# Intel® Desktop Boards BIOS Settings Dictionary – By Menu

The BIOS Setup program can be used to view and change the BIOS settings for the computer. The BIOS Setup program is accessed by pressing the <F2> key after the Power-On Self-Test (POST) memory test begins and before the operating system boot begins. The following menus are available:

Menu Title	Purpose
Maintenance	Clears passwords and displays processor information.
	The maintenance menu is displayed only when the Desktop Board is in Configure Mode.
Main	Displays processor and memory configuration.
Configuration	Configures advanced features available through the chipset.
Performance	Allows for advanced configuration of CPU, memory and bus settings.
Security	Sets passwords and security features.
Power	Configures power management features and power supply controls.
Boot	Selects boot options.
Exit	Saves or discards changes to Setup program options.

The presence of menus and BIOS settings are dependent on your board model, hardware components installed, and the BIOS version. BIOS menu titles may differ.

If any problems occur after making BIOS settings changes (poor performance, intermittent issues, etc.), reset the desktop board to default values:

- 1. During boot, enter the BIOS setup by pressing F2.
- 2. Press F9 to set defaults.
- 3. Press F10 to Save and Exit.

If the system locks or won't boot after making BIOS settings changes, perform a BIOS recovery as described at <a href="http://support.intel.com/support/motherboards/desktop/sb/CS-023360.htm">http://support.intel.com/support/motherboards/desktop/sb/CS-023360.htm</a>.

#### Maintenance

BIOS Setting	Options	Description / Purpose
Clear BIOS Passwords	OK Cancel	Allows you to clear passwords
Fixed Disk Boot Sector	Normal     Write Protect	Boot sector VIRUS protection

## Main

BIOS Setting	Options	Description / Purpose
Active Processor Cores	• All • 1 • 2	Indicates the number of cores to enable in each processor package.
BIOS Version	No changeable options	Displays the version of the BIOS currently installed on the PC.
Core Multiplexing Technology  This BIOS setting is present only when a dual core processor is installed.	<ul><li>Disable</li><li>Enable</li></ul>	When disabled, turns off all but one processor core. You may need to disable this for legacy operating systems that do not support multiple cores. The remaining core may have access to more cache. The amount of cache available to the remaining core will depend on the particular processor. The increase in available cache can result in better performance under certain applications.
Host Clock Frequency	No changeable options	Displays the current host clock frequency.
Intel® Hyper-Threading Technology	Disable     Enable	When disabled, only one thread per active core will operate.
This BIOS setting is present only on Intel® Desktop Boards that support Hyper-Threading Technology if a processor supporting Hyper-Threading Technology is installed.		For information on Hyper-Threading, refer to http://en.wikipedia.org/wiki/Hyperthreading
Intel® Management Engine Information: Firmware Version	No changeable options	Displays the current firmware version of the Intel® Management Engine (Intel® ME)
L2 Cache RAM	No changeable options	Displays the size of L2 processor cache.
L3 Cache RAM	No changeable options	Displays the size of L3 processor cache.
Memory Channel X Slot X	No changeable options	Displays the amount of memory in each populated memory slot.
Memory Speed	No changeable options	Displays the current memory speed.
On-board LAN MAC Address	No changeable options	Displays the system's LAN MAC Address
Processor Turbo Speed	No changeable options	Displays the current processor speed.
Processor Type	No changeable options	Displays processor type.

SW Single Processor Mode  This BIOS setting is present only on Intel® Desktop Boards that include support for dual core processors when a dual core processor is installed.	Disable     Enable	Sets the processor mode for dual core processors.  Disabled: Dual Core processor will run in Dual Core mode.  Enabled: Dual Core processor will NOT run in Dual Core mode.
System Date	Month, day, year	Specifies the current date.
System Identification Information	No changeable options	Displays information such as System Information, Desktop Board Information, Chassis Information, etc.
System Time	Hour, minute, and second	Specifies the current time.
Total Memory	No changeable options	Displays the total amount of RAM.

