The fastest way to deploy BIOS on your target with ease and reduced risk. Features provide embedded x86 developers:

- Increased flexibility and configurability
- Shorter adaptation time
- Faster time to market
- Lower total cost of ownership

**Embedded BIOS® with StrongFrame™ Technology highlights:**

- Mature code base deployed on more diverse targets than any other desktop BIOS kit
- Flexibility and configurability are unsurpassed with 1,000+ simple, selectable source-level configuration options
- Fastest, lowest risk BIOS deployment system in the industry makes BIOS a solution, not a problem
- Deep compatibility with industry standards and OSes
- Widest support for x86 chipsets, CPUs, and SIO building blocks keeps roadmap options open and flexible
- Competitive edge is maintained without overhead or risk when migrating to minor v6 releases
- Full lifecycle support for multiple releases of chipsets, CPUs, SIOs, and board adaptations
Perfect-fit firmware every time

Embedded BIOS® with StrongFrame™ Technology is the sixth evolution of General Software’s firmware SDK solution for embedded x86 designs. Having been deployed across the entire range of embedded verticals on more diverse targets than any other desktop BIOS kit, Embedded BIOS with StrongFrame™ Technology has a mature, proven code base.

You are in control of your BIOS adaptation with unsurpassed configuration flexibility, rapid and risk-reducing deployment tools, compatibility with x86 industry standards, support for the widest range of embedded chipsets, CPUs, and SIO building blocks. Major features are configured with intuitive descriptions eliminating thousands of lines of otherwise tediously-written assembly language. Multi-core and support module versioning architecture extend the flexibility by allowing different firmware projects to be validated with different levels of the core itself as well as with different versions of chipsets, CPUs, SIOs, and other modules.

Produce working prototypes in days and finish deployments in weeks with Embedded BIOS with StrongFrame™ Technology. The StrongFrame™ configuration management is based on platform descriptions using intuitive and descriptive methods. Measurable results can be achieved much earlier in the development process and the amount of code that must be validated in system test is reduced.

To get a jump start on your project, General Software provides world class support services and training. Use our experts to produce a turn-key BIOS or use them for consulting and engineering services to augment an existing in-house BIOS team.

Our team of experts is eager to answer your questions and help you get started at any level — from hardware and BIOS to business models.

Reach the General Software Team by

Phone: 425.576.8300 or 1.800.850.5755
Email: info@gensw.com
Website: www.gensw.com

Customer Comments

“We accomplished in 4 days what we expected to do in 3-4 weeks.”
– BIOS Engineer

“I couldn’t be happier with what I’ve seen in terms of product and what we can do with it. I am already dreaming about our future designs not in terms of the CPU and layout, but what we can do with the BIOS.”
– President
**Embedded BIOS® with StrongFrame™ Technology**

### Key Benefits

- **High productivity and fast time to market**
  - 1,000+ selectable configurations implement your custom policies; reduce image size and complexity for a perfect fit
  - High standards of code documentation
  - Simple incremental development strategy for fast, low risk BIOS adaptations
  - Full source code for the BIOS core enables perfect-fit firmware

- **Lowest total cost of ownership**
  - Re-use of modular components reduces each new project cost to an incremental one that leverages prior work
  - Flexible licensing model

- **Keep a competitive edge while reducing risk**
  - Mature code base deployed on more diverse targets than any other desktop BIOS kit
  - BIOS becomes a solution, not a problem
  - Roadmap options are open and flexible
  - Architectural support for multiple minor releases

### Options Available

**Powerful pre-boot, OS-independent firmware applications**

- High Availability Monitor
  - Increase uptime; Detect H/W and S/W failures and respond automatically
- Platform Update Facility
  - Easily manage updates remotely and securely
- Boot Security
  - Protect against threats; ensure system integrity at boot time and during execution

**Firmbase® Software Development Kit**

- Build custom firmware applications that are OS-independent
- Patented 32-bit environment for SMM applications
- Separate networking components for device management

