

Your product platform may be compact. Your market may be worldwide. What you need is an embedded multilingual text solution that scales to fit both your product and your market.



That solution is the iType font engine.  
Your partner is Monotype Imaging.

#### EMBEDDED TEXT TECHNOLOGY FOR A MULTILINGUAL WORLD

*Here's what we offer:*

##### PERFORMANCE

The iType font engine is designed to satisfy the particular demands of memory-constrained devices — whether those demands involve legibility, display quality, storage capacity, portability across devices, speed, font choice or all of these.

##### CRITICAL MASS

It takes worldwide resources to build a global selection of fonts and the technology to use them. Monotype Imaging is an international company with offices in the U.S., the U.K., Germany, China and Japan, with additional resources in Taiwan and Korea. Our professionals include specialists in a variety of disciplines, including typeface design, typographic engineering, language expertise and type production.

##### MARKET PRESENCE

We produce fonts and font technologies for consumer electronics devices, displays and printers that generate text in a variety of languages. Some of our fonts are part of standard operating systems, including the Windows<sup>®</sup> and Mac OS<sup>®</sup> platforms. We also offer a rich assortment of typeface products — more than 125,000 are available from Monotype Imaging's Fonts.com<sup>™</sup> store for creative professionals working in desktop environments.

##### COMMITMENT

Monotype Imaging is committed to developing fonts and font technologies that best meet customer needs — whether for global, regional or local distribution — now and into the future. We're also active in industry standards organizations to promote technologies that enable stylistic, scalable fonts in display environments.

# A Great Time to Look Great

When's the best time to leverage a technology advantage? When it's also a competitive advantage.

*Consider three issues that can adversely impact the display quality of embedded text: low resolution, small screens and small text size. Even when others can't address these issues, you can — with the iType font engine.*

*The result is a product that features:*

- *Easy-to-read text, even at small sizes*
- *Properly composed text in the user's language*
- *Aesthetically appealing typefaces that complement on-screen graphics*

*High-quality text completes the “fit and finish” of a professional-looking product.*

## **EAST ASIAN FONT SOLUTIONS: DELIVER STYLE. MANAGE MEMORY.**

Chinese, Japanese, Korean and other world scripts contain complex character shapes that can be difficult to display legibly, particularly at small text sizes. East Asian fonts such as Simplified Chinese, which can contain more than 28,000 characters, present the additional challenge of storing and managing large files. To address these issues, Monotype Imaging offers a suite of scalable, East Asian font solutions that allow OEMs and developers to enable stylish text while managing the font memory footprint.

### **EAST ASIAN TRUETYPE FONTS**

TrueType fonts are known for delivering the greatest aesthetics. TrueType fonts are also larger in file size than other formats. To compensate, Monotype Imaging offers Compact Asian Technology for TrueType (CATT™) fonts. CATT fonts provide the same aesthetics yet require significantly less memory compared to the same fonts available in the TrueType format. File size reduction is accomplished through a unique compositing process that allows glyphs used in multiple characters to be stored just once within the font file.

### **EAST ASIAN STROKE FONTS**

Stroke-based fonts from Monotype Imaging are an ideal solution for memory-constrained devices. With their simple, stroke-based forms, stroke fonts contain the thousands of characters required for East Asian scripts with a file size the fraction of a traditional East Asian TrueType design.

### **SMARTHINT TECHNOLOGY**

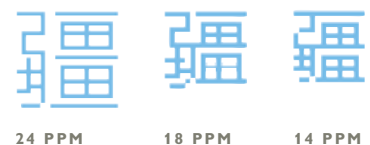
A key Monotype Imaging innovation is SmartHint™ technology, a patent-pending technique applied to East Asian stroke-based characters to ensure optimal text quality and readability on screen, regardless of text size. SmartHint technology involves a new method of character fine-tuning or “hinting,” which incorporates hand-editing techniques by typographic specialists to improve display quality, particularly at small text sizes. SmartHint technology relieves OEMs and developers from integrating embedded bitmaps to handle the smallest text sizes – a common workaround before the invention of SmartHint technology. Thanks to SmartHint technology, OEMs and developers today can implement a truly scalable solution without having to compromise.

