



The ultimate guide to

CHOOSING THE RIGHT PRINTING MODULE FOR KIOSKS

Introduction

Self-service kiosks have become an integral part of modern customer interactions, offering convenience and efficiency across various industries, including **ticketing, parking, vending, gaming, and retail**. A crucial yet often overlooked component of these kiosks is the thermal printing module, responsible for generating receipts, tickets, and labels. Selecting the right thermal printer is essential to **ensuring seamless operation, reduced maintenance, and a superior user experience**.

However, **kiosk manufacturers face multiple challenges** when integrating a thermal printer into their systems. **Space constraints, durability in harsh environments, vandal protection, and long-term cost efficiency** must all be considered when choosing the right printing solution. Additionally, factors like **print speed, paper roll capacity, ease of integration, and ticket management** significantly impact a kiosk's overall performance and operational costs.

Why this guide?

This guide is designed to **help mechanical engineers, project managers, and purchasing managers navigate the decision-making process** with an objective approach. By understanding key selection criteria, common frustrations, and available technologies, kiosk manufacturers can optimize their thermal printing solutions for **maximum reliability, reduced maintenance, and lower total cost of ownership (TCO)**.

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"The **ticketing kiosks market** was valued at approximately USD 1.57 billion in 2023 and is **expected to reach USD 2.86 billion by 2032**, with a **CAGR of about 6.9%** during the forecast period."

Source: Business Research Insights, 2023

Understanding thermal printing technology

How thermal printing works

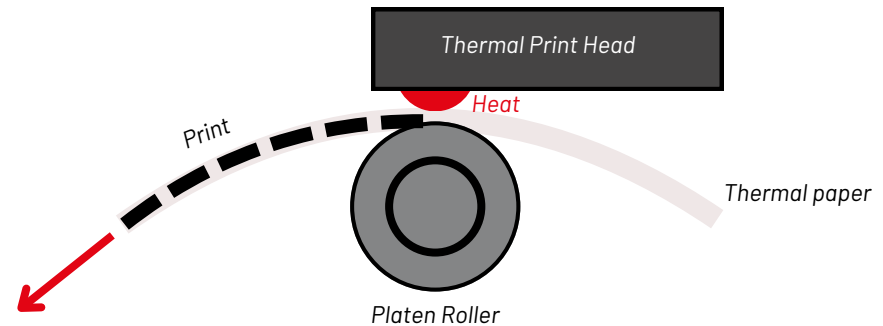
Thermal printers create images by applying heat to specially coated thermal paper, which reacts to produce text or graphics. There are two primary types:

1. Direct Thermal Printing

- Mechanism: applies heat directly to heat-sensitive paper, darkening it where heated.
- Consumables: no ink or ribbon required, reducing consumable costs.
- Applications: ideal for tickets, receipts, and labels.
- Considerations: prints may fade over time, especially when exposed to heat or light.

2. Thermal Transfer Printing

- Mechanism: uses heat to transfer ink from a ribbon onto various media.
- Durability: produces long-lasting, resilient prints.
- Applications: suitable for high-durability labels and barcodes.
- Considerations: requires ribbon replacement, leading to higher consumable and maintenance costs. Usually not used for kiosk applications.



Advantages of direct thermal printing for kiosks

- ✓ **High-Speed Printing:** Capable of speeds up to 300 mm/s, facilitating quick transactions.
- ✓ **Low Maintenance:** Fewer moving parts and no ink systems reduce maintenance needs.
- ✓ **Compact and Quiet:** Ideal for environments where space and noise are concerns.
- ✓ **Reliability:** Performs well in various conditions, including extreme temperatures and dusty settings.

6 Key factors to consider when selecting a printing module for kiosk applications

Choosing the right thermal printing module for a kiosk is not just about print quality— it's about **ensuring long-term reliability, efficiency, and ease of integration**. Below are the critical factors to evaluate when selecting a thermal printer for your kiosk application.





1. Integration & space constraints

Thermal printers must integrate seamlessly into the kiosk's structure while maintaining accessibility for servicing and efficient operation.

