



# LTO Cartridge Memory Analyzer

*Revealing the Quality of LTO Cartridges and Tape Drives*

**Do you know the quality of your cartridge?**

**Your cartridge does!**

*If you don't know the quality of your cartridge, you may be gambling with your company's data. The cartridge knows its past history. Don't you think you should know it too? The Maxell Cartridge Memory Analyzer gives you the ability to access and display that history in a clear and easy to understand format, and takes the "mystery" out of trying to determine whether or not a tape is safe to use.*

## **Introducing the Maxell LTO Cartridge Memory Analyzer**

All LTO Cartridges contain an internal memory chip called Cartridge Memory (CM). This chip contains vital information about the cartridge. The Maxell CM Analyzer reads this information and extracts it into special software with a clear and concise display.

- Identify deteriorating cartridges before they fail
- Head off a problem before it becomes one
- Store mission critical data with confidence
- Establish quality standards for LTO cartridges and tape drives



Most systems identify defective cartridges after they fail. These cartridge failures can be disruptive and expensive. **But with the Maxell CM Analyzer you can monitor any cartridge and retire aging or damaged ones BEFORE they fail! Fewer Failures equals saving time and money in reruns.**

There is no way to judge the cartridge quality from the outside appearance of the cartridge. **The Maxell CM Analyzer allows you to "look inside" the cartridge and get its complete history.**

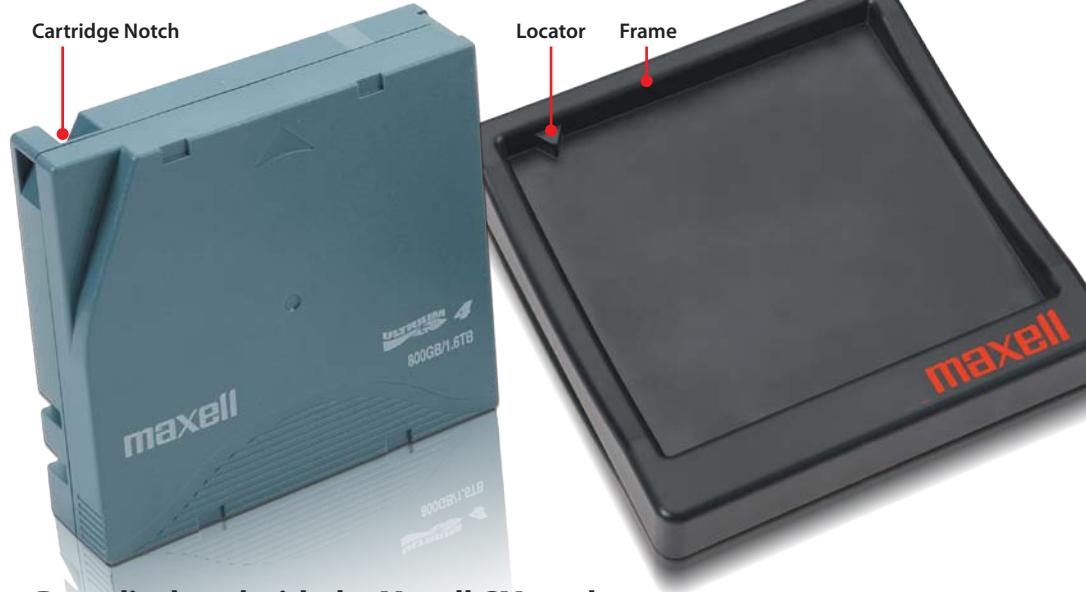
When saving critical data to tape you must have complete confidence that your data can be recovered without problems. **The Maxell CM Analyzer enables you to identify and eliminate any cartridge that does not meet your standards.**

## How It Works

### Loading The Cartridge

The Maxell CM reader is approximately the same size as an LTO cartridge. Unlike an LTO tape drive, however, the Maxell CM reader does not need to thread the tape in order to access the CM. Just place the cartridge on top of the reader and the display immediately shows the relevant information.

A locator feature in the frame matches a notch in the cartridge, thereby ensuring that the cartridge is always correctly oriented.

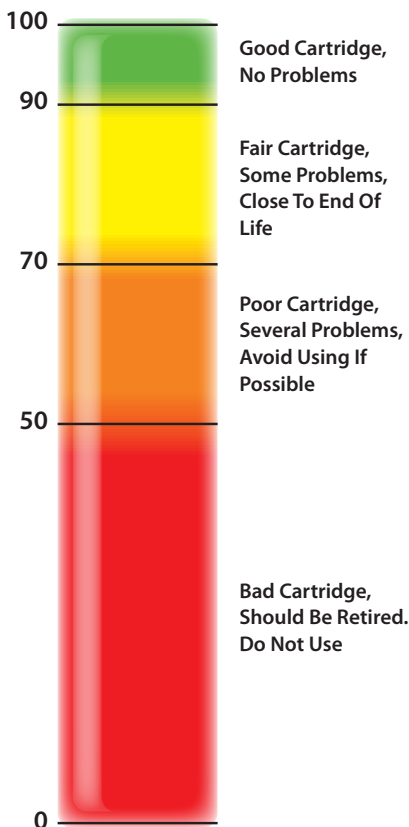


### Data displayed with the Maxell CM reader

The available data include:

