Thunderbolt™ LTO

mTape ®

Thank you for purchasing mTape!

You are now the proud owner of the world's first certified Thunderbolt LTO tape drive!

mTape revolutionizes LTO, empowering users to easily connect LTO technology to portable, desktop and all-in-one computers that feature Thunderbolt connectivity. Another mLogic first.

Welcome to mTape.

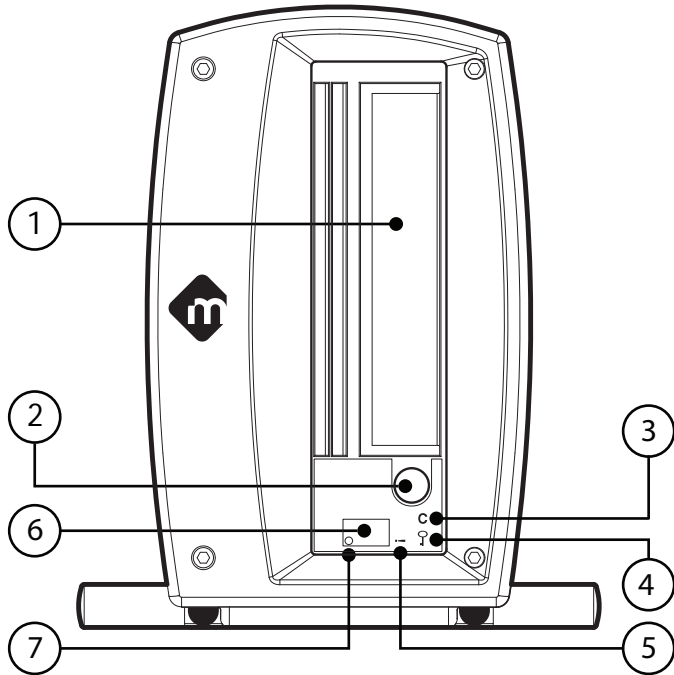For more information contact us at **support@mlogic.com** or visit us at **www.mlogic.com**
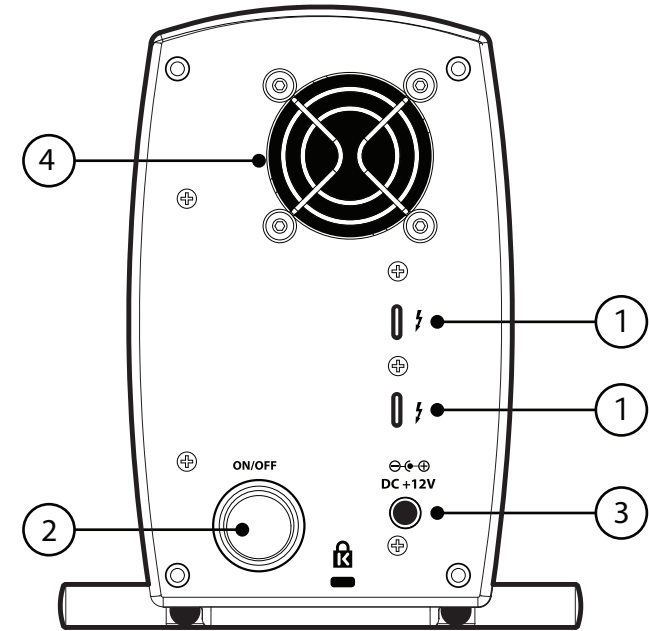
4.50"

11.61"

7.210"

