

MODSYNC[®]

The intelligent solution for control and sequencing of multiple boiler systems



SYNEX
CONTROLS

MODSYNC[®]



What is ModSync?

THE NEW STANDARD FOR BOILER SEQUENCING CONTROLS

The majority of boiler system designs incorporate multiple boilers to meet heating or process load demands. Part load efficiencies and system redundancy are a few of the factors used in determining the number of boilers in the system. The operating efficiency of each boiler stage will vary based on the type of boiler being used and the system configuration. Maximizing boiler system performance is based on utilizing a control system that understands where the peak boiler efficiencies are gained and controlling each boiler stage as part of the system.

The ModSync Sequencing System was designed to do exactly that. ModSync monitors the system demand requirements and then determines the most efficient boiler stage operating mode to meet those demands. A user-friendly, touchscreen interface provides quick access to current system status information. Multiple configuration screens allow key system parameters to be easily located and updated which decreases commissioning time requirements significantly. With an expandable platform, ModSync can be configured to control up to 75 boiler stages from one sequencing system.

Why Should I Use ModSync?

BETTER CONTROL, INCREASED SYSTEM EFFICIENCY

The most popular application for ModSync is integration with multiple condensing boilers. Hydronic systems are configured to maintain building room temperatures on "design days", thus ensuring there is plenty of heat available during the coldest days of the year.

What happens if the outdoor temperature is warmer than the design temperature? On these days, the boiler system has too much capacity. The warmer the day, the less boiler capacity is required. Lower hydronic loop temperatures can be used while still maintaining building temperature. This allows for significant efficiency gains during non-peak or "shoulder loads."

The ModSync provides outdoor reset functionality to adjust the hydronic loop temperature setpoint based on the measured outdoor temperature. As the outdoor temperature increases, the ModSync automatically decreases the hydronic loop setpoint. Lower loop temperatures during warmer days allow for significant energy savings while still maintaining building comfort levels.

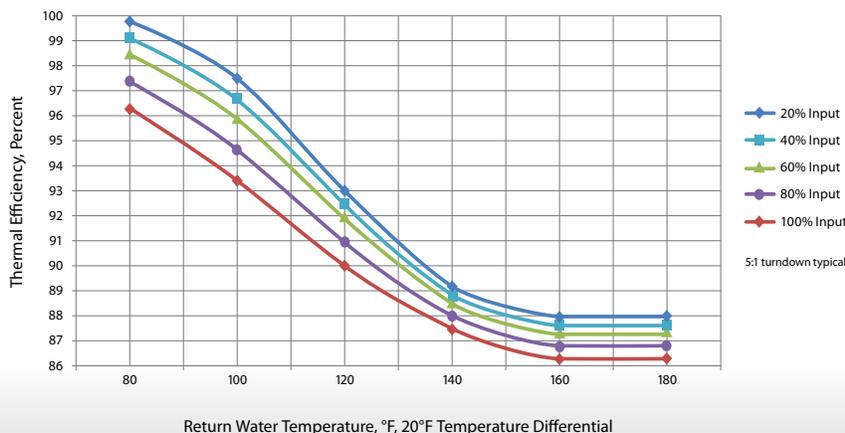
The ModSync provides independent outdoor reset functions based on the building status, Occupied and Unoccupied. Each function has unique user defined variables that determine a linear setpoint value based on the measured outdoor temperature.

Condensing Boiler Efficiency

LOW FIRING RATE AND RETURN WATER TEMPERATURE EQUALS EFFICIENCY GAINS

Condensing boiler efficiency has two main determining factors: the temperature of the water returning from the system and the BTU firing rate output of the boiler. Increased efficiencies are gained with colder return water temperatures and minimum firing rate levels. ModSync logic has been configured around these principles to maintain peak efficiencies throughout the entire heating season.

Thermal Efficiency vs. Return Water Temperature



Key Features

UNIQUE QUALITIES OF THE MODSYNC

Ease of Use: The ModSync combines sophisticated control capabilities with a user-friendly interface.

Intelligent Lead/Lag: Optimized logic for boiler lead/lag position keeps a consistent number of cycles/run hours across all stages.

Building Integration: The ModSync can be configured to communicate with Energy/Building Management Systems using BACnet, Modbus, Lonworks and many other protocols.