**Configuration > On-Board Devices** 

BIOS Setting	Options	Description / Purpose
1394	Disable     Enable	Disables or enables IEEE 1394 support
This BIOS setting is present only on Intel® Desktop Boards that include IEEE 1394.		
Audio	Disable     Enable	Enables or disables onboard audio.
Bluetooth	Disable     Enable	Enable or disable the onboard Bluetooth device. Note that this device is physically tied to a USB line and if the USB controller settings are changed it may affect this device
Display Setup Prompt	• On • Off	Displays the "F2 to enter BIOS setup" message during boot.
Enhanced Consumer IR	Disable     Enable	Enables or disables consumer infrared communication feature.
HPET	Disable     Enable	Enables or disables HPET (High Precision Event Timer) support.
		For information on HPET, refer to
		http://en.wikipedia.org/wiki/HPET
Internal LED Brightness Level	• OFF • Low	Sets the brightness level for the board's power switch
This BIOS setting is present only on certain Extreme Series Intel® Desktop Boards.	• Med • High	
LAN	Disable     Enable	Enables or disables the onboard LAN.
This BIOS setting is present only on Intel® Desktop Boards that include onboard LAN.		

Legacy Front Panel Audio	Disable     Enable	When enabled, the system assumes that a High Definition audio connector is not present in the system (Legacy audio is present)  When disabled, the system assumes that a High Definition audio connector is present in the system.
Numlock	• Off • On	Specifies the power-on state of the Numlock feature on the numeric keypad of the keyboard.
PCI Latency Timer	• 32 • 64 • 96 • 128 • 160 • 192 • 224 • 248	Sets PCI latency time.
POST Code Routing	• PCI • LPC	Routing for POST Codes.  PCI - routes POST codes to the PCI bus (POST card in PCI slot) LPC - routes POST codes to the LPC bus (onboard POST display if it exists)
Skull Backlighting  This BIOS setting is present only on certain Extreme Series Intel® Desktop Boards.	Disable     Enable	Enable backlighting on the onboard skull.
Skull Eye Hard Drive Activity  This BIOS setting is present only on certain Extreme Series Intel® Desktop Boards.	Disable     Enable	Sets the skull's eyes to light up matching hard drive activity.
USB Legacy	Disable     Enable	Disables or enables USB functionality.
USB Port X	Disable     Enable	Enable or disable individual USB ports

Configuration > SATA Drives

BIOS Setting	Options	Description / Purpose
Chipset-SATA Mode	• IDE • RAID • AHCI	RAID: enables RAID which may require you to install the RAID Driver during OS installation  AHCI: allows you to take advantage of Advanced Host Controller Interface features such as Native command Queuing, Hot plug, etc., without the option to use RAID. Requires a hard drive that supports AHCI.
Discrete SATA	Disable     Enable	Enable or disable the discrete SATA controller

Discrete SATA Controller Mode	• IDE • RAID	IDE is default  RAID: enables RAID which may require you to install the RAID Driver during OS installation
eSATA Port x	[drive]	Displays the drive installed on this external SATA port. Shows [Not installed] if no drive is installed.
Hard Disk Pre-Delay	<ul> <li>Disable</li> <li>3 Seconds</li> <li>6 Seconds</li> <li>9 Seconds</li> <li>12 Seconds</li> <li>15 Seconds</li> <li>21 Seconds</li> <li>30 Seconds</li> </ul>	Causes the BIOS to insert a delay before attempting to detect IDE drives in the system. Time options available may vary by board.
S.M.A.R.T.	Auto     Disable     Enable	Enable or Disable support for the hard disk's S.M.A.R.T. (Self Monitoring Analysis And Reporting Technology) capability. S.M.A.R.T. is supported by all current hard disks and allows the early prediction and warning of impending hard disk failures.  You should enable it if you want to use S.M.A.R.Taware utilities to monitor the hard disk's condition.  For information on S.M.A.R.T., refer to <a href="http://en.wikipedia.org/wiki/Self-Monitoring">http://en.wikipedia.org/wiki/Self-Monitoring</a> , Analysis, and Reporting Technology
SATA Port x	[drive]	Displays the drive installed on this SATA port. Shows [Not installed] if no drive is installed.

