3. PS/2 Protocol

The PS/2 protocol allows synchronous, bidirectional bit-serial communication between the host and the pointing device. Either side may transmit a command or data byte at any time, although only one side can transmit at one time. During initialization, the host sends command bytes to the device. Some commands are followed by argument bytes. The device acknowledges each command and argument byte with an ACK ($FA) byte, possibly followed by one or more data bytes. If the host has enabled "Stream mode" transmission, then the device may send spontaneous data packets to the host describing finger motions and button state changes.
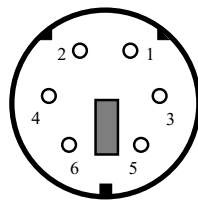
TouchPads integrated into notebook computers typically use the PS/2 protocol.

3.1. Electrical interface

The PS/2 protocol includes two signal wires as well as +5V power and ground. The signal wires, CLK and DATA, are bidirectional "open-collector" signals; they are normally held at a high (+5V) level by a 5–10K pull-up resistor on the host, but either the host or the TouchPad device can pull them low at any time. When the port is idle, both signal wires are floating high. The host can inhibit the device at any time by holding CLK low.

Note that neither side ever actively pulls CLK or DATA high; to output a logic 1, the wire is left undriven and allowed to float high. The CLK and DATA lines should have a total capacitance of no more than 500pF to ensure that the 5–10K pull-up resistor is able to drive them to a high voltage level in a reasonable time.

An external PS/2 mouse port uses a mini-DIN-6 connector with the following pinout (male connector view):

1	PS/2 DATA
2	N/C
3	Ground 0V
4	Power +5V
5	PS/2 CLK
6	N/C

Figure 3-1. PS/2 cable pinout

On the Synaptics Standard PS/2 TouchPad module TM41P*xx*134, the 8-pin FFC connector has the following pinout:

1	2	3	4	5	6	7	8
Power +5V	PS/2 DATA	PS/2 CLK	Right Switch	Left Switch	Ground 0V	N/C	N/C

Figure 3-2. PS/2 module connector pinout