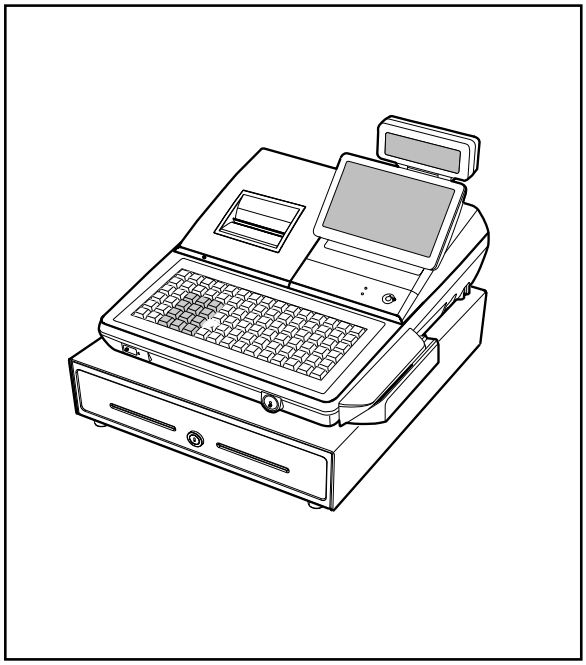
SAM4S

POS SYSTEM

SAP-630 SERIES

SERVICE Manual

SAP-630 Series



C O N T E N T S

About this Manual

This service manual describes how to perform hardware service maintenance for the SAM4S SAP-630 Series POS System

Notes

Notes may appear anywhere in the manual. They describe additional information about the item.

Precaution symbols

⚠. Indicates a Safety Precaution that applies to this part component.

⚠. Indicates the part or component is an electro-statically sensitive device. Use caution when handling these parts.

SAM4S SAP-630 SERIES

July. 2018

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Overview of this POS System

This service manual provides the technical information for many individual component systems and circuits and gives an analysis of the operations performed by the circuits. Schematics and specifications provide the needed information for the accurate troubleshooting.

1 Precaution Statements

Follow these safety, servicing and ESD precautions to prevent damage and to protect against potential hazards such as electrical shock.

1-1 Safety Precautions

1. Be sure that all built-in protective devices are replaced. Restore any missing protective shields.
2. When reinstalling the chassis and its assemblies, be sure to restore all protective devices, including nonmetallic control knobs and compartment covers.
3. Make sure there are no cabinet openings through which people - particularly children - might insert fingers and contact dangerous voltages. Such openings include excessively wide cabinet ventilation slots and improperly fitted covers and drawers.
4. Design Alteration Warning:
   Never alter or add to the mechanical or electrical design of the POS. Unauthorized alterations might create a safety hazard. Also, any design changes or additions will void the manufacturer's warranty.
5. Components, parts and wiring that appear to have overheated or that are otherwise damaged should be replaced with parts that meet the original specifications. Always determine the cause of damage or over- heating, and correct any potential hazards.
6. Observe the original lead dress, especially near the following areas : sharp edges, and especially the AC and high voltage supplies. Always inspect for pinched, out-of-place, or frayed wiring. Do not change the spacing between components and the printed circuit board. Check the AC power cord for damage. Make sure that leads and components do not touch thermally hot parts.
7. Product Safety Notice:
   Some electrical and mechanical parts have special safety-related characteristics which might not be obvious from visual inspection. These safety features and the protection they give might be lost if the replacement component differs from the original - even if the replacement is rated for higher voltage, wattage, etc.
   Components that are critical for safety are indicated in the circuit diagram by shading, (⚠) or (⚠). Use replacement components that have the same ratings, especially for flame resistance and dielectric strength specifications. A replacement part that does not have the same safety characteristics as the original might create shock, fire or other hazards.
8. The socket-outlet shall be installed near
   The equipment and shall be easily accessible

9. This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and

(2) This device must accept any interference received, including interference that may cause undesired operation

10. This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense

THE GRANTEE IS NOT RESPONSIBLE FOR ANY CHANGES OR MODIFICATIONS NOT EXPRESSLY APPROVED BY THE PARTY RESPONSIBLE FOR COMPLIANCE. SUCH MODIFICATIONS COULD VOID THE USER' S AUTHORITY TO OPERATE THE EQUIPMENT

IMPORTANT NOTE : FCC RF Radiation Exposure Statement

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

CAUTION
RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE.
DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS

ATTENTION
IL Y A RISQUE D'EXPLOSION SI LA BATTERIE EST REMPLACÉE
PAR UNE BATTERIE DE TYPE INCORRECT.
METTRE AU REBUT LES BATTERIES USAGÉES CONFORMÉMENT AUX INSTRUCTIONS

1-2 Servicing Precautions

WARNING: First read the-Safety Precautions-section of this manual. If some unforeseen circumstance creates a conflict between the servicing and safety precautions, always follow the safety precautions.
WARNING: An electrolytic capacitor installed with the wrong polarity might explode.

1. Servicing precautions are printed on the cabinet. Follow them.
2. Always unplug the units AC power cord from the AC power source before attempting to:
   (a) Remove or reinstall any component or assembly (b) Disconnect an electrical plug or connector (c) Connect a test component in parallel with an electrolytic capacitor
3. Some components are raised above the printed circuit board for safety. An insulation tube or tape is sometimes used. The internal wiring is sometimes clamped to prevent contact with thermally hot components. Reinstall all such elements to their original position.
4. After servicing, always check that the screws, components and wiring have been correctly reinstalled. Make sure that the portion around the serviced part has not been damaged.
5. Check the insulation between the blades of the AC plug and accessible conductive parts (examples : metal panels and input terminals).
6. Insulation Checking Procedure:
   Disconnect the power cord from the AC source and turn the power switch ON. Connect an insulation resistance meter (500V) to the blades of AC plug.

   The insulation resistance between each blade of the AC plug and accessible conductive parts (see above) should be greater than 1 megaohm.
7. Never defeat any of the B+ voltage interlocks. Do not apply AC power to the unit (or any of its assemblies) unless all solid-state heat sinks are correctly installed.
8. Always connect an instrument's ground lead to the instrument chassis ground before connecting the positive lead ; always remove the instrument's ground lead last.

1-3 Precautions for Electrostatically Sensitive Devices (ESDs)

1. Some semiconductor (solid state) devices are easily damaged by static electricity. Such components are called Electrostatically Sensitive Devices (ESDs); examples include integrated circuits and some field-effect transistors. The following techniques will reduce the occurrence of component damage caused by static electricity.
2. Immediately before handling any semiconductor components or assemblies, drain the electrostatic charge from your body by touching a known earth ground. Alternatively, wear a discharging wrist-strap device. (Be sure to remove it prior to applying power - this is an electric shock precaution.)
3. After removing an ESD-equipped assembly, place it on a conductive surface such as aluminum foil to prevent accumulation of electrostatic charge.
4. Do not use freon-propelled chemicals. These can generate electrical charges that damage ESDs.
5. Use only a grounded-tip soldering iron when soldering or unsoldering ESDs.
6. Use only an anti-static solder removal device. Many solder removal devices are not rated as anti-static; these can accumulate sufficient electrical charge to damage ESDs.
7. Do not remove a replacement ESD from its protective package until you are ready to install it. Most replacement ESDs are packaged with leads that are electrically shorted together by conductive foam, aluminum foil or other conductive materials.
8. Immediately before removing the protective material from the leads of a replacement ESD, touch the protective material to the chassis or circuit assembly into which the device will be installed.
9. Minimize body motions when handling unpackaged replacement ESDs. Motions such as brushing clothes together, or lifting a foot from a carpeted floor can generate enough static electricity to damage an ESD.

2 Product Specifications

Specifications are correct at the time of printing. Product specifications are subject to change without notice. See below for product specifications.

General Specifications

Item	Description	Remark
PROCESSOR	• Intel Celeron N3160(Quad Core up to 2.24GHz)	
OS	• Android 6.0(Marshmallow)	
MEMORY	• Storage : eMMC 8GB • SDRAM : DDR3 2GB	
SERIAL INTERFACE (RS-232C)	• Flow Control : ① CTS / RTS : H/W Flow Control ② XON / XOFF : S/W Flow Control • Voltage Supply : VCC(+5V/1A) supplies at RS-232C#1~#4	RS-232C #1(DSUB-9) RS-232C #2(DSUB-9) RS-232C #3(RJ45) RS-232C #4(RJ45)
LAN	• 10/100 base-T ETHERNET(TCP/IP)	
SD CARD	• 1-Slot [64GB_max]	SDHC Compatible
MSR	• 1-Slot [option]	1/2 Track or 2/3 Track
i-BUTTON	• Magnetic [option]	
DRAWER	• 3-port [Default (internal) #1 / RJ-11 #2,#3]	
USB	• 2-port [HOST]	
WIRELESS	• WiFi / Bluetooth [option]	
PRINTER	• Model : LTPF347E(SII) • Printing Speed : 100mm/sec	Detail Spec refer to Next Page
AUTO CUTTER	• Type : Guillotine • Cutting Method : 1 Point Partial Cutting	
DISPLAY	• Operator Display : 9.7” TFT-LCD(LED B/L), 1024x768 • Customer Display : 16char*2line LCD	
TOUCH	• 5-Wire Resistive	
KEY BOARD	• Flat Rubber Key : 160 Key • Raised Key : 90Key	
POWER CONSUMPTION	• Approx. 40W (Regularity)	
POWER REQUIREMENT	• AC 100-240V 50/60Hz	
ENVIRONMENT CONDITION	• Temperature : 0℃ ~ 45℃ • humidity : 30% ~ 80% RH	
WEIGHT	• Approximately 12Kg	
DIMENSION(mm)	• 400(W) × 468(L) × 344(H) : With G-Drawer	Set Size

Table2-1 General Specifications

2-2 Appearance

2-2-1 Appearance Dimensions (mm)

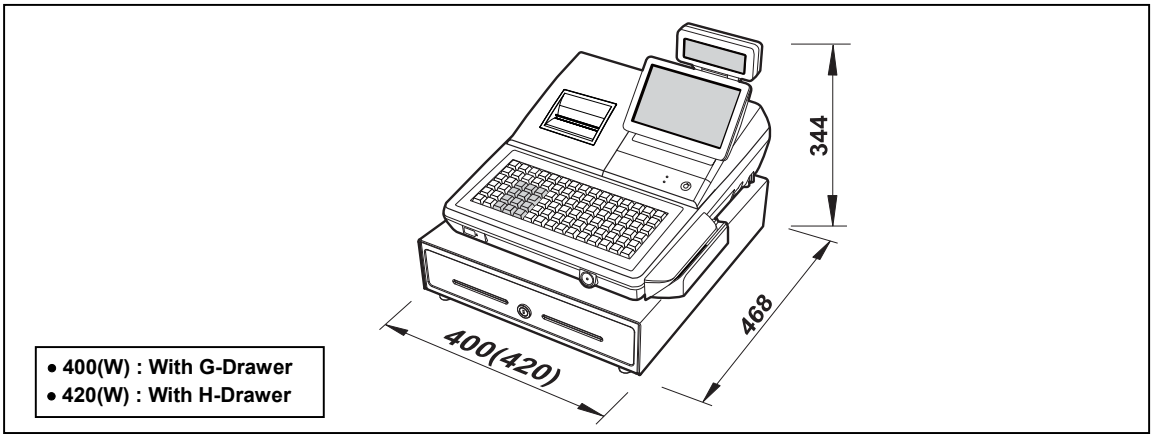


Figure2-1 Dimensions

2-2-2 Location Features

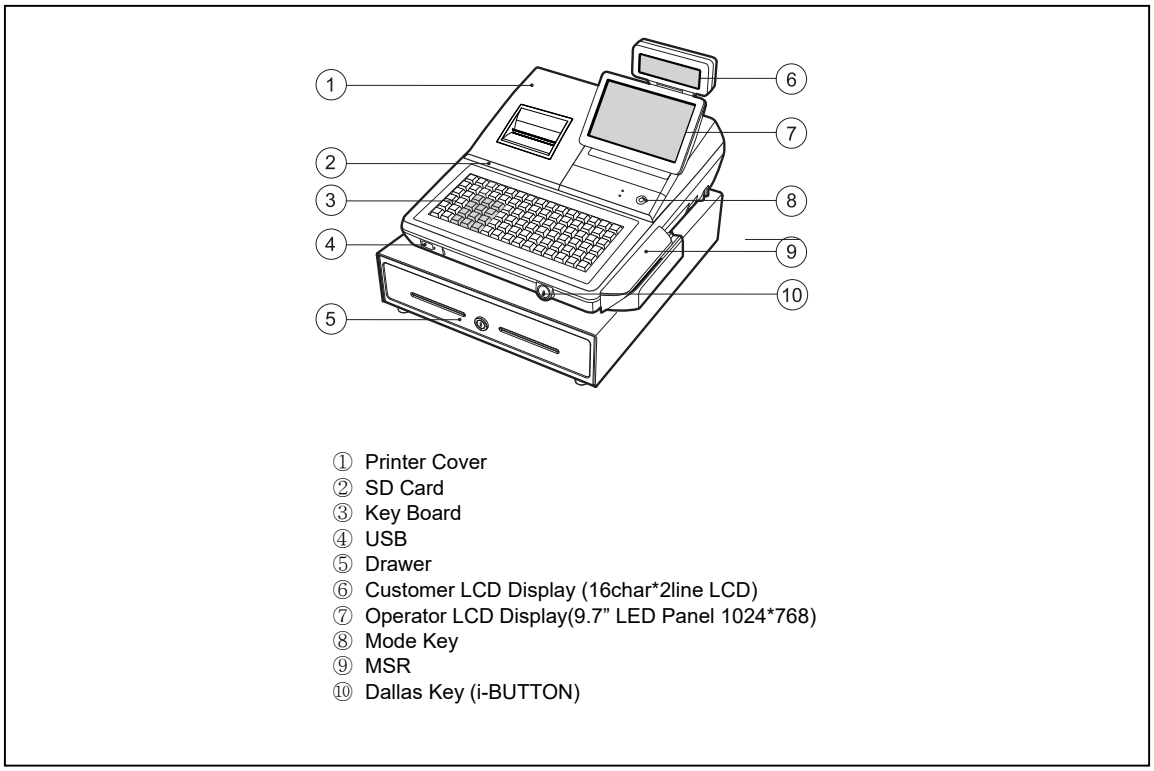


Figure2-2 Location Features

2-3 Thermal Printer Specifications

2-3-1 Printer Specification (3")

Item		Description	Remark
Model		• LTPF347E	SII
Print Method		• Thermal Line Printing	
Printing Format	Total Number of Dots	• 576 Dots / I Line	
	Dot Pitch	• Vertical : 0.125 mm • Horizontal : 0.125 mm	
Printing Speed		• 100 mm/Sec	
Printing Direction		• Unidirectional Friction Feed	
Paper Feeding	Feeding Method	• Friction Feed	
	Minimum Feed Pitch	• 0.0625 mm	
	Feeding Speed	• 100 mm/Sec	
Power Supply Volt	Power Voltage	• 24V/24V (Recommend)	Head/Motor
	Circuit Input Voltage	• 5V	Head Control/Sensor
Printer Head	Heat Element Density	• 8 Dots/mm (200dpi)	
	Total Head Elements	• 576 Dots/Dot Line	
	Available Printing Width	• 72 mm	
	Heat Element Typical Ω	• 1500 Ω ±3%	
Line Feed Motor		• 4-Phase Bi-Polar Stepping Motor	
Sensor	Head Temperature	• Thermistor	
	Paper-End Sensor	• Reflecting Photo Sensor	
	Printer Cover Open Sensor	• Micro Switch	
Auto Cutter	Type	• Guillotine Type	SII
Reliability	TPH	• 100Km , 1×10^8 Pulses	
	Auto-cutter	• 1,000,000 Cuts	Paper : PD-160R-N (Oji paper co.,Ltd)
Dimension (mm)		• 110.2 (W) ×54 (D) ×25.8 (H)	
Weight		• Approx. 175 g	

