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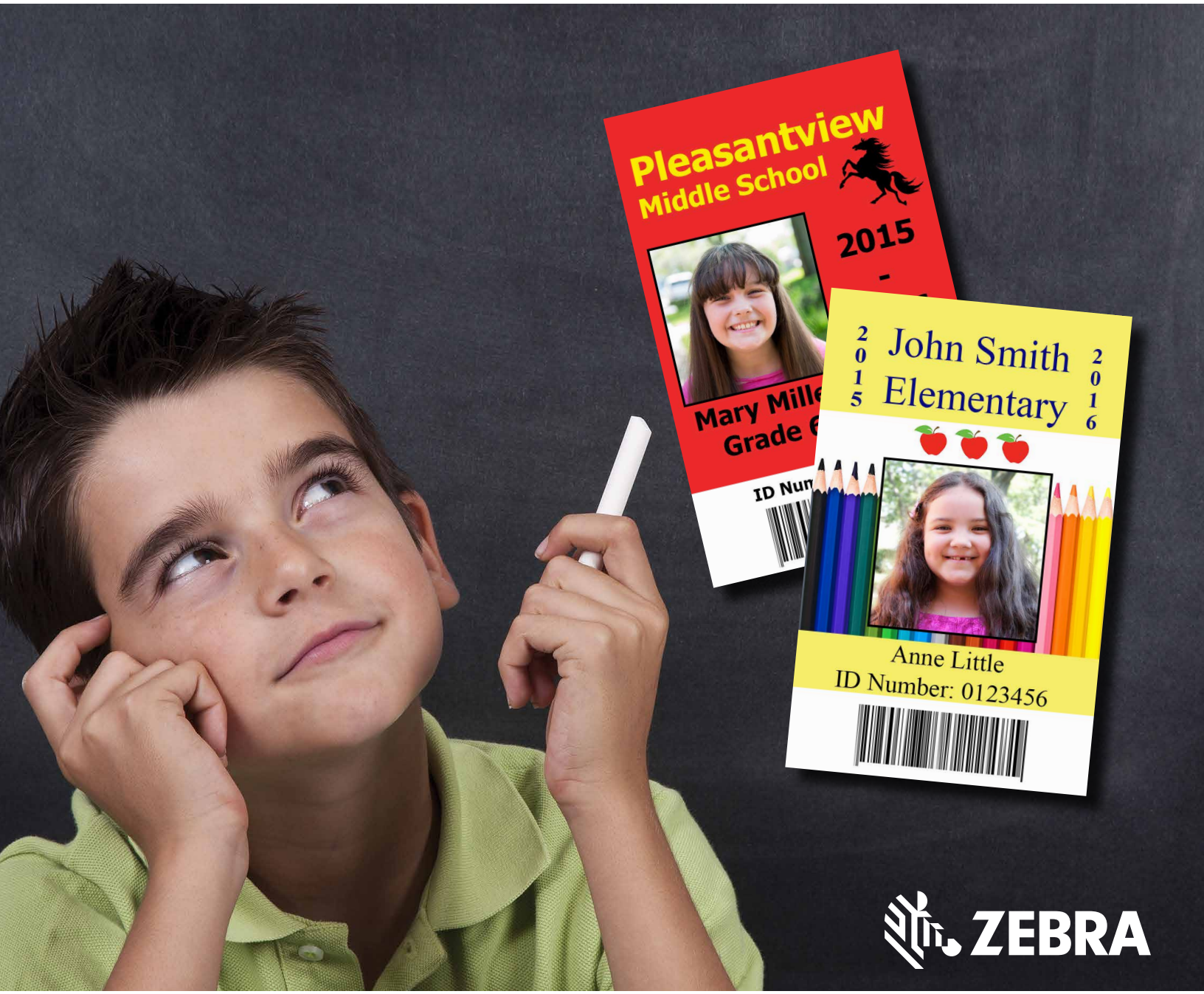
IT Professional's Guide to ID Card Printers and Solutions



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In private K-12 education, building a highly secure, connected, and efficient campus is critical to attracting students and delivering the educational outcomes and quality that make a private education such a valuable investment. Thankfully, new technologies, such as ID card solutions, have been revolutionizing private schools and making these tasks much easier. The latest ID card technologies have helped many campuses eliminate security risks, reduce paperwork, increase faculty and staff productivity, and deliver outstanding services that meet the demands of today's students, teachers, and parents.

But, as always, the challenge for any private school is to deploy and maintain the right technologies and solutions to enable these benefits while keeping costs and budget expenditures to a minimum. With rapid changes and innovation in technology, it can be difficult to keep up with the latest developments and identify the best choices for your school.

