

To: X3T9.2 X3T9.2/92-215
From: Bill Ham (DEC)
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Subject: 50 line to 68 line connections for SPI

The SPI document presently describes a scheme to connect a 50 line "A" cable to a 68 line "P" cable. The present description does not address the differential option and leaves the A cable "open" line unconnected from the term power. This document proposes how this 50 to 68 line connection should be accomplished for SPI.

With a 50 to 68 connection two reserved lines in the A cable cannot be used since there are only two reserved lines available in the P cable and the A cable has four reserved lines. Therefore the reserved lines on pins 12 and 37 are left open in the 50 line side. This applies to both single ended and differential implementations.

The reserved lines on pins 27 and 28 in the A cable are connected to the reserved lines on pins 19 and 53 respectively in the P cable for both single ended and differential implementations.

All four term power lines (pins 17, 18, 51, and 52) are connected together in the P cable and this common connection is connected to both pins 38 and 13 in the A cable. Pins 13 and 38 are both term power lines in the differential pinout for the A cable but only pin 38 is designated for term power in the single ended pinout for the A cable. This means that pin 13, which is designated as "open" in the single ended A cable, becomes a term power pin.

Wiring the 50 to 68 connection in the above way makes a single solution for both single ended and differential. It raises the possibility that pin 13 could be grounded by some early SCSI-1 devices that grounded pin 13. If this were to happen the term power would become grounded.

The single ended A cable does not benefit from an extra term power line because single ended terminators are designed to use only pin 38 for term power. If a single ended terminator were wired to both pins 13 and 38 (to take advantage of both single ended term power lines) then this terminator could short term power in systems that do not use any 50 to 68 connections but have one or more devices that connect pin 13 to ground.

The proposed wiring rules are intended for SPI devices where pin 13 is not grounded in the single ended connections. Therefore a single cable set for both differential and single ended is maintained in SPI.

There are two basic kinds of 50 to 68 connections:

- (1) An A cable is connected in series with a P cable
- (2) A 50 pin "tap" is made to a P cable

In case (1) the 18 lines in the P cable that do not continue into the A cable (DB8 thru DB15 and P1) must be terminated in the P cable within a stub length of end of the 18 lines.

In case (2) there are two sub-cases:

- a) Where the 50 pin tap is an 8 bit termination point
- b) Where the 50 pin tap is a stub off the 68 line cable (unterminated)

In case 2a DB8 thru DB15 and P1 in the P cable must be the only lines terminated in the P cable and the remaining lines in the P cable should not extend more than a stub length beyond the tap. In case 2b the termination for all active lines must be done within a stub length of the end of the P cable.

All lines passing through both the 68 and 50 connections that are not specifically mentioned above are connected to the pins with the same function (DB0 goes to DB0, REQ to REQ etc.).