**Configuration > Event Log** 

BIOS Setting	Options	Description / Purpose
Clear Event Log	<ul><li>Disable</li><li>Enable</li></ul>	<b>Enable</b> discards all events in the event log and will reset the option to <b>disable</b> upon exiting BIOS.
CMOS Battery Failure (x)	No changeable options	Displays the number of times (in parenthesis) that this type of event has occurred; displays date/time of the last event of this type
CMOS Checksum Error (x)	No changeable options	Displays the number of times (in parenthesis) that this type of event has occurred; displays date/time of the last event of this type
CMOS Time Not Set (x)	No changeable options	Displays the number of times (in parenthesis) that this type of event has occurred; displays date/time of the last event of this type
Event Logging	Disable     Enable	Enables or disables tracking occurrences during system boot.
Memory Size Decrease (x)	No changeable options	Displays the number of times (in parenthesis) that this type of event has occurred; displays date/time of the last event of this type
Missing AA# (x)	No changeable options	Displays the number of times (in parenthesis) that this type of event has occurred; displays date/time of the last event of this type

Configuration > Video

BIOS Setting	Options	Description / Purpose
Primary Video Adapter	<ul> <li>Ext PCI Express Graphics</li> <li>Ext PCI</li> <li>Auto</li> </ul> Options may vary depending on your configuration.	Allows selecting a specific video controller as the display device that will be active when the system boots.

**Configuration > Fan Control & Real-Time Monitoring** 

BIOS Setting	Options	Description / Purpose
Aux Fan Speed	No changeable options	Displays aux fan speed.
Aux Fan Type	• 3-Wire Fan • 4-Wire Fan	Be sure to enter the proper fan type or your fan might not work properly which can lead to system instability or damage.
CPU Fan Control	Disable     Enable	Disables or enables processor fan control.
Front Fan Speed	No changeable options	Displays front fan speed.
Front Fan Type	• 3-Wire Fan • 4-Wire Fan	Be sure to enter the proper fan type or your fan might not work properly which can lead to system instability or damage.
Internal Temp	No changeable options	Reads the thermal sensor in the Heceta chip itself
Lowest Fan Speed	• Slow • Off	This option defines the fan speed at the lowest system temperature.  Slow allows the fans to continue to run at a reduced speed at low system temperatures.  Off turns off the fans at low system temperatures.
Processor Fan Speed	No changeable options	Displays processor fan speed.
Processor Thermal Margin  This BIOS setting is present only on Intel® Desktop Boards with certain processors installed.	No changeable options	Displays the processor's thermal specification minus its current temperature, giving you a general indication of how much hotter it can get before it is running hotter than what it is designed to handle.  Example: Processor Thermal Margin = 10°C This processor can get about 10°C hotter than it is currently running before it will exceed its thermal specification.

Rear Fan Speed	No changeable options	Displays rear fan speed.
Rear Fan Type	• 3-Wire Fan • 4-Wire Fan	Be sure to enter the proper fan type or your fan might not work properly which can lead to system instability or damage.
Remote Temp	No changeable options	Displays the temperature of the onboard remote thermal diode.
System Fan Control	Disable     Enable	Disables or enables system fan control.
v_SM	No changeable options	Displays voltage level of the +1.5V in supply
v12.0	No changeable options	Displays voltage level of the +12V in supply
v3.3	No changeable options	Displays voltage level of the +3.3V in supply
v5.0	No changeable options	Displays voltage level of the +5V in supply
Vccp	No changeable options	Displays voltage level of the VCCP in supply

Configuration > PCI/PCIe Add-In Slots

BIOS Setting	Options	Description / Purpose
Compliance Test Pattern	Disable     Enable	Used for making sure a PCI Express slot remains functional and enabled per PCI Express specification for Compliance test card testing of PCI Express cards.
PCI Config Map Slot x	No changeable options	Displays memory map for each PCI or PCIe slot; "FFFF" will appear if slot is empty.
PCI Config VendID:DevID	No changeable options	Displays Vendor ID and Device ID of any add-in card in a given PCI or PCIe slot. Displays FFFF:FFFF if slot is empty.
Slot x PCI	No changeable options	Displays speed of any add-in card in this slot; shows "Not populated" if slot is empty.
Slot x PCIe x1	No changeable options	Displays speed of any add-in card in this slot; shows "Not populated" if slot is empty.
Slot x PCIe x4	No changeable options	Displays speed of any add-in card in this slot; shows "Not populated" if slot is empty.
Slot x PCIe x8	No changeable options	Displays speed of any add-in card in this slot; shows "Not populated" if slot is empty.
Slot x PCIe x8/x16	No changeable options	Displays speed of any add-in card in this slot; shows "Not populated" if slot is empty.

