**Thank you for purchasing MAChSpeed Control. This product is designed to offer an unparalleled level of compatibility for all G3 and G4 systems and upgrades.**

MAChSpeed Control – OSX has been re-written from the ground up to provide the most modern and most compatible cache control solution available today.

This file contains information about the XLR8 MAChSpeed Control software for Mac OS X. Additional information about this product can be found at http://xlr8.com and http://daystartechnology.com

## Contents



## Features

XLR8 MAChSpeed Control is designed to provide performance and compatibility tools for Mac CPUs. It has a range of features for automated and manual configuration, testing and reporting of the CPU and Backside Caches. It supports all G3, G4 and G5 systems and upgrade cards within Mac OS 9 and Mac OS X. Features will vary by the specific CPU and system.

### Features of XLR8 MAChSpeed Control

**Compatibility**:

- **System tuning.** Works around a variety of processor errors in early G3 and G4 CPUs. Improves overall stability, including motherboard cache management, and improved sleep mode support on the PowerBook G3. XLR8 MAChSpeed Control was the first software to correctly support speculative processing on older ROMs and to do so in a persistent fashion at the earliest stages of bootup -a technique arbitrarily copied by competitors throughout the years.
- **System Information.** Updates low-level information in the IORegistry. It also updates the kernel of OS X itself to ensure that Apple System Profiler can display the most accurate details about the system speed and capabilities. This ensures that accurate information is available to applications that would otherwise be limited by the processing power available.
- **Advanced AltiVec Support.** Enables AltiVec support in a technologically sophisticated and correct manner when running G4 upgrades under Mac OS 9 in pre-G4 systems. This ensures true across-the board compatibility with AltiVec applications and is unmatched by competitive products.
- **CPU Startup Speed Management.** Available on 750 fx/gx CPUs. For enhanced compatibility, this feature allows the system to boot at the hardware speed, and then reset to the software selected speed automatically after the system boot sequence is complete.
- **System 9 through Mac OS 10.4 (single CPU).** Supports, by far, the widest range of CPUs and systems available.
- **Improved XPOSTFACTO Support.** MAChSpeed Control is designed to enhance compatibility and performance for older Mac systems with OS X installed.

**Performance:**

- **Improved Memory / Cache Performance.** Uses faster memory and cache access settings to maximize performance.
- **Semi-automatic Cache and System Controls.** Allows user to dynamically adjust backside cache speeds by choosing from tested “safe” cache speeds. Speeds that failed testing are indicated and prohibited.
- **Dynamic CPU Speed Switching.** Available on 750 FX/GX CPUs as found in the iBook G3 and on high-speed G3 upgrades. This feature allows the user to change the CPU speed on the fly via software.

**Testing And Reporting:**

- **Automatic Cache Testing.** Exclusive profiling and initialization at startup, insures a robust test of the system. Factory retest on restart allows the utility to be set to re-test the backside cache on every restart.
- **Active System Profiling and Tests.** When opened, the software profiles and provides a looping CPU/Cache/RAM test of the machine. It uses a graphical display to represent accurate architectural information about the system at a glance, including processors, internal, inline, backside and motherboard caches, busses, and motherboard memory. Data paths and relative speeds being tested are demonstrated by simulated data flows between the components. Detailed dynamic information about each of the CPUs is presented next to the graphic.
- **Dynamic Status Information.** Exclusively provides real-time updates of the system’s status, including its speed, CPU temperature, version, and caches.
- **Thermal Monitoring.** When supported by the CPU (750-7410), it will alert you if potentially dangerous overheating occurs.
- **Memory.** A detailed memory overview is available on Beige G3 and earlier machines. This view will provide an extremely accurate view of the RAM configuration as well as valuable suggestions about how to optimize performance by effectively pairing RAM DIMMs.

**Configuration:**

- **Backside Cache Control.** Allows user to dynamically adjust backside cache speeds by choosing from tested “safe” cache speeds. Speeds that failed testing are indicated and prohibited. Various cache operation modes can be adjusted if needed.
- **Dynamic CPU Speed Switching.** Available on 750 FX/GX CPUs as found in the iBook G3 and on high-speed G3 upgrades. This feature allows the user to change the CPU speed on the fly via software.

