NC-5100

Two-Pocket Currency Discriminator

Service Manual

Document Version 1.4
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Masterwork Automodules Tech Corp Ltd.
11F-3, 3, Park St., Nangang, 11503, Taipei, Taiwan
support@automodules.com

Content

Chapter 1 Introduction

1.1 About NC-5100 Service Manual

This manual is for the maintenance of NC5100 and it includes the disassembly process, spare part replacement, basic inspection and repair.

1.2 Important Safety Precaution

- NC-5100 is exclusively for indoor usages only, please do not use or install it outdoor.
- Please check the adaptor and power cord periodically to protect from any damages. The power source is between AC 90V~240V, 50/60 Hz.
- Keep NC-5100 away from magnets, activated cellular phones, electrical appliances, or speakers within 13cm / 5 inches.
- Please disconnect power adaptor and remove batteries when the machine left unused for a long time.
- NC-5100 is designed for notes processing. Please process banknotes ought to be verified in the four orientations (“Head Up-Right”, “Head Reversed”, “Tail Up-Right” or “Tail Reversed”).

1.3 Abbreviations and Acronyms

CIS	Contact Image Sensor
IR	Infrared
MA	Masterwork Automodules
MB	Megabyte
MG	Magnetic
MR	Magnetoresistive
MT	Metal Thread
PC	Personal Computer
USB	Universal Serial Bus

1.4 Contact Information

Masterwork Automodules Tech Corp Ltd.
www.automodules.com

Address: 11F-3, 3, Yuanqu St,
Nangang, 11503,
Taipei, Taiwan

Tel: +886 2 2655 7997
Fax: +886 2 2655 7996

Email: support@automodules.com

Chapter 2 NC-5100 Outline

2.1 NC-5100 At A Glance

2.2 Specification

2.2.1 Functional and Mechanical Specification

Sensors:	CIS, IR Array, MG, MR, MT
Denomination Detection:	Contact Image Sensor
Dual User Operation:	Yes
Available Currencies	USD, EUR and up to 3 additional currencies
Countable Note Size:	60 X 85 X 0.08mm ~ 100 X 190 X 0.12mm
Hopper Capacity:	500 notes (circulated notes)
Stacker Capacity:	250 notes (circulated notes)
Reject Pocket Capacity:	Max. 100 notes (circulated notes)
Display:	3.5 Inch color TFT
Display Language:	English or Customized
Feed System:	Roller friction system
Piece Count Speed:	900/1200/1500 notes/min. (selectable)
Denomination Count Speed:	600/900/1200 notes/min. (selectable)
Serial Number Count Speed:	600/900/1200 notes/min. (selectable)
Dimensions (mm):	330(W) X 330 (D) X 350 (H)
Weight:	Approx. 15Kg
Operating Temperature Range:	
Humidity:	
Options:	Remote Display / Thermal Printer

2.2.2 Electrical Specification

Power Supply:	100-240V AC, 50/60Hz
Power Consumption:	Max. 150W

2.2.3 Interface Specification

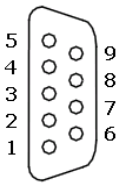
2.2.3.1 Thermal Printer (RS-232)

(A) Communication Conditions

Item		Specification
Standard:		EIA RS-232C
Baud Rate:		9600bps ,38400bps ,115200bps
Synchronous Method:		Asynchronous
Data Format:	Start	1 bit
	Data	8 bits
	Parity	None
	Stop	1 bit
Connector:		D-sub 9pin (male)
Cable length:		15m max

(B) Interface Connector - Equipment Side Connector

Pin NO.	Signal	Direction
1	———	———
2	———	———
3	TXD	NC5100→thermal Printer
4	———	———
5	GND	———
4	———	———
7	———	———
8	———	———
9	———	———



2.2.3.2 Remote Display

(A) Communication Conditions

Item		Specification
Standard:		UART
Baud Rate:		115200bps
Synchronous Method:		Asynchronous
Data Format:	Start	1 bit
	Data	8 bits
	Parity	None
	Stop	1 bit
Connector:		Mini USB 5 pins (female)
Cable length:		1.5m max

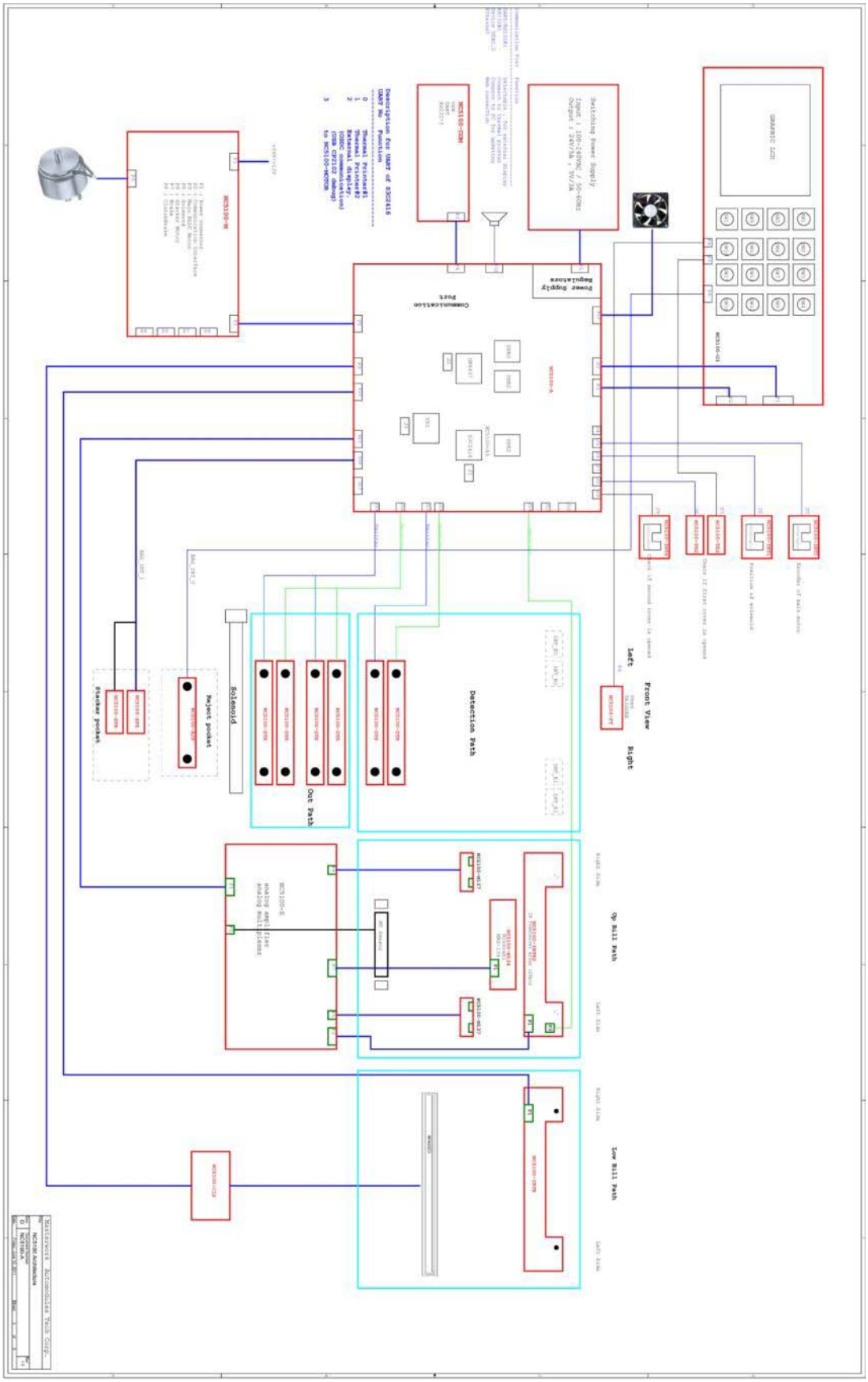
(B) Interface Connector - Equipment Side Connector

Pin NO.	Signal	Direction
1	VCC	———
2	VCC	———
3	RXD	———
4	TXD	NC5100→Remote display
5	GND	———

2.2.3.4 PC

Item	Specification
Data Communication Port	USB

2.3 System Overview



Chapter 3 Maintenance

3.1 Cleaning the Cover of NC-5100

❶ Prepare a mixture of a gentle kitchen-use detergent (one that does not contain abrasive powder or strong chemicals such as acid or alkaline.) Use 5 parts water to 1 part detergent.
❷ Absorb the diluted detergent into a sponge.
❸ Squeeze excess liquid from the sponge.
❹ Wipe the cover with the sponge, use a circular motion and take care not to let any excess liquid drips into the interior of the device.
❺ Wipe the surface to remove the detergent.
❻ Rinse the sponge with clean running water.
❼ Wipe the over with the clean sponge.
❽ Wipe the surface again with a dry, soft lint-free cloth.
❾ Wait for the surface to dry completely and remove any fibers.

3.2 Cleaning the bill path of NC-5100

❶ Open the bill path.
❷ Gently wipe it or dust the bill path with a MA brush or a dry, soft lint-free cloth.
❸ If stains remain, moisten a soft, lint-free cloth with water or a 50-50 mixture of isopropyl alcohol and water that does not contain impurities.
❹ Wring out as much of the liquid as you can.
❺ Wipe the bill path and the sensor surface again; do not let any liquid drip into the device.
❻ Repeat 1-5 to clean the conveyer path.

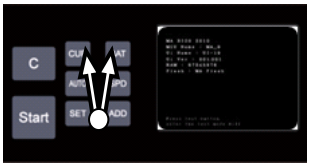
*NOTE: Avoid spraying cleaner directly on the device, and be sure to day the bill path before closing it.

Chapter 4 Maintenance Mode

Maintenance Mode is for testing and maintaining NC-5100 only. Please follow the instruction as below when operating under the mode, or there is a risk to damage the device.

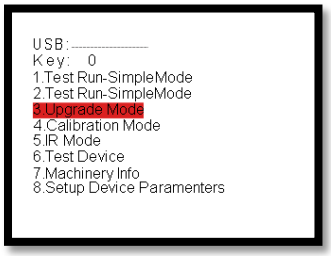
How to enter Maintenance mode:

1. Turn on the device.



2. Press and hold the “ CUR ” and “ BAT ” keys together on the initializing page.

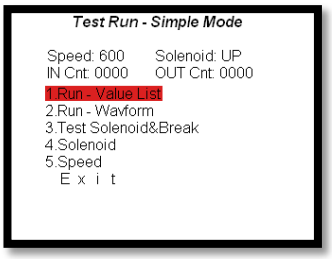
3. The device enters the Maintenance mode automatically.



4. After enter the test mode, use the following keys to operate:
   - 2: Move Up
   - 8: Move Down
   - Start: Toggle between options and/or confirm a selection.
   - C: Go back to upper layer.

4.1 Test Run – Simple Mode

To test the feeding process with the four sets of IR trigger sensors in the bill path.



4.1.1 Run – Value List

To check the gap adjustment by using the retrieved values.

5.Speed

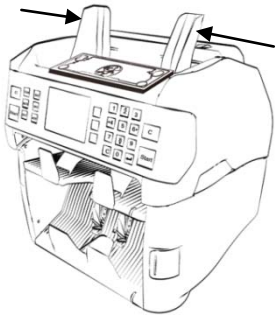
1. Choose a desired speed for testing.

4.Solenoid

2. Change the solenoid to a preferred position.

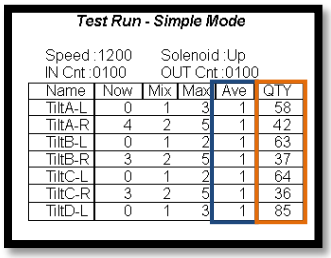
1.Run - Value List

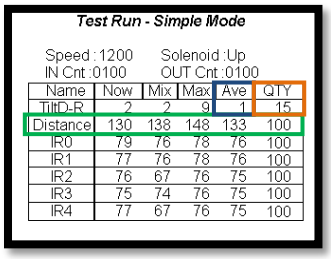
3. Start "Run – Value List" by pressing the " Start " after selecting on the item.



4. Place a bundle of 100 pcs test notes on the hopper and pull the hopper guide to fix the size of test note. The machine starts running once it detects notes on the hopper.

*Note: it can be operated with 100 pcs of US dollar notes.





5. Once notes proceed, sensors retrieve value and they are showed on the list.
   - AVE: Value of Tilt shall not over 2.
   - QTY: Value of L shall not over three times difference than value of R.
   - Distance: Value shall be between the range 120–150, and can't surpass 150 or be less than 120.

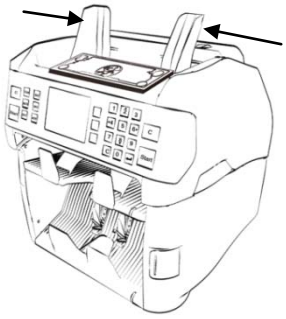
*Note: Repeat the same process FIVE times and the result should be similar. If two or more test results are not under acceptable range, please adjust the gap and test.

4.1.2 Run – Wavform

To check the gap adjustment by using the graphic wave formed by the retrieved value.

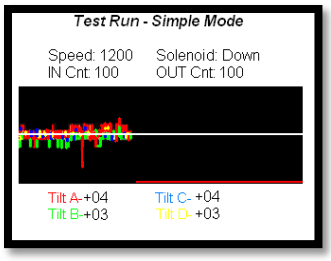
2.Run - Wavform

1. Enter “Run – Wavform” by press the “Start” after selecting on the item.



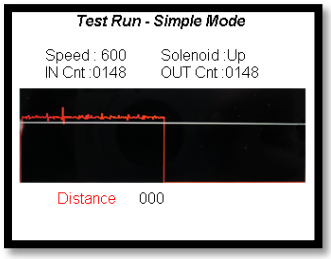
2. Place a bundle of 100 pcs test notes on the hopper and pull the hopper guide to fix the size of test note. The machine starts running once it detects notes on the hopper.

*Note: it can be operated with 100 pcs of US dollar notes.



3. The wave shall be drowned around the white line

*Note: If a majority of drowing is not on the white line, it is necessary to adjust the gap and test again.

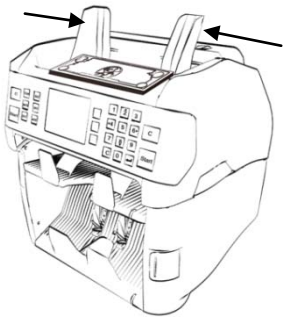


4. Press the direction key to switch to next page and see the wave form of distance.

*Note: If the drowing shows big waves and pops up and down, it is necessary to adjust the gap and test again.

4.1.3 Test Solenoid & Brake

To test the functionality of solenoid and brake (Manually start).

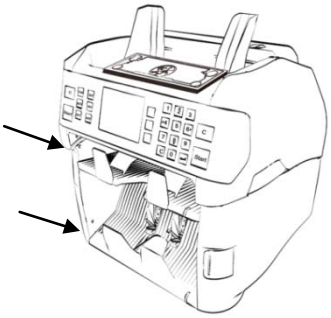


Place a bundle of 100 pcs test notes on the hopper and pull the hopper guide to fix the size of test note. The machine starts running once it detects notes on the hopper.

*Note: it can be operated with 100 pcs of US dollar notes.

3.Test Solenoid&Brake

Press the “Start” to activate the solenoid & Brake function.

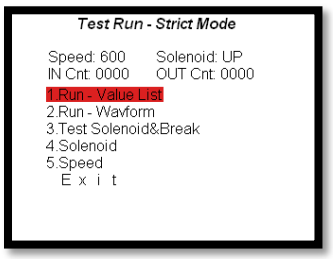


The machine counts and the solenoid toggles between reject pocket and stacker. Check the two pockets to make sure that banknote are separated equally in both pockets.

*Note: If the Solenoid &Break doesn't function well, please contact MA.

4.2 Test Run – Strict Mode

To test the feeding process with 128 pairs IR array and the four sets of IR trigger sensors in the bill path.



4.2.1 Run – Value List

To check the gap adjustment by using the retrieved values.

5.Speed

1. Choose a desired speed for testing.

4.Solenoid

2. Change the solenoid to a preferred position.

1.Run - Value List

3. Start "Run – Value List" by pressing the " Start " after selecting on the item.

4. Place a bundle of 100 pcs test notes on the hopper and pull the hopper guide to fix the size of test note. The machine starts running once it detects notes on the hopper.

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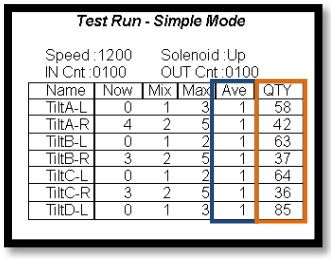

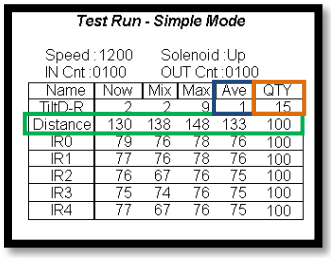

5. Once notes proceed, sensors retrieve value and they are showed on the list.
   - AVE: Value of Tilt shall not over 2.
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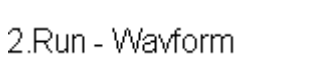
   - Distance: Value shall be between the range 120–150, and can't surpass 150 or be less than 120.

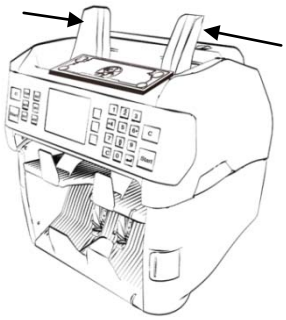
*Note: Repeat the same process FIVE times and the result should be similar. If two or more test results are not under acceptable range, please adjust the gap and test.

4.2.2 Run – Wavform

To check the gap adjustment by using the graphic wave formed by the retrieved value.

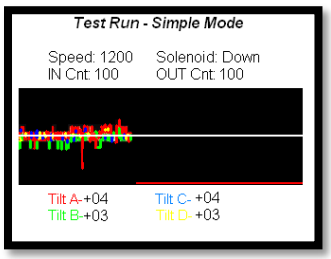


1. Enter "Run – Wavform" by press the "Start" after selecting on the item.



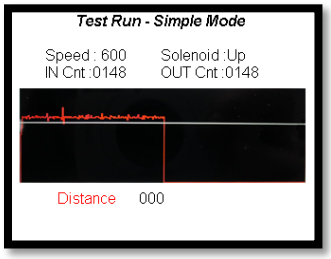
2. Place a bundle of 100 pcs test notes on the hopper and pull the hopper guide to fix the size of test note. The machine starts running once it detects notes on the hopper.

*Note: it can be operated with 100 pcs of US dollar notes.



3. The wave shall be drowned around the white line

*Note: If a majority of drowing is not on the white line, it is necessary to adjust the gap and test again.

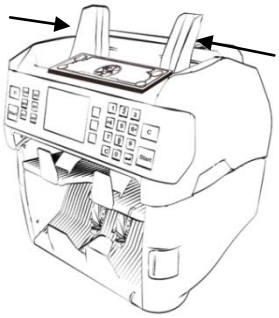


4. Press the direction key to switch to next page and see the wave form of distance.

*Note: If the drowing shows big waves and pops up and down, it is necessary to adjust the gap and test again.

4.2.3 Test Solenoid & Brake

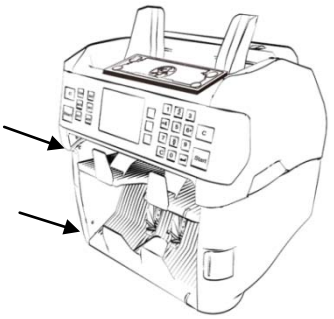
To test the functionality of solenoid and brake by using 128 pairs IR array (Manually start)



1. Place a bundle of 100 pcs test notes on the hopper and pull the hopper guide to fix the size of test note. The machine starts running once it detects notes on the hopper.

*Note: it can be operated with 100 pcs of US dollar notes.

2. Press the " Start " to activate the solenoid & Brake function.

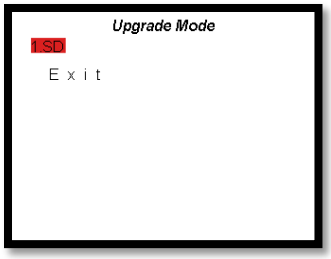


The machine counts and the solenoid toggles between reject pocket and stacker. Check the two pockets to make sure that banknote are separated equally in both pockets.

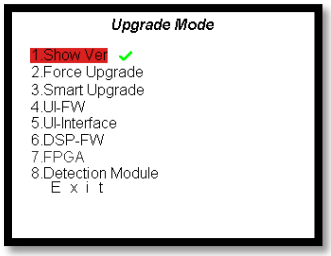
*Note: If the Solenoid & Break doesn't function well, please contact MA.

4.3 Upgrade Mode

Using supported devices to upgrade NC-5100.



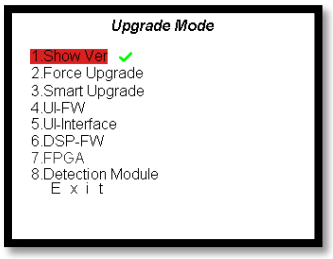
1. Insert SD card with upgrade firmware into the device.
2. Highlight the "SD" and press " Start " to enter the upgrade mode.



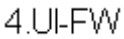
3. Once SD card is detected, a green mark ✔ shows next to the "Show Ver" option.

