



# OpenCore

Reference Manual (0.8.~~0~~.1)

[2022.05.05]

*Note:* In order for Aquantia cards to properly function, `DisableIoMapper` must be disabled, DMAR ACPI table must not be dropped, and VT-d must be enabled in BIOS.

*Note 2:* While this patch should enable ethernet support for all Aquantia AQtion series, it has only been tested on AQC-107s based 10GbE network cards.

*Note 3:* To address AppleVTD incompatibilities after applying this quirk, the Reserved Memory Region section of the corresponding device in the DMAR ACPI table might be removed. This table should be disassembled and edited, then recompiled to AML with tool iASL. For the patched DMAR table to be added, the original one should be deleted. More details can be found at comment on commit 2441455.

13. `ForceSecureBootScheme`

**Type:** plist boolean

**Failsafe:** false

**Requirement:** 11

**Description:** Force x86 scheme for IMG4 verification.

*Note:* This option is required on virtual machines when using `SecureBootModel` different from `x86legacy`.

14. `IncreasePciBarSize`

**Type:** plist boolean

**Failsafe:** false

**Requirement:** 10.10

**Description:** Allows IOPCIFamily to boot with 2 GB PCI BARs.

Normally macOS restricts PCI BARs to 1 GB. Enabling this option (still) does not let macOS actually use PCI devices with larger BARs.

*Note:* This option should be avoided whenever possible. A need for this option indicates misconfigured or defective firmware.

15. `LapicKernelPanic`

**Type:** plist boolean

**Failsafe:** false

**Requirement:** 10.6 (64-bit)

**Description:** Disables kernel panic on LAPIC interrupts.

16. `LegacyCommpage`

**Type:** plist boolean

**Failsafe:** false

**Requirement:** 10.4 - 10.6

**Description:** Replaces the default 64-bit commpage bcopy implementation with one that does not require SSSE3, useful for legacy platforms. This prevents a `commpage no match for last panic` due to no available 64-bit bcopy functions that do not require SSSE3.

17. `PanicNoKextDump`

**Type:** plist boolean

**Failsafe:** false

**Requirement:** 10.13 (not required for older)

**Description:** Prevent kernel from printing kext dump in the panic log preventing from observing panic details. Affects 10.13 and above.

18. `PowerTimeoutKernelPanic`

**Type:** plist boolean

**Failsafe:** false

**Requirement:** 10.15 (not required for older)

**Description:** Disables kernel panic on `setPowerState` timeout.

An additional security measure was added to macOS Catalina (10.15) causing kernel panic on power change timeout for Apple drivers. Sometimes it may cause issues on misconfigured hardware, notably digital audio, which sometimes fails to wake up. For debug kernels `setpowerstate_panic=0` boot argument should be used, which is otherwise equivalent to this quirk.

- (g) As the `Default` value will increase with time to support the latest major released operating system, it is not recommended to use the `ApECID` and the `Default` settings together.
- (h) Installing macOS with Apple Secure Boot enabled is not possible while using HFS+ target volumes. This may include HFS+ formatted drives when no spare APFS drive is available.

The installed operating system may have sometimes outdated Apple Secure Boot manifests on the `Preboot` partition, resulting in boot failures. This is likely to be the case when an “OCB: Apple Secure Boot prohibits this boot entry, enforcing!” message is logged.

When this happens, either reinstall the operating system or copy the manifests (files with `.im4m` extension, such as `boot.efi.j137.im4m`) from `/usr/standalone/i386` to `/Volumes/Preboot/<UUID>/System/Library/CoreServices`. Here, `<UUID>` is the system volume identifier. On HFS+ installations, the manifests should be copied to `/System/Library/CoreServices` on the system volume.

For more details on how to configure Apple Secure Boot with UEFI Secure Boot, refer to the UEFI Secure Boot section.

## 8.6 Serial Properties

### 1. Custom

**Type:** plist dict

**Description:** Update serial port properties in `BaseSerialPortLib16550`.

This section lists the PCD values that are used by the `BaseSerialPortLib16550`. When option `Override` is set to `false`, this dictionary is optional.

### 2. Init

**Type:** plist boolean

**Failsafe:** false

**Description:** Perform serial port initialisation.

This option will perform serial port initialisation within OpenCore prior to enabling (any) debug logging.

Refer to the `Debugging` section for details.

### 3. Override

**Type:** plist boolean

**Failsafe:** false

**Description:** Override serial port properties. When this option is set to `false`, no keys from `Custom` will be overridden.

This option will override serial port properties listed in the `Serial Custom Properties` section below.

### 8.6.1 Serial Custom Properties

#### 1. BaudRate

**Type:** plist integer

**Failsafe:** 115200

**Description:** Set the baud rate for serial port.

This option will override the value of `gEfiMdeModulePkgTokenSpaceGuid.PcdSerialBaudRate` defined in `Mde-ModulePkg.dec`.

#### 2. ClockRate

**Type:** plist integer

**Failsafe:** 1843200

**Description:** Set the clock rate for serial port.

This option will override the value of `gEfiMdeModulePkgTokenSpaceGuid.PcdSerialClockRate` defined in `Mde-ModulePkg.dec`.