### Technical Fundamentals

- Full source code for core BIOS SDK keeps the environment open with nothing hidden.
- Supports the latest commercially available build tools including Microsoft Visual Studio with MASM 8 and above, and both Intel and Microsoft ASL compilers.
- Off-the-shelf add-on modules support north and south bridges, processors, and SIO’s from major silicon vendors. Each module performs highly technical silicon-specific functions.
- Full-source code sample board-level modules demonstrate working BIOS for silicon vendor development boards. Enabling rapid deployment and the introduction of proprietary pre-boot policies.
- Firmbase® Technology v2 provides a highly-optimized 32-bit environment with High Availability, TCP, and USB stacks and OEM-written SMM applications. Minimal SMM latency, as little as 50us (configuration dependent), will not interfere with foreground OS operations including serial communications (some Firmware Applications may exhibit additional latency when performing I/O).
- Optimized USB stack supports OHCI, UHCI, and EHCI (USB 2.0); up to 8 USB mice and keyboards; up to 8 CD/DVD, 16 hard disks, 4 floppy disks, and other USB storage devices; along with complex hub topologies. (Boot from USB sold separately).
- Rapid Deployment Core reduces project files by \( \frac{1}{2} \) to \( \frac{1}{10} \) their original size enabling Embedded BIOS 2000 v5.x adaptations to be ported to the StrongFrame™ core in as little as a week; two weeks typical. Configuration tables for ACPI, PCI, MP, and Setup describe the platform and eliminate thousands of lines of assembly code.
- BBS feature adds automatic boot device detection, configuration, and prioritization (including boot ROMs and mass storage devices).
- Most-configurable and flexible PC-Based Setup system. Entirely table-driven with no assembly language required. Setup menus give a unified look and feel and include context-sensitive help, multiple core and OEM defined menus, dependent fields, field security, real-time fields (including bar graphs), different screen shapes, sizes and color sets, all of which can be redirected over serial in color. In addition, the setup screen parameters can be stored to CMOS and OEM-defined media (which could include Flash, TPM, or other devices).
- Integrated Core Diagnostics Framework provides burn-in diagnostics and makes it easy to add your own diagnostics suites to the system BIOS.
- Powerful 2nd generation core compression shrinks system BIOS on the ROM enabling developers to include high-end features like HTTP server, TCP stack, Security stack, High Availability tools, and OEM-written C code that runs in the Firmbase environment.
- PCI configuration supports large complex I/O topologies including high-end bridges and 64-bit PCI address space. Automatic device detection enables Embedded PCI option ROMs to automatically expand and run during POST, saving ROM space and streamlining deployment.
**Embedded BIOS® with StrongFrame™ Technology**

