ZebraLink™ Solutions for Extending and Enhancing Zebra® Printer Capabilities

A ZEBRA **BLACK&WHITE** PAPER

ZebraLink is a collection of software, firmware and connectivity solutions from Zebra Technologies to enhance and extend the performance of Zebra bar code and RFID smart label printers. ZebraLink Solutions, which are completely optional and are not required for printing, unlock the full value of Zebra printers by reducing configuration, integration, and management time; making label design and modification easy; providing real-time connectivity and control; simplifying networking; and leveraging features that improve printer performance.

This white paper provides an introduction to ZebraLink, describes its leading software, firmware and connectivity components, and how to take advantage of them to get more performance and value from Zebra printers.

Defining ZebraLink

ZebraLink is an umbrella term for a family of software applications, utilities, connectivity tools, and other resources developed specifically to extend and enhance Zebra printer capabilities. Users can pick and choose the ZebraLink Solutions they want to use; all are completely optional and are not required to run Zebra printers. ZebraLink Solutions have been developed for users and developers with different experience levels and printing environments. For example, there are solutions for customers with a single printer, and for managing hundreds of printers worldwide from a central location. Most solutions are for Zebra printers with the ZPL® printer command language, but some CPCL and EPL™ models are also supported. Many ZebraLink Solutions are available as free downloads or options.

How well a printer creates labels is an incomplete measure of its value. Ease of use, required IT support, compatibility with legacy systems, support for enterprise security standards, and other considerations have a tremendous impact on total cost of ownership (TCO) and the value the printer provides. It is impractical and cost-prohibitive to support all the potential enterprise interfaces, security and networking protocols, and other features in every printer produced. Therefore users must choose printers with the features and options that provide value for their specific printing environment.

ZebraLink provides a way to efficiently add capabilities to bar code and smart label printers as needed, without expensive custom development or premature printer replacement. It also significantly reduces the time required to set up, configure, manage, and modify printers, which minimizes support requirements. The following sections describe how ZebraLink Solutions improve performance and add value to Zebra label printing systems.

Host Integration

Thermal label printers use proprietary printer command languages (e.g., ZPL) that aren't supported by most enterprise computer systems and software applications. Information from enterprise systems on bar code and RFID labels often requires a model-specific label printer driver, middleware, or a custom interface. Such printing architectures may require specialized knowledge to maintain and may be inefficient to modify and upgrade. Several ZebraLink Solutions simplify the process of integrating printers with host systems and expressing information from databases, ERP applications, and other legacy systems on bar code and RFID labels.

XML Interface

Optional firmware for Zebra Xi™ series printers gives them the ability to process XML data streams received through a TCP/IP connection. XML-enabled Zebra printers can output bar code and RFID labels by receiving XML data streams directly from the host computer or application. The data stream is matched inside the printer to a stored label format, variable data fields are populated, and the label is printed. No additional middleware or drivers are necessary, resulting in a simple architecture that is easy to manage and expand. Zebra's Oracle-certified XML solution includes XML-enabled label formats for Oracle® WMS and Mobile Supply Chain Applications (MSCA) stored in printer memory, which eliminates the need to design label formats. For more information about XML printing and the Oracle solution, download the "Bar Code Printing Options for Zebra Printers with Oracle WMS and MSCA" white paper from the Resource Library section of www.zebra.com.

Zebra Universal Driver

Zebra's Universal Driver enables bar code, text, and graphic output on Zebra printers directly from Windows® applications. It's available as a free download for Zebra printers and includes support for ZPL, EPL, and CPCL models. Native fonts and bar codes are supported to ensure maximum throughput.

Label Design

ZebraDesigner™ and ZebraDesigner Pro make producing sophisticated labels easier than ever before. Created specifically for use with Zebra bar code printers, the ZebraDesigner software line delivers a unique level of access to the advanced features found on the printers.

ZebraDesigner, available as a free download, offers primary label design features in a wizard-driven, Windows interface. ZebraDesigner Pro, available for demo and purchase, offers additional advanced features, such as database connectivity, RFID tag encoding, and real-time clock support. Both ZebraDesigner and ZebraDesigner Pro can be used to create labels for printers with the ZPL, EPL, and CPCL command languages, including the mobile models. Label designs can be printed directly from the software, or easily downloaded and stored on Zebra printers, for later recall and printing from a host or ERP system.

All editions of the software support IP, USB, serial, and parallel printer interfaces. The software is compatible with computers running Windows 98SE, Windows NT®, Windows 2000, Windows XP, and Windows 2003. All editions are available for download at www.zebra.com.

