

X379.2/88-008  
05/14/86  
from Bob Snively

8.1.7. SET THRESHOLD Command

Peripheral Device Type: Direct Access, Write-Once Read-Multiple, and Read-Only Direct Access  
Operation Code Type: Optional  
Operation Code: 10h

Table 8-15: SET THRESHOLD Command

Bit Byte	7	6	5	4	3	2	1	0
0	Operation Code							
1	Logical Unit Number		Reserved					
2	Reserved							
3	Reserved							
4	Parameter List Length							
5	Vendor Unique		Reserved			Flag		Link

The SET THRESHOLD command (Table 8-\_\_ ) provides an error logging capability for those errors that are normally retried without any notification to the host system. When set in a logging mode, the target counts logical blocks transferred by read operations, seek errors, and retried and corrected data errors. The error logging mode and the frequency of error presentation is established by the SET THRESHOLD command, while the actual error information is presented by the READ/RESET USAGE COUNTER command. The default state is error logging not active. Power on reset, BUS DEVICE RESET, or an SCSI hard reset establishes the default state.

The parameter list length specifies the length in bytes of the SET THRESHOLD parameter list that shall be transferred from the initiator to the target. A parameter list length of zero indicates that no data shall be transferred. This condition shall not be considered as an error.

The SET THRESHOLD parameter list (Table \_\_-\_\_ ) contains four bytes.

Table 8-16: SET THRESHOLD Parameter List

Bit Byte	7	6	5	4	3	2	1	0
0	Threshold Value							
1	Reserved							
2	Reserved							
3	Reserved							

A Threshold Value of zero specifies that the system will not be notified if a counter overflow takes place. A value between 1 and 255 will request that the error log in overflow notification takes place. When the number of errors of any single type exceeds the threshold, the command that finds that error is completed normally. All subsequent commands will be terminated immediately with Check Condition. The resulting REQUEST SENSE command will present a RECOVERED ERROR sense key and an additional sense code of 2Ch, error counter overflow. A READ/RESET USAGE COUNTER COMMAND must then be executed, the usage and error counters are off loaded and reset and normal operation begins again. The same threshold value remains in effect until a power on reset, BUS DEVICE RESET or an SCSI hard reset occurs.

could be collapsed to 1 byte in command.

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## 8.1.8. READ/RESET USAGE COUNTER Command

Peripheral Device Type: Direct Access, Write-Once Read-Multiple, and Read-Only Direct Access  
 Operation Code Type: Optional  
 Operation Code: 11h

Table 8-17: READ/RESET USAGE COUNTER Command

Bit	7	6	5	4	3	2	1	0
0	Operation Code							
1	Logical Unit Number			Reserved				
2	Reserved							
3	Reserved							
4	Allocation Length							
5	Vendor Unique		Reserved			Flag		Link

The READ/RESET USAGE COUNTER command (Table 8-\_\_ ) provides a means to recover the information logged by a target for a particular LUN. The information is valuable to observe the statistical performance of the device and to point to devices which may need service before performance degrades system performance. A READ/RESET USAGE COUNTER command resets all counters to zero after the data has been transferred to the Initiator.

The allocation length specifies the number of bytes that the initiator has allocated for returned READ/RESET USAGE COUNTER data. An allocation length of zero indicates that no READ/RESET USAGE COUNTER data shall be transferred. This condition shall not be considered as an error. Any other value indicates the maximum number of bytes that shall be transferred. The target shall terminate the DATA IN phase when allocation length bytes have been transferred or when all available READ/RESET USAGE COUNTER data have been transferred to the initiator, whichever is less.

The READ/RESET USAGE COUNTER parameter list (Table \_\_-\_\_ ) contains <sup>sixteen</sup> ~~four~~ bytes.

Table 8-18: READ/RESET USAGE COUNTER Parameter List

Bit	7	6	5	4	3	2	1	0
0	Reserved							
1	Reserved							
2	Reserved							
3	Reserved							
4	Sectors Read Count (MSB)							
5	Sectors Read Count							
6	Sectors Read Count							
7	Sectors Read Count (LSB)							
8	Seek Usage Count (MSB)							
9	Seek Usage Count							
10	Seek Usage Count							
11	Seek Usage Count (LSB)							
12	Uncorrectable Data Check Count							
13	Seek Check Count							
14	Correctable Data Check Count (MSB)							
15	Correctable Data Check Count (LSB)							

\*\* what about relocated sectors ?

Whether or not the error logging mode is enabled by the SET THRESHOLD command, all sectors read and all seeks performed are counted in the Sectors Read count and the Seek Usage count. Uncorrectable data errors, seek errors, and correctable data errors are counted.

If a SET THRESHOLD command has been issued and one of the counters exceeds the threshold value any subsequent data transfer requests will be terminated with a CHECK CONDITION status with the Sense Key set to RECOVERED ERROR and the Additional Sense Code set to 2Ch. This condition will exist until a READ/RESET USAGE COUNTER command is issued.

If a SET THRESHOLD command has not been issued the data is collected in the counters to be read at the discretion of the Initiator. The counters will wrap around if the count exceeds the maximum value ~~for~~ <sup>of</sup> which the counter is

capable.

The Sectors Read Count is a complete count of all logical blocks read to any initiator from the specified LUN. This provides usage information against which error counts can be calibrated. The Seek Usage Count is a complete count of all occurrences of an initial seek by the drive. Cylinder switching is not counted. The Uncorrectable Data Check Count counts all occurrences of an uncorrectable data check on the specified device. Each uncorrectable data check was also posted as a medium error with additional sense code of 11h.

The Correctable Data Check Count counts all occurrences of the successful recovery of a logical block that was unsuccessfully read at first. This information is available only through error logging, since these errors are recovered without notifying the host unless a diagnostic mode has been invoked. The error is counted once, regardless of the number of retries executed to recover the block or the ECC correction ~~applied~~. If recovery is disabled, blocks that would have been added to this will instead be added to the Uncorrectable Data Check count. If more than one block is recovered in a single command, each recovered block will be counted once.

The Seek Check Count counts all occurrences of a seek error whether or not recovery was successful. This information is available only from error logging, since seek errors are normally recovered without notifying the host.

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