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To: T10 Technical Committee
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Subj: **SPI-4 ISI reduction via transmit pre-compensation**

Change Control

Rev.	Date	Description of Change
0	9/9/99	Initial Document

1. PROPOSAL SUMMARY

The effects of timing distortions on SCSI signal lines that remain in a single state for an extended duration of time (often referred to as the “First Pulse Problem”) can be reduced by transmit signal pre-compensation. This compensation may be composed of either timing modifications, drive current modifications, or both.

1.1 Primary Goals

- To reduce or eliminate pattern dependant run length induced timing variations.
- Ensure a more robust signal crossing amplitude for first pulse events.
- May be implemented by any device that sources signals on the SCSI bus.
- Easy to implement with a minimum gate count impact.

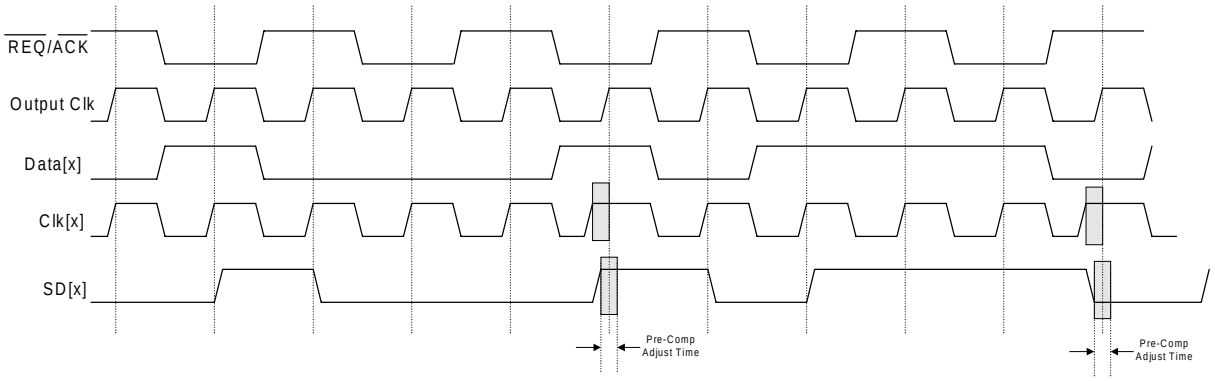
1.2 Assumptions

- Open loop correction method that does not require training or destination involvement.
- Locally induced timing variations are small with respect to local timing budget.

2. Implementation Method

The major source if signal timing errors relating to the first pulse phenomenon is caused by the propagation delay variation of the receiver due to input amplitude fluctuations. It is recommended that an open loop correction method to increase the energy content of the first pulse following an (n)bit run length be used. Advancing the output clock, for example, has the effect of pulling the transition to an earlier time and allows the receiver extra time to detect it.

Output Pre-compensation



NOTE: The same run length detection logic could also be used to adjust the amplitude of the bit being corrected although it would require the additional logic to intelligently back the current down to normal operating levels upon completion of the boost event.