ON/OFF

DC +12V
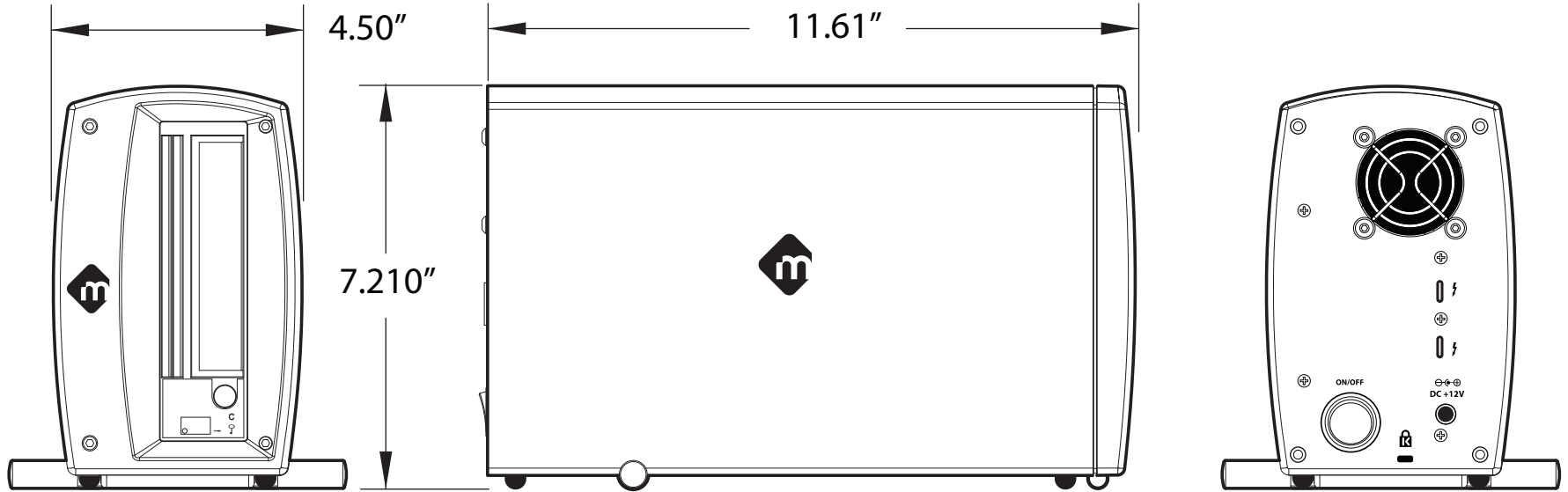
1) A Mac running macOS 10.10.x or above with a Thunderbolt port and a Thunderbolt cable (included).
2) mTape LTFS Utility or compatible tape backup/archive software.

mTape Features.

FRONT VIEW

REAR VIEW

①	Cartridge door	⑤	Fault light (amber)
②	Cartridge unload button	⑥	Single character display (SCD)
③	Ready light (green)		
④	Encryption key	⑦	SCD dot

①	Thunderbolt ports
②	On/Off switch - Note: On/Off Switch powers on the LTO drive only.
③	Power jack
④	Fan