Alternative Programming Language (APL™)

Because label formats are printer language-specific, organizations are somewhat limited in their ability to add printers from another manufacturer to upgrade or replace legacy models. Zebra's Alternative Programming Language (APL) solutions enable users of competitive bar code label printers to upgrade to Zebra models without having to redevelop label files, add new interfaces, or replace their entire printing infrastructure. APL is a firmware option that enables select Zebra printers to output label formats developed for another printer command language. It replaces the ZPL language normally included on Zebra printers, which means they cannot process label formats and print commands developed for ZPL. Different versions of APL correspond to specific competitive printer command languages. Zebra's white paper "Overcoming Printer Command Language Incompatibility" provides a complete overview of APL and its advantages.

Unicode™

Printers create text by using a codepage to convert numeric codes into characters and expressing them in a font that supports the required characters. Most codepages, including ASCII, support less than 256 characters, which

severely limits their ability to support multiple languages. Users have traditionally added new language support to bar code label printers by purchasing multiple codepages and fonts, and additional printer memory to accommodate them. These label printing systems become complex and expensive to manage as business expands into new regions because of the required font licensing, installation, and printer configuration costs. Another option is to treat international characters as graphics, which often results in extremely slow printing.

The Unicode codepage supports more than 65,000 characters and can be used to print all of the world's major languages. The ZebraLink Unicode solution includes the Unicode codepage and a supporting font for printing all major European, Middle Eastern, and African languages. The Unicode solution is free and included in the firmware of Zebra PAX™ and Xi™ series, S Series™, and Z Series® printers. Asian languages can be printed by purchasing a memory card with the required fonts.

Zebra's Unicode solution eliminates the time and money associated with continually installing fonts and codepages to support new languages. Unicode encoding and supporting fonts let the printer seamlessly output any language, with no need for an operator to select the language, font, or codepage, or otherwise configure or adjust the printer. Many leading IT systems and enterprise software applications now support Unicode. By networking a Unicode-enabled Zebra printer to these systems, organizations can print international language labels directly from their applications.

Printer Management

The time and expertise required to install and configure printers, and the effort required to keep them up and running, are leading elements of total cost of ownership. If a printer fails, the resulting cost of lost productivity, shipment delays and potential chargebacks can quickly exceed the printer purchase price. Solid printer management, monitoring and troubleshooting tools will protect the investment in label printers and improve the return it provides.

ZebraNet™ Bridge Enterprise

System administrators can use ZebraNet Bridge Enterprise to remotely manage all the organization's Zebra printers from a central location. It can be used for both stationary and mobile printers, including those on wireless networks. There are two versions: ZebraNet Bridge Enterprise, a comprehensive management system for large printer populations, and ZebraNet Bridge Enterprise, a free download with many of the same features developed for smaller printing operations. Each version includes many new configuration, troubleshooting, and administration tools, plus the most popular Zebra printer utilities. ZebraNet Bridge Enterprise can be used on Zebra printers with firmware version X.10 and higher, which makes it compatible with many legacy units and all new ZPL printer models. It also has features to support Zebra printers with the EPL and CPCL control languages.

ZebraNet Bridge Enterprise takes redundancy and labor out of configuring, managing, and modifying printers. Administrators can create groups and subgroups of printers and then set configurations, download new label formats, and change settings for entire groups at once. One-to-many management provides significant time savings compared to traditional management applications that require the administrator to set each printer individually. New firmware and fonts can be installed the same way. Administrators can receive real-time alerts and error messages from printers and perform troubleshooting using the desktop software console. All ZebraNet Bridge Enterprise features are done remotely, with no need to physically handle the printer. Remote management enables a single administrator to manage Zebra printers at multiple locations.

ZebraNet Bridge Enterprise has many other features and capabilities. For more information see the Printer Management section in the Products area of www.zebra.com and download the Zebra white paper "Realize More Value from Your Label Printing Systems with ZebraNet™ Bridge Enterprise."

ZebraNet Utilities

The functionality of two of Zebra's legacy management utilities, ZebraNet Alert and ZebraNet View, have been incorporated into ZebraNet Bridge. Alert and View remain available as part of ZebraNet Utilities. Other ZebraNet Utilities include Connect, which enables Windows-based selection of IP-addressable printers, and View Java Applet, which provides discovery features for the Java platform.

ZebraNet Alert is a utility that captures and reports unsolicited printer and print server alerts from Zebra printers located on a wired or wireless network. Downtime is minimized because system administrators receive instant notification of error messages and other problems. Printer conditions are displayed in a simple graphical user interface for easy monitoring.

ZebraNet View allows adminstrators to remotely view and configure settings for printers on the network with a wired or wireless print server. Configuring printer settings remotely results in less time required to set up printers during new deployments.