4.3.1 SD Upgrade

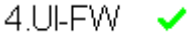
To upgrade the device with a SD card.



1. Once a SD card is detected, a green mark is shown next to "Show Ver" and the device is available to be upgraded via SD card. If not, a red cross is shown instead.



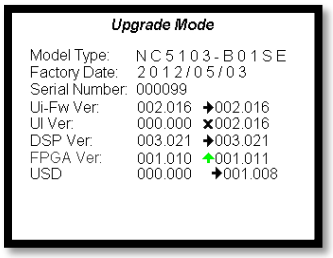
2. Highlight the desired option and press "Start" to upgrade.
3. A mark shall be shown next to the upgraded module. The following are the definitions of the status.

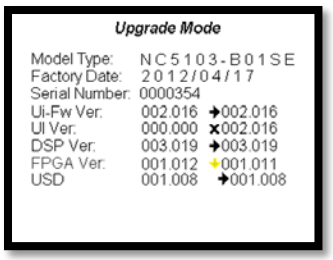


: On the process of upgrading module.
: The module has been upgraded correctly.
: Upgrading process is failed.

4.3.1.1 Show Ver

To check the available and currency firmware version.



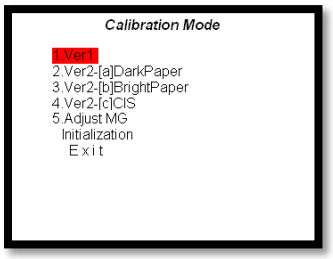


1. The current module version and the available version on the SD card can be checked here.
2. The following are the definition of different signs.

: A new version is found.
: Firmware data cannot be found.
: The same firmware as current version has been detected.
: The available version is older than current firmware is detected.

4.4 Calibration mode

To calibrate and/or adjust sensors



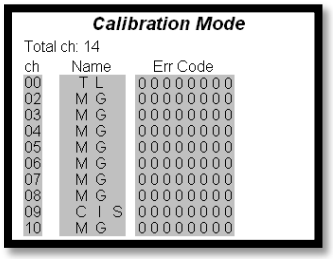
There are two versions of calibration mode, please follow the instruction carefully when calibrating the device.

4.4.1 Version 1

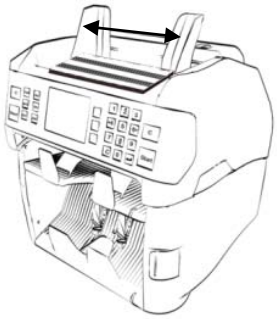
The first version of calibration mode, which shall be operated with the supported calibration paper.

1.Ver1

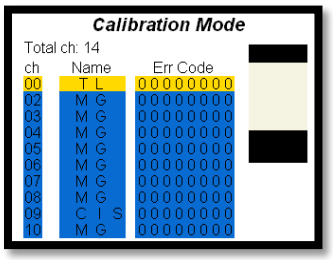
1. Highlight the “Ver1” and press the “Start” key to start the calibration process.



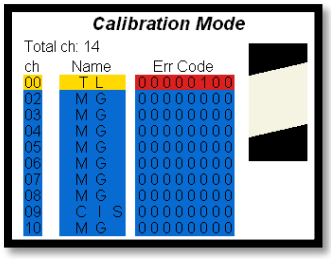
2. The device enters calibration mode.



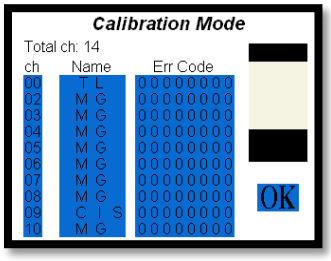
3. Push the hopper guide to maximum
4. Place 1 piece of calibration papers on the hopper.



5. The device runs the calibration paper automatically and verifies each calibrating process.
6. Keep feeding calibration paper to continue the process



7. When a calibration paper enters crookedly, the calibrating data will not be adopted and an error code shows on the display.



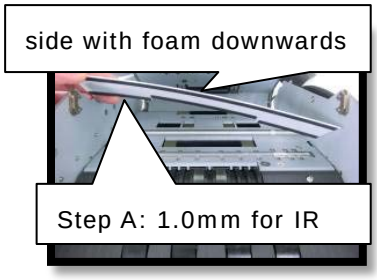
8. Repeat feeding one piece of calibration paper until the display shows “OK”.
9. Once the calibration process is done, turn off the device.

*Note: Please do not process the calibration with dusted calibration paper.

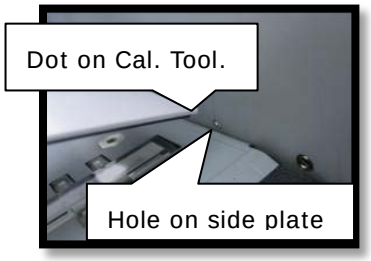
4.4.2 Version 2

The second version of calibration mode, which shall be operated with plastic calibration plates.

Step A: Transmission Calibration.

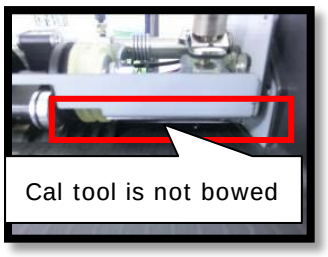


1. Open the lid and insert the Calibration tool A (1.0mm for IR), side with foam downwards.



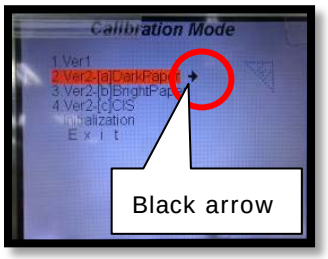
2. Insert the dots on calibration tool to the holes on side plates.

3. Adjust the position of the Cal tool to the center part of the bill path.

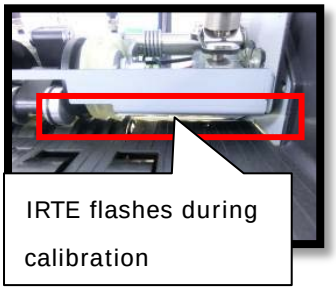


4. Close the Lid, check if the Cal tool is placed properly, no bending.

2.Ver2-[a]DarkPaper

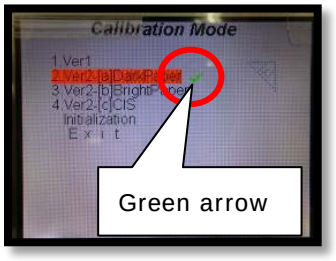


5. Move cursor to “2.Ver2-[a]Darkpaper” and press “ Start ”, a black arrow appears.

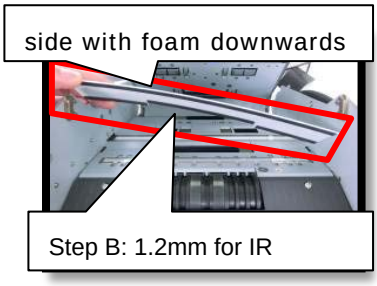


6. IRTE lights up for 3sec.

Green arrow appears, calibration done.

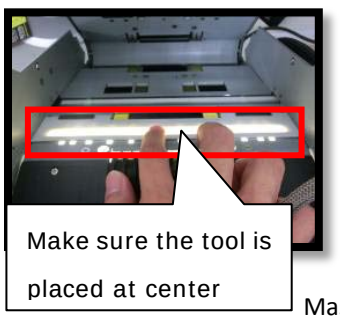


Step B: Transmission Calibration



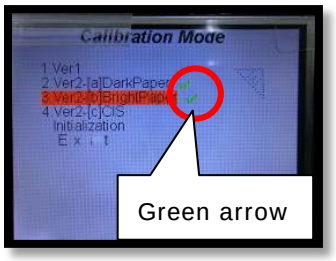
1. Open lid and remove calibration tool A (1.0mm For IR).

2. Insert the Calibration tool B (1.2mm for IR), side with foam downwards.



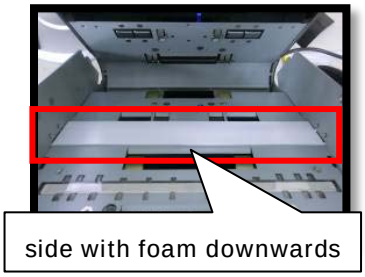
3. Close the Lid, check if the Cal tool is placed properly, no bending.

3.Ver2-[b]BrightPaper



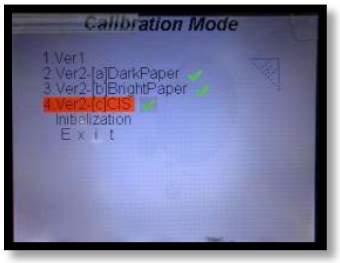
4. Move cursor to “3.Ver2-[b]BrightPaper” and press “Start”, a black arrow appears.
5. Wait until green arrow appears, calibration done.

Step C: CIS Calibration



1. Open lid and remove calibration tool B (1.2mm for IR). Insert the Calibration tool C (1.2mm for CIS),side with foam downwards.

4.Ver2-[c]CIS



2. Move cursor to “4.Ver2-[c]CIS”, and press “Start”, a black arrow appears.
3. Wait until green arrow appears, calibration done.
4. Open lid and remove calibration tool C (1.2mm for CIS).

4.4.3 Adjust MG

To adjust the retrieved value of magnetic sensor.

5.Adjust MG

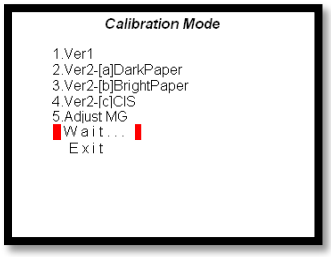
1. Highlight the option and press “Start”.
2. Adjust the value of magnetic sensor by pressing the keys “2” and “8”. (from 000 to 128)

Note: To adjust the MG value, please contact MA.

4.4.4 Initialization

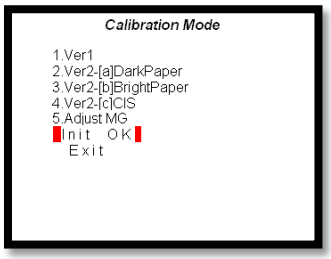
Initializing the sensor.

nitialization 4



*Note: Initialization shall only be executed with indication from MA.

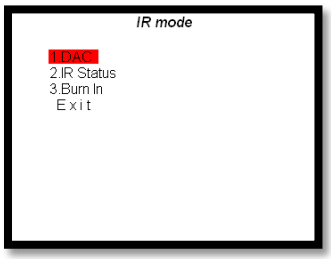
1. Press the "Start" key for the initialization and the display shows "Wait…". Do not touch any button and wait until the process is finished.



2. Once the initialization process is done, the display shows "Init OK".
3. Calibrate the device immediately.

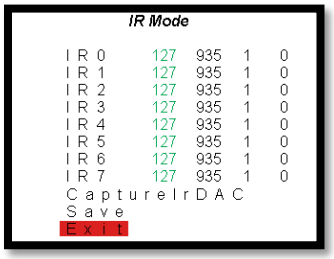
4.5 IR Mode

To check the status of IR sensors and triggers.

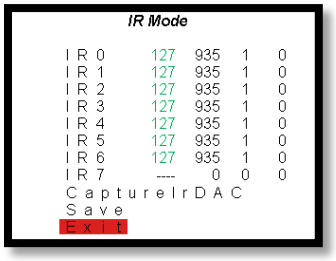


4.5.1 DAC

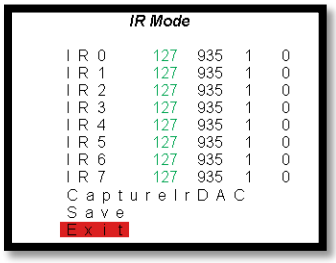
To check the DAC value from the eight triggers in the bill path.



1. Highlight "CaptureIrDAC" and press the "Start", the values vary.



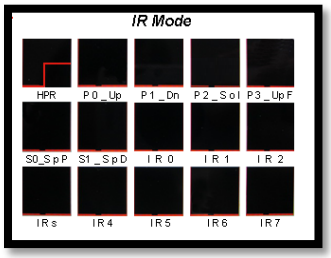
2. If there is any value showed "---" as the picture shows on the left side, please contact MA.

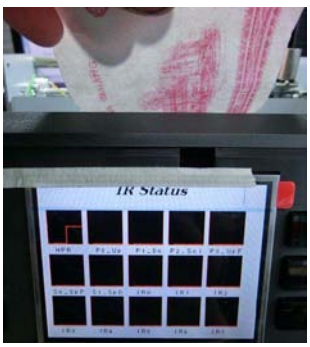


3. To go back to upper layer under, highlight "Exit" and press the "Start".

4.5.2 IR Status

To see the IR triggers' reactions.





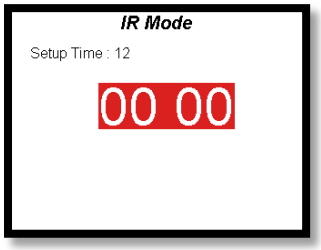
1. Once a IR sensor is covered, the curve on the display reacts. Users may use hand or supporting items to cover sensors and test the status of IR sensors.

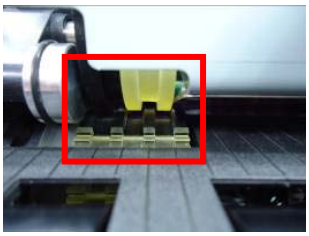
2. The following are the actions to get reaction from IR sensors.
   - HPR: Cover the trigger.
   - P 0-Up: Open top bill path
   - P 1-Dn: Open bottom bill path
   - P 2-Sol: Solenoid is up.
   - P 3-UpF: Reject pocket is full.
   - S0-SpP: Check notes in reject pocket.
   - S1-SpD: Stacker is full.
   - IR0 – IR3: Sensors in top bill path. When top bill path is opened, there are reactions on the 3 channels.
   - IR4 - 7: Sensors in bottom bill path. When top bill path is opened, there are reactions on the 4 channels.

4.5.3 Burn in

To burn in the 128 set IR array. [Factory used only].

3.Burn in

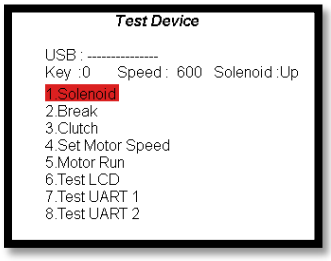




1. Highlight the option and press "Start" to enter the burn in mode.
2. Press "Start" to burn in IR array which will can keep the sensor in a stable situation.
3. Use "2" and "8" to set the burn in time, and press "Start" to activate. IR array lights up while burn in is under processing.
4. Check the rollers and ensure each cog gears smoothly.
5. Press "C" to stop the burn in function and press "C" again to go back to the upper layer.

4.6 Test Device

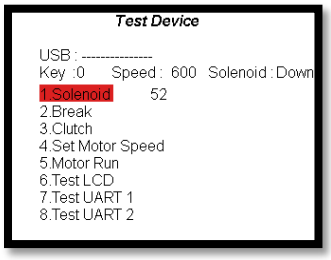
To test the functionalities of all the parts and to make sure the stability of machine.



4.6.1 Solenoid

To test the reaction time of solenoid.

1.Solenoid



1. Highlight the option and press "Start" key.
2. Solenoid toggles between UP and DOWN to stacker pocket and the display shows a speed.

4.6.2 Machine Running Status

Testing the machine for basic running status under different speeds.

4.Set Motor Speed

1. Set a preferred speed for testing the device.
2. Different speed can be set by press "Start" key: 600, 650, 700, 800, 900, 1200, 1500, Min and Max.

5.Motor Run

3. Highlight the option "Motor Run" and press "Start" key.
4. Motor starts running.

5.Motor Stop

*Note: The option "Motor Run" changes to "Motor Stop".

3.Clutch

5. Highlight the option "Clutch" and press "Start" key. Feeder and kicker wheels start running.

2.Brake

6. Highlight the option "Break" and press "Start" key. Check if the break stops feeder and kicker wheels.

5.Motor Stop

7. Once confirming all works well, Highlight the option "Motor Stop" and press "Start" key.

5.Motor Run 34657

8. A number of Encoder is showed on the right side of the "Motor Run"

4.6.3 Test LCD

Testing the functionality of LCD display.

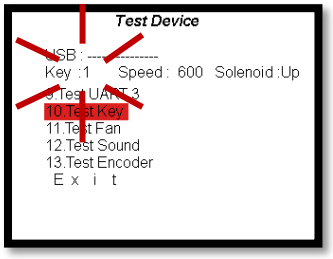
6.Test LCD

1. Highlight the option and press "Start" key.
2. The display shows RED, GREEN and BLUE continually, then it goes back to the test mode.

4.6.4 Test Key

Testing the functionality of each key.

10.TestKey



1. Press a key, the key number shows on the top left side of the screen.
2. When pressing different key, a reaction number shows on the display.

4.6.11 Test Fan

Testing the functionality of fan.

11.Test Fan

1. Highlight the option and press “ Start ” key.
2. The fan starts running. Put a hand on the back side of the device to feel if the fan works properly.
3. Press “ Start ” key again to stop it.

4.6.12 Test Sound

Testing the functionality of sound.

12.Test Sound

1. Highlight the option and press “ Start ” key. A testing sound can be heard.

4.6.13 Test Encoder

Testing the functionality of encoder.

13.Test Encoder

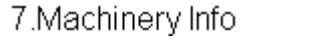
1. Highlight the option and press “ Start ” key. The motor starts running a certain time.

13.Test Encoder 6864

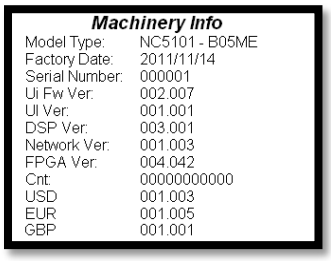
2. A number of Encoder is shown on the left side of the option. The shown number of every should the similar.

4.7 Machinery Info

To look over the date of production, serial number and firmware version on the machine.

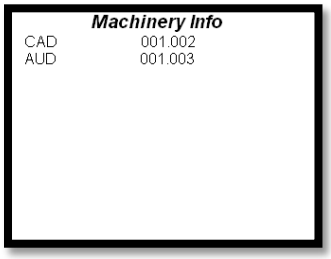


1. Use the direction keys to highlight “Machinery Info” under the main menu, and press “Start” for confirming selection.



2. All the versions information of firmware and detection is showed on the display.

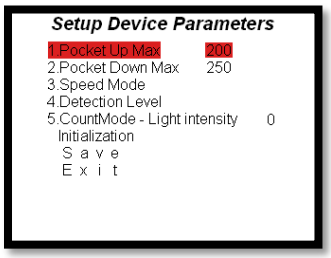
*Note: If currency list isn’t shown completely on the display, please press 8 to move to next page.



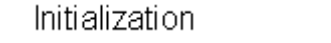
3. Press “8” to see the completed currency version.
4. Press “C” to go back to upper layer.

4.8 Setup Device Parameters

To change the machine setting parameters.



1. Use the direction key to highlight the option and press the “Start” to toggle between options.
2. After modifying the setting, highlight SAVE and press “Start” to confirm setting. Once the display shows “SAVE OK”, the modification is saved.
3. To go back to factory default setting, highlight the initializaiton and press “Start”.



*Note: It’s suggested to use default setting on the device.

4.8.1 Capacity of pockets

To change the default capacity of pockets.

1.Pocket Up Max

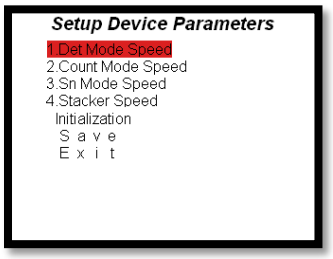
2.Pocket Down Max

1. To change the maximum capacity of banknote for reject pocket.
2. To change the maximum capacity of banknote for stacker.
   - Options: 50, 100, 150, 200, 250, 300, 350, 400

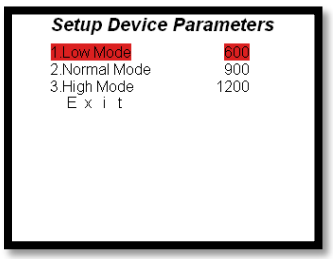
*Factory Deault Setting:
-Pocket Up (reject pocket): 100
-Pocket Down (stakcer): 250.

4.8.2 Speed mode

To change the setting of speed.



1. Highlight the desired speed mode and press "Start" to change the low, normal and high mode speed settings.
   - Options: 600, 650, 700, 800, 900, 100, 1200, 1500.



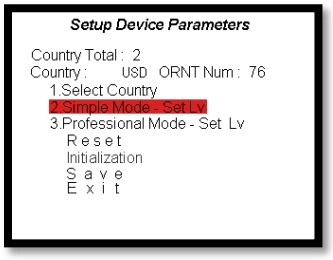
2. Press "Save" to keep the change of setting and press "Exit" to go back to the upper layer.

*Factory Deault Setting for Detection and SN mode:
- low 600, normal 900, high 1200.

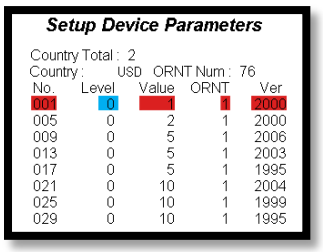
*Factory Deault Setting for Count mode:
- low 600, normal 900, high 1500.

