

**Proposed
Draft**

**Serial ATA
International Organization**

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**SATA30_ECN_D130_20091019_V02_DCO_corrections
Title: DCO Corrections**

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

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Document History

Version	Date	Comments
1	10/12/2009	Initial draft
2	10/19/2009	Changed IDENTIFY DEVICE word 77, from bit 7 to bit 5

1 Introduction

There are some minor corrections needed for the DEVICE CONFIGURATION IDENTIFY and DEVICE CONFIGURATION SET commands.

2 Summary of the problem

SATA Revision 3.0 does not adequately handle some feature dependencies in the DCO SET command (word 8, bits 0, 2 and 6). In addition, there are some grammar issues to be corrected

3 Proposed correction

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

[editors note: replace SATA Revision 3.0 section 13.4 in its entirety with this section 3.1 below]

3.1 *Device Configuration Overlay*

3.1.1 Device Configuration Overlay Identify

Figure 1 defines additional features and capabilities that support may be controlled for using the DEVICE CONFIGURATION IDENTIFY command in the ATA8-ACS standard. The device is only required to support setting these features if the device reports support for Device Configuration Overlay in either IDENTIFY DEVICE or IDENTIFY PACKET DEVICE, respectively.

Word	Description
0-7	As defined in the ATA8-ACS standard
8	Serial ATA command / feature sets supported 15-7 Reserved (0) 6 1 = Reporting support for NCQ QUEUE MANAGEMENT ¹ is-allowed is changeable 5 1 = Reporting support for Automatic Partial to Slumber transitions is changeable 4 1 = Reporting support for software settings preservation is changeable 3 1 = Reporting support for asynchronous notification is changeable 2 1 = Reporting support for interface power management is changeable 1 1 = Reporting support for non-zero buffer offsets in DMA Setup FIS ¹ is changeable 0 1 = Reporting support for Native Command Queuing ¹ is changeable
9	Reserved for Serial ATA
10-255	As defined in the ATA8-ACS standard
NOTE: 1. Applicable to non-PACKET devices only – i.e. IDENTIFY DEVICE.	

Figure 1 –DEVICE CONFIGURATION IDENTIFY data structure

WORD 8: Serial ATA command / feature sets supported

This word describes which features for which support is changeable. A feature may be supported but not be changeable. If bit 0 of word 8 is set to one, then support for Native Command Queuing is changeable. The setting of this bit is applicable to non-PACKET devices only.

If bit 1 of word 8 is set to one, then support for non-zero buffer offsets in the DMA Setup FIS is changeable. The setting of this bit is applicable to non-PACKET devices only.

If bit 2 of word 8 is set to one, then support receiving host initiated power management requests and/or sending device initiated power management requests is changeable.

If bit 3 of word 8 is set to one, then support for asynchronous notification is changeable.

If bit 4 of word 8 is set to one, then support for software settings preservation is changeable.

If bit 5 of word 8 is set to one, then support for Automatic Partial to Slumber transitions is changeable.

If bit 6 of word 8 is set to one, then support for the NCQ QUEUE MANAGEMENT command is changeable.

Bits 7-15 are reserved and shall be cleared to zero.

WORD 9: Reserved for Serial ATA

This word is reserved for Serial ATA and all bits shall be cleared to zero.

3.1.2 Device Configuration Overlay Set

Figure 2 defines additional features and capabilities that support may be controlled for using the DEVICE CONFIGURATION SET command in the ATA8-ACS standard. The device is only required to support setting these features if the device reports support for Device Configuration Overlay in either IDENTIFY DEVICE or IDENTIFY PACKET DEVICE, respectively.

Word	Description
0-7	As defined in the ATA8-ACS standard
8	Serial ATA command / feature sets supported 15-7 Reserved 6 1 = Reporting support for the NCQ QUEUE MANAGEMENT command ¹ is allowed 5 1 = Reporting support for Automatic Partial to Slumber transitions is allowed 4 1 = Reporting support for software settings preservation is allowed 3 1 = Reporting support for asynchronous notification is allowed 2 1 = Reporting support for interface power management is allowed 1 1 = Reporting support for non-zero buffer offsets in DMA Setup FIS ¹ is allowed 0 1 = Reporting support for Native Command Queuing ¹ is allowed
9	Reserved for Serial ATA
10-255	As defined in the ATA8-ACS standard
NOTE: 1. Applicable to non-PACKET devices only – i.e. IDENTIFY DEVICE.	