Table2-2 Thermal Printer Specifications

2-3 Thermal Printer Specifications

2-3-2 Paper Specification

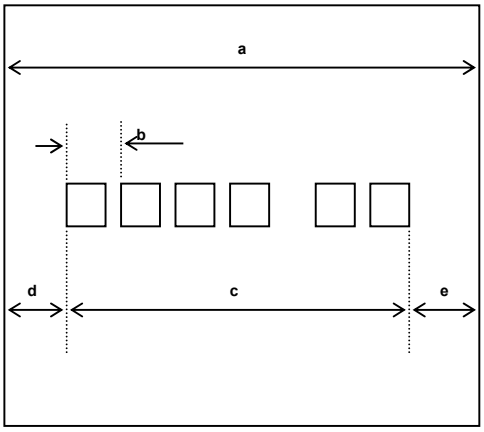
Item	Description	Remark
Paper Type	• Single-ply Thermal Paper Roll	
Paper Size	• 79.5 mm ± 0.5 mm (Width) × 80 mm or less	
Specified Paper	• Original Paper No : HPK-110 (Hansol paper XT)	

Table2-3 Paper Specification

Note: The following paper can be used instead of the specified paper above.
TF50KS-E: Nippon paper industries Co.,Ltd.
PD 160R : New Oji paper Mfg, Co.,Ltd.
F380 : Kansaki specialty papers, Inc. (USA)

2-3-3 Printable Area

The Printable area of a paper with width of 79.5mm is 72.0mm(576 dots) and the space on the right and left sides are approximately 4.0mm.



a = 79.5±0.5 ㎜ (Paper Width)
b = 0.141 ㎜ (1 Dot)
c = 72.0 ㎜(576 Dots/Printable Area)
d = 4.0 ㎜ (Left Space)
e = 4.0 ㎜ (Right Space)

Figure2-3 Printable Area

2-3-4 Character Specification

Item	Description	Remark
Character Structure	• 12(W) × 24(H) Font (Including a Horizontal)	
Character Size	• 1.25 mm(W) × 3.0 mm(H)	
Column Pitch	• 1.5 mm	
Line Pitch	• 3.75 mm (Including 6-dot Line Spacing)	
Number of Column	• 32 (12×24 Dots/Character)	

Table2-4 Character Specification

2-4 Power Specifications

2-4-1 Power Specification

Item	Description	Remark
Input Voltage & Current	• AC 100~240V, 800mA, 50/60Hz (Min : 90V, Max : 264V) [AC/DC Adaptor(24V/2.5A) Internal]	
Power Consumption	• Peak : 50W	

Table2-5 Power Specification

2-5 Interface Specifications

2-5-1 RS-232C Serial Interface Specification

Item	Description	Remark
Data Transmission	• Serial Data Transmission	
Synchronization	• Asynchronous	
Hand Shaking (Flow Control)	• H/W : CTS / RTS • S/W : XON / XOFF	XON : ASC Code 11h XOFF : ASC Code 13h
Signal Level	• Logic"1" (MARK) : -3V ~ -15V • Logic"0" (SPACE) : +3V ~ +15V	
Baud Rate	• 2400 / 9600 / 19200 / 38400 / 57600 / 115200 bps	
Data Word Length	• 7 Bit / 8 Bit	
Parity	• None / Even / Odd	
Connector	• DB9P Male : COM#1, COM#2 • RJ-45 Modular Jack : COM#3, COM#4	
Voltage Supply	• VCC(+5V/1A):COM#1~#4 • VCC(+5V/1A):USB#1~#2	

Table2-6 RS-232C Serial Interface Specification

CAUTION :
"VCC" is supplied for the Barcode or other devices. Supply current 1A is total value including COM#1~COM#4.
If the Total Power Consumption exceeds specification (1A), the system cuts "VCC" of COM#1~COM#4.

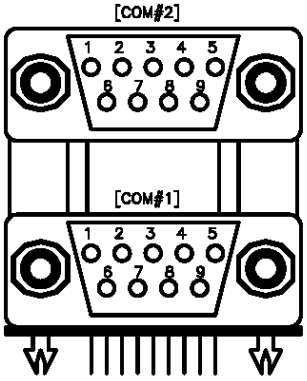
"VCC " is supplied for the USB Device. Supply current 1A is total value including USB1#~USB#2.
If the total Power Consumption exceeds specification (1A), the system cuts "VCC" of USB#1~USB#2.

2-5 Interface Specifications

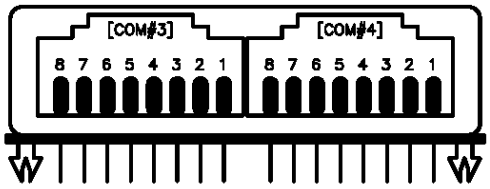
2-5-2 RS-232C Signal Description

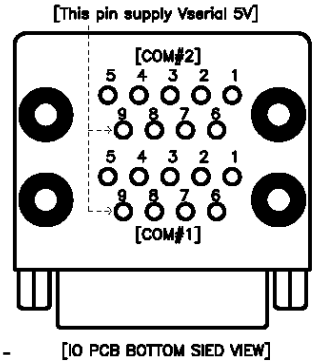
PIN NO		Signal Name	Direction	Function
DSUB9	RJ45			
1	-	DCD	IN	Carrier Detect
2	4	RXD	IN	Receive Data
3	3	TXD	OUT	Transmit Data
4		DTR	OUT	Data Set Ready
5	7	GND	-	-
6		DSR	IN	Data Terminal Ready
7	8	RTS	OUT	Request To Send
8	2	CTS	IN	Clear To Send
		RI	IN	Ring Indicator
9	1	+5V/500mA	-	Total Power : 1A (COM#1,#2 : Pin9, COM#3,#4 : Pin1)

[DSUB9 CONNECTOR]

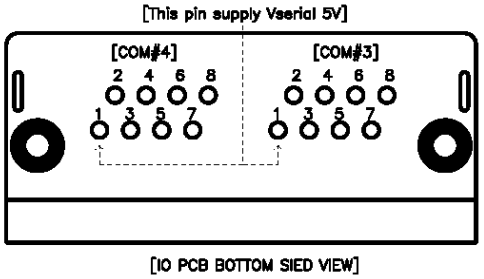


[RJ-45 MODULAR CONNECTOR]





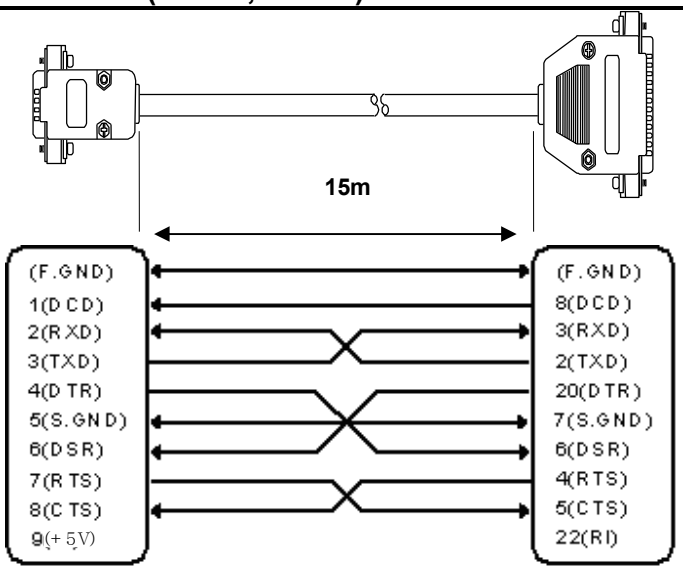
[IO PCB BOTTOM SIED VIEW]

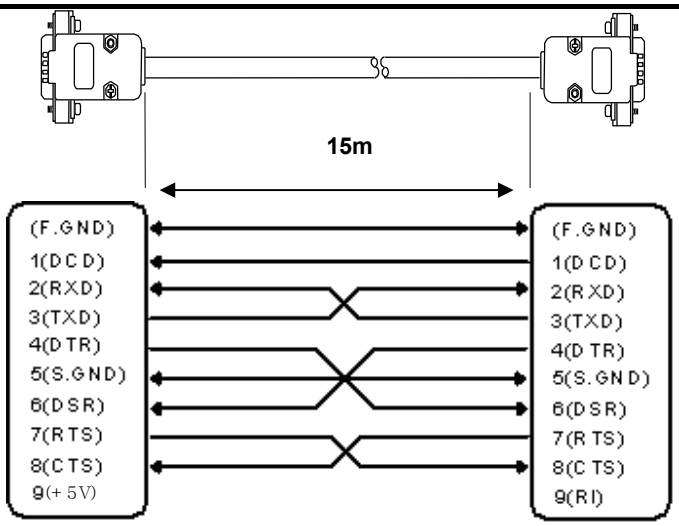


[IO PCB BOTTOM SIED VIEW]

2-5 Interface Specifications

2-5-3 RS-232C Interface Cable (COM1, COM2)

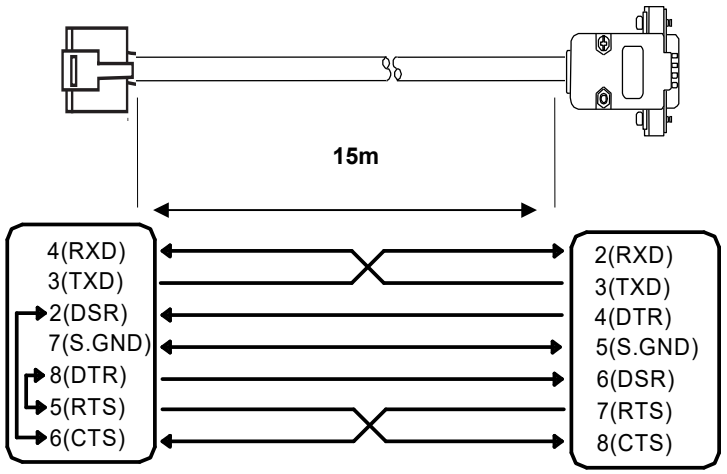
SAP-630 SIDE (DSUB9 FEMALE)	 **(PIN CONNECTION)**	**USER SIDE (DSUB25 MALE)**

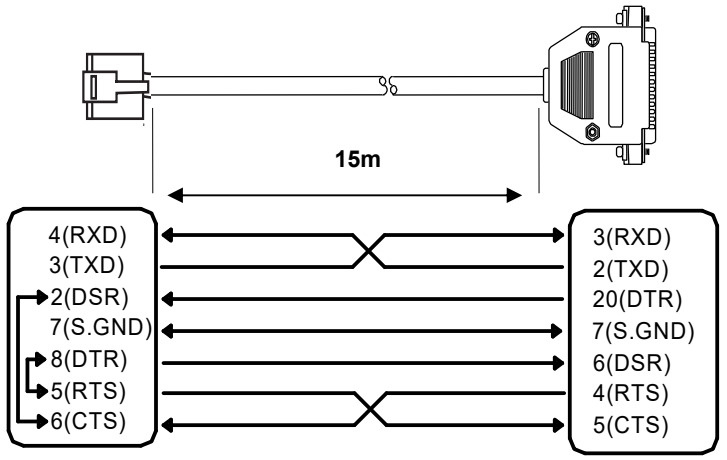
SAP-630 SIDE (DSUB9 FEMALE)	 **(PIN CONNECTION)**	**USER SIDE (DSUB9 MALE)**

CAUTION :
COM#1~COM#2 supplies “+5V” to DSUB9 “Pin Num 9”.

2-5 Interface Specifications

2-5-3 RS-232C Interface Cable (COM3, COM4)

SAP-630 SIDE (RJ-45 Modular)	 **(PIN CONNECTION)**	**USER SIDE (DSUB9 MALE)**

SAP-630 SIDE (RJ-45 Modular)	 **(PIN CONNECTION)**	**USER SIDE (DSUB25 MALE)**

CAUTION :
COM#3~COM#4 supplies “+5V” to RJ45 “Pin Num 1”.

2-5 Interface Specifications

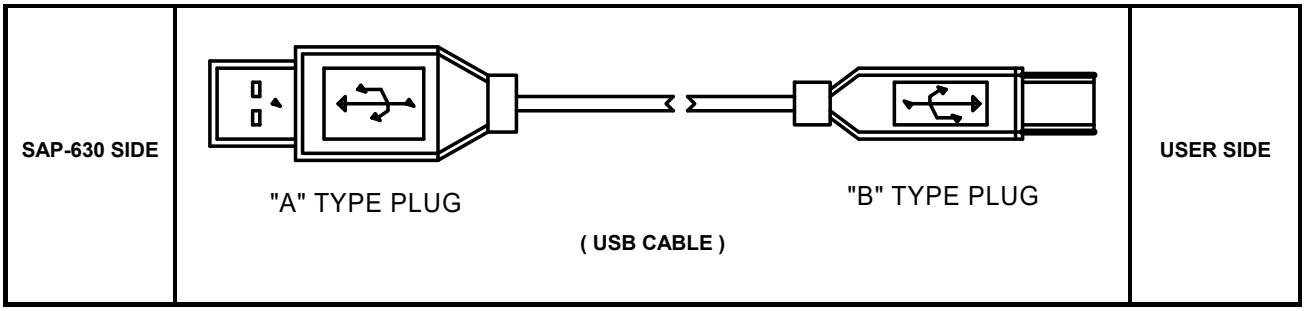
2-5-4 USB Interface Specification

Item	Description	Remark
Transfer Type	● BULK	
Data Signal	● Bi-Direction, Half-Duplex ● Differential Signal Pair (D+ / D-)	
Data Format	● NRZI Format ● Zero Bit Stuffing after 6 Ones	
Transceiver	● Differential Common Mode Range : 0.8 ~ 2.5[V] ● Differential Receive Sensitivity : 200[mV] ● Single End Receive Threshold : 0.8 ~ 2.5[V]	
Speed	● 480Mbps, 12Mbps	
Power	● Supply 5V/500mA (For HID)	
Cable & Connector	● Cable :5m/2m ● Connector :A type	
Support Spec	● USB Spec Version 2.0	

2-5-5 USB Signal Description

Pin No	Signal Name	Color	Function
SHELL	Shield	Drain Wire	Frame GND
1	VBUS	Red	Host Power : DC5[V] / 500[mA]
2	D-	White	Differential Data Line
3	D+	Green	Differential Data Line
4	GND	Black	Signal GND

