

## Product Information Note

Profit<sup>®</sup> Blend Controller

Honeywell's Profit<sup>®</sup> Blend Controller (PBC), part of Honeywell's Profit<sup>®</sup> Blending Suite, is Experion<sup>®</sup>-based software that controls the basic operation of in-line blenders typically for fuel oil, crude, bitumen and chemical blending applications. PBC 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.
- Automatic startup, operation and shutdown of the blender and associated equipment
- Master flow rate setpoint flow control
- Blend flow rate and volume control
- Recipe validation
- Maintenance of the component percentages and additive concentrations as dictated by the blend recipe
- Pacing of the blend flow rate when a controller is unable to meet a high flow demand
- Interface to property analyzers
- Analyzer signal validation
- Abnormal condition monitoring, taking corrective action as required
- Blend header pressure control
- Blend report generation, containing key blending information, at the completion of every blend

Controller	Source	Material	Recipe	Flow	Status	Pump
1 BaFCV101	STK101	AlkyID	70.00 %	630.00 m <sup>3</sup> /hr	Running	bcmpmp101
2 BaFCV102		Cat Gas	0.00 %	0.00 m <sup>3</sup> /hr	Stopped	bcmpmp102
3 BaFCV103	STK103	Reformat	30.00 %	270.00 m <sup>3</sup> /hr	Running	bcmpmp103
4 BaFCV104	LS	Butane	0.00 %	0.00 m <sup>3</sup> /hr	Stopped	bcmpmp104
5 BaFCV105			0.00 %	0.00 L/hr	Stopped	
6 BaFCV106		HCN	0.00 %	0.00 m <sup>3</sup> /hr	Stopped	
7 BaFCV108	STK105	MTBE	5000.00 %	74.93 L/hr	Running	bcmpmp108

Profit Blend Controller is integrated with Honeywell's Experion<sup>®</sup> PKS control system for accurate ratio control of in-line blending.

**Key Capabilities**

Profit<sup>®</sup> Blend Controller is part of Honeywell's Profit<sup>®</sup> Blending Suite within the Profit<sup>®</sup> Blending and Movement Solution. PBC 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:

A number of these key capabilities are described below:

**Blend Equipment and Flow Control**

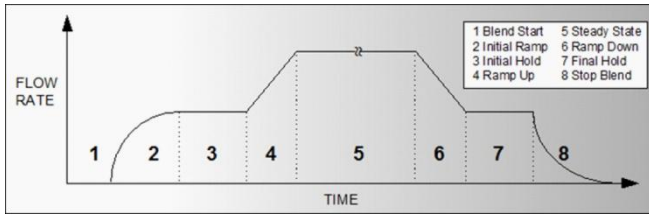
Once the blend recipe is validated and an operator chooses to start a blend, PBC starts the component and additive pumps in a configured sequence, and manages the opening of the flow controllers. Component and additive flow rates are manipulated to ensure accurate volumetric blending during both steady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



PBC 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:

Output High	The requested output of a flow controller is higher than the configured maximum.
Deviation Low	The difference between the flow controller's SP and PV is greater than a configured percentage.
Setpoint High	The flow controller's setpoint is higher than the configured maximum.

**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.

PBC 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, PBC controls the output of the pressure controller directly. The operator can manually override this and adjust the output.

**Property Analyzer Interface**

PBC 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**

PBC 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 PBC.

```

14-Dec-04 11:06:53 RPT001: BlendRpt1 :          Demanded : Page  1
Blend Report 1
      EEC Megas 1 Blend Report
=====
Grade      :REGULAR
RECIPE ID  :RcpIDMapped          BLEND NO      :      21
BATCH ID   :Test Batch I         HEELVOLUME   :      22.00
TARGET Volume : 10000.00         BLENDED VOLUME : 402.37
Blend State :Steady State        Event         :Demand Print
START TIME  : 10:32 14-Dec-2004  DESTINATION TANK :DTK104

=====
COMPONENT      TANK      ORIGIN %      CURRENT VOL      CURRENT % UNITS
=====
Alky           STK101      30.00          132.48          31.48 m3
Cat Gas       STK102      40.00          156.28          36.94 m3
Reformate     STK103      20.00           87.98          21.01 m3
Butane        STK104      10.00           44.16          10.57 m3
              0.00           0.00           0.00 m3

=====
ADDITIVE      TANK      ORIGIN CONC      CURRENT VOL      CURRENT CONC
=====
NTBE          STK105          123.00           0.05          130.35

=====
PROPERTY      HEEL  SPIC  HEADER AVERAGE  TANK AVERAGE  UNITS
=====
RON           92.00  90.00          98.30          94.91
MON           85.00  80.00           0.00          85.00
RVF           8.00  11.00           0.00           6.00
    
```

Typical blend report generated by Profit Blend 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

**PBC on the Experion Platform**

Profit Blend 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 PBC user interface.

Profit Blend 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, Profit Blend Controller supports controller redundancy. Alternatively, PBC may run on the Experion ACE node; however Experion ACE does not support redundancy.

