



Color Laser MFP

Xpress C480 series

SL-C480 / C480W / C480FN /

C480FW

(Ver 1.01)

SERVICE MANUAL

Color Laser MFP

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1. Precautions

In order to prevent accidents and damages to the equipment please read the precautions listed below carefully before servicing the product and follow them closely.

1.1. Safety warning

- 1) Only to be serviced by a factory trained service technician.

High voltages and lasers inside this product are dangerous. This product should only be serviced by a factory trained service technician.

- 2) Use only Samsung replacement parts.

There are no user serviceable parts inside the product. Do not make any unauthorized changes or additions to the product as these could cause the product to malfunction and create an electric shocks or fire hazards.

- 3) Laser Safety Statement

The printer is certified in the U.S. to conform to the requirements of DHHS 21 CFR, chapter 1 Subchapter J for Class I(1) laser products, and elsewhere is certified as a Class I laser product conforming to the requirements of IEC/EN 60825-1:2014. Class I laser products are not considered to be hazardous. The laser system and printer are designed so there is never any human access to laser radiation above a Class I level during normal operation, user maintenance or prescribed service condition.

- Wavelength: 800 nm
- Beam divergence
 - Parallel: 11 degrees
 - Perpendicular: 35 degrees
- Maximum power of energy output: 12 mW



WARNING

Never operate or service the product with the protective cover removed from Laser/Scanner assembly. The reflected beam, although invisible, can damage your eyes.

When using this product, these basic safety precautions should always be followed to reduce risk of fire, electric shock, and personal injury.



- 4) Lithium battery not replaceable by user

1.2. Caution for safety

1.2.1. Toxic material

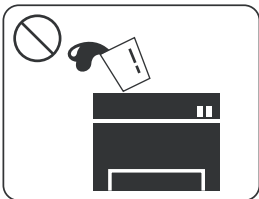
This product contains toxic materials that could cause illness if ingested.

- 1) Please keep imaging unit and toner cartridge away from children. The toner powder contained in the imaging unit and toner cartridge may be harmful, and if swallowed, you should contact a doctor.

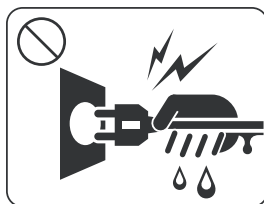
1.2.2. Electric shock and fire safety precautions

Failure to follow the following instructions could cause electric shock or potentially cause a fire.

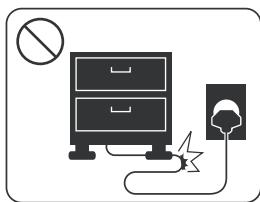
- 1) Use only the correct voltage, failure to do so could damage the product and potentially cause a fire or electric shock.
- 2) Use only the power cable supplied with the product. Use of an incorrectly specified cable could cause the cable to overheat and potentially cause a fire.
- 3) Do not overload the power socket, this could lead to overheating of the cables inside the wall and could lead to a fire.
- 4) Do not allow water or other liquids to spill into the product, this can cause electric shock. Do not allow paper clips, pins or other foreign objects to fall into the product, these could cause a short circuit leading to an electric shock or fire hazard.



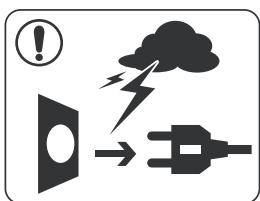
- 5) Never touch the plugs on either end of the power cable with wet hands, this can cause electric shock. When servicing the product, remove the power plug from the wall socket.



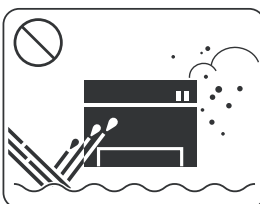
- 6) Use caution when inserting or removing the power cord. When removing the power cord, grip it firmly and pull. The power cord must be inserted completely, otherwise a poor contact could cause overheating leading to a fire.
- 7) Take care of the power cable. Do not allow it to become twisted, bent sharply around corners or power cable may be damaged. Do not place objects on top of the power cable. If the power cable is damaged it could overheat and cause a fire. Exposed cables could cause an electric shock. Replace the damaged power cable immediately, do not reuse or repair the damaged cable. Some chemicals can attack the coating on the power cable, weakening the cover or exposing cables causing fire and shock risks.



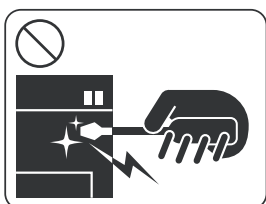
- 8) Ensure that the power sockets and plugs are not cracked or broken in any way. Any such defects should be repaired immediately. Take care not to cut or damage the power cable or plugs when moving the machine.
- 9) Use caution during thunder or lightning storms. Samsung recommends that this machine be disconnected from the power source when such weather conditions are expected. Do not touch the machine or the power cord if it is still connected to the wall socket in these weather conditions.




- 10) Avoid damp or dusty areas, install the product in a clean well ventilated location. Do not position the machine near a humidifier or in front of an air conditioner. Moisture and dust built up inside the machine can lead to overheating and cause a fire or cause parts to rust.



- 11) Do not position the product in direct sunlight. This will cause the temperature inside the product to rise possibly leading to the product failing to work properly and in extreme conditions could lead to a fire.
- 12) Do not insert any metal objects into the machine through the ventilator fan or other part of the casing, it could make contact with a high voltage conductor inside the machine and cause an electric shock.



- 13)  When replacing the SMPS board, please wait 5 minutes after unplugging the power cord, then replace it. You can get a shock by the electric discharge.

1.2.3. Handling precautions

The following instructions are for your own personal safety to avoid injury and so as not to damage the product.

- 1) Ensure the product is installed on a level surface, capable of supporting its weight. Failure to do so could cause the product to tip or fall.
- 2) The product contains many rollers, gears and fans. Take great care to ensure that you do not catch your fingers, hair or clothing in any of these rotating devices.
- 3) Do not place any small metal objects, containers of water, chemicals or other liquids close to the product which if spilled could get into the machine and cause damage or a shock or fire hazard.
- 4) Do not install the machine in areas with high dust or moisture levels, beside an open window or close to a humidifier or heater. Damage could be caused to the product in such areas.
- 5) Do not place candles, burning cigarettes, etc on the product, These could cause a fire.
- 6) Ensure that the machine is installed and used in proper area to meet the temperature and humidity specifications.
 - If the machine is stored at below zero Celsius for a long time, do not use the machine instantly after movement. It can malfunction. Take care of the machine storage. If the machine is stored at below zero Celsius for a long time, keep the machine at room temperature and install it.

1.2.4. Assembly and Disassembly precautions

- 1) Replace parts carefully and always use Samsung parts. Take care to note the exact location of parts and also cable routing before dismantling any part of the machine. Ensure all parts and cables are replaced correctly. Please carry out the following procedures before dismantling the product or replacing any parts.
- 2) Ensure that power is disconnected before servicing or replacing any electrical parts.
- 3) Disconnect interface cables and power cables.
- 4) Only use approved spare parts. Ensure that part number, product name, any voltage, current or temperature rating are correct.
- 5) When removing or re-fitting any parts do not use excessive force, especially when fitting screws into plastic.
- 6) Take care not to drop any small parts into the machine.
- 7) Handling of the OPC Drum
 - The OPC Drum can be irreparably damaged if it is exposed to light. Take care not to expose the OPC Drum either to direct sunlight or to fluorescent or incandescent room lighting. Exposure for as little as 5 minutes can damage the surface of the photoconductive properties and will result in print quality degradation. Take extra care when servicing the product. Remove the OPC Drum and store it in a black bag or other lightproof container. Take care when working with the Covers (especially the top cover) open as light is admitted to the OPC area and can damage the OPC Drum.
 - Take care not to scratch the green surface of the OPC Drum Unit. If the green surface of the Drum Cartridge is scratched or touched the print quality will be compromised.

1.2.5. Disregarding this warning may cause bodily injury

- 1) Be careful with the high temperature part.

The fuser unit works at a high temperature. Use caution when working on the printer. Wait for the fuser unit to cool down before disassembly.



- 2) Do not put fingers or hair into the rotating parts.

When operating a printer, do not put hand or hair into the rotating parts (Paper feeding entrance, motor, fan, etc.). If do, you can get harm.



- 3) When you move the printer, use safe lifting and handling techniques.

This printer is heavy. Use the lifting handles located on each side of the machine. Back injury could be caused if you do not lift carefully.

- 4) Ensure the printer is installed safely.

Ensure the printer is installed on a level surface, capable of supporting its weight. Failure to do so could cause the printer to tip or fall possibly causing personal injury or damaging the printer.

- 5) Do not install the printer on a sloping or unstable surface. After installation, double check that the printer is stable.

1.3. ESD precautions

Certain semiconductor devices can be easily damaged by static electricity. Such components are commonly called “Electrostatically Sensitive (ES) Devices” or ESDs. Examples of typical ESDs are: integrated circuits, some field effect transistors, and semiconductor “chip” components. The techniques outlined below should be followed to help reduce the incidence of component damage caused by static electricity.



CAUTION



Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

- 1) Immediately before handling a semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, employ a commercially available wrist strap device, which should be removed for your personal safety reasons prior to applying power to the unit under test.
- 2) After removing an electrical assembly equipped with ESDs, place the assembly on a conductive surface, such as aluminum or copper foil, or conductive foam, to prevent electrostatic charge buildup in the vicinity of the assembly.
- 3) Use only a grounded tip soldering iron to solder or desolder ESDs.
- 4) Use only an “anti-static” solder removal device. Some solder removal devices not classified as “anti-static” can generate electrical charges sufficient to damage ESDs.
- 5) Do not use Freon-propelled chemicals. When sprayed, these can generate electrical charges sufficient to damage ESDs.
- 6) Do not remove a replacement ESD from its protective packaging until immediately before installing it. Most replacement ESDs are packaged with all leads shorted together by conductive foam, aluminum foil, or a comparable conductive material.
- 7) Immediately before removing the protective shorting 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.
- 8) Maintain continuous electrical contact between the ESD and the assembly into which it will be installed, until completely plugged or soldered into the circuit.
- 9) Minimize bodily motions when handling unpackaged replacement ESDs. Normal motions, such as the brushing together of clothing fabric and lifting one’s foot from a carpeted floor, can generate static electricity sufficient to damage an ESD.

2. Product specification and description

2.1. Product Specification

2.1.1. Product Overview

 <p>[C480FN / C480FW (4 in 1 model)]</p>  <p>[C480/ C480W (3 in 1 model)]</p>	<ol style="list-style-type: none">1) Printing Speed<ul style="list-style-type: none">• 18 (Mono) / 4 (Color) ppm in A4 (19/4 ppm in Letter)2) Processor<ul style="list-style-type: none">• 800 MHz3) Memory<ul style="list-style-type: none">• 128MB (Standard) / 128MB (Max)4) Interface<ul style="list-style-type: none">• High Speed USB 2.0• 10/100 BaseTX network connector• 802.11b/g/n wireless LAN (C480W / C480FW only)• NFC (Near Field Communication) Printing (C480W / C480FW only)5) Toner cartridge yield<ul style="list-style-type: none">• Initial : 700 (K)/ 500 (CMY)• Sales: 1,500 (K)/ 1,000 (CMY)
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2.1.2. Specifications



NOTE

Product Specifications are subject to change without notice.

2.1.2.1. General Print Engine

Item		Specification
Engine Speed	Simplex (C/M)	<ul style="list-style-type: none"> • Mono : 19 ppm @Letter, 18 ppm @A4 • Color : 4 ppm @Letter, A4
	Duplex	N/A
FPOT	From Ready (C/M)	Less than 26/14 sec
	From Sleep (C/M)	Less than 29.5/29.5 sec
Resolution	Optical	600 x 600 dpi
	Enhanced	Up to 2,400 x 600 dpi Effective Output (600 x 600 x 2 bit)

2.1.2.2. Copy

Item			Specification
Copy Speed	Simplex (SDMC : Single Document Multiple Copy)		<ul style="list-style-type: none"> • Mono : 19 cpm / Ltr, 18 cpm / A4 • Color : 4 cpm / A4, Ltr
	Duplex		N/A
FCOT	From Ready		<ul style="list-style-type: none"> • Color : Less than 36 seconds • Mono : Less than 14 seconds
	From Sleep		<ul style="list-style-type: none"> • Color : Less than 45 seconds • Mono : Less than 32 seconds
Resolution (Original Type)	Platen	Text	Scan: 600 x 600 dpi (Optical 600 x 600 dpi) , Printing : 600 x 600 x 2bit
		Text/Photo	Scan: 600 x 600 dpi (Optical 600 x 600 dpi) , Printing : 600 x 600 x 2bit
		Photo	Scan: 600 x 600 dpi (Optical 600 x 600 dpi) , Printing : 600 x 600 x 2bit
		Magazine	Scan: 600 x 600 dpi (Optical 600 x 600 dpi) , Printing : 600 x 600 x 2bit
	ADF	Text	Scan: 600 x 600 dpi (Optical 600 x 600 dpi) , Printing : 600 x 600 x 2bit
		Text/Photo	Scan: 600 x 600 dpi (Optical 600 x 600 dpi) , Printing : 600 x 600 x 2bit
		Photo	Scan: 600 x 600 dpi (Optical 600 x 600 dpi) , Printing : 600 x 600 x 2bit
		Magazine	Scan: 600 x 600 dpi (Optical 600 x 600 dpi) , Printing : 600 x 600 x 2bit




NOTE

C480FN /
C480FW only

Item		Specification
Features	Multi Copy	1~99
	ID Copy	Yes (Platen only)
	N-up	2-up / 4-up
	Poster Copy	No
	Clone Copy	No

2.1.2.3. Scan

Item		Specification
Scan method		Color 3 channel CIS
Scan Speed through ADF (300 dpi) <div>  NOTE C480FN / C480FW only </div>	B/W (Lineart, Halftone)	Approx. 7 sec
	Gray	Approx. 7 sec
	Color	Approx. 13 sec
Scan Speed through Platen (300 dpi)	B/W (Lineart, Halftone)	Approx. 15 sec
	Gray	Approx. 20 sec
	Color	Approx. 30 sec
Resolution	Optical	Up to 600 x 600 dpi
	Enhanced	Up to 4,800 x 4,800 dpi
Halftone		256 levels
Scan Size	Max. Document Width	Max. 216 mm (8.5")
	Effective Scan Width	Max. 208 mm (8.2")
Scan-to	USB	Yes
	Email	No
	PC	Yes


2.1.2.4. Fax (C480FN / C480FW only)

Item	Specification
Compatibility	ITU-T G3
Communication System	PSTN/PABX
Modem Speed	33.6 Kbps
Tx Speed	Approx. 3 sec (Mono / Standard / ECM-MMR / ITU-T G3 No1.standard)
Compression	MH / MR / MMR / JBIG / JPEG


2. Product specification and description

Item		Specification
Telephone Features	Handset	No
	On hook Dial	Yes
	Search	Yes (Phone Book)
	1-Touch Dial	No
	Speed Dial	200 locations
	TAD I/F	Yes
	Tone/Pulse	Selectable in Tech Mode or User Menu (Depends on each country)
	Pause	Yes
	Auto Redial	Yes
	Last Number Redial	Yes
	Distinctive Ring	Yes
	Caller ID	Yes (Depends on each country)
	External Phone Interface	Yes
Report & List Print out	Tx/Rx Journal	Yes
	Confirmation	2 Types available (with Image TCR, w/o image TCR)
	Auto Dial List	No
	System Data List	Yes
Scan speed	Std	5 sec/ LTR
	Fine	5 sec/ LTR
	S.Fine	6 sec/ LTR
Fax Memory Std/Max		5 MB (400 pages)

2.1.2.5. Controller and Software

Item		Specification
CPU		800 MHz
Memory	Std.	128 MB
	Max.	128 MB
Printer Languages		SPL-C / PCL-5c/6 / PS3 / URF
Supporting OS	Windows	Windows 8, 7, Vista, XP, 2008R2, 2008, 2003
	Linux	<ul style="list-style-type: none"> • RedHat Enterprise Linux WS 4, 5, 6 (32/64 bit) • Fedora 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 (32/64 bit) • OpenSUSE 10.2, 10.3, 11.0, 11.1, 11.2, 11.3, 11.4 (32/64 bit) • Mandriva 2007, 2008, 2009, 2009.1, 2010 (32/64 bit) • Ubuntu 6.06, 6.10, 7.04, 7.10, 8.04, 8.10, 9.04, 9.10, 10.04, 10.10, 11.04 (32/64 bit) • SuSE Linux Enterprise Desktop 10, 11 (32/64 bit) • Debian 4.0, 5.0, 6.0 (32/64 bit)
	Mac	Mac OS X 10.5~10.8
Fonts		<ul style="list-style-type: none"> • PCL: 95 Scalable Fonts (include OCR-A, OCR-B), 1 bitmap • PS : 136 Scalable Fonts
Interface	USB	Hi-Speed USB 2.0
	USB Host	Yes
	Wired LAN	Ethernet 10/100 Base TX
	Wireless LAN	IEEE 802.11 b/g/n
 NOTE C480W / C480FW only		
Network	Protocol	<ul style="list-style-type: none"> • TCP/IPv4/IPv6 / Standard TCP/IP printing / LPR / IPP / SNMPv1/2/3 / HTTP / SLP / Bonjour / DDNS / WSD / DHCP / Bootp / AutoIP • Authentication : Open System, Shared Key, WPA Personal, WPA2 personal • Encryption : WEP64 / WEP128 / TKIP / AES

2.1.2.6. Paper Handling

Item		Specification
Standard Capacity		<ul style="list-style-type: none"> 150-sheet Cassette Tray @75g/m² (130-sheet Cassette Tray @80g/m²)
Printing	Max. Size	216 x 356 mm (8.5" x 14")
	Min. Size	76 x 152.4 mm (3.0" x 6.0")
Multi-purpose tray		N/A
Standard Cassette Tray	Capacity	<ul style="list-style-type: none"> 130 sheets @80g/m² Label, thick paper : 5 Sheets Glossy Photo 220g/m² : 1 Sheets
	Media sizes	A4 / A5 / A6 / Letter / Legal / Executive / Folio / ISO B5 / JIS B5 / GlossyPhoto 220 g/m ² / Label / Postcard 4x6
	Media types	Plain Paper / Thin Paper / Bond / Pre-Printed / Recycled / Label / CardStock / Thick / Cotton / Colored / Glossy
	Media weight	<ul style="list-style-type: none"> Plain : 60 ~ 85 g/m² Thick Paper: 86 ~ 120 g/m² Cardstock: 121 ~ 163 g/m² Photo : 220 g/m²
Option Cassette (SCF)		N/A
ADF  NOTE C480FN / C480FW only	Capacity	40 sheet @80g/m ²
	2-sided Document Scanning	No
	Document Weight	16 ~28 lb (60 to 105 g/m ²)
	Document Size	<ul style="list-style-type: none"> Width: 142 ~ 216 mm (5.6" ~ 8.5") Length : 148 ~ 356 mm (5.8" ~ 14.0")

2.1.2.7. Reliability and Service

Item	Specification
Average Monthly Volume	Color 46 pages, Mono 140 pages
Max. Monthly Duty	20,000 images

2.1.2.8. Environment

Item		Specification
Temperature	Operation	10 to 30°C (50 to 86°F)
Humidity	Operation	20 to 80% RH
Acoustic Noise Level (Sound Power/Pressure)	Ready mode	Background noise level
	Print mode	<ul style="list-style-type: none"> • Color printing : Less than 46 dB (A) • Mono printing : Less than 48 dB (A)
	Copy mode	<ul style="list-style-type: none"> • Scanner glass : Less than 52 dB (A) • Document feeder : Less than 53 dB (A)
	Scan mode	<ul style="list-style-type: none"> • Scanner glass : Less than 51 dB (A) • Document feeder : Less than 51 dB (A)
Power Consumption	Average operating mode	Less than 290 W
	Ready mode	Less than 60 W
	Power save mode	<ul style="list-style-type: none"> • C480 : Less than 1.2 W • C480W : Less than 1.7 W (WI-FI Direct on: Less than 2.5 W) • C480FN : Less than 1.7 W • C480FW Series: Less than 2.1 W (WI-FI Direct on: Less than 2.9 W)
	Power off mode	Less than 0.45 W
	Network Standby Mode (All Port Activation)	C480W / C480FW : Less than 1.15 W
Dimension (W x D x H)		<ul style="list-style-type: none"> • C480 / C480W : 406 x 362 x 288.6 mm (16.0 x 14.3 x 11.4 inch) • C480FN/ C480FW : 406 x 362 x 333.5 mm (16 x 14.3 x 13.1 inches)
Weight	Machine with consumables	<ul style="list-style-type: none"> • C480 / C480W : 12.80 Kg (28.22 lbs) • C480FN/ C480FW : 13.96 Kg (30.78 lbs)

2.1.2.9. Supplies

Item	Model	Average Yield
Toner Cartridge	<ul style="list-style-type: none"> K404(CLT-K404S) : Black C404(CLT-Y404S) : Yellow M404(CLT-M404S) : Magenta Y404(CLT-C404S) : Cyan 	<ul style="list-style-type: none"> Average continuous black cartridge yield: Apporx. 1,500 standard pages (Black) Average continuous color cartridge yield: Apporx. 1,000 standard pages (Yellow/Magenta/Cyan)
Imaging Unit	CLT-R406	Approx. 16,000 images*
Waste Toner Container	CLT-W406	Approx. 7,000 images*

**NOTE**

Declared yield value in accordance with ISO/IEC 19798. The number of pages may be affected by operating environment, printing interval, graphics, media type and media size.

* Image counts based on one color on each page. If you print documents in full color (Cyan, Magenta, Yellow, Black), the life of this item will be reduced by 25%.


2.1.2.10. Maintenance Parts

Item	Part Code	Average yield
Transfer roller Assy	JC93-00708A	20,000 pages
Fuser unit	<ul style="list-style-type: none"> JC91-01137A (110V) JC91-01138A (220V) 	Approx. 20,000 images B&W or 5,000 images Color
Pick-Up roller	JC73-00309A	20,000 pages
ITB unit	JC96-06292A	Approx. 20,000 images B&W or 5,000 images Color

2.2. System Overview

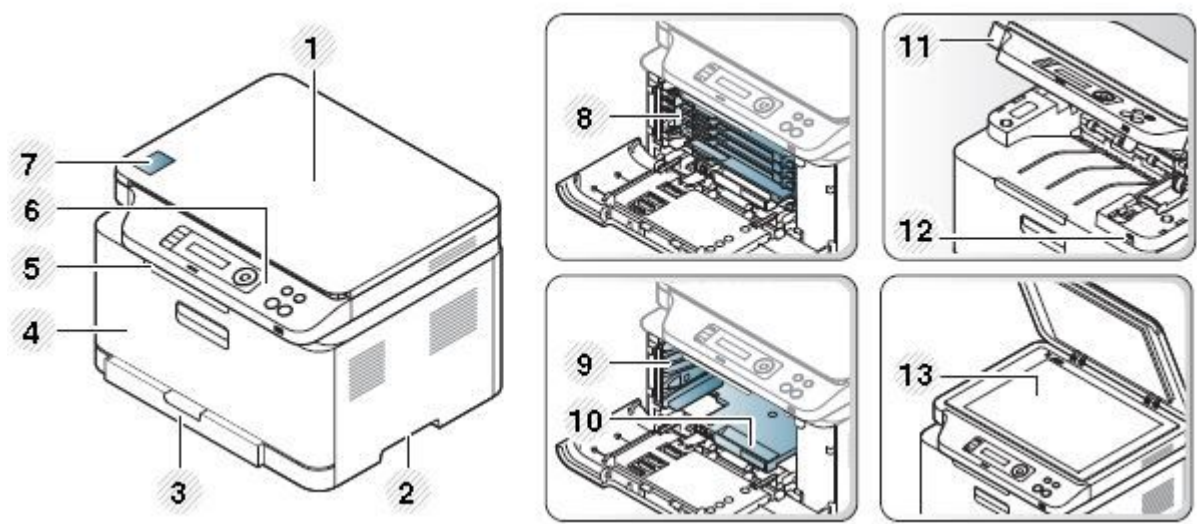
This chapter describes the functions and operating principal of the main component.

2.2.1. Front View

 **NOTE**

- This illustration may differ from your machine depending on your model. There are various types of machine.
- Some features and optional goods may not be available depending on model or country.

C480

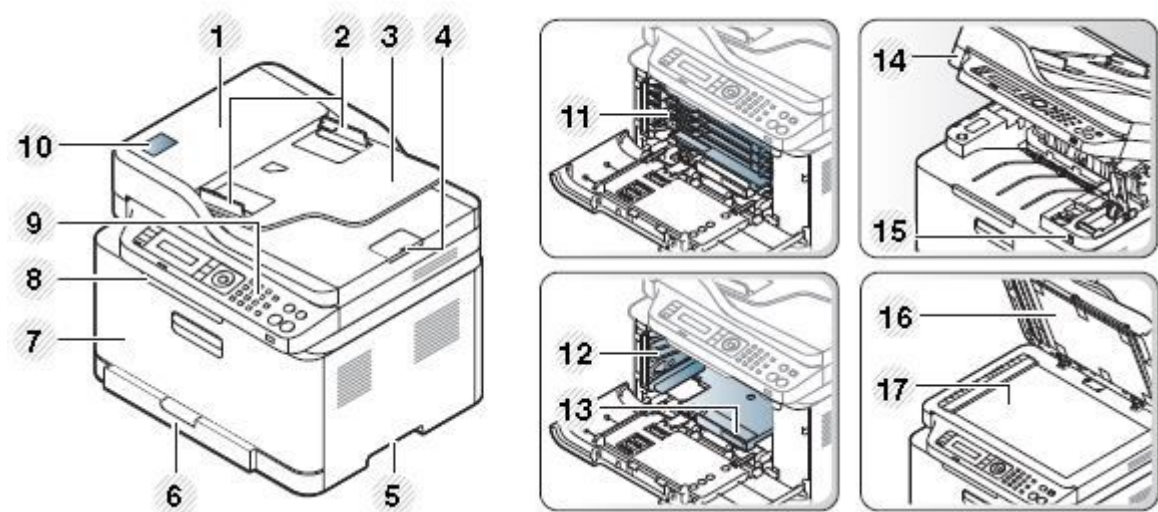


1	Scanner lid
2	Handle
3	Tray
4	Front door
5	Output support
6	Control panel

7	NFC tag *
8	Toner cartridges
9	Waste toner container
10	Imaging unit
11	Scan unit
12	USB port
13	Scanner glass

* C480W only.

C480FN / C480FW



1	Document feeder cover
2	Document feeder width guide
3	Document feeder input tray
4	Document feeder output support
5	Handle
6	Tray
7	Front cover
8	Document output tray
9	Control panel

10	NFC tag *
11	Toner cartridge
12	Waste toner container
13	Imaging unit
14	Scan unit
15	USB port
16	Scanner lid
17	Scanner glass

* C480FW only.

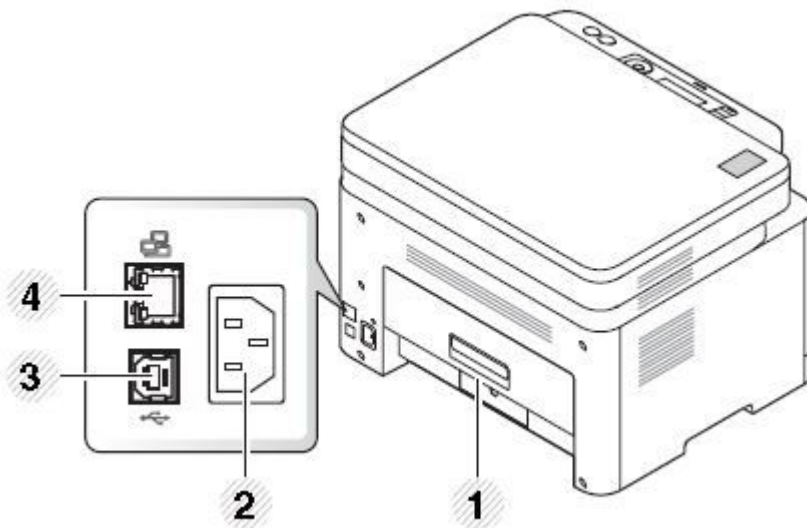
2.2.2. Rear View



NOTE

- This illustration may differ from your machine depending on your model. There are various types of machine.
- Some features and optional goods may not be available depending on model or country.

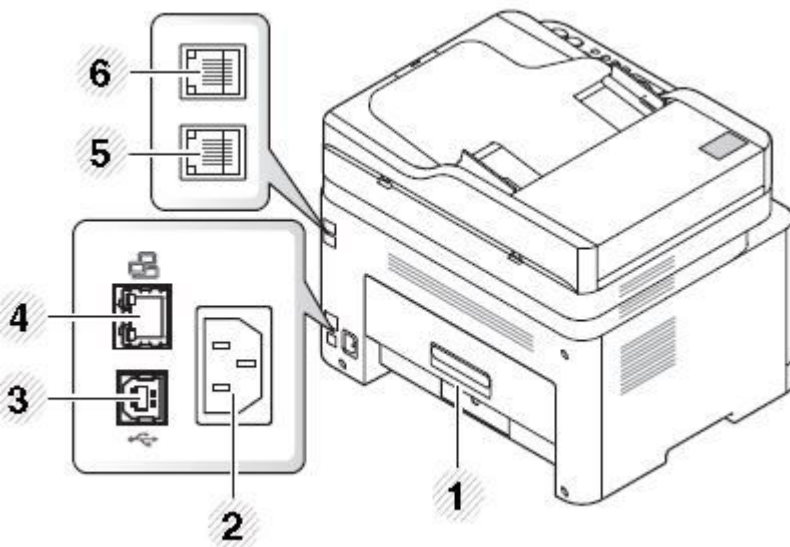
C480 / C480W



1	Rear cover
2	Power receptacle
3	USB port
4	Network port *

* C480W only

C480FN / C480FW



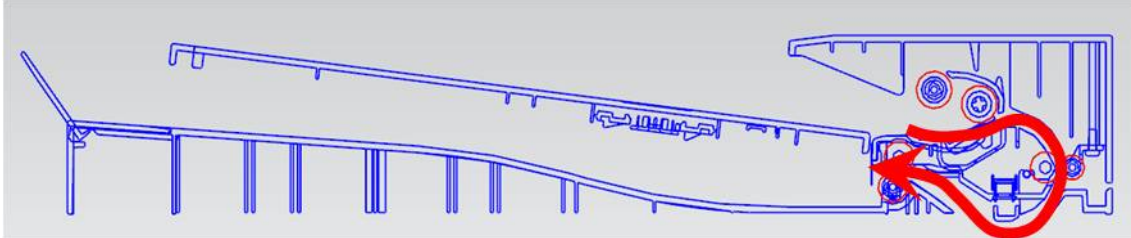
2. Product specification and description

1	Rear cover
2	Power receptacle
3	USB port
4	Network port
5	Telephone line socket (LINE)
6	Extension telephone socket (EXT.)

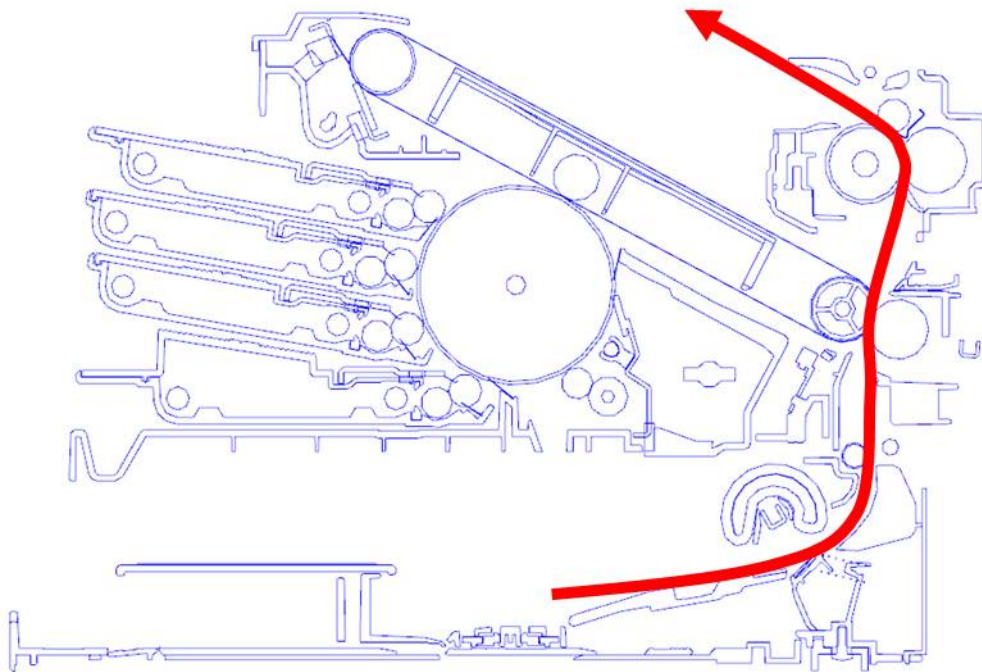
2.2.3. Paper Path

The following diagram displays the path the paper follows during the printing process.

