WIL-Acro II

Compact Label Printer with Color Touchscreen

Service Manual: Technical

Introduction

● Purpose of this Manual

The purpose of this manual is as reference material for the delivery, installation, repair and maintenance of this machine.

● Target Readers

This manual has been written specifically for use by our service personnel.
The use of this manual by any person other than the above is strictly prohibited.

● Related Manuals

Manual Name	Content
WIL-Acro II Instruction Manual	Instruction Manual (included in the package of this machine)
WIL-Acro II Program Manual	Description of each mode for software
WIL-Acro II Parts Price List	Description of part number/price/delivery date for each part

● Signal Words

The signal words shown in this manual are separated into three stages depending on the level of danger or the seriousness of potential injury. Fully understand the meanings of the signal words shown below and follow the directions as shown in this manual and on the stickers placed on the machine.

Signal Word	Meaning
⚠ DANGER!	Indicates an imminently hazardous situation which, if not avoided, is likely to result in serious injury or may result in death.
⚠ WARNING	Indicates a potentially hazardous situation which, if not avoided, will result in minor or moderate injury, or may result in serious injury or death.
⚠ CAUTION	Indicates a potentially hazardous situation, which, if not avoided, may result in minor or moderate injury or in property damage.

NOTE	Indicates information that needs to be noted or emphasized.
INFORMATION	Indicates reference information when performing an operation.
REFERENCE	Indicates the reference page related to performance of an operation.

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Notes on Software

Special software is installed in this machine to meet the customer's needs.
Software can be divided into the following two programs:

● Application Program

Our originally designed "Application Program" is a program that executes actual operations of the machine (key input, display, printing, etc.) in accordance with predetermined procedures.
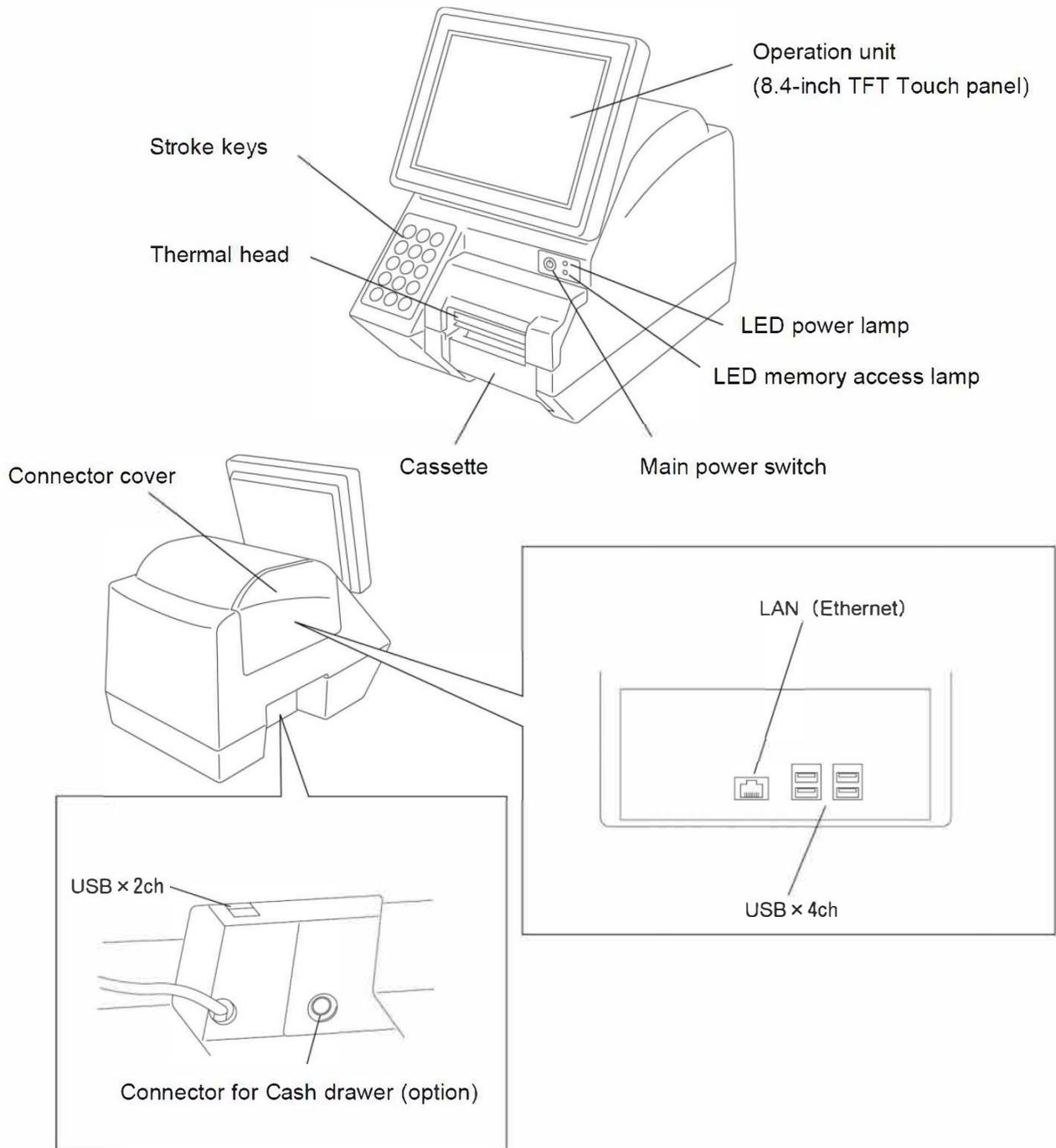
● OS (Operating System)

OS (operating system) has the role of managing the basic parts of "Application Program" (data management, etc.) when it is executed.

Table of Contents

Chapter 1   Overview

1.1   Name of Each Part

Operation unit
(8.4-inch TFT Touch panel)

Stroke keys

Thermal head

LED power lamp

LED memory access lamp

Connector cover

Cassette

Main power switch

LAN (Ethernet)

USB × 2ch

USB × 4ch

Connector for Cash drawer (option)

1.2 Specifications

Item	Content
Machine name	WIL-AcroII
Operating environment	Temperature: 0 to 35°C
	Humidity: 20 to 80% (non-condensing)
	* Printable environment depends on label specifications.
External dimensions	226 (W) x 370 (D) x 360 (H) mm
Weight	11 kg
Power supply	100VAC ±10%, 50/60 Hz
Insect-proof measures	Use of cockroach repellent
	* Contact-type pest repellent processing
	Odorless, harmless, lasting effect for 5 years
Display unit	8.4-inch TFT color LCD with backlight
	800 x 600 dots (SVGA)
Printing method	Direct thermal printing
Thermal head used	3 inches (960 dots) 12 dots/mm (single color)
Printing speed	100 mm/sec (standard label)
	120 mm/sec (standard label)
	150 mm/sec (high sensitivity label)
Printable size	Width 78 mm
Label dimensions	Label width: 30mm to 80mm (Max. 82 mm width of liner)
	Label length: 20mm to 100mm
Number of label cassettes	7 cassettes
Input/Output	USB (Ver.2.0): 4 channels
	Ethernet (100BASE): 1 channel
	RS-232C: 1 channel
	For cash drawer interlocking: 1 channel
	Keyboard (PS/2): 1 channel
	Customer-side display output: 1 channel
	Monitor output (analog RGB): 1 channel
Option	Wand scanner
	Cash drawer
	Fluorescent display tube (customer-side display)

1.3　Features

QR codes can be printed.