Outdoor Reset: The system setpoint is automatically adjusted based on outdoor temperature. Warmer outdoor temperatures lower the hydronic loop setpoint, increasing system efficiency.

Multiple Setpoint Modes: Easily select between ModSync Outdoor Reset, Remote Setpoint (4-20mA, 0-10VDC), E/BMS Communication or Manual setpoint modes through the ModSync touchscreen.

Setback Scheduling: The loop setpoint can be configured to change based on occupancy of the building. This allows for automatic switch over to lower operating temperatures during off hours such as nights, weekends and holidays.

System Interface Flexibility: The ModSync can be custom programmed by in-house specialists to match your most demanding system design requirements, eliminating "canned logic" limitations.

Trending: Key variables such as Supply Temperature, Return Temperature and Setpoint can be trended to show system response and performance data.

Alarm Status and History: Alarm conditions are easily communicated with an icon display and text description of the current alarm. The Alarm History provides a date and time stamp of any recent alarm conditions.

Remote Monitoring: Addition of an inSite interface option allows remote monitoring and adjustment of the ModSync using any web enabled device. Smartphone compatibility provides another solution for monitoring system variables.

Boiler Staging Logic

BOILER STAGING LOGIC THAT ACTUALLY MAKES SENSE

Boiler staging and firing rate control logic requires flexibility for maximum efficiency gains. The number and types of boilers in the system will define loop control requirements. ModSync logic allows for multiple configuration options to meet the unique requirements of even the most complex system configurations. By effectively controlling the boiler stages, the ModSync significantly reduces the number of boiler cycles and increases heat exchanger life.

Parallel Modulation

CONDENSING BOILER APPLICATIONS



LEAD

LAG 1

LAG 2

ModSync utilizes a Parallel Modulation control scheme for applications where the boiler stages have a higher part load (low fire) efficiency. Systems incorporating condensing boilers would utilize this control philosophy.

Multiple stages are controlled at their minimum modulation rates to match the system load requirements. Operating condensing boilers at lower modulation rates provide significant energy savings opportunities throughout the heating season.

Sequential Modulation

PROCESS APPLICATIONS



LEAD

LAG 1

LAG 2

A number of boiler designs used in process applications have higher efficiencies when "base loaded" to near 100% capacity. Steam boilers, thermal fluid heaters and some hydronic, non-condensing boiler designs fall into this category.

ModSync uses a Sequential Modulation control scheme for applications where the boiler stages have a higher base load (high fire) efficiency. A boiler is allowed to modulate to near capacity before another stage is enabled.

Intelligent Lead/Lag

THE STANDARD FOR BOILER SEQUENCING CONTROLS

Lead/lag designs are used with multiple boiler installations to maintain an even number of operating cycles and run hours across all of the boilers in the system. Traditional sequencing systems rotate the boilers based on a random time schedule. This control technique is flawed in that it does not take into account any operational history of the boilers in the loop.

The ModSync solves this issue through an intelligent lead/lag technology that automatically assigns the lead/lag positions based on each boiler's operating history.

