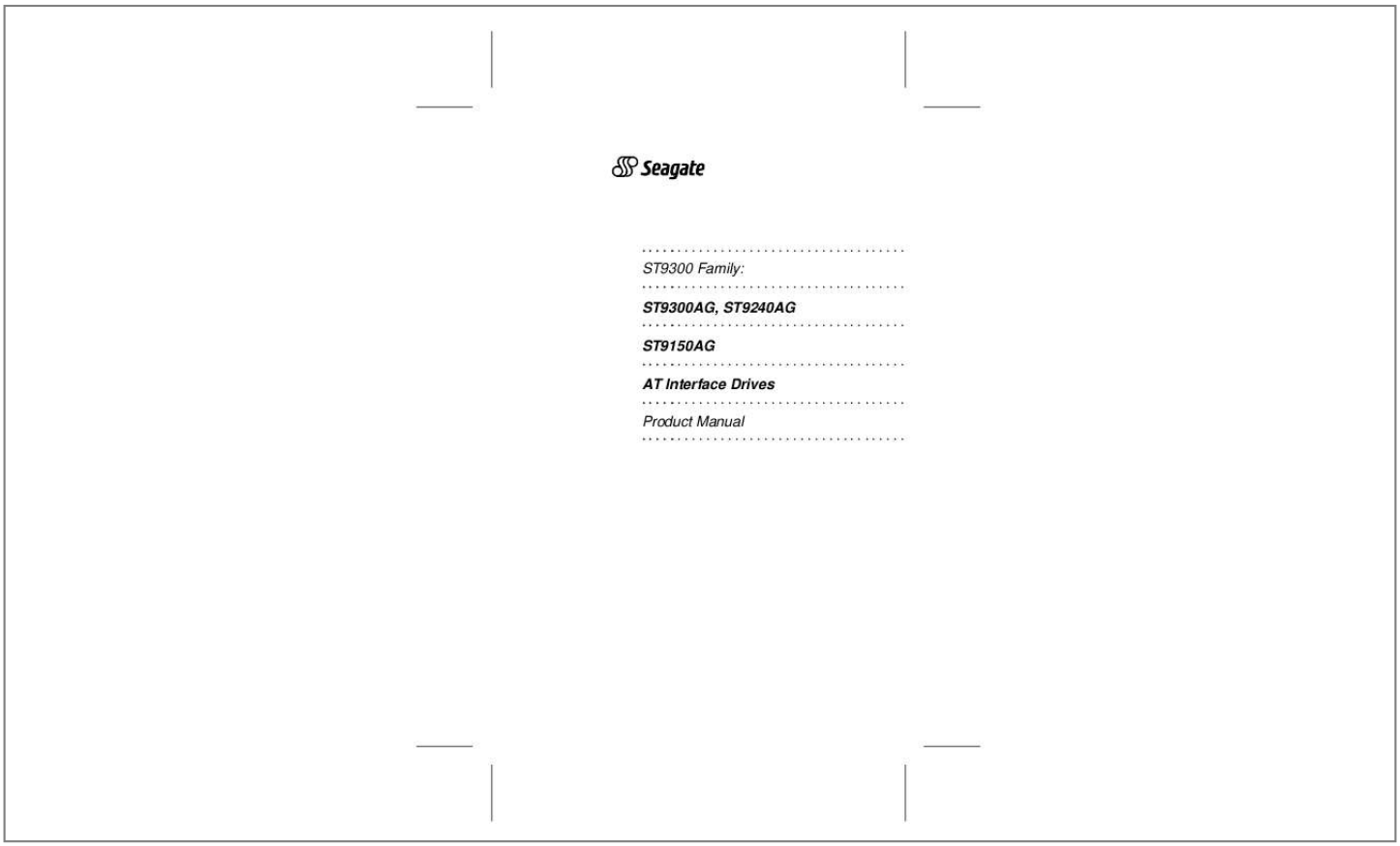

Seagate

ST9300 Family:

ST9300AG, ST9240AG

ST9150AG

AT Interface Drives

Product Manual

Manual abstract:

