SEGGER

ISO 9001 certified

embeddedsoftware
solutions

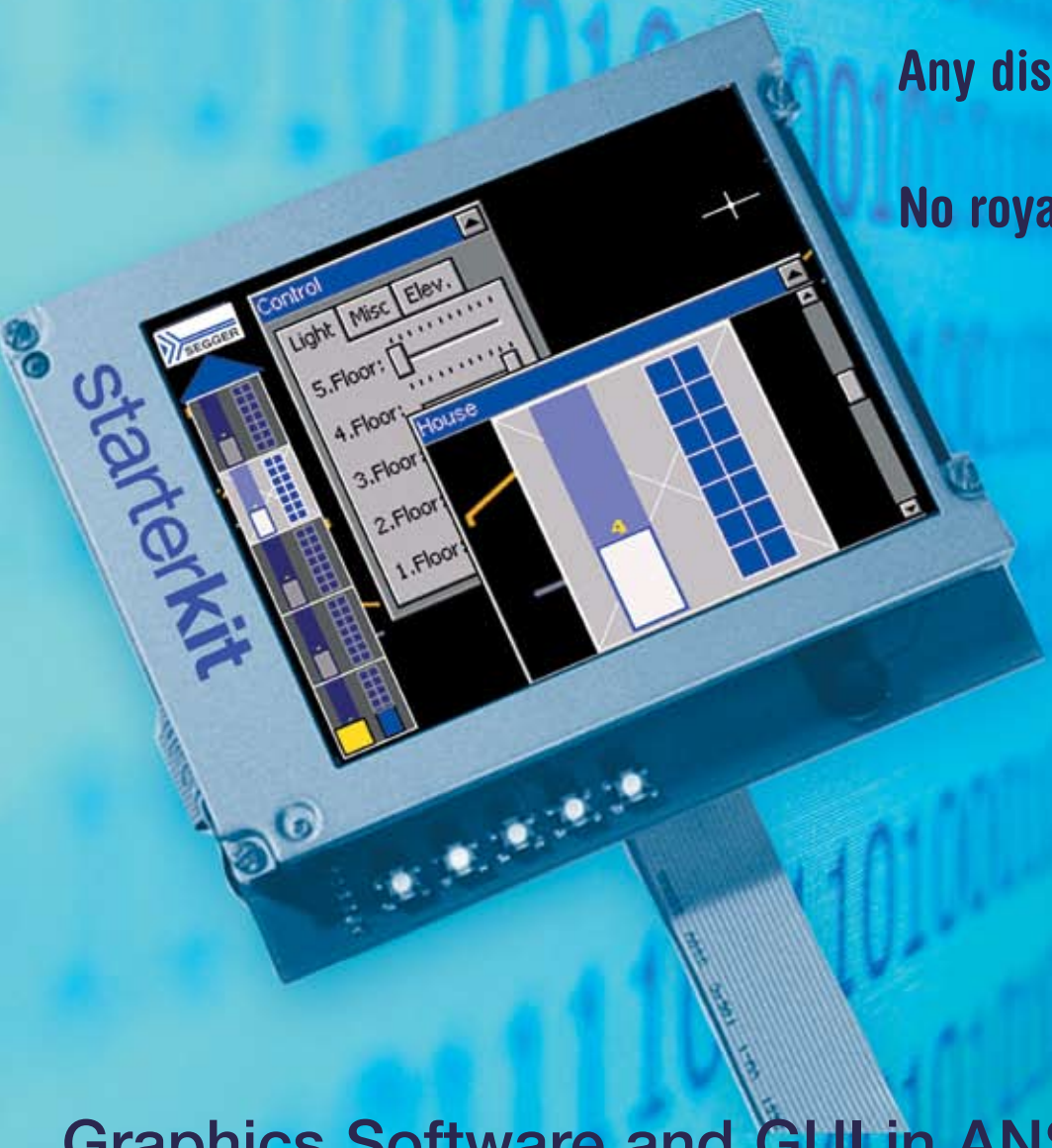
emWin®

Any display controller

Any CPU (8/ 16 / 32 bit)

Any display

No royalties



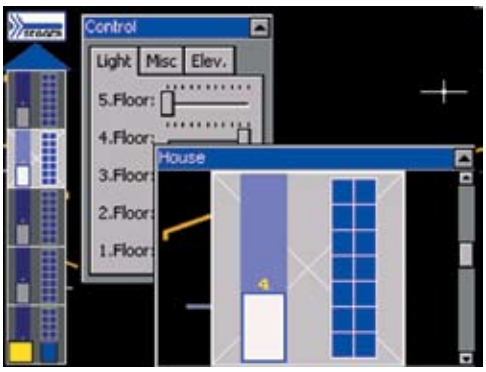
Graphics Software and GUI in ANSI-"C "