4.8.3 Detection Level

Modify the sensor intensity on different denomination of currency.



1. Press "Start" again and choose the desired orientation, denomination and banknote version with direction keys.
2. Press "Start" then use direction keys to change the set level of intensity from -10(low) to 10(high).



3. To confirm the setting, press "Start".

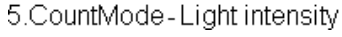
4. Press "C" to go back to the upper layer.

5. Press "save" to keep the change of setting.

*Note: It's suggested to use default setting on the device. All the initialzed value of detection level shall be 0.

4.8.4 Count Mode Intensity

Modify the sensor intensity for count mode.



1. Highlight the "Count Mode-Light intensity" and change the level of intensity 0(low) to 3(high) in count mode by pressing "Start".

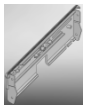
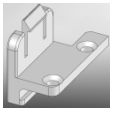
Note: It's suggested to use default setting on the device. Value of initialization should be 0.

Chapter 5 NC-5100 part list and Disassembly

5.1 Tool preparation

	Screwdriver (+)
	Screwdriver (-)
	Long Nose Plier
	7 mm Wrench
	3 mm Hex Key
	1.5 mm Hex Key

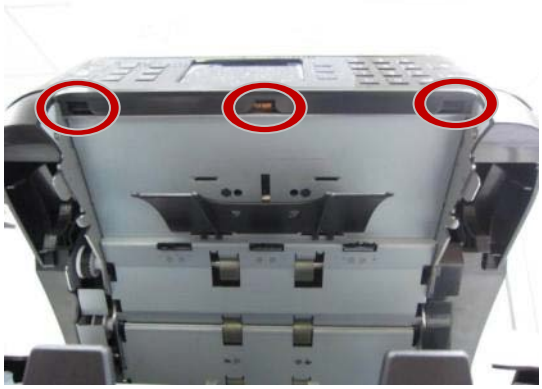
5.2 Housing

No	Part Name	Accessory Code	Picture	Q'ty
1	UI panel	3PP72110080030		1
2	Top module lid	3PP02110100010		1
3	Banknote guide bracket	3PP72110100020		1
	Banknote guide holder - R	3PP52110100000		1
	Banknote guide holder - L	3PP52110100010		1

	Banknote guide - R	3PP92110100020		1
	Banknote guide - L	3PP92110100010		1
4	Middle module housing - R	3PP42110090001		1
5	Middle module housing - L	3PP32110090001		1
6	Bottom module housing - R	3PP42110090010		1
	Power button	3PP62110090030		1
	PCB board: NC5100-PLED	S-BNC5100A24		1
7	Bottom module housing - L	3PP32110090010		1
8	Bottom module rear panel	3PP22110100001		1

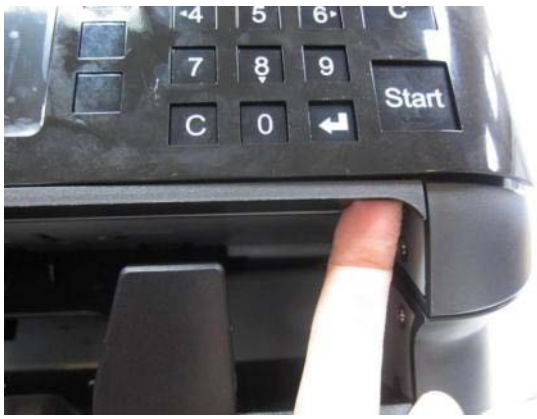
5.2.1 UI Panel

1. Prepare the machine and all the necessary tools.



2. Open the conveyer path.

3. Find the three buckles of the control panel on the top of reject pocket.



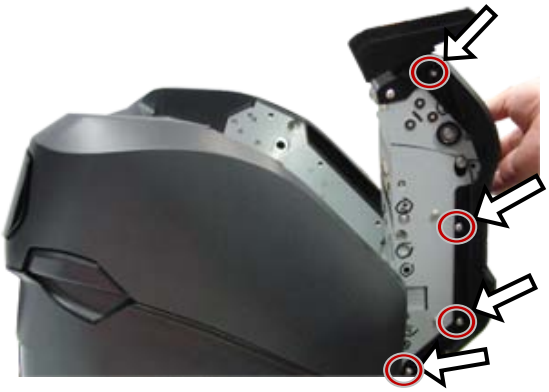
4. Undo the three buckles to remove the control panel cover.

5. Use the nail to pull upward the right side of control panel cover.

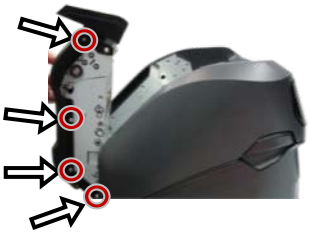
6. Push the control panel cover toward the right side.

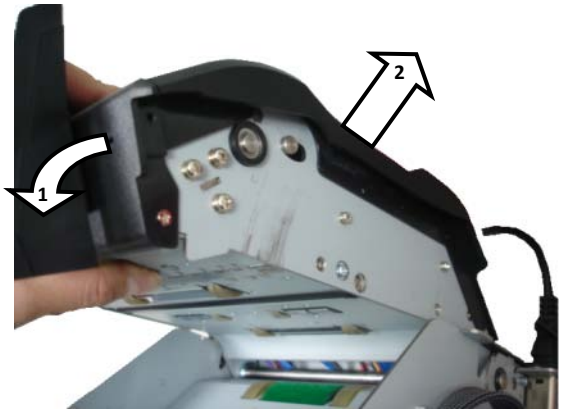
7. The control panel cover is removed.

5.2.2 Top Module Lid



1. Open the bill path and use screw driver (+) to loosen the screws on both sides. (Total: 8 screws.)

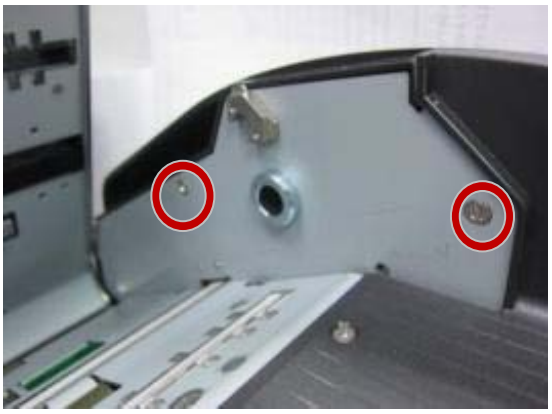




2. Pull the hopper set toward and remove the top housing.

3. Loosen the last screws on the hopper set and remove it.

5.2.3 Middle Module Housing



1. Loosen the two screws of the right side in the bill path.

2. Open the conveyer path and loosen the screw on the right side.
   *There are two screws on the left side.

3. Turn the machine to the rear side and loosen the screws on top side housings.

4. Open the conveyer path again and loosen the screw on the right side of the reject pocket.

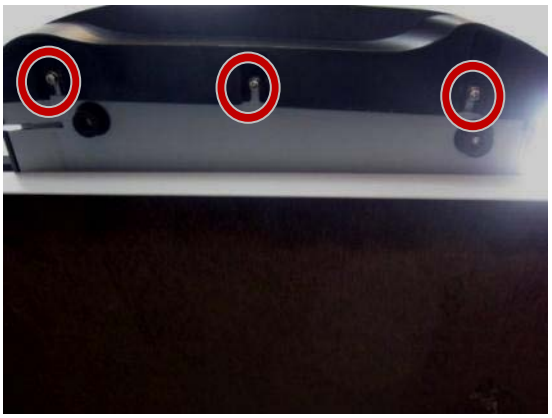
5. Remove the right top side housing.

*Repeat from the steps 4 to 14 to disassemble the left top side housing.

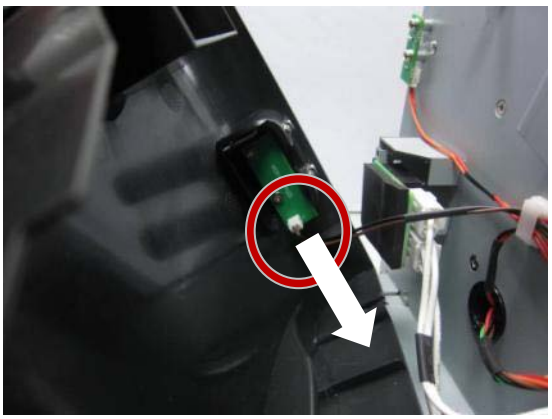
5.2.4 Bottom Module Housing

1. Loosen the two screws on the back side of the bottom side housings.

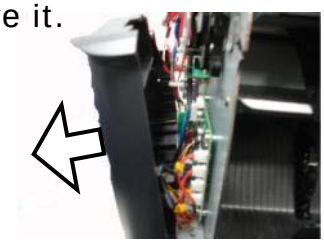
2. Loosen the screw on bottom right side of the reject pocket.



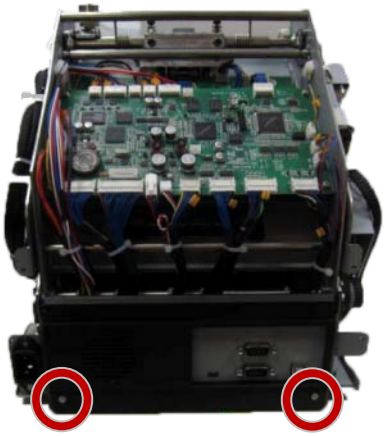
3. Remove the screws on the bottom of the device. There are three screws on each side.



4. The bottom right side housing has a power switch button cable. Disconnect the cable before remove it.



5.2.5 Bottom Module Rear Panel

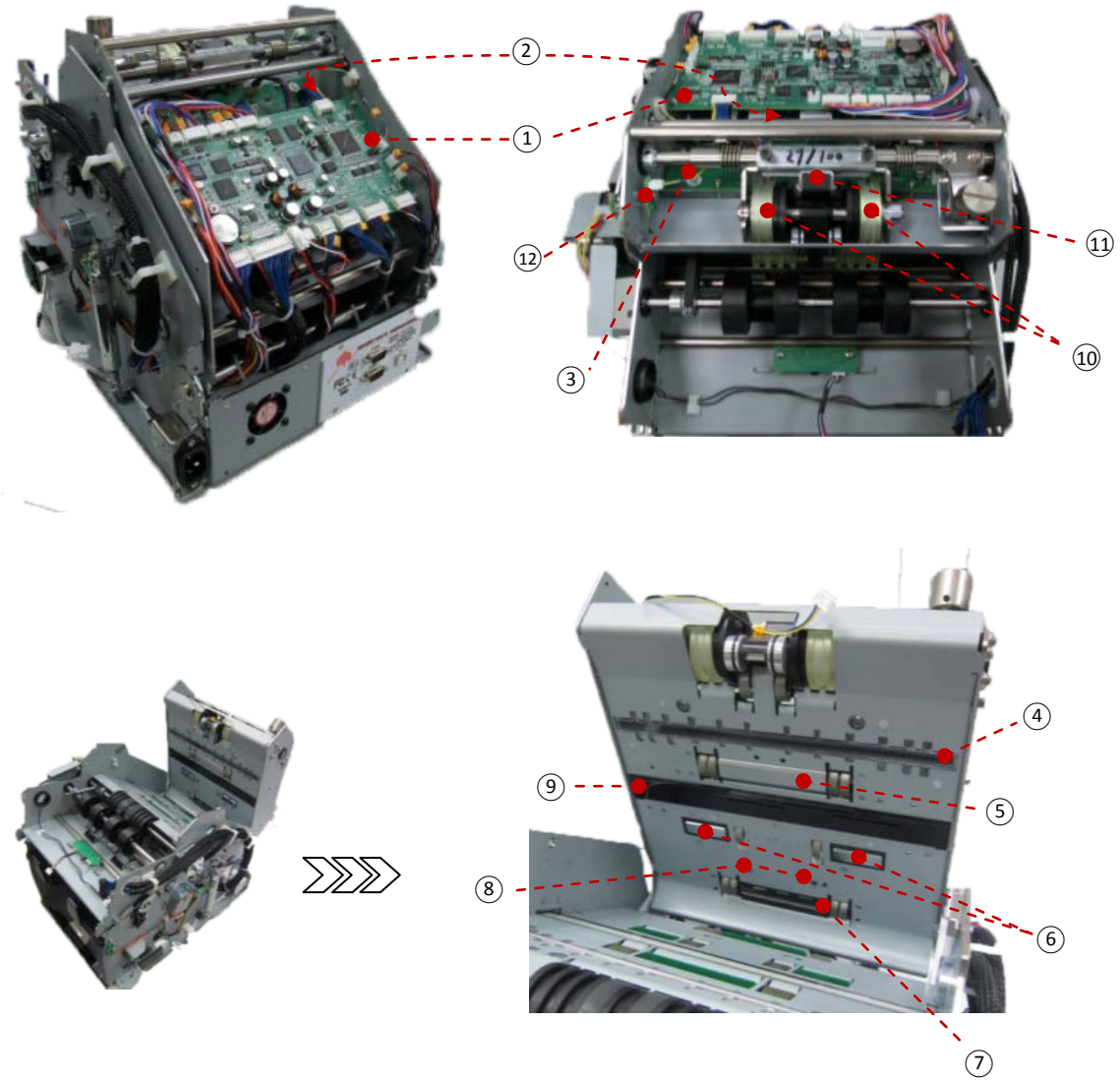


1. After all the screws are dismounted, the bottom side housings are removed.

*Repeat from the steps 9 to 11 to disassemble the left bottom side cover.

2. Turn the device to the back side and loosen the two screws to disassemble the back housing –bottom.

5.3 Top Module

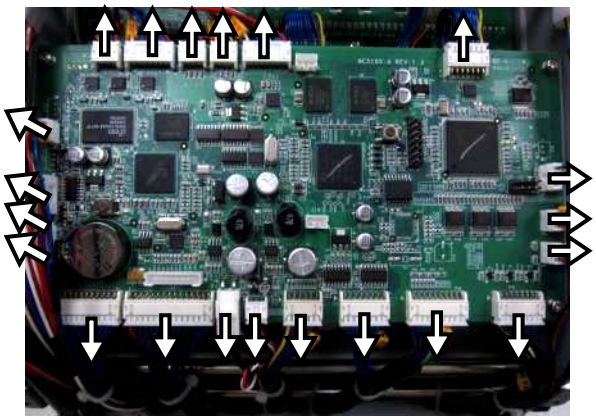


No	Part Name	Accessory Code	Picture	Q'ty
1	PCB board: NC5100-A	S-BNC5103A01		1
2	PCB board: NC5100-S	S-BNC5103A02		1
3	PCB board:NC5100-IRTR2	S-BNC5100D01		1
4	IR-GUARD set	3PP82400000070		1
		3OC26410000000		1
5	PCB board:NC5100-M134	S-BNC5100A06	 	1
6	PCB board:NC5100-M137	S-BNC5100B05		2
7	NC5100-MT sensor	3RPA3150220030		1
8	PCB board: NC5100-DTR	S-BNC5100C04		1

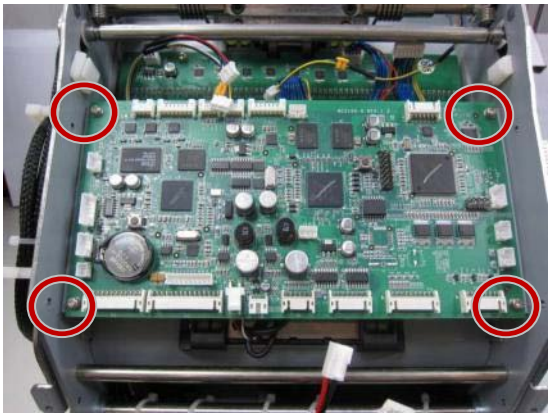
9	Transmission emitter housing	3PP52400100090		1
10	Singler roller module	RPNC5100037100		1
	Sub singler roller	TPNC5100054500		1
	Sub singler roller bracket	3PP52210100030		1
	Singler bracket	3NC51500120130		1
11	Passive roller type A	3RPA3100000000		1
	Passive roller type B	RPNC5100107100		
	Singler passive roller bracket	3PP52210100021		1
12	PCB board: NC5100-TR	S-BNC5100B13		1

5.3.1 PCB NC5100-A board

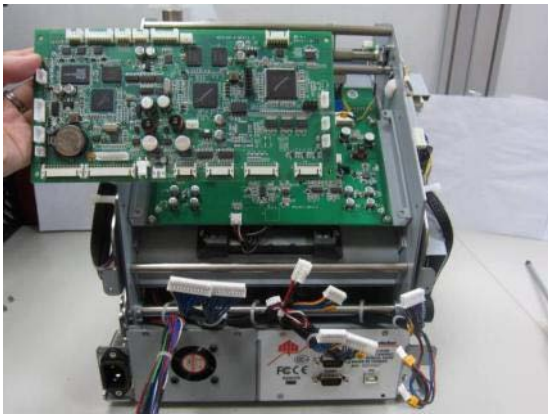
1. Turn the device to the back side.



2. Disconnect all the cables (twenty one) on the NC5100-A board.

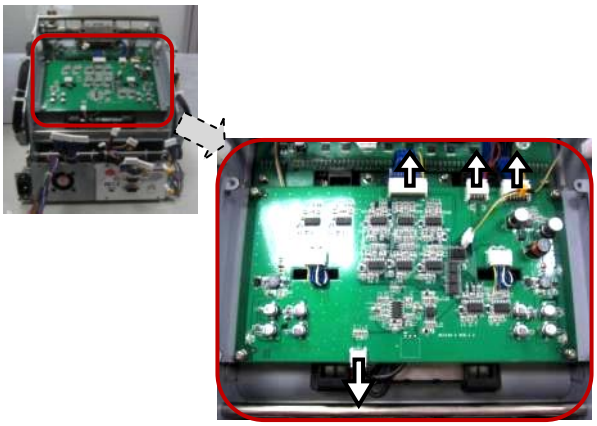


3. Loosen the four screws on the NC5100-A board.

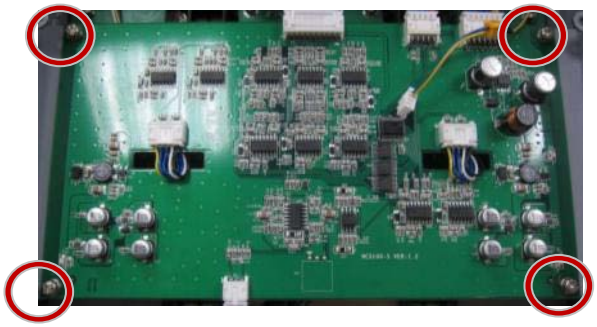


4. The NC5100-A board is disassembled.

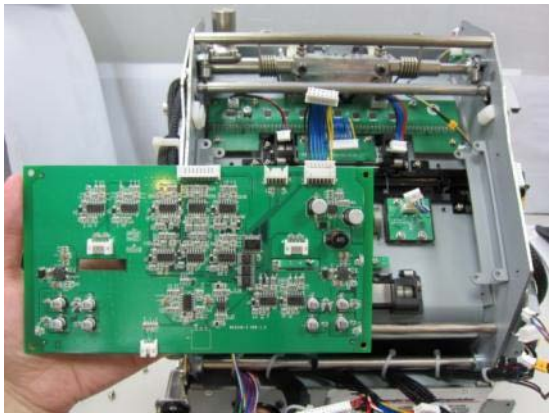
5.3.2 PCB NC5100-S board



1. Disconnect the cables on the NC5100-S board.

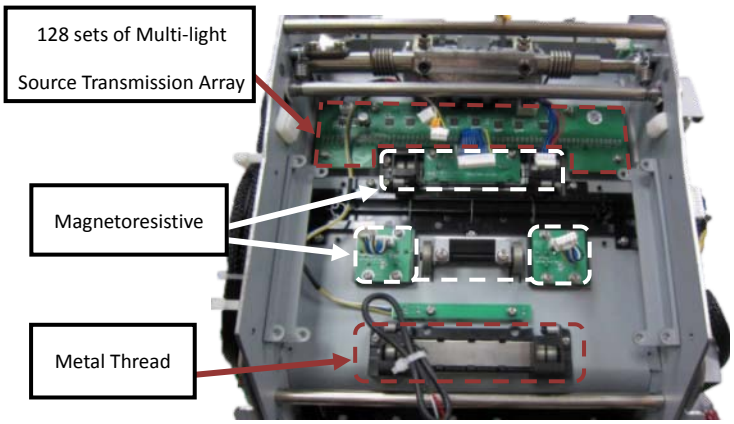


2. Loosen the screws on the NC5100-S board to disassemble it.



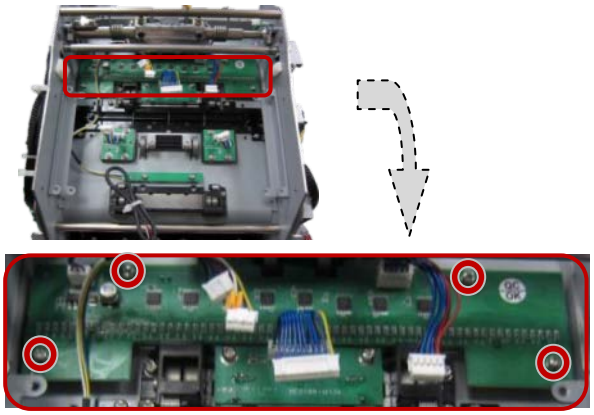
3. NC5100-S board is removed.