Unpack your mTape

LTO TAPE

CLEANING TAPE
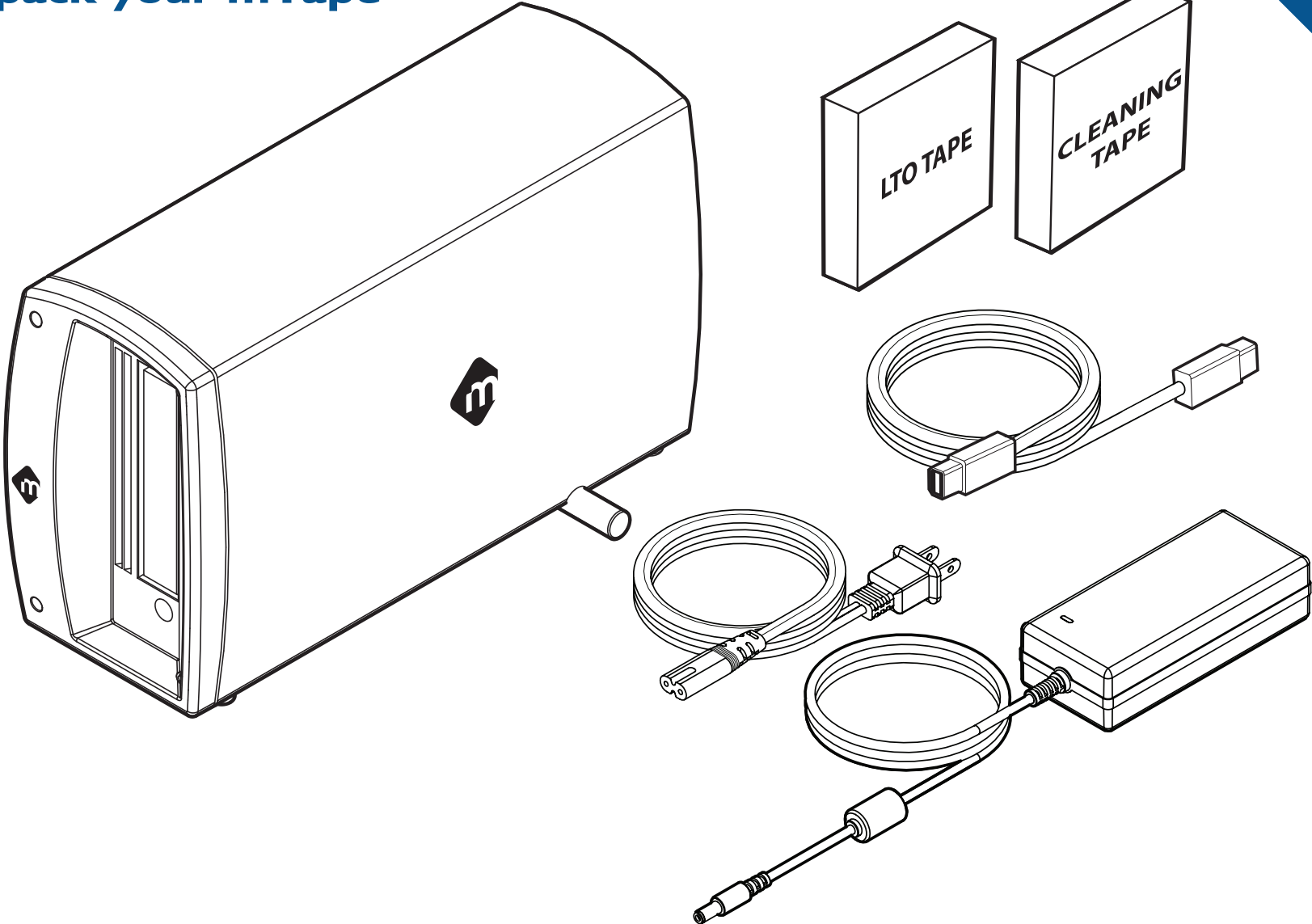
Disabling Sleep Mode

It is necessary to disable your Mac's sleep mode to ensure your Mac does not go to sleep when archiving content.
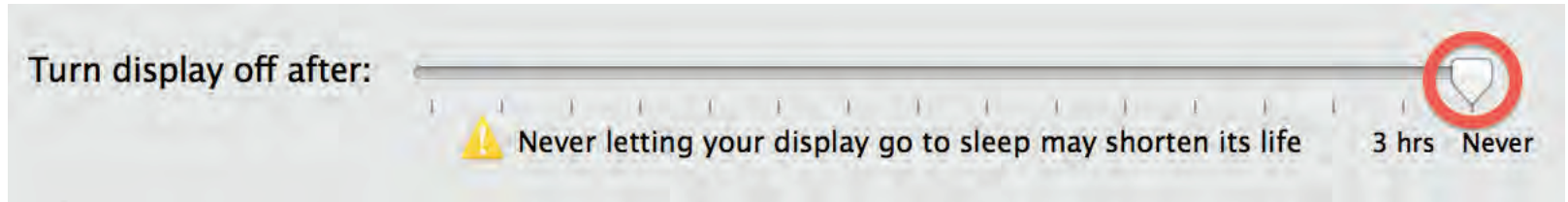
Disable System Sleep when using LTFS

macOS systems can corrupt an LTO tape cartridge if the system goes to sleep or hibernates while an offload is in process.

