450C First Street
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THERMOSPYDER™ OPERATIONAL DESCRIPTION

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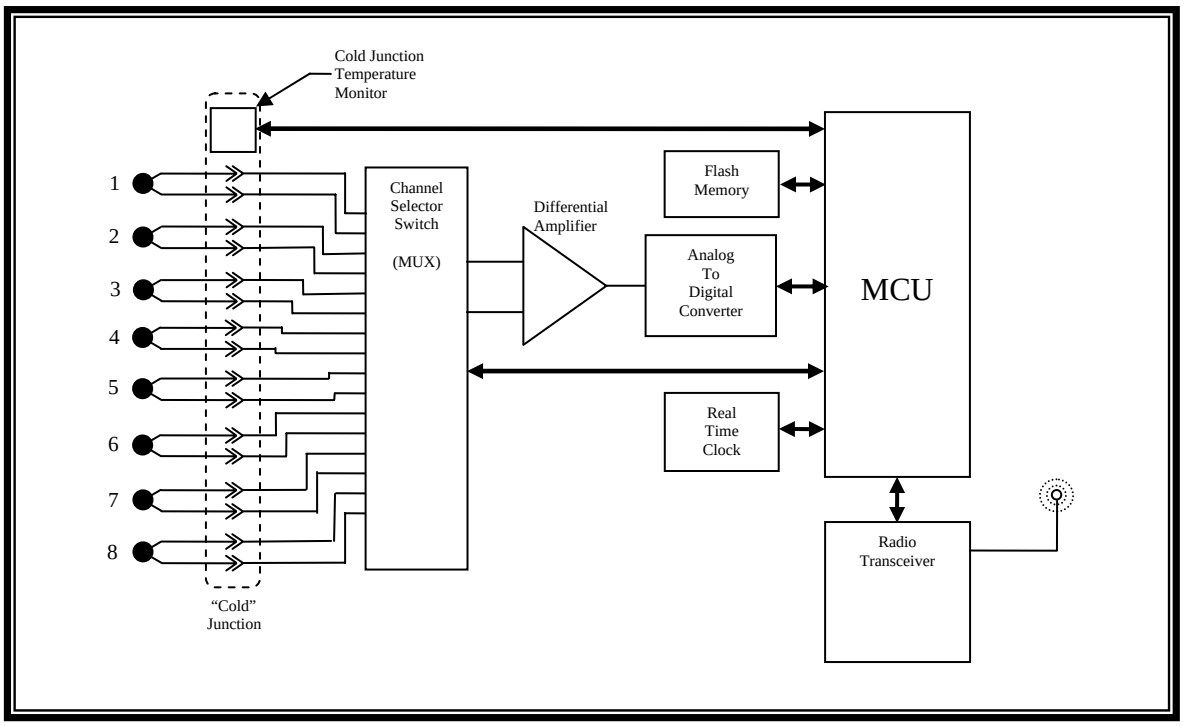
How the ThermoSpyder Works

A simplified block diagram of the ThermoSpyder with a thermocouple assembly attached is shown below.



To make a measurement, the microcontroller unit selects the desired thermocouple by sending control signals to the channel selector switch. The switch connects the selected thermocouple across the inputs of the differential amplifier. This low-noise, zero-drift amplifier magnifies the relatively small thermocouple voltage such that an effective measurement can be made. The amplified voltage is presented to the input of the analog to digital converter where it is converted to a digital code. The digital code is read by the microcontroller unit and stored in memory. In order to interpret the digital code representing the thermocouple temperature correctly, the "cold" junction voltage must be compensated. The ThermoSpyder uses an integrated circuit temperature sensor to accurately measure the "cold" junction temperature and the microcontroller then performs software based compensation. The microcontroller then selects the next channel to be measured and the process is repeated as required. The radio transceiver is used to periodically transfer acquired temperature data to DataLink using the GateWay network access node. If, for any reason, the data is not transferred to DataLink, the ThermoSpyder stores the data in the flash memory and transmits the data later.