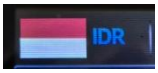
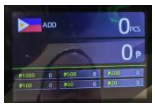
Operational Manual for Horizontal Infrared Machine Table of Contents

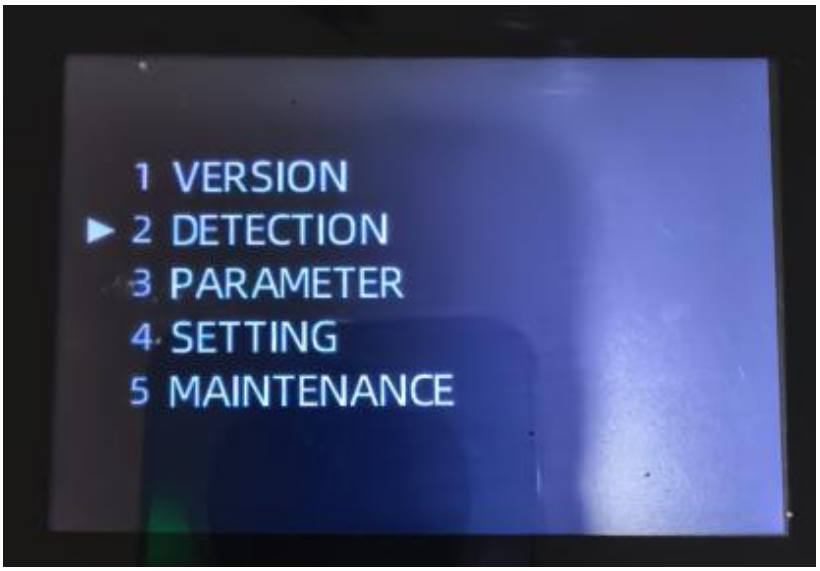
1. Main Page and Button Description

Interface element	function declaration	key	function declaration
	Mark the currency to be verified now	CUR	Currency toggle key: Switches the currency type for current counting
	Currency counting mode (3 types) "MIX" 、 "SORT" 、" CNT"	MODE	Mode toggle key: Switches between three counting modes
	Number of banknotes counted	MENU	Menu key: Enter the machine settings interface to adjust parameters such as authentication sensitivity and sound.
	Amount of completed banknote counting	LIST	Details key: View current currency count details and statistics
	Sound alarm alert (Triggered when authentication fails or an exception occurs)	CLR	Clear key: Clears current statistics such as sheet count and amount, restoring to initial state
	The machine initiates inventory counting mode (2 types) "AUTO START/MANUAL START"	ST	Start/Reset button: Manually initiate the count or reset current statistics after completing the count. **Long press "ST" to switch between "Auto/Manual" modes**
	Cumulative function	ADD	Accumulation function key: Turn on/off accumulation mode
	Number of preset sheets	BAT	Preset count key: Press "BAT" to switch preset values— "100", "50", "20", "10", or "OFF" —or use the "+" /-" keys to set the preset count. An automatic prompt appears when the target is reached.
	Currency Count Details Page View current currency details and statistics	+/-	Value adjustment key: Used to adjust the size of preset targets
Money counting mode	MIX: Mixed counting mode that supports multiple denominations in the same currency and features anti-counterfeiting capabilities		
	SORT: Intelligent sorting mode that automatically identifies the denomination of the first coin and accurately separates coins of different denominations. It also features anti-counterfeiting capabilities.		
	CNT: Counting mode, capable of counting banknotes of different versions and denominations, suitable for low-denomination currency and bills		

2. Menu Page Description

Press "MENU" → Press  "ADD" four times to access the main menu page.

key	function declaration	key	function declaration
ADD	Enter the password and tap four times	+/-	Used to adjust the numerical size of preset targets
CUR	Press the key to switch entries upward	LIST	Press down to switch entries
MENU	Confirm key	CLR	return key



