



Color Laser Printer

CLP-36x series

CLP-36x / 36xW

(Ver 1.01)

SERVICE MANUAL

Color Laser Printer

Contents



1. Precautions
2. Product specification and description
3. Disassembly and Reassembly
4. Alignment and Troubleshooting
5. System Diagram
6. Reference Information

Refer to the service manual in the GSPN (see the rear cover) for more information.

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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 60825-1. 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: 788 nm (-13/ +12)
- Beam divergence
 - Parallel : 8 degrees (-2/ +4)
 - Perpendicular: 31 degrees (-6/ +4)
- 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.



CAUTION - CLASS 3B LASER RADIATION WHEN OPEN
AVOID EXPOSURE TO THE BEAM.
DANGER - LASER RADIATION AVOID DIRECT
EXPOSURE TO BEAM.
DANGER - RADIATIONS INVISIBLES DU LASER EN CAS
D'OUVERTURE. EVITER TOUTE EXPOSITION
DIRECTE AU FAISCEAU
VORSICHT - UNSICHTBARE LASERSTRAHLUNG, WENN
ABDECKUNG GEÖFFNET.
NICHT DEM STRAHL AUSSETZEN.
ATTENZIONE - RADIAZIONE LASER INVISIBILE IN CASO DI
APERTURA. EVITARE L'ESPOSIZIONE AL FASCIO.
PRECAUCIÓN - RADIACIÓN LASER INVISIBLE CUANDO SE ABRE.
EVITAR EXPONERSE AL RAYO.
PERIGO - RADIAÇÃO LASER INVISÍVEL AO ABRIR, EVITE
EXPOSIÇÃO DIRECTA AO FEIXE.
GEVAAR - ONZICHTBARE LASERSTRALEN BIJ GEOPENDE
KLEP. DEZE KLEP NIET OPENEN.
ADVARSEL - USYNLIG LASERSTRÅLNING VED ÅBNING.
UNNGÅ UDSÆTTELSE FOR STRÅLNING.
ADVARSEL - USYNLIG LASERSTRÅLNING NÅR DEKSEL
ÅPNES. UNNGÅ EKSPONERING FOR STRÅLEN.
VARNING - OSYNLIG LASERSTRÅLNING NÅR DENNA DEL
ÄR ÖPPEN. STRÅLEN ÄR FARLIG.
VAROITUS - NÄKYMÄTÖNTÄ LASERSÄTEILYÄ AVATTAESSA.
VARO SUORAA ALTISTUMISTA SÄTEELLE.
注意 - 严禁翻开此盖, 以免激光泄露灼伤
주의 - 이 덮개를 열면 레이저광에 노출될 수 있으므로
주의하십시오.

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

	<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">• 300 MHz3) Printer Language<ul style="list-style-type: none">• SPL-C4) Memory<ul style="list-style-type: none">• 32MB (Standard) / 32MB (Max)5) Interface<ul style="list-style-type: none">• High Speed USB 2.0• 10/100 BaseTX network connector (CLP-36xW only)• 802.11b/g/n wireless LAN (CLP-36xW only)6) Toner cartridge<ul style="list-style-type: none">• Initial : 700 (K)/ 500 (CMY) pages• Sales: 1,500 (K)/ 1,000 (CMY) pages
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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		<ul style="list-style-type: none"> Best 600x600 2bit (Default) Normal 600x600 1bit

2.1.2.2. Controller and Software

Item		Specification
Processor		Samsung 300MHz
Memory	Std.	32 MB
	Max.	32 MB
Printer Languages		SPL-C
Fonts		Windows fonts
Printer Driver	Default Driver	SPL-C
	Supporting OS	[WINDOW]
		<ul style="list-style-type: none"> Windows XP/2003/Vista/2008, Windows 7/2008 R2
		[Linux]
<ul style="list-style-type: none"> RedHat Enterprise Linux WS 4, 5 (32/64 bit) Fedora 5, 6, 7, 8, 9, 10, 11, 12, 13 (32/64 bit) SuSE Linux 10.1 (32 bit) OpenSUSE 10.2, 10.3, 11.0, 11.1, 11.2 (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 (32/64 bit) SuSE Linux Enterprise Desktop 10, 11 (32/64 bit) Debian 4.0, 5.0 (32/64 bit) 		
		Mac OS X 10.4~10.7
	WHQL	Windows XP/2003/Vista, Windows 7

Item		Specification
Network Interface	Protocol	<ul style="list-style-type: none"> • CLP-36x : N/A • CLP-36xW <ul style="list-style-type: none"> • TCP/IPv4/IPv6, Standard TCP/IP printing, LPR, IPP, SNMPv1/2/3, HTTP, SLP, Bonjour • Authentication : WPA2 personal (PSK) • Encryption : WEP,TKIP,AES
	Network OS	<ul style="list-style-type: none"> • Windows : 7/XP (32/64 bit)/2003 Server (32/64 bit)/Vista (32/64 bit) • MAC OS X : 10.3 ~ 5 (TCP/IP Only) • Linux(Printer only)OS : <ul style="list-style-type: none"> • Fedora 2,~9 (32/64bit) • openSuSE 9.1, 9.2, 9.3, 10.0, 10.1, 10.2, 10.3, 11.0 (32/64bit) • Ubuntu 6.04, 6.10, 7.04, 7.10, 8.04 (32/64bit) • Mandriva 10.0, 10.1, 2005, 2006, 2007, 2008 (32/64bit) • Debian 3.1, 4.0 (32/64bit) • Redhat Enterprise Linux WS 4, 5 (32/64bit) • SuSE Linux Enterprise Desktop 9, 10 (32/64bit) • Novell : NetWare 5.x, 6.x (TCP/IP Only) • Others : Unix HP-UX, Solaris, SunOS, SCO UNIX
Application	Easy Printer Manager	YES
	Network Management	Set IP, SWAS 5.0 & SWS 2.0 (Linux, Mac not support, SWAS&SWS need I explorer 5.0 or Higher)

■ Interface

Item		Specification
Parallel	Option Interface	N/A
USB	High Speed USB 2.0	USB Host 2.0
Wired Network		<ul style="list-style-type: none"> • CLP-36x : N/A • CLP-36xW : Ethernet 10/100 base Tx
Wireless Network		<ul style="list-style-type: none"> • CLP-36x : N/A • CLP-36xW : 802.11b/g/n

2.1.2.3. Paper Handling

Item		Specification
Standard Capacity		<ul style="list-style-type: none"> • 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

Item		Specification
	Media sizes	A4, A5,A6, Letter, Legal, Executive, Folio, ISO B5, JIS B5 Glossy Photo 220g/m ²
	Media weight	<ul style="list-style-type: none"> • Plain : 60 ~ 85g/m² • Thick Paper: 86 ~ 120g/m² • Cardstock: 121 ~ 163g/m² • Photo : 220g/m²
Option Cassette (SCF)		N/A
Output Stacking	Capacity	50 sheets @80g/m ²
	Output Full sensing	Yes

2.1.2.4. Reliability and Service

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

2.1.2.5. Environment

Item		Specification
Temperature	Operation	10 to 32°C (50 to 89.6°F)
Humidity	Operation	20 to 80% RH
Acoustic Noise Level(Sound Power/Pressure)	Ready mode	Background Level
	Print mode	<ul style="list-style-type: none"> • color printing: Less than 45 dB (A) • black and white printing: Less than 48 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"> • CLP-36x Series: Less than 1.0 W • CLP-36xW Series: Less than 1.8 W
	Power off mode	Less than 0.45 W
Dimension (W x D x H)		382 x 309 x 211 mm (15.0 x 12.2 x 8.3 inch) (except paper tray)
Weight	Machine with consumables	10.3 kg (22.7 lb)

2.1.2.6. Consumables

Item		Specification
Toner Cartridge	Model	<ul style="list-style-type: none"> • K406(CLT-K406S) : Black • C406(CLT-Y406S) : Yellow • M406(CLT-M406S) : Magenta • Y406(CLT-C406S) : Cyan
	Yield*	<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	Model	CLT-R406
	Yield*	Approx. 16,000 images**
Waste Toner Container	Model	CLT-W406
	Yield*	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%.

