

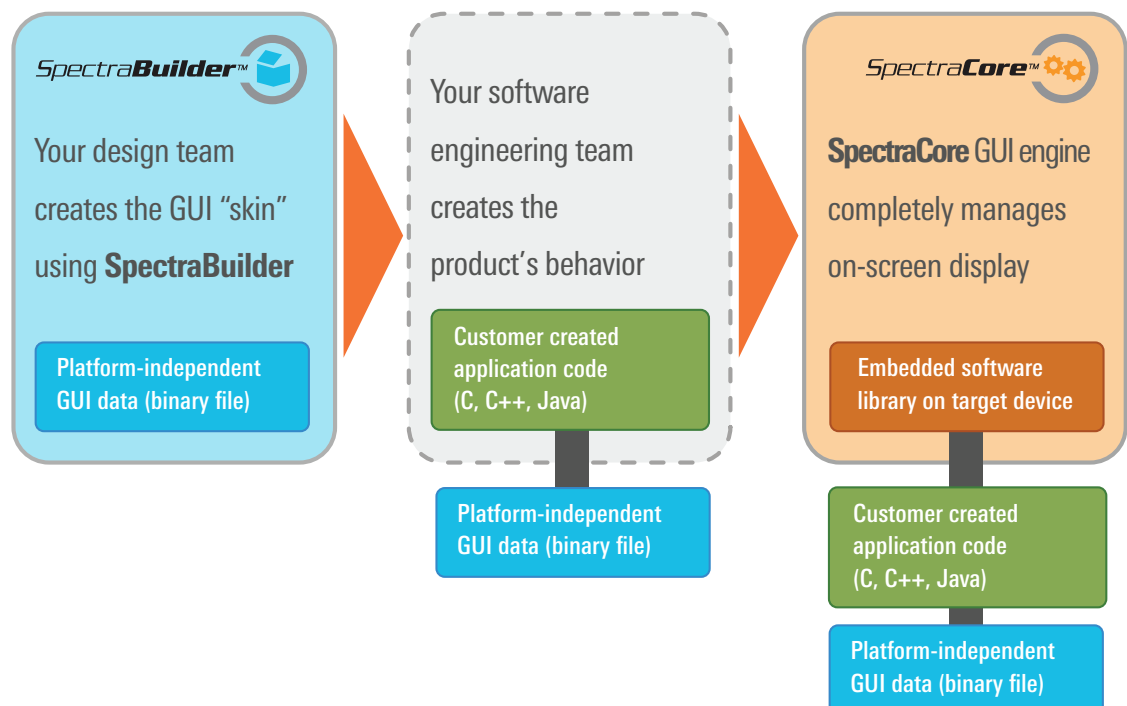
# SpectraCore™

Monotype Imaging's **SpectraCore™** is a graphical user interface engine for embedded systems—enabling rich, interactive UI experiences on a broad range of consumer devices such as digital cameras, white goods and printer control panels.

SpectraCore provides complete management of the on-screen display (OSD), delivering a rich UI experience with higher performance and less system resources than conventional methods.

- Runs on small target embedded devices (50Mhz and higher)
- Small code footprint. Production level projects can run in as little as 70KB of code space. 256KB code space required for full functionality
- Quick and simple porting to virtually **any platform** (any CPU, any OS, even no OS)
- No graphics hardware required—but can use it if available
- Low RAM usage (as little as 16KB, 1MB recommended for full functionality)
- Lightning fast boot time
- Includes OSD drivers for 16-color, 256-color, 15/16 bit, and 24/32 bit graphics display systems
- Fast and efficient 3D-style effects (e.g. coverflow, perspective effects, alpha-blending, etc.)
- Built-in iType® runtime outline font support for TrueType®, OpenType®, CATT™ and stroke fonts
- Complex script language support with World Type® Shaper built-in to display the world's languages
- Industry's most robust textual solution, highest display quality with minimal overhead
- SpectraWorks™ visual effects library—source level, pre-built professional UI paradigms of transition effects

The look of a GUI (consisting of widgets, fonts, and basic navigation flow) is described using the SpectraBuilder tool, a Windows-based graphical utility. Applications are coded in C, C++ or the Java® language and are written to the SpectraCore™ API to control the behavior of the GUI.



## Portable

SpectraCore is designed with portability in mind. SpectraCore natively drives the OSD, supporting a broad range of color formats which include 4-bit, 8-bit, 16-bit and 32-bit display systems. The SpectraCore Hardware Abstraction Layer (“HAL”) cleanly interfaces SpectraCore with the Real Time Operating System (“RTOS”) for quick and easy porting to new designs. The HAL is also easily adapted to no-OS solutions. **Porting time often averages less than a week**, with initial bringup usually occurring within two days. Widely compatible with embedded CPUs, SpectraCore works on ARM®, MIPS®, uSparc, NIOS® II, x86 processors and many more. SpectraCore is currently ported to a variety of embedded operating system solutions including embedded Linux®, Android™, VxWorks®, pSOS®, itron® and Windows® Embedded CE platforms.

## Lightweight / High-Performance

SpectraCore uses an event-driven architecture, resulting in no CPU overhead when GUI functions are not occurring. SpectraCore can deliver a graphically rich interactive experience on CPUs as small as 50 MIPS, without affecting the performance of the other native features and functions. Due to its small code size (as little as 70KB and 256KB for full functionality) and low RAM (as little as 16KB, 1MB recommended for full functionality) usage and highly optimized algorithms, **SpectraCore keeps hardware costs low.**

## Flexible

SpectraCore’s flexibility comes from its building-block widgets that can be formatted and combined by the designer, and dynamically controlled by the software engineer, to express a broad range of GUI designs. Additionally, applications can take direct drawing control over individual widgets to blend external data sources and decoders.