[ADF]

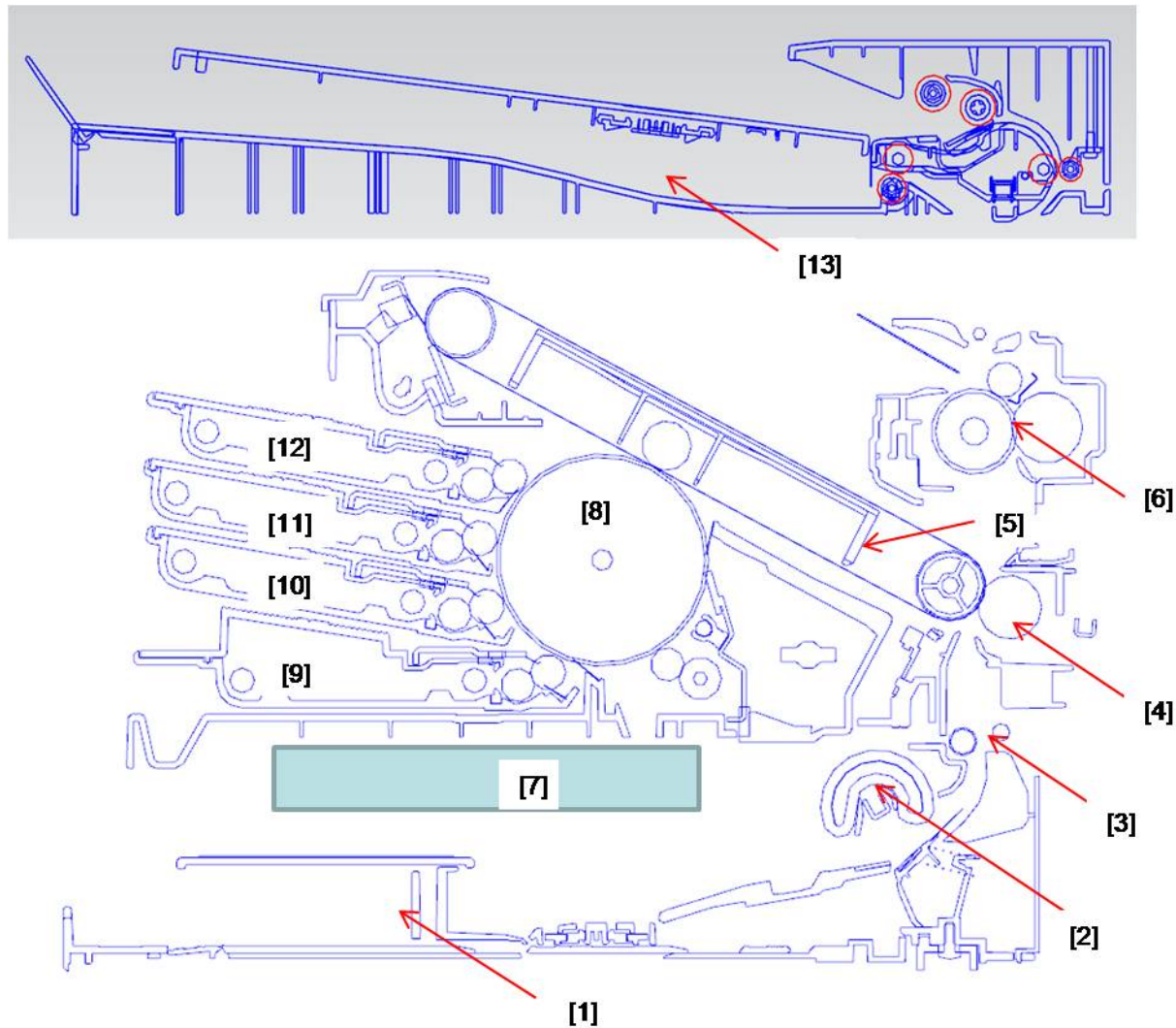


[Engine]



2.2.4. System Layout

This model consists of the scanner parts, engine parts, hardware parts, firmware. The scanner parts consists of ADF and platen. The engine parts consists of the mechanical parts comprising Frame, Toner Cartridge, Drive Unit, Transfer roller, Pick up unit, Fuser, Cassette. The hardware parts consists of the main board, SMPS, HVPS board, OPE board, PC interface.



1	Cassette
2	Pick up roller
3	Registration roller
4	Transfer(T2) roller
5	ITB Unit
6	Fuser Unit
7	LSU

8	OPC drum
9	K toner cartridge
10	C toner cartridge
11	M toner cartridge
12	Y toner cartridge
13	ADF unit

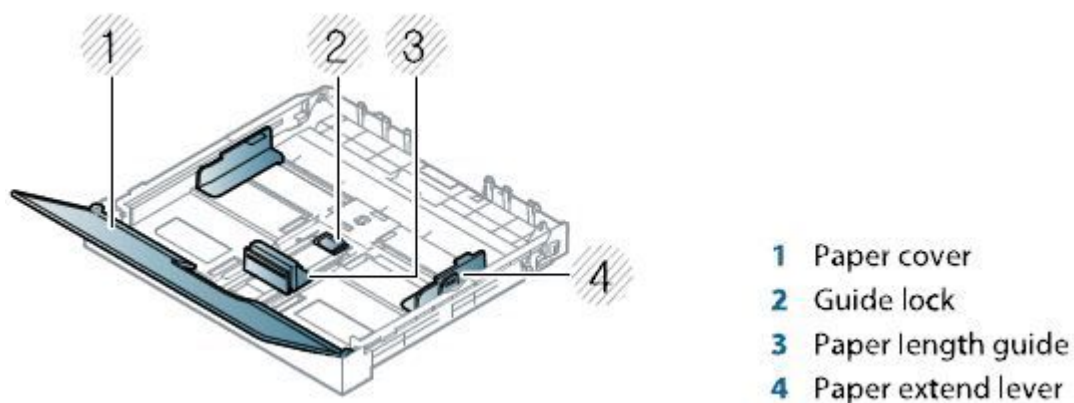
2.2.4.1. Feeding Section

It consists of a basic cassette, pick up/forward/retard roller and parts related to paper transferring.

1) Cassette (Tray1)

This model has a cassette type tray.

It has a paper existence sensing function, paper arranging function.

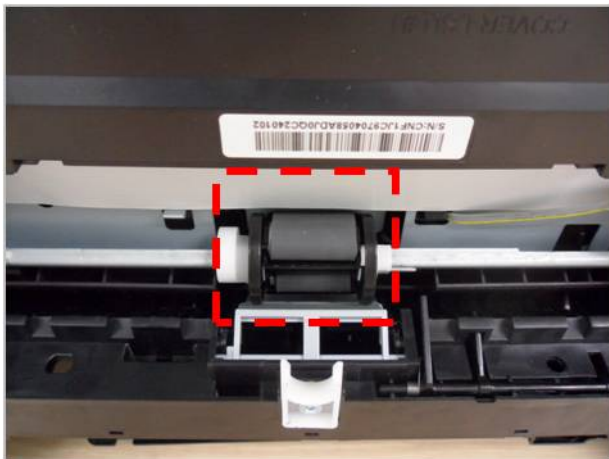


NOTE

If you do not adjust the guide, it may cause paper registration, image skew, or jamming of the paper.

2) Pick up roller

This roller has functions such as a paper pickup function, paper feeding function, and removing electronic static function. Pick up roller is driven by solenoid.



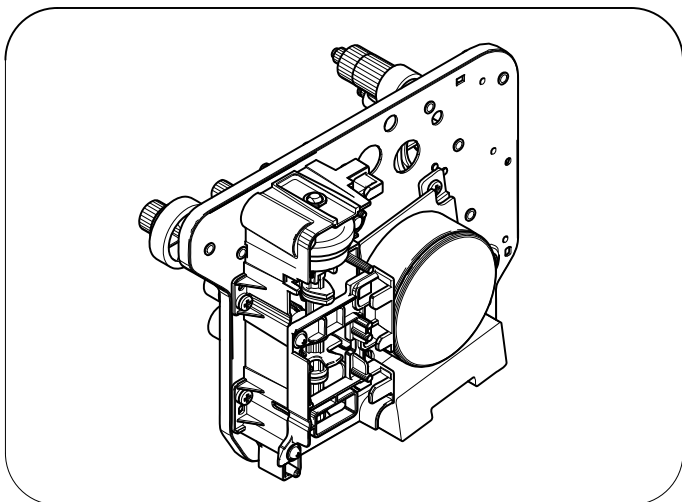
2.2.4.2. Transfer Roller

The transfer roller unit is assembled to the rear of the machine. The transfer roller delivers the toner of the OPC drum to the paper.



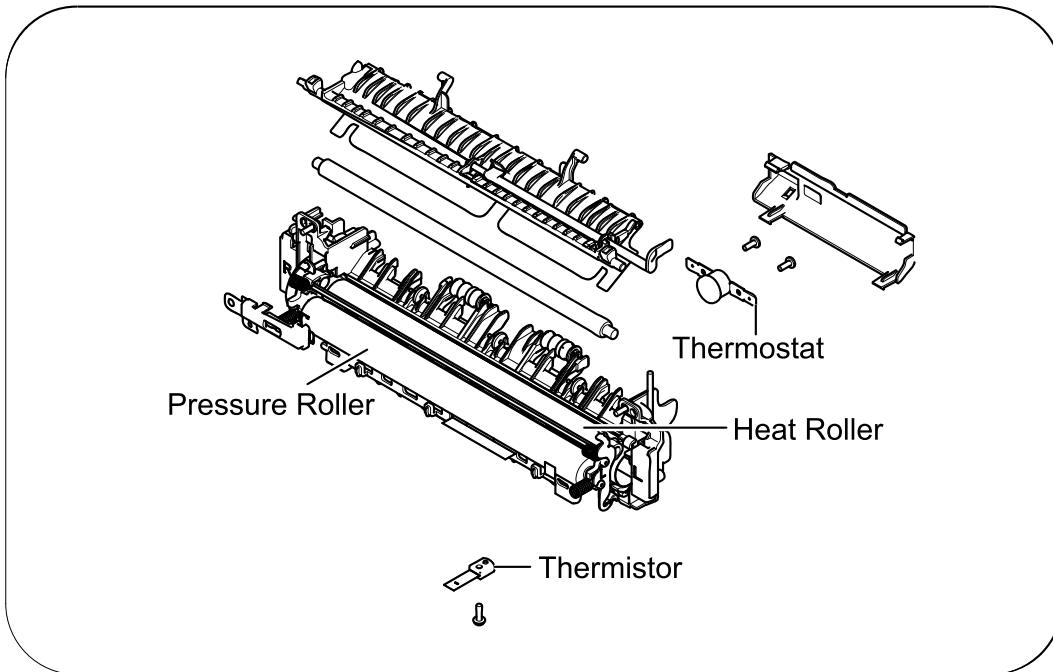
2.2.4.3. Drive Unit

The Drive unit is assembled to the right frame. It consists of a BLDC motor, a clutch, and various gears.



2.2.4.4. Fuser Unit

This unit consists of Heat Roller, a Thermostat, and Thermistor, etc. It fuses the toner that was transferred by the transfer roller onto the paper, by applying heat and pressure to complete fusing process.



1) Thermostat

When a heat lamp is overheated, a Thermostat cuts off the main power to prevent over- heating.

- Thermostat Type : Non- Contact type Thermostat
- Control Temperature : $195^{\circ}\text{C} \pm 5^{\circ}\text{C}$

2) Thermistor

It is a temperature detecting sensor.

- Temperature Resistance : $7\text{ k}\Omega(180^{\circ}\text{C})$

3) Heat roller

The heat roller transfers the heat from the lamp to apply a heat on the paper.

The surface of a heat roller is coated with Teflon, so toner does not stick to the surface.

4) Pressure roller

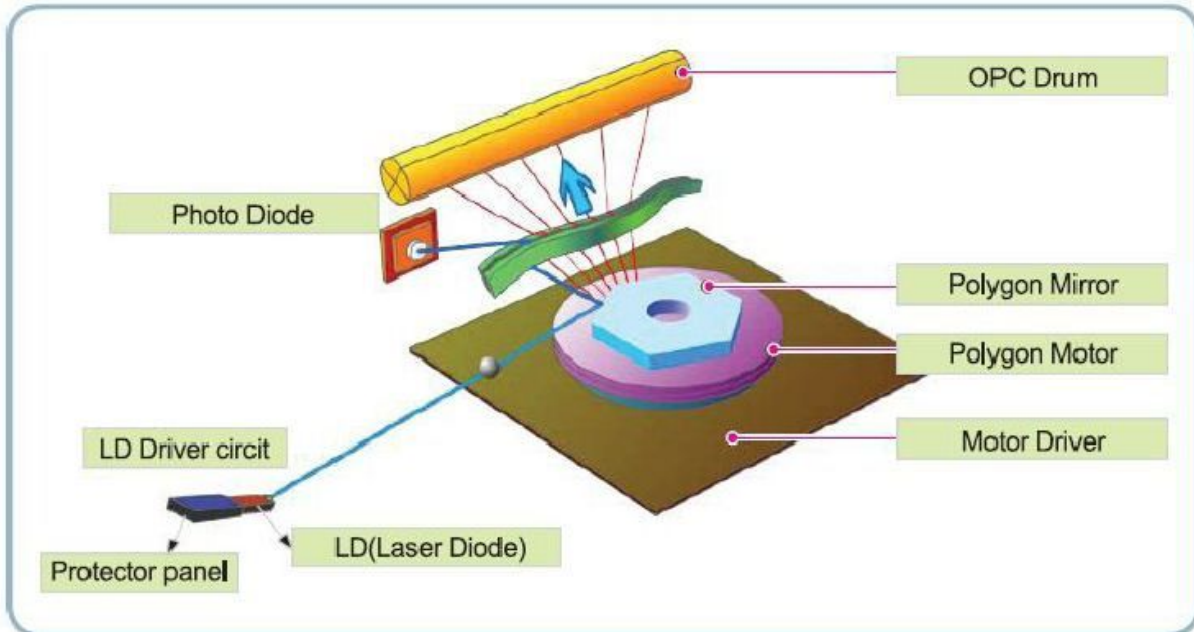
A pressure roller mounted under a heat roller is made of a silicon resin, and the surface also is coated with Teflon. When a paper passes between a heat roller and a pressure roller, toner adheres to the surface of a paper and is permanently fused.

5) Halogen Lamp

- Voltage : $110\text{ V} (115 \pm 5 \%) / 220\text{ V} : 230 \pm 5 \%$
- Capacity : $850\text{ Watt} \pm 25\text{ W}$

2.2.4.5. LSU (Laser Scanner Unit)

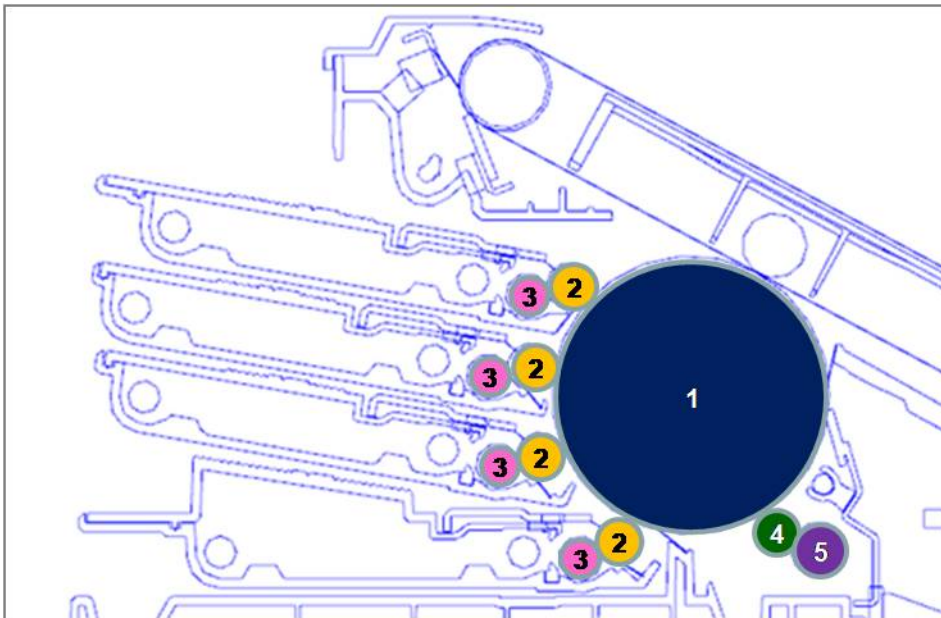
The LSU (Laser Beam Printer) is a sealed factory assembly in which the video data received to the controller is used to form an electrostatic latent image on the OPC drum. It is accomplished by use of a polygon mirror and laser beam. The OPC drum is turned with the paper feeding speed. The HSYNC signal is created when the laser beam from LSU reaches the end of the polygon mirror, and the signal is sent to the controller. The controller detects the HSYNC signal to adjust the vertical line of the image on paper. In other words, after the HSYNC signal is detected, the image data is sent to the LSU to adjust the left margin on paper. The one side of the polygon mirror is one line for scanning.



2.2.4.6. Toner Cartridges and Imaging Unit

By using the electronic photo process, they creates a visual image. The toner cartridge consists of the supply roller and developing roller. The imaging unit consists of the OPC drum, charge roller, cleaning roller.

- Developing Method : Non magnetic single component non-contacting method
- Toner : Non magnetic single component pulverized type toner
- The life span of toner (ISO 19798 pattern / A4 standard)
 - 1.5K (K) / 1K (CMY)
- The life span of imaging unit
 - Approx. 16,000 images.
- OPC Cleaning : Collect the toner by using cleaning blade
- Handling of wasted toner : Collect the wasted toner in the cleaning frame by using cleaning blade
- Classifying device for toner cartridge: ID is classified by CRUM



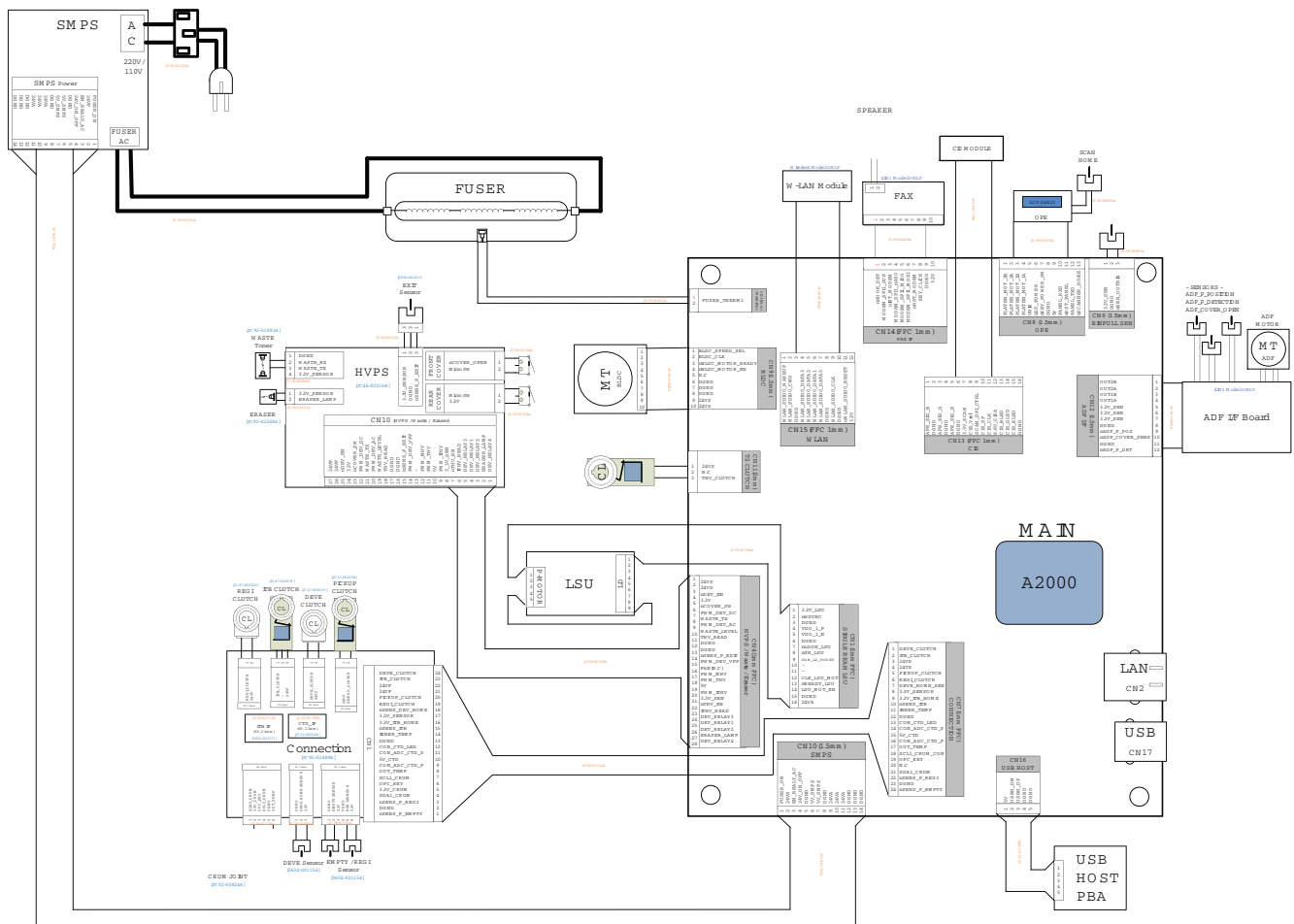
1	OPC drum
2	Developing Roller
3	Supply Roller
4	Charge Roller
5	Cleaning Roller

2.2.5. Hardware configuration

The C480 series Electrical Circuit System consists of the following:

- Main board (System board)
- OPE board
- Fax board
- Connection board
- CTD board
- CRUM Joint board
- USB Host board
- SMPS board
- HVPS board
- WLAN board

Diagram of the C480 series Electrical Circuit



C480 series has a system board of integrated engine controller, video controller and scan controller.

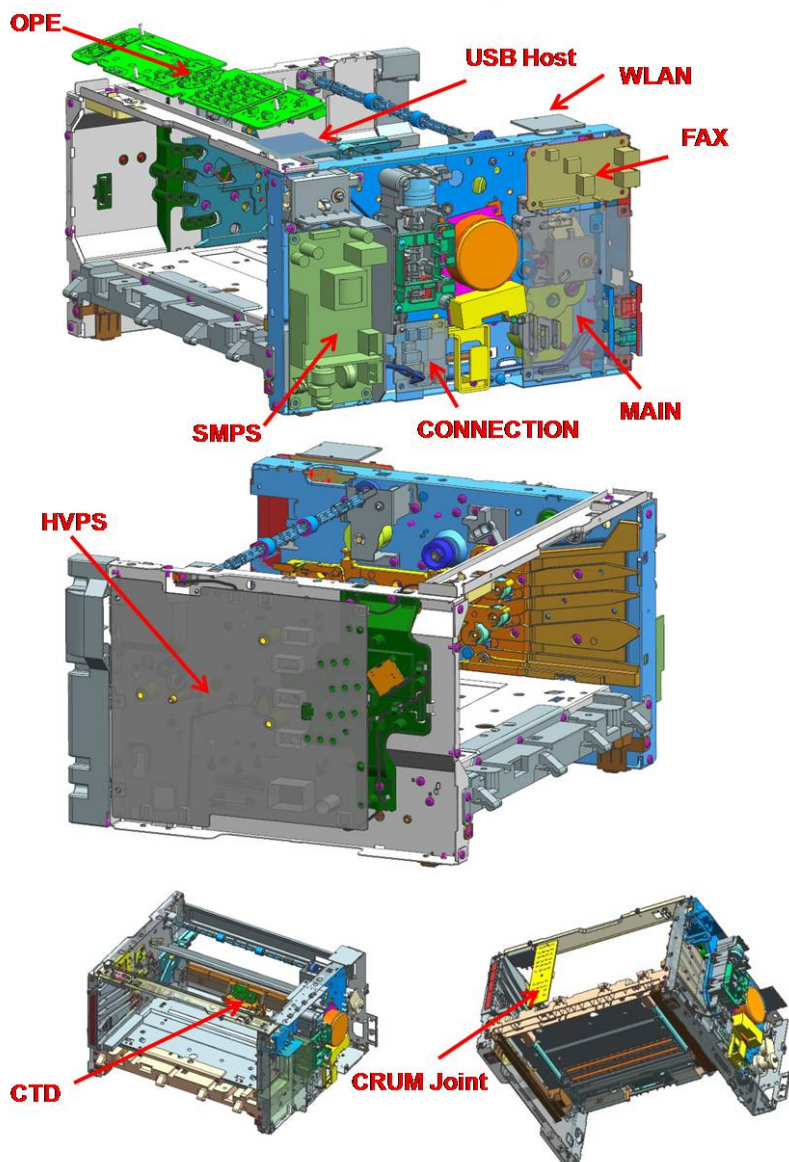
The engine controller controls all modules required to print, that is, LSU, HVPS/SMPS, Fuser, Motor etc. It communicates with the video control block inside CPU for printing; and it has the interface for all video sync signal to print out the video data.

The video controller receives print data from the host through network or USB Port and receives copy data from the scan controller. It takes this information and generates printable video bitmap data.

The main board is adopted 800MHz CPU that is integrated with engine/ video/ scan controller. It uses DDR3 128MByte.

Circuit board locations

The following diagrams show the locations of the printer circuit boards:



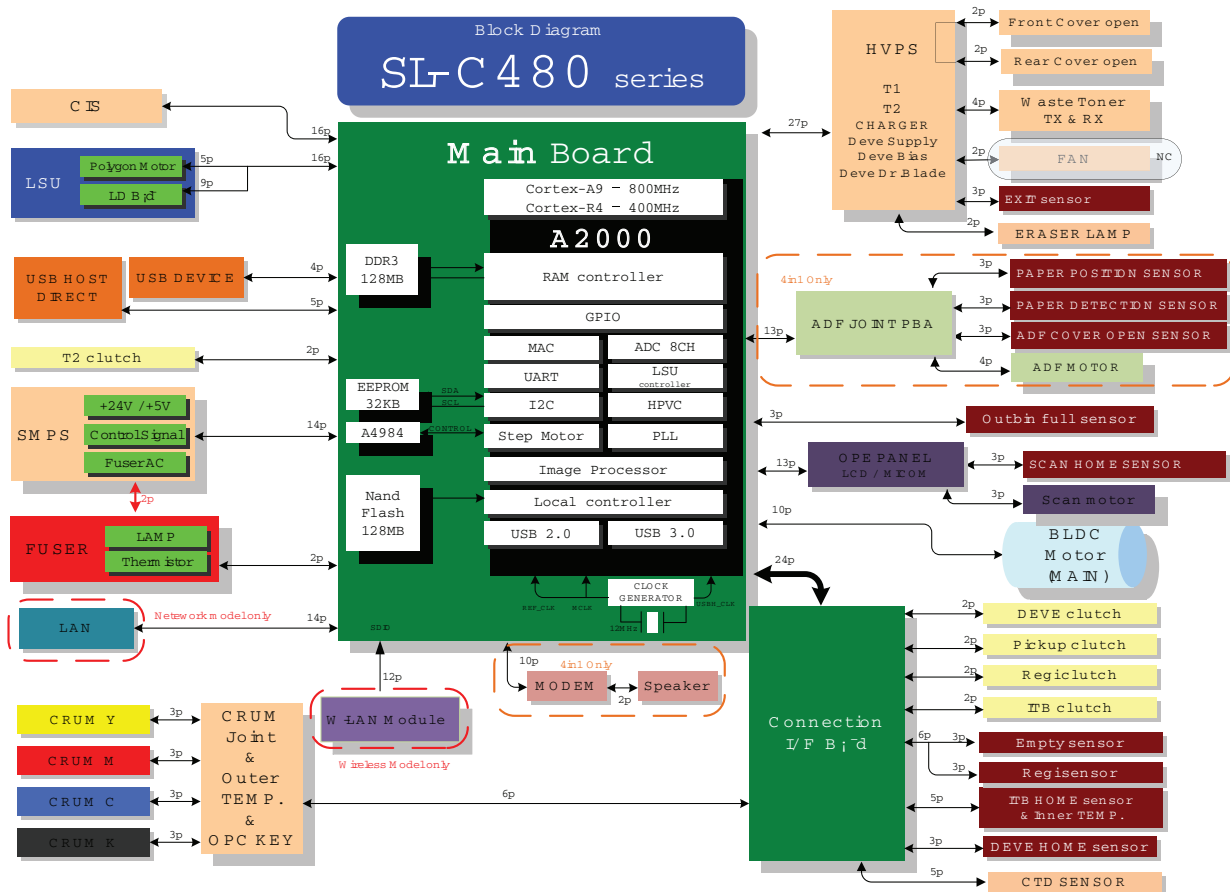
2.2.5.1. Main board

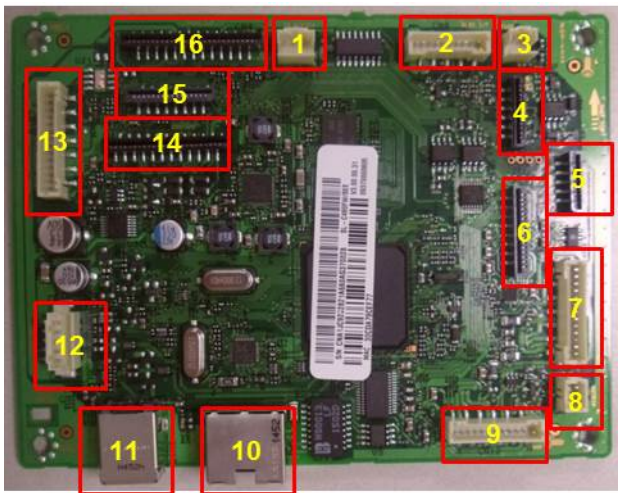
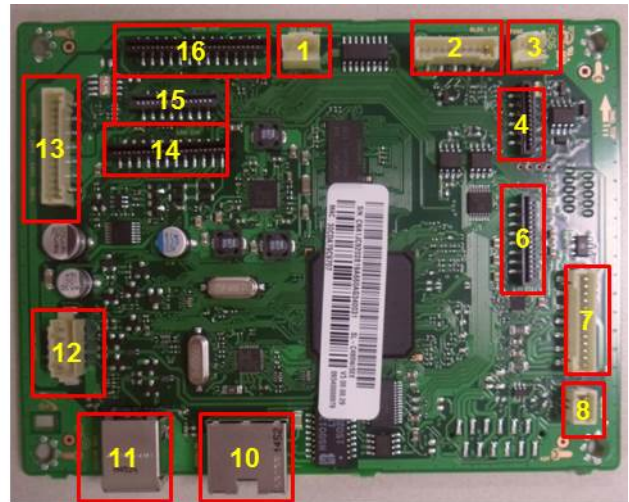
A2000 chip is adopted as the main processor. Its process speed is 800 MHz. It is integrated engine controller, video controller, scan controller.

DDR3 128MB is adopted for high speed data processing.

USB is the embedded type and wired network supports 100M full duplex.

[Main board diagram]



[Main board image]**[SL-C480FW]****[SL-C480W]**

- Connection**

1	T2 Clutch connector
2	BLDC Motor connector
3	Fuser thermistor interface connector
4	Wireless module interface connector
5	Fax board interface connector
6	CIS interface connector
7	OPE connector
8	Outbin Full sensor connector
9	ADF Module interface connector
10	Wired network connector
11	USB device connector
12	USB Host connector
13	SMPS interface connector
14	Connection Board interface connector
15	LSU interface connector
16	HVPS interface connector

- Information**

- Part Code

- C480 : JC92-02815A
 - C480W : JC92-02819A
 - C480FN : JC92-02820A
 - C480FW : JC92-02821A

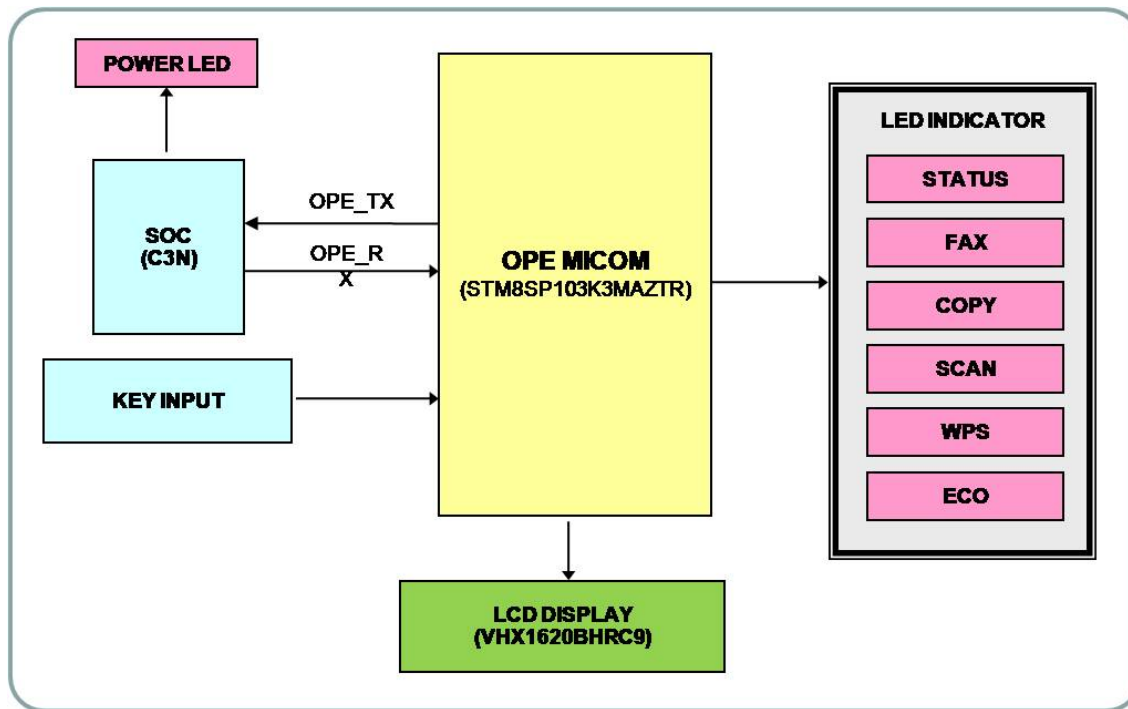
2.2.5.2. OPE board

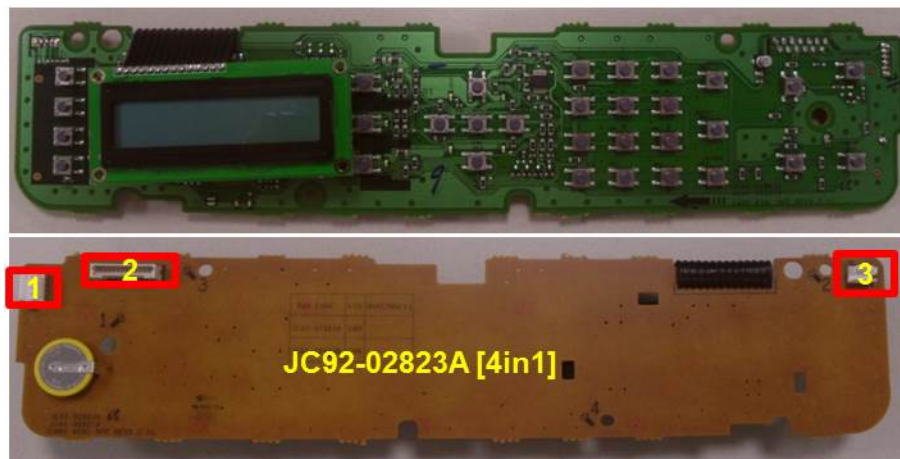
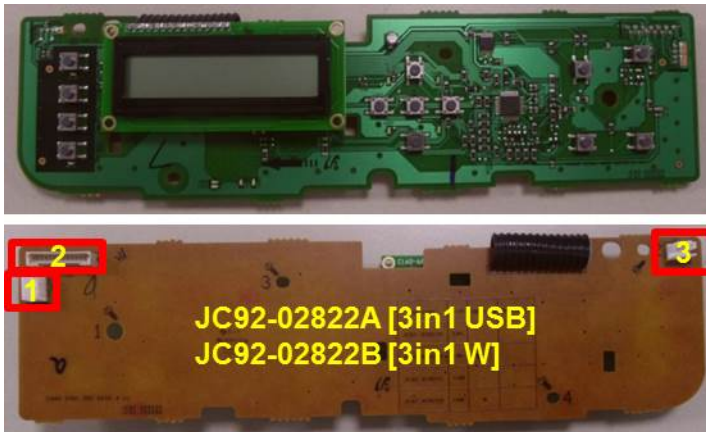
There are 2 types (3-in-1, 4-in-1) of OPE board.

