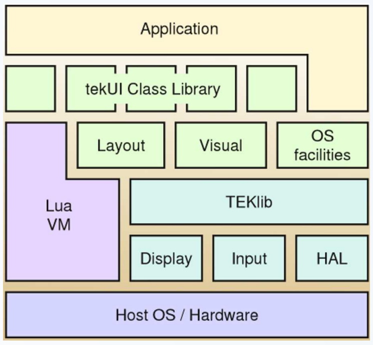
Schulze & Müller GbR
Middleware - Open Source - Embedded Systems

tekUI embeddable GUI toolkit

tekUI is a self-contained, light-weight, scriptable graphical user interface toolkit with advantages in prototyping and rapid application development for 32bit microcontrollers, set-top boxes and kiosk systems.

Overview

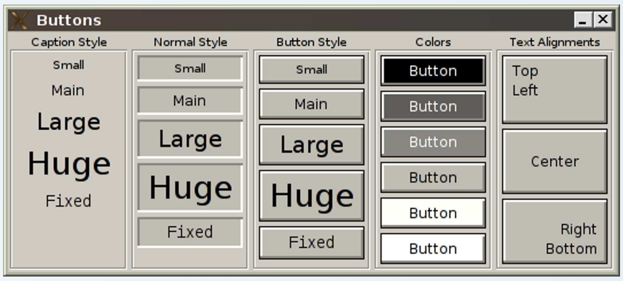
Based on our host- and hardware isolation layer **TEKlib** and a few platform-specific bindings, **tekUI** consists of the Lua virtual machine, a class library and some C modules. There are no dependencies other than **TEKlib** and the ANSI-C standard, and all essential components are available under an open source license. **tekUI**'s key features are:



- Small, ROM-able code base, not exceeding a total of 300k binary code
- Highly portable across different architectures and platforms
- GUI code is executed in a **safe environment** and **cannot crash** your device or application.
- The application, the GUI and custom controls can be developed on a regular workstation. Classes can be linked to binaries or loaded at runtime.
- Extensible class library: New controls can be created with little effort. It is possible to derive new classes *ad hoc* in C code or Lua scripts.
- Performance-critical classes can be ported to C successively, in varying degrees of reliance on the VM's resource management.
- Benefit from a programmable, fine-tuneable garbage collector and our patch for O(1) runtime behavior of the Lua VM's memory manager.
- A comprehensive online documentation for the class library is provided. Also, an automated class documentation system is included.

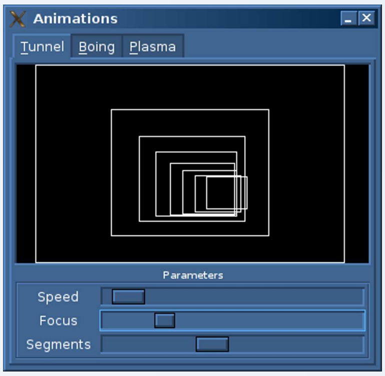
Platform support

Host operating systems currently supported are POSIX (Linux, FreeBSD) and Windows. Back-ends currently supported or in development are X11, DirectFB, Windows and a *raw framebuffer*, which can be further specialized for your target system. Additional custom drivers or bindings can be provided on request.



GUI properties

- Fully event driven
- Automatic layouting and scalability
- Support for themes and Cascading Style Sheets
- Support for multiple and antialiased fonts
- Full UTF-8 Unicode and localization support
- Allows for multi-windowed, tabbed and fullscreen applications, pop-ups, menus and dialog boxes
- Concurrency thanks to built-in support for method dispatching to cooperative threads
- Timing events allow for easy programming of multimedia controls and smooth animations.



- GUIs are self-modifyable and can change their layout dynamically.

Thanks to **tekUI**'s clean and modular architecture, unneeded features can be removed with moderate effort. More characteristics benefiting resource-friendliness:

- Fully incremental refresh logic, backbuffers are not required

- Remarkably fast and resource-friendly virtual machine: an interpreter state occupies less than 50k of RAM. A JIT version is available for the x86 architecture.
- Entirely based on the number range of 32bit integers, to equally support stock (double precision), single precision and integer versions of the VM

GUI elements

Notes: Buttons are actually *Text* instances with special behavior. This list is not exhaustive; abstract and auxiliary classes have been omitted.

- Canvas (smoothly scrollable)
- CheckMark
- DirList (file chooser included)
- FloatText (adaptive to available space)
- Gauge
- Group (horiz., vert., grid, pages, scrollable)
- Handle (for group balancing)
- Image
- List (also multi-column and multi-selection)
- Menu (pop-up and window, also nested)
- PopItem (also nested)
- PopList (*combo box*)
- RadioButton
- ScrollBar
- Slider
- Spacer
- Text (also static label, also multi line)
- TextInput

Support and services

tekUI itself is free of charge, and you are free to use the public source code repository and documentation.

We are available for support and services as well as for creating drivers, components and classes, either on request or within the scope of adaptions to your target application. Also, we design and implement complete systems and applications based on your requirements and specifications.

In any case, **ask for quotes** for a fitting support, service or work contract.

Open source licensing

More and more customers *a priori* demand the use and application of open source components and production methods, for they deem it necessary for **securing their investment** and for **staying in control** of their products. We resort to open source licenses for substantial parts of our work, so that customers can test and employ our products and frameworks. Our license can be combined with the GPL, but it allows derivative work to remain closed, to be sold and sublicensed.

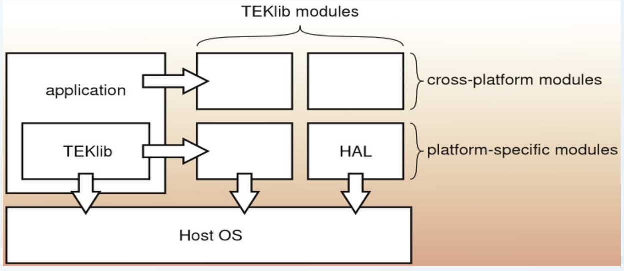
TEKlib is an OS abstraction, software development kit and interface collection concerned mainly with resource and namespace management: Memory, threads, signals, IPC, dynamic libraries, a component model, device driver and file system interfaces.

Embedded operating system

TEKlib equips software with a small, inbuilt host/hardware isolation layer, which makes it a matter of adapting a few isolated lines of code and a simple recompile to port it to different platforms.

In doing so, **TEKlib** components can be developed and tested under Unix or Windows as hosting environments and be readily used in all kinds of applications, DLLs and connectors.

On top of this, **TEKlib** offers a platform-independent interface toolkit for the development of components, device drivers, file systems and services. This allows **TEKlib**-based software to be embedded into any environment imaginable, such as device drivers, libraries, plug-ins or applications in a normal desktop environment.



TEKlib is not just a *wrapper* but implements its own, distinct architecture; it ensures that code can be written in a cleanroom manner with minimal (ideally zero) reliance on platform-specific peculiarities. This extra effort is rewarded with a high degree of reusability and portability.