SEM1750 Control Functions

Control Functions: A – B (A- B Absolute) / Differential

The SEM1750 has several control functions as standard that can be selected using the USB Speed Link software.
Both input channels can be equated and the result applied to the output giving the user powerful control tools within the standard product. This functionality can be applied separately to each output channel.

A-B (A-B Absolute)/Differential

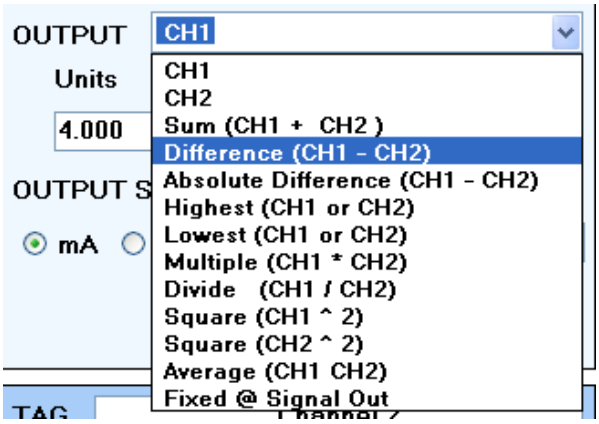
In many processes control applications the difference between two input values is required to be known. This can commonly be a temperature or a pressure difference but can be tank level or even a flow rate.

The SEM1750 can work out a difference between its input signals in two different ways, the standard or signed difference or the absolute difference.

The standard difference (A-B)
In this mode the scaled input on channel two is subtracted from the scaled input on channel one. The result can be either a positive or a negative number depending on whether A is larger or smaller then B.
Because the result can be negative or positive the output scaling generally speaking will need to include the negative as well as the positive results.

Example
Ch1 input (4 to 20) mA = (0 to 100) °C
Ch2 input (4 to 20) mA = (0 to 100) °C

Control function selected “Difference (CH1 – CH2)”

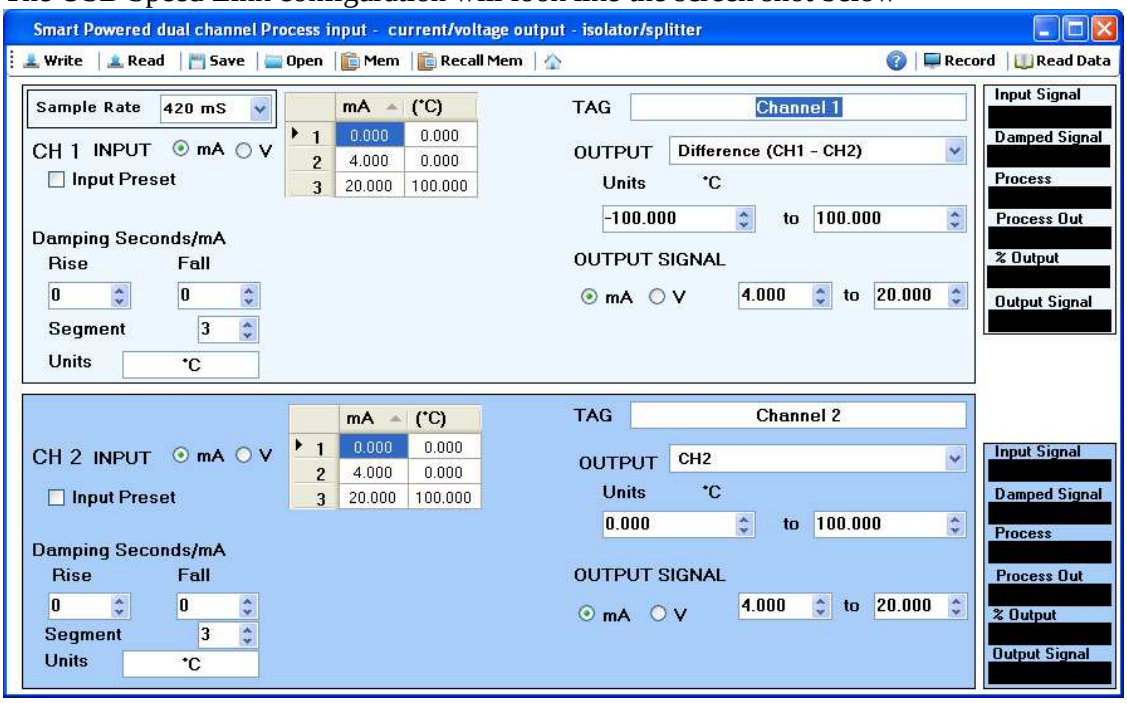


The maximum range of input conditions possible and the results are shown in the table below