The OPE controller is composed of an OPE MICOM(STM8SP103K3MAZTR), Status LED, Fax LED, Copy LED, Scan LED, WPS LED, ECO LED, POWER LED, 16×2 LINE LCD, KEY.

The OPE controller communicates with main board via UART. The power LED is controlled by the main board.

[OPE controller diagram]



[OPE controller image]

- Information**

- Part Code
 - C480 : JC92-02822A
 - C480W : JC92-02822B
 - C480FN / C480FW : JC92-02823A
- PBA Name : PBA-OPE

- Connection**

1	Platen step motor connector
2	Interface connector to Main board
3	Scan home sensor connector

2.2.5.3. Fax board (C480FN_FW only)

Fax board controls the fax sending and receiving. It consists of the modem chip, fax chip, audio control chip etc.



- **Information**

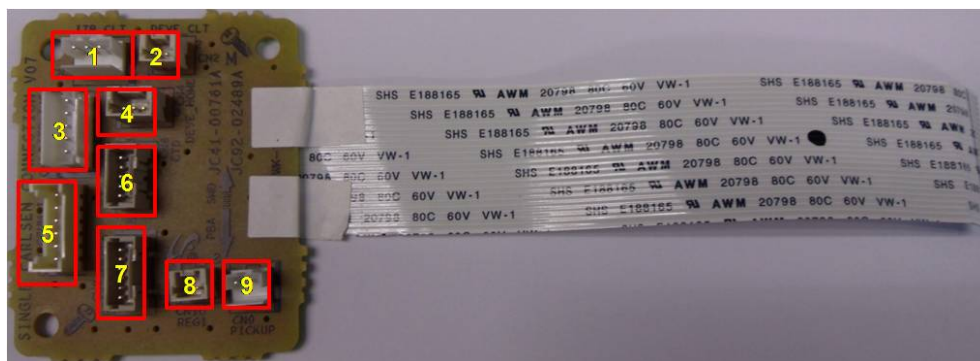
- Part Code : JC92-02569A
- Part Name : PBA-LIU

- **Connection**

1	Interface Connector to Main board
2	Speaker Interface

2.2.5.4. Connection board

This board connects between the clutch/sensor/CRUM I/F board and the main board.



- **Connection**

1	ITB Clutch
2	DEVE Clutch
3	ITB I/F
4	DEVE Home Sensor
5	Crum I/F board

6	CTD
7	Regi/Empty Sensor
8	Regi Clutch
9	Pickup Clutch

- **Information**

- Part Code : JC92-02489A
- Part Name : PBA-CONNECTOR

2.2.5.5. CTD (Color Tone Density) board

This board is for compensating the color tone density.



- **Information**

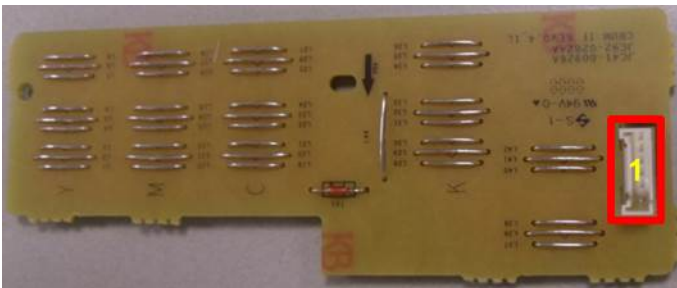
- Part Code : JC32-00014A
- Part Name : SENSOR-CTD

- **Connection**

1	INTERFACE CONNECTOR TO SYSTEM BOARD (JC39-01798A, HARNESS-CTD)
---	---

2.2.5.6. CRUM Joint board

This board connects the signal and power of the CRUM, OPC vender signal and outer temperature sensor.



- **Information**

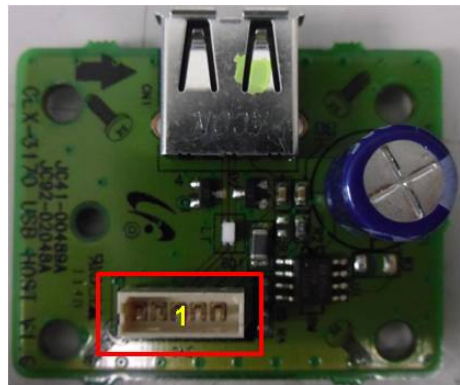
- Part Code : JC92-02824A
- Part Name : PBA-CRUM JOINT

- **Connection**

1	Interface Connector to Main Board
---	-----------------------------------

2.2.5.7. USB Host

This board provides the USB port for USB memory stick.



- **Information**
 - Part Code : JC92-02048A
 - Part Name : PBA-USB HOST
- **Connection**

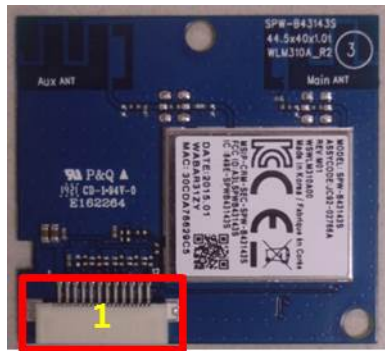
1	INTERFACE CONNECTOR TO SYSTEM BOARD (JC39-01799A, HARNESS-USBHOST)
---	---

2.2.5.8. Wireless LAN board

The Wireless LAN Module supports 802.11b/g/n. It communicates with main board via SPI.

**NOTE**

Only C480W & C480FW supports wireless functions.



- **Information**
 - Part Code : JC92-02766A
 - Part Name : PBA-WNPC
- **Connection**

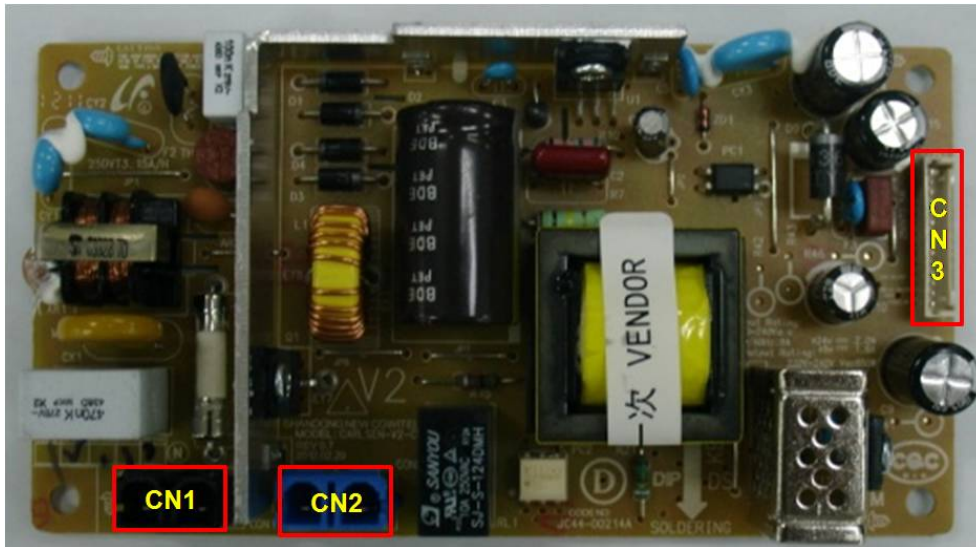
1	Interface Connector to Main board (JC39-02404A, FLAT CABLE-WLAN)
---	---

2.2.5.9. SMPS (Switching Mode Power Supply) Board

This SMPS convert AC input(110Vac or 220Vac) to DC output +24V,+5V power.

The output supply the DC power for Main Controller Board and other electrical equipments.

SMPS has some protective functions against over current, over voltage and over load condition for the overall system to be operated safely.



- Specification**

General Input/Output Voltage

- 1) AC 110V (110V ~ 127V)
- 2) AC 220V (220V ~ 240V)
- 3) Input Current : 4A (110V) / 2A (220V)
- 4) Output Power: 58.2W
 - DC 5.1V : 10.2W
 - DC 24V : 48W

- Information**

	110V	220V
Part Code	JC44-00213A	JC44-00214A
Part Name	CARLSEN-V1-xx	CARLSEN-V2-xx

xx : SH(Sung Ho), CW(New Cowitel)

- Connection**

1	AC Inlet
2	Fuser_AC output
3	Output_DC

◆ Input / Output connector

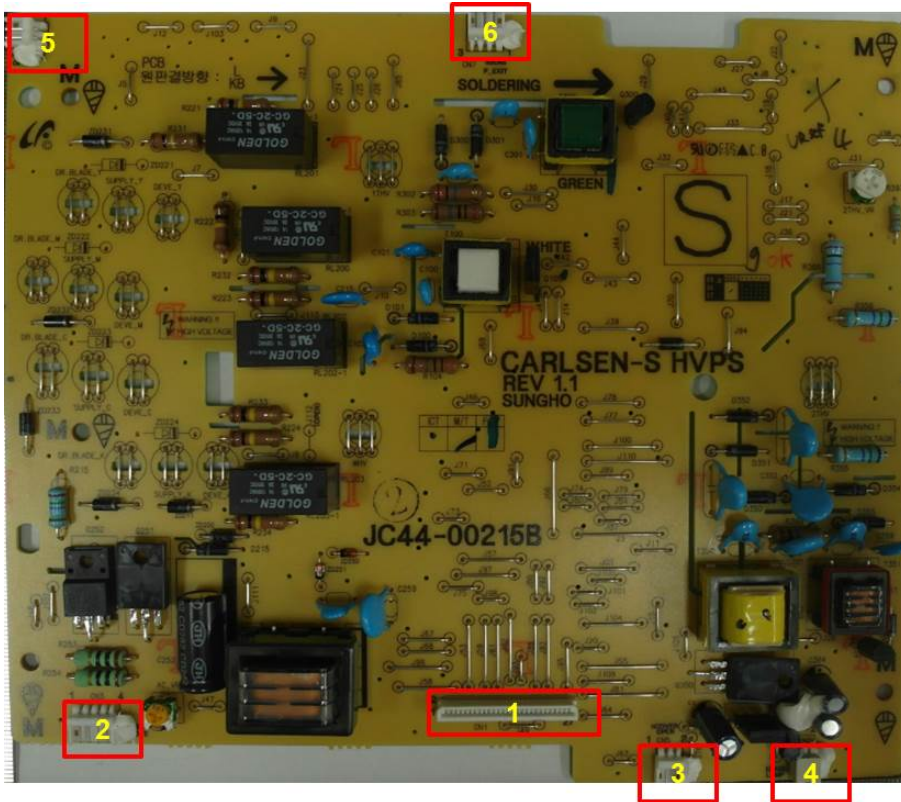
AC Input Connector(CON1)		
PIN ASSIGN	PIN NO	Description
1	AC_L	AC Input
2	AC_N	

Fuser AC Output Connector(CON2)		
PIN ASSIGN	PIN NO	Description
1	AC_L	AC Output for Heater Controller
2	AC_N	

DC Output Connector (CON3)		
PIN ASSIGN	PIN NO	Description
1	GND	Ground
2	GND	Ground
3	GND	Ground
4	+24V	+24V power
5	+24V	+24V Power
6	+24V	+24V Power
7	GND	Ground
8	+5V	+5V Power
9	+5V	+5V Power
10	GND	Ground
11	24V_OFF	Sleep mode (Input)
12	RELAY ON	Fuser Relay
13	24VS	Main PBA 24VF (Input)
14	Fuser on	Fuser On

2.2.5.10. HVPS board

High Voltage Power Supply(HVPS) board generates the high voltage such as MHV, DEV, Blade, SUP and THV.



- Connection**

1	HVPS I/F
2	Waste Toner
3	Rear Cover Open
4	Eraser lamp
5	Front Cover Open
6	Paper Exit sensor

- Information**

- Part Code : JC44-00215B
- Part Name : HVPS

2.2.5.11. NFC Tag Sticker

Near field communication (NFC) is a set of standards for smartphones and similar devices to establish radio communication with each other by touching them together or bringing them into close proximity, usually no more than a few centimeters. Present and anticipated applications include contactless transactions, data exchange, and simplified setup of more complex communications such as Wi-Fi. Communication is also possible between an NFC device and an unpowered NFC chip, called a "tag". NFC tag sticker stores Mac, PIN, Mobile Print App URL of Printer/MFP.



Front - label

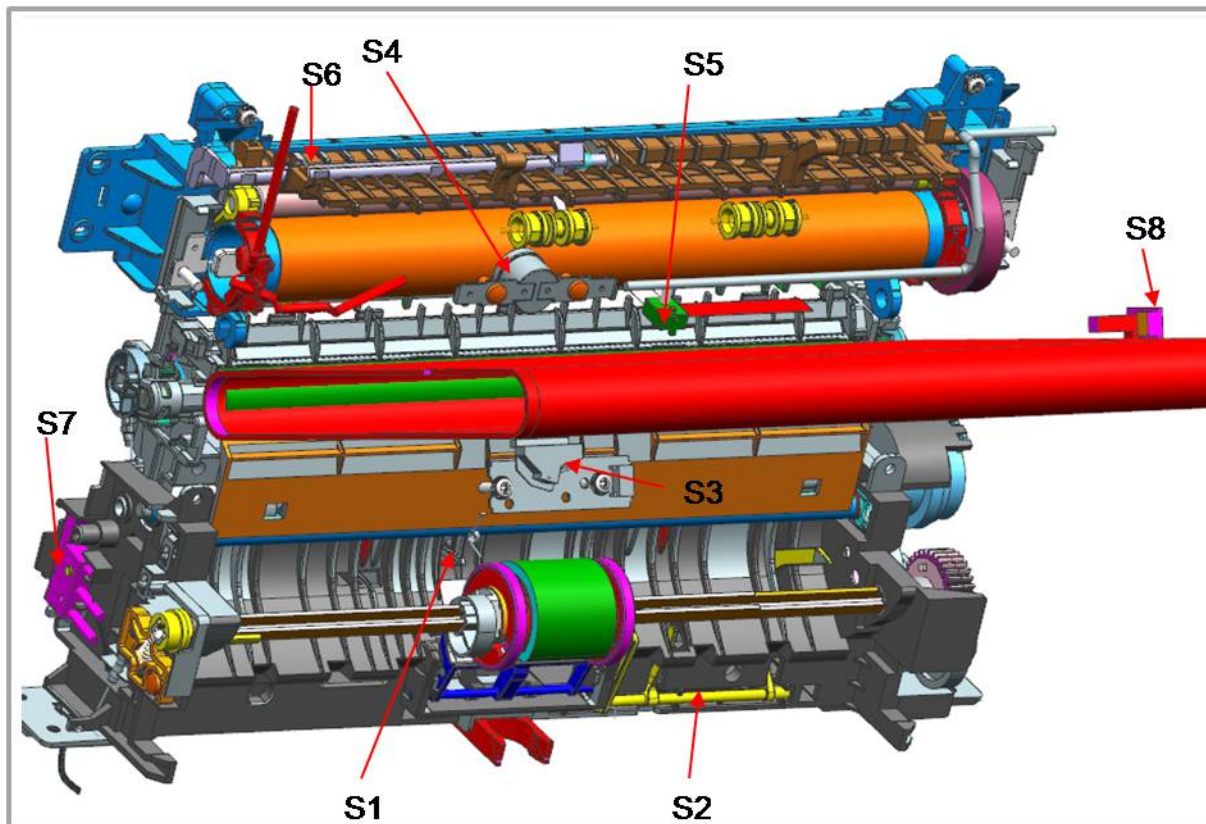


Rear – Inlay & NFC chip

- **Information**
 - Part Code : JC68-03012A
 - Part Name : LABEL ETC-NFC TECTILE STICKER (25x25mm)

2.2.5.12. Electrical Parts Location

Sensors



No.	Description	Function
S1	Photo interrupter (Regi sensor)	Paper detection
S2	Photo interrupter (Paper empty sensor)	Paper detection
S3	CTD sensor	Color density sensing
S4	Thermostat	temperature detection
S5	Thermistor	temperature detection
S6	Photo interrupter (Paper exit sensor)	Paper detection
S7	Cover open sensor	Cover open detection
S8	Photo interrupter (ITB belt sensing)	Belt rotation sensing

2.2.6. Engine F/W Control Algorithm

2.2.6.1. Feeding

If feeding from a cassette, the drive of the pickup roller is controlled by controlling the solenoid. The on/off of the solenoid is controlled by controlling the general output port or the external output port. Provided below are the jam conditions for the device:

Item	Description
Paper Jam in Tray1	<ul style="list-style-type: none">• After paper pick up initialization, the paper is not fed.• After picking up the paper the lead edge does not reach to the feed sensor within a predetermined period of time, due roller slippage, etc.• After picking up the paper from the cassette, if the feed sensor is not detected, a re-pick up initialization occurs. After re-picking up, if the feed sensor is still not on after a predetermined amount of time, JAM 0 occurs.• Even though the paper reaches to the feed sensor, the feed sensor doesn't not change state.
Paper Jam inside machine	<ul style="list-style-type: none">• After the leading edge of the paper passes the feed sensor, the trailing edge of the paper does not clear the feed sensor after predetermined period of time.• After the tail edge of the paper passes the feed sensor, the lead edge of paper is not detected by the exit sensor within a predetermined period of time.
Paper jam in exit area	The tail edge of the paper does not clear the exit sensor within a predetermined period of time.

2.2.6.2. Transfer

The charging voltage, developing voltage and the transfer voltage are controlled by PWM (Pulse Width Modulation). Each output voltage is changeable due to the PWM duty. The transfer voltage provided when the paper passes the transfer roller is decided by environment conditions. The resistance value of the transfer roller is changed when the Temperature and Humidity Sensor in the device senses a change in the environment. The current to the Transfer Roller is changed through the AD converter on the HVPS. The voltage value for provided to the transfer roller is decided by the changed value.

2.2.6.3. Fusing

The temperature change of the heat roller's surface is changed to the resistance value through the use of a thermistor. The Main Board uses the resistance value of a negative coefficient Thermistor and converts it to a voltage value through the use of an AD converter, the temperature is decided based on the voltage value read. The AC power is controlled by comparing the target temperature to the value from the thermistor. If the value from the thermistor is out of controlling range, or does not change after a predetermined amount of time an error is displayed and the Fuser Power is cut off. Errors occur based on the bullets below:

- Open Heat Error

When the engine operates the warm-up process, if the temperature of the fixing unit is not higher than a specified temperature, the engine defines Open Heat Error. When this error is detected, the engine stops all functions and keeps the error state. Also, the engine informs the error status of the main system, so it can take appropriate action; and then the error message is displayed at LCD window or LED informing the error status of the user.

- Low Heat Error

When the engine is at stand-by, printing or warm-up mode, if the temperature of the fixing unit is lower than the specified temperature at each state and the lower temperature state is maintained during the specified time, the engine defines Low Heat Error. When this error is detected, the engine stops all functions and keeps it at the error state. Also, the engine informs the error status of the main system, so it can take appropriate action; and then the error message is displayed at LCD window or LED informing the error status of the user.

- Over Heat Error

For overall engine state, if the temperature of the fixing unit is higher than the specified temperature and the temperature state is detected for a specific duration, then the engine defines Over Heat Error. When this error is detected, the engine stops all functions and keeps it at the error state. Also, the engine informs the error status of the main system, so it can take appropriate action; and then the error message is displayed at LCD window or LED informing the error status of the user.

2.2.6.4. LSU

LSU receives the image data from PVC or HPVC and make the latent image on OPC surface. It uses the single beam, LD. The errors related to the LSU are as follows:

- By Lready

When the printing is started, the engine drives the polygon motor of LSU. After the specified time is elapsed, if the motor is not in a ready status, the engine detects the error that the polygon motor is not in a ready status. If this error happens, the engine stops all functions and keeps it at the error state. Also, the engine informs the error status of the main system and the error message is displayed at LCD window to inform the error status of the user.

- By Hsync

When the polygon motor is ready, the LSU sends out the signal called Hsync and used to synchronize with each image line. So, if the engine does not detect consecutively the signal for a fixed time, it defines the Hsync Error. If this error happens, the engine stops all functions and keeps it at the error state. Also, the engine informs the error status of the main system and then the error message is displayed at LCD window to inform the error status of the user. LSU Error Recovery: If the LReady or Hsync error happens, the paper is exited before the error code is initiated. The engine mode is changed to recovery mode and the engine informs the main system of the engine mode. And the engine checks the LSU error. If the error doesn't happen, the printing job resumes.

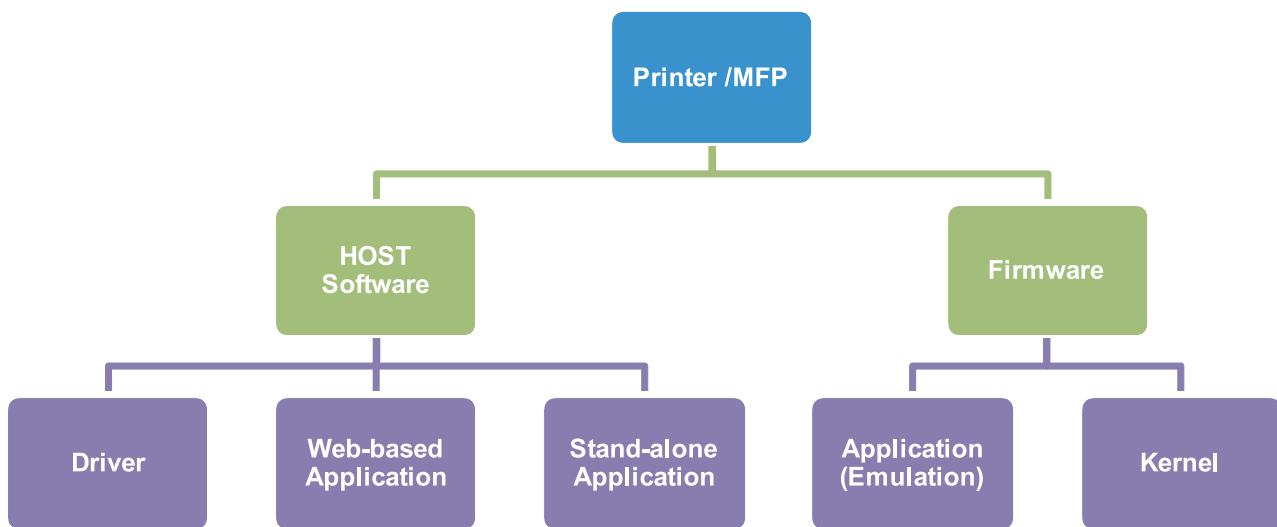
2.2.7. Software Descriptions

2.2.7.1. Software system overview

The software system of this model is constructed in the following manner :

- Host Software part that the application software operated in Window and Web Environment
- Firmware parts that is a Embedded software controls printing job.

2.2.7.2. Architecture



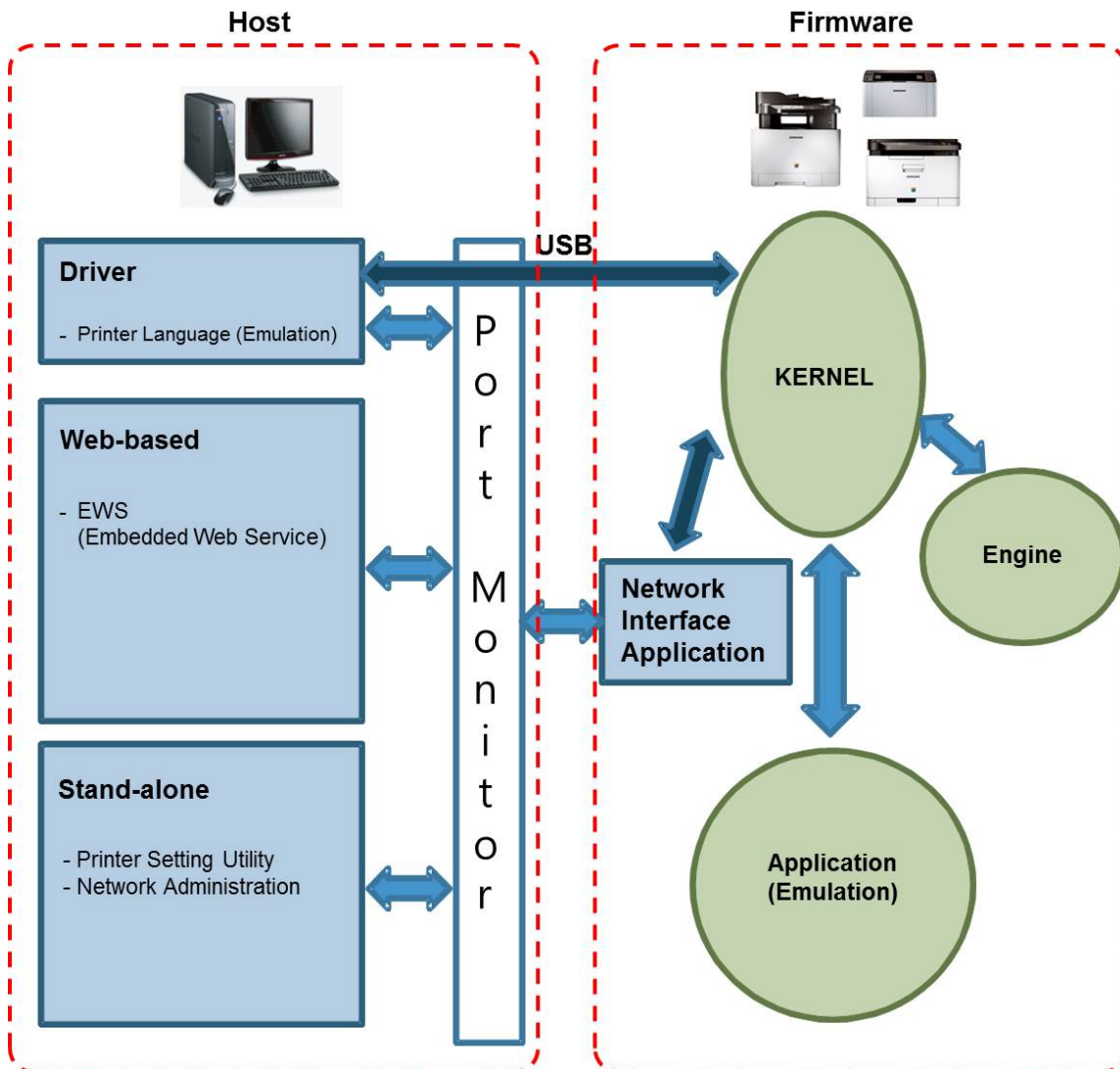
Host Software is made up of

- 1) Graphic User Interface offers the various editing functions to user in Host.
- 2) Driver translates the received document to a Printing Command language which printer can understand and transfers data to spooler.
- 3) Stand-alone Application offers the various printing application such as Easy Printer Manager, Printer Status in Window system.
- 4) Web-based-Application offers the same functions as Stand-alone Application in Web environment.

Firmware is made up of

- 1) The Application (Emulation) interprets and translates data received from the Host to a printing language to complete the users job.
- 2) The Kernel controls and manages the whole procedure including Control flow and the Printing Job before transferring it to the Engine for printing.

2.2.7.3. Data and Control Flow



The above Block Diagram is explained that:

Host Side is made up of

- 1) Driver that is Windows application software translate printed data to one of printer language and create spooler file.
- 2) Web-based Application that offer a various printer additional functions, management of printing job, printer administration, Status monitor to monitoring the printer status by real time in Web, independent environment on OS.
- 3) Stand-alone Application that is a similar Window software as same as above 2.
- 4) The Port Monitor facilitates the flow of information between the Host and Firmware.

Firmware Side is made up of

- 1) The Network Interface Card is used to relay the communication between Host and Kernel using various network protocol.
- 2) The Kernel is manages the flow control emulation as it receives data from Host or Network card; then manages the printing of the image by the engine.
- 3) The Application Layer containing the Emulation portion interprets the data from the selected emulation, and transfers the data to the Kernel Layer.

- 4) The Engine prints the rendered bit-map data to paper with required size and type by Kernel.

And then, for Job Spooling function for Multi-User, Multi-Printing that is occurred in Network printing and various additional printing functions, this Kernel use max. 10 Queuing systems in a memory.

Printing Procedure

- 1) After user start to print the wanted document to PCL string, the Driver translates the all graphic data of the client PC and send data to host spooler; and then the spooler sends the data stream to the printer via USB port.
- 2) Kernel receives this data from Host, and then select emulation fit to data and start selected one. After emulation job end, Kernel sends the output bit-map data to Engine using Printer Video Controller (by clock type for LSU).
- 3) Engine print the received data to required paper with the sequential developing process.

3. Disassembly and Reassembly

3.1. Precautions when replacing parts

3.1.1. Precautions when assembling and disassembling

- Use only approved Samsung spare parts. Ensure that part number, product name, any voltage, current or temperature rating are correct. Failure to do so could result in damage to the machine, circuit overload, fire or electric shock.
- Do not make any unauthorized changes or additions to the printer, these could cause the printer to malfunction and create electric shock or fire hazards.
- Take care when dismantling the unit to note where each screw goes. There are 19 different screws. Use of the wrong screw could lead to system failure, short circuit or electric shock.
- Do not disassemble the LSU unit. Once it is disassembled dust is admitted to the mirror chamber and will seriously degrade print quality. There are no serviceable parts inside.
- Regularly check the condition of the power cord, plug and socket. Bad contacts could lead to overheating and fire. Damaged cables could lead to electric shock or unit malfunction.

3.1.2. Precautions when handling PBA

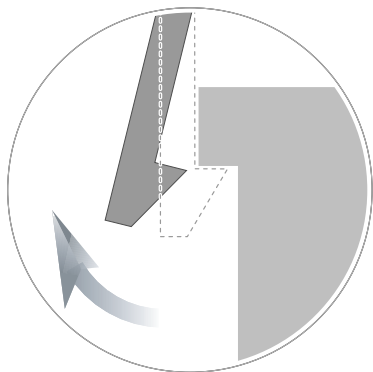
Static electricity can damage a PBA, always use approved anti-static precautions when handling or storing a PBA.

- **Precautions when moving and storing PBA**
 - 1) Please keep PBA in a conductive case, anti-static bag, or wrapped in aluminum foil.
 - 2) Do not store a PBA where it is exposed to direct sunlight.
- **Precautions when replacing PBA**
 - 1) Disconnect power connectors first, before disconnecting other cables.
 - 2) Do not touch any soldered connections, connector terminals or other electronic parts when handling insulated parts.
- **Precautions when checking PBA**
 - 1) Before touching a PBA, please touch other grounded areas of the chassis to discharge any static electrical charge on the body.
 - 2) Take care not to touch the PBA with your bare hands or metal objects as you could create a short circuit or get an electric shock. Take extra care when handling PBAs with moving parts fitted such as sensors, motors or lamps as they may get hot.
 - 3) Take care when fitting, or removing, screws. Look out for hidden screws. Always ensure that the correct screw is used and always ensure that when toothed washers are removed they are refitted in their original positions.

3.1.3. Releasing Plastic Latches

Many of the parts are held in place with plastic latches. The latches break easily; release them carefully.

To remove such parts, press the hook end of the latch away from the part to which it is latched.



3.2. Screws used in the printer

The screws listed in the table below are used in this printer. Please ensure that, when you disassemble the printer, you keep a note of which screw is used for which part and that, when reassembling the printer, the correct screws are used in the appropriate places.



NOTE

This list is based on C480FW. So, this list may differ from your machine depending on its model.