Why it matters

- ➔ **Compact design is essential** – Many kiosks have limited internal space, requiring efficient printer placement.
- ➔ **Easy maintenance reduces downtime** – Accessible loading mechanisms simplify paper roll changes and servicing.
- ➔ **Reliable connectivity for smooth operation** – Thermal printers must communicate efficiently with kiosk control systems.

Key considerations

- ✓ **Choose a compact, modular design** – Smaller and lighter printers help maximize kiosk space and allow for more flexible layouts.
- ✓ **Ensure flexible mounting options** – Vertical, horizontal, or custom mounting orientations should align with kiosk size and servicing requirements.
- ✓ **Ensure easy access for maintenance** – Top or back-loading designs are common in kiosk printers and facilitate paper roll replacement without disassembling the terminal, helping reduce downtime.
- ✓ **Opt for standard, stable connectivity** – USB and RS232 ensure seamless communication with kiosk control boards while keeping integration straightforward.

2. Performance & speed

Print speed is a critical factor in kiosk operations, affecting transaction times, user experience, and efficiency. However, speed must be balanced with print quality and system responsiveness to ensure seamless performance.

Why it matters

- ➔ **Faster printing reduces wait times** – Slow print speeds lead to longer transaction times, causing queues and user frustration.
- ➔ **System responsiveness matters** – Efficient data processing ensures smooth operation without buffering or lag.
- ➔ **Speed vs. print quality trade-off** – High speeds may reduce contrast, affecting barcode readability and small text clarity.

Key considerations

- ✔ **Select the right speed for your use case** – High-speed (200+ mm/s) for high-traffic areas, moderate speed (50-150 mm/s) for standard transactions.
- ✔ **Ensure the processor can handle high-speed printing** – A strong internal controller prevents lag and print job delays.
- ✔ **Optimize print settings** – Adjust thermal intensity to maintain quality without slowing down printing.





3. Paper handling and cutting options

Reliable paper handling ensures smooth operation, fewer jams, and minimal maintenance. The right cutting mechanism optimizes ticket separation and retrieval efficiency.

Why it matters

- ➔ **Prevents paper jams and misfeeds** – A guided paper path and high-quality cutter ensure smooth, uninterrupted operation, preventing costly service interventions.
- ➔ **Reduces maintenance frequency** – Large paper rolls (Ø150mm+) minimize replacement needs.
- ➔ **Ensures clean ticket separation** – The correct cutter type improves ticket retrieval and usability.

Key considerations

- ✔ **Select the right paper width and thickness** – Choose a printer that supports multiple formats: standard paper widths (58mm, 80mm, 112mm) and 100-220 µm thickness (ideal for durability in transport, parking, and gaming kiosks)
- ✔ **Ensure reliable cutting performance** – Full-cut completely separates each receipt or ticket (ideal for quick retrieval) ; partial-cut leaves a small connection point (preventing tickets from falling out before collection)
- ✔ **Prevent curling or folding issues** – A well-designed paper exit path ensures that tickets and receipts remain flat for easy handling and barcode scanning.

