Proposed Draft

Serial ATA International Organization

Version 1
August 20, 2007

Serial ATA Revision 2.6 ECN # 022
Title : Editorial cleanup – 8KB, IDENTIFY DEVICE

Author Information

Author Name	Company	Email address
Brian Dees	Intel	Brian.m.dees@intel.com

Workgroup Chair Information

Workgroup (Phy, Digital, etc…)	Chairperson Name	Email address
Digital	Brian Dees	Brian.m.dees@intel.com

Document History

Version	Date	Comments
0	07/26/2007	Initial release.
1	08/20/2007	Inclusion of additional IDENTIFY DEVICE / IDENTIFY PACKET DEVICE editorial items.

1 Introduction

1.1 Problem Statement

SATA Rev 2.6 as a specification currently utilizes the “KB” term as shorthand in some cases to provide further clarification around amounts of data moved. The term itself (KB) may be interpretted as a mis-use of SI units, and the potential impact of this comment outweighs the benefit provided of having this term within a small amount of locations in the specification.

Additionally, the alignment & definition of IDENTIFY DEVICE / IDENTIFY PACKET DEVICE Word 49 is not consistent with the text material, as well as other specific values in other data words. This errata intends to align the table with existing text as the intended definition.

1.2 Solution Summary

Remove all references to the “KB” term from the specification.

Updates to Tables 73 & 74 to address inconsistencies.

1.3 Background (optional)

2 Technical Specification Changes

2.1 Proposed "8KB" Changes

[**Editor's Note:** The changes described below will be incorporated in sections 11.7, 11.9, 11.11, 11.12, and 13.9]

There are 8 total instances within the SATA Rev 2.6 specification in which the KB term is used, and all instances are used in a consistent manner. For all cases within the specification that have the following text "2048 Dword (8KB)", modifications are to be made to the text resulting in the following "2048 Dword ~~(8KB)~~".

2.2 Proposed "IDENTIFY DEVICE" Changes

[**Editor's Note:** The changes marked in red (and strikethrough) will be incorporated in section 13.2.1]

Table 73 – IDENTIFY DEVICE information

Word	O/M	F/V	
0-46			Set as indicated in ATA/ATAPI-6
47	M		Multiple Count
		F	15-8 80h
		~~F~~R	7-0 00h = Reserved 01h-10h = Maximum number of sectors that shall be transferred per interrupt on READ/WRITE MULTIPLE commands 11h-FFh = Reserved
48			Set as indicated in ATA/ATAPI-6
49	M		Capabilities
		~~R~~	15-1214 Set as indicated in ATA/ATAPI-6~~Reserved for the IDENTIFY PACKET DEVICE command.~~
		~~F~~	~~13~~ ~~1=Standby timer values as specified in this standard are supported~~
		~~R~~	~~12~~ ~~0=Standby timer values shall be managed by the device~~
		~~F~~	~~11~~ ~~Reserved for the IDENTIFY PACKET DEVICE command.~~
		F	11 1=IORDY supported
		~~F~~	~~10~~ ~~0=IORDY may be supported~~
		F~~R~~	10~~9~~ 1=IORDY may be disabled
		~~R~~	~~8~~ ~~Shall be set to one.~~
		~~X~~	~~7~~9-0 Set as indicated in ATA/ATAPI-6~~Shall be set to one. Retired~~
50-52			Set as indicated in ATA/ATAPI-6
53	M		Field validity
		R	15-3 Reserved
		F	2 1=the fields reported in word 88 are valid 0=the fields reported in word 88 are not valid
		F	1 1=the fields reported in words (70:64) are valid 0=the fields reported in words (70:64) are not valid
		F	0 Obsolete
54-62			Set as indicated in ATA/ATAPI-6
63	M		Multiword DMA transfer
			15-3 Set as indicated in ATA/ATAPI-6
		F	2 1= Multiword DMA mode 2 and below are supported
		F	1 1= Multiword DMA mode 1 and below are supported
		F	0 1= Multiword DMA mode 0 is supported
64	M		PIO transfer modes supported
			15-2 Set as indicated in ATA/ATAPI-6
		F	1-0 PIO modes 3 and 4 supported
65	M		Minimum Multiword DMA transfer cycle time per word
		F	15-0 Cycle time in nanoseconds
66	M		Manufacturer's recommended Multiword DMA transfer cycle time
		F	15-0 Cycle time in nanoseconds
67	M		Minimum PIO transfer cycle time without flow control
		F	15-0 Cycle time in nanoseconds
68	M		Minimum PIO transfer cycle time with IORDY flow control

