

WHY BARCODE LABELS MATTER

Enhancing Efficiency,
Accuracy, and ROI Through
Smart Labeling Choices



INTRODUCTION: THE POWER OF BARCODE LABELING

A barcode label is more than just a sticker—it is a critical component of your business operations. From inventory management to customer fulfillment, the right barcode labeling system can significantly impact efficiency, accuracy, and cost savings. This whitepaper explores the essential elements of barcode labeling, providing insights on how to maximize your return on investment (ROI) through smart technology choices.

THE FUNDAMENTALS OF BARCODE LABELS

Why Barcode Labels Matter

Barcode labels streamline operations by reducing manual entry errors, improving tracking, and ensuring product traceability. Improper use of labels or running out during inopportune times can cause huge productivity and profits losses.

An effective labeling system comprises three key components:

- **Printer:** Determines print quality and durability. Selecting the correct printer comes down to your application and your need to be mobile or to use a tabletop. Options for interfaces, rewinders, peelers, cutters, and embedded fonts ensure the best configuration for your application.
- **Media (Labels & Ribbons):** Labels and ribbons are matched to your printer model to ensure the best print quality with minimal set-up. Another important area to be aware of is what method of printing is being performed—wound-in or wound-out.
- **Barcode Software:** Enables design, automation, and integration with business systems. Label design software can be as simple as manually creating static or serialized designs to fully automated print servers dynamically pulling information from a database.

Pre-Printed vs. On-Demand Printing

- **Pre-Printed Labels:** Ideal for static information, sequential numbering, or multi-color designs/graphics.
- **On-Demand Printing:** Offers flexibility for real-time data, reducing waste and enhancing customization.

Key Benefits

- Improve data accuracy to over 99% by labeling assets and inventory with barcodes and automating data collection.
- Increase efficiency (work faster and free up employees' time) by converting manual tracking tasks into electronic, real-time processes using barcode labels.
- Ensure consistent and predictable operations for enhanced product quality by combining data management functions and preventing bottlenecks at data entry stations.

CHOOSING THE RIGHT PRINTING METHOD

Direct Thermal Printing

Direct thermal printing utilizes heat-sensitive media that blackens as it passes under the printhead. They print without a ribbon.

Advantages:

- Low maintenance, cost-effective, and environmentally friendly (with recyclable materials)
- Sharp print quality with good scannability
- Ideal for applications requiring only a brief shelf life
- Simple to operate
- Direct thermal enables batch or single label printing with virtually no waste
- 100% duty cycle

Thermal Transfer Printing

Thermal transfer printed labels are easily identified by their crisp, often glossy printed surface. This clarity is achieved by using a thin ribbon roll that is heated by the printhead and melts onto the label to form the image.

Advantages:

- High durability, versatile material compatibility, and superior barcode clarity
- Crisp, high-definition text, graphic and barcode print quality for maximum readability and scannability
- Long-life image stability
- Batch or single label printing with virtually no waste
- Low long-term maintenance costs
- Print on a nearly unlimited variety of media stock (except multi-form)
- Built more durably than dot matrix or laser printers



7 KEY CONSIDERATIONS FOR WHEN TO CHOOSE THERMAL PRINTING



1. Point of Application System

“Point-of-application” means the printer is located where the label is applied. By printing labels on demand, thermal printers increase productivity. Point-of-application printing is related to distributed printing, whereby printers are placed at various points throughout a facility.



2. Graphics and Scalable Text Font Sizes

Thermal printers can cleanly print any graphic image, including logos. Text fonts are “scalable,” meaning that we can adjust them to any point size requirement.



3. Variable Data

Ideal for applications that require individual or batch labels with variable data fields that change frequently. In such cases, thermal printers promote efficient and flexible label production with virtually no label waste.



4. Varying Label Sizes

Adapt easily to a variety of label sizes. In fact, on thermal printers with wide print widths, labels of assorted sizes can be printed at once.