5.3.3 Top Module Sensor

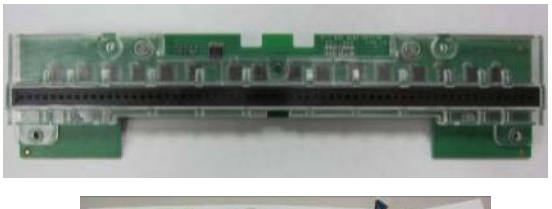


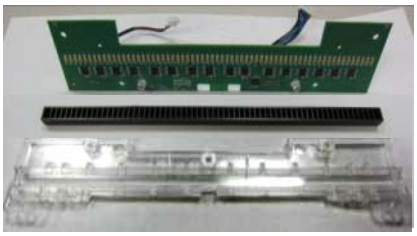
The sensors in the top module are located as the picture on the left side.

5.3.3.1 PCB NC5100-IRTR2 board



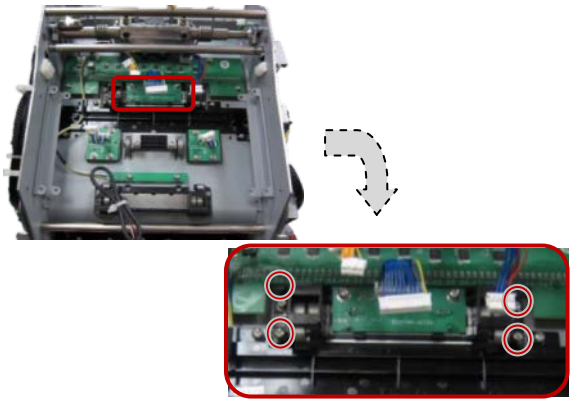
1. Loosen the four screws on the NC5100-IRTR2 board.





2. The NC5100-IRTR2 board and IR-GUARD set are disassembled.

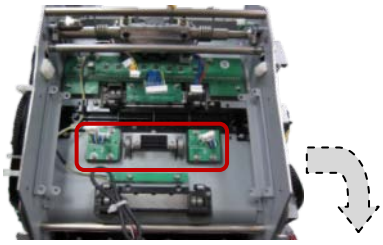
5.3.3.2 PCB NC5100-M134 board



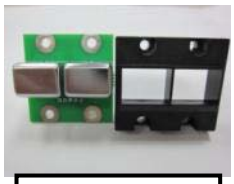
1. Loosen the four scews on the NC5100-M134 MR set.

2. NC5100-M134 MR set is disassembled.

5.3.3.3 PCB NC5100-M137 board



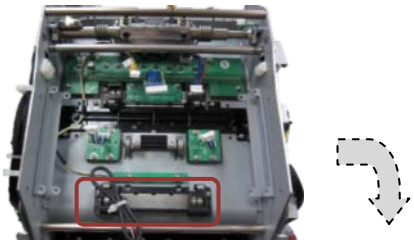
1. Loosen the four screws on the two pieces of NC5100-M137.



NC5100-M137

2. The two pieces of NC5100-M137 are disassembled

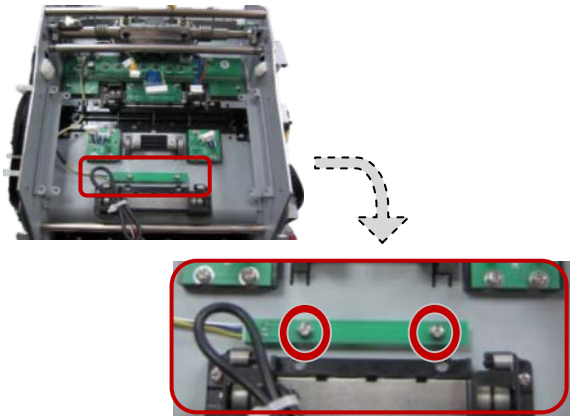
5.3.3.4 NC5100-MT sensor



1. Loosen the screws on the metal thread sensor set to disassemble it.

2. The NC5100-MT sensor is removed.

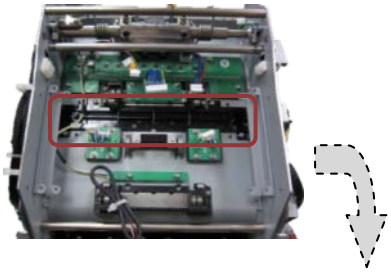
5.3.4 PCB NC5100-DTR board



1. Loosen the two screws on the NC5100-DTR board.

2. The NC5100-DTR board is disassembled.

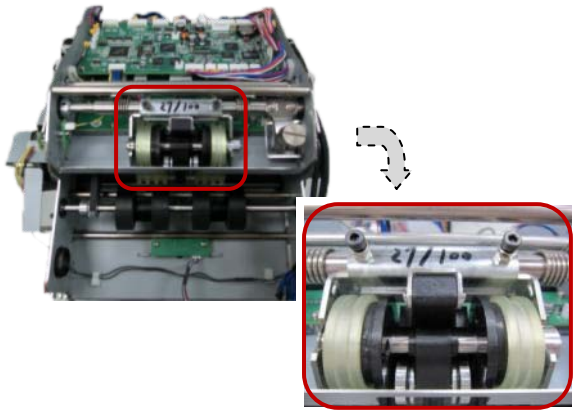
5.3.5 Transmission Emitter Housing



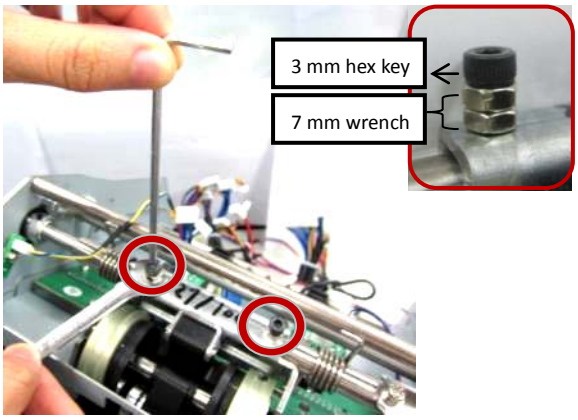
1. Loosen the five screws on the transmission emitter housing.

2. The transmission emitter housing is disassembled.

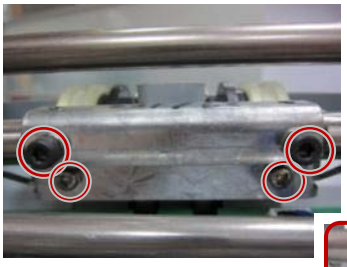
5.3.6 Top Feeding Wheel Set



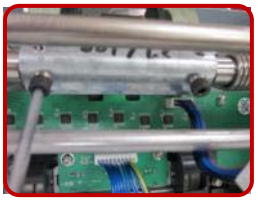
1. Find the upper feeding wheel set.



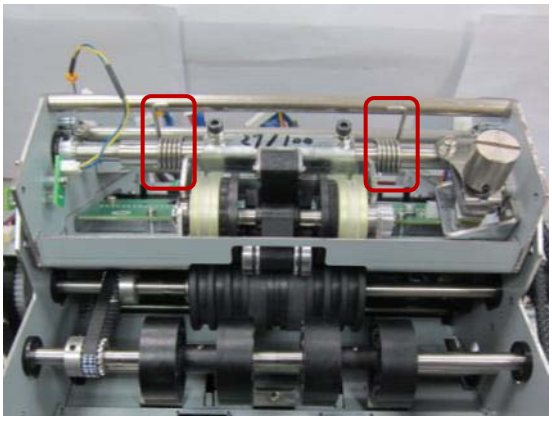
2. Use a 7 mm wrench to steady the nuts and loosen the hex flange with a 3 mm hex key.



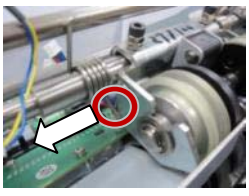
3. Trun the machine to the rear side and use the 3 mm hex key to loosen the two hex flange.

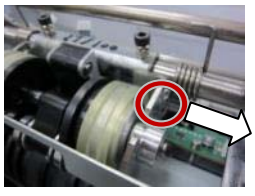


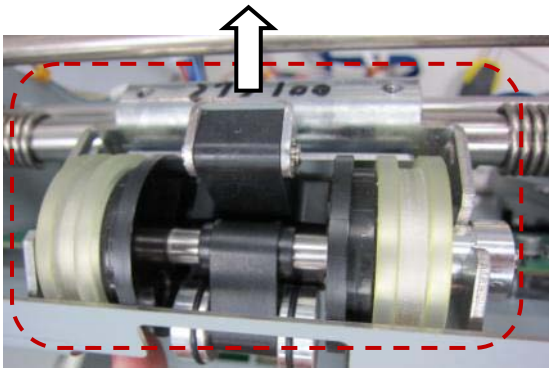
4. Loosen the two screws on the bottom with screwdriver.



5. Release the springs in the both sides of the upper feeding wheel set.



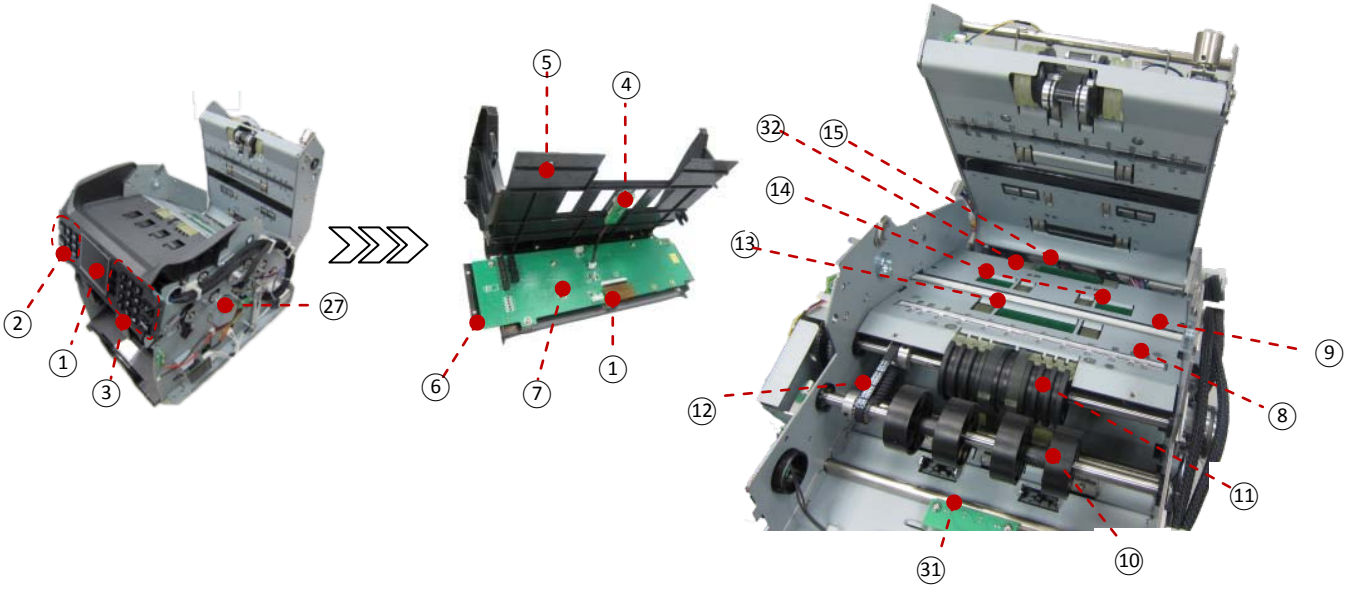


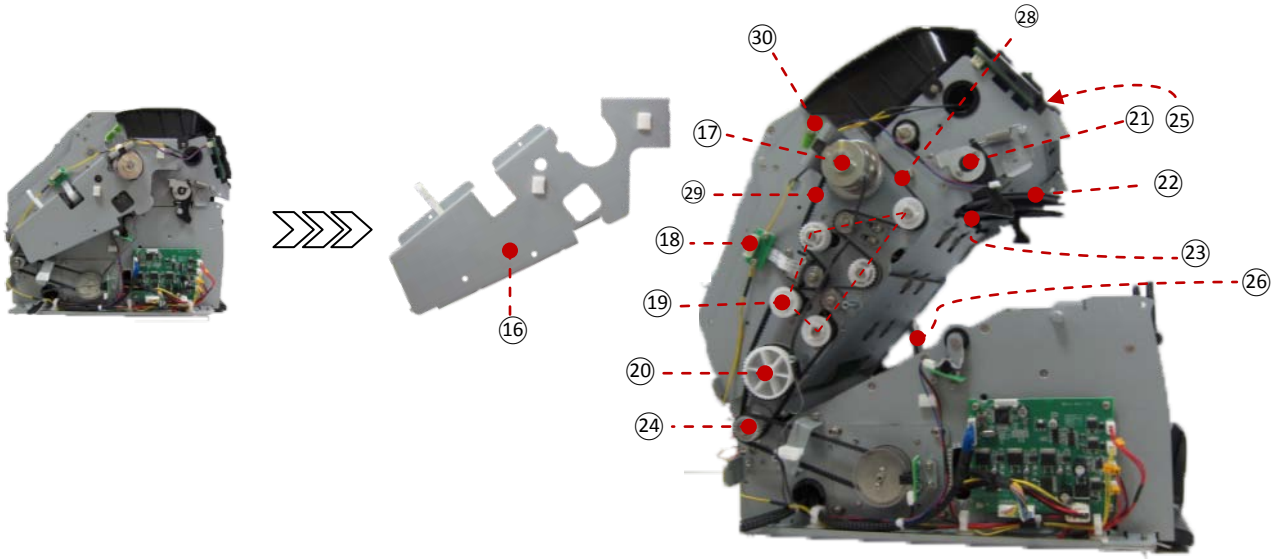


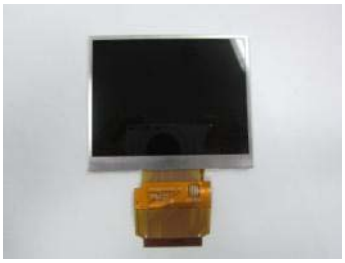
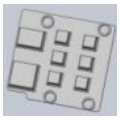
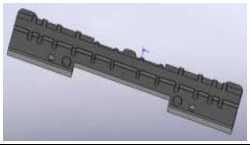
6. Hold the upper feeding wheel set and remove it from the device.

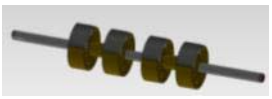
7. The upper feeding wheel set is disassembled.

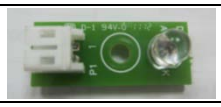
5.4 Middle Module





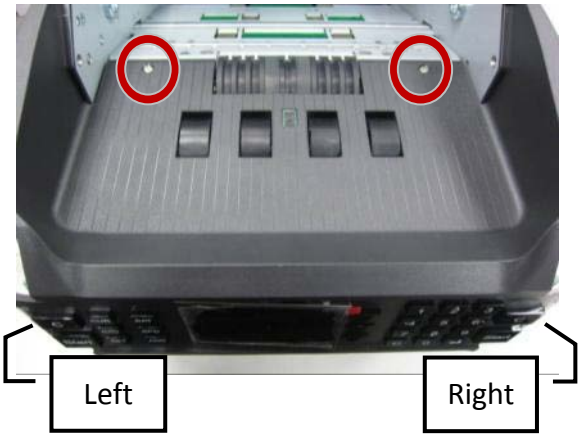
No	Part Name	Accessory Code	Picture	Q'ty
1	LCD display module	C-L00010		1
2	NC5100-button-Right	3PP62114100060	 	1
		3RP13400000010		1
3	NC5100-button-Left	3PP62114100050	 	1
		3RP13400000000		1
4	PCB board: NC5100-FT	S-BNC5100B16		1
5	Hopper	3PP72110090001		1
6	UI bracket	3PP72110090010		1
7	PCB board: NC5100-UI	S-BNC5100B08		1
8	PCB board: NC5100-IRRE	S-BNC5100C07		1
	Transmission emitter cover	3PP52010110070		1
	Transmission sensor housing	3PP52110100082		1

9	Contact Image Sensor	C-E00003		1
	FCC cable	C18AF18BF200		1
10	Kicker roller module	RPNC5100012500		1
11	Feeder roller module	RPNC5100027100		1
12	Timing Belt A (144-S3M*6mm)	LB048S3M060100		1
13	Conveying Roller module A	3RPA3150220020		1
14	Conveying Roller module B	3RPA3150220030		1
15	Conveying Roller module C	3RPA3150220040		1
16	Gear protection cover	3NC30800120021		1
17	Clutch	3OP00000000000		1
18	PCB board: NC5100-CIS	S-BNC5100B21		1
19	Timing gear A (S3M*23T)	PPNC5100061600		5
20	Timing gear B (S3M*43T)	PPNC5100071600		1
21	Mid module latch - L	3NC30800120040		1
		3PP62610100020		1
22	Reject pocket note holder	3PP92110100000		1

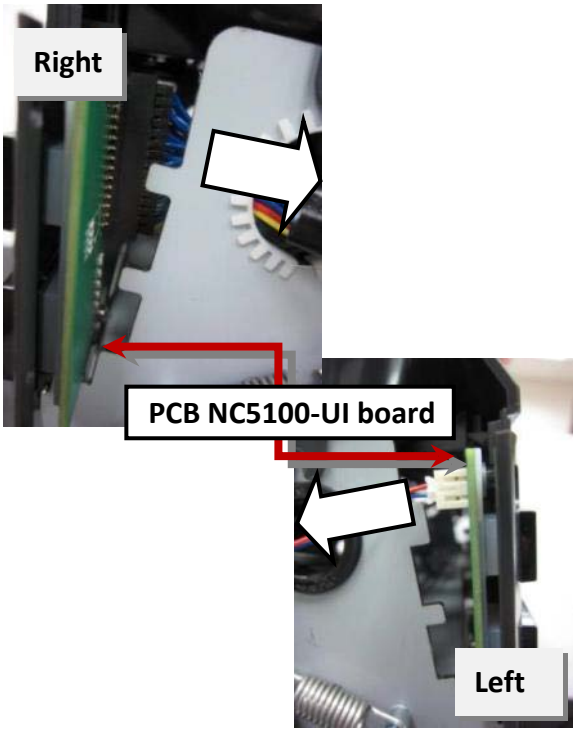
23	Static brush	3OC25390000000		3
24	Bearing type A	BE0688ZZ160510		
25	Mid module latch – R	3NC40800120020		1
		3PP62610100020		1
26	Gas spring	GS063811DEWDF0		1
27	Brake	OSPBRA11203110		1
28	Timing Belt B (192-S3M*6mm)	LB064S3M060100		1
29	Timing Belt D (633-S3M*6mm)	LB211S3M060100		1
30	PCB board: NC5100-TE	S-BNC5100B12		1
31	PCB board: NC5100-RJP	S-BNC5100B09		1
32	PCB board: NC5100-DTE	S-BNC5100C05		1

5.4.1 Hopper Set

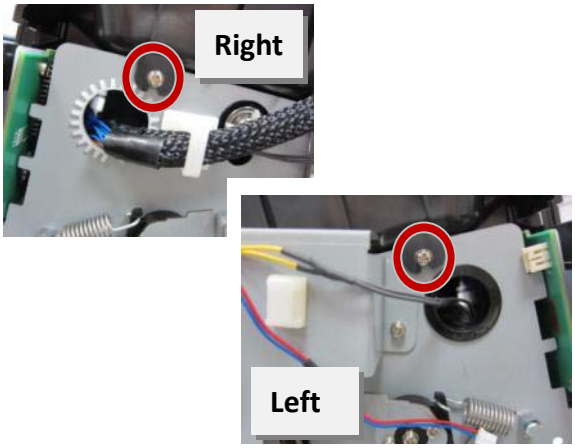
5.4.1.1 Hopper Set



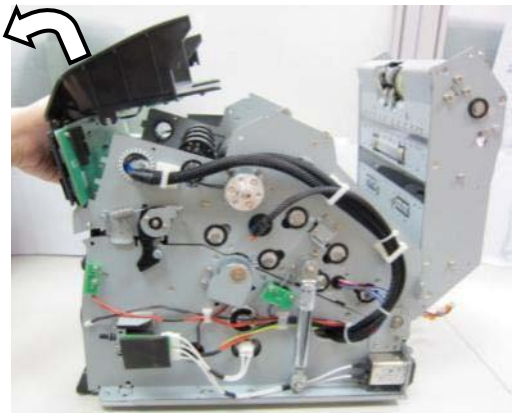
1. Open the top bill path.
2. Loosen the two screws on the hopper.



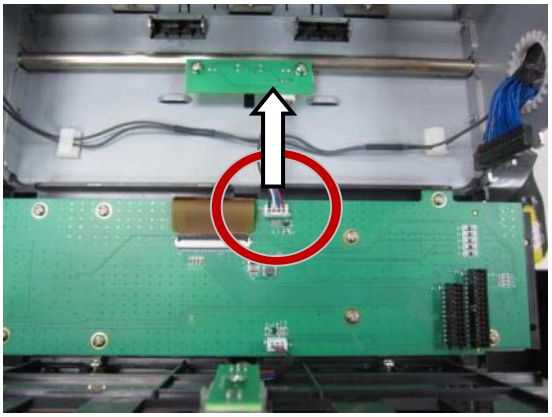
3. Disconnect the cables on the both sides of the NC5100-UI board.



