

White paper

Evaluating Label Printers to Support Transportation & Logistics Operations

Bar coded shipping labels are key to sophisticated tracking and material handling systems that make efficient transportation and distribution operations possible. Therefore the shipping label printer is a key component of these systems. Plenty of printers can produce shipping labels. The true differentiator among these printers isn't their purchase price, but the value they return by performing reliably, minimizing support time and costs, and consistently meeting label quality requirements.

The ideal shipping label printer is easy to set up, install and integrate, easy to use, easy to maintain and has a long life cycle. This white paper identifies the features that save time for users, and those that simplify integration and management for IT support staff, so the printer will return maximum value for long-term, low-cost reliable operations.

Printers Are Part of the Total Service Package

Parcel, trucking, transportation and distribution companies provide their customers with convenience and speed. If they do so reliably at a reasonable price, their customers won't have a reason to look anywhere else. Label printers can support this value proposition or undermine it. Just as with companies, customers want to use printers that are convenient, fast and reliable. If it is easy for customers to produce your shipping labels, you make it easy for them to work with you. Problems with the printer can cause customers to look elsewhere.

That is why it is important for printers to be easy to set up, use and manage. Here are some brief examples of how these attributes can affect the carrier's value proposition.

Easy to set up – Consider a customer that experiences significant variability in its orders, such as a company that does more than half of its annual business during the holiday season. These firms often take on extra staff during their peak periods to fulfill orders. With a plug-and-play printer that has flexible power and communications options, companies can quickly set up temporary packaging/labeling stations as volume scales. A printer that takes extensive network and business system integration is not a good candidate, because it requires IT support at a time the company is extremely busy.

Easy to use – When given a choice, workers tend to take the path of least resistance. This comes into play in shipping operations, where it is common to have multiple printers installed to support different transportation companies. If one company's printer is inconvenient to change media, or frequently jams, or doesn't provide clear instructions and error messages, users will bypass it whenever possible and use a competitor. The printer that supports the fastest, easiest labeling process is the printer (and provider) users will prefer.

Easy to manage – Approximately 15 to 20 percent of calls for support for shipping label printers result in a "no problem found" disposition by the support staff; 100 percent of "no problem found" issues still cost money because support staff spend time responding to the call. Further, a study found that 43 percent of people delay reporting a printer problem¹.

Help Wanted

Shipping department seeks label printer. Must be extremely reliable, professional and perform consistent, high quality work. Must be able to work independently without support from IT staff. Knowledge of specific label formats and bar code symbols required. Ability to get along with others (e.g. Ethernet, USB, Wi-Fi and other connectivity protocols, in addition to shipping and warehouse management systems) a must; support for multiple languages a plus. We offer long hours, tight deadlines and demand spikes that cause periods of high-volume operation with no breaks allowed. This is a full-time position with no scheduled vacations or unplanned downtime. Must be able to work within a fixed service budget with no annual increases. General-purpose inkjet and laser printers need not apply.

This adds to downtime, and when it comes to shipping label printers, downtime is money, since customers might choose another carrier. Printers that can be monitored remotely and managed proactively have more uptime and return more value.

Most shipping label printing problems are largely preventable, therefore so are the delays, costs and service issues that result. Proactive printer management is a foundation for preventing problems; using models that are optimized to support shipment labeling processes is another. The following sections highlight printer issues that can impact business operations, and describes the performance characteristics and optional features that are desired and required for printers to produce bar code shipping labels as reliably, conveniently and cost effectively as possible.

Installation & Integration Considerations

Printers that are the best fit for the physical and IT environment return the best value. Size, mounting options and available power sources determine a printer's ease of installation. Configuration method, network connectivity options, software compatibility and other factors are major differentiators in the time required to integrate different printer models, and for the time and cost that will be incurred to support them throughout their lifecycle. Here are some points to consider about how these specifications contribute to ease of use and total cost of ownership.

Installation

Shipping departments are often small and cluttered, so compact design is an essential requirement. The smaller the printer, the more installation options and convenience it gives customers. For example, the closer the printer can be installed to where labels are needed, the lesser the chances that labels will be applied to the wrong packages. With shipping error costs estimated at \$33 per piece, \$44 per carton and \$59 per pallet², it is important to create labeling processes that minimize the chance of errors and to insist on printers that can support these processes.

¹ICM Research report commissioned by Canon Europe. "Unnecessary printer downtime costs Europe's businesses EUR 663 billion per year." Results summarized at: http://www.canon.lu/about_us/news/solutions_business_news/1h08/unnecessary_printer_downtime.asp.
² Aberdeen Group, December 2009.