5. High-Definition Barcodes

Ideal where high-definition barcodes are required. Barcodes printed on direct thermal printers—including complex, 2-D barcodes—offer the highest first-time scan rates of any printing technology, reducing errors and increasing productivity.



6. Compact Printers

Thermal printers are clean, quiet, and compact. Thermal printers come in three basic varieties: tabletop, desktop, and mobile.



7. Low Operating Costs

Thermal printers have a higher initial cost, but a lower maintenance cost compared to other print technologies, resulting in a lower cost of ownership. Lower long-term maintenance costs can quickly offset the higher initial investment.

SELECTING THE BEST BARCODE PRINTER

Your type of label, unique application, and environment will drive your printer selection.

Questions to Ask:

- Implement rapid replacement and repair management processes
- Minimize RMA-related administrative burdens
- Keep pre-configured spare units ready to deploy for quick substitution
- What are the intended uses of the barcode labels?
- Where will the printers be located?
- In what kind of environment will the printers operate (temperature fluctuation, vibration, high humidity, exposure to chemicals, etc.)?
- What are the expected duty cycles for the printers?
- Are there any minimum speed requirements?
- What are the dimensions of the labels to be used?
- How frequently do label specifications change?
- What environments will the labels be exposed to (temperature fluctuation, abrasion, high humidity, exposure to chemicals, etc.)?
- Will the printers be connected to a network or to stand-alone terminals?
- What is the budget for the project?

Choosing the right barcode printer depends on:

- **Printer Durability:** Ensures the printer withstands operational wear and tear, reducing downtime and maintenance costs.
- **Print Volume:** Low, medium, or high throughput needs.
- **Print Speed:** Necessary for fast-moving production lines.
- **Label Image Durability:** Must withstand operating conditions.
- **Print Width:** Determines readability and compliance with industry standards.



CHOOSING THE RIGHT LABELING SUPPLIES

Selection of the label material depends first on whether direct thermal or thermal transfer print technology is being used. For optimum printer performance and to extend the life of the printhead, choose the right media (or the right media and ribbon combination with thermal transfer printing). Choosing the wrong media can cause poor print quality, printer malfunction, and/or frequent printhead replacement.



Selecting the correct label materials ensures print longevity and readability. Considerations include:

- **Application Surface:** Labels must adhere to different materials (e.g., plastic, metal, fabric). *Example: Standard permanent adhesives will never work to apply a label to an oily surface.*
- **Temperature & Environmental Conditions:** Labels should withstand temperature changes, moisture, and chemicals. *Example: A printed circuit board manufacturer needs to make sure the label will survive the heated production process.*
- **Readability and Compliance:** Poor barcode readability can lead to fines or shipment rejections. *Example: There are companies that will penalize (with substantial fines) suppliers for shipments that have unreadable barcodes.*
- **Ribbon Match:** Ensures compatibility between ribbon type and label material for optimal print quality and durability. *Example: A wax ribbon cannot be used with a polyester top coat label stock. The printing will rub right off.*
- **Printhead Resolution Match:** Selecting the correct printhead resolution (e.g., 203dpi, 300dpi, or 600dpi) ensures barcode clarity and scannability.

Label Varieties

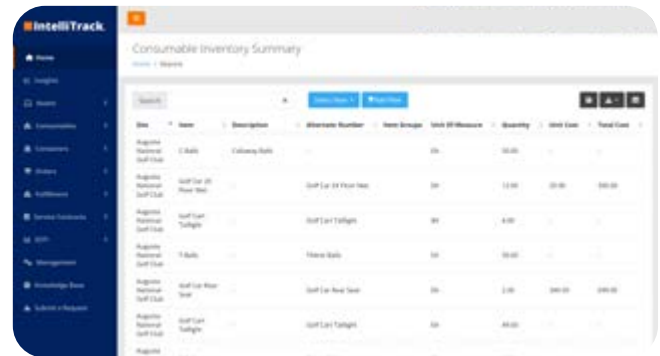
Thermal printers are designed to operate with a variety of media types, including:

