

LAB 2.1 POWER SUPPLY MEASUREMENTS

Name: _____

Date: _____

Read the Electricity and Multimeters.pdf before attempting this lab.



Precautions:

- For unknown voltages, set scale to highest setting.
- Take measurements with power on and connectors plugged in normally unless noted otherwise.
- Never short meter leads unless a continuity test is requested.
- Be careful not to accidentally short out and components on boards being measured.
- Remove metallic jewelry that might accidentally touch components in computer (e.g. rings & watches)

Go to the ninth page of the Electricity and Multimeters.pdf and review:

How to Measure the Voltage of a Power Supply

The computer must be turned on to test the power supply output. Be very careful not to touch any chips or disturb any circuit boards as you work.

You can hurt yourself if you accidentally create a short circuit from the power supply to ground through the probe. Make sure the probes only touch one metal object, preferably only a single power pin on a connector, or you could cause a short. Because of the danger of touching a hot probe to a ground probe, you might prefer not to put the black probe into a ground lead too close to the hot probe.

Be certain the multimeter is set to measure voltage and not current (amps). If the multimeter is set to measure current, you might damage the power supply or motherboard or both.

Dell ATX power supplies and motherboards made after 1998 might not use the standard P1 pinouts for ATX, although the power connectors look the same. For this reason, never use a Dell power supply with a non-Dell motherboard, or a Dell motherboard with a non-Dell power supply, without first verifying that the power connector pinouts match; otherwise, you might destroy the power supply, the motherboard, or both.

ATX Power Connector Standards

Complete ATX Standard Table defined at internet site: http://www.hardwarebook.info/ATX_v2.2_Power_Supply

Measure the pin voltages and record in the table below. For ALL readings, use 20 V DC voltage settings with black meter lead in any of the black wire holes.

ATX v2.2 Power Supply

As specified in ATX Specification, from 2.2.
As specified in ATX12V Specification, from v2.0.

Pinout

24 PIN MOLEX 44206-0007 at the motherboard

24 PIN MOLEX 39-01-2240 at the cable



Table 1

Pin	Color	Voltage	Pin	Color	Voltage
1			13		
2			14		
3			15		
4			16		
5			17		
6			18		
7			19		
8			20		
9			21		
10			22		
11			23		
12			24		

ATX Power supply voltages normally include voltages of +3.3 volts, ± 5 volts, and ± 12 volts. Calculate acceptable minimum & maximum voltage values using the assumed acceptable tolerances listed in table below. Record calculated acceptable minimum and maximum values in table.

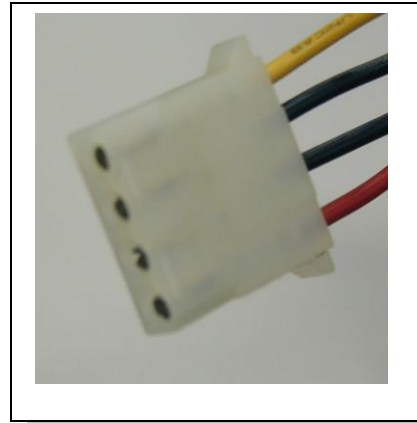
Nominal Value <volts>	Acceptable Tolerance	Acceptable Minimum Value <volts>	Acceptable Maximum Value <volts>
+3.3 volts	± 0.2 volts		
+5 volts	$\pm 10\%$		
-5 volts	$\pm 10\%$		
+12 volts	$\pm 10\%$		
-12 volts	$\pm 10\%$		

Compare the readings in Table 1 with the acceptable Minimum and Maximum values.
Question: Are all of the readings with acceptable ranges (Yes or No)? _____

Measure the Molex Connector DC voltage values. Record values in Dell ATX Connector Table below. For ALL readings, use 20 V DC voltage settings with black meter lead in either of the two unconnected MOLEX black wire holes. Measurements can be made on any of the unused Molex connectors.

Table 2

Dell ATX Motherboard MOLEX Connector Table		
Pin	Standard Voltage	Recorded Voltage
Yellow	+12V	
Black	GND	
Black	GND	
Red	+5V	



Compare the readings in Table 1 with the acceptable Minimum and Maximum values.
Question: Are all of the readings with acceptable ranges (Yes or No)? _____

Review Questions

1. What is the electrical voltage from the house outlet to the power supply?
2. What voltages are supplied by the power supply on your system?
3. What model of multimeter was used in this lab?
4. List the steps to set this multimeter to measure resistance?
5. Besides voltage and resistance, what else can this multimeter measure?