Service Manual

NC-1000 Series

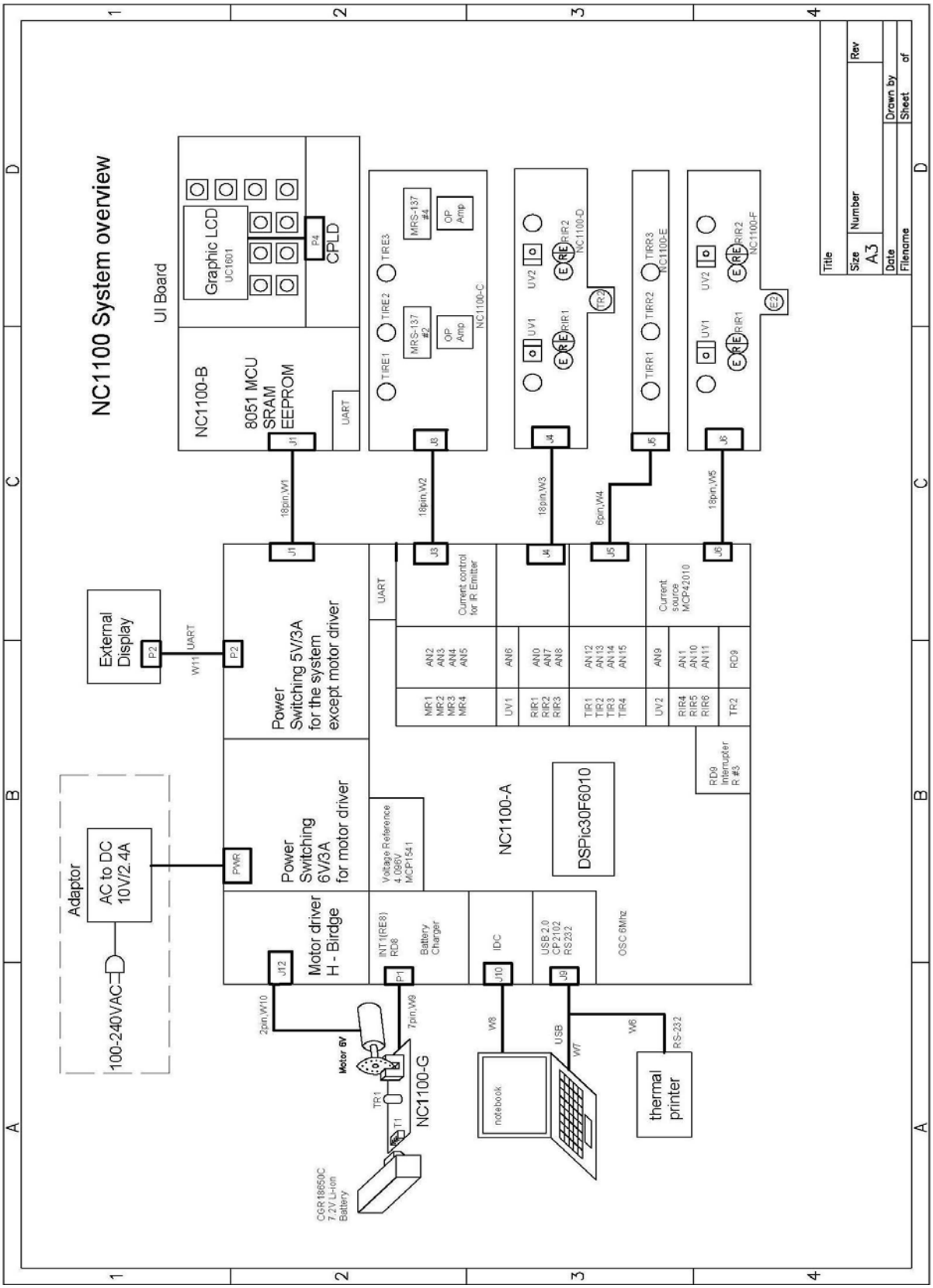
Table of Contents

Chapter 1. NC-1000 Series Specifications

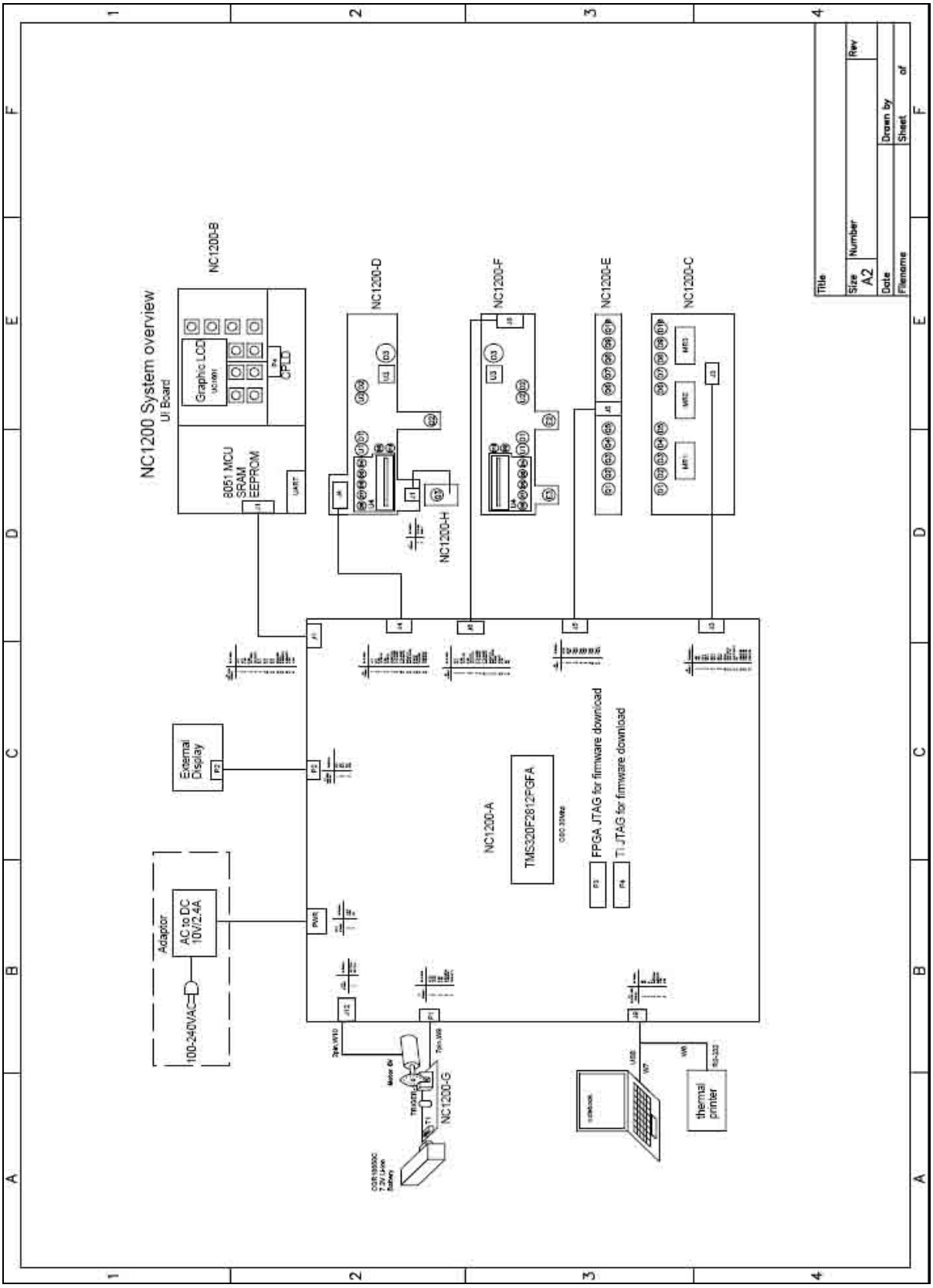
	NC-1100	NC-1200	NC-1300
Power Requirement	AC90~240V 50／60Hz./ MA Li-Ion Battery pack	AC90~240V 50／60Hz./ MA Li-Ion Battery pack	AC90~240V 50／60Hz./ MA Li-Ion Battery pack
Power Consumption (in action)	15W + 5W(Charging)	15W + 5W(Charging)	15W + 5W(Charging)
Power Consumption (ideal status)	1.8W + 5W(Charging)	1.8W + 5W(Charging)	1.8W + 5W(Charging)
External Dimensions	Folded – 240 x 138 x 67 (mm) Unfolded – 428 x 138 x 110 (mm)	Folded – 240 x 138 x 67 (mm) Unfolded – 428 x 138 x 110 (mm)	Folded – 240 x 138 x 67 (mm) Unfolded – 428 x 138 x 110 (mm)
Weight	1.1Kg without Battery Pack 1.2Kg with Battery Pack	1.1Kg without Battery Pack 1.2Kg with Battery Pack	1.1Kg without Battery Pack 1.2Kg with Battery Pack
Ambient Conditions	Temperature 0° ~ 40° C Humidity 20% ~ 90% RH.	Temperature 0° ~ 40° C Humidity 20% ~ 90% RH.	Temperature 0° ~ 40° C Humidity 20% ~ 90% RH.
Feed-out Method	Roller Friction Type	Roller Friction Type	Roller Friction Type
Applicable currencies	175 * 85 * 0.5 (mm)	175 * 85 * 0.5 (mm)	175 * 85 * 0.5 (mm)
Counting Speed	At least 250 Notes Per Minute	At least 250 Notes Per Minute	At least 250 Notes Per Minute
Hopper Capacity	Approx. 60 circulated notes	Approx. 60 circulated notes	Approx. 60 circulated notes
Stacker Capacity	Approx. 100 circulated notes	Approx. 100 circulated notes	Approx. 100 circulated notes
Counterfeit Detection	MG, UV, IR, Color	MG, IR, Color	MG, IR, Color