- | | | |
|--------------|----------------|-----------------------------|
| ■ die-cut | ■ hole-punched | ■ ticket stock |
| ■ butt cut | ■ continuous | ■ pressure sensitive labels |
| ■ perforated | ■ receipts | |
| ■ notched | ■ tags | |

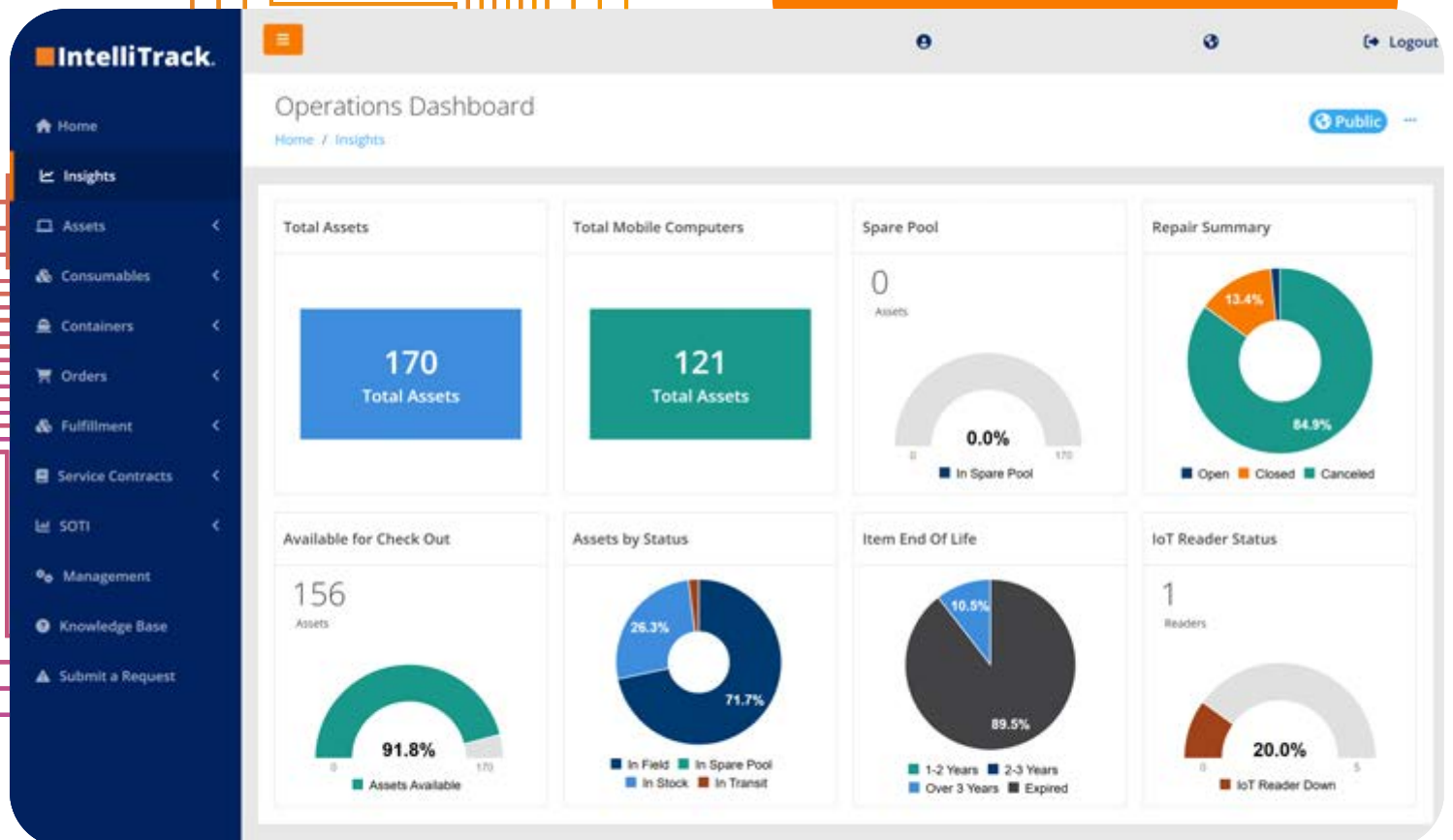
INTELLITRACK AND SUPPLIES MANAGEMENT

DecisionPoint Technologies' **IntelliTrack®** platform offers a comprehensive asset and inventory tracking solution that ensures businesses maintain optimal levels of barcode labeling supplies.

- **Real-Time Inventory Management:** Prevents stockouts of critical labeling materials such as ribbons and adhesive labels.
- **Automated Replenishment:** Reduces manual oversight and ensures supplies are ordered before they run out.
- **Multi-Location Tracking:** Enables businesses to track label supplies across different warehouses and distribution centers.
- **Integrated Reporting:** Provides detailed usage insights to help optimize supply chain operations.



By integrating IntelliTrack®, businesses can streamline their labeling processes, reduce downtime, and maintain efficiency across all operations.



CALCULATING BARCODE LABEL ROI

Implementing barcode labeling significantly reduces manual errors, enhances productivity, and improves inventory tracking, leading to cost savings and operational efficiency.

How Barcode Labeling Saves Money

- **Eliminates Manual Errors:** Reduces costly mistakes in inventory management.
- **Enhances Productivity:** Employees spend less time on data entry. Scanning labels at shipping points ensures order accuracy and fulfillment efficiency.
- **Improves Inventory and Asset Tracking:** Reduces loss and misplacement of valuable equipment.
- **Enables Real-Time Tracking:** Barcode labels enable real-time tracking of production and inventory.

