

EBX-11 CMOS SETUP PARAMETERS

This article provides reference information and tips for setting CMOS Setup parameters on the EBX-11 (Python). Start CMOS Setup by pressing Delete during the early boot cycle. The CMOS Setup Main Menu is shown below. The setup parameters are accessed from four screens (the first four menu items).

Note: The configurations and factory defaults described here are for EBX-11 BIOS version 5.3.103.

```
+-----+
|                System Bios Setup - Utility v5.3.103                |
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+-----+
|
|                >Basic CMOS Configuration
|                Features Configuration
|                Custom Configuration
|                Shadow Configuration
|
|                Undo Configuration Changes (no reboot)
|                Reset CMOS to factory defaults
|                Reset CMOS to custom defaults
|                Write to CMOS and Exit
|                Exit without changing CMOS
|
+-----+
```

You can exit CMOS Setup by selecting one of the following options:

- **Undo Configuration Changes (no reboot):** Reverts any changes made to CMOS settings to the state when the board was booted. An equivalent operation would be to reboot the board without saving changes, and then re-enter CMOS setup.
- **Reset CMOS to Factory Defaults:** Resets CMOS to factory defaults, even if there are custom defaults available. All changes made to CMOS settings during the current and previous CMOS Setup sessions will revert.
- **Reset CMOS to Custom Defaults:** Resets CMOS to custom defaults. All changes made to CMOS settings during the current and previous CMOS Setup sessions will revert. **Note:** Custom defaults are saved using the Flash BIOS Update (FBU) utility. See the [EBX-11 Reference Manual](#) for instructions.
- **Write to CMOS and Exit:** Saves all changes made to CMOS settings and reboots the EBX-11
- **Exit without Changing CMOS:** Does not save any changes made to CMOS settings and reboots the EBX-11.

Basic CMOS Configuration

The Basic CMOS Configuration screen is where you configure EBX-11 drive types, boot activities, and Power On Self Test (POST) optimizations. To use disk drives with the EBX-11:

1. Select the appropriate drive types in Drive Assignment Order.
2. Configure the drive types in Floppy Drive Types and ATA Drv Assignment.



3. Configure the boot sequence in Boot Order.

The following screen shows the Basic CMOS Configuration factory settings. Click a link for information on a parameter group or individual parameter.

```
+-----+
|                System Bios Setup - Basic CMOS Configuration                |
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+-----+-----+-----+
| DRIVE ASSIGNMENT ORDER: | Date:>Nov 02, 2010 | Typematic Delay : 250 ms |
| Drive A: (None)           | Time: 00 : 00 : 00 | Typematic Rate  : 30 cps |
| Drive B: (None)           | NumLock: Disabled | Seek at Boot    : None   |
| Drive C: Ide 0/Pri Master | BOOT ORDER:      | Show "Hit Del"  : Enabled |
| Drive D: (None)           | Boot 1st: Drive C:  | Config Box     : Enabled |
| Drive E: (None)           | Boot 2nd: (None)   | Fl Error Wait  : Enabled |
| Drive F: (None)           | Boot 3rd: (None)   | Parity Checking: (Unused) |
| Drive G: (None)           | Boot 4th: (None)   | Memory Test Tick: Enabled |
| Drive H: (None)           | Boot 5th: (None)   | Debug Breakpoints: (Unused) |
| Drive I: (None)           | Boot 6th: (None)   | Debugger Hex Case: Upper |
| Drive J: (None)           |                     | Memory Test :StdLo FastHi |
| Drive K: (None)           |                     |                               |
+-----+-----+-----+
| Boot Method: Boot Sector | ATA DRV ASSIGNMENT: Sect Hds Cyls | Memory |
+-----+-----+-----+
| Ide 0: 3 = AUTOCONFIG, LBA | Ide 1: 3 = AUTOCONFIG, LBA | Base: |
| FLOPPY DRIVE TYPES:     | Ide 2: 3 = AUTOCONFIG, LBA | 631KB   |
| Floppy 0: Not installed    | Ide 3: 3 = AUTOCONFIG, LBA | Ext: |
| Floppy 1: Not installed    |                               | 219MB   |
+-----+-----+-----+
```

[BACK TO TOP](#)

Date and Time

The date is factory set to the date of the BIOS build. The date and time are editable.