Chapter 2. NC-1000 Series System Overview

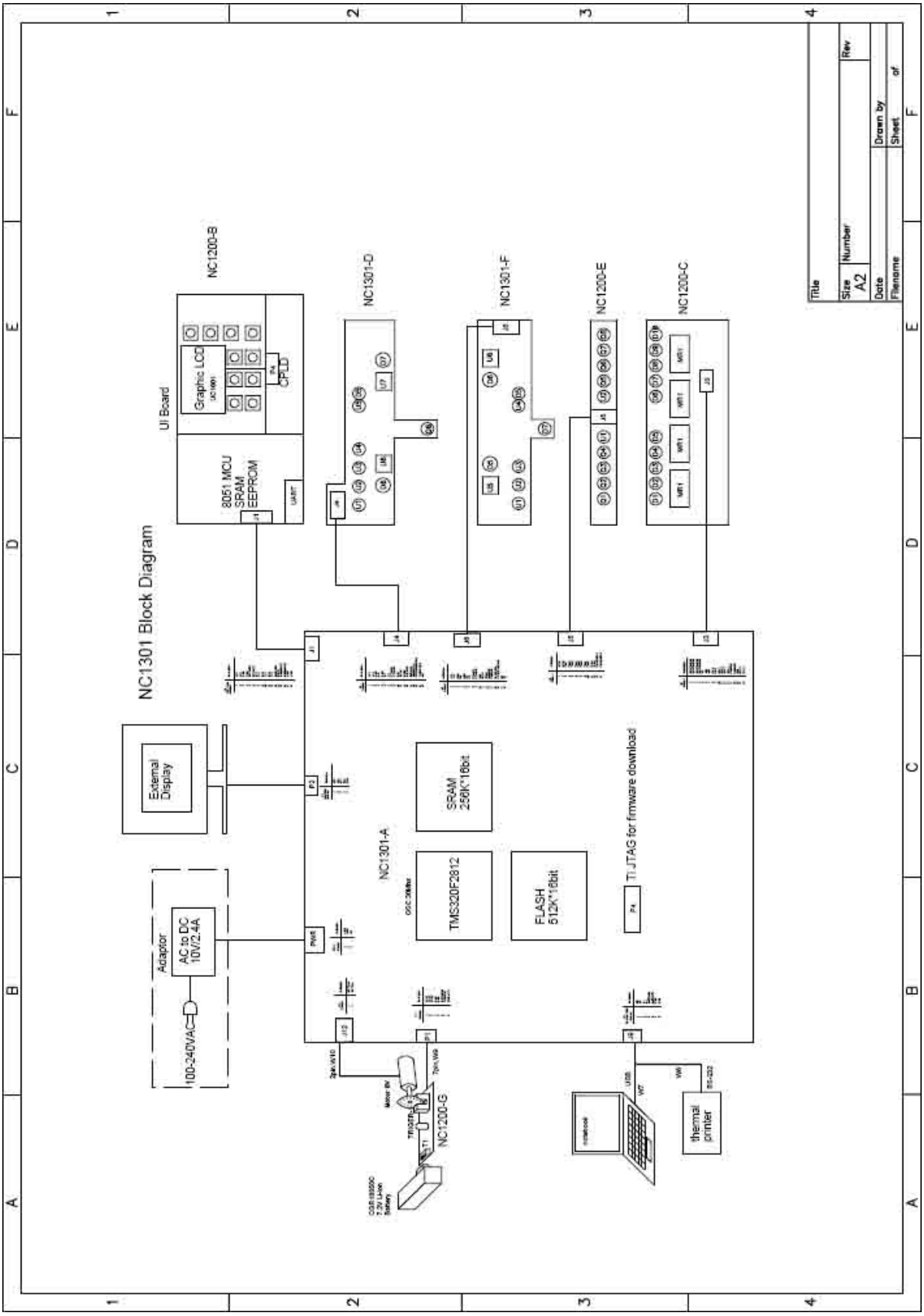
A. NC-1100



B. NC-1200

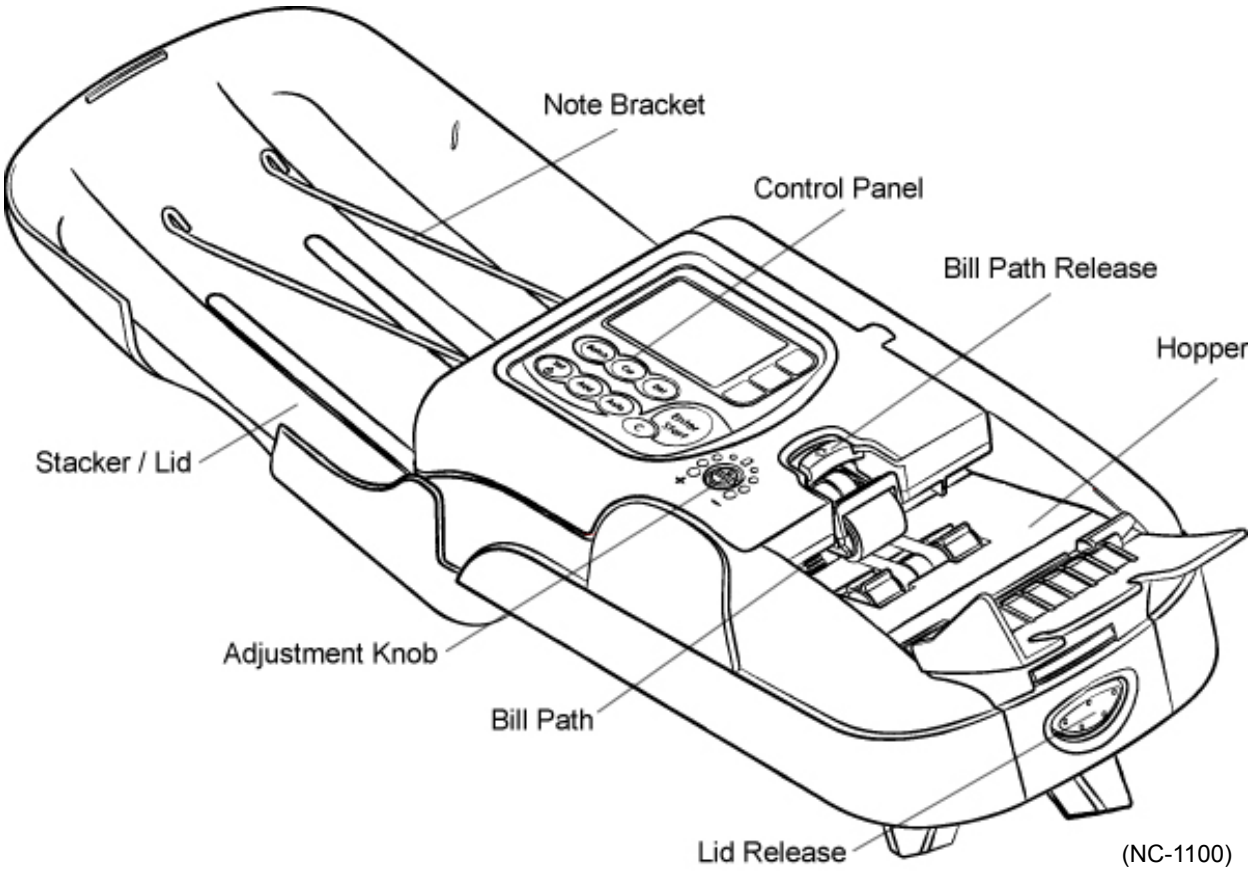

NC1200 System overview
UI Board
NC1200-B
Graphic LCD
CPLD
8051 MCU
SRAM
EEPROM
UART
NC1200-D
NC1200-F
NC1200-E
NC1200-C
NC1200-H
NC1200-A
TMS320F2812PGFA
FPGA JTAG for firmware download
T1 JTAG for firmware download
External Display
Adaptor
AC to DC 10V/2.4A
100-240VAC
NC1200-G
thermal printer
Title
Size
A2
Number
Rev
Date
Drawn by
Filename
Sheet
of

C. NC-1300

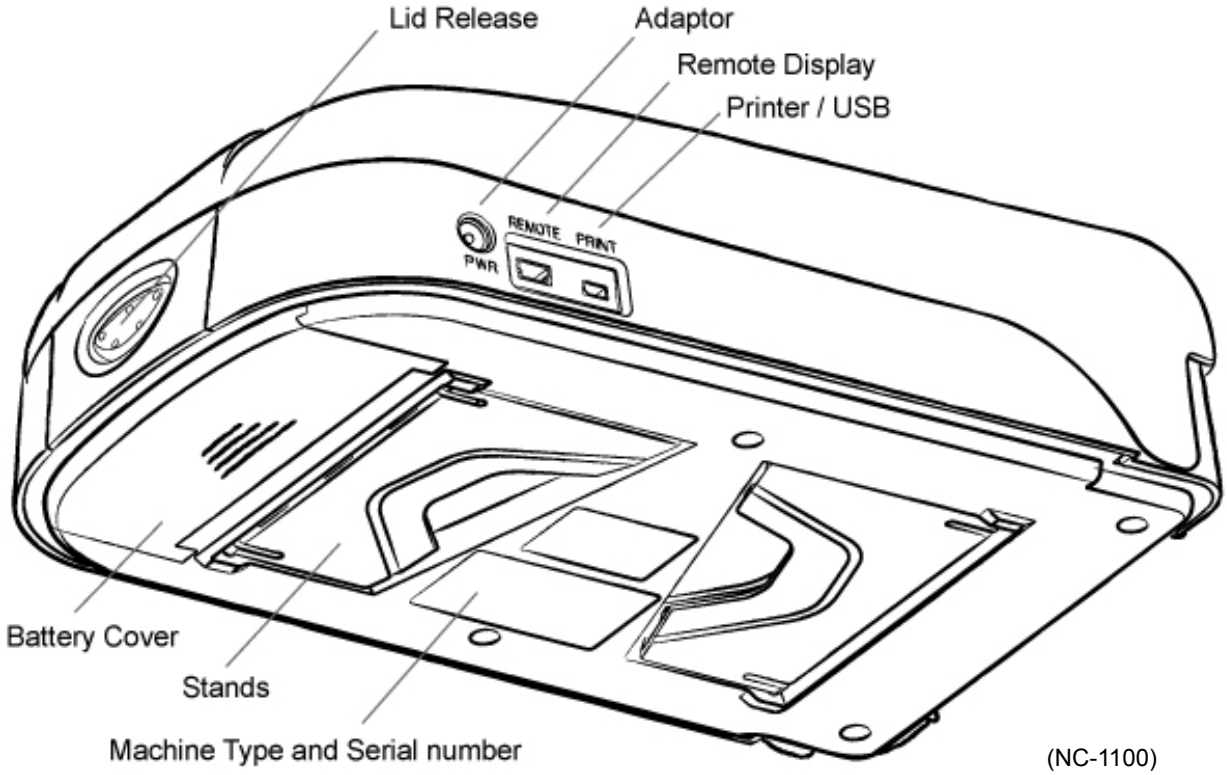

NC1301 Block Diagram
NC1200-B
UI Board
Graphic LCD
CPLD
8051 MCU
SRAM
EEPROM
NC1301-D
NC1301-F
NC1200-E
NC1200-C
NC1301-A
SRAM
256K*16bit
TMS320F2812
FLASH
512K*16bit
TI JTAG for firmware download
External Display
Adaptor
AC to DC
10V/2.4A
100-240VAC
NC1200-G
thermal printer
Title
Size
A2
Number
Rev
Date
Drawn by
Filename
Sheet
of

Chapter 3. Description

1. NC-1000 Series at a glance:



(NC-1100)



(NC-1100)