2.1.2.7. Maintenance Parts

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

2.1.3. Model Comparison Table

	Samsung CLP-365W	Samsung CLP-325W	HP CP1525n
Image			
Mono/Color Speed (A4)	18 / 4 ppm	16 / 4 ppm	12 / 8 ppm
Processor	300 MHz	375 MHz	264 MHz
Memory (Std/ Max)	32 MB / 32 MB	32 MB / 256 MB	128 MB / 384 MB
Print Language	SPL-C	SPL-C	HP PCL 6
Paper Input	130 sheets Cassette	150 sheets Cassette	150 sheets Cassette
Duplex	N/A	N/A	N/A
Interface	High Speed USB 2.0 10/100 Base TX IEEE 802.11 b/g/n	High Speed USB 2.0 10/100 Base TX IEEE 802.11 b/g/n	High Speed USB 2.0 10/100 Base TX
Size (mm)	382 x 309 x 211 mm	388 x 313 x 243 mm	399 x 505 x 254 mm
Toner Cartridge (K/CMY)	1.5K / 1K	1.5K / 1K	2K / 1.3K

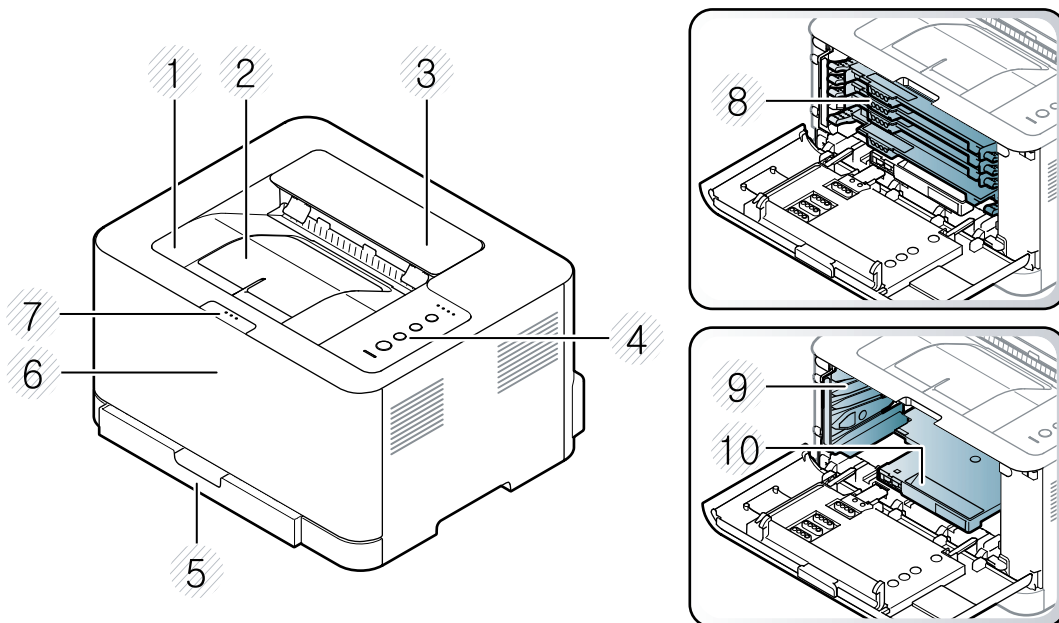
2.2. System Overview

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.

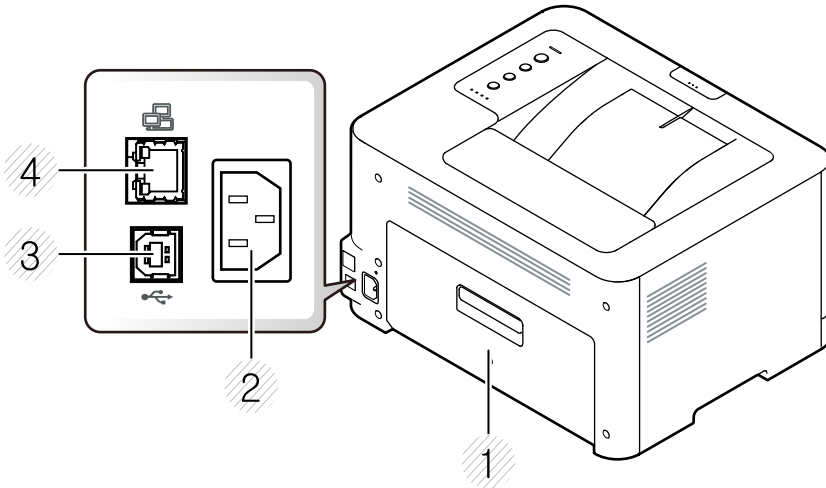


1	Output tray
2	Output support
3	Top cover
4	Control Panel
5	Tray
6	Front cover
7	Front cover release button
8	Toner cartridges
9	Waster toner container
10	Imaging unit

2.2.2. Rear View

NOTE

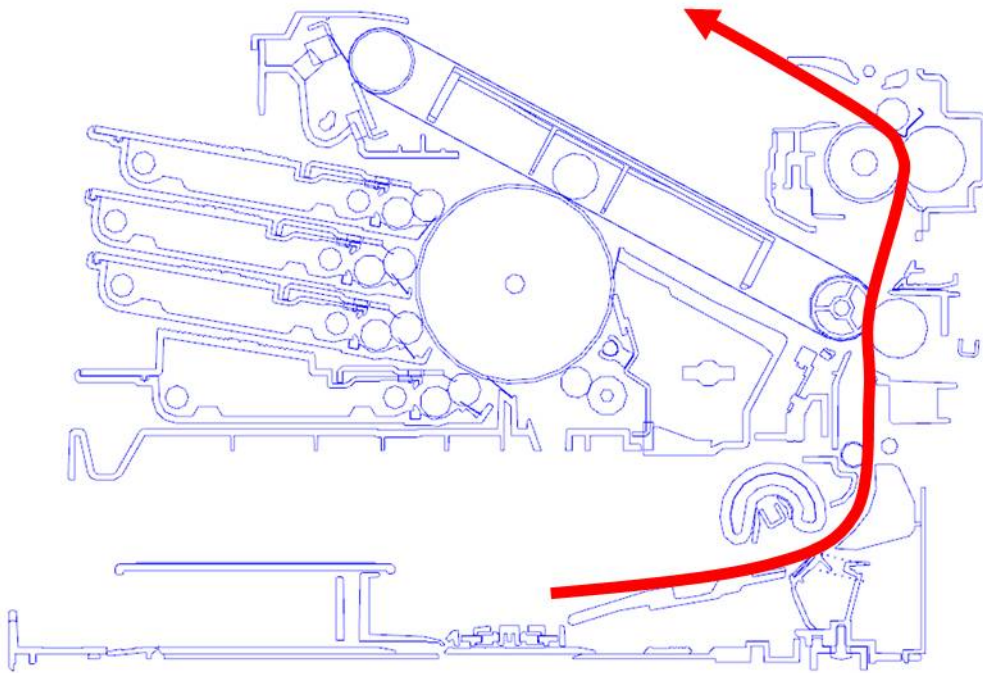
- This illustration may differ from your machine depending on your model. There are various types of machine.
- Some features and optional goods may not be available depending on model or country.



