

**Proposed
Draft**

**Serial ATA
International Organization**

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Title: IDENTIFY DEVICE words 63, 78 and 79

Proposed change, new functionality, or behavior to Serial ATA Revision 3.0

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Document History

Version	Date	Comments
1	05/03/2010	Initial draft
2	5/17/2010	Actual recommendations to be made
3	6/7/2010	After final comments from June 7, 2010 review were incorporated

1 Introduction

This issue is being brought to SATA-IO as a liaison activity from T13.

In discussion at T13 in April 2010, it was reported that SATA Revision 3.0 and ACS-2 have slightly different requirements for IDENTIFY PACKET DEVICE words 63, 78 and 79

2 Summary of the problem

2.1 IDENTIFY PACKET DEVICE word 63, bits (2:0)

Problem:

SATA Revision 3.0 does not specify special handling for Serial ATAPI devices requiring the DMADIR bit in the PACKET command, but ACS-2 does.

SATA Revision 3.0 says:

"Bits 2 - 0 of word 63 shall be set to one indicating that the device supports Multiword DMA modes 0, 1, and 2. Bits 15 – 3 shall be set as indicated in ATA8-ACS."

ACS-2 (rev 2) says:

"If bit 2 of Word 63 is set to one, then Multiword DMA modes 2 and below are supported. If this bit is cleared to zero, then Multiword DMA mode 2 is not supported. If Multiword DMA mode 2 is supported, then Multiword DMA modes 1 and 0 shall also be supported. If bit 2 of Word 63 is set to one, bits (1:0) shall be set to one.

For SATA devices, bit 2 of word 63 shall be set to one except this bit shall be cleared to zero for Serial ATAPI devices requiring the DMADIR bit in the PACKET command.

If bit 1 of Word 63 is set to one, then Multiword DMA modes 1 and below are supported. If this bit is cleared to zero, then Multiword DMA mode 1 is not supported. If Multiword DMA mode 1 is supported, then Multiword DMA mode 0 shall also be supported. If bit 1 of Word 63 is set to one, bit 0 shall be set to one.

For SATA devices, bit 1 of word 63 bit shall be set to one except this bit shall be cleared to zero for Serial ATAPI devices that require the DMADIR bit in the PACKET command.

If bit 0 of word 63 is set to one, then Multiword DMA mode 0 is supported. For SATA devices, this bit shall be set to one except this bit shall be cleared to zero for Serial ATAPI devices that require the DMADIR bit in the PACKET command.

Question: Should ACS-2 be changed ? or SATA Revision 3.0 ?

2.2 IDENTIFY PACKET DEVICE word 79

Problem:

SATA Revision 3.0 specifies that IDENTIFY PACKET DEVICE, word 79, bits (1, 2 and 4) are 'Reserved', but that these bits are defined in IDENTIFY DEVICE.

SATA Revision 3.0 specifies that IDENTIFY PACKET DEVICE, word 79, bit 5 is defined, but that this bit is 'Reserved' in IDENTIFY DEVICE.

However, ACS-2 states that these two commands return the same content

7.19.6.31 Word 79: Serial ATA features enabled

Word 79 shall have the content described for IDENTIFY DEVICE data word 79
(see 7.18.7.37)

3 Proposed corrections

[editor note: New text is marked as underlined in blue color. Material to be deleted ~~is red with strikethrough markings.~~]

3.1 IDENTIFY PACKET DEVICE word 63, bits (2:0)

Recommendation:

1. Correct SATA Revision 3.0, section
13.2.2.6 Word 63: Multiword DMA transfer

Current text:

~~"Bits 2–0 of word 63 shall be set to one indicating that the device supports Multiword DMA modes 0, 1, and 2. Bits 15 – 3 shall be set as indicated in ATA8-ACS."~~

Proposed replacement text

If bit 15 of word 62 is set to one, then bit 2 of word 63 shall be cleared to zero. If bit 15 of word 62 is cleared to zero, then bit 2 of word 63 shall be set to one.

If bit 15 of word 62 is set to one, then bit 1 of word 63 shall be cleared to zero. If bit 15 of word 62 is cleared to zero, then bit 1 of word 63 shall be set to one.

If bit 15 of word 62 is set to one, then bit 0 of word 63 shall be cleared to zero. If bit 15 of word 62 is cleared to zero, then bit 0 of word 63 shall be set to one.

Bits 15 – 3 shall be set as indicated in ATA8-ACS.

3.2 IDENTIFY PACKET DEVICE word 79

Recommendation:

1. Correct SATA Revision 3.0, section
13.2.2.16 Word 79: Serial ATA features enabled

Current text:

~~Word 79 shall have the content described for IDENTIFY DEVICE data word 79.~~

Proposed replacement text

Word 79 bit 0 shall have the content described for IDENTIFY DEVICE data word 79 bit 0 (see 13.2.1.19).

Word 79 bit 1 is reserved.

Word 79 bit 2 is reserved.

Word 79 bit 3 shall have the content described for IDENTIFY DEVICE data word 79 bit 3 (see 13.2.1.19).

Word 79 bit 4 is reserved.

Word 79 bit 5 indicates whether device support for asynchronous notification to indicate to the host that attention is required is enabled. When set to one the device may initiate notification events. When cleared to zero the device shall not initiate notification events. This field shall be cleared to zero by default. An example of an event that the device may need attention for includes a media change. Asynchronous notification is described in section 13.8.

Word 79 bit 6 shall have the content described for IDENTIFY DEVICE data word 79 bit 6 (see 13.2.1.19).

Word 79 bit 7 shall have the content described for IDENTIFY DEVICE data word 79 bit 7 (see 13.2.1.19).

Word 79 bits 15-8 are reserved.