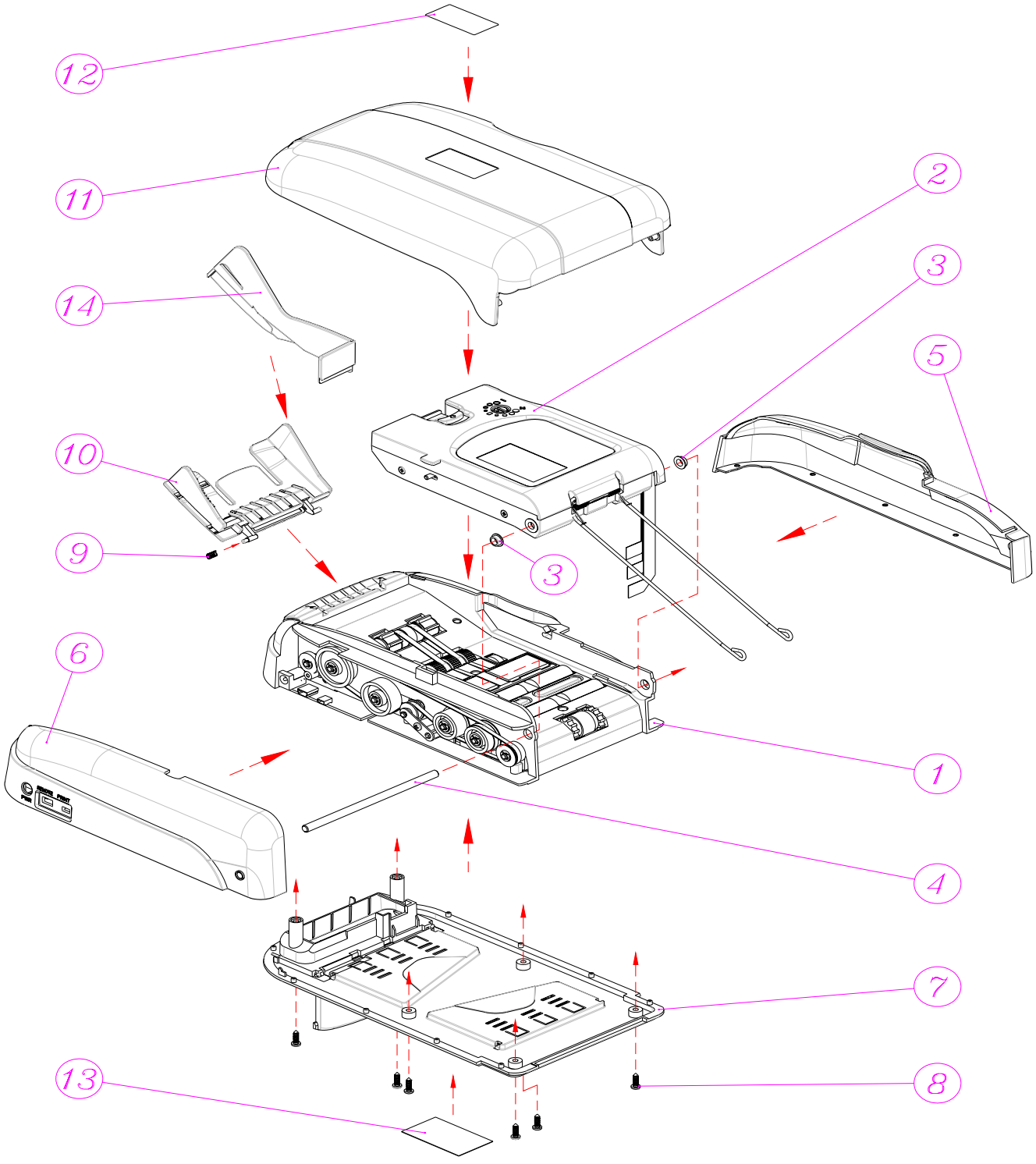
Chapter 4. Maintaining NC-1000 Series and Important Safety Precautions

1. These products are exclusively for indoor usages only, do not use or install these products outdoor.
2. Please check the adapter and power cord periodically to protect from any damages.
3. The power source for NC-1000 Series is between AC 90V~240V, 50/60 Hz
4. NC-1000 Series are very sensitive products. Miss-counting may occur if dirt, dust or any other foreign objects get stuck or cluttered the sensor. Avoid influencing the accuracy, the best for the units is clean the sensors and rollers once a day with the brush supplied or a dry, soft lint-free cloth.
5. Keep NC-1000 Series away from magnets, activated cellular phones, electrical appliances, or speakers within 13 cm / 5 inch
6. Please disconnect power adapter and remove battery when the machine left unused for a long time.
7. To switch on the unit, press and hold the “Set” key until the Power on bar has run to the end.
8. NC-1000 Series are designed for processing banknotes and these are compatible for multi-banknotes, such as USD, EUR, and other specified currencies. Please process the notes ought to be verified in all four orientations (“Head Up-Right”, “Head Reversed”, “Tail Up-Right” or “Tail Reversed”) when doubtful notes appeared. Process result may be varied due to minting quality and circulation of different currencies which cause reject and alarm.

【Advice】When the suspicious note is detected, please reprocess it and confirm the reason of the alarm (MG, UV, or IR Error).

