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User manual MAXTOR ST340016A
User guide MAXTOR ST340016A
Operating instructions MAXTOR ST340016A
Instructions for use MAXTOR ST340016A
Instruction manual MAXTOR ST340016A



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Barracuda ATA IV Family

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ST380021A, ST360021A,

.....
ST340016A, ST320011A

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Ultra ATA Interface Drives

.....
Product Manual
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Manual abstract:

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A.R.T. drive monitoring and reporting · Support for Read Multiple and Write Multiple commands · Support for autodetection of master/slave drives that use cable select (CSEL) 2 Barracuda ATA IV Family Product Manual, Rev. B Specification summary table The specifications listed in this table are for quick reference. For details on specification measurement or definition, see the appropriate section of this manual. Drive specification Formatted Gbytes (512 bytes/sector) Guaranteed sectors Bytes per sector Default sectors per track Default read/write heads Default cylinders Physical read/write heads Discs Recording density BPI (bits/inch max) Track density TPI (tracks/inch max) Areal density (Mbits/inch² max) Spindle speed (RPM) Internal data transfer rate OD (Mbits/sec max) I/O data-transfer rate (Mbytes/sec max) ATA data-transfer modes supported Cache buffer Height (mm max) Width (mm max) Length (mm max) Weight (typical) 4 2 3 2 540,000 58,000 31,300 7,200 ST380021A 80.0 156,301,488 ST360021A 60.0 117,231,408 512 63 16 16,383 2 1 1 1 0 39,102,336 555 100 PIO modes 04 Multiword DMA modes 02 Ultra DMA modes 05 2 Mbytes 26.1 101.8 147.0 635 grams (1.4 lb) Barracuda ATA IV Family Product Manual, Rev.

B Drive specification Average latency (msec) Power-on to ready (sec typical) Standby to ready (sec typical) Startup current (typical) 12V (peak) Track-to-track seek time (msec typical) Average seek time (msec typical) Average seek, read (msec typical) Average seek, write (msec typical) Seek power (typical) Read/write power (typical) Idle mode (typical) Standby mode Sleep mode Voltage tolerance (including noise) Ambient temperature Temperature gradient (°C per hour max) Relative humidity (op. and nonop.) Relative humidity gradient Wet bulb temperature (°C max) Altitude, operating 9.5 9.5 10. 5 13.0 watts 12.5 watts 9.8 watts 1.15 watts (typical), 1.3 watts (max) 0.9 watts (typical), 1.1 watts (max) 5V ± 5% 12V ± 10% 0° to 60°C (op.



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), 40° to 70°C (nonop.) 20°C (op.

) 30°C (nonop.) 5% to 90% (op.) 5% to 95% (nonop.) 30% per hour max 30 (op.), 40 (nonop.) 198.12 m to 3,048 m (650 ft to 10,000+ ft) ST380021A
ST360021A 4.16 10 sec 10 sec 2.8 amps 1.0 (read), 1.

2 (write) 9.0 9.0 10.0 ST340016A ST320011A 3 4 Drive specification Altitude, nonoperating (meters below mean sea level, max) Shock, operating (Gs max at
2 msec) Shock, nonoperating (Gs max at 2 msec) Vibration, operating Vibration, nonoperating Drive acoustics Sound power (bels) FDB: Idle* Quiet seek
Performance seek Nonrecoverable read errors Mean time between failures (power-on hours) Contact start-stop cycles (25°C, 40% relative humidity)

SeaShield Barracuda ATA IV Family Product Manual, Rev. B ST380021A ST360021A ST340016A ST320011A 198.

12 m to 12,192 m (650 ft to 40,000+ ft) 63 350 Gs 0.5 Gs (0 to peak, 22350 Hz) 5 Gs (0 to peak, 22350 Hz) 2.5 (typical), 2.7 (max) 2.8 (typical), 3.
0 (max) 3.3 (typical), 3.6 (max) 2.1 (typical), 2.3 (max) 2.4 (typical), 2.6 (max) 3.0 (typical), 3.4 (max) 1 per 1014 bits read 600,000 50,000 Yes *During
periods of drive idle, some offline activity may occur according to the S.M.

A.R.T. specification, which may increase acoustic and power to operational levels. Barracuda ATA IV Family Product Manual, Rev. B 5 1.0 Drive
specifications Unless otherwise noted, all specifications are measured under ambient conditions, at 25°C, and nominal power. For convenience, the phrases
the drive and this drive are used throughout this manual to indicate the ST380021A, ST360021A, ST340016A and the ST320011A. 1.1 Formatted capacity

Drive model ST380021A ST360021A ST340016A ST320011A Formatted Gbytes 80.

