

HEAT-TIMER®

*Save Energy while
improving comfort in
Multi Family Buildings*

Objectives

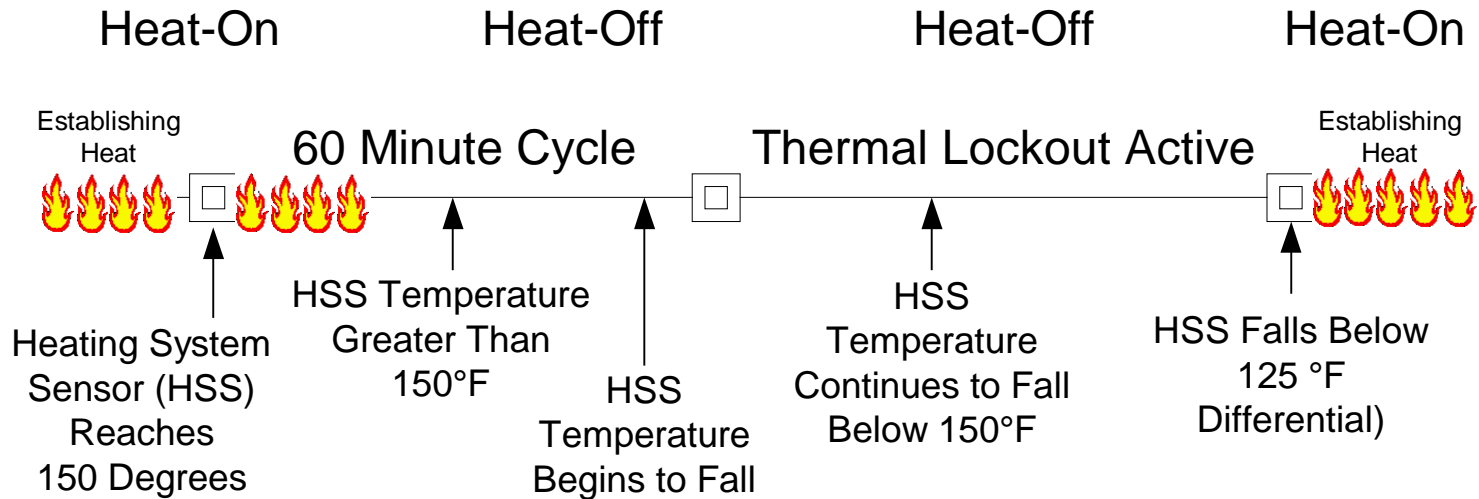
- Proper control methods for Steam heat and hot water heat
- Basic multiple boiler control options
- Using Communication Options to save energy. Both on direct fuel usage and through information to better maintain equipment.

In heating: What can we control ?

- Flow (On Off)
 - Steam System: steam temperature (non vacuum) remains relatively constant.
 - Control the flow of steam based on outdoor air
- Temperature of heating medium
 - Hydronic system: Water is easily controllable and we can do this in numerous ways based on system and boilers being used .
 - Vary the water temperature to the radiators based on outdoor air.

Steam Cycle Concept

Thermal Lockout and Differential



EXAMPLE

Heating System Sensor Adjustment (XYZ)	150°
Heating System Sensor Differential	-25°
Thermal Lockout	ON
Cycle Minutes	60

Hot Water Reset

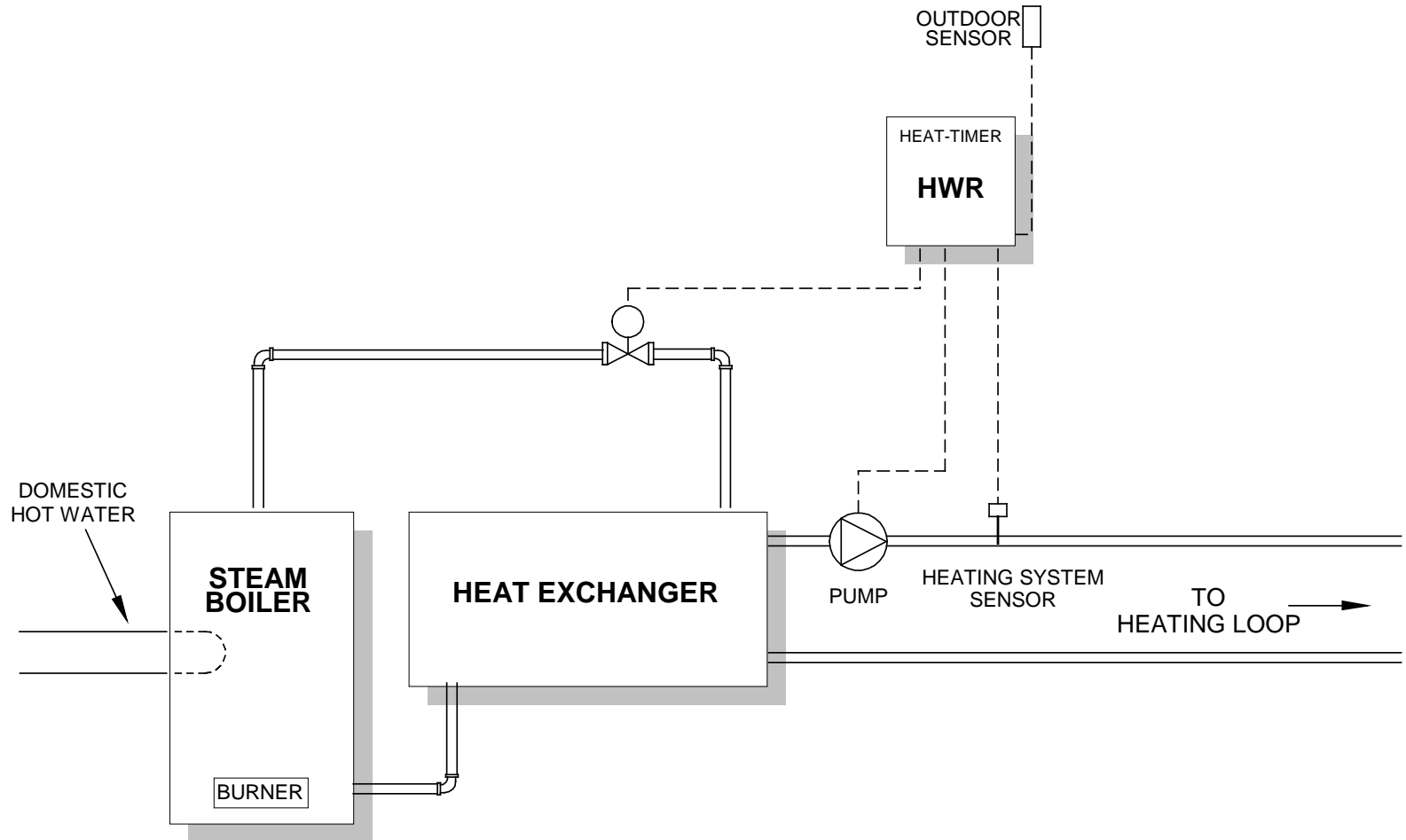
- Varies the system *water temperature* based on outdoor air
 - I.e: Water sent to radiation increases as it gets colder outside
- Does NOT turn pump off and on