**Recovery:**

- **Reset Mode.** In the event that the CPU or Backside Cache speed cannot run at selected speeds, the user can boot into Mac OS X safe mode using the shift key, and use MAChSpeed Control’s reset mode to return to default settings. On Mac OS 9, hold down the command-option-x-r keys on restart.

## Installation

**Before installation, you need to remove all third party cache enablers.**

Note: *MSC-OSX* is designed to handle all aspects of Cache and CPU control. Its semi-automatic controls can conflict with other "manual" cache enablers such as offerings from Sonnet, PowerLogix and OWC. These utilities MUST be removed before installation.

Third-party components will not be removed automatically. If you are using alternative upgrade software, consult the accompanying documentation for instructions on its removal. You may need to boot into SAFE MODE (holding the shift key on boot) in OS X to remove any existing or third party enablers. These usually reside in the Library directories within the System directory. Review the information in the Deinstallation section for removal of earlier versions of MAChSpeed Control

1. **Boot into the correct Mac OS** for the version of MAChSpeed Control you wish to install (OS9 or OSX), startup your system as you normally would.
2. **Remove all other Cache enablers and their extensions** following each manufacturer's instructions.
3. **Double-click on the image file or folder** for the MAChSpeed Control version to be installed. In some download versions, you may need to decompress the .SIT or .ZIP file first. This will open a virtual disk (or folder in Mac OS 9) on your desktop.
4. **Review the Read Me** to understand installation and use.
5. **Double-click the installer** to begin the installation.
6. **Follow all instructions** to complete the installation
7. **Restart your system** to initialize XLR8 MAChSpeed Control
8. **Open XLR8 MAChSpeed Control** in /Applications/Utilities/ (OS X) or Control Panels (OS 9)
9. **Enter the serial number** provided with your purchase. In most cases, you can copy this from the text in the same folder as the MAChSpeed Control installer (DSX… for OSX, DS9… for OS9).
10. **Review all settings** and close the utility.
11. **XLR8 MAChSpeed Control is now fully operational!**

*Note – on OS 9 your machine will double-boot one time after installing the software and restarting. It will not do this again unless OS 9 is reinstalled.*

Note –on OS X the spinning "circle" at the beginning of the boot sequence may spin for one to two minutes on the first reboot. Mac OS X is rebuilding its kernel caches and system level indexes that are used to make boot up much faster in future.

## Serialization

**A serial number (including dashes) is required for this release of the MAChSpeed Control software. You will be prompted for this number when the *MSC-OSX* utility is first opened. Until a valid serial number is provided, the caches on your machine may not be correctly enabled.**

- All XLR8 MAChSpeed Control versions after 1.4.3 (OS 8.x) require a serial number. Until a serial number is entered, the software will not function (although the machine will be stabilized at startup). The number is a 16-digit number (including dashes), and begins with XLR- (2.6.1), DS9- (MSC-OS9) or DSX- (MSC-OSX).
- Open XLR8 MAChSpeed Control in the Utilities folder to enter the serial number. If the number is already entered correctly the utility will open without any prompts.
- XLR8 MAChVelocity (multiprocessing) owners should not install this software. Multiple CPU configurations are not supported In MSC-OSX. You should continue to use the software that came with the velocity. Due to the discontinuance of the multiprocessing program (associated with severe hard drive corruption), a multiprocessing version of MSC-OSX is not expected.

## Purchasing and Upgrading

Note that MSC-OSX is bundled with Daystar marketed hardware only. This software is available via download or separate purchase from http://daystartechnology.com, or http://4Daystar.com.