NumLock

Values: Enabled, Disabled

Enables or disables NumLock. Set this option to Disabled to turn off the NumLock key when the computer is booted so you can use the arrow keys on both the numeric keypad and the keyboard. Some operating systems, such as DOS, honor this initial setting and use it for run-time operations. Other operating systems, such as Windows, assume complete control of the NumLock state, and do not honor this setting.

Drive Assignment Order

Values: (None), Floppy 0, Floppy 1, USB Floppy, IDE 0/Pri Master, IDE 1/Pri Slave, USB Hard Drive 0, USB Hard Drive 1, USB Hard Drive 1, USB Hard Drive 2, USB Hard Drive 3

Maps a different device to each drive letter. The default configuration maps the first drive on the primary IDE channel (IDE 0/Pri Master) to drive C:.

Floppy drives can be mapped to drives A:, B:, C:, or D:. Hard drives can be mapped to drives C: through K:.

[BACK TO BASIC](#)

Boot Method

Values: Boot Sector, Windows CE

Configures the boot method for different operating systems. Selecting Boot Sector causes the standard boot record to be invoked, allowing proper loading for standard operating systems, such as DOS, Windows 9x, ME, 2000, NT, and XP, and Linux. Selecting Windows CE causes the BIOS to load and execute the Windows CE kernel file, NK.BIN, from the boot directory of each boot device.

Floppy Drive Types

Values: Not installed; 360 KB, 5.25"; 1.2 MB, 5.25"; 720 KB, 3.5"; 1.44 MB, 3.5"; 2.88 MB, 3.5"

If standard floppy drives are mapped to drive letters, they must be configured here. Floppy 0 is the first FDD on the ribbon cable (typically drive A:), and Floppy 1 is the second FDD on the cable (typically drive B:).

[BACK TO BASIC](#)

Boot Order

Values: (None), Drive A:, Drive B:, Drive C:, Drive D:, Alarm, Browser, Network, PowerOff, Reboot, High ROM, DOS-ROM, Mfg Mode, Debugger, CDROM, Desktop

Defines the steps in the boot sequence. Up to six steps can be defined. When the system has been initialized, POST executes these steps in order until an operating system load attempts. Specify Drive A: through Drive D: to boot from the specified drive. Other values include:

- **Alarm:** Not implemented.
- **Browser:** Not implemented.
- **CDROM:** Boots from the first CD-ROM drive found that contains an EI Torito bootable CD-ROM. If available, USB CD-ROM drives will boot before IDE CD-ROM drives. USB CD-ROM drives are not declared in the Drive Assignment Order.
- **Debugger:** Not implemented.
- **Desktop:** Not implemented.
- **DOS-ROM:** Not implemented.
- **High ROM:** Not implemented.
- **Mfg Mode:** Not implemented.
- **Network:** Not implemented.
- **PowerOff:** Not implemented.
- **Reboot:** Reboots the system.

[BACK TO BASIC](#)

ATA Drv Assignment

Values: Not Installed; 1 = User Type; 2 = AUTOCONFIG, PHYSICAL; 3 = AUTOCONFIG, LBA; 4 = AUTOCONFIG, PHOENIX; 5 = IDE CDROM



If IDE drives are mapped to drive letters or accessible as boot devices, they must be configured here. IDE 0 and IDE 1 are the master and slave devices, respectively, of the primary IDE channel (1F0h). IDE 2 and IDE 3 are the master and slave, respectively, of the secondary IDE channel (170h).

Most hard drives and CompactFlash modules use the standard logical block addressing (LBA) method of addressing sectors; therefore, AUTOCONFIG, LBA is the typical setting for these devices. Use the IDE CDROM setting for all IDE CDROM drives.

Typematic Delay

Values: 250 ms, 500 ms, 750 ms, 1000 ms, Disabled

Sets the amount of time a keyboard key must be held down before it begins automatically repeating. Some operating systems, such as DOS, honor this initial setting and use it for run-time operations. Other operating systems, such as Windows, assume complete control of the Typematic Delay, and do not honor this setting.

[BACK TO BASIC](#)

Typematic Rate

Values: 30 cps, 24 cps, 20 cps, 15 cps, 12 cps, 10 cps, 8 cps, 6 cps

Sets the rate at which a keyboard key will automatically repeat when held down, expressed in characters per second (cps). Some operating systems, such as DOS, honor this initial setting and use it for run-time operations. Other operating systems, such as Windows, assume complete control of the Typematic Rate, and do not honor this setting.

