

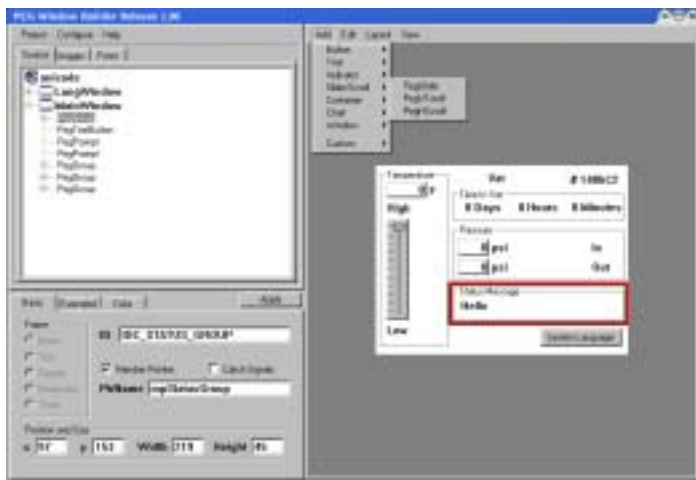
# C/PEG<sup>TM</sup>

Graphics Software for Embedded Systems

*A graphical interface development package designed exclusively for real-time embedded systems.  
The tools you expect, the support you need, the quality and reliability your project demands.*

C/PEG has been built from the ground up to support your needs as an embedded system developer. Its light weight, portability and adherence to the ANSI C language standard make it the right choice for any type of application.

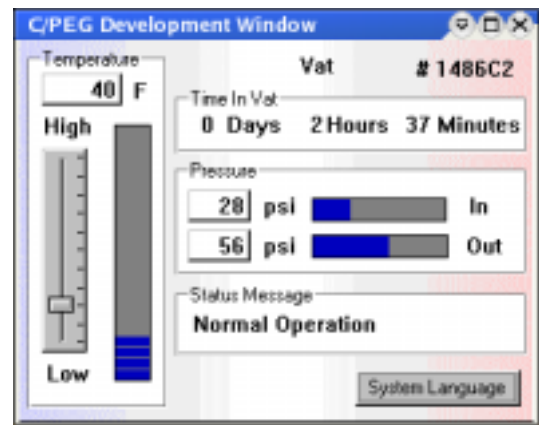
The default look and feel of C/PEG is similar to that of many standard desktop windowing systems. By providing these default objects as well as exposing the underlying graphics primitives, this look and feel can easily be modified to create a custom application to give your product distinction in the market place.



Anti-aliased text output as well as anti-aliased line drawing are supported for high color depth targets. Industry leading multi-lingual application support includes full Unicode and SJIS character encoding support, and string table editing facilities incorporated into the StringTableEditor.

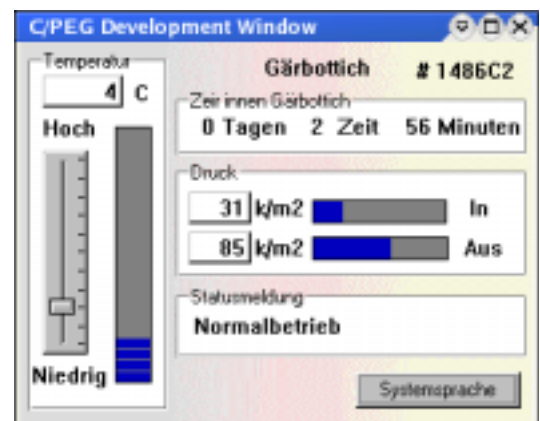
The two panels shown at right are examples of how easily C/PEG is able to handle applications that require multiple language support.

PEG WindowBuilder, shown above, is a complete visual layout and design tool included with C/PEG. The output of PEG WindowBuilder is ANSI C source code, ready to be compiled and linked into your ROM or FLASH. PEG WindowBuilder is written entirely using the C/PEG library, allowing it to run on all Windows and Unix/X11 development hosts.



Custom graphics and fonts are also incorporated into your PEG WindowBuilder project, allowing you to do complete and accurate screen design using simple drag-and-drop techniques.

