



Safety monitor for flash media

It is important that you register Lifespan if you require technical support or wish to be notified of updates and upgrades. Online registration is the preferred way to register. It immediately places your information into our user base and saves you the inconvenience of filling out, stamping, and mailing in the registration.

Lifespan Registration

To register online go to:
www.micromat.com

Micromat Inc.
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Windsor, CA 95492

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About Lifespan

Lifespan is a flash media utility for the Apple Macintosh. It utilizes ongoing research and development to identify the factors which contribute to the useful life of a flash-based storage device, and to track how much useful life remains in simple percentage terms.

Flash-based storage devices include Solid State Drives (SSDs), Compact Flash cards, and CFast cards. These devices utilize flash memory to store data. Flash memory is a non-volatile computer storage medium that can be programmed and erased electronically rather than using physical rotating disks and read/write heads found in traditional hard drives.

Every solid state drive or memory card that utilizes flash-based memory has a finite life. Each cell in flash memory has a limited number of p/e cycles

(program erase cycles), and each cell must be erased before it can be programmed again. As these cycles increase, it requires more and more voltage to program the cells, and eventually they cannot be programmed reliably.

For flash media to function properly, these cells must wear at roughly equivalent rates. As a result, flash-based media devices tend to wear out suddenly, resulting in data loss. Lifespan tracks the useful life remaining in your flash media so that you can replace it before data loss occurs.

Getting Started

System Requirements

- A Macintosh capable of running OS X 10.13 'High Sierra' or later
- 8 GB RAM or higher recommended.

(Specifications subject to change without notice.)

Installation

Lifespan is a self-contained application which does not require a traditional installer application. To install, simply drag the application icon to the Applications folder. When running the Lifespan application for the first time, you will be prompted to install the Lifespan Agent. Monitoring will only occur when the agent is installed, which will be indicated by the menu bar item being visible in

the menu bar. When the application and agent are installed, additional files will be installed as well.:

```
/Library/PrivilegedHelperTools/com.micromat.LifespanHelper
```

```
/Library/LaunchDaemons/com.micromat.LifespanHelper.plist
```

```
/Library/LaunchAgents/com.micromat.LifespanAgent.plist
```

```
/Library/Application Support/Lifespan
```

```
~/Library/Preferences/com.micromat.LifespanAgent.plist
```

Uninstalling Lifespan

Rather than including an uninstaller, Lifespan includes a menu item in the application to remove the extra files created by running Lifespan. To uninstall, simply choose Uninstall Lifespan... from the Lifespan menu in the application. Lifespan will remove all of its components and then quit.

Using Lifespan

The Lifespan Interface

Lifespan runs from an installation on your hard drive. To launch the program, either double-click the Lifespan application icon found in the Applications folder or choose Open Lifespan from the Lifespan menu item. After the program has launched, you will see the main Lifespan window.

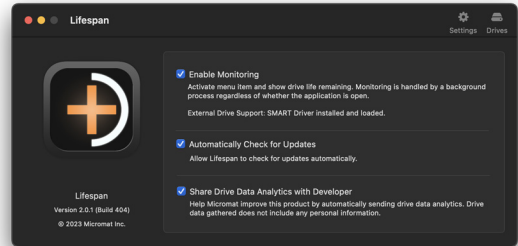


Lifespan

The window consists of a toolbar containing two tabs, Settings, and Drives.

Settings Tab

The Settings tab is a simple set of preferences, with the primary functions being provided by a background agent, which is represented by the menu bar icon.



Enable Monitoring

The main window of Lifespan includes simple checkboxes to configure Lifespan. The first, and most important, is the Enable Monitoring checkbox. When this checkbox is enabled, Lifespan installs a background agent which monitors supported flash-based storage devices. When enabled, a menu bar icon is added on the right side of the macOS menu bar. Clicking on this menu will display the drive health data for any available supported drives.

Below this checkbox, you will find text indicating External Drive Support status. External drive support is enabled by loading a third-party SAT SMART Driver. To install this driver and access health data from flash-based media connected via USB (and FireWire on older Macs), choose Open SAT SMART Driver Installer from the Lifespan application menu.

Automatically Check for Updates

The second checkbox configures the Check for Update mechanism in Lifespan. When selected, Lifespan will auto-

matically check for updates every week. If the checkbox is not checked, product updates must be checked manually by using the Check for Updates... menu option either in the Lifespan application or Lifespan menu bar item.

Share Drive Data Analytics with Developer

The third checkbox configures whether Lifespan will upload drive data analytics to Micromat servers. If enabled, Lifespan will upload data about drive usage so that future versions of Lifespan will be able to more accurately define and predict the useful life of supported drives.

Drives Tab

Clicking the Drives icon in the toolbar will bring up the Drives tab, which displays all of the devices currently connected to your Mac. The Drives tab is populated only when drive monitoring is enabled.