4. Ticket management

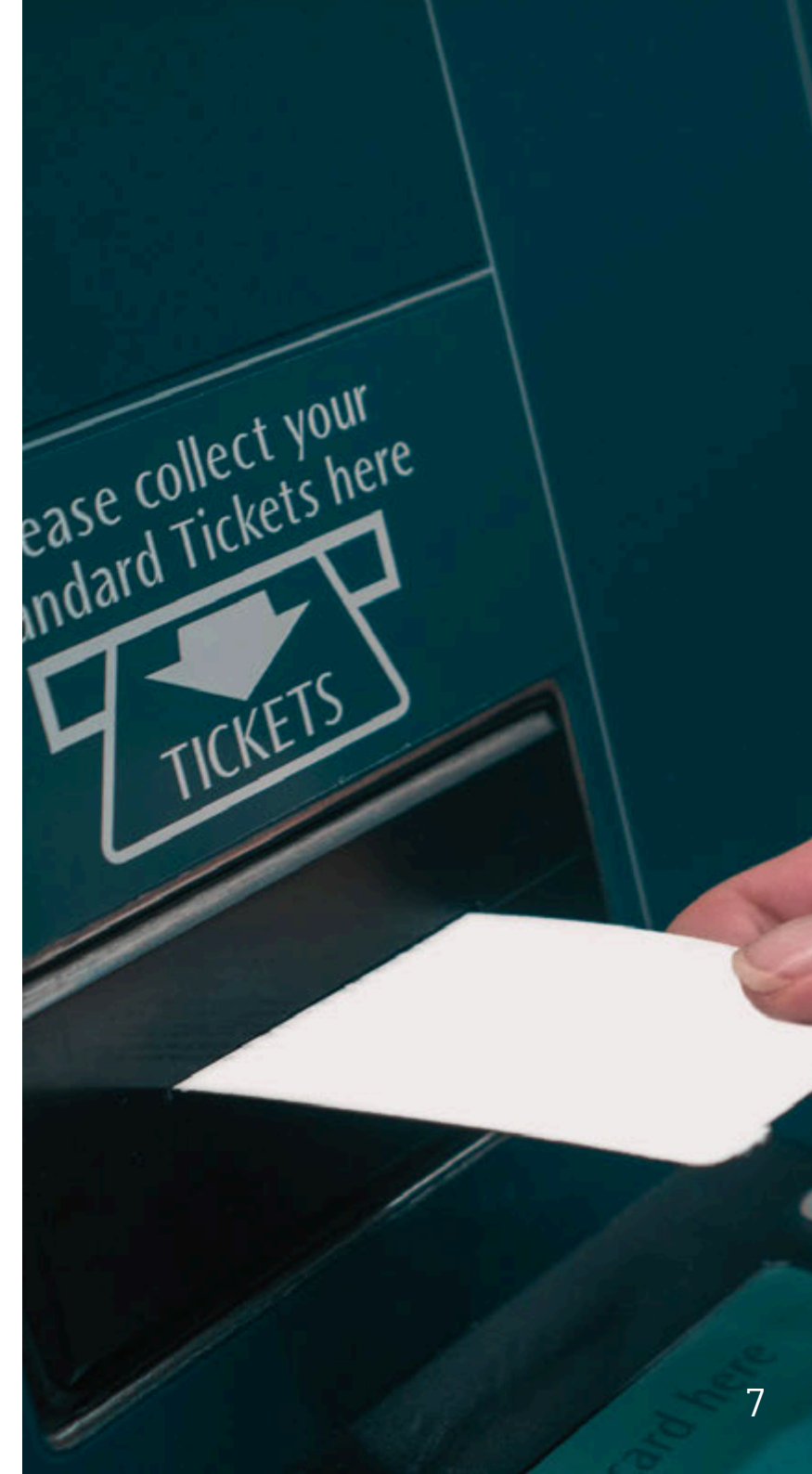
Proper ticket management prevents paper buildup, lost tickets, and system errors while ensuring smooth user interactions.

Why it matters

- ➔ **Prevents ticket buildup** – Uncollected tickets can clog the system, cause paper jams, or accumulate at the base of the machine, leading to operational issues.
- ➔ **Improves user experience** – Proper guidance ensures quick, frustration-free ticket retrieval.
- ➔ **Minimizes waste & maintenance** – Proper ticket management reduces discarded or unclaimed tickets, lowering operating costs and maintenance frequency.

Key considerations

- ✓ **Use a loop presenter for secure ticket retrieval** – Holds the ticket inside the printer until the user collects it, retracting it if left unclaimed.
- ✓ **Use a printer with reject handling capability** – Enables uncollected or faulty tickets to be redirected to a secure reject box via a dedicated mechanism, preventing internal accumulation and ensuring smooth kiosk operation.
- ✓ **Ensure anti-jamming technology** – Ensure anti-jamming technology – Intelligent sensors monitor paper movement and automatically detect misfeeds, pausing or reversing the feed to prevent jams and maintain smooth, uninterrupted operation.
- ✓ **Add a flashing light on the bezel** – Guides users to the ticket exit, reducing uncollected prints.





**Anti-vandal bezel
prevents object insertion**

5. Durability & vandalism protection

Kiosks in high-traffic, unattended, or outdoor environments require rugged, tamper-resistant thermal printers to withstand physical damage, environmental conditions, and security threats.