1 VERSION	Version 1 Description
2 DETECTION	2 Authentication sensitivity
3 PARAMETER	3 Parameter Settings
4 SETTING	4 Set up related settings
5 MAINTENANCE	5 Maintenance-related

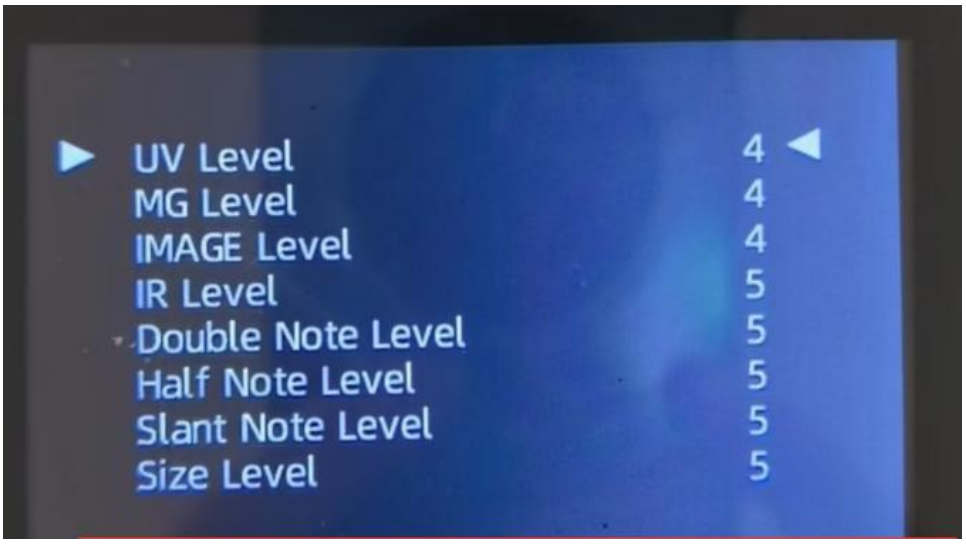
1. VERSION (Version Description)

After entering the main menu page, press "CUR" or "LIST" to select "►1 VERSION", then press "MENU" to access the machine version description page. Press "CLR" to exit the current settings menu and return to the parent menu page.

Note: The "Success" message appears in the lower right corner, indicating successful machine authorization.
The "Fail" machine is not authorized.

2. DETECTION (authentication sensitivity)

After entering the main menu page, select "CUR" or "LIST" and choose "►2 DETECTION". Press "MENU" to adjust the authentication sensitivity parameters. After adjustment, press "CLR" to exit the current settings menu and return to the parent menu page.



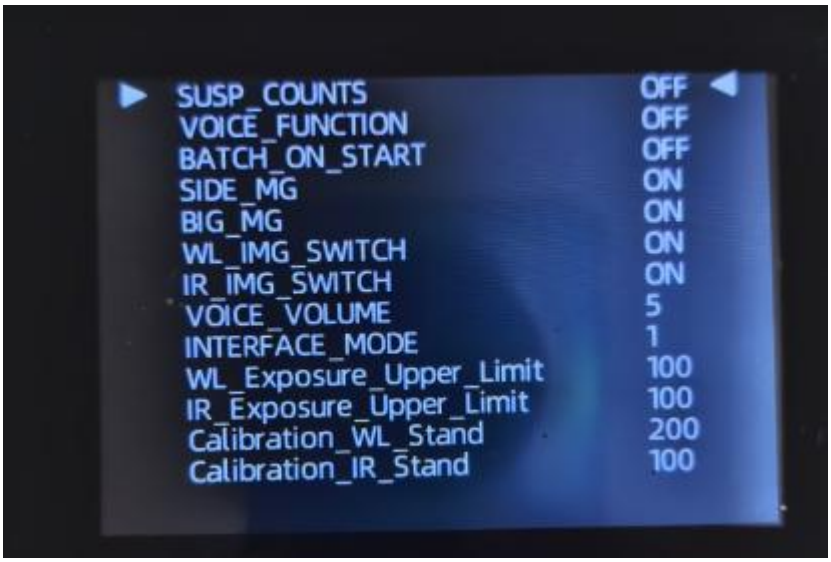
Press 'CUR' or 'LIST' to select an item, then press '+' or '-' to adjust the parameter value.