However, the value of a printer's size value goes beyond its width-depth-height measurements. Companies may find it advantageous to mount the printer on a wall or even a cart, so support for these options provides flexibility. Some shipping label printers can run from batteries and do not require a plug-in power source, which greatly increases their installation location options. Battery-powered operation is very valuable for organizations that set up temporary printing stations to meet peak shipping demand.

Connectivity support is the final major variable to a printer's installation and integration convenience. Wireless connectivity provides the most flexibility because it enables printers to be installed anywhere there is network coverage. Bluetooth support is an often overlooked and potentially valuable option because it allows printers to access data for labels from scales and other peripheral devices without a cabled connection. Since not all businesses use wireless networking, the printer should have physical interfaces (e.g. USB, RS-232, Ethernet) for connecting with needed networks and devices. The printer should also have the ability to be field upgraded with additional connections as needs change.

Integration

Integration involves more than connecting cables. Connectivity to the host computer systems and software applications the printer will work with is also required. Prior to use the printer must be configured with media, printhead, network and other settings. If required fonts, bar code symbology support and label formats are not native to the printer they may need to be downloaded and stored. How these and other integration tasks are conducted is a major differentiator among shipping label printers. For example, sometimes configuration can be accomplished using function keys and a LCD on the printer, or even by using a bar code menu to scan in desired settings. Other times, configuration is done through a separate software utility and downloaded to the printer, with the process repeated for each unit. Consider the time and level of expertise required to configure printers and update settings when comparing different models. Here are some points to consider

Backwards compatibility – if the label printer is replacing a model that was already installed, will the new product recognize the print commands and label files developed for the old printer? Features that provide backwards compatibility and easy integration include XML support, drivers and emulations.

Intelligence – some printers are programmable and have onboard memory and processing capability so they can produce shipping labels without being connected to a network or PC, even when variable information (e.g. quantity, shipment weight, customer address) is required. Intermec's [white paper](#) *A Guide to Smart Printing* provides several examples of how programmable printers enable error-proofing labeling processes.

Configuration – As mentioned, there is considerable variation in how printers are configured and adjusted. Review printer set up utilities to see what is required to adjust printhead settings, update firmware, load fonts and international character sets, upgrade memory, change label formats, add drivers and make other configuration changes. Some printers enable configurations to be downloaded from a flash drive inserted into a USB port, so no specialized IT support or computer connection are needed to configure printers once the initial settings are loaded into the flash drive.

Ease of Use Considerations

Workers will judge a printer's ease-of-use primarily on its output speed (specifically, how long they must wait after requesting a label), the effort required to change media and overall uptime. An ideal printer is reliable and fast for everyday tasks like printing labels and changing media, and makes it easy to resolve issues that come up infrequently, such as clearing error messages and performing periodic maintenance.

User Interface

The more intuitive a printer is the more convenient it is to use, which makes the user interface very important. Many printers indicate a problem via a blinking LED. Printers that can show graphic icons or have a display screen that can show both icons and a plain-language description of what specifically is wrong (e.g. "media out" or "cable disconnected") are much easier for operators to work with and save valuable time. Presenting messages and instructions in the worker's native language is even better.

Speed

Because productivity is so important for shipment labeling operations, where workers often have to rush to meet pickup deadlines, it is important to look beyond common metrics like pages-per-minute (ppm) and inches-per-second (ips) to assess printer speed. When comparing label printers, it is important to measure the time to first label (also referred to as first label out), which is measured as the elapsed time between when a user hits <print> and when the label is presented for use. Time to first label is essentially a measure of how long a worker will have to wait for materials before he or she can complete the task at hand. Another metric, total print time, should be evaluated if operations call for workers to produce multiple labels simultaneously. Some printers require a pause between each label produced to process the next print job, while others can print nearly continuously after output begins. Purpose-built thermal label printers generally excel at first label out and total print time performance because they are optimized to print labels instead documents, have native support for bar code formats and can print commonly used label formats and graphics from on-board memory without having to access the files from a PC or server. Accessories like label cutters and automatic dispensers also help reduce the total time required to request, print and apply labels.

Media

Consider not only how easy it is to load label media, but how often media will need to be replaced. Good design can save a few minutes every time media needs to be replaced by providing easy access to the media roll. Media capacity is another often overlooked specification that can reduce non value-added support time. The larger the roll the printer can accept, the less often media needs to be changed. Going a few extra days between media roll replacement will produce valuable and documentable labor time savings over the life of the printer.