Word	O/M	F/V	
		F	15-0 Cycle time in nanoseconds
69-74			Set as indicated in ATA/ATAPI-6
75	O		Queue depth
		~~R~~F	15-5 Reserved
		F	4-0 Maximum queue depth - 1
76	O		Serial ATA capabilities
		~~R~~F	15-13 Reserved
		F	12 Supports Native Command Queuing priority information
		F	11 Supports Unload while NCQ commands outstanding
		F	10 Supports Phy event counters
		F	9 Supports receipt of host-initiated interface power management requests
		F	8 Supports Native Command Queuing
		~~R~~F	7-3 Reserved for future Serial ATA signaling speed grades
		F	2 1 = Supports Serial ATA Gen2 signaling speed (3.0 Gbps)
		F	1 1 = Supports Serial ATA Gen1 signaling speed (1.5 Gbps)
		F	0 Shall be cleared to zero
77		~~R~~	Reserved for future Serial ATA definition
78	O		Serial ATA features supported
		~~R~~F	15-7 Reserved
		F	6 1 = Supports software settings preservation
		~~R~~F	5 Reserved
		F	4 1 = Supports in-order data delivery
		F	3 1 = Device supports initiating interface power management
		F	2 1 = Supports DMA Setup Auto-Activate optimization
		F	1 1 = Supports non-zero buffer offsets in DMA Setup FIS
		F	0 Shall be cleared to zero
79	O		Serial ATA features enabled
		~~R~~F	15-7 Reserved
		V	6 1 = Software settings preservation enabled
		~~R~~F	5 Reserved
		V	4 1 = In-order data delivery enabled
		V	3 1 = Device initiating interface power management enabled
		V	2 1 = DMA Setup Auto-Activate optimization enabled
		V	1 1 = Non-zero buffer offsets in DMA Setup FIS enabled
		F	0 Shall be cleared to zero
80-87			Set as indicated in ATA/ATAPI-6
88			15-6 Set as indicated in ATA/ATAPI-6
		F	5 1=Ultra DMA mode 5 and below are supported
		F	4 1=Ultra DMA mode 4 and below are supported
		F	3 1=Ultra DMA mode 3 and below are supported
		F	2 1=Ultra DMA mode 2 and below are supported
		F	1 1=Ultra DMA mode 1 and below are supported
		F	0 1=Ultra DMA mode 0 is supported
89-92			Set as indicated in ATA/ATAPI-6
93		V	COMRESET result. The contents of this word shall be cleared to zero.
94-255			Set as indicated in ATA/ATAPI-6

Key:
M = Support of the word is mandatory.
O = Support of the word is optional.
F = the content of the word is fixed and does not change. For removable media devices, these values may change when media is removed or changed.

V = the contents of the word is variable and may change depending on the state of the device or the commands executed by the device.
X = the content of the word is vendor specific and may be fixed or variable.
R = the content of the word is reserved and shall be zero.

2.3 Proposed "IDENTIFY PACKET DEVICE" Changes

[**Editor's Note:** The changes marked in red (and strikethrough) will be incorporated in section 13.2.2]