0 60.0 40.0 20.0 Guaranteed sectors 156,301,488 117,231,408 78,165,360 39,102,336 Bytes per sector 512 512 512 512 1.1.

1 Default logical geometry CHS mode ST380021A ST360021A ST340016A ST320011A Cylinders 16,383 16,383 16,383 16,383 Read/write heads 16 16 16 16
Sectors per track 63 63 63 63 LBA mode When addressing these drives in LBA mode, all blocks (sectors) are consecutively numbered from 0 to n-1, where n is
the number of guaranteed sectors as defined above. 6 Barracuda ATA IV Family Product Manual, Rev. B 1.2 Physical organization Drive model ST380021A

ST360021A ST340016A ST320011A Read/write heads 4 3 2 1 Number of discs 2 2 1 1 1.3 Recording and interface technology Interface Recording method
Recording density BPI (bits/inch max) Track density TPI (tracks/inch max) Areal density (Mbits/inch² max) ATA 16/17 EPRML 540,000 58,000 31,300 7,200
555 16.

6 (PIO mode 4) 100 (Ultra DMA mode 5) 1:1 2 Mbytes Spindle speed (RPM) ($\pm 0.2\%$) Internal data-transfer rate OD (Mbits/sec max) I/O data-transfer rate
(Mbytes/sec max) Interleave Cache buffer Barracuda ATA IV Family Product Manual, Rev. B 7 1.4 Physical characteristics Drive specification Maximum
height (mm) (inches) Maximum width (mm) (inches) ST380021A, ST360021A, ST340016A, ST320011A 26.1 1.028 101.8 4.01 147.0 5.787 635 1.

40 Maximum length (mm) (inches) Typical weight (grams) (pounds) 1.5 Seek time Seek measurements are taken with nominal power at 25°C ambient
temperature. All times are measured using drive diagnostics. The specifications in the table below are defined as follows: · Track-to-track seek time is an
average of all possible single-track seeks in both directions. · Average seek time is a true statistical random average of at least 5,000 measurements of seeks
between random tracks, less overhead. Typical seek times (msec) Track-to-track Average 1 disc 2 disc Average latency: Read 0.95 9.0 9.5 4.16 Write 0.
76 10.0 10.5 4.16 Note. These drives are designed to consistently meet the ment through the system setup program.

The drive features the following power-management modes: Power modes Active Idle Standby Sleep Heads Tracking Tracking Parked Parked Spindle
Rotating Rotating Stopped Stopped Buffer Enabled Enabled Enabled Disabled · Active mode The drive is in Active mode during the read/write and seek
operations. · Idle mode The buffer remains enabled, and the drive accepts all commands and returns to Active mode any time disc access is necessary.
Barracuda ATA IV Family Product Manual, Rev. B 11 · Standby mode The drive enters Standby mode when the host sends a Standby Immediate command. If
the host has set the standby timer, the drive can also enter Standby mode automatically after the drive has been inactive for a specifiable length of time.
The standby timer delay is established using a Standby or Idle command. In Standby mode, the drive buffer is enabled, the heads are parked and the spindle is
at rest. The drive accepts all commands and returns to Active mode any time disc access is necessary. · Sleep mode The drive enters Sleep mode after
receiving a Sleep command from the host. In Sleep mode, the drive buffer is disabled, the heads are parked and the spindle is at rest. The drive leaves Sleep
mode after it receives a Hard Reset or Soft Reset from the host. After receiving a reset, the drive exits Sleep mode and enters Standby mode with all current
translation parameters intact. · Idle and Standby timers Each time the drive performs an Active function (read, write or seek), the standby timer is reinitialized
and begins counting down from its specified delay times to zero. If the standby timer reaches zero before any drive activity is required, the drive makes a
transition to Standby mode. In both Idle and Standby mode, the drive accepts all commands and returns to Active mode when disc access is necessary.

1.8 Environmental specifications 1.8.1 Ambient temperature Ambient temperature is defined as the temperature of the environment immediately surrounding
the drive. Actual drive case temperature should not exceed 69°C (156°F) within the operating ambient conditions. Recommended measurement locations are
shown in Figure 3 on page 23. Above 1,000 feet (305 meters), the maximum temperature is derated linearly to 112°F (44°C) at 10,000 feet (3,048 meters).