## Performance

BIOS Setting	Options	Description / Purpose
Failsafe Watchdog	Disable     Enable	Enables or disables Failsafe Watchdog.  For more information, refer to http://download.intel.com/design/chipsets/applnots/29227301.pdf
Host Clock Frequency (Mhz)	Multiple options ranging from 133 to 500	This overrides the host clock frequency.  Host Clock Frequency x Processor Multiplier = Processor Speed

## **Performance > Processor Overrides**

BIOS Setting	Options	Description / Purpose
1-Core Ratio Limit	No changeable options	Display's Maximum CPU performance given adequate thermal margin, voltage, and current applied while not in C3 or C6 power states.
2-Core Ratio Limit	No changeable options	Display's Maximum CPU performance given adequate thermal margin, voltage, and current applied while not in C3 or C6 power states.
3-Core Ratio Limit	No changeable options	Display's Maximum CPU performance given adequate thermal margin, voltage, and current applied while not in C3 or C6 power states.
4-Core Ratio Limit	No changeable options	Display's Maximum CPU performance given adequate thermal margin, voltage, and current applied while not in C3 or C6 power states.
CPU Idle State	High     Performance     Low Power	High Performance: forces operating system to use Maximum Multiplier at all times.  Low Power: allows operating system to adjust multiplier down.
CPU Voltage Override Type	None     Static     Dynamic	None: lets the CPU manage its own power usage with default upper limits.  Static: keeps the CPU at a user-specified voltage at all times.  Dynamic: allows the CPU to vary its voltage use, but with new upper limits.
CPU Voltage Override	• 1.1125V • 1.1000V • 1.0875V • 1.0750V • 1.0625V • 1.0500V • 1.0375V • 1.0250V • 1.0125V • 1.000V • Default	Sets the CPU Voltage (VID).  Warning: The use of this option will shorten the life of the processor. The default value is strongly recommended.

CPU Vreg Droop Control	High V-droop (Power Saving)     Low V-droop	Changes the amount of voltage drop applied when the processor draws maximum current. Choosing the "Low V-droop" option causes the desktop board to supply voltage with no drop even at maximum processor current draw.
Intel® Turbo Boost Technology	Disable     Enable	<b>Enable</b> to automatically allow processor cores to run faster than the base operating frequency if it is operating below power, current and temperature specification limits.
Maximum Non-Turbo Ratio	+/- to change value	Maximum non-turbo processor speed = maximum non- turbo ratio x host clock frequency
TDC Current Limit Override (Amps)	No changeable options	Displays the default current limit.
TDP Power Limit Override (Watts)	No changeable options	Displays the default processor rated TDP.

**Performance > Memory Overrides** 

BIOS Setting	Options	Description / Purpose
Command Rate	• Auto • 1T • 2T	Auto will adjust based on memory mode. 2T is usually more stable.
Memory Multiplier	• Auto • 12: DDR3-1600 • 10: DDR3-1333 • 8: DDR3-1067 • 6: DDR3-800	Select the memory speed: Memory Multiplier x Host Clock = Memory Speed
Memory Voltage	Multiple options ranging from 1.30 to 2.00	Allows you to override the memory voltage.  WARNING: Altering memory voltage may reduce system stability, cause the processor and other system components to fail, cause reductions in system performance, and/or affect system data integrity.
Performance Memory Profiles	Automatic     Manual - User Defined	Auto allows timings to be programmed according to the memory detected.  Manual – User Defined allows manual override of detected SDRAM settings.  WARNING: Altering memory voltage may reduce system stability, cause the processor and other system components to fail, cause reductions in system performance, and/or affect system data integrity.
tCL	+/- to change value	CAS Latency: # of cycles between request for data and data read
tFAW	+/- to change value	Four Active Window: period of time before the 5th successive ACTIVE command to a new bank can be issued
tRASmin	+/- to change value	Minimum RAS Active Time: # cycles between precharge and bank activation
tRCD	+/- to change value	RAS-to-CAS Delay: # of cycles between activating and read/write

