TECHNICAL DATA SHEET

MODSYNC SE:
Modular Boiler Sequencing System

FOR BOILERS:
Steam

Fulton's ModSync SE is a highly-optimized sequencing control system engineered to maximize the thermal efficiency of modular (multiple boiler) plants for exceptional energy savings. A user-friendly intuitive touchscreen interface provides rapid access to robust functionality. Reliable lead-lag staging precisely matches system load to boiler output, thereby minimizing boiler cycling and extending equipment life.

STANDARD FEATURES: VERSION 6.6.1.X AND NEWER

- Lead-Lag of 2 to 8 Steam Boilers
- Support for Sequential or Parallel Modulation Staging
- Modbus Communication Protocol
- Operator Configurable Assignable Inputs/Outputs (I/O)
- Multiple Setpoint Modes (Remote 4-20mA, OAT Reset, Manual, BMS)
- Supply Header Pressure Monitoring (Process Variable)
- Warm Standby for Idle Boilers
- Outdoor Air Temperature Monitoring and Setpoint Reset
- System Clock with Setback Schedule Modes
- Automatic Boiler Rotation via Cycle/Run Hour Ratio
- Forced Boiler Rotation
- Running Transition for Seamless Rotation
- Trending Data Logging of Supply, Setpoint and Outdoor Temperatures
- Access Password and Screensaver Time Out
- Preventative Maintenance Reminders

PROJECT DETAILS:

Project Name		City, State (Province)	
Date Submitted		Engineer of Record	
Fulton Representative		Contractor	

BOILER CONTROL INTEGRATION SUPPORT:

- Fulton PURE Control™
- Siemens LMV3 Series
- Siemens LMV5 Series
- Legacy I/O *(Up to 5 boilers; enable, 4-20mA fire rate, status)*

ASSIGNABLE INPUTS/OUTPUTS AVAILABLE:

- 16 Digital Inputs (24 VDC)
- 14 Digital Outputs (24 VDC)
- 3 Analog Inputs (4-20 mA)
- 4 Analog Outputs (4-20 mA)

OPTIONAL ACCESSORIES: PARTS SHIP LOOSE FOR FIELD INSTALLATION

- ☐ Supply Header Pressure Transducer (0-30 PSI) *2-40-000996*
- ☐ Supply Header Pressure Transducer (0-100 PSI) *2-40-000999*
- ☐ Supply Header Pressure Transducer (0-200 PSI) *2-40-000994*
- ☐ N54 BACnet Protonode *2-45-001058*
- ☐ LonWorks Gateway *2-45-001055*
- ☐ Outdoor Air Temperature Sensor Kit *4-30-000500*
- ☐ 0-10VDC to 4-20mA Setpoint Signal Converter *2-45-001140*
- ☐ A06X Expansion (For 10 Total Analog Outputs) *2-45-001045*
- ☐ 24VDC Relay (DPDT 10A) *2-45-880400*
- ☐ 120VAC Relay (DPDT 10A) *2-45-880360*
- ☐ Resistor Kit for 4-20mA to 0-135Ω Conversion *2-40-000334*
- ☐ _____
- ☐ _____
- ☐ _____

NOTE:
The ModSync SE is designed for use with the standard configurations of Fulton ICS, VMP, and VSRT series of boilers. It is not compatible with boilers utilizing the SC500 or SC750 controls such as the ICT or VSRT-E series. The ModSync SE may not be compatible with custom ordered off-standard boiler controls, or applications on other equipment manufacturers. This submittal is not applicable to the ModSync LX custom engineered controls system.

HARDWARE SPECIFICATIONS: ☐ PART NUMBER 7-53-006024

- 5.7-inch 256 Color Touchscreen Display
- UL 508A Listed and Labeled
- NEMA4X Enclosure
- Panel Mount Non-Fused Disconnect Switch
- 120VAC 60Hz 1ø
- 5,000A SCCR
- Syphon Loop

HARDWARE SPECIFICATIONS: ☐ PART NUMBER 7-53-006025

- 5.7-inch 256 Color Touchscreen Display
- UL 508A Listed and Labeled
- NEMA4X Enclosure
- Factory Installed N54 BACnet Protonode
- Panel Mount Non-Fused Disconnect Switch
- 120VAC 60Hz 1ø
- 5,000A SCCR
- Syphon Loop

FIXED I/O FUNCTIONALITY:

- Remote 4-20mA Pressure Setpoint Input
- Remote Enable/Disable Contact (24VDC)
- General Alarm Dry Contact
- Supply Header Pressure Transducer
- Outdoor Air Temperature Sensor (3 Wire RTD)

ASSIGNABLE I/O FUNCTIONALITY:

Digital Input (24 VDC)

- Individual Boiler Remote Mode Selected
- Individual Boiler Main Burner On Status
- Individual Boiler Alarm Status
- Individual Boiler Primary Low Water
- Individual Boiler Secondary Low Water
- Individual Boiler High Water
- Emergency-Stop Status *(Monitoring only; Not a safety shutdown interlock)*

Digital Output (0.5A max 24 VDC)

- General Heat Demand Status Output
- Individual Boiler Alarm Output
- Individual Boiler Status Output
- Individual Boiler Heat Demand Status Output