Operating Nonoperating 0° to 60°C (32° to 140°F) 40° to 70°C (40° to 158°F) 12 Barracuda ATA IV Family Product Manual, Rev. B 1.8.

2 Temperature gradient Operating Nonoperating 20°C per hour (68°F per hour max), without condensation 30°C per hour (86°F per hour max) 1.8.3
Humidity 1.8.3.

1 Relative humidity Operating Nonoperating 5% to 90% noncondensing (30% per hour max) 5% to 95% noncondensing (30% per hour max) 1.8.3.2 Wet bulb
temperature Operating Nonoperating 30°C (86°F max) 40.0°C (104°F max) 1.

8.4 Altitude Operating Nonoperating 198.12 m to 3,048 m (650 ft to 10,000+ ft) 198.12 m to 12,192 m (650 ft to 40,000+ ft) 1.8.5 Shock All shock
specifications assume that the drive is mounted securely with the input shock applied at the drive mounting screws.



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Shock may be applied in the X, Y or Z axis. 1.8.5.

1.8.5.1 Operating shock These drives comply with the performance levels specified in this document when subjected to a maximum operating shock of 63 Gs based on half-sine shock pulses of 2 msec. Shocks should not be repeated more than two times per second. 1.8.5.2 Nonoperating shock The nonoperating shock level that the drive can experience without incurring physical damage or degradation in performance when subsequently put into operation is 350 Gs based on a nonrepetitive half-sine shock pulse of 2 msec duration. Barracuda ATA IV Family Product Manual, Rev. B 13 1.8.6 Vibration All vibration specifications assume that the drive is mounted securely with the input vibration applied at the drive mounting screws.

Vibration may be applied in the X, Y or Z axis. 1.8.6.1 Operating vibration The following table lists the maximum vibration levels that the drive may experience while meeting the performance standards specified in this document.

522 Hz 22350 Hz 0.25-inch displacement (zero to peak) 0.5 Gs acceleration (zero to peak) 1.8.6.

2 Nonoperating vibration The following table lists the maximum nonoperating vibration that the drive may experience without incurring physical damage or degradation in performance when subsequently put into operation. 522 Hz 22350 Hz 1.0-inch displacement (zero to peak) 5.0 Gs acceleration (zero to peak) 14 Barracuda ATA IV Family Product Manual, Rev. B 1.9 Drive acoustics Drive acoustics are measured as overall A-weighted acoustic sound power levels (no pure tones). All measurements are consistent with ISO document 7779. Sound power measurements are taken under essentially free-field conditions over a reflecting plane. For all tests, the drive is oriented with the cover facing upward. Note.

For seek mode tests, the drive is placed in seek mode only. The number of seeks per second is defined by the following equation: (Number of seeks per second = $0.4 / (\text{average latency} + \text{average access time})$) ST380021A, ST360021A (2 disc) Acoustic mode Sound power (bels): Fluid dynamic bearing motor (FDB) Idle* 2.5 (typ) 2.7 (max) Quiet seek 2.8 (typ) 3.0 (max) Performance seek 3.3 (typ) 3.6 (max) ST340016A, ST320011A (1 disc) Acoustic mode Sound power (bels): Fluid dynamic bearing motor (FDB) Idle* 2.1 (typ) 2.

3 (max) Quiet seek 2.4 (typ) 2.6 (max) Performance seek 3.0 (typ) 3.4 (max) *During periods of drive idle, some offline activity may occur according to the S.M.A.R.T. specification, which may increase acoustic and power to operational levels.

