Service Reference Card

HP Compaq dx6100 and dc7100 Series Personal Computers

Key Specifications

Key Specifications	
Processor Type:	Intel Pentium 4 or Intel Celeron
RAM Type:	DDR2 PC3200 400 MHz or PC4200 533 MHz
Maximum RAM Supported:	up to 4 GB depending on the model
System Bus:	800MHz front side bus
Graphics Adapter	Integrated controller, PCI Express x16
Hard drive interface:	SATA
I/O Interfaces:	Serial, parallel, USB 2.0 (8), PS/2 keyboard, PS/2 mouse, VGA, RJ-45 network, audio (5).

System Setup and Boot

Basic system information regarding file, storage, security, and power configuration is maintained in the Setup Utility held in the system ROM. The Setup Utility is accessed by pressing the F10 key as soon as the computer is turned on. If the screen prompt opportunity is missed, a restart will be necessary.

Computer Setup Menu

Heading	Option / Description
File	System Information - Lists product name, processor type/speed/stepping, cache size, installed memory size/speed, no. channels, integrated MAC for enabled or embedded NIC, system ROM/family name/version, chassis serial number, and asset tracking number.
	About - Provides copyright information.
	Set Time and Date - Allows selection of system time and date.
	Replicated Setup -Allows saving to and restoring from removable media.
	Default Setup - Allows both saving current settings and restoring factory settings as defaults.
	Apply Defaults and Exit - Applies currently selected default settings and clears all passwords.
	Ignore Changes and Exit - Exits Computer Setup without applying or saving any changes.
	Save Changes and Exit - Saves changes to system configuration and exits Computer Setup.
Storage	Device Configuration - Lists all installed BIOS storage devices. The following options appear when a device is selected.

	Diskette Type (legacy diskette drives only) Identifies the highest capacity media type accepted by the diskette drive.
	Drive Emulation (IDE devices only) Selects drive type emulation for storage

Drive Type	Emulation Options
ATAPI Zip Drive	None (treated as other), diskette (treated as diskette drive).
ATA Hard drive	None (treated as other), disk (treated as hard drive.
Legacy Diskette	No emulation available.
IDE CD-ROM	No emulation available.
ATAPI LS-120	None (treated as other), diskette (treated as diskette drive).

Default Values IDE/SATA	
Multisector Transfers ATA disks only	Selects number of sectors transferred. Options are disabled, 8, and 16.
Transfer Mode ATA devices only	Selects active data transfer mode. Options are PIO 0, Max PIO, Enhanced DMA, Ultra DMA 0, and Max UDMA.

Translation Mode (ATA disks only) Selects translation mode to enable the BIOS to access disks partitioned and formatted on other systems and may be necessary for users of older versions of Unix. Options are: Automatic, Bit-Shift, LBA Assisted, User, and None.
NOTE: The translation mode automatically selected by BIOS should usually not be changed.

Translation Parameters (ATA disks only) Allows you to specify disk parameters logical cylinders (max. of 1024), heads (max. of 256), and sectors per track (max. of 63) used by BIOS to translate disk I/O requests. Fields are visible and changeable only when drive translation mode is set to User.

Storage Options	Removable Media Boot. Enables/disables ability to boot system from removable media.
	Legacy Diskette Write. Enables/disables ability to write data to legacy diskettes.
	BIOS DMA Data Transfers. Allows control of BIOS I/O requests. Enable allows read and write with DMA transfers. Disable allows read and write with PIO transfers.
	SATA Emulation. Allows method of accessing SATA controller and devices. Default is Separate IDE Controller. Option is combined IDE Controller
	IDE Controller. Enable/disable primary IDE controller.
	Primary SATA Controller - Enable/disable.
	Secondary SATA Controller - Enable/disable.