To turn off sleep mode **macOS**
Go to System Preferences ➔ Energy Saver ➔ Set "Turn display off after:" to **Never**

Turn display off after:

Never letting your display go to sleep may shorten its life   3 hrs   Never

Connecting mTape to your computer
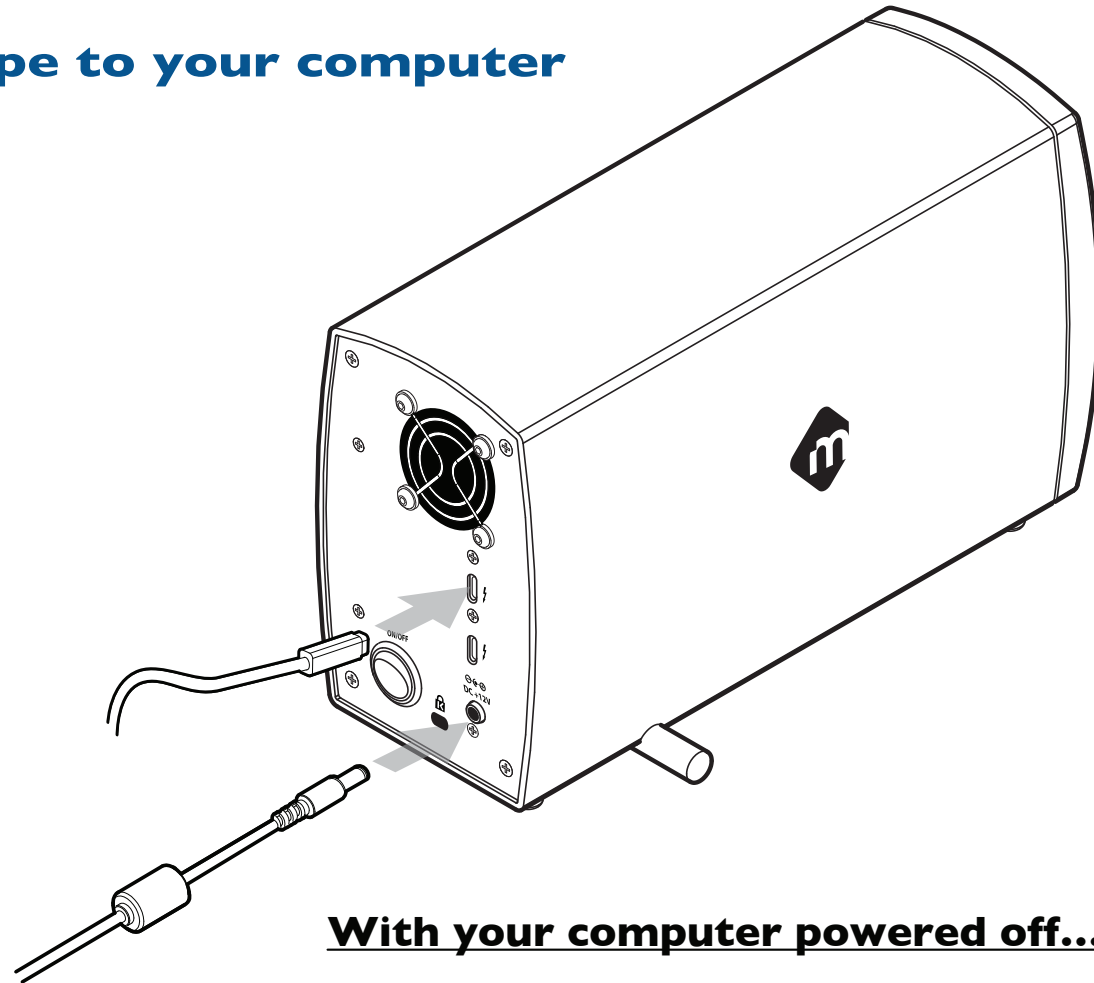
With your computer powered off...

1) Connect the included Thunderbolt cable to your computer and the other end of the cable to one of the Thunderbolt ports located on the rear of mTape.

2) Attach the power plug to the power jack on the rear of mTape and plug the power cord into a power outlet.

Powering on mTape

Note:
Before powering on mTape, ensure that the cooling holes located on the bottom of the unit are not blocked

1) Press the power button located on the back of the unit down to the "I" position
2) Wait for the Green Ready Light on front of mTape to illuminate
3) Power on your computer

Note: When initially powered on, mTape will perform a hardware Power On Self-Test (POST). The POST checks to make sure that the LTO drive is functioning properly. During POST, the Single Character Display (SCD) flashes several segmented characters. Each character represents a test performed during POST. When POST finishes, the SCD will momentarily light all segmented characters and will then go blank. POST takes approximately 12 seconds.