Barracuda ATA IV Family Product Manual, Rev. B 15 1.10 Electromagnetic immunity When properly installed in a representative host system, the drive operates without errors or degradation in performance when subjected to the radio frequency (RF) environments defined in the following table: Test Electrostatic discharge Radiated RF immunity Description Contact, HCP, VCP: ± 4 kV; Air: ± 8 kV 80 to 1,000 MHz, 3 V/m, 80% AM with 1 kHz sine 900 MHz, 3 V/m, 50% pulse modulation @ 200 Hz ± 1 kV on AC mains, ± 0.5 kV on external I/O ± 1 kV differential, ± 2 kV common, AC mains 150 kHz to 80 MHz, 3 Vrms, 80% AM with 1 kHz sine 0% open, 5 seconds 0% short, 5 seconds 40%, 0.10 seconds 70%, 0.01 seconds Performance level B A Reference standard EN 61000-4-2: 95 EN 61000-4-3: 96 ENV 50204: 95 Electrical fast transient Surge immunity Conducted RF immunity Voltage dips, interrupts B B A C C C B EN 61000-4-4: 95 EN 61000-4-5: 95 EN 61000-4-6: 97 EN 61000-4-11: 94 1.11 Reliability Nonrecoverable read errors Mean time between failures 1 per 10¹⁴ bits read, max 600,000 power-on hours (nominal power, 25°C ambient temperature) 50,000 cycles (at nominal voltage and temperature, with 60 cycles per hour and a 50% duty cycle) None required Contact start-stop cycles Preventive maintenance 16 Barracuda ATA IV Family Product Manual, Rev. B 1.12 Agency certification 1.12.

1.12.1 Safety certification The drives are recognized in accordance with UL 1950 and CSA C22.2 (950) and meet all applicable sections of IEC950 and EN 60950 as tested by TUV North America. 1.12.2 Electromagnetic compatibility Hard drives that display the CE mark comply with the European Union (EU) requirements specified in the Electromagnetic Compatibility Directive (89/336/EEC). Testing is performed to the levels specified by the product standards for Information Technology Equipment (ITE). Emission levels are defined by EN 55022, Class B and the immunity levels are defined by EN 55024. Seagate uses an independent laboratory to confirm compliance with the EC directives specified in the previous paragraph. Drives are tested in representative end-user systems. Although CE-marked Seagate drives comply with the directives when used in the test systems, we cannot guarantee that all systems will comply with the directives.

The drive is designed for operation inside a properly designed enclosure, with properly shielded I/O cable (if necessary) and terminators on all unused I/O ports. Computer manufacturers and system integrators should confirm EMC compliance and provide CE marking for their products. Korean RRL If these drives have the Korea Ministry of Information and Communication (MIC) logo, they comply with paragraph 1 of Article 11 of the Electromagnetic Compatibility control Regulation and meet the Electromagnetic Compatibility (EMC) Framework requirements of the Radio Research Laboratory (RRL) Ministry of Information and Communication Republic of Korea. These drives have been tested and comply with the Electromagnetic Interference/Electromagnetic Susceptibility (EMI/EMS) for Class B products. Drives are tested in a representative, end-user system by a Korean recognized lab.

· EUT name (model numbers): ST380021A, ST360021A, ST3340016A, ST320011A · Certificate numbers: E-H011-01-3269 (B), E-H011-01-3268 (B), E-H011-01-3248 (B), E-H011-01-3250 (B) · Trade name or applicant: Seagate Technology · Manufacturing date: June 2001 · Manufacturer/nationality: Singapore Barracuda ATA IV Family Product Manual, Rev. B Australian C-Tick (N176) 17 If these models have the C-Tick marking, they comply with the Australia/ New Zealand Standard AS/NZS3548 1995 and meet the Electromagnetic Compatibility (EMC) Framework requirements of the Australian Communication Authority (ACA). 1.12.3 FCC verification These drives are intended to be contained solely within a personal computer or similar enclosure (not attached as an external device).

As such, each drive is considered to be a subassembly even when it is individually marketed to the customer. As a subassembly, no Federal Communications Commission verification or certification of the device is required. Seagate Technology LLC has tested this device in enclosures as described above to ensure that the total assembly (enclosure, disc drive, motherboard, power supply, etc.) does comply with the limits for a Class B computing device, pursuant to Subpart J, Part 15 of the FCC rules.



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Operation with noncertified assemblies is likely to result in interference to radio and television reception. Radio and television interference. This equipment generates and uses radio frequency energy and if not installed and used in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. @@@@Move the device to one side or the other of the radio or TV. Move the device farther away from the radio or TV. @@@@This booklet is available from the Superintendent of Documents, U.

S. Government Printing Office, Washington, DC 20402. @@@@Barracuda ATA IV Family Product Manual, Rev. @@@@This minimizes handling damage. @@@@. The drive is extremely fragile--handle it with care. @@@@Removal voids the warranty. @@@@Master or single drive. The drive is configured at the factory for a master or single-drive operation with a jumper set on pins 7 and 8. Drive as slave. Remove all jumpers.