Why it matters

- ➔ **Prevents dust and moisture damage** – Kiosks placed in transport hubs, parking facilities, and outdoor areas face temperature fluctuations, dust, humidity, and vibrations.
- ➔ **Ensures long-term reliability** – Frequent breakdowns due to fragile components or environmental exposure increase servicing needs and operational costs.
- ➔ **Prevents tampering & forced entry** – In unattended kiosks, users may attempt to forcefully pull tickets or damage bezels leading to malfunctions.

Key considerations

- ✓ **Use secure exit bezels to prevent tampering** – Ensures that users cannot pull or remove tickets before printing is complete.
- ✓ **Opt for dust & moisture-resistant designs** – A protected printing mechanism shields sensitive components from ambient humidity, occasional spills, and airborne particles, helping to extend printer lifespan in kiosk environments.
- ✓ **Ensure wide operating temperature tolerance** – For outdoor kiosks, choose a printer that operates reliably in -20°C to $+70^{\circ}\text{C}$ conditions.

6. Low maintenance & Total Cost of Ownership

A well-designed low-maintenance printer reduces operating costs, service calls, and downtime, maximizing kiosk profitability.

Why it matters

- ➔ **Minimizes operational disruptions** – Frequent maintenance leads to kiosk downtime, frustrating users and reducing revenue potential.
- ➔ **Minimizes servicing needs** – Long-life components reduce breakdown frequency.
- ➔ **Reduces servicing costs** – Fewer roll changes and repairs lead to lower operating expenses.

Key considerations

- ✓ **Use long-life components** – printer with print heads rated for 100-200 km, guillotine cutters with 1-2 million cut cycles.
- ✓ **Support large paper rolls** – Ø150mm+ paper rolls significantly reduces roll-change frequency, lowering maintenance requirements and operational downtime.
- ✓ **Ensure easy access for servicing** : Top-loading or back-loading mechanisms simplify paper roll replacement, depending on kiosk design and integration constraints. Modular designs allow for quick component swaps without dismantling the entire kiosk.





Additional considerations for kiosk printing

Beyond core performance factors, some specialized requirements can impact kiosk efficiency, user experience, and long-term sustainability. Here are three additional considerations to enhance your kiosk printing solution:

Multi-paper compatibility & special media printing

Some kiosk applications require non-standard printing materials for enhanced functionality, security, or regulatory compliance.

- ✓ **Black mark or notch detection** – Allows precise ticket alignment and accurate cutting, essential for pre-printed or security-enhanced ticketing.
- ✓ **Label support**, including linerless options – Enables kiosks to print self-adhesive labels for applications like order tracking, parcel kiosks, and queue management.

Noise & user perception in public spaces

In environments where quiet operation is required, such as hospitals, libraries, and customer service kiosks, loud printers can disrupt the user experience.

- ✓ **Silent cutting mechanisms** – Reduces mechanical noise for a smoother, quieter ticketing process.
- ✓ **Dampened printing action** – Minimizes vibrations and sound, enhancing user comfort in noise-sensitive areas.
- ✓ **Controlled paper ejection speed** – Ensures smooth ticket output without excessive noise or sudden movements.

Environmental considerations & sustainability

As businesses move toward greener operations, kiosk manufacturers can adopt eco-friendly printing solutions to minimize waste and energy consumption.

- ✓ **Energy-efficient printers** – Reduce power consumption, particularly in battery-powered or solar kiosks.
- ✓ **Auto power-saving modes** – Sleep modes and low-energy standby features optimize power use in low-traffic periods.
- ✓ **Linerless printing compatibility** – Removes unnecessary waste from backing paper, reducing carbon footprint.

Choosing the right supplier

Selecting the right thermal printing module goes beyond just the product itself—it requires a **reliable and experienced partner who can provide long-term support, innovation, and global availability**. A strong partnership with the right supplier ensures consistent performance, minimized risks, and seamless integration into your kiosk solutions.

Here are the 6 key company-related criteria to consider when choosing a thermal printing supplier:



1

Proven track record & industry experience

- A supplier with a history of success in kiosk printing solutions demonstrates long-term reliability.
- A well-established supplier understands the challenges of kiosk manufacturers and can provide expertise beyond just the hardware.

