

- Add up to 8 Thermocouples to an Arduino
- Cold Junction Compensated Output
- K, J, N, S, T, E or R Type thermocouples supported dependent on model
- 0.1" (2.54mm) Pitch Screw Terminals for Thermocouple connection
- 14-bit 0.25°C Resolution
- Nominal $\pm 2^{\circ}\text{C}$ Accuracy^[1]
- Based on MAX31855 Cold-Junction Compensated Thermocouple-to-Digital Converter and ADG608 Multiplexer IC
- 13 x 8 Prototyping Area with Analog, I²C and Power pins
- Chip Select Pin Jumper Selectable means multi SPI shield compatibility
- Combine with SD card shield for powerful Temperature Logging
- Powered from 3.3V Arduino Pin, 5V compatible

[1] See "Thermal Characteristics" table on page 3 of MAX31855 data sheet (<http://datasheets.maximintegrated.com/en/ds/MAX31855.pdf>) for full range accuracies for all thermocouple types

Based on the MAX31855 cold junction compensated thermocouple to digital converter from Maxim Integrated, the new KTA-259 Thermocouple Multiplexer Shield is designed to easily allow multiple high temperature readings with an Arduino control board. With the new version there are multiple advantages over the old KTA-259, namely, wider temperature range including below 0°C, higher accuracy, higher resolution and ability to use more thermocouple types (dependent on model).

The addition of an SD card shield can allow for temperature logging.

A sample Arduino sketch is provided to read the temperatures from 8 thermocouples as well as the internal cold junction temperature of the MAX31855 and send these to a serial terminal emulation program.

Screw terminals are provided for thermocouple connections as thermocouple wires can not be soldered.

Uses:

Automotive – Engine, Exhaust and Brake temperatures are higher than most temperature sensors can handle, but within the range of Thermocouples.

Ovens, Furnaces and Kilns – At temperatures where other temperature sensors will not operate.

Freezer or Cryogenic monitoring – Where temperatures are well below 0°C.

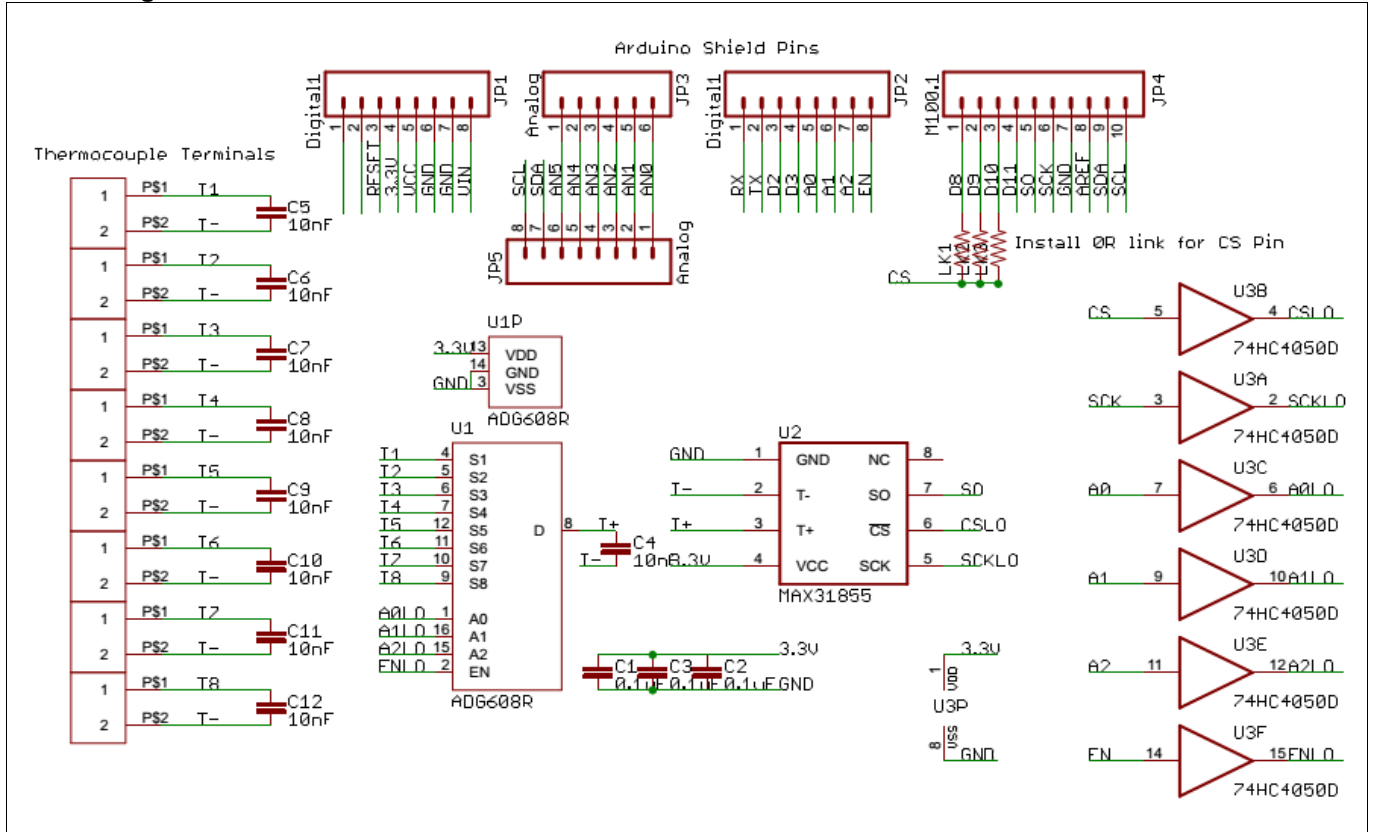
Chemical Processes – Where corrosive chemicals may damage probes or reach high temperatures thermocouples are more readily available for such processes.

