controllers, Experion Ratio Controller supports controller redundancy. Alternatively, ERC may run on the Experion ACE node; however Experion ACE does not support redundancy.
Experion Ratio Controller is a key component of Honeywell’s Blending Suite and integrates with other Honeywell applications.

Integration with Honeywell Applications

Experion Ratio Controller (ERC) is a key component of Honeywell’s Blending Suite, which is part of the Blending and Movement Management Solution. Other components of Honeywell’s Blending Suite are:

- **BLEND** - Offline multi-period blend planning and event-based scheduling
- **Blending Instructions** - Interface for management and transfer blend recipes / instructions
- **Experion Blend Controller (EBC)** - Advanced ratio control of in-line blending.
- **OpenBPC** - Online blend control with dynamic recipe adjustment
- **Blend Performance Monitor** - Collect, store, manage blend performance metrics

Together, these components form Honeywell’s Blending Suite, a set of integrated tools to deliver optimum in-line blending.

The **Blending Instructions** application is used to specify how a blending operation is to proceed in the field. Each set of blending instructions contains data that uniquely describes a blend and its associated property model. **Blending Instructions** provides facilities for creating, editing, copying and deleting blending instructions that are, in turn, used by ERC users to define blending operation requirements and ensure that the settings match the physical blending process in the field. These facilities may also be used to define blending operation requirements for field personnel.

The blend plan and recipes may be downloaded from Honeywell’s BLEND multi-period blend planning application to ERC via the **Blending Instructions** application.

ERC blend data is collected, along with data from other sources, by Honeywell’s **Blend Performance Monitor** application, where actual blend data is compared to planned performance. ERC blend data is integrated into a data historian, such as Uniformance® PHD, via the **Blend Performance Monitor** application for blend reports and archiving.
Integration with Non-Honeywell Applications

The Experion Ratio Controller is also designed to allow non-Honeywell applications to be interfaced via OPC and XML. ERC may accept blend recipes from a non-Honeywell planning application through the Blending Instructions application.

ERC may also be used for blend ratio control over non-Honeywell DCSs using the Experion system’s OPC connectivity.

System Requirements and Architecture

ERC is designed to operate within the Experion PKS environment. The following illustration shows the hardware architecture recommended for ERC when loaded on the Experion Process Controllers. Contact Honeywell for the latest list of supported Experion PKS releases.

ERC software is split between two servers, the ERC Process Server and the ERC Display Server. These application servers can be set up together on an Experion Server or on separate, network connected computers. These servers run Windows Server 2008 Standard Edition (32-bit) with SP2, or Windows Server 2008 R2 Standard Edition (64-bit) with SP1, depending on the version of Experion supported. The ERC servers typically require Intel Xeon X5650 2.66 GHz Quad-Core or faster processors, with at least 4GB RAM and minimum 146 GB hard disk space. For specific Honeywell computer platforms and supported software that meet these requirements, please contact your Honeywell representative.

Support Services

This product comes with worldwide, premium support services through our Benefits Guardianship Program (BGP). BGP is designed to help our customers to improve and extend the usage of their software and the benefits they deliver, ultimately maintaining and safeguarding their advanced software.

Training Services

Training courses addressing Experion Ratio Controller implementation, use and maintenance are available through Honeywell’s Automation College (www.automationcollege.com). On-site courses are also offered upon request.

For More Information

To learn more about Honeywell’s Experion Ratio Controller, visit our website www.honeywellprocess.com/software or contact your Honeywell account manager.

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