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ATA interface connector for the ST9300 family drives . . . 17 ST9300 Family Product Manual, Rev. B 1 1.
0 Drive specifications 1.1 Formatted capacity ST9300AG Guaranteed Mbytes (1 Mbyte = 106 bytes) Guaranteed sectors Bytes per sector 262.1 512,100 512 ST9240AG 210.4 411,008 512 ST9150AG 131.0 256,009 512 1.
2 Physical organization ST9300AG Read/Write heads Discs 4 2 ST9240AG 4 2 ST9150AG 2 1 1.3 Logical organization The ST9300 family drives support all head, cylinder and sector geometries, subject to the maximums specified below and to the following condition: (sectors) × (heads) × (cylinders) total sectors per drive ST9300AG Sectors per track (max) Read/Write heads (max) Cylinders (max) 64 16 1,024 ST9240AG 64 16 1,024 ST9150AG 64 16 1,024 1.4 Default logical geometry ST9300AG Sectors per track Read/Write heads Cylinders 60 15 569 ST9240AG 52 8 988 ST9150AG 47 13 419 2 ST9300 Family Product Manual, Rev. B 1.5 Functional specifications Interface Recording method Recording density (BPI) Flux density (FCI) Track density (TPI) Spindle speed (RPM) (± 0.5%) Internal data transfer rate (Mbits per sec max--ZBR) I/O data transfer rate (Mbytes per sec max) Interleave Cache buffer (Kbytes) AT RLL (1,7) 59,124 44,360 3,282 3,980 29.7 8.0 (PIO mode 3 with IORDY) 13.3 (multiword DMA mode 2) 1:1 120 1.6 Physical dimensions ST9300AG Height (max) inches (mm) Width (max) inches (mm) Depth (max) inches* (mm) Weight (typical) ounces (kg) 0.

504 (12.80) 2.760 (70.10) 4.010 (101.85) 5.4 (0.154) ST9240AG 0.504 (12.80) 2.
760 (70.10) 4.010 (101.85) 5.4 (0.
154) ST9150AG 0.504 (12.80) 2.760 (70.10) 4.
*010 (101.85) 5.4 (0.154) * Excludes I/O connector pins, which may extend up to 0.010 inches beyond the edge of the head/disc assembly. 1.7 Seek time All seek times are measured using a 25 MHz 486 AT computer (or faster) with a 8.3 MHz I/O bus. The measurements are taken with nominal power ST9300 Family Product Manual, Rev. B 3 at sea level and 25°C ambient temperature.*

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. · Full-stroke seek time is one-half the time needed to seek from the first data cylinder to the maximum data cylinder and back to the first data cylinder. The full-stroke average is determined by measuring 100 full-stroke seeks in both directions. Seek type Track-to-track Average Full-stroke Average latency: 7.54 msec Typical read (msec) 6 16 26 Typical write (msec) 7 20 28 1.8 Spinup time Power-on to Ready (sec) Standby to Ready (sec) 5 typical 3 typical * The drive responds to selection and status commands within 2 seconds of power-up. 1.9 Reliability Nonrecoverable read errors Mean time between failures 1 per 1013 bits read 300,000 power-on hours (nominal power, at sea level, 25°C ambient temperature) None required 10 minutes 5 years Preventive maintenance Mean time to repair Service life 4 ST9300 Family Product Manual, Rev. B 1.*
10 Environment 1.10.1 Acoustics Drive acoustics are measured as sound pressure 1 meter from the drive. Mode Idle Mode (dBA) Seek (dBA) Typical 24 26 Maximum 28 30 1.10.
2 Ambient temperature Operating Nonoperating 5° to 55°C (41° to 131°F) 40° to 70°C (40° to 158°F) 1.10.3 Temperature gradient Operating Nonoperating 30°C / hr (54°F / hr) max, without condensation 30°C / hr (54°F / hr) max, without condensation 1.10.4 Relative humidity Operating Nonoperating 8% to 80% noncondensing (10% per hour max) Max.
wet bulb temperature: 29.4°C (85°F) 8% to 90% noncondensing (10% per hour max) Max. wet bulb temperature: 40°C (104°F) 1.10.5 Altitude Operating Nonoperating 1,000 ft to 10,000 ft (304 m to 3,048 m) 1,000 ft to 40,000 ft (304 m to 12,192 m) ST9300 Family Product Manual, Rev. B 5 1.10.6 Shock All shock specifications assume that the drive is mounted in an approved orientation with the input levels at the drive mounting screws. The nonoperating specifications assume that the read/write heads are positioned in the shipping zone. Note.

At power-down, the read/write heads automatically move to the shipping zone.