Drive as master with a non-ATA-compatible slave. Use this jumper setting only if the drive does not work as a master with no jumpers installed. Options jumper block Master or single drive Drive is slave Master with non ATACompatible slave Cable select Limit drive capacity to 32 Gbytes 7531 8642 Figure 2. Master/slave jumper settings Circuit Board Barracuda ATA IV Family Product Manual, Rev. B 21 2.

2.2 Cable-select option Computers that use cable select determine the master and slave drives by selecting or deselecting pin 28, CSEL, on the interface bus. Master and slave drives are determined by their physical position on the cable. To enable cable select, set a jumper on pins 5 and 6 as shown in Figure 2 on page 20. Refer to your computer manual to determine whether your computer supports this option.

2.2.3 Alternate capacity jumper Some older computers may "hang" at startup if their BIOS detects a disc drive with a capacity greater than 32 Gbytes. For models ST380021A, ST360021A and ST340016A, this limits the drive's capacity to 32 Gbytes when the alternate capacity jumper is used. To access the full capacity of the drive, you can: · Update the BIOS · Use third-party software such as DiscWizard™ or Disk Manager · Use a third-party host adapter For drives with capacities greater than 32 Gbytes, the alternate capacity jumper changes the total available LBA sectors to 32 Gbytes to solve issues with some BIOS during power on. The ATA Set Features subcommand "F1H Report Full Capacity Available" causes Identify Data words 60 and 61 to report the full capacity. See Section 3.1.3 on page 33 for more details on the Set Features command. Windows Me, Windows 98 or newer versions are needed to support drives with capacities greater than 32 Gbytes.

2.2.4 Ultra ATA/100 cable An 80-conductor 40-pin cable is required to run Ultra DMA mode 3, mode 4 and mode 5. This cable uses even-numbered conductors connected to the ground pins to improve signal integrity. Note. If you are using a 40-pin 80-conductor cable, attach the blue connector to the motherboard, the black connector to the master drive, and the grey connector to the slave. The host detects the 80-conductor cable by sampling pin 34, CBLID, on the interface bus. The drive supports both host and drive cable detection.

2.3 Drive mounting You can mount the drive in any orientation using four screws in the sidemounting holes or four screws in the bottom-mounting holes. See Figure 4 on page 23 for drive mounting dimensions. Follow these important mounting precautions when mounting the drive: · Allow a minimum clearance of 0.030 inches (0.76 mm) around the entire perimeter of the drive for cooling. · Use only 6-32 UNC mounting screws.

· The screws should be inserted no more than 0.200 inch (5.08 mm) into the bottom mounting holes and no more than 0.14 inch (3.55 mm) into the side mounting holes. · Do not overtighten the mounting screws (maximum torque: 6 inch-lb). · Do not use a drive interface cable that is more than 18 inches long. Barracuda ATA IV Family Product Manual, Rev. B 23 Notes: 1. Dimensions are shown in inches (mm).

2 Dimensions per SFF-8301 specification. 0.218 (5.54) 1.028 max (26.11) 3× 0.25 ± 0.01 (6.35 ± 0.25) both sides 2. 23 (56.56) 2.83 (71.80) 3.71 (94.35) 0.168 (4.27) 1.122 ± 0.02 (28.5 ± 0.51) 1.625 ± 0.02 (41.28 ± 0.51) 1.638 ± 0.01 (41.61 ± 0.25) 5.

787 max (146.99) 1.75 ± 0.01 (44.45 ± 0.25) 4.0 ± 0.01 (101.60 ± 0.25) 4× 6-32 UNC-2B 3 min. thread depth 0.15 (3.8) max. fastener penetration Recommended case temperature measurement location 3× 6-32 UNC-2B 3 min. thread depth 0.15 (3.8) max. fastener penetration both sides 0.125 ± 0.01 (3.18 ± 0.25) 3.75 ± 0.01 (95.25 ± 0.25) 4.0 ± 0.01 (101.60 ± 0.25) Recommended case temperature measurement location Figure 4.

Mounting dimensions--top, side and end view 24 Barracuda ATA IV Family Product Manual, Rev. B Barracuda ATA IV Family Product Manual, Rev. B 25 3.0 ATA interface These drives use the industry-standard ATA task file interface that supports 16-bit data transfers. It supports ATA programmed input/output (PIO) modes 04; multiword DMA modes 02, and Ultra DMA modes 05. The drive also supports the use of the IORDY signal to provide reliable high-speed data transfers. You can use a daisy-chain cable to connect two drives to a single AT host bus. For detailed information about the ATA interface, refer to the draft of AT Attachment with Packet Interface Extension (ATA/ATAPI-5), NCITS T13 1153D, subsequently referred to as the Draft ATA-5 Standard. 3.1 ATA interface signals and connector pins Figure 5 on page 26 summarizes the signals on the ATA interface connector that the drive supports.

