USB Connector Pinouts

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USB is a serial bus. It uses 4 shielded wires: two for power (+5v & GND) and two for differential data signals (labelled as D+ and D- in pinout).
In a USB data cable Data+ and Data- signals are transmitted on a twisted pair with no termination needed. Half-duplex differential signalling is used to reduce the effects of electromagnetic noise on longer lines. D+ and D- operate together; they are not separate simplex connections.

USB supports four data rates:

- Low Speed (1.5 Mbit per second) that is mostly used for Human Input Devices (HID) such as keyboards, mice, joysticks and often the buttons on higher speed devices such as printers or scanners;
- Full Speed (12 Mbit per second) which is widely supported by USB hubs.
- Hi-Speed (480 Mbit per second) was added in USB 2.0 specification. Not all USB 2.0 devices are Hi-Speed.
- SuperSpeed (USB 3.0) rate of 4800 Mbit/s (~572 MB/s).

A USB device must indicate its speed by pulling either the D+ or D- line high to 3.3 volts. These pull up resistors at the device end will also be used by the host or hub to detect the presence of a device connected to its port. Without a pull up resistor, USB assumes there is nothing connected to the bus.

Pinout for the various connectors are shown below