2-5-6 USB Interface Cable

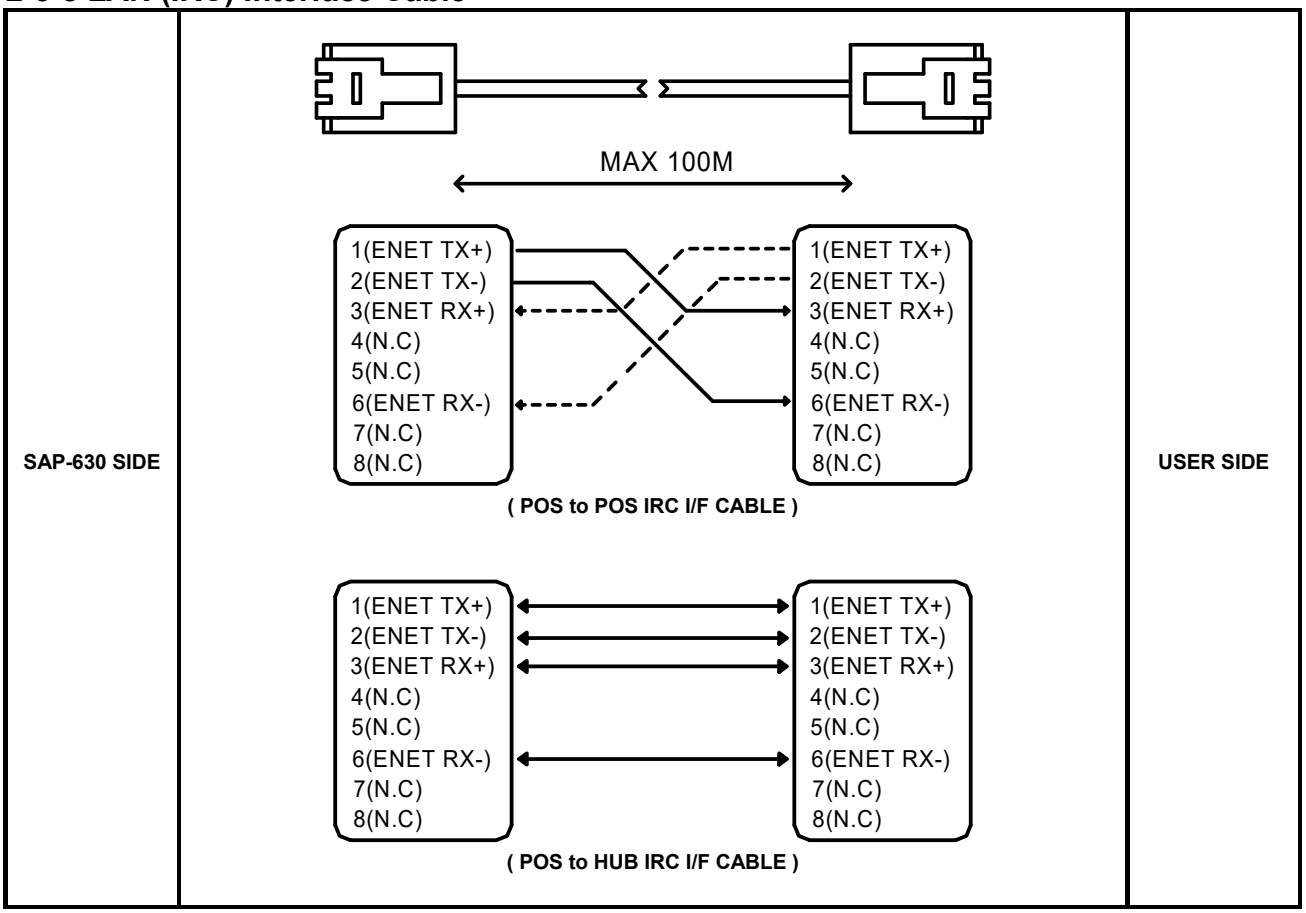


2-5 Interface Specifications

2-5-7 LAN (IRC) Signal Description

Pin No	Signal Name	Signal Direction	Function
1	ENET TX+	OUT	Ethernet Transmit Data Line(+)
2	ENET TX-	OUT	Ethernet Transmit Data Line(-)
3	ENET RX+	IN	Ethernet Receive Data Line(+)
4	N.C	-	
5	N.C	-	
6	ENET RX-	IN	Ethernet Receive Data Line(+)
7	N.C	-	
8	N.C	-	

2-5-8 LAN (IRC) Interface Cable



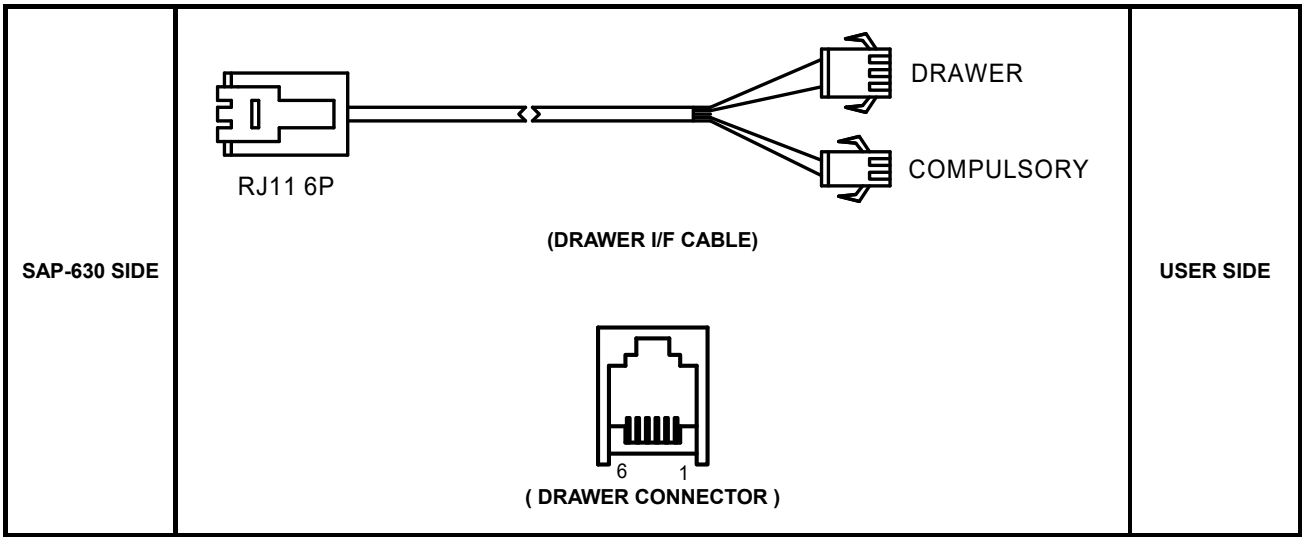
2-5 Interface Specifications

2-5-9 DRAWER Signal Description

Pin No	Signal Name	Direction	Function
1	S.G	-	Signal GND
2	DRAWER#OUT	OUT	Drawer Kick-Out Driver Signal.
3	DRA_COMP	IN	Drawer Open / Close Signal
4	+24V	-	Supply DC +24[V]
5	DRAWER#OUT	OUT	Drawer Kick-Out Driver Signal.
6	F.G	-	Frame GND

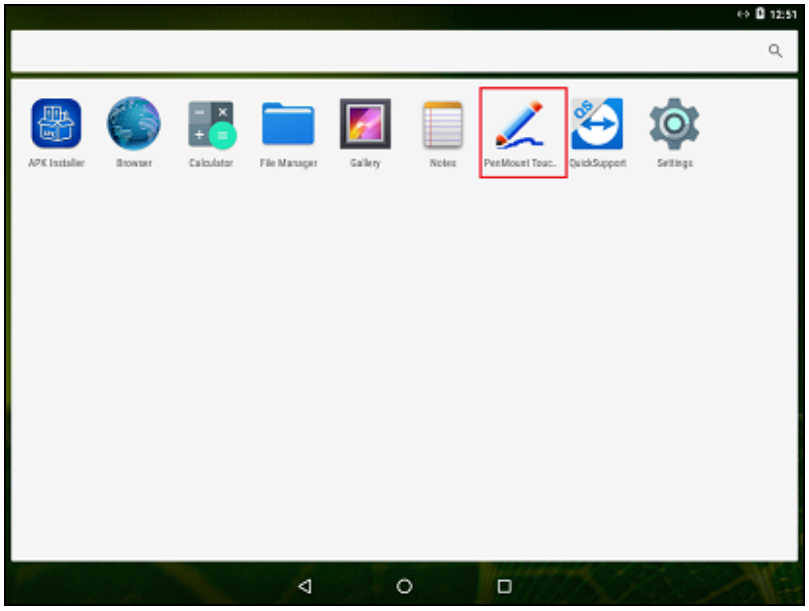
CAUTION :
Make sure that installed “+24V Cash Drawer”.
Make sure that the Cash Drawer Solenoid Resistance is more than 20[Ohm]

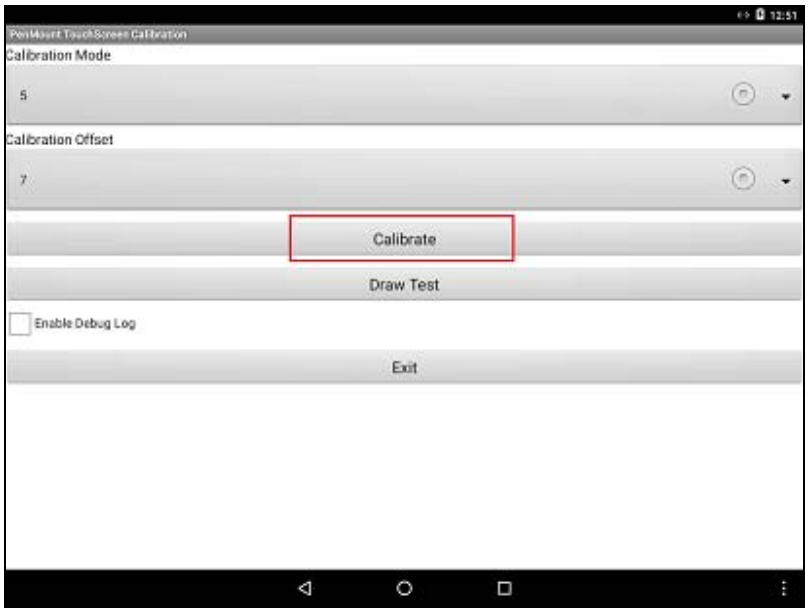
2-5-10 DRAWER Interface Cable



3 Installation and Operation

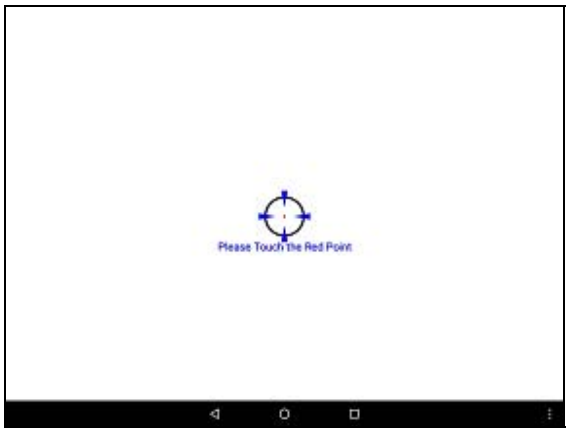
3-1 Touch Calibration

No	Setup Method	Remark
1	• Click the menu 	
2	• Click Touch Screen “APP” 	
3	• Click Calibration	



4

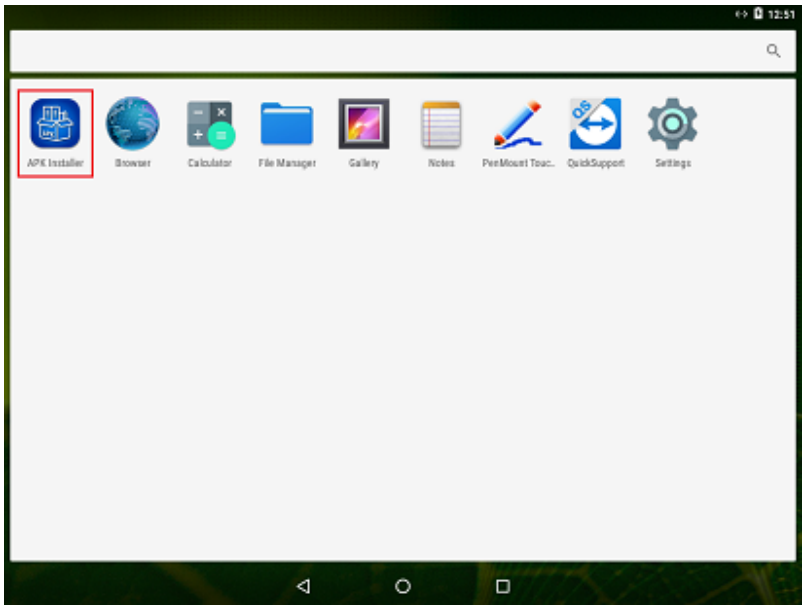
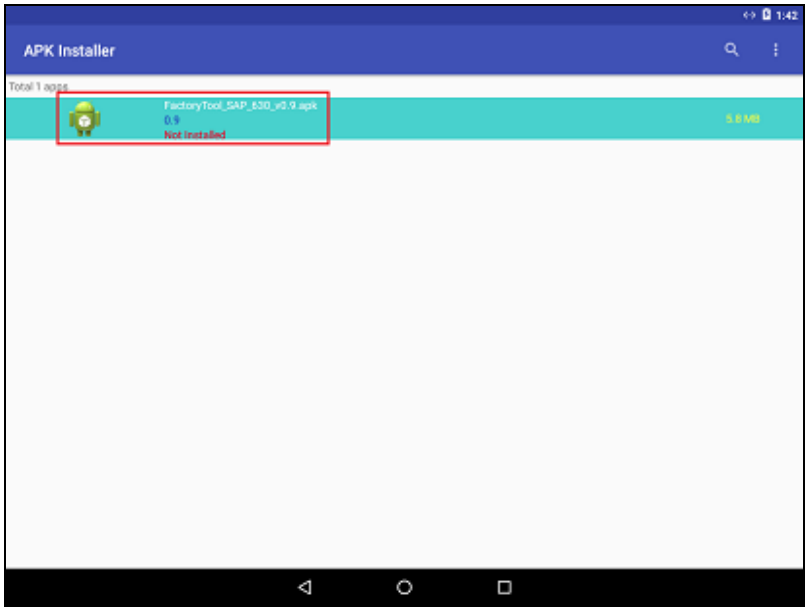
• Follow below steps