Seek at Boot

Values: Floppy, IDE, Both, None

Set this option to the device that will perform a seek operation at system boot. The IDE option is not enabled. If IDE is selected, the parameter reverts to None. If Both is selected, the parameter reverts to Floppy. When the BIOS "seeks" a floppy drive, it turns on the motor, seeks to the last track, and then parks the head over the first track.

This parameter is not essential for booting from or using a floppy disk. It is simply a legacy test that the BIOS can run; however, no error message results if the test fails. This parameter is sometimes used to delay the bootstrap in order to make it easier to view the BIOS startup messages or provide extra time for the initialization of certain hardware.

[BACK TO BASIC](#)

Show "Hit Del"

Values: Enabled, Disabled



Set this option to Disabled to prevent the message "Hit DEL if you want to run Setup" from appearing on the first BIOS screen when the computer boots.

Config Box

Values: Enabled, Disabled

Enables or disables the display of system information during the boot cycle. If Config Box is disabled, and Splash Screen is enabled, the splash screen will be displayed until the operating system changes the video mode.

F1 Error Wait

Values: Enabled, Disabled

If this option is set to Enabled, the BIOS waits for the user to press F1 before continuing. If this option is set to Disabled, the BIOS continues the boot process without waiting for F1 to be pressed.

Parity Checking

This parameter is not used.

[BACK TO BASIC](#)

Memory Test Tick

Values: Enabled, Disabled

Enables or disables Memory Test Tick. When enabled, the POST memory test will make a tick sound as it counts up your system memory.

Debug Breakpoints

This parameter is not used.

Debugger Hex Case

Values: Upper, Lower

This parameter is not used.

[BACK TO BASIC](#)

Memory Test

Values: StdLo FastHi, StdLo StdHi, StdLo Full Hi, FullLo FastHi, FullLo StdHi, FullLo FullHi, FastLo FastHi, FastLo StdHi, FastLo FullHi



This option configures the test that will be performed on the Low memory (below 1 MB) and the High Memory (above 1MB). The settings are Full (exhaustive testing), Standard, and Fast.

Full memory tests perform an analysis of every word in the tested range of RAM; and for each word, every bit is tested. Thus, the exhaustive memory test takes much longer to execute than the standard memory test, but it finds problems that the standard memory test can't find, such as data lines wired together or address aliasing. Standard memory tests perform basic storage/retrieval testing of every word in the tested range of RAM, but every bit is not individually tested. Thus, the standard memory test runs much more quickly than the exhaustive one does. Fast memory tests perform a general high level detection and verification of overall size memory size. This is the fastest boot method.

Base Memory and Ext

These parameters are read-only and reflect the memory configuration of the EBX-11.

[BACK TO BASIC](#)

Features Configuration

The following screen shows the Custom Configuration factory settings. Click a link for information on a parameter group or individual parameter.

```

+-----+-----+
|                System BIOS Setup - Features Configuration                |
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+-----+-----+
| System Management Mode      : Enabled | POST Memory Manager      : Disabled |
| Splash Screen              : Disabled | System Management BIOS  : Enabled  |
| Primary IDE UDMA          : Enabled | Console Redirection    : Auto     |
| Firmware Debug Console   : None   | UsbMassStorage        : Enabled  |
| Usb20                    : Enabled |
+-----+-----+

```

[BACK TO TOP](#)

System Management Mode

Values: Enabled, Disabled

Enables or disables System Management Mode. Disabling System Management Mode is not recommended, as it will disable video, legacy USB support (USB keyboard and drives), and control of the CPU A20 address line. Effectively, this would limit the choice of operating systems to real-mode DOS. With System Management Mode disabled, it is still possible to boot from a parallel IDE hard drive and control the console via a serial port. Disabling this feature might be useful in very limited cases to test if Firmware is interfering with an application as it runs in the background.

Splash Screen

Values: Enabled, Disabled



Enables or disables the display of the splash screen during the boot cycle. When the splash screen is enabled, it appears on the computer display for approximately one second. To learn how to create a custom splash screen, see [VT1400 How to Create a Splash Screen](#).

[BACK TO FEATURES](#)

Primary IDE UDMA

Values: Enabled, Disabled

Enables or disables the use of Ultra Direct Memory Access (UDMA) on the primary IDE channel.