ZebraLink WebView

WebView provides a browser-based graphical interface to monitor printers across the enterprise When a Zebra printer is configured for a TCP/IP Ethernet network, the printer's embedded Web server allows a network administrator to point a Web browser to the Zebra printer's URL just as one would point to a URL on the Internet. The printer's Web server then responds by sending a Web page to the network administrator's browser, thus providing an instant record of the printer's status, configuration, settings, status conditions, and all printing parameters. Every printer parameter may be viewed through this interface and modified with easy-to-use Web components.

ZebraNet Bridge, ZebraNet Alert, ZebraNet View, and ZebraLink WebView require the printer to be connected to a network. Other ZebraLink networking and connectivity products help securely and efficiently connect Zebra printers to wired and wireless enterprise networks, host computers, and mobile devices. These are described in the next section.

Networking & Connectivity

The ZebraNet Print Server family is the flagship for ZebraLink connectivity solutions, which also include interfaces for the IBM® environment and Bluetooth® tools for communicating with mobile printers. ZebraNet Print Servers let you add label printers to wireless or Ethernet networks. Printer network connectivity is a gateway for many more ZebraLink features.

ZebraNet PrintServer II

ZebraNet PrintServer II provides 10Base-T connectivity for Zebra's tabletop and desktop printers. It is available as an internal option or as an external configuration that connects to the printer's parallel port. Neither configuration requires its own power supply.

ZebraNet 10/100 Print Server

This solution provides wired connectivity to 10Base-T, 100-BaseTX, and fast Ethernet 10/100 auto-switching networks. When used with Zebra XiIIIPlus™, PAX4™, 105SL™, Z4Mplus™, and Z6Mplus™ printers, the ZebraNet 10/100 Print Server provides enhanced ECP parallel support and faster data transmission speeds that improve printing throughput. It is available in external and internal versions that each draw their power from the printer.

Twinax

Twinax connectivity provides connectivity to IBM System 34/26/38 and AS/400® computers or associated controllers. The Zebra printer can be configured on the IBM host as either an IBM 4214, 5224, 5225 or 5256 printer.

Coax

Coax provides communication to IBM 3270 mainframe computers or associated controllers and IBM 3287 and Model 2 printer compatibility, including LU1 (SCS) and LU3 (3270 data stream) modes.

Mobile & Wireless

Select Zebra high-performance, mobile, and industrial and commercial printers, PAX print engines, and RFID printer/encoders can connect to IEEE 802.11b-standard wireless LANs. Mobile printers are also available with Bluetooth wireless connectivity to eliminate the cable to a mobile computer or other device.

ZebraNet Wireless Print Server

The ZebraNet Wireless Print server allows printers to be included in 802.11b-standard wireless networks without wireless bridges or additional power supplies. The solution is available for PAX4, XiIIIPlus, 105SL, Z4Mplus and Z6Mplus printers. The ZebraNet Wireless Print Server supports network radio cards from Cisco Systems and Symbol Technologies, offers multiple security protocol options, and performs at user-selectable speeds.

Bluetooth

Bluetooth radios are available for select Zebra mobile printers so they can communicate with handheld computers and other devices without cables. The Bluetooth radio inside Zebra's mobile printers complies with Bluetooth Specification 1.1 and supports the Serial Port Profile (SPP). All print jobs sent to the printer will be done through the SPP, which provides a Bluetooth emulation of an RS-232 serial communication.

Active X Controls

The Zebra Print Active X control aids integration between mobile printers and computers. The control is installed on a Microsoft® Pocket PC or Windows CE device and provides four options to interface with a Zebra mobile printer: serial (COM port), TCP, Bluetooth, and infrared (IrDA-standard). The control is compatible with any programming language that supports Active X, including Visual Basic and C++.

Conclusion

ZebraLink simplifies every aspect of bar code and RFID label printing, from creating label formats, to installing and configuring printers, to managing daily printing operations and performing upgrades. The software takes advantage of features and capabilities specific to Zebra printers to improve printer performance, uptime, management, and modifications to label printing operations. By extending the power of Zebra printers and improving their productivity, and reducing support requirements, ZebraLink lowers costs and enhances the value of investments in Zebra printing solutions.

Zebra Technologies Corp. (Nasdaq: ZBRA) delivers innovative and reliable on-demand printing solutions for business improvement and security applications in 100 countries around the world. More than 90 percent of Fortune 500 companies use Zebra-brand printers. A broad range of applications benefit from Zebra-brand thermal bar code, "smart" label, receipt, and card printers, resulting in enhanced security, increased productivity, improved quality, lower costs, and better customer service. The company has sold more than 4 million printers, including RFID printer/encoders and wireless mobile solutions, and also offers software, connectivity solutions and printing supplies. Information about Zebra bar code and RFID products can be found at www.zebra.com.

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