

# **AHCI 1.1**

## **Errata 004 Draft**



AHCI 1\_1 Errata\_004.doc

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# 1 Serial ATA Port Status Prior to Setting Start (PxCMD.ST)

## 1.1 Description of Technical Issue

Prior to setting PxCMD.ST to '1', software needs to check PxSSTS.DET = 3h according to section 10.3.1 of AHCI Revision 1.1. When the Serial ATA port is in Partial or Slumber mode, due to either device-initiated or host-initiated interface power management, PxSSTS.DET is not 3h. Thus, if the interface is in Partial or Slumber, software will never set PxCMD.ST. The correction to this issue is to ensure that the interface is in a valid state (Active, Partial, or Slumber) prior to PxCMD.ST being set to '1'.

## 1.2 Description of Correction to Specification

**Modify section 10.3.1 as follows:**

### 10.3.1 Start (PxCMD.ST)

When PxCMD.ST is set to '1', software is limited in what actions it is allowed to perform on the port (refer to section 5.3.2.3).

- It shall not manipulate PxCMD.POD to power on or off a device through cold presence detect logic (if supported by the HBA).
- It shall not manipulate PxSCTL.DET to change the Phy state
- It shall not manipulate PxCMD.SUD to spin-up the device (if supported by the HBA)

The above actions are only allowed while the HBA is idle, indicated by both PxCMD.ST and PxCMD.CR being equal to '0'. This is noted by the HBA state machine H:NotRunning state. If software performs any of the above actions while the port is not idle (PxCMD.ST or PxCMD.CR are set to '1'), indeterminate results may occur.

Software shall not set PxCMD.ST to '1' until it verifies that PxCMD.CR is '0' and has set PxCMD.FRE to '1'. Additionally, software shall not set PxCMD.ST to '1' until a functional device is present on the port (as determined by PxTFD.STS.BSY = '0', PxTFD.STS.DRQ = '0', and (PxSSTS.DET = 3h, or PxSSTS.IPM = 2h or 6h)).

**Modify section 5.3.2.3 as follows:**

### 5.3.2.3 P:NotRunning

P:NotRunning		HBA sets pIssueTag = 32. HBA sets pSlotLoc = CAP.NCS.	
1.	GHC.AE is cleared to '0'	→	P:NotRunning
2.	PxCMD.POD written to '1' from a '0'	→	P:PowerOn
3.	PxCMD.POD written to '0' from a '1'	→	P:PowerOff
4.	PxSCTL.DET written to '4h' from any other value	→	P:Offline
5.	PxSCTL.DET written to 1h from any other value and PxCMD.SUD = '1'	→	P:StartComm
6.	PxCMD.SUD written to '1' from '0' and PxSCTL.DET = '0h'	→	P:StartComm
7.	PxCMD.SUD written to '0' from '1' and PxSCTL.DET = '0h'	→	P:PhyListening
8.	PxCMD.FRE written to '1' from a '0' and previously processed Register FIS is in receive FIFO and PxSERR.DIAG.X = '0'	→	P:RegFisPostToMem
9.	PxCMD.ST = '1' and PxSSTS.IPM = (2h or 6h)	→	PM:LowPower
10.	PxCMD.ST = '1'	→	P:Idle
11.	D2H Register FIS received	→	NDR:Entry
12.	Else	→	P:NotRunning
NOTE:			
1. This state is entered asynchronously when GHC.AE is transitions from '1' to '0'. Disabling AHCI mode while commands are outstanding has indeterminate results.			