

White paper

**Smart Printers.  
Smart Investment.**

People generally relate to industrial printers as they do to their desktop printers. It's a "dumb" device that prints whatever a computer sends it. As long as it does that well and keeps working, people really don't think too much about it.

Bar code printers have generally fallen into the same "dumb" and reliable category, but are also rugged and fast at producing labels.

However, there is a different type of industrial-strength printer that's in a class by itself. It has the same characteristics as other bar code printers—rugged, fast, and reliable—but these printers are "smart." Smart printers have built-in intelligence that enables them to perform a wide variety of operations that normal printers cannot.

First, smart printers do not require a computer to be able to produce labels. The immediate benefits are you save the cost of a computer dedicated to controlling the printer and you save space by reducing the number of devices needed to perform operations. Smart printers' intelligence also allows them to actually run processes and devices. Smart printers can act as programmable logic controllers (PLC) to run other devices in production applications.

Smart printers are not new; they have been manufactured for over a decade. The latest generation delivers even more capability than before, adding advanced bar code printing capabilities, error-proofing, the ability to print directly from ERP systems via XML data, and RFID labeling and data management capabilities.

#### **Foolproof bar code printing**

First and foremost, a printer needs to produce high-quality, readable bar codes. Printers use thermal printheads to position the ink precisely to produce a readable label. Even the highest quality printheads wear out and need replacing, but the printer may run for some time with a printhead that is starting to fail.

One of the symptoms of a failing printhead is a missing dot or a single fault dot. Missing dots will produce thin "white" (absence of ink) lines along the media in the feed directions. While text and graphics can tolerate the missing dots, horizontal bar codes can become unreadable because what should be a solid black bar will lose some of its width or be divided through the middle by the white line.

A failing printhead can stop workflow or, if the problem is discovered down the line, create the need for expensive re-labeling of parts or cartons. In some cases, it will require manufacturers to pay penalties to customers for unreadable bar codes.

Smart printers have the ability to detect single fault dots and make subtle adjustments so the printer can continue to produce readable labels even as the printhead is failing. This allows the workflow to continue uninterrupted. If the printer detects it's impossible to produce a readable label, it will stop the process altogether so that poor quality labels will not be printed.

#### **Intermec Automatic Bar Code Adjustment**

Intermec smart printers feature Automatic Bar Code Adjustment, which allows the printer's Fingerprint firmware to automatically re-adjust the bar code position on the label slightly to compensate for the fault dots.

If that's not possible due to the positions of multiple fault dots, the printer will produce an error message so no unreadable labels will be produced. ABC Adjustment prevents bad labels from being produced and helps keep production lines up and running.

#### **Error-proof labeling**

Creating high-quality labels is just the first step of the process. That label then needs to be placed on the correct part or carton. Mislabeled parts can cause production line shutdowns, angry customers, and in some industries, like automotive, can cause significant penalties to be levied against a supplier.

Smart printers help here too. Instead of batch printing labels ahead of time to be applied to parts, smart printers (with or without label applicators) produce labels one-at-a-time, on-demand as the part is finished. In this case, the part-making machine communicates directly with the printer, which is programmed to know the part number that corresponds to the machine's signal. The printer produces a new label for each part, eliminating the possibility of mislabeling. Even in a manufacturing environment where parts look virtually identical, each part is correctly labeled at the point of production. In an application where parts are serialized, the printer, prior to printing the label, will confirm a serial number has not been used.

As parts are packaged together, each bar code is read to ensure they are the same part and a carton label is automatically generated at the point of application, eliminating another potential source of error.

Smart printers eliminate mislabeling caused by human error and serialized part data is stored to provide an audit trail for recalls and warranty claims.

#### **XML printing: eliminating middleware**

Smart printers simplify printing with data from ERP systems. In the past, enterprises with ERP infrastructures have had to depend on middleware to translate that data into meaningful label information. With the growing acceptance of XML as a common language by which to share data between devices, smart printers have now added XML-compatibility to their list of intelligent features.