Electricity

1. 8.4-inch color TFT LCD is used for the store-side display (800 x 600 dots: SVGA)
2. The printing speed is faster (max. 150 mm/sec for high-sensitivity labels)
3. PC standard general-purpose USB port (Ver. 2.0) is provided
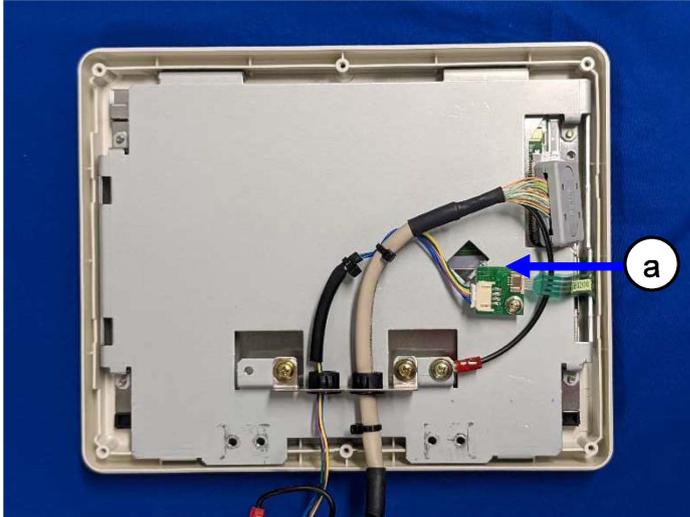
Mechanism

1. Improved visibility and operability of the store-side operation panel
2. Continued sanitation
   - The use of repellents inside the main body makes it difficult for cockroaches and other pests to survive.
     Odorless, harmless, long-lasting effects
   - The entire surface of the case is textured to prevent labels from sticking to it.
3. Designed for thermal efficiency
4. Improved maintainability
   - The structure is designed to allow replacement parts (HDD, intake filter) to be replaced within 5 minutes.
   - The cassette of this machine is the same as SR-2000, IL-2000SA, and NSR-Acro.
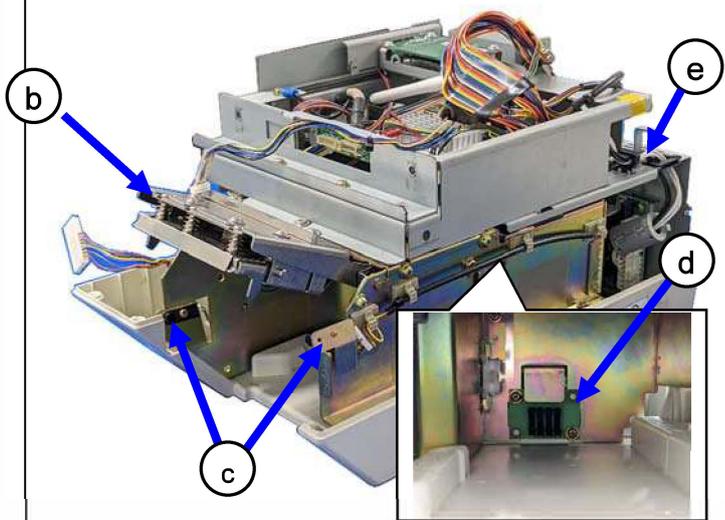
Chapter 2   Electrical

2.1   Placement of Each Electrical Component
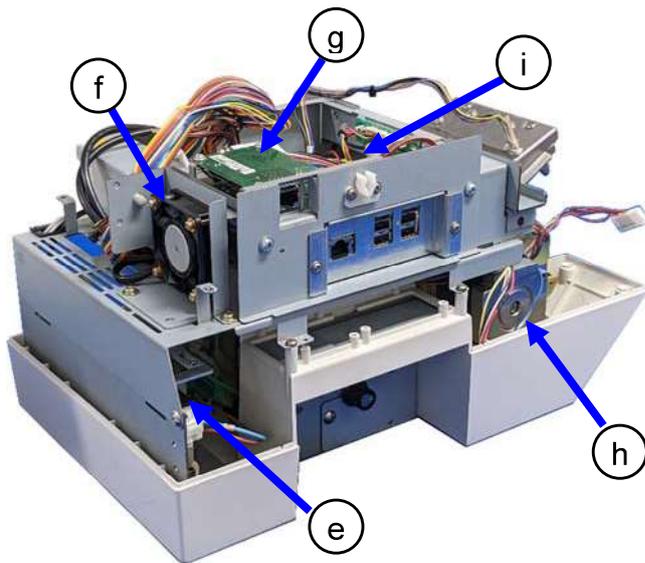
Inside the controller unit	a. LCD connector board (P-1033)
Inside the main body (viewed from the right front)	b. Thermal head, label gap sensor c. Peel sensor d. Cassette sensor e. Switch power supply unit

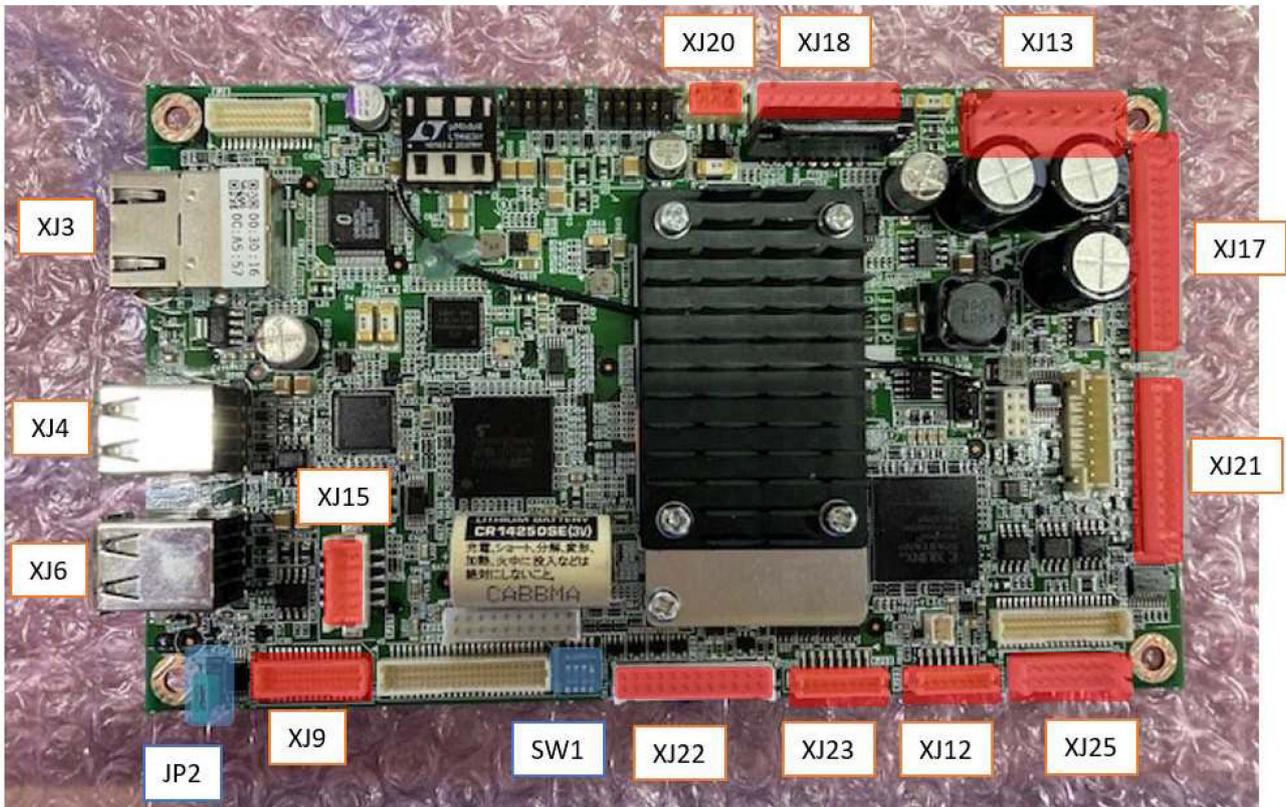|	
Inside the main body (viewed from the left rear) 	e. Switch power supply unit f. Fan g. Wireless LAN board h. Stepping motor i. Main board (P-1100)
Inside the body case 	j. Power switch board (P-984) k. Numeric keypad board (P-944) l. LCD junction board (P-985)
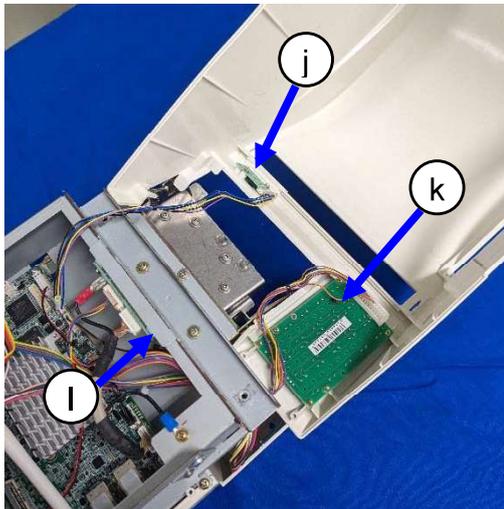
2.2 Electrical Block Diagram