- Users that purchased a XLR8 brand card previous to the release of MSC-OS9 (2.6.3+) & MSC-OSX (3.0+), can use the serial number (XLR-) found on the CD label or on the card itself for version 2.6.1 ONLY.
- Users that purchased a XLR8 card manufactured after the release of 2.6.3 can use the serial number (DS9-) found on their CD label, or sent with the download of the software.
- Users owning version 2.6.1 and wanting to upgrade to MSC-OS9 for improved OS 9.2 compatibility can purchase the new version of software at http://daystartechnology.com or http://4Daystar
- Users that purchased MAChSpeed Control are upgraded free for 12 months at no additional charge. All other users will need to purchase via http://4Daystar.com.

## Compatibility

- MAChSpeed Control 1.4.3 is compatible with System 7.5.2 through 8.6x
- MAChSpeed Control 2.6.1 is compatible with System 9 through 9.1x
- MAChSpeed Control 2.7-2.8.2 is compatible with System 9 through 9.2x
- MAChSpeed Control – OS9 (2.6.2+) is compatible with System 9 through 9.2x
- MAChSpeed Control – OSX (3.0.0+) is compatible with OS X 10.1 through 10.2.x
- MAChSpeed Control – OSX (3.2.0+) is compatible with OS X 10.1 through 10.3.x
- MAChSpeed Control – OSX (3.4.0+) is compatible with OS X 10.2 through 10.4.x

## Deinstalling

### De-installing XLR8 MAChSpeed Control – OS 9

Run the XMSC OS 9 installer. Select “Custom Install” and then check the Uninstall checkbox. Click “Install”. The software will be removed from your hard drive.

### De-installing XLR8 MAChSpeed Control – OS X

Manually remove the components listed below. Note that you may need to log-in as the “root” superuser. Then restart. *MSC-OSX* will be completely deinstalled and inactive.

- In: /System/Library/Extensions/
  Remove: XLR8MAChSpeedKernel.kext
- In: /Library/StartupItems/
  Remove: XLR8MAChSpeedStartup
- In: /Applications/Utilities/
  Remove: XLR8 MAChSpeed Control
- In: /Applications/
  Remove: XLR8 Folder

*A deinstall is not needed when upgrading or re-installing XLR8 MAChSpeed Control. The installer will install the new version, reset caches and update the preferences automatically.*

*A deinstall is not needed to reset MAChSpeed control. Simply safe boot, by holding the shift-key on boot. Then open MAChSpeed Control. Hit the reset button and reboot.*

## Using the XLR8 MAChSpeed Control Software

The first time the machine starts up with the processor upgrade installed, the XLR8 MAChSpeed Control software will establish the necessary settings automatically. However, if the software has not already been serialized, the caches on your upgrade will not be enabled.

The software must be run and serialized at least once for full-functionality. It is a good idea to open the control panel and inspect the settings to make sure everything is set the way it should be. In particular check the backside cache settings to make sure that the caches are running at the rated speed of your upgrade.

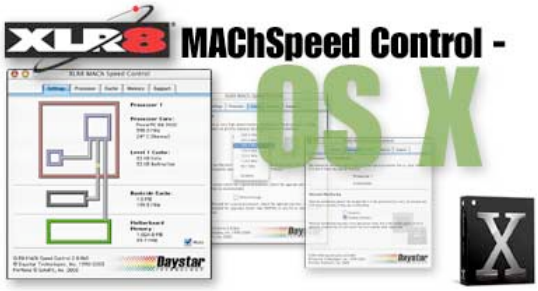
It is not necessary to keep MAChSpeed Control open. The extensions will automatically re-load and run at bootup. Opening the utility is recommended for reviewing, changing, or extended testing only,

## To begin using XLR8 MAChSpeed Control, open the Utility (OSX) or Control Panel (OS9)

- In OSX the Utility is located in Applications/Utilities
- In OS9 the Control Panel is located under the Apple Menu, in Control Panels

**Viewing and Adjusting Performance:** View and adjust configuration settings by clicking on each of the Panels and choosing available choices. The section “Panels” provides additional information of available features.

When open, MAChSpeed Control provides a graphical display of the active tests being performed between the CPU, caches and RAM. All other information is also dynamically updated based on current system feedback.