tRC	+/- to change value	Row Cycle Delay: minimum interval between successive ACTIVE commands to the same bank
tRFC	+/- to change value	RAS Refresh: # cycles from refresh to activation of a row
tRP	+/- to change value	RAS Pre-Charge: # cycles between closing one row and opening the next.
tRRD	+/- to change value	RAS to RAS Delay: # cycles to activate next bank in the same rank
tRTP	+/- to change value	Read to Precharge Delay: # cycles between read and precharge command to same rank
tWR	+/- to change value	Write Recovery: # cycle between write and precharge
tWTR	+/- to change value	Write to Read: # cycles between write and next read commands; related to tCL
Uncore Multiplier	+/- to change value	Sets the Uncore CPU multiplier. This is non-adjustable for Intel Core i7 and Intel Core i5 processors. It is shown for information purposes.
Uncore Voltage Override	Multiple options ranging from 1.10 to 1.80	Allows the CPU Uncore voltage to be adjusted.

## **Performance > Bus Overrides**

BIOS Setting	Options	Description / Purpose
PCH Core Voltage Override	Multiple options ranging from 1.0300V to 1.500V	PCH Core Voltage might need to be adjusted when raising Uncore/QPI Voltage under the configuration page to achieve stable operation.
PCI Bus Frequency	No changeable options	Displays the PCI bus frequency
PCI Express Bus Frequency	• 110MHz • 109MHz • 108MHz • 107MHz • 106MHz • 105MHz • 104MHz • 103MHz • 102MHz • 101MHz • Default	Set the PCI Express Clock frequency. Also modifies PCI Clock frequency.

Security

BIOS Setting	Options	Description / Purpose
Chassis Intrusion	Disable     Enable	Enables or disables the chassis intrusion feature.
Intel® Trusted Execution Technology	Disable     Enable	Enables or disables Intel Trusted Execution Technology.
		For information on Trusted Execution Technology, refer to http://www.intel.com/technology/security/

Intel® VT	Disable     Enable	Enables or disables Virtualization Technology. Takes affect only after power cycling.
		For more information refer to http://www.intel.com/technology/virtualization/index.htm
Intel® VT for Directed I/O (VT-d)	Disable     Enable	Enables or disables Intel® VT for Directed I/O.
		For information on Intel® VT, refer to http://www.intel.com/technology/advanced_comm/virtualization.htm
Set Supervisor Password	Password can be up to seven alphanumeric characters.	Specifies the supervisor password.
Set User Password	Password can be up to seven alphanumeric characters.	Specifies the user password.
Supervisor Password	No changeable options	Reports if there is a supervisor password set.
User Password	No changeable options	Reports if there is a user password set.
XD Technology	Disable     Enable	Enables or disables "No Execute" memory protection.  For more information, refer to
		http://www.intel.com/technology/xdbit/

## Power

BIOS Setting	Options	Description / Purpose
ACPI Suspend State	• S1 State • S3 State	Specifies the ACPI sleep state.  For information on ACPI sleep states, refer to  http://en.wikipedia.org/wiki/Advanced_Configuration_and_Power_Interface
After Power Failure	• Stay Off • Last State • Power On	Determines the mode of operation if a power loss occurs.  Stay Off keeps the power off until the power button is pressed.  Last State restores the previous power state before power loss occurs.  Power On restores power to the computer.
CPU C State	Disable     Enable	Allows processor to set idle state for power savings. Takes affect only after reboot.
Enhanced Intel SpeedStep® Technology	Disable     Enable	Allows processor to dynamically transition speed and voltage states.  For information on SpeedStep, refer to http://en.wikipedia.org/wiki/Speedstep