PRINTER UNIT

Label Sensor (2-53) DF13-5 (2-155)
Peel Sensor(Trans.) (2-51) ZH-3
Peel Sensor(Rec.) (2-52) ZH-3
Cassette Sensor (2-54) EH-9
Thermal Head (2-5B) HIF-34 (2-157)

Stepping Motor (2-22) M

XJ21 PHD-28
XJ17 PHD-34
XJ18 XH-8

(1-109)

1) The No. inside ⌒ means as follows.

X-XXX
← No. on the parts list
← UNIT NAME

Unit No. as follows

NO.	UNIT NAME
1	MAIN BODY UNIT
2	PRINTER UNIT
3	CONTROLLER UNIT

100-016-7784-00

Main Board P-1100* (1-101)

XJ22 PHD-24 (1-112)
Ten Key Board P-944-1 (1-104) DF1B-14 XJ1

DF11-10 XJ15 (1-120)

XJ9 SHD-30 (1-114)
LCD Junction Board P-985 (1-103) DF1B-20 XJ101
SHD-30 XJ102

XJ23 ZH-7 (1-113)

VH-6 XJ13 (1-110)

Switching Power Supply LFA150F-24-HJ1
CN3 VH-7 (1-107)
CN2 VH-6

ZH-8 XJ12 (1-119)
PH-3 XJ20 (1-117)
PHD-16 XJ25 (1-129)
LAN RJ45 (1-128)

USB-AX4

Switching Board P-984-1 (1-105)
XJ1 ZH-7

SHD-30 XJ3 (3-104)
DF13-20 XJ2 (3-105)

CONTROLLER UNIT

VH-5 CN1 (1-108)

SM-2 SM-2 (1-116)
XH-2 XJ1
RJ45 XJ2
Wireless LAN Board PK-265* (1-126)
Antenna (1-127)

Speaker
Fan

P-1033 XJ1 (3-101) XJ2 PH-4

FI-30
8.4 inches LCD (3-102)
8.4 inches Touch Panel (3-103)

MAIN BODY UNIT

9

2.3 Printed Circuit Boards

2.3.1 Main Board: PWB'P-1100B (PN 158280)

Connector Functions

Connector No.	Functions
XJ3	LAN
XJ4	USB connector A
XJ5	Unused
XJ6	USB connector A
XJ7	Unused
XJ8	Unused
XJ9	LCD
XJ10	CF card (backside)
XJ12	Speaker
XJ13	Power (+24V)
XJ14	Unused
XJ15	Jumper harness
XJ16	Unused
XJ17	Thermal head
XJ18	Stepping motor
XJ19	Unused
XJ20	Fan
XJ21	Sensor
XJ22	Touch / Key
XJ23	Power SW
XJ24	Unused
XJ25	Optional wireless LAN board
XJ26	Unused
XJ27	Unused

DIP SW
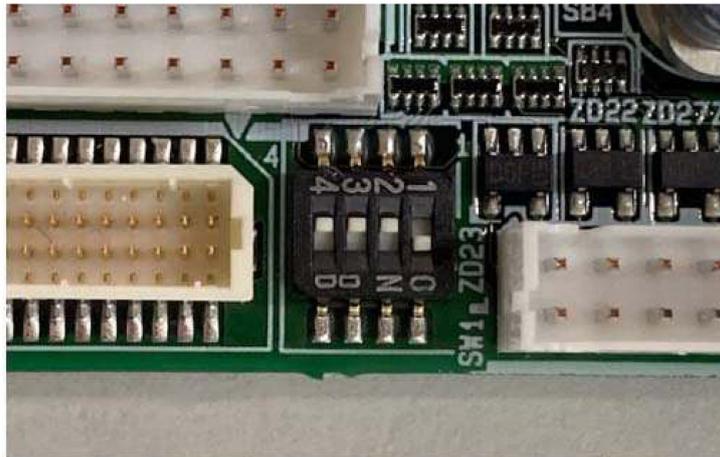
The above photo shows that only switch position 1 is in the ON state.

SW	SW No.	Setup	Remarks
SW1	1	ON	Four-wire touch panel
	2	OFF	
	3	OFF	
	4	OFF	

Battery Jumper

The battery jumper should be at the ON position (down) when viewed from the direction in the first photo.

(The side where ON is silk-printed on the board)

When shipped as a replacement board, the battery jumper is set to OFF, so move the jumper to ON when the board is installed. Since the battery is mounted on the board, it cannot be removed or replaced.

Type	ON / OFF	Replacement
Short pin	Bottom side: ON	Impossible

2.3.2   Power Switch Board: PWB'P-984'-1 (PN 158263)

Connector No.	Other end
XJ1	Main board, XJ23

2.3.3   LCD Junction Board: PWB'P-985' (PN 87519)

Connector No.	Other end	Remarks
XJ1	Faston terminal	Shielded line
XJ2	P-1033, XJ2	Touch panel
XJ3	LCD	LCD
XJ100	Faston terminal	Shielded line
XJ101	Main Board, XJ22	Touch panel
XJ102	Main Board, XJ9	LCD

2.3.4   Numeric Keypad Board: PWB'P-944'-1 (PN 185572)
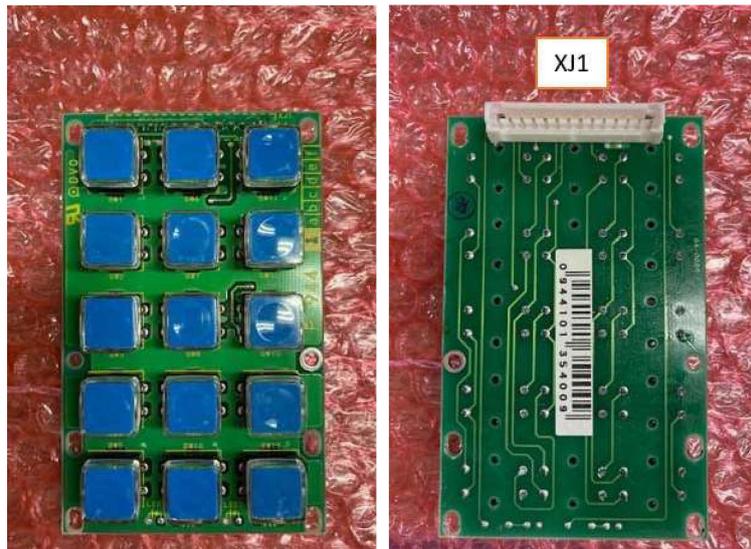
Connector No.	Other end	Remarks
XJ1	Main board, XJ22	Key