Firmbase Debug Console

Values: None, 3f8h, 2f8h, Custom

This parameter is not used.

[BACK TO FEATURES](#)

Usb20

Values: Enabled, Disabled

The BIOS is capable of booting from a USB device, or of mounting one as a drive letter. If Usb20 is enabled, this access will take advantage of the USB 2.0 (EHCI) controller. Otherwise, the USB 1.1 (OHCI) controller will be used. In either case, the EHCI controller is available for the OS to use.

POST Memory Manager

Values: Enabled, Disabled

Enables or disables the POST Memory Manager, which is needed by Preboot Execution Environment (PXE) boot ROMs to allocate memory for POST-time operation in order to perform their functions. If your boot ROM supports PXE, then you should enable this option.

System Management BIOS

Values: Enabled, Disabled

Enables or disables System Management BIOS, which supports DMI agents and other PXE clients.

[BACK TO FEATURES](#)

Console Redirection



Values: Auto, Redirect

When set to Redirect, the console is directed to COM1. When set to Auto, the console will be directed to COM1 only when there is no video device available, or when the user has specifically requested redirection by pressing Enter or Ctrl-C on the serial terminal. CMOS Setup and some operating systems such as DOS can use the redirected console for user interaction. The redirected console uses 115200 baud, 8 data bits, 1 stop bit, no parity, and no flow control. (See "Console Redirection" in the [EBX-11 Reference Manual](#).)

UsbMassStorage

Values: Enabled, Disabled

Enables BIOS access to USB mass storage devices. The Enabled setting is required for booting from USB hard drives or CD-ROM drives. It is not required for the OS access to USB mass storage devices.

[BACK TO FEATURES](#)