Computer Setup Menu *(Continued)*

Heading	Option / Description
Storage (continued)	DPS Self-Test - Allows execution of self-tests on ATA hard drives capable of Drive Protection System (DPS) tests.
	Boot Order - Allows selection of priority in the boot sequence. Each drive may be included or excluded. May use **F9** on rebooting to select a one time boot override to a selected bootable device.
Security	Setup Password - Enable/disable setup (administrator) password.
	Power-On Password - Enable/disable power-on password.
	Password Options (appears if Power-On or Setup password is set) - Enable/disable password for warm boot.
	Smart Cover Lock (some models) - Enable/disable Smart Cover Lock.
	Embedded Security - Enable/disable Embedded Security device. Reset device to Factory Settings.
	Device Security - Enable/disable serial/parallel/USB ports, system audio, NIC (some models).
	Network Service Boot - Enables/disables Network Service Boot (some models).
	System IDs - Allows setting of Asset and Ownership Tags, chassis serial number, keyboard locale, and Universal Unique Identifier (UUID).
	DriveLock - Allows assignment of master or user password for Multi-Bay hard drive(s).
	Data Execution Prevention - Enable/disable to prevent OS Security breaches.
	Master Boot Record (MBR) Security - Enable/disable MBR.
	Save MBR - Saves backup copy of MBR of current bootable disk.
	Restore MBR - Restores MBR to current bootable disk.
Power	OS Power Management - Enable/disable processor voltage and frequency during run and idle times; ACPI S3 support.
	Hardware Power Management - Enable/disable SATA bus and/or device power management.
	Thermal - Fan idle mode to control minimum fan speed.
Advanced (advanced users only)	Power-On Options - Select POST mode for QuickBoot, FullBoot, Full-Boot every 1-30 days; Enable/disable POST messages; Enable/disable option ROM prompt; Enable/disable I/O APIC mode; Select computer state after power loss; Select wakeup boot source; Enable/disable POST delay (for slow hard drives); Enable/disable ACPI/USB buffers; Enable/disable NIC option ROM download; Enable/disable Hyper-threading.
	BIOS Power-On - Set computer to turn on at specific time of day.
	Onboard Devices - Set resources for onboard devices (serial/parallel port or diskette controller).
	PCI Devices - Lists currently installed PCI devices and IRQ settings. Allows configuration/disabling of devices (no effect on APIC systems)
	Bus Options - Enable/disable PCI bus mastering, PCI VGA palette snooping, PCI SERR# function, and ECC on select systems.
	Device Options - Set printer mode (bidirectional output only); Num Lock State;Wake-up events; processor cache; unique sleep state blink patterns; integrated video; monitor tracking; NIC PXE Option ROM download.
	PCI VGA Configuration - Allows selection of VGA controller (if multiple PCI video controllers are installed).

Failsafe Boot Block ROM
The computer comes with a reprogrammable flash system ROM (read only memory).

NOTE: No USB device of any type will function during boot block recovery.

To upgrade the ROM, you may:
a. Order an upgraded ROMPaq diskette from HP.
or
b. Download the latest ROMPaq images from the HP Web site (www.hp.com).
All ROM images used with HPQFlash and SSM are digitally signed to ensure authenticity and mini-mize potential corruption. Your system ROM includes a Failsafe Boot Block that is protected during the flash process and allows the computer to be restarted in the unlikely event of an unsuccessful ROM flash.

If the system detects an invalid system ROM during the boot sequence the system will sound one long and three short beeps, flash the three keyboard LEDs twice, and display a recovery mode message on the screen. To recover from the Boot Block recovery mode complete the following steps:

1. Remove any diskettes from the diskette drive and turn off power.
2. Insert a ROMPaq diskette into the diskette drive or a bootable CD-ROM into an IDE CD-ROM drive. (Bootable ISO CDs are available on the Web at www.hp.com.)
3. Turn on power to the system.
4. If a Setup password has been established, the Caps Lock LED will come on to prompt you for the password. Enter the password.
5. A successful boot and ROM flashing (re-programming) with a ROMPaq diskette is indicated by the three keyboard LEDs turning on and a series of beeps rising in tone.

Security Functions

The system offers independent Power-On and Setup passwords for system and data protection. The Power-On password protects the computer from unauthorized access by prompting the user for a password during power up. The Setup password protects the computer from unauthorized or inadvertent re-configuration of legacy device resource settings or ROM flash upgrade by prompting the user for a password prior to entering the Setup Utility.

To establish a password:

1. Turn on or restart the computer. If you are in Windows, click Start > Shut Down > Restart the computer.

2. As soon as the computer is turned on, press and hold **F10** until you enter Computer Setup. Press Enter to bypass the title screen, if necessary. If you do not press **F10** as soon as the computer starts, a restart will be necessary.