The head and slider assembly park inside of the maximum data cylinder. When power is applied, the heads recalibrate to Track 0. 1.10.6.1 Operating shock The ST9300 family drives, which incorporate SafeRiteTM components, can withstand a maximum operating shock of 100 Gs without nonrecoverable data errors (based on half-sine shock pulses of 2 or 11 msec). 1.10.6.

2 Nonoperating shock The maximum nonoperating shock that the ST9300 family drives can experience without incurring physical damage or degradation in performance when subsequently put into operation is 150 Gs (based on half-sine shock pulses of 11 msec) or 250 Gs (based on half-sine shock pulses of 2 msec). 1.10.7 Vibration All vibration specifications assume that the drive is mounted in an approved orientation with the input levels at the drive mounting screws. The nonoperating specifications assume that the read/write heads are positioned in the shipping zone.

1.10.7.1 Operating vibration The following table lists the maximum vibration levels that ST9300 family drives may experience without incurring physical damage or degradation in performance. 522 Hz 22450 Hz 45022 Hz 225 Hz 0.

020-inch displacement (double amplitude) 0.5 Gs acceleration (peak) 0.5 Gs acceleration (peak) 0.020-inch displacement (double amplitude) 6 ST9300 Family Product Manual, Rev. B 1.10.7.2 Nonoperating vibration The following table lists the maximum nonoperating vibration that ST9300 family drives may experience without incurring physical damage or degradation in performance when the drive is put into operation. 522 Hz 22450 Hz 45022 Hz 225 Hz 0.162-inch displacement (double amplitude) 4 Gs acceleration (peak) 4 Gs acceleration (peak) 0.

162-inch displacement (double amplitude) 1.11 Power specifications ST9300 family drives receive DC power (+5V) through pin 41 and pin 42 of the AT interface connector. 1.11.1 Power-management modes Power management is required for low-power and portable computer systems. In most systems, you can control power management through the system setup program. The ST9300 family drives feature several power-management modes, which are described briefly below: Active mode. The drive is in Active mode during the read/write and seek operations. Idle mode. At power-on, the drive sets the idle timer to enter Idle mode after 5 seconds of inactivity.

You can set the idle timer delay using the system setup utility. In Idle mode, the spindle remains up to speed. The heads are parked away from the data zones for maximum data safety. The buffer remains enabled, and the drive accepts all commands and returns to Active mode any time disc access is necessary. Standby mode.

The drive enters Standby mode when the host sends a Standby Immediate command. If the standby timer has been set by the host system, 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 system-dependent and is usually established using the system setup utility. In Standby mode, the buffer remains 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 Immediate command from the host. The heads are parked and the spindle is at rest. The drive leaves Sleep mode when a Hard Reset or ST9300 Family Product Manual, Rev. B 7 Soft Reset command is received from the host. After receiving a soft reset, the drive exits Sleep mode and enters Standby mode with all current emulation and translation parameters intact. Rest mode. Some host systems reduce drive power consumption by removing all power from the drive, using a state known as Rest mode. As the drive enters Rest mode, the host saves drive state information (including current logical geometry, set feature parameters, cache status and task file registers) before powering down the drive. After power is restored, the host restores the drive to its prerest condition.

Rest mode is implemented using three commands: Rest, Read Drive State and Restore Drive State. The Rest command prepares the drive for a subsequent Read Drive State command. The Read Drive State command captures the state of the I/O registeof the device is required. Seagate Technology, Inc. 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. 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. 10 ST9300 Family Product Manual, Rev.

B This equipment is designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television, which can be determined by turning the equipment on and off, you are encouraged to try one or more of the following corrective measures: · Reorient the receiving antenna. · Move the device to one side or the other of the radio or TV. · Move the device farther away from the radio or TV.

· Plug the computer into a different outlet so that the receiver and computer are on different branch outlets. If necessary you should consult your dealer or an experienced radio/television technician for additional suggestions. You may find helpful the following booklet prepared by the Federal Communications Commission: How to Identify and Resolve Radio-Television Interference Problems. This booklet is available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. Refer to publication number 004-000-00345-4. ST9300 Family Product Manual, Rev. B 11 2.0 Drive mounting and configuration 2.1 Handling and static-discharge precautions After unpacking, and before installation, the drive may be exposed to potential handling and ESD hazards. It is mandatory that you observe standard static-discharge precautions. A grounded wrist-strap is preferred. Handle the drive only by the sides of the head/disc assembly. Avoid contact with the printed circuit board, all electronic components and the interface connector.