Parts Code	Location	Description	Qty
6003-000196	FRAME-MAIN	SCREW-TAPTYPE;PWH,+,B,M3,L10,NI PLT,SWRCH18A	11
6003-000269	FRAME-MAIN	SCREW-TAPTYPE;BH,+, -,S,M3,L6,ZPC(WHT),SWRCH18A,-	13
6003-000196	FUSER	SCREW-TAPTYPE;PWH,+,B,M3,L10,NI PLT,SWRCH18A	5
6003-000282	FUSER	SCREW-TAPTYPE;BH,+, -,B,M3,L8,ZPC(BLK),SWRCH18A,-	2
6003-000152	FRAME BASE-PAPER PATH	SCREW-TAPTYPE;PH,+, -,B,M2,L10,ZPC(WHT),SWRCH18A,-	1
6003-000282	FRAME BASE-PAPER PATH	SCREW-TAPTYPE;BH,+, -,B,M3,L8,ZPC(BLK),SWRCH18A,-	4
6003-000196	FRAME	SCREW-TAPTYPE;PWH,+,B,M3,L10,NI PLT,SWRCH18A	5
6003-000269	FRAME DUMMY MFP	SCREW-TAPTYPE;BH,+, -,S,M3,L6,ZPC(WHT),SWRCH18A,-	2
6003-000269	FRAME	SCREW-TAPTYPE;BH,+, -,S,M3,L6,ZPC(WHT),SWRCH18A,-	43
6003-000301	FRAME	SCREW-TAPTYPE;BH,+,S,M4,L6,ZPC(WHT),SWRCH18A	1
6003-000269	FRAME-SUB_LEFT	SCREW-TAPTYPE;BH,+, -,S,M3,L6,ZPC(WHT),SWRCH18A,-	26
6003-000269	FRAME-SUB FRONT	SCREW-TAPTYPE;BH,+, -,S,M3,L6,ZPC(WHT),SWRCH18A,-	1
6003-000196	FRAME-SUB_CTD	SCREW-TAPTYPE;PWH,+,B,M3,L10,NI PLT,SWRCH18A	2
6003-000269	FRAME-SUB RIGHT	SCREW-TAPTYPE;BH,+, -,S,M3,L6,ZPC(WHT),SWRCH18A,-	24
6002-000440	DRIVE	SCREW-TAPPING;PWH,+,2,M3,L8,ZPC(BLK),SWRCH18A	3
6003-000269	DRIVE	SCREW-TAPTYPE;BH,+, -,S,M3,L6,ZPC(WHT),SWRCH18A,-	8
6003-000282	LSU	SCREW-TAPTYPE;BH,+, -,B,M3,L8,ZPC(BLK),SWRCH18A,-	5
6003-000196	COVER-MIDDLE	SCREW-TAPTYPE;PWH,+,B,M3,L10,NI PLT,SWRCH18A	6
6003-000196	COVER-FRONT	SCREW-TAPTYPE;PWH,+,B,M3,L10,NI PLT,SWRCH18A	7
6003-000196	COVER-REAR	SCREW-TAPTYPE;PWH,+,B,M3,L10,NI PLT,SWRCH18A	2
6003-000196	MFA	SCREW-TAPTYPE;PWH,+,B,M3,L10,NI PLT,SWRCH18A	3
6003-000196	OPE	SCREW-TAPTYPE;PWH,+,B,M3,L10,NI PLT,SWRCH18A	4
6003-000282	SCANNER	SCREW-TAPTYPE;BH,+, -,B,M3,L8,ZPC(BLK),SWRCH18A,-	4
6003-000196	PLATEN	SCREW-TAPTYPE;PWH,+,B,M3,L10,NI PLT,SWRCH18A	5
6003-000196	PLATEN-LOWER	SCREW-TAPTYPE;PWH,+,B,M3,L10,NI PLT,SWRCH18A	6
6003-000269	DRIVE-PLATEN	SCREW-TAPTYPE;BH,+, -,S,M3,L6,ZPC(WHT),SWRCH18A,-	2
6003-000196	ETC	SCREW-TAPTYPE;PWH,+,B,M3,L10,NI PLT,SWRCH18A	4
6003-000196	FAX	SCREW-TAPTYPE;PWH,+,B,M3,L10,NI PLT,SWRCH18A	3
6003-000196	REAR	SCREW-TAPTYPE;PWH,+,B,M3,L10,NI PLT,SWRCH18A	4
6003-000196	WLAN	SCREW-TAPTYPE;PWH,+,B,M3,L10,NI PLT,SWRCH18A	1

3. Disassembly and Reassembly

Parts Code	Location	Description	Qty
6003-000269	BRACKET FAX	SCREW-TAPTYPE;BH,+,-,S,M3,L6,ZPC(WHT),SWRCH18A,-	1
6003-000269	COVER-MIDDLE	SCREW-TAPTYPE;BH,+,-,S,M3,L6,ZPC(WHT),SWRCH18A,-	6

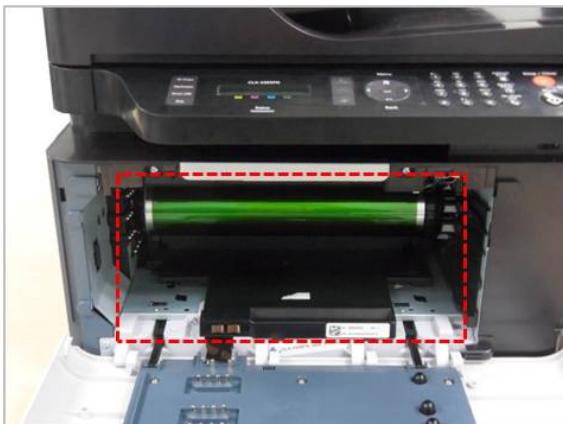
3.3. Replacing the maintenance parts

3.3.1. ITB Unit

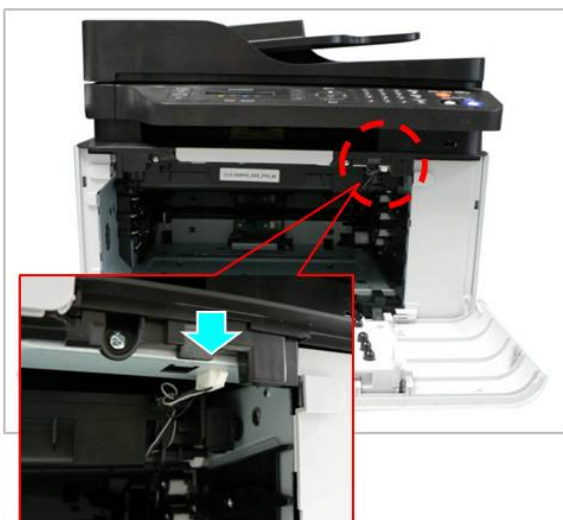
1. Open the front cover.
2. Remove YMCK toner cartridges and waste toner container.



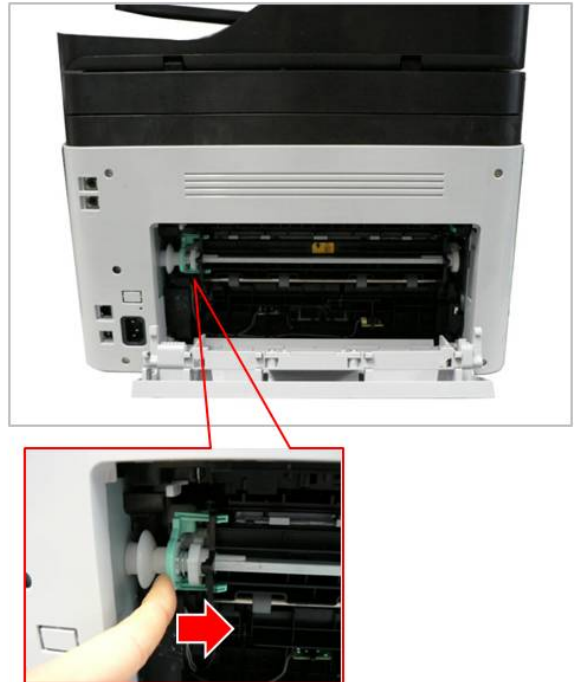
3. Remove the imaging unit.



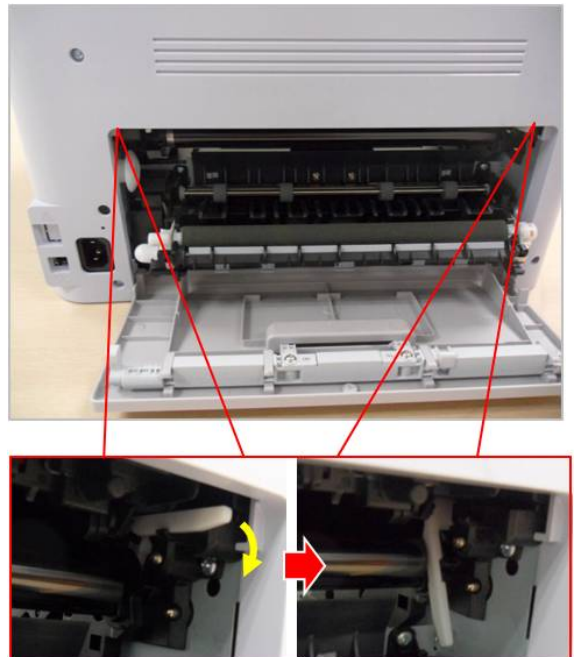
4. Unplug the ITB connector from the top-right.



5. Open the rear cover. Release the FRAME-TRANSFER from the left hole.



6. Pull down the both levers.



7. Remove the ITB Unit while holding its handle.



3.3.2. Fuser Unit

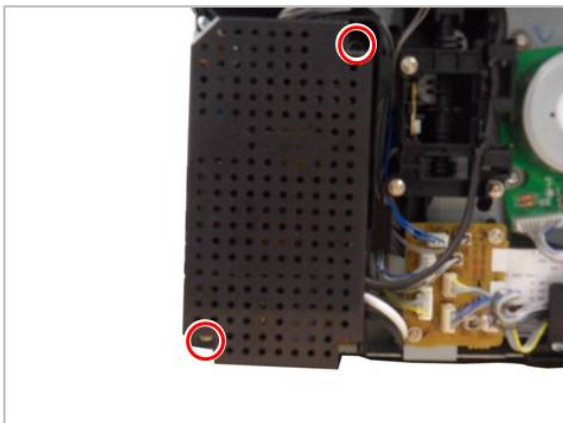
1. Open the rear cover door.
2. Remove the rear cover after removing 4 screws.



3. Remove the right cover.



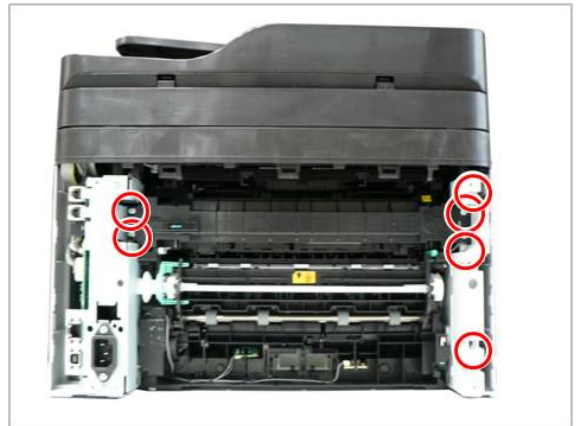
4. Remove the SMPS cover after removing 2 screws.



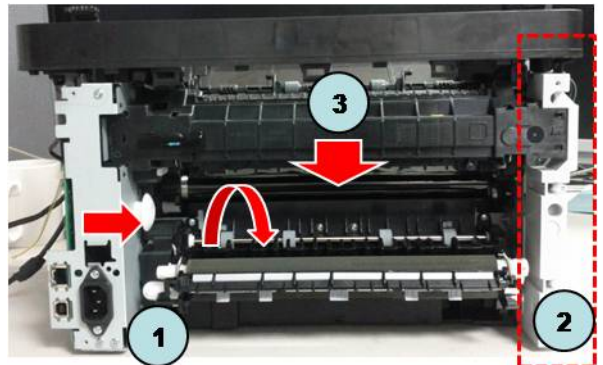
5. Unplug 2 connectors from the SMPS board and main board.



6. Remove 6 screws.

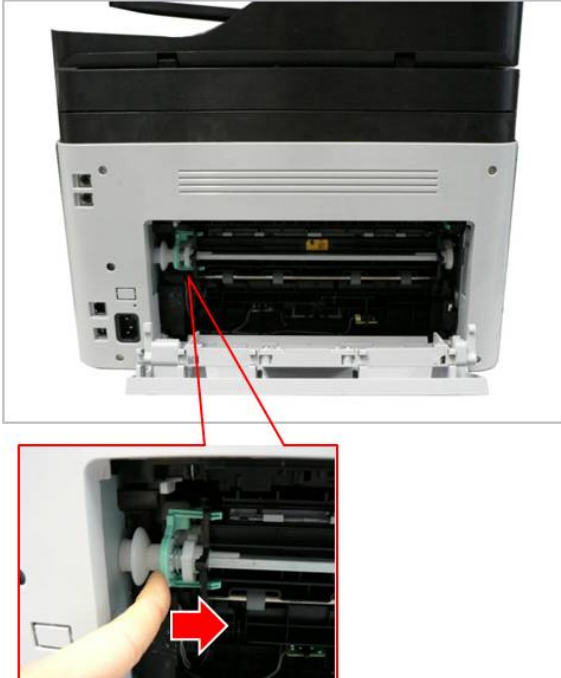


7. Release the FRAME-TRANSFER. Remove the FRAME-DUMMY MFP. And remove the fuser unit.

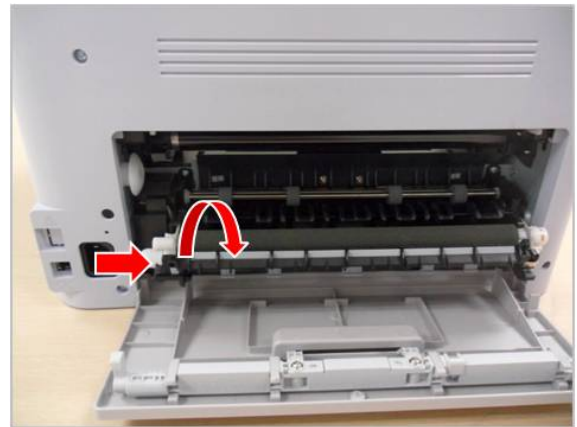


3.3.3. Transfer(T2) roller

1. Open the rear cover door. Release the FRAME-TRANSFER from the left hole by pulling it to the direction of arrow.

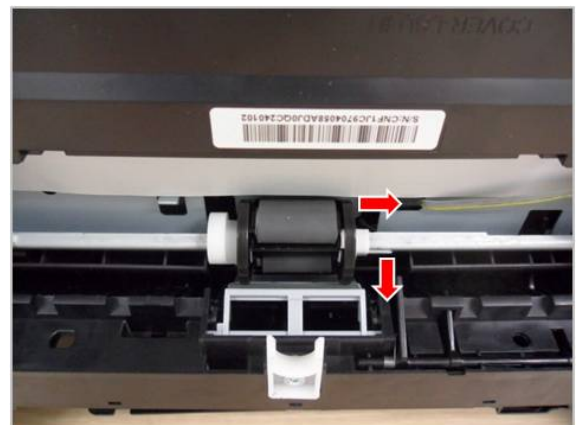


2. Push and release the FRAME-TRANSFER.



3.3.4. Pick up roller

1. Remove the cassette. See the bottom of the machine.
2. Release the stopper from the shaft. Move the right HOUSING-PICK UP to the right.
3. Remove the pick up rubber.



3.4. Replacing the main SVC parts



NOTE

Before service, remove all toner cartridges and waste toner container.

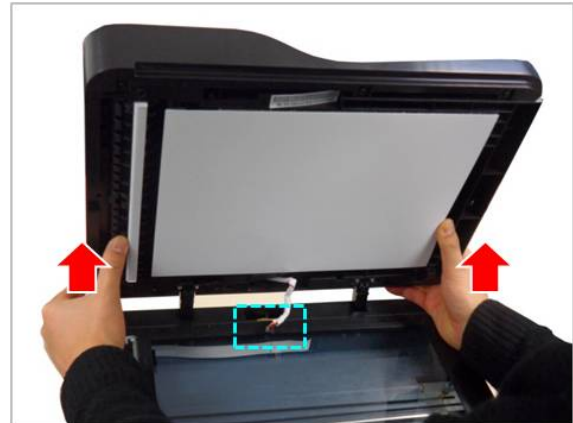
3.4.1. Cover

1. Open the rear cover door.
2. Remove the rear cove after removing 4 screws.
3. Release the right cover.
4. Release the left cover.



3.4.2. ADF Unit

1. Open the ADF Unit. Remove the connector cover. And then unplug the connector.
2. Lift up and release the ADF Unit.



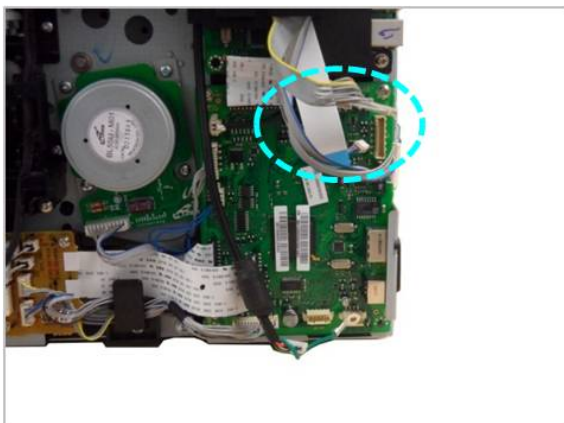
3.4.3. OPE Unit

1. Open the scanner unit.
2. Remove 3 screws from the bottom of the scanner unit.
3. Turn the OPE Unit over.
4. Remove the OPE Unit after unplugging the connector.



3.4.4. Platen Unit

1. Remove the left and right cover.
2. Unplug the scan connectors from the main board.



3. Open the platen unit. Release the Scanner Hinge unit.

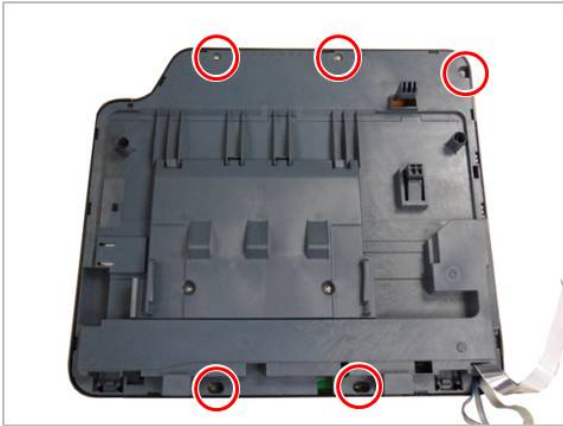


4. Lift up and release the platen unit.



3.4.5. CIS unit and Scan Drive unit

1. Remove the platen unit. (Refer to 3.4.4)
2. Remove 5 screws from the bottom of the platen unit.



3. Remove the OPE Unit.



4. Remove 3 screws.



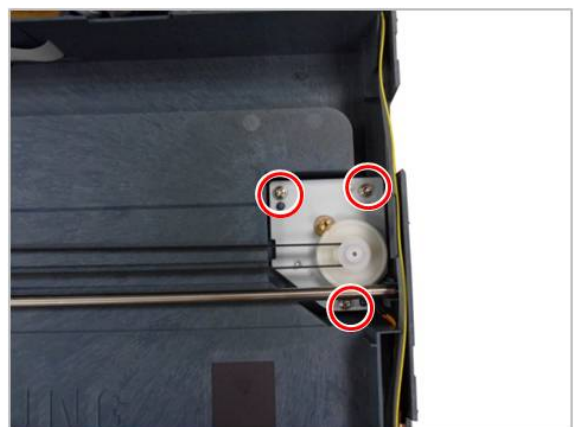
5. Lift up and release the platen upper from the platen lower.



6. Unplug the flat cable. Release the CIS unit.

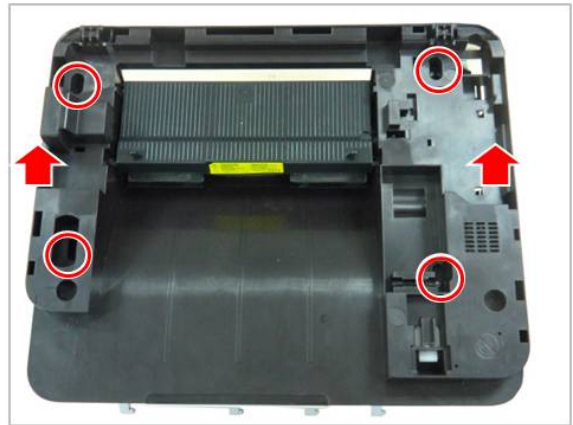


7. Remove the scan drive unit after removing 3 screws.



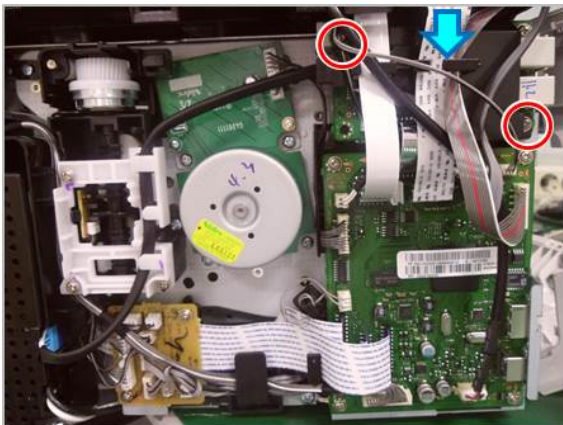
3.4.6. Middle Cover

1. Remove the left and right cover. (Refer to 3.4.1)
2. Remove the platen unit. (Refer to 3.4.4)
3. Remove 2 screws from the front.
4. Lift up and release the middle cover after removing 4 screws.



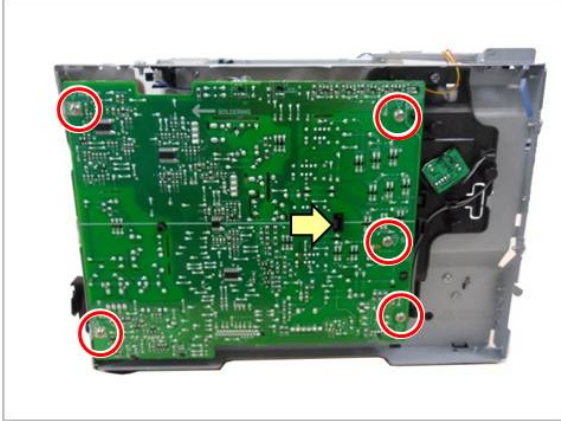
3.4.7. Fax board

1. Remove the right cover.
2. Release the harness from the fax board.
3. Remove the fax board cover after removing 2 screws.
4. Unplug the flat cable. Remove 1 screw. And remove the fax board.



3.4.8. HVPS board

1. Remove the left cover. (Refer to 3.4.1)
2. Remove 5 screws. Release the lock. And release the HVPS board.



3. Unplug all connectors from the HVPS board.



3.4.9. LSU

1. Remove the cassette. Stand the machine to see the bottom.
2. Remove 3 screws. Unplug the flat cable. And release the LSU.



3.4.10. FRAME BASE-PAPER PATH

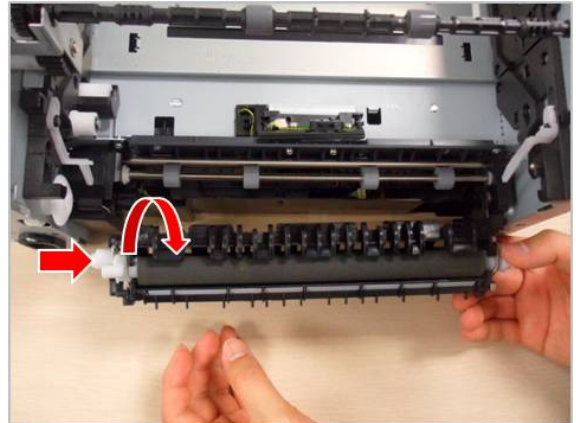
1. Remove the right cover.
2. Unplug the connector from the PBA-CONNECTOR. Remove the main board after removing 4 screws and connectors.



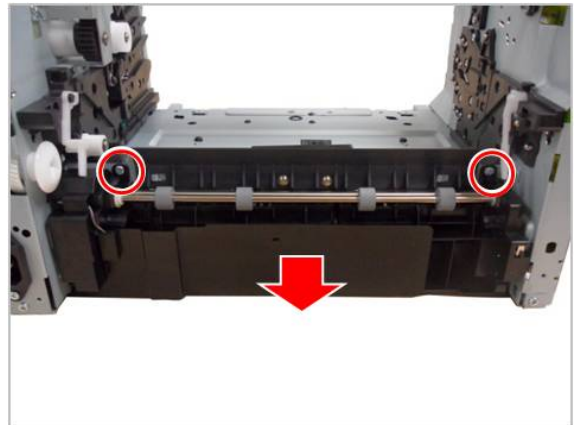
3. Remove 4 screw from the bottom of the machine.



4. Remove the FRAME-TRANSFER.

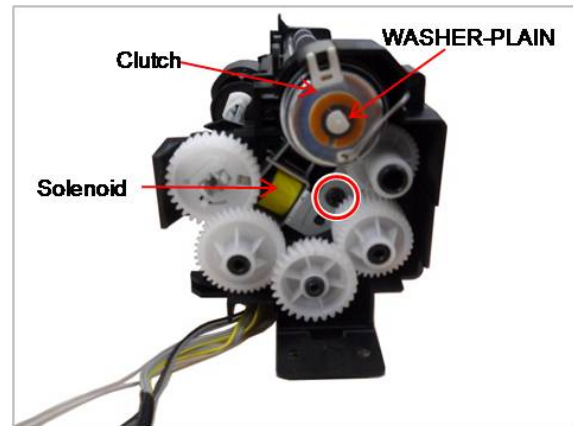


5. Remove the FRAME BASE-PAPER PATH after removing 2 screws.



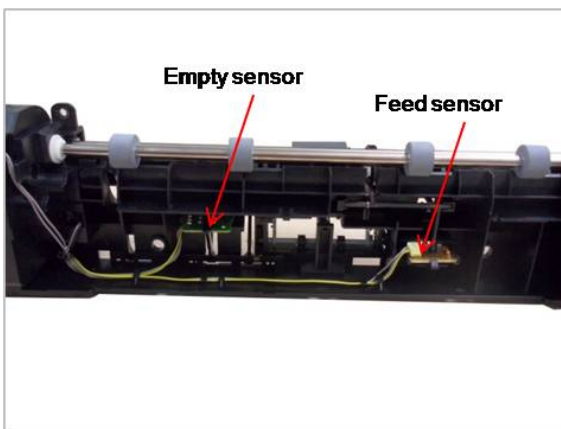
3.4.11. Regi clutch and Pick up solenoid

1. Remove the FRAME BASE-PAPER PATH. (Refer to 3.4.10)
2. Release the regi. clutch after removing the WASHER-PLAIN.
3. Remove 4 gears.
4. Release the pick up solenoid after removing 1 screw.



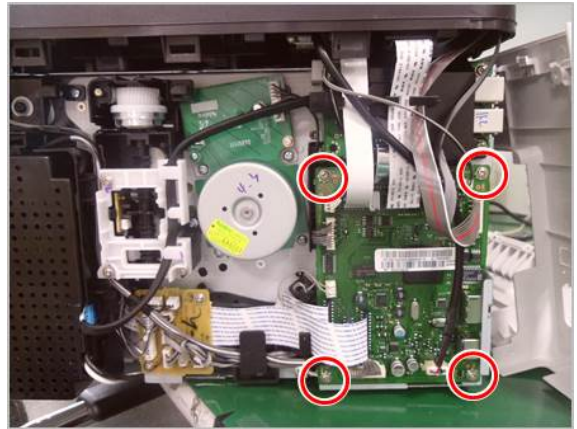
3.4.12. Feed sensor and Empty sensor

1. Remove the FRAME BASE-PAPER PATH. (Refer to 3.4.10)
2. Release the Empty sensor and Feed sensor.



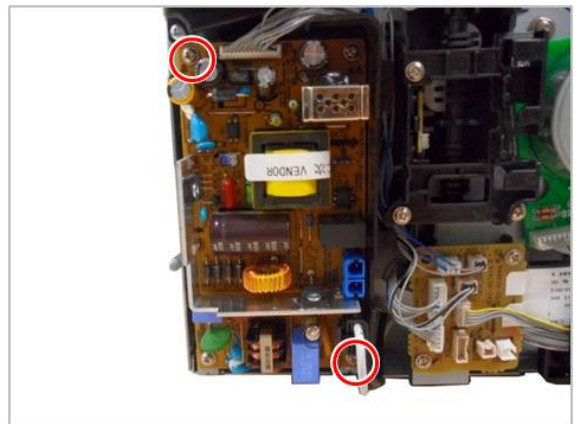
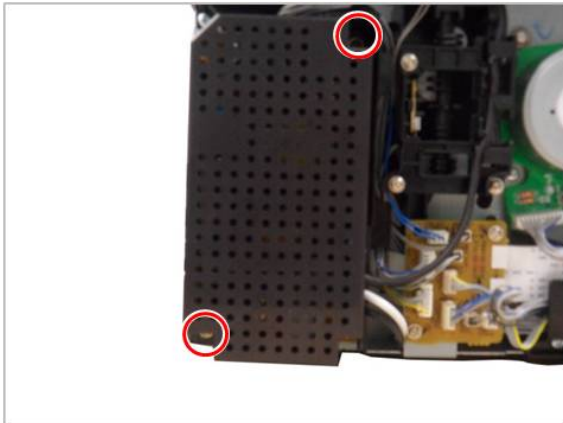
3.4.13. Main board

1. Remove the right cover. (Refer to 3.4.1)
2. Unplug all connector. Remove 4 screws. And remove the main board.



3.4.14. SMPS board

1. Remove the right cover. (Refer to 3.4.1)
2. Remove the SMPS cover after removing 2 screws.
3. Unplug all connectors on SMPS board. Remove 2 screws. And remove the SMPS board.

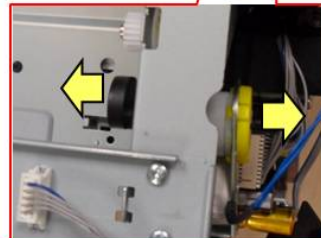
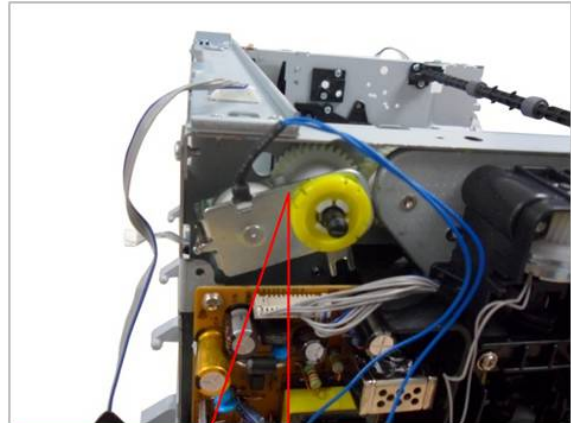


3.4.15. Cam Solenoid

1. Remove the right cover.
2. Remove the middle cover. (Refer to 3.4.6)
3. Remove the Cam Solenoid cover after removing 1 screw.

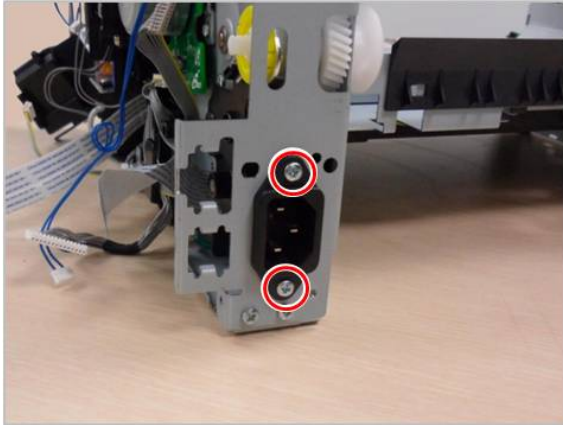


4. Release the Cam Solenoid.

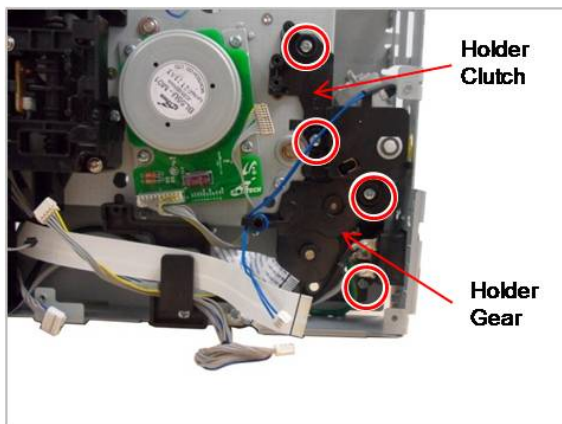


3.4.16. Main Drive Unit

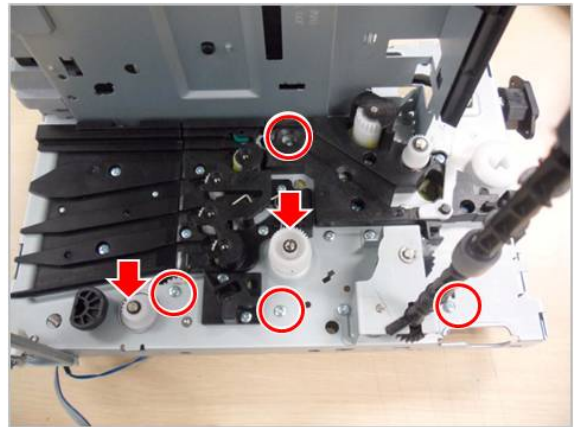
1. Remove the right cover.
2. Remove the main board and fax board.
3. Remove 2 screws.



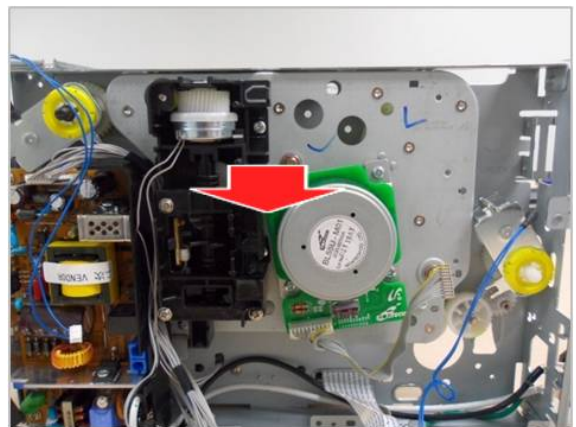
4. Remove the Holder-Clutch and Holder-Gear after removing 4 screws.



5. Remove 4 screws and 2 gears inside the right frame.



6. Release the Main Drive Unit.



4. Alignment and Troubleshooting

4.1. Alignment and Adjustments

This chapter describes the main functions for service, such as the product maintenance method, the test output related to maintenance and repair, Jam removing method, and so on. It includes the contents of user guide.

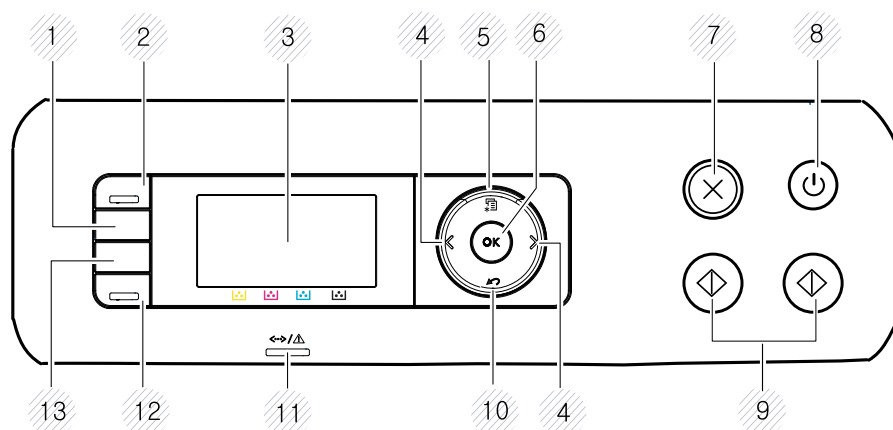
4.1.1. Control panel



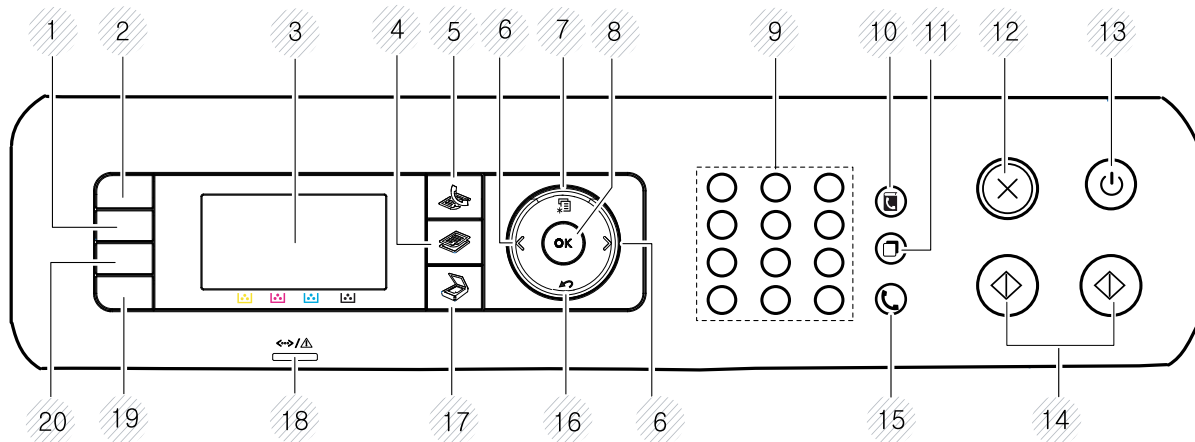
NOTE

- Some features and optional goods may not be available depending on model or country.