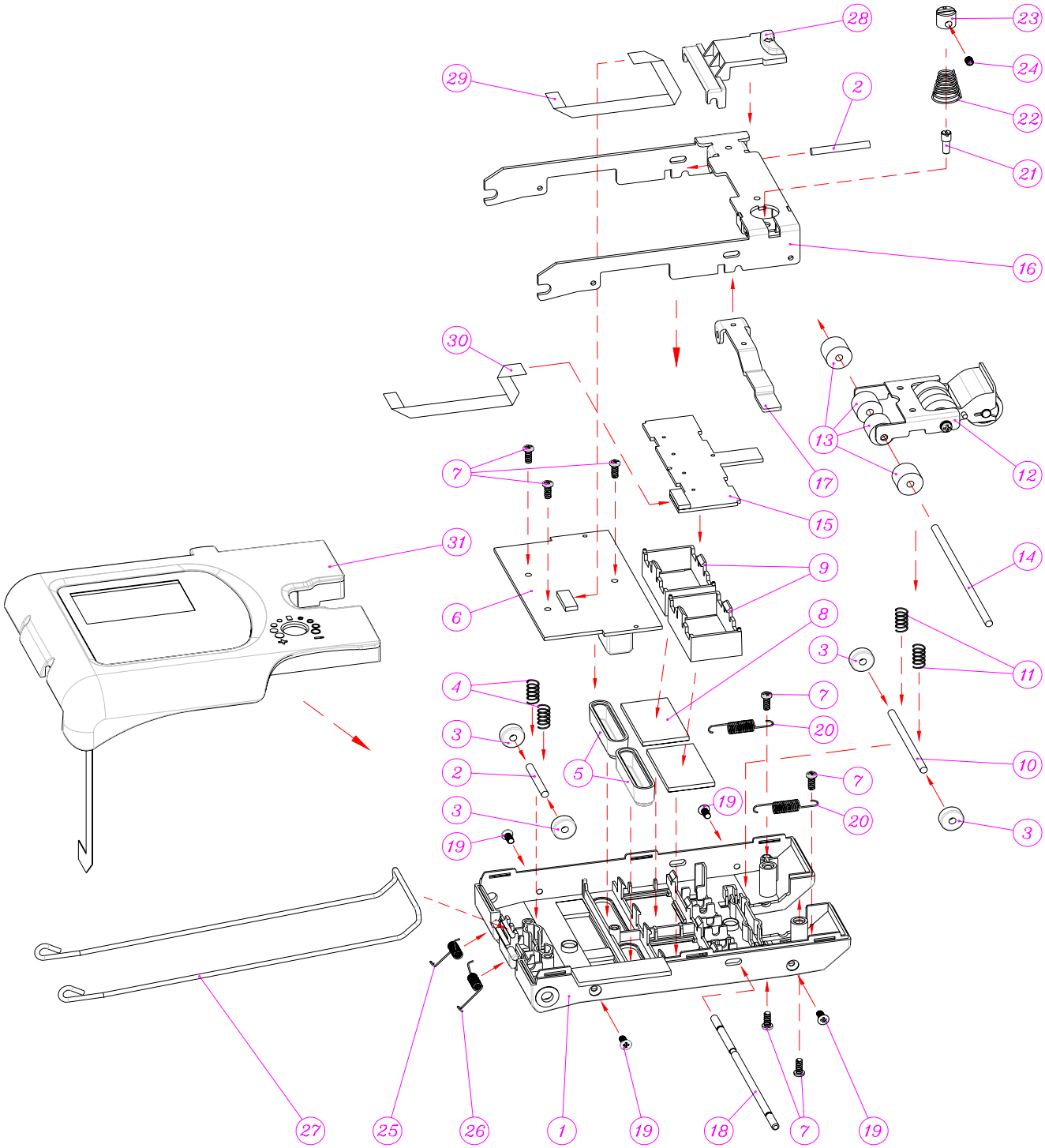
Chapter 5. Part List

1. Total Assembly



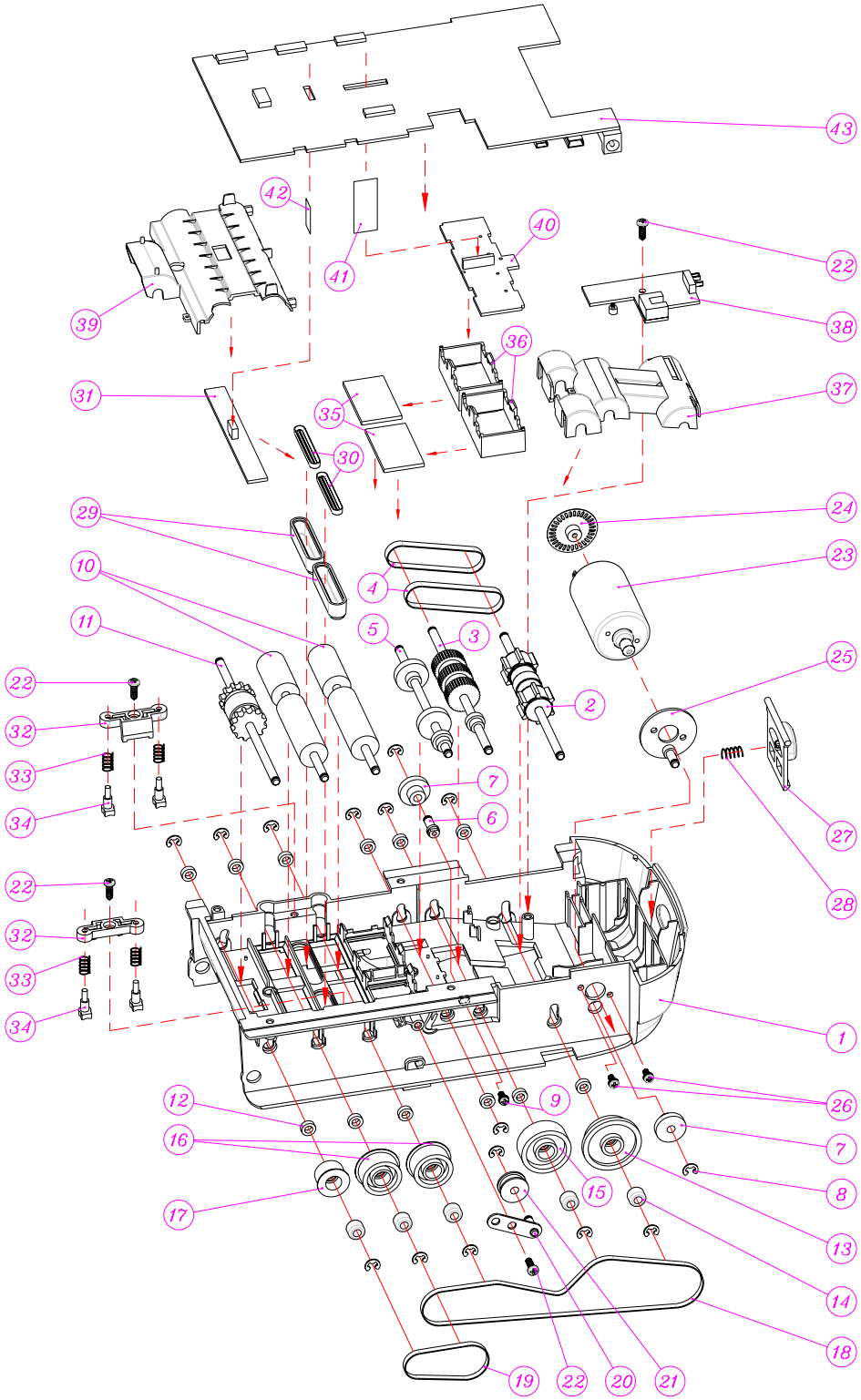
No	Part Name	Part Number	Material/Spec	Qty	Note
1	Lower Module Assembly	S-CNC1100AB1		1	
2	Upper Modules Assembly	S-CNC1100AB2		1	
3	Bronze Bearing	TPNC1100042500	Bronze	2	
4	Upper Module shaft	TPNC1100031500	SUS-303	1	
5	Side Cover(Front)	PPNC1100041100	ABS 94V0	1	NC1100
		PPNC1100042100	ABS 94V0 - Black	1	Nc1200/NC1300
6	Side Cover(Rear)	PPNC1100051100	ABS 94V0	1	NC1100
		PPNC1100052100	ABS 94V0 - Black	1	Nc1200/NC1300
7	Bottom Cover Assembly	S-CNC1100AD1		1	
8	φ3*10 self tapping screw	SC30010T01NR00	Round, Nickel	6	
9	Spring	SPNC1100081450	φ0.3 /φ3*8.6L	1	
10	Hopper	S-CNC1200AD1	ABS 94V0	1	NC1100
		S-CNC1200AF1	ABS 94V0, Silver	1	Nc1200/NC1300
11	Lid	PPNC1100031100	ABS 94V0	1	NC1100
		PPNC110003C100	ABS 94V0 - Gray	1	NC1200/NC1300
12	LOGO Plate	NPNC11002AL100	0.5t Aluminum	1	
13	Version Label	NPNC1100402000	0.1t Sticker	1	NC1100
		STNC1300000S1A	0.1t Sticker	1	NC1200/NC1300
14	Extension Hopper	PPNC1200052100	increase capacity	1	

2. Upper Module Assembly



No	Part Name	Part Number	Material/Spec	Qty	Note
1	Upper housing	PPNC110002220A	PC+ABS Black, flat	1	
2	Shaft	TPNC1100051500	SUS-303	1	
3	Micro Bearing	BE0623ZZ100410	623ZZ	4	
4	Spring	SPNC1100091450	SUφ0.4×φ4.8×10	2	
5	IR Lens	PPNC110021D400	Clear Acrylic	2	
6	MR Sensor PCB Assembly	S-BNC1101A02	NC1100-C	1	NC1100