### Core Features (not inclusive)
- Boot from PATA/SATA (including native mode), ATAPI, IDE, Iomega ZIP/LS-120, SCSI storage
- Boot from USB CDROM, hard disk, floppy, disk on key, and other mass storage devices*
- Boot from network, PCI slots, ROM images, Windows CE, and EFI
- Boot to debugger, pre-boot menu, setup screen, or OEM-written code
- CMOS backup/restore from Flash
- Console redirection over serial link
- Common User Interface (CUI) menu system supports pre-boot applications built into BIOS
- Debugger (BIOS-aware)
- Driver architecture for BIOS modules
- Disk emulators using ROM, RAM, and Flash
- EFI loader
- Embedded option ROM extensions
- Firmbase Technology, including:
  - Email client in firmware can send email based on OEM policies even if OS crashes
    - Trusted Computing Base (TCB)
    - Multi-user command shell
    - High Availability (HA) subsystem
      - HA Monitor monitors entire system health, implements OEM recovery policies*
      - Hardware Monitor monitors hardware health with OEM-defined plugins*
      - OS Monitor monitors OS health including processes (Windows and Linux)*
    - Platform Update Facility*
    - Boot Security Application*
  - Flash programming API, exposed through INT 15h to BIOS and DOS applications
  - Graphical desktop UI. Can boot DOS in window, Firmbase in window. API exposed to OEM firmware applications. GUI up and running in as little as 500ms (hardware and platform-dependent).
  - Headless operation
  - HTML browser BIOS user interface
  - POST codes to any I/O port
  - POST diagnostics
  - POST memory tests including quick, standard, and exhaustive options in low and high ranges
  - Pre-boot menu and applications
  - Pre-boot diagnostics suite
  - Pre-boot manufacturing mode server
  - Pre-boot system monitor (real-time target analysis)
- Pre-boot system configuration browser
- Pre-boot registration screen system
- Pre-boot user login/logout
- Quick Boot with sub-second POST*** (dependent on hardware platform and other factors.) Fastest in industry.
- Refresh BIOS ROM in-circuit
- RTOS loader
- Setup engine, data driven, with real time fields, security, OEM-customizable to any extent. Standard menus include the following (but can be removed, replaced, or augmented by OEM):
  - Boot devices (BBS), IDE, and Floppy configuration
  - Chipset configuration
  - Exit menu
  - Core features (ACPI, APM, MP, Quick Boot, etc.)
  - Firmbase configuration
    - Main menu (system identification, RTC setup)
    - Miscellaneous configuration
    - PnP configuration
    - POST configuration (error handling, headless, etc.)
    - Security configuration
    - Shadowing configuration
    - Real-time system status display
    - User interface configuration (colors, etc.)
- Splash screen supporting graphics, animation and sound
- TCP stack (MACs, ICMP, DHCP, IP, UDP, TCP, TFTP, Telnet, HTTP, SMTP, SNMP)
- USB stack (OHCI, UHCI, EHCI, USBD, USBMS and USBHID)
- User-level security based on Firmbase Technology’s Trusted Computing Base (TCB). Users assigned individual access controls for system objects; protected objects include menus and fields, boot actions, and OEM-defined actions. TCB supports plug-in Security Authorities allowing authentication and authorization using any OEM-defined means.
- Setup configuration stored in CMOS or OEM-designated alternate devices
- Virtualized emulation of PCI, I/O, and memory-mapped hardware with OEM-written code
- Watchdog timer support
- Web server in firmware can respond to maintenance requests even if OS crashes
- Windows CE loader and EFI loaders

### Industry Standards Supported (not inclusive)
- ACPI 2.0 Specification
- AGP 3.0 Specification
- AHCI Specification (dependent on chipset/platform)
- APIC/IOAPIC
- APM 1.2 Specification
- ATAPI Specification
- ATAPI 1.0 Specification
- BBS 1.01 Specification
- BIOS32 Specification
- DMIBIOS 2.3.1 Specification
- EFI 1.0 Specification**
- Enhanced Disk Drive 3.0 Specification
- El Torito 1.0 CD-ROM Boot Specification
- Firmbase 2.0 Specification
- JEDEC DRAM Specifications (dependent on chipset/platform)
- Legacy Free
- LPC 1.1 Specification
- Microcode Update
- Microsoft Debug Port 1.0 Specification
- Microsoft Simple Boot Flag 1.0 Specification
- MP 1.4 Specification
- PAE to 64GB
- PCI 2.2 Specification
- PCI Express 1.0A Specification
- PCI-X 2.0 Specification
- PE 6.0 Specification (for Portable Executables loaded by BIOS)
- PMM 1.01 Specification
- PnP 1.0A Specification
- PXE Specification*
- System Management Bus BIOS Interface 1.0 Specification
- UDMA6 Specification
- USB 1.0, 1.1, 2.0 Specifications, including Legacy USB and Boot from USB
- Linux)*
- PXE Specification (MACs, ICMP, DHCP, IP, UDP, TCP, TFTP, Telnet, HTTP, SMTP, SNMP)
- USB stack (OHCI, UHCI, EHCI, USBD, USBMS and USBHID)
- User-level security based on Firmbase Technology’s Trusted Computing Base (TCB). Users assigned individual access controls for system objects; protected objects include menus and fields, boot actions, and OEM-defined actions. TCB supports plug-in Security Authorities allowing authentication and authorization using any OEM-defined means.
- Setup configuration stored in CMOS or OEM-designated alternate devices
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When you are designing embedded devices you have specific needs and challenges. With over 17 years of experience and thousands of embedded x86 projects, you can rely on General Software to understand those needs and help you through the tough challenges.

For more information please contact us by email, phone, or visit our website. We look forward to helping you make your project a success.

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*SDK option, sold separately. **Requires Intel EFI toolkit to build EFI load image. ***Depending on platform and configuration.