Multi-Zone Temperature Monitoring, Data Acquisition or Logging Systems– With cheap readily available thermocouples.

Notes:

1. The temperature sensor used for the cold junction compensation is internal to the MAX31855 IC and is not directly at the input terminals therefore temperature gradients across the KTA-259 device should be avoided.
2. The MAX31855 assumes a linear relationship between temperature and voltage. Because all thermocouples exhibit some level of non-linearity, for greater accuracy, corrections should be applied to the data.

Circuit Diagram:



Ordering Information:

Each KTA-259 Device can take 8 thermocouples of one particular type, when using different thermocouple types multiple KTA-259 Devices must be used.

Ocean Controls SKU / Part Number	Thermocouple Type	IC	Measured Temperature Range	Thermocouple Maximum Temperature Range ^[1]
KTA-259K	K	MAX31855K	-200°C to +1350°C	-270°C to +1372°C
KTA-259J	J	MAX31855J	-40°C to +750°C	-210°C to +1200°C
KTA-259N	N	MAX31855N	-200°C to + 1300°C	-270°C to +1300°C
KTA-259S	S	MAX31855S	+50°C to +1600°C	+50°C to +1768°C
KTA-259T	T	MAX31855T	-250°C to +400°C	-270°C to +400°C
KTA-259E	E	MAX31855E	-40°C to +900°C	-270°C to +1000°C
KTA-259R	R	MAX31855R	-50°C to +1770°C	-50°C to +1768°C
KTA-259 ^[2]	K	MAX6675	0 to +1024°C	-270°C to +1372°C
KTB-259 ^[2]	K	MAX6674	0 to +128°C	-270°C to +1372°C

[1] This is the range of temperatures that a thermocouple of this type can measure, the Measured Temperature Range is the actual range the KTA-259 can digitise.

[2] KTA-259 and KTB-259 are discontinued and only available while stock remains and included for reference only.

Revision History

Version	Notes
V1	KTA-259 and KTB-259 using MAX6675 and MAX6674
V2	First version with MAX31855 series of chips
V3	Updated table underneath PCB to have measured temp range instead of max temp range
V4	Broke connection between SDA/A4 and SCL/A5 and added new breakout holes for SDA/SCL