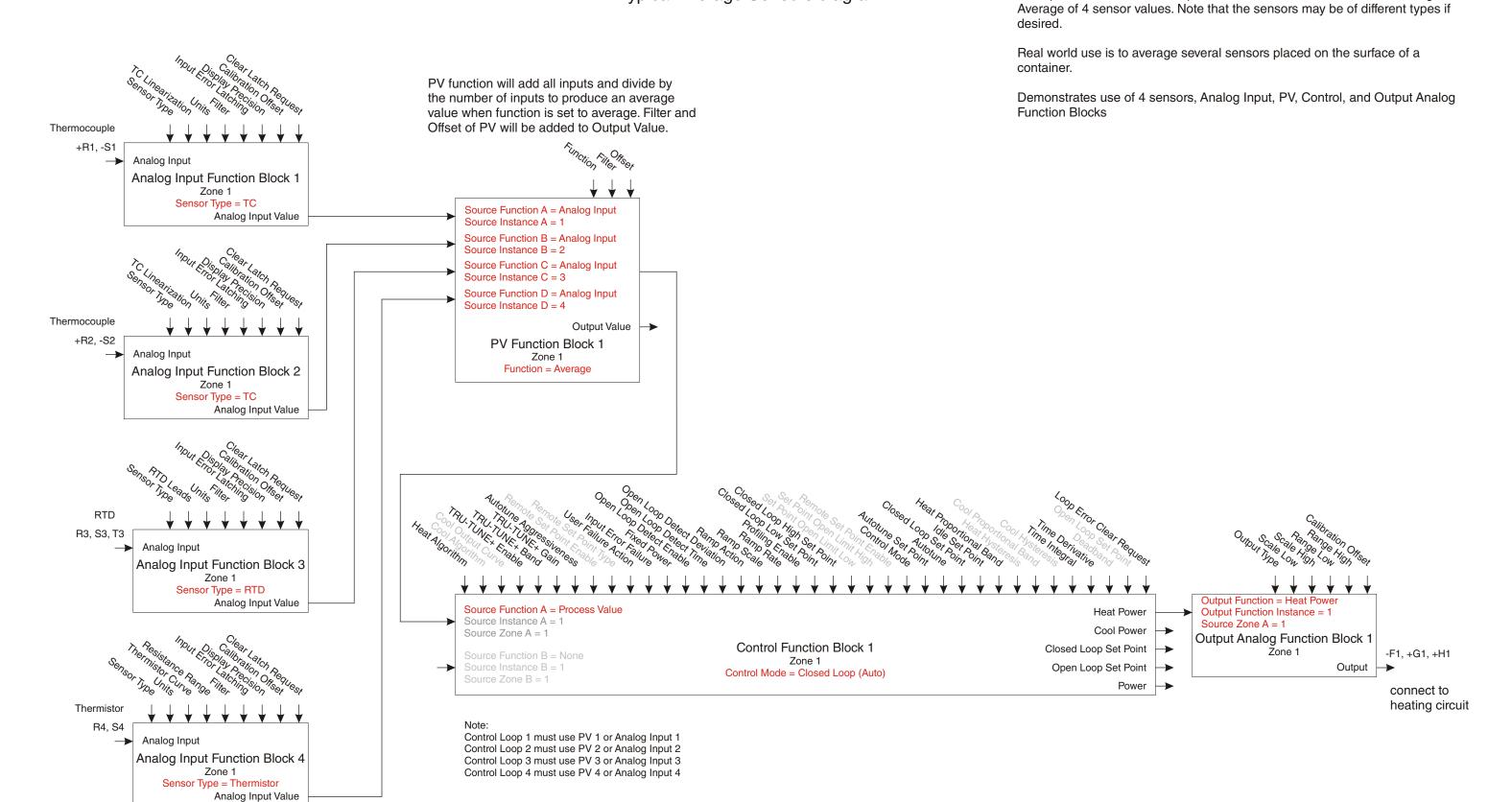# Typical Average Sensors diagram

Example 13 - Heat, closed loop, PID control without remote SP controlling to the Average of 4 sensor values. Note that the sensors may be of different types if desired.