1	Rear cover
2	Power receptacle
3	USB port
4	Network port (CLP-36xW only)

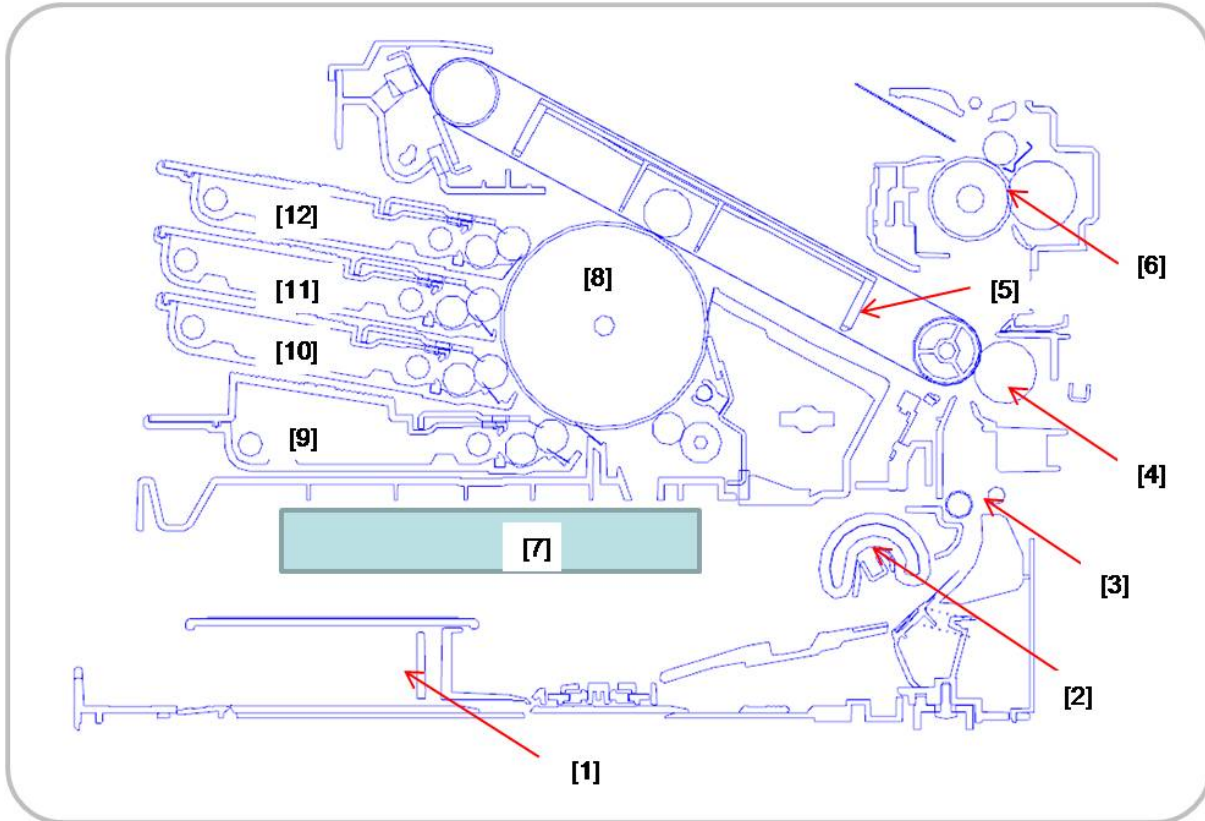
2.2.3. Paper Path

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



2.2.4. System Layout

This model consists of the engine parts, hardware parts, firmware. 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

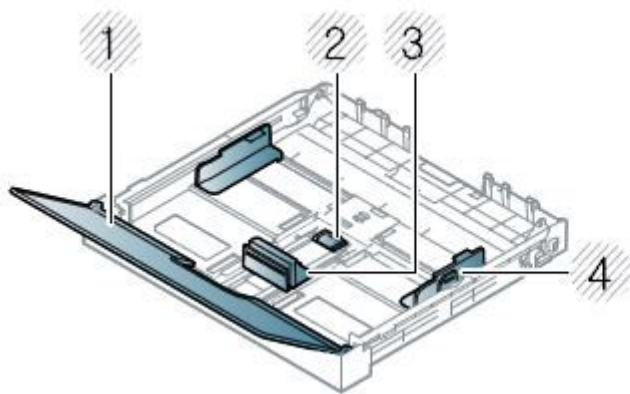
2.2.4.1. Feeding Section

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.



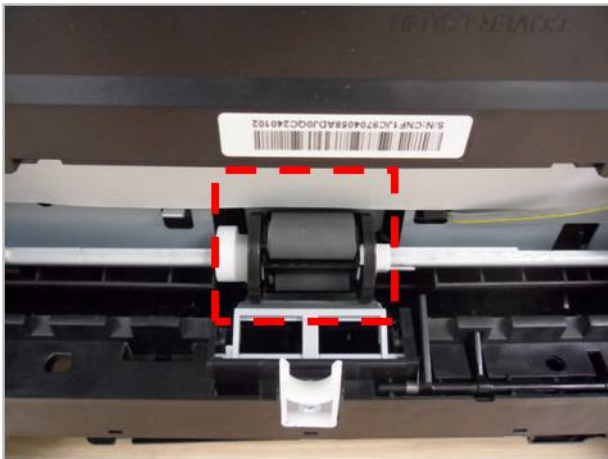
- 1 Paper cover
- 2 Guide lock
- 3 Paper length guide
- 4 Paper extend lever

 **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.



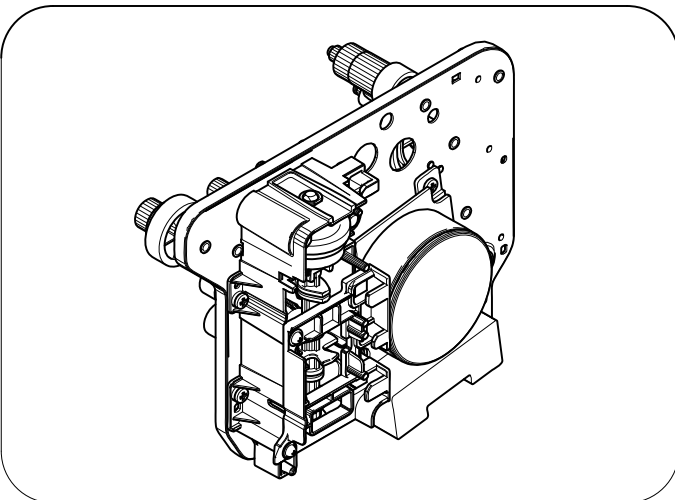
2.2.4.2. Transfer Roller

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.