Typical Hot Water Reset Methods

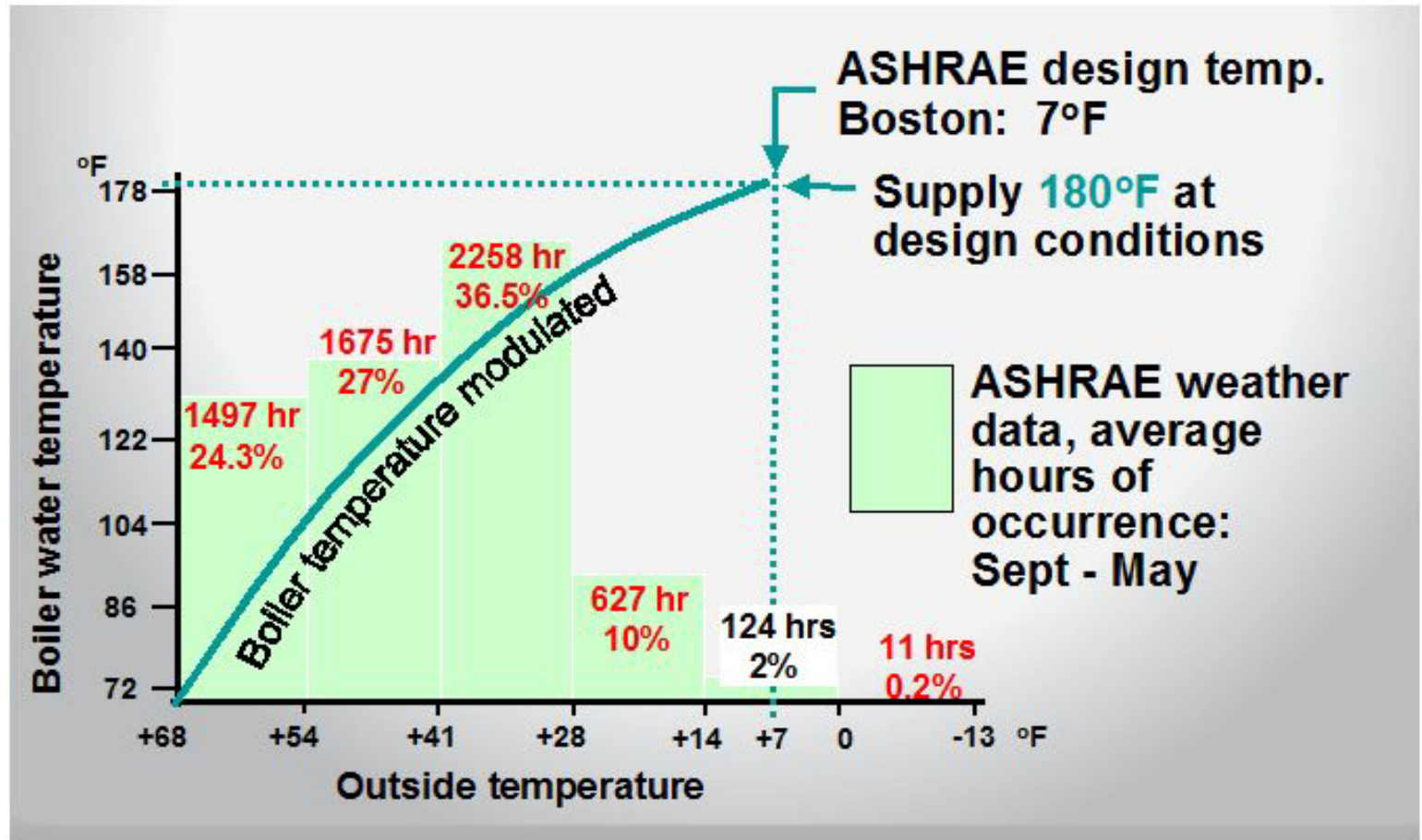
- Direct Single Boiler reset
 - NOTE: Make sure that boiler can be operated at lower temperatures
 - Do not recommend when DHW is supplied via coil in boiler.
- Direct Multiple Boiler reset
- 2-way , 3-way or 4-way Motorized Valve