Real world use is to average several sensors placed on the surface of a container.

Demonstrates use of 4 sensors, Analog Input, PV, Control, and Output Analog Function Blocks

PV function will add all inputs and divide by the number of inputs to produce an average value when function is set to average. Filter and Offset of PV will be added to Output Value.

Thermocouple

+R1, -S1

Sensor Type
TC Linearization
Input Error Latching
Display Precision
Units
Filter
Calibration Offset
Clear Latch Request

Analog Input
Analog Input Function Block 1
Zone 1
Sensor Type = TC
Analog Input Value

Thermocouple

+R2, -S2

Sensor Type
TC Linearization
Input Error Latching
Display Precision
Units
Filter
Calibration Offset
Clear Latch Request

Analog Input
Analog Input Function Block 2
Zone 1
Sensor Type = TC
Analog Input Value

RTD

R3, S3, T3

Sensor Type
RTD Leads
Input Error Latching
Display Precision
Units
Filter
Calibration Offset
Clear Latch Request

Analog Input
Analog Input Function Block 3
Zone 1
Sensor Type = RTD
Analog Input Value

Thermistor

R4, S4

Sensor Type
Thermistor Curve
Input Error Latching
Display Precision
Resistance Range
Units
Filter
Calibration Offset
Clear Latch Request

Analog Input
Analog Input Function Block 4
Zone 1
Sensor Type = Thermistor
Analog Input Value

Function   Filter   Offset

Source Function A = Analog Input
Source Instance A = 1

Source Function B = Analog Input
Source Instance B = 2

Source Function C = Analog Input
Source Instance C = 3

Source Function D = Analog Input
Source Instance D = 4

Output Value

PV Function Block 1
Zone 1
Function = Average

Heat Algorithm
Cool Algorithm
Cool Output Curve
TRU-TUNE+ Enable
TRU-TUNE+ Band
TRU-TUNE+ Gain
Autotune Aggressiveness
Remote Set Point Enable
Remote Set Point Type
User Failure Action
Input Error Failure
Fixed Power
Open Loop Detect Enable
Open Loop Detect Time
Open Loop Detect Deviation
Ramp Action
Ramp Scale
Ramp Rate
Profiling Enable
Closed Loop Low Set Point
Closed Loop High Set Point
Set Point Low Limit
Set Point Open Limit High
Remote Set Point
Control Mode
Closed Loop Set Point
Idle Set Point
Autotune
Autotune Set Point
Heat Proportional Band
Cool Proportional Band
Cool Hysteresis
Heat Hysteresis
Time Integral
Time Derivative
Dead Band
Open Loop Set Point
Loop Error Clear Request

Source Function A = Process Value
Source Instance A = 1
Source Zone A = 1

Source Function B = None
Source Instance B = 1
Source Zone B = 1

Control Function Block 1
Zone 1
Control Mode = Closed Loop (Auto)

Heat Power
Cool Power
Closed Loop Set Point
Open Loop Set Point
Power

Calibration Offset
Range High
Range Low
Scale High
Scale Low
Output Type

Output Function = Heat Power
Output Function Instance = 1
Source Zone A = 1

Output Analog Function Block 1
Zone 1
Output

-F1, +G1, +H1

connect to
heating circuit

Note:
Control Loop 1 must use PV 1 or Analog Input 1
Control Loop 2 must use PV 2 or Analog Input 2
Control Loop 3 must use PV 3 or Analog Input 3
Control Loop 4 must use PV 4 or Analog Input 4

Information Flow

EZ-ZONE RM Application Example - using function blocks
Print on 11" x 17" landscape paper for best viewing

User parameter settings in RED

Revision A