counterfeiting parameter	function declaration
UV Level	Detection sensitivity of ultraviolet fluorescence anti-counterfeiting features on banknotes

MG Level	Detection sensitivity of magnetic anti-counterfeiting features such as magnetic ink and security thread on banknotes
IMAGE Level	Sensitivity of image comparison recognition for visual features such as banknote patterns and watermarks
IR Level	Detection sensitivity of infrared light-transmitting anti-counterfeiting features on banknotes
Double Note Level	Detects overlapping banknotes (duplicate notes) with high sensitivity to avoid missed counts or counting errors
Half Note Level	Detect the sensitivity of damaged or half-sized banknotes and filter incomplete banknotes
Slant Note Level	Detection sensitivity for identifying tilted and skewed banknotes
Size Level	Sensitivity for detecting whether banknote dimensions meet standards (including height and width)
	Sensitivity explanation: Value range 0-9. 0 disables the authentication feature. Higher values enable stricter recognition, with 9 indicating maximum sensitivity.

3. PARAMETER (Parameter settings)

After entering the main menu page, select "CUR" or "LIST" and choose "►3 PARAMETER", then press "MENU" to access the parameter settings page. After adjusting the parameters, press "CLR" to exit the current settings menu and return to the parent menu page.

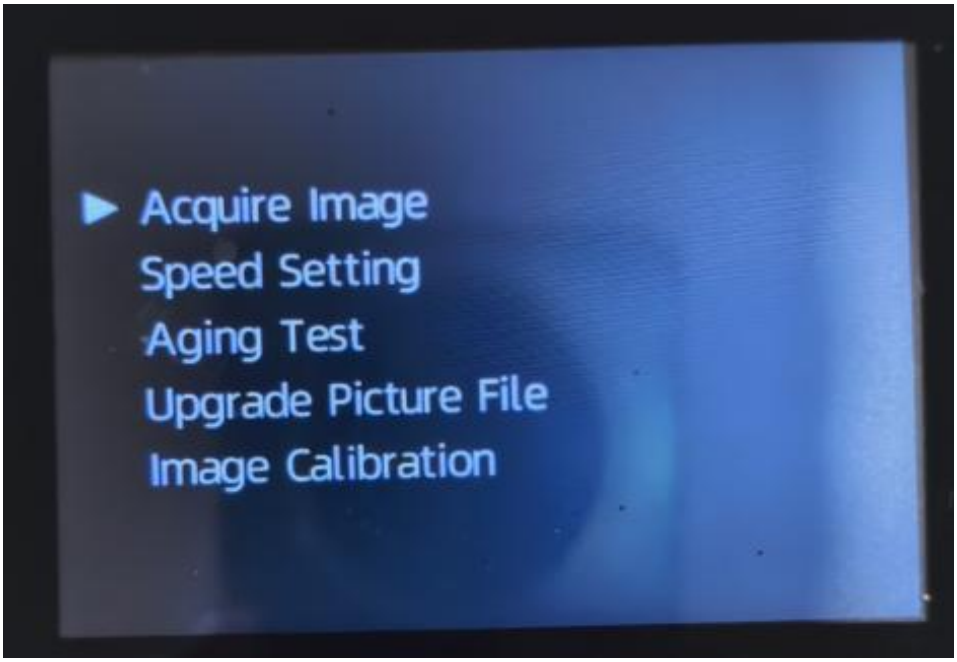


parameter	function declaration
SUSP_COUNTS	Alarm counting switch, ON for alarm counting
VOICE_FUNCTION	Automatic switch activation after alarm (function disabled)

