# Driving high current loads with the iNet-100 Vout

*Application Note #38, 7/27/2002*

The instruNet 100 has a voltage output screw terminal that is used to provide excitation to different various sensors. Each sensor type has its own current requirements (i.e. milliamps of Vout output current), as discussed below.

**What load does my sensor require?**

This varies depending on the sensor. For example, a 350ohm strain gage typically puts out 2mV per 1 Volt of applied excitation. One might want to apply 4V excitation, so that 8mV max comes out, and then read this with the +/-10mV voltage input. And this requires 11.4mA of drive capability from the instruNet voltage output (4V / 350ohm = 11.4mA). The iNet-100HC, which is capable of supplying 15mA would suffice, whereas the iNet-100 or iNet-100B would not.

**What current can instruNet provide?**

| Product | BNC Connectors | Vout Max Current | Vout max Cap. |
|---|---|---|---|
| iNet-100 | no | 4 mA | 1,000pF |
| iNet-100B | yes | 4 mA | 1,000pF |
| iNet-100HC | no | 15 mA | 10,000pF |

Adding a load to the Vout screw terminal increases the current drawn from the instruNet +/-12V power supply inputs; and the user must make sure that adequate power is supplied to the units. For example, an instruNet box without any loads draws 80mA of +/-12V power, and with 8x 15mA loads with alternating positive and negative voltage, it would draw 80mA + (4 * 15mA) = 140mA from the +12V supply and 140mA from -12V supply.

**External Power Supply**

The user has the option of supplying excitation via their own external reference voltage, and then telling instruNet what voltage is applied by entering this value into the Vout field of the Constants Settings group and making the Ro value negative to indicate an external power supply. If the user provides their own power source (e.g. 5V), it is recommended that they run this voltage though a voltage reference IC (e.g. the National Semiconductor LM4040A-4.1 device has a .1% initial accuracy). Note that these reference IC's are very stable and accurate, yet usually only provide 15mA of current; therefore multiple IC's might be needed when powering multiple devices. Powering a sensor directly from a power supply is ok if accuracy of several percent is acceptable. A precision power source that provides much current (several hundred milliamps) at a precise voltage would be most useful with multiple sensors that require much (e.g. >10mA) current.