**Using in Test Mode:** When open and in the forefront, MAChSpeed Control is performing a random looping test between the CPU, Caches and RAM. This is an effective extended test when the CPU or Cache are suspected of having problems.

- **Open MAChSpeed Control,** and click in the window to ensure it is operating as the primary application. Additional applications and utilities can be running in the background to enhance full system stress testing.
- **Let MAChSpeed Control run overnight.** This will allow complete warm-up, testing and working of the CPU and Cache.
- **Animation lockup, or a system crash indicates a problem.** A problem while running MAChSpeed Control is most likely a CPU/Cache problem. If additional applications are running, the test should be repeated. If no failure occurs, then the problem could be related to other components or software being used by the additional applications.
- **Unclicking the Mute checkbox will allow blind testing.** The Mute checkbox was added to allow technicians to test systems without the need for constant viewing or monitors. When the sound stops, a MAChSpeed control lockup has occurred.
- **On systems with Backside Caches, enable retest on restart.** Additional Backside cache testing can be performed by selecting (on the Cache Panel), retest on restart.

## Panels

**Settings panel --** This is the Main Panel of MSC (MAChSpeed Control). It displays the current system configuration. All components represented are available, as listed for use by the system. For example, if the backside cache is displayed, then it does exist. If not, then it is either defective, or non-existent.

All reporting is conducted and verified independently with timing and profiling tests directly on the components. This assures that you are getting actual accurate information. Other reporting software such as Apple System Profiler or third party utilities may rely on system database, which can provide outdated or flawed info.

**Additional text information is also listed**

- **Processor Core:**
  - Shows type, speed, and if available the reported core temperature.
  - The CPU speed type is derived from the published CPU values. It is not possible to correctly discern between a 744x and745x CPU via software.
  - Late versions of G3 CPUs supported either 8x or 10 multipliers. This information is displayed after the CPU type when available.
  - The temperature monitoring relies on the ability of the CPU to accurately report its core temperature. Freescale (Motorola) has identified that the reporting can be inaccurate and has since disabled the functions. It is supported on most PowerPC G3 and early G4 CPUs.
  - Depending on the CPU type, it will also show Normal or High, when the temp reports an unsafe (90c plus) temperature. You will also receive an temperature alert from MAChSpeed Control.
- **Level 1 Cache:**
  - Shows size and type of cache if a Level 1 Cache is present.
- **Level 2 Cache (and Backside):**
  - Shows size and type of cache if a Level 2 Cache is present.
- **Level 3 Cache:**
  - Shows size and type of cache if a Level 3 Cache is present.
- **Motherboard Memory:**
  - Shows total size of RAM installed.
  - Shows current speed of motherboard bus to RAM.
- **Mute Checkbox**
  - The mute checkbox will silence the animation.
  - The animation sound is offered for blind monitoring of extended testing. It will continue as long as the test is looping successfully.

**Processor Panel –** This panel displays the processor version number and other processor related information. Note that if an XLR8 MAChVelocity is installed, its version information can be obtained here.

**Features vary on this panel by CPU and System.**
*If the features are not available, they will not be shown.*

- ***PowerPC 740-7410 - Changing the status of Thermal Monitoring --*** Thermal monitoring is only available when one or more CPUs in the system provide temperature-measuring facilities. While enabled by default, it is okay to disable monitoring after you are comfortable that the systems cooling measures are functioning consistently well. Even when disabled, thermal monitoring will still take place for two minutes after startup.
- ***PowerPC on Older Systems - Changing the status of Speculative Processing -*** The option to change the status of speculative processing is only available on systems where speculative processing may cause problems. If you have a choice, please note that enabling speculative processing is NOT recommended. Please refer to the XLR8 white paper.
- ***PowerPC 750 fx/gx - Changing the speed of the CPU*** – This option allows you to dynamically change the speed of your CPU in real-time. Speed changes will take effect immediately and be maintained on restart. Note that on boot, the system will boot at the default speed. The MAChSpeed selected speed will not take effect until the loading of the OS at the end of the boot sequence.