IMPORTANT

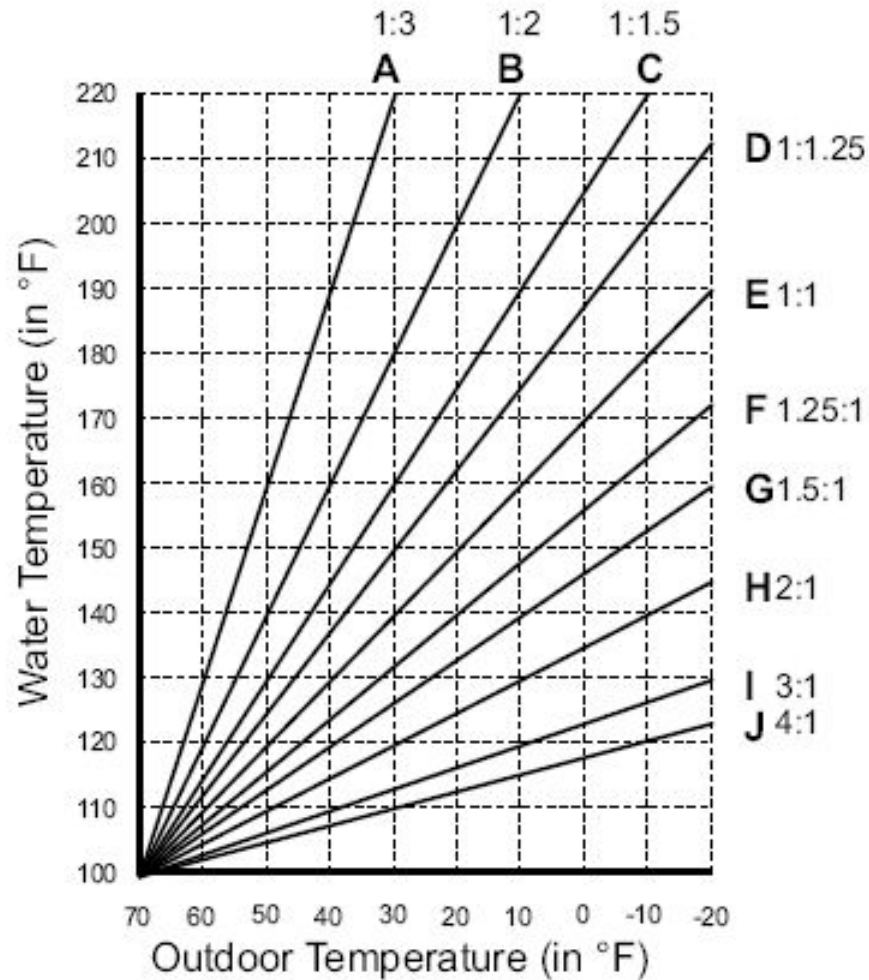
Steam to Heat Exchanger



Design Temperature only required on very cold day

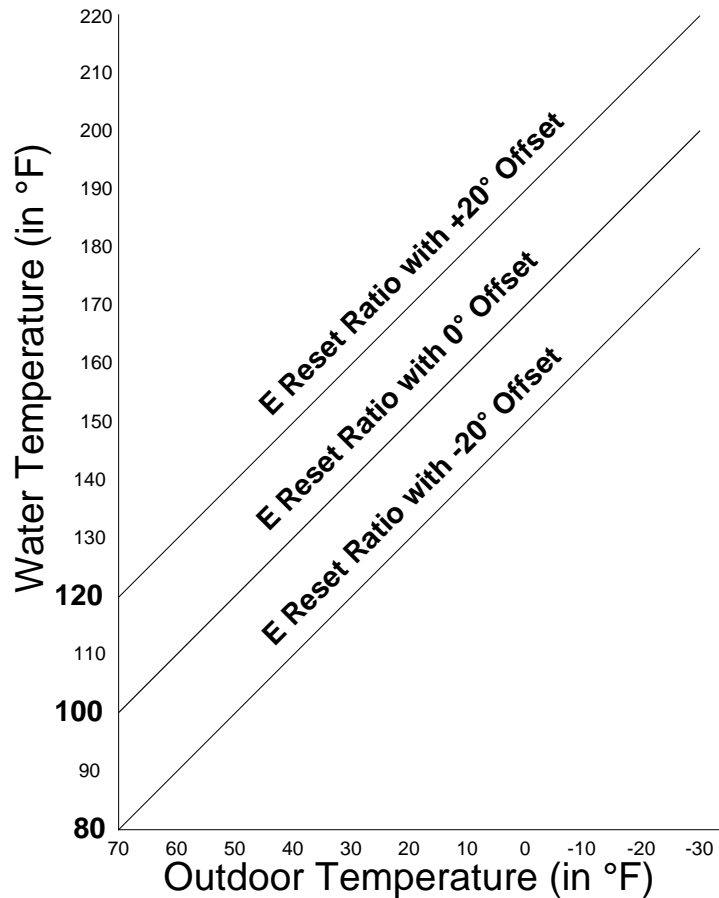


Reset Ratio Ranges



Reset Ratio Curves

Water Temperature Offset



Sequencing Controls for Multiple Boilers

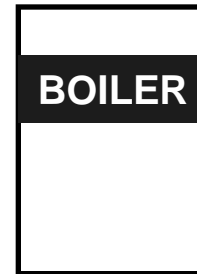
- To maximize multiple boiler efficiency you must control them as a team.
 - A) Not all types of boilers should be controlled in the same fashion.
 - B) When selecting a control, make sure you know what type of burners you have and not just the number of boilers.