2.3.5   Touch Panel Relay Board: PWB'P-1033' (PN 198416)
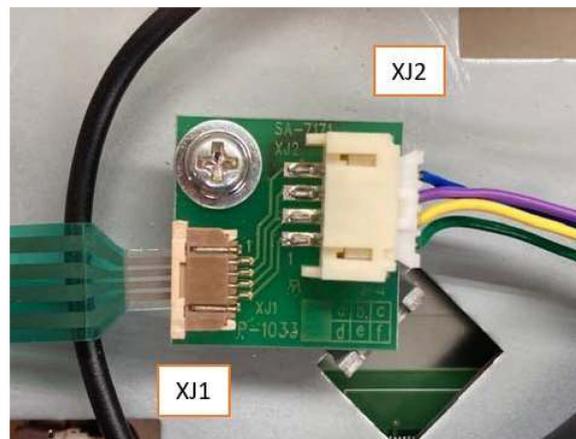
Connector No.	Other end	Remarks
XJ1	Touch panel	
XJ2	LCD junction board, XJ2	

2.3.6   Wireless LAN Board: PWB'PK-265'B (PN 119158)

Connector No.	Other end	Remarks
XJ1	Main board, XJ25	Wireless LAN module power supply
XJ2	Main board	LAN

Chapter 3   Mechanical

3.1   Description Items

a. "3.2.1 Removing the Controller Unit"
    "3.11 Replacing the Electrical Components in the Controller Unit"
b. "3.2.2 Removing the Printer Cover"
c. "3.2.3 Removing the Body Case"
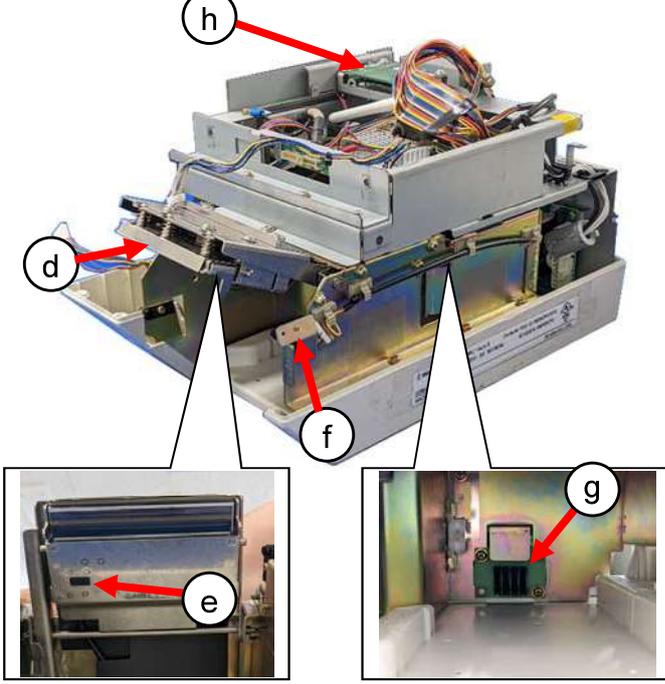
d. "3.3 Replacing and Repositioning the Thermal Head"
e. "3.4 Replacing the Label Gap Sensor"
f. "3.5 Replacing the Peel Sensor"
g. "3.10 Replacing the Cassette Sensor"
h. "3.7 Replacing the Wireless LAN Unit"
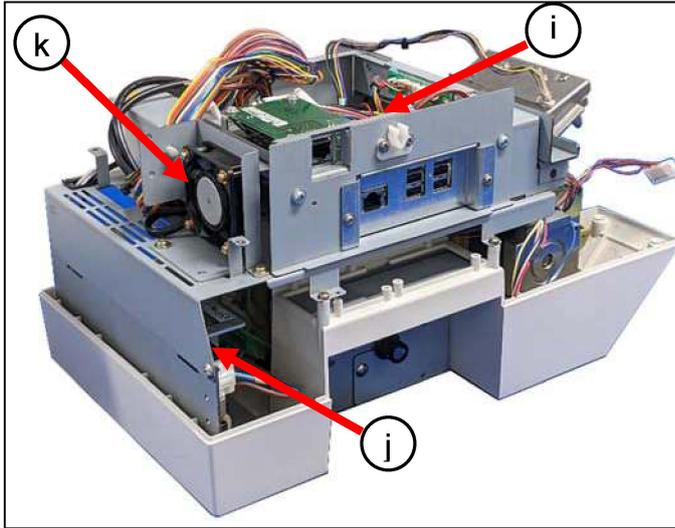
i. "3.8 Replacing the Main Board"
j. "3.9 Replacing the Switch Power Supply (DL912W)"
k. "3.6 Replacing the Fan"

3.2 Removing Controller Unit, Printer Cover, and Body Case

This section describes the procedures for removing the controller unit, printer cover, and body case.

3.2.1 Removing the Controller Unit

NOTE When disassembling this machine, be sure to unplug the power plug from the power outlet.

① Remove the hinge cover of the controller unit.

	② Remove the four screws securing the hinge. NOTE ・ Remove the horizontal screws first, then remove the vertical screws while supporting the controller unit so that it does not topple. ・ The cable is connected to the controller unit. Be careful not to disconnect the cable.
	③ Disconnect the wires connected to the main body. Connector: 4 places This completes the removal of the controller unit. ■ **Installing the controller unit** ・ For installation, carry out the procedure in reverse order.

3.2.2   Removing the Printer Cover

	① Take out the cassette.

	② Remove the right side of the printer cover by pushing the right side inward while lifting the front of the cover. **NOTE** ・ Be careful not to scratch the printer cover by letting the cover come in contact with the printer bracket.
	③ In the same manner, remove the left side of the printer cover. This completes the removal of the printer cover. ■ **Installing the printer cover** ・ For installation, carry out the procedure in reverse order.

3.2.3   Removing the Body Case

⚠**CAUTION** When disassembling this machine, be sure to unplug the power plug from the power outlet.

! If the seal is broken, the machine must be re-certified.
NOTE

	① Remove the following parts
	    a. Controller unit
	    b. Cassette
	    c. Printer cover
	
	REFERENCE
	
	・ Refer to "3.2.1 Removing the Controller Unit" and "3.2.2 Removing the Printer Cover".

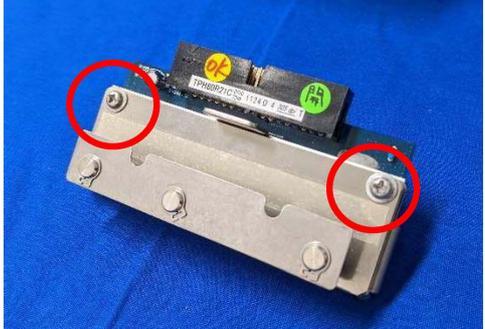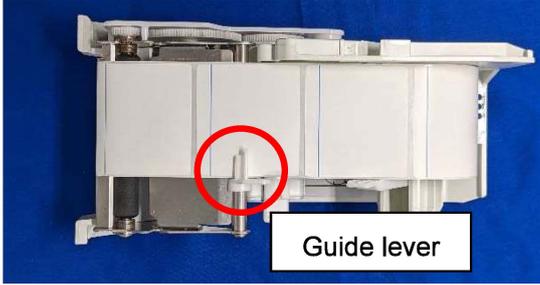|	② Disconnect the LAN cable. ③ Remove the connector cover. ④ Remove the cover inside the connector. Screw: 2 places
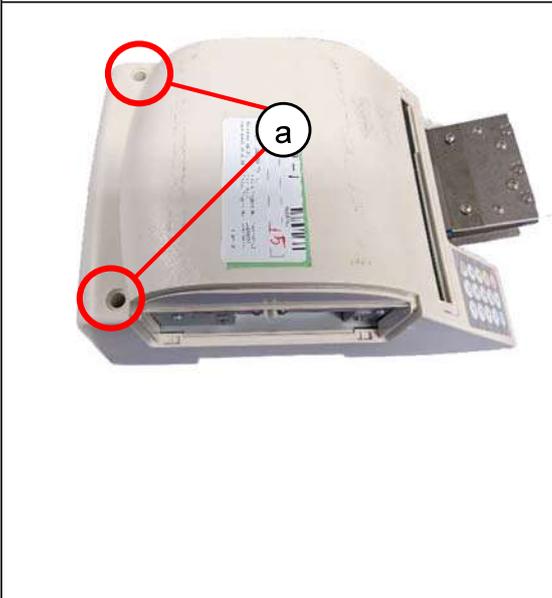
	⑤ Remove the body case.
	      Screw (a): 2 places
	      Screw (b): 2 places
	      Screw (c): 1 place
	
