



For Data Centers

Device Activity Signal (DAS)

Monitor drive behavior with a blinking LED

Application note

Device Activity Signal (DAS)

1. How does the Device Activity Signal (DAS) work?

Some Serial Advanced Technology Attachment (SATA) storage manufacturers use the SATA power pin P11 as the DAS to control LED blinking in the host system to indicate the device's activity. This DAS feature can be activated by implementing the firmware (FW). The host system then reads the signal from the P11 pin and makes the LED blink. However, the solid-state drive (SSD) does not operate the system's LED directly, but just sends signals to indicate the SSD's behavior to the host system, which can reduce the drive's power consumption.

2. Why is the DAS important?

The DAS is an optional feature and the detailed operating condition can differ between systems and SSDs. By making the LED blink on each storage slot, system managers can easily manage and control all connected storage devices. For example, they can find which device is not connected or operates well by inspecting the LED signal.

3. How do I activate the DAS feature?

To make the LED operate in the host system, the DAS feature in the SSD must be enabled. The DAS is defined in the Serial ATA specifications, but there are differences in the default value between the SATA 3.0 and SATA 3.1 specifications to make the LED blink. In SATA 3.0, the default value of the DAS feature is "enabled"(ON) while in SATA 3.1 it is "disabled"(OFF). In SATA 3.1, the DAS default value can be changed by the host system (the host system should support SATA 3.1) by changing the DAS default value from "disabled" to "enabled."

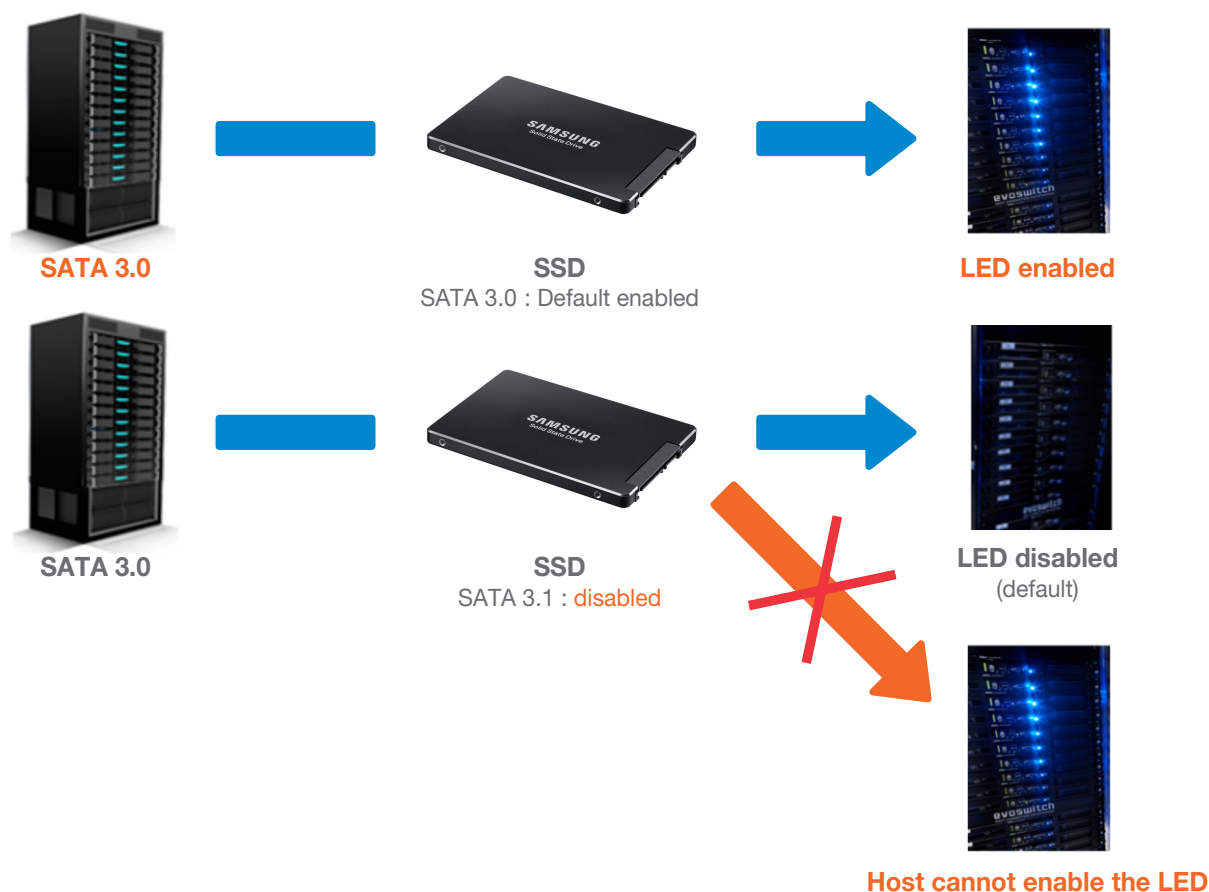
Below is an example of an LED blinking according to the SATA specifications support in the host system and the SSD.

Host system	SSD	LED blink
SATA 3.0	SATA 3.0	O
	SATA 3.1	X
SATA 3.1	SATA 3.0	O
	SATA 3.1	O

If the SSD supports SATA 3.0, the LED can operate regardless of the host system's SATA support. However, if the host system supports up to SATA 3.0 and the SSD supports SATA 3.1, the host system cannot change the SSD's DAS default feature from "disabled" to "enabled" and, as a result, the LED cannot operate.

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Therefore, users should check the SATA information in both the host system and the storage device to make the system LED blink.

4. Samsung SSDs for data centers are

Basically, Samsung SSD 845DC PRO and 845DC EVO support the SATA 3.1 specifications. However, Samsung has adjusted only the DAS feature as “enabled” by default to make the LED blink regardless of the SATA specifications in the host systems.

Host system	Samsung SSD (845DC PRO/845DC EVO)	LED blink
SATA 3.0	SATA 3.1 DAS feature is enabled	Yes
SATA 3.1		

This FW policy can avoid any LED issues arising from misaligned SATA specifications between the host and the SSD for user convenience.

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