Proposed Draft

Serial ATA International Organization

Version 0
March 12, 2007

Serial ATA Revision 2.6 ECN # 010
Title : Power State Resume Speed

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Document History

Version	Date	Comments
0	03/18/2007	Initial release.

1 Introduction

Within the current specification (sec 8.4.3.2), it is outlined that speed negotiation is bypassed when resuming from the Partial or Slumber states. There is some notation within the device state machines relative to device initiated sequences (DP6 Note 6), where this might be too specific as it was intended for all resume cases (host initiated or device initiated) to avoid re-negotiation of the interface rate.

2 Technical Specification Changes

2.1 Device Phy Initialization State Machine

[**Editor's Note:** The changes marked in red (and underlined/strikethrough) will be incorporated in section 8.4.2]

DP6: DR_SendAlign	Transmit $ALIGN_P$[1,2,3,5]	
1. $ALIGN_P$ detected from host (device locked to incoming data)[4].	→	DR_Ready
2. $ALIGN_P$ not detected from host and $ALIGN_P$ primitives transmitted for 54.6 us (2048[5] Gen1 $ALIGN_P$ primitives) at speed other than lowest[6].	→	DR_ReduceSpeed
3. $ALIGN_P$ not detected from host and $ALIGN_P$ primitives transmitted for 54.6 us (2048[5] Gen1 $ALIGN_P$ primitives) at lowest speed[6].	→	DR_Error
4. $ALIGN_P$ not detected from host and $ALIGN_P$ primitives transmitted for less than 54.6 us (2048 Gen1 $ALIGN_P$ primitives).	→	DR_SendAlign

NOTES:

1. If this is part of a recovery from a Slumber or Partial power management state, the device shall send $ALIGN_P$ at the previously negotiated speed. For all other cases, $ALIGN_P$ should be sent at the device's fastest supported speed. ~~$ALIGN_P$ should be sent at the devices fastest supported speed first.~~
2. $ALIGN_P$ primitives should be sent only at valid frequencies (if PLL not locked, send D10.2).
3. After COMWAKE is released as specified in the OOB signaling section, the device shall ensure the interface is active (not quiescent).
4. Device designers should be aware that the host is allowed 533 ns (20 Gen1 Dwords) after detecting the negation of COMWAKE to start sending D10.2 characters. Until this occurs, the bus is in an idle condition and may be susceptible to crosstalk from other devices. Care should be taken so that crosstalk during this window doesn't result in a false detection of an $ALIGN_P$. Devices may extend this timeout up to an additional 54.6 us (2048 Gen1 Dwords) (for a max total of 109.2 us), as necessary to allow their receiver time to lock to the host $ALIGN_P$.
5. Device shall not leave the bus idle more than 53.3 ns (2 Gen1 Dwords) longer than the required 175 ns to negate COMWAKE.
6. If this is part of a ~~device-initiated~~ recovery from the Slumber or Partial power management state, the device Phy ~~shall resume at the speed previously negotiated and~~ shall not reduce its speed in response to failure to establish communications. Upon failing to establish communications it should instead transition directly to the DR_Error state to initiate a retry of the COMWAKE sequence.