Capacitance vs. Length of Run

RS-232 Cables and Connector Options

Cables:

RS-232 serial interface cables should be shielded, low capacitance cables, ideally designed specifically for serial data transmission.

Grounding:

The shield should be grounded at both ends of the cable. Chassis Ground available on the shell of DigiBoard's DB-25 and DB-9 connectors, and pin 4 of our 10-pin RJ-45 connector, is ideal for this purpose.

Environment:

While good shielding provides reasonable protection against "noise" (Electro-Magnetic Interference, or EMI), cables should still be routed away from noise sources wherever possible. Avoid laying cables in close proximity to transformers, generators, motors, fluorescent lights, etc.

Capacitance vs. Length of Run:

The total capacitance of a cable affects the integrity of transmitted data. As a rule of thumb, the total capacitance of a cable (including the connectors) should not exceed 2500 pF. Serial interface cable is usually rated in pico Farads per foot. Therefore, if a cable has a capacitance of 50 pF/ft, and the connectors are 100 pF each, the maximum recommended cable length is 46 feet. If the cable is rated at 12.5 pF/ft, the maximum recommended cable length is 184 feet, and 5 pF/ft cable can be run up to 460 feet.

In situations where low-capacitance cable is unavailable, or very long cable runs are required, "short-haul" modems, available from suppliers such as Black Box, can be used to increase the effective range of the RS-232 interface. Short-haul modems are similar to standard modems, except that they are connected directly to each other via a cable instead of going through a telephone circuit.

NOTE:_Use only externally-powered short-haul modems with DigiBoard products.