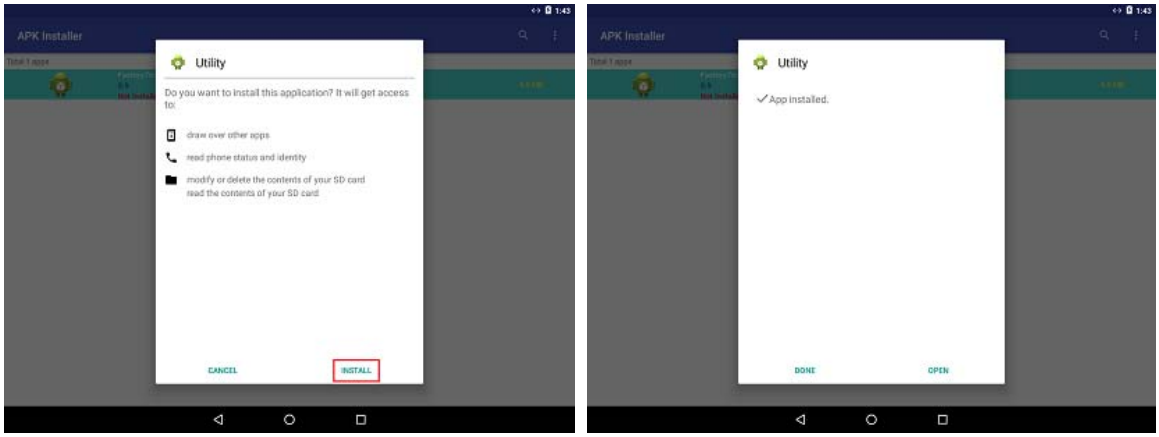


3-2 Application Management

3-2-1 Application INSTALL

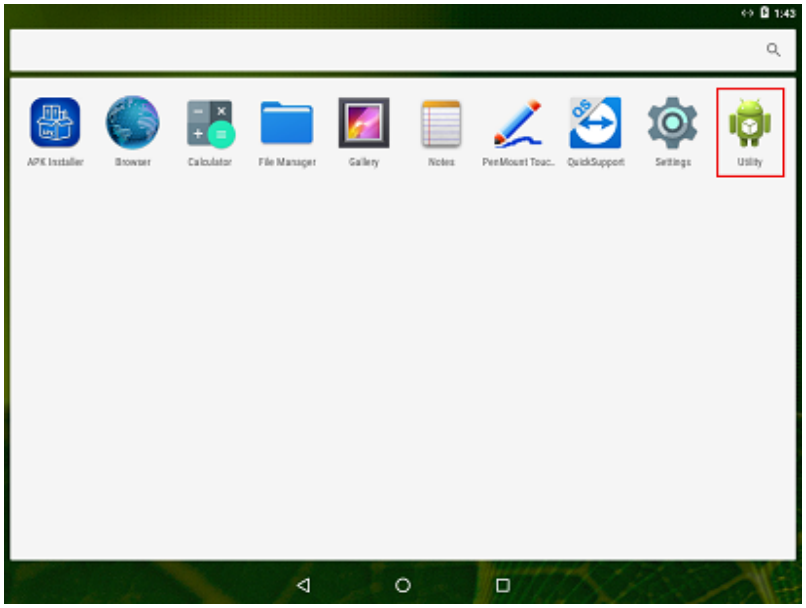
No	Setup Method	Remark
1	•Click “the APKInstaller”	

		
2	•Click “the APK” 	
3	• Click Install	



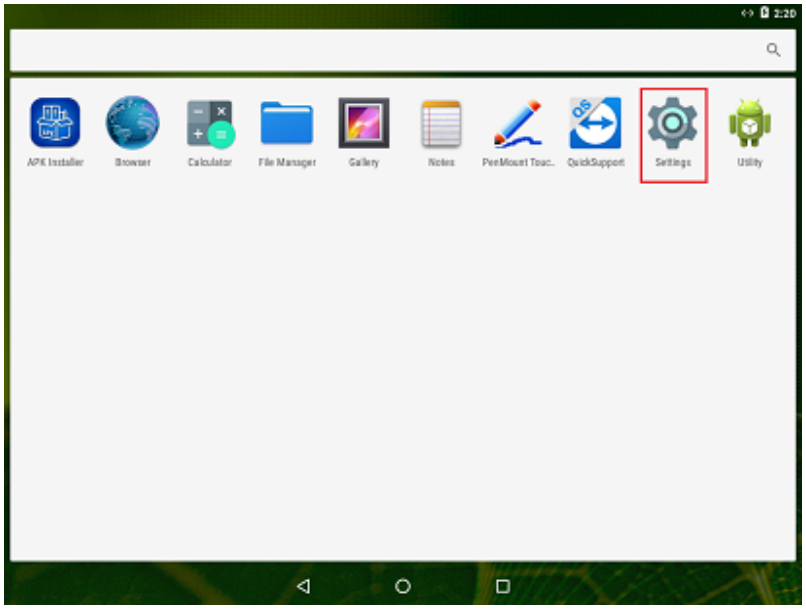
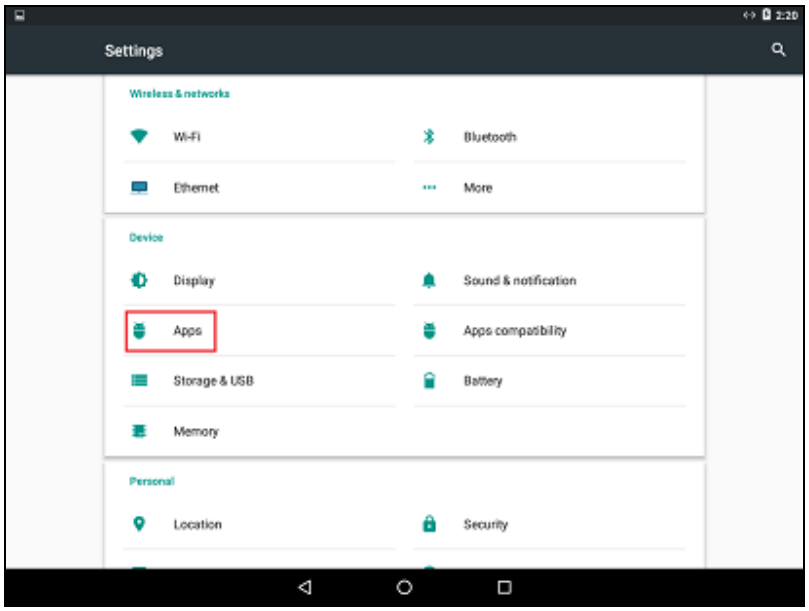
4

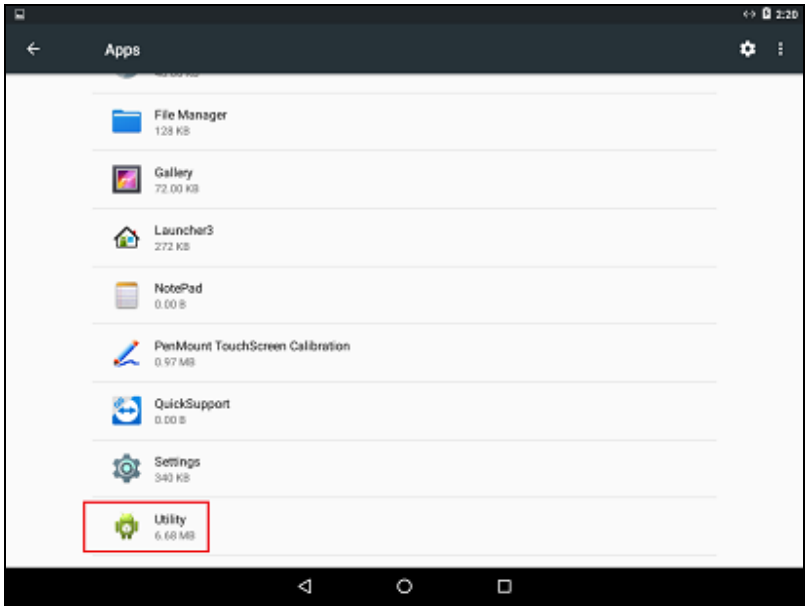
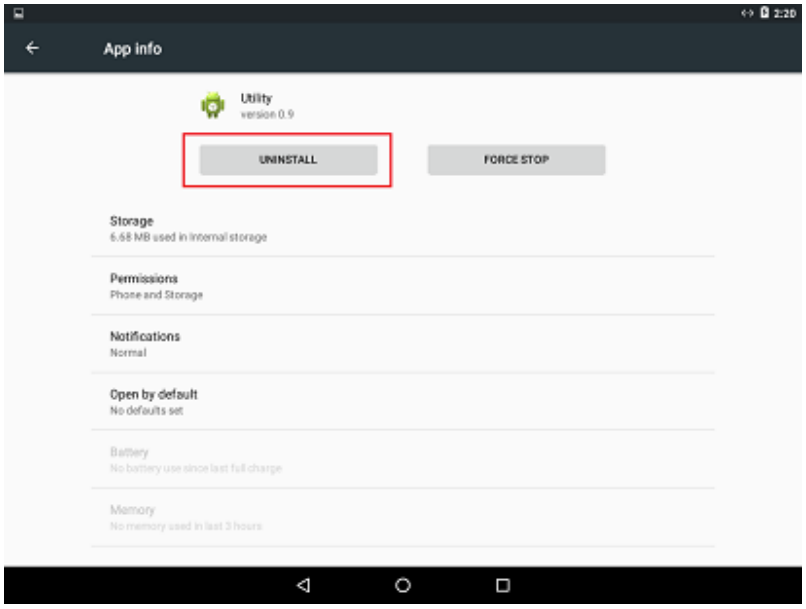
• You can check what is installed on the menu screen.

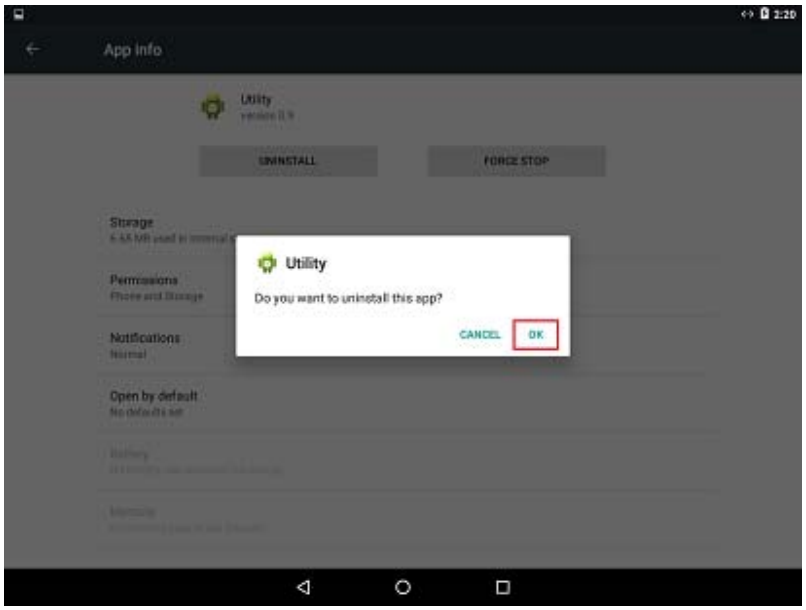
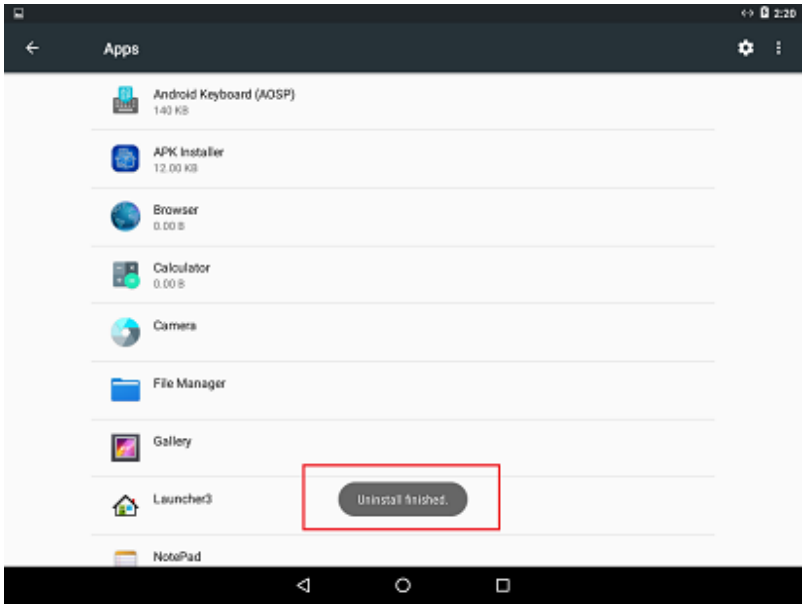


3-2 Application Management

3-2-2 Application UNINSTALL

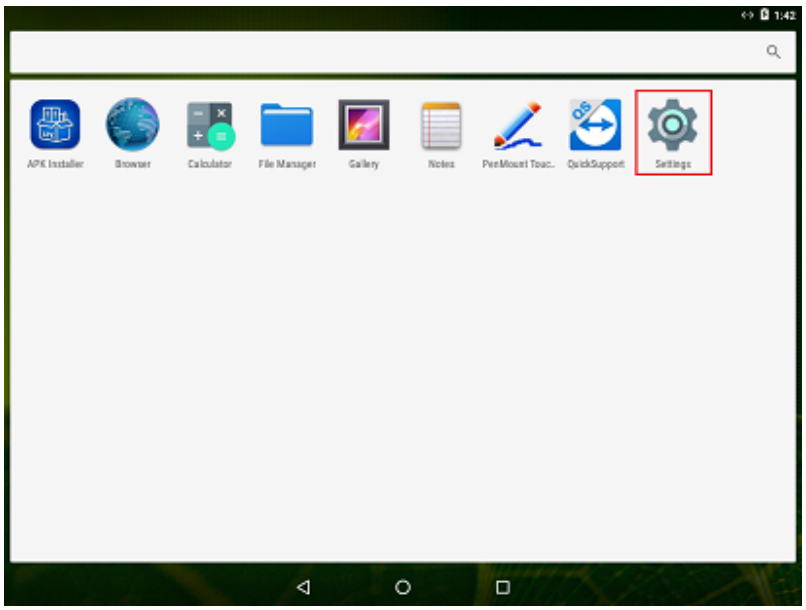
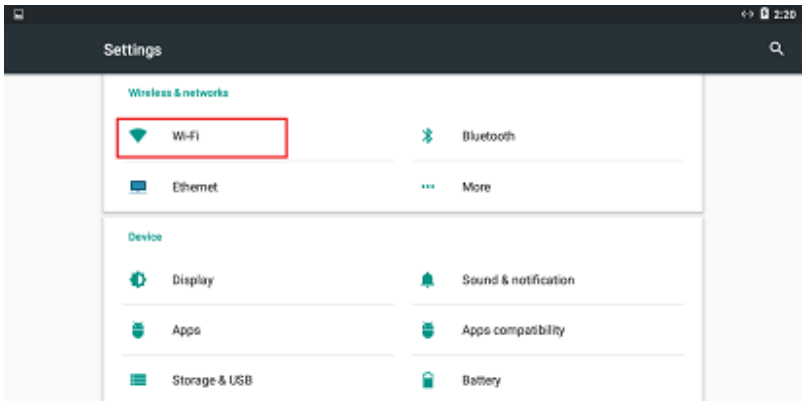
No	Setup Method	Remark
1	•Click “Settings” 	
2	•Click “the APK” 	

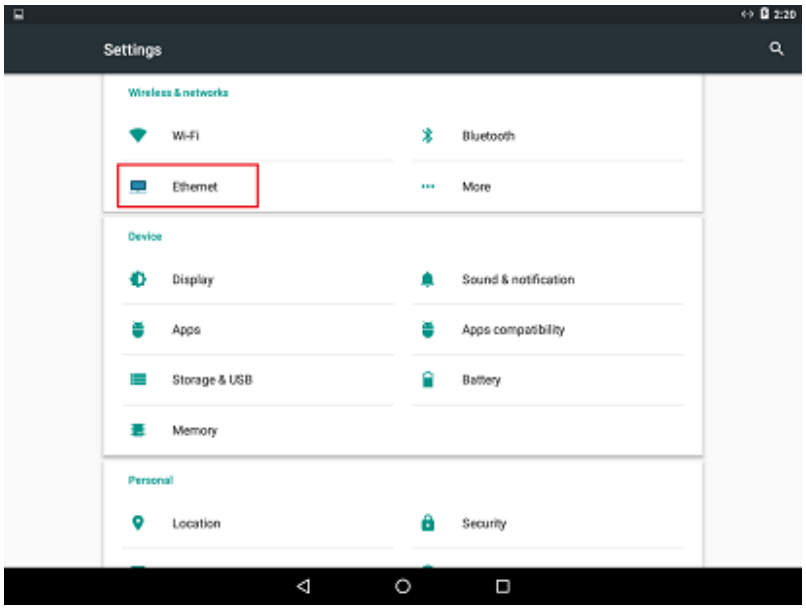
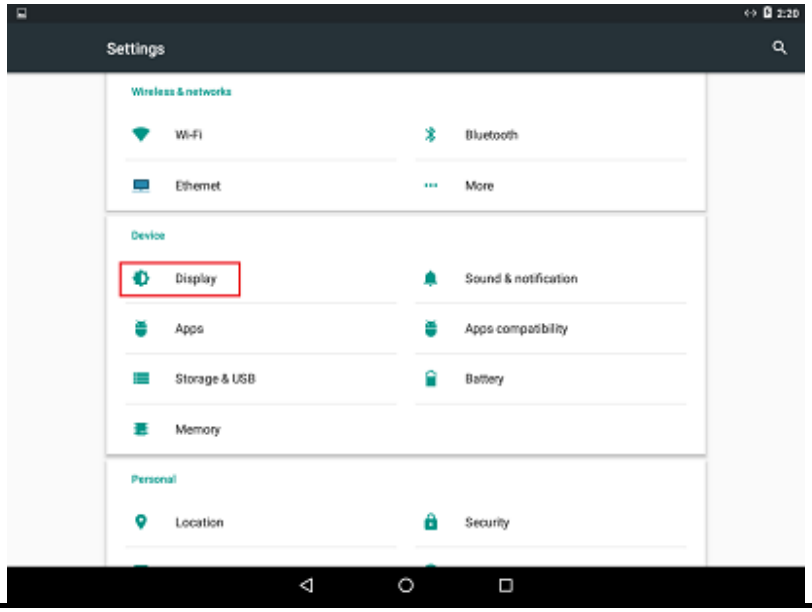
3	• Click on the app you want to delete. 	
4	• Click “UNINSTALL” button. 	