## Built-in Widget Support

The SpectraCore engine supports a vast array of built-in widgets that can be manipulated extensively to produce a unique GUI personality (e.g. button, checkbox/toggle, combo box, edit box, gauge, layout, progress bar, slider, static text, gradient text, tree control).



Digital still camera



Refrigerator



Multi-function printer

## iType font engine and Edge Technology

SpectraCore integrates Monotype Imaging's iType font engine, allowing SpectraCore to draw iType-supported scalable font formats, including our CATT (Compact Asian for TrueType® Technology) fonts and East Asian stroke-based fonts. SpectraCore also supports iType's Edge™ Technology, which enables the high-quality display of typographically rich East Asian text in a small memory footprint. In addition, iType adds flexibility to font effects, giving you control over attributes such as bold weight and italic angle, the ability to create effects such as "glow" and automatic hinting for maximum flexibility.

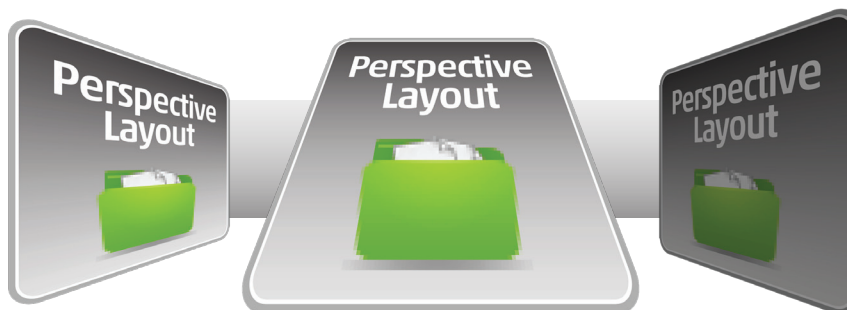
## WorldType Shaper

SpectraCore integrates Monotype Imaging's WorldType Shaper® enabling rapid and robust support for international markets more quickly. WorldType Shaper provides the ability to clearly display characters from complex scripts such as Arabic, Indic and Hebrew.



## 3D-style effects (*perspective transformations*)

SpectraWorks allows for the rotation of the layout widget, and all of its children, around the X-axis or Y-axis. In addition, depth cueing through alpha and size transformation complete the portfolio of new tools for the designer and software engineer to create leading-edge GUI experiences (e.g. coverflow, billboard, and other effects). The algorithms for all of our 3D-style effects have been designed for minimum processing load and are **suitable for small CPU devices without hardware acceleration**, making advanced GUIs available on even low-cost hardware.



Example of 3D-style effects

## SpectraWorks Visual Effects Library

These professional, pre-built modules include both design and source code that can be used to quickly and easily generate attractive UI capabilities.

### Advanced Menus

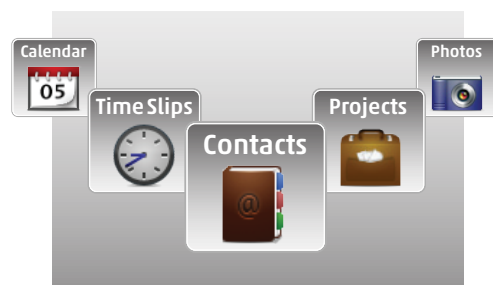
- Album covers (Flip through a series of graphical pages)
- Billboard menu (Panels that turn to show contents on reverse)
- Card stack menu (Sort through a stack of cards)
- Carousel menu (Rotating disc with icons on the edges)
- Grid menu (Icon grid)
- Wave menu (Line of growing icons)

### Transition Effects

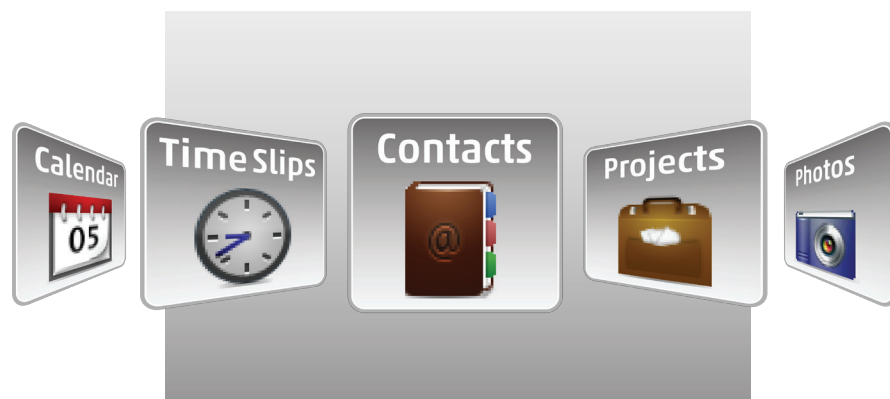
- Slide
- Turn (Edge rotate)
- Spin (Center rotate)
- Fade (Dynamic alpha blend)
- Scale (Grow and shrink)

### Other Useful Components

- Scrolling icon grid
- On-screen keyboard



Example of the carousel menu



Example of the album cover menu

### Minimum Device Requirements

- CPU: 32-bit
- RAM: Production level projects can run in as little as 16KB data space (plus off-screen frame buffer). 1MB code space required for full functionality
- ROM: Production level projects can run in as little as 70KB of data space. 256KB code space required for full functionality
- On Screen Display: 16-color/gray, 256-color/gray, 1555 ARGB, 565 RGB, 8888 ARGB, X888 RGB, and others
- Operating System: Many supported, none required

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