

- 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 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 KTA-259v3 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 .

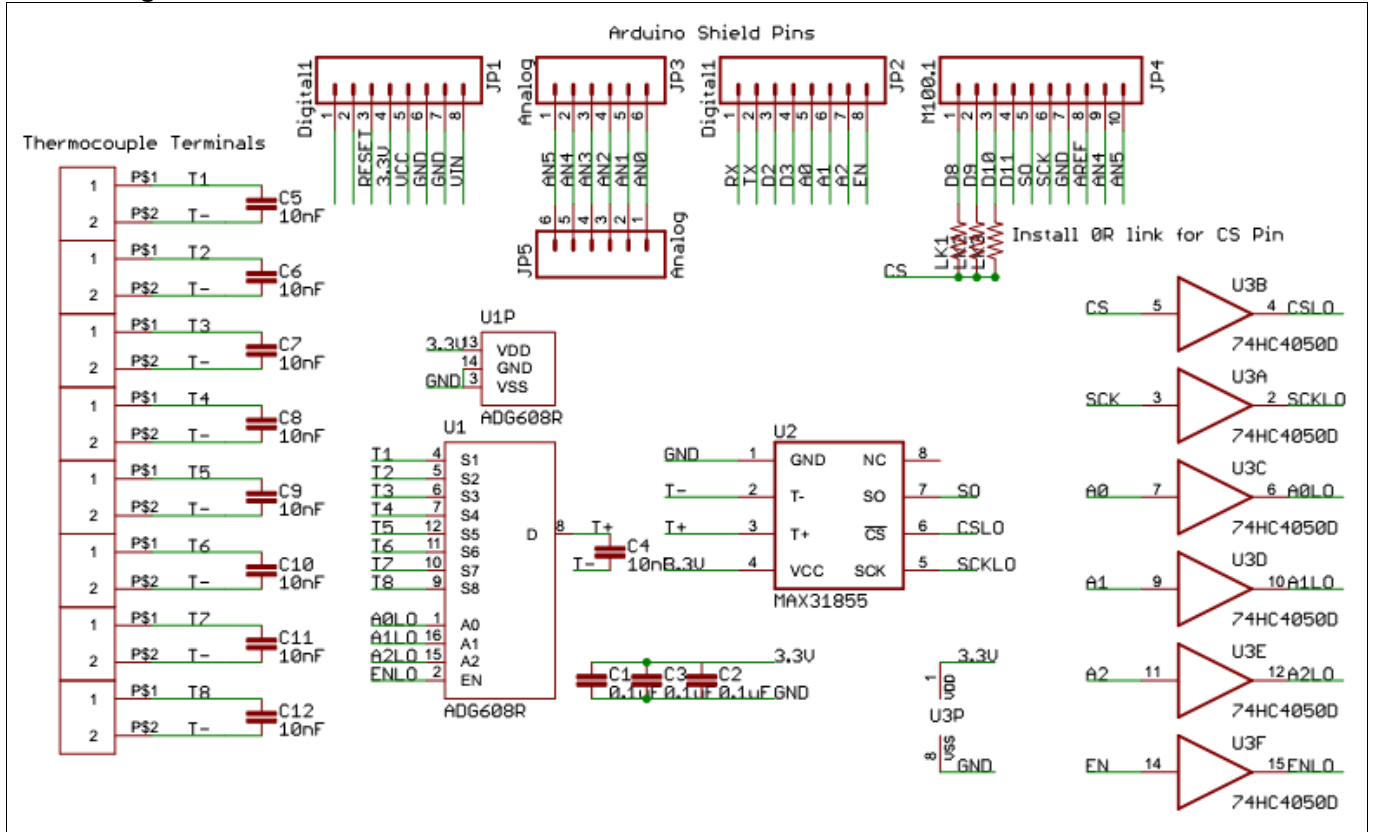
Chemical Processes – Where corrosive chemicals may damage probes or reach high temperatures thermocouples are more readily available for such processes.

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
V4	Broke connection between SDA/A4 and SCL/A5 and added new breakout holes for SDA/SCL