*smx*MicroBrowser

The smxMicroBrowser provides embedded systems with a small, yet capable browser and graphical interface.

*smx*MicroBrowser can be used on the Internet, on private networks, or to create graphical user interfaces using HTML files. It is compliant with most HTML 4.0 requirements, yet is small compared to other commercial browsers.

*smx*MicroBrowser is based upon PEG™ (Portable Embedded GUI), which was developed for embedded systems. PEG provides display and input drivers as well as display management, graphics and font compression, dynamic image conversion and other functions. See the *smxPEG* brochure for more information on PEG.

In order to maintain good user responsiveness, image conversion is performed in one or more background tasks. Hence, operation with *smx* is recommended for best performance.

Standards Compliance

*smx*MicroBrowser supports a subset of the HTML 4.01 standard. 57 tags are supported and 34 tags are not supported. The majority of unsupported tags contribute only inline physical style information. The effects of these can be emulated by supported tags. Exceptions to this are APPLET, OBJECT, PARAM, and BUTTON tags which represent major HTML features not yet supported.

A subset of CSS level 1 is supported. *Smx*MicroBrowser supports Javascript language version 1.4. Subsets of DOM level 1 and Explorer 5.0 DOM are supported. Contact us for more detailed compliance information.

Operation on the WWW

It is difficult to create a small browser, which is Internet capable. Common problems include hanging on non-compliant HTML (a frequent occurrence), terrible looking displays due to inadequate font selection and other problems, and lack of support for Javascript, CSS, cookies, and Unicode, used by most websites. *smx*MicroBrowser has, done a good job of overcoming these problems during its six plus years of development as can be seen from its Windows demo.

FEATURES

- Internet capable
- HTML 4.0 subset compliant
- Forms
- Frames
- Tables
- GIF, JPG, Animated GIF
- Background Bitmaps
- Client Side Imagemaps
- Scalable Vector or bitmap fonts
- Portable C source code
- HTML pages may come from ROM, disk, or network
- Uses standard 'PEG' graphics library
- Local Caching
- Metatag Support
- Integrated FTP client
- 260 KB minimum code size, including PEG
- 210 KB RAM, minimum
- Javascript
- Cookies
- Cascading Style Sheets
- Unicode
- SSL support

Windows Demo

The *smx*MicroBrowser Windows demo can be downloaded from our website (www.smxrtos.com/2). The demo uses Winsock to connect to the Internet. The text and graphics are displayed in a Windows window using PEG graphics primitives. This demo uses Windows only as a low-level pixel display device. Thus, on an embedded system the look and feel of the Browser will be very similar to this demo.

SSL

SSL (Secure Socket Layer) adds safety for connecting embedded devices to the Internet. It is available for the *smx*MicroBrowser and our MicroWeb server. It takes advantage of public or private public key infrastructure and certificate authority. SSL v2, SSL v3, and TLS v1 are supported.

¼ VGA

*smx*MicroBrowser works best on a full VGA, or better, display. However, we have customers using ¼ VGA displays. In general, this resolution with 16 colors will not produce high quality results for live web browsing. *smx*MicroBrowser offers a few options to improve display quality:

- Image scaling – permits more of the total page to fit in the viewing window.
- Customizable dithering – turn on or off to produce best result.
- Interface customization – allows turning off any element of the browser window such as scroll bars to increase viewing area.

WebC™ Graphical Interface

In addition to being used as a general-purpose web browser, the *smx*MicroBrowser can be used as a GUI, driven by HTML pages. It provides an interface for the application programmer to handle user interaction through the use of custom C function event handlers.

By implementing DOM (Document Object Model), WebC allows the application code and custom event handlers to manipulate the document data, including tag properties such as position, size, color, source URL, etc., as well as opening and closing multiple HTML display windows, and modifying the properties of existing ones. DOM is accessible through a simple, easy-to-use C API, and also through an object oriented C++ based interface for more advanced users.

The WebC API consists of over 80 C functions to control windows, HTML documents, HTML elements, cookies, and other objects.

WebC SDK

The WebC SDK allows developers to utilize existing tools and expertise in HTML content development. WebC's rapid interface prototyping saves valuable development time and cost. The developer can write the application once and modify the presentation at any time simply by changing the HTML code and keeping the C event handlers and application code the same. The WebC solution requires less memory and runs faster than Java or Javascript solutions.

ROM and RAM Requirements

The ROM requirement is as little as 260KB, including PEG. Cascading Style Sheets add 36KB. Javascript adds 430KB. SSL adds 350KB to 1MB, depending upon the level of protection required.

The minimum RAM requirement is 210KB. Increasing this to 400KB provides a good selection of fonts for general WWW browsing. CSS adds 5KB, Javascript 18KB, and SSL 50 to 200KB.

Portability

*smx*MicroBrowser has been tested on ARM, PowerPC, x86, and ColdFire processors with SMX and other RTOS's. If a port of PEG is available, the rest of the port is very simple. Although it normally runs with *smxNet* and, optionally, with *smxFile*, the networking and file layers are abstracted to permit porting. *smx*MicroBrowser also comes with a virtual file system.