**Integration with Honeywell Applications**

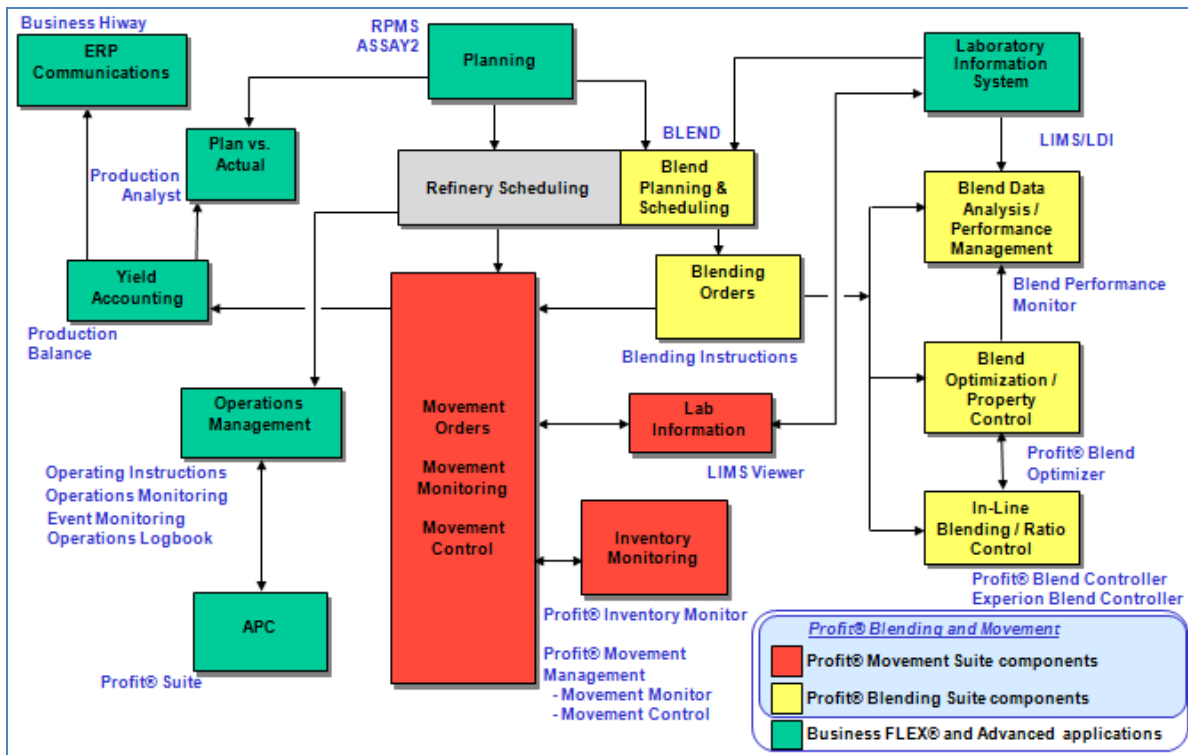
Profit Blend Controller (PBC) is a key component of Honeywell’s Profit Blending Suite, which is part of the Profit Blending and Movement Solution. Other components of Honeywell’s Profit Blending Suite are:

- **BLEND** - Offline multi-period blend planning and event-based scheduling
- **Blending Instructions** - Interface for management and transfer blend recipes / instructions
- **Profit Blend Optimizer** - Online blend control with dynamic recipe adjustment
- **Blend Performance Monitor** - Collect, store, manage blend performance metrics

Together, these components form Honeywell’s Profit 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 PBC 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 PBC via the **Blending Instructions** application.

PBC 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. PBC blend data is integrated into a data historian, such as Uniformance® PHD, via the **Blend Performance Monitor** application for blend reports and archiving.



Profit Blend Controller is a key component of Honeywell’s Blending Suite and integrates with other Honeywell applications

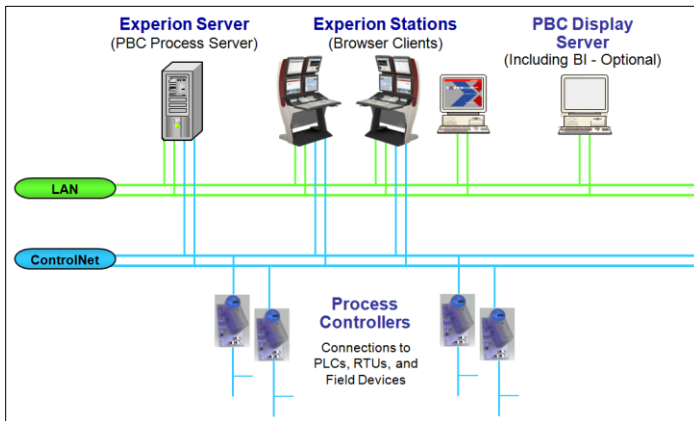
## Integration with Non-Honeywell Applications

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

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

## System Requirements and Architecture

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



Sample PBC Architecture for Experion Controller-based Systems

### For More Information

To learn more about Honeywell's Profit Blend Controller, visit our website [www.honeywellprocess.com/software](http://www.honeywellprocess.com/software) or contact your Honeywell account manager.

### Honeywell Process Solutions

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Shanghai, China 20051

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PBC software is split between two servers, the PBC Process Server and the PBC 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 PBC 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 Profit Blend Controller implementation, use and maintenance are available through Honeywell's Automation College ([www.automationcollege.com](http://www.automationcollege.com)). On-site courses are also offered upon request.

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