Note: If mTape is powered on with a tape cartridge installed, the system will perform a much more intensive POST while the system verifies the integrity of the data on the tape. Never leave a tape in mTape with the unit powered off!

Note: The mTape power button located on the rear panel turns the LTO tape drive inside of mTape on and off. Power to the Thunderbolt electronics inside mTape are control by the host computer. When mTape is attached to a computer that is powered on the mTape electronics are on. When the computer is powered off the electronics in mTape also power off.

Note: Never remove power from mTape during read, write, load and unload activities.

Verify mTape is recognized by your system

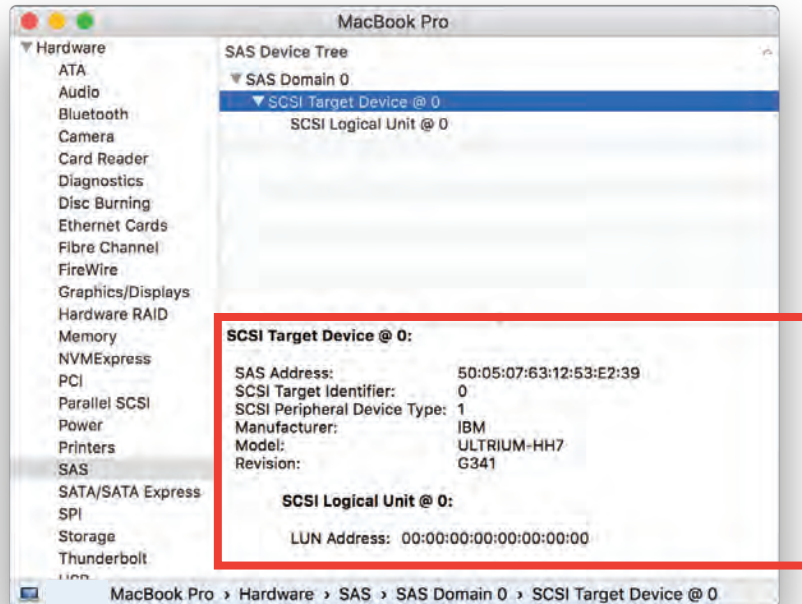1) Under "System Information", verify mTape is displayed under "Thunderbolt" setting.....
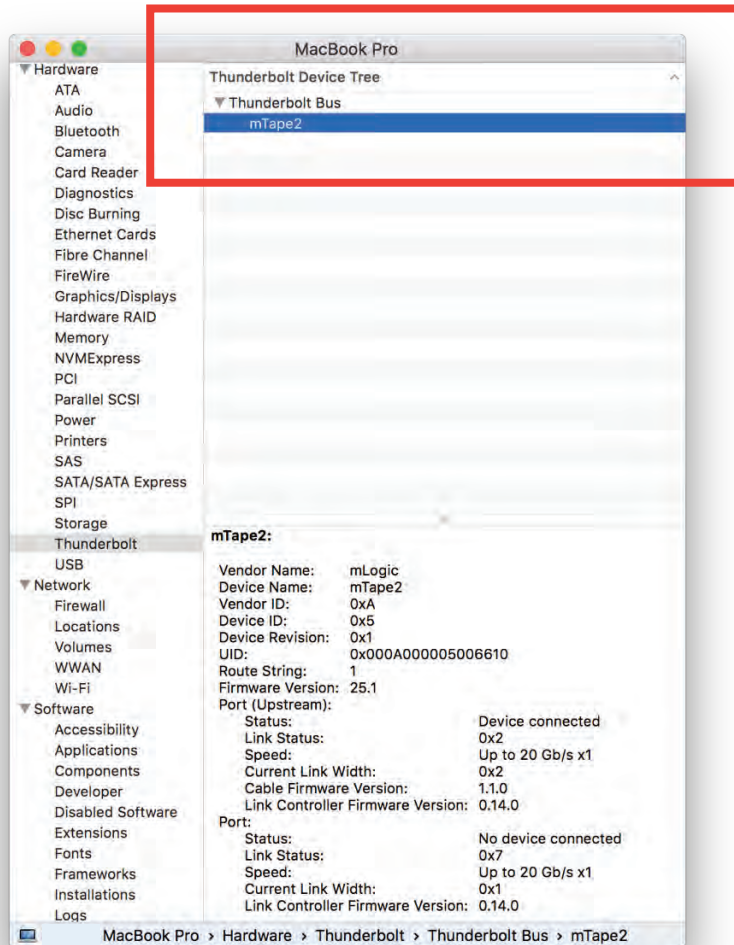
If mTape is not displayed, check your Thunderbolt cable. You may need to unplug and replug the cable for your system to detect mTape.

