

# ESF Base™

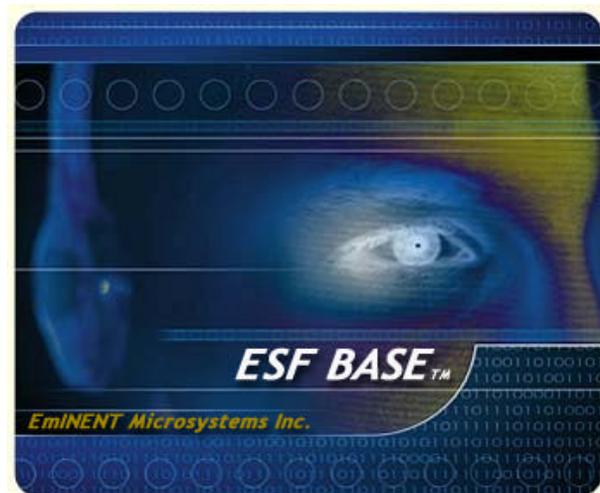
Embedded Software Framework

ESF Base® is an OS and platform independent data structure and algorithm library. It contains many C++ classes that have hybrid architectures of base classes and template classes providing the benefits of inheritance (small code size) as well as the benefits of templates (fast code).

This library complements other libraries, such as the C++ Standard Template Library (STL), but distinguishes itself by supporting the needs of embedded applications (reentrancy, no C lib dependencies, no code bloat, advanced buffer management, etc.). For code compactness, reliability, and efficiency, all ESF™ modules use these data structures.

ESF Base® is one component of a suite of software frameworks for the development of software subsystems. Additional pre-integrated ESF OS® modules include TCP/IP, Web Server, E-Mail Protocols, SNMP v1/v2, PPP, SCSI, and RAID.

- *No Royalties*
- *Micro foot print*
- *ROMable and reentrant*
- *Processor independent*
- *No external library dependencies*
- *Containers – linked lists, hash tables, AVL trees, etc.*
- *Memory – alignment, circular buffers, block allocators, etc.*
- *Clear well defined header framework (removes clutter)*
- *Event/Callback management*
- *CRC encoding/decoding*
- *Microsoft and Linux compatible*



### Signal Processing / Math Library Properties:

- Follows general reusability principles.
- Vector/Matrix base classes for “Matlab/Octave style” data arithmetic.
- FORTRAN comparable numerical efficiency.
- Mathematical topological graph base classes and streaming mode support for easy creation and modification of topological properties – branching, insertion/deletion of processing components, etc.
- Event, Callback Abstractions to support application independence and application specific event handling.
- State Machine base classes.
- Core signal processing support – Filter, Signal, FIR, IIR, FFT, etc.
- Advanced signal processing support – Filter Banks, Adaptive Filtering, Pattern Recognition, Wavelets, Neural Nets, Time-frequency Analysis.

### CPU Support:

- X86
- PowerPC
- 68XXX
- ARM
- MIPS
- Blackfin
- NECv850
- X-Scale
- SPARC
- DragonBall

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**ESF Base™** is an OS and platform independent data structures and algorithms common to all other frameworks.

**ESF RTOS™** is an elegant, simple, powerful, and easily customizable, object-oriented interface to kernel services, such as thread creation and synchronization.

**ESF Device™** is a framework of object-oriented, multi-threaded device drivers having portable interfaces and portable implementation, i.e. CPU independence and explicit separation of hardware dependent and hardware independent code.

**ESF Tcp/Ip™** is a flexible, fast, compact, no-shortcuts real-time implementation (e.g. no heap allocation, timeouts, etc.) of the standard TCP/IP protocols.

**ESF SNMP™** is a complete implementation of the standard SNMP protocols, including a framework for rapid MIB implementation that uses advanced data structures such as “balanced binary trees” for high performance object retrieval.

**ESF Web Server™** is an embedded implementation of an HTTP web server that supports all basic HTML (including HTML forms), a website in ROM, and a CGI method for direct execution of internal C or C++ functions.

**ESF SCSI™** is a complete implementation of both Initiator and Target side SCSI protocols.

### Architectural Box Diagram