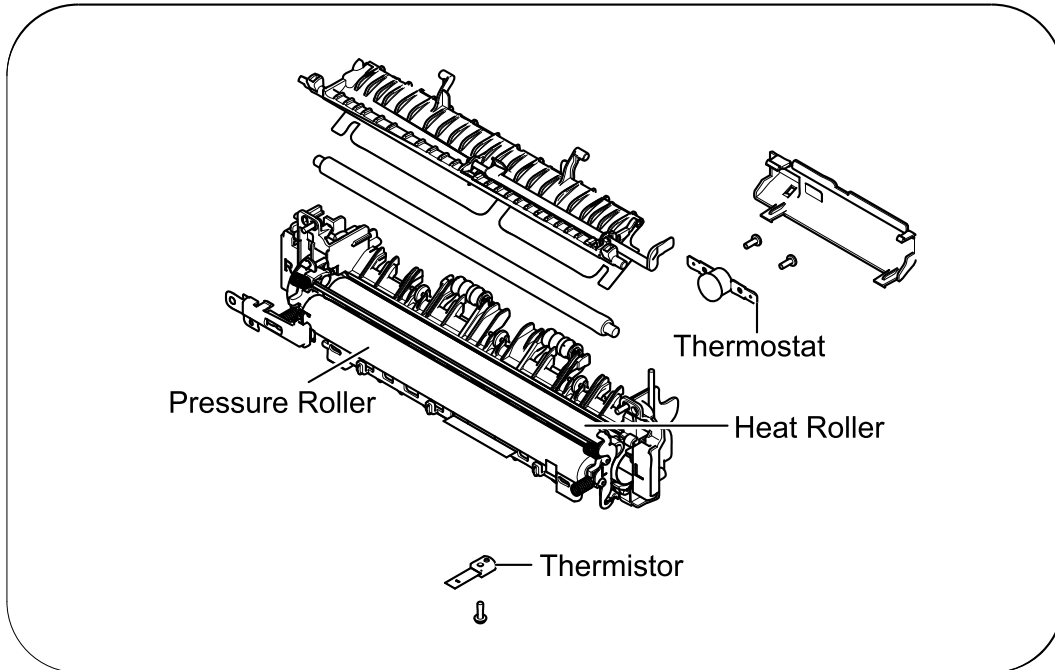
2.2.4.3. Drive Unit

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**

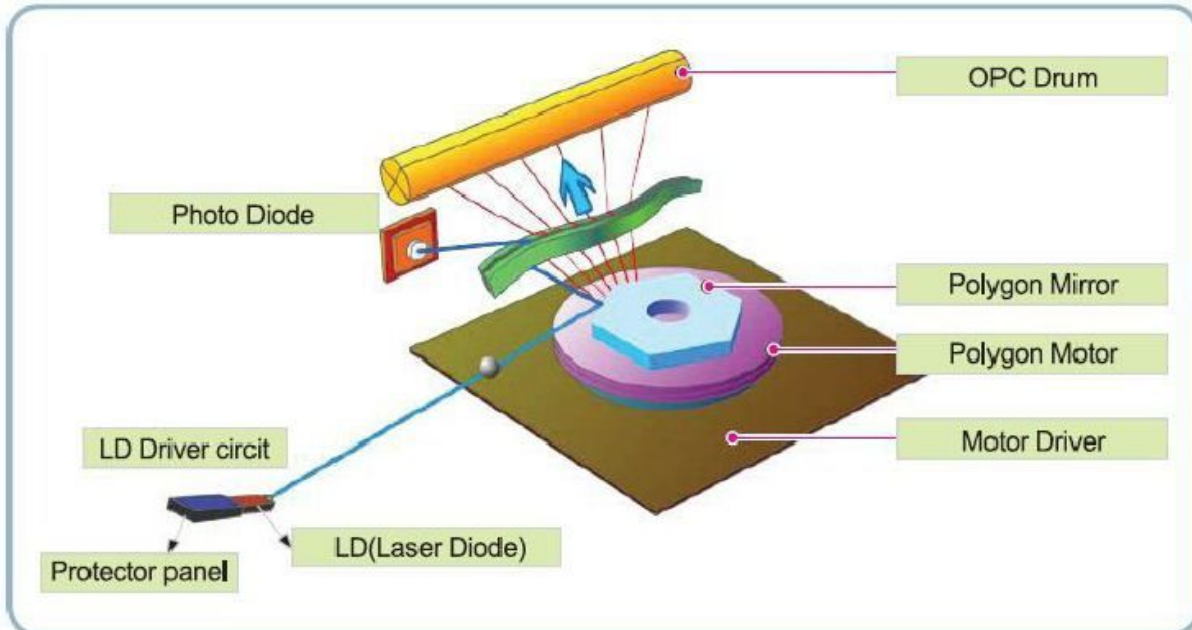
A pressure roller mounted under a heat roller is made of a silicon resin, and the surface also is coated with Teflon. When a paper passes between a heat roller and a pressure roller, toner adheres to the surface of a paper and is permanently fused.

5) **Halogen Lamp**

- Voltage : $120\text{ V} (115 \pm 5 \%) / 220\text{ V} : 230 \pm 5 \%$
- Capacity : $850\text{ Watt} \pm 25\text{ W}$

2.2.4.5. LSU (Laser Scanner Unit)

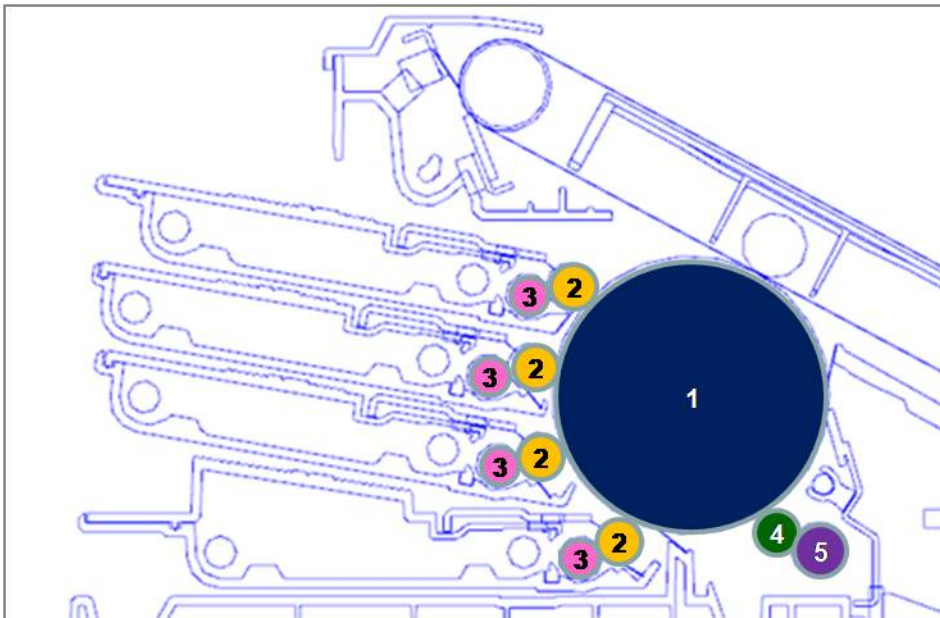
It is the core part of the LBP (Laser Beam Printer) which switches from the video data received to the controller to the electrostatic latent image on the OPC drum by controlling laser beam, exposing OPC drum, and turning principle of polygon mirror. The OPC drum is turned with the paper feeding speed. 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