+ + + 8 / 16 / 32 - bit + + +

emWin ® graphics software and GUI

emWin ®

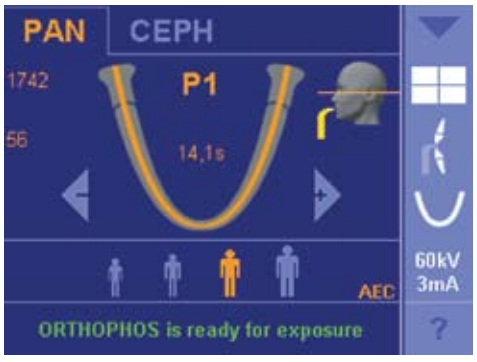
One of the most challenging aspects of many development projects is designing an attractive and useful display. Besides creating images that look exactly how



Sample application

you want them to appear, the implementation of windows techniques, complex drawing routines, different fonts and flicker-free updates are also expected.

The developer has to implement this complex functionality in short time periods, which can take up to months or years of development time. emWin, probably the most efficient and comprehensive embedded GUI available, helps developers beat their timelines and development costs. It is written in ANSI "C" and supports any b/w, gray-scale or color display. Drivers for all common LCD controllers are available. All types of graphical displays (STN-LCD, TFT, CRT, OLED, Plasma...) are supported.



Typical customer application

2-D graphic routines

All required graphic routines, such as drawing points, lines and circles, are part of the software. An efficient algorithm to draw arbitrary polygons is implemented. Bitmaps of any size and color depth (1/2/4/8/16 bits per pixel, usually generated by the bitmap converter) may be shown at any place on the display.

Drivers for display controllers

Drivers can be written for all types of displays and display controllers, including monochrome, grayscale, passive and active color (TFT) displays. Drivers for all common display controllers already exist.

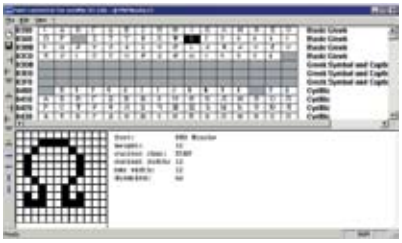
Fonts

A variety of fonts - in "C" code form - are shipped with the software. Additional fonts can easily be generated from PC fonts using FontConvert, the font converter for emWin.

Bitmap converter

The bitmap converter can convert any bitmap into standard "C" code. It supports palette conversion for different displays (monochrome, b/w and color displays). For efficiency, bitmaps may also be saved without palette data and in compressed form. Any bitmap can be displayed in your application, on any display.

Bitmap converter



FontConvert

Font converter

FontConvert is a Windows program, that makes it easy to add new fonts to emWin. It can convert any installed PC font into a "C" file that can be compiled and linked with the application. Simply load a font which is installed on your system into the program, edit its appearance if necessary, and save it as a "C" file. The generated file can then be used by emWin and shown on the display like any other standard emWin font.

Features of FontConvert include:

- Support for proportional fonts and fonts for foreign languages.
- Generation of fonts in standard or 2/4-bit antialiased modes (to give fonts a smoother appearance).
- Complete Unicode support. Fonts may be encoded in Unicode, ASCII + ISO 8859 or Shift JIS.
- Easy-to-use interface that allows optional editing of fonts before conversion. Individual characters may be modified pixel by pixel; the width of characters or the height of entire fonts can be adjusted.
- Generation of pattern files (font files with particular set of characters), typically used to create the most efficient "C" file possible for a specific text.
- Uconvert – a simple tool that converts Unicode or Shift JIS texts into "C" files – is included.

for b/w, grayscale and color displays

FontConvert: Sample "C"-output

Color management

emWin features an integrated, very efficient color management system. This system allows conversion of logical colors (RGB format) into physical colors, which can be displayed at run time. As a result, your application does not really need to be too concerned with the available colors, and displays can easily be interchanged. The system can also display bitmaps using indices generated at (pre-)compile time by the application programmer or by the bitmap converter.

Sample widgets

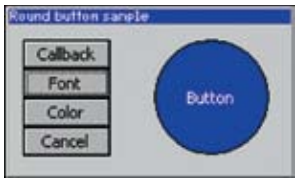
Sample application

Virtual screen support

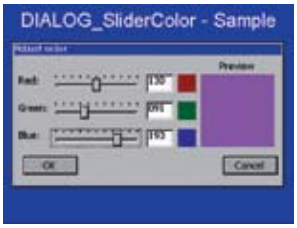
The virtual screen feature supports display areas greater than the physical size of the display. It allows switching between different screens even on slow CPUs.

