specification

CUTTER CABINET PRODUCT SPECIFICATION

Smart Tool Cabinet: ZSC-C03

(Spring Transport Channel)

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1. Product Image

Main Cabinet

Tool Recycling

II. Product Overview

The ZSC-C03 spiral tool smart cabinet is an integrated intelligent tool management system specifically developed for the machining industry. Its spiral transport channel ensures precise tool delivery, combining the modular design and multi-scenario adaptability of mainstream smart compartment cabinets with advanced technologies such as biometric recognition, IoT, big data analytics, and intelligent security monitoring. It comprehensively addresses key requirements in machining enterprises — including tool issuance, recycling, trade-in programs, compliant disposal, and full lifecycle management of various tool types.

This intelligent cabinet addresses key challenges in tool management within the machining industry, including disorganized tool records, severe tool waste, unreliable nighttime tool requisition processes, non-standard disposal of used tools, and difficulties in tracking tool lifespan. Through automated operational workflows and an intelligent management platform, it enables comprehensive digital control throughout the entire tool lifecycle — from requisition to disposal. Enterprises can monitor critical data such as tool inventory levels, requisition details, service life status, and disposal progress in real time, significantly reducing manual intervention and lowering inventory holding costs as well as management expenses. It also ensures compliance and traceability in tool usage,

providing essential support for lean production and intelligent management in machining enterprises.

III. Application Scenarios

(1) Large-scale integrated mechanical processing plant: Designed to meet the tool management requirements of multiple production lines and various operations, it can simultaneously store a variety of spiral tools such as milling cutters, drill bits, and reaming bits, supports frequent borrowing and return, and enables centralized tool resource allocation across workshops through a unified management platform, thereby avoiding redundant procurement and inventory overstocking.

(2) Precision component manufacturing enterprises: To meet the stringent requirements of precision machining for tool accuracy and service life, the system accurately records tool usage duration and automatically triggers replacement alerts based on preset lifespan thresholds, while standardizing the old-to-new replacement process to prevent defective tools from entering production and compromising processing quality.

(3) Multi-shift continuous production facility: Supports 24/7 uninterrupted operation, addressing the challenge of unmanned tool issuance during shift changes and holidays. Employees can complete tool requisitions through self-service, ensuring smooth operations for

enterprises requiring continuous production of components and construction machinery.

(4) Small and Medium-Sized Machining Workshops: No dedicated management team is required. The system utilizes features such as automated inventory tracking, stock level alerts, and tool-life reminders to enable SMEs to implement streamlined tool management, reduce labor costs, and facilitate shared use of idle tools through a centralized storage solution, thereby enhancing resource utilization efficiency.

(5) Group-wide cross-factory enterprises: Leveraging IoT technology to enable seamless data interoperability across facilities, group administrators can monitor tool inventories, usage frequencies, and disposal status in real time. Through big data analytics, procurement plans are optimized to achieve efficient allocation of global tool resources.

(6) Defense/aerospace supporting enterprises with stringent compliance requirements: These enterprises must meet the full-process traceability compliance requirements for tools in the defense and aerospace sectors, generating tamper-proof records at every stage—from procurement and use to recycling and disposal—while integrating video surveillance and access control systems to ensure secure and compliant tool management.

IV. Product Features

(1) Comprehensive Tool Management Throughout the Entire Process

1. Supports four authentication methods: facial recognition, card swiping, QR code scanning, and account password verification, tailored to different employee usage habits to prevent unauthorized tool access and enable intelligent allocation and issuance. Allows customization of issuance quotas by personnel, position, or tool type, with the system automatically rejecting excess requests to reduce tool waste and ensure precise quota control.

2. Quick self-service operation: Use the 8-inch capacitive touchscreen to select tool types and quantities; the spiral conveyor automatically delivers tools to the pickup port, completing the requisition in just 3 steps within ≤15 seconds.

3. Categorized Recycling Registration: When returning tools, users can select the recycling category, and the system automatically records the recycling time, tool model, and status. Tool administrators can verify this information in real-time to ensure accurate and traceable recycling records.

4. Trade-in program: A mandatory process requires completing the old blade recycling before claiming a new one, ensuring proper recycling and preventing issues like lost blades or unreturned blades.

5. Recycling label printing: The optional printer supports automatic

printing of recycling labels, which employees can attach and submit for recycling, facilitating subsequent sorting and disposal by tool administrators.

(2) Tool Life Management: The system records tool usage duration and generates a lifespan profile for each tool.

(3) Intelligent Inventory Monitoring: Features real-time inventory tracking and early-warning capabilities, updating stock levels in real time based on usage data. When tool inventory falls below a preset threshold, it automatically sends restocking alerts to the management system and relevant personnel, eliminating the need for manual periodic counting and preventing both shortages and overstocking.

(4) Comprehensive security protection: The cabinet is constructed from 1.2 mm cold-rolled steel plate to prevent forced entry.

(6) Data Security and Connectivity: Supports three communication modes—WIFI, RJ-45 wired network, and 4G (optional)—ensuring stable connectivity even in areas without network coverage, with data synchronized to the management platform in real time without latency or loss.

V. Product Parameters

Main Specification Parameters	
product model	ZSC-C03

operating system	Android 11
CPU	A quad-core 64-bit Cortex-A55 processor with a maximum clock speed of 2.0 GHz
Industrial Control Configuration	RK3568
internal storage	2G
capacity	16G
Overall dimensions (Height * Width * Depth)	Tool storage cabinet: 910**620*550 mm ±5 mm;
Case Material	1.2 mm cold-rolled steel plate
screen	8-inch capacitive touchscreen;
capacity	Standard configuration: 4 layers, with 8 cargo lanes per layer, totaling 32 cargo lanes.
mechanical lock	Use a mechanical lock with key control to open the door.
Tool Recycling Bin (Optional)	(1) Tool recycling bin (height * width * depth): 850 × 620 × 550 mm ± 5 mm; (2) Printer: Label printer; (3) Recycle ports: Dual recycle ports;
Card Reader (Optional)	ID card/IC card, reading distance 0–30 mm
Face Camera (Optional)	Dual 2-megapixel cameras
communication interface	WIFI, RJ-45,4G (optional)
Work Environment Requirements	temperature -20℃ ~ 60℃

QR Code Reader	Reading accuracy ≥ 7 mil Effectively identifies codes from various media including mobile phone screens, paper codes, and plastic codes.
power requirement	Single-phase AC 220 V, 50–60 Hz

VI. Precautions

The device must be installed in a flat, dry, and well-ventilated indoor environment, avoiding direct sunlight, humid conditions, or areas with severe dust exposure.

Power supply must strictly adhere to the rated electrical parameters to prevent equipment failure caused by voltage instability or overload.

Perform regular cleaning and maintenance of the cabinet, inspect components such as locks, sensors, screens, and communication interfaces to ensure proper equipment operation.

Administrators must regularly back up data and update system versions promptly to ensure device functionality stability and data security.

Prohibit violent lock-breaking or cabinet impact; such actions will shorten equipment lifespan and result in losses that must be borne by the user.