BATCH_ON_START	The preset function switch activates automatically upon startup. ON means enabled
SIDE_MG	Total Magnetic Side Function Switch
BIG_MG	Medium Large Head Function Master Switch
WL_IMG_SWITCH	White Light Image Processing Master Switch
IR_IMG_SWITCH	Infrared Image Processing Main Switch
VOICE_VOLUME	Volume parameter for voice, ranging from 1 to 5, with 5 being the maximum volume.
INTERFACE_MODE	Peripheral mode, reserved for later use with different external displays or printers
WL_Exposure_Upper_limit	Calibration parameters for white light exposure upper limit
IR_Exposure_Upper_limit	Calibration of infrared exposure upper limit parameters
Calibration_WL_Stand	Reference standard for white light after placing a blank sheet during calibration
Calibration_IR_Stand	Reference standard for infrared emission after placing white paper during calibration

4. SETTING (Parameter Configuration)

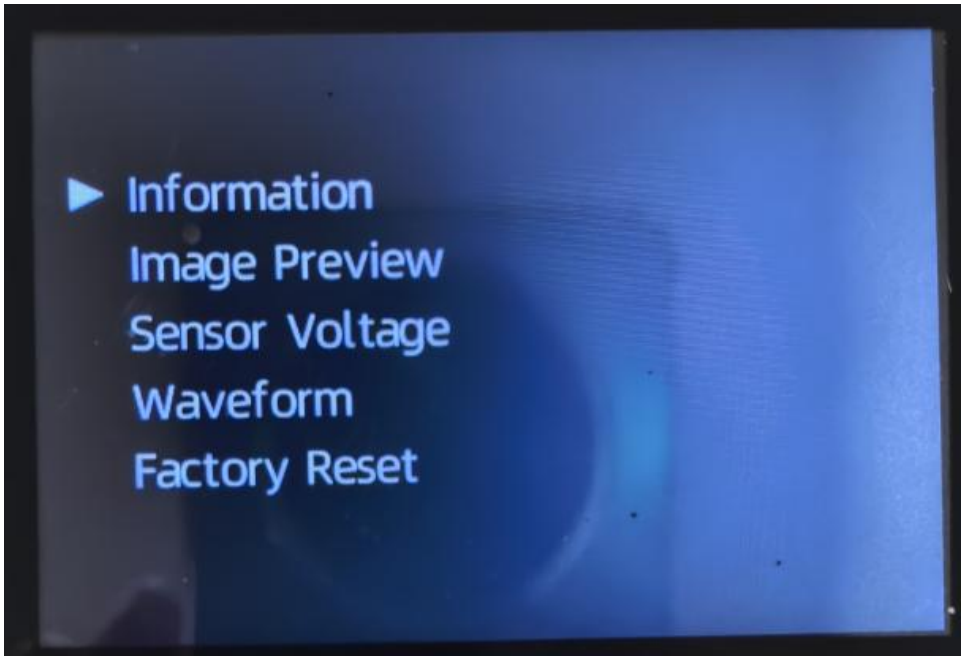
After entering the main menu page, press "CUR" or "LIST" to select "►4 SETTING", then press "MENU" to access the settings page. After adjustments, press "CLR" to exit the current settings menu and return to the parent menu page.



function	function declaration
Acquire Image	Image and magnetic data acquisition
Speed Setting	Speed mode (the machine starts running upon entry, displaying the code disk cycle and corresponding banknote counting speed)
Aging Test	burn-in test ，
Upgrade Picture File	Upgrade the display screen gallery (automatically processes based on USB drive files upon entry. If a gallery exists, it will upgrade; otherwise, it displays "no file").
Image Calibration	Image calibration (Follow the instructions after entering)

5. MAINTENANCE (maintenance-related)

After entering the main menu page, select "CUR" or "LIST" and choose "►5 MAINTENANC". Press "MENU" to access the maintenance-related page. After adjustments, press "CLR" to exit the current settings menu and return to the parent menu page.



function	function declaration
Information	Information Query Interface
Image Preview	Image preview (shows the last cashed banknote)
Sensor Vortage	sensor voltage interface
Waveform	Waveform interface (shows the waveform of the last cash flow. Press up or down to switch waveforms)

Factory Reset	Restore factory settings interface (after entering, follow the prompts to press ADD to restore factory settings) Restoring factory settings will modify the data in sensitivity and parameter settings.