		S-BNC1100A03	NC1200-C	1	NC1200
		S-BNC1200A03	NC130X-C	2	NC1300
7	φ2.6*6 self tapping screw	SC26006T02NR00	Round, Nickel	7	
8	White Glass	GLA03502030C00	35*20*3mm with	2	
9	UV LED Frame	PPNC1100192600	POM, black.	2	NC1100
		PPNC1100192800	POM, Black.	2	NC1200/NC1300
10	Upper feeding wheel shaft	TPNC1100081500	SUS-303	1	
11	Spring	SPNC1100021450	SUφ0.35×φ4.8×10	2	
12	Feeding wheel	S－CNC110A04		1	NC1100
		RPNC1100087100		2	NC1200/NC1300
13	Upper sensor conduction	TPNC1100075600	POM, white	4	
14	Upper sensor conduction	TPNC1100061500	SUS-303	1	
15	PCB Assembly	S-BNC1101A03	NC1100-D	1	NC1100
		S-BNC1100A04	NC1200-D	1	NC1200
		S-BNC1300A01	NC1300-D	1	NC1300
16	Upper gap adjusting rack	MPNC1100010200	1.5t SUS304	1	
17	Gap adjusting board	MPNC1100030200	1.5t SUS304	1	
18	Upper Tenon shaft	TPNC1100111500	SUS-303	1	
19	M2.6*6 machine screw	SC26006M05NF00		4	
20	Spring, Extension	SPNC1100012450	SUS-WH	2	
21	Gap adjusting Screw	TPNC1100142500	Bronze	1	
22	Spring	SPNC1100041450	SUφ0.6×三×14	1	
23	Gap adjusting rack	TPNC1100121500	SUS-303	1	
24	M3.0*3 machine screw	SC30003M05B040	Plate, black, Hex	1	
25	Twisted Spring (Right)	SPNC1100073450	SUS-WH	1	
26	Twisted Spring (Left)	SPNC1100063450	SUS-WH	1	
27	Metal Guide	SPNC1100051450	SUS-WH	1	
28	Push Bottom	PPNC1100171100	ABS 94V0	1	
29	FCC Cable	C18AF18BF155	155mm, 18pin, 0.5P	1	
30	FCC Cable	C18AF18BF155	155mm, 18pin, 0.5p	1	
31	Control Panel assembly	S－CNC1100AD2		1	