On/Off and Lo/Hi Burners

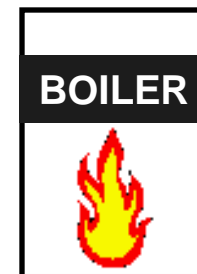
- On/Off Burners

- Flame is OFF
- Flame is ON

OFF



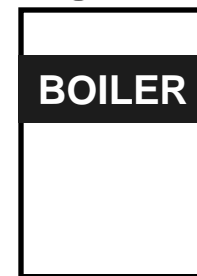
ON



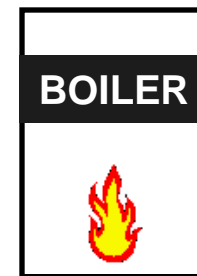
- Lo/Hi Fire Burners

- Flame is OFF
- Flame is Low
- Flame is High

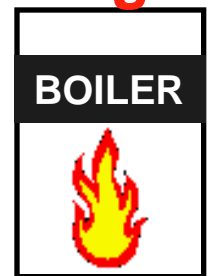
OFF



Low



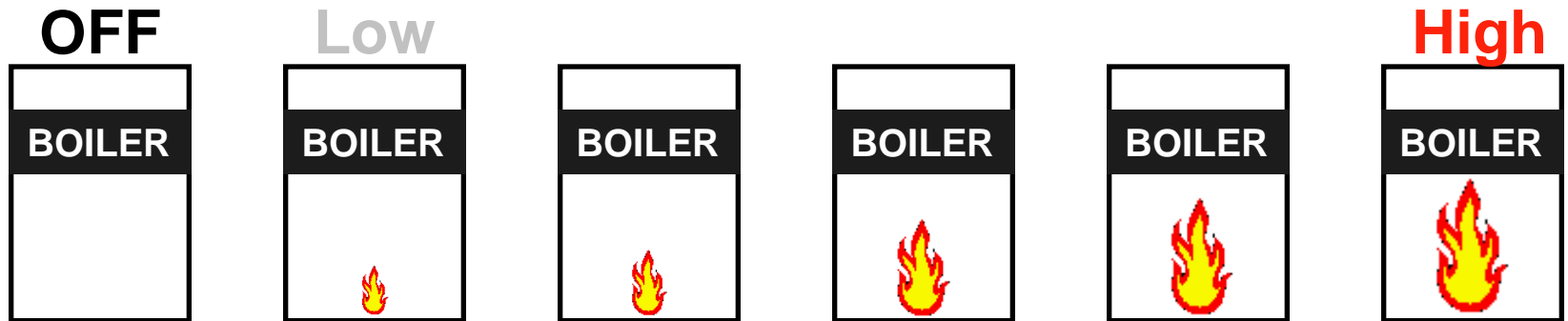
High



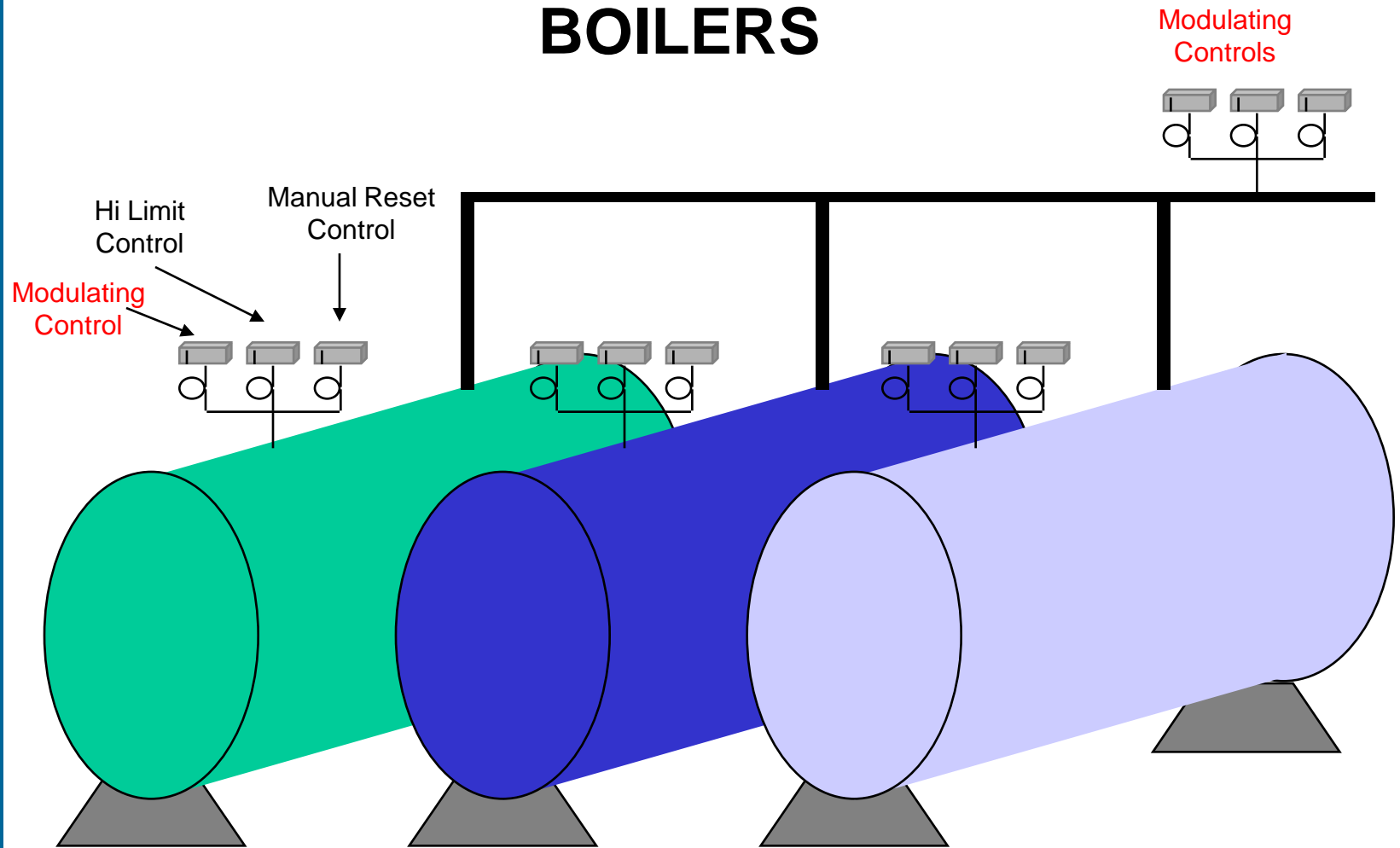
- Also 3 stage and 4 stage burners

Full Modulation Burners

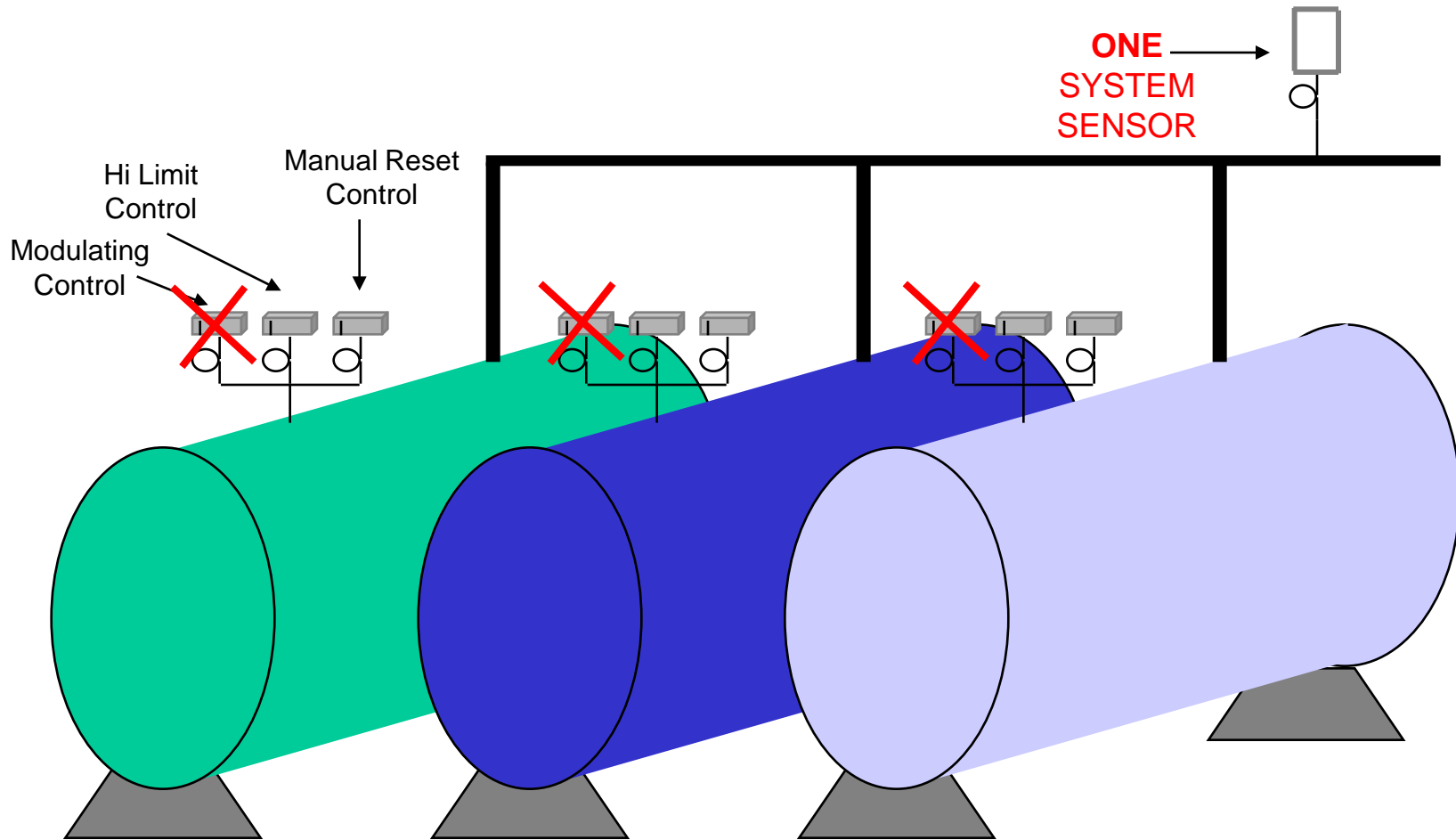
- Full Modulation Burners allow the flame to be adjusted anywhere from low to high fire.