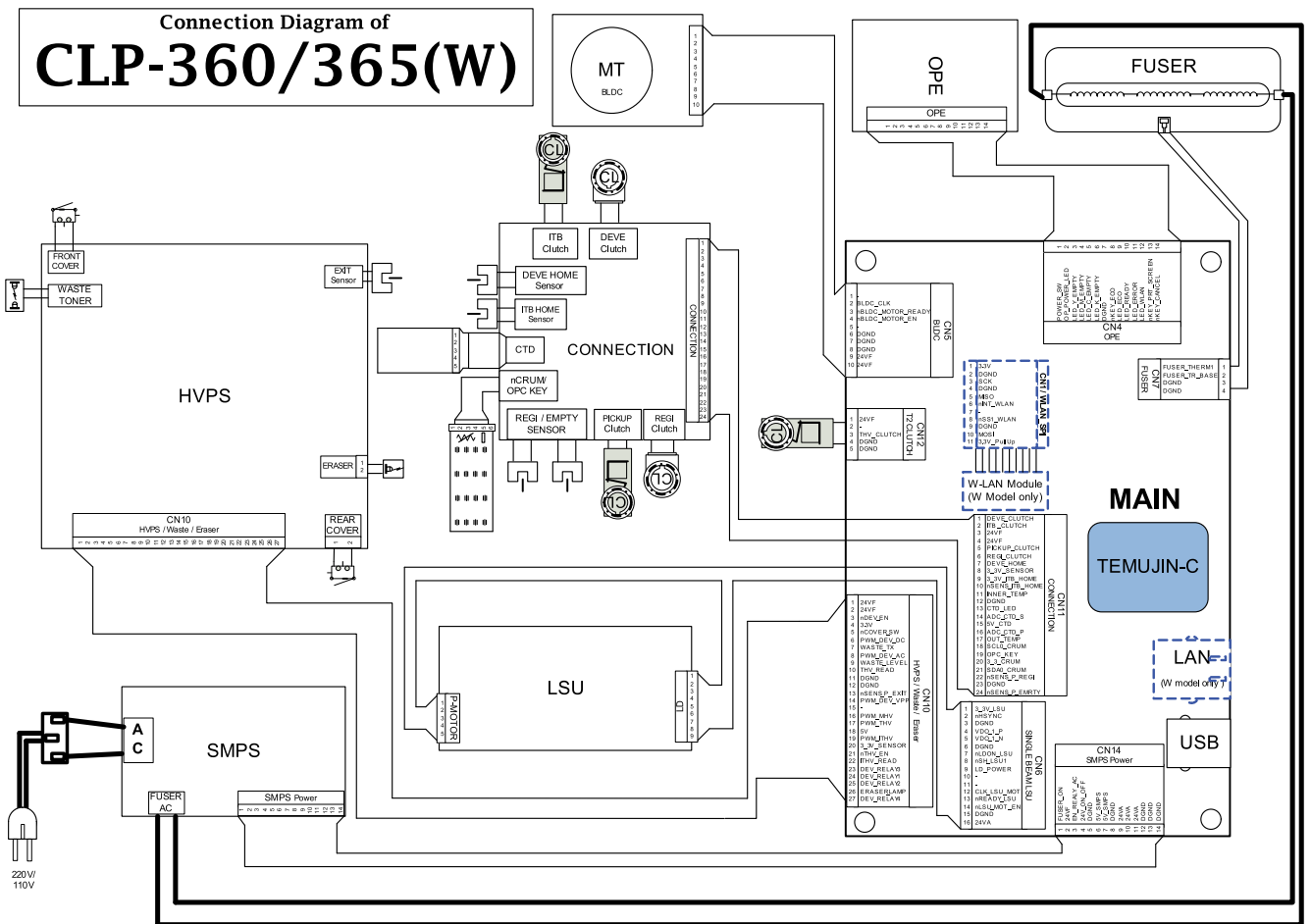
1	OPC drum
2	Developing Roller
3	Supply Roller
4	Charge Roller
5	Cleaning Roller

2.2.5. Hardware configuration

The CLP-36x series Electrical Circuit System consists of the following:

- Main board (System board)
- OPE board
- Connection board
- CTD board
- CRUM Joint board
- SMPS board
- HVPS board
- WLAN board (Wireless model only)

Diagram of the CLP-36x series Electrical Circuit



CLX-330x series has a system board of integrated engine controller, video controller.

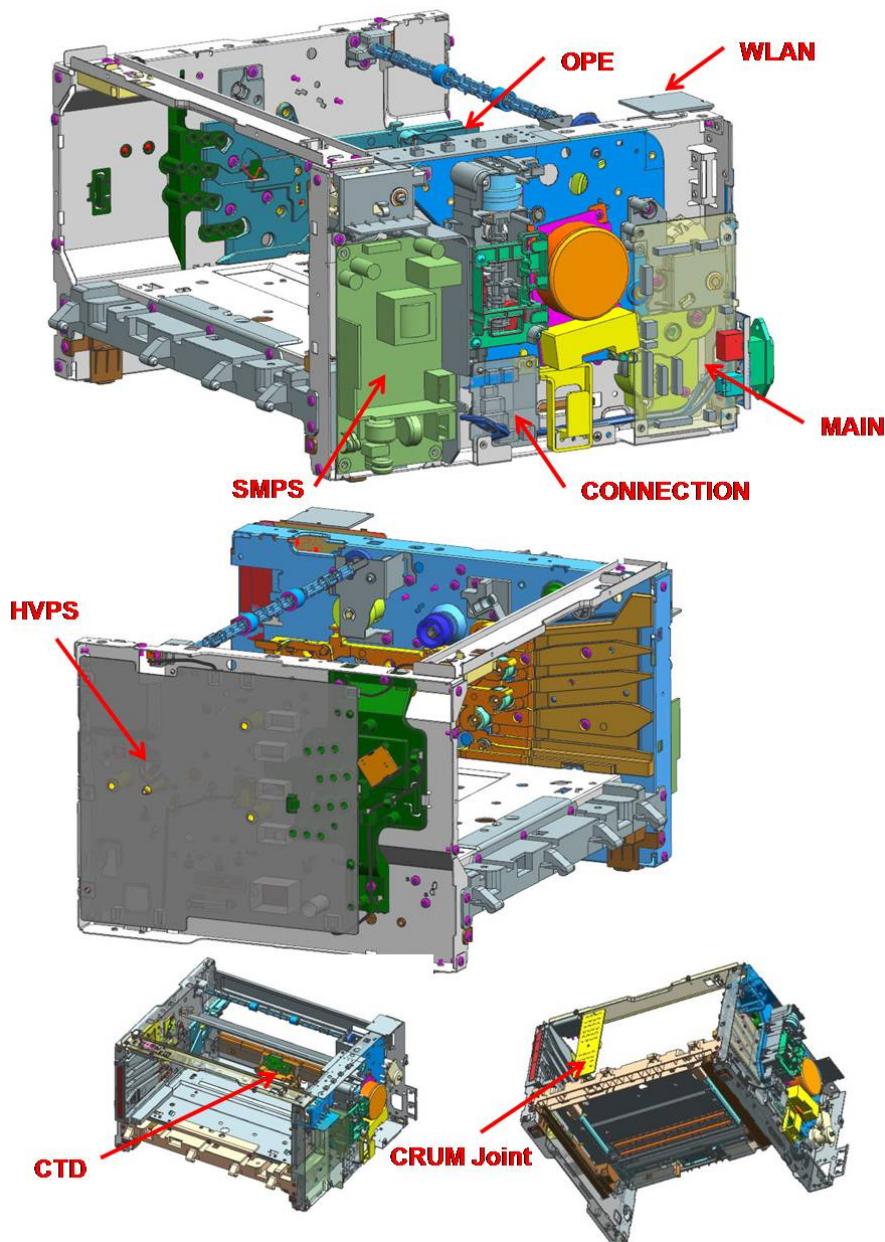
The engine controller controls all modules required to print, that is, LSU, HVPS/SMPS, Fuser, Motor etc. It communicates with the video control block inside CPU for printing. And it has the interface for all video sync signal to print out the video data.

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

The main board is adopted 300 MHz Temujin-C CPU that is integrated with engine/ video controller. It has the SDRAM internal memory 32MByte.

