
ATX Power Supplies

Configured as a bench supply

Techno-Plaza - July 20, 2020



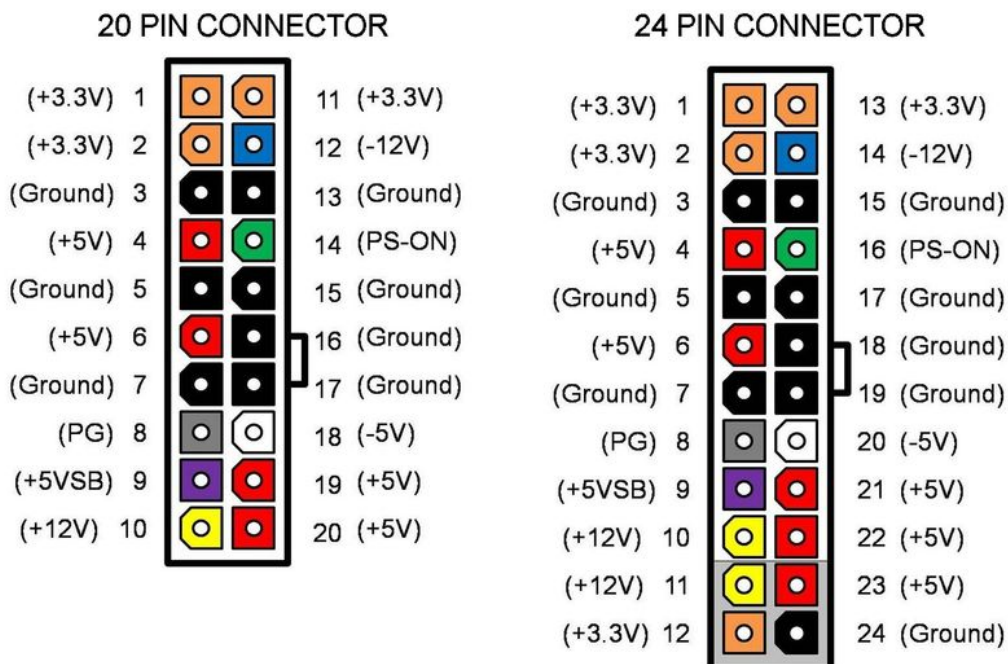
Introduction

The ATX standard is based on a specification introduced by Intel in 1995 (currently revision: <https://www.intel.com/content/dam/www/public/us/en/documents/guides/power-supply-design-guide-june.pdf>).

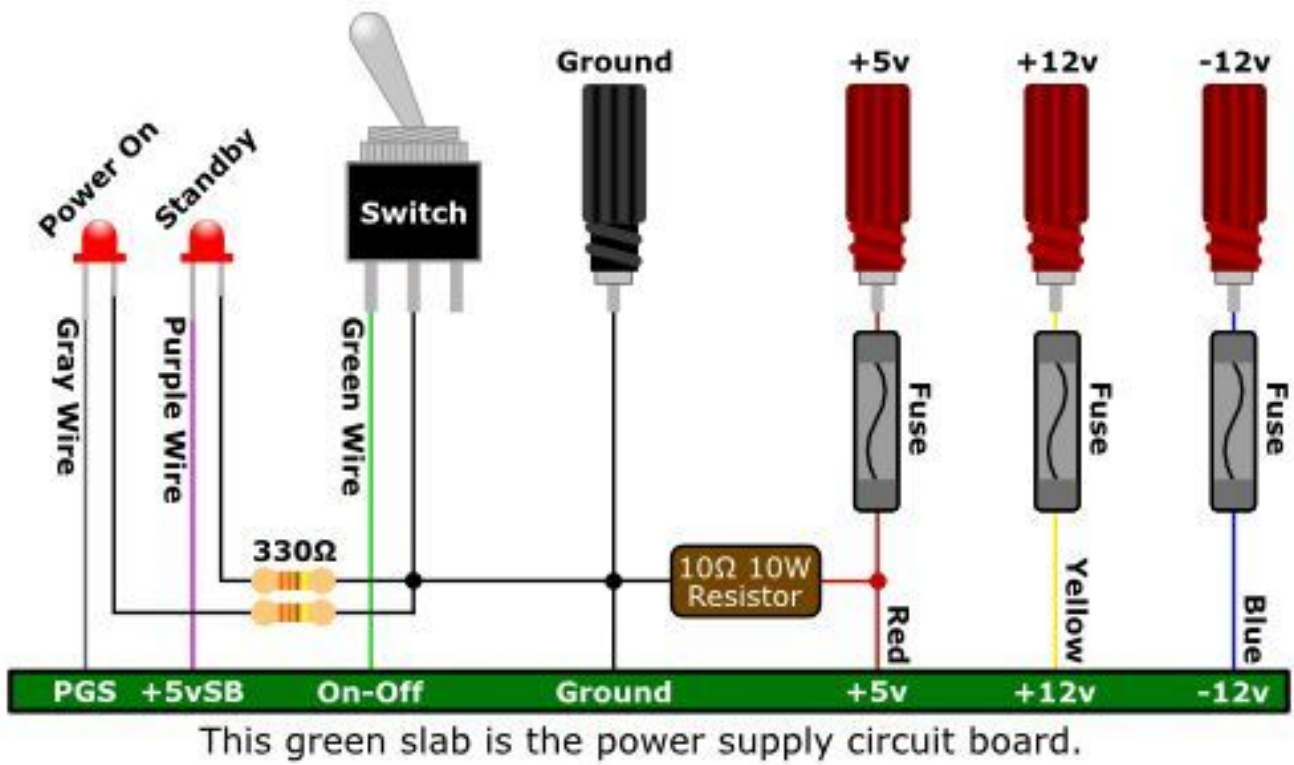
Besides the +5V, +12V, -12V, +3.3V commonly used by a computer that is supplied from an ATX power supply, there are control signals and a keep-alive voltage that have to be understood.

Notice on pin 9 of the figure below the +5VSB or standby voltage that supplies a small amount of power to the motherboard enabling the computer to quickly restart, rather than performing a full, lengthy, boot cycle. There is also a -5V output rarely used anymore.

The control signals are the PS-ON or power-on and the PG or power good signal. The power supply is turned on by grounding the PS-ON signal. This is a logic signal that is held high by an internal pull-up resistor. When the supply voltages rise two things happen. The PG logic signal goes high when all the voltage reach specified levels. Second the supply looks for a load on the +5V. If it doesn't see some current draw, the supply powers down. Usually, the motherboard has sufficient load to meet this requirement, but if the supply is being used as an independent bench supply, one has to provide a load resistor to provide about 100ma load.



Here is a typical way to configure an ATX supply as a bench supply.



I have built a few bench supplies using ATX and used a 50 ohm 5W resistor with good success. This reduces the heat generated by the standard approach.