C480 / C480W



1	WPS	Configures the wireless network connection easily without a computer.
2	Scan to	Switches between scan and copy mode. The Scan to LED turns on scan mode and turns off on copy mode.
3	Display screen	Shows the current status and displays prompts during an operation.
4	Arrows	Scrolls through the options available in the selected menu and increases or decreases values.
5	Menu	Opens Menu mode and scrolls through the available menus.
6	OK	Confirms the selection on the screen.
7	Stop/Clear	Stops an operations at any time.
8	Power/Wake up	Turns the power on or off, or wakes up the machine from the power save mode. If you need to turn the machine off, press this button for more than three seconds.
9	Start	Starts a job.
10	Back	Sends you back to the upper menu level.
11	Status LED	Indicates the status of your machine.
12	Eco	Turn into eco mode to reduce toner consumption and paper usage when pc-printing and copying only
13	Direct USB	Allows you to directly print files stored on a USB memory device when it is inserted into the USB port on the front of your machine.

C480FN / C480FW

1	WPS	Configures the wireless network connection easily without a computer.
2	ID Copy	Allows you to copy both sides of an ID card like a driver's license on a single side of paper.
3	Display screen	Shows the current status and displays prompts during an operation.
4	Copy	Switches to Copy mode.
5	Fax	Switches to Fax mode.
6	Arrows	Scrolls through the options available in the selected menu and increases or decreases values.
7	Menu	Opens Menu mode and scrolls through the available menus.
8	OK	Confirms the selection on the screen.
9	Numeric keypad	Dials a number or enters alphanumeric characters.
10	Address Book	Allows you to store frequently used fax numbers or search for stored fax numbers.
11	Redial/ Pause	Redials the recently sent fax number or received caller ID in ready mode, or inserts a pause(-) into a fax number in edit mode.
12	Stop/ Clear	Stops an operations at any time.
13	Power/Wake up	Turns the power on or off, or wakes up the machine from the power save mode. If you need to turn the machine off, press this button for more than three seconds.
14	Start	Starts a job.
15	On Hook Dial	When you press this button, you can hear a dial tone. Then enter a fax number. It is similar to making a call using speaker phone.
16	Back	Sends you back to the upper menu level.
17	Scan	Switches to Scan mode.
18	Status LED	Indicates the status of your machine.

4.1.2. Understanding the status LED

The color of the LED indicates the machine's current status.



NOTE

- Some LEDs may not be available depending on model or country.
- To resolve the error, look at the error message and its instructions from the troubleshooting part.
- You also can resolve the error with the guideline from the computers's Samsung Printing Status window.

LED	Status		Description
Status	Off		The machine is off-line.
	Ice Blue	Blinking	When the backlight blinks, the machine is receiving or printing data.
		On	<ul style="list-style-type: none">• The machine is on-line and can be used.
	Orange	Blinking	<ul style="list-style-type: none">• A minor error has occurred and the machine is waiting for the error to be cleared. Check the display message. When the problem is cleared, the machine resumes.• Small amount of toner is left in the cartridge. The estimated cartridge life* of toner is close. Prepare a new cartridge for replacement. You may temporarily increase the printing quality by redistributing the toner.
		On	<ul style="list-style-type: none">• A toner cartridge has almost reached its estimated cartridge life*. It is recommended to replace the toner cartridge.• The cover is opened. Close the cover.• There is no paper in the tray. Load paper in the tray.• The machine has stopped due to a major error.• A paper jam has occurred.
	Wireless**	Ice Blue	Blinking
On			The machine is connected to a wireless network.
Off			The machine is disconnected from a wireless network.
Power/Wake up	Ice Blue	On	The machine is in power save mode.
		Off	The machine is in ready mode or machine's power is off.
Eco	Green	On	Eco mode is on. The default setting of Eco mode is 2-up and toner save.
		Off	Eco mode is off.
Scan to	Ice Blue	On	Scan mode is on.
		Off	Copy mode is on.

* Estimated cartridge life means the expected or estimated toner cartridge life, which indicates the average capacity of print-outs and is designed pursuant to ISO/IEC 19798. The number of pages may be affected by operating environment, percentage of image area, printing interval, graphics, media and media size. Some amount of toner may remain in the cartridge even when red LED is on and the printer stops printing.

** Some LEDs may not be available depending on model or country.

4.1.3. JAM removal

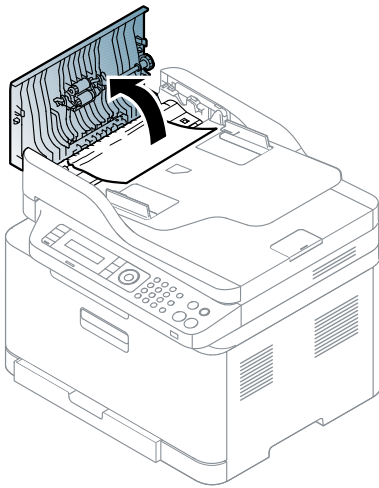
4.1.3.1. Clearing original document jams

NOTE

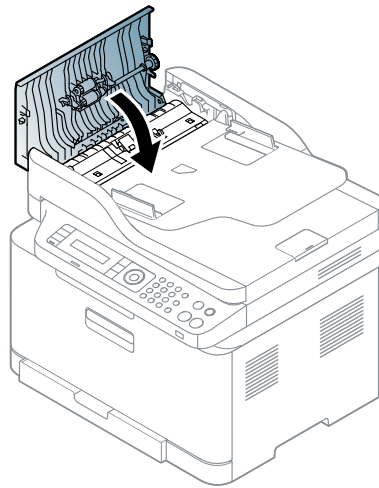
- Illustrations on this user's guide may differ from your machine depending on its options or models.
- This troubleshooting may not be available depending on model or optional goods

Original paper jam in front of scanner

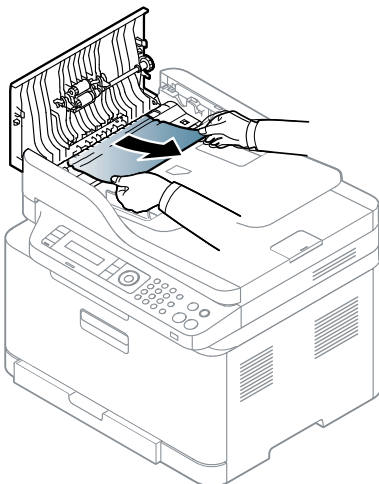
1) Open the document feeder cover.



3) Close the document feeder cover.

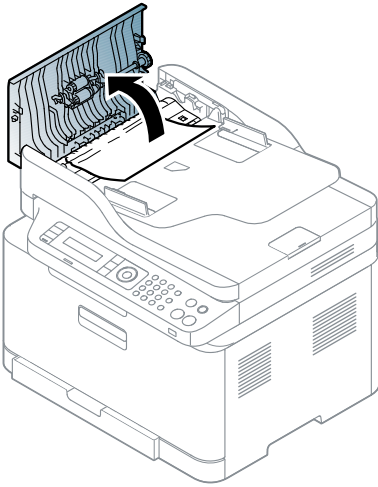


2) Gently remove the jammed original from the document feeder.

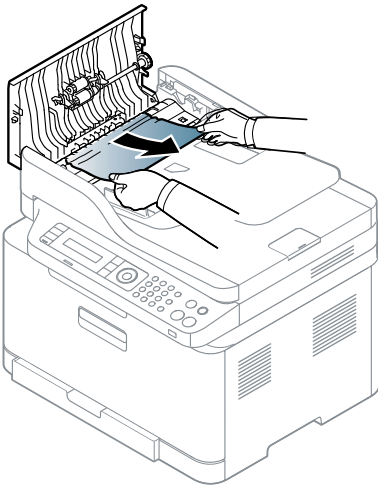


Original paper jam inside of scanner

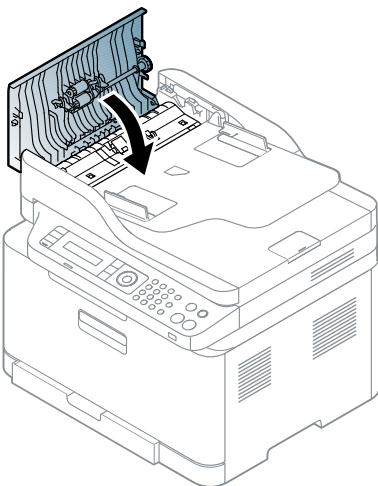
1) Open the document feeder cover.



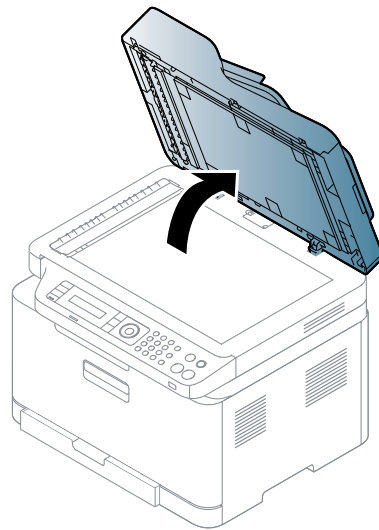
2) Gently remove the jammed original from the document feeder.



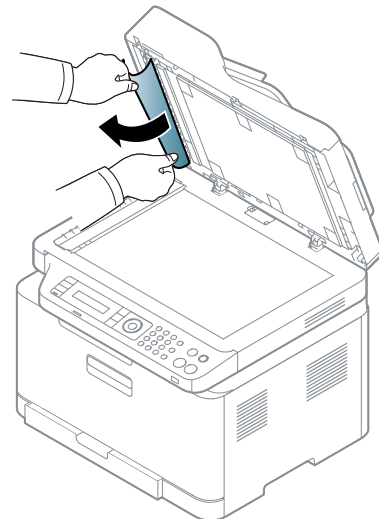
3) Close the document feeder cover.



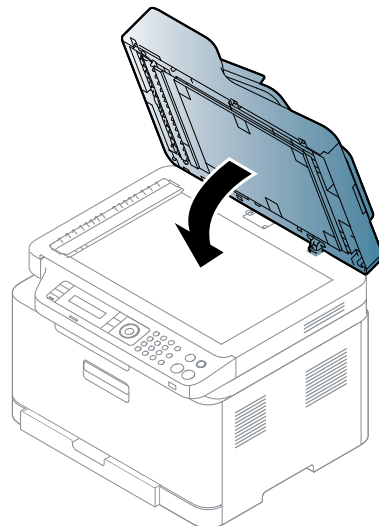
4) Open the document feeder.



5) Gently remove the jammed original from the bottom of the document feeder.

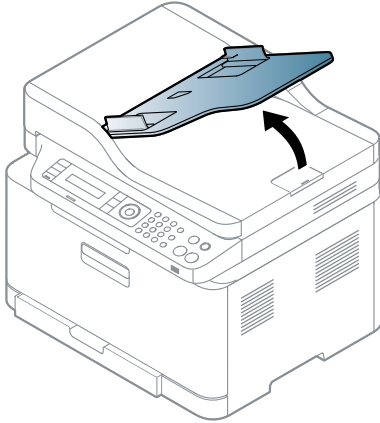


6) Close the document feeder.

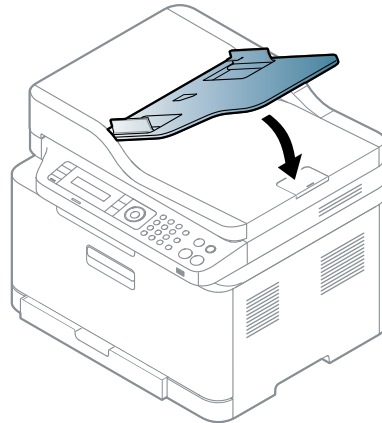
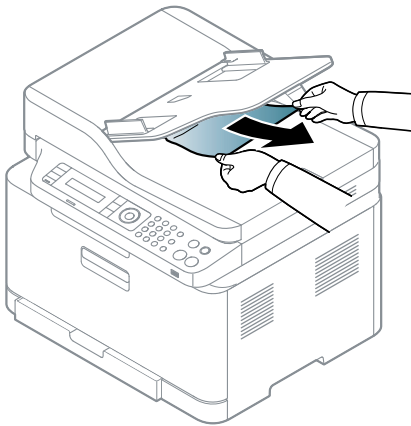


Original paper jam in exit area of scanner

- 1) Remove any remaining originals from the document feeder.
- 2) Open the Stacker up.
- 4) Close the Stacker.



- 3) Gently remove the jammed original from the document feeder.



4.1.3.2. Clearing paper jams

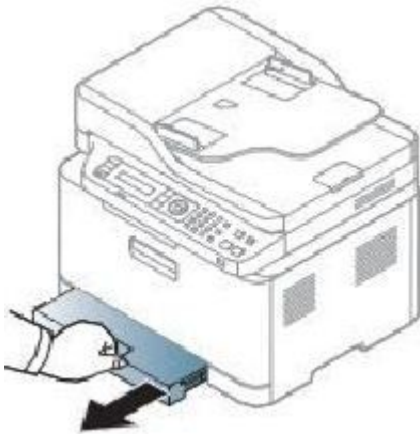


NOTE

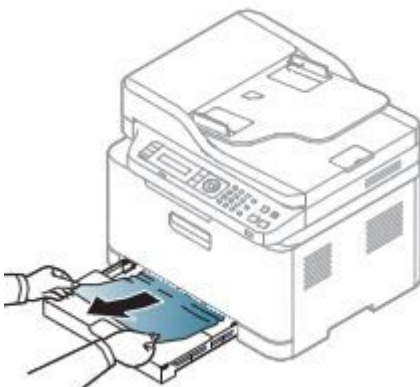
To avoid tearing the paper, pull the jammed paper out slowly and gently.

In tray1

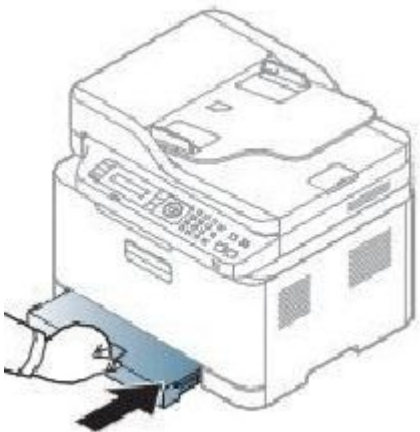
- 1) Take off the cassette.



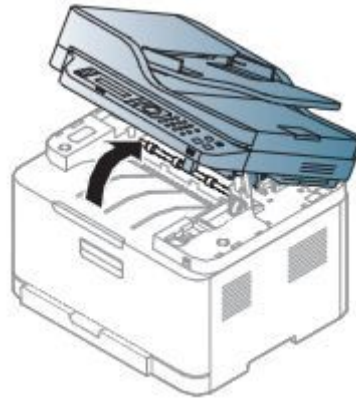
- 2) Remove the jammed paper by gently pulling it straight out.



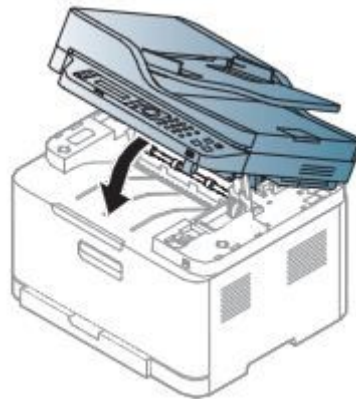
- 3) Reinstall the cassette.



- 4) Open the scanner unit.



- 5) Close the scanner unit.



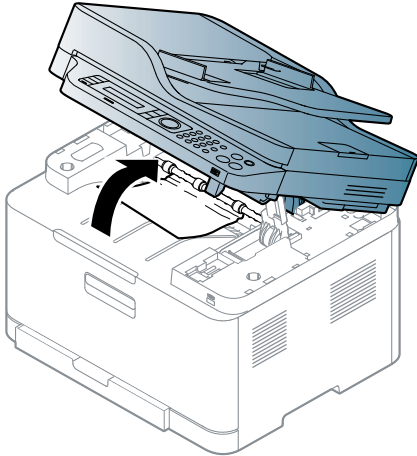
Inside the machine



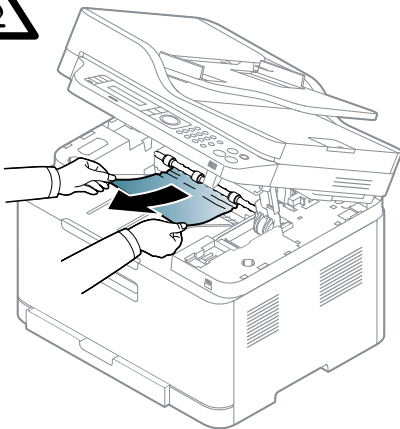
CAUTION

The fuser area is hot. Take care when removing paper from the machine.

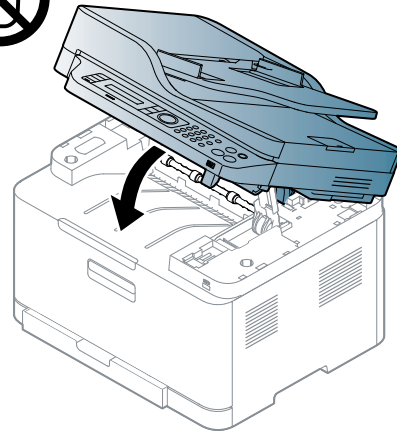
- 1) Open the scanner unit.



- 2) Remove the jammed paper by gently pulling it straight out.

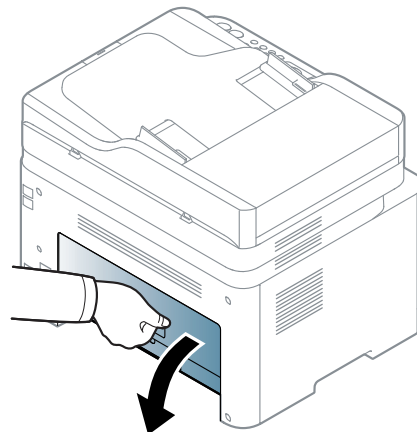


- 3) Close the scanner unit.

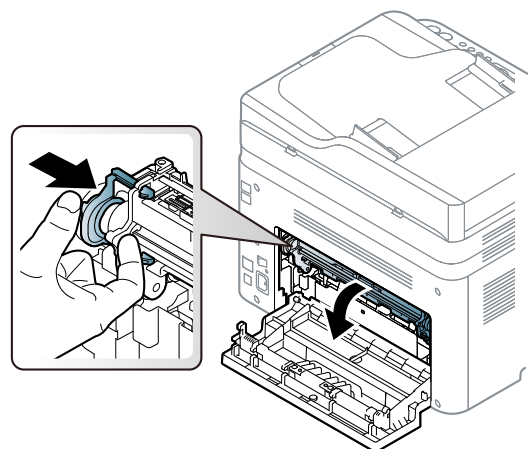


If you do not see the paper in this area, stop and go to next step:

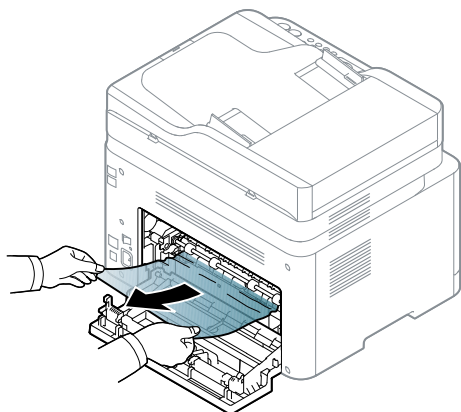
- 4) Open the rear cover door.



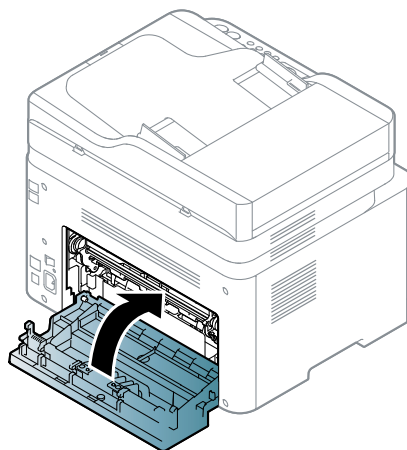
- 5) Open the FRAME-TRANSFER.



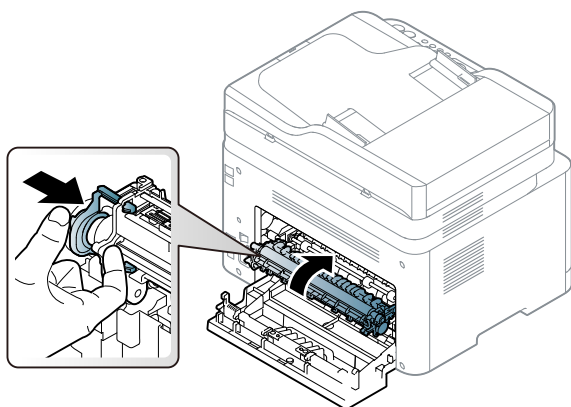
- 6) Remove the jammed paper by gently pulling it straight out.



- 8) Close the rear cover door.



- 7) Close the FRAME-TRANSFER.



4.1.4. Useful menu item for service

1) Monitoring the supplies life

If you experience frequent paper jams or printing problems, check the number of pages the machine has printed or scanned. Replace the corresponding parts, if necessary.

NOTE

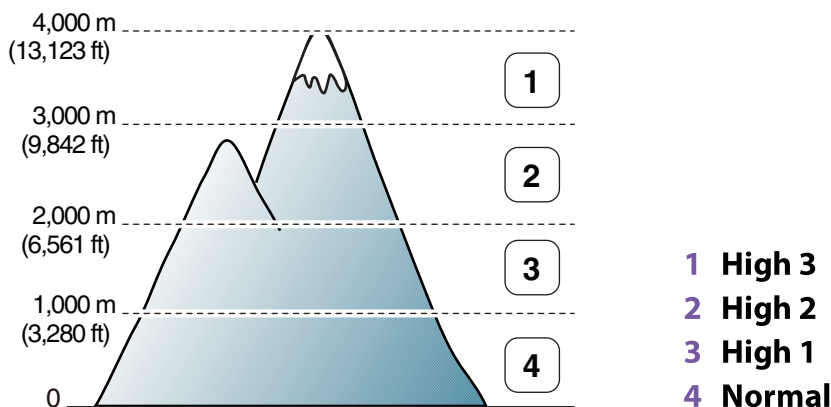
- It may be necessary to press OK to navigate to lower-level menus for some models.

- 1) Select “**Menu > System Setup > Maintenance > Supplies Life**” on the control panel.
- 2) Select the option you want and press OK.
 - Total: Displays the total number of pages printed.
 - ADF Scan: Displays the number of pages printed by using the document feeder.
 - Platen Scan: Displays the number of pages scanned by using scanner glass.
 - Supplies Info.: Prints the supply information page.
- 3) Press “**Stop/Clear**” button to return to ready mode.

2) Altitude adjustment

Print quality is affected by atmospheric pressure, which is determined by the height of the machine above sea level. The following information will guide you on how to set your machine for the best print quality.

Before you set the altitude value, determine the altitude where you are.



You can set the altitude value from Device Settings in Samsung Easy Printer Manager program.

- For Windows and Macintosh users, you set from **Samsung Easy Printer Manager > Switch to advanced mode > Device Settings**.

NOTE

- If your machine is connected to the network, you can set the altitude via SyncThru™ Web Service.
- You can also set the altitude in System Setup option on the machine's display.
 - Menu > System Setup > Machine Setup > Altitude Adj

3) Printing a machine report

This product provides several printable reports for maintenance purposes.

These reports can be used to aid the diagnosis of print quality problems.

To print the report :

- Press “**Menu > System Setup > Report**” on the control panel.
 - Configuration : Prints a report on the machine's overall configuration.
 - Supplies Info. : Prints supplies' information page.

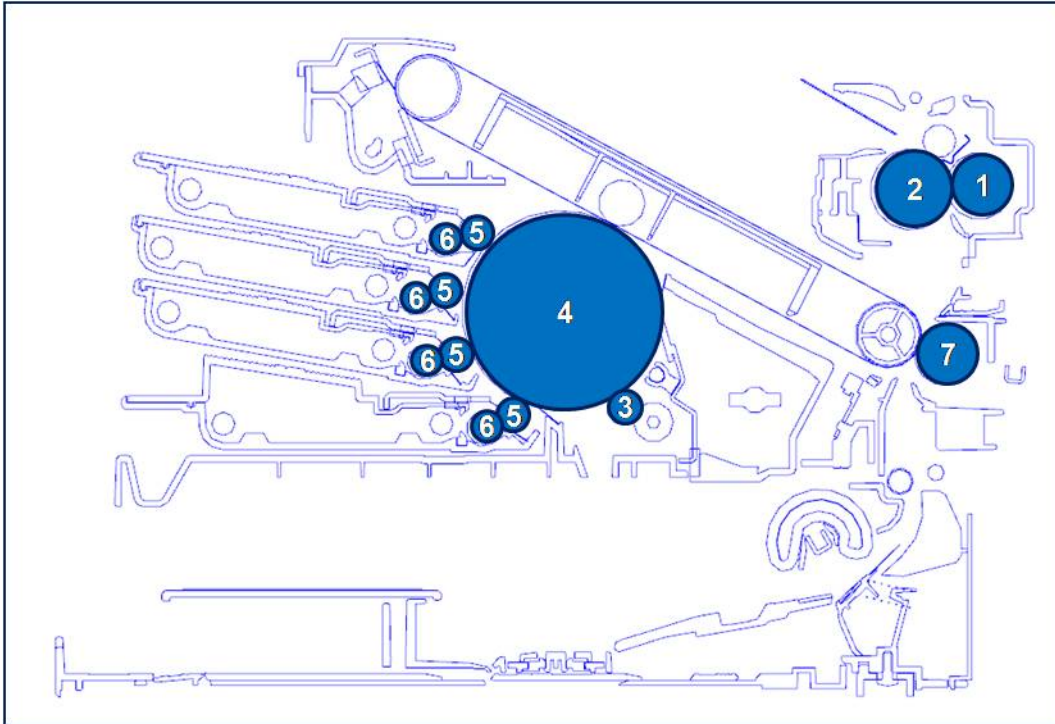
4) Image manager

This menu allows you to adjust the color setting such as contrast level, color registration, color density, etc.

- Press “**Menu > System Setup > Maintenance**” on the control panel.
- **Custom Color** : adjusts contrast, color by color.
 - Default : optimizes colors automatically.
 - Print Density : allows you to manually adjust the color contrast for each cartridge. It is recommended to use the Default setting for best color quality.
- **Tone Adjust.**: The machine calibrates the toner density of machine for the best possible color print quality.

4.1.5. Periodic Defective Image

If an image defects appears at regular intervals on the printed-paper, it maybe due to a faulty or damaged roller. Refer to the table below and check the condition of the appropriate roller.



	Roller	Period (mm)	Phenomenon	Defective part
1	Pressure Roller	62.4mm	Background	Fuser Unit
2	Heat Roller	76.3mm	Black spot and image ghost	
3	Charging Roller	37.7mm	Black Spot and line and periodic band	Toner Cartridge
4	OPC Drum	188.5mm	White and Black Spots	
5	Developing Roller	26.0mm	White spot, Horizontal black band	
6	Supply Roller	47.5mm	Periodic Band by little difference of density	
7	Transfer Roller	54.64mm	Ghost, Damaged image by abnormal transfer	Transfer roller

4.1.6. Useful management tools

4.1.6.1. SyncThru™ Web Service

This chapter gives you step-by-step instructions for setting up the network environment through SyncThru™ Web Service.



NOTE

- Internet Explorer® 6.0 or higher is the minimum requirement for SyncThru™ Web Service.
- Some menus may not appear on the display screen depending on the settings or models. If so, it is not applicable to your machine.

What is SyncThru™ Web Service?

If you have connected your machine to a network and set up TCP/IP network parameters correctly, you can manage the machine via SyncThru™ Web Service. Use SyncThru™ Web Service to :

- View the machine's device information and check its current status.
- Change TCP/IP parameters and set up other network parameters.
- Change the printer preference.
- Set the email notifications advising of the machine's status.
- Get support for using the machine.
- Upgrade machine firmware.

Required web browser

You need one of the following web browsers to use SyncThru™ Web Service.

- Internet Explorer® 6.0 or higher
- Chrome 4.0 or higher
- FireFox 3.0 or higher
- Safari 3.0 or higher

Connecting to SyncThru™ Web Service

[IPv4 supported web browser]

- 1) Start a web browser, such as Internet Explorer®, that supports IPv4 addressing as a URL.
Enter the machine's IP address (<http://xxx.xxx.xxx.xxx>) in the address field and press the Enter key or click Go.



NOTE

You can get the machine's IP address from the machine report.

- 2) Your machine's SyncThru™ Web Service website opens.

[IPv6 supported web browser]

- 1) Start a web browser, such as Internet Explorer®, that supports IPv6 addressing as a URL.

- 2) Select one of the IPv6 addresses (Stateless Address, Stateful Address, Manual Address) from Network Configuration Report.

**NOTE**

You can get the machine's IPv6 address from the machine report.

- 3) Enter the IPv6 addresses (eg., `http://[3ffe:10:88:194:213:77ff:fe82:75b]`).

**NOTE**

The address must be enclosed in '[']' brackets.

- 4) Your machine's SyncThru™ Web Service website opens.

Logging into SyncThru™ Web Service

Before configuring options in SyncThru™ Web Service, you need to log-in as an administrator. You can still use SyncThru™ Web Service without logging in, but you will not have access to or view the Settings tab and the Security tab.

- 1) Click Login on the upper right of the SyncThru™ Web Service website. A log-in page appears.
- 2) Type in the ID and Password.
Use the same login ID, Password, Domain as when logging in from the machine.

Information tab

This tab gives you general information about your machine. You can check things, such as the machine's status, supplies' status, count information, network information, and more. You can also print reports, such as configuration page.

- **Active Alerts:** You can check the current alerts in the machine. Use this information to troubleshoot machine errors.
- **Supplies:** You can check the supplies' information. For toner cartridges and imaging units, supplies' status is displayed with a visual graph showing you the amount of each supply left. Page counts are also available which can help you predict when to change the supplies. This feature is also available from the machine.
- **Usage Counters:** You can check the billing information and usage counter of the machine. This feature is also available from the machine.
- **Current Settings:** Shows the current settings of the machine and network.
- **Machine Information:** Shows the current machine settings.
- **Network Information:** Shows the current network settings. Use this page as a reference and change the necessary settings needed for using the network.
- **Security Information:** Shows the current security settings of the machine and network.
- **Print Information:** You can print all the reports provided by your machine. You can use these reports to help you maintain your machine. This feature is also available in the machine.

Address book tab

You can manage the address book. This feature is also available from the machine.

- **Individual:** You can manage individual entries in the address book.
- **Group:** You can manage group address books.

Settings tab

Settings tab has sub menus, Machine Settings and Network Settings. You cannot view or access this tab if you do not log-in as an administrator.

- **Machine Settings:** You can set machine settings.
 - **System:** You can set machine related settings.
 - **Printer:** You can set print related settings such as darkness or adjust the background. This feature is also available from the machine.
 - **Copy:** You can set copy related settings such as darkness or adjusting the background.
 - **Fax :** You can set fax related settings such as fax number or redial times. This feature is also available from the machine
 - **Scan:** You can set scan related settings. This feature is also available from the machine.
 - **E-mail Notification:** When an error occurs or the consumables are running out, the machine sends a notification to the administrator via email. You can set whether to use this feature or not. You can also select which alerts to receive and when.
- **Network Settings:** You can set up the network environment to use your machine as a network machine. You can also set the settings from the machine.
 - **General:** You can set general machine information to use in the network and set ethernet settings. This feature is also available from the machine.
 - **TCP/IPv4, TCP/IPv6, Raw TCP/IP, LPR/LPD, IPP, Telnet, WSD, SLP, UPNP, mDNS, CIFS, SNMPv1/v2, SNMPv3:** You can set protocol settings.
 - **Outgoing Mail Server (SMTP):** You can set server settings for outgoing emails. If this setting is not configured, you cannot use scan to email feature. Outgoing emails will be sent through SMTP server you set here.
 - **HTTP:** You can allow or block users from accessing the SyncThru™ Web Service.
 - **Proxy:** You can set proxy settings and enable authentication.

Security tab

The security tab has System Security, Network Security, User Access Control and System Log. You cannot access this tab if you do not log-in as an administrator.

