

**Proposed
Draft**

**Serial ATA
International Organization**

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**Serial ATA Revision 3.2 Technical Proposal #058
Title: DAS/DSS/DHU Changes**

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Introduction

In the SATA revision 3.2 spec (as well as previous versions) devices are allowed to support both DSS and DAS, but hosts are not.

There are two hardware control features listed as:

- a) Disable Staggered Spinup (DSS); and
- b) Device Activity Signal (DAS) (e.g., light emitting diode (LED)).

A device may optionally support activity indication, staggered spinup control, or both features.

Presently, a host is only allowed to support one feature, either receiving activity indication or disable staggered spinup control. If a host supports receiving activity indication, then the host shall not use pin P11, P7, or P8, depending upon connector, to disable staggered spinup. If a host does not support receiving activity indication, then the host may use pin P11, P7, or P8, depending upon connector, to disable staggered spinup.

This proposal changes this restriction in order to allow hosts to optionally support activity indication, staggered spinup control, or both features.

This proposal additionally provides clarification regarding the DHU function by stating that the DHU option is, by nature, incompatible with the DAS option.

(Editor's note: modify the text of SATA revision 3.2 as follows)

Additions are in [blue underline](#) and removals are in ~~red strikethrough~~.

13.10 Hardware Feature Control (optional)

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Table 123 specifies the pins used by Hardware Feature Control for various connectors

Table 123 – Pins used by Hardware Feature Control

Standard Connector (3.5 inch & 2.5 inch)	1.8 inch Micro SATA Connector ^a	LIF-SATA Connector
Pin P11: a) DSS; b) DAS ^b ; c) DHU ^b ; or d) other vendor specific.	Pin P7: a) DAS ^b ; b) DHU ^b ; or c) other vendor specific.	Pin P8: a) DSS; b) DAS; or c) other vendor specific. Pin P21: a) DHU
^a DSS is not defined for 1.8 inch Micro SATA Connector. ^b Concurrent support of both DAS and DHU on the same pin is not permitted.		

6.13.1.2 Default behavior

There are two hardware control features listed as:

- a) Disable Staggered Spinup (DSS); and
- b) Device Activity Signal (DAS) (e.g., light emitting diode (LED)).

Due to various hardware issues, these features are mapped onto different physical pins depending on the connector type as indicated in Table 41 [and Table 123](#). Not all features are defined for all connector types.

The Hardware Feature Control, (i.e., pins P11, P7, or P8 depending upon connector) may be used by the device to provide the host with an activity indication and it may be used by the host to indicate whether staggered spinup should be used. To accomplish both of these goals, the Hardware Feature Control acts as an input from the host to the device prior to PHYRDY for staggered spinup control and then acts as an output from the device to the host after PHYRDY for activity indication. The activity indication provided is primarily for use in backplane applications. See 13.15 for information on activity LED generation for desktop applications.

A [host or](#) device may optionally support activity indication, staggered spinup control, or both features. If neither feature is supported, then pin P11, P7, or P8 depending upon connector is a no connect at the device as specified in Table 5.

~~A host shall support one feature, either receiving activity indication or disable staggered spinup control. If a host supports receiving activity indication, then the host shall not use pin P11, P7, or P8 depending upon connector to disable staggered spinup. If a host does not support receiving activity indication, then the host may use pin P11, P7, or P8 depending upon connector to disable staggered spinup.~~

6.13.4.1 Electrical and functional definition

The staggered spinup feature ~~as is~~ defined in 13.10. ~~Devices~~ [Hosts or devices](#) may optionally provide support to disable staggered spinup through pin P11 [of the Standard Connector or pin P8 of the LIF-SATA Connector \(see table 123\)](#) of the power segment connector. The disable staggered spinup control is an active asserted low host signal.

Before the device spins up its media, devices that support disable staggered spinup control shall detect whether pin P11 [of the Standard Connector or pin P8 of the LIF-SATA Connector](#) is asserted low by the host. If pin P11 [of the Standard Connector or pin P8 of the LIF-SATA Connector](#) is asserted low the device shall disable staggered spinup and immediately initiate media spinup. If pin P11 [of the Standard Connector or pin P8 of the LIF-SATA Connector](#) is not ~~connected~~ [asserted low](#) in the host (~~floating~~), devices that support disable staggered spinup through pin P11 [of the Standard Connector or pin P8 of the LIF-SATA Connector](#) shall enable staggered spinup. Table 46 defines the electrical signal requirements for the device detection of disable staggered spinup.

The staggered spinup control indication provided by a host or storage subsystem ~~shall be static and~~ shall not be changed [before PHYRDY is asserted](#) ~~while power is applied~~. If the signal is pulled low by the host during the disable staggered spinup detection period, the signal shall remain low [at least until after PHYRDY is asserted](#). ~~Devices shall disable the activity signal if the host signals disable staggered spinup.~~

If [the staggered spinup feature is](#) supported, the device shall:

- a) sample the disable staggered spinup condition after the time DC power is applied and before PHYRDY is asserted; ~~and~~
- b) [not enable the device activity signal before PHYRDY is asserted.](#)

For devices utilizing either the Standard Connector or the 1.8 inch Micro SATA Connector, if the Direct Head Unload (DHU) feature is supported, the device shall disable the device activity signal.