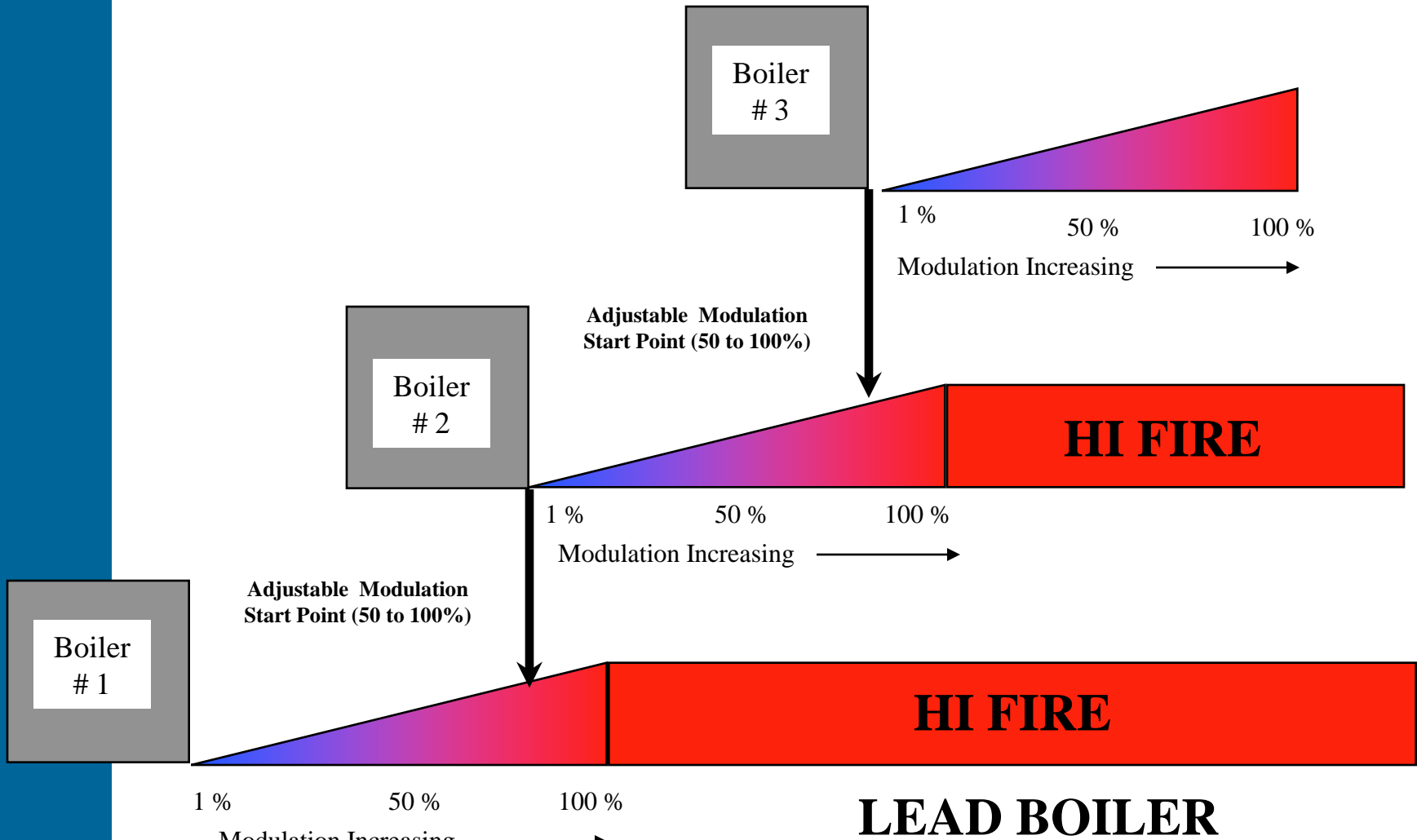
TYPICAL CONTROL SYSTEM FOR MULTIPLE FULL MODULATION BOILERS



Control Of Multiple Full Modulation Boilers with MultiMod

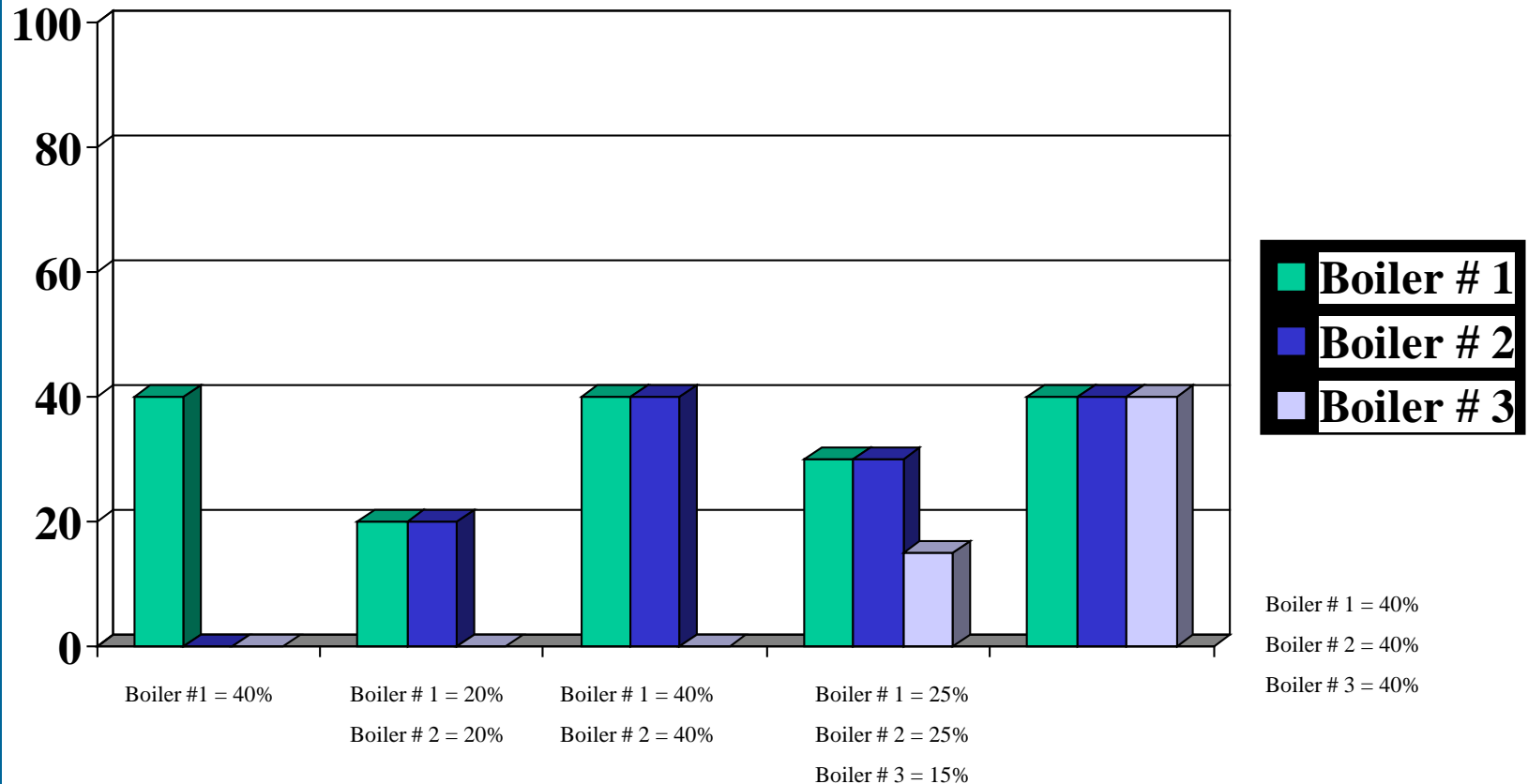


Typical Sequence of Operation for Higher Mass Boilers w/ Modulating Burners



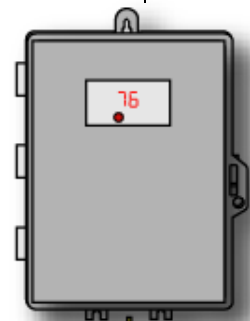
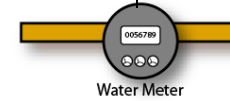
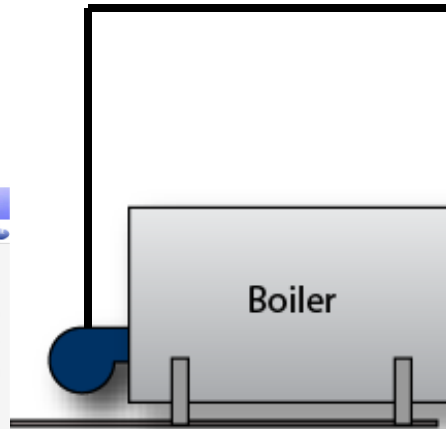
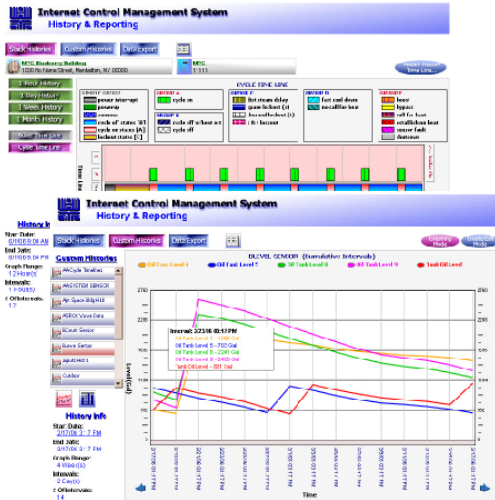
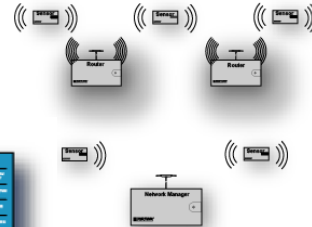
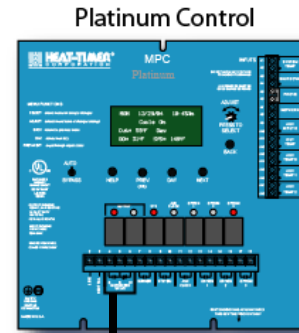
Typical Parallel Loading Mode for Lower Mass Condensing Boilers

As Load is Increasing



Using Communication
Options to save energy.
*Both on direct fuel usage and
through information to
better maintain equipment.*

Heat-Timer Internet Control Management System (ICMS)



Internet Controls Capabilities

Capabilities:

Web Based Application.