- Percentage of records in error
  - Recovered read & write errors
  - Unrecovered read & write errors
  - Servo errors & fatal servo errors
- Number of cartridge loads
- Age of cartridge
- Details of the last four times the cartridge was used
- Details of the drive(s) that the cartridge was used in
- Number of bytes written & read

### MaxellScore



Maxell LTO CM Analyzer - Files read from C:\Documents and Settings\My Documents\Maxell lto cm analyzer\Disc files\history											
File	Min	Max	Avg	LT3246L1	TESTOOL1	11030189123	1030589344	1030825815	1050254904	1070510539	111077632
Maxell Tape Score	13.00	92.00	57.15	84	87	90	90	93	93	93	97
Manufacture Date / Age	0.62 yr	5.89 yr	2.38 yr	2005.09.20	2006.03.27	2003.03.11	2006.01.13	2007.10.05	2003.10.03	2005.08.13	2007.09.16
Cartridge Type				LTO 1 cartridge	LTO 2 cartridge	LTO 2 cartridge	LTO 2 cartridge	LTO 4 cartridge	LTO 2 cartridge	LTO 2 cartridge	LTO 4 cartridge
Tape Alerts				None	15	None	8	None	None	None	5, 4, 38
Last Unload				Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
EOD Mark				Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid
% Full	0	100.00 %	25.23 %	1 %	1 %	100 %	100 %	45 %	1 %	1 %	1 %
Free Space	0	800 GB	322 GB	99 GB	198 GB	198 GB	0	109 GB	793 GB	793 GB	4.85 MB
Mounts	3.00	216.00	44.62	30	82	216	12	36	9	9	11.3 MB
Total Data Read	0	1.82 TB	221 GB	104 MB	44.4 GB	406 GB	238 MB	5.17 GB	4.85 MB	4.85 MB	3.23 MB
Total Data Written	0	3.51 TB	866 GB	993 GB	790 GB	3.51 TB	1.25 TB	380 GB	3.23 MB	3.23 MB	0
Recent Data Read	0	412 GB	87.3 GB	17.7 GB	0	412 GB	0	412 GB	0	0	0
Recent Data Written	0	22.7 GB	2.09 GB	31.5 MB	0	148 MB	58.2 MB	0	0	0	0
Recent Write Retries	0	22.8 / MB	2.9 / MB	1 (56.3 / TB)	0	4 (9.7 / TB)	0	0	0	0	0
Recent Read Retries	0	1.5 B	227 / KB	0	0	0	0	0	0	0	2 (0.19 / GB)
Recent Servo Errors	0	667 / KB	60.6 / KB	0	0	4 (9.7 / TB)	0	0	0	0	0
Recent Fatal Write Errors	0	667 / KB	60.6 / KB	0	0	0	0	0	0	0	0
Recent Fatal Read Errors	0	2 B	364 / KB	0	0	0	0	0	0	0	2 (0.18 / GB)
Recent Fatal Servo Errors	0	24.6 / MB	2.24 / MB	0	0	0	0	0	0	0	0
Total Write Retries	0	292 / MB	28.4 / MB	22 (22.2 / TB)	572 (724 / TB)	137 (38.1 / TB)	52 (41.6 / TB)	2 (5.26 / TB)	0	0	0
Total Read Retries	0	3 B	361 / KB	4 (38.2 / GB)	2 (45.1 / TB)	15 (38.9 / TB)	0	3 (580 / TB)	0	0	5 (1.03 / MB)
Total Servo Errors	0	153 / MB	31.3 / MB	0	6 (7.6 / TB)	0	6 (4.8 / TB)	35 (92.1 / TB)	0	0	0
Total Fatal Write Errors	0	713 / GB	126 / GB	0	1 (1.27 / TB)	0	0	0	0	0	0
Total Fatal Read Errors	0	3.5 B	397 / KB	0	1 (22.5 / TB)	0	0	0	0	0	5 (1.03 / MB)
Total Fatal Servo Errors	0	24.6 / MB	1.9 / MB	0	0	0	0	0	0	0	0
CM Corrected Count	0	0	0	0	0	0	0	0	0	0	0

### Interpreting Maxell data

It can be time consuming, tedious, and inconsistent if you try to examine all the data in order to evaluate a cartridge. Not everyone may give each parameter the same weight. It is more helpful to create a single score number that is automatically and consistently calculated from all available data. **MaxellScore** is a Tape Evaluation Score ranging from 0 (very bad) to 100 (very good). Within seconds you will learn if a used cartridge meets your standards.

# Maxell Software

## Display

When in 'automatic mode', the Maxell CM reader automatically detects the presence of a cartridge, reads its memory chip, and displays the data.