**Cache panel --** This panel allows the user to change the backside cache speed and to adjust the status of speculative processing and the motherboard cache on certain machines (for more information on speculative processing, please refer to the XLR8 white paper).

**Features vary on this panel by CPU and System.**
*If the features are not available, they will not be shown.*

- **PowerPC 750-7410 - Changing the speed of the Backside Cache** – Once the system is profiled on boot, MAChSpeed Control will automatically choose the safest speed setting for the Backside Cache. The Automatic button will be selected.

  Selecting the "Automatic" setting will cause the cache to run at the safest working speed. Sometimes this is not the fastest speed that may be available. Selecting the "Manual" setting allows the user to select any available speed, possibly including speeds faster than that selected by "Automatic". Speeds selected manually will remain in effect until changed by the user.

  - **To change the speed of the Backside Cache, select the Manual button.** This will allow the user to select from tested speeds. Only speeds that have passed the initial cache test can be selected. Speeds shown in ‘italic’ failed and cannot be used.
  - **To disable the Backside Cache, select the Manual button.** This will allow the user to select the ‘disabled’ selection in the pull down menu.

- **PowerPC 750-7410 - Changing the status of Power Conservation --** Checking "Power Conservation" will allow the OS to put the backside cache into low-power mode when the system is inactive. Battery life on portables will be extended and electricity bills will be reduced. Enabling Power Conservation will not affect system performance.
- **Changing the status of Write-through --** Generally write-through is not necessary except on some older machines or at very high CPU speeds. If you are having stability issues on 6 PCI-slot hardware, or are running at 500 MHz or faster, you may wish to consider turning write-through on. Note that there is a modest performance penalty associated with this action. If write-through comes on by default in the control panel, it is a good idea to leave it on.

- **Changing the status of the Motherboard Cache --** This selection is only available on Apple or Daystar systems that have a motherboard cache. If you have a choice, please note that enabling the motherboard cache is NOT recommended - your system will run more reliably with the motherboard cache disabled. If your motherboard cache is removable, it is highly recommended that it be physically removed from the system.
- **Retest on Restart --** This selection is only available on systems with Backside Caches. It will automatically force MAChSpeed Control to re-profile, and retest the Cache at all possible speed configurations on reboot. This is meant as a diagnostic testing mechanism and is not recommended as a long-term setting.

**Memory Panel --** The memory panel provides highly detailed information about the DIMMs installed in pre-"blue and white" machines. This information is particularly useful on clone-era equipment.

- Enough information is provided that will allow a memory configuration to be calculated that will take maximum advantage of the interleaving capabilities of those machines. Note that information provided by alternative tools will not correctly cover the more unusual possibilities that exist.
- DIMM information for later machines is not provided.

**Support panel --** Contact info and addresses for Daystar.

## Troubleshooting

### Troubleshooting XLR8 MAChSpeed Control

**Problem: Does not accept serial number**
Solution: Ensure that all characters and dashes are being entered correctly. Capitalization is not important.

**Problem: Crash or hang on bootup, or intermittent crashing.**
Cause: Manual CPU speed settings are too high.
Solution: Shut down your machine, and inspect the settings on your CPU accelerator card. Use the guides that came with your card to ensure that jumpers or dipswitches are positioned correctly for a safe speed.

Cause: Selected speeds for the backside cache or processor are too high.
Solution: Manually reset MAChSpeed Control

- In OS 9 reboot your machine and hold down command-option-x-r until the XLR8 MAChSpeed Control extension has passed by. This will reset the preferences.
- In OS X reboot the machine while holding the shift key down and once the Finder is available, launch XLR8 MAChSpeed Control in /Applications/Utilities. Click “Reset” to reset the preferences, then reboot normally.

Cause: Third party cache-enabler conflicts.
Solution: Inspect the Extensions folder for third-party cache enablers, especially those from PowerLogix, Sonnet or OWC. Uninstall or remove any items you find (in OS X you may need to log in as root, or reboot into OS 9).

