



## ExpressSAS Host Adapter 6Gb v1.56 – Linux

### 1. General Release Information

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These product release notes define the new features, changes, known issues and release details that apply to the ExpressSAS Host adapter products v1.56 that was released on 11/30/10. This information pertains to Linux.

### 2. Changes

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- **Version 1.56 (Released 11/30/10)**
  - **Note:** It is recommended that firmware dated 11/19/10 be utilized with this driver release.
  - The following applies to changes made from release v1.50 to 1.56
  - **New Features, Enhancements and Changes**
    - Added support for H60R HBA.
    - Modified data frame offset error checking to improve Transport Layer retries.
    - Improved ease-of-use install with 2.6.30 kernel.
    - Enhanced SATA drive ID display.
    - Implemented reset method to recover from Identity frame timeout.
    - Enhanced discovery process concerning self configuring expanders.
    - Improved device reporting to the OS.
    - Added support for hdparm.
    - Improved interoperability with kernel versions 2.6.14 to 2.6.17.
    - Enhanced discovery process for expanders.
    - Improved stability during booting with regards to SAS transport disabling.
    - Improved interoperability with openSUSE11 and SAS transport.
    - Modified device reporting during initial discovery process.
  
- **Version 1.50 (Released 7/30/10)**
  - **Note:** It is recommended that firmware dated 7/27/10 be utilized with this driver release.
  - The following applies to changes made from release v1.32 to 1.50
  - **New Features, Enhancements and Changes**
    - Improved negotiation for devices behind expander which require lower rates due to partial paths.
    - Enhanced recovery from a chip reset.
    - Enhanced Discovery Process by delaying certain SATA commands, while discovery is in progress.
    - Corrected an issue where I/O could be prematurely completed with an error prior to the link down timeout expiring.
    - Corrected an issue with SCSI pass through requests initiated by the CLI tools where the command timeout was not honored.
    - Improved check condition returns with ATA Pass Through command.
    - Link negotiation to SATA devices improvements.
    - Changes made to improve the consistency of the state of SATA devices and formatting SATA commands during discovery process.
    - Improved staging of multiple SMP commands to compensate for resource deficiencies.

- Commands pended while discovery is in progress.
  - Enhanced configuration discovery for expanders that are actively self configuring.
  - Updated the SMP connection time and PHY transmitter settings for increased uptime.
  - Improved recovery for Initiator to Target errors with expanders.
  - Corrected an issue where task management could fail because a device error could not be recovered at the same time.
  - Corrected an issue where a SATA command that was aborted and then retried could be erroneously aborted again.
  - Enhanced SATA device retries for parity errors.
- **Version 1.32 (Released 3/31/10)**
    - **Note:** It is recommended that firmware dated 3/26/10 be utilized with this driver release.
    - The following applies to changes made from release v1.30 to 1.32
    - **New Features, Enhancements and Changes**
      - Enhanced interoperability for SuperMicro chassis with expanders.
      - When an IDENTIFY frame timeout occurs on an expander and/or a controller PHY, a link reset is issued to each PHY to attempt link recovery.
      - Improved controller initialization to allow backup firmware built into the driver to load when the firmware in flash is corrupt.
      - The SMP API has been updated to allow access to the SGPIO interfaces on the controller. Firmware version 1.09 is required for SGPIO operation.
      - Task management timeout enhancements.
      - Improved device discovery during initial driver startup.
      - Additional events have been added for SMP command errors.
      - CSMI interface improvements for reporting an unknown SAS port for a PHY whose link is down.
      - Improved performance when the controller has limited resources to transmit frames within an open connection.
      - Descriptor based sense data support added.
      - Command failures due to an invalid link rate are detected with rediscovery and corrected to account for the new link rate.
      - When a valid SAS port does not exist and a hard reset sequence is detected, a PHY restart is implemented.
      - Added PHY restart when a hard reset sequence is detected, when a valid SAS port does not exist.
      - 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."
      - Improved recovery for flash data due to a controller fault.
      - Enhanced discovery of topology changes behind an expander.
      - More efficient stack usage for event logging code.
- **Version 1.30 (Released 10/29/2009)**
    - **Note:** It is recommended that firmware dated 10/22/09 be utilized with this driver release.
    - The following applies to changes made from release v1.20 to 1.30
    - **New Features, Enhancements and Changes**
      - CSMI support added.
      - Descriptive strings for sense keys to SCSI error event logging added.
      - Failed task management commands which may have been reported to the OS as successful, were corrected
      - Enhanced discovery process after an expander routing failure detection.
      - The Immediate bit in the Start Unit command enhanced for SATA device support.
      - SATA drive enhancement when transferring I/O in multiple segments.
      - Improved device wait count setting when handling power cycle devices.
      - SMP API direct attached target discovery report enhanced.
      - Bus reset processing enables devices for I/O after reset completion.