## Save

The 'save file' function allows you save the CM contents in a file.

## Save Cartridge History

The 'Save Cartridge History' function reads the CM and saves its contents in a file. This function allows you to rapidly read and save the CM contents of many cartridges.

If you scan a cartridge that has been previously scanned, the Maxell software automatically finds and appends the previously saved file, allowing you to easily build a complete performance record for each cartridge.

## Open

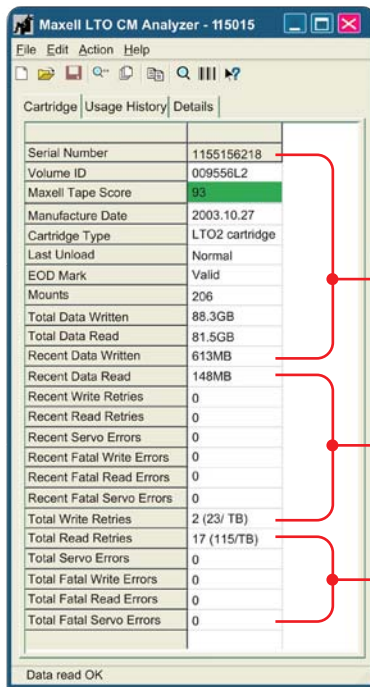
Opens and displays previously saved files. When more than one file is selected, the software performs a **statistical analysis** and displays statistical data including maximum, minimum, average, and standard deviation from the selected files.

Regardless of the number of cartridges you evaluate, unacceptable cartridges will immediately be shown.

## Hardware & Software Requirements

The Maxell CM reader can be connected to most systems. All you need is a USB port. The Maxell application software runs under all recent Windows operating systems.

Item #	183100
UPC	0-25215-90990-0



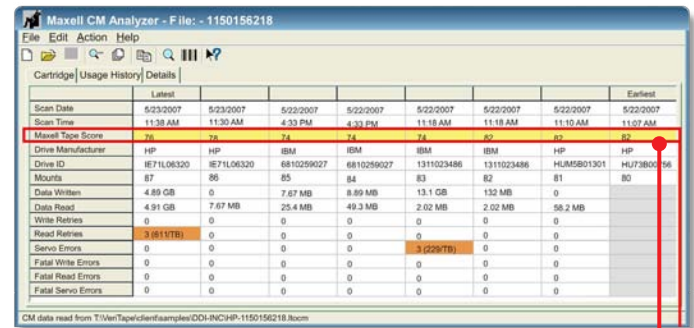
### Summary Screen

The display gives you the information you need. Values that are outside acceptable norms are highlighted in order of severity in yellow, orange, and red colors.

#### Maxell Score and Summary

Errors that occurred within the last four times the cartridge was loaded are known as "recent errors". Because of their importance they are displayed first and are weighted higher than other errors in calculating MaxellScore.

#### Error summary for entire cartridge

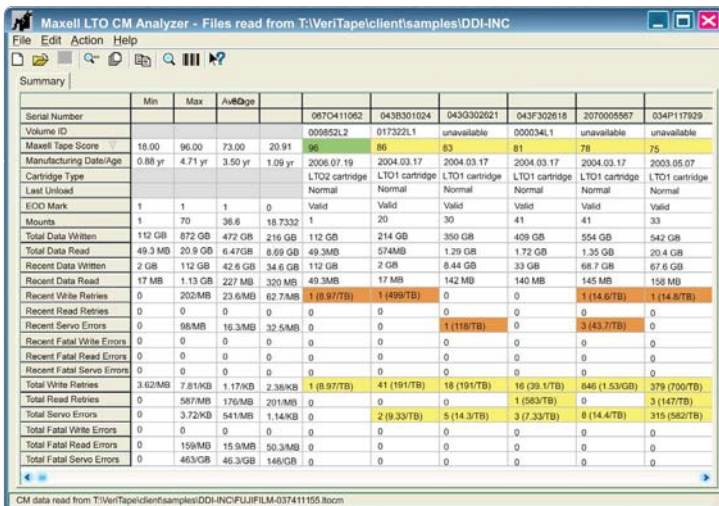


### Usage History Screen

Scanning a cartridge periodically with the "Save Cartridge History" option enabled, creates a complete record of the cartridge. The example above shows a cartridge record with 8 scans. Notice the change of MaxellScore. (82 to 76)

Scanning a cartridge periodically is the best way to track its performance and detect the time when the cartridge should be retired. The graph below is derived from the MaxellScore row in the "Usage History" page of a cartridge that has been scanned periodically.

The red vertical line shows the point when the cartridge should be retired.



### Summary Screen

When the saved results of several cartridges are selected, the Maxell software displays the summary information of all tapes plus additional statistical information, which includes the minimum, the maximum, the average, and the standard deviation of all values. Click on a value (on MaxellScore, for example) and the table is sorted for this value. Cartridges that do not meet your standard can immediately be identified and discarded.

# ULTRIUM LTO



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