III. Procedures for Sample Coin Collection

1. Collection Preparation

1.1 Prepare a USB drive

1.2 Start the machine and connect the USB drive. The connection is successful when the USB icon appears on the current interface.

2. Image Acquisition (Image/Magnetic Data Acquisition)

2.1 Press the "MENU" key → Press "ADD" to enter the main menu → "4 SETTING" → "Acquire Image" to access the currency acquisition page

function	function declaration
deno: 100	When collecting data, create corresponding denomination folders to categorize and store currency data by denomination. Use the '+' and '-' keys to change the collected currency denominations.
Ver: 0	Create a corresponding version folder when collecting data to distinguish currency versions across iterations. For detailed version descriptions, contact the factory.

Face: A	Create a corresponding banknote counting direction folder when collecting data
MG Signal: ON	The magnetic acquisition switch captures currency magnetic signals synchronously when activated. Two images in each orientation per denomination are sufficient.

When set to A, counting banknotes with serial numbers is in the forward direction. When set to B side, counting banknotes with serial numbers is in the reverse direction. When set to CD, both forward and reverse directions are used. During actual storage on a USB drive, images are mapped to corresponding folders based on their orientation, ensuring that the folder names match the image orientation.

2.2 Organize currency and collect data according to the following rules

· Prepare 50-100 banknotes and arrange them according to Figure 1, ensuring identical denomination, edition, and orientation to guarantee complete consistency in all aspects.

The machine enters the collection page to verify parameters such as denomination, version, and orientation for collection.

· Place the banknotes as shown in Figure 2 and initiate data acquisition. To ensure data coverage, the currency must be fully collected at three positions (left, center, and right) of the cash inlet to avoid insufficient algorithmic recognition accuracy due to deviation in cash passage positions.

Figure 3 shows the orientations A, B, C, and D, with data collection completed sequentially as illustrated.

During image acquisition, set the MG Signal setting to OFF and capture two magnetic feature images in each direction for each denomination.

Figure 3 Orientation of banknotes A, B, C, and D

2.3 After data collection is completed, you will receive the following data. As shown in Figure 4

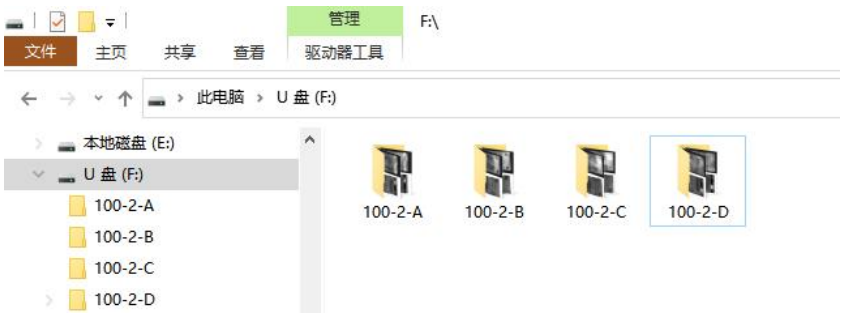


Figure 4 Data collected from corresponding currency folders

三 False alarm currency collection

If a banknote of a specific denomination or particular edition occasionally displays error codes E10(56) to E10(89), it indicates that the machine may have misidentified the currency.

In the event of the above circumstances:

- ❖ First, check whether the banknote is genuine.
- ❖ During the banknote running process, check whether the banknotes are tilted.
- ❖ Check whether the gap between the checkboard and incoming banknotes is too tight or too loose, as this condition may cause deformation of banknotes during dispensing.