Circuit board locations

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



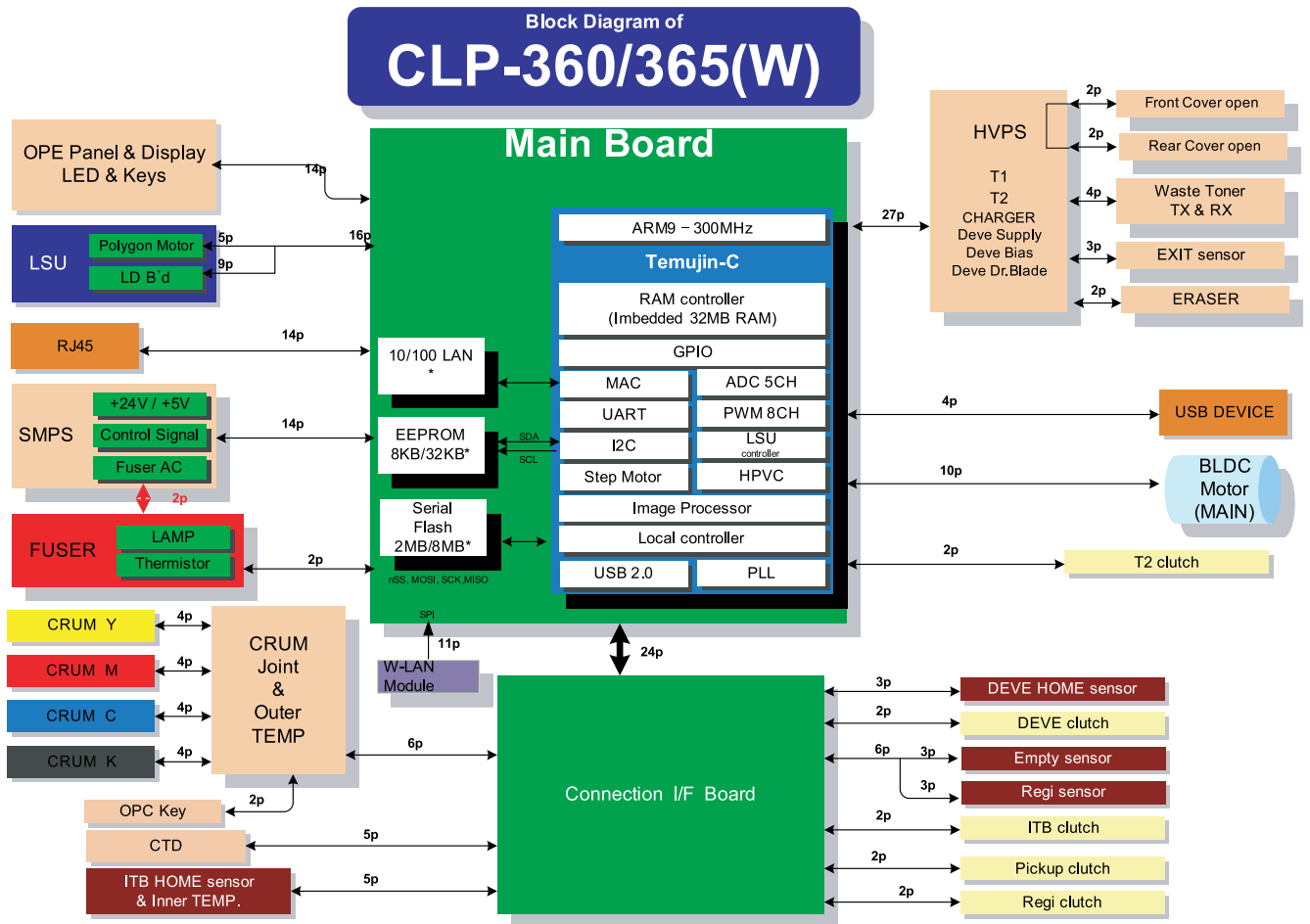
2.2.5.1. Main board

The Temujin-C chip is adopted as the main processor. Its process speed is 300 MHz. It is integrated engine controller, video controller.

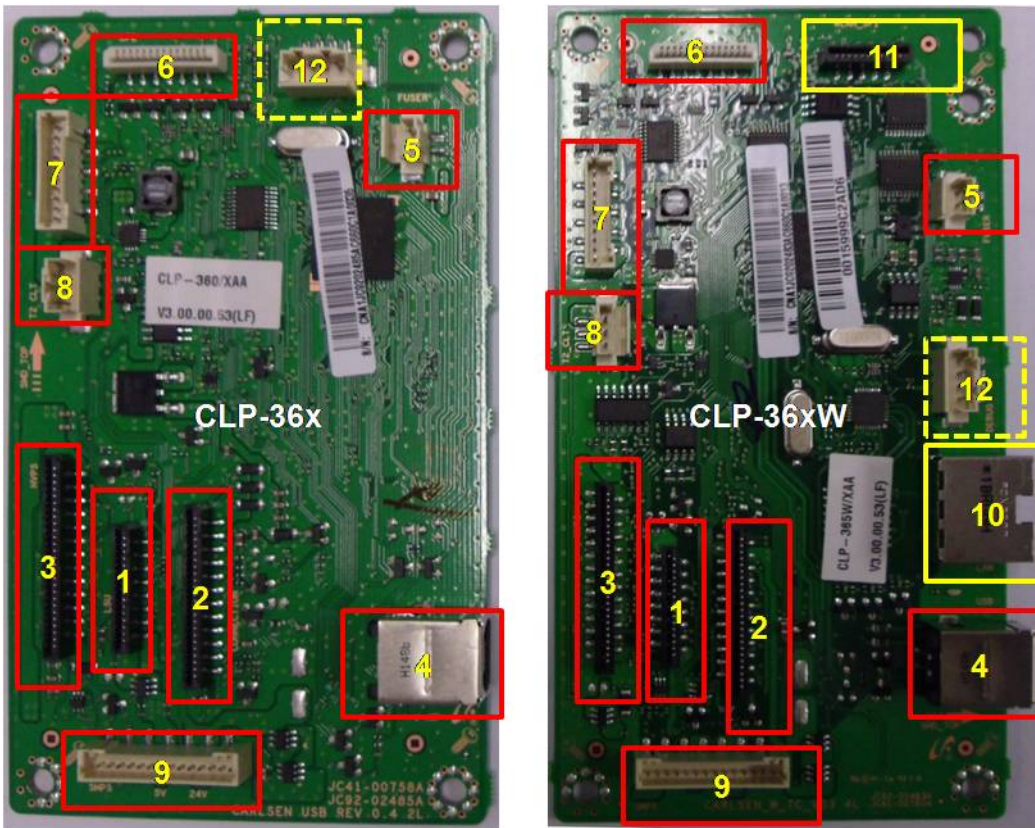
There is a SDRAM 32Mbyte in the Temujin-C chip.

