



## ExpressSAS Host Adapter 6Gb Flash Bundle v181102

### 1. General Release Information

---

These product release notes define the new features, changes, known issues and release details that apply to the ExpressSAS 6Gb Host Adapter products flash bundle package **v181102**, which was released on **November 12, 2018**. This information pertains to the flash bundles and BIOS utility associated with the ExpressSAS 6Gb Host Adapter products.

### 2. New Features, Enhancements and Changes

---

- **Version 181102/BIOS v2.35/EFI v2.00 (Released 11/12/2018)**
  - [EFI] Added the ability to detect and explicitly disable host managed SMR SATA drives
  - [EFI] Added an NVRAM setting to enable SEMB SATA devices as disks
  - [EFI] Added a workaround for SATA drives with improperly formatting firmware versions
  - [EFI] Removed the requirement for non-zero LUNs to be present below LUN 64 in able to discover non-zero LUNs at or above LUN 64
  - Updated the flash bundle format to support smaller download chunks compatible with the maximum transfer size for the driver
  - Removed the Open Firmware expansion ROM image
- **Version 160105/BIOS v2.35/EFI v1.95 (Released 01/08/2016)**
  - [EFI] The EFI driver is now signed to support UEFI Secure Boot.
  - [EFI] Added support for the EFI Human Interface Infrastructure (HII).
  - [EFI] Fixed Write and Verify support for SATA devices to verify the data when the device supports FUA.
  - Improved discovery of SATA devices that require excessive recovery time from a hard reset.
  - Added workaround for Super Micro expanders that report invalid discovery data for SATA drives.
  - Added support for expander edge buffering.
  - Incorporated SAS controller firmware version 1.18.09.
  - [EFI] Added support for Extended Inquiry Data VPD page for SATA devices.
  - [BIOS] Ask the user where to load the Configuration Utility if memory allocation fails. This resolves issue of Configuration Utility failing to work on certain platforms.
- **Version 150511/BIOS v2.30/EFI v1.90 (Released 05/27/15)**
  - Add support for spinning up SATA drives that have PUIS enabled.
- **Version 141211/BIOS v2.25/EFI v1.85 (Released 12/16/14)**
  - [EFI] Fixed the behavior of the driver when the Boot Driver setting is set to Scan Only.
  - Modified discovery process to find Seagate Constellation and Western Digital WD800JD drives when they do not send a signature FIS.
  - [EFI] In the presence of multiple logical SAS ports, when the controller is reset or resumes from power management, fixed an issue that could result in the SAS ports not containing the correct PHYs. This could result in improper SAS discovery or detection of read-only ports.
  - Increased the discovery command timeout to account for slow SATA SSDs.