Do not apply pressure to the top cover. Always rest the drive on a padded antistatic surface until you mount it in the host system. 2.2 Mounting the ST9300 family drives You can mount ST9300 family drives in any orientation. Allow a minimum clearance of 0.030 inches (0.76 mm) around the entire perimeter of the drive for cooling. Figure 2 on page 12 provides mounting dimensions for the ST9300 family drives.

These drives conform to the industry-standard MCC directmounting specifications and require the use of MCC-compatible connectors in direct-mounting applications. Note.
The I/O connector pins may extend up to 0.010 inches beyond the edge of the head/disc assembly. Caution. To avoid damaging the drive: · Use M3X0.5 metric mounting screws only.
· Do not insert mounting screws more than 0.150 inches (3.81 mm) into the mounting holes. · Do not overtighten the screws (maximum torque: 3 inch-lb). 12 ST9300 Family Product Manual, Rev.
B Dimensions are in inches (mm) 0.489 ± 0.015 (12.42 ± 0.38) 4.010 (101.85) max. (head/disc assembly) 0.118 ± 0.010 (3.

00 ± 0.25) 0.000 in (mm) 4X 3 mm × 0.5 mm, 0.15 in (3.81mm) min. full thread 0.152 ± 0.005 (3.86 ± 0.
13) 1.227 ± 0.020 (31.17 ± 0.51) 4.
020 (102.11) max. @@@@@@@@@@@@@@@@@@@@@@@@@@@CSEL is ignored. Drive is master; slave drive is present. CSEL is ignored. DASP is ignored. Drive is slave (a master drive should be present also). CSEL is ignored. @@@@@@@@@@@@@This allows ECC correction without degrading drive performance. @@@@Such a report does not indicate a drive malfunction. ST9300 Family Product Manual, Rev. B 17 3.0 ATA interface The ST9300 family drives use the industry-standard ATA task file interface. The drives support both 8-bit and 16-bit data transfers. They support ATA programmed input/output (PIO) modes 0, 1 and 3, as well as ATA single-word DMA modes 0, 1 and 2, and ATA multiword DMA modes 0 and 1.

The ST9300 family drives also support the use of the IORDY signal to provide reliable high-speed data transfers. The drives can differentiate between a hard reset and a soft reset while in Sleep mode. You can use a daisy-chain cable to connect two drives using the same AT host bus. For detailed information regarding Seagate's implementation of the ATA interface, see the Seagate ATA Interface Reference Manual. 3.1 ATA interface connector The drive connector is a 44-conductor connector with 2 rows of 22 male pins on 0.079-inch (2 mm) centers (see Figure 4). The mating cable connector is a 44-conductor, nonshielded connector with 2 rows of 22 female contacts on 0.079-inch (2 mm) centers. The connectors should provide strain relief and should be keyed with a plug in place of pin 20.
The ST9300 family drives are designed to support the industry-standard MCC direct-mounting specifications. When installing these drives in fixed mounting applications, use only MCC-compatible connectors such as Molex part number 87368-442x. For applications involving flexible cables or printed circuit cables (PCCs), use Molex part number 87259-4413 or equivalent to connect the drive to the system. Select a connector that provides adequate clearance for the master/slave configuration jumpers if the application requires the use of such jumpers. The ATA interface cable should be no more than 18 inches long. Dimensions are in inches (mm) Master/slave jumpers 0.079 ± 0.003 (2.00 ± 0.08) 0.
020 ± 0.002 (0.51 ± 0.05) 0.152 ± 0.005 (3.71 ± 0.20) 0.020 ± 0.002 (0.