Custom Configuration

The following screen shows the Custom Configuration factory settings. Click a link for information on a parameter group or individual parameter.

```

+-----+
|                System BIOS Setup - Custom Configuration                |
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+-----+-----+-----+
| PCI INT A Assignment  :>IRQ 11 | ISA IRQ 3           : Disabled |
| PCI INT B Assignment : IRQ 5   | ISA IRQ 4           : Disabled |
| PCI INT C Assignment : IRQ 9   | ISA IRQ 5           : Disabled |
| PCI INT D Assignment : IRQ 9   | ISA IRQ 10          : Disabled |
| Write protect BIOS   : Enabled  | COM 1 enable/IRQ    : IRQ4    |
| Video buffer size    : 32 MB   | COM 2 enable/IRQ    : IRQ3    |
| Flat panel display  : Disabled | COM 3 enable/IRQ    : Disabled |
| Video refresh rate  : 60 Hz   | COM 4 enable/IRQ    : Disabled |
| Video data width    : 1 pix/clock | COM 3 mode         : RS232 (4pin) |
| Primary video device : Auto    | COM 4 mode         : RS232 (4pin) |
| Memory timings     : Optimal  | LPT 1 enable/IRQ    : IRQ7    |
| CPU Temp threshold  : 80*C    | LPT 1 mode         : Printer   |
| CPU overtemp IRQ    : Disabled | BIOS extension     : Disabled  |
| CPU/Memory speeds   : 500/333 MHz | USB OTG device     : Disabled  |
| IDE cable type      : 40-Wire  | Legacy USB support : Enabled   |
| Voltage Alert IRQ   : Disabled  | Periodic SMM IRQ   : Enabled   |
| Geode audio controller: Enabled  |
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```

[BACK TO TOP](#)

- PCI INT A Assignment**
- PCI INT B Assignment**
- PCI INT C Assignment**
- PCI INT D Assignment**

Values: Auto, IRQ 5, IRQ 9, IRQ 10, IRQ 11, IRQ 15



Sets PCI interrupts. All four PCI interrupts can be shared without conflict, but in certain high performance hardware configurations, the assignment of separate IRQs can reduce IRQ latency. Make sure there are no conflicts with the ISA IRQ settings.

Write Protect BIOS

Values: Enabled, Disabled

Enables or disables BIOS write protection for the user-programmable sectors of Flash. (For the EBX-11 there are no sectors that are always protected.)

Video Buffer Size

Values: Disabled, 2 MB, 4 MB, 8 MB, 16 MB, 20 MB, 24 MB, 28 MB, 32 MB, 36 MB, 40 MB, 44 MB, 52 MB, 56 MB, 60 MB

Allots memory to video. **Note:** The current Windows driver contains a bug that may display a corrupted picture when Video Buffer Size is not set to a power of 2. Operating under Windows, video buffer size should be limited to values that are powers of 2 (that is, 2, 4, 8, 16, or 32 MB); video corruption will occur in Windows using settings other than these.

[**BACK TO CUSTOM**](#)

Flat Panel Display

Values: Disabled, 320x240, 640x480, 800x600, 1024x768, 1152x864, 1280x1024, 1600x1200

Sets the flat panel display resolution or disables output to the flat panel display. Make sure that the resolution setting in CMOS Setup matches the flat panel video resolution setting. If set differently, the display image might not display, be too large to fit on the screen, or shrink so there is black border surrounding the desktop.

Note: "Cloned" display with VGA is supported. If separate video (extended desktop) is desired, see [VT1520](#). See [VT1521](#) if you are using a flat panel display in Windows.

Video Refresh Rate

Values: 60 Hz, 70 Hz, 72 Hz, 75 Hz, 85 Hz, 100 Hz

Determines the video refresh rate.

Video Data Width

Values: 1 pix/clock, 2 pix/clock

Determines the flat panel data bus width. Should be matched with the flat panel in use.

[**BACK TO CUSTOM**](#)

Primary Video Device

Values: None, Auto, LX Graphics, PCI VGA card

Determines the primary video controller.

None:	Turns off both the on-board and PC/104-Plus video output.
Auto:	Assigns the PC/104-Plus VGA device as the primary video display; if absent, assigns the on-board video as the primary display.
LX Graphics:	Uses the on-board device as the primary video display.
PCI VGA:	Uses the PC/104-Plus device as the primary video display.

Memory Timings

Values: Optimal, Conservative

Sets memory timings. The Conservative setting increases the memory signal drive strengths. (The Conservative memory timing sets bits 60-62 of the MSR 4c00000fh register.)

CPU Temp Threshold

Values: 60°C, 70°C, 80°C, 90°C, 100°C

Determines the CPU temperature at which the IRQ specified by the CPU Overtemp IRQ is generated. (See "CPU Temperature Monitor" in the [EBX-11 Reference Manual](#).) **Note:** The overtemp bit can be polled by reading the Hardware Monitoring registers within the SCH3114 Super I/O chip.

[BACK TO CUSTOM](#)

CPU Overtemp IRQ

Values: Disabled, No IRQ, IRQ3, IRQ4, IRQ5, IRQ7 ([see note](#)), IRQ9, IRQ10

Determines which interrupt asserts when the CPU temperature exceeds the value specified in CPU temperature threshold.

Note: IRQ7 does not work for CPU Overtemp IRQ and is reserved for future use.

CPU/Memory Speeds



Value range: 200/200 to 500/400

Sets the CPU memory speed. The first value specifies the CPU frequency, and the second specifies the GLIU (GeodeLink Interface Unit, AMD's internal bus architecture) frequency, which also determines the memory controller frequency.

IDE Cable Type

Values: 40-Wire, 80-Wire

Selects the type of IDE cable used. Selecting 80-Wire for a 40-wire cable may result in problems. Selecting 40-Wire for an 80-wire cable should not cause problems.

Voltage Alert IRQ

Values: Disabled, No IRQ, IRQ3, IRQ4, IRQ5, IRQ7 (see note), IRQ9, IRQ10

Sets voltage alert IRQ. If an IRQ is selected, it will be triggered when the 5V power rail exceeds 5.25V or drops below 4.75V. These voltage thresholds conform to the published power supply recommendation of 5V +/- 5%.

Note: IRQ7 does not work for voltage alerts and is reserved for future use.

Geode Audio Controller

Values: Enabled, Disabled

Enables or disables the Geode audio controller. When disabled, the audio controller does not appear in the PCI space and is unavailable to operating systems.

ISA IRQ 3
ISA IRQ 4
ISA IRQ 5
ISA IRQ 10

Values: Enabled, Disabled

Enables or disables ISA interrupts 3, 4, 5, and 10 for access by ISA (PC/104) devices. These must not conflict with the PCI IRQ settings.

[BACK TO CUSTOM](#)

COM 1 Enable/IRQ
COM 2 Enable/IRQ
COM 3 Enable/IRQ
COM 4 Enable/IRQ

Values: Disabled, No IRQ, IRQ3, IRQ4, IRQ5, IRQ7, IRQ9, IRQ10



Sets COM port interrupts. Because the COM ports are ISA devices, and IRQs cannot be shared with devices (including other COM ports) on the ISA bus, you must assign independent IRQs to these ports, or disable them if not needed. Make sure you don't assign an IRQ used by a PCI interrupt.

COM 3 Mode
COM 4 Mode

Values: RS232 (4pin), RS422, RS485 ManuFC, RS485 AutoFC

Sets the COM port mode.

RS-232 (4-pin) - Only the TX, RX, CTS, and RTS signals are used. This will work for terminal communication, but not for a modem.

RS-485 Manual Flow Control - Data is only driven onto the RS-485 shared bus lines when the RTS bit is set.

RS-485 Auto Flow Control - Data is only driven onto the RS-485 shared bus lines when the UART output FIFO contains data. If the FIFO is disabled, Auto Flow Control will not work.

LPT 1 Enable/IRQ

Values: Disabled, No IRQ, IRQ3, IRQ4, IRQ5, IRQ7, IRQ9, IRQ10

Sets parallel port interrupt.

LPT 1 Mode

Values: Printer, SPP/EPP1.7, ECP/EPP1.7, SPP, SPP/EPP1.9, ECP, ECP/EPP1.9

Determines the mode of the parallel port.

[BACK TO CUSTOM](#)

BIOS Extension

Values: Enabled, Disabled

Enables or disables BIOS extension support. BIOS extensions are programmed using the Flash BIOS Update (FBU) utility. (KnowledgeBase article [VT1371 How to Boot from the Ethernet Controller](#) describes how to use FBU to program a BIOS extension, in this case, a remote boot agent.)

USB OTG Device

Values: Disabled, Enabled



Enables or disables the USB On-The-Go (OTG) device controller. This setting is always disabled, as the EBX-11 can only be used as the USB host, and not as a device.

Legacy USB Support

Values: Disabled, Enabled, Auto

Enables or disables BIOS support for USB keyboards and USB mice.

Periodic SMM IRQ

Values: Disabled, Enabled

Enables or disables the Periodic System Management Interrupt. Disabling the Periodic SMI can improve IRQ latency and real-time performance in some operating environments.

[BACK TO CUSTOM](#)

Shadow Configuration

The Shadow/Cache Configuration screen allows the selective enabling and disabling of shadowing in 16Kb sections, except for the top 64Kb of the BIOS ROM, which is shadowed as a unit. Normally, shadowing should be enabled at C000/C400 (to enhance VGA ROM BIOS performance), and E000-F000 should be shadowed to maximize system ROM BIOS performance.

The Shadowing parameter is a master setting for memory shadowing. If you select None, it will have the same effect as setting all shadow blocks to Disabled.

The EBX-11 Shadow/Cache Configuration has been factory set for optimal performance.