	 NOTE
	
	 ・ When removing the body case, be careful not to let the "c" section come in contact with the peel sensor to avoid scratching the sensor.
	 ・ Cables are connected to the power switch and numeric keypad. Be careful not to disconnect them.
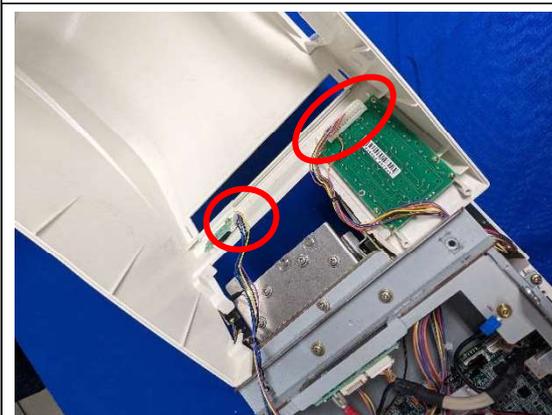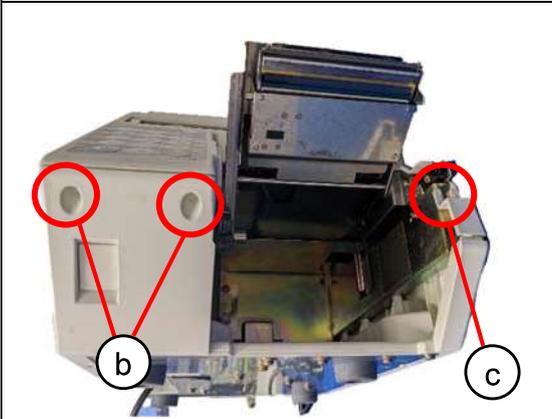
	⑥ Disconnect the cables from the power switch and numeric keypad board.
	      Connector: 1 each
	
	      This completes the removal of the body case.
	
	 ■ Installing the body case
	 ・ For installation, carry out the procedure in reverse order.

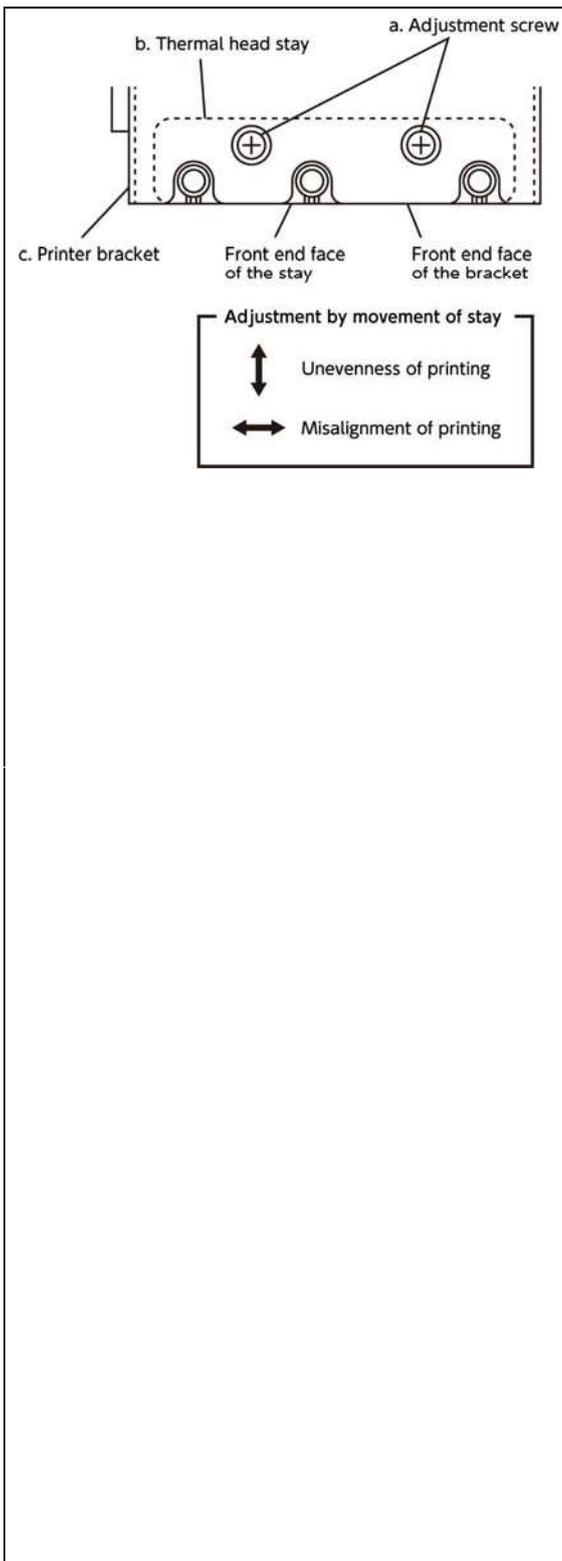## 3.3 Replacing and Repositioning the Thermal Head

3.3.1 Replacing the Thermal Head

* Be sure to remove the printer cover beforehand in accordance with the procedure described in "3.2.2 Removing the Printer Cover".

	① Pull out the head section.
	② Lift the thermal head section with both hands to compress the springs and pull it toward you.
	③ Disconnect the connector. **!** NOTE · Do not pull the head cable too hard.
	④ Remove the bracket. Screw: 2 places ⑤ Replace the thermal head and install it in the reverse order of removal.

3.3.2   Adjusting the Thermal Head Position

<table>
<tr>
<td>
Guide lever</td>
<td>

① Take out the cassette.
② Check if each of the following gaps are in the state shown below, and if not, adjust them.
  - Gap between the guide lever and label width (paper tube) of the label receiving section: 0.2 to 1 mm
  - Gap between the label guide and the liner: 0.1 to 0.4 mm

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

③ Remove the printer cover from the head section.

REFERENCE
  - Refer to "3.2.2 Removing the Printer Cover".

④ Insert the cassette into the main body.

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

⑤ Select [PRINTER] from the Adjust menu and set the head resistance.
⑥ Press [LABEL TYPE] to set the label information, and press [FEED] several times to send the label.
⑦ Select "CHECKER" in "TEST PRINT CONTENT".
⑧ Press [PRINT] on the numeric keypad to issue several labels.
⑨ Check for left-right misalignment and left-right printing unevenness on the third or so printed labels. If there is left-right misalignment or uneven printing, make the following adjustments.

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

b. Thermal head stay
a. Adjustment screw
c. Printer bracket
Front end face of the stay
Front end face of the bracket

Adjustment by movement of stay

↕ Unevenness of printing

↔ Misalignment of printing

■ **How to align the reference position**

① Loosen the adjustment screw (a).