51 ± 0.05) 1.654 (42.01) 0.079 ± 0.003 (2.00 ± 0.08) 0.158 ± 0.003 (4.
00 ± 0.08) Figure 4. ATA interface connector for the ST9300 family drives Note. The I/O connector pins may extend up to 0.010 inches beyond the edge of the head/disc assembly.
18 ST9300 Family Product Manual, Rev. B 3.2 ATA interface signals and connector pins The following diagram summarizes the signals on the ATA interface connector that are supported by the ST9300 family drives. For a detailed description of these signals, refer to the Seagate ATA Interface Reference Manual. 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 41 42 43 44 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 Ground DIOR Ground IORDY CSEL DMACK Ground INTRQ IOCS16 DA1 PDIAG DA0 DA2 CS1FX CS3FX DASP Ground Power Power Ground Reserved 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 41 42 43 44 Host 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 Host Data Bus Bit 15 Ground (No Pin) DMA Request Ground Host I/O Write Ground Host I/O Read Ground I/O Channel Ready Cable Select pin DMA Acknowledge Ground Host Interrupt Request Host 16 Bit I/O Host Address Bus Bit 1 Passed Diagnostics Host Address Bus Bit 0 Host Address Bus Bit 2 Host Chip Select 0 Host Chip Select 1 Drive Active / Slave Present Ground +5 volts DC (logic) +5 volts DC (motor) Ground for power pins Reserved Pins 28, 34 and 39 are used for master-slave communication (details shown below).
Drive 1 (slave) 28 34 39 Drive 0 (master) 28 34 39 CSEL PDIAG DASP Host 28 34 39 ST9300 Family Product Manual, Rev. B 19 3.2.1 AT bus signal levels Signals that the drive sends have the following output characteristics at the drive connector: Logic Low Logic High 0.0V to 0.4V 2.5V to 5.25V Signals that the drive receives must have the following input characteristics, measured at the drive connector: Logic Low Logic High 0.0V to 0.8V 2.

0V to 5.25V 20 ST9300 Family Product Manual, Rev. B 3.3 ATA interface commands The following table lists ATA-standard and Seagate-specific drive commands that the ST9300 family drives support. For a detailed description of these commands, refer to the Seagate ATA Interface Reference Manual. Command code Supported by ST9300 family drives Command name ATA-standard commands Execute Drive Diagnostics Format Track Identify Drive Initialize Drive Parameters NOP Read Buffer Read DMA (w/retry) Read DMA (no retry) Read Long (w/retry) Read Long (no retry) Read Multiple Read Sectors (w/retry) Read Sectors (no retry) Read Verify Sectors (w/retry) Read Verify Sectors (no retry) Recalibrate Seek Set Features Set Multiple Mode Write Buffer Write DMA (w/retry) 90H 50H ECH 91H 00H E4H C8H C9H 22H 23H C4H 20H 21H 40H 41H 1xH 7xH EFH C6H E8H CAH Yes Yes Yes Yes No Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes ST9300 Family Product Manual, Rev. B 21 Command name Write DMA (no retry) Write Long (w/retry) Write Long (no retry) Write Multiple Write Same Write Sectors (w/retry) Write Sectors (no retry) Write Verify Command code CBH 32H 33H C5H E9H 30H 31H 3CH Supported by ST9300 family drives Yes Yes Yes Yes No Yes Yes No ATA-standard power-management commands Check Power Mode Idle Idle Immediate Sleep Standby Standby Immediate 98H or E5H 97H or E3H 95H or E1H 99H or E6H 96H or E2H 94H or E0H Yes Yes Yes Yes Yes Yes Seagate-specific power-management commands Active and Set Idle timer Active Immediate Check Idle Mode Idle Immediate Idle and Set Idle timer FBH F9H FDH F8H FAH Yes Yes Yes Yes Yes 22 ST9300 Family Product Manual, Rev.