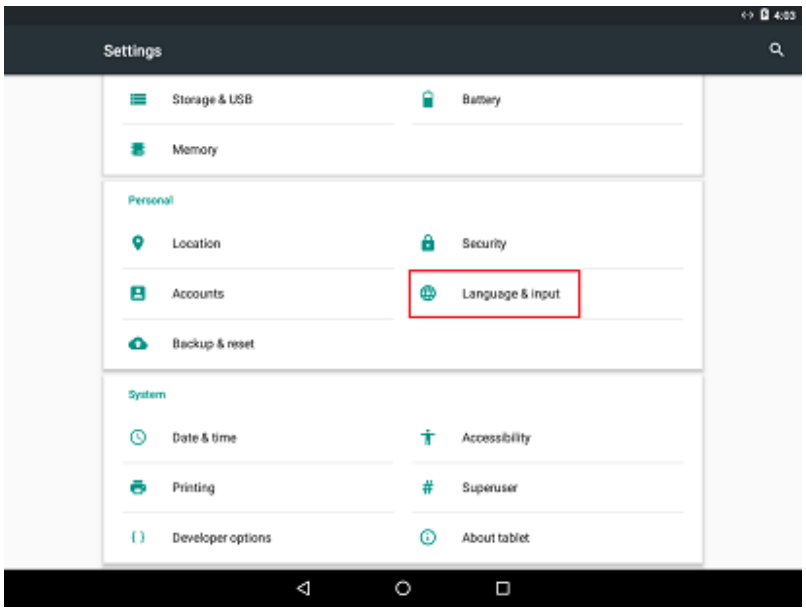
5	• Click “OK” 	
6	• You can check the success message. 	

3-3 System Set Up

In the system user can setup according to their own requirements, such as network connection, language, Input methods, Display brightness, Sound output and check storage space

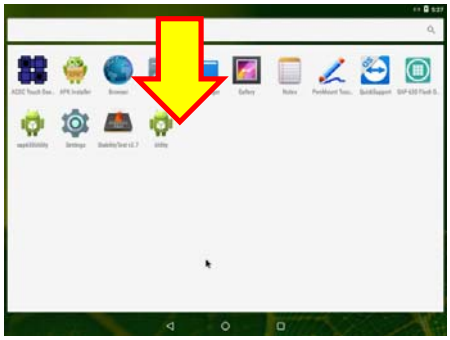
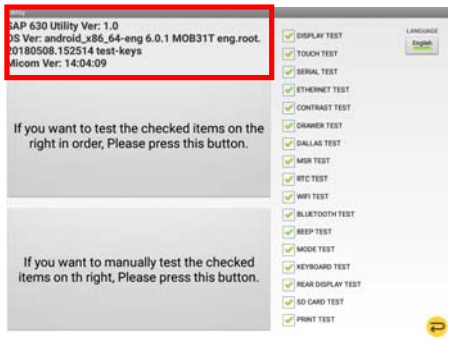
No	Setup Method	Remark
1	Click Settings Icon. 	
2	**WIFI** When opened WIFI Setting would search available wireless router signals, user just select a router and input correct password then could browser internet. If the router does not have password, WIFI would connect it directly 	

3	**Ethernet** First, check box to turn on Ethernet, click “Ethernet” to choose connection type. 	
4	**Display** This is for Display setting; Brightness: Click to setup brightness of backlight. Font Size: Click to setup system font size according to their preference. 	

5	**Language & Input** User can set the language for system menus according to their Country or preference. (About 60 languages supported) System default support Chinese and English, user need manual installing other input methods. 	

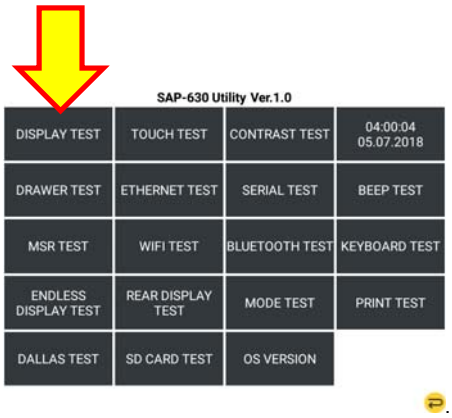
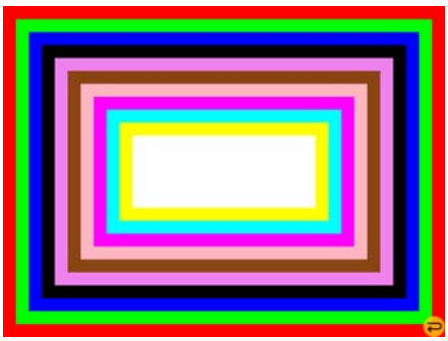
3-4 Hardware Self Test

3-4-1 INSTALL UTILITY

No	Setup Method	Remark
1	•After Install “Utility Apk” •Click this APK 	
2	•Check the F/W versions (OS & Micom) 	

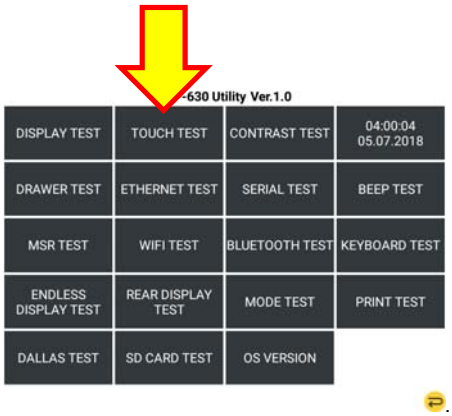
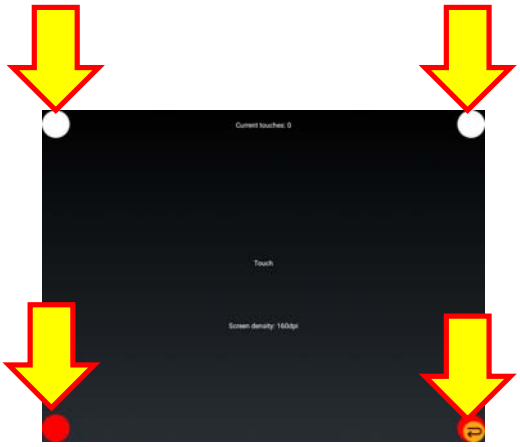
3-4 Hardware Self Test

3-4-2 DISPLAY TEST

Test	Method	Remark
Display TEST	•Press **"DISPLAY TEST"** from the main menu in the Touch Screen.  •Check the LCD State.(9.7inch LCD). You must touch the screen for test is done. 	

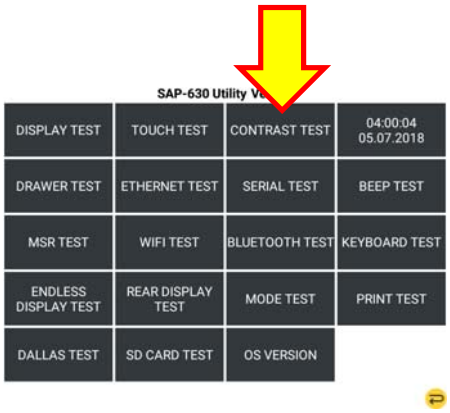
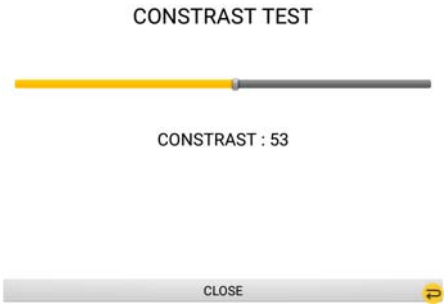
3-4 Hardware Self Test

3-4-3 TOUCH TEST

Test	Method	Remark
Touch TEST	•Press **"TOUCH TEST"** from the main menu in the Touch Screen.  • Touch the 4 Circles or Press and drag 4 Circles. 	

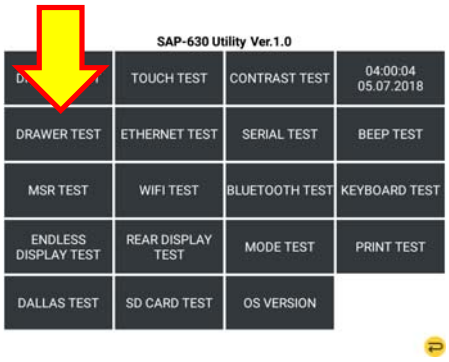
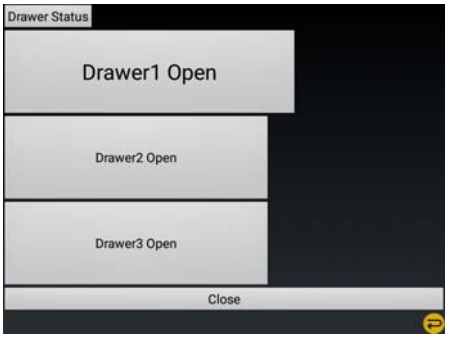
3-4 Hardware Self Test

3-4-4 Contrast TEST

Test	Method	Remark
CONTRAST TEST	• Press **"CONSTRAST TEST"** from the main menu in the Touch Screen.  •Adjust "Brightness" 	

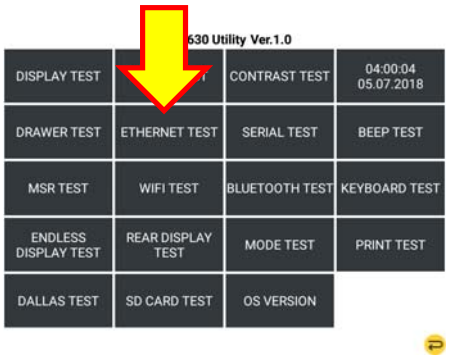
3-4 Hardware Self Test

3-4-5 DRAWER Port TEST

Test	Method	Remark
DRAWER TEST	•Press **"DRAWER TEST"** from the main menu in the Touch Screen.  •When DRAWER Open , DRAWER Status is changed 	

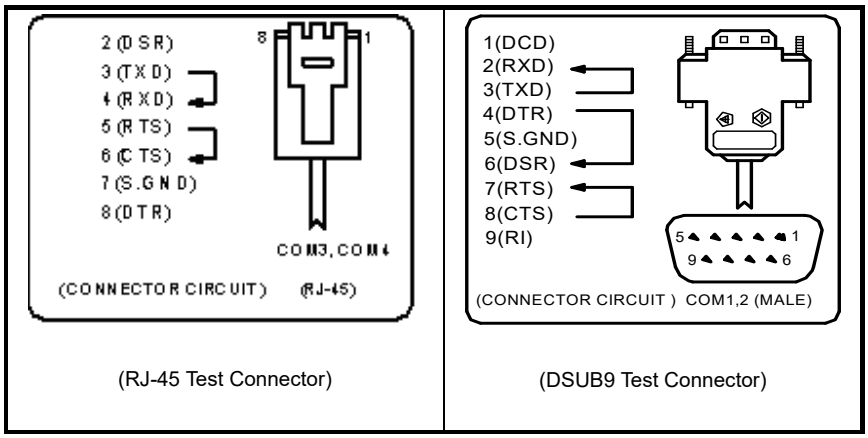
3-4 Hardware Self Test

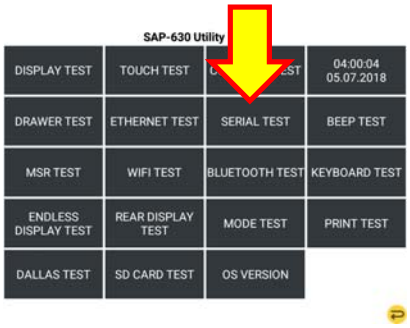
3-4-6 Ethernet TEST

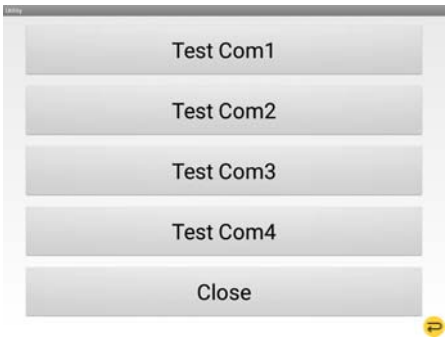
Test	Method	Remark
Ethernet TEST	•Connect The UTP CABLE to Ethernet Port •Press **"ETHERNET TEST"** from the main menu in the Touch Screen. 	

3-4 Hardware Self Test

3-4-7 Serial Port TEST

<table>
<tr><th>Test</th><th>Method</th><th>Remark</th></tr>
<tr><td>SERIAL
PORT TEST</td><td>
•Connect Loop-back Test Connector to SERIAL Port


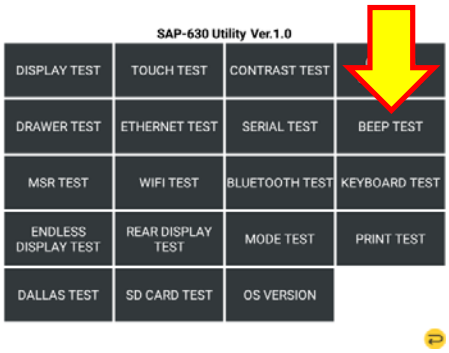
(RJ-45 Test Connector) (DSUB9 Test Connector)
•Press “SERIAL TEST” from the main menu in the Touch Screen.