- Modified behavior so that devices in expander topologies with a link rate not applicable to the NVRAM setting are not presented to the system.
- **Version 131202/BIOS v2.20/EFI v1.80 (Released 12/06/13)**
  - [BIOS] Corrected timing issues that could cause the driver to take several minutes to load in certain platforms.
  - [BIOS] Fixed boot hang when using PMM.
  - [BIOS] Corrected the drive capacity and block size reported to the system BIOS.
  - [BIOS Config] Fixed target ID display in the device list.
- **Version 130529/BIOS v2.15/EFI v1.75 (Released 06/04/13)**
  - [EFI] During a command retry, TLR is disabled in the active command when a target does not support it.
  - [EFI] Fixed SCSI-to-ATA translation for the Inquiry command to have the correct length for VPD page B0.
  - [EFI] Attempt to load only one EFI driver image per driver version in the system. Previously multiple images would be loaded if more than one card was present.
  - [BIOS] Fixed a stall after displaying the device list for systems that switch between video modes during the boot process.
  - Added support for the Link Down Timeout NVRAM setting.
- **Version 121214/BIOS v2.10/EFI v1.70 (Released 12/18/12)**
  - [EFI] Corrected several issues with staggered spin-up and hot plugging SAS and SATA drives on the same PHY that could cause unnecessary link resets.
  - [EFI] Corrected timer freq. controlling several operations including command timeout.
  - [EFI] Corrected a rare issue that could cause a command to be completed twice.
  - [BIOS] Don't hook the system timer tick when installing boot devices to work around a problem with a specific Trenton motherboard.
  - [BIOS] Fixed a problem where the system may hang when another BIOS driver allocates memory in the EBDA area after this driver.
  - [BIOS] Several problems regarding chip resets have been resolved.
  - Add an NVRAM setting to set individual PHYs as read-only.
  - Multiple Invalid Frame errors are required before Transport Layer Retries are disabled for a device.
  - [BIOS Config] Update with new features added to the EFI Configuration Utility.
  - Updated SCSI-to-ATA translation for the Test Unit Ready command to be compliant with specification.
  - [BIOS] Added POST memory manager (PMM) support.
  - Corrected an issue with PHY initialization that could cause some Seagate direct attached SAS drives to not be discovered.
- **Version 120521/BIOS v2.07/EFI v1.67 (Released 05/24/12)**
  - [BIOS Config] Fixed an issue where the Configuration Utility would incorrectly warn that NVRAM settings were not saved.
  - [EFI] Added SCSI-to-ATA translation for the FORMAT UNIT command.
  - [EFI] The default number of supported targets has been increased from 256 to 512.
  - [EFI] Discovery completes faster when hot plugging expander topologies.
  - [EFI] Improvements have been made to keep track of system time more precisely.
  - [EFI] Fixed several issues with using CD-ROM type devices.
  - [BIOS, EFI] Corrected issues with detecting when the boot driver is disabled and being able to re-enable it.
  - [EFI] Added a workaround so SATA hot plugging works when staggered spinup is enabled.
  - Fixed support for SATA drives with non-512 byte sector sizes.
- **Version 110927 / BIOS V2.06 (Released 9/29/2011)**
  - Resolved a memory corruption issue when the NVRAM is saved and the configuration utility is exited and re-entered.

- Corrected an error in expander routing that could cause devices to be routed in the wrong order in complex tree-like topologies. This prevents temporarily invalid routing tables in multi-initiator topologies.
  - Discovery has been enhanced to account for multiple link rates throughout the topology. The lowest link rate in a wide port is used for all connections. If the link rate changes, the new rate will take effect when rediscovers completes. If a path to an expander has a lower link rate than the expander to SATA device link, the SATA device is ignored since a connection cannot be opened.
  - If a SATA device is detected, but the device type is unknown, the signature FIS is assumed to be corrupt and the PHY is reset to recover.
  - Corrected an issue that prevented errors on SATA IDENTIFY DEVICE commands during discovery from being retried.
  - Discovery has been enhanced to gracefully stop if a timeout occurs on a command waiting to be started. Previously, the adapter was reset to recover.
  - SATA device resets during discovery have been replaced by SMP PHY Control hard resets to improve reliability.
  - SGPIO initialization has been updated to prevent the driver from entering degraded mode with 1.11 and later controller firmware.
- **Version 110519 / BIOS V2.05 (Released 6/2/2011)**
  - Corrected an issue in which some devices may not have been reported to the OS if the Device Wait Time expired during the initial discovery.
  - Incorporated SAS controller firmware version 1.16.16.
  - Added LED Control setting to the NVRAM panel in the ATTO Config Tool™.
- **Version 101119 / BIOS V2.00 (Released 11/30/10)**
  - Enhanced Intelligent Platform Management Interface (IPMI) and Serial Over Lan (SOL) support within BIOS and the configuration utility.
  - Improved interoperability with HP.
  - Improved interoperability with Intel motherboards.
- **Version 100727 / BIOS V1.50 (Released 07/30/10)**
  - Enhanced uptime concerning command retries during chip resets.
  - Improved Parity calculation algorithm.
  - Discovery SATA command timeouts minimized by SATA drive resets while performing expander discoveries.
  - Changes made to improve the consistency of the state of SATA devices and formatting SATA commands during discovery process.
  - Enhanced Discovery Process by delaying certain SATA commands, while discovery is in progress.
  - Incorporated 1.10 controller firmware.
- **Version 100326 / BIOS V1.31 (Released 03/31/10)**
  - For SATA drives, after a Stop Unit command has spun down the media, access commands are completed with a SCSI check condition for the message “Not Ready, Initializing Command required.”
  - Incorporated 1.09 controller firmware.
  - Improved adapter negotiation rates for SAS devices behind expanders.
- **Version 091022 / BIOS V1.30 (Released 10/29/09)**
  - Enhanced discovery process after expander routing failure detection.
  - The Immediate bit in the Start Unit command enhanced for SATA device support.
  - PHY speed setting added.
  - Discovery resource management enhanced for improved expander PHY routing accuracy.
  - Data overruns for expander discovery commands are enhanced to support inaccuracies with expanders sending an invalid response length.
- **Version 090727 / BIOS V1.20 (Released 07/31/09)**