C/PEG includes a large set of control types such as push buttons, radio buttons, check boxes, text input fields, lists, combo boxes and scroll bars. In addition, C/PEG provides tools such as FontCapture for generating custom fonts and ImageConvert for converting PNG, JPG, GIF or BMP graphics into ROMable format supported by the C/PEG library. Advanced color reduction, dithering and optimal palette production can be applied to assist those running on greyscale, monochrome or limited palette targets. Rotated screen mounting is also seamlessly supported.



## Summary

C/PEG provides the most complete GUI solution available to realtime embedded system developers. All of the utilities, documentation, support and development tools you will require for creating a graphical user interface on an embedded system are included with the C/PEG library development package.

## Features

### Reduced Size

C/PEG is written with the embedded market firmly in mind, meaning that the value of every feature is weighed against the code size and performance requirements of that feature.

A minimum C/PEG footprint requires roughly 40K of code space, 4K of stack space and 8K of dynamic memory. A typical full-featured GUI requires a C/PEG footprint of roughly 100K code, 4K stack and 16K dynamic memory.

C/PEG is fully integrated with the RTOS messaging, memory management and synchronization services. This yields the lowest possible overhead and the only true real-time multitasking GUI environment available. C/PEG input devices are interrupt driven, and again use RTOS services to communicate user input information to the graphical user interface.

C/PEG can also be configured to support multiple GUI tasks. These tasks can be of differing priorities and can each directly create, display and control any number of GUI windows or child controls. This advanced capability is unique to the design of C/PEG.

## Microsoft Windows Development

C/PEG provides a set of hardware and OS encapsulation classes which allow your C/PEG user interface to run as a standard 32-bit Windows application. You can create and test your entire user interface while using the very mature Windows application development tools. Moving to the final target requires only that you rebuild the C/PEG library and application software using your target specific tools.

## X11 Development

C/PEG also provides an X11 Window System integration that allows your C/PEG application to run as a standard X11 application. Most major Unix platforms are supported including Linux, Lynx OS, NetBSD and Solaris. The C/PEG development tools are also X11 hosted, allowing you to do full application development and testing using this alternative host environment.

## Input Devices

C/PEG can be configured to support any combination of mouse, keyboard, touch screen or membrane keypad input.

## Compiler Support

The C/PEG library has been fully verified with all of the most popular embedded compilers including Green Hills Multi, Metrowerks CodeWarrior, MetaWare, IAR, CAD-UI, ARM RealView, Borland, Microsoft, Hitachi, ST Microelectronics, Paradigm, Watcom, GCC, Tasking, TI Code Composer and Analog Devices Visual DSP.

## Processor Support

C/PEG can be used with nearly any embedded CPU. A partial list of supported CPU types includes:

- All x86 designs including 8086, 80186, 80286, 80386, 80486, Pentium, Itanium, Athlon, Elan and other x86 derivatives.
- All 68K core designs including 68000, 68020, 68030, 68332
- FreeScale ColdFire, DragonBall, and i.MX1, i.MXL, i.MX21, PowerPC 823 and 860, and derivatives.
- Hitachi H8, SH
- MIPS R3000, R4000
- ARC cores
- All ARM cores including Sharp LH Series, Cirrus Logic Maverick series and Samsung. Includes ARM7, ARM9, Thumb Mode support and MMU enabled designs. Internal or external LCD controllers.
- Infineon C166, C167
- Intel PXA250, PXA255
- Analog Devices Blackfin
- Texas Instruments OMAP family
- Texas Instruments DM270 and DM320

## Video Output

C/PEG can be configured for monochrome, 4 greys, 16 greys, 16 colors, 256 colors, 256 greys, 65K colors and 24-bit RGB color depths. Any x, y display resolution may be used, including custom resolutions and profile orientation or rotation of the display device. Many CPUs include built-in video/LCD control, while external video/LCD controllers may also be used. Commonly used external controllers include:

- Advanced Micro Devices - Geode Processor
- ATI - Rage Mobility, Mobility Radeon
- Trimedia
- Permedia II
- Topro - TP6508 controller
- 3DLabs
- Linux: Standalone - VGA, Linux Framebuffer Device
- Linux, Solaris, NetBSD, Lynx OS - X11 Windows
- Chips & Technology - CT545 Alpine, CT65550, CT 69000
- MediaQ - MQ200
- Epson - S1D13300, S1D13503, S1D13505, S1D13506, S1D13704, S1D13705, S1D13706, S1D13806, S1D13A04/ S1D13A05
- Silicon Motion - Lynx 3DM, LynxEM+, SM501

## For More Information

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