SmartHint technology enables intelligent scaling of East Asian characters. At larger sizes, characters are more uniform and regular. At smaller sizes, correct spatial relationships are preserved. In some cases, strokes are removed from characters without changing the meaning of characters. Without SmartHint technology, spaces between strokes can disappear, making characters look blotted.

STANDARD:



SMARTHINT™  
TECHNOLOGY:



# Highlights

## HIGH-PERFORMANCE ARCHITECTURE

Optimized for both space efficiency and speed, the iType subsystem lets you tune the engine's already small footprint even smaller by selecting at build time only the resources you need.

## PORTABILITY

The iType font engine is packaged as ANSI® C source code for broad, flexible integration in a variety of devices and applications. A simple API makes integration easy.

## HINT PROCESSING

In addition to SmartHint technology, the iType font engine reads and processes hints that typographic engineers have applied manually to optimize Latin-based or other multilingual fonts for high-quality text display at various sizes.

## COMPRESSION TECHNOLOGIES

Patented font compression/decompression algorithms save significant memory for font data storage. They provide random-access capabilities allowing portions of font data to be decompressed as needed at run-time — so users receive space-saving benefits without paying performance penalties. Font compression can also be applied when downloading fonts between connected devices, reducing needed bandwidth and transmitted data size.

## EASY INTEGRATION WITH WORLDTYPE LAYOUT ENGINE

Monotype Imaging's WorldType® Layout Engine builds on top of the iType font engine and handles the often complex rules associated with text composition and layout using languages from around the world. Combined, the two represent a simple, tested solution for reducing time to market and improving the quality of embedded products requiring multiple language and text layout support.

## FONTS IN A BOX

Fonts in a Box™ technology compensates for characters that might otherwise be clipped when rendered on a small display — something that doesn't happen in desktop environments or where limitations associated with small screens don't exist. The problem occurs when diacritics such as accent marks should display on top of a character, extending its height beyond the display region for that character. The iType font engine is able to intelligently reshape characters so they appear in full and properly proportioned next to other characters.



## LINKED FONTS

The iType font engine solves the problem of how to efficiently run applications that require multiple fonts, for example, to support multiple languages in a single device. Font linking reduces the memory footprint by eliminating data redundancy when using multiple language scripts. Special characters can also be added to a linked font, and the iType software will also link bold and nonbold fonts, and automatically embolden the nonbold font to maintain a consistent appearance across all characters in the linked font set.

## DOWNLOADED FONT SUPPORT

The iType font engine offers support for application environments that enable font downloading and installation, while complying with industry specifications that call for these features. Once downloaded, font files can be validated prior to installation. Once installed, font management capabilities ensure that only licensed applications can access font data. Applications may also request a font by trait, such as 'sans serif' and 'bold,' and the font discovery feature will return a list of available fonts which satisfy the requested traits. Through the iType font engine, downloaded fonts can be linked to resident font data to extend language or glyph coverage.

## MULTILINGUAL FONT SUPPORT

Scalable fonts designed for optimal display quality and minimal storage requirements are available for specific devices. Monotype Imaging offers a host of scalable, multilingual TrueType fonts that may also be customized. Where bitmap fonts are required, a utility is available to convert scalable data to bitmaps, which have the look of scaled type.

## ESQ MOBILE FONTS

Tailored for crisp readability on small screens, ESQ® (Enhanced Screen Quality™) Mobile fonts are available to lend theme-based personality to applications, user interfaces and content.

## WORLDTYPE FONT SUITE

The WorldType font suite comprises aesthetically compatible fonts that support various world scripts. Fonts can be linked to each other, to a Latin WGL font or to an East Asian selection. This allows OEMs and developers to obtain the desired level of language coverage while using as little memory as possible. Supported scripts include Arabic, Hebrew, Thai, Bengali, Kannada, Gujarati, Malayala, Tamil and Devanagari.