Table 74 – IDENTIFY PACKET DEVICE information

Word	O/M	F/V		
0-48			Set as indicated in ATA/ATAPI-6	
49	M		Capabilities	
		F	15-12	Set as indicated in ATA/ATAPI-6
		F	11	1=IORDY supported
				~~0=IORDY may be supported~~
		F	10	1=IORDY may be disabled
		~~R~~	~~9~~	~~Shall be set to one.~~
		~~R~~	~~8~~	~~1=DMA supported~~
		~~X~~	~~7~~9-0	Set as indicated in ATA/ATAPI-6~~Vendor specific~~
50-52			Set as indicated in ATA/ATAPI-6	
53	M		Field validity	
		R	15-3	Reserved
		F	2	1=the fields reported in word 88 are valid
				0=the fields reported in word 88 are not valid
		F	1	1=the fields reported in words (70:64) are valid
				0=the fields reported in words (70:64) are not valid
		F	0	Obsolete
54-62			Set as indicated in ATA/ATAPI-6	
63	M		Multiword DMA transfer	
			15-3	Set as indicated in ATA/ATAPI-6
		F	2	1= Multiword DMA mode 2 and below are supported
		F	1	1= Multiword DMA mode 1 and below are supported
		F	0	1= Multiword DMA mode 0 is supported
64	M		PIO transfer modes supported	
			15-2	Set as indicated in ATA/ATAPI-6
		F	1-0	PIO modes 3 and 4 supported
65	M		Minimum Multiword DMA transfer cycle time per word	
		F	15-0	Cycle time in nanoseconds
66	M		Manufacturer's recommended Multiword DMA transfer cycle time	
		F	15-0	Cycle time in nanoseconds
67	M		Minimum PIO transfer cycle time without flow control	
		F	15-0	Cycle time in nanoseconds
68	M		Minimum PIO transfer cycle time with IORDY flow control	
		F	15-0	Cycle time in nanoseconds
69-74			Set as indicated in ATA/ATAPI-6	
75	O		Queue depth	
		~~R~~F	15-5	Reserved
		F	4-0	Maximum queue depth - 1
76	O		Serial ATA capabilities	
		~~R~~F	15-13	Reserved
		F	12	Supports Native Command Queuing priority information
		F	11	Supports Unload while NCQ commands outstanding
		F	10	Supports Phy event counters
		F	9	Supports receipt of host-initiated interface power management requests
		F	8	Supports Native Command Queuing

Word	O/M	F/V		
		RF	7-3	Reserved for future Serial ATA signaling speed grades
		F	2	1 = Supports Serial ATA Gen2 signaling speed (3.0 Gbps)
		F	1	1 = Supports Serial ATA Gen1 signaling speed (1.5 Gbps)
		F	0	Shall be cleared to zero
77		R	Reserved for future Serial ATA definition	
78	O		Serial ATA features supported	
		RF	15-7	Reserved
		F	6	1 = Supports software settings preservation
		RF	5	Reserved
		F	4	1 = Supports in-order data delivery
		F	3	1 = Device supports initiating interface power management
		F	2	1 = Supports DMA Setup Auto-Activate optimization
		F	1	1 = Supports non-zero buffer offsets in DMA Setup FIS
		F	0	Shall be cleared to zero
79	O		Serial ATA features enabled	
		RF	15-7	Reserved
		V	6	1 = Software settings preservation enabled
		RF	5	Reserved
		V	4	1 = In-order data delivery enabled
		V	3	1 = Device initiating interface power management enabled
		V	2	1 = DMA Setup Auto-Activate optimization enabled
		V	1	1 = Non-zero buffer offsets in DMA Setup FIS enabled
		F	0	Shall be cleared to zero
80-87			Set as indicated in ATA/ATAPI-6	
88			15-6	Set as indicated in ATA/ATAPI-6
		F	5	1=Ultra DMA mode 5 and below are supported
		F	4	1=Ultra DMA mode 4 and below are supported
		F	3	1=Ultra DMA mode 3 and below are supported
		F	2	1=Ultra DMA mode 2 and below are supported
		F	1	1=Ultra DMA mode 1 and below are supported
		F	0	1=Ultra DMA mode 0 is supported
89-92			Set as indicated in ATA/ATAPI-6	
93		V	COMRESET result. The contents of this word shall be cleared to zero.	
94-255			Set as indicated in ATA/ATAPI-6	

Key:
M = Support of the word is mandatory.
O = Support of the word is optional.
F = the content of the word is fixed and does not change. For removable media devices, these values may change when media is removed or changed.
V = the contents of the word is variable and may change depending on the state of the device or the commands executed by the device.
X = the content of the word is vendor specific and may be fixed or variable.
R = the content of the word is reserved and shall be zero.

2.3.1 Word 49: Capabilities

Bits 15 through 12 of word 49 shall be set as indicated in ATA/ATAPI-6.

Bit 11 of word 49 is used to determine whether a device supports IORDY. This bit shall be set to one, indicating the device supports IORDY operation.

Bit 10 of word 49 is used to indicate a device's ability to enable or disable the use of IORDY. This bit shall be set to one, indicating the device supports the disabling of IORDY. Disabling and enabling of IORDY is accomplished using the SET FEATURES command.

~~Bit 9 of word 49 shall be set to one.~~

~~Bit 8 of word 49 is used to indicate whether the device supports DMA. This bit shall be set to one.~~

Bits ~~7~~9 - 0 of word 49 shall be set as indicated in ATA/ATAPI-6.