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

[Main board diagram]



[Main board image]



• Connection

1	LSU connector
2	Connection board connector
3	HVPS interface connector
4	USB device connector
5	Fuser thermistor interface connector
6	OPE connector
7	Main BLDC Motor connector
8	T2 Clutch connector
9	SMPS interface connector
10	Wired network connector (W model only)
11	Wireless module interface connector(W model only)
12	Debugger connector(will be deleted)

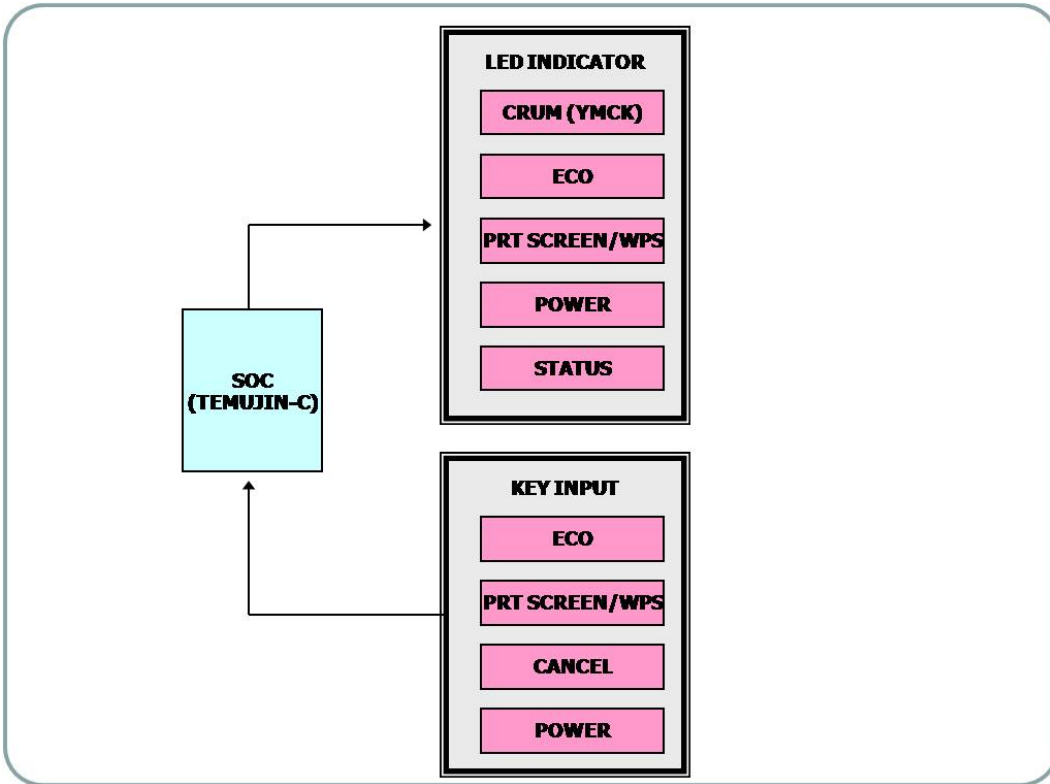
• Information

- Part Code
 - JC92-02485A (CLP-360/365 Model)
 - JC92-02483A (CLP-360W/365W Model)
- Part Name : PBA-MAIN

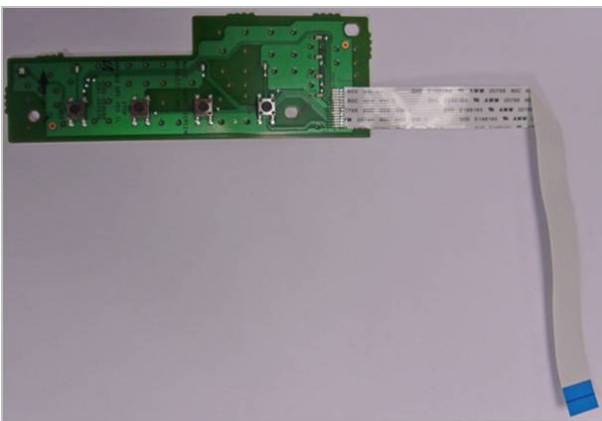
2.2.5.2. OPE board

The OPE board receives information from key input and send it to the main board. The main board controls the LED on OPE board.

[OPE controller diagram]



[OPE controller image]



• **Information**

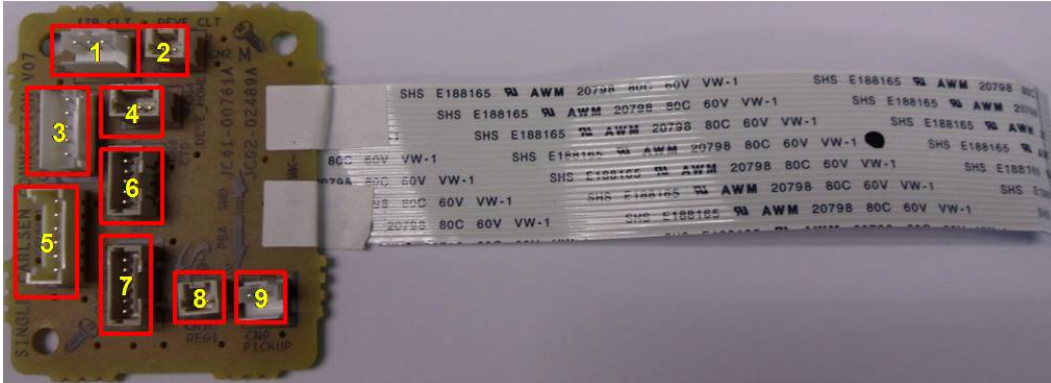
- Part Code
 - JC92-02500A (CLP-360/365 Model)
 - JC92-02501A (CLP-360W/365W Model)
- PBA Name : PBA-OPE

• **Connection**

1	Interface connector to Main board
---	-----------------------------------

2.2.5.3. 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

2.2.5.4. CTD (Color Tone Density) board

This board is for compensating the color tone density.



- **Information**

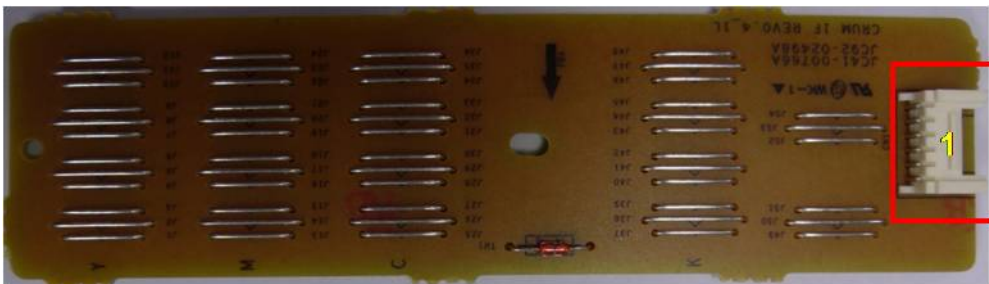
- Part Code : JC32-00014A
- Part Name : SENSOR-CTD

- **Connection**

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

2.2.5.5. CRUM Joint board

This board is assembled to the front cover inside. It connects the signal and power of the CRUM, OPC vender signal and outer temperature sensor.