- **System Security:** From the SyncThru™ Web Service, select the Security tab > System Security.
 - **System Administrator :** Enter the system administrator's information. The machine sends email notification to the email address set here. This feature is also available from the machine.
 - **Feature Management :** You can enable/disable network features. Check the features you want to enable and click Apply.
 - **Information Hiding :** You can enable/disable network features. Check the features you want to enable and click Apply.
 - **Restart Device :** You can reboot your machine. Click the Restart Now button to reboot.
- **Network Security:** From the SyncThru™ Web Service, select the Security tab > Network Security.
 - **Digital Certificate:** You can manage digital certificates. A digital certificate is an electronic certificate that verifies the secure association between communication nodes. You need to add the certificate for SSL communication.
 - **Secure Connection :** You can enable or disable secure connection to use more enhanced secure network channel. For secure communication, using the Secure Connection feature is recommended.
 - **SNMPv3 :** You can set SNMPv3.
 - **IP Security :** You can set IP security settings.
 - **IP/MAC Filtering :** You can set filtering options for IP and MAC addresses. If the administrator does not add a filtering rule for IPv4, IPv6, and MAC addresses, nothing is filtered. If the administrator has added a filtering rule, filtering will be applied to the entered IPv4, IPv6, and MAC addresses.
 - IPv4 Filtering: You can enable/disable IPv4 filtering as well as manage filtering rules.
 - IPv6 Filtering: You can enable/disable IPv6 filtering as well as manage filtering rules.
 - MAC Filtering: You can enable/disable Mac filtering as well as manage filtering rules.
 - **802.1x :** You can enable/disable 802.1x Security as well as manage filtering rules.
 - **External Authentication Server :** Set the servers for authentication.
- **User Access Control:** You can restrict users from accessing the machine or application. You can also give specific permission for user to only use certain feature of the machine. For example, you can allow user A to only use print feature. In this case, user A will not be able to scan, copy or fax with the machine.
 - **Authentication (Activating access control) :** You can choose the authentication method for user authentication. Select a mode and click on the Options button.
 - **Authorization (Giving rights):** You can give permissions to a user to only use certain features of the machine.
 - **Authority Management:** You can give different rights to different users. For example, you can allow user A to use all the machine's functions while giving user B only the right to print.
 - **Accounting :** You can manage accounts.
 - **User profile:** You can store user information on the machine's hard drive. You can use this feature to manage the users using the machine. You can also group the users and manage them as a group. You can add up to 1,000 entries. User identified by user ID and password are allowed to modify their password. They are allowed to view all of their profile information. When it comes to the role, users are allowed to see only the role they belong to but not its permissions.
- **System Log:** You can keep logs of events that have happened in the machine. The administrator can record and manage the machine usage information by keeping the system log files. The system log files are stored on the machine's HDD (hard disk drive), and when it is full, it will erase old data. Export and save the important audit data separately using the exporting feature.
 - **Log configuration:** You can enable or disable keeping logs. You can also backup log files by periods and transfer to a repository server.
 - **Log Viewer :** You can view, delete, and search log files.

Maintenance tab

This tab allows you to maintain your machine by upgrading firmware, managing applications, and setting contact information for sending emails. You can also connect to the Samsung website or download manuals and drivers by selecting the Link menu.

- **Firmware Version** : You can check the firmware version used in the machine. Check the version and update it if necessary.
- **Application Management** : You can add or delete applications/license. If you add an application, you need to activate the license of the installed application. Some applications may not have a license.
- **Backup/Restore** : You can backup the machine's configurations and restore the configuration when there is a problem with the machine. The saved (backed up) files can also be used to configure other machines.
- **Contact Information** : You can view contact information.
- **Link** : You can view links to useful websites where you can:
 - view product information and get support (Samsung website).
 - download manuals and drivers.
 - order consumable supplies.
 - register your machine on-line.

4.1.6.2. Samsung Easy Printer Manager

Samsung Easy Printer Manager is an application that combines Samsung machine settings into one location. Samsung Easy Printer Manager combines device settings as well as printing environments, settings/actions and launching. All of these features provide a gateway to conveniently use your Samsung machine. Samsung Easy Printer Manager provides two different user interfaces for the user to choose from: the basic user interface and the advanced user interface. Switching between the two interfaces is easy: just click a button.

NOTE

- Available for Windows and Mac OS users only.
- For Windows, Internet Explorer 6.0 or higher is the minimum requirement for Samsung Easy Printer Manager.

Understanding Samsung Easy Printer Manager

To open the program :

For Windows,

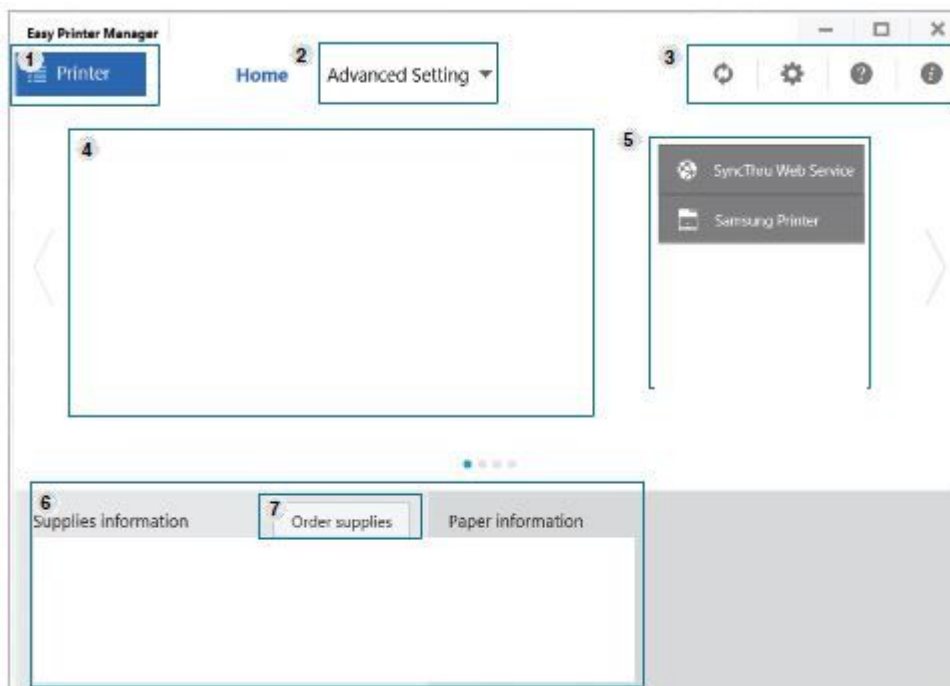
Select Start > Programs or All Programs > Samsung Printers > Samsung Easy Printer Manager .





For Mac,

The Samsung Easy Printer Manager interface is comprised of various basic sections as described in the table that follows:

NOTE

The screenshot may differ depending on operating system you are using.



1	Printer list	The Printer List displays printers installed on your computer and network printers added by network discovery (Windows only).
2	Advanced Setting	<p>The advanced user interface is intended to be used by the person responsible for managing the network and machines.</p> <div>  NOTE Some menus may not appear in the display depending on options or models. If so, it is not applicable to your machine. </div> <ul style="list-style-type: none"> • Device Settings : You can configure various machine settings such as machine setup, paper, layout, emulation, network, and print information. <div>  NOTE If you connect your machine to a network, the SyncThru™ Web Service icon is enabled. </div> <ul style="list-style-type: none"> • Scan to PC Settings : This menu includes settings to create or delete scan to PC profiles. <ul style="list-style-type: none"> • Scan Activation : Determines whether or not scanning is enabled on the device. • Basic tab : Contains settings related general scan and device settings. • Alert Settings (Windows only) : This menu includes settings related to error alerting. <ul style="list-style-type: none"> • Printer Alert : Provides settings related to when alerts will be received. • Email Alert : Provides options relating to receiving alerts via email. • Alert History : Provides a history of device and toner related alerts.
3	Application information	Includes links for changing to the refresh, preference setting, help, and about.
4	Printer information	<p>This area gives you general information about your machine. You can check information, such as the machine's model name, IP address (or Port name), and machine status.</p> <div>  NOTE This button opens the Troubleshooting Guide when an error occurs. You can directly open the troubleshooting section in the user's guide. </div>
5	Quick links	<p>Displays Quick links to machine specific functions. This section also includes links to applications in the advanced settings.</p> <div>  NOTE If you connect your machine to a network, the SyncThru™ Web Service icon is enabled. </div>
6	Contents area	Displays information about the selected machine, remaining toner level, and paper. The information will vary based on the machine selected. Some machines do not have this feature.
7	Order supplies	Click on the Order button from the supply ordering window. You can order replacement toner cartridge(s) from online.

4.1.7. Updating Firmware

This chapter includes instructions for updating the printer firmware. You can update the printer firmware by using one of the following methods :

- Update the firmware by using the USB port.
- Update the firmware by using the Network.

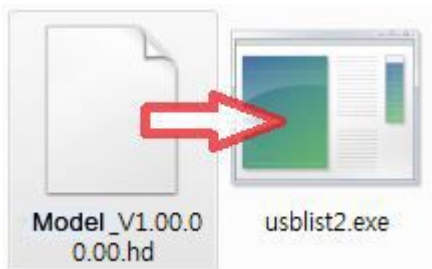
4.1.7.1. Update the firmware by using the USB port

Upgrading preparations

- usblist2.exe : Tool which sends firmware data to printer.
- Firmware file to update.

Upgrade Procedure

- 1) Turn the machine off.
- 2) Connect USB cable to printer.
- 3) Turn the machine on. Check if the printer is the ready status.
- 4) Drag the SWUPGRADE_ON.prn file and drop down on the usblist2.exe.
- 5) Drag the firmware file and drop down on the usblist2.exe icon.



And then firmware update will be started automatically.

- 6) When upgrading is completed, the machine will automatically reboot.

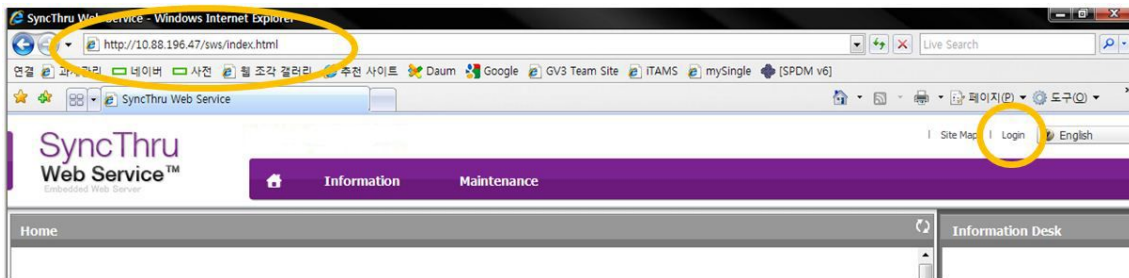
4.1.7.2. Update the firmware by using the network

Upgrading preparations

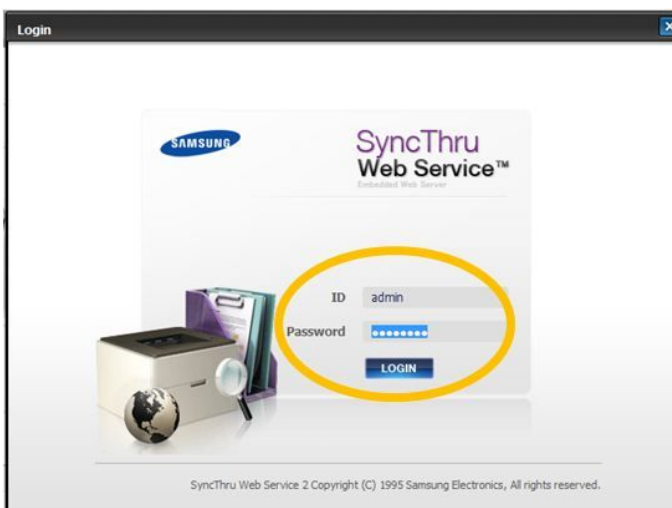
- Wired or Wireless Network connection is established.
- Firmware file to update

Upgrade Procedure

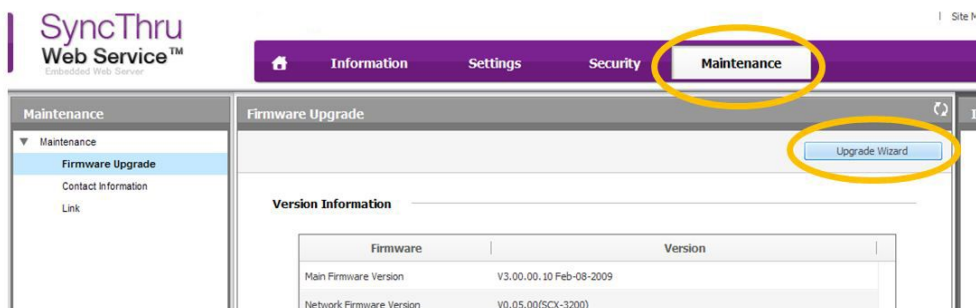
- 1) Open the Web-browser and input IP address of machine. Click “Login”.



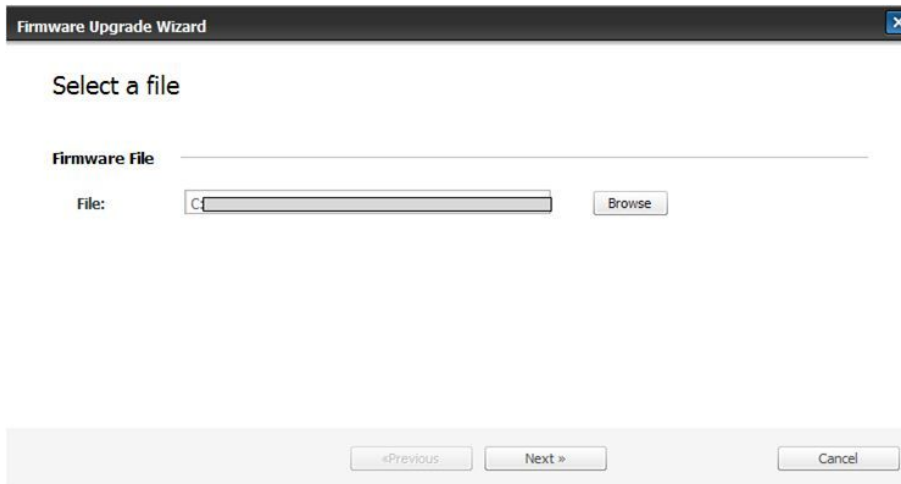
- 2) Log-in Admin Mode. (ID: admin, PW: sec00000)



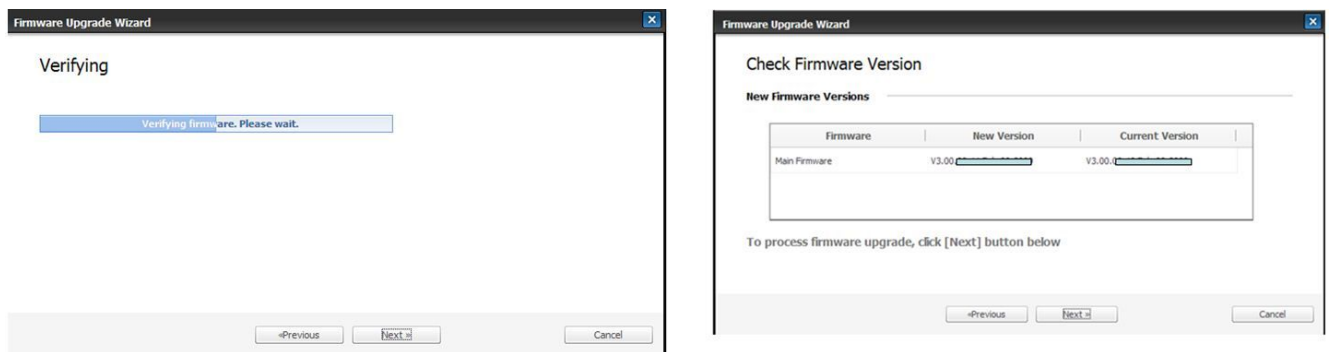
- 3) Select Maintenance menu and click “upgrade wizard”



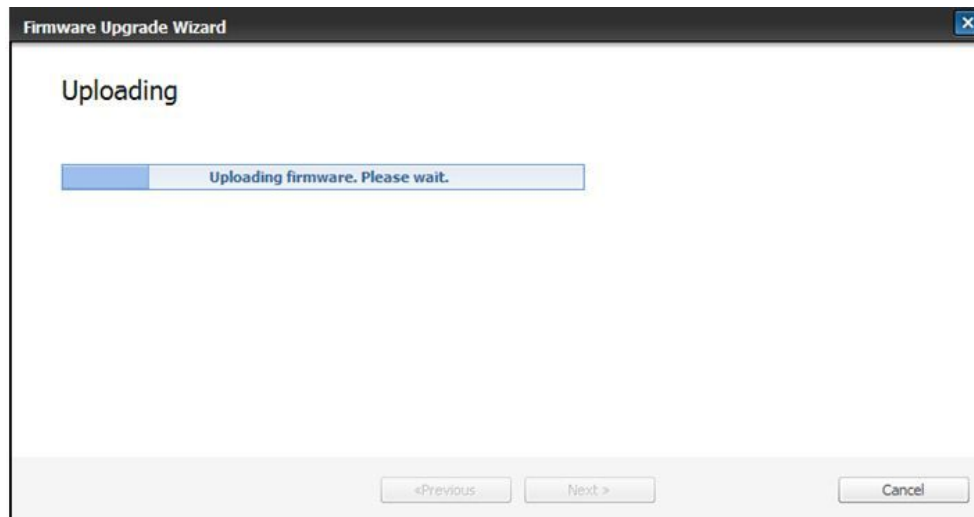
- 4) Select firmware file using “browser” button and press next button.



- 5) SyncThru will check verify firmware file and compare version and press next button.



- 6) Machine starts upgrading. SyncThru will return home page after upgrading is completed.



4.1.8. Tech mode

In service (tech) mode, the technician can check the machine and perform various test to isolate the cause of a malfunction. While in Tech mode, the machine still performs all normal operations.

a) Entering Tech mode

- **4-in-1 Model (C480FN / C480FW)**

- 1) Press “**Menu > # > 1 > 9 > 3 > 4**” on the control panel continuously.
- 2) Press **Menu**.
- 3) Select “**Tech Mode**”.

- **3-in-1 Model (C480 / C480W)**

- 1) Press “**Menu > Back > Left > Right > OK > Stop**” on the control panel continuously.

b) Tech mode menu



NOTE

Some menus may not appear on the display depending on the models.

Depth 1	Depth 2	Depth 3	Depth 4
Data Setup	Send Level	[9-15]	12
	F/W Upgrade	Off*	
		On	
	DTMF Level	High [0-15]	Low [0-15]
	Pause Time	[1-9]	
	Dial Mode	Tone,Pulse	Tone
	Modem Speed	33.6, 28.8, 14.4, 12.0, 9.6, 4.8	33.6
	Error Rate	5%, 10%	10%
	Clear All Mem.		
	Toner Low Level	[1:30]:10	
	Clear Count	Enter Password [????]	Platen Scan
			ADF Scan
			Transfer Roller
			Fuser
			Pickup Roller
			Imaging Unit
			Transfer Belt
			ADF Roller
			ADF Rubber Pad
	Engine Footer	Off*	
		On	
	Dial Tone	On	
		Off	

Depth 1	Depth 2	Depth 3	Depth 4
	Caller ID	On	
		Off	
	Busy Tone	On	
		Off	
	F/W Upgrade	Off*	
		On	
Machine Test	Switch Test		
	Modem Test		
	Dram Test		
	Rom Test		
	Shading Test	Shading&Print Print	
	Scan Aging		
	Scan Aging2		
Report	Protocol Dump		
	Supplies Info.		
	Configuration		
	Error Info		
	Usage Counter		
	ComponentCheck		
	Fax Options		
	Auto Toning H.		
EDC Mode	NVM Read Write		
	NVM Initialize		
	Test Routine		
Special Func.	Toner Remain	Off*/On	
	Ave. Coverage	Off*/On	

c) Data Setup

- Send Level**

You can set the level of the transmission signal. Typically, the Tx level should be under -12 dBm.



NOTE

The Send Fax Level is set at the best condition in the shipment from factory.

- DTMF Level**

This is a setting value of the High level tone and low level tone at DTMF mode. (Not dial mode)

- Pause Time**

It shows the delay time when receiving the pause input at auto dial.

- Dial Mode**

This function can choose dial method.

* Default : Dial (Dial/Pulse)

- **Modem Speed**

You can set the maximum modem speed. Communication is done with modem speed automatically set at lower speed when communicating with a slower speed modem since communication is done on the standard of the side where modem speed is low for transmission/reception. It is best set 33.6 Kbps as default setting.

- **Error Rate**

When the error rate is about exceed the set value, the Baud rate automatically adjusts to 2400 bps. This ensures that the error rate remains below the set value. You can select the rate between 5% and 10%.

- **Clear All Memory**

The function resets the system to factory default settings. This function is used to reset the system to the initial value when the product is functioning abnormally . All the values are returned to the default values, and all the information, which was set by the user, will be erased.

**NOTE**

Always perform a memory clear after replacing the main board. Otherwise, the system may not operate properly.

- **Toner Low Level**

The function is to set up the time to inform toner low status. This function can provide user convenience for replacing the toner cartridge.

- **Clear Count**

This function resets the count value you select.

- **Engine Footer**

This function is for monitoring of the engine status. If you perform this function, at printing, the setting value for engine is shown on the bottom of the printed page.

d) Machine Test

- **Switch Test**

Use this feature to test all keys on the operation control panel. The result is displayed on the LCD window each time you press a key.

- **Modem Test**

Use this feature to hear various transmission signals to the telephone line from the modem and to check the modem. If no transmission signal sound is heard, it means the modem part of the main board malfunctioned.

- **Dram Test**

Use this feature to test the machine's DRAM. The result appears in the LCD display.

- **Shading Test**

The function is to get the optimum scan quality by the specific character of the CIS (Contact Image Sensor). If the copy image quality is poor, perform this function to check the condition CIS unit.

e) Report

- **Protocol Dump**

Protocol list shows the sequence of the CCITT group 3 T.30 protocol during the most recent sending or receiving operation. Use this list to check for send and receive errors.

- **Supplies Info**

Supplies Information Report shows toner cartridge information such as toner remaining, toner capacity, toner product date etc.

- **Configuration**

Configuration report shows the status of the user-selectable options. You may print this list to confirm your changes after changing settings. This page provides useful information for service.

- **Error Info**

Error Information Report shows error records.

- **Usage Counter**

Usage page report shows usage page counts since service date. It shows total counts of the simplex print and duplex print.

- **Component Check**

Component Check Report shows the operation procedure of the machine test in tech mode.

- **Fax Options**

This report shows fax options.

- **Auto Toning H.**

This report shows the CTD performance result.

f) EDC mode

- NVM Initialize : This menu initializes all engine NVM value to the default.
- NVM Read Write : This menu changes a configuration value for engine firmware.

Code	Display	Meaning	Max/Min	Default
112-0120	00120-Regi X Yellow	Distant from hsync to lsync (multi-hsync) for yellow	+200/0	100
112-0130	00130-Regi X Magenta	Distant from hsync to lsync (multi-hsync) for Magenta	+200/0	100
112-0140	00140-Regi X Cyan	Distant from hsync to lsync (multi-hsync) for Cyan	+200/0	100
112-0150	00150-Regi X Black	Distant from hsync to lsync (multi-hsync) for Black	+200/0	100
112-0160	00160-Regi Y Yellow	Distant from psync to Image area for yellow	+200/0	100
112-0170	00170-Regi Y Magenta	Distant from psync to Image area for Magenta	+200/0	100
112-0180	00180-Regi Y Cyan	Distant from psync to Image area for Cyan	+200/0	100
112-0190	00190-Regi Y Black	Distant from psync to Image area for Black	+200/0	100

- Test Routine : This menu can perform the operation test for the main components.
-

Code	Display	Meaning
100-0000	0000-Main BLDC	Main BLDC Motor is On/Off
100-0001	0001-Main BLDC Slow	Main BLDC Motor Slow(50% speed) On/Off
100-0010	0010-Main BLDC Rdy	Detect if Main BLDC Motor runs at normal speed
100-0191	0191-System Fan Run	Start/Stop System (Main) Fan run
100-0241	0241-Waste Ton LED	Waste Toner Led On/Off
100-0250	0250-Waste Ton Sens	Detect if the waste toner is full or not. Display Waste Tank Full adc

Code	Display	Meaning
101-0010	0010-Tray1 Pickup	Engages drive to pick up a paper from tray1.
101-0050	0050-Registration	Engages drive to registration rolls.
101-0190	0190-OutBin Full	Detect when a paper is at Outbinfull sensor.
101-0201	201-Dev Cam Clutch	Rotate Deve cam
101-0202	202-Dev Relay1	Turn on the deve relay1
101-0203	203-Dev Relay2	Turn on the deve relay2
101-0204	204-Dev Relay3	Turn on the deve relay3
101-0205	204-Dev Relay4	Turn on the deve relay4
101-0210	0210-ITB Clutch	Engages drive to ITB Cleaning Blade
101-0231	0231-T2 Nip Release	T2 Nip Release
101-0260	0260-Cover Open Sensor	Check if the set main cover is open or not
102-0010	0010-Tray1 Empty	Detect when paper is in Tray1.
102-0360	0360-Regi Sens	Detect when a paper is at Regi. sensor.
102-0370	0370-Exit Sens	Detect when a paper is at Exit. sensor.
105-0032	0032-MHV Bias	MHV bias voltage on at normal drive level
106-0037	0037- Dev Bias	Dev bias voltage on at normal drive level
106-0038	0038- Dev AC Bias	Dev bias AC voltage on at normal drive level
107-0032	0032-THV Bias	THV plus bias voltage on at normal drive level
107-0033	0033-THV- Bias	THV minus bias voltage on at normal drive level
107-0080	0080-iTHV +	iTHV plus bias voltage on at normal drive level
107-0160	0160-Erase Lamp	Erase Lamp 1
109-0000	0000-Temp A	Detects what the temperature A is on fuser.
110-0000	0000-LSU Motor1 Rdy	Detects if LSU motor1 runs at normal speed.
110-0060	0060-LSU Motor1 Run	LSU Motor1 On/Off
110-0111	0080-LD Power	LSU LD Power On/Off with normal LD Power
111-0080	0080-ID Sensor	Start ID sensor sensing On/Off
111-0090	0090-IC Sensor Chk	Display ID sensor reading value

4.1.9. NFC Tag Writing

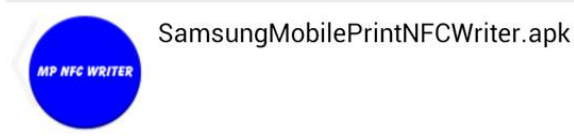
- 1) Print the report and check the PIN code.
- 2) Check the NFC setting.
 - Turn the NFC function on from the device.
 - Android 4.1 : Settings → WIRELESS & NETWORKS More...→ NFC check box
 - Android 4.0 : Settings → WIRELESS & NETWORKS On



NOTE

NFC setting depends on Android version.

- 3) Install the NFC writing tag application.
 - a) Download and install the NFC tag application.



- b) Execute the application.



- 4) Select the machine.

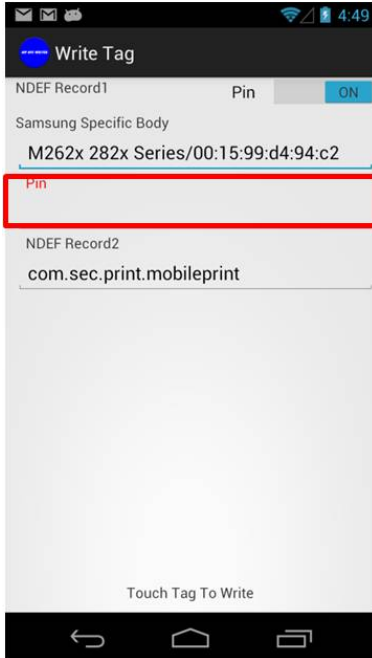




NOTE

The device must be Wi-Fi Direct on.

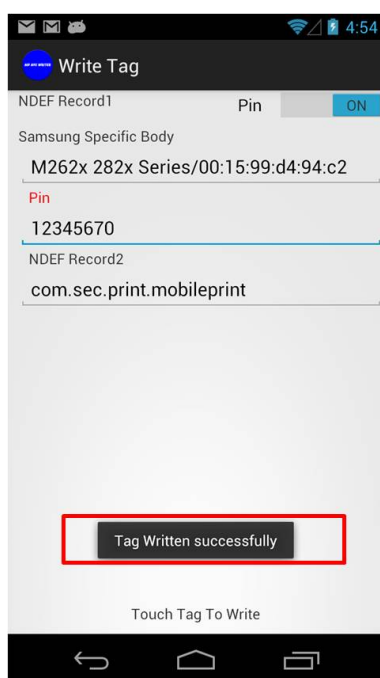
- 5) When selecting the machine, machine information will display. If you want to enter PIN code, set up the Pin button is ON. Enter the PIN code.



- 6) Contact the mobile device to NFC tag.



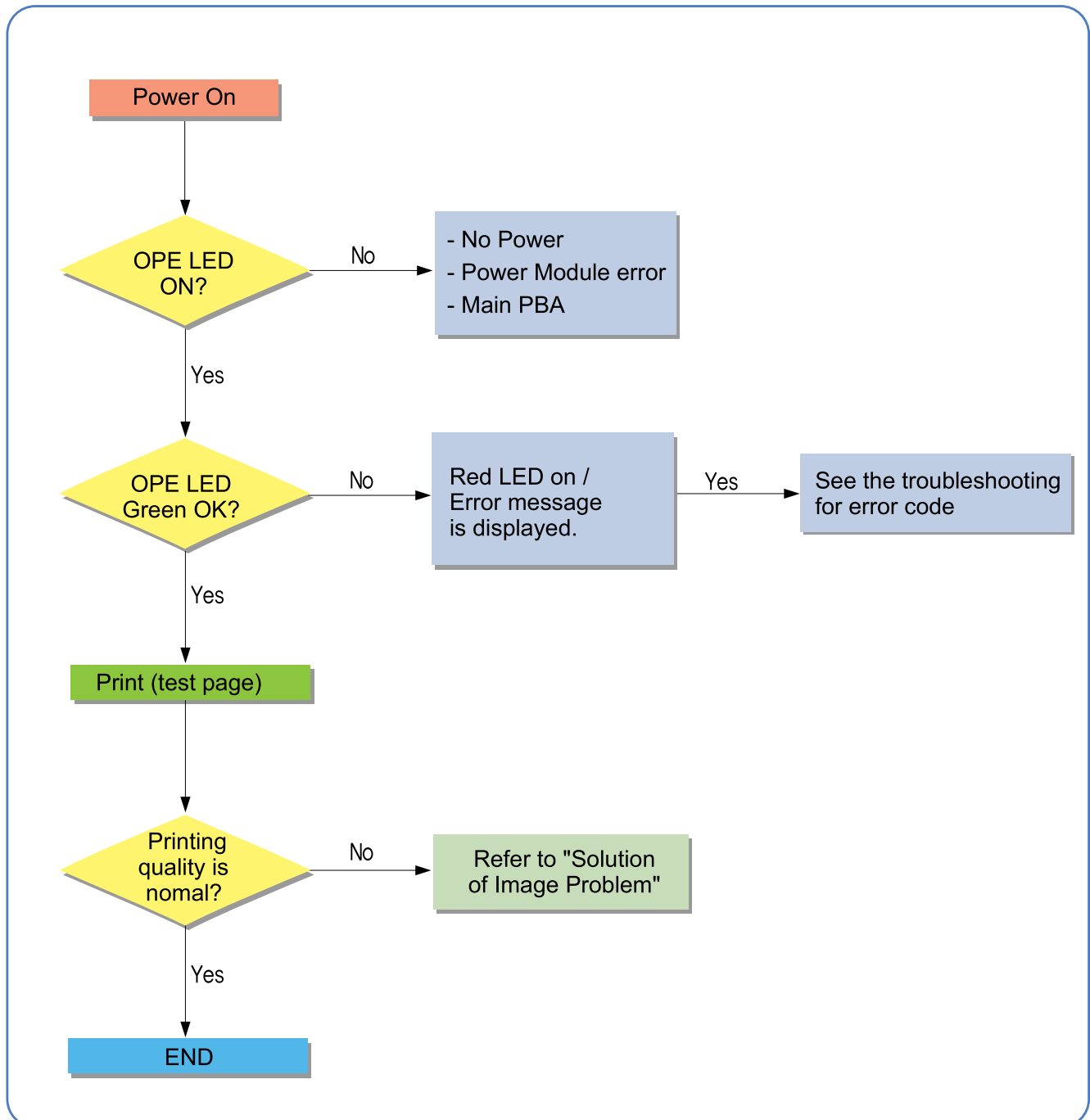
- 7) “Tag Written successfully” message will display. If not, retry the tagging.



4.2. Troubleshooting

4.2.1. Procedure of checking the symptoms

Before attempting to repair the printer first obtain a detailed description of the problem from the customer.



4.2.1.1. Basic Check List

1) Check the Power.

- Check that the power switch is turned on.
- Check that the power cable is plugged into the outlet and the printer.
- Check the voltage of the power outlet.

2) Check the LED of Panel.

- Is there OPE LED ON?
 - › If not check power cable, switch SMPS or Main board.
- Is the Lamp abnormal?
 - › Check the Main board and cable harness.

3) Check the Paper Path

- Is there a Paper Jam?
 - › Remove any paper fragments caught in the paper path.
- Paper Jam occurs repeatedly at a specific point in the Paper Path
 - › Open the fuser cover, Jam clear.
 - › Dismantle the machine and carefully inspect the region where the jam occurs.
(Especially, check if paper fragments are caught in the Fuser)

4) Print the Information Page (Configuration).

- Try printing a test page from a computer.
 - › If there is an error check cables and driver installation.

5) Check the Print Quality.

- Is there are a Print Quality Problem?
 - › Refer to image quality problem section.

6) Check consumables (toner etc.).

- Using the keys print the Test Pattern.
 - › Expected life of various consumable parts, compare this with the figures printed and replace as required

4.2.2. Error Code and Troubleshooting

Messages appear on the control panel display to indicate the machine's status or errors. Refer to the tables below to understand the messages' and their meaning, and correct the problem, if necessary.


NOTE

Some messages may not appear on the display depending on the options or models.