Cause: Hardware incompatibilities.
Solution: Remove any unnecessary third-party hardware from the system, especially PCI cards. Add the hardware back to the system one item at a time until the conflicting hardware is isolated.

Cause: Motherboard Cache.
Solution: If a motherboard cache is present (clone-era machines only) physically remove the cache, or, if the cache is soldered to the board, press and hold down command-option-x-r while booting which will reset the preferences, and cause the motherboard cache to be disabled when the extension runs.

Cause: Faulty backside cache.
Solution: If your upgrade card has a backside cache, and you are able to run for any length of time, use XLR8 MAChSpeed Control to disable it. If the problem goes away, the backside cache might be faulty, however, be sure to look for other possible solutions before assuming the cache is bad. In particular, make sure that the cache speed is not set too high, either via hardware jumpers, or via XLR8 MAChSpeed Control.

Cause: Faulty or sub-standard RAM.
Solution: Test the RAM by removing all RAM and booting with one DIMM at a time. Because your machine is running faster with an upgrade it is possible that sub-standard RAM may fail where it was previously working. By booting with each DIMM individually it will be possible to quickly isolate which DIMM or DIMMs are failing.

Cause: Disk / permission errors.
Solution: Boot from an OS X CD –preferably one that matches the OS X version you are running. If you are not running OS X, boot from your latest OS 9 CD. Open Disk Utility and run “Repair Permissions” and “Repair Disk” then reboot.

Cause: SCSI or IDE errors.
Solution: although very unlikely, it may be possible to boot by unplugging all storage devices except the CD player and subsequently booting from an OS 9 or OS X CD. If this does work, plug devices back in one at a time until the failing device has been detected.

Cause: System extension conflicts.
Solution: This is a difficult problem to isolate. It will require disabling potentially conflicting extensions and rebooting –a time-consuming and error-prone process. In OS 9 this can be handled most easily using the Extensions Manager. In OS X this is more difficult and will probably require logging in as root and manually moving items in and out of /System/Library/Extensions/ and /Library/StartupItems/ until an incompatible extension is found. Use this option as a last resort –especially in OS X.

**Problem: System does not seem to run at full speed.**
Cause: Software is not serialized.
Solution: Although XLR8 MAChSpeed Control makes its best effort to inform the user if it is not serialized, under some systems, the notification will not take place. Be sure to run XLR8 MAChSpeed Control in /Applications/Utilities/ (OS X) or Control Panels (OS 9) at least once immediately after installing it so that it can be properly serialized and enabled.

Cause: Third party cache-enabler conflicts.
Solution: Inspect the Extensions folder for third-party cache enablers –especially those from PowerLogix, Sonnet or OWC. Uninstall or remove any items you find (in OS X you may need to log in as root, or reboot into OS 9).

**Problem: 5 tones at startup -screen stays black.**
Cause: Running a G4 upgrade on original firmware in Blue&White machine.
Solution: If you are attempting to run a G4 upgrade in a Blue&White machine you will need to update your firmware. Remove the G4 ZIF upgrade and restore the original G3 processor. Follow the instructions for the Blue&White ROM updater you received from the manufacturer. WARNING –the XLR8 updater MUST be run from OS 9. Do NOT attempt to run it from OS X.

**Problem: "Happy Mac" freeze or grey screen after “Happy Mac” (OS 9 only).**
Cause: low-level initialization has failed.
Solution: Reboot the machine and immediately press and hold down the option key. Let the option key go at the 'Welcome to Macintosh" screen. Report the problem immediately to Daystar tech support.

**Problem: Screen artifacts (OS 9 only).**
Cause: Conflict with ATI graphics accelerator software.
Solution: Use the Extensions Manager to disable any and all extensions containing the words "Graphics Accelerator".

## Contacting Daystar Technology

If you have questions about your XLR8 MAChSpeed software or any other XLR8 or Daystar products you may contact us as follows:

**Daystar Technology**
5018 Bristol Ind. Way #202, Buford, GA USA
(770) 614 5400 (email is preferred and fastest)
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www.xlr8.com

**Inquiries:**
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