

The following methods can be used to reduce noise in a measurement.

## 1. INTEGRATION

Each input channel is averaged over a programmable period of time to produce 1 measured value. This time is referred to as its integration time. This is extremely helpful at reducing high frequency noise ( $>1\text{KHz}$ ), and can be used to reduce power line noise as well by integrating for 1 whole power line cycle (e.g. 16ms or 20ms).

## 2. ANALOG FILTER

Each instruNet 100 voltage input channel has a programmable 1 pole 40Hz or 4KHz analog low pass filter that can be used to reduce higher frequency noise.

## 3. LOCAL EARTH GROUND

Attaching a wire from the instruNet 100 GND screw terminal to a local earth ground will reduce the chance of the instruNet box radiating at a high frequency w.r.t. earth ground (e.g. 100MHz at 1mVrms). This is sometimes helpful when measuring low level signals of  $< 10\text{mV}$ .

## 4. OPTICAL ISOLATION

Adding optical optical isolation via the #iNet-330 will reduce the chance of a ground loop disturbing a low level measurement. This is often necessary when reading a  $<10\text{mV}$  signal greater than 10meters from the computer. The #iNet-330 isolates the computer ground from the 1st instruNet device signal ground; otherwise, they are connected, current might flow, and voltage drops might be induced in the measurement circuitry or the measurement leads. This current/voltage may have several components: dc, power line frequency, or high frequency spikes (which could have been induced by millions of simultaneously switching transistors in a computer from hell with 1ns rise times).

## 5. GROUND A RADIATING THERMOCOUPLE

To reduce the chance of a thermocouple radiating at a high frequency (e.g. 100MHz at 1mVrms), it is sometimes helpful to attach the thermocouple negative lead to instruNet GND terminal.

## 6. DIGITAL FILTER

Each instruNet channel includes a programmable digital filter, with a programmable cut off frequency. This can be used to reduce noise above the specified cutoff frequency.