For a detailed description of these signals, refer to the Draft ATA-5 Standard. 26 Drive pin # 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 Barracuda ATA IV Family Product Manual, Rev. B Host pin # and signal description 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 Hardware Reset Ground Host Data Bus Bit 7 Host Data Bus Bit 8 Host Data Bus Bit 6 Host Data Bus Bit 9 Host Data Bus Bit 5 Host Data Bus Bit 10 Host Data Bus Bit 4 Host Data Bus Bit 11 Host Data Bus Bit 3 Host Data Bus Bit 12 Host Data Bus Bit 2 Host Data Bus Bit 13 Host Data Bus Bit 1 Host Data Bus Bit 14 Host Data Bus Bit 0 Device Data (15:0) Ground (No Pin) DMA Request Ground Device I/O Write: Stop Ultra DMA Burst Ground Device I/O Read: Host Ultra DMA Ready: Host Ultra DMA Data Strobe Ground I/O Channel Ready Device Ultra DMA Ready Device Ultra DMA Data Strobe Cable Select DMA Acknowledge Ground Device Interrupt Reserved Host Address Bus Bit 1 Passed Diagnostics Cable Assembly Type Identifier Device Address (2:0) Device Address (2:0) Chip Select (1:0) Chip Select (1:0) Drive Active/Slave Present Ground Signal name Reset Ground DD7 DD8 DD6 DD9 DD5 DD10 DD4 DD11 DD3 DD12 DD2 DD13 DD1 DD14 DD0 DD15 Ground (removed) DMARQ Ground DIOW STOP Ground DIOR HDMARDY HSTROBE Ground IORDY DDMARDY DSTROBE CSEL DMACK Ground INTRQ IOCS16 DA1 PDIAG CBLID DA0 DA2 CS0 CS1 DASP Ground Pins 28, 34 and 39 are used for master-slave communication (details shown below).



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Drive 1 (slave) 28 34 39 Drive 0 (master) 28 34 39 CSEL PDIAG DASP Host 28 34 39 Figure 5. I/O pins and supported ATA signals Barracuda ATA IV Family Product Manual, Rev.

B 27 3.1.1 Supported ATA commands The following table lists ATA-standard commands that the drive supports. For a detailed description of the ATA commands, refer to the Draft ATA-5 Standard. See Section 3.

1.4 on page 34 for details and subcommands used in the S.M.A.R.T. implementation. Command name Command code (in hex) ATA-standard commands Download Microcode Execute Device Diagnostics Flush Cache Format Track Identify Device Initialize Device Parameters Read Buffer Read DMA Read Multiple Read Sectors Read Verify Sectors Recalibrate Seek Set Features Set Multiple Mode S.M.A.

R.T. Write Buffer Write DMA Write Multiple Write Sectors 92H 90H E7H 50H ECH 91H E4H C8H, C9H C4H 20H, 21H 40H, 41H 10H 70H EFH C6H B0H E8H CAH, CBH C5H 30H, 31H 98H or E5H 97H or E3H ATA-standard power-management commands Check Power Mode Idle 28 Barracuda ATA IV Family Product Manual, Rev. B Command name Command code (in hex) 95H or E1H 99H or E6H 96H or E2H 94H or E0H F1H F2H F3H F4H F5H F6H ATA-standard security commands Idle Immediate Sleep Standby Standby Immediate Security Set Password Security Unlock Security Erase Prepare Security Erase Unit Security Freeze Lock Security Disable Password 3.1.2 Identify Device command The Identify Device command (command code ECH) transfers information about the drive to the host following power up. The data is organized as a single 512-byte block of data, whose contents are shown in the table on page 27. All reserved bits or words should be set to zero. Parameters listed with an "x" are drive-specific or vary with the state of the drive. See Section 1.

