

CoalFusion™

Fully Automated Blending

CoalFusion™ is a fully automated blending system that allows you to deliver the exact blend of fuel that your power plant needs. Blend from an unlimited number of coal yard feeders to an unlimited number of boiler blend specifications while minimizing the cost of your fuel. With advanced process control algorithms, CoalFusion™ increases your plant profitability by delivering the right fuel blend at the right time all the time.

Technical Specification

### Control Your Fuel

Over 70-percent of the cost of fossil fuel power generation is attributed to fuel. Derates, slagging, and emissions excursions due to poor fuel quality can seriously impact the economic performance of a facility. The bottom line is that efficient use of fuel is an opportunity for significant savings for the power plant.

Knowing what type of fuel your boiler is designed for, and actively controlling the quality of fuel you are feeding your boiler can immediately improve plant operation, reduce derates, and allow you to reduce your fuel costs.

While the benefits of blending are being realized by a few power plants, blending usually consists of using heavy equipment to mix different coals, or by tracking coal qualities in a stockpile. Blending is then performed manually by the coal yard operators who adjust feeder setpoints and may monitor the coal mixture entering the plant using an online analyzer.

In contrast, **CoalFusion™** allows you to implement fully automated blending to achieve the type of closed loop process control that is standard (and expected) for your other power plant processes. You use closed loop control to provide precise control in the rest of your power plant—expect nothing less of your fuel delivery system.

### Increase Your Fueling Options

Your facility was likely built for a specific blend of coal that was available when the plant was built (i.e. Illinois coal, Appalachian Coal, coal from your local mine). However, due to new constraints such as emissions limits, cost of coal, or availability, the original coal source may no longer be a viable option.

Power plants that have to switch coal sources often have to modify boiler operating procedures, suffer reduced boiler efficiencies, or accept increased shutdowns due to slagging or boiler wear. Substantial investment is often required to control these new issues that result from a significant change in coal composition.

Instead of an either/or dilemma where you are forced to choose between two undesirable fuels, implement automated blending with **CoalFusion™** and deliver an optimal mix of fuel without damaging or derating your boiler. With a reliable automatic blending system, you have the capability to define *and deliver* the exact blend that will best meet the ever increasing list of constraints being placed on your facility while minimizing fuel costs.

In addition, automated fuel blending allows you to consider fuel sources that were previously not an option. Instead of focusing your purchasing decisions solely on the quality of purchased fuel, focus on factors such as price and delivery time and blend the coal to create your boiler's optimal blend.



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## Implement Automated Blending

**CoalFusion™** takes fuel blending to a new level, providing the ability to precisely blend different quality coals to create the specific mixture that your plant needs. With **CoalFusion™** you can blend coal to any fuel specification from an unlimited number of sources, each with an unlimited number of qualities, using any coal yard configuration.

**CoalFusion™** does not simply select feeder setpoints based on source coal qualities entered by the operator or read from stockpile tracking software. Using advanced process control algorithms, **CoalFusion™** effectively places “virtual” analyzers and weigh scales at each upstream coal yard feeder so that you know what you are sending to your plant from each source.

Using this information, **CoalFusion™** calculates and continuously updates the required setpoints for each available coal yard feeder to provide the final blend that you’ve specified (i.e. 600 TPH with 10,000BTU/LB, 10% ash, 1% sulfur, and 10% moisture). Blend targets can be defined to blend to specific quality parameters (i.e. ash and sulfur), specific ratios (i.e. Lignite:PRB), or any combination of parameters needed to meet the needs of the generating unit.

**CoalFusion™** can dynamically change the blend for market, environmental, and boiler conditions; different generating units, different coal silos, or even to layer a coal silo.

## Improve Your Coal Yard Control

**CoalFusion™** integrates with your existing control room operator consoles, providing your operators with a seamless window into the coal blending operations. Through a simple interface with your existing control system, **CoalFusion™** reads the status of feeders, conveyors, gates, weigh scales, and analyzers to collect the information it needs for its blending calculations.

**CoalFusion™** automatically detects and corrects coal yard feeder problems by adjusting feeder setpoints to compensate for

increased or decreased feeder flow rates caused by varying coal flow characteristics.