3. Select Security, then select Setup Password or Power-On Password and follow the instructions on the screen.

4. Before exiting, click **File > Save Changes and Exit**.

Security Functions (continued)

To change a Power-On or Setup password:

1. Turn on or restart the computer. If you are in Windows, click **Start > Shut Down > Restart the Computer.** Run Computer Setup (F10).

2. To change the Power-On password, go to step 3.

   To change the Setup password, as soon as the computer is turned on, press and hold the **F10** key until you enter Computer Setup. Press **Enter** to bypass the title screen, if necessary.

3. When the key icon appears, type the current password, a slash (/) or alternate delimiter character, the new password, another slash (/) or alternate delimiter character, and the new password again as shown: **current password/new password/new password**

4. Press **Enter**.

The new password will take effect the next time the computer is restarted.

To delete a password using Setup:

1. Turn on or restart the computer. If you are in Windows, click **Start > Shut Down > Restart the Computer**.

2. To delete the Power-On password, go to step 3.

   To delete the Setup password, as soon as the computer is turned on, press and hold the **F10** key until you enter Computer Setup. Press **Enter** to bypass the title screen, if necessary.

3. When the key icon appears, type the current password followed by a slash (/) or alternate delimiter character as shown: **current password/**

4. Press **Enter**.

Security Features

Feature	Purpose	How It Is Established
Pre-Boot Authorization	Allows you to enable/disable the Smart Card to be used in place of the Power-On Password.	Setup Utilities. [1]
Embedded Security [2]	Allows you to enable/disable the Embedded Security device, and reset the device to Factory Settings.	Setup Utilities. [1]
Network Service Boot	Enables/disables the computer's ability to boot from an operating system installed on a network server. (Feature available on NIC models only; the network controller must reside on the PCI bus or be embedded on the system board.)	Setup Utilities. [1]
Device Security	Enables/disables serial ports, parallel port, front USB ports, system audio, network controllers (some models), MultiBay devices (some models), and SCSI controllers (some models).	Setup Utilities. [1]
Power-On Password	Prevents use of computer until password is entered. Can apply to both initial startup and restart.	Setup Utilities. [1]
Setup Password	Prevents reconfiguration of computer until password is entered.	Setup Utilities. [1]
DriveLock	Prevents unauthorized access to data on drives supporting password protection.	Setup Utilities. [1]
Smart Cover [2]	Allows you to enable/disable the Cover Lock, enable/disable the Cover Removal Sensor.	Setup Utilities. [1]
Master Boot Record (MBR) Security	May prevent unintentional or malicious changes to MBR of the current bootable disk and provides a means of recovering "last known" parameters.	Setup Utilities. [1]
Save Master Boot Record	Saves a backup copy of the Master Boot Record of the current bootable disk. Only appears if MBR Security is enabled.	Setup Utilities. [1]
Restore Master Boot Record	Restores the backup Master Boot Record to the current bootable disk.	Setup Utilities. [1]
Drive Protection System (DPS	Diagnostic tool built into hard drives on select models designed to discover problems that might result in unwarranted drive replacement.	Setup Utilities or Diagnostics for Windows.
Memory Change Alerts	Detects addition or removal of memory modules. Notifies system administrator.	Refer to Intelligent Manageability Guide.
System IDs	Allows you to set: Asset Tag, Ownership Tag, chassis serial number or Universal Unique Identifier (UUID) number, keyboard locale setting.	Setup Utilities. [1]
Kensington CableLock Provision	Inhibits access to interior of computer chassis. Can also be used to secure computer to a fixed object for prevent theft.	Requires Kensington cable lock accessory to secure computer to a fixed object.
Security Loop Provision	Inhibits access to the interior of the computer to prevent unwanted configuration changes or component removal.	Install a lock in the security loop to prevent unwanted configuration changes or component removal.

NOTES:
[1] For more information about Setup Utilities refer to the Computer Setup Guide.
[2] Available on some models.