Figure 2 - DEVICE CONFIGURATION SET data structure

WORD 8: Serial ATA command / feature sets supported

This word enables configuration of command sets and feature sets.

If bit 0 of word 8 is cleared to zero, then the device shall:

- a) disable support for Native Command Queuing;
- b) clear word 76 bits 8, 11, and 12 in the IDENTIFY DEVICE data to zero;
- c) clear word 77, bits 4 and 75 in the IDENTIFY DEVICE data to zero;
- d) clear word 78 bits 1, 2, and 4 in the IDENTIFY DEVICE data to zero;
- e) clear word 79 bits 1, 2 and 4 in the IDENTIFY DEVICE data to zero; and
- f) if NCQ is disabled and a READ FPDMA QUEUED or WRITE FPDMA QUEUED or NCQ QUEUE MANAGEMENT command is issued to the device, the device shall abort the command with the ERR bit set to one in the Status field and the ABRT bit set to one in the Error field.

The setting of this bit is applicable to non-PACKET devices only.

If bit 1 of word 8 is cleared to zero, then the device shall

- a) disable support for non-zero buffer offsets in the DMA Setup FIS;
- b) clear word 78 bits 1 and 4 in the IDENTIFY DEVICE data to zero;
- c) clear word 79 bits 1 and 4 in the in the IDENTIFY DEVICE data to zero; and
- d) if non-zero buffer offsets in the DMA Setup FIS are disabled, the device shall only issue a DMA Setup FIS that has the DMA Buffer Offset field cleared to zero.

The setting of this bit is applicable to non-PACKET devices only.

If bit 2 of word 8 is cleared to zero, then the device shall:

- a) disable support for receiving host initiated power management requests and shall not support device initiated power management requests;
- b) clear word 76 bits 9, 13 and 14 of IDENTIFY DEVICE or IDENTIFY PACKET DEVICE data to zero;
- c) clear word 78 bit 3 of IDENTIFY DEVICE or IDENTIFY PACKET DEVICE data to zero;
- d) clear word 79 bits 3 and 7 of IDENTIFY DEVICE or IDENTIFY PACKET DEVICE data to zero; and
- e) if interface power management requests are disabled, the device shall respond with PMNAK_P to any interface power management requests and the device shall not issue PMREQ_P or PMREQ_S to the host.

If bit 3 of word 8 is cleared to zero, then the device shall:

- a) disable support for asynchronous notification;
- b) clear word 78 bit 5 of IDENTIFY PACKET DEVICE data to zero;
- c) clear word 79 bit 5 of IDENTIFY PACKET DEVICE data to zero; and
- d) when asynchronous notification is disabled, the device shall not initiate a Set Device Bits FIS with the Notification bit set to one.

If bit 4 of word 8 is cleared to zero, then the device shall:

- a) disable support for software settings preservation;
- b) clear word 78 bit 6 of IDENTIFY DEVICE or IDENTIFY PACKET DEVICE data to zero;
- c) clear word 79 bit 6 of IDENTIFY DEVICE or IDENTIFY PACKET DEVICE data to zero; and

- d) when software settings preservation is disabled, the device shall not preserve any software settings that are normally cleared following a COMRESET.

If bit 5 of word 8 is cleared to zero, then the device shall:

- a) disable support for Automatic Partial to Slumber transitions;
- b) clear word 76 bits 13 and 14 of IDENTIFY DEVICE or IDENTIFY PACKET DEVICE data to zero;
- c) clear word 79 bit 7 of IDENTIFY DEVICE or IDENTIFY PACKET DEVICE data to zero; and
- d) when Automatic Partial to Slumber transitions are disabled neither the device nor host may transition to Slumber from Partial without first entering Active.

If bit 5 of word 8 is set to one and bit 2 ~~of~~ of word 8 is cleared to zero, then the device shall return command aborted.

If bit 6 of word 8 is cleared to zero, then the device shall:

- a) disable support for the NCQ QUEUE MANAGEMENT command;
- b) clear word 77 bit 5 of IDENTIFY DEVICE data to zero; and
- c) if an NCQ QUEUE MANAGEMENT command is issued to the device, the device shall return command aborted.

If bit 6 of word 8 is set to one and bit 0 of word 8 is cleared to zero, then the device shall return command aborted.

Bits (15:7) of word 8 are reserved and shall be cleared to zero.

WORD 9: Reserved for Serial ATA

This word is reserved for Serial ATA and all bits shall be cleared to zero.