Support Considerations

Many of the issues that lead to technical support involvement are avoidable, and many more could be resolved by the printer operator without calling tech support if the nature of the problem and the remedy were clear. Printers that make it easy to diagnose and correct common problems thus create value by reducing reliance on skilled tech support. Most of these issues take only a few minutes to resolve, but there are thousands of such calls made every year, resulting in hundreds of thousands of dollars worth of lost tech support time. Support-friendly printers with features to assist operators can help businesses avoid these unnecessary costs. Figure 1 highlights features that can prevent unnecessary support calls.

The best way to handle printer problems is to prevent them, which is largely possible by including label printers in a remote management system. Such systems enable support staff to monitor printer performance and output volume, and to proactively make adjustments and perform maintenance. This helps prevent failures and unscheduled downtime that can threaten shipping schedules and inconvenience printer users and support staff alike. Remote support requires a printer capable of bi-directional communication. The type of information that can be exchanged and support that can be performed depend on the printer and the management solution. Some of the available capabilities include receiving out of media alerts and other warnings from the printer, the ability to remotely test printheads, add new fonts or bar code symbologies, perform printer calibration, or adjust settings such as printhead temperature, resolution, print speed or label format.

Conclusion

Thermal label printers should last a long time and produce millions of shipping labels. Over this duty cycle, seemingly small differences in printer characteristics and performance will have a material effect on productivity and the total cost of printing operations. To find the most convenient and cost effective printer it is important to look beyond basic performance. The specifications for many printers are similar – 4 inches per second print speed, 203 dpi resolution and support for widely used bar code formats are all common and do not provide comparative advantages. What sets printers apart and determines their relative value are the features that make printers easy to install, integrate use and support.

About Intermec Desktop Printers

The PC43d/PC43t Desktop printers from Intermec were specifically developed to make it convenient for companies to install a dedicated printer to support shipping operations. The feature set makes the printers very easy to use and minimizes the need for support, while maintaining flexibility to scale as needs change. The printers are very easy to use because operators can simply follow icons or get text instructions on the LCD screen in one of 10 native languages to be guided through the processes of producing shipping labels, changing media and performing simple maintenance. The PC43d/PC43t is capable of 8 inches per second print speed and the fastest time to first label. Onboard intelligence enables standalone operations, and the printers can also connect to other systems through Ethernet, CCX-compliant 802.11 b/g/n, Bluetooth, USB, serial and parallel interfaces. These connectivity options can be added at any time, so users do not have to pay for options they don't need but retain flexibility for future integration. The printers support common printer control languages, XML and RFID to provide compatibility with label formats and software applications that businesses already have in place. The PC43d/PC43t is so easy to use it can operate independently of a PC, a valuable feature when space and/or budget is tight.

Figure 1: Printer Features That Can Mitigate Common Support Issues

Problem	Mitigating Printer Features
Cable disconnected	Icon to indicate good connection; icon error message only or LCD screen to display disconnected cable icon and an text error message
Media out	Media out error message icon only or LCD screen to display media out icon and text error message; alert issued to IT asset management system when media supply is out; LCD instructions for how to change media
Media jammed	Icon error message only, or LCD screen to display error message and instructions on how to clear the jam
Cover not latched	Icon or error message on LCD screen to indicate cover is open
Light or uneven printing	Printhead odometer so support team can monitor when printhead needs to be cleaned and eventually replaced

Compatibility with the existing infrastructure, plus their small size, durable construction and remote configuration capability, simplify integration so companies can quickly install PC23d and PC43d/PC43t Desktop printers without disrupting the systems and processes that are already in place. Use them to enhance operations or replace other printers and take advantage of the fast printing, flexible media support, and native 1D and 2D bar code capabilities to add convenience and control to shipment labeling.

About Intermec

Intermec invented the first on-demand bar code label printer in 1971. Today Intermec label, ticket and tag printers cover every type of application, from economical low-volume needs to rugged, industrial-strength printers and applicators. Recognized for quality, durability and reliability, Intermec printers offer a wide range of features including multiple protocol support, programmability, Internet printing and management, wireless, internal Ethernet support, RFID, and liner-less technology.

Our connectivity support and software resources make it easy to set up and use Intermec printers right out of the box in manufacturing, warehouse, retail, healthcare, office and other environments. To learn more about the complete Intermec printer product line, complementary software and accessories, and to review case studies and white papers about successful printing programs visit http://www.intermec.com/products/printers_media/index.aspx.

Intermec Inc. (NYSE:IN) develops and integrates products, services and technologies that identify, track and manage supply chain assets and information. Core technologies include rugged mobile computing and data collection systems, bar code printers, label media, and RFID. The company's products and services are used by customers in many industries worldwide to improve the productivity, quality and responsiveness of business operations. For more information about Intermec, visit <http://www.intermec.com> or call 800-347-2636.



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