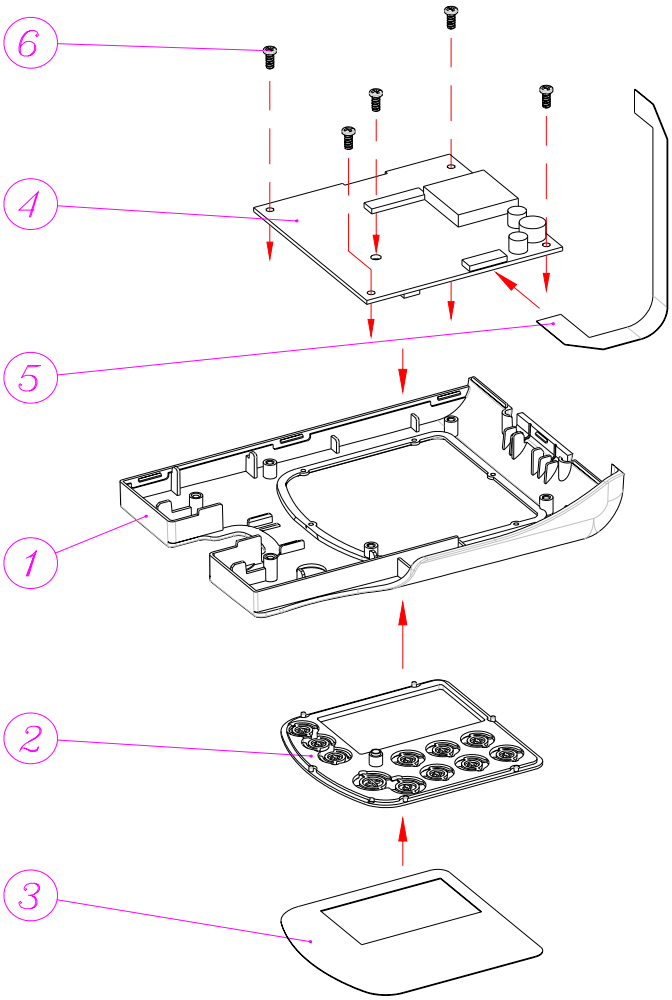
3. Lower Modules Assembly



No	Part Name	Part Number	Material/Spec	Qty	Note
1	Lower Housing	PPNC110001222A	PC+ABS 94V0	1	
2	Feeding rubber wheel	RPNC1100017100	Semi Clear – Yellow	1	
3	Distribution wheel	S-CNC1100A08	Front Rubber wheel + Gear	1	
4	Rubber Belt	LB035007040300	φ35×0.7×4w(NBR)	2	
5	Distribution wheel	S-CNC1100A09	Rear Rubber wheel + Gear	1	
6	Gear Shaft	TPNC1100011500	SUS-303	1	
7	Gear	PPNC11003616A0	HYTREL, white	2	
8	E-ring	WA030706SX7100	φ3	15	
9	M2.6×6 Machine Screw	SC26006M05NW00	Round, plate, w/2 washers.	1	
10	Sensor conduction	RPNC1100057100	Semi Clear – Yellow	2	
11	Outputting wheel	RPNC1100047100	Semi Clear – Yellow	1	
12	Micro Bearing	BEMR74ZZ070310	MR74ZZ	12	
13	Gear for feeding	PPNC1100261600	POM- white	1	
14	Single Direction Bearing	BEFC4KXX080610	FC4K	5	
15	Gear for distributing	PPNC1100271600	POM- white	1	
16	MXL Drive Belt	PPNC1100301600	POM- white	2	
17	MXL Drive Belt	PPNC1100291600	POM- white	1	
18	Drive Belt	LB155MXL032100	155MXL×3.2w	1	
19	Drive Belt	LB050MXL032100	50MXL×3.2w	1	
20	Belt pressing frame	MPNC1100050200	1.0 t SUS304+φ4SUS303	1	
21	Belt pressing frame	TPNC1100025600	POM- white	1	
22	φ3×10 self tapping	SC30010T01NR00	Round, nickel plated	4	
23	DC Motor Assembly	DMNC1100M20608	6V×7.6W×7200N	1	
24	Encoder film	PPNC1100242100	ABS – Black	1	
25	Gear Bracket	MPNC1100060200	SUS303+PU	1	
26	M2.6×8 Machine Screw	SC26008M05NW00	Round, plated, w/2 washers.	2	
27	Button	PPNC1100101100	ABS - Cream	1	NC1100
		PPNC110010C100	ABS - Gray	1	NC1200/NC1300
28	Spring	SPNC1100091450	SUS-WH	1	
29	IR Lens	PPNC110021D400	Clear Acrylic	2	
30	IR Cover	PPNC1100222800	POM - Black	2	
31	PCB Assembly	S-BNC1100A05	NC1100-E		
		S-BNC1200A05	NC1200-E	1	
		S-BNC1200A05	NC1300-E		
32	Bearing sustain perch	PPNC1100131100	ABS – Cream	2	
33	Spring	SPNC1100021450	SUS-WH	4	
34	Bearing sustain perch	PPNC1100121100	Cream	4	

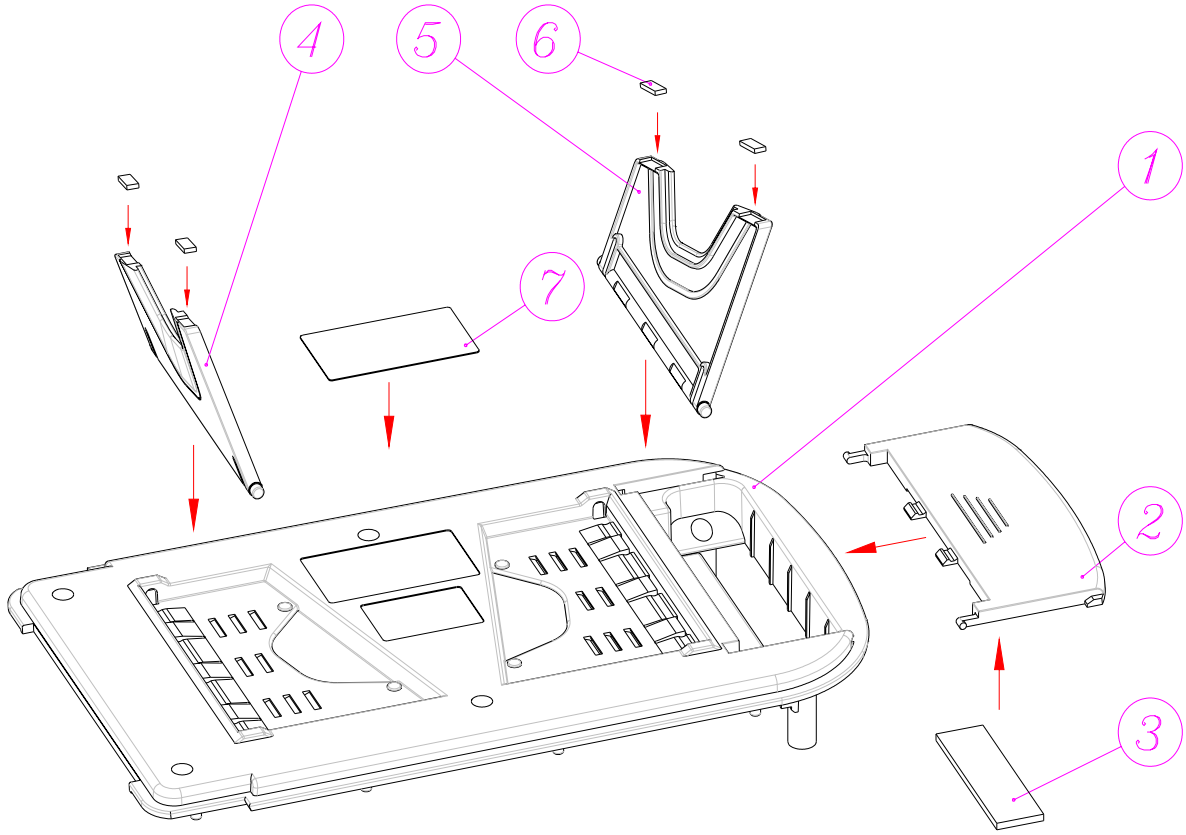
35	White Glass	GLA03502030C00	35×20×3mm with Angle	2	
36	UV LED Frame	PPNC1100192800	POM – Black	2	
37	Front Dust Cover	PPNC1100322100	ABS - Black	1	
38	PCB Assembly	S-BNC1101A07	NC1100-G	1	NC1100
			NC1200-G	1	NC1200
			NC1300-G	1	NC1300
39	Rear Dust Cover	PPNC1100332100	ABS - Black	1	
40	PCB Assembly	S-BNC1101A04	NC1100-F	1	NC1100
		S-BNC1300A02	NC1200-F	1	NC1200
		S-BNC1300A02	NC1300-F	1	NC1300
41	FCC Cable	C18AF18BF037	37mm,18pin,0.5p	1	
42	FCC Cable	C06AF06BF037	37mm, 6pin, 1p	1	
43	PCB Assembly	S-BNC1101B01	NC1100-A	1	NC1100
		S-BNC1200A01	NC1200-A	1	NC1200
		S-BNC1200A01	NC1300-A, NC1302-A, NC1304-A	1	NC1300
		S-BNC1301A01	NC1301-A	1	

