Agilent E3630A Triple DC Power Supply

and

Agilent 34401A Digital Multimeter (DMM)

Agilent 3630A Triple DC Power Supply

The DC power supply used in this lab is the Agilent E3630A Triple DC power supply. It has three separate power supplies that are internally joined. This produces 3 separate and adjustable dc voltages. One output varies from 0 to 6 Volts and has a larger maximum current capacity for use with ICs. The other two produce plus and minus voltages that can be varied from 0 – 20 Volts and are used to bias op amp circuits and/or transistor circuits. The input jack called COM (Common) is common to all 3 power supplies. So the + 5 output is +5 V above common, the + 20 output is +20 V above common, and the – 20 V output is 20 V

below common. The input jack on the far right is normally not used and is connected to the ground wire in the AC power cord for the instrument.

Agilent 34401A DMM

The DMM is the Agilent 34401A which can be used to measure dc or ac voltages and currents as well as frequency and resistance. It is known as $6\frac{1}{2}$ digits which means that if there are 7 digits displayed the most significant digit won't be a 9 due to the way the instrument performs an AD conversion.

Both the power supply and DMM have female banana jack plugs. The types of leads that are used to connect circuits to either instrument are known as banana plugs because of the resemblance to small metal bananas. (These are the male banana plugs.) Other types of leads can be used but the banana plugs are preferable.

Turn on the dc power supply and the DMM using the ON/OFF button on the lower left of the front panel. Make sure the button on the DMM in the lower right is set for terminals on the front of the instrument. (Button in lower right is out.) Obtain two male to male banana plug leads from the wall rack in the lab room.

Press the button +20 V on the dc power supply and adjust the +/- 20 V rotary knob until it states 10 V on the display for the dc power supply. The voltage and current being produced by the supply are indicated. Connect a lead from the + 20

V jack to the COM. Note that the voltage drops to zero and the current supplied is indicated and a yellow overload light turns on. Record the value of the short circuit current.

$$I_{sc} = \underline{\hspace{5cm}}$$

Remove the lead.

Connect one lead from the COM (Common) on the dc power supply to the LO (low) input on the right of the DMM. Connect the other lead from the + 20 V jack to the dc power supply to the Input on the DMM indicated with V Ω→. Record the dc voltage indicated by the DMM and the dc power supply.

$$V_{DMM} = \underline{\hspace{5cm}}$$

$$V_{supply} = \underline{\hspace{5cm}}$$

If the least significant bits are varying record a typical value.
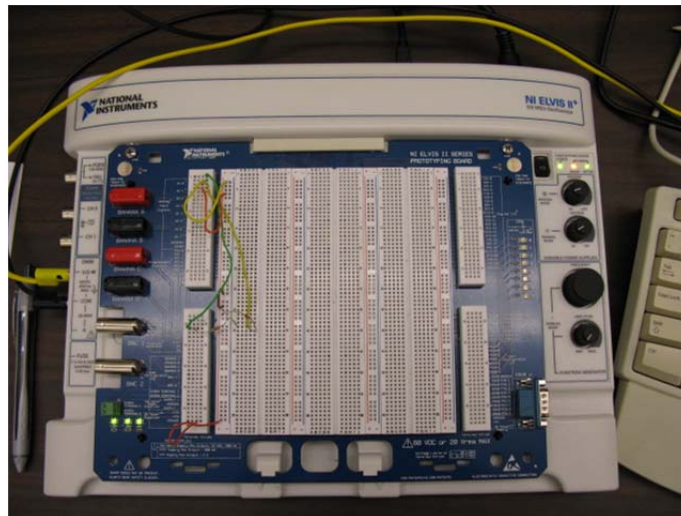
ELVIS II$^+$

ELVIS

ELVIS (Educational Laboratory Virtual Instrumentation Suite) is a DAQ (Data Acquisition) device manufactured by National Instruments that allows a pc to be used as the computational device. It has ADs and DAs which enable it to produce and measure voltages. It can be used as a DMM, oscilloscope, RCL meter, or FG. It

can also be used with user written programs with their signature product the graphical program LabVIEW. The display for these instruments appears on the screen of a computer. This version of ELVIS is known as ELVIS II[+].

Turn on the ELVIS workstation; use the switch on the upper right topside and switch it on. Log onto the pc and start ELVIS in Start Programs, National Instruments, NI ELVIS, Instrumentation Launcher, DMM. Connect the two leads that were connected to the Agilent DMM to the ELVIS DMM input (banana jacks on left side of ELVIS). Press Run on the ELVIS DMM front panel and record the value measured by ELVIS.

$$V_{ELVIS} = \rule{4cm}{0.4pt}$$

$$V_{supply} = \rule{4cm}{0.4pt}$$

Obtain Verification Signatures from the Laboratory Instructor after the data has been recorded.

Resistance Measurement

Turn off and remove the leads from the dc power supply. Leave the leads attached to the ELVIS and add alligator clips to the end of each of the two free ends. Connect the two leads together, press the Ohm symbol on the DMM ELVIS softpanel, and the null offset on the ELVIS front panel.

Perform the Resistance Measurement section in Experiment 1 in the lab manual. Build the resistance networks on your breadboard; *DO NOT USE the ELVIS breadboard*. Record the resistances measured by ELVIS for each of the resistor networks. Also measure the same resistance networks with the Agilent 34401A DMM. To use the Agilent DMM as an Ohmmeter press the button on the instrument Ω 2W (Ohms Two Wires).

Obtain Verification Signatures from the Laboratory Instructor after the data has been recorded.