4. Loosen the two screws on the both side of hopper.

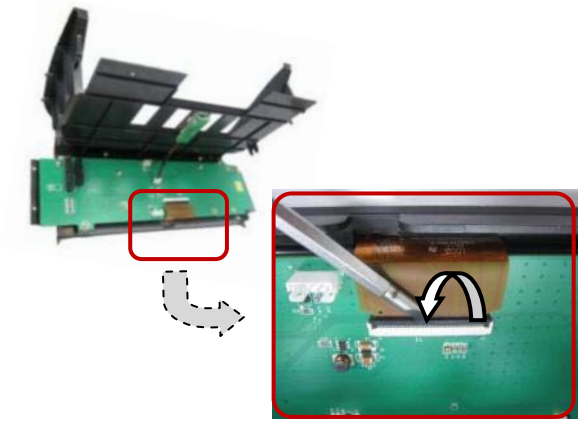


5. Pull the hopper set toward.

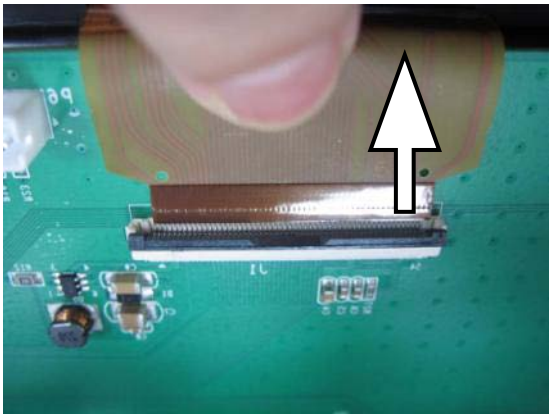


6. Disconnect the cable and the hopper set is removed.

5.4.1.2 LCD Display Module



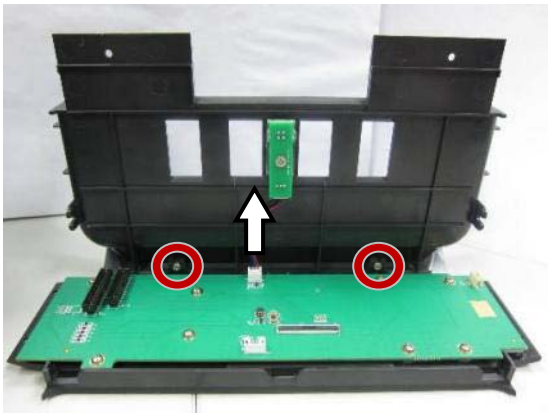
1. Use a screw driver (-) to open the cable connecter.



2. Pull out the cable of LCD display.

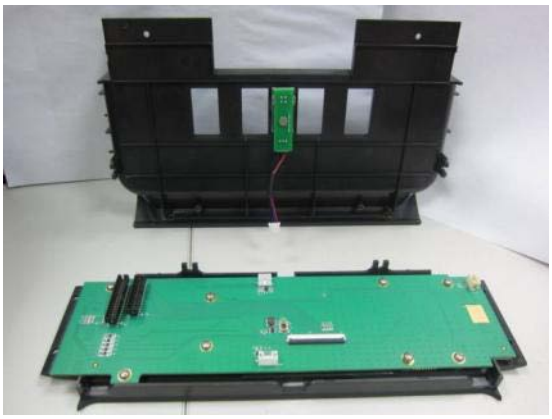
3. The LCD display is disassembled.

5.4.1.3 Hopper



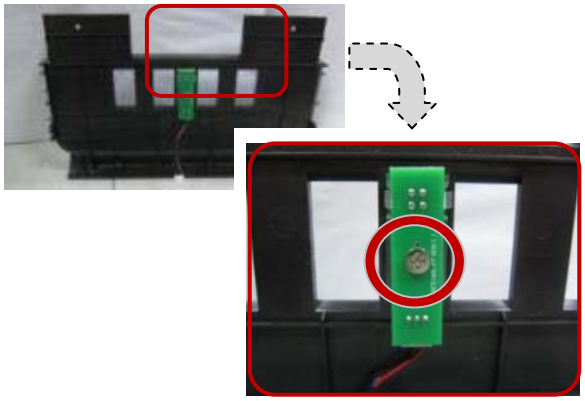
1. Disconnect the cable between the NC5100-UI board and NC5100-FT board.

2. Loosen the two screws on the import plate form.



3. The UI bracket is removed from the hopper.

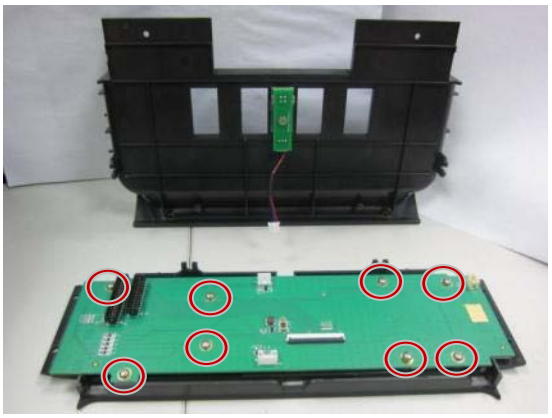
5.4.1.4 PCB NC5100-FT board.



1. Loosen the screw on the NC5100-FT board to remove the trigger.

2. The hopper and the NC5100-FT board are disassembled.

5.4.1.5 PCB NC5100-UI board

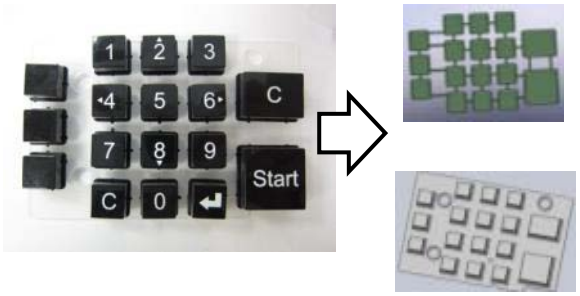


1. Loosen the eight screws on the NC5100-UI board.

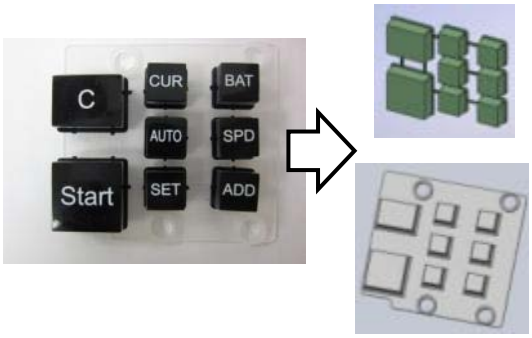
2. The NC5100-UI board and buttons are removed from the control panel.

5.4.1.6 NC5100-Buttons

1. Take off the NC5100-buttons-R and NC51000-button-L from the UI bracket.

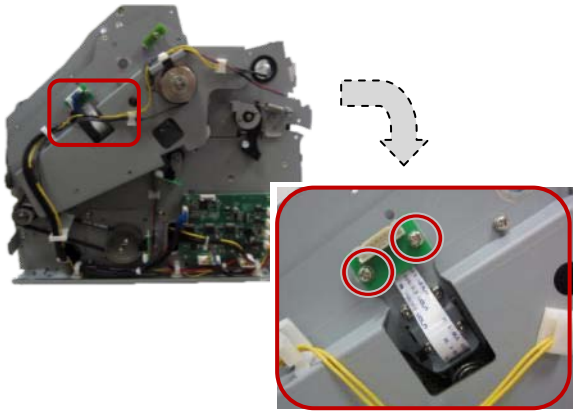


2. Dismount the NC5100-Right Button from the NC5100-Right keypad.

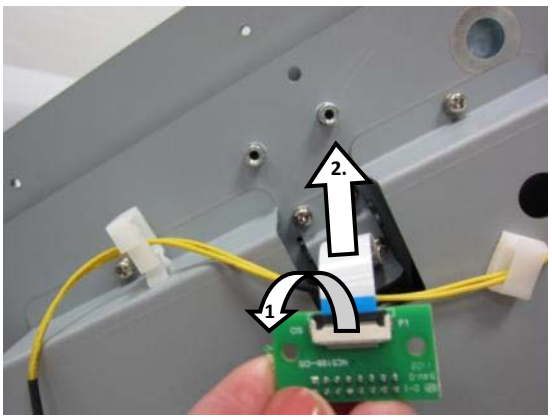


3. Dismount the NC5100- Left Button from the NC5100-left keypad.

5.4.2 PCB NC5100-CIS board



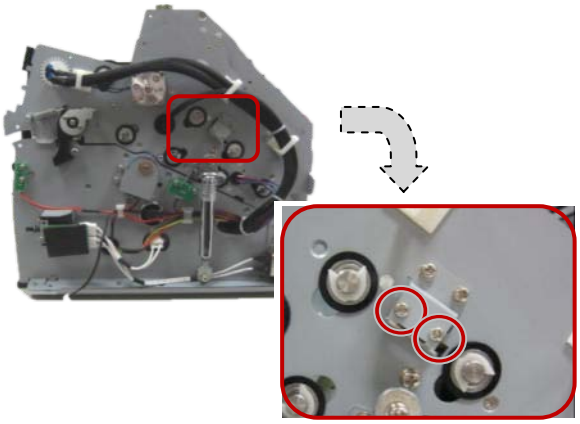
1. Turn the deivce to the left side.
2. Loosen the screws on the connection plate.



3. Open the FCC cable socket to release the cable.

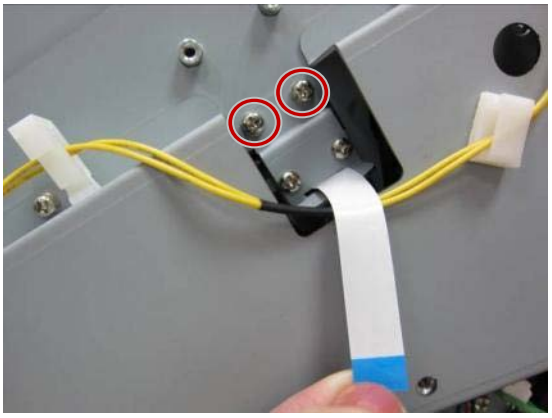
4. The NC5100-CIS board I disassembled.

5.4.3 Contact Image Sensor



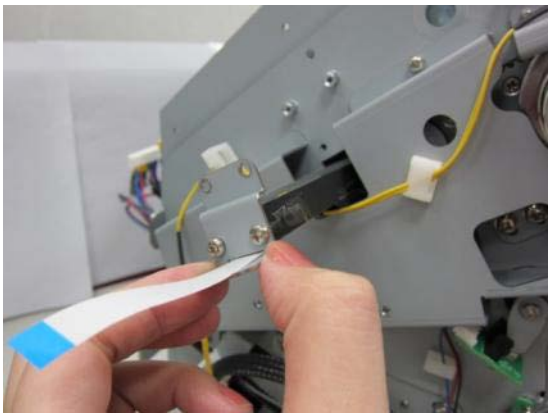
1. Turn the device to right side.

2. Loosen the two screws on the contact image sensor.

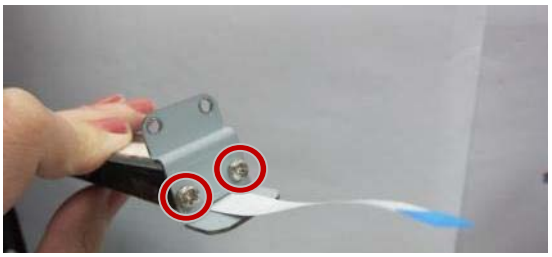


3. Turn the device back to the left side again.

4. Loosen the two screws.



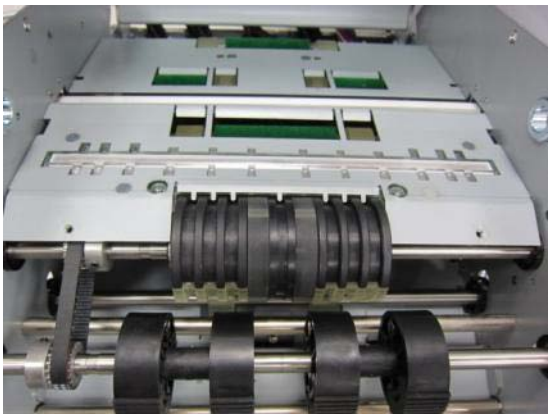
5. Pull out the contact image sensor.



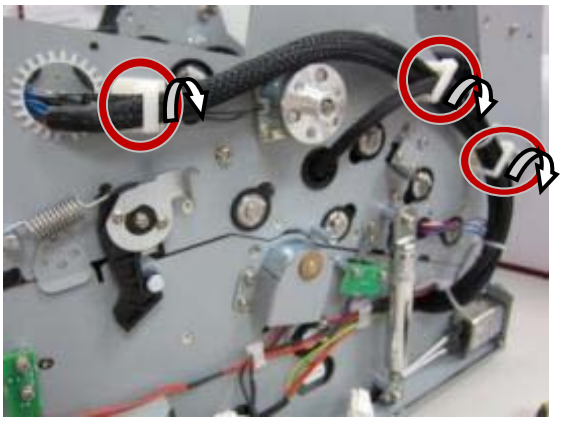
6. Loosen the two screws on the CIS bracket.

7. The contact image sensor is disassembled.

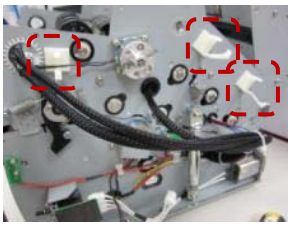
5.4.4 NC5100-IRTR board



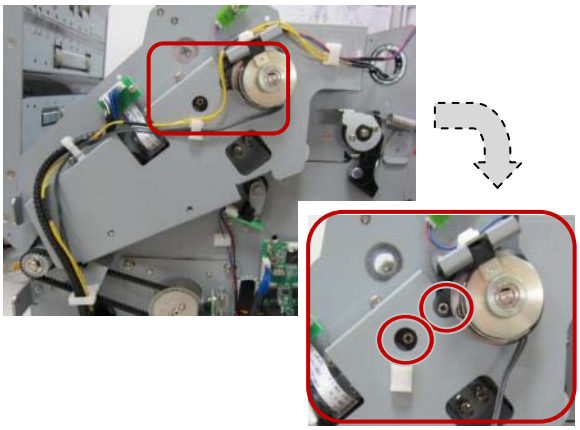
1. Open the top bill path and start to disassemble the lower part.



2. Turn the device to right side and release the cable from the cable clamps.

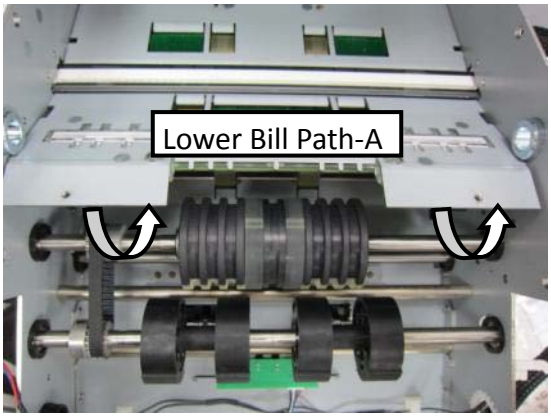


3. Loosen the two screws.

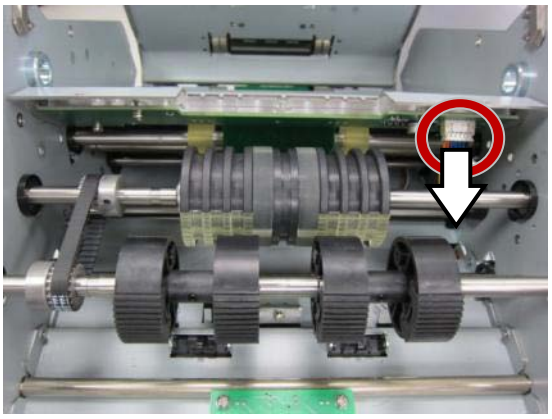


4. Turn to left side.

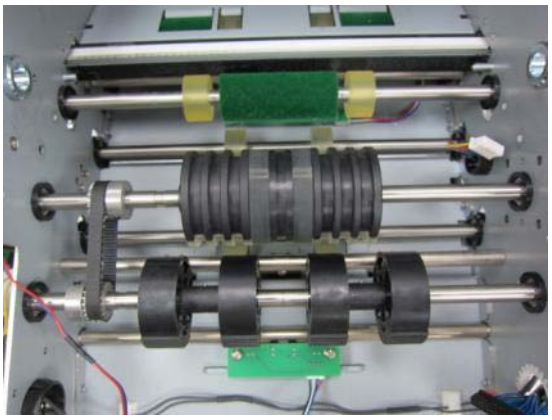
5. Loosen the two screws.



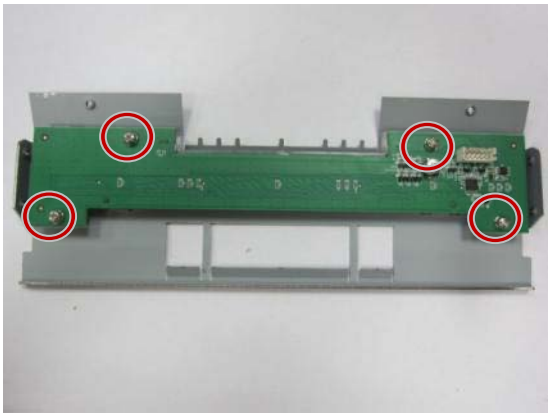
6. Pull toward lower bill path-A.



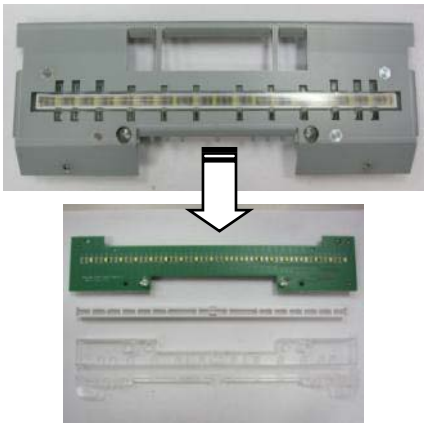
7. Disconnect the cable on NC5100-IRTE board.



8. Remove the lower bill path-A plate.

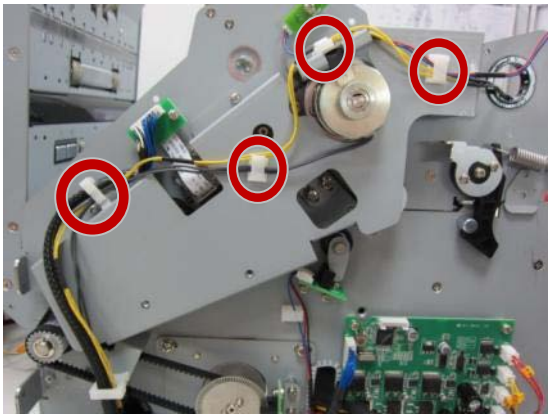


9. Loosen the four screws on the NC5100-IRTR board to disassemble from the lower bill path-A plate.

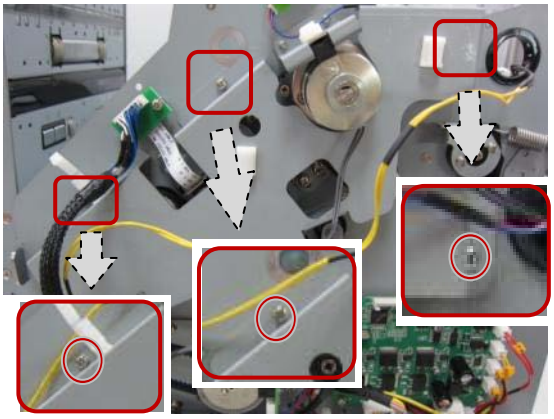


10. The NC5100-IRTR board is disassembled.

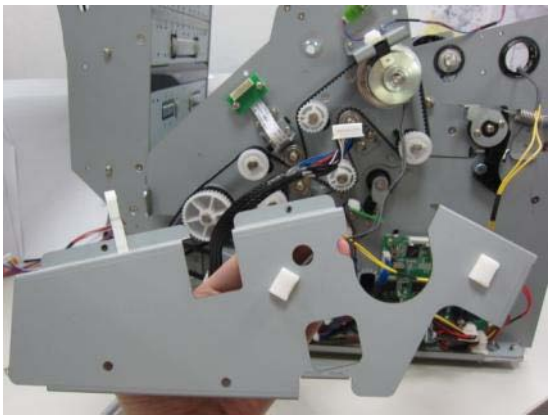
5.4.5 Gear Protection Cover



1. Release the cables from the cable clamps.

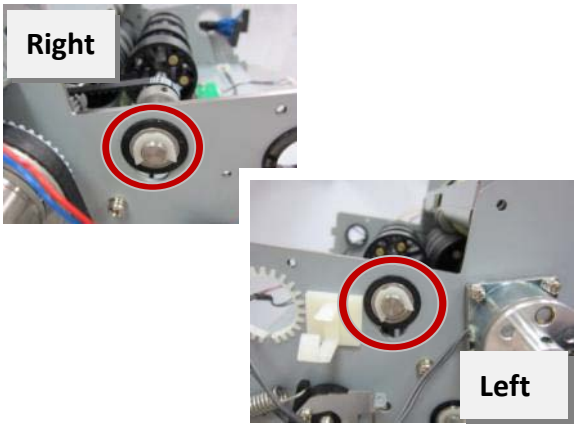


2. Loosen the three screws on the gear cover.

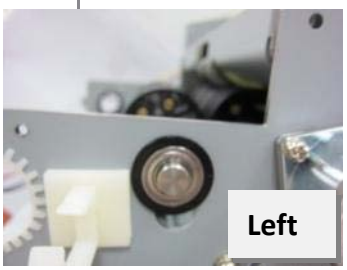


3. The gear cover is removed.

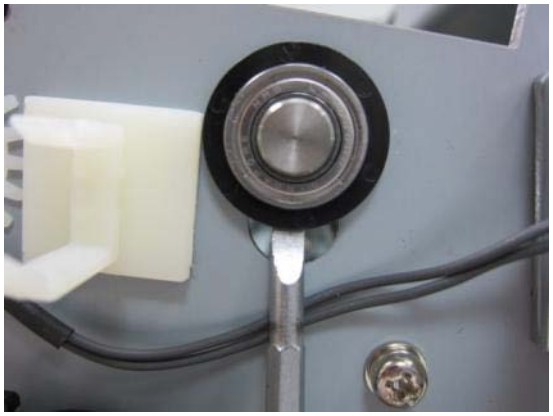
5.4.6 Kicker Roller Module



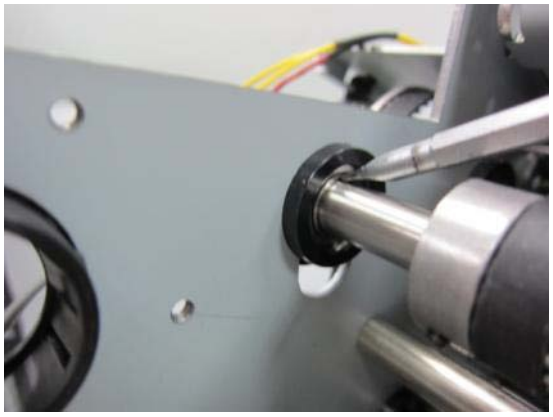
1. Use a screwdriver (-) to remove the plastic E-ring on the both sides of kicker roller module.