Diagnostic Functions

Diagnostic functions are provided by the Setup Utility (in system ROM) and by Diagnostics for Windows. Diagnostics for Windows provides detailed system information including:

- Processor type and speed
- Memory amount, mapping, and integrity
- Hardware peripheral availability/settings
- Hard drive type, space used/available
- System identification, asset tracking

Diagnostics for Windows may be pre installed on some models and can be downloaded free of charge from www.hp.com.

Error Conditions and Messages

Keyboard Light Combinations Used by Boot Block ROM

Failsafe Boot Block ROM	Keyboard LED Color	Keyboard LED Activity	State/Message
NumLock	Green	On	ROMPaq diskette or ROMPaq CD not present, is bad, or drive not ready
Caps Lock	Green	On	Enter password.
Num, Caps, Scroll Lock	Green	Blink on in sequence, one-at-a-time-N,C,SL	Keyboard locked in network mode.
Num, Caps, Scroll Lock	Green	On	Boot Block ROM Flash successful. Turn power off, then on to reboot.
*Diagnostic lights do not flash on USB keyboards			

POST Diagnostic Front Panel LEDs and Audible Codes

Power LED	# Beeps	Event
Steady green	None	System on (normal operation)
Blinks green every 2 seconds	None	Suspend to RAM
Blinks red 2 times	2	Processor thermal shutdown
Blinks red 3 times	3	Processor not seated / installed
Blinks red 4 times	4	Power supply failure
Blinks red 5 times	5	Pre-video memory error
Blinks red 6 times	6	Pre-video graphics error
Blinks red 7 times	7	PCA failure
Blinks red 8 times	8	Invalid ROM checksum (error)
Blinks red 9 times	9	Wrong power supply input voltage
Blinks red10 times	10	Bad option card
None	None	System unable to power on.

NOTE: Beeps will occur only for 5 iterations and then stop. LEDs will continue to blink until corrective action is taken.

Common POST Error Messages

Screen Message	Probable Cause	Recommended Action
101-Option ROM Error	System ROM or expansion board option ROM checksum.	Verify the correct ROM. Flash the ROM if needed. If an expansion card was recently added, remove it and see if the problem remains. Clear CMOS. If the message disappears, there may be a problem with the expansion card. Replace the system board.
110-Out of Memory Space for Option ROMs	Recently added PCI expansion card contains an option ROM too large to download during POST.	If a PCI expansion card was recently added, remove it to see if the problem remains. In Computer Setup, disable the NIC PXE Option ROM Download to prevent PXE option ROM for the internal NIC from being downloaded during POST to free more memory for an expansion card's option ROM. Internal PXE option ROM is used for booting from the NIC to a PXE server. Enable the ACPI/USB Buffers @ Top of Memory setting in Computer Setup.
164-Memory Size Error	Memory amount has changed since the last boot (memory added or removed). -------------------------- Memory configuration is incorrect.	Press the F1 key to save the memory changes. --- Run Computer Setup (F10 Setup). Make sure memory module(s) (if any) are installed properly. If third party memory has been added, test using HP-only memory. Verify proper memory module type.
201-Memory Error	RAM failure	Run Computer Setup (F10 Setup) or Windows utilities. Ensure memory and continuity modules are installed correctly. Verify proper memory module type. Remove and replace memory module(s) one at a time to isolate faulty module. Replace the faulty memory module(s). If error persists after replacing memory modules, replace the system board.
301-Keyboard Error	Keyboard failure.	Reconnect keyboard with computer turned off. Check connector for bent or missing pins. Ensure that none of the keys are depressed. Replace keyboard.
501-Display Adapter Failure	Graphics controller.	Reseat the graphics card (if applicable). Clear CMOS. Verify that the monitor is attached and turned on. Replace the graphics controller (if applicable).
601-Diskette Controller Error	Diskette controller circuitry or floppy drive circuitry incorrect.	Run Computer Setup (F10 Setup). Check and/or replace cables. Clear CMOS. Replace diskette drive. Replace the system board.
1720-SMART Hard Drive Detects Imminent Failure	Hard drive is about to fail. (Some hard drives have a firmware patch that will fix an erroneous error message.)	Determine if hard drive is giving correct error message. Run the Drive Protection System test if applicable. Apply firmware patch if applicable. (see www.hp.com/support) Back up contents and replace hard drive.