2) Under "System Information", verify that the Ultrium-HH tape drive inside of mTape is displayed under the "SAS" setting...

If the Ultrium-HH is not displayed, make sure you have powered on mTape and the green Ready Light is on.

Note: Once mTape is powered on and you attach mTape to your computer, it takes approximately 20 seconds for the tape drive to show up in "SAS" setting.

If you have issues with mTape being recognized by your system, please contact **support@mlogic.com.**

Loading the LTO cartridge into mTape

1) Make sure mTape is powered on and the Green Ready Light is illuminated. Do not try to insert a tape cartridge before the Green Ready Light is on and steady.
2) Insert the cartridge in to the LTO drive. The cartridge goes in with the arrow pointing upward.
3) Apply gentle pressure until the drive engages the cartridge.
4) When the cartridge is loaded, the Green Ready Light will glow steady green.

Unloading the LTO cartridge

1) Always use the backup/archive application that you are running to unload the LTO tape cartridge. This ensures that the application has finished writing data to the tape before the cartridge is unloaded.
2) During the unload process, the drive will complete any current tasks, rewind the tape and unload the cartridge. The Green Ready light flashes while the unload process in under way.
3) After the cartridge partially unloads, grasp the cartridge and remove from the drive.

Note: Never leave a tape cartridge inside of a mTape when the unit is powered off. If you forget to remove a tape, simply power on the unit and press the Unload button. There is no need to have mTape attached to a Thunderbolt port during a manual unload.

Linear Tape File System (LTFS)

mTape supports the Linear Tape File System (LTFS). LTFS is an industry standard file system designed by IBM that effectively mounts mTape as a volume on your desktop. LTFS makes it possible to drag and drop content to mTape as if it were a hard disk.

mTape ships with a simple drag and drop LTFS archiving/retrieve utility.
Download the mLogic LTFS Utility here...

www.mtapeltfsutility.com
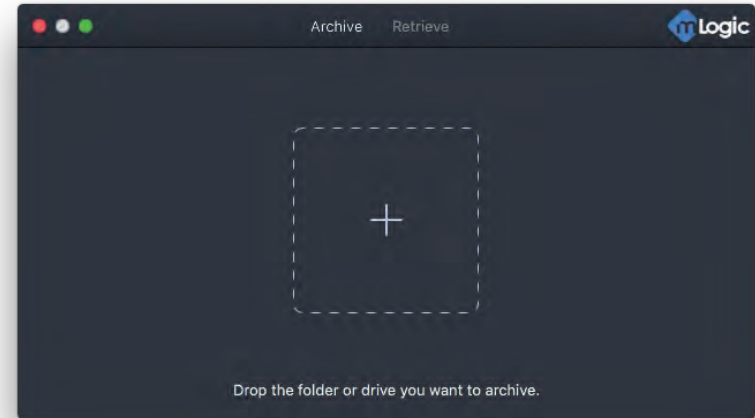
Backup/Archiving Software

We recommend the applications listed below to assist with the backup/archive process. In addition to creating searchable indexes and verifying archives, these applications optimize how data is written to the tape and manage the entire process so you don't have to.

- Archiware - P5
- Codex - Production Suite
- Imagine Products - PreRoll Post
- IBM LTFS

- Retrospect, Inc. - Retrospect
- StorageDNA - DNA Evolution
- Xendata - Xendata Work Station
- YoYotta - YoYottaID LTFS

Cleaning the LTO Tape Drive

mTape will alert you when it becomes necessary to clean the LTO tape drive. The SCD will display a "C" to indicate that cleaning is required. To clean, insert the included cleaning cartridge in to the LTO drive. Cleaning is performed automatically. When the cleaning is finished, the cartridge is unloaded and the SCD will be blank.