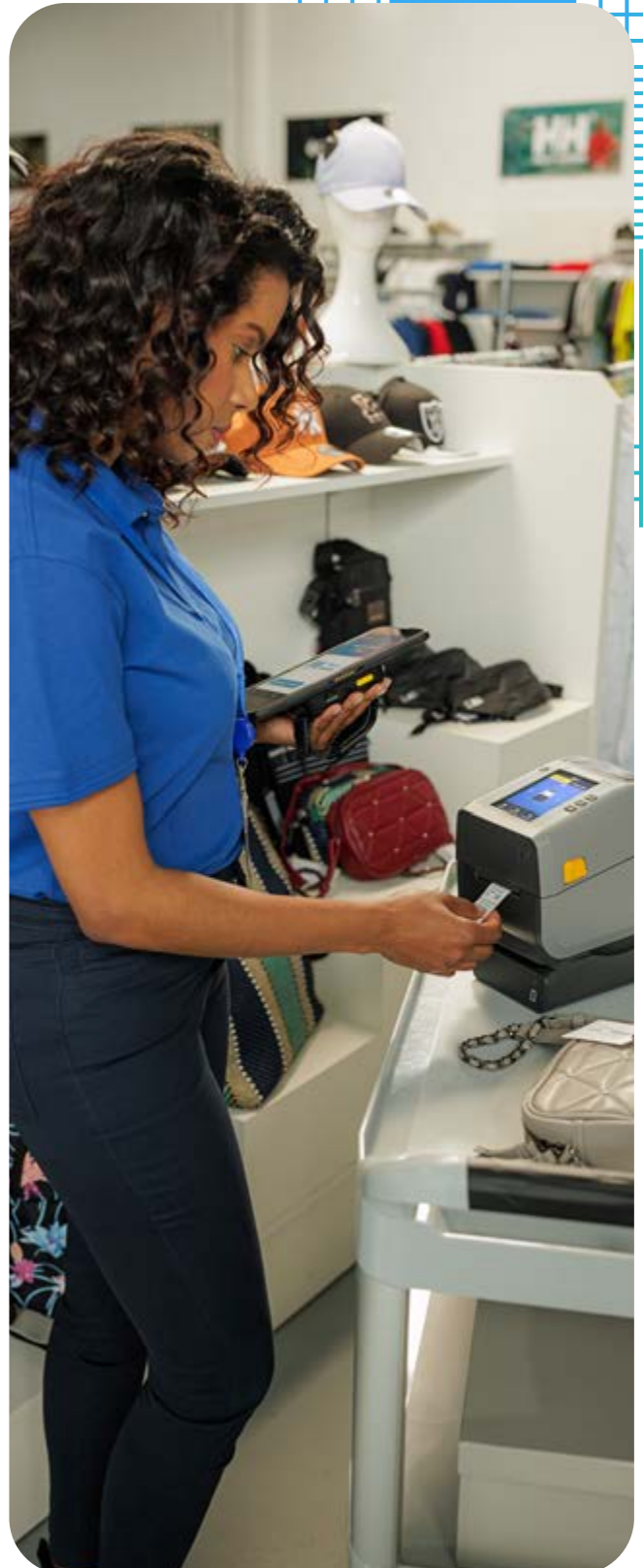
Finished Goods—A Use Case

When completing the manufacturing process, companies will affix a label to the finished product, container, or pallet.

The human-readable portion of the label is likely to describe the product characteristics, the packaged quantity, and the names of both the manufacturer and the customer, if known.

The barcode contains internal information such as production line number, date of completion, materials used, serial numbers and miscellaneous quality control information.

By scanning the label in the shipping department, the company can identify the exact inventory in real-time, as well as the precise date and time that any product leaves the warehouse.



WHAT IF THE LABELS ARE NOT RIGHT?

If you do not get your labels right and/or your labeling is sub-par or ineffective, it can have a profound effect on the overall health of your business.

Productivity and efficiency will be negatively impacted:

- Lost man hours
- Cost overruns
- Mis-shipments
- Poor delivery and customer service

Inventory will be mismanaged, resulting in:

- *Too much inventory*: and then you lose money from obsolescence, spoilage, or from carrying costs.
- *Too little inventory*: and then your sales people lose business for lack of ability to deliver on time.

CASE STUDY: ENHANCING DHL'S SHIPPING PROCESSES WITH STRATEGIC LABELING

Challenges:

- **Poor label quality and major losses:** Prior to partnering with Zebra and DPT, DHL faced excessive shipping costs and chargebacks due to unreadable labels. One center faced \$100k in chargebacks.
- **Widespread impact:** As a global logistics leader, DHL needed better labeling across multiple industries.