2

Certified quality standards & manufacturing excellence

- A trusted supplier should comply with recognized quality standards, such as: ISO 9001 (Quality Management System), ISO 14001 (Environmental Management System), RoHS & REACH compliance for environmentally responsible products.
- Precision in manufacturing, testing, and component selection ensures long-lasting reliability.

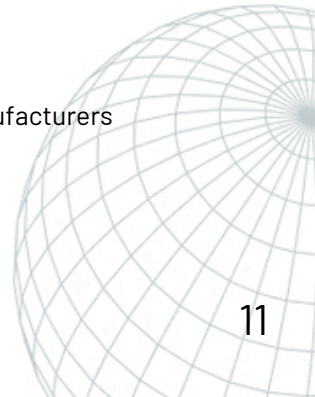
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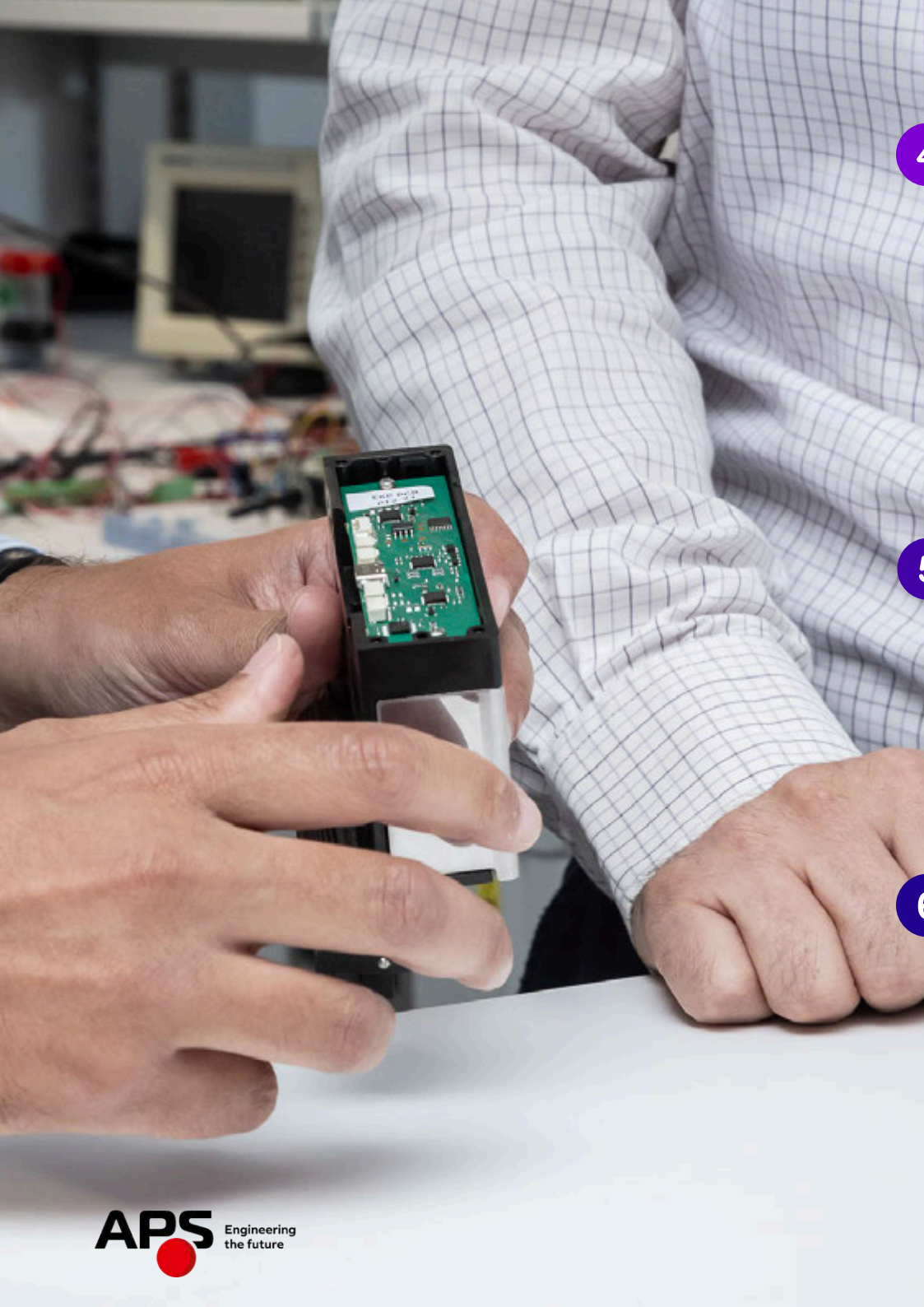
Global Presence & Local Support