Note: The drive will automatically unload an expired cleaning cartridge. Cleaning cartridges are valid for 50 uses.

ULTRIUM LTO	LTO Tape Cartridges			
	12TB (Ultrium8)	6TB (Ultrium7)	2.5TB (Ultrium6)	1.5TB (Ultrium5)
mTape LTO 8	Read/Write	Read/Write		
mTape LTO 7		Read/Write	Read/Write	Read Only
mTape LTO 6			Read/Write	Read/Write

Appendix B: Status Lights / Error codes

The status of mTape is indicated by the front panel SCD and Status lights as outlined below.

Mode	SCD	Ready LED (green)	Fault LED (amber)
Operational	Blank	On	Off
Activity (tape movement) in Operational mode	Blank	Flashing	Off
Error condition	Solid character	Off	Flashing
Power is turned on or a reset is initiated	Random segments	Off	On

Ready status light	Fault status light	Encryption status light	SCD	SCD dot	Meaning
Off	Off	Off	Off	Off	The drive has no power or is powered off.
Green and solid	Off	On or off	Off	Off	The drive is powered on and in an idle state.
Flashing green (once per second)	Off	On or off	Off	Off	The drive is reading from the tape, writing to teh tape, rewinding the tape, locating data on the tape, loading the tape, or unloading the tape.
Flashing green (once per second)	Off	Off	Off	Off	If the drive contains a cartridge when the drive is turned on, the drive completes POST and slowly rewinds the tape (the process may take up to 10 minutes). The light stops blinking and becomes solid when the drive completes the recovery and is ready for a read or write operation. To eject the cartridge, press the Unload button.
Off	Amber and solid	Off	Displaying an error code.	On or off	The drive is displaying an error code on the SCD. See Appendix C for error code information.

Ready status light	Fault status light	Encryption status light	SCD	SCD dot	Meaning
On or off	On or off	On or Off	Displaying random segments, then blank, then displaying random segments, then displaying blank	On or off	During power on, or a drive reset, the drive front panel will display drive progress as follows: 1. SCD will display random segments (no LEDs on). 2. SCD will display random segments (LEDs - green on, amber off) 3. SCD will display random segments (LEDs - green off, amber on) 4. SCD will display [8] (LEDs - green off, amber on) 5. SCD will go blank (LEDs - green on, amber off) after the power is turned on or after the drive is reset. If an error is detected when the drive power is turned on or during a reset, the tape drive posts an error code to the SCD. To determine the error, locate the code in Appendix C

Off	Flashing amber (once per second)	Off	Displaying error code	Off	An error occurred and the drive or media may require service, or it may require cleaning. Note the code on the SCD, then go to Appendix C
Off	Flashing amber		Displaying $\boxed{C}$	Off	The drive needs to be cleaned.
Off	Flashing amber (twice per second)	Off	Off	Off	The drive detected an error and is performing firmware recovery. It will reset automatically.
Off	Amber and solid	Off	Flashing $\boxed{C}$	Off	The drive is ready for a cartridge to be loaded.

Appendix C: Error codes and messages

If the drive detects a permanent error, it displays the error code on the SCD and flashes the Fault light (Ready light is Off).

- Make note of the SCD error code before a cartridge is removed or the SCD error code is cleared.
- If an error ocurred with the cartridge in the drive, push the Unload button to eject the cartridge.
- To clear the SCD error code and power cycle the drive, press the Unload button for 10 seconds.

Error Code	Cause and Action
1	Temperature problem. The tape drive detected that the recommended operating temperature was exceeded. Complete one or more of these actions: • Ensure that the cooling fan is rotating. • Remove any blockage that prevents air from flowing freely through the tape drive.
2	Power problem. The tape drive detected that the externally supplied power is outside the specified voltage limits (the tape drive is not operating). Complete this action: **1.** Ensure that the power connector is properly seated. **2.** Turn power off/on to the mTape to see whether the problem repeats.
3	Firmware problem. The tape drive determined that a firmware error occurred.