0 on page 5 for default parameter settings. @@@@B Description Security status Seagate-reserved ATA-reserved Integrity word Value 0001H xxxH 0000H xxA5H Note. See the bit descriptions below for words 63, 88, 93 and 94 of the Identify Drive data: Description (if bit is set to 1) Bit 0 1 2 8 9 10 Bit 0 1 2 3 4 8 9 10 11 12 13 Word 63 Multiword DMA mode 0 is supported. Multiword DMA mode 1 is supported. Multiword DMA mode 2 is supported. Multiword DMA mode 0 is currently active. Multiword DMA mode 1 is currently active. Multiword DMA mode 2 is currently active. Word 88 Ultra DMA mode 0 is supported. Ultra DMA mode 1 is supported.

Ultra DMA mode 2 is supported. Ultra DMA mode 3 is supported. Ultra DMA mode 4 is supported. Ultra DMA mode 0 is currently active. Ultra DMA mode 1 is currently active. Ultra DMA mode 2 is currently active. Ultra DMA mode 3 is currently active. Ultra DMA mode 4 is currently active. Ultra DMA mode 5 is currently active. Barracuda ATA IV Family Product Manual, Rev.

B Bit 13 Bit 07 Word 93 I=80-conductor cable detected, CBLID above VIH 0=40-conductor cable detected, CBLID below VIL Word 94 Current AAM setting 33 815 AAM Power on default 3.1.3 Set Features command This command controls the implementation of various features that the drive supports. When the drive receives this command, it sets BSY, checks the contents of the Features register, clears BSY and generates an interrupt. If the value in the register does not represent a feature that the drive supports, the command is aborted. Power-on default has the read look-ahead and write caching features enabled. The acceptable values for the Features register are defined as follows: 02H 03H Enable write cache (default). Set transfer mode (based on value in Sector Count register). Sector Count register values: 00H Set PIO mode to default (PIO mode 2). 01H Set PIO mode to default and disable IORDY (PIO mode 2).

08H PIO mode 0 09H PIO mode 1 0AH PIO mode 2 0BH PIO mode 3 0CH PIO mode 4 (default) 20H Multiword DMA mode 0 21H Multiword DMA mode 1 22H Multiword DMA mode 2 40H Ultra DMA mode 0 41H Ultra DMA mode 1 42H Ultra DMA mode 2 34 Barracuda ATA IV Family Product Manual, Rev.

B 43H Ultra DMA mode 3 44H Ultra DMA mode 4 45H Ultra DMA mode 5 05H 42H Enable advanced power management Auto acoustic management FEH Performance seek 80H Quiet acoustic seek 55H 82H AAH F1H Disable read look-ahead (read cache) feature. Disable write cache. Enable read look-ahead (read cache) feature (default). Report full capacity available Note.

At power-on, or after a hardware or software reset, the default values of the features are as indicated above. 3.1.4 S.M.A.R.T. commands S.M.A.R.T. provides near-term failure prediction for disc drives. When S.

M.A.R.T. is enabled, the drive monitors predetermined drive attributes that are susceptible to degradation over time. If self-monitoring determines that a failure is likely, S.M.A.R.T.

makes a status report available to the host. Not all failures are predictable. S.M.A.

R.T. predictability is limited to the attributes the drive can monitor. For more information on S.M.

A.R.T. commands and implementation, see the Draft ATA-5 Standard. SeaTools diagnostic software activates a built-in drive self-test (DST S.M.A.R.T. command for D4H) that eliminates unnecessary drive returns.

The diagnostic software ships with all new drives and is also available at: <http://seatools.seagate.com>. This drive is shipped with S.M.A.R.T. features disabled. You must have a recent BIOS or software package that supports S.

M.A.R.T. to enable this feature.

The table below shows the S.M.A.R.T.

command codes that the drive uses. Code in features register D0H D1H S.M.A.R.T. command S.M.A.R.

T. Read Data Vendor-specific Barracuda ATA IV Family Product Manual, Rev. B Code in features register D2H D3H D4H D5H D6H D7H D8H D9H DAH S.M.A.R.T. command S.M.A.

R.T. Enable/Disable Attribute Autosave S.M.A.

R.T. Save Attribute Values S.M.A.

R.T. Execute Off-line Immediate (runs DST) S.M.A.R.T. Read Log Sector S.M.A.

R.T. Write Log Sector Vendor-specific S.M.A.R.T. Enable Operations S.M.A.

R.T. Disable Operations S.M.A.

R.T. Return Status 35 Note. If an appropriate code is not written to the Features Register, the command is aborted and 0x04 (abort) is written to the Error register. 36 Barracuda ATA IV Family Product Manual, Rev.

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