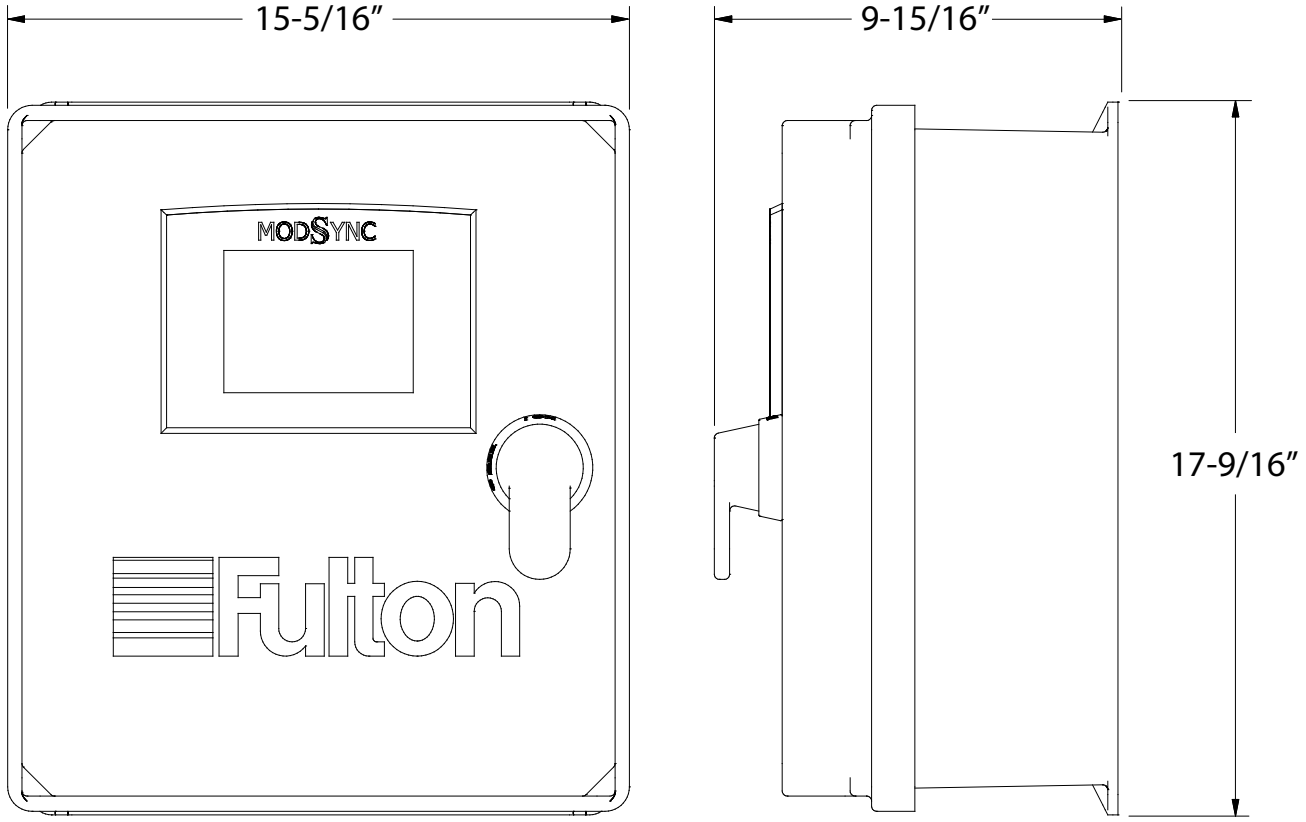
Analog Input (4-20 mA)

- Supply Header Pressure
- Pressure Retransmission

Analog Output (4-20 mA)

- Individual Boiler Firing Rate Output

PANEL DIMENSIONS:



BOILER LEAD/LAG SEQUENCE OF OPERATION:

1. The ModSync SE monitors the steam header pressure using a pressure transducer. A Proportional/Integral/Derivative (PID) Control Variable (CV) determines when the steam boilers will begin sequencing based on the difference between the actual header pressure and the steam pressure setpoint.

2. When the ModSync SE determines a request for steam, the lead steam boiler is energized. The initial firing rate is determined by the Lead Start Firing Rate variable set in the Lead/Lag configuration screens.

3. If the steam pressure continues to decrease the PID Control Variable will increase. The Lead Steam boiler's firing rate will increase with the Control Variable. The ModSync will enable a Lag Boiler when the Lag Boiler Start control variable value has been reached.

4. If additional steam is required, the ModSync SE will enable each additional Lag Boiler until all of the available boilers in the loop have been energized.

5. Both sequential and parallel staging methods are provided through an interface selection. Sequential staging allows each boiler to reach a high firing rate before the next stage is enabled. Parallel staging commands the plant to modulate in parallel at the same firing rate to satisfy demand at the lowest possible firing rate.

6. As the steam pressure increases, the ModSync SE will begin to decrease the firing rate of the boilers required to maintain the header pressure. If a boiler is at low fire and the control variable decreases to a user configurable level, the ModSync SE will stage that boiler off. The first lag boiler energized will be the last boiler to be disabled. The boilers will continue to be disabled based on the pressure rise and control variable response.

7. The lead boiler is disabled when the Header Pressure reaches a selectable value referenced around the setpoint.

8. Automatic Rotation of the boiler Lead and Lag positions will be determined using configurable operating history cycle count or run hours.

OTHER FUNCTIONS:

1. *Warm Standby:* To ensure boilers are prepared to respond to rapid steam demands the control will enable any boiler which has remained idle for a configurable amount of time and command the burner to low fire.

2. *General Alarm:* Provides a dry contact that will close whenever an alarm condition is present.