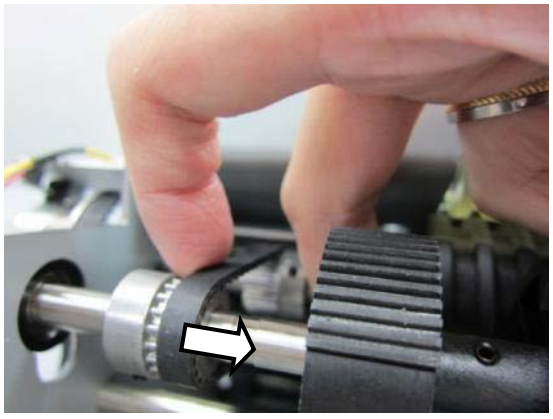
2. The E-rings are removed.



3. Turn the device to right side and use a screwdriver (-) to pull out the shaft block.



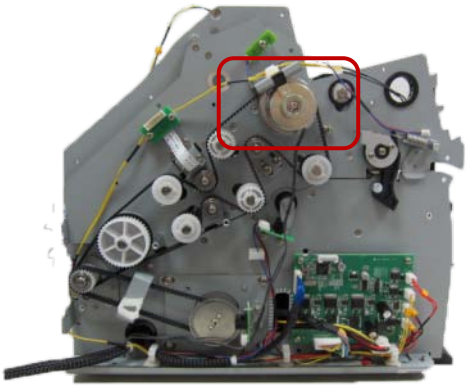
4. Use the screwdriver (-) to push out the left shaft block.



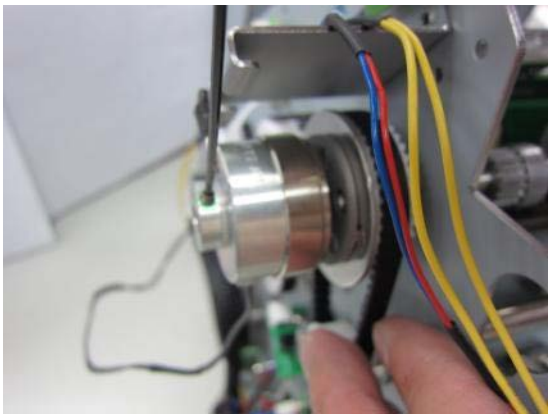
5. Push toward the timing belt A on the kicker roller module to the right side.

6. The kicker roller module is removed.

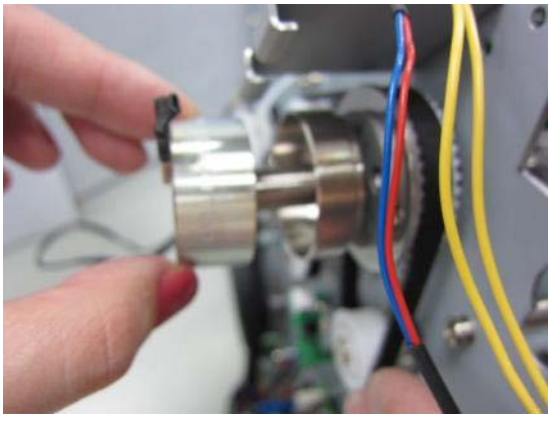
5.4.7 Clutch



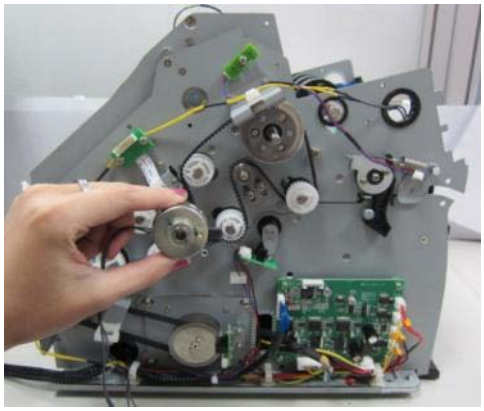
1. Turn the device to the left side and fine the clutch.



2. Use a 1.5 mm hex key to loosen the two screws on the clutch

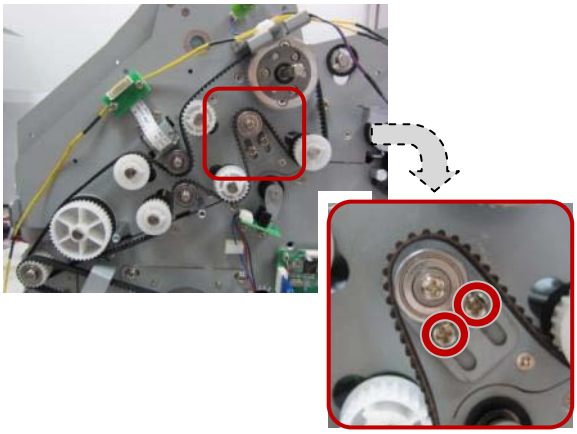


3. Take off the clutch from the device.



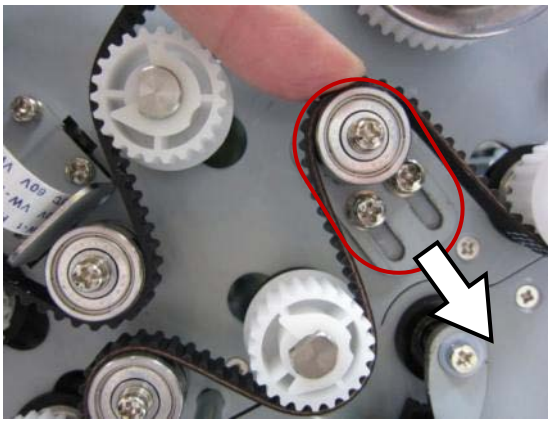
4. The clutch is removed.

5.4.8 Time Belt D

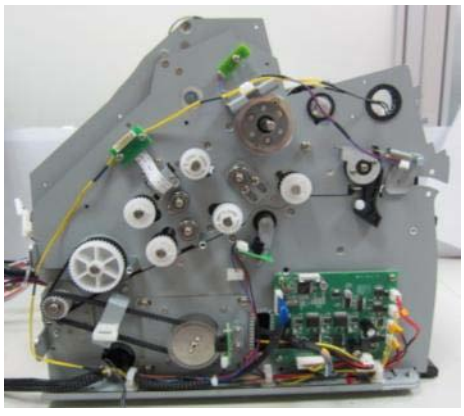


1. Loosen a little the two screws.

*it's not necessary to disamount the two screws entirely.

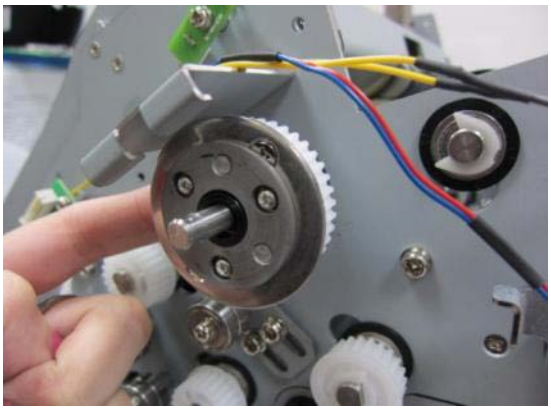


2. Push down the pulley.



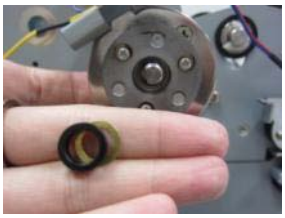
3. The time belt D is removed.

5.4.9 Clutch Gear



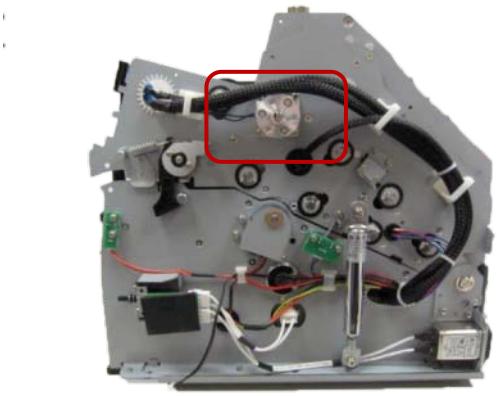
1. Pull out the clutch gear.

*If the bearing falls, please put them back into the clutch gear.



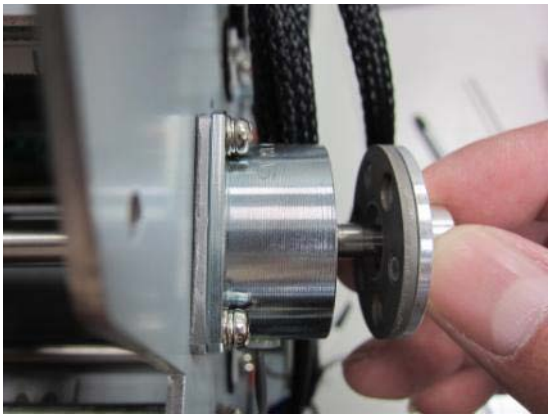
2. The clutch gear and time belt B are removed.

5.4.10 Brake

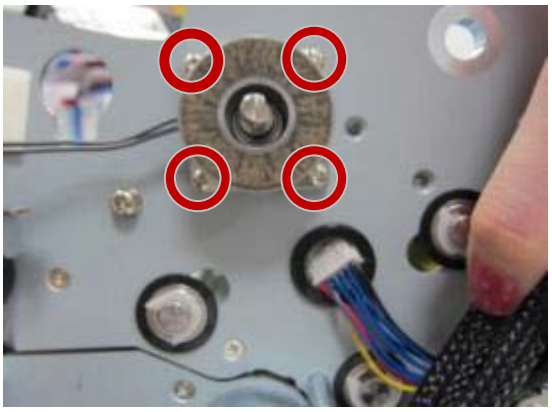


1. Turn the device to the right side and find the brake.

2. Use a 1.5 mm hex key to loosen the two screws on the brake pad.



3. Remove the brake pad.



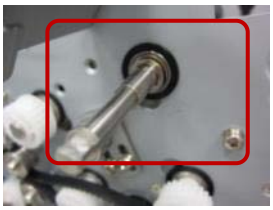
4. Loosen the four screws on the brake.

5. Remove the brake from the device.

5.4.11 Feeder Roller Module and Timing Belt A

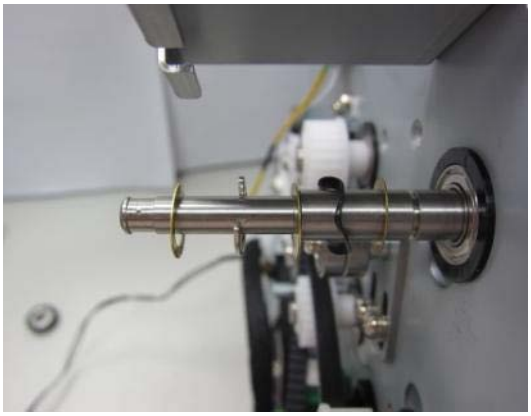
1. Turn the device to the left side.

2. Take off theclutch spacer.



3. A E-ring is on the bottom feeding wheel shaft.

4. Take off the E-ring with a screwdriver (-).

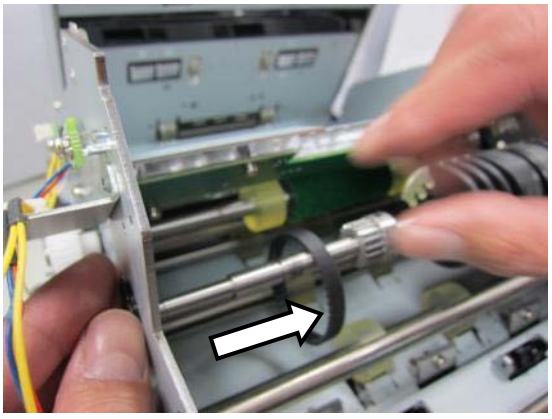


5. The three clutch spacer under the E-ring can be released.

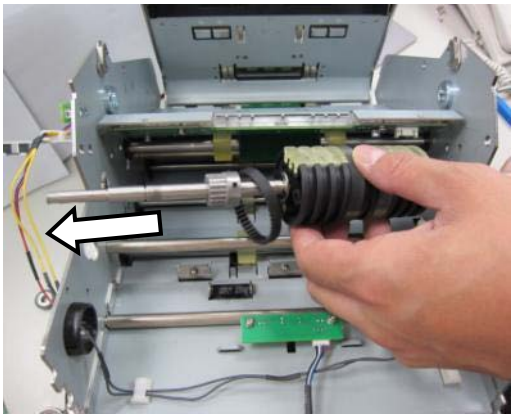
*Note: Please check the order of all the materials when assembling the machine.

6. Turn the device to the right side.

7. Use a screwdriver (-) to remove the E-ring.

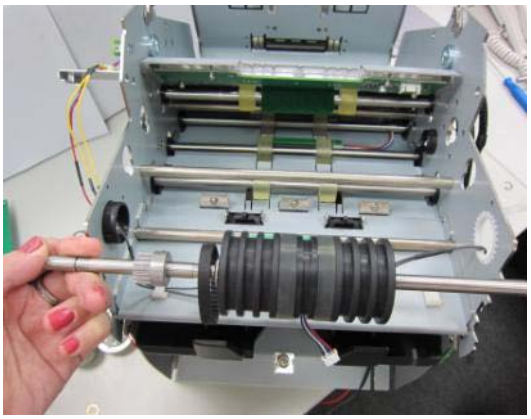


8. Push the feeder roller module toward right.



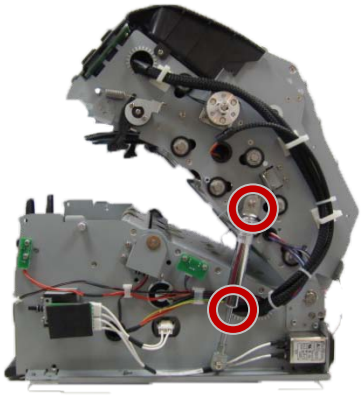
9. Release the left side of the feeder roller module from the device.

10. Push the feeder roller module to the left side again to disassemble it.



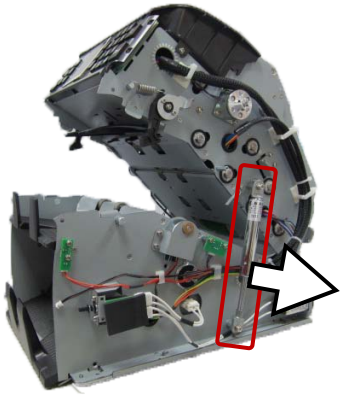
11. The feeder roller module and timing belt A are removed.

5.4.12 Gas Spring



1. Turn the device to the right side.

2. Loosen the two screws on the gas spring.

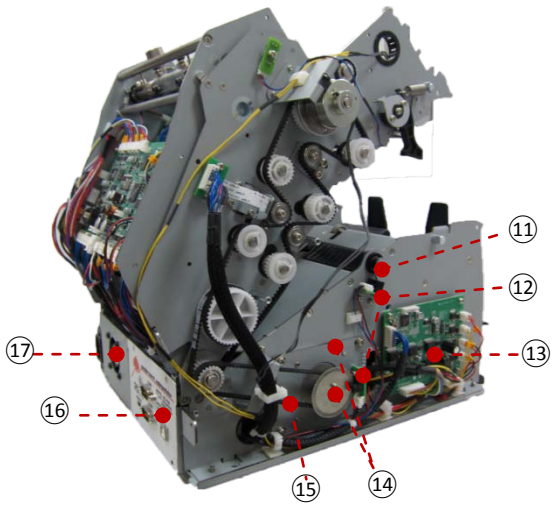


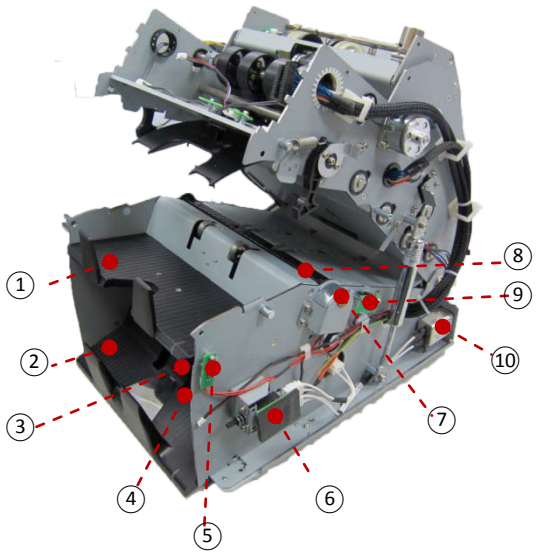
3. Pull toward the gas spring.

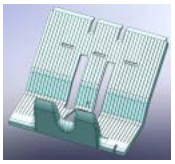
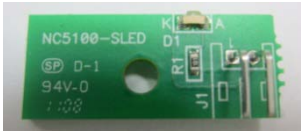
4. The gas spring is removed from the device.

*Note: please close the conveyer path smoothly.