That is why our experts at American Barcode and RFI have prepared this guide to ID card solutions for IT professionals. New ID card technologies are playing a fundamental role in making private schools safer, smarter, and more efficient, and, to help you understand the potential applications of these solutions and the benefits for your school, we offer an overview and introduction to the some of the latest ID card printers and solutions

ID Cards Overview

ID card solutions have been playing a pivotal role in meeting the goals of top private schools in K-12 education, particularly in improving campus and asset security, delivering smarter and more seamless student services, and managing attendance, registration, and more. Many schools have established or are expanding ID card usage and integration, while others have upgraded or replaced existing solutions that are no longer making the grade in meeting growing campus needs.

ID Card Usage

One of the key benefits of the latest ID card solutions is that a single card can cover a full range of potential uses. With smart-encoded cards and easy-to-use software applications, any card can serve as a multi-purpose resource for identifying members of the campus community and authorized visitors, providing access, services, and information, and for tracking card usage and transactions.

ID Card Strategies for Private Schools

For more details about potential ID card applications and how you can integrate or expand ID card technologies to build a safer, smarter, and more efficient campus community, please download our free guide, ***"ID Card Strategies for Private Schools."***

Types of Identity Cards

Various types of identity cards can be produced with ID card printers, including standard magnetic stripe cards or smart ID cards with embedded and encoded chips.

- **Student ID Cards**
- **Faculty and Staff IDs**
- **Multi-purpose and Smart-encoded Cards**
- **Visitor Badges**
- **Wristbands**

Potential Applications of ID Cards

- **Access Controls and Security**
- **Student Attendance and Staff Time Tracking**
- **Electronic Checkouts and Reservations**
- **Cashless Payments and Transactions**
- **Visitor Management**
- **Emergency Planning**
- **Location Tracking and Monitoring**
- **Self-service Student Kiosks**
- **Student Registration**
- **Documenting Allergies and Special Requirements**
- **Emergency Contacts**
- **Off-campus Trips and Activities**
- **Integration with Wireless Campus**

Evaluating ID Cards and Printers

Before you invest in an ID card system or upgrading your current solutions, make sure you have identified your specific security and identification needs. Based on these factors, you can choose the right card printer and ID card technology for your applications. Here are a few key considerations when evaluating your needs and the potential solutions to meet them:

Key Considerations for ID Cards

- **The needs of your school and campus community**
- **Type of card you plan to use (e.g. magnetic stripe vs. smart cards)**
- **How many cards you plan and need to produce**
- **How often you need to print cards**
- **Printed elements that you need on your card**
- **Desired quality of your card images**
- **Type of encoding required on the card (e.g. smart chips or RFID chips)**

Five Major Factors in Choosing Card Printers

1. Card size

Standard vs. non-standard size and thickness. The standard CR-80 card, used for plastic cards in wallets and purses, measures 3.375” x 2.125” and has a standard thickness of 0.75 mm, though this can range from 0.25 mm to 1.5 mm.

2. Printing speeds

Card printers feature a variety of printing speeds depending on whether you need to print on both sides or just one side of the card. In general, as is the case with inkjet or laser printers for computers, faster printers are more expensive. The needs of your printer speed will also be determined by your application, such as on-premise or on-demand printing, mass duplication, or one-off jobs.

3. Physical characteristics

If you have workspace limitations, then a printer with a smaller space requirements will be ideal. If the printer must operate in a space where other work is being performed, then you may also want to purchase a printer that is relatively quiet. Space and noise factors can be particularly important in smaller school offices or in locations such as school libraries or classrooms.

4. Ease of use

To meet the needs of a wide range of potential users, including faculty and staff with varying levels of experience or comfort with printing devices, a card printer should be easy to use right out of the box.

5. Type of printing you want

There are a number of types of printing that you may need or prefer, although some offer distinct advantages or drawbacks. We will cover print types below, but the varieties are thermal, dye sublimation, mass transfer printing, direct-to-card (DTC), and retransfer printing.

Choosing Your Type of Printing

Thermal Printing

Just like other computer-based printers in your school, current photo ID printers are all digital. Most photo IDs are printed by digital thermal transfer, a process by which color is transferred from a single-use ribbon to various kinds of receptor materials. With 300 dots per inch (dpi) or higher resolution, thermal printers can produce reasonably good quality ID cards at a minimal cost.