Window manager/widgets

The window manager allows creation of windows of arbitrary size at any point of the display. It is an optional component, which is fully integrated into the software. Child windows and the exchange of messages between windows and their children/parents are supported.
Windows may be transparent or overlapping. They can be moved or resized at run time. All functions of the graphic software can be used with the window manager, which performs any necessary clipping. If callback routines are used, it also manages the redrawal of invalidated areas. A variety of widgets (windows with object type properties) such as buttons, checkboxes, listboxes, sliders, etc. come with the window manager module.



Customized widget



Slider widget

Touch screen simulation

Mouse and touch screen support

Touch screen support is available. A driver for analog touch panels, which handles the analog input (from an 8-bit or better AD-converter), debouncing and calibration of the touch screen is included.

The window manager deals with touch messages and widgets such as button objects. It takes no more than one line of code to create a button or another widget, which then automatically handles touch messages and reacts accordingly. Cursors can be displayed and a variety of standard cursors is included as part of the software. Additional cursors can also be added.

Headquarter:
Email: info@segger.com
http://www.segger.com

U.S. office:
Email: info@segger.com
http://www.segger.com

embeddedsoftware
solutions

SEGGER

Touch screen simulation
The touch screen simulation is integrated into the emWin simulation. Mouse events are used to simulate the touch screen. The simulation can be used to write the user interface of your application. It can be sent as a simple .exe file to anybody for discussion, demonstration or verification.

Flicker-free real time animation/antialiasing
More hightech applications require animation. emWin supports flicker-free animation with or without antialiasing which is useful in a variety of ways. They allow the presentation of classic dial indicators, which can easily be displayed in any size, form or style, on any color or monochrome display.

Multi layer/multi display support
emWin is capable of controlling multiple displays or display controllers with multiple layers. Different displays may have different resolutions, color formats and display controllers. Multi layer/multi display is fully integrated into the simulation. If multiple layers are simulated, the individual layers can be viewed as well as the contents of the display.

VNC Server
The emWin VNC server can be used for administration of the embedded target and a variety of other purposes. It supports compressed (hexitle) encoding.

VNC stands for 'Virtual Network Computing'. It is a client server system based on a simple display protocol, which allows the user to view and control a computing 'desktop' environment from anywhere on the Internet and from a wide variety of machine architectures, communicating via TCP/ IP. In other words: The display contents of the embedded device are visible on the screen of the machine running the client (e.g. your PC); your mouse and keyboard can be used to control the target.

Multitasking support
emWin has been designed from the beginning to be compatible with different types of execution models. It works in single and multitask environments, and most common RTOS are supported. Support for any RTOS can easily be added, even by the user.

Technical data
emWin works very efficiently. With small displays, hardware access can be minimized by using a cache. Written in pure "C" and highly optimized, the performance of the software is excellent.

Memory requirements*
The memory requirements vary depending on which parts of the software are used and how efficient your target compiler is. Because emWin is modular, only the necessary functions are linked into the application program. It is therefore not possible to specify precise values, but the following applies to typical systems.

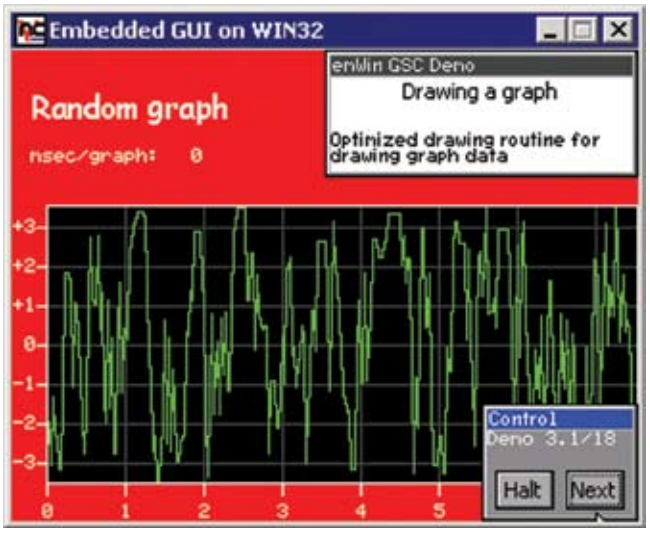
Small systems
(no window manager)

- RAM: 100 bytes
- Stack: 500 bytes
- ROM: 6-25 kb

Big systems
(including window manager and widgets)

- RAM: 2-6 kb
- Stack: 1200 bytes
- ROM: 30-60 kb

Starterkits
"Ready-to-go" starterkits allow you to work on real hardware and get familiar with emWin as well as with the microcontroller and other development tools.



*Precise values depend on the functionality used. ROM requirement will increase if your application use many fonts. Values are measured on a specific target system and will be different for other systems.

PC Eval Version available at www.segger.com