- **Inconsistent sourcing:** Over 400 distribution centers sourced labels inconsistently, leading to inefficiencies and excessive costs.
- **Short-term cost cutting issues:** Locations prioritized short-term savings by purchasing low-quality labels, resulting in compliance failures and rejected shipments.

Results Achieved:

- Increased efficiency in shipping operations.
- Cost savings through improved label management and printing strategies.
- Reduction in printhead replacements, with estimated savings exceeding \$400,000 annually.
- Reliable, high-quality labels improved barcode readability, reducing shipment delays, returns, and rejected deliveries.
- Set the foundation for continuous process improvement and scalability.

Solution Implemented:

- Partnered with DPT and Zebra Technologies to develop and execute a strategic labeling initiative.
- Implemented optimized labeling processes to improve speed and accuracy in shipping workflows.
- Adopted durable, high-quality labels with various material, size, and adhesive options, ensuring they withstand shipping wear-and-tear while remaining scannable.
- Empowered corporate teams to manage label purchasing, preventing distribution centers from sourcing lower-quality products that could impact shipping reliability.

MAXIMIZING BARCODE LABELING FOR BUSINESS GROWTH

To fully harness the benefits of barcode labeling, businesses must invest in the right combination of printers, labels, and software. The costs of getting the label wrong are too high to ignore. Working with an expert ensures that labels meet operational demands and compliance standards while minimizing costs and maximizing efficiency.

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