

**COMPLETE BOILER PLANT CONTROL,
MONITORING & COMMUNICATIONS!**

PAC (programmable automation controller) platforms are cutting edge technology. They offer the expansion and control capability of PLC's, the PID performance of multiple loop controllers and the communication options of DCS. Initial investment and maintenance costs are low.

APPLICATION EXAMPLES

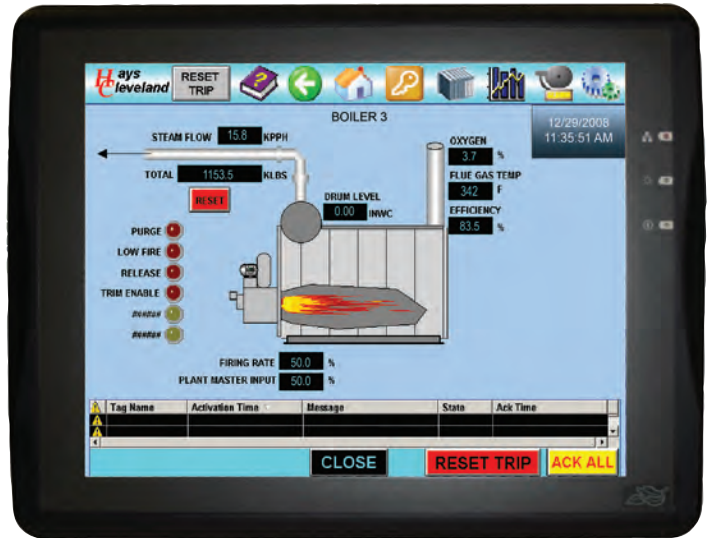
- Single Package Plant Automation & Control
- Linkageless Servomotor Control
- Single Point to Full Metering Combustion Control
- O₂ Trim Control
- Advanced PID Control
- Boiler Lead Lag Sequencing
- Pump Sequencing
- Feed Water Control
- Surge Tank Control
- BMS Interface
- Flow & Efficiency Computations
- Economizer Bypass Control

STANDARD FEATURES

- 12.1" TFT Touch Screen HMI
- System Diagnostics
- Compact Modular Design
- SCADA Communications
- Alarm Displays
- Boiler Displays
- Control Loop Displays
- Trend Displays
- Commissioning Displays
- UL508 Listed
- UL 1998 Certified Safety-Critical Software

COMMUNICATIONS

- Ethernet
- Multiple RS232/485, Ethernet & RJ45 Ports
- Modbus (Master and/or Slave)
- Web Server, Email & Paging Options

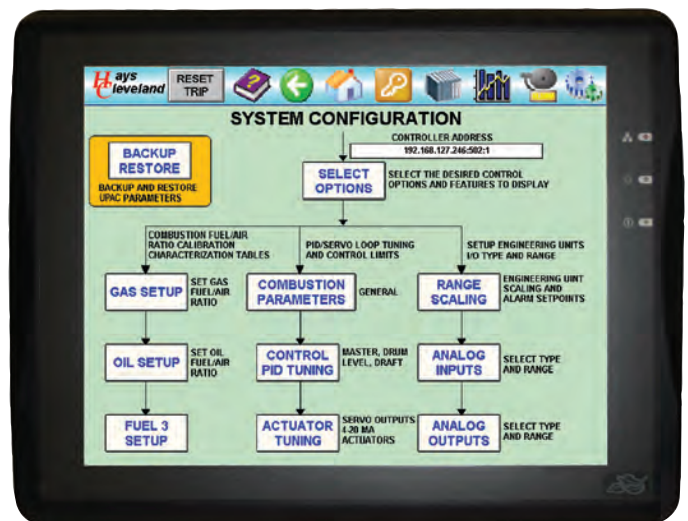


INTRODUCTION

The new Hays Cleveland UPAC™ package provides complete facility control, monitoring and communications with the accuracy, speed and advanced capabilities expected in high-end PLC and PC automation products--at a much lower than expected investment! With UPAC™, boiler plant operations and other facility operations are fully integrated in one platform. UPAC™'s modular approach provides almost unlimited capability. Components include a touch screen, control unit and modules for analog and digital I/O.

BOILER PLANT CONTROL OPERATIONS

UPAC™ enhances operator awareness, improving efficiency and safety throughout the facility. It can control more than 10 devices for applications ranging from boiler combustion control to DA tank and condensate tank control. For example, in a typical parallel positioning application with O₂ trim and boiler efficiency monitoring, UPAC™ would control the gas and oil valves; FD damper and



FD damper VFD with by-pass; FGR, feed water control valve, draft damper and boiler feed water pump VFD.

UPAC™ parallel positioning and metering applications use the same Hays Cleveland UL 1998 Certified Strategies as our AC Station™ hardware platforms. For safety, both cross-limiting and deviation-limiting logic as well as actuator failure detection are employed in these strategies to prevent the occurrence of low excess air.

MAJOR COMPONENTS

Each Hays Cleveland UPAC™ is individually configured and programmed for its specific application. Every UPAC™ system includes a control unit and auxiliary I/O to meet the job requirements for control and monitoring.

The major UPAC™ components (UL508) include:

Operator's Display (P/N 42049): The standard display includes a 12.1" color TFT screen (800 x 600 pixel resolution) with a Cirrus Logic 32-bit processor and NEMA 4 panel. Optionally, smaller displays are available for applications with minimal I/O and display requirements.

Control Unit (P/N 42026): This 32-bit CPU contains UPAC's control, computation and display logic. It has 4Mb flash memory, 16Mb DRAM and 128 Kb SRAM with battery backup. The control unit is networked with the I/O modules via high speed CANopen™. SCADA communications is via Ethernet 10BASE-T port (Modbus TCP). For safe boiler shutdown in the event of a fault, a watchdog timer wired to a proprietary fault module is provided.

Mini-Control Unit (P/N 42062): The mini-control unit combines the computation and control capability of the standard control unit with built-in I/O for simpler applications. It has 4Mb flash

memory, 16Mb DRAM and 128 Kb SRAM with battery backup. Standard I/O includes 8 analog inputs & 4 analog outputs, 8 digital inputs & 8 digital outputs with Ethernet & Serial Ports.

Analog Input Module (P/N 42008): This module has 8 channels, mADC or VDC inputs, 16-bit resolution, 0.1% accuracy, and 10ms acquisition time. Typical inputs include transmitters, meters, and feedback signals from servomotors, actuators and VFD's.

Analog Output Module (P/N 42014): This module has 8 channels, mADC or VDC outputs, 16-bit resolution, 0.1% accuracy, and 20ms acquisition time. Typical outputs drive final elements such as servomotors and positioners, or transmit computed parameters such as boiler efficiency and temperature or pressure compensated flow rates.

RTD/TC Input Module (P/N 42010): This module has 4 channels for RTD and TC inputs, 16-bit resolution, 0.1% accuracy, and 120ms acquisition time. Typical inputs are economizer temperatures.

Digital Input Module (P/N 42012): This module has 16 channels for 24VDC input voltage. Typically serves as BMS interface.

Digital Output Module (P/N 42016): This module has 16 channels, 24VDC output voltage, and 0.5A output current. Typically provides signals for alarms or servomotors and actuators.

ENGINEERING SERVICES

We program each UPAC™ system for a specific application. Typical packages include the auxiliary instrumentation necessary for a complete system: level and pressure transmitters, flow meters and actuators, and an optional SCADA workstation. Complete wiring and system schematics are provided.



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