4. Control Panel Assembly



No	Part Name	Part Number	Material/Spec	Qty	Note
1	Control Panel Housing	PPNC11001611B0	ABS 94V0 – Cream	1	NC1100
		PPNC110016C1B0	ABS - Gray	1	NC1200/NC1300
2	Push Buttons	PPNC11002311A0	ABS 94V0 – Cream	1	
3	Control Panel Plate	NPNC11003PC000	0.3t pc	1	
4	PCB Assembly	S-BNC1100A02	NC1100-B	1	
5	FCC Cable	C18AF18BF155	155mm,18pin,0.5p	1	7202
6	φ2.6×6 Phillips Screw	SC26006T02NR00	Nickel plated	5	

5. Bottom Cover Assembly



No	Part Name	Part Number	Material/Spec	Qty	Note
1	Bottom Cover	PPNC110006C100	ABS – Cream	1	NC1100
		PPNC1100062100	ABS - Black	1	NC1200/NC1300
2	Battery Cover	PPNC110007C100	ABS 94V0 – Cream	1	NC1100
		PPNC1100072100	ABS 94V0 - Black	1	NC1200/NC1300
3	Sponge	DT05001403SP10	Self Adhesive50×14×3T	1	
4	Stand (Left)	PPNC110008C100	ABS – Cream	1	NC1100
		PPNC1100082B00	ABS - Black	1	NC1200/NC1300
5	Stand (Right)	PPNC110009C100	ABS – Cream	1	NC1100
		PPNC1100092B00	ABS - Black	1	NC1200/NC1300
6	Self Adhesive	OCRNC110001200	Rubber 10×3.0×0.8t, black	4	
7	Spec Plate	NPNC1100301000	0.15t Polyester	1	NC1100
		NPNC11004PC00	0.254t Polyester	1	NC1200/NC1300

Chapter 6. Inspection problems and Recovery

A. Operating Problem

Display and Operating Errors	
Phenomenon	**Treatment**
When turn on the unit, no indication on LCD, either the buzzer can not be heard	1. Is the power cord connected properly? 2. Please check the adapter is specially supplied 10V/24W by MA. 3. If you can turn on the machine with a fully charged battery, please replace the breakdown adapter. 4. Remove the battery, connect with a functional adapter then turn on the machine again. * If you followed the steps as the above-mentioned and the unit still can not boot up, please contact with MA.
No display on LCD	1. Is the power cord plugged in? 2. Reboot machine to re-start LCD..
Unclear display on LCD	Reboot machine to re-start LCD.
No Backlight	1. To turn the backlight in setting menu (Backlight Setting) 2. LED is damaged, please contact with MA.
Low battery	1. Charge the battery. 2. Replace the battery.
Hopper Error	1. Foreign matter is left in the hopper. 2. Foreign matter is left in the bill path. * If there is any question after, please contact with MA.
Key malfunction	To enter the “Self diagnosis test” mode, and check on the key. * If there is any question, please contact with MA.
Counting Errors	
Phenomenon	**Treatment**
Error occurs often	1. Turn the thickness adjustment dial to the anti-clockwise rotation (left-handed) to make the space wider. 2. Do Calibration. 3. Please record the information of the error banknote by “Sample Tool” and sending these sampling data to MA.
Denomination misread	May caused by index mismatch, please update PCSuite again
Value Error IR/UV	1. Please check the note path for any matter left in the bill path and obstructed the IR/UV Sensor. 2. To clear the bill path. 3. Adjust the Sensor; please refer to “Calibration Process”. *If there is any question after adjustment, please contact with MA.

B. Error Code and Processing:

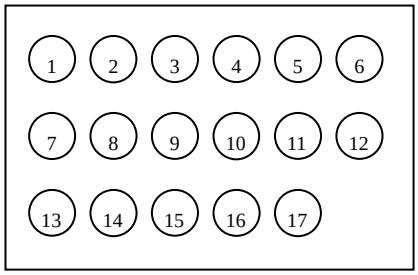
Error Code	Treatment
Paper Jam	1. Adjust thickness in the transport path. 2. Please reduce the banknote on the hopper. 3. Please check is there any foreign matter in the bill path or transmission gear. * If there is any question after, please contact with MA.
Double	Two bills were fed at same time.
Dimension Error	If the note on the top of stacker is a genuine note however has been rejected. Turn the thickness adjustment knob clockwise and test again
MG Error	1. The suspicious note's MG is different to genuine note. 2. Please confirm the suspicious note. * If there is MG Error (the suspicious note is genuine), please sample the note by "MA PCSuite" and send the sampling data to MA.
UV Error	1. The suspicious note's UV is different to genuine note. 2. Please confirm the suspicious note. * If there is UV Error (the suspicious note is genuine), please sample the note by "MA PCSuite" and send the sampling data to MA.
IR Error	1. The suspicious note's IR is different to genuine note. 2. Please confirm the suspicious note. * If there is IR Error (the suspicious note is genuine), please sample the note by "MA PCSuite" and send the sampling data to MA.
Wrong denomination	At the SORT mode, the banknote in different denomination to the first genuine note is detected.
Bill path error	Please confirm the Trigger of hopper or the first Trigger of bill path without foreign matter.
Bill path error – IR	If the bill path is clear, nothing on the IR sensors, please calibrate the unit.
Bill path error –UV	If the bill path is clear, nothing on the UV and Color sensors, please calibrate the unit.
Motor Error	1. Please note does motor error always occur when power on. 2. Confirm if there is any problem of the Encoder. * If the motor does not turn at power on, please contact with MA
Wrong Face	At the FACE mode, the banknote in same denomination but different face to the first genuine note is detected.
Wrong Orientation	At the ORNT mode, the banknote in same denomination but different orientation to the first genuine note is detected.
EEPROM Error	Component breakdown please sent back it to MA and replace it.
UART Error	The flat cable has loosened, please sent it back to MA.
Print Error	1. Please check the position and the paper box. 2. Please check the power supply system. 3. Does the printer cable plug in properly? 4. The printer port may lose contact, please sent it back it to MA.