XML-ready printers have the ability to communicate directly with ERP systems (e.g. Oracle MSCA/WMS, SAP Auto-ID Infrastructure or other compatible systems) to receive XML data and produce labels without the need for additional middleware, reducing the total cost of ownership. XML data can be used to produce bar code and RFID labels.

XML printing adds flexibility and increased interoperability for production and supply chain applications allowing systems to grow as needs dictate.

### **Investing for the future**

As companies invest more in automating processes and adding RFID capabilities to their supply chain systems, smart printers are positioned to quickly and easily add functionality to grow with them.

As enterprises have added printers and other devices to support the increase in applications, device management has become a significant issue. Tasks like adding or upgrading software or upgrading firmware has become increasingly difficult, especially in companies with remote and/or mobile workers.

Device management systems are critical in helping IT staff perform tasks like remote diagnostics, status monitoring, user support, remote firmware upgrades and remote printing notifications.

Device management provides a consistent, centralized way to manage a wide variety of devices, allowing enterprises to add new devices and upgrade existing ones to meet changing demands without the need for support staff to physically have the device. These systems reduce support costs, lower the total cost of ownership for data capture equipment and future-proof systems.

### **Smart investment**

Smart printers are a smart investment. They eliminate the need for computers dedicated to controlling them, can act as PLCs to run other devices on production lines, enable fool-proof and error-proof bar code printing, and provide investment protection with advanced features like XML printing and RFID label encoding. Smart printers lower the total cost of ownership now and provide an easy, flexible path for future applications.

### **Intermec Smart Printers**

Intermec, which invented the first on-demand thermal bar code printer in 1981, is the leader in smart printer technology. For over a decade, Intermec has been designing smart printers that are capable of executing user-defined programs, accessing information from network hosts and offering the ability to change with future demands, for additional investment protection.

All Intermec smart printers are XMLReady™ allowing them to print using data directly from XML-compatible systems and its XMLLabel™ software creates label formats that can be distributed to every printer on the network.

Intermec also offers smart printers that produce RFID labels supporting EPCglobal UHF Gen 2 and ISO standard protocols.

For more information on Intermec smart printers, visit [www.intermec.com](http://www.intermec.com).

### **Intermec SmartSystems™ Device Management**

Intermec's SmartSystems Foundation provides a single, integrated environment for hands-free deployment and management of devices located anywhere in the enterprise—on-site or remote. It works with the Intermec devices, including smart printers, mobile computers, RFID readers and bar code scanners, to allow limited IT resources to easily manage devices across the entire enterprise from one location.

### **Glossary**

#### **Automatic Bar Code (ABC) Adjustment**

An Intermec smart printer feature that allows the Fingerprint firmware to automatically re-adjust the bar code position slightly to the left or right to adjust for a detected fault dot.

#### **Fingerprint**

Intermec's highly-adaptable printer programming language that allows easy management of bar code data and seamless information exchanges with a company's host system, making it possible to customize any type of printer function.

#### **Fault Dots**

Very thin "white" lines created by a falling printhead's inability to apply ink at a specific location, which can cause labels to become unreadable.

#### **PLC**

Programmable Logic Controller, a device used to automate industrial processes, such as on/off control, timing, logic, counting and sequencing.

#### **RFID**

Radio frequency identification, a data collection technology that uses electronic tags, made up of an RFID chip attached to an antenna, for storing data. Tags may be battery-powered (active) or derive their power from the RF waves coming from the reader (passive).

#### **SmartSystems™ Foundation**

A software platform that provides a single, integrated environment for hands-free deployment and management of devices located anywhere in the enterprise.

#### **XML**

Extensible Markup Language, a mark-up language designed to describe data. XML is emerging as the standard language for communicating data between dissimilar devices.

#### **XMLLabel™**

Plug-in software from Intermec that creates label files that are stored on any XMLReady printer on the network.

#### **XML printing**

Producing bar code and RFID labels using XML data directly from ERP or other compatible systems.

#### **XMLReady™**

Intermec printers that are ready for XML printing right out of the box.



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