The Power Supply

- Power supplies transform AC from wall outlet to DC for the computer
- Standard connectors for motherboard are 20-24 pin ATX and 4-8 pin P4
- Use Molex and SATA connectors for peripherals and drives

ATX Style Power Supply - Most common type of Power Supply used today

Most Power Supply's will auto-sense the Voltage coming from the outlet
US 120V; Europe 230V
If this isn't auto-sensing, you'll see a red slider by the fan

Air goes through the Power Supply (from inside the PC, to the outside of it)

Technically not supplying power. They're Step-Down Transformers, converting AC to DC Power

Primary ATX Power Connector for the Mobo
Power Supply's provide 12V (yellow wire), 5V (red), and 3.3V (orange)

The Original ATX Standard has a 20 Pin Connector that plugged onto every Mobo there was.
Later they realized they needed more power, so they added 4 more Pins (24 Total)

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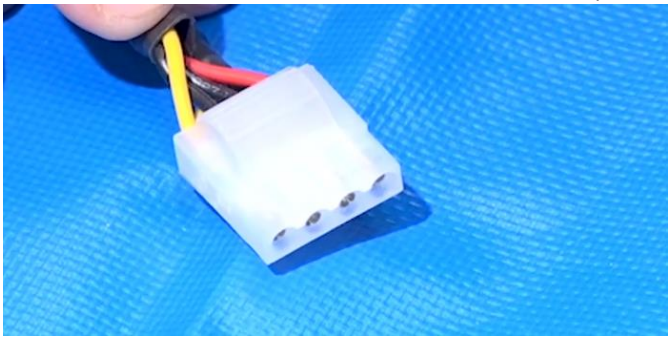
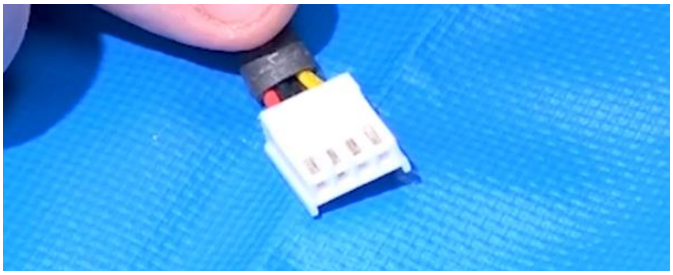
ATX12V - Extensions to the original ATX Power allowing us to put more electricity into the Mobo
Some Mobo's only need 1 Plugged in, others need both

These are essentially what power the Mobo,
but there's more to power in the case (Hard Drives; Video Cards; etc)

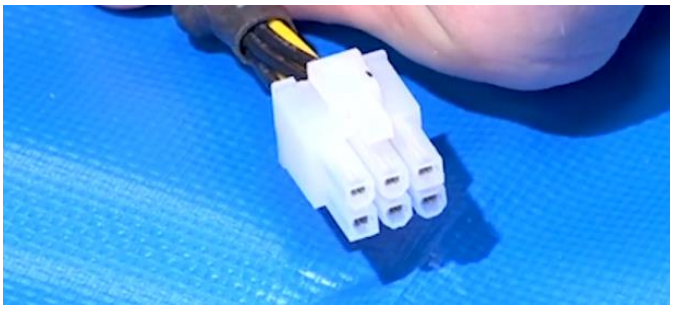


Molex - 5V & 12V - Power systems



Mini Connector - Floppy Drive, and other devices

SATA Power Connection - Hard Drives; Optical Media



PCIe Connector - High-End Video Cards (need a little extra power)

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Modular (Connector) Power Supply - Allows you to choose what cables you actually want/need

The power supply comes with the wires

What's nice about this is the older power supplies came with a bunch of wires pre-soldered on the power supply. If you didn't use the cable, you had to do your best to zip-tie the loose ends and shove them in the case.

Connect the Primary ATX Power Connector & ATX12V

Don't plug in anything else until after the installation of the Power Supply and knowing what you actually will be needing

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Choosing a Power Supply

- Get a PSU with a little more wattage than your system needs
- Shop for higher-efficiency power supplies
- Modular power supplies cut down on cable clutter

Buy your Power Supply based on the Watts (ex: 460W; 575W; 750W; 1500W)

Volts x Amps = Watts
(Energy per Charge x Charge per sec = Energy per sec)

This formula isn't perfect because there is energy loss in imperfect systems through heat & the wiring

How much wattage do I need? (very subjective question)
Think about your needs for your
Mobo; Video Cards; Hard Drives; etc
(keep in mind this is the max wattage displayed for these components)

Find a Wattage calculator online & make your best guess (add 20%)

Mike buys 750-1500W Power Supply's and never has any issues

80 Plus Rating System - Indicates a High Efficiency Power Supply of 80%
vs 60% which is common
(loss of efficiency due to heat in the power supply being in non-ideal conditions)

750W Theoretical x 80% = 600W Actual

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80 Plus test type	115 V US			
Percentage of rated load	10%	20%	50%	100%
80 Plus		80%	80%	80%
80 Plus Bronze		82%	85%	82%
80 Plus Silver		85%	88%	85%
80 Plus Gold		87%	92%	89%
80 Plus Platinum		90%	92%	89%
80 Plus Titanium	90%	92%	94%	90%

80 Plus test type	230 V EU			
Percentage of rated load	10%	20%	50%	100%
80 Plus		82%	85%	82%
80 Plus Bronze		85%	88%	85%
80 Plus Silver		87%	90%	87%
80 Plus Gold		90%	92%	89%
80 Plus Platinum		92%	94%	90%
80 Plus Titanium	90%	94%	96%	94%

Modular vs Solder Power Supplies - People claim that Modular reduces efficiency,
but wire management is so much nicer

Standard ATX Size covers the majority of systems (Mobo)
A lot of the Small Form Factor Systems fit that full size ATX power supply

There are Smaller Power Supply's in ATX Standard for very small form factors

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Cooling Your System

- You can maximize the airflow in your PC
by practicing proper cable management and regular cleanings
- Used canned air or a PC blower instead of a vacuum when cleaning out a PC
- A mobo's BIOS may have custom fan settings and temperature alerts

Purpose of Fans - intake cool air, and exhaust hot air

Placement of the Fans relative to the PC….
To bring cool air in,
Front - 1 or 2 fans
Bottom - maybe 1 fan
To exhaust the hot air,
Back - 1 fan
Top - 0 fans

Compressed/Canned Air - clean out the dust!

BIOS - manage thermal/fan settings
System fans, CPU fan
Enable "Smart Fan Mode", or Disable this mode to configure this yourself

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Installing and Troubleshooting a PSU

- Always double check cable connections when building out your PC
- If a PSU has died out, your system will not boot up and the PSU fan will not spin
- PSU problems can present themselves in a variety of ways ranging from random rebooting to complete system lockups

Non-Modular Power Supply - all the wires are pre-attached to the Power Supply Unit.
You cannot remove any of the wires,
which makes it a little messy when it comes to Cable Management

Modular Power Supply – connect only the cables you need!
This makes for great Cable Management!

Types of Cables
24-Pin Motherboard Power Cable

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8-Pin CPU Power Cable

Power Supply Tester (aka ATX Tester) – connects the 24-Pin Motherboard Power Cable and the 8-Pin CPU Power Cable

Compare the values on the display to the PSU Manual provided by the vendor

If you have any PSU Issues you may experience….

Random Reboots
Beep Codes on Startup
System Lockup

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