•Check the Port #1,#2,#3,#4


</td><td></td></tr>
</table>

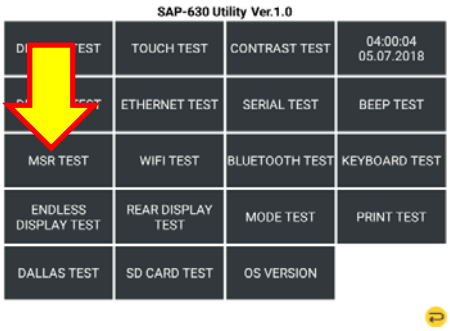
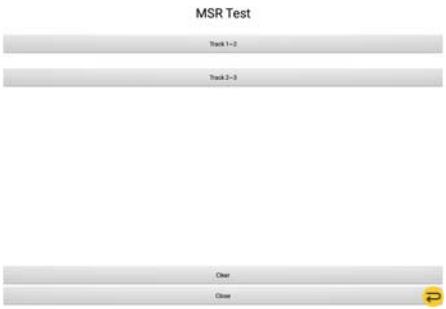
3-4 Hardware Self Test

3-4-8 Beep TEST

Test	Method	Remark
BEEP TEST	•Press **"BEEP TEST"** from the main menu in the Touch Screen.  • Check the Beep #1, #2  	

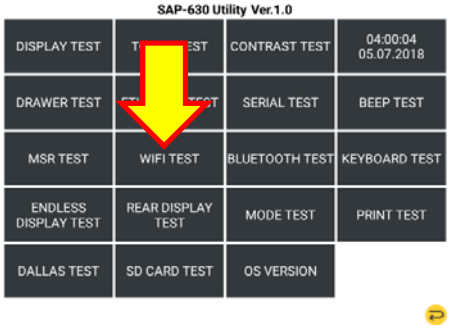
3-4 Hardware Self Test

3-4-9 MSR TEST

Test	Method
MSR TEST	•Press **"MSR TEST"** from the main menu in the Touch Screen.  • When you swipe a magnetic card, If you see the value of the card .Test is done. 

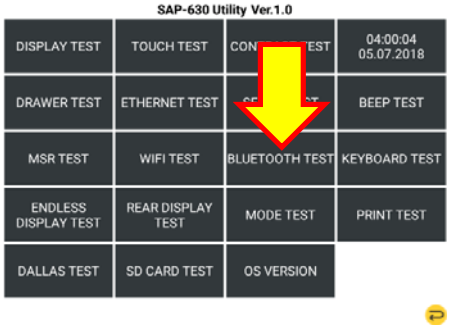
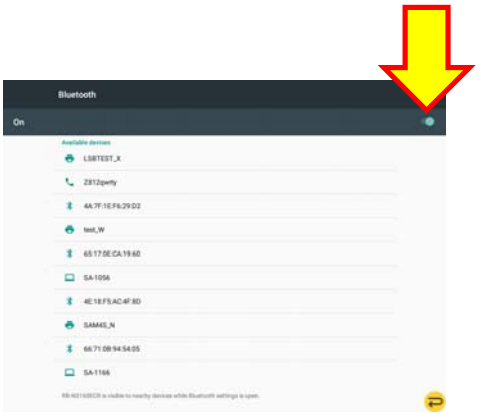
3-4 Hardware Self Test

3-4-10 WIFI TEST

Test	Method
WIFI TEST	•Press **"WIFI TEST"** from the main menu in the Touch Screen.  • Press WIFI ON button and then show the dbm. 

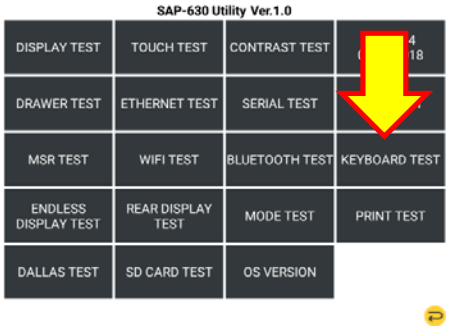
3-4 Hardware Self Test

3-4-11 BLUETOOTH TEST

Test	Method
BLUETOOTH TEST	•Press **"BLUETOOTH TEST"** from the main menu in the Touch Screen.  • Press ON button and then show the list of devices. 

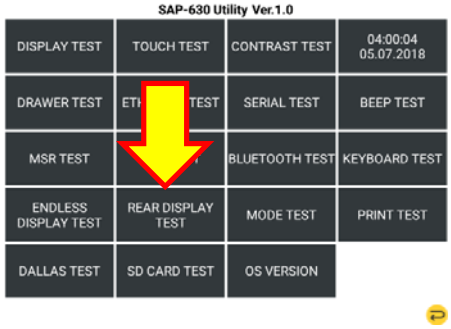
3-4 Hardware Self Test

3-4-12 KEYBOARD TEST

Test	Method	Remark
KEYBOARD TEST	•Press **"KEY BOARD TEST"** from the main menu in the Touch Screen.  •Press **"KEY BOARD 160KEY"** on Keyboard**.** When You press Keys, Button is changed to black **Test is done.**  	

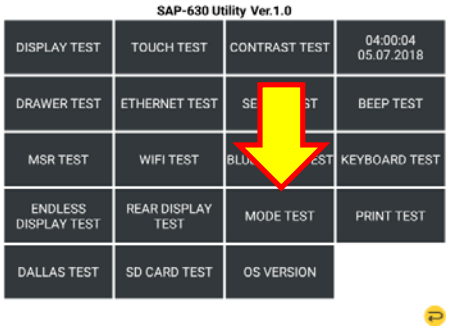
3-4 Hardware Self Test

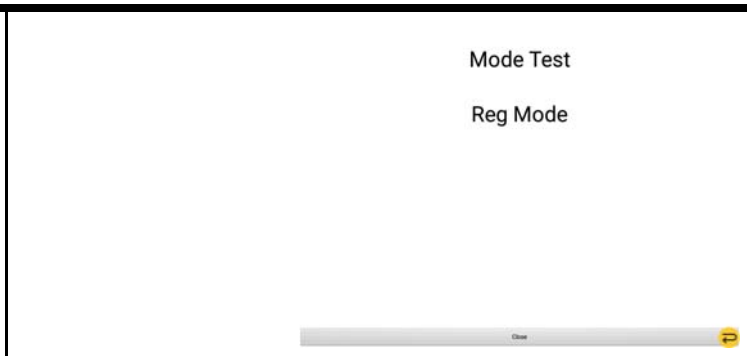
3-4-13 REAR DISPLAY TEST

Test	Method	Remark
REAR DISPLAY TEST	• Press **"REAR DISPLAY TEST"** from the main menu in the Touch Screen.  •Check the Rear Display(2Line LCD).	

3-4 Hardware Self Test

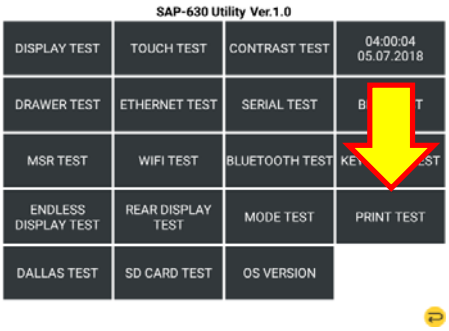
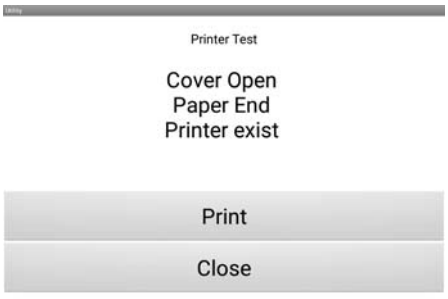
3-4-14 MODE TEST

Test	Method	Remark
MODE TEST	•Press **"MODE TEST"** from the main menu in the Touch Screen.  •When the key is turned ,If you see the all testing mode value, test is done	

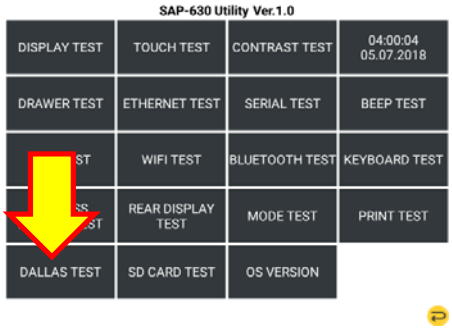
3-4 Hardware Self Test

3-4-15 Printer TEST

Test	Method	Remark
PRINTER TEST	•Press **"MODE TEST"** from the main menu in the Touch Screen. •Press **"PRINTER"** from the main menu in the Touch Screen.  • Click the Print button. • Open the Print Cover and then show the Error messages. 	

3-4 Hardware Self Test

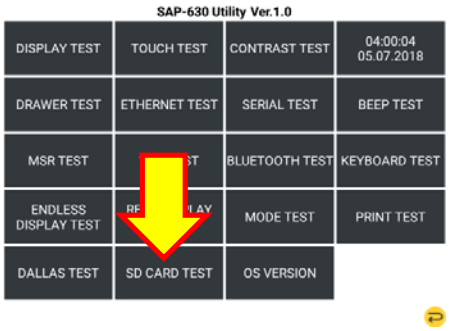
3-4-16 DALLAS TEST

Test	Method	Remark
DALLAS TEST	•Press **"DALLAS TEST"** from the main menu in the Touch Screen.  •When You connect Dallas key to Dallas module, You can see the numbers on Screen. 	

3-4 Hardware Self Test

3-4-17 SD CARD TEST

Test	Method	Remark
SD CARD TEST	•Insert SD Card •Press **"SD CARD TEST"** from the main menu in the Touch Screen.	


SAP-630 Utility Ver.1.0
DISPLAY TEST
TOUCH TEST
CONTRAST TEST
04:00:04
05.07.2018
DRAWER TEST
ETHERNET TEST
SERIAL TEST
BEEP TEST
MSR TEST
BLUETOOTH TEST
KEYBOARD TEST
ENDLESS DISPLAY TEST
MODE TEST
PRINT TEST
DALLAS TEST
SD CARD TEST
OS VERSION

3-5 System Configuration

3-5-1 Configuration

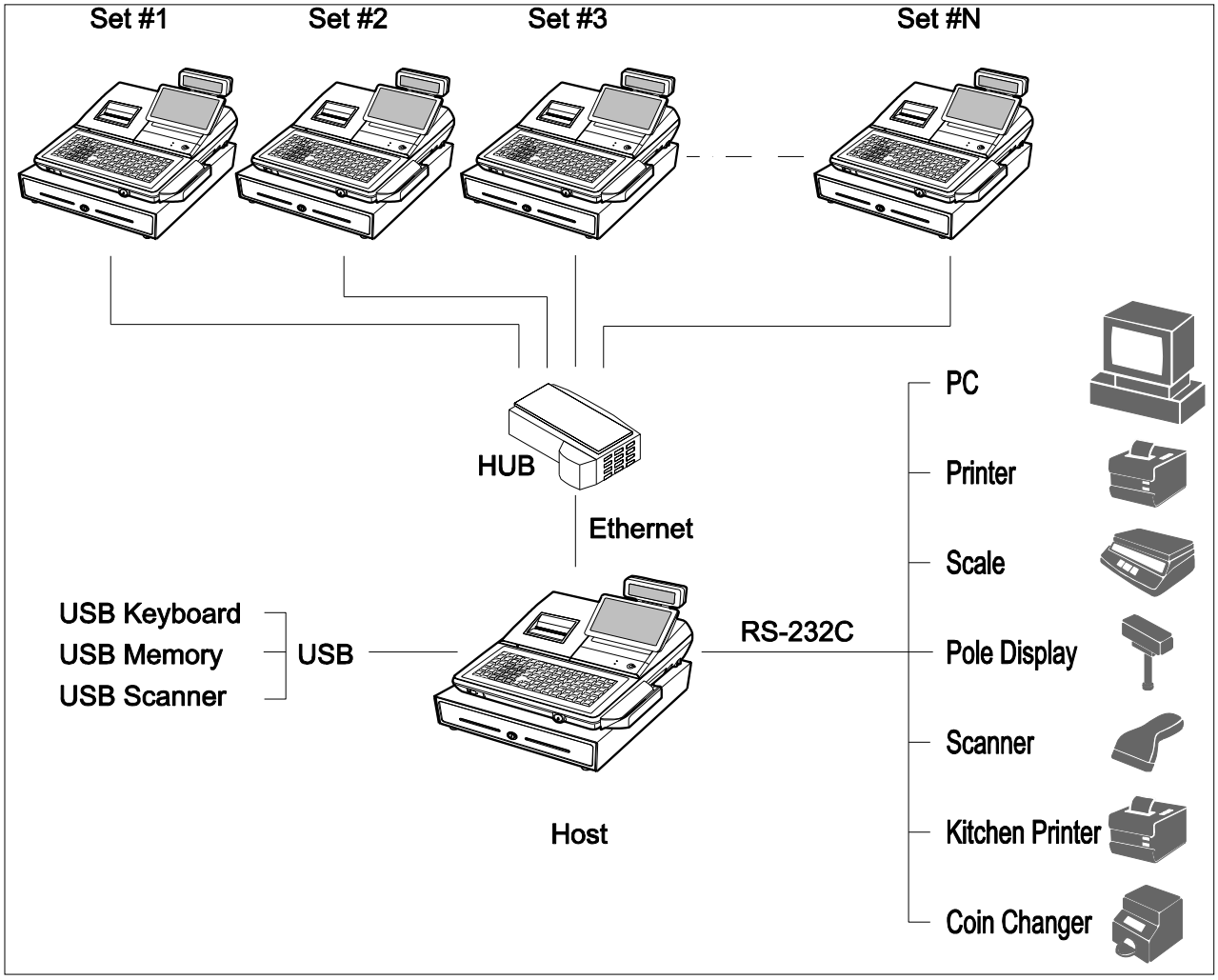


Figure 3-1 System Configuration

3-6 Installation

3-6-1 Options

No.	Item	Description	Remark
1	Dallas Key	5EA, 10EA, 15EA	Selectable
2	Water Proof	Default	
3	MSR	1Slot	

Table 3-1 Option

3-6-2 Supplies

No.	Item	Description	Remark
1	Paper Roll	1EA	
2	Mode Key	VD, REG, X, Z, P, C	
3	User Manual	1 EA	

Table 3-2 Supplies

3-7 Installation

3-7-1 Paper Roll Installation

1. Open the cover printer.
2. Pulling the Orange Lever will open paper cover in Figure3-2-①.
3. Ensure that the paper is being fed from the bottom of the roll. Place the roll into the concave bottom of the printer. And put the leading edge of the paper over the printer in Figure3-2-②.
4. Close the printer cover slowly until it locks firmly.
5. Tear off the excess paper.