A supplier with global coverage can ensure:

- product availability worldwide through distributors & service centers.
- Fast shipping and local inventory, reducing lead times and stock shortages.
- Technical support in multiple regions and languages.

The ability to provide local assistance is crucial for kiosk manufacturers operating across multiple countries.





4

Strong Engineering & Customization Capabilities

A supplier should offer more than just standard products—the ability to adapt to specific needs is key.

Look for a partner that can:

- Develop custom firmware & software for seamless integration.
- Modify printer mechanics (paper handling, bezels, mounting solutions).
- Provide co-engineering to create tailored solutions.

Customization is essential for unique kiosk applications, such as ticketing for public transport, gaming, parking, and retail.

5

Fast & Reliable Customer Support

Reactivity matters—a kiosk printer supplier should offer:

- Fast response times for technical inquiries and troubleshooting.
- Direct support from engineers, not just sales teams.
- Comprehensive product documentation & training for smooth integration.

The best suppliers anticipate customer needs rather than just reacting to problems.

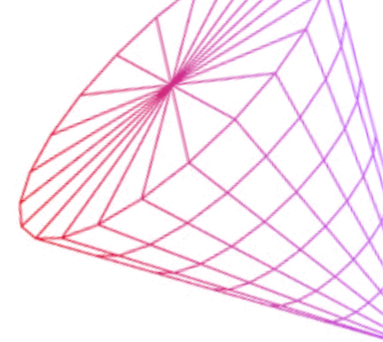
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Supply Chain Stability & Long-Term Commitment

Inconsistent suppliers create risks for product availability & continuity.

A reliable partner should have:

- Stable supply chains & production capacity to avoid disruptions.
- Long-term availability of spare parts & printer models.
- Predictable lead times to prevent project delays.



Thermal printer selection criteria cheat sheet

General Requirements of your project

- What is the main application of the printer? (Receipts, ticketing, labels, etc.)
- What is the expected daily print volume? (Low, medium, or high usage)
- Will the kiosk operate indoors or outdoors? (Temperature, humidity, dust exposure)
- Will the kiosk be installed in noise-sensitive environments (hospitals, libraries, offices)?
- What are the kiosk's printer power supply constraints? (12V, or 24V)
- Does the kiosk need battery-powered operation for off-grid or mobile use?

Print Performance & Paper Handling

- What print speed is required? (50-100 mm/s for receipts, 150-300 mm/s for ticketing)
- What paper width and thickness does the application require? (58mm, 80mm, 112mm?)
- What thickness does the application require? (60 to 150 µm...)

Ticket Management

- Should the printer have a loop presenter to hold tickets until collected?
- Should the printer retract uncollected tickets to a reject box?
- Is a partial-cut or full-cut mechanism required for ticket separation?
- Do you need a flashing light on the bezel to guide users to collect their tickets?

Integration, Space Constraints & Connectivity

- How much space is available inside the kiosk for the printer and the paper roll?
- What mounting options (horizontal, vertical) work best for your kiosk?
- What interfaces are required? (USB Type A / B or C, RS232) for stable long-term connectivity?

Durability, Security & Anti-Fraud Protection

- Will the kiosk operate in extreme temperatures (-20°C to +70°C) or humid environments?
- Will the printer be protected by a vandal-resistant kiosk casing for public or unattended use?
- Will the kiosk need secure ticket stock handling (e.g., RFID validation, black mark detection)?

