

## On-Demand Color RFID Label and Tag Printing



### Introduction

Companies of almost all sizes and types often find themselves in need of on-demand (one at a time) or short-runs (many at a time) of full-color customized product labels. Printers such as Primera's LX400 and LX900 Color Label Printers are used on-site to produce highly-professional, photo-quality labels for use on a wide variety of products. Although these labels can be used in applications such as shipping or box labels, they are of such high-quality that they are most often used as "prime" labels that go on the products themselves, not just the shipping containers.

A new trend in many businesses today is to add Radio Frequency Identification (RFID) solutions into their inventory, security, and transaction systems. RFID has progressed in the past decade to become a more efficient and economical solution. The basic building block of an RFID system is the RFID label or tag. (Unless otherwise noted in this white paper we'll refer to all types of RFID labels and tags simply as "RFID label.")

### RFID: Mostly a Monochrome Technology

Until now, all on-demand RFID label printers have been monochrome. Almost all used thermal transfer printing technology. This works fine for many shipping, work-in-progress and logistics applications. But previously there was not a fast and easy way to produce full-color RFID labels. The only practical solution was to purchase a color inkjet or laser printer, print whole sheets of RFID labels, and manually encode each label individually using a handheld RFID encoder after the labels were printed. This was not only inconvenient, but cross-encoding of labels with the wrong data is always a possibility using this method. So, many very real applications that required both on-demand color + RFID simply were not possible. But no longer.

## Full-Color, On-Demand RFID Printing

With the recent introduction of Primera's new RX900 Color RFID Printer, applications that require both color and RFID are now possible.

This fast, high-resolution printer can produce from one to thousands of full-color RFID labels at a time. With 4800 dpi print quality, even true photo-quality images can be printed onto a wide range of gloss, semi-gloss and matte labels made from paper, polyester and polypropylene based materials. So, not only does color open up new on-demand RFID label printing applications, but also photo-quality printing – as in printing an oversized ID badge for event management.

RX900's built-in RFID technology is sourced from industry-leader Intermec®. The encoding process is quite sophisticated yet simple to use since it is automatic. To produce a label, this sequence happens every time you request a label to be printed:

- The blank RFID label is fed forward under the built-in RFID antenna.
- The antenna reads the label's RFID inlay (chip + antenna).
- If the inlay reads "good," the label is RFID encoded with data, fed backwards, and verified. Then, one of two things happen:
  1. If the inlay verifies (i.e. the data made it to the chip properly) the label is printed in full color and presented to the operator for applying to the product.
  2. If the chip is bad, a series of red "X" symbols are printed, the label is rejected, and the next label is fed forward. This process ensures the accuracy and quality of every RFID label as it is produced.

All of this happens in less than 10 seconds per label.

To build an RFID system, four main components are necessary: RFID Inlays, RFID Label Printer/Encoder, UHF RFID Reader, and RFID Tracking Software. (There are many different RFID system solutions available for each application.)

Here are just a few of the applications that can benefit from using color + RFID on labels:

### File Folder & Data Tape Tracking

Many organizations, including hospitals, medical clinics, law offices, auto dealerships, government agencies, insurance agencies, banks and more use color-coded file folders to easily locate patient and customer information.

It is a business liability to lose confidential documents enclosed within each file folder. An RFID-encoded file folder makes it easy to locate and secure confidential files with a handheld RFID reader. Files can also be tracked with stationary RFID readers at checkpoints within the office. Some antenna systems are sophisticated enough to even triangulate within an office or warehouse to find a misplaced folder to within a foot or two.



Data tapes such as LTO or DAT used for computer system back-ups have traditionally been tracked in the same manner – by color coding and barcode. Adding RFID encoding is a more secure and efficient way to make sure that a company’s valuable back-up data tapes can be tracked and located when necessary.

### **Retail & Apparel**

Color RFID retail and apparel tags are great for streamlining supply chain logistics, locating in-store inventory, tracking in-store promotional campaigns, brand authentication and providing security sensing technology.



Why is color important in retail tags? There are two main reasons:

- Color coding for sizes. With so many different sizes available at retail, color coding is used to properly identify sizes and put them in the right place. With monochrome thermal transfer RFID printers, pre-printed tag stock must be used. Typically, a short run of tags is printed. Then, the operator must take out the colored tags being used, find the color needed for the next run, load those tags, print another short run – the process is typically repeated over and over many times each day.