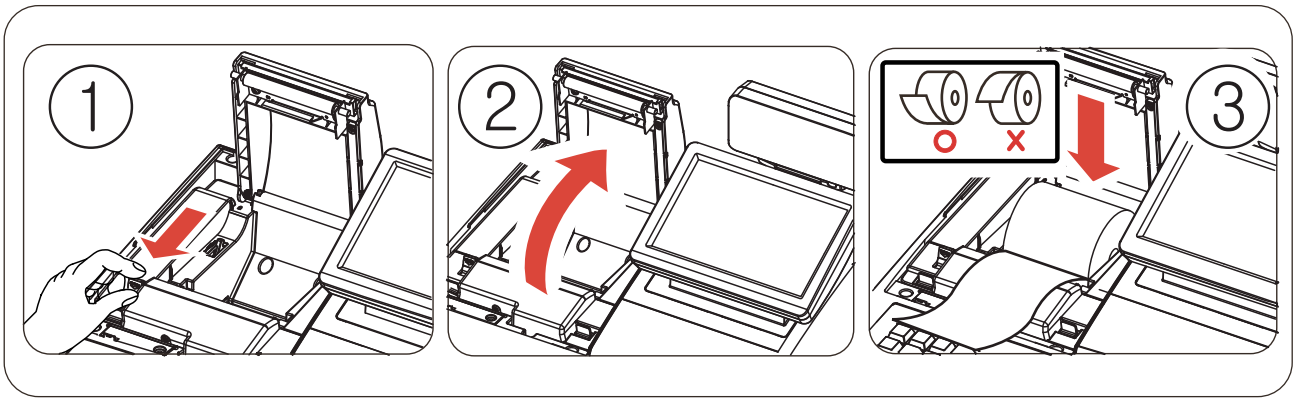


Figure 3-2 Paper Installation

3-7 Installation

3-7-2 Installation of MSR Assembly

Caution :
· Before installation, be sure to turn off the power switch.
· Use gloves to protect your hand from being cut by the angle and the chassis.
· Connect all the cables correctly. When connecting or disconnecting the cables, be careful not to apply stress to the cables. (It may cause disconnection)
· Be careful not to bind interface cables and AC power cord together.

1. Cut off the area (MSR assembly area) shown in the Figure 3-3-① by using a (-) shaped screw driver.
2. Figure 3-3-② shows the difference before and after.

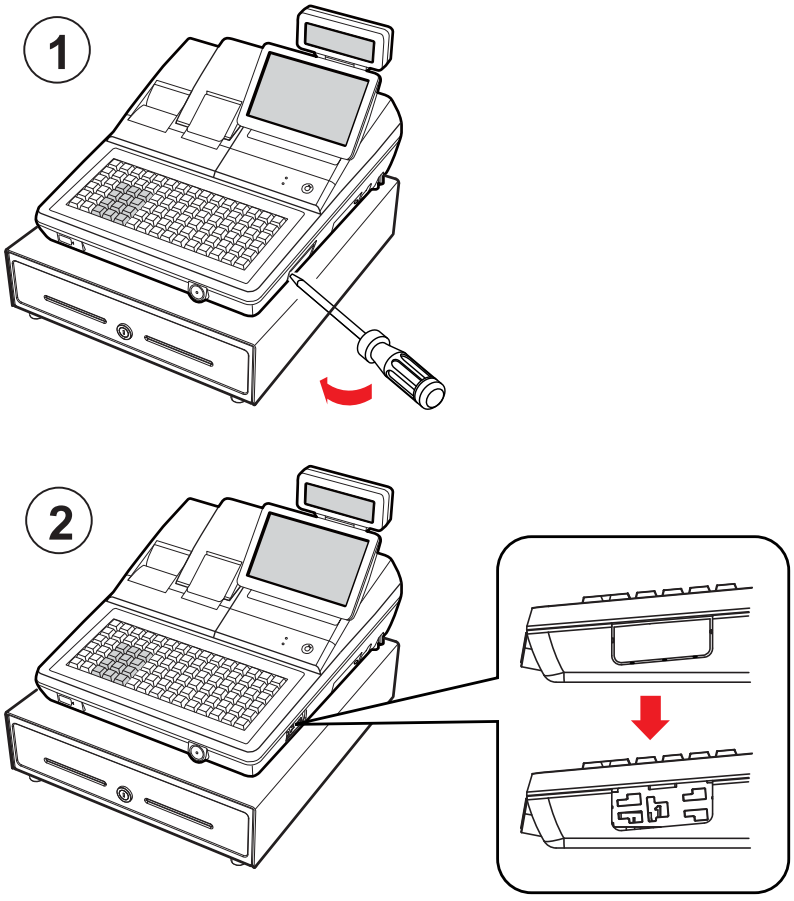


Figure 3-3 MSR Installation (1)

3-7 Installation

3-7-3 Installation of MSR Assembly

1. Connect Ground Wire & MSR Harness of MSR Assembly to the main set as shown in Figure 3-4-①-ⓐ.
2. Tidy up the connectors of Ground Wire & MSR Harness by inserting them into the MSR Assembly (Connectors should be hidden inside the MSR Assembly), Figure 3-4-①-ⓑ.
3. Insert MSR Assembly into the main set bracket holes as in Figure 3-4-②, Figure 3-4-③.
4. Tighten MSR Assembly by moving it to the direction shown in Figure 3-4-④.

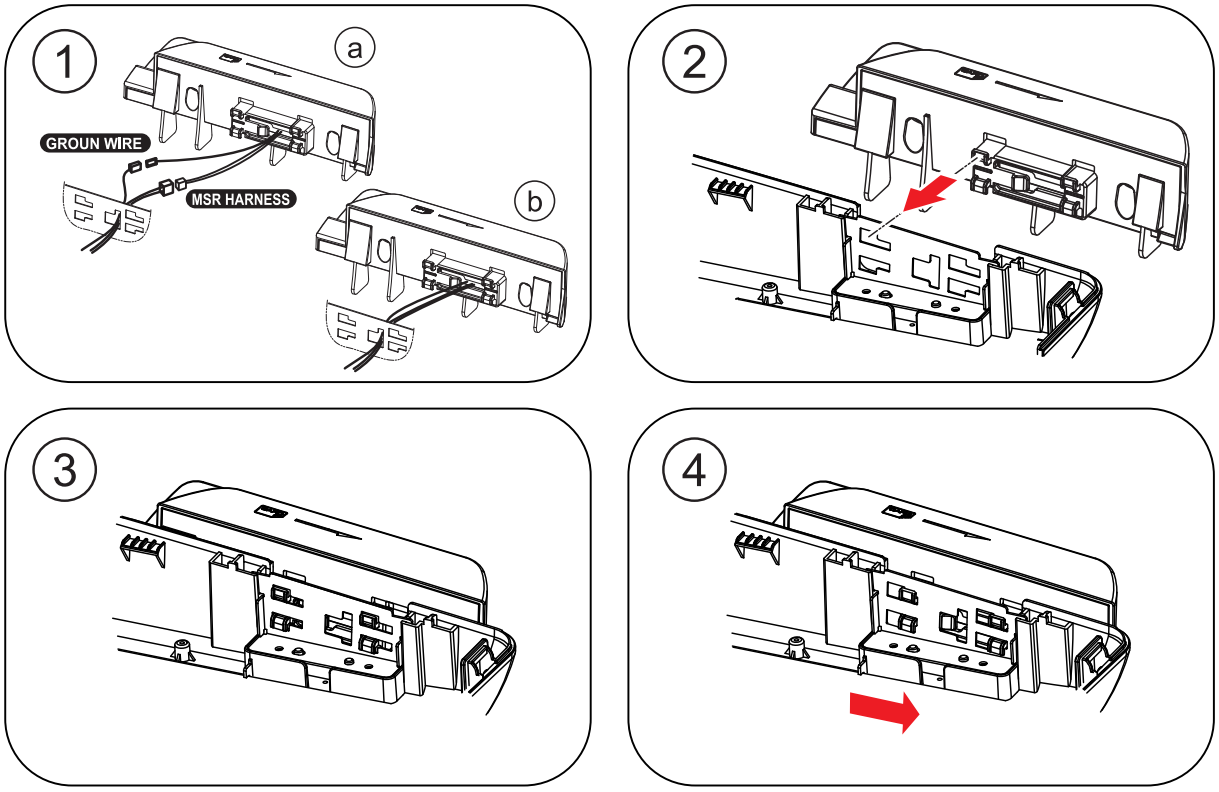


Figure 3-4 MSR Installation (2)

3-7 Installation

3-7-4 Installation of MSR Assembly

1. Figure 3-5 shows the MSR Assembly is in position

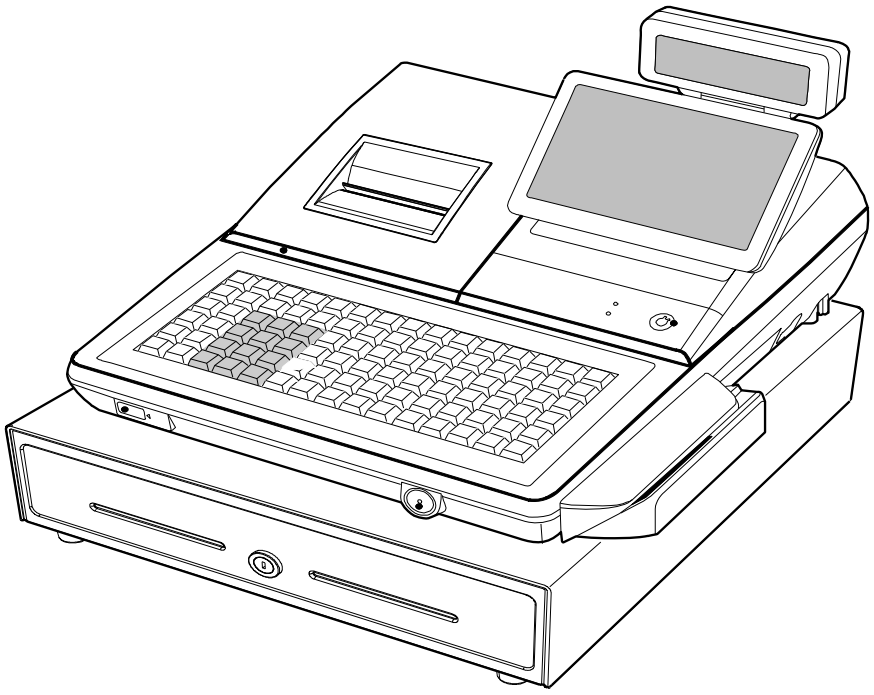


Figure 3-5 MSR Installation (3)

3-8 Operation

Note: Before using this POS for the first time, leave it powered ON in the REG mode for at least 24 hours. This allows the MS-Lithium Rechargeable battery, which maintains the POS's memory while the power is OFF, to fully charge.

3-8-1 Mode Switch

The position of the Mode Switch determines the action of the POS. The modes are described in Table 3-3

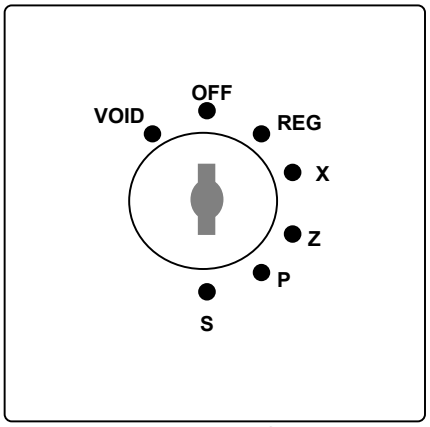


Figure3-6 Mode Switch

Mode	Key	Function
VOID	VD	Use to void (correct) items outside of a sale.
OFF	-	The Register is inoperable.
REG	REG	Used for normal registrations.
X	X	Used to read register reports and perform other manager functions.
Z	Z	Used to read register reports and reset totals to zero.
P	P	Used to program the register
S	C	Used for H/W tests and special setting.

Table3-3 Mode Switch Function

The mode keys can be used to access the following key lock positions.

Mode	Accessible Position	Remark
VOID	Void, Off, Register, Manager	
X	Off, Register, Manager	
Z	Off, Register, Manager, Clear Totals	
PGM	Void, Off, Register, Manager, Clear Totals, Program	
S	Void, Off, Register, Manager, Clear Totals, Program, Service Mode	

Table3-4 Key Function

Note : Key can be removed from the key lock in the OFF or REG position.

4 Disassembly and Assembly

Caution :

· Before installation, be sure to turn off the power switch.
· Use gloves to protect your hand from being cut by the angle and the chassis.
· Connect all the cables correctly. When connecting or disconnecting the cables, be careful not to apply stress to the cables. (It may cause disconnection)
· Be careful not to bind interface cables and AC power cord together.

4-1 Disassembling the Case Upper Block

4-1-1 Ass'y Case Upper

1. Open the ASS'Y COVER PRINTER(B) and lift it off. (Page7-1)
2. Remove the five screws(C19:4pcs, C20:1pcs) from the ASS'Y CASE LOWER(G). (Page7-4)
3. Separate the two harnesses(ⓑ,ⓗ) from the INTERFACE BRKT(G-28). (Page7-11)
4. Separate the two harnesses(ⓒ,ⓘ) from the MOTHER BOARD(G-37). (Page7-11)
5. Lift off the ASS'Y CASE UPPER(C) from the ASS'Y CASE LOWER(G). (Page7-1)

4-1-2 Ass'y Front LCD Display

1. Separate the ASS'Y LCD DISPLAY(A) from the ASS'Y CASE UPPER (C). (Page7-1)
2. Remove the two CAP RUBBER(A-17) on the ASS'Y LCD DISPLAY(A).(Page7-2)
3. Remove the two screws(A-16) on the ASS'Y CASE UPPER(C). (Page7-2)
4. Remove the four screws(A-15) on the LCD HOLDER(A-14) and separate the LCD HOLDER(A-14).
5. Remove the four screws(A-13) on the LCD REAR(A-12) and separate the LCD REAR(A-12).(Page7-2)
6. Remove the six screws(A-9) from the BRKT LCD(A-6) and separate the LCD FRONT(A-1).(Page7-2)
7. Separate the TOUCH PANEL(A-3) and DISPLAY-LCD(A-5) from the BRKT LCD(A-6). (Page7-2)

4-1-3 Ass'y Rear Display

1. Separate the ASS'Y TURRET from the ASS'Y CASE UPPER (C). (Page7-4)
2. Remove the screw(C-28) on the TURRET REAR(C-27). (Page7-4)
3. Separate the TURRET REAR(C-27) and remove the two screws(C-26). (Page7-4)
4. Separate the UNIT-REAR DISPLAY (C-24) from the TURRET FRONT(C-22). (Page7-4)

4-1-4 Ass'y Cover Mode Switch

1. Separate the ASS'Y COVER MODE S/W from ASS'Y CASE UPPER(C). (Page7-4)
2. Remove the four screws(C-14 and C-18) on the ASS'Y COVER MODE S/W and separate the ASS'Y SWITCH ROTARY (Reference:C-15), LED BOARD(C-13) from the COVER MODE S/W(C-11). (Page7-4)
3. Remove the two screws(C-17) on the ASS'Y SWITCH ROTARY(Reference:C-15) and separate the BRKT MODE SWITCH(C-16) and the SWITCH ROTARY (C-15). (Page7-4)

4-2 Disassembling the Case Lower Block

4-2-1 Ass'y Printer

1. Open the ASS'Y COVER PRINTER(B) and lift it off. (Page7-1)
2. Separate the GROUND(ⓙ and ⓛ) from the ASS'Y CASE LOWER(G). (Page7-6,Page7-11)
3. Remove the two screws(G-7) from the ASS'Y CASE LOWER(G). (Page7-11)
4. Separate the ASS'Y PRINTER from the ASS'Y CASE LOWER(G). (Page7-11)

4-2-2 Ass'y key Board

1. Separate the two FPC cables from the MOTHER BOARD(G-37).
   And then lift off the ASS'Y KBD(E or F).(Page7-11)

4-2-3 Ass'y Dallas Key

1. Disconnect the Harness of the ASS'Y DALLAS KEY(G-5) from the MOTHER BOARD(G-37).(Page7-11)
2. Lift up the ASS'Y DALLAS KEY.
3. If don't use it, only lift up COVER FRONT(G-6) from the ASS'Y CASE LOWER(G).(Page7-15,Page7-11)

Note
There are three types in DALLAS KEY; ADDIMAT KEY, DALLAS KEY or ADDIMAT KEY

4-2-4 Ass'y MOTHER BOARD

1. Separate the six harnesses(ⓒ,ⓘ,ⓜ,ⓝ,ⓡ,ⓢ) and remove the six screws(G-38:5pcs,G-42:1pcs).
2. Remove the one screw(G-40) and separate the Wifi/Bluetooth module from the MOTHER BOARD(G-37).
3. Separate the MOTHER BOARD(G-37).(page7-11)
4. Remove the one screw(G-43) and separate the PLATE SHIELD(G-35) from the ASS'Y LOWER(G). (page7-11)

4-2-5 Ass'y USB BOARD

1. Remove the one screw(G-12) and separate the harnesses(n) from the MOTHER BOARD(G-37).(Page7-11)
2. Lift up the USB BOARD(G-11).(Page7-11).