② Align the front end face of the thermal head stay (b) with the front end face of the printer bracket (c) and temporarily tighten the adjustment screws (a).

③ Perform positioning while repeating test printing.

■ **If the print is light overall**

The center line of the heating element of the thermal head and that of the print roller are parallel, but the entire thermal head is shifted backward or forward from its optimum position.

Determine the position for the darkest printing by shifting the adjustment screws (a) to the back or front while observing the printing conditions, and tighten the adjustment screws (a).

■ **If the print density on the left and right sides is different**

The position of the thermal head on the side where the print density is light is shifted backward or forward relative to the center line of the print roller.
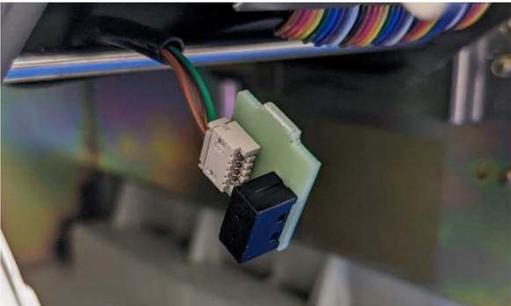
Loosen the adjustment screws (a) and make adjustments by shifting the screws so that the left and right sides of the thermal head and the center line of the print roller are parallel (meaning that the center lines overlap) on the plane when viewed from directly above.

■ **If the print position is misaligned to the right or left**

Loosen the adjustment screws (a), and while maintaining the above-mentioned parallelism, shift the position of the thermal head in the opposite direction of the misalignment and fix it in place.

23

3.4　Replacing the Label Gap Sensor

* Be sure to remove the printer cover beforehand in accordance with the procedure described in "3.2.2 Removing the Printer Cover".

	①　Pull out the head section. ②　Remove the bracket. 　　Screw: 2 places **❗ NOTE** ・　Be careful not to lose the collars.
	③　Loosen the fixing bracket and remove the label gap sensor from the bracket.
	④　Disconnect the connector and remove the label gap sensor. ⑤　Replace the label gap sensor and install each part in the reverse order of removal. **❗ NOTE** ・　Do not forget to attach the collars.

	⑥ Make sure that the label gap sensor is securely attached. **①** NOTE - Check that the sensor surface is flush with the sheet metal surface.

3.5 Replacing the Peel Sensors
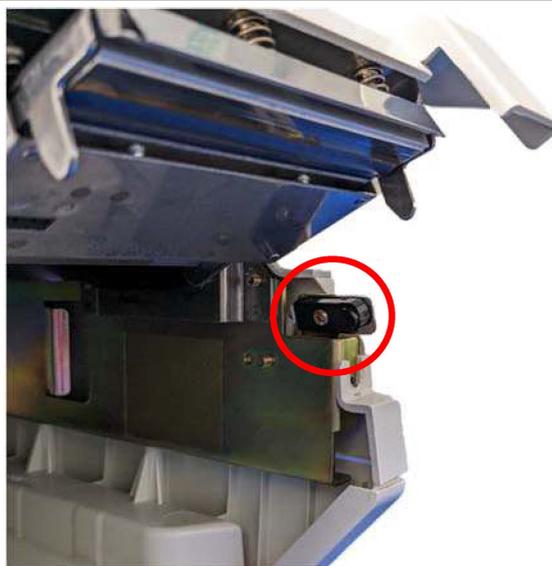
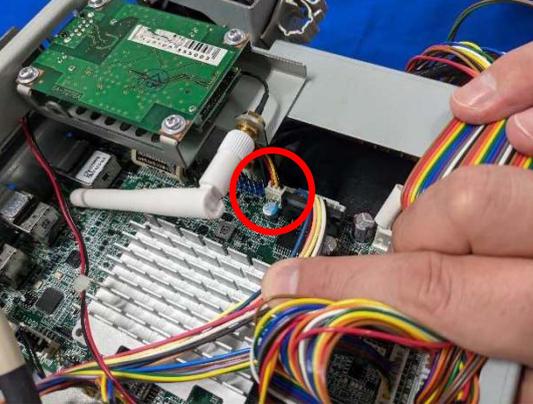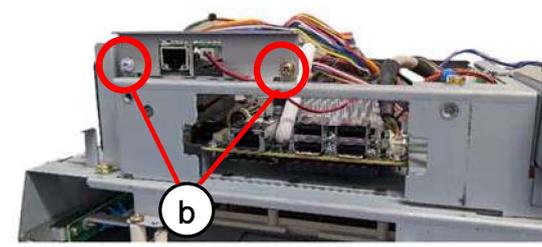|	① Take out the cassette. ② Remove the peel sensor (right side). Screw: 1 place Connector: 1 place **①** NOTE - Do not pull on the connector. ③ Replace the peel sensor (right side) and install it in the reverse order of removal.
	④ Remove the peel sensor (left side). Screw: 1 place Connector: 1 place **①** NOTE - Do not pull on the connector. ⑤ Replace the peel sensor (left side) and install it in the reverse order of removal.

3.6 Replacing the Fan

* Be sure to remove the body case beforehand in accordance with the procedure described in "3.2.3 Removing the Body Case".
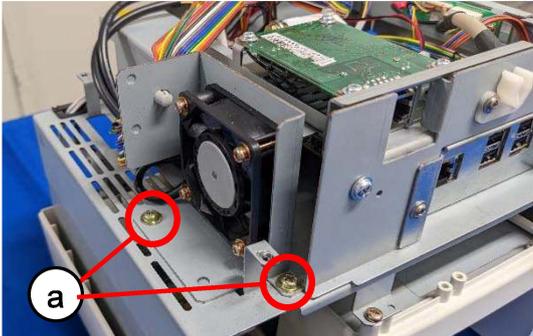
	① Remove the bracket. 　Screw (a): 2 places
	② Disconnect the fan connector on the main board.
	③ Open the clamp and remove the fan. ④ After replacement, install each part in the reverse order of removal.

3.7　Replacing the Wireless LAN Board

* Be sure to remove the body case beforehand in accordance with the procedure described in "3.2.3 Removing the Body Case ".
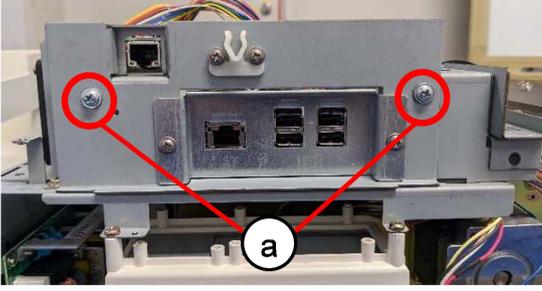
	①　Remove the connector cover plate. 　　Screw (a): 2 places
	②　Remove the wireless LAN board. 　　Screw (b): 2 places 　　Connector: 1 place ③　After replacement, install each part in the reverse order of removal.

3.8   Replacing the Main Board and Downloading Firmware

■ Main board replacement

P-1100, the main board of WIL-AcroII, is designed to operate with the OS and applications placed in the flash ROM of the CF.

Downloading EC and FPGA applications to the flash ROM of the P-1100 enables operation of printers and board-to-board communication.

If the P-1100 is replaced, startup is possible as long as the main application is in the CF.

Even if there is no application, startup is still possible with the application firmware in the USB flash memory.

The firmware is then automatically downloaded to the main board from the Soft folder in the USB flash memory.

■ Precautions for P-1100 board replacement

After starting from the USB flash memory and completing the download of the program to the main board, remove the USB flash memory and restart the machine before carrying on with the work.

In the case of startup from the USB flash memory, the setting work may not be reflected correctly in the body memory.