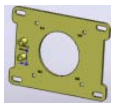
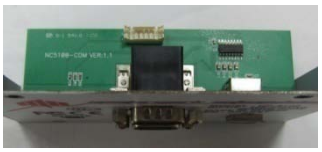
5.5 Bottom Module





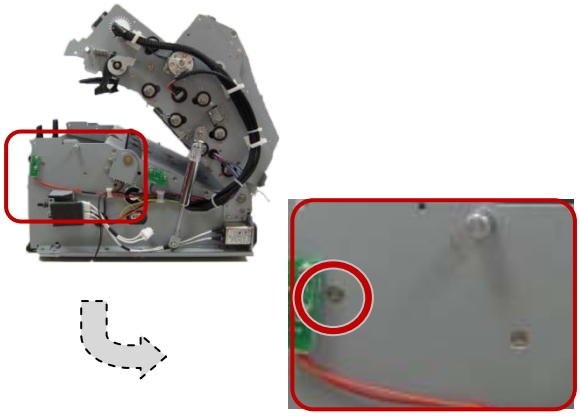
No	Part Name	Accessory Code	Picture	Q'ty
1	Reject pocket	3PP72110100042		1
	Reject pocket stopper - L	3PP92110100040		1
	Reject pocket stopper -R	3PP92110100030		1
2	Stacker	3PP72110100051		1
	PCB board: NC5100-SPR	S-BNC5100B15		1
	PCB board: NC5100-SLED	S-BNC5100B18		1
	Stacker static brush holder	3NC50800120090		1

	Static brush	3OC25390000000		3
3	PCB board: NC5100-SPE	S-BNC5100B14		1
4	Impeller	3DM11205040010		1
		3PPA2610100060		2
5	PCB board: NC5100-RLED	S-BNC5100B17		1
6	PCB board: NC5100-SW	S-BNC5100B22		1
7	Solenoid	OSPSOLRSA32470		1
	Solenoid bracket	3NC50800120051		1
8	Note toggler	3PP62210100072		1
9	PCB board: NC5100-INT2	S-BNC5100B11		1
10	Power socket	ED000003F001		1
		C03MH03NN210		1
11	Solenoid interrupter plate	3NC60800120011		1
12	PCB board: NC5100-INT1	S-BNC5100B10		2
13	PCB board: NC5100-MOTOR	S-BNC5100B20		1

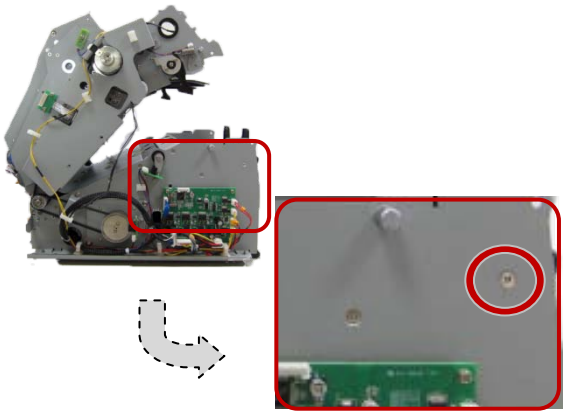
14	Brushless DC motor	OSPBLDDBT566L0		1
	Main motor encoder	3NCA030019001		1
	Main motor bracket	3NC50800120072		1
15	Time belt C (300-S3M*6mm)	LB100S3M060100		1
16	Output panel plate	3NC70800000011		1
	PCB board: NC5100-COM	S-BNC5103A03		1
17	Power tray / Power supply	3NC20800120021		1
		3NC70800120003		1
		C-V00016		1
		C-F00003		1

5.5.1 Reject Pocket

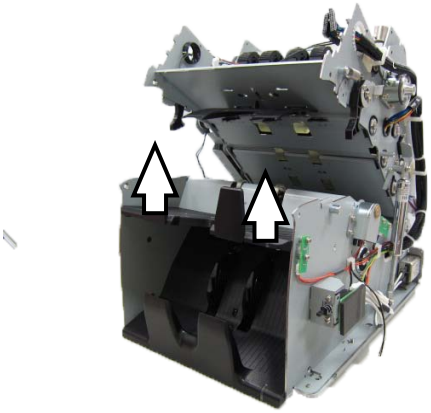
5.5.1.1 Reject Pocket



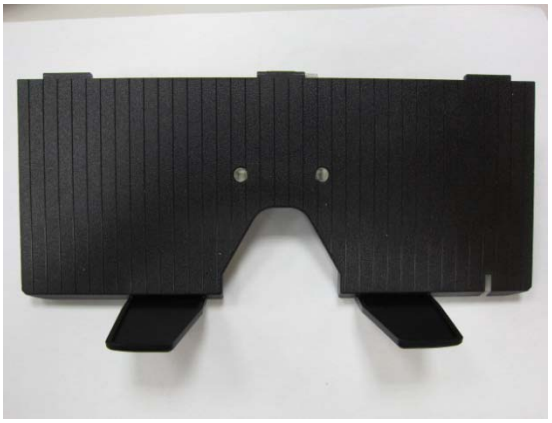
1. Turn the device to the rigth side.
2. Loosen the screw.



3. Turn the device to the left side.
4. Loosen the screw.

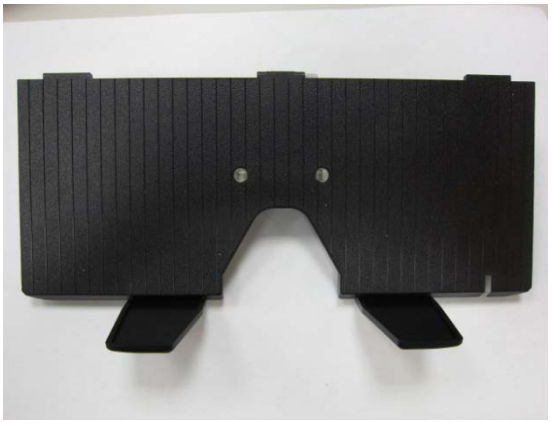


5. Pull up the reject pocket.

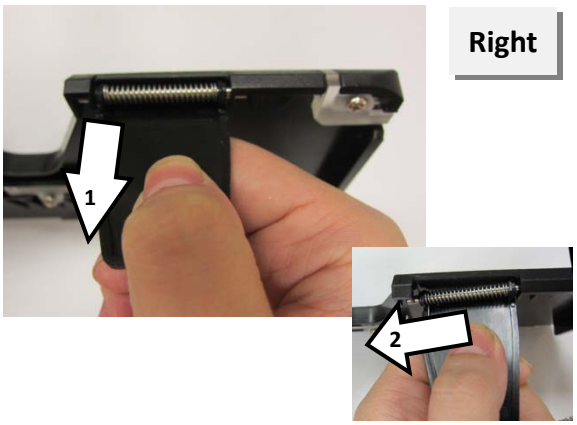


6. The reject pocket is removed.

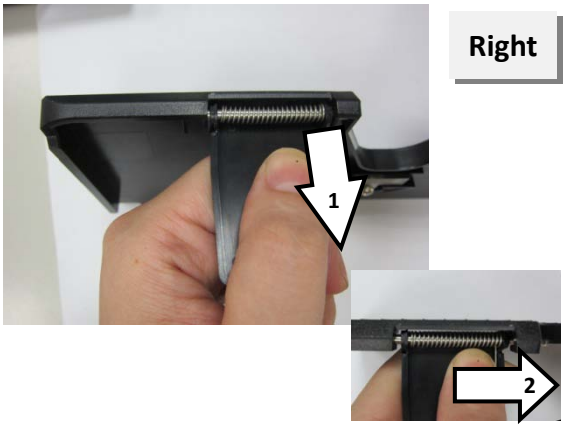
5.5.1.2 Reject Pocket Stopper



1. Find the reject pocket.



2. Hold the reject pocket stopper –R.
3. Pull it down.
4. Push toward the left side to release it from the reject pocket.



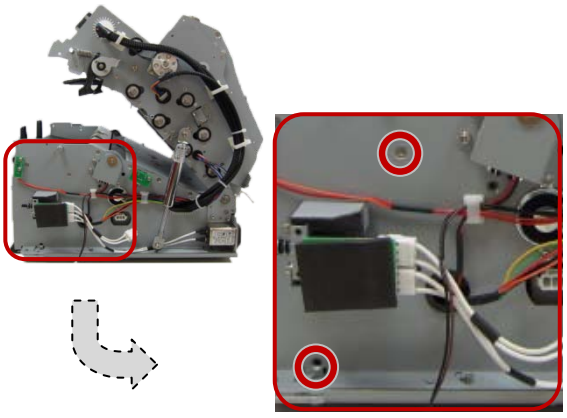
5. Hold the reject pocket stopper –L.
6. Pull it down.
7. Push toward the right side to release it from the reject pocket.

8. The reject pocket stoppers are removed.

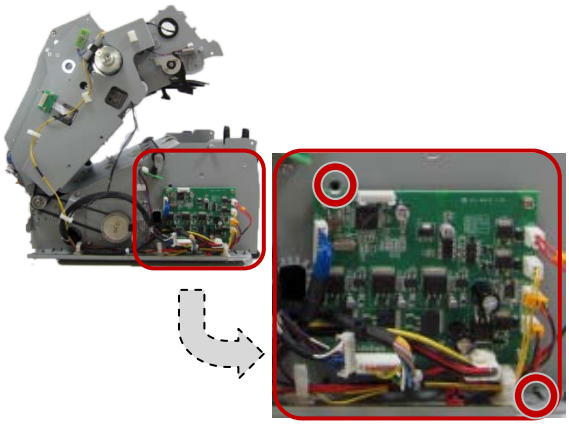
*Note: while assemble the stoppers, it's necessary to make sure to hold the spring in the right position.

5.5.2 Stacker

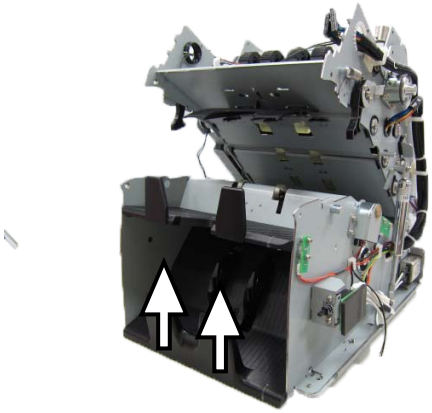
5.5.2.1 Stacker



1. Turn the device to the rigth side.
2. Loosen the two screws.

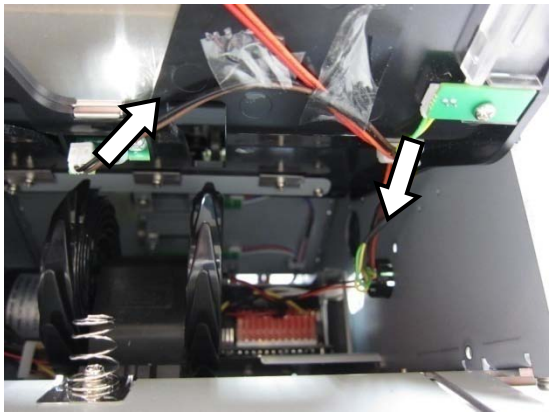


3. Turn the device to the left side.
4. Loosen the two screws.

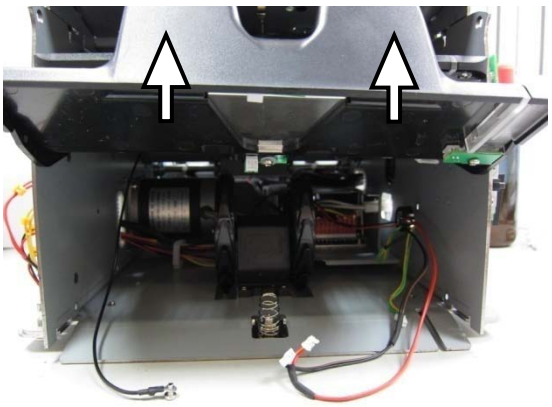


5. Pull up the stacker.

*Note: there are cables connecting to the boards on the stacker, so do not pull it out directly.



6. Release the two cables from connector.



7. The cables are released.

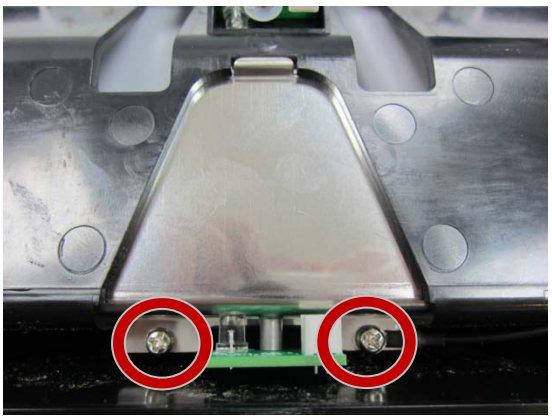
8. Pull out the stacker from the device.

9. The stacker is disassembled.

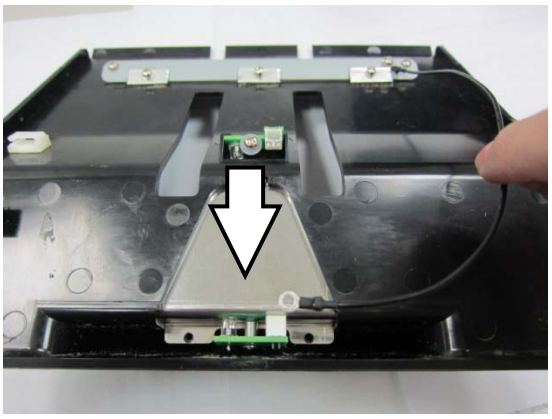
5.5.2.2 PCB NC5100-SPR board

1. Turn around the stacker.

2. Find the PCB NC5100-SPR board in the lower part.

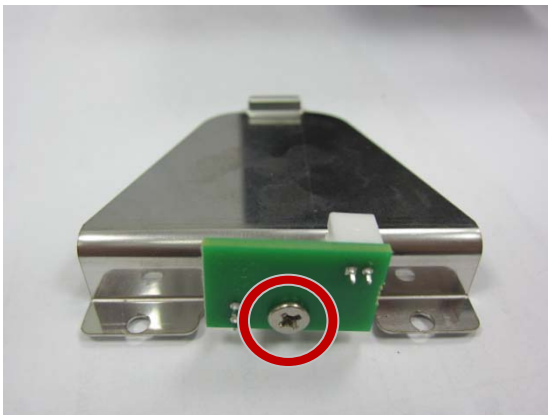


3. Loosen the two screws.



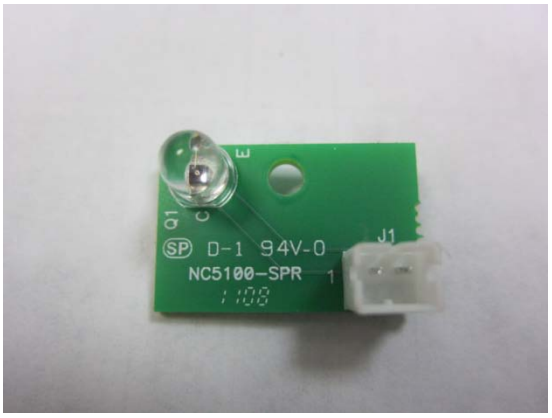
4. After the two screws are loosened, the static conntion cable is released.

5. Push the static discharging plate.



6. The static discharging plate is disassembled from the stacker.

7. Loosen the screw.

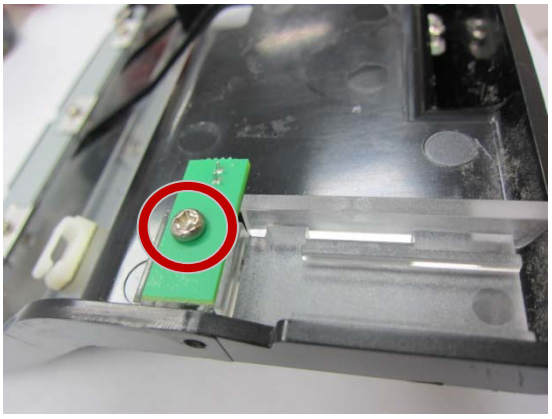


8. The PCB NC5100-SPR board is removed.

*Note: while assembling the static discharging plate, it's better to put it from the front side of the stacker.

5.5.2.3 PCB NC5100-SLED board

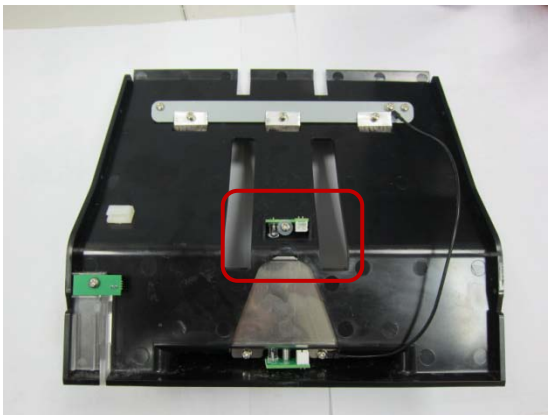
1. Find the PCB NC5100-SLED board on the bottom left of the stacker.



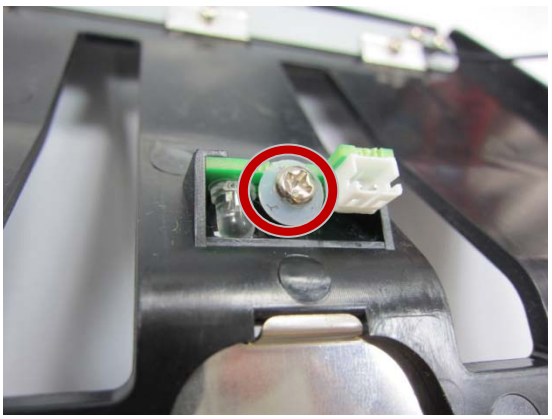
2. Loosen the screw.

3. The NC5100-SLED board is removed.

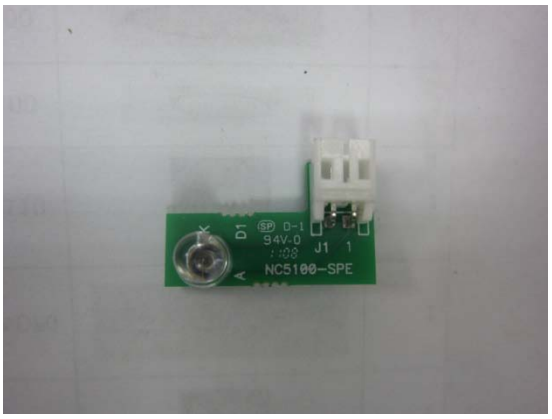
5.5.2.4 PCB NC5100-SPE board



1. Find the PCB NC5100-SPE board in the middle of the stacker.

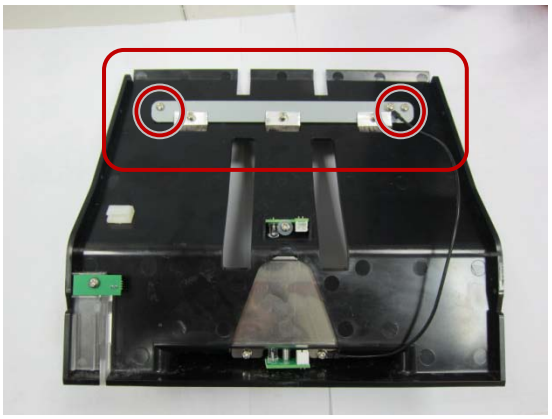


2. Loosen the screw.



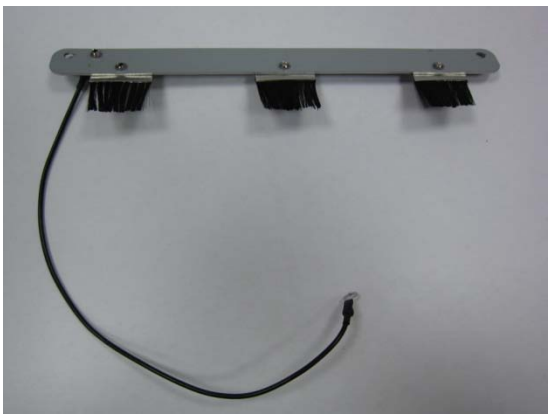
3. The PCB NC5100-SPE board is remvoed.

5.5.2.5 Static Brush Holder



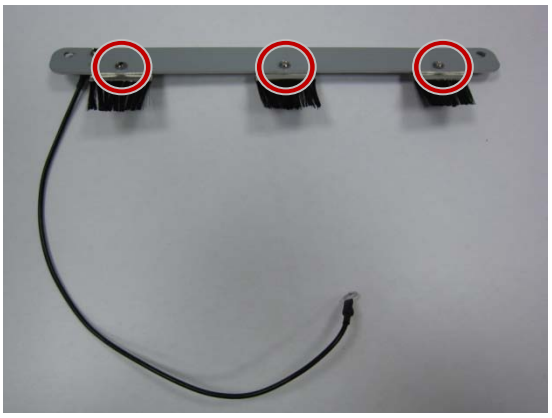
1. Find the static brush holder on the top of stacker.

2. Loosen the two screws.



3. The static brush holder is removed.

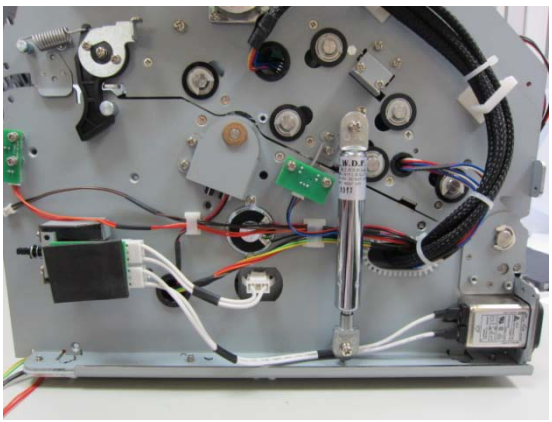
5.5.2.6 Static Brush



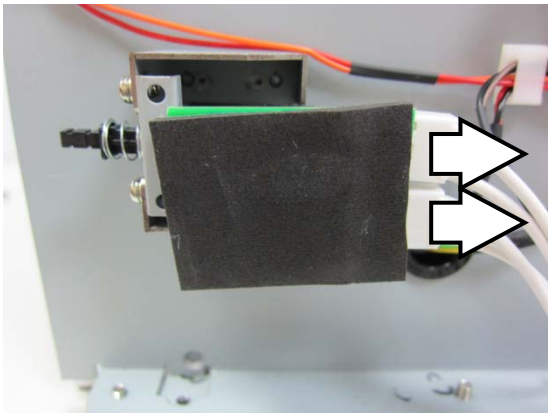
1. Loosen the three screws on the static brush holder.

