To: X3T9.2 Membership

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Subject: Comments on X3T9.2/92-139r0, Blind-pluggable connector

We strongly support a standard definition for the configuration pins
in a "combo connector". Ideally all configuration pins necessary for
"normal" use would be in the combo connector, but the limited pins
available make this a challange. Below are some thoughts on
accomplishing this. If more configuration pins are needed than are
available on the combo connector, Digital would support standardizing
their definition and placement as well. We would also support
standardizing the placement of any on-board indicators, such as a
Fault LED.

Overloading Output and Ground Pins

Ground pins have commonly been placed adjacent to SCSI ID select pins,
allowing the ID to be selected with jumpers. However, it is not
necessary to jumper ID pins to ground, it is sufficient to merely
jumper them to a signal that is low when the ID is being read. Thus
the pins adjacent to the SCSI ID select pins can be used for outputs,
provided that those outputs can be pulled low whenever the drive reads
its SCSI ID during initialization.

One attractive possibility are the (open-collector) outputs used to
drive external Fault and Activity LEDs. Such LEDs are commonly
illuminated during initialization as a lamp test. The drive need
merely perform a "lamp test" when it reads its SCSI ID.

Another possibility might be the spindle sync reference. Normally all
drives in an array power-on and initialize at a time when spindle
synchronization is irrelevant. If isolated drives occasionally
initialize and "glitch" the spindle sync reference, it will not
significantly affect synchronization. And if drives are initializing
often enough to prevent synchronization, then the array has far worse
problems than being unsynchronized. Note that we simply define the
spindle sync reference as being open-collector, wired together, and
pulled low during initialization. The meaning during normal operation
would be (drive) vendor unique. Also we can maintain compatibility
with current spindle sync implementations by pairing this with SCSI ID
bit 3, so that it need only be pulled low for drives that support 16
SCSI IDs.

Suggested Pin Definitions

The following pin definitions are based on the above pin overloading
suggestions and configuration settings that Digital has found useful.
Also, these assume that 12 configuration pins are available on the
combo connector, which is the most recent rumor I've heard.

Pin   Description

1. SCSI ID select 0 input.

2. Open-collector output for external Fault LED. Pulled low during initialization.

3. SCSI ID select 1 input.

4. Open-collector output for external Drive Activity LED. Pulled low during initialization.

5. SCSI ID select 2 input.

6. Vendor Unique open-collector output or ground. Pulled low during initialization.

7. SCSI ID select 3 input.

8. Open-collector output for spindle synchronization reference. If the drive supports 16 SCSI IDs, then it shall pull this signal low during initialization. Enclosure vendors should connect this pin to the same pin of other drives in an array. Note that spindle synchronization is only effective if all drives in the array are the identical make and model.

9. Enable termination input. Connect to ground to enable the drive's terminators, leave unconnected to disable them.

10. Ground.

11. Drive quiesce and external fault indication input. Normally pulled high or left unconnected. Pulled low to request that the drive cease operation and illuminate its on-board fault LED (if any). Used to indicate an impending power failure or drive removal. (We would prefer two separate inputs, but it's more important to get both functions within the available configuration pins).

12. Spinup control input. If left unconnected, drive spins up automatically when power is applied. If pulled low, drive does not spinup until instructed to do so by a START STOP UNIT command.

For reference, the following are the configuration settings that we would expect to see elsewhere on the drive module:

1. Enable / disable firmware replacement.

2. Supply / don't supply TERMPWR. This appears unnecessary in a self-configuring board-mounted connector environment, as the board containing the connectors contains both TERMPWR and power supply signals, so it can provide TERMPWR itself.