The function of copying files from the USB flash memory to the body memory basically only overwrites files to the body flash ROM and does not delete unnecessary files.

If the flash ROM capacity is spent by mistakenly copying unnecessary files, the program files may fail to be copied due to insufficient capacity. In this case, it is necessary to first delete all files and then copy them again.

If the program of another machine is mistakenly copied to the main body, the system may not start. In this case, restart the system from the USB flash drive, delete all files, and then re-copy the correct program files.

*To copy the backed-up firmware to the main board, select again on the "Download" screen in the Adjust menu after the automatic download is completed.
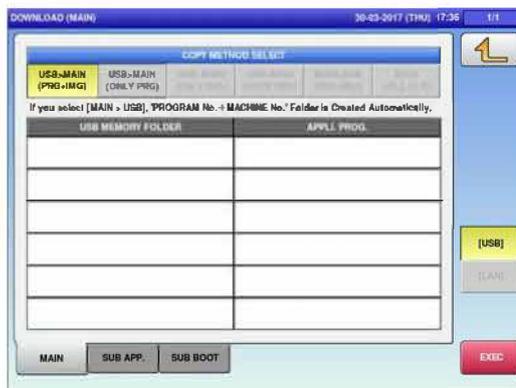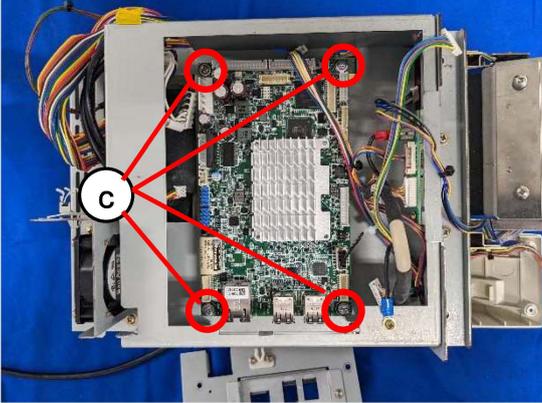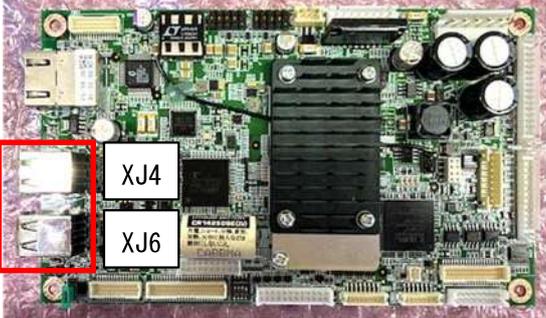

Download (main) reference screen   Download (sub apps) reference screen

3.8.1 Replacement of Main Board (P-1100)

* Be sure to remove the wireless LAN board beforehand in accordance with steps 1) and 2) of
  "3.7 Replacing the Wireless LAN Board".

① Disconnect all connectors and remove the main board.
Screw (c): 4 places

[CF (XJ10)]
Transfer the CF(CompactFlash) from the original board to the replacement board.

[Clock battery jumper (JP2)]
When managing the inventory, make sure that the short pin is inserted on the battery OFF side (#2-3).
When installing the new main board, move the short pin for the battery to the ON side (#1-2).
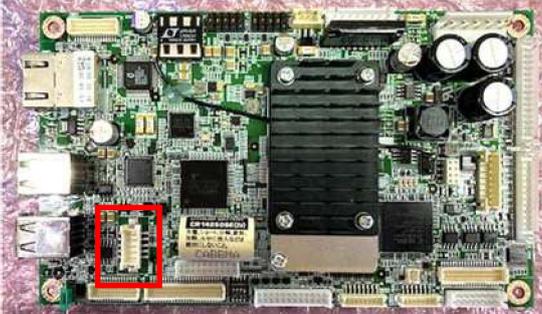
[App/boot switching connector (XJ15)]
If the XJ15 is not equipped with a jumper connector, the firmware written to the board will be in bootloader startup mode.
If the board to be replaced is not equipped with this connector, transfer the jumper(XJ15) to the replacement board.

	[DIP switch (SW1)] Since the DIP switch function settings differ for each model, when replacing a board, be sure to match the DIP switch settings of the board before replacement.
	[USB connectors (XJ6, XJ4)] XJ6 and XJ4 have the same connectors but different functions. Connect the connectors correctly in accordance with the harness markings.
	[LCD connector (XJ9)] Connect the connector correctly in accordance with the harness marking.
	② After replacement, install in reverse order.

3.8.2 Downloading Firmware for P-1100 Board after Board Replacement

NOTE

· "EC" and "FPGA" cannot be downloaded at the same time.
  Download the applications one by one.

	① Remove the CF (CompactFlash) from the old board and insert it into the new board. ② Install the new board in the machine. ③ Turn on the power. 　The "OPERATE" screen will appear.
	④ Go to the maintenance menu screen in adjustment mode and press [DOWNLOAD]. 　The "Download" screen will appear. NOTE · It may be necessary to download the main firmware.
	⑤ Press the [SUB APP.] tab. 　The "Download (Sub App.)" screen will appear.

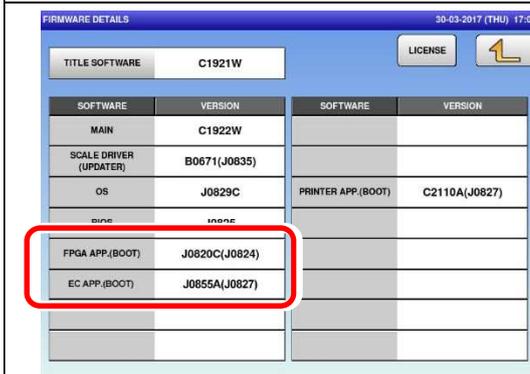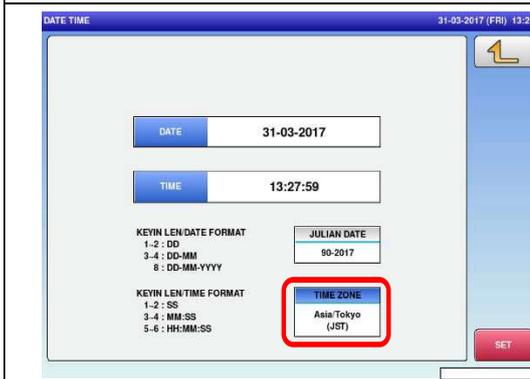|	
	⑥ Select "FPGA". ・Check the firmware version before downloading. ⑦ Press [EXEC]. The "Optional Device Program Download Confirmation" screen will appear.
	⑧ Press [EXEC]. Download will start. ⑨ Confirm that the "Reboot check" screen is displayed after the download is completed, and then turn off the power. ・Do not turn off the power while writing. ⑩ Turn the power back on.
	⑪ Repeat steps 4) and 5) and select "EC" this time. ・Check the firmware version before downloading. ⑫ Press [EXEC]. The "Optional device program download confirmation" screen will appear.
	⑬ Confirm that the "Reboot check" screen is displayed after the download is completed, and then turn off the power. ・Do not turn off the power while writing. ⑭ Turn the power back on.

	⑮ Go to the maintenance menu screen in adjustment mode and press [FIRMWARE DETAILS]. The "Firmware Details" screen will appear.
	⑯ Confirm that the downloaded version is reflected on the "Firmware Details" screen.
	⑰ Go to the maintenance menu screen in adjustment mode and press [DATE TIME]. The "Date Time" screen will appear.
	⑱ Set the "Time Zone". Adjust the Date and Time as needed. The service password must be entered at the main menu to access the Time Zone setting.

