Single OpAmp Differential Input

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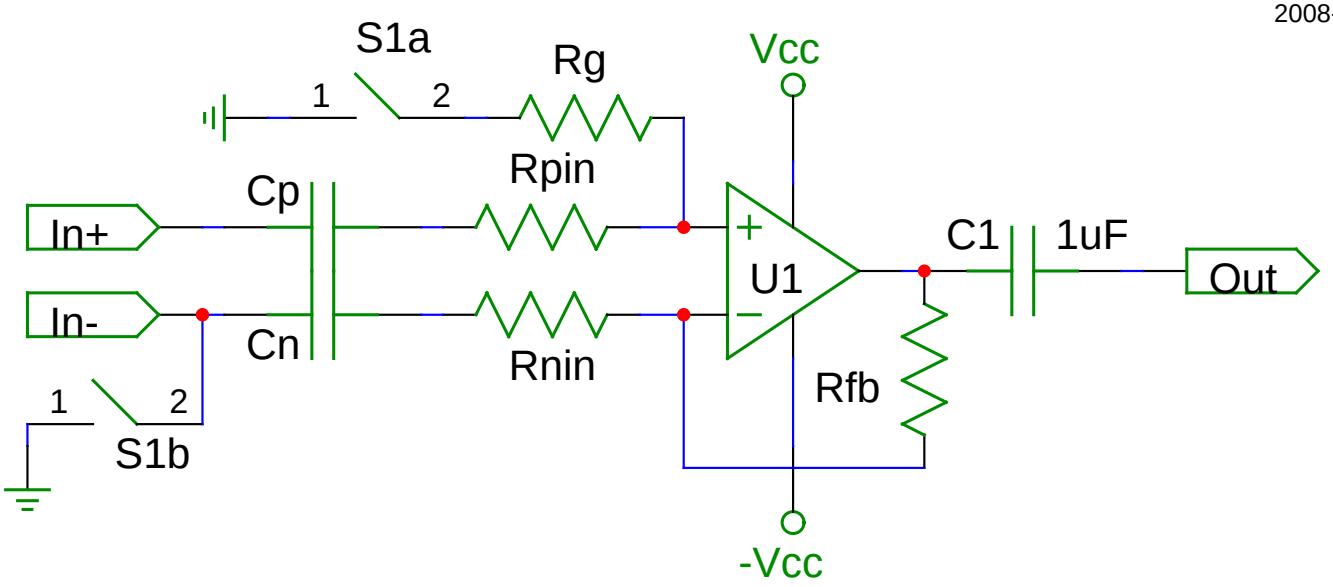

If all resisters are equal, then this is a buffer. Rg attenuates [In+] so its gain is unity on output.
Impedance imbalances on inputs will make CMRR less. Worst case CMRR is usually at 6db.
Meter and match resisters as carefully as possible.
When Rfb=Rg and Rpin=Rnin: gain = (Rfb/Rnin) * ([In+] - [In-])
Chosen values for Rfb are usually 10-50k.
Cp+Cn are DC removal on input (>1uF if needed). C1 is DC removal on output (if needed).
Warning: Cn+Rnin will form a high pass filter.
Warning: Rg bleeds off Cp and keeps it from floating. Cn and C1 may need similar.
Option: S1 is SPDT and quick converts this to single input (non-differential) mode. S1a is closed and S1b is open for differential input mode. For a better setup, S1 should be DPDT and also change Rpin to (Rfb||Rnin). Switch wiring would be: [In-] Gnd [Amp+] and (Rfb||Rnin) [Amp+] Rpin.
Option: Rpin and Rnin can be split in the middle with a pF range capacitor each going to ground to block RF noise.
Option: Cable impedance balancing help. Connect a 1k resistor from each input to each other. At the mid point, connect a 50k resistor to ground.
Option: 2 sets of back to back (pointed at or away from each other) zener diodes from each input (between Cp+Rpin and Cn+Rnin) to ground can be used for over voltage protection (mandatory clamps when phantom power is used).
Manual Trimming. Change Rg to variable. Join the two inputs together. Connect a test signal or small battery to the inputs with both signal and op amp grounds tied together. Adjust Rg until the output voltage is zero. This should give >40db CMRR.

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