- No On-site server is required
- No local software is required on personal computer
- Wireless Space Sensors allow control to AUTOMATICALLY fine tune heating reset curve based on desired space targets
- Alarm E-mail/Text Message capability
 - Can alarm on any monitoring point
- Reporting Capability
 - Standard Reports, Custom reports
- Additional Sensor Monitoring

Sensor Monitoring Benefits

- Space Temperature Inputs (Wired and Wireless)
 - Allows the HTC control to fine-tune the reset curves based on space feedback and desired space temperatures.
- Burner Lockout
 - Alerts management when burner goes into a safety lockout condition
- DHW Temperature Inputs
 - Alerts management to possible dangerous high temperature DHW
- Boiler DHW Coil Temperature
 - Alerts management to possible dirty coil
- Oil Tank Monitoring
 - Alerts management to oil deliveries and consumption
- Oil Filter Monitoring
 - Alerts management to a dirty oil filter

Additional Sensor Monitoring Benefits

- Boiler Feed Water (Water Meter)
 - Alerts management to potential boiler damage due to excessive make up water. Either due to numerous blow downs or leaks in piping system. Can assist in monitoring boiler chemical levels
- Boiler Stack Temperature
 - Alerts management to a dirty boiler which can decrease boiler operating efficiency
- Sump Pump Failure
 - Alerts management to a possible flood condition or damaged sump pump
- Conductivity Sensor
 - Monitor boiler chemical level for both scaling condition or corrosive condition.
- Can monitor alarm outputs from others controls
 - I.e.: Heat-Timer snow Melt control in alarm condition.

Alarm Capabilities

All sensors have alarm capability (e-mail or text message)

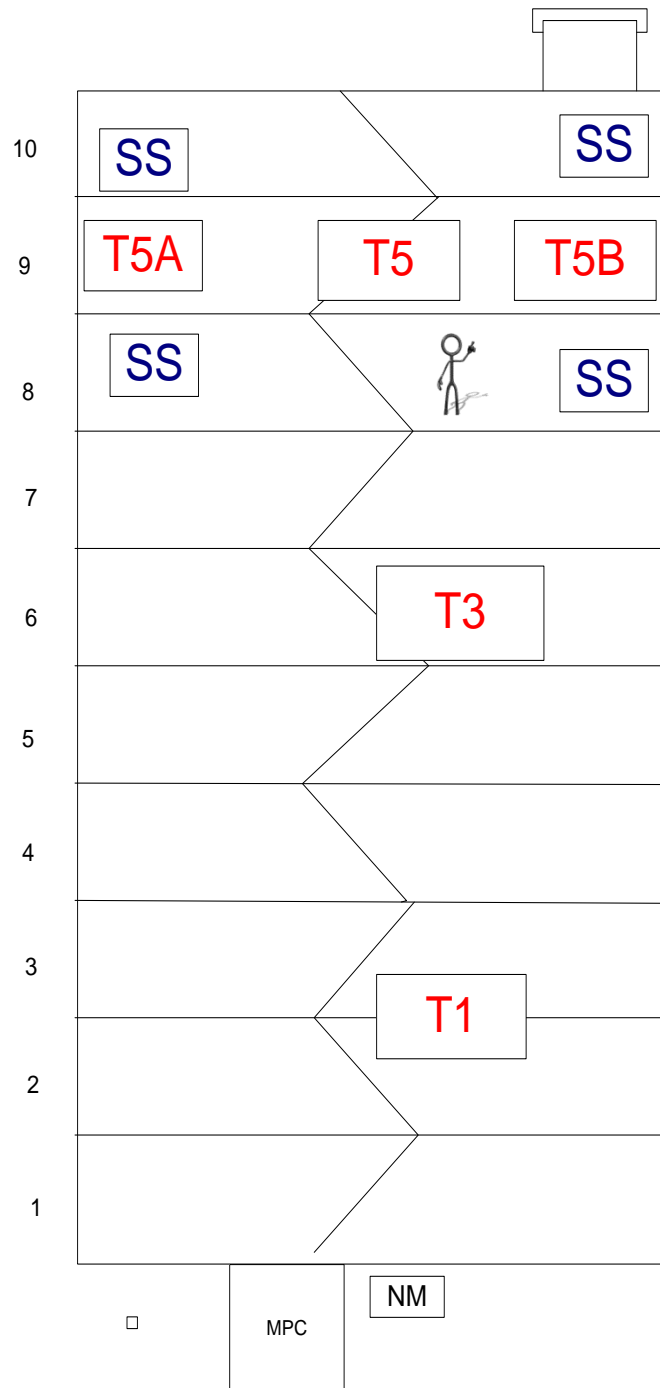
- The alarm can be sent to multiple people
 - This provides the capability of immediate notification in critical situations.
- Less critical or maintenance alarms can be e-mailed to the appropriate personnel
 - Sample Critical Alarm = Control in bypass, boiler in lockout
 - Sample Maint. Alarm = High stack sensor

Wireless Space Sensor Example


10 Story
Building


60 Units

10% Rule = 6
Apt Space
Sensors

















WIRELESS DIAGNOSTICS

 **K10**
Whitestone, NY 11357

 **HWR Plat K10**
HWR00A11F032

Wireless Reception

[Back To Building](#)

Name	ID #	Floor	Current Value	Battery	TRCVR Address	RSSI Sensor	RSSI Master
 Network mgr	000000001AE8	BR			NM		
 TRV 1	0000000010BD	BR			1		60%
 TRV 2	0000000010B8	BR			2		72%
 TRV-1A	000000001202	1			1A		54%
 TRV-3	000000001212	1			3		84%
 TRV-4	00000000120F	1			4		72%
 TRV-5	000000001216	1			5		60%
 TRV-6	000000001206	1			6		88%
 TRV-7	00000000120B	1			7		56%
 160-50 WPB	00000000105F	1	71 °F*	Good	1A	86%	67%
 160-68 WPB	00000000101F	2	72 °F*	Good	3	64%	57%
 163-18 WPB	000000001034	2	72 °F*	Good	1	79%	74%
 163-40 WPB	000000001077	2	71 °F*	Good	NM	73%	61%
 163-42 WPB	00000000104F	2	72 °F*	Good	4	65%	61%

Space Temps

Battery Indication

BUILDING 3D VIEW

K10

16306 Willets point Blvd., , Whitestone, NY 11357

Superintendent: Mark Russo, Phone: 718-3528700

Floors: 2 Units: 50 Controls: 1 Devices: 38 Time Zone: Eastern

ALL PATHS ON

View Modes:

3D Layer View

Control List

Add Device(s)

Edit Device(s)

View Instructions

Functions:

Edit Building Info And Floor Setup

Boiler Room / Install/View Ctrl

Wireless II Diagnostic View

Wireless II TRCVR / NM

Wireless II Sensors

Non-Wireless II Sensors

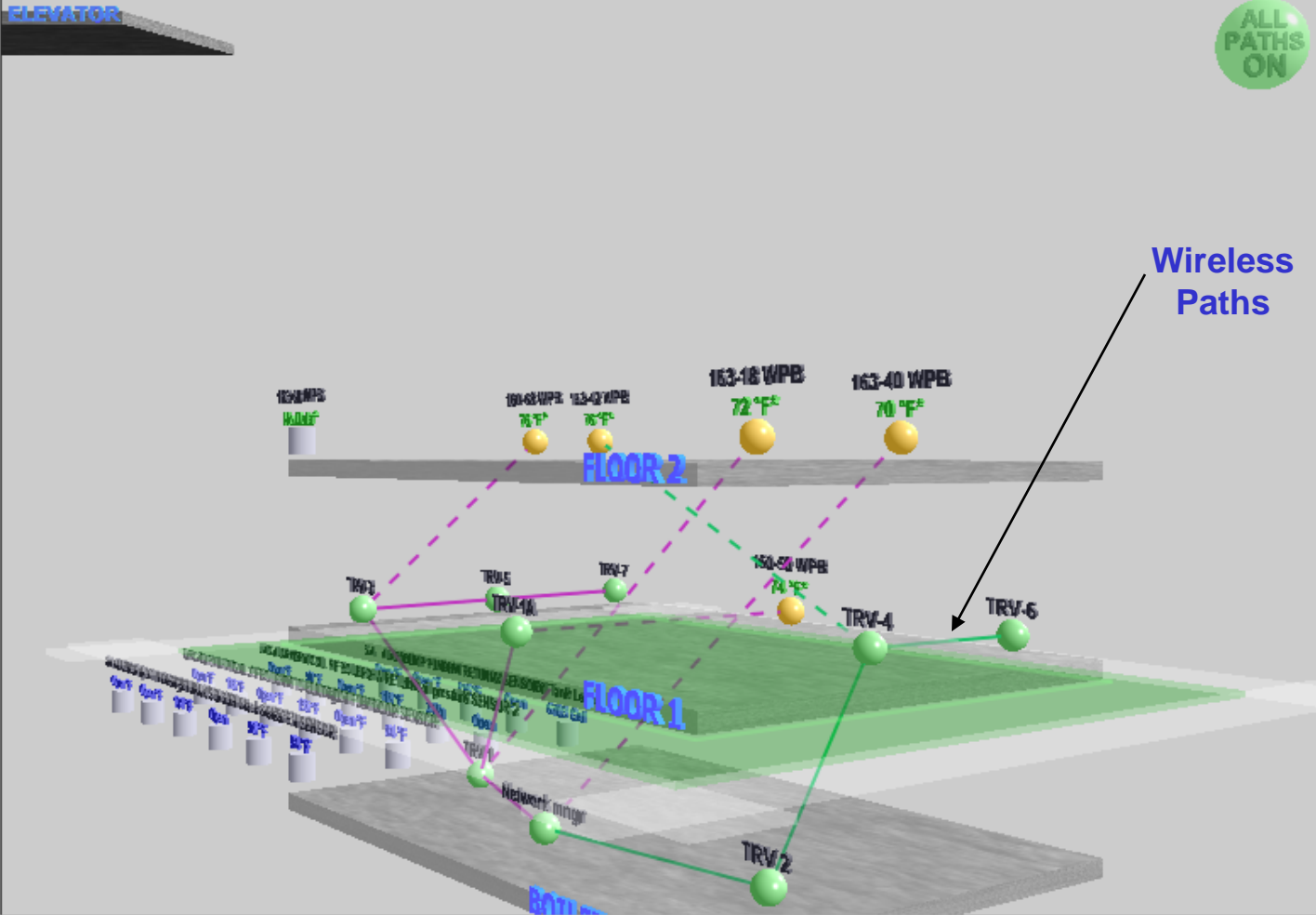
Wireless II Sensor Path

Wireless II TRCVR / NM Path

EVEN Wireless II paths

ODD Wireless II paths

NOTE: Requires Java3D version 1.5.1 or higher. [Click here to install Java 3D.](#)





SHORTCUTS

Address View Summary View **Shortcuts**

Heat-Timer Corp Building	MPC Sensor Link II	
HWR Heat Timer	Internal Ctrl 1	
MPC Blueberry Building	MPC 622 W 114th St	

Heat-Timer Service	MPC RI-NET 1	
	HWR RI-NET 2	
HWRQ New Building	HWRQ Internet Ctrl	
SRCX Hectagon Building	SRCX Develop Ctrl	
	MMOD Internet Ctrl	

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 Protected by U.S. Patent # 6,147,601, # 6,160,477, # 6,211,782, # 6,437,691, # 6,535,123. Other patents pending.

Click for Control Settings

Click to View Boiler Room

Click to View Alarms

Click to View Histories

Click to Set Schedules

Click to View Over-rides

Click to View Sensors



Internet Control Management System

Building Monitoring Mode

Server Comm Indicator

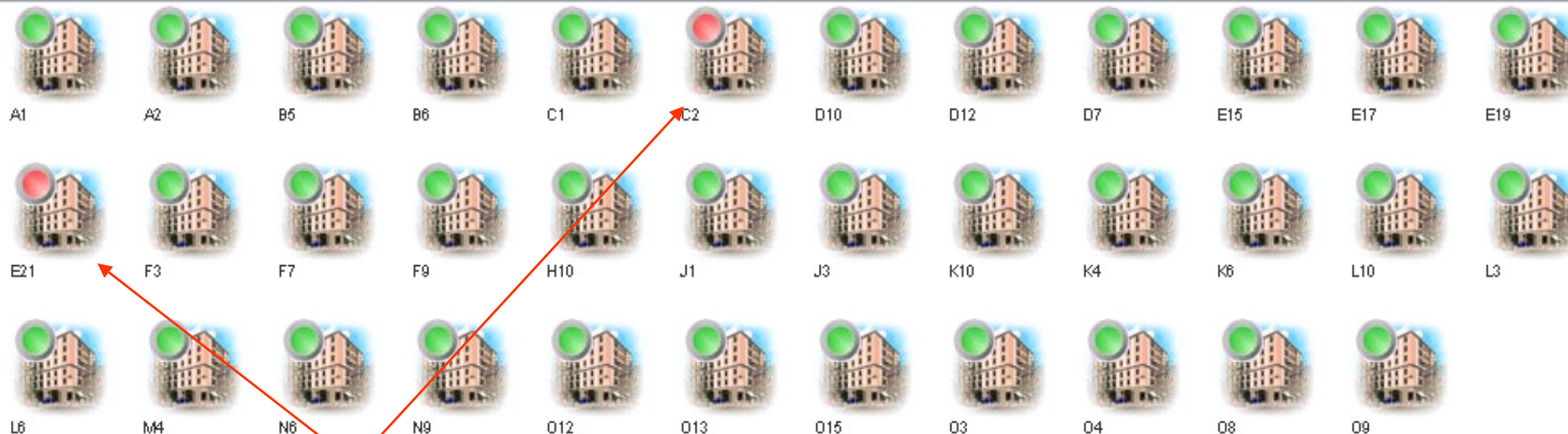


Account # 125

User Name: monitor2




Last Update: 6/12/06 2:42:52 PM

Status: 2 active alarms, in 2 buildings.

 Show all buildings Show only buildings in alarm

Alarm Date	Building Name	Alarm Message Text	Item Name	Alarm Value
Jun 12 2006 2:24PM	C2	C2 ALARM Sensor	ALARM Sensor	Shorted
Jun 1 2006 8:21PM	E21	E21 Alarm Sensor Shorted	ALARM Sensor	Shorted

Monitor Multiple Building Alarms on One Screen

Building Alarm Legend:  No controls installed  No active alarms  Active alarm(s) found

Server Comm Legend:  Comm normal  Retrying comm to server  Comm error

MPC PLATINUM (Steam)

Cycle Timeline



Internet Control Management System
History & Reporting

Stock Histories

Custom Histories

Data Export



5 W 5th St. MPC G002
5 W 5th St., New York, NY 10001



5 W 5th St. MPC G002
MPC00G01G002

Modify History
Time Line...