**CoalFusion™** also integrates with your existing plant alarm system to notify operators if required coal quality or delivered tonnage varies from target values, allowing your operators to investigate and correct the problem before it impacts boiler performance.

## Use Your Existing Coal Yard

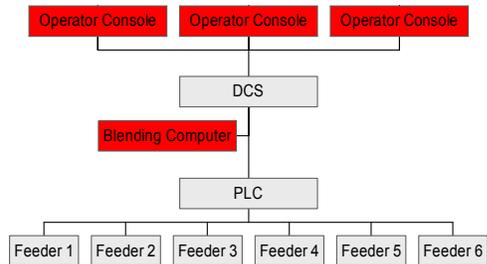
In the past the perception has been that blending requires major investment and rework of existing coal yards that were not specifically designed for blending. In many cases this perception is incorrect and a low investment in **CoalFusion™** will allow owners to immediately recognize the benefits of automated blending.

Many existing blending software packages require operators to limit the configuration of their coal yard belts, gates, and coal sources to work within the constraints of the software. **CoalFusion™** is completely configurable so that it can be set up to match your coal yard (not the other way around). Whether the coal yard feeders are dedicated to a single unit or shared by multiple units, **CoalFusion™** is able to simultaneously produce multiple blends from multiple sources so you can get the full benefit of your existing coal yard infrastructure.

**CoalFusion™** is a flexible coal blending solution that can easily adapt to changing blending goals or methods—the addition of another weigh scale or a new source of coal is simply a matter of changing the CoalFusion configuration.

## Make Your Fuel a Controlled Variable

In the past, your boiler control system has had to deal with fuel as a disturbance variable and react to the fuel quality as the coal is burned. With **CoalFusion™**, make your fuel a controlled variable to minimize costs, optimize boiler performance, and reduce disturbances.



**What are you feeding your plant?**

# Specifications

## CoalFusion™ – Fully Automated Blending

Specifications	
Sources	Unlimited number of sources.
Control Parameters	Unlimited number of parameters.
Input Signals from Control System	Run status of equipment, auto/manual status of feeders, manual feeder percent control setpoints, gate positions (if not assigned by CoalFusion™), scale and quality signals.
<b>Inputs from Operator</b>	
Source Name	Identified both by name and product ID code. The number of defined sources (products) is unlimited.
Source Definition	Unlimited (i.e. ash, moisture, sulfur percentages). Source parameters are calculated in real-time when a single downstream analyzer is available on the plant coal belt. Nominal quality ranges can be defined for each defined quality type and used for alarming. Any unit of measure may be used (i.e. %, PPM, kg). Also define cost of each source.
<b>Blend Target Definition</b>	
Simultaneous Blends	Unlimited.
Tonnage	Set desired maximum and minimum coal flow in tons per hour.
Quality Parameters	Unlimited (i.e. ash, moisture, sulfur percentages). Set maximum and minimum of each.
Product Splits	Unlimited (i.e. PRB, local pit percentages). Set maximum and minimum of each.
Equipment Constraints	Unlimited (i.e. limit the flow from a specific coal yard feeder).
<b>Feeder Information</b>	
Transport time from the coal yard feeder to weigh scales, gates, and analyzer(s).	
Maximum feeder capacity.	
Minimum feeder capacity.	
Feeder flow characteristics are calculated in real-time by CoalFusion™.	
<b>Output Data from CoalFusion™</b>	
Setpoints required of each coal yard feeder to achieve the blend targets. As a fully automated system, CoalFusion™ continuously updates the setpoints to compensate for the ever-changing characteristics of the coal yard feeders. Additionally, <b>CoalFusion™</b> outputs feeder characteristics such as flow rate and quality as well as the exact blend delivered, all in real-time.	
<b>Data Transfer</b>	
CoalFusion™ will interface using OPC or using platform-specific I/O modules, interfacing to any PLC or DCS system that provides an open communications architecture.	
CoalFusion™ can operate as an off-line plant modeling tool with data transfer to any standard ODBC database.	



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