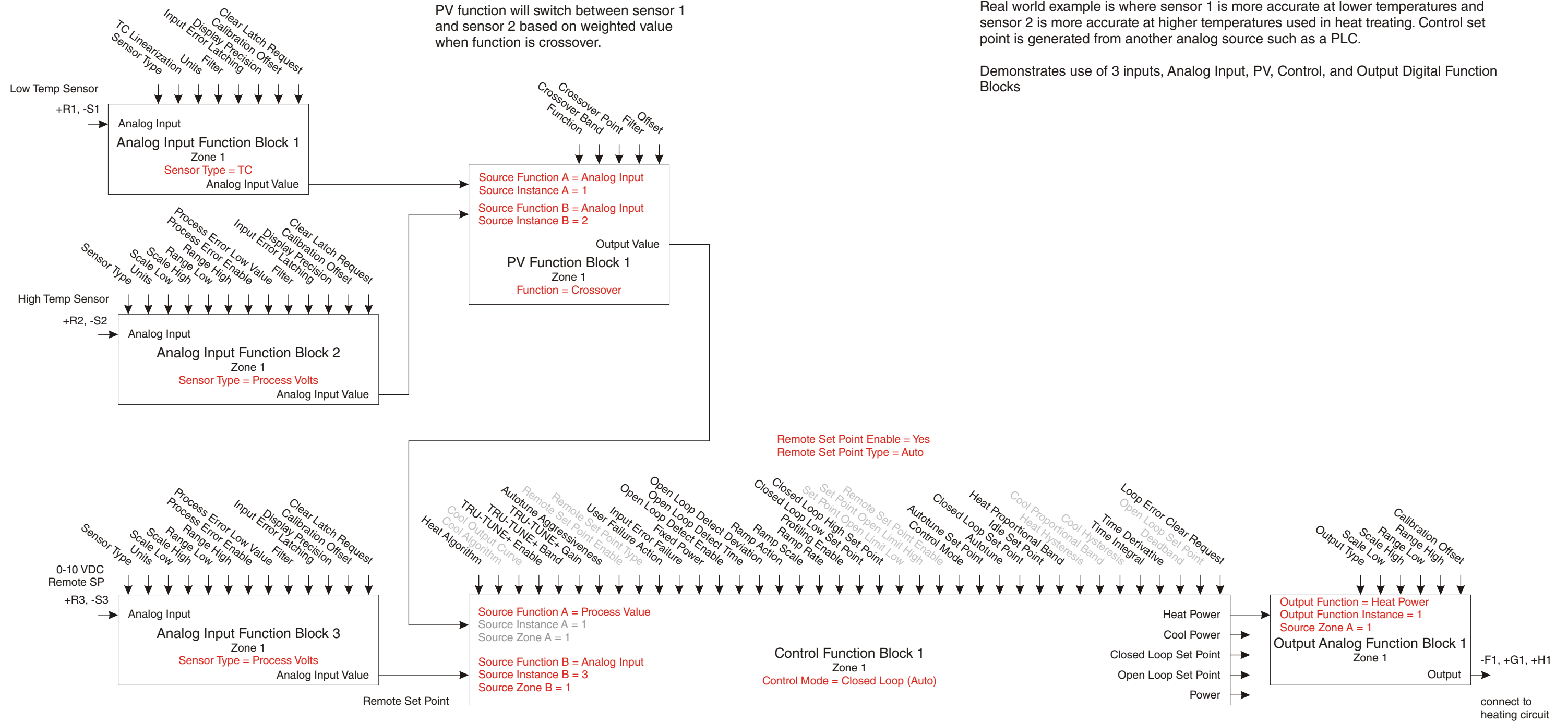# Typical sensor cross over diagram

Example 23 - Heat, closed loop, PID control with remote SP utilizing sensor value 1 or sensor value 2 for heat control. When the sensor crosses from sensor 1 to sensor 2, each sensor has weighted value in the control loop.

Real world example is where sensor 1 is more accurate at lower temperatures and sensor 2 is more accurate at higher temperatures used in heat treating. Control set point is generated from another analog source such as a PLC.

Demonstrates use of 3 inputs, Analog Input, PV, Control, and Output Digital Function Blocks

PV function will switch between sensor 1 and sensor 2 based on weighted value when function is crossover.

Analog Input Function Block 1 labels: TC Linearization, Sensor Type, Input Error Latching, Display Precision, Units, Calibration Offset, Clear Latch Request, Filter

Low Temp Sensor
+R1, -S1

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

PV Function Block 1 labels: Crossover Band, Function, Crossover Point, Filter, Offset

PV Function Block 1
Zone 1
Source Function A = Analog Input
Source Instance A = 1
Source Function B = Analog Input
Source Instance B = 2
Output Value
Function = Crossover

Analog Input Function Block 2 labels: Sensor Type, Units, Scale Low, Scale High, Range Low, Range High, Process Error Enable, Process Error Low Value, Input Error Latching, Display Precision, Calibration Offset, Clear Latch Request, Filter

High Temp Sensor
+R2, -S2

Analog Input
Analog Input Function Block 2
Zone 1
Sensor Type = Process Volts
Analog Input Value

Analog Input Function Block 3 labels: Sensor Type, Units, Scale Low, Scale High, Range Low, Range High, Process Error Enable, Process Error Low Value, Input Error Latching, Display Precision, Calibration Offset, Clear Latch Request, Filter

0-10 VDC Remote SP
+R3, -S3

Analog Input
Analog Input Function Block 3
Zone 1
Sensor Type = Process Volts
Analog Input Value
Remote Set Point

Remote Set Point Enable = Yes
Remote Set Point Type = Auto

Control Function Block 1 labels: Heat Algorithm, Cool Output Curve, Cool Algorithm, TRU-TUNE+ Enable, TRU-TUNE+ Band, TRU-TUNE+ Gain, Autotune Aggressiveness, Remote Set Point Enable, Remote Set Point Type, User Set Point Type, Input Error Failure, Input Error Failure Action, 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 Open Limit Low, Set Point Open Limit High, Remote Set Point, Control Mode Enable, Control Mode, Autotune Set Point, Autotune, Closed Loop Set Point, Idle Set Point, Heat Proportional Band, Cool Proportional Band, Heat Hysteresis, Cool Hysteresis, Cool Proportional Band, Time Integral, Time Derivative, Dead Band, Open Loop Set Point, Loop Error Clear Request

Control Function Block 1
Zone 1
Source Function A = Process Value
Source Instance A = 1
Source Zone A = 1
Source Function B = Analog Input
Source Instance B = 3
Source Zone B = 1
Control Mode = Closed Loop (Auto)

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

Output Analog Function Block 1 labels: Output Type, Scale Low, Scale High, Range Low, Range High, Calibration Offset

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