1 Hour History

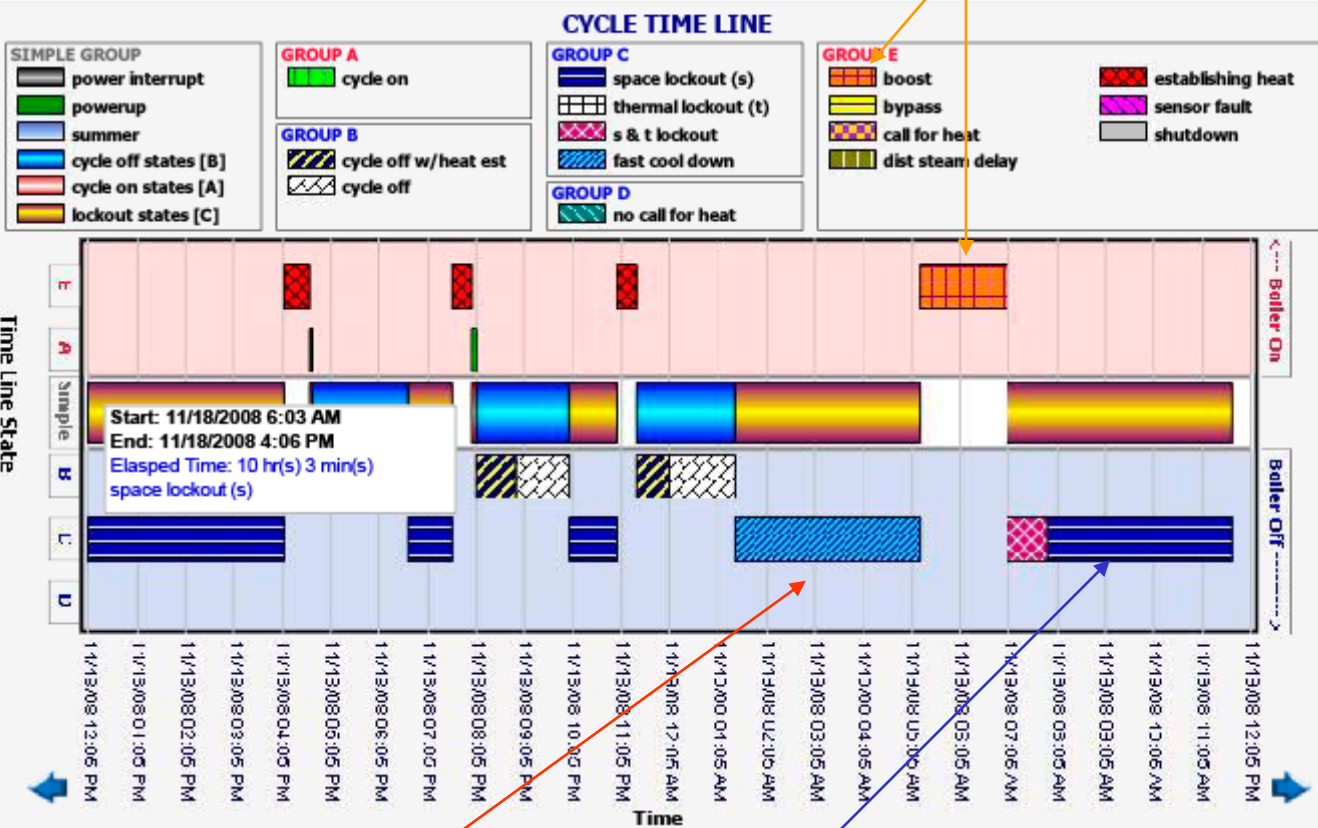
1 Day History

1 Week History

1 Month History

Boiler Time Line

Cycle Time Line



Var i-Boost

Fast Cool Down

SPACE Lockout



HISTORY (Multi-Temp. Sensors)

Stock Histories

Custom Histories

Data Export



Graphing Mode

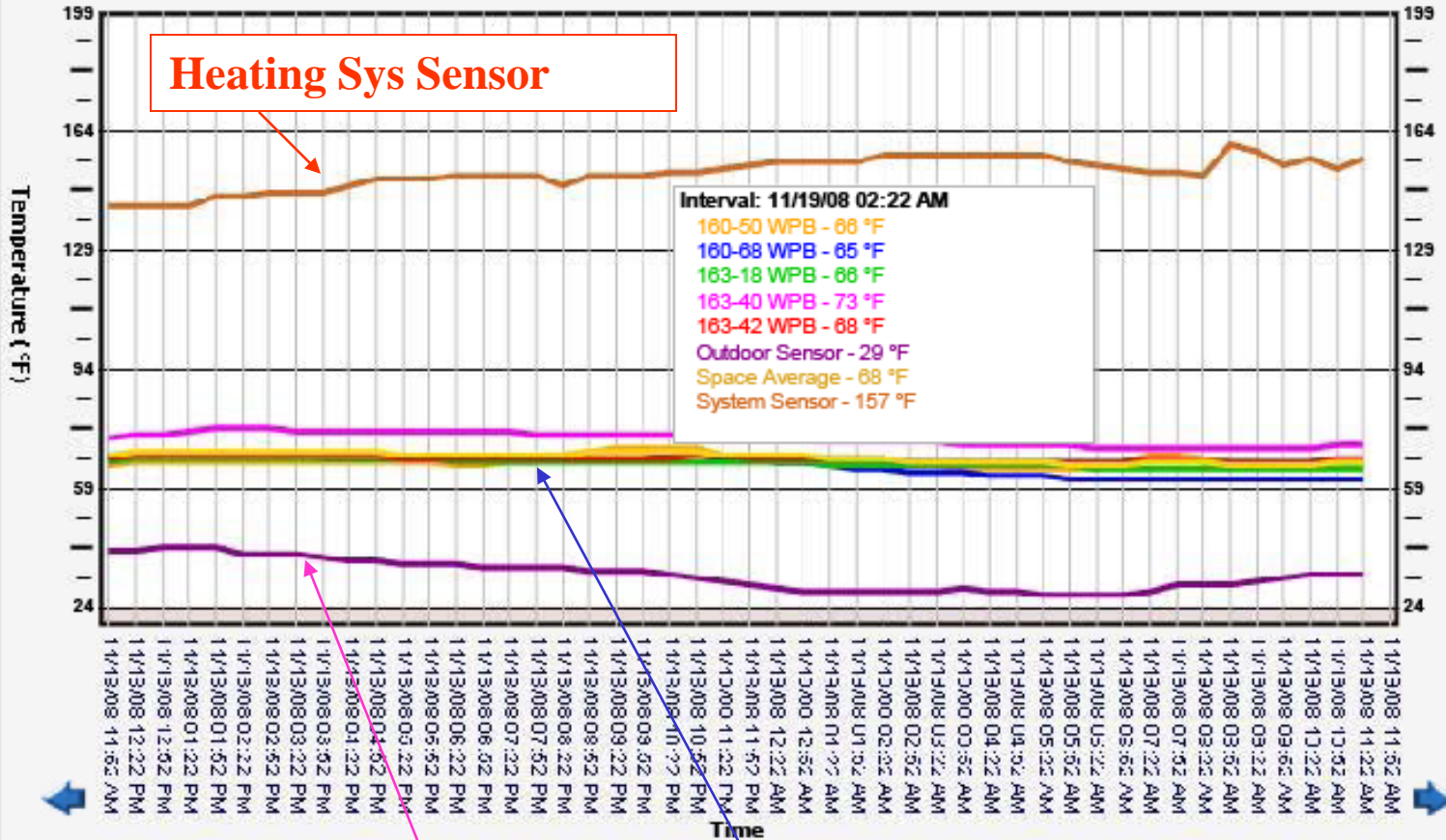
Create/Edit Mode

Custom Histories

K10 Space

K10 SPACE

- 160-50 WPB
HWR Plat K10
- 160-68 WPB
HWR Plat K10
- 163-18 WPB
HWR Plat K10
- 163-40 WPB
HWR Plat K10
- 163-42 WPB
HWR Plat K10
- Outdoor Sensor
HWR Plat K10
- Space Average
HWR Plat K10
- System Sensor
HWR Plat K10



History Info

Start Date:
[11/18/08 11:52 AM](#)

End Date:
[11/19/08 11:52 AM](#)

Graph Range:
1 Day(s)

Intervals:
30 Minute(s)

Of Intervals:
48



Outdoor Temp

Space Temps