Maintenance and Total Cost of Ownership

- Does the printer have long-life components? (Print head: 100-200 km, Cutter: 1-2M cuts)
- Should the printer support large paper rolls (Ø150mm+) for longer operation without refilling?
- Does it have anti-jamming mechanisms to minimize servicing needs?

Supplier selection

- Does the supplier have proven experience in kiosk printing solutions with deployments in similar industries?
- Are the printers ISO-certified, RoHS & REACH compliant, ensuring high manufacturing and environmental standards?
- Does the supplier guarantee long-term product availability and spare parts support?
- Is there a dedicated technical support team with fast response times?
- Can the supplier provide customization options (firmware modifications, hardware adaptations) to meet specific project needs?
- Does the supplier offer global distribution and hotswap services for faster delivery and maintenance?

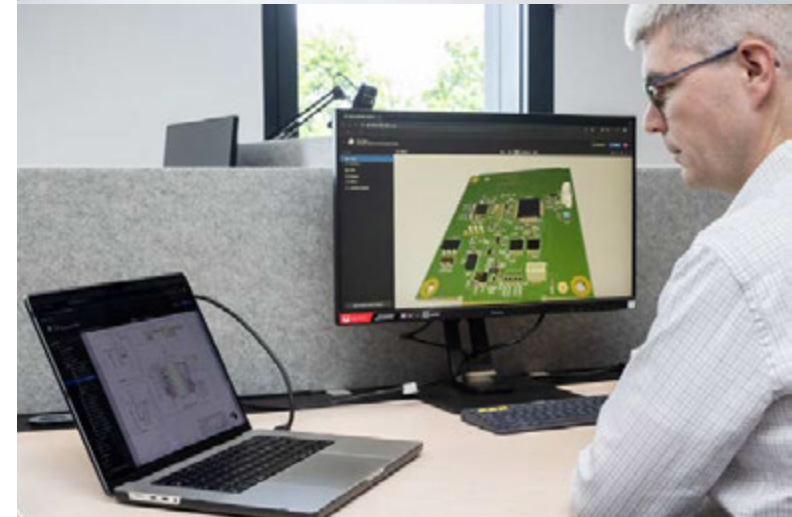
Take your kiosk printing to the next level !

Now that you understand the key factors in selecting a high-performance, reliable, and cost-effective thermal printing module, the next step is to choose a trusted partner who can deliver the right solution.

APS is a global leader in thermal printing technology, offering cutting-edge, customizable, and durable solutions designed specifically for self-service kiosks in ticketing, vending, gaming, parking, and retail.

Why Partner with APS?

- **Field-proven reliability** – APS printers are deployed in thousands of kiosks worldwide, ensuring uninterrupted operation in ticketing, vending, parking, gaming, and retail applications.
- **Optimized for low maintenance & high autonomy** – APS designs printers with long-life components (100-200 km print head durability, 1-2 million cut cycles) and supports large paper rolls to reduce servicing frequency.
- **Engineered for public use & harsh environments** – APS printers are built to withstand vandalism, dust, humidity, and extreme temperatures (-20°C to $+70^{\circ}\text{C}$), ensuring kiosks operate smoothly in challenging conditions.
- **Seamless integration & customization** – Compact, modular designs fit within tight kiosk spaces, while USB & RS232 connectivity ensures easy integration with kiosk control boards. APS also provides custom firmware, mechanical modifications, and tailored software solutions.
- **Global presence & fast support** – With a worldwide distribution network, APS ensures global delivery, spare part availability, and responsive technical assistance, helping kiosk operators minimize downtime.



Let's find the best solution for your kiosk !

Don't leave your kiosk performance to chance. Partner with APS and ensure seamless, reliable printing for your self-service applications.

Need expert advice? Our team is ready to help you select the right printer for your specific application.

Contact us today :



EUROPE, MIDDLE-EAST and AFRICA : +33 611 974 650

AMERICAS and ASIA-PACIFIC : + 33 611 979 554



BULGARIA :
APS Trading OOD
Industrial zone "Microelectronica"
2140 Botevgrad, Bulgaria
Telephone: +359 2 439 63 91

FRANCE:
APS
14 Rue Olivier de Serres,
49070 Beaucouzé, France
Telephone: +33 987 091 007

www.aps-printers.com