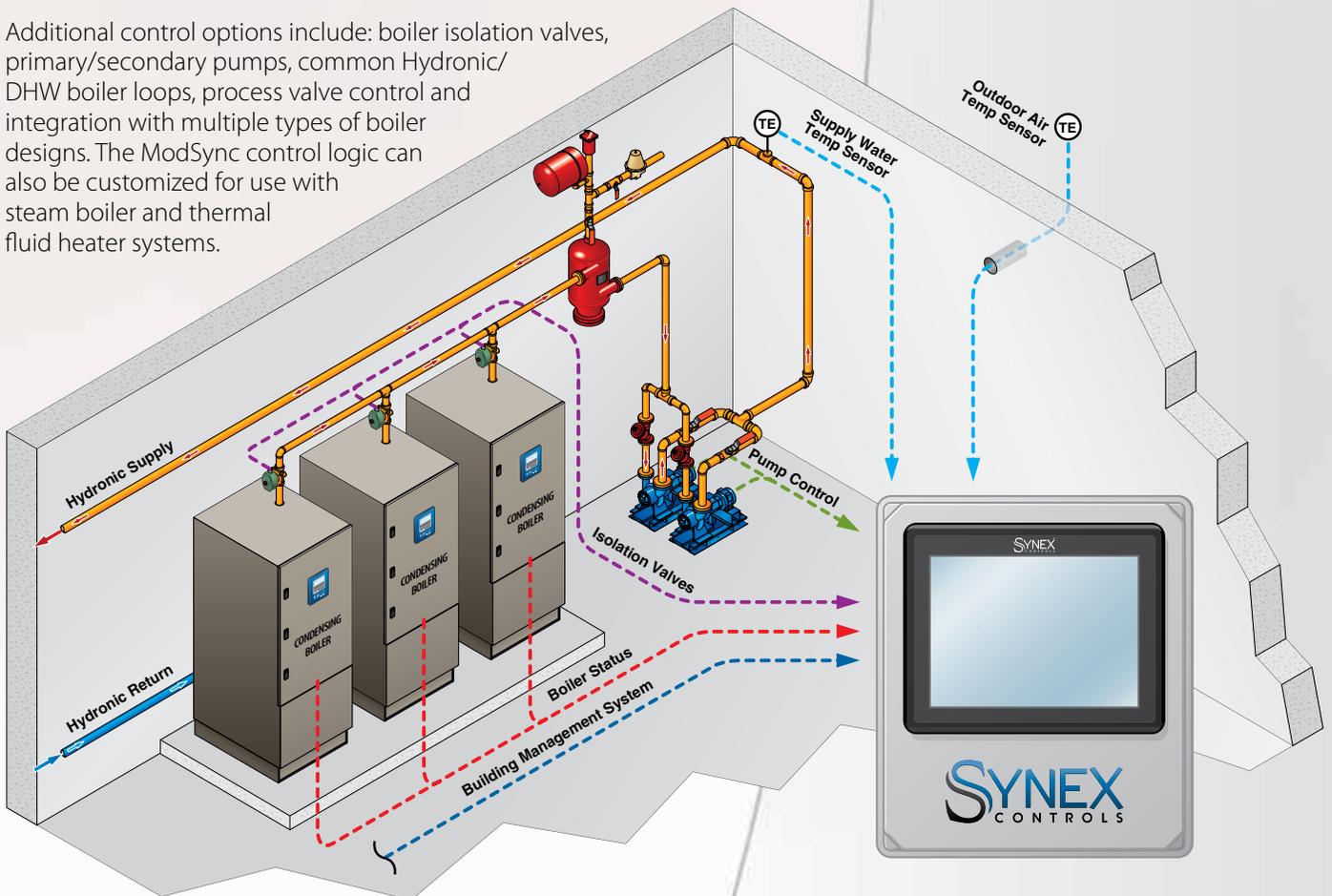
The ModSync's intelligent lead/lag technology provides peace of mind that the boiler system is being controlled and operated to its optimal potential while minimizing boiler cycling. This equates to decreased heat exchanger stresses and increased heat exchanger life.

Customizable

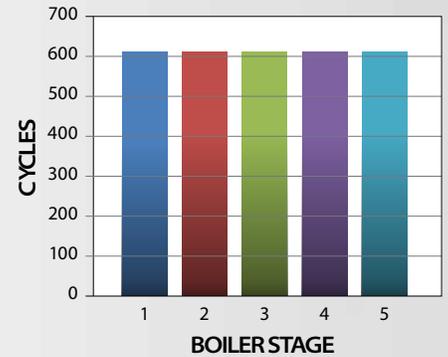
LOGIC ADAPTED TO SYSTEM DESIGN REQUIREMENTS

In addition, the ModSync is perfect for applications involving condensing and non-condensing (hybrid) boiler designs. The control logic is designed to take advantage of the condensing boiler during shoulder loads and bring the non-condensing boilers online only during the peak design days.

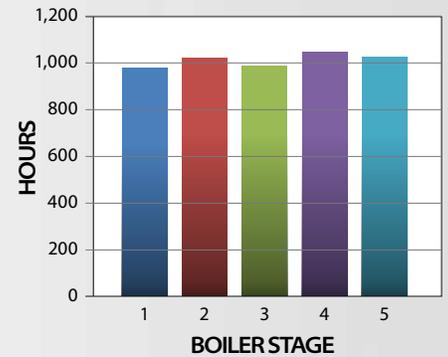
Additional control options include: boiler isolation valves, primary/secondary pumps, common Hydronic/DHW boiler loops, process valve control and integration with multiple types of boiler designs. The ModSync control logic can also be customized for use with steam boiler and thermal fluid heater systems.