#### 3. DetectCable

**Type:** plist boolean

**Failsafe:** false

**Description:** Enable serial port cable detection.

This option will override the value of `gEfiMdeModulePkgTokenSpaceGuid.PcdSerialDetectCable` defined in `MdeModulePkg.dec`.

4. **ExtendedTxFifoSize**

**Type:** plist integer

**Failsafe:** 64

**Description:** Set the extended transmit FIFO size for serial port.

This option will override the value of `gEfiMdeModulePkgTokenSpaceGuid.PcdSerialExtendedTxFifoSize` defined in `MdeModulePkg.dec`.

5. **FifoControl**

**Type:** plist integer

**Failsafe:** 0x07

**Description:** Configure serial port FIFO Control settings.

This option will override the value of `gEfiMdeModulePkgTokenSpaceGuid.PcdSerialFifoControl` defined in `MdeModulePkg.dec`.

6. **LineControl**

**Type:** plist integer

**Failsafe:** 0x07

**Description:** Configure serial port Line Control settings.

This option will override the value of `gEfiMdeModulePkgTokenSpaceGuid.PcdSerialLineControl` defined in `MdeModulePkg.dec`.

7. **PciDeviceInfo**

**Type:** plist data

**Failsafe:** 0xFF

**Description:** Set PCI serial device information.

This option will override the value of `gEfiMdeModulePkgTokenSpaceGuid.PcdSerialPciDeviceInfo` defined in `MdeModulePkg.dec`.

*Note:* The maximum allowed size of this option is 41 bytes. Refer to [acidanthera/bugtracker#1954](#) for more details.

*Note 2:* This option can be set by running the `FindSerialPort` tool.

8. **RegisterAccessWidth**

**Type:** plist integer

**Failsafe:** 8

**Description:** Set serial port register access width.

This option will override the value of `gEfiMdeModulePkgTokenSpaceGuid.PcdSerialRegisterAccessWidth` defined in `MdeModulePkg.dec`.

9. **RegisterBase**

**Type:** plist integer

**Failsafe:** 0x03F8

**Description:** Set the base address of serial port registers.

This option will override the value of `gEfiMdeModulePkgTokenSpaceGuid.PcdSerialRegisterBase` defined in `MdeModulePkg.dec`.

10. **RegisterStride**

**Type:** plist integer

**Failsafe:** 1

**Description:** Set the serial port register stride in bytes.

This option will override the value of `gEfiMdeModulePkgTokenSpaceGuid.PcdSerialRegisterStride` defined in `MdeModulePkg.dec`.

On certain firmware, the controllers that produce the console protocols (simple text out) must be reconnected when the screen resolution is changed via GOP. Otherwise, they will not produce text based on the new resolution.

*Note:* On several boards this logic may result in black screen when launching OpenCore from Shell and thus it is optional. In versions prior to 0.5.2 this option was mandatory and not configurable. Please do not use this unless required.

#### 13. SanitiseClearScreen

**Type:** plist boolean

**Failsafe:** false

**Description:** Some types of firmware reset screen resolutions to a failsafe value (such as 1024x768) on the attempts to clear screen contents when large display (e.g. 2K or 4K) is used. This option attempts to apply a workaround.

*Note:* This option only applies to the **System** renderer. On all known affected systems, **ConsoleMode** must be set to an empty string for this option to work.

#### 14. UIScale

**Type:** plist integer, 8 bit

**Failsafe:** -1

**Description:** User interface scaling factor.

Corresponds to 4D1EDE05-38C7-4A6A-9CC6-4BCCA8B38C14:UIScale variable.

- 1 — 1x scaling, corresponds to normal displays.
- 2 — 2x scaling, corresponds to HiDPI displays.
- -1 — leaves the current variable unchanged.
- 0 — automatically chooses scaling based on the current resolution.

*Note 1:* Automatic scale factor detection works on the basis of total pixel area and may fail on small HiDPI displays, in which case the value may be manually managed using the NVRAM section.

*Note 2:* When switching from manually specified NVRAM variable to this preference an NVRAM reset may be needed.

#### 15. UgaPassThrough

**Type:** plist boolean

**Failsafe:** false

**Description:** Provide UGA protocol instances on top of GOP protocol instances.

Some types of firmware do not implement the legacy UGA protocol but this may be required for screen output by older EFI applications such as EfiBoot from 10.4.

## 11.15 ProtocolOverrides Properties

#### 1. AppleAudio

**Type:** plist boolean

**Failsafe:** false

**Description:** Replaces Apple audio protocols with builtin versions.

Apple audio protocols allow OpenCore and the macOS bootloader to play sounds and signals for screen reading or audible error reporting. Supported protocols are beep generation and VoiceOver. The VoiceOver protocol is ~~specific to only provided natively by~~ Gibraltar machines (T2) ~~and~~, however versions of macOS which support VoiceOver will see and use the implementation provided by OpenCore, on screens such as FileVault 2 unlock. VoiceOver is not supported before macOS High Sierra (10.13). Older macOS versions use the AppleHDA protocol (which is not currently implemented) instead.

Only one set of audio protocols can be available at a time, so this setting should be enabled in order to enable audio playback in the OpenCore user interface on Mac systems implementing some of these protocols.

*Note:* The backend audio driver needs to be configured in **UEFI Audio** section for these protocols to be able to stream audio.

#### 2. AppleBootPolicy

**Type:** plist boolean