CH1 °C	CH2 °C	Difference °C
0	0	0
0	100	-100
100	100	0
100	0	100

So the maximum output range will be -100 to 100 a span of 200

The USB Speed Link configuration will look like the screen shot below

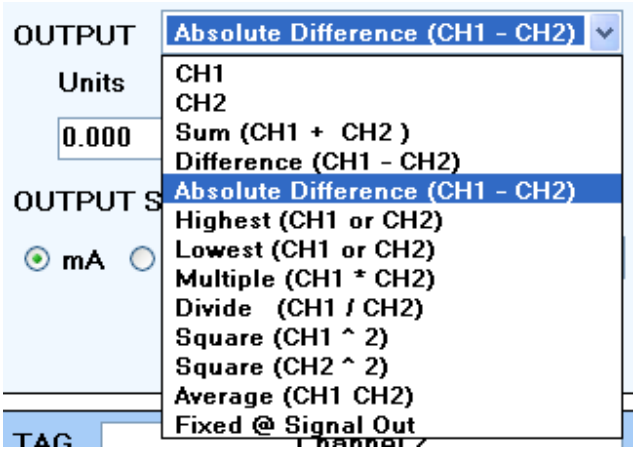


Note the output range for CH1 (-100 to 100) °C

The Absolute difference (A-B)
In this mode the scaled input on channel two is subtracted from the scaled input on channel one. The result will be the numeric difference with no sign that is any negative number will be converted into a positive one
Because the result will only be positive the output scaling generally speaking will need only to include positive values.

Example
Ch1 input (4 to 20) mA = (0 to 100) °C
Ch2 input (4 to 20) mA = (0 to 100) °C

Control function selected “Absolute Difference (CH1 – CH2)”

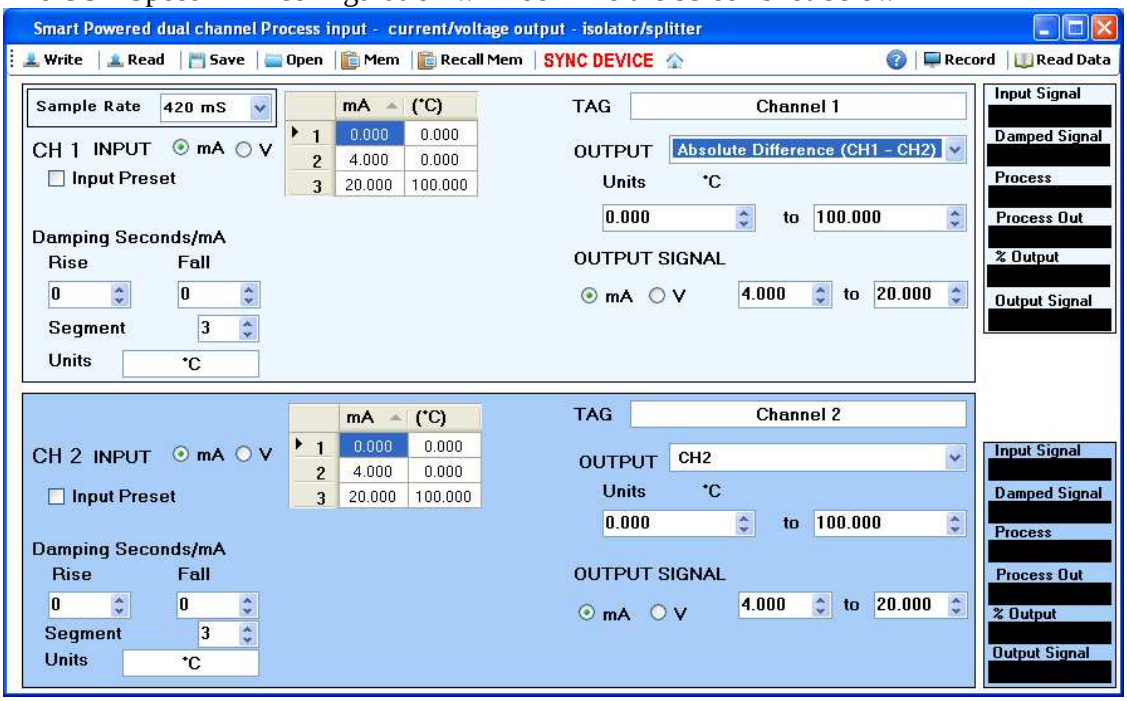


The maximum range of input conditions possible and the results are shown in the table below

CH1 °C	CH2 °C	Absolute Difference °C
0	0	0
0	100	100
100	100	0
100	0	100

So the maximum output range will be 0 to 100 a span of 100

The USB Speed Link configuration will look like the screen shot below



Note the output range for CH1 (0 to 100) °C

The examples shown can be checked without live input signals using the SEM1750 diagnostic function "Simulation of Input signals" see separate instruction.