■ Precautions for writing firmware after board replacement

Until the writing of all the firmware is completed, the following phenomena may occur due to mismatches between the firmware written in the flash memory on the board and the main application firmware written in the CF (CompactFlash).

<LED lighting phenomenon during shutdown>

For the target model, turn off the power switch after writing the firmware.

The LED on the P-1100 board may not turn off when the OS (operating system) shuts down and the screen goes black.

In this case, turn off the breaker or pull out the power plug from the outlet, wait 20 to 30 seconds after confirming that the LED goes out. Then, turn on the breaker again or insert the power plug into the outlet and turn on the power switch.

<Error display>

A battery error, communication error, or other error screen may appear after the main application firmware starts and before the firmware write operation is performed, but continue the firmware write operation.

If the error is still displayed after all the firmware has been written and the basic settings such as memory initialization and model settings have been completed, take appropriate action in response to the content of the error.

## 3.8.3 Replacing the CF (Compact Flash) Card

⚠ CAUTION

・ If the CF is damaged, all data will be lost.
  Set up the system again by referring to the following procedure.

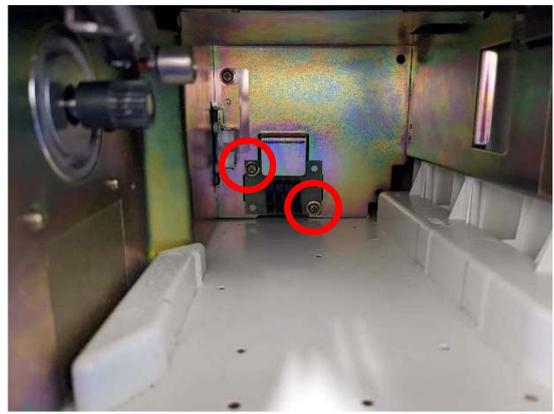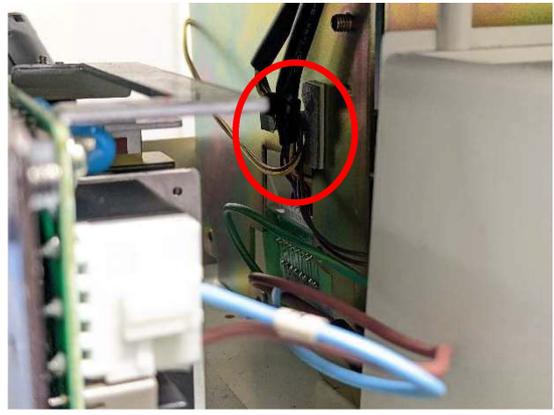|	
	① Insert a new CF (CompactFlash) into the P-1100 board. **🛈 NOTE** ・ Only the OS (operating system) is installed on the new CF at the time of shipment. ・ The CF card is accessible by removing the left side LAN / USB ports cover.
	② Download the main application (folder name: "soft") to a USB flash drive. ③ Insert the USB flash drive into the USB connector. ④ Start the machine. Automatic downloading of the main application will start. ⑤ After downloading, restart the machine.

	⑥ Go to the maintenance menu screen in adjustment mode and set the following items in order.
	  1. Touch panel
	  2. Machine type
	  3. Date time
	  4. Memory clear
	  5. Printer
	
	⑦ Set up all master data.

3.9　Replacing the Switch Power Supply Unit

* Be sure to remove the body case beforehand in accordance with the procedure described in "3.2.3 Removing the Body Case ".
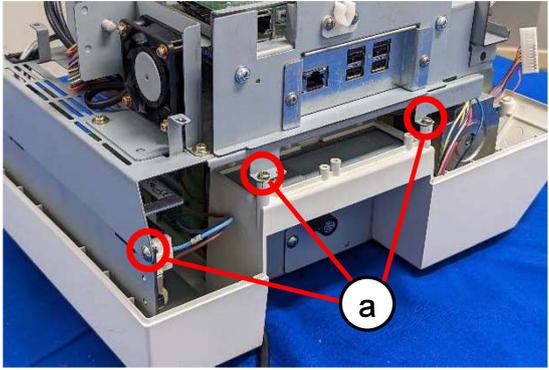
① Unscrew the base so that it can be shifted.
Screw (a): 3 places
Screw (b): 1 place
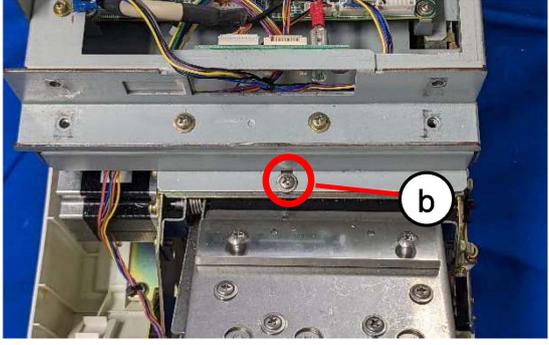
② Shift the base and unscrew the switch power supply unit.
Screw (c): 2 places on the left and right
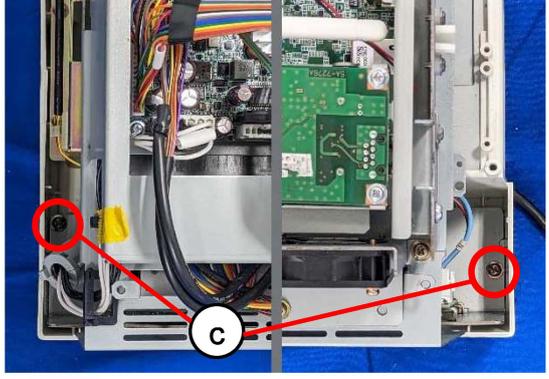
③ Pull the switch power supply unit out through the gap and remove it.

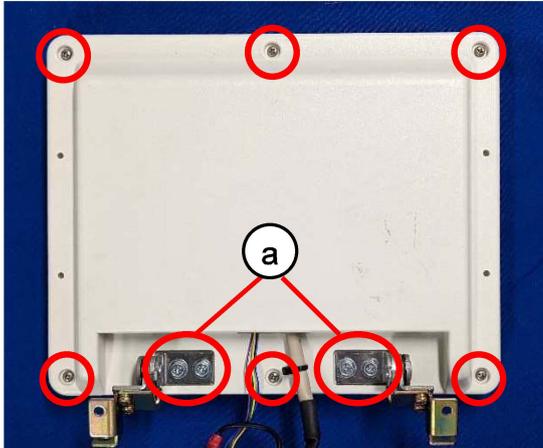④ After replacement, install each part in the reverse order of removal.

3.10 Replacing the Cassette Sensor

*Be sure to remove the switch power supply unit beforehand in accordance with steps 1) to 3) of "3.9 Replacing the Switch Power Supply Unit".

① Take out the cassette.

② Remove the sensor mounting screws.
Screw: 2 places

③ Disconnect the cables from the clamp on the power supply unit side.

④ Pull out the cassette sensor, disconnect the connector, and remove the cassette sensor.

NOTE

• Do not forcibly pull on the harness or connectors.

⑤ Replace the cassette sensor and install it in the reverse order of removal.

3.11 Replacing the Electrical Components in the Controller Unit

* Be sure to remove the controller unit beforehand in accordance with the procedure described in "3.2.1 Removing the Controller Unit".

	① Remove the hinge torque. Screw: 2 screws each ② Remove the rear cover. Screw: 6 places
	③ Remove the harnesses and screws and replace each board as appropriate. ④ After replacement, install each part in the reverse order of removal.

3.12 Consumable Parts / Periodic Replacement Parts

■ Consumable parts

No.	Part Name	Ishida Genuine Part	Replacement Cycle (approximate)
1	Thermal head	3-inch A "+" driver is required to remove the thermal head from the mounting bracket.	30 to 60 km