Cycles



Hours



Proven Results

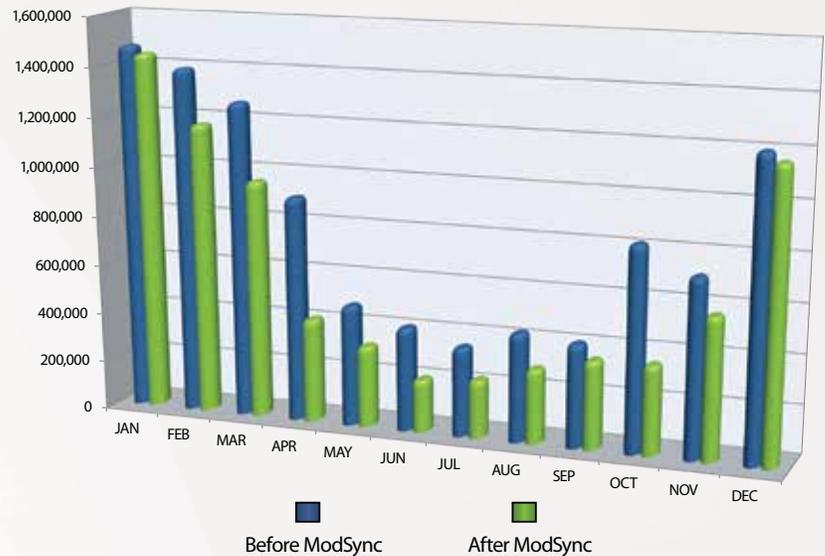
EFFICIENCY GAINS WITH MODSYNC

ModSync control philosophies allow for significant energy savings of any boiler system. When integrated with condensing boiler systems, the savings become significant. Using condensing boilers in hydronic system designs is one part of the performance gain potential. Another significant portion is the control of the condensing boiler stages as a system.

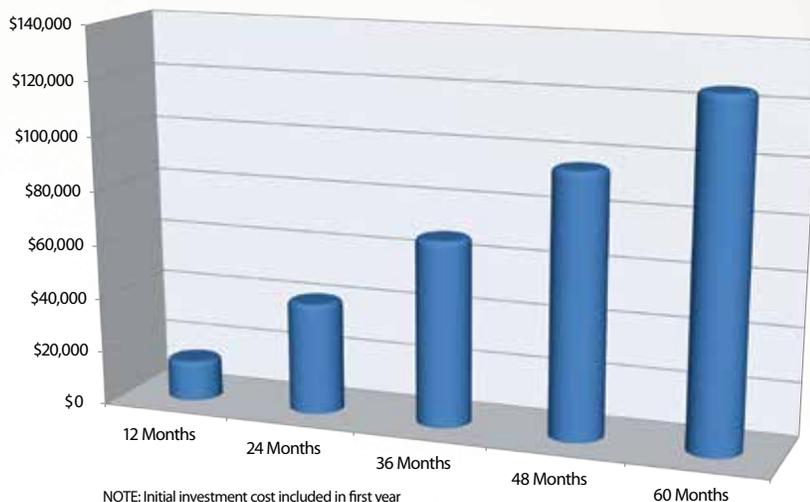
ModSync provides load matching, parallel modulation logic that operates only the boilers required at their minimum modulation rates to match the system load. Decreased boiler cycling associated with the relational load control lowers system losses while significantly increasing heat exchanger life expectancies.

This information was obtained from an existing condensing boiler system. The achieved efficiency gains were a result of simply replacing the original lead/lag system with a ModSync Sequencing System.

Total Natural Gas Usage (ft³): Before and After ModSync Installation



ModSync Savings (Accumulated)



The ModSync control algorithm is unmatched in the industry and has been proven to provide building owners significant energy savings opportunities, year after year.

ModSync Product Line

CUSTOMIZED FEATURES, INCREASED EFFICIENCY



DESIGN FEATURES	ModSync	ModSync LX
Screen Design	5.7" Color Touchscreen	12.1" Color Touchscreen
Number of Stages	8	75
Outdoor Reset	●	●
Intelligent Lead/Lag	●	●
BMS Interfacing	●	●
Alarm History	100 Alarms	100 Alarms
Customized Programs	●	●
Data Trending	●	●



972 Centerville Road, Pulaski, NY 13142
Call: (315) 298-8555 • www.synexcontrols.com

ModSync-Bro_2013-1220