Error Code	Error Message	Troubleshooting Page
11-2T01	Tray Paper Mismatch	P.4-36
A1-1110	Error: #A1-1110 Turn off then on	P.4-36
A3-2210	ID Control Fail Check CTD Sensor	P.4-37
A3-3312	Error: #A3-3312 Turn off then on	P.4-38
A3-6110	Error: #A3-6110 Turn off then on	P.4-39
C1-2110	Prepare Toner	P.4-40
C1-2120	Replace Toner	P.4-40
C1-2150	Replace Toner	P.4-40
C1-2160	Replace Toner	P.4-40
C1-2411	Install toner	P.4-40
C1-2512	Not compatible Yellow toner	P.4-41
C1-2711	Error: #C1-2711 Call for Service	P.4-41
C1-2712	Error: #C1-2712 Call for Service	P.4-41
C1-3110	Prepare Toner	P.4-40
C1-3120	Replace Toner	P.4-40
C1-3150	Replace Toner	P.4-40
C1-3160	Replace Toner	P.4-40
C1-3411	Install Toner	P.4-40
C1-3512	Not compatible magenta toner	P.4-41
C1-3711	Error: #C1-3711 Call for Service	P.4-41
C1-3712	Error: #C1-3712 Call for Service	P.4-41
C1-4110	Prepare Toner	P.4-40
C1-4120	Replace Toner	P.4-40
C1-4150	Replace Toner	P.4-40
C1-4160	Replace Toner	P.4-40
C1-4411	Install toner	P.4-40
C1-4512	Not compatible cyan toner	P.4-41
C1-4711	Error: #C1-4711 Call for Service	P.4-41
C1-4712	Error: #C1-4712 Call for Service	P.4-41
C1-5110	Prepare Toner	P.4-40
C1-5120	Replace Toner	P.4-40
C1-5150	Replace Toner	P.4-40
C1-5160	Replace Toner	P.4-40
C1-5411	Install Toner	P.4-40

Error Code	Error Message	Troubleshooting Page
C1-5512	Not compatible Black toner	P.4-41
C1-5711	Error: #C1-5711 Call for Service	P.4-41
C1-5712	Error: #C1-5712 Call for Service	P.4-41
C3-6110	Prepare new Imaging unit	P.4-42
C3-6120	Replace with new imaging unit	P.4-42
C3-6140	Replace with new imaging unit	P.4-42
C3-6520	Error: #C3-6520 Door open/close	P.4-43
C5-1110	Prepare new Transfer belt	P.4-43
C5-1120	Replace new Transfer belt	P.4-43
C5-1710	Transfer Belt Error	P.4-43
C5-3110	Prepare new transfer roller	P.4-44
C5-3120	Replace new transfer roller	P.4-44
C6-1110	Prepare Fuser Soon	P.4-44
C6-1120	Replace new Fuser unit	P.4-44
C7-1131	Replace/Install Waste Toner Tank	P.4-44
M1-1013	Paper Jam in tray	P.4-45
M1-5012	Paper Empty in tray	P.4-46
M1-5013	Paper Empty in tray	P.4-46
M2-1210	Paper Jam in tray	P.4-45
M3-1110	Paper jam in exit area	P.4-46
M3-1112	Paper jam inside machine	P.4-46
M3-2130	Output bin full Remove paper	P.4-46
S1-5221	Install wireless NIC	P.4-47
S2-4110	Door open Close it	P.4-47
S2-4612	Scan Unit Open or Exit JAM	P.4-47
S3-3122	Scanner Locked	P.4-48
S4-3140	Error: #S4-3140 Call for service	P.4-48
S6-3113	Error: #S6-3113 Call for service	P.4-48
S6-3123	Network Problem : IP Conflict	P.4-49
S6-3231	Not found Wireless network	P.4-49
S6-3232	Not Correct Wireless setting	P.4-49
S6-3233	Not connect Wireless AP	P.4-50
S6-3234	Fail connection to WPS	P.4-50
S6-3235	Wi-Fi Direct is not ready	P.4-50
S6-3236	Wi-Fi Direct is not connect	P.4-50
U1-2320	Error: #U1-2320 Turn off then on	P.4-51
U1-2330	Error: #U1-2330 Turn off then on	P.4-55
U1-2340	Error: #U1-2340 Turn off then on	P.4-59
U2-6120	Error #U2-6120 Turn off then on	P.4-64
U2-6140	Error #U2-6140 Turn off then on	P.4-64

Error Code	Error Message	Troubleshooting Page
U3-3313	Document jam. Remove jam	P.4-65
U3-3314	Document jam. Remove jam	P.4-65
U3-4110	Door of scanner is open	P.4-65

► Error Code**11-2T01****► Error message****Tray paper mismatch****► Symptom**

Paper in tray is not matched to the machine paper setting.

► Troubleshooting method

- 1) Check and change the paper setting of the corresponding tray properly.

► Error Code**A1-1110****► Error message****Error #A1-1110 Turn off then on****► Symptom**

The main motor does not operate.

► Troubleshooting method

- 1) Turn the machine off then on. If the error persists, turn the machine off again.
- 2) Remove the rear and right cover.
- 3) Check if the connection between main board and main motor are correct. If the connection is OK, replace the main motor.



- 4) If the problem persists, replace the main board.

► **Error Code**

A3-2210

► **Error message**

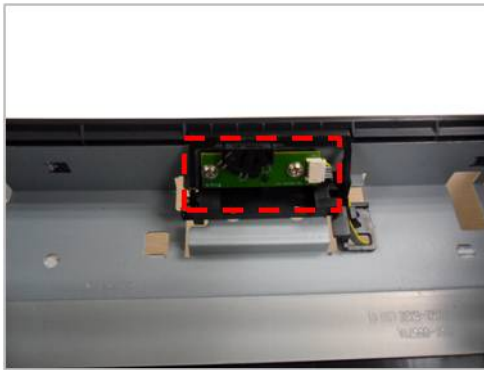
ID Control Fail Check CTD Sensor

► **Symptom**

CTD sensor is defective.

► **Troubleshooting method**

- 1) Turn the machine off then on. If the error persists, turn the machine off again.
- 2) Remove the all toner cartridges and imaging unit.
- 3) Check if the CTD sensor connector is connected correctly. If the sensor connection is OK, replace the CTD board.

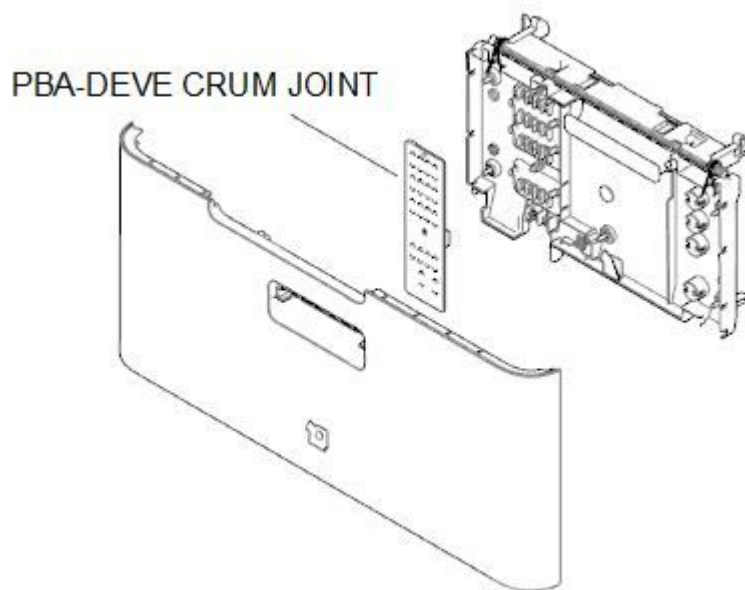


► Error Code**A3-3312****► Error message****Error: #A3-3312 Turn off then on****► Symptom**

The outer temperature sensor is defective.

► Troubleshooting method

- 1) Turn the machine off then on. If the error persists, turn the machine off again.
- 2) Remove the front cover.
- 3) Replace the PBA-DEVE CRUM JOINT.



► **Error Code**

A3-6110

► **Error message**

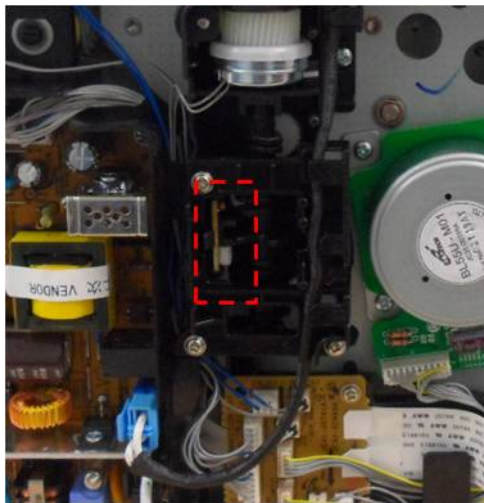
Error #A3-6110 Turn off then on

► **Symptom**

The Deve Home sensor is defective.

► **Troubleshooting method**

- 1) Turn the machine off then on. If the error persists, turn the machine off again.
- 2) Remove the right cover.
- 3) Check if the Deve home sensor connector is connected correctly.



- 4) If the sensor is defective, replace it.

► Error Code

C1-2110

C1-3110

C1-4110

C1-5110

► Error message

Prepare Toner

► Symptom

The remaining toner cartridge is low status.

► Troubleshooting method

- 1) Print the supply information report. Check the life remaining of the toner cartridge.
- 2) If its life is at the end, turn the machine off and replace the toner cartridge with new one.

► Error Code

C1-2120 / 2150 / 2160

C1-3120 / 3150 / 3160

C1-4120 / 4150 / 4160

C1-5120 / 5150 / 5160

► Error message

Replace Toner

► Symptom

The toner cartridge is at the end of its life.

► Troubleshooting method

- 1) Turn the machine off and replace the toner cartridge with new one.

► Error Code

C1-2411

C1-3411

C1-4411

C1-5411

► Error message

Install toner

► Symptom

The toner cartridge is not installed or the CRUM has some problem.

► Troubleshooting method

- 1) Check if the toner cartridge is installed properly. Turn the machine off then on.
- 2) If the error message is not disappear, remove the toner cartridge. Thoroughly roll the cartridge five or six times to distribute the toner evenly inside the cartridge. And reinstall the toner cartridge.
- 3) If the problem persists, check that the CRUM contact area is contaminated. Clean it.
- 4) If the problem persists, replace the toner cartridge with new one.

► **Error Code**

C1-2512

C1-3512

C1-4512

C1-5512

► **Error message**

Not compatible Yellow toner

Not compatible Magenta toner

Not compatible Cyan toner

Not compatible Black toner

► **Symptom**

Toner cartridge is not compatible.

► **Troubleshooting method**

- 1) If the toner cartridge is not a Samsung genuine toner cartridge, replace with new one.

► **Error Code**

C1-2711

C1-2712

C1-3711

C1-3712

C1-4711

C1-4712

C1-5711

C1-5712

► **Error message**

Error: #C1-2711 Call for Service

Error: #C1-2712 Call for Service

Error: #C1-3711 Call for Service

Error: #C1-3712 Call for Service

Error: #C1-4711 Call for Service

Error: #C1-4712 Call for Service

Error: #C1-5711 Call for Service

Error: #C1-5712 Call for Service

► **Symptom**

CRUM chip of the toner cartridge is defective.

► **Troubleshooting method**

- 1) Check if the toner cartridge is installed properly. Turn the machine off then on.
- 2) If the problem persists, check that the CRUM contact area is contaminated. Clean it.
- 3) If the problem persists, replace the toner cartridge with new one.

► **Error Code**

C3-6110

C3-6130

C3-6140

► **Error message**

Prepare new Imaging unit

Replace with new imaging unit

► **Symptom**

The imaging unit is low status (C3-6110) or at the end of its life (C3-6130/6140).

► **Troubleshooting method**

- 1) If its life is at the end, turn the machine off and replace the imaging unit with new one.

► **Error Code**

C3-6520

► **Error message**

Error: #C3-6520 Door open/close

► **Symptom**

The imaging unit is not compatible.

► **Troubleshooting method**

- 1) Open and close the front cover.
- 2) Turn the machine off then on. If the error persists, turn the machine off again.
- 3) Check if the imaging unit is installed.
- 4) Remove and reinstall it.
- 5) If the problem persists, replace the imaging unit with new one.

► **Error Code**

C5-1110

C5-1120

► **Error message**

Prepare new Transfer belt

Replace new Transfer belt

► **Symptom**

The ITB Unit is low or at the end of its life.

► **Troubleshooting method**

- 1) If its life is at the end, turn the machine off and replace the ITB unit with new one.

► **Error Code**

C5-1710

► **Error message**

Transfer Belt Error

► **Symptom**

The ITB home sensor is defective.

► **Troubleshooting method**

- 1) Turn the machine off then on. If the error persists, turn the machine off again.
- 2) Remove and reinstall the ITB unit.
- 3) Check if the ITB home sensor connector is connected correctly.
- 4) If the problem persists, replace the ITB unit.

► Error Code

C5-3110

C5-3120

► Error message

Prepare new Transfer roller

Replace new Transfer roller

► Symptom

The transfer roller is at the end of its life.

► Troubleshooting method

- 1) If its life is at the end, turn the machine off and replace the transfer roller Assy with new one.

► Error Code

C6-1110

C6-1120

► Error message

Prepare new fuser unit.

Replace with new fuser unit.

► Symptom

The fuser unit is at the end of its life.

► Troubleshooting method

- 1) Print the supply information report. Check the life remaining of the fuser unit.
- 2) If its life is at the end, turn the machine off and replace the fuser unit with new one.

► Error Code

C7-1311

► Error message

Waste toner container is not installed. Install it.

► Symptom

The waste toner container is not installed

► Troubleshooting method

- 1) Check if the waste toner container is installed properly.
- 2) Remove and reinstall the waste toner container.

► **Error Code**

M1-1013

M2-1210

► **Error message**

Paper Jam in Tray1

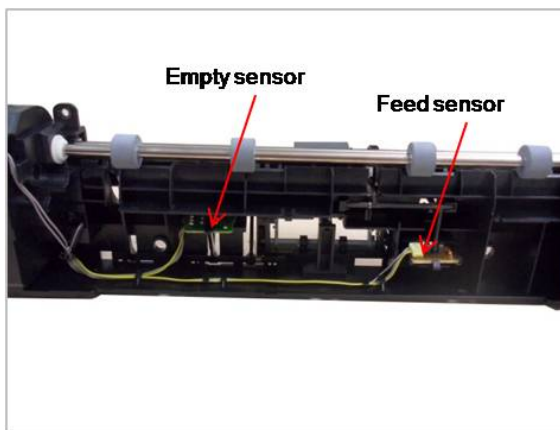
Paper Jam inside machine

► **Symptom**

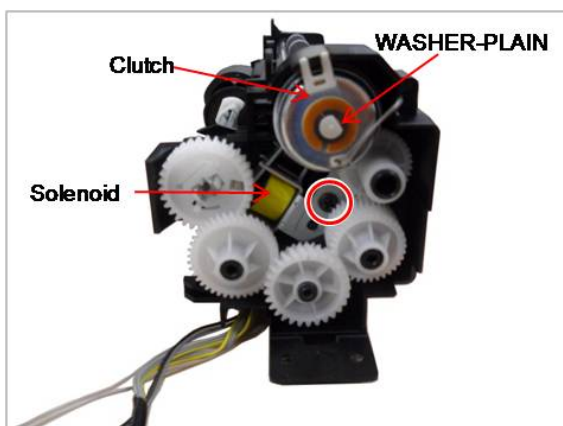
The jammed paper has occurred in the tray1 or inside the machine.

► **Troubleshooting method**

- 1) Remove the jammed paper.
- 2) If the jammed paper occurs continually, check the followings.
 - a) Check if the pick up roller are worn out or contaminated. Clean the contaminated part or replace it.
 - b) Check if the feed actuator or feed sensor is assembled correctly.



- 3) If the pick up solenoid is defective, replace it.



► Error Code

M1-5012 / M1-5013

► Error message

Paper Empty in Tray

► Symptom

Paper is empty in tray.

► Troubleshooting method

- 1) Remove the cassette. Check if the paper is loaded in tray.
- 2) Check if the paper empty sensor is contaminated or defective. Replace it.

► Error Code

M3-1110 / M3-1112

► Error message

Paper jam in exit area.

► Symptom

The jammed paper has occurred in the exit area.

► Troubleshooting method

- 1) Remove the jammed paper.
- 2) If the problem persists, check the following.
 - a) Check if there is any obstacles or paper on the paper path. Remove it.
 - b) Check if the fuser unit is assembled properly. If the fuser unit is defective, replace it.

► Error Code

M3-2130

► Error message

Output bin full Remove paper

► Symptom

The machine detected that the output tray has got full or the bin-full sensor is defective.

► Troubleshooting method

- 1) Remove the paper on the output tray.
- 2) Check if the Bin-full Sensor connector is connected properly. Reconnect it.
- 3) If the sensor is defective, replace it.

► **Error Code**

S1-5221

► **Error message**

Wireless Network Error

► **Symptom**

Communication Error with wireless NIC has occurred.

► **Troubleshooting method**

- 1) Check if the wireless cable is connected correctly.
- 2) If the error persists, replace the wireless board.

► **Error Code**

S2-4110

► **Error message**

Door is open. Close it.

► **Symptom**

Door is open or the cover open switch is defective.

► **Troubleshooting method**

- 1) Check if the front cover is closed perfectly.
- 2) If the error persists, check that the cover-open sensor is working normally. If it is defective, replace it.

► **Error Code**

S2-4612

► **Error message**

Scan Unit Open or Exit JAM

► **Symptom**

Scanner is opened or exit jam has occurred.

► **Troubleshooting method**

- 1) Remove the jammed paper from exit area.
- 2) Close the scanner unit.

► Error Code**S3-3122****► Error message****Scanner Locked****► Symptom**

Scanner lock error has occurred. CIS does not move.

► Troubleshooting method

- 1) Check if the CIS unit is moving when power on.
- 2) Check if the cable is connected to the CIS unit properly. Re-connect or replace the cable.
- 3) If the CIS is defective, replace it.
- 4) Check if there is any defective part in the scanner unit. (Gear, Belt, Motor etc.)
- 5) If the problem persists, replace the main board.

► Error Code**S4-3140****► Error message****Error: #S4-3140 Call for service****► Symptom**

Fax modem is defective.

► Troubleshooting method

- 1) Check if the line cable is connected to the fax port correctly.
- 2) If the fax card is defective, replace it with new one.

► Error Code**S6-3113****► Error message****Network Failure: #S6-3113. Turn off then on. Call for service if the problem persists****► Symptom**

Network PHY chip is defective.

► Troubleshooting method

- 1) Replace the main board.

▶ **Error Code**

S6-3123

▶ **Error message**

This IP address conflicts with that of other system. Check it

▶ **Symptom**

IP address conflicts with that of other system.

▶ **Troubleshooting method**

- 1) Change the machine's IP address.
- 2) Check the setting-up for 802.1x confirmation server.

▶ **Error Code**

S6-3231

▶ **Error message**

Can not find a wireless network. Please check the wireless environment

▶ **Symptom**

The machine can not find the SSID(Service Set Identifier).

▶ **Troubleshooting method**

- 1) Check the setting-up for wireless network.

▶ **Error Code**

S6-3232

▶ **Error message**

Wireless security settings are incorrect. Please change the settings

▶ **Symptom**

Wireless security settings like a WEP/WPA/WPA2 are incorrect.

▶ **Troubleshooting method**

- 1) Turn the machine and AP off then on.
- 2) Change the wireless network settings.

► Error Code**S6-3233****► Error message**

Not connected from the wireless AP. If you do not reconnect automatically, check the wireless settings

► Symptom

Wireless BSSID value is 0 or wireless module is disconnected.

► Troubleshooting method

- 1) Turn the machine and AP off then on.
- 2) Change the wireless network settings.

► Error Code**S6-3234****► Error message**

Failed connection to WPS. Try again or set up other wireless connection

► Symptom

WPS connection to AP is failed.

► Troubleshooting method

- 1) Retry the connection with WPS button.

► Error Code**S6-3235****S6-3236****► Error message**

Wi-Fi Direct is not ready. Turn off then on. Call for service if the problem persists

Failed to connect to Wi-Fi Direct. Turn off your mobile device and turn it on

► Symptom

Wi-Fi Direct library is initialized.

► Troubleshooting method

- 1) Turn the machine off then on.
- 2) Change the wireless network settings. Retry it.

► **Error Code**

U1-2320

► **Error message**

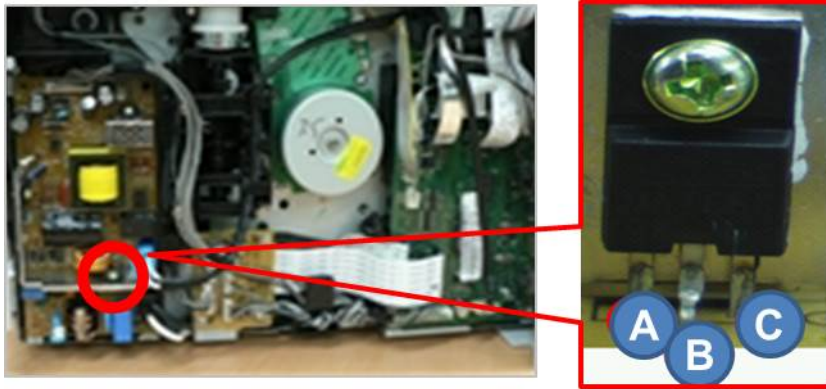
Error: #U1-2320 Turn off then on

► **Symptom**

The temperature control of fuser unit is abnormal. (Open Heat Error)

► **Troubleshooting method**

- 1) Check the harness connection.
 - Check if the related harness like a thermistor harness, fuser motor harness, SMPS harness is connected correctly and defective. Reconnect or replace the harness.
- 2) Check the SMPS TRIAC Short test. If test result is abnormal, replace the SMPS board.
 - a) Check the SMPS Triac resistance for each terminal with DVM.



- Normal Value
 - A-B : 30 M Ω ~ Open (Infinite)
 - A-C : 10 Ω ~ 100 Ω
 - B-C : 30 M Ω ~ Open (Infinite)
 - Abnormal Value
 - A-B : 0 Ω ~ 10 Ω
- 3) Check the main board open test.
 - Check the ADC port operation and H/W protect operation.
 - Thermistor Open test : After unplugging the fuser connector, check if the U1-2320 error occurs. If the error occurs, the main board is normal. If not, replace the main board.

[Fuser Connector]**[CLP-36x / SL-C41x / SL-C43x]****[CLX-330x / SL-C46x / SL-C48x]****[Short Jig Harness]**

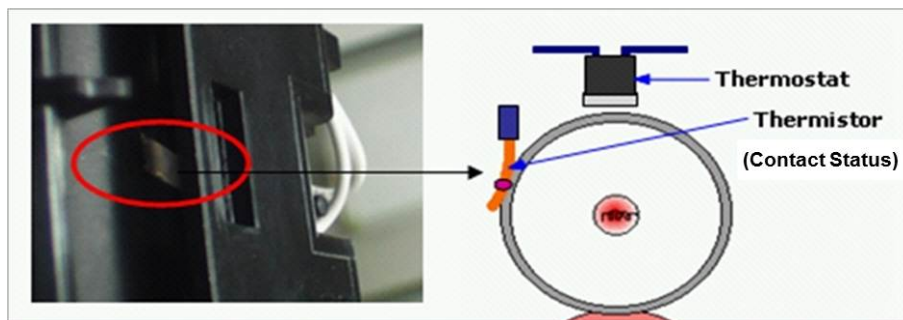
- Thermistor Short test : After unplugging the fuser connector, connect the shrot jig. If the U1-2340 error occurs, the main board is normal. If not, replace the main board.

4) Check the thermostat, thermistor, heater. If the mesured resistance value is abnormal, replace the fuser unit.

- Thermostat test : Measure the resistance for both terminals of the thermostat.
 - Normal : 0 ~ 5 Ω
 - Abnormal : More than 20 M Ω



- Thermistor test
 - a) Check if the thermistor contacts the heat roller.
 - Normal : Contact / Abnormal : Non-Contact



b) Check the thermistor resistance.

- Check the thermistor resistance with DVM. And then, check if the measured value is normal with the table below.



Temperature (°C)	Resistance Range (KΩ)
0 ~ 5	657 ~ 1200
5 ~ 10	539 ~ 965
10 ~ 15	444 ~ 782
15 ~ 20	368 ~ 637
20 ~ 25	307 ~ 522
25 ~ 30	257 ~ 430
30 ~ 35	217 ~ 357
35 ~ 40	183 ~ 297

- Check the Heater.

Check the fuser lamp terminal resistance with DVM. (Normal range : 5 ~ 10 Ω)



- 5) Check if the input voltage is normal.
- 6) If the check item for step 1~5 is normal, replace the fuser unit.

► **Error Code**

U1-2330

► **Error message**

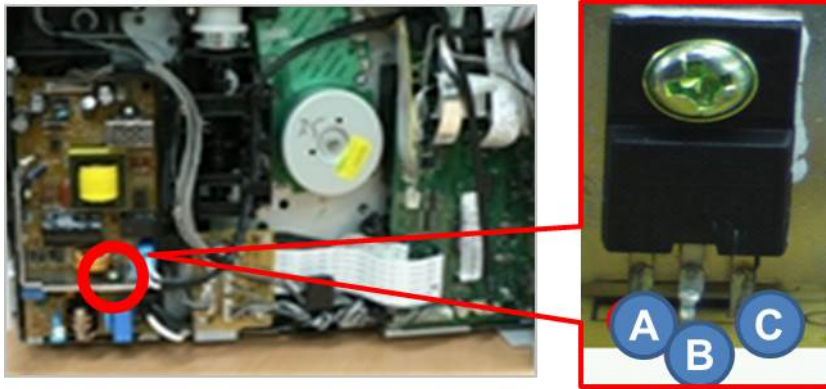
Error: #U1-2330 Turn off then on

► **Symptom**

The temperature control of fuser unit is abnormal. (Low Heat Error)

► **Troubleshooting method**

- 1) Check the harness connection.
 - Check if the related harness like a thermistor harness, fuser motor harness, SMPS harness is connected correctly and defective. Reconnect or replace the harness.
- 2) Check the SMPS TRIAC Short test. If test result is abnormal, replace the SMPS board.
 - a) Check the SMPS Triac resistance for each terminal with DVM.



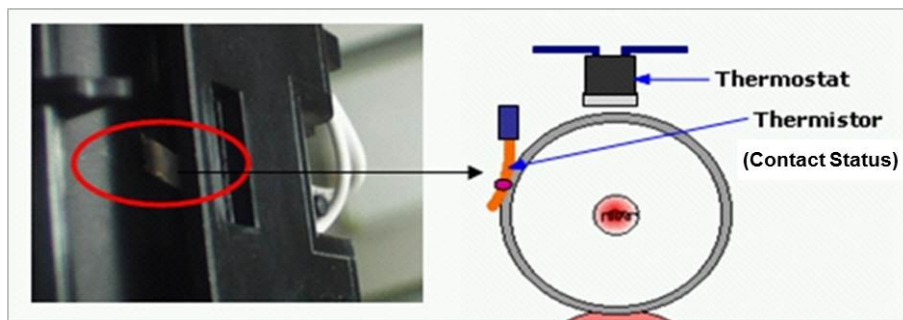
- Normal Value
 - A-B : 30 M Ω ~ Open (Infinite)
 - A-C : 10 Ω ~ 100 Ω
 - B-C : 30 M Ω ~ Open (Infinite)
 - Abnormal Value
 - A-B : 0 Ω ~ 10 Ω
- 3) Check the main board open test.
 - Check the ADC port operation and H/W protect operation.
 - Thermistor Open test : After unplugging the fuser connector, check if the U1-2320 error occurs. If the error occurs, the main board is normal. If not, replace the main board.

[Fuser Connector]**[CLP-36x / SL-C41x / SL-C43x]****[CLX-330x / SL-C46x / SL-C48x]****[Short Jig Harness]**

- Thermistor Short test : After unplugging the fuser connector, connect the shrot jig. If the U1-2340 error occurs, the main board is normal. If not, replace the main board.
- 4) Check the thermostat, thermistor, heater. If the mesured resistance value is abnormal, replace the fuser unit.
- Thermostat test : Measure the resistance for both terminals of the thermostat.
 - Normal : 0 ~ 5 Ω
 - Abnormal : More than 20 M Ω



- Thermistor test
 - a) Check if the thermistor contacts the heat roller.
 - Normal : Contact / Abnormal : Non-Contact



b) Check the thermistor resistance.

- Check the thermistor resistance with DVM. And then, check if the measured value is normal with the table below.



Temperature (°C)	Resistance Range (KΩ)
0 ~ 5	657 ~ 1200
5 ~ 10	539 ~ 965
10 ~ 15	444 ~ 782
15 ~ 20	368 ~ 637
20 ~ 25	307 ~ 522
25 ~ 30	257 ~ 430
30 ~ 35	217 ~ 357
35 ~ 40	183 ~ 297

- Check the Heater.

Check the fuser lamp terminal resistance with DVM. (Normal range : 5 ~ 10 Ω)



- 5) Check if the input voltage is normal.
- 6) If the check item for step 1~5 is normal, replace the fuser unit.

► **Error Code**

U1-2340

► **Error message**

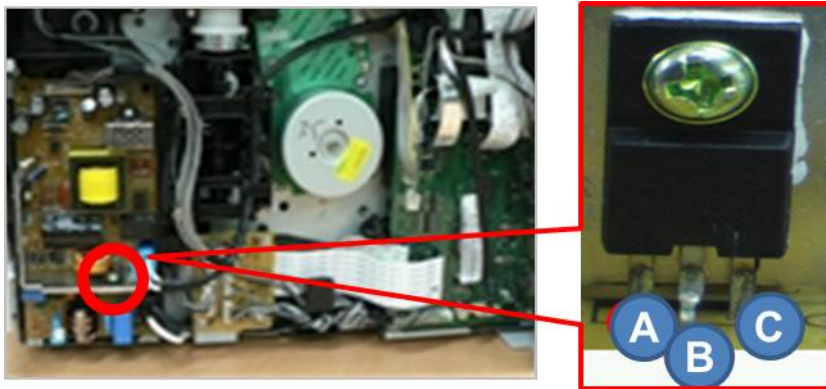
Error #U1-2340 Turn off then on

► **Symptom**

The temperature control of fuser unit is abnormal. (Over Heat Error)

► **Troubleshooting method**

- 1) Check the harness connection.
 - Check if the related harness like a thermistor harness, fuser motor harness, SMPS harness is connected correctly and defective. Reconnect or replace the harness.
- 2) Check the SMPS TRIAC Short test. If test result is abnormal, replace the SMPS board.
 - a) Check the SMPS Triac resistance for each terminal with DVM.



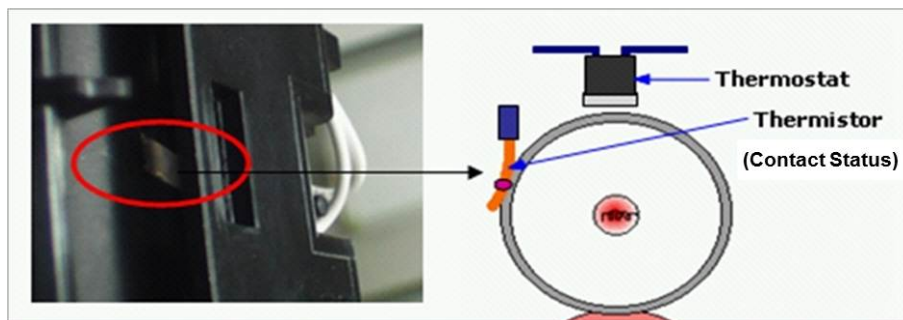
- Normal Value
 - A-B : 30 M Ω ~ Open (Infinite)
 - A-C : 10 Ω ~ 100 Ω
 - B-C : 30 M Ω ~ Open (Infinite)
 - Abnormal Value
 - A-B : 0 Ω ~ 10 Ω
- 3) Check the main board open test.
 - Check the ADC port operation and H/W protect operation.
 - Thermistor Open test : After unplugging the fuser connector, check if the U1-2320 error occurs. If the error occurs, the main board is normal. If not, replace the main board.

[Fuser Connector]**[CLP-36x / SL-C41x / SL-C43x]****[CLX-330x / SL-C46x / SL-C48x]****[Short Jig Harness]**

- Thermistor Short test : After unplugging the fuser connector, connect the shrot jig. If the U1-2340 error occurs, the main board is normal. If not, replace the main board.
- 4) Check the thermostat, thermistor, heater. If the mesured resistance value is abnormal, replace the fuser unit.
- Thermostat test : Measure the resistance for both terminals of the thermostat.
 - Normal : 0 ~ 5 Ω
 - Abnormal : More than 20 M Ω



- Thermistor test
 - a) Check if the thermistor contacts the heat roller.
 - Normal : Contact / Abnormal : Non-Contact



b) Check the thermistor resistance.

- Check the thermistor resistance with DVM. And then, check if the measured value is normal with the table below.



Temperature (°C)	Resistance Range (KΩ)
0 ~ 5	657 ~ 1200
5 ~ 10	539 ~ 965
10 ~ 15	444 ~ 782
15 ~ 20	368 ~ 637
20 ~ 25	307 ~ 522
25 ~ 30	257 ~ 430
30 ~ 35	217 ~ 357
35 ~ 40	183 ~ 297

- Check the Heater.

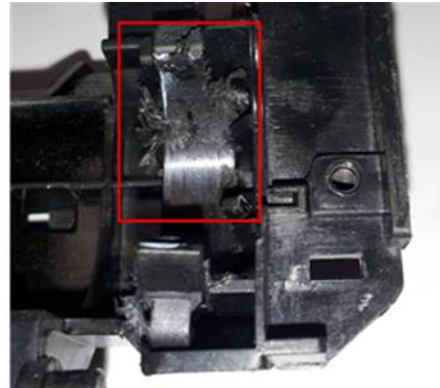
Check the fuser lamp terminal resistance with DVM. (Normal range : 5 ~ 10 Ω)



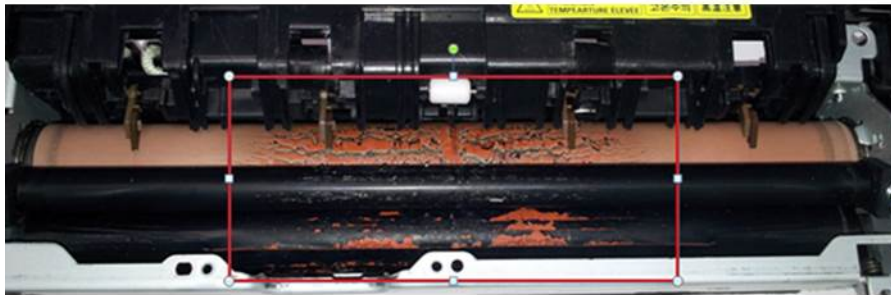
- Check if the fuser is melted.
 - Procedure
 - a) Remove the fuser unit from the set.
 - b) Check if the fuser gear, bush, roller are melted. If yes, replace the fuser unit.