- Firmware enhancements for I/O's on large topologies and task management
  - Transport layer retries are enabled on all commands for SAS 2.0 compliant devices.
  - SMP PHY Control command for clearing SATA affiliations programmed to use the hard reset function.
  - Expander enhancements which include discovery process reorganization for clearing SATA affiliations. All devices reported to the OS will have sequential target IDs starting with zero.
  - SCSI check status for data phase errors and other bus events that occur due to signal integrity problems are now retried
  - EFI driver and configuration programs have been enhanced for x86 and x64 platforms.
  - Changed all drivers to use interrupt polling instead of hardware interrupts for systems that assign the adapter the wrong IRQ.
  - Fixed a problem that would cause the system to hang before listing devices if more than 3 drives are attached.
  - Stability fixes in discovery processing when commands timeout or need to be retried due to bus errors.
  - SATA NCQ error and head-of-line blocking recovery mechanisms improvements.
  - Drive rejection to an OPEN address.
  - The OPEN REJECT RETRY interval is set to 5  $\mu$ s.
- **Version 090320 / BIOS V1.11 (Released 03/24/09)**
    - Added the Device Name field to the SAS Identify Address Frame (an optional field added in SAS 2.0).
    - Resolved an issue during initial device discovery that could result in a driver crash if the device rejects a discovery command.
    - SATA devices behind expanders are no longer reset during discovery
    - Improved SATA NCQ processing so performance is maintained as the queue depth increases
    - Improved port down cleanup to ensure all I/O is completed before destroying devices when multiple ports are instantiated
    - The SMP PHY control command to clear affiliations for SATA devices behind and expander now uses Clear Affiliation function and escalates to the Hard Reset function is necessary
    - SATA NCQ is disabled in NVRAM by default
    - Bus resets will no longer result in resource failures
    - Data under-runs are reported when a SCSI error occurs on the same command
    - Improved Head-of-line blocking detection to expedite SATA error recovery
  - **Version 090128 / BIOS V1.01 (Released 02/18/09)**
    - Resolved issues that may cause the driver to crash or hang if a device rejects a discovery command on initial load.
    - Resolved any unexpected target ID changes after a cable pull and reinsertion, when a SATA device is connected behind an expander.
  - **Version 081205 / BIOS V1.00 (Released 12/11/08)**
    - Initial release for the ExpressSAS H680 and H608 host adapter products

### 3. Known Issues/Advisements

---

- The HP ML150 BIOS hangs when an H6xx adapter is installed.
- The HP xw6400 and xw8400 BIOS will halt and display "922- Fatal Error on PCI-E Slot <#>. Press F1 to Boot" on a cold boot with an H6xx adapter installed. The system will boot and function normally after pressing F1. This is believed to be a false error message and does not occur on warm boots.
- In certain applications, disabling NCQ may increase SATA performance.
- ATAPI devices are not supported (e.g. SATA CD and DVD drives).
- SAS multiplexing is not supported.
- SATA port multipliers and port selectors are not supported.

- The adapter firmware is not able to open simultaneous connections on multiple PHYs to a wide ported end device, resulting in limited read and write performance in these configurations. A work around exists in the device driver; however, ATTO cannot guarantee discovery or interoperability with SAS RAID devices.

#### 4. Affected Products

---

Product
ExpressSAS H680
ExpressSAS H608
ExpressSAS H60F
ExpressSAS H6F0
ExpressSAS H644

#### 5. Contacting ATTO Support

---

ATTO Technology, Inc. is renowned for its technical support services. ATTO's goal is to provide you the quickest response possible for your technical support needs, and is available Monday-Friday, 8:00 AM to 8:00 PM EST (except holidays and plant closings).

ATTO Technical Support can be contacted via phone or email:

- Phone: 716.691.1999 ext. 242
- E-Mail: [techsupport@attotech.com](mailto:techsupport@attotech.com)