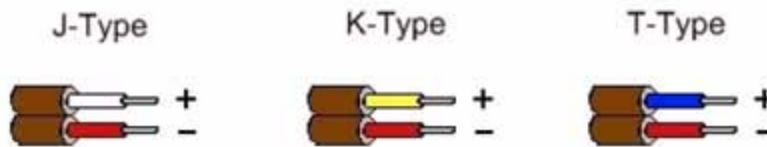


# How To Connect and Calibrate Thermocouples Using DI-8B47 Series Amplifiers

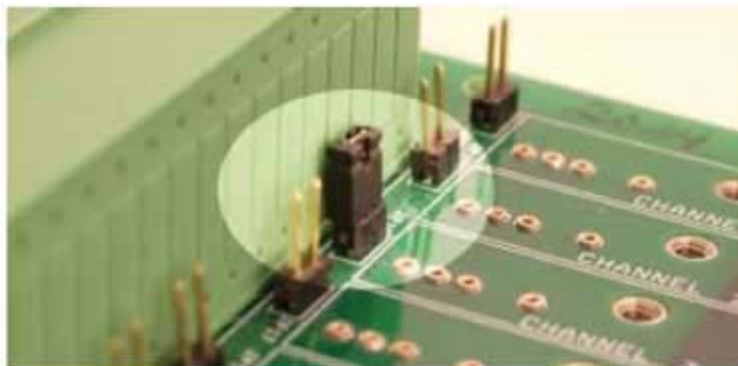
By Shawn MacDonald  
DATAQ Instruments

Thanks to the American National Standards Institute (ANSI), thermocouple wire is color coded to indicate thermocouple type and polarity. This takes the guesswork out of connecting thermocouple wires to your DI-718B, DI-718Bx, or DI-788.



In this example, we'll connect a K-type thermocouple to a DI-718B with a DI-8B47K-13 amplifier plugged into channel three.

We'll begin by inserting a cold junction compensation jumper (included with your DI-718B, DI-718Bx, or DI-788).

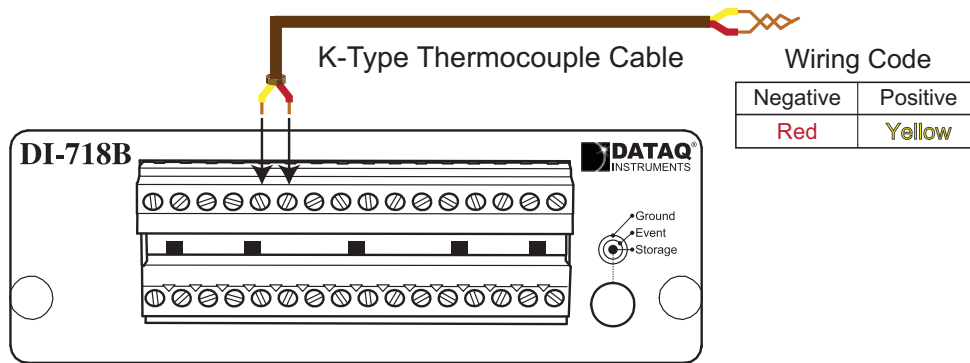


A cold junction compensation jumper placed on channel 3

Next, we'll insert the DI-8B47K-13 amplifier and connect the positive and negative thermocouple wires to In+ and In- respectively. If you reverse the polarity, increasing temperatures will display like they're decreasing and visa versa.

DI-718B pinout

CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
In+ In-	In+ In-	In+ In-	In+ In-	In+ In-	In+ In-	In+ In-	In+ In-
Ex+Ex-	Ex+Ex-	Ex+Ex-	Ex+Ex-	Ex+Ex-	Ex+Ex-	Ex+Ex-	Ex+Ex-

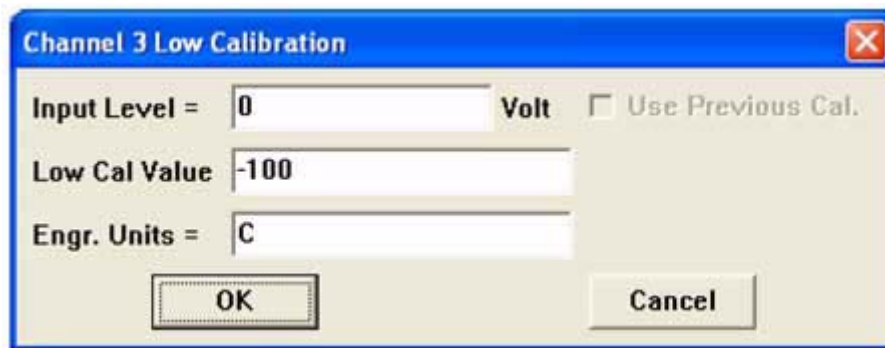


Front end of DI-718B

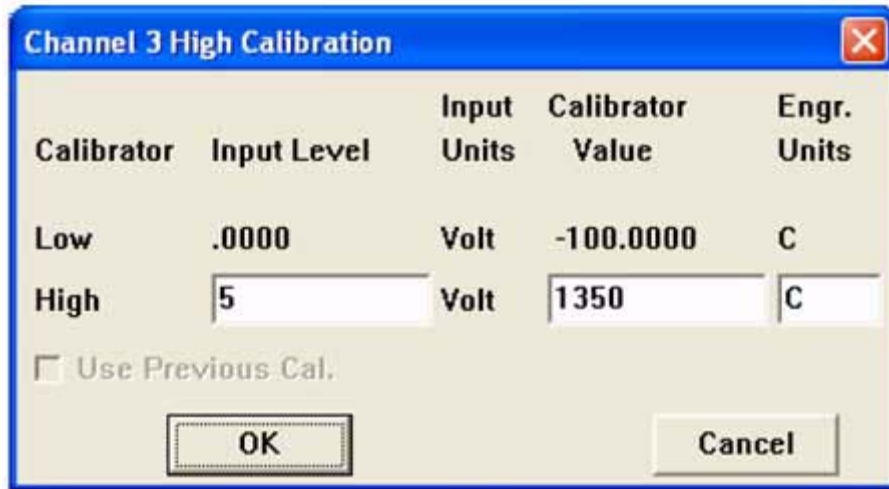
With our thermocouple connected, we'll use Low and High Calibration in WinDaq to display temperature in calibrated °C units.

We'll begin by selecting "Low Calibration" from the "Edit" pull-down menu.

Since we know that the DI-8B47K-13 has a full-scale output of 0 to 5 volts and a measurement range of -100°C to 1350°C (printed on the side of the amplifier), we'll enter "0" (zero) for Input Level and "-100" for Low Cal Value. For Engr. Units enter "C".



Next, we'll choose 'High Calibration' from the 'Edit' pull-down menu and enter "5" for Input Level and "1350" for High Cal Value.



Finally, to optionally display the actual measurement range of the amplifier we'll select "Limits" from the "Scaling" pull down menu. Enter "1350" for the Top Limit and "-100" for the Bottom Limit.



You can set limits to any top and bottom combination that you want, subject only to the resolution of the instrument that you are using. Entries outside the instrument's resolution range will be automatically flagged. Note also that adjustments to top and bottom limits do not affect channel calibration, only how the data is displayed.

Channel 3 is now calibrated to display temperature over the full-scale range of the DI-8B47K-13!

