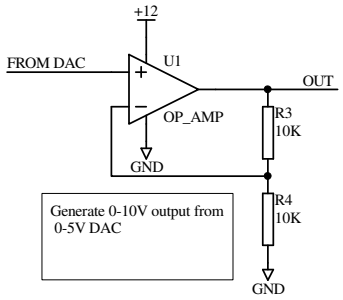
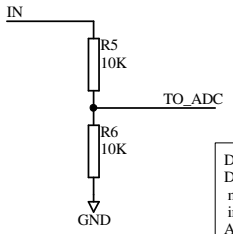
Simple Circuits for use with VM-1 ADCs and DACs



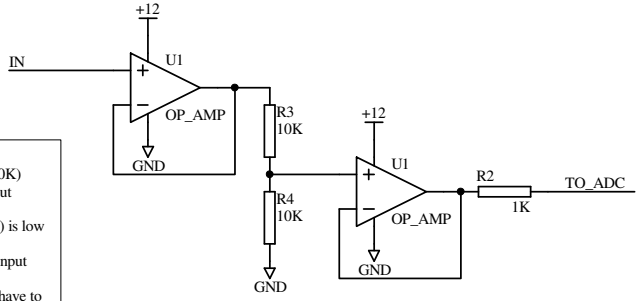
Generate 0-10V output from 0-5V DAC

0 - 10V Output



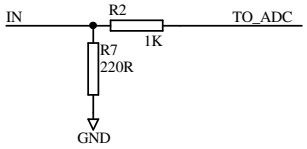
0 - 10V Input

Drop 0-10V signal down so it feeds a 0-5V ADC.
Disadvantages: low-ish input impedance of the cct (~20K) means it should be driven by something with low output impedance.
Also, check that the output impedance of this cct (~5K) is low enough to drive the ADC.
If either of these is a problem then use op amps in the input and/or output ccts.
If you do this, then the input amp (if you use one) will have to be powered from something like 12V.
The output amp (if you use one) has to have rail-to-rail inputs and outputs, or be powered from ~12V,
in which case it should have a ~1K resistor in it's output to protect the ADC in the case of over voltage faults.



0 - 10V Input

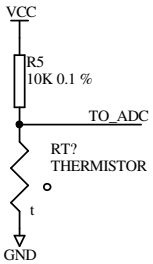
TO_DAC



Convert 4-20mA signal into signal in the range 0-5V, ready for input to ADC.
1K is to provide some input protection for the ADC in fault conditions.
Note: the current returns via GND. If you are using lots of these ccts.
then you may need to consider what tracks/wires this current is to flow through,
and check any related voltage drops don't affect the measurement.

4 - 20 mA Input

4-20mA output circuits are not simple and so are not shown here.



Thermistor Input

This cct. works best if the ADC is referenced to the supply (VCC) rather than to an absolute reference.
Choose the bias resistor value to be the resistance of the thermistor at around the centre of the temperature range required.
You may not need 0.1% precision here.
Don't use values much different to 10K because less means there will be self heating of the thermistor, and more means
the output impedance of the cct. is too high to read directly with most ADCs.
Algorithms to convert the ADC reading to temperature can be found on our website.

Simple Analogue CCTs	Micro-Robotics Ltd.
Revision:	The Old Maltings
Date: 19-Jun-2007 14:17:51	135 Ditton Walk
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