## Standards leverage your investment

*A great solution does not translate into a profitable business if it must be reinvented each time it is transferred to another device. That's why the iType font engine supports key standards in the embedded space — and why Monotype Imaging works closely with leading standards organizations.*

**The iType font engine and other Monotype Imaging offerings enable compliance with key industry specifications, such as:**

- EIA-708B closed captioning requirements for digital TVs
- Japan's ARIB (Association of Radio Industries and Businesses) data encoding and transmission specification for digital broadcasting
- Character requirements of the i-mode™ Japanese Internet access platform
- MPEG-4 specification for font compression
- DVB®-GEM standard for interactive media, encompassing the MHP® tru2way™ and Blu-ray™ specifications
- Java® ME (JSR-271 Mobile Information Device Profile 3.0 and JSR-287 Scalable 2D Vector Graphics API 2.0 for Java ME), OMA Rich Media Environment™ and 3GPP™ Dynamic interactive Multimedia Scenes standards that support downloading of custom fonts in OpenType® and TrueType format.
- Java MIDP 3.0 and OMA RME™ standards for font downloading
- Compatibility with Khronos OpenVG™ hardware acceleration implementations

### LEVERAGE ADVANCED RENDERING CAPABILITIES WITH ITYPE CONNECTS PLUG-INS

Monotype Imaging's iType Connects™ plug-ins allow OEMs and developers using various platforms to easily integrate the iType font engine. OEMs can take advantage of advanced rendering capabilities with minimal impact to delivery schedules. iType Connects plug-ins enable superior display of scalable, stylistic and multilingual text with functionality not available in resident text rendering offerings. These capabilities may include:

- SmartHint technology: Monotype Imaging's patent-pending solution for enabling the clear display of East Asian text, even at small sizes
- Fonts in a Box technology: a Monotype Imaging innovation that prevents the clipping of tall characters
- Font linking capabilities: techniques that provide flexibility in managing the language support and font memory footprint of a device
- Integration with WorldType Layout Engine: Monotype Imaging's modular software library for composing, positioning and rendering multilingual text

**Various development environments support iType Connects plug-ins, including:**

- Linux® open source
- BREW® solution
- Symbian OS™
- Windows® Embedded CE
- OpenTV® Core2™ set-top box middleware



## SCALABLE FONTS SCALE YOUR BUSINESS TOO

*The way modern computer systems change the size of text is to scale it rather than store individual bitmaps of all characters at various sizes.*

One problem with bitmaps is that they consume lots of memory. Another is that they often don't display well in combination to form words. For example, character shapes can't be changed to obey language conventions or enhance readability, such as by adding accent marks or to spacing proportionately. Nor can sizes be selected for display other than those for which bitmaps have been pre-rendered and stored.

Scalable fonts store characters as data sets that define either outlines or strokes. The font engine scales the outlines or strokes and then fills them in to render the character to the specific size the application has requested. The font engine may also call out hinting instructions, which optimize characters at specific sizes to ensure crisp on-screen viewing.

But scalable type can help businesses scale too. Compared to bitmap solutions with their big memory requirements, scalable fonts make it much easier to introduce new products, new product features and new typefaces within products. Scalable fonts also make it easier to deploy advanced features — like custom-tailored user interfaces — especially in products with small memories and displays. The key is having a scaling engine optimized for that purpose and fonts able to exploit the engine's advanced features.

*Monotype Imaging's iType font engine is a scalable font rendering subsystem based on industry-standard TrueType® and OpenType® font standards. Designed to work in mobile phones, television set-top boxes, interactive TVs, console displays, portable media players, camcorders and other resource-constrained environments, the iType font engine brings the benefits of scalable type and high-quality multilingual font display to the embedded environment.*



# Specifications

## FONT ENGINE

- Small footprint
- Code size: 40-200 KB depending on compiler and features selected
- RAM size: as little as 28 KB for basic Latin fonts
- Unicode™ encodings and native encodings supported
- Internal memory manager available
- Multithread and multiprocess support
- Fast and flexible caching system
- Anti-alias output in 2-, 4-, and 8-bit image formats
- Special effects, including pseudo-emboldening, pseudo-italics, emboss, engrave, filled and unfilled outline, mirror, rotate, skew, extra softness, phased graymaps
- Licensed support for patented TrueType hinting plus SmartHint technology
- Support for OpenVG hardware acceleration
- MIDP 3.0 font management and font discovery features

## COMPATIBLE FORMATS

- TrueType and OpenType® (TrueType + OpenType® layout extensions)
- Monotype Imaging stroke fonts (Japanese, Chinese, Korean)
- Compact Asian Technology for TrueType (CATT) fonts
- Monotype Imaging linked fonts
- Support for embedded bitmaps and colored icons
- Support for embedded scalable multicolored icons
- PFR fonts to support digital TV standards