Error Code	Cause and Action
4	Firmware or hardware problem. The tape drive determined that a firmware or tape drive hardware failure occurred.
5	Tape drive hardware problem. The drive determined that a tape path or read/write error occurred. To prevent damage to the drive or tape, you cannot insert a cartridge if the current cartridge was successfully ejected. The error code might clear when you cycle power to mTape.
6	Tape drive or media error. The tape drive determined that an error occurred, but it cannot isolate the error to faulty hardware or to the tape cartridge. Ensure that the tape cartridge is the correct media type: • Ultrium 1, 2, 3, and 4 cartridges are not supported in mTape LTO-7 models. • Ultrium 1,2 and 3 cartridges are not supported in mTape LTO-6 models. • Drive does not accept an expired Cleaning Cartridge.
7	Media error. The tape drive determined an error occurred because of a faulty tape cartridge or an invalid tape cartridge. Ensure that the tape cartridge is the correct media type: • Ultrium 1, 2, 3, and 4 cartridges are not supported in mTape LTO-7 models. • Ultrium 1,2 and 3 cartridges are not supported in mTape LTO-6 models. • Drive does not accept an expired Cleaning Cartridge.
8	Interface problem. The tape drive determined that a failure occurred in the tape drive 's hardware or in the host bus.
9	Tape drive or RS-422 error. The tape drive determined that a failure occurred in the tape drive 's hardware or in the RS-422 connection.

Error Code	Cause and Action
A	Degraded operation. The tape drive determined that a problem occurred which degraded the operation of the tape drive, but it did not restrict continued use.
C	The tape drive must be cleaned. Clean the tape drive. See "Cleaning Cartridge" on page 12
P	Write operation to a write protected cartridge was attempted (includes any attempt to overwrite a WORM protected tape). Ensure that the tape cartridge is the correct media type. If the tape cartridge is the correct media type, check the write-protect switch on the cartridge. The drive does not write to a write-protected cartridge.

If an error code persists contact support@mLogic.com for assistance

LIMITED WARRANTY

mLOGIC, LLC (the "Company") warrants its products will be free from defects in material and workmanship for two years from the date of purchase of the product.

This Limited Warranty only applies to the original purchaser of the product, and is not transferable to subsequent owners.

This Limited Warranty is void if the product is subjected to abuse, misuse, abnormal, excessive or improper conditions (including, without limitation, attempts to utilize the product under any condition that exceeds its design capabilities, or any other use beyond the use specified in any product instructions), or if the product is altered or modified in any manner. This Limited Warranty does not cover damage to the product due to external causes (including, without limitation, accident, liquids, chemicals, oxidation, corrosion, or exposure to the elements), or problems caused by use of parts and components not supplied by the Company.

The sole remedy under this Limited Warranty is product repair, replacement, or refund of the purchase price, at the sole discretion of the Company.

In order to make a claim, the purchaser must ship the product to the Company at the purchaser's expense, together with proof of purchase, and a description of the nature of the defect. The Company will not be held responsible for any product that is damaged or lost in transit to the Company.

PURCHASER AGREES THAT MLOGIC, LLC SHALL NOT BE LIABLE FOR ANY SPECIAL, INCIDENTAL, INDIRECT, SECONDARY OR CONSEQUENTIAL DAMAGES, OR FOR THE DAMAGE, INJURY, OR LOSS OF LIFE, PROPERTY OR OTHER PRODUCTS PURCHASER CONNECTS TO THE PRODUCT, OR LOSS OF REVENUE OR DATA, WHETHER BASED ON CONTRACT, TORT, PRODUCTS LIABILITY OR ANY OTHER LEGAL THEORY, EVEN IF THE DAMAGE, INJURY OR LOSS IS CAUSED BY THE NEGLIGENCE OR OTHER FAULT OF MLOGIC, LLC. THE FOREGOING WARRANTY IS THE ONLY WARRANTY MADE BY MLOGIC, LLC, AND MLOGIC, LLC MAKES NO OTHER WARRANTIES, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

This Limited Warranty shall be governed by the laws of the State of California. Any dispute under this Limited Warranty shall first be submitted to binding arbitration before the American Arbitration Association in Los Angeles, California.