IPSconductor from Zoran Corporation is a feature-rich high performance driver development kit for use with color and monochrome printers and multifunction peripherals (MFPs) supporting raster, JBIG, PCL 5, PCL XL (PCL 6) and PostScript on laser, inkjet and other marking technologies. In the past, only monolithic drivers met OEM requirements for features, customization, performance and print quality. By extending the capabilities of the standard Microsoft Unidrv and PScript provided in Windows, IPSconductor provides all of the features and flexibility and eliminates the requirement for developing both monolithic and Unidrv/PScript based drivers in parallel. In addition, IPSconductor offers unparalleled user interface consistency across Windows operating systems and print language technologies.

Benefits

• Conforms to Microsoft Unidrv/PScript architecture; fully Windows-compatible and WHQL compliant; positions development for future Windows releases

• Full customization capabilities and control over user interface design and feature set

• Easy integration of OEM intellectual property: proprietary color management, halftone algorithms and screens, finishing options, document processing and other device features

• Source code availability provides independence, design flexibility and facilitates value-added customization

• Single code base for worldwide distribution localizable to all native Windows languages and locales; only one executable to distribute

Key Features

• Easily customized user interface design, portable to both Unidrv and PScript, and compliant with both Microsoft in-box and OEM UI specifications

• Full range of feature enhancements to standard Unidrv and PScript: page and device preview, watermark generation, N-up formatting, complex booklet printing, reverse ordering, manual duplex, scaling/poster printing and more

• High-fidelity color and quality, object-specific rendering and halftoning

• Integrated high-speed, assembler-optimized, JBIG compression module for raster devices

Description

IPSconductor Driver Extension Kit
Zoran's IPSconductor is specifically designed to comply with Microsoft's Printing Architecture to ensure complete compatibility with Windows operating systems. It takes full advantage of the standard spool system, I/O architecture and OS-supplied components in Windows 2000, Windows XP and Windows Server 2003. Using IPSconductor, OEMs can create drivers using Microsoft's Unidrv-based PCL 5 and PCL XL emitters and PScript-based PostScript emitter, Zoran's JBIG raster emitter, or their own proprietary formats. The DDK supports both color and monochrome output in bitonal, multi-bit, N-color or contone format for laser, inkjet and other marking technologies.

Plug-In Architecture
Zoran has built on the Unidrv and PScript architecture with an innovative plug-in model that takes full advantage of the Microsoft core components and adds powerful functionality and customization capabilities. The IPSconductor plug-ins are implemented as a small number of DLLs. Because IPSconductor leverages standard Microsoft interfaces, it is well positioned for seamless migration to future operating system releases.

User Interface Plug-In
Full customization of the driver's user interface is provided by the User Interface Plug-In. Various OEM custom designs are possible: rich graphics in the user interface such as logos, printer configuration images, page preview, etc. are standard functionality. The user interface is controlled through a combination of extended Generic Printer Description (GPD) files or PostScript Printer Description (PPD) files; more complex UI constraints are supported by easily debugged source code.

Feature Plug-Ins
Features that are not natively supported by Unidrv or PScript are implemented using advanced controls and processing options in the Feature Plug-Ins:

• Document Transformation features add functionality to application features, including zooming, watermarks, N-up, booklet and more

• An enhanced Page Preview allows the user to see at a glance what print options are active (e.g. watermarks, N-up, booklet printing, binding options and much more)

• Interactive Printer Configuration Preview graphically reflects the current hardware configuration of the printer and the selected settings and finishing options

• Manual Duplex and Reverse Print Order provide double-sided printing without a mechanical duplexing device installed in the printer
Product Brief

**Descriptions (continued)**

**Render Plug-In**
Print quality superior to standard Unidrv is achieved through the Render Plug-In DLL and innovative co-renderers. OEM proprietary color management systems and halftones can be implemented as an alternative or in addition to Windows ICM. This unique feature enables OEMs to protect and retain their intellectual property and to re-use many man-years of research in a Unidrv-based raster driver solution.

Through object recognition and object-specific rendering it can be determined whether an object is text, vector graphics or bitmap image. Then each object type can be rendered using a distinct method. Halftoning can be specific to engine, resolution and bit depth. Bit-depth conversion is performed from internal 8x8x8 RGB to device-specific bit depth and the number of engine marking colors in order to maintain highest image fidelity.

**Zoran JBIG Compression Module**
The IPSconductor raster driver uses the ITU standard JBIG compression format to efficiently encode printer data. The JBIG compression module is assembler-optimized to generate an extremely compact data stream that can be sent over any standard port. Driver code is highly optimized to provide the performance required by today's high-speed print devices and low cost color page printers. The compression module takes advantage of white-space-skip, black-plane separation and features supported by Zoran's Quatro™ family of System-on-Chip (SOC) solutions.

**Cross-Driver Consistency**
With the User Interface Plug-In, a fully customized look-and-feel can be applied to a family of drivers, including raster and multiple PDLs, in a single design and development effort. The IPSconductor DDK enables designs for Unidrv-based drivers to be reused to customize PScript drivers by reconciling the differences between the architectures.

**Ease of Development**
The IPSconductor DDK is provided as C++ language source and object code with full documentation. The highly object-oriented code base does not require proprietary development tools; the entire development environment is integrated into Microsoft Visual Studio.NET. Since interfaces are based on COM, customized extensions are forward- and backward-compatible.

**Ease of Localization**
All strings in the user interface and help system can be fully localized using Unicode into all native Windows languages and locales, including support for double-byte and right-to-left layouts. A preview utility is provided with the DDK to enable localization experts to easily match each string ID to its location and size in dialogs.

**Support for In-Box and Windows Update**
Drivers built with IPSconductor can be dynamically switched between the Microsoft standard Common Property Sheet User Interface (CPSUI), or "tree view", and the OEM-specific dialog designs. This allows a single driver development effort to meet both Microsoft and OEM UI requirements for broadest distribution with a single binary.

**Zoran Engineering Support Services**
Zoran offers Source Code Maintenance and Engineering Support Programs that can shorten development cycles and ensure that the latest operating system and print language features are available as new drivers are developed. The Source Code Maintenance Program provides extended source code maintenance and technical consulting, including informative technical bulletins and service packs and updates. Zoran's Engineering Support Program provides direct software integration assistance and design recommendations, or NRE development, to optimize the quality, feature set and performance of the collection of drivers.