Printing Technology White Paper

Adopting PCL as a Thermal Printing Standard Command Language

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Introduction

Historically, manufacturer's proprietary language was required to communicate with thermal printers. Unlike other types of printers commonly used in the work place, thermal printers do not use a standard programming language for communications and control.

Problem Overview

The lack of a standard programming language has created problems for both product users and technology adopters such as system integrators.

The first issue is proprietorship where the end user has to deal with command compatibility and single manufacturer sourcing. When printers that are integrated with a proprietary language, there is only one source for continued support and supply. Thus users may be subjected to down time or transitional support issues.

The second issue is the lack of integration or adoption of thermal technology. Thermal printing technology is extremely cost efficient and reliable for on-demand, fast label printing. However, businesses tend to go with other types of printing methods, because they are easily implemented. Technology staff limitations may prevent the learning of a proprietary language, since it is perceived that there are better resources available for more broadly based printing standards.

Solution Barriers

There are several barriers to the standardization of a thermal printer language. First there is the "barcode printer paradigm" where all thermal printers are thought to be barcode printers. The thermal printing industry continues to struggle to promote the adoption of thermal printers in non-barcoding applications.

Second, thermal printing command language standards have not been considered necessary. Unlike RFID (radio frequency identification), which quickly gained acceptance and adopted international standards, thermal printing has received little attention. Creating a new standard is not an easy task and usually requires the support of manufacturers and industry standards organization leadership.

The Solution

Since the auto identification and data collection (AIDC) industry is not planning to develop a command language standard, and major manufacturers are not going to support development without an incentive to do so, it is unlikely that a thermal printer command language standard will happen.

Luckily, there is no need to develop a whole new standard. Instead, the thermal printing industry can adopt an established printing standard, Printer Control Language or PCL. PCL was developed by Hewlett-Packard to control printer features across many different printing devices. It is the most commonly used industry standard printer command language. Almost any computer system is able to communicate with a PCL printer, making it the ideal command language to be adopted into the thermal printing industry.

Not only does PCL offer a widely used standard, but it also offers an extension of commands for additional features that are not found in thermal printers. This opens the way for the thermal

printing industry to develop new and exciting applications. Additionally, PCL will allow thermal printing to be easily integrated and utilized in fast, reliable, and efficient label printing.

Solution Implementation

The first step in solution implementation is to develop a thermal printer that completely utilizes PCL. Any partial adaptation would only hinder integration. A true PCL thermal printer would also successfully handle commands that not needed for thermal printing.

Application Adaptation

Thermal printers do not use the same features of laser printers. In turn, thermal printers must develop exception handling capabilities that enable a printer's operating system to ignore commands that are not within its capabilities such as color printing, page sorting, stapling, page size, and tray selection.

A common example is page size. Laser printers are capable of printing 8 ½″ x 11″ pages and thermal printers usually do not print that wide. A PCL thermal printer must be adapted to only print at sizes at which it is capable. It may also be necessary to take the information being printed on a laser printer, and reduce or divide it to fit on a thermal printer page.

Benefits

Thermal printers are:

- Reliable – Simple mechanical design and the efficient use of printing energy make thermal printers better performers. Thermal printers image at the exact point and time that printing occurs. Unlike other printing technologies that have moving ink carriages or heated drums to transfer the image, thermal printers print directly on the paper as it passes through the mechanism.

- Compact – Thermal printers are available in small sizes, are mobile, and take up very little counter space.

- Time Savers – The time it takes for thermal printers to start printing – known as first label out – depends on communications and the printer's processing capability. Unlike other printing technologies, there is no warm up time or ink level checks to take place before printing begins.

- Affordable – The cost of ownership for thermal technology is relatively simple to determine because there is one wear component, the printhead, and media cost for labels, tags, and ribbons are predictable.

  Labels and tags for thermal printing come on rolls and not on expensive sheets. In this way, cost and waste are reduced since each label or tag is printed as needed, and not on a sheet of labels where only a few are used and the rest are thrown away.

Cognitive's PCL Printing Solution

Cognitive's printers offers true PCL 5 printing. Our printers are not preprogrammed to accept specific label formats. Instead, Cognitive printers are ready to receive PCL commands, thus opening the door for development around an adopted printer language.

Cognitive's PCL printing solution is available on the C Series printer line (Cxi, Ci, and CRx).

Conclusion

- Cognitive's true PCL solution supports development utilizing a standardized printer command language, and overcomes the barriers that prohibit most thermal printers from being integrated.

- The application adaptation of thermal printing technology for label printing is more efficient, portable, and reliable, making it the right technology for the job.

- The end user benefits from adopting thermal printing technology because operating and ownership costs are drastically less than other printing technologies.