Dye Sublimation Printing

To achieve true photo-quality printing with bright colors and no jagged edges, dye sublimation offers a great solution given the variable size and density of each color dot during this printing process. Dyes penetrate the receptor, color migrates from the dye ribbon onto the surface, and the spread of the dye depends on the amount of heat applied by the printhead. Yellow, magenta, and cyan colors are combined in varying proportions to print photo-quality images. For infrared readable bar codes and other data, a black resign is used instead. The number of images and the output per ribbon varies based on the type of ribbon, the number of panels on the ribbon, and the manufacturer.

Mass Transfer Printing

With mass transfer printing, the printer cannot control the ink dot's size or its density. The dot is simply printed or not printed, which is not a good choice for continuous tone images such as photo-quality images for IDs. To create the illusion of continuous tone from discrete ink dots, mass transfer printers use a process called dithering, which is the same behind-the-scenes operation that your computer performs when it sends a picture to an office laser printer. A mass transfer ribbon uses a layer of monochrome resin on a thin backing film. The resin is usually black, so this type of printing is also called "black resin printing." When heated, the resin is stripped from the backing and deposited as a physical layer on the receptor. Mass transfer delivers sharp text and graphics plus infrared readable bar codes. Its photo reproduction is quality is not ideal, but it is adequate for many applications that call for high printing speed and low costs.

Direct-to-Card (DTC) Print Technology

With direct-to-card or DTC technology, card printers use dye sublimation or thermal transfer methods to render a digitized image directly onto the flat surface of a plastic card. The number of affordable, durable card materials that accept dyes limits the types of cards that can be used for DTC printing and also limits the intensity of colors that DTC can reproduce. The DTC process depends on uniform, intimate contact between the printhead, dye ribbon, and card surface. Therefore, uneven card surfaces cannot achieve high color density and uniformity when dye is transferred directly to the card.

Retransfer Print Technology

Retransfer printing uses a process called reverse thermal transfer. Unlike traditional dye sublimation card printers—which use a printhead to transfer the image through a dye ribbon directly onto the card surface—retransfer printers use a two-step process:

1. Prints a high-resolution image in reverse, directly onto a clear receiving layer carried by a flexible, intermediate film. The dye sublimation process prints the image to the film, just like it does in DTC printing.
2. Uses heat and pressure to thermally transfer the image and the entire image-receiving intermediate film onto the card surface. During this process, the layer thermally bonds to the card surface, and the printed image resides underneath the clear image-receiving layer.

Benefits of Retransfer Printing:

- **Superior image quality**
- **Prints on more types of cards**
- **Tamper-resistant for improved security**
- **Lower printhead costs**
- **High throughput for efficient printing**
- **Simultaneous dual-sided printing**

How to Maximize Card Security

When you want to be sure that your school ID cards are truly secure, it is best to combine media features, printer capabilities, database verification, and special security features. Media features include surface quality, durability, and built-in security elements such as tamper-proof retransfer printing. Printer capabilities are the key to producing high-resolution graphics, photo quality images, and reliable bar codes, plus covert features that are created when the cards are printed. Database verification consist of a central archive of cardholder data, including photos, personal statistics, ID numbers, and the dates, times, and places of card issue.

Start with High-quality Cards

To enhance security, your cards should be physically tough and durable and also difficult to counterfeit. The right card media and multiple card security features can deliver both qualities. Proper card stock can offer much greater flex life, resist cracking, ensure permanent adhesion of laminate, and protect the ID card image. Higher capability card printers can also deliver stronger lamination, with or without holograms, for extra durability and security. Some printers can also laminate one side of the card or both sides at once.

Use Modern Print Features that are Hard to Copy

To prevent counterfeiting, alteration, or duplication, many techniques can be used with digital card printers. Multiple security images or holograms can be used, a photo can be screened multiple times for increased integrity, similar to a driver's license, and unique graphic identifiers can also be applied during printing. You can also purchase card stock with pre-printed security features, including ultraviolet-visible text and graphics that are available in two colors. And, with micro-printing, text can be added, including random font changes or deliberate misspellings if desired. Pre-printed serial numbers can also be incorporated into card stock, and laser etching patterns are another option to prevent counterfeiting.

Log Critical Information and Serialize Cards

Logging and tracking a cardholder's personal data and information, along with other point-of-issue data, can be a key to help security officers validate the card by comparing a photo ID card with a central database. Cards can be supplied with pre-printed serial numbers printed on the front or back. Printers with magnetic stripe encoding, proximity encoding, or smart card contact options can be set up to function only with serial numbered card stock. The use of non-numbered cards will be automatically detected and rejected. Serial numbers can be added to the identity log and database for future verification.

