



# Sigma Thermal Automation Solutions

Sigma Thermal has a full service Automation Group that specializes in process and safety control systems. Our experienced engineers, designers, programmers and fabricators work together to execute all project specifications and requirements. Sigma Thermal Automation offers comprehensive and cost effective solutions to complex industrial challenges. Our Automation solutions include:

- » **Electrical & Functional Safety Engineering & Design**
- » **Burner Management & Combustion Control Systems**
- » **Upgrades & Modifications**
- » **Basic Process Control Systems (BPCS)**
- » **Safety Instrumented Systems (SIS)**
- » **Field Support-Programming and Training**

## Industries Served

- » Power Generation
- » Gas Processing
- » Chemical / Petrochemical
- » Food & Beverage
- » Crude Oil Production & Processing
- » Water & Wastewater
- » Pulp & Paper
- » Textiles
- » Aerospace
- » Agriculture
- » Automotive
- » Wood Products
- » General Manufacturing
- » Mining & Minerals
- » Asphalt & Roofing





# Sigma Thermal Automation Solutions

## Burner Management & Combustion Control Systems

Sigma Thermal offers several Burner Management Systems (BMS) and Combustion Control Systems (CCS) to meet a wide range of customer requirements and environmental conditions. These solutions range from low cost microprocessor based systems to complex Safety Instrumented Systems (SIS) using a Programmable Logic Controller (PLC). Our systems provide safe and efficient operation of your fuel fired process heaters without the need for constant operator attention.

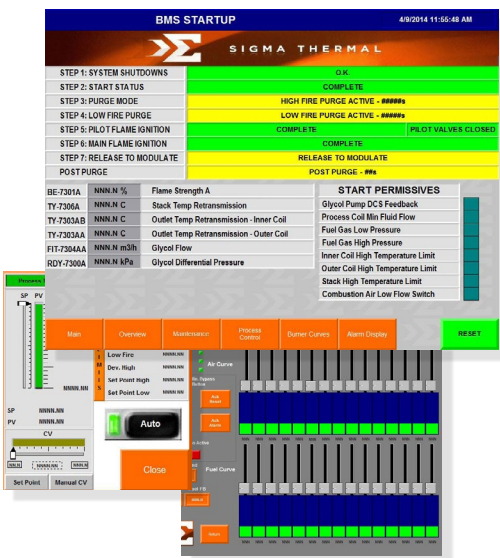
Our BMS and CCS systems are provided for maximum safety and reliability while maintaining a simple and cost effective design.

### Products and Services

- » Microprocessor Based BMS Systems
- » Panel Mounted Temperature Controllers
- » PLC Based Safety Instrumented Systems (SIS)
- » Advanced Combustion Control Systems
- » Efficiency Upgrades & Modifications to Aging Systems
- » Local/Regional Code Compliant Audits & Studies

### Benefits and Options

- Single and Multi-Burner Applications
- Fail-Safe Technology
- Increased Safety and Reliability
- Simplex and Redundant Configurations
- High Availability & Fault Tolerant Design
- Advanced Diagnostics & Communications
- Independent Fuel Air Ratio Control (F.A.R.C.)
- Temperature Compensation
- Enhanced Operator Interface Modules



## Combustion Control Upgrades & Retrofits

Stringent air quality standards have been imposed on industrial manufacturers and facilities to reduce existing emission rates. Combustion Control System upgrades provide cost effective results that satisfy emission requirements. Sigma's upgrade and retrofit solutions are fairly inexpensive and simple to implement and offer years of cost saving benefits.

- » High Turndown Burners & Fuel Trains
- » Fuel Air Ratio Control (F.A.R.C.) Logic
- » Oxygen or Fuel Trim Systems
- » Draft Control
- » Sequence Control
- » Control System Modifications
- » Engineering Studies
- » Emissions Control Systems

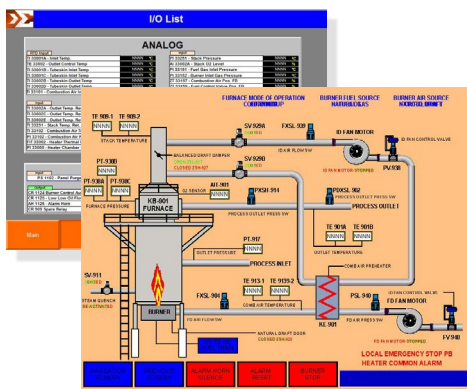
Screen Shots Operator Interface Screens



## Basic Process Control Systems (BPCS)

The Basic Process Control Systems are responsible for maintaining the normal operations of a plant and in many instances is used in the first layer of protection against unsafe conditions. Our BPCS are designed and built to meet industrial challenges with equipment operation and control. These systems address particular performance and economic improvement opportunities such as:

- » Optimizing plant operation to produce good quality products.
- » Providing the first layer of protection against unsafe conditions.
- » Controlling a process within pre-set operating conditions.
- » Providing operator interface for monitoring & control-HMI.
- » Providing alarm/event logging and trending.
- » Generating production data reports.



Screen Shots Operator Interface Screens

## Safety Instrumented Systems (SIS)

Safety Instrumented Systems (SIS) are engineered to perform "specific control functions" to failsafe or maintain safe operation of a process when unacceptable or dangerous conditions occur. SIS are engineered by Sigma Thermal to reduce risk and achieve a risk based level of safety and performance. These solutions include:

- » Interlock & Process Shutdown Systems
- » Safety Critical Control Systems
- » Emergency & Safety Shutdown Systems
- » Equipment & Instrumentation Protection Systems

Operator control room for a biomass system



## Functional Safety Engineering & Design

Sigma Thermal Automation uses the Safety Lifecycle approach in our Functional Safety Engineering & Design. This provides the framework for each stage of the safety system from conception to decommissioning. We offer the following in support of the Functional Safety Lifecycle:

- » Risk or Hazard Assessment
- » Safety System Functions/SIL Determination
- » Safety System Design & Verification
- » Safety System Installation & Validation
- » Maintenance & Improvements





## Sigma Thermal Automation Solutions (continued)

### Field Programming Support

Field service support is offered for new and existing installations. Our technicians provide premium services that include:

- » Firmware Upgrades & System Configuration
- » Process Tuning, Optimization & Validation
- » Network Configuration & Setup
- » Programming & Troubleshooting
- » Commissioning & Training

### Certifications and Compliance

ISO 9001:2008 Certified

US and International Certified Hardware (CE, UL, FM, CSA, ANSI, ATEX, IEC, etc.)

US and International Compliant System Design (CE, FM, NFPA, and CSA, IEC, ISA, API, SIL)

### Electrical Engineering & Design

Our EE group provides expert analysis, design, fabrication and integration to meet all project requirements. Sigma engineers, designers, programmers and fabricators work together to support the following project activities:

- » Preliminary Engineering & Documentation
- » Drafting & Design
- » PLC & HMI Programming
- » Hardware & Software Specification
- » Network Design & Configuration
- » Alarm/Event Logging and Trending
- » Panel Fabrication and Testing (UL Certified)