- 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.
  - Removed “num\_ioreq” module parameter
  - Added “io\_time\_out” module parameter (default value of 30 seconds)
- **Version 1.20 (Released 07/31/2009)**
  - **Note:** It is recommended that firmware dated 07/27/09 be utilized with this driver release.
  - The following applies to changes made from release v1.10 to 1.20
  - **New Features, Enhancements and Changes**
    - Enhanced firmware which contributed in an up to 25% increase in throughput.
    - The supported expander chain depth was increased from 8 to 10.
    - Transport layer retries are explicitly enabled on all commands for SAS 2.0 compliant devices instead of being enabled in the device’s mode pages.
    - All command retries are disabled for sequential (e.g. tape) devices.
    - SMP PHY Control command for clearing SATA affiliations improved. Uses the hard reset function instead of the clear affiliation 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.
    - The heartbeat mechanism has been redesigned to improve I/O resources allocation.
    - Confirmation of I/O completion to the OS prior to reporting a device removal.
    - SCSI check status for data phase errors and other bus events that occur due to signal integrity problems are now retried
    - When a port is reset due to a task management command timeout, the aborted collateral is retried.
    - Enhanced event logging to include retried commands
    - Added support to the SMP API for discovering direct attached devices. A SAS address can be associated with all target IDs.
    - Changed the scatter/gather allocation to improve performance and conserve memory.
    - Improved optimizations and memory allocation to expander discovery process to increase number of drives that can be discovered.
    - Stability fixes in discovery processing when commands timeout or need to be retried due to bus errors.
    - Fixes to SATA NCQ error and head-of-line blocking recovery mechanisms to ensure commands are properly aborted and retried.
    - Task management processing correction for when a discovery is in progress for the same port.
    - When a device rejects an OPEN address, it is infinitely retried to account for devices that stop responding to commands for extended periods of time.
    - Resolved compilation error for kernel 2.6.29 and newer.
    - Fixed resource leak when aborting commands that can eventually lead to failing commands.
    - Return codes from the abort handler repaired
    - The OPEN REJECT RETRY interval is set to 5  $\mu$ s.
- **Version 1.10 (Released 03/24/2009)**
  - **Note:** It is recommended that firmware dated 03/20/09 be utilized with this driver release.
  - The following applies to changes made from release v1.01 to 1.10
  - **New Features, Enhancements and Changes**
    - 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.
    - Resolved issues with discovery processing when a discovery command timed out
    - 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
  - Resolved an issue with SCSI-to-ATA translation of the WRITE AND VERIFY commands that would allow NCQ commands to be started between the write and verify phases
  - Now support SMP API
  - Added timeout processing for commands issued through the SMP API
  - SATA NCQ is disabled in NVRAM by default
- **Version 1.01 (Released 02/18/2009)**
  - **Note:** It is recommended that firmware dated 01/28/09 be utilized with this driver release.
  - The following applies to changes made from release v1.00 to 1.01
  - **New Features, Enhancements and Changes**
    - 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 1.00 (Released 12/11/2008)**
  - **Note:** It is recommended that firmware dated 2008\_12\_05 be utilized with this driver release.
  - The following applies to release v1.00
  - **New Features, Enhancements and Changes**
    - Initial release of ExpressSAS H608 and H680

### 3. Known Issues/Advisements

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- Please refer to the DOS release notes for any known firmware issues.
- SAT exceptions: (SCSI-to-ATA Translation for SATA support). The following SCSI commands are not translated: FORMAT UNIT, REASSIGN BLOCKS, SECURITY PROTOCOL IN, and SECURITY PROTOCOL OUT.

### 4. Affected Products

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| Product Name                 | SKU           |
|------------------------------|---------------|
| ExpressSAS H680 Host Adapter | ESAS-H680-000 |
| ExpressSAS H608 Host Adapter | ESAS-H608-000 |
| ExpressSAS H6F0 Host Adapter | ESAS-H6F0-000 |
| ExpressSAS H60F Host Adapter | ESAS-H60F-000 |
| ExpressSAS H644 Host Adapter | ESAS-H644-000 |

### 5. Contacting ATTO Support

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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:

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