5 Maintenance and Adjustment

5-1 Maintenance

5-1-1 Cleaning the Printer Head

Paper dust on the heating elements may lower the print quality. In this case, clean the print head as follows:
After printing, the printer head can be very hot.
Be careful not to touch it.
Also let it cool before you clean it.
Do not damage the printer head by touching it with your fingers or any hard object.

1. Turn the POS System power switch off.
2. Open the Printer Cover.
3. Open the cover of paper supplier with pushing the ORANGE CAP LEVER.
4. Clean the Printer Head Thermal Element with a cotton swab moistened with alcohol solvent. (ethanol, methanol or IPA)
5. After confirming that alcohol solvent has been dried up completely, close the cover of paper supplier until be locked.

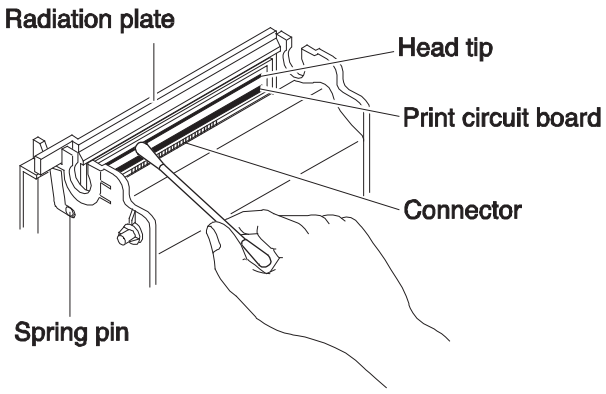


Figure 5-1 Clean the Printer Head

Caution: Note that the thermal head(Thermal Element and Radiation Plate) becomes very hot during normal operation. To prevent the danger of burn injury from thermal, be sure to wait for about 10 minutes after turning power off before beginning the cleaning.

5-1 Maintenance

5-1-2 Removing Paper Jam

When the paper jam occurs, buzzer will beep and error message will be shown on the display. In this case, open the COVER PRINTER with power ON. If the PRINTER COVER will not open, follow the below steps.

1. Lift it off COVER. (Figure 5-3-①)
2. Turn the KNOB(Orange color) forward or backward until the buzzer beep stops as illustrated Figure5-3-②.
3. Remove the jammed paper from the PRINTER.

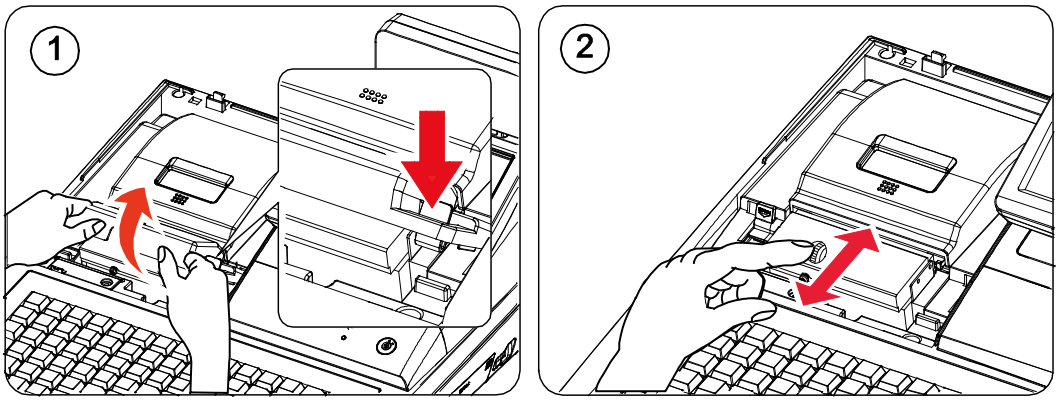


Figure 5-3 Removing Paper Jam

6 Troubleshooting

6-1 System power-up sequence

The following lists the chain of events that occur when you turn on the POS. You can follow this list as one means of determining if the POS is operating correctly.

When the power switch is turned on, these events occur:

6-1-1 Main B'D power-up sequence

- All devices (CPU, Memory, Controller…etc,) are reset.
- The OS & application program is copy from eMMC to DDR3 (2GB).
  It takes about 10 sec.
- Now, Application program is run on DDR3 and TFT-LCD is displayed.

- All devices (micom, Memory…etc,) are reset.
- The power 5V LED are light on IO B'D. (LED1)
- And then, IO MICOM(U17) is waiting for communication with main CPU.

6-1-3 LCD B'D power-up sequence

- The micom (ATMEGA8) is reset.
- The power(5V) LED are light on LCD B'D
- The Rear 2Line LCD are displayed
- And then, LED B'D is waiting for communication with main B'D.

6-2 Power problem

6-2-1 Verifying the power supply

- Checking AC power cord.
- Checking the power switch whether it is connected well.
- Separate the power harness between SMPS and MAIN B'D.
  And measure the DC output voltage on SMPS (+24V)
- If it does not go out, please replace the SMPS.
- If it output voltage is ok, check next.

6-2-2 Verifying the MAIN B'D power line

- Checking the power 5V LED on MAIN B'D (LED1), if it is on or not.
- If the power 5V LED are off, It must be short between power line and ground. (+V5S)
  In this case, power off and separate the SMPS, MAIN B'D, LCD B'D and measure the resistance between power line and ground.
- Measure other voltage.(Ex : VDD3.3V, VDD1.8V, Vserial)
- If these voltages above mentioned do not go out, check the appropriate regulator or component.
  And check power line is short or open.

6-2-3 Verifying the LCD B'D power line

- The LCD B'D source voltage (VDD5V) is supplied the IO B'D
- Checking the power LEDs on lcd B'D, if it is on or not.
- If the power LEDs are off, It must be short between power line and ground. (VDD5V)
  In this case, power off and measure the resistance between power line and ground.
- Measure other voltage.(Ex : +V3.3S, LCDVDD, VLED+)
- If these voltages above mentioned do not go out, check the appropriate regulator or component.
  And check power line is short or open.

NOTE :

During servicing & repairing, Be careful against receiving an electric-shock.

6-3 Back-light, LCD, Data Memory, RTC, Battery Problem

6-3-1 Back-light of TFT-LCD problem

- Check the back-light voltage (VLED+ 19.2V) on LCD B'D.
- Check harness
  → Harness between MAIN B'D and LCD B'D (30-pin).
  → Harness between LCD B'D and TFT-LCD (IPEX cable 30-pin).
- Check the signal (Back-light adjust signal)
  → Check this signal whether it short / open.

6-3-2 TFT-LCD panel problem (No display)

- Check the LCD LVDS signals at LVDS Connector on Main B'D.
  → Measure these signals and check whether it short/open or not
- Check harness.
  → Harness between Main B'D and LCD B'D. (20-pin).
- Check the voltage VLCD3.3V. This voltage is used for TFT-LCD panel logic.(MAIN B'D output)
- Check the LVDS Cable between LCD B'D and TFT-LCD panel (IPEX CABLE 30-pin)

6-3-3 RTC problem

- Check backup circuit on MAIN B'D
  → Check the RTC clock, this frequency is 32.768KHz
  → Check battery voltage whether above 2.5V or not.

6-4 LAN, USB, Serial Port Problem

6-4-1 LAN

- **Cable NOT attached (Green LED of LAN connector does not turn on).**
  → Check LAN cable. Refer to chapter 2 cable connection diagram.
  → For IRC (Inter Register Communication), It has to be used the cross cable.
  → For LAN, It has to be used the direct connection cable.
  → Check LAN RJ-45 modular jack insert right position..
- **Communication fail occurs (Yellow LED of LAN connector does not blank).**
  → Check LAN cable whether cable wire is open or not.
  → Check cable length. Based on LAN specification, the cable length has to less than 100M.
  → Check MAIN B'D and related circuit & component whether short or not.
- **Related System Clock.**
  → Check the crystal, if it operates correctly or not.
  → Clock frequency is 25MHz. (LX1)

6-4-2 USB

- **USB device NOT attached and Communication fail occurs.**
  → Check USB device whether it is broken or not.
  → Check USB version. This product supports USB 2.0 version.
  → Check related circuit & component whether short or not.
  → Check USB source voltage (+5V) for HID (Ex ; Mouse, Keyboard, Scanner…etc,.)
  → Check the Cable for front USB Connector

6-4-3 Serial (COM#1 ~ COM#4)

- **Communication fail occurs.**
  → Check communication setting parameter (Speed, Parity, Data Bit…etc,.)
  → Check the interface cable. Refer to Chapter 2 for cable connection.
  → Check the RS232 driving voltage (+12V, -12V).
  → Measure +12V, -12V on main B'D. If -12V voltage level is less than -7.0V, it is OK.
  → Check related circuit & component whether open or not.
  → Check controller chip and related circuit. (COM#1:U43, COM#2:U44, COM#3:U46, COM#4:U45)
  → Perform the loop-back test at self test mode. Refer to Chapter3 for loop-back connection.
- **Scanner device NOT attached and Communication fail occurs.**
  → The source voltage (+5V) for scanner comes out at COM#1,#2,#3,#4..
  → Check the power consumption of scanner. This product limits the power current;
  → Scanner is less than 300[mA]. (Recommend)
  → Check related circuit & component whether open or not.

6-4-4 SDCARD

- **Operation Fail.**
  → Performs the SDCARD test at H/W test Utility.
  → Check the harness between SD B'D and Main B'D, if it is connected or not.
  → Check the 10-Pin harness, it is OK or not.
  → Check related circuit & component whether short or not.

6-5 LCD B'D Problem (Boot, LCD Panel, Touch Panel, Rear LCD, LED)

6-5-1 LCD B'D Boot problem

- **Related RESET**
  → Check the reset signal of ATMEGA8 (U1) input.
  → Check related circuit & component whether short or not.
  → Check the harness Between Main B'D and LCD B'D, if communication is OK or not.
- **Related Program**
  → The micom(ATMEGA8, U1) has the internal flash to store the program.
  → Check the program is broken or erased.
  → For program download or upgrade, refer the chapter 3.
- **Related System Clock**
  → Check the crystal, if it operates correctly or not.
  → Clock frequency is 14.7456MHz.

6-5-2 LCD Panel problem

- **Operation Fail**
  → Performs the LCD panel test at H/W test Utility.
  → Check the power voltage (VLCD3.3V) on LCD B'D.
  → Check the IPEX cable between LCD panel to LCD B'D.
  → Check related circuit & component whether short or not.
  → Check the Micom on LCD B'D whether it works normally or dead.
  → Check the harness between LCD B'D and Main B'D, if communication is OK or not.

6-5-3 Touch panel problem

- **Operation Fail**
  → Performs the touch panel test at H/W test Utility.
  → Check the FPC harness between touch panel to LCD B'D.
  → Check related circuit & component whether short or not.
  → Check the harness between LCD B'D and Main B'D.

6-5-4 Rear LCD problem

- **Operation Fail**
  → Performs the Rear LCD test at H/W test Utility.
  → Check the harness between Rear LCD to LCD B'D.
  → Check the harness between LCD B'D to Main B'D.
  → Check related circuit & component whether short or not.

6-5-5 LED B'D problem

- **Operation Fail**
  → Performs the LED test at H/W test Utility.
  → Check the harness between LED B'D to LCD B'D.
  → Check related circuit & component whether short or not.

6-6 Main B'D problem (Boot, Thermal Printer, Feed motor, Auto-cutter)

6-6-1 Boot Flash ROM (MX29F800CBTI-70) problem of Main B'D

- **Related RESET**
  → Check the reset block (LM809M3X, U51) & reset time (150 ~ 270ms).
- **Related System signals (Address, Data, nCE, nOE, nWE)**
  → Check these signals whether it short / open.
- **Related System Clock**
  → Check the crystal, if it operates correctly or not.
  → Clock frequency is 9.216MHz.
- **Related boot Flash ROM program.**
  → If the boot program is erased during servicing, boot error is occurred.

6-6-2 Thermal Printer problem

- **Print Operation Fail**
  → Check the Flat cable between PRINTER and Main B'D, if it is connected or not.
  → Check the TPH voltage.(+24V),
  → Check the Control Signal on micom (data, clk, latch, strobe)
  → Check the Thermister of printer.
  → Check the ADC port of micom.
  → Check related circuit & component whether short or not.

- **Feed motor Operation Fail**
  → Check the harness between PRINTER and Main B'D, if it is connected or not.
  → Check the Voltage.(+24V),
  → Check the Phase signal.
  → Check the Driver (TEA3718, U36,39) enable signal.
  → Check the sensor's input.
  → Check related circuit & component whether short or not.

6-6-3 Auto-cutter problem

- **cutting Operation Fail**
  → Check the Flat cable between PRINTER and Main B'D, if it is connected or not.
  → Check the Driver (TEA3718, U41) enable signal.
  → Check the sensor's input.
  → Check related circuit & component whether short or not.

6-7 Main B'D problem (Key Board, Mode key, Drawer, MCR, Dallas-key)

6-7-1 Key Board & Mode Key

- **Key Board Operation Fail**
  → Check the FPC harness between Key Board and IO B'D.
  → Check the key scan part (74HC138, U24, U26, U27) and key return part(74HCT541, U25).
  → Change the Key board Assy
  → Check related circuit & component whether short or not.

- **Mode key Operation Fail**
  → Check the harness between Mode Key and LCD B'D.
  → Check the key return part(74HCT541, U25).
  → Change the mode key Assy
  → Check related circuit & component whether short or not.

6-7-2 Drawer & Compulsory

- **Drawer Operation Fail**
  → Check Drawer specification whether it is +24V drawer or not.
  → If +12V drawer is installed, System can be shutdown when open the drawer
  → Check the cable. Refer to Chapter 2 for cable connection.
  → Check related circuit & component whether short or not.

- **Compulsory Fail**
  → Check the cable and compulsory connector.
  → Check the micro switch in the Drawer.

6-7-3 MCR (Magnetic Card Reader)

- **Operation Fail**
  → Check the harness between MCR and Main B'D, if it is connected or not.
  → Check the connection between MAIN B'D and IO B'D, if communication is OK or not.
  → Check the CPU on IO B'D whether it works normally or dead.
  → Check related circuit & component whether short or not.

6-7-4 Dallas-Key

- **Operation Fail**
  → Check the harness between Dallas-Key and Main B'D, if it is connected or not.
  → Check the MICOM on Main B'D whether it works normally or dead.
  → Check related circuit & component whether short or not.
  → If these are OK above but Dallas-Key does not work, Please contact our R&D.

MEMO