Z1564-01-01 SEM1720 multi point user calibration

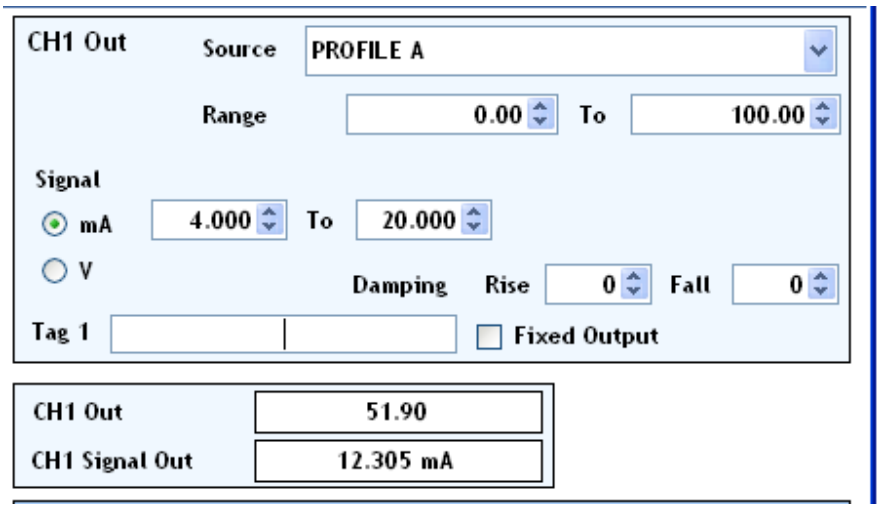
Temperature probe inputs.

It is useful to be able to calibrate an instrument with its input probe connected, to remove probe error and connection wiring effects from the system.
Using the profiling tool in the advanced mode of the USB Speedlink software, the SEM1720 can be calibrated to a probe at a known temperature.
This alignment can be done at up to 22 points as required, at any points on the temperature range.
The SEM1720 also has a user offset function, which is the capability to apply a single value offset that affects the entire temperature range.

Errors

Use the USB Speedlink software to measure the temperature on the SEM1720 at each of the calibration points.

This shows the reading on the SEM1720 when probe has 50.0 °C applied. The SEM1720 is reading 51.89 °C : an error of -1.89 °C on the input is propagated as an error on the output.



The output is correct in retransmitting the value of 51.90 °C because the error is present at the input.

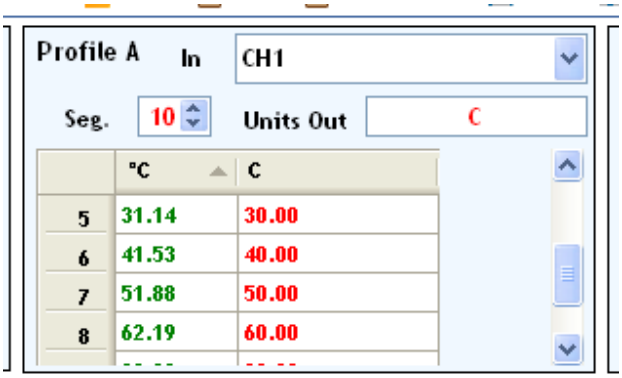
Multiple point correction: Up to 22 points.

Example
All temperatures in °C

Make a table to correlate the applied temperatures against the temperatures measured on the SEM1720

Applied temperature	Measured on SEM1720	Error
-10	-9.98	-0.02
0	0.10	-0.10
10	9.88	0.12
20	19.99	0.01
30	31.10	-1.10
40	41.53	-1.53
50	51.88	-1.88
60	62.19	-2.19
80	82.20	-2.20
100	103.21	-3.21

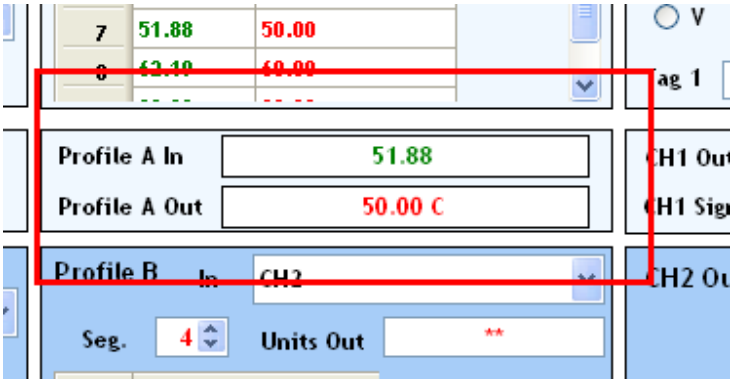
Enter the table into the profile tool in the USB Speedlink software as shown below.



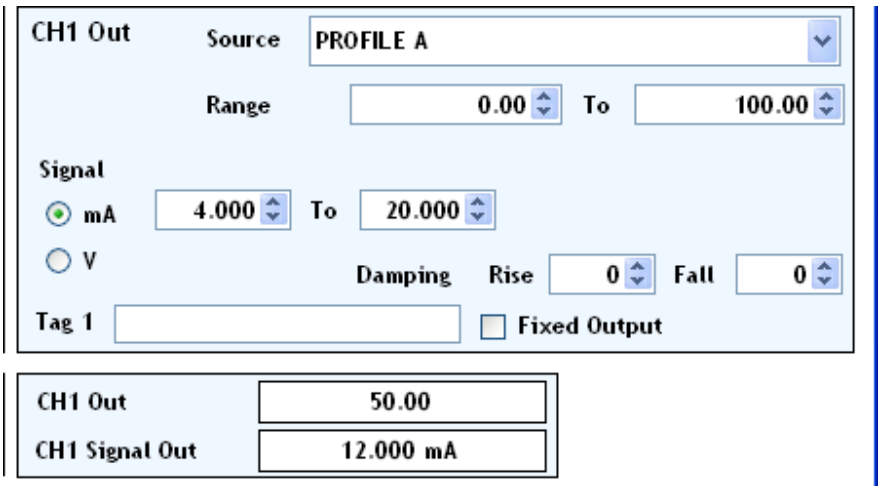
Enter the measured temperature first then the required reference temperature to be aligned to.

The engineering units for input and output are in °C in this example.

Now when the temperature of the calibration points are applied to the probe the SEM1720 unit will compensate for the corrected values.



This shows the reading on the SEM1720 when probe has 50.0 °C applied to it. An error of -1.89 °C is corrected for and the SEM1720 unit now reads 50.0 °C.



The output value is now correct.