If all data is correct but a warning still appears, collect data in Warning collection mode.

3.1 Enter the information query page. Press the "MENU" key → press "ADD" to access the main menu → select "5 MAINTENANCE" → choose "Information" to enter the information query page.

3.2 During banknote processing on the information inquiry page, an alarm will be triggered if the machine misidentifies banknotes, causing the machine to stop processing and automatically saving data to a USB drive. A

"ErrorImage" folder will be created in the root directory of the USB drive, with automatic data collection (as shown in Figure 5). Additionally, a photograph of the data from the information inquiry page will be taken for record-keeping (Figure 6).

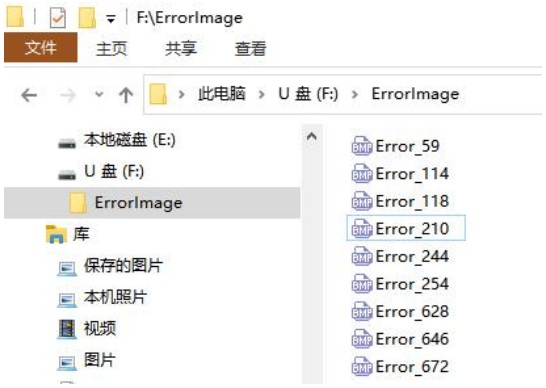


Figure 5 Acquisition image data of misreported currency

Figure 6 Data on false currency alerts

四 Infrared images are more accurate

1. Prepare a sheet of white paper measuring 178mm × 130mm (standard A4 paper for office printing is sufficient).

2. Prepare a clean wipe cloth (included in the accessory pack)

3. Press the "MENU" key → press "ADD" to enter the main menu → select "4 SETTING" → then choose "Image Calibration" to access the infrared image calibration interface (Figure 7). Successful entry is confirmed by the illumination of the infrared lamp tube (Figure 8).

Figure 7 Initial infrared image learning accuracy page

Figure 8 Infrared lamp tube illuminated (arrow position)

4. Clean the lamp tube: Open the top cover → Lift the infrared lamp tube handle → Clean the surface of the infrared lamp tube with a wiping cloth.

5. Place white paper: Insert the white paper into the machine as shown in Figure 9, rotate the wheel to allow the white paper to enter and fully cover the infrared lamp tube, ensuring no displacement or wrinkles (Figure 10).

Figure 9 Insert white paper (1)

Figure 10 Insert white paper (2)

6. Accurate alignment: Cover the infrared lamp tube bracket → Press the "MENU" key to initiate alignment. A white paper sheet will automatically pop up, and the screen will display "success" indicating the alignment is complete.

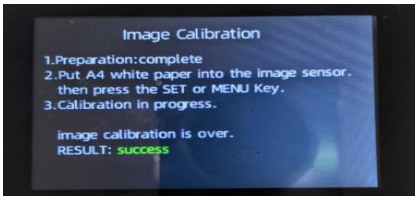


Figure 11 Successful

Figure 12 Successful

7. After completing, reinstall the cover and press the "CLR" key to exit or restart the machine.

五 Upgrade the program

1. Prepare a USB drive

2. Extract the upgrade package (e.g.,.zip or.rar format), then copy the extracted "CUR_UPDATE" folder (keep the full folder name without modification or splitting) directly into the root directory of the USB drive (do not include any subfolders).