With RX900, a single blank white tag stock can be loaded into the machine and colors are printed on the tag. This not only saves time and money, but also no pre-printed stocks are needed.

- Private label goods. Many manufacturers and Distribution Centers (DCs) need to private label their goods. This requires pre-printed tags which again have to be constantly swapped out of monochrome RFID printers. With RX900, the same blank white tags can be used for all customers.

Contributing to this next revolution in retail technology is the introduction of lower-cost POS RFID software and hardware. RX900 is an important component in these DC and in-store systems. The printer delivers true reliability with on-demand variable data printing for color-coding retail tags along with providing high-resolution graphic printing with up to 16.7 million colors available. Its affordable price also helps to cost-justify an in-store color RFID printer for re-tagging an item that has been returned or for some other reason is missing its RFID tag.



### **Medical & Pharmaceutical**

The medical world is taking a strong, active stance to help fight the wave of counterfeit prescription drugs. An effective solution starting to be implemented is having medicine containers be RFID tracked and embedded with serialized information to prevent the spread of counterfeit drugs.

Another use of RFID is patient identification through medical

wristbands. RFID is an effective way to verify that the correct patient is receiving the correct medication, allergy information, and proper surgery information.

## Color RFID Wristbands & Identification Badges

Along with applications such as patient identification, RFID wristbands have started to be adopted in markets such as theme parks and resorts, as a use for easy on-the-go transactions and entry access into park, pool, and hotel areas.



Bars, clubs, and festivals have started to employ this technology by using RFID wristbands for easy transactions at events. Using the full-color technology of the RX900, they will now be able to positively identify the user of the wristband by placing full-color photos of the customer directly on the wristband to help verify age and purchase.

RFID-embedded identification badges are great for printing on-demand event and trade show badges and ski passes, which can help streamline as well as verify security and access. RFID has long been used in renowned marathons all around the world using large active RFID tags, but now can be made much simpler by being embedded into marathon bibs that are printed and encoded from the same color RFID printer.

## Box Labels for Inventory & Document Storage

Tracking your supply chain can be made simple by using full-color RFID inventory and pallet labels to easily keep inventory sorted and tracked when trucks load or unload at the warehouse dock. Short and long term document storage is made easy by color-coding each box and assigning unique numbers to each. Locating the right boxes is then fast and easy. RFID tracking lets you know where your assets are at all times.



## Durable Output

Labels printed on the RX900 printer are not only glossy and highly professional looking, they're also scratch and smudge-resistant and with certain substrates virtually waterproof. Because the label material allows inks to sublimate and become sealed below the actual print surface, your printed photos, graphics, text and barcodes are protected against a wide range of environmental factors. For applications requiring longer-term exposure to water, chemicals and other elements, specialized materials such as polypropylene and polyester are available.

## Variable Data and More

Another significant advantage of digital inkjet printing and RFID encoding on RX900 is the ability to add variable data. You can print serial numbers, incrementing barcodes and serialized or database-supplied text, graphics and RFID data.

## RFID Specifications

The integrated UHF reader/encoder is supplied by RFID industry leader Intermec® and supports EPC Global Class 1 Gen 2 as well as ISO 18000 -6b and -6c. Frequencies for most major countries are available from the two primary RX900 models. Please contact Primera

sales at 1-800-797-2772 or +1-763-475-6676 for information on the frequency that is required for your country.

### **Integration Basics**

RX900 is supplied with a printer driver that supports Windows® XP/Vista®/7. It is a raster-based device that prints from virtually any existing Windows-based software. However, to encode RFID data (beyond a built-in demo mode) a specialized software program with RFID integration is required.

One of the first companies to support RX900 directly from their software is Seagull Scientific, Inc. Their product called BarTender® is an industry standard for this type of labeling. BarTender lets you include a field on your label layout that is specifically designated for RFID encoding. Data for the field can then be automatically supplied by various supported databases or fixed or variable data fields.

### **Summary**

The need for on-demand, full-color RFID label printing is growing in organizations of all types and sizes. The time to track your inventory, secure your assets and explore your market potential is now. Primera's RX900 Color RFID Printer can bring you one step closer.

(RX900 sells for US\$4995 MSRP and is available now from Primera's Authorized Resellers and Distributors in the USA and more than 160 other countries.)