Chapter 7.Combination Key Description

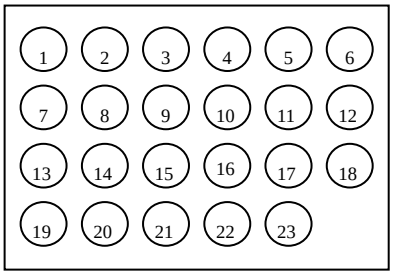
Combination Key		
Combinaiton	**Denomination**	**Use**
Set + CUR + Start	QC_CALIBRATION_KEY	Adjust Sensor.
Set + C + Start	QC_SIMPLE_KEY	Calibration process.
Set + F1 + Start	SHOW_VER_KEY	Check the machine's information, such as the firmware version, serial number and manufacturing date.
Set + F1 + Batch + Start	UPDATE_LD_KEY	To update the boot loader.
Set + ADD + M/A	SET_DET_PAGE_USE_KEY	Set to disable/enable FACE and ORNT mode
Set + ADD + DET + F2	SET_MOTOR_KEY	Motor self check and speed adjustment

Chapter 8. Sensor Calibration Process

1. Plug in the adaptor power cord, and connect the DC jack to NC-1000 Series.
2. While the initializing, press the function keys “Cur” and “Start” together and hold until the display shows the number 1~17 (NC-1100)/1~23 (NC-1200, NC-1300)(see below)

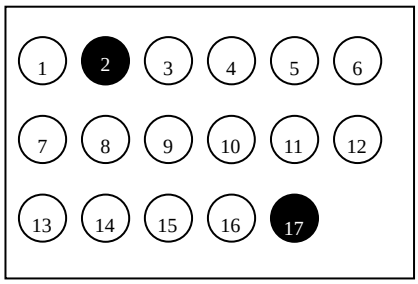


(NC-1100)

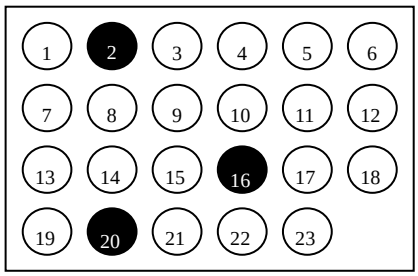


(NC-1200/NC-1300)

3. 1 ~ 17/ 1~23 stand for different sensors.
4. Feed the exclusive calibration paper supplied by MA, NC-1000 Series start to calibrate automatically.
5. While calibrating the unit, will see as below:



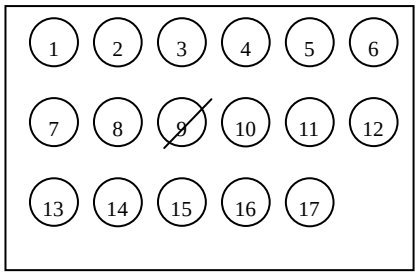
(NC-1100)



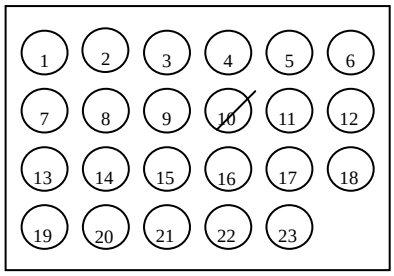
(NC-1200/NC-1300)

6. Repeat step 4~5, until the display shows “OK” (as below).

7. If the display shows the stroke circle appears continuously, it means the sensor out of range (see below). Please check on the Sensor (such as the wrong position, Emitter malfunction or Receiver dusted)



(NC-1100)



(NC-1200/NC-1300)

8. To detect whether any foreign matter left in the bill path:
   a. Open the Lid, and covered IR and UV Sensor with a piece of paper.
   b. Turned on the NC-1100.
   c. NC-1100 will buzz three short beeps when you turned on. It is abnormal if there is no sound.

*Sensors position

◆ **NC-1100**

Sensor No.	Detection	Corresponding Assembly	NO.	PCB Assembly	Part number
1 ~ 2	MG	Upper Modules Assembly	6	NC1100-C	S-BNC1101A02
3 ~ 5	Color	Upper Modules Assembly	15	NC1100-D	S-BNC1101A03
6	UV	Lower Modules Assembly	40	NC1100-F	S-BNC1101A04
7 ~ 9	IR Emitter	Upper Modules Assembly	6	NC1100-C	S-BNC1101A02
	IR Receiver	Lower Modules Assembly	31	NC1100-E	S-BNC1100A05
10 ~ 11 14 ~ 15	IR Reflect	Upper Modules Assembly	15	NC1100-D	S-BNC1101A03
12~13 16~17		Lower Modules Assembly	40	NC1100-F	S-BNC1101A04

◆ **NC-1200**

Sensor No.	Detection	Corresponding Assembly	NO.	PCB Assembly	Part number
1 ~ 4	MG	Upper Modules Assembly	6	NC1200-C	S-BNC1100A03
5 ~ 6	RIR	Upper Modules Assembly	15	NC1200-D	S-BNC1100A04
7 ~ 8		Lower Modules Assembly	40	NC1200-F	S-BNC1300A02
15 ~18		Lower Modules Assembly	31	NC1200-E	S-BNC1200A05
9	Color	Upper Modules Assembly	15	NC1200-D	S-BNC1100A04
10		Lower Modules Assembly	40	NC1200-F	S-BNC1300A02
11~14 19~22	TIR	Lower Modules Assembly	31	NC1200-E	S-BNC1200A05

◆ **NC-1300**

Sensor No.	Detection	Corresponding Assembly	NO.	PCB Assembly	Part number
1 ~ 4	MG	Upper Modules Assembly	6	NC1300-C	S-BNC1100A03
5~6, 23~26	RIR	Upper Modules Assembly	15	NC1300-D	S-BNC1100A01
7~8, 27~29		Lower Modules Assembly	40	NC1300-F	S-BNC1300A02
15 ~18		Lower Modules Assembly	31	NC1300-E	S-BNC1200A05
9, 30	Color	Upper Modules Assembly	15	NC1300-D	S-BNC1100A01
10, 31		Lower Modules Assembly	40	NC1300-F	S-BNC1300A02
11~14 19~22	TIR	Lower Modules Assembly	31	NC1300-E	S-BNC1200A05

Chapter 9. Simple Operating Instructions

1. To operate the device smoothly, please follow below instructions:

   A. Avoid processing wet, excessively dirty or spoiled notes.

   B. Remove notes been folded or heavily curled.

   C. Check for foreign matter mixed with notes, i.e.: paper shreds, rubber, clips, dust, etc.

2. Placing Bills

   A. Spread and separate newly printed notes well; some of them are slightly adhesive.

   B. Align all the corners and edges of the notes, improper operation may cause process errors.

   C. Put the notes along the lower side of the bill path to prevent false alarms.

   D. Slightly adjust the gap adjustment knob depending on condition of the notes. Recommended to keep the knob position between 11 o'clock to 1 o'clock.

3. Operating and Setting NC-1000 Series,

   1.1 Plug in the adaptor power cord, and connect the DC jack to NC-1000 Series. Press and hold the "Set" key until the Power bar runs to the end.

   1.2 Place the notes on the hopper, NC-1000 Series keep running until the last note, in the mean time, if a suspicious note is detected, the equipment will stop, by giving three short beeps while displaying "Suspicious note – (reason: i.e. MG-Magnetic, UV-Ultraviolet, IR-Infrared). Check the note, and press "C" to clear the status. Press "Start" to continue counting. The result will be shown on the LCD as amount and number of notes.

   1.3 Connect the printer and the Print icon lights up at the right bottom of the panel. Press the navigation key to print the counting result.

   1.4 Function Keys

   - Add: Switch the Add Mode on; the counting of notes will be accumulated automatically. The display will show the icon "✞".
   - Auto: Switch between Auto Mode and Manual Mode. When "Auto" mode is on, the display shows "A" and the unit will start counting automatically; oppositely, when the "Manual" mode is on and the display shows "M", it is necessary to start counting by pressing "Enter/Start" key.
   - Cur: Select preferred currency to start counting.