[Gear Melted]

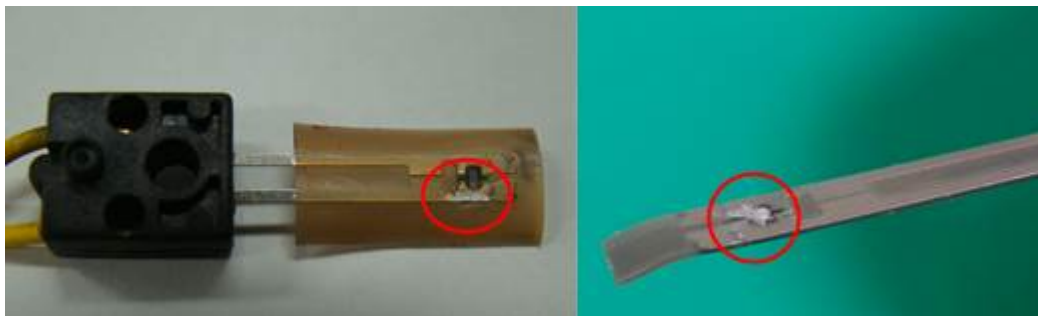


[Bush Melted]



[Roller Melted]

- If the fuser is melted but the thermostat, thermistor, and heater are normal, check the surface of the thermistor.



- a) If the surface of the thermistor is defective, replace the fuser unit.
 - b) If the surface of the thermistor is normal, replace the fuser unit, SMPS board, and main board all together.
- 5) Check if the input voltage is normal.
- 6) If the check item for step 1~5 is normal, replace the fuser unit.

► **Error Code**

U2-6120

U2-6140

► **Error message**

Error #U2-6120 Turn off then on

Error #U2-6140 Turn off then on

► **Symptom**

LSU Motor does not work normally. / LSU Hsync signal is abnormal.

► **Troubleshooting method**

- 1) Check if the LSU harness on the main board is connected properly.
- 2) If it is OK, check that the LSU harness on LSU board is connected properly.
- 3) Check if the LSU harness is defective.
- 4) If the problem persists, replace the LSU.



- 5) If the problem persists after replacing LSU, replace the main board.

► Error Code

U3-3313

U3-3314

► Error message

Document jam. Remove jam

► Symptom

A document jam was detected in the ADF unit.

► Troubleshooting method

- 1) Remove the jammed paper from ADF unit.
- 2) If the error persists, turn the machine off then on.
- 3) If the document jam occurs continually, open the ADF cover-top. Check if the ADF pick up roller is contaminated or worn out. Clean or replace it.
- 4) If the pick up roller is OK, check the followings.
 - a) Check if the ADF motor is working normally.
 - b) Check if the connector on the ADF joint board is connected correctly.
- 5) If the problem persists, replace the ADF unit.

► Error Code

U3-4110

► Error message

Door of scanner is open.

► Symptom

ADF cover is opened.

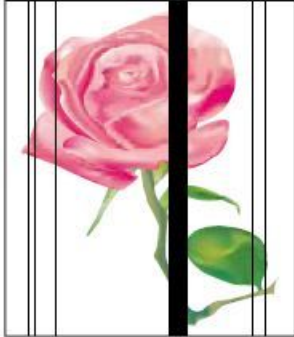
► Troubleshooting method

- 1) Close the ADF cover.

4.2.3. Image quality problems

1) Vertical Black Line and Band

- Description : Straight thin black vertical line occurs in the printed image.



Cause and Check Point	Solution
Check if the surface of the charge roller is scratched or contaminated.	Replace the imaging unit and test again.
Check if there are grooves on the circumference of the OPC drum.	Replace the imaging unit and test again.
Check if the cleaning blade is damaged	Replace the imaging unit and test again.
Check if paper transfer belt is damaged or contaminated.	Replace the ITB unit and test again.

2) Vertical White Line

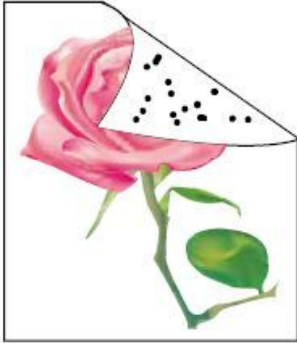
- Description : White vertical voids in the image.



Cause and Check Point	Solution
Check if the LSU window or internal lenses of LSU is contaminated.	Clean the LSU window with recommended cleaner(IPA). Clean the window with a clean cotton swab. If dirt is inside the LSU, replace the LSU.
Check if there are scratches on the circumference of the OPC drum.	Replace the imaging unit and test again.
Check if there are scratches on the circumference of the developing roller.	Replace the corresponding toner cartridge and test again.
Check if paper transfer belt is damaged or contaminated.	Replace the ITB unit and test again.

3) Contamination on back of page

- Description : The back of the page is contaminated.



Cause and Check Point	Solution
Dirty registration roller, pressure roller, feed roller, etc. Any dirty rollers through the path of the paper.	Identify the roller which may cause the problem by comparing the period of the contamination on images with the size of rollers. Clean any dirt from the roller or replace the dirty roller.
Check if the transfer roller is damaged or contaminated.	Replace the transfer roller and test again.
Check if paper transfer belt is damaged or contaminated.	Replace the ITB unit and test again.

4) Dark or Black image

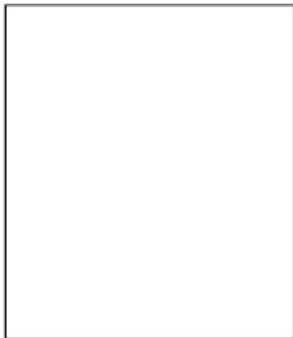
- Description : The black page is printed out.



Cause and Check Point	Solution
No charging voltage in the HVPS.	Check the connecting state between the Main PBA and HVPS. Reconnect the harness.
Poor contact between toner cartridge and set contacts.	Clean the contacts as necessary. Replace any deformed or damaged contacts.
HVPS is defective.	Replace the HVPS.

5) Blank Page

- Description : Blank page is printed.



Cause and Check Point	Solution
Bad contacts from OPC drum and/or toner cartridge to ground.	Check the terminal of Ground-OPC.
Not working the LSU.	Check the connector of LSU.
Not working the developing bias voltage on HVPS.	Replace the HVPS.

6) Uneven Density

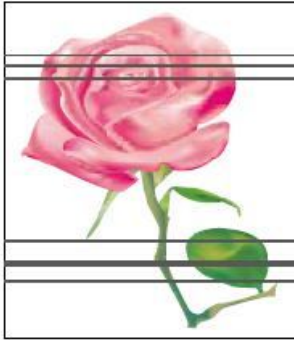
- Description : Print Density is uneven between left and right.



Cause and Check Point	Solution
The life of the Toner Cartridge has expired.	Replace the toner cartridge.
The pressure force in the left and right springs of the ITB unit is not even.	Replace the ITB Unit

7) Horizontal Bands

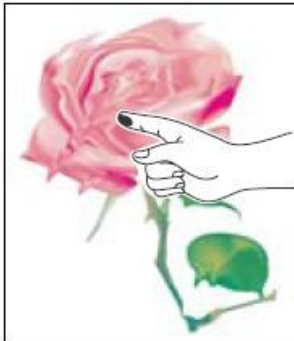
- Description : Dark or white horizontal stripes appear in the page. (These may occur at regular intervals down the page.)



Cause and Check Point	Solution
The developing roller, OPC drum or other rollers in the toner cartridge and imaging unit may be contaminated or deformed.	Replace the toner cartridge or imaging unit.
Bad contacts of HV terminals of the toner cartridge with high voltage terminals from printer set.	Clean all HV terminals in the cartridge and on the set frame. Ensure all toner or paper dust, particles are removed.

8) Poor Fusing

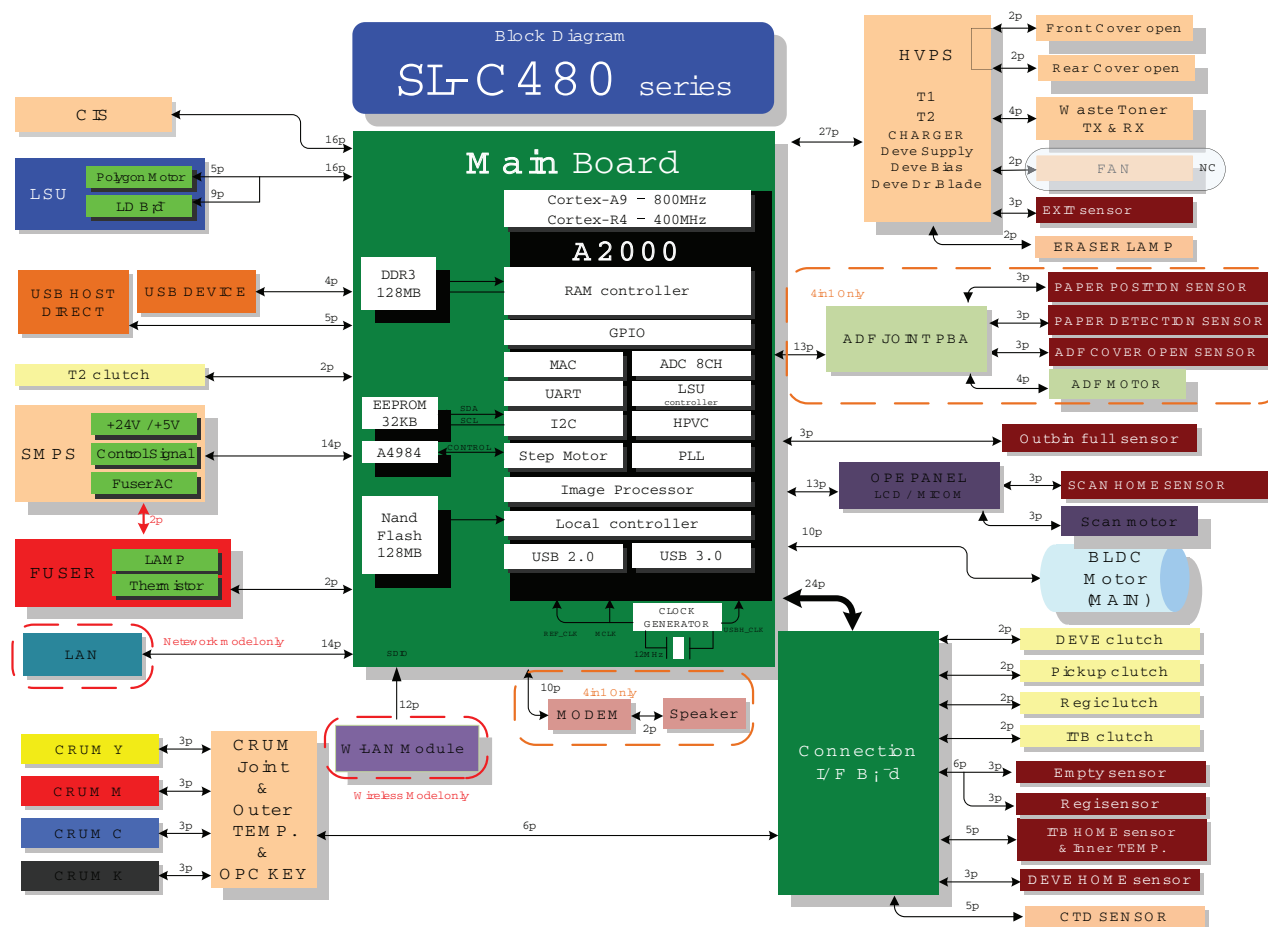
- Description : Toner is not properly fixed on paper.



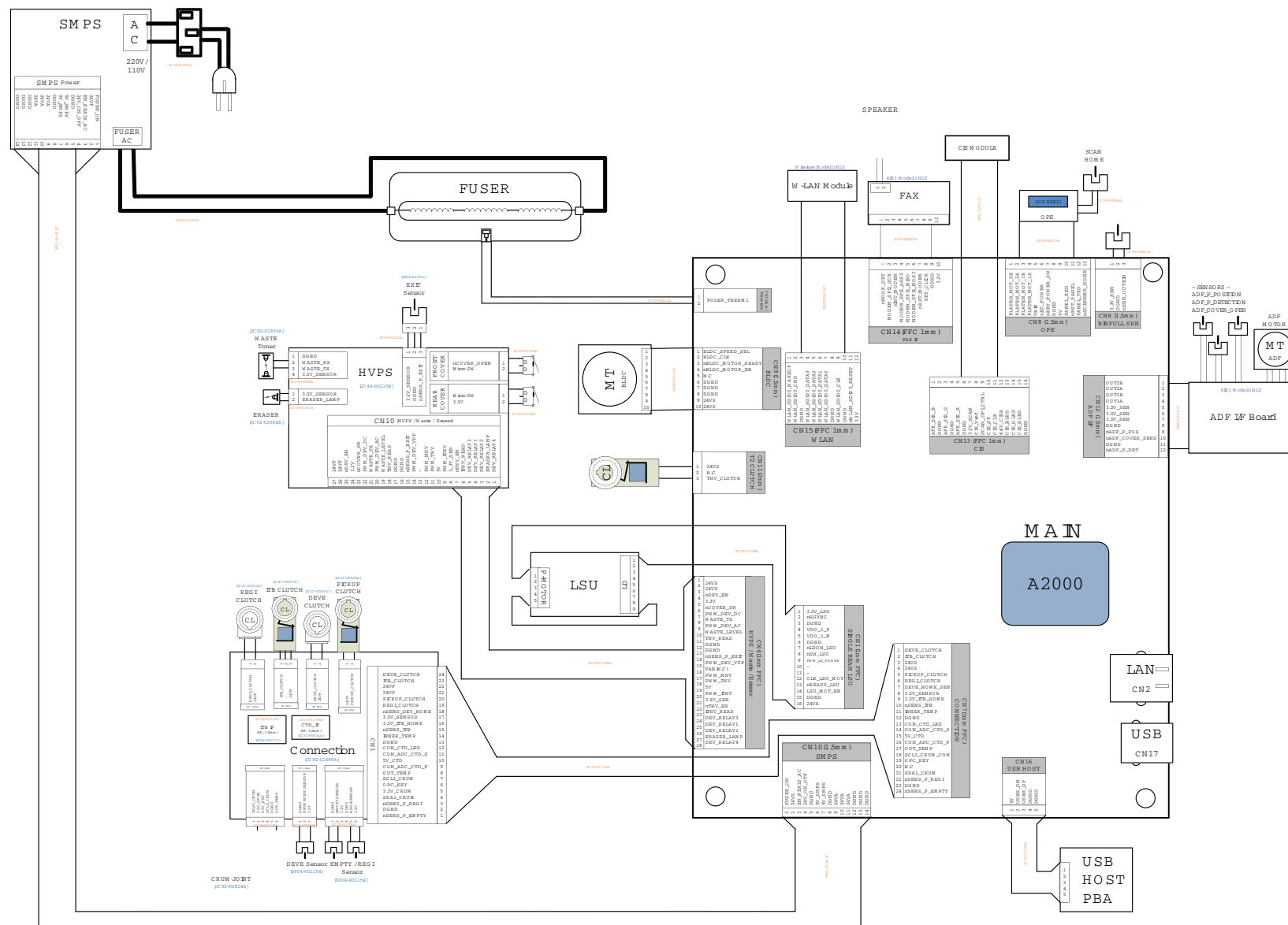
Cause and Check Point	Solution
The media doesn't meet specification	Use the proper media in specifications.
Fuser is defective	Replace the fuser unit.

5. System Diagram

5.1. Block Diagram



5.2. Connection Diagram

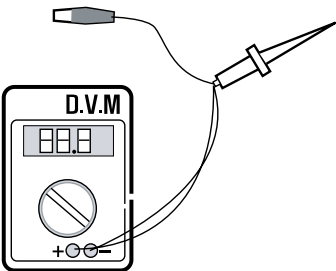
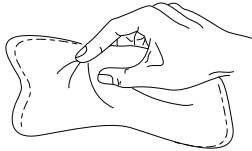
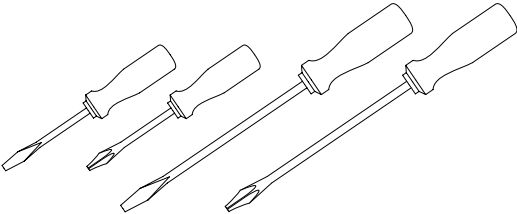
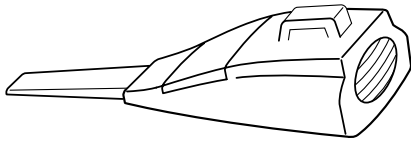



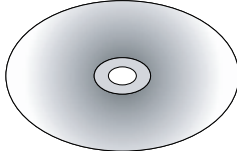


6. Reference Information

This chapter contains the tools list, list of abbreviations used in this manual, and a guide to the location space required when installing the printer. A definition of test pages and Wireless Network information definition is also included.

6.1. Tool for Troubleshooting

The following tools are recommended safe and easy troubleshooting as described in this service manual.

<p>DVM (Digital Volt Meter) Standard : Indicates more than 3 digits.</p> 	<p>Cleaning Equipments Standard : An IPA (Isopropyl Alcohol) dry wipe tissue or a gentle neutral detergent and lint-free cloth.</p> 
<p>Driver Standard : “-” type, “+” type (M3 long, M3 short, M2 long, M2 short).</p> 	<p>Vacuum Cleaner</p> 
<p>Tweezers Standard : For general home use, small type.</p> 	<p>Spring Hook Standard : For general use</p> 
<p>Cotton Swab Standard : For general home use, for medical service.</p> 	<p>Software (Driver) installation CD ROM</p> 

6.2. Glossary

The following glossary helps you get familiar with the product by understanding the terminologies commonly used with printing as well as mentioned in this user's guide and service manual.

802.11	802.11 is a set of standards for wireless local area network (WLAN) communication, developed by the IEEE LAN/MAN Standards Committee (IEEE 802).
802.11b/g/n	802.11b/g/n can share same hardware and use the 2.4 GHz band. 802.11b supports bandwidth up to 11 Mbps, 802.11n supports bandwidth up to 150 Mbps. 802.11b/g/n devices may occasionally suffer interference from microwave ovens, cordless telephones, and Bluetooth devices.
Access point	Access Point or Wireless Access Point (AP or WAP) is a device that connects wireless communication devices together on wireless local area networks (WLAN), and acts as a central transmitter and receiver of WLAN radio signals.
ADF	An Automatic Document Feeder (ADF) is a scanning unit that will automatically feed an original sheet of paper so that the machine can scan some amount of the paper at once.
AppleTalk	AppleTalk is a proprietary suite of protocols developed by Apple, Inc for computer networking. It was included in the original Macintosh (1984) and is now deprecated by Apple in favor of TCP/IP networking.
BIT Depth	A computer graphics term describing the number of bits used to represent the color of a single pixel in a bitmapped image. Higher color depth gives a broader range of distinct colors. As the number of bits increases, the number of possible colors becomes impractically large for a color map. 1-bit color is commonly called as monochrome or black and white.
BMP	A bitmapped graphics format used internally by the Microsoft Windows graphics subsystem (GDI), and used commonly as a simple graphics file format on that platform.
BOOTP	Bootstrap Protocol. A network protocol used by a network client to obtain its IP address automatically. This is usually done in the bootstrap process of computers or operating systems running on them. The BOOTP servers assign the IP address from a pool of addresses to each client. BOOTP enables 'diskless workstation' computers to obtain an IP address prior to loading any advanced operating system.
CCD	Charge Coupled Device (CCD) is a hardware which enables the scan job. CCD Locking mechanism is also used to hold the CCD module to prevent any damage when you move the machine.
Collation	Collation is a process of printing a multiple-copy job in sets. When collation is selected, the device prints an entire set before printing additional copies.
Control Panel	A control panel is a flat, typically vertical, area where control or monitoring instruments are displayed. They are typically found in front of the machine.
Coverage	It is the printing term used for a toner usage measurement on printing. For example, 5% coverage means that an A4 sided paper has about 5% image or text on it. So, if the paper or original has complicated images or lots of text on it, the coverage will be higher and at the same time, a toner usage will be as much as the coverage.
CSV	Comma Separated Values (CSV). A type of file format, CSV is used to exchange data between disparate applications. The file format, as it is used in Microsoft Excel, has become a de facto standard throughout the industry, even among non-Microsoft platforms.
DADF	A Duplex Automatic Document Feeder (DADF) is a scanning unit that will automatically feed and turn over an original sheet of paper so that the machine can scan on both sides of the paper.
Default	The value or setting that is in effect when taking a printer out of its box state, reset, or initialized.
DHCP	A Dynamic Host Configuration Protocol (DHCP) is a client-server networking protocol. A DHCP server provides configuration parameters specific to the DHCP client host requesting, generally, information required by the client host to participate on an IP network. DHCP also provides a mechanism for allocation of IP addresses to client hosts.
DIMM	Dual Inline Memory Module (DIMM), a small circuit board that holds memory. DIMM stores all the data within the machine like printing data, received fax data.

DLNA	The Digital Living Network Alliance (DLNA) is a standard that allows devices on a home network to share information with each other across the network.
DNS	The Domain Name Server (DNS) is a system that stores information associated with domain names in a distributed database on networks, such as the Internet.
Dot Matrix Printer	A dot matrix printer refers to a type of computer printer with a print head that runs back and forth on the page and prints by impact, striking an ink-soaked cloth ribbon against the paper, much like a typewriter.
DPI	Dots Per Inch (DPI) is a measurement of resolution that is used for scanning and printing. Generally, higher DPI results in a higher resolution, more visible detail in the image, and a larger file size.
DRPD	Distinctive Ring Pattern Detection. Distinctive Ring is a telephone company service which enables a user to use a single telephone line to answer several different telephone numbers.
Duplex	A mechanism that will automatically turn over a sheet of paper so that the machine can print (or scan) on both sides of the paper. A printer equipped with a Duplex Unit can print on both sides of paper during one print cycle.
Duty Cycle	Duty cycle is the page quantity which does not affect printer performance for a month. Generally the printer has the lifespan limitation such as pages per year. The lifespan means the average capacity of print-outs, usually within the warranty period. For example, if the duty cycle is 48,000 pages per month assuming 20 working days, a printer limits 2,400 pages a day.
ECM	Error Correction Mode (ECM) is an optional transmission mode built into Class 1 fax machines or fax modems. It automatically detects and corrects errors in the fax transmission process that are sometimes caused by telephone line noise.
Emulation	Emulation is a technique of one machine obtaining the same results as another. An emulator duplicates the functions of one system with a different system, so that the second system behaves like the first system. Emulation focuses on exact reproduction of external behavior, which is in contrast to simulation, which concerns an abstract model of the system being simulated, often considering its internal state.
Ethernet	Ethernet is a frame-based computer networking technology for local area networks (LANs). It defines wiring and signaling for the physical layer, and frame formats and protocols for the media access control (MAC)/data link layer of the OSI model. Ethernet is mostly standardized as IEEE 802.3. It has become the most widespread LAN technology in use during the 1990s to the present.
EtherTalk	A suite of protocols developed by Apple Computer for computer networking. It was included in the original Macintosh (1984) and is now deprecated by Apple in favor of TCP/IP networking.
FDI	Foreign Device Interface (FDI) is a card installed inside the machine to allow a third party device such as a coin operated device or a card reader. Those devices allow the pay-for-print service on your machine.
FTP	A File Transfer Protocol (FTP) is a commonly used protocol for exchanging files over any network that supports the TCP/IP protocol (such as the Internet or an intranet).
Fuser Unit	The part of a laser printer that fuses the toner onto the print media. It consists of a heat roller and a pressure roller. After toner is transferred onto the paper, the fuser unit applies heat and pressure to ensure that the toner stays on the paper permanently, which is why paper is warm when it comes out of a laser printer.
Gateway	A connection between computer networks, or between a computer network and a telephone line. It is very popular, as it is a computer or a network that allows access to another computer or network.
Grayscale	A shades of gray that represent light and dark portions of an image when color images are converted to grayscale; colors are represented by various shades of gray.
Halftone	An image type that simulates grayscale by varying the number of dots. Highly colored areas consist of a large number of dots, while lighter areas consist of a smaller number of dots.
HDD	Hard Disk Drive (HDD), commonly referred to as a hard drive or hard disk, is a non-volatile storage device which stores digitally-encoded data on rapidly rotating platters with magnetic surfaces.

IEEE	The Institute of Electrical and Electronics Engineers (IEEE) is an international non-profit, professional organization for the advancement of technology related to electricity.
IEEE 1284	The 1284 parallel port standard was developed by the Institute of Electrical and Electronics Engineers (IEEE). The term "1284-B" refers to a specific connector type on the end of the parallel cable that attaches to the peripheral (for example, a printer).
Intranet	A private network that uses Internet Protocols, network connectivity, and possibly the public telecommunication system to securely share part of an organization's information or operations with its employees. Sometimes the term refers only to the most visible service, the internal website.
IP address	An Internet Protocol (IP) address is a unique number that devices use in order to identify and communicate with each other on a network utilizing the Internet Protocol standard.
IPM	The Images Per Minute (IPM) is a way of measuring the speed of a printer. An IPM rate indicates the number of single-sided sheets a printer can complete within one minute.
IPP	The Internet Printing Protocol (IPP) defines a standard protocol for printing as well as managing print jobs, media size, resolution, and so forth. IPP can be used locally or over the Internet to hundreds of printers, and also supports access control, authentication, and encryption, making it a much more capable and secure printing solution than older ones.
IPX/SPX	IPX/SPX stands for Internet Packet Exchange/Sequenced Packet Exchange. It is a networking protocol used by the Novell NetWare operating systems. IPX and SPX both provide connection services similar to TCP/IP, with the IPX protocol having similarities to IP, and SPX having similarities to TCP. IPX/SPX was primarily designed for local area networks (LANs), and is a very efficient protocol for this purpose (typically its performance exceeds that of TCP/IP on a LAN).
ISO	The International Organization for Standardization (ISO) is an international standard-setting body composed of representatives from national standards bodies. It produces world-wide industrial and commercial standards.
ITU-T	The International Telecommunication Union is an international organization established to standardize and regulate international radio and telecommunications. Its main tasks include standardization, allocation of the radio spectrum, and organizing interconnection arrangements between different countries to allow international phone calls. A -T out of ITU-T indicates telecommunication.
ITU-T No. 1 chart	Standardized test chart published by ITU-T for document facsimile transmissions.
JBIG	Joint Bi-level Image Experts Group (JBIG) is an image compression standard with no loss of accuracy or quality, which was designed for compression of binary images, particularly for faxes, but can also be used on other images.
JPEG	Joint Photographic Experts Group (JPEG) is a most commonly used standard method of lossy compression for photographic images. It is the format used for storing and transmitting photographs on the World Wide Web.
LDAP	The Lightweight Directory Access Protocol (LDAP) is a networking protocol for querying and modifying directory services running over TCP/IP.
LED	A Light-Emitting Diode (LED) is a semiconductor device that indicates the status of a machine.
MAC address	Media Access Control (MAC) address is a unique identifier associated with a network adapter. MAC address is a unique 48-bit identifier usually written as 12 hexadecimal characters grouped in pairs (e. g., 00-00-0c-34-11-4e). This address is usually hard-coded into a Network Interface Card (NIC) by its manufacturer, and used as an aid for routers trying to locate machines on large networks.
MFP	Multi Function Peripheral (MFP) is an office machine that includes the following functionality in one physical body, so as to have a printer, a copier, a fax, a scanner and etc.
MH	Modified Huffman (MH) is a compression method for decreasing the amount of data that needs to be transmitted between the fax machines to transfer the image recommended by ITU-T T.4. MH is a codebook-based run-length encoding scheme optimized to efficiently compress white space. As most faxes consist mostly of white space, this minimizes the transmission time of most faxes.
MMR	Modified Modified READ (MMR) is a compression method recommended by ITU-T T.6.

Modem	A device that modulates a carrier signal to encode digital information, and also demodulates such a carrier signal to decode transmitted information.
MR	Modified Read (MR) is a compression method recommended by ITUT T.4. MR encodes the first scanned line using MH. The next line is compared to the first, the differences determined, and then the differences are encoded and transmitted.
NetWare	A network operating system developed by Novell, Inc. It initially used cooperative multitasking to run various services on a PC, and the network protocols were based on the archetypal Xerox XNS stack. Today NetWare supports TCP/IP as well as IPX/SPX.
OPC	Organic Photo Conductor (OPC) is a mechanism that makes a virtual image for print using a laser beam emitted from a laser printer, and it is usually green or rust colored and has a cylinder shape. An imaging unit containing a drum slowly wears the drum surface by its usage in the printer, and it should be replaced appropriately since it gets worn from contact with the cartridge development brush, cleaning mechanism, and paper.
Originals	The first example of something, such as a document, photograph or text, etc, which is copied, reproduced or translated to produce others, but which is not itself copied or derived from something else.
OSI	Open Systems Interconnection (OSI) is a model developed by the International Organization for Standardization (ISO) for communications. OSI offers a standard, modular approach to network design that divides the required set of complex functions into manageable, self-contained, functional layers. The layers are, from top to bottom, Application, Presentation, Session, Transport, Network, Data Link and Physical.
PABX	A private automatic branch exchange (PABX) is an automatic telephone switching system within a private enterprise.
PCL	Printer Command Language (PCL) is a Page Description Language (PDL) developed by HP as a printer protocol and has become an industry standard. Originally developed for early inkjet printers, PCL has been released in varying levels for thermal, dot matrix printer, and laser printers.
PDF	Portable Document Format (PDF) is a proprietary file format developed by Adobe Systems for representing two dimensional documents in a device independent and resolution independent format.
PostScript(PS)	PostScript (PS) is a page description language and programming language used primarily in the electronic and desktop publishing areas. - that is run in an interpreter to generate an image.
Printer Driver	A program used to send commands and transfer data from the computer to the printer.
Print Media	The media like paper, envelopes, labels, and transparencies which can be used in a printer, a scanner, a fax or, a copier.
PPM	Pages Per Minute (PPM) is a method of measurement for determining how fast a printer works, meaning the number of pages a printer can produce in one minute.
PRN file	An interface for a device driver, this allows software to interact with the device driver using standard input/output system calls, which simplifies many tasks.
Protocol	A convention or standard that controls or enables the connection, communication, and data transfer between two computing endpoints.
PSTN	The Public-Switched Telephone Network (PSTN) is the network of the world's public circuit-switched telephone networks which, on industrial premises, is usually routed through the switchboard.
RADIUS	Remote Authentication Dial In User Service (RADIUS) is a protocol for remote user authentication and accounting. RADIUS enables centralized management of authentication data such as usernames and passwords using an AAA (authentication, authorization, and accounting) concept to manage network access.
Resolution	The sharpness of an image, measured in Dots Per Inch (DPI). The higher the dpi, the greater the resolution.
SMB	Server Message Block (SMB) is a network protocol mainly applied to share files, printers, serial ports, and miscellaneous communications between nodes on a network. It also provides an authenticated Interprocess communication mechanism.

SMTP	Simple Mail Transfer Protocol (SMTP) is the standard for e-mail transmissions across the Internet. SMTP is a relatively simple, text based protocol, where one or more recipients of a message are specified, and then the message text is transferred. It is a client server protocol, where the client transmits an email message to the server.
SSID	Service Set Identifier (SSID) is a name of a wireless local area network (WLAN). All wireless devices in a WLAN use the same SSID in order to communicate with each other. The SSIDs are case-sensitive and have a maximum length of 32 characters.
Subnet Mask	The subnet mask is used in conjunction with the network address to determine which part of the address is the network address and which part is the host address.
TCP/IP	The Transmission Control Protocol (TCP) and the Internet Protocol (IP); the set of communications protocols that implement the protocol stack on which the Internet and most commercial networks run.
TCR	Transmission Confirmation Report (TCR) provides details of each transmission such as job status, transmission result and number of pages sent. This report can be set to print after each job or only after failed transmissions.
TIFF	Tagged Image File Format (TIFF) is a variable-resolution bitmapped image format. TIFF describes image data that typically come from scanners. TIFF images make use of tags, keywords defining the characteristics of the image that is included in the file. This flexible and platform-independent format can be used for pictures that have been made by various image processing applications.
Toner Cartridge	A kind of bottle or container used in a machine like a printer which contains toner. Toner is a powder used in laser printers and photocopiers, which forms the text and images on the printed paper. Toner can be fused by a combination of heat/pressure from the fuser, causing it to bind to the fibers in the paper.
TWAIN	An industry standard for scanners and software. By using a TWAIN-compliant scanner with a TWAIN-compliant program, a scan can be initiated from within the program. It is an image capture API for Microsoft Windows and Apple Macintosh operating systems.
UNC Path	Uniform Naming Convention (UNC) is a standard way to access network shares in Window NT and other Microsoft products. The format of a UNC path is: \\<servername>\<sharename>\<Additional directory>
URL	Uniform Resource Locator (URL) is the global address of documents and resources on the Internet. The first part of the address indicates what protocol to use, the second part specifies the IP address or the domain name where the resource is located.
USB	Universal Serial Bus (USB) is a standard that was developed by the USB Implementers Forum, Inc., to connect computers and peripherals. Unlike the parallel port, USB is designed to concurrently connect a single computer USB port to multiple peripherals.
Watermark	A watermark is a recognizable image or pattern in paper that appears lighter when viewed by transmitted light. Watermarks were first introduced in Bologna, Italy in 1282; they have been used by papermakers to identify their product, and also on postage stamps, currency, and other government documents to discourage counterfeiting.
WEP	Wired Equivalent Privacy (WEP) is a security protocol specified in IEEE 802.11 to provide the same level of security as that of a wired LAN. WEP provides security by encrypting data over radio so that it is protected as it is transmitted from one end point to another.
WIA	Windows Imaging Architecture (WIA) is an imaging architecture that is originally introduced in Windows Me and Windows XP. A scan can be initiated from within these operating systems by using a WIA-compliant scanner.
WPA	Wi-Fi Protected Access (WPA) is a class of systems to secure wireless (Wi-Fi) computer networks, which was created to improve upon the security features of WEP.
WPA-PSK	WPA-PSK (WPA Pre-Shared Key) is special mode of WPA for small business or home users. A shared key, or password, is configured in the wireless access point (WAP) and any wireless laptop or desktop devices. WPA-PSK generates a unique key for each session between a wireless client and the associated WAP for more advanced security.

WPS	The Wi-Fi Protected Setup (WPS) is a standard for establishing a wireless home network. If your wireless access point supports WPS, you can configure the wireless network connection easily without a computer.
XPS	XML Paper Specification (XPS) is a specification for a Page Description Language (PDL) and a new document format, which has benefits for portable document and electronic document, developed by Microsoft. It is an XML-based specification, based on a new print path and a vector-based device-independent document format.

6.3. Document Revision List

Version	Date	Page	Description
1.00	01/Apr/2015	-	Release
1.01	12/Jan/2016	4-51 ~	Update fuser error troubleshooting.



GSPN (GLOBAL SERVICE PARTNER NETWORK)

Area	Web Site
Europe, MENA, CIS, Africa	https://gspn1.samsungcsportal.com
E.Asia, W.Asia, China, Japan	https://gspn2.samsungcsportal.com
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