B The following commands are specific to the ST9300 family drives or contain drive-specific features. 3.3.
1 Identify Drive command The Identify Drive 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 below. 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 of this manual for default parameter settings for the ST9300 family drives.
Word Description Configuration information: · Bit 10: disc transfer > 10 Mbits/sec · Bit 6: fixed drive · Bit 4: head switch time > 15 µsec · Bit 3: not MFM encoded · Bit 1: hard-sectored disc Number of fixed cylinders (default logical emulation) ATA reserved Number of heads (default) Number of unformatted bytes per track (36,240) Number of unformatted bytes per sector (584) Number of sectors per track (default logical emulation) ATA reserved ST9300AG ST9240AG ST9150AG 0 045AH 045AH 045AH 1 2 3 4 5 6 79 0239H 0000H 000FH 8D90H 0248H 003CH 0000H ASCII 03DCH 0000H 0008H 8D90H 0248H 0034H 0000H ASCII 01A3H 0000H 000DH 8D90H 0248H 002FH 0000H ASCII Serial Number: 1019 (20 ASCII characters, 0000H = none) 20 Controller type = dual-port multisector buffer with caching 0003H 0003H 0003H ST9300 Family Product Manual, Rev. B Word 21 22 Description Buffer size (240 sectors of 512 bytes each) Number of ECC bytes available (16) 23 ST9300AG ST9240AG ST9150AG 00F0H 0010H 00F0H 0010H 00F0H 0010H Firmware revision (8 ASCII character string): xx = ROM 2326 version, ss = RAM version, tt = RAM version Drive model number: (40 2746 ASCII characters, padded with blanks to end of string) 47 Maximum sectors per interrupt on read/write multiple Double word I/O (not supported) DMA data transfer and IORDY (supported) ATA reserved PIO data transfer cycle timing mode DMA transfer cycle timing mode (not used) Validity of words 5458 and words 6470 (words may be valid) Number of cylinders (current emulation mode) Number of heads (current emulation mode) Number of sectors per track (current emulation mode) Number of sectors (current emulation mode) xx.ss.tt xx.ss.
tt xx.ss.tt ST9300AG ST9240AG ST9150AG 0010H 0010H 0010H 48 49 50 51 52 0000H 0900H 0000H 0100H 0000H 0000H 0900H 0000H 0100H 0000H 0000H 0900H 0000H 0100H 0000H 53 0003H 0003H 0003H 54 55 56 5758 xxxxH xxxxH xxxxH xxxxH xxxxH xxxxH xxxxH xxxxH xxxxH xxxxH xxxxH 24 Word Description ST9300 Family Product Manual, Rev. B ST9300AG ST9240AG ST9150AG 59 Number of sectors transfered during a Read Multiple or Write Multiple command 01xxH 01xxH 01xxH 6061 ATA reserved 62 63 Single-word DMA active / modes supported Multiword DMA active / modes supported* Advanced PIO modes supported (mode 3 supported) Minimum multiword DMA transfer cycle time per word (150 nsec) Recommended multiword DMA transfer cycle time per word (250 nsec) Minimum PIO cycle time without IORDY flow control (363 nsec) Minimum PIO cycle time with IORDY flow control (250 nsec) 0000H 0x07H 0x03H 0000H 0x07H 0x03H 0000H 0x07H 0x03H 64 0001H 0001H 0001H 65 0096H 0096H 0096H 66 00FAH 00FAH 00FAH 67 016BH 016BH 016BH 68 00FAH 0000H 00FAH 0000H 00FAH 0000H 69127 ATA reserved 128159 Seagate reserved 160255 ATA reserved xxxxH 0000H xxxxH 0000H xxxxH 0000H * For all ST9300 family drives, DMA mode settings are reflected in the bit settings for words 62 and 63, as shown on the following page. ST9300 Family Product Manual, Rev. B 25 The following DMA mode settings are used in words 62 and 63 of the Identify Drive command: Word 62 62 62 62 62 62 63 63 63 63 Bit 0 1 2 8 9 10 0 1 8 9 Description (if bit is set to 1) Single-word DMA mode 0 available Single-word DMA mode 1 available Single-word DMA mode 2 available Single-word DMA mode 0 currently active Single-word DMA mode 1 currently active Single-word DMA mode 2 currently active Multiword DMA mode 0 available Multiword DMA mode 1 available Multiword DMA mode 0 currently active (default) Multiword DMA mode 1 currently active 26 ST9300 Family Product Manual, Rev. B 3.3.2 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 and 4 bytes of ECC. The acceptable values for the Features register are defined as follows: 02H Enable write cache (default) 03H Set transfer mode (based on value in Sector Count register) Sector Count register values: 00H Set PIO mode to default (PIO mode 1) 08H PIO Mode 0 09H PIO Mode 1 (default) 0BH PIO Mode 3 10H Single-word DMA Mode 0 11H Single-word DMA Mode 1 12H Single-word DMA mode 2 20H Multiword DMA Mode 0 21H Multiword DMA Mode 1 44H Sixteen bytes of ECC apply on read long and write long commands 55H Disable read look-ahead (read cache) feature 66H Disable reverting to power-on defaults 82H Disable write cache AAH Enable read look-ahead (read cache) feature (default) BBH 4 bytes of ECC apply on read long and write long commands (default) CCH Enable reverting to power-on defaults (default) At power-on, or after a hardware reset, the default values of the features are as indicated above. A software reset also changes the features to default values unless a 66H command has been received. ST9300 Family Product Manual, Rev. B 27 3.3.3 Rest/Resume commands Some host systems reduce overall power consumption by temporarily removing power from the disc drive. The Rest/Resume process allows drive-state information to be saved to disc before powering down the drive. After power is restored, the drive-state information is retrieved and used to return the drive to its prerest condition.
The drive-state information is saved in a single 512-byte data block that includes current logical geometry, set feature parameters, cache status and task-file registers. The Rest/Resume process involves three commands: Rest, Read Drive State and Restore Drive State. The drive does not recognize and execute these commands unless the Features register contains the value 0ACH. Any other value in the Features register causes the drive to reject the command with a command abort error. Note.
The Rest/Resume process does not save the contents of data buffers or caches. . 28 ST9300 Family Product Manual, Rev. B 3.3.
3.1 Rest command (E7H) The host prepares the drive for a subsequent Read Drive State command by issuing a Rest command.