OS ACPI C2 report	Disable     Enable	Enable or disable the C3 (ACPI C2) report to the operating system.
PCIe ASPM Support	Disable     Enable	Enables or disables ASPM (Active State Power Management) support for PCI Express devices.
S1 State Indicator	• Off • Blink • On	Sets the action for the front panel power LED when the system is in S1 sleep mode.  Off: LED stays of when in S1 Blink: LED blinks when in S1 On: LED stays solid on when in S1
S3 State Indicator	Off Blink On Alternate Color	Sets the action for the front panel power LED when the system is in S3 sleep mode.  Off: LED stays of when in S3 Blink: LED blinks when in S3 On: LED stays solid on when in S3 Alternate color: Systems built with a dual-color front panel power LED may set this
Wake on LAN from S5	Stay Off     Power-On	In ACPI soft-off mode only, determines how the system responds to a LAN wake up event when the system is in the ACPI soft-off mode.
Wake system from S5	Disable     Enable	Enable or disable System wake on alarm event. When enabled, system will wake on the day/hour/minute/second specified.

#### **Boot**

BIOS Setting	Options	Description / Purpose
Boot Device Priority	Optical Drives     Removable     Devices     Hard Disk Drive     Network	Specifies the boot sequence from the available devices. The list of options may vary depending on board model and hardware configuration.
Boot Menu Type	Normal     Advance	<b>Normal</b> allows you to set boot priority based on type of device.
		Advanced allows you to set boot priority for each device regardless of category
Boot to Network	Disable     Enable	Disables or enables booting from the network.
Boot to Optical Devices	Disable     Enable	Disables or enables booting from optical devices (CD/DVD).
Boot to Removable Devices	<ul><li>Disable</li><li>Enable</li></ul>	Disables or enables booting from removable devices.
Boot USB Devices First	Disable     Enable	Sets USB devices to be first in boot order.
Hard Drive Order	Lists all installed hard drive devices	Allows you to set the boot order of hard drives (used when Boot Menu type is set to normal)
Optical Drive Order	Lists all installed optical drives	Allows you to set the boot order of optical drives (used when Boot Menu type is set to normal)

Removable Drive Order	Lists all installed removable devices	Allows you to set the boot order of removable devices (floppy drives, USB thumb drives, etc) - used when Boot Menu type is set to normal.
UEFI boot	Disable     Enable	Enables or disables Unified Extended Firmware Interface (UEFI) Boot.  For information on UEFI, refer to <a href="http://www.uefi.org/home">http://www.uefi.org/home</a>
USB Boot	Disable     Enable	Disables or enables booting from USB boot devices.

**Boot > Boot Display Options** 

BIOS Setting	Options	Description / Purpose
Display F10 to Enter Boot Menu	Disable     Enable	When enabled, system displays the F10 key prompt string during POST.
Display F12 for Network Boot	Disable     Enable	When enabled, system displays the F12 key prompt string during POST.
Display F2 to Enter Setup	Disable     Enable	When enabled, system displays the F2 key prompt string during POST.
Display F7 to Update BIOS	Disable     Enable	When enabled, system displays the F7 key prompt string during POST.  To use the F7 BIOS Flash Update tool, USB media containing a BIOS update file (.bio) must be connected during boot.
Hide Option ROM/Expansion Card Text	Disable     Enable	Displays add in Option ROM text
POST Code Routing	PCI     On-Board	Routing for 80h, 84-6h, 88h, 8C-Eh  Used to select between sending BIOS POST codes to the PCI BUS (POST card in PCI slot) or to the On-Board POST display
POST Function Hotkeys	Disable     Enable	Displays whatever function keys are selected to display during POST.

#### Exit

BIOS Setting	Options	Description / Purpose
Discard Changes	No changeable options	Discards changes without exiting Setup. The option values present when the computer was turned on are used.
Exit Discarding Changes	No changeable options	Exits without saving any changes made in the BIOS Setup program.
Exit Saving Changes	No changeable options	Exits and saves the changes in CMOS SRAM.
Load Custom Defaults	No changeable options	Loads the custom defaults for Setup options.
Load Optimal Defaults	No changeable options	Loads optimal defaults.

Save Custom Defaults	No changeable options	Saves the current values as custom defaults. Normally, the BIOS reads the Setup values from flash memory. If this memory is corrupted, the BIOS reads the custom defaults. If no custom defaults are set, the BIOS reads the factory defaults.
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