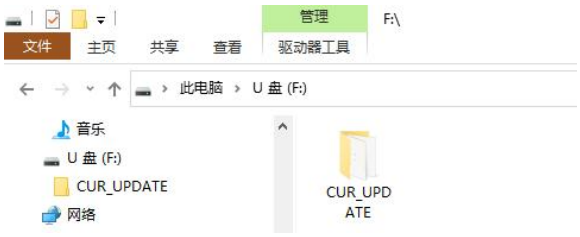


Figure 13: Upgraded folder copied to USB drive

3. Insert the USB drive when the machine is off, then turn it on.

4. The machine automatically enters the upgrade page (see Figures 14 and 15) and waits for the upgrade to complete.

Figure 14 Program upgrade in progress (1)

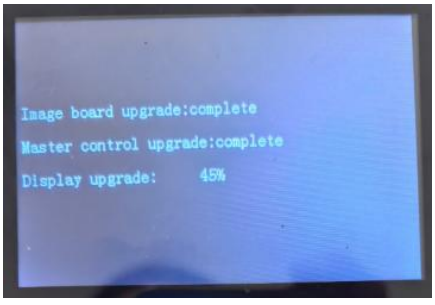


Figure 15 Program upgrade in progress (2)

5. After the upgrade, the machine restarts automatically and the main control program is upgraded.

6. After upgrading, if the main page UI images do not need updating, simply unplug the USB drive to complete the upgrade. If updates are required, follow these steps.

7. Press the "MENU" key → Press "ADD" to enter the main menu → Select "4 SETTING" → Press "Upgrade Picture File" to access the main UI image update page. After completing the image update, press the "ST" key to finalize the upgrade and unplug the USB drive.

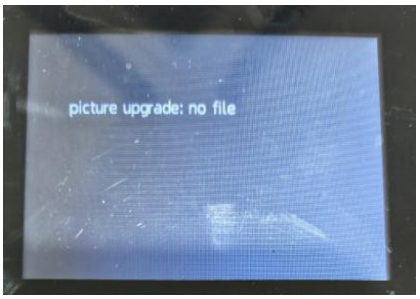


Figure 16 No UI image update

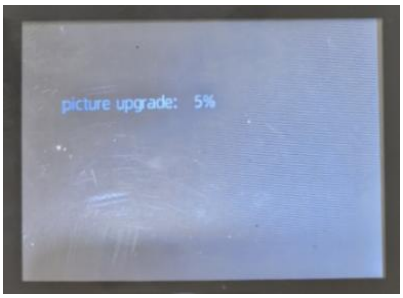


Figure 17 UI image is updating

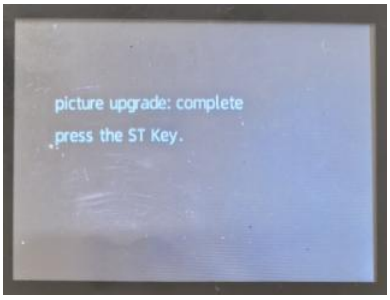


Figure 18 UI image update completed

六 Check the correspondence between self-inspection error codes and alarm error codes

1. Boot self-test error code

Self-check information	Self-examination description
START_SENSOR	Banknote sensor error
CLEAR_SENSOR	Cash dispensing sensor error
CNT_IRL_SENSOR	Left counting error of the electrophorographic eye
CNT_IRR_SENSOR	Right counting eye error
ENCODE_SENSOR	Disk sensor error
IMAGE_SYSTEM	Image system error
UV_SENSOR	Fluorescence sensor error
IMAGE_SENSOR	Image sensor error
MG_SENSOR	Magnetic sensor error

2. Alarm Error Code Correspondence

Error code	error message	Specific error code	Error description
E2	DOUBLE ERROR	155	Image reattachment (transmission)
		187	Cash shortage
E3	CHAIN ERROR	156	Image Reconnection Stretch (Width)
E10	IMAGE ERROR	51	bias
		56	Image not recognized
		59	No denomination recognition
		141	bias
		152	Error in banknote or denomination signal (image)
		154	Error in banknote collection or denomination signal (all)
E11	WIDTH ERROR	11	Width mismatch
		12	Inconsistent aspect ratio and height
E14	DENOMINATION ERROR	161	Different denominations
E15	IMAGE SIGNAL ERROR	182	Result timeout
		183	Result timeout
E30	IR ERROR	153	Error in banknote collection or distribution signal (to the tube)