Device Model	Life Remaining	Serial Number	Volumes
APPLE SSD SM0128L	85%	S4E2NYDN409402	Macintosh HD - Data, Macintosh HD
NX-1TB 2280	100%	0014113003120	KingSpec 1TB
APPLE HDD ST3000DM001	Not Supported	ZA50DZJF	Macintosh HD - Data, Macintosh HD
Apple SDXC Reader Media	Not Supported		Install macOS Ventura
SanDisk Cruzer Media	Not Supported	Unknown	Untitled
TOSHIBA DT01ACA050	Not Supported	X8AP3GDK	ExFAT HD

Drive Data Columns

The Drives tab lists data relevant to each drive connected to your Mac. Along with Device Model and Serial number, this table lists the Volumes contained on a device, as well as the life remaining on that device. The data in this table mirrors what is available in the menu bar item.

Lifespan Menu

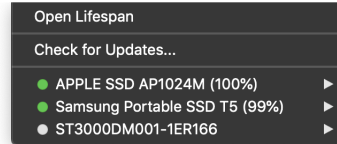
The primary functionality of Lifespan is contained within

the menu bar item.



If one or more of your drives are reaching the end of their lives, the icon will begin to pulse a yellow glow to draw your attention.

When clicked, the Lifespan menu bar item displays several traditional menu items, as well as device items which represent the primary functionality of Lifespan.



Device Life

There will be one device life menu item for each flash-based drive visible to your Mac. Each menu item consists of the drive model identifier, a percentage of life remaining, and a colored dot to indicate if the drive still has useful life remaining. A green dot indicates that there is sufficient life remaining, while a yellow triangle indicates that the drive is reaching the end of its useful life. A white dot indicates that a device is not supported. When any one of the drives is below this threshold the Lifespan icon in the menu bar will also begin to glow yellow.



When a device life menu item is selected for a given drive, additional information about that drive will be displayed:

Device Model: The model number of the device. This value will match the drive life menu item title.

Serial Number: The unique serial number of the device. This number can be useful in identifying a device if there are multiple drives with the same model number.

Connection Bus: The method of connection for the drive.

Life Remaining: The percentage of life remaining on the device.

Volume(s): Any volumes present on the device. This can also help in identifying which device is represented.

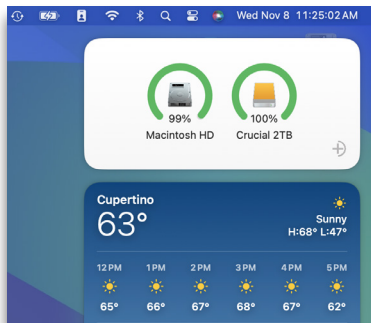
Menu Items

The remaining menu items found in the Lifespan menu perform ancillary functions. *Open Lifespan* will open the Lifespan application in order to change settings or to stop monitoring devices. *Check for Updates...* will also open the Lifespan app, which will then check with the update server

for any available updates. If updates are found, a dialog will appear to prompt an installation of the update.

Lifespan Widgets

For Macs running macOS 11 'Big Sur' and later, Lifespan data is now available as a glanceable widget. The widget is available in three sizes, displaying the life available for up to nine supported devices. Because of space limitations, only supported drives are displayed in Lifespan widgets.



To add a Lifespan widget, click on the date and time in your Mac's menu bar, and scroll through the notification center until you see the Edit Widgets button. After clicking Edit Widgets, you should see Lifespan Agent in the list of applications with widgets. You can then select a widget by size, and place it in your Notification Center. Macs running macOS 14 'Sonoma' can also place widgets on the desktop.

The smallest widget will display your startup drive. The medium and large widgets can display up to three or nine devices, respectively. The widget will display the device's icon, volume name, and life remaining, both graphically and as a percentage. For drives with more than one volume, the first volume name is displayed.

Contacting Technical Support

Micromat provides technical support to its customers via email. Technical support email is answered during business hours: Monday through Friday (excluding public holidays), from 9:00 AM to 5:00 PM Pacific time.

- Email: help@micromat.com

This information is subject to change. For our current contact information, please visit our website at www.micromat.com.

Please provide the following information for our technical support staff, and be sure to include it in any email you send to Micromat.

- A brief description of the problem.
- Version number of your Lifespan software.
- Type of Macintosh and configuration, including Processor and RAM installed. (Example: MacBook Pro 3 GHz Intel i7, 4 GB RAM, 2 TB internal hard drive.)
- Version of macOS installed.

About Micromat Inc.

Micromat Incorporated has been developing Macintosh diagnostic utilities since 1989. As the first company to offer diagnostic products for Macintosh, Micromat has pioneered many new technologies for helping Macintosh users bring their computers back to life and to keep them running their absolute best.