...cards should be physically tough and durable and also difficult to counterfeit.

These serial numbers can also be recorded on the card's credential medium, such as the magnetic stripe, proximity chip, or smart card integrated circuit (IC). This means that the serial number can be checked against a central database at the time of scanning. This instant check makes it easy for security officers or administrators to verify identity and the legitimacy of the card itself.

Recommended Printers and Solutions

Zebra Card Printers

Top quality card printers offer intuitive user interfaces and color touch points, making them easy to use and reducing the amount of user training required. With the right supplier and manufacturer, you can choose from a broad range of printers that offer full-color and monochrome card printing. Options from leading suppliers will typically include USB, wireless, or Ethernet connectivity; smart card, magnetic stripe and ultra-high frequency (UHF) RFID encoding; and lamination, card stock, and special features for higher security and card durability.

...Zebra card printers produce more than 1.5 million cards during every business and school day.

We typically recommend card printers from Zebra Technologies, a global leader in card printing, RFID tracking technologies, and wireless networking. In more than 90 countries, Zebra card printers produce more than 1.5 million cards during every business and school day. And the company has extensive experience in serving K-12 schools and higher education in both public and private settings.

Most Zebra printers print directly to plastic cards using dye sublimation and/or thermal transfer technology. These printing methods offer edge-to-edge, high-quality card printing for a wide variety of uses. You can select from models that are ideal for higher or lower volume printing, with multiple security and encoding options to meet your specific needs. For some applications, we also recommend Zebra retransfer card printers, which are ideal when you need very high image quality or cards that are extremely durable and resistant to abrasion.

Quality Supplies

Genuine supplies from a manufacturer such as Zebra will always ensure that your printers produce outstanding images, text, and bar codes—no matter how many cards that you produce. Our recommended Zebra solutions generate high-quality plastic cards that enhance the print quality and image sharpness needed for vivid colors and detailed, readable barcodes. We also guarantee that the pure PVC and composite PVC cards of our recommended printers are dust-free with smooth edges.

All Zebra printing supplies meet stringent quality standards and are recommended for optimal printing quality and proper printer performance. To ensure these benefits, Zebra printers are designed to work only with genuine Zebra ribbons with properly secure and professional laminates and retransfer film.

Printer Ribbons

Our recommended Zebra card printers feature printer ribbons that produce high-quality IDs and extend the life of your printer and cards. Additional benefits include vibrant colors, “true-to-life” flesh tones, and sharp barcodes and text. And these printers deploy patented print ribbon technology to minimize printhead build-up and increase the durability of cards.

Print Cartridges

One of the advantages of Zebra card printers is that their Load-n-Go™ ribbons let you know when it is time for replacement, so your downtime is minimized. The Load-N-Go™ ribbon cartridge has intelligent media technology for automatic ribbon detection and configuration, optimized imaging, and a low ribbon warning. Its open cartridge and eco-friendly design makes it easy to identify, repair, and remove the ribbon, and it contains less plastic and special additives, which improves biodegradability and reduces environmental impact.

Card Printing Software

Of course, the benefits of a card printer are potentially lost if it is not easy for your faculty or staff to use it and create and print cards. Thankfully, when schools use our recommended Zebra printers, they also get access to ***Zebra's CardStudio™,*** which makes designing and printing professional-looking cards easy. This print job management and network printing tool simplifies card design and printing, and it makes it easy for IT staff to integrate card printing through distributed printer deployments.

Also, ***Zebra's Virtual PrintWare™*** is designed to make it easy to issue cards from your own applications. The template-based printing capability allows for quick third-party application integration of card-printing and card-production. With Virtual PrintWare, you can print to one or more networked card printers, and you can remotely monitor printer health and status. To increase print capacity and throughput, you can also use the software to pool and manage multiple printers as if they were a single unit.

More About Zebra ID Card Printers

To learn more about Zebra Technologies and its ID card printing solutions, you can access free product specifications and details by visiting our website and downloading our ***Zebra Card Printers*** overview.

How to Get Started: Free Consultation

At AB&R (American Barcode and RFID), we've been serving schools and businesses for 35 years, delivering the latest technology solutions and insights to meet ever-growing needs for greater security, efficiency, and cost-effectiveness. In partnership with Zebra, a world leader in card printing, RFID tracking, and wireless networking solutions, we would like to offer you free expert consultation to help you assess your school's needs and evaluate your best options in ID card printing. We would love to help you make your campus community safer, smarter, and more efficient.

Contact us today to schedule a call or set up an appointment at your earliest convenience.

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