If two drives (master and slave) are present, the host must issue the Rest and Read Drive State commands to the slave before issuing them to the master. @@@@@@@@When the drive receives a Rest command, it captures the state of the I/O registers as they existed upon completion of the previous command, then enters Rest mode. After entering Rest mode, the drive rejects any command other than a Read Drive State command with an aborted command error. The Rest mode can be cleared only by power off or reset. After issuing the Rest command, the host should poll the Alternate Status register to monitor for completion status without clearing the interrupt flag that may have been set for an application program. Bit 7 Command (1F7H) Cyl. High (1F5H) Cyl. Low (1F4H) Drv.

Head (1F6H) Sec. Num. (1F3H) Sec. Cnt. (1F2H) Features (1F1H) 1 0 1 D/S X X 0ACH 1 Bit 6 1 Bit 5 1 Bit 4 0 X X X Bit 3 0 Bit 2 1 Bit 1 1 Bit 0 1 ST9300 Family Product Manual, Rev. B 29 3.3.3.2 Read Drive State command (E9H) The Read Drive State command allows the host system to save certain drive parameters to nonvolatile system memory before shutting down power to the drive. The host should only issue this command following a successful Rest command.

If any command other than a Read Drive State command follows a Rest command, the Rest command is aborted. If a Read Drive State command follows any command other than a Rest command, the Read Drive State command is aborted. If the drive receives a Read Drive State command while in Rest mode, it transfers essential drive-state information to disc, where the Restore Drive State command can recover it following power-on. Bit 7 Command (1F7H) Cyl. High (1F5H) Cyl.

Low (1F4H) Drv. Head (1F6H) Sec. Num. (1F3H) Sec. Cnt.

(1F2H) Features (1F1H) 1 0 1 D/S X X 0ACH 1 Bit 6 1 Bit 5 1 Bit 4 0 X X X Bit 3 1 Bit 2 0 Bit 1 0 Bit 0 1 30 ST9300 Family Product Manual, Rev. B 3.3.3.3 Restore Drive State command (EAH) This command allows the host system to restore the drive to the state it was in at the time of the power-down in Rest mode. If the host has previously caused a Rest mode, it must ensure that the first command issued to the drive (after the drive powers up and is ready to accept commands) is not one that interferes with the intended resume operation. The host should only issue a Restore Drive State command when powering up the drive after a successful Read Drive State command. Otherwise, the Restore Drive State command is aborted. When the drive receives a Restore Drive State command, it reads the 256 bytes of drive-state information that were saved with the Read Drive State command. This drive-state information is checked for validity.

If there is a problem with the data, the drive hangs busy with the trap code set to F5H in all of the AT interface registers. If bit zero of the last word transferred is 0H (reset to 0), INTRQ is not asserted at the completion of this command. If bit zero of the last word transferred is set to 1, INTRQ is asserted following the command. After issuing the Restore Drive State command, the host should poll the Alternate Status register to monitor for completion status without clearing any interrupt flag that may have been set for an application program. Bit 7 Command (1F7H) Cyl. High (1F5H) Cyl. Low (1F4H) Drv. Head (1F6H) Sec. Num. (1F3H) Sec.

Cnt. (1F2H) Features (1F1H) 1 0 1 D/S X X 0ACH 1 Bit 6 1 Bit 5 1 Bit 4 0 X X X Bit 3 1 Bit 2 0 Bit 1 1 Bit 0 0 Seagate Technology, Inc. 920 Disc Drive, Scotts Valley, California 95066, USA Publication number: 36253-001, Rev. B, Printed in USA .