```

+-----+-----+-----+-----+
|                System BIOS Setup - Shadow/Cache Configuration                |
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+-----+-----+-----+-----+
| Shadowing          :>Chipset          | Shadow 16KB ROM at C000   : Enabled |
| Shadow 16KB ROM at C400 : Enabled    | Shadow 16KB ROM at C800   : Disabled|
| Shadow 16KB ROM at CC00 : Disabled    | Shadow 16KB ROM at D000   : Disabled|
| Shadow 16KB ROM at D400 : Disabled    | Shadow 16KB ROM at D800   : Disabled|
| Shadow 16KB ROM at DC00 : Enabled     | Shadow 16KB ROM at E000   : Enabled  |
| Shadow 16KB ROM at E400 : Enabled     | Shadow 16KB ROM at E800   : Enabled  |
| Shadow 16KB ROM at EC00 : Enabled     | Shadow 64KB ROM at F000   : Enabled  |
+-----+-----+-----+-----+

```

About Shadowing

Shadowing is the process of copying the contents of a ROM directly into extended memory that is given the same address as the ROM, from where it will run much faster. The original ROM is then disabled, and the new location is write protected.

If your applications execute ROM routines often enough, shadowing could increase performance by about 8 or 9%, assuming a program spends about 10% of its time using ROM instructions, but theoretically as high as 300%. The drawback is that the RAM set aside for shadowing cannot be used for anything else, and you will lose a corresponding amount of



extended memory; this is why there is a shortfall in the memory count when shadowing is enabled.

[BACK TO TOP](#)

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