2. The static brush is removed.

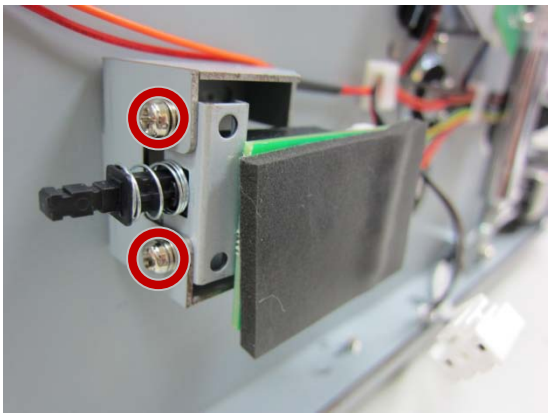
5.5.3 PCB NC5100-SW board



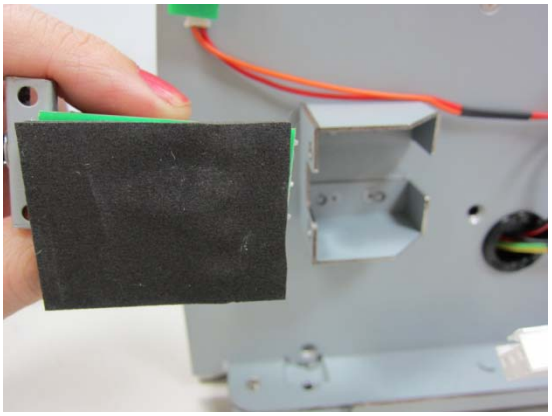
1. Find the PCB NC5100-SW board on the right side of the device.



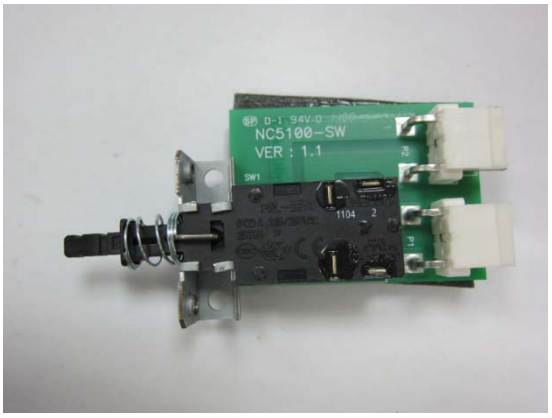
2. Disconnect the two cables from the connector.



3. Loosen the two screws.

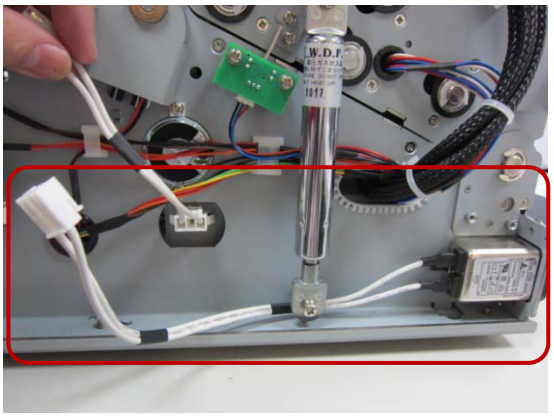


4. Remove the PCB NC5100-SW board from the socket.

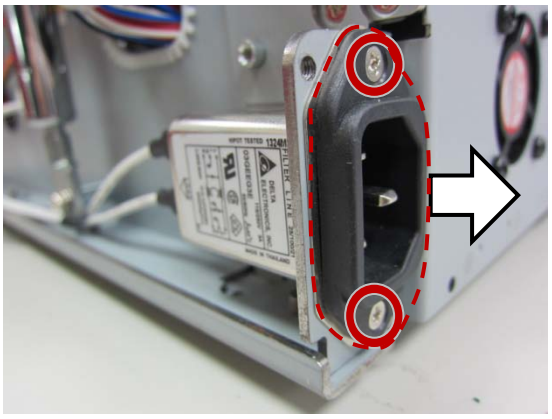


5. The PCB NC5100-SW board is disassembled.

5.5.4 Power Socket



1. Find the Power socket.

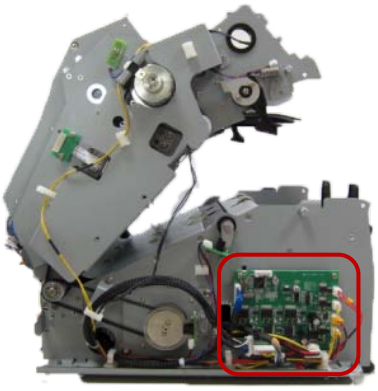


2. Loosen the two screws.

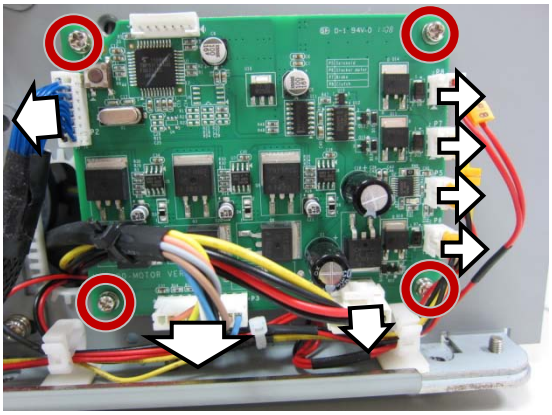
3. Pull out the power socket.

4. The power socket is removed.

5.5.5 PCB NC5100-MOTOR board



1. Find the PCB NC5100-MOTOR board on the left side.



2. Disconnect all the cables on the NC5100-MOTOR board.

3. Loosen the four screws.

4. The NC5100-MOTOR board is disassembled.

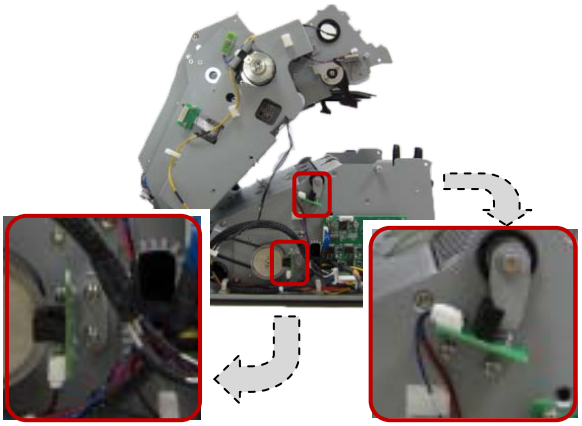
5.5.6 Output Panel Plate and PCB NC5100-COM board

1. Turn the device to the rear side.

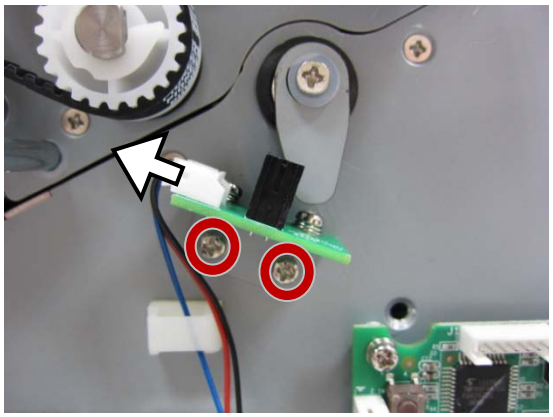
2. Loosen the two screws.

3. The output panel plate and PCB NC5100-COM board are disaasembled.

5.5.7 PCB NC5100-INT1 board



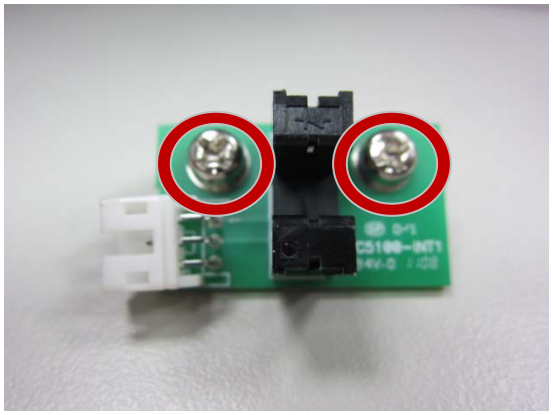
1. There are two PCB NC5100-INT1 board on the left side of the device.



2. Find the NC5100-INT1 board next to the Solenoid interruptor plate.

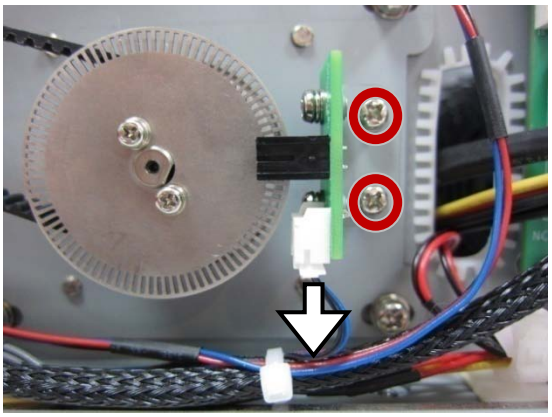
3. Disconnect the cable from the connector.

4. Loosen the two screws.



5. Loosen the two screws on the PCB NC5100-INT1 board to remove the photo interrupter holder.

6. The PCB NC5100-INT1 board is removed.



7. Find the another NC5100-INT1 board next to the encoder.

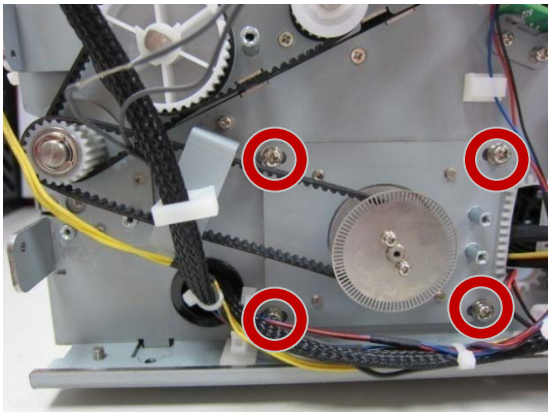
8. Disconnect the cable.

9. Loosen the two screws.

10. Follow the step 5 to remove the photo interrupter holder from the PCB NC5100-INT1 board.

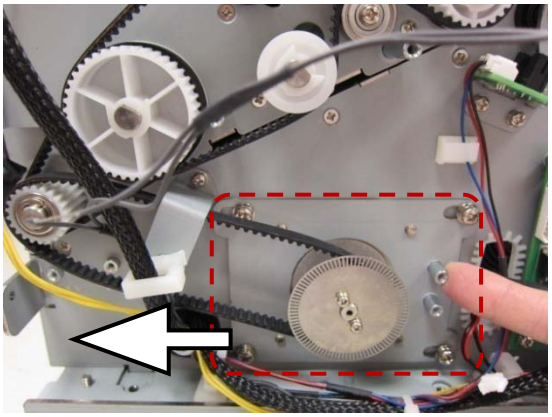
11. The PCB NC5100-INT1 board is removed.

5.5.8 Time Belt C

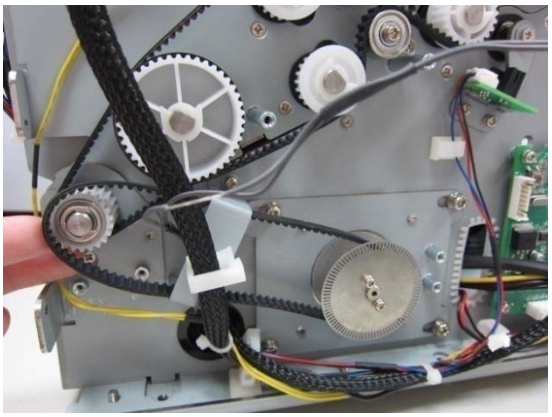


1. Loosen the four screws.

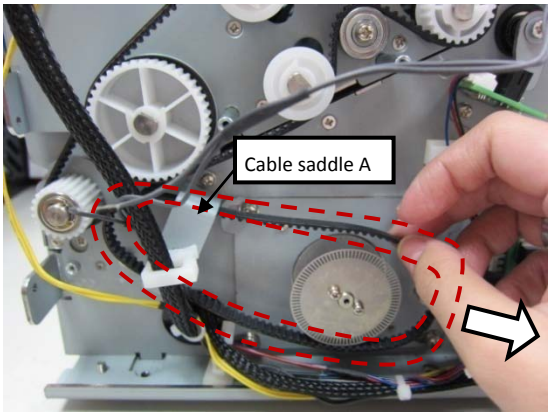
*Note: it's not necessary to disamount entirely.



2. Push the main motor bracket to left.

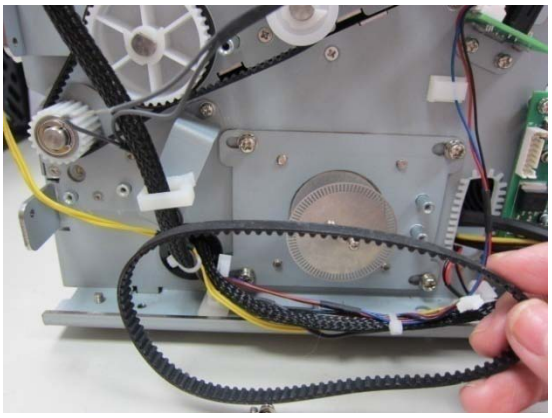


3. Push out the time belt C from the time gear.



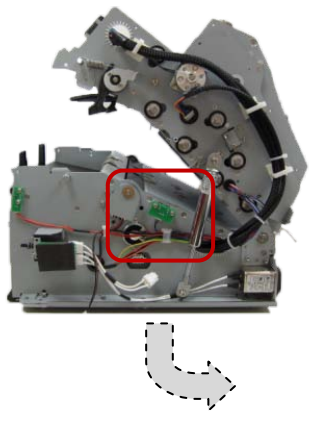
4. Pull the time belt C through the cable saddle A.

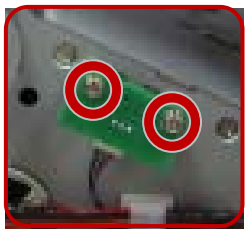
5. Release the time belt C from the motor.



6. The time belt C is removed.

5.5.9 PCB NC5100-INT2 board



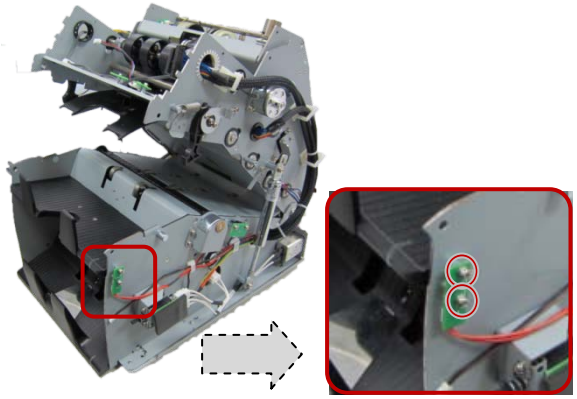


1. Find the PCB NC5100-INT2 board on the right side of the device.

2. Loosen the two screws

3. The PCB NC5100-INT2 board is removed.

5.5.10 PCB NC5100-RLED board

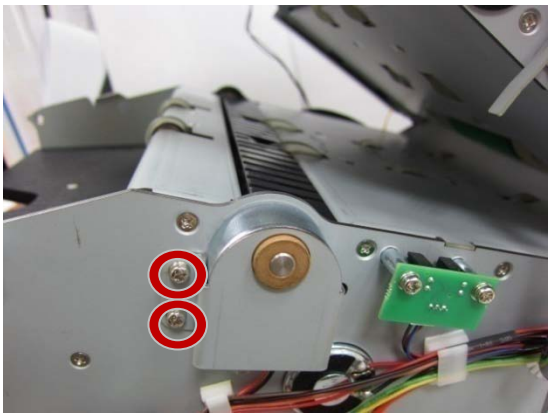


1. Find the PCB NC5100-RLED board on the right side.

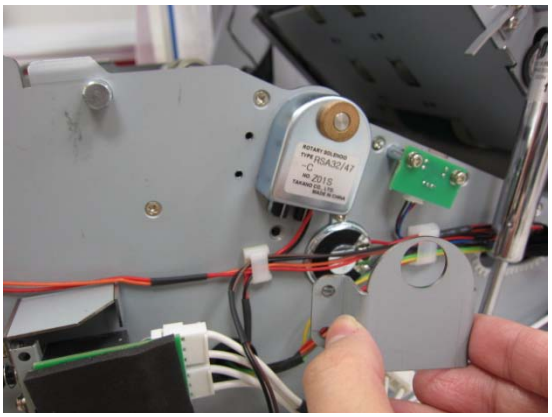
2. Loosen the two screws.

3. The NC5100-RLED board is removed.

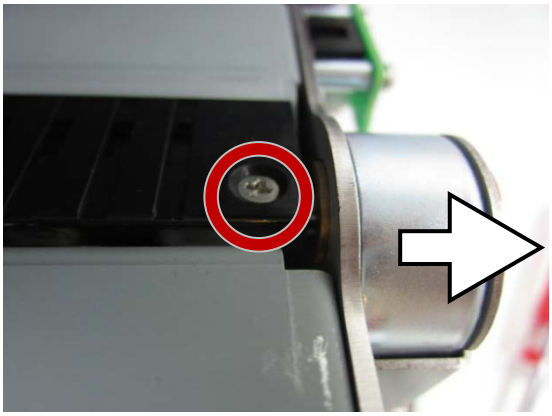
5.5.11 Solenoid



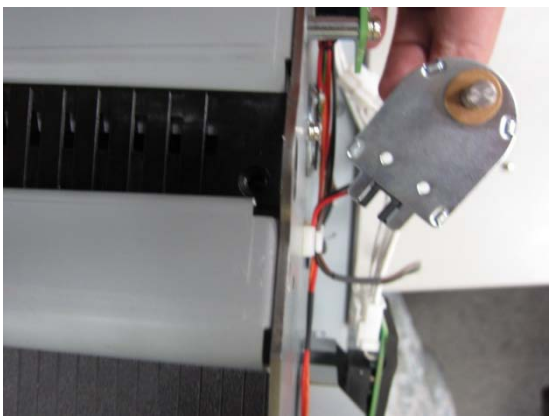
1. Turn the device to the right side and find the solenoid.
2. Loosen the two screws on the soleniod bracket.
3. Take out the solenoid bracket.



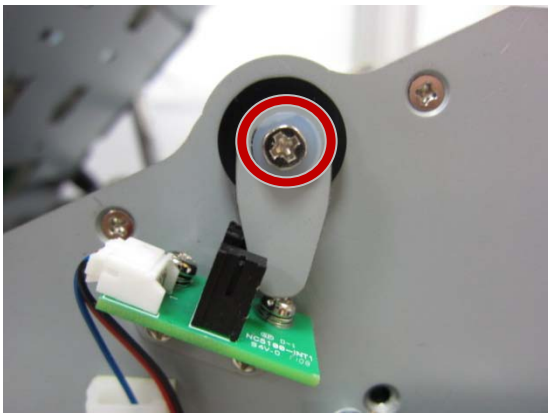
4. The soleniod bracket is removed.



5. Loosen the screw on the note toggler.
6. Take out the solenoid.

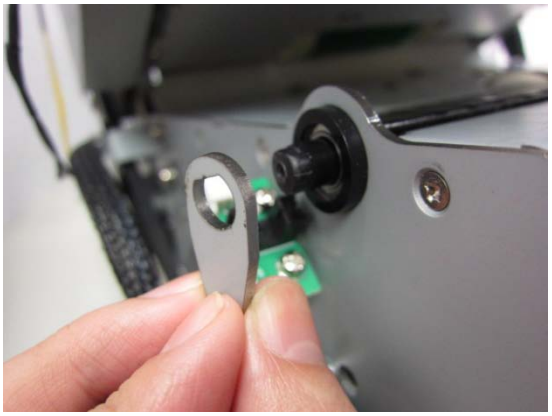


7. The Solenoid is removed.



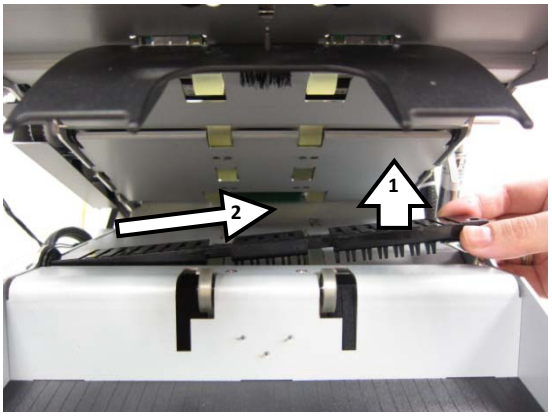
8. Turn the device to the left side.

9. Loosen the screw of the solenoid interruptor plate.



10. Remove the solenoid interruptor plate.

5.5.12 Note Toggler



1. Pull up the note toggler.

2. Hold the note toggler and pull to the right.

3. The note toggler is removed from the device.

Chapter 6 Trouble Shooting

6.1 Definition of Message Codes

6.1.1 Check Bill Path

- Please open the bill path and check no foreign matter inside.

- Error with top bill path, please open it and check no foreign matter inside.

- Please open the bill path and remove the jammed banknotes from it.

- Error with buttom bill path, please open it and check no foreign matter inside.

6.1.2 Open Bill Path

- Top bill path is opened. Please close it before operation.

- Buttom bill path is opened. Please close it before operation.

6.1.3 Remove Banknotes

- Please remove the banknotes from hopper and place them again.

- Please remove the banknotes from reject pocket. After removing it, the operation continues.

- The reject pocket is full. Please remove the banknotes from reject pocket.

- Please remove the banknotes from the stacker. After removing them, the oepration continues.

- The stacker is full. Please remove the banknotes from the stacker.

- The counted quantity doesn't reach preset number. Please check again.

6.1.4 Error

- Please check if the motor error occurs when power on.
- Please make sure the encoder is working correctly.
- If the error still occurs, please contact MA.