## COMPRESSION/DECOMPRESSION

- Monotype Imaging ACT™ (Asian Compression for TrueType)
- Stroke font compression/decompression (CCC)
- SmartHint compression/decompression

## ITYPE FONT ENGINE SDK CONTENTS

- iType TrueType rasterizer in ANSI-C source code
- Evaluation fonts
- Sample and demo code
- Developer user guide (PDF)
- Supplemental utility library and dynamic font-linking library

## PORT-SPECIFIC FILES AVAILABLE, INCLUDING:

- BREW/uiOne (available through Qualcomm)
- Linux
- Symbian OS
- GTK/FreeType™
- Sun® OS (32-bit and 64-bit)
- ARM7™, ARM9™, MIPS™
- iTron
- VxWorks®

## STANDARDS-READY SOFTWARE/FONT COMBINATIONS FOR:

- EIA-708B
- Teletext
- ARIB
- W3C® HTML/XML
- OpenVG4
- tru2way
- MIDP 3.0
- OMA RME®
- DVB-GEM

### Monotype Imaging Inc.

500 Unicorn Park Drive  
Woburn, MA 01801  
phone 781 970 6000  
fax 781 970 6001

### Monotype Imaging Ltd.

Unit 2, Perrywood Business Park  
Salfords, Redhill, Surrey RH1 5DZ  
England  
phone 44 (0)1737 765959  
fax 44 (0)1737 769243

### Monotype Imaging K.K.

8th floor Hikari Building  
1-43-7 Yoyogi  
Shibuya-ku, Tokyo 151-0053, Japan  
phone 81 3 5304 0920  
fax 81 3 5304 0921

### Linotype GmbH

Werner-Reimers-Straße 2-4  
61352 Bad Homburg  
Germany  
Phone: +49 (0) 6172 484-418  
Fax: +49 (0) 6172 484-429

### China Type Design Ltd.

7A Yardley Commercial Building  
3 Connaught Road West, Sheung Wan  
Hong Kong  
phone 852 2575 6789  
fax 852 2591 9232

[www.monotypeimaging.com](http://www.monotypeimaging.com)

© 2008 Monotype Imaging Inc. All rights reserved.

Monotype, the Monotype Imaging logo, iType, WorldType and ESQ are trademarks of Monotype Imaging Inc. registered in the U.S. Patent and Trademark Office and may be registered in certain jurisdictions. Fonts.com, SmartHint, Fonts in a Box, CATT, Enhanced Screen Quality, iType Connects and Asian Compression for TrueType are trademarks of Monotype Imaging Inc. and may be registered in certain jurisdictions. TrueType, Mac and Mac OS are trademarks of Apple Inc. registered in the United States and other countries. Microsoft, Windows and OpenType are either registered trademarks or trademarks of Microsoft Corp in the U.S. and/or other countries. i-mode is a registered trademark of NTT DoCoMo, Inc. Qualcomm, BREW and the BREW logo are registered trademarks and uiOne is a trademark of Qualcomm Incorporated. Symbian and all Symbian based trademarks and logos are trademarks of Symbian Software Limited. VxWorks is a registered trademark of Wind River Systems, Inc. Linux is a registered trademark of Linus Torvalds, the original author of the Linux kernel. Sun and Java are trademarks or registered trademarks of Sun Microsystems, Inc., in the United States and other countries. Khronos and OpenVG are trademarks of the Khronos Group Inc. Unicode™ is a trademark of Unicode Inc. OpenTV is a registered trademark and OpenTV Core2 is a trademark of OpenTV, Inc. FreeType is a trademark of the FreeType Project. OMA Rich Media Environment and OMA RME are worldwide trademarks or registered trademarks of Open Mobile Alliance Ltd. 3GPP is a trademark of ETSI in France and other jurisdictions. tru2way™ is a trademark of Cable Television Laboratories, Inc. DVB and MHP are registered trademarks of the DVB Project. Blu-ray is a trademark of the Blu-ray Disc Association. ARM7 and ARM9 are trademarks of ARM Limited. MIPS is a trademark of MIPS Technologies, Inc. in the U.S. and other countries. W3C® is a trademark (registered in numerous countries) of the World Wide Web Consortium; marks of W3C are registered and held by its host institutions MIT, ERCIM, and Keio. All other trademarks are the property of their respective owners.

