Date: October 2829, 2002
To: T10 Technical Committee
From: Alvin Cox (alvin.cox@seagate.com)
Subject: SAS LED patterns

The following proposed change to the READY LED patterns is made to include devices without rotating media as well as to support power management by eliminating the 20/80 flashing which was previously included under condition b). Some power conditions of section 10.3 have been included in the LED behavior description. The result is that a device with rotating media that is not in a state for safe removal will either flash the LED at a significant rate during spin up / spin down / format, or will have the LED primarily on. When removal is safe from a mechanical standpoint, the LED will be primarily off.

 r1 changed 0.1 to 0,1 and added a space between 10 and % in pattern description b), corrected the spelling of vendor in d) and added a clean copy (no change bars) to the end of the document to aid in review.

5.6 READY LED pin

The READY LED patterns for target devices without rotating media are vendor-specific.

The READY LED signal shall be driven by a target device containing rotating media using the following patterns:

a)If rotating media is spinning and the target device is processing a command, the target device shall negate READY LED (i.e., LED is off);

b)a)If the rotating media is not spinning, the target device is in the standby or stopped power condition state, it shall assert READY LED while processing a command (i.e., the LED is usually off, but flashes on when commands are processed)., and shall assert and negate READY LED with a 2 s cycle of 20 % asserted, 80 % negated when not processing a command. The intent is that the LED appears to be flashing with the 20 % / 80 % cycle when the media is not spinning but that an indication is presented each time activity is in process. The target device may be removed with no danger of mechanical damage in this state;

c)b)If the target device has rotating media and is in the process of performing a spin-up or spin-down, it shall assert and negate READY LED with a 1 s +/- 0,1 s cycle using a 50 % +/- 10 % duty cycle (i.e., LED is on for approximately 0,5 s and off for approximately 0,5 s);

d)c)If the target device is ready in the active or idle power condition state, it shall assert READY LED continuously except when the target device is processing a command. When processing a command, the target device shall negate READY LED for a period long enough to be detected by an observer (i.e., LED is usually on, but flashes off when commands are processed); or

e)d)If the target device is formatting the media, it shall toggle READY LED between asserted and negated at significantsignificant intervals during the format operation (e.g., with each cylinder change on a disk drive). The interval is vendor specific.

Target devices with rotating media transition from pattern d) c) to pattern c) b) during the spin-down process. When the target device has reached a state stable enough for it to be removed without mechanical damage, it shall change from pattern c) b) to pattern b)a).

5.6 READY LED pin

The READY LED signal shall be driven by a target device using the following patterns:

a) If the target device is in the standby or stopped power condition state, it shall assert READY LED while processing a command (i.e., the LED is usually off, but flashes on when commands are processed). The target device may be removed with no danger of mechanical damage in this state;

b) If the target device has rotating media and is in the process of performing a spin-up or spin-down, it shall assert and negate READY LED with a 1 s +/- 0,1 s cycle using a 50 % +/- 10 % duty cycle (i.e., LED is on for 0,5 s and off for 0,5 s);

c) If the target device is in the active or idle power condition state, it shall assert READY LED continuously except when the target device is processing a command. When processing a command, the target device shall negate READY LED for a period long enough to be detected by an observer (i.e., LED is usually on, but flashes off when commands are processed); or

d) If the target device is formatting the media, it shall toggle READY LED between asserted and negated at significant intervals during the format operation (e.g., with each cylinder change on a disk drive). The interval is vendor specific.

Target devices with rotating media transition from pattern c) to pattern b) during the spin-down process. When the target device has reached a state stable enough for it to be removed without mechanical damage, it shall change from pattern b) to pattern a).