- **Information**

- Part Code : JC92-02563A
- Part Name : PBA-TONER CRUM

- **Connection**

1	Interface Connector to Main Board (JC39-01719A, HARNESS-CRUMJOINT)
---	--

2.2.5.6. Wireless LAN board (CLP-36xW only)

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



- **Information**

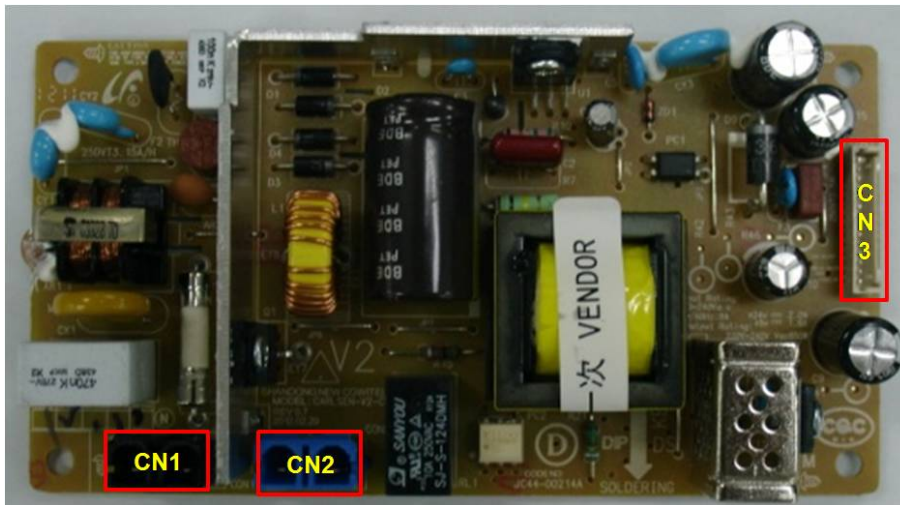
- Part Code : JC92-02517A
- Part Name : PBA-WNPC

- **Connection**

1	Interface Connector to Main board (JC39-01887A, FLAT CABLE-WLAN_C)
---	---

2.2.5.7. SMPS (Switching Mode Power Supply) Board

The SMPS (Switching Mode Power Supply) Board supplies electric power to the Main Board and other boards through a Main Controller. The voltage provided includes +5V, +24V from a 110V/220V power input.



- **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	SMSP V1	SMPS V2

- **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	

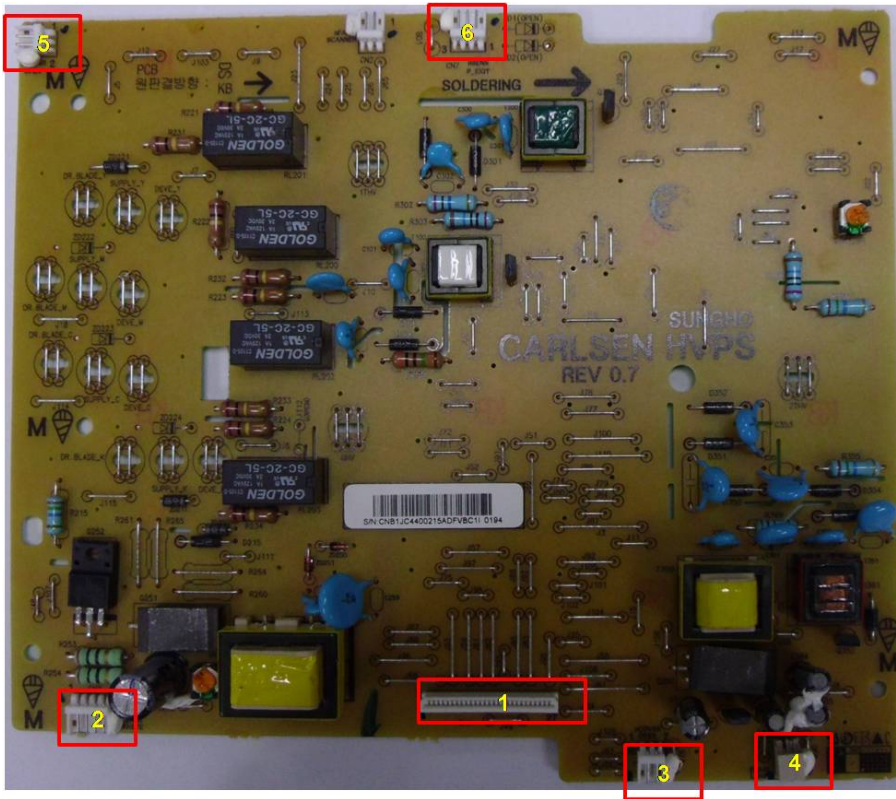
2. Product specification and description

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

2.2.5.8. HVPS board

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



- **Connection**

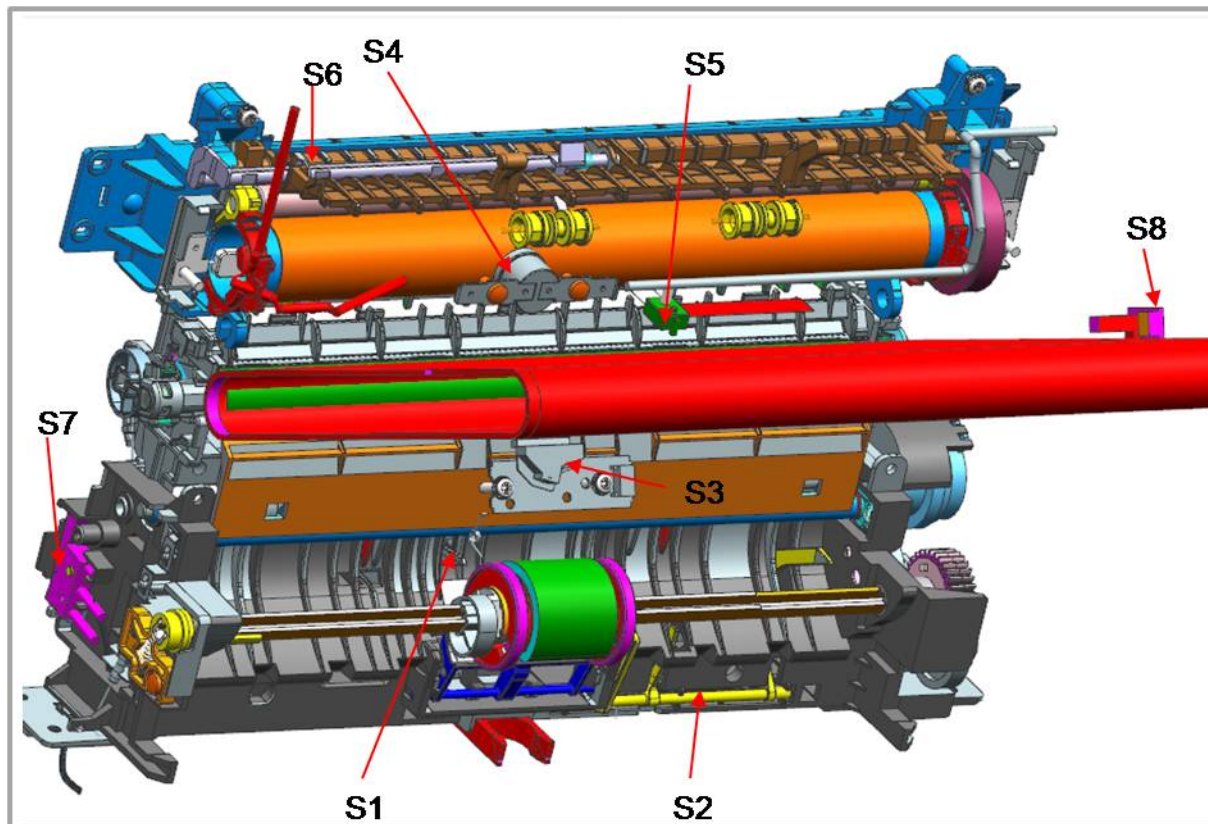
1	HVPS I/F
2	Waste Toner
3	Rear Cover Open
4	Eraser lamp
5	Front Cover Open
6	Paper EXIT sensor

- **Information**

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

2.2.5.9. 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. While paper moves, occurrence of Jam is judged as below.

Item	Description
JAM 0	<ul style="list-style-type: none"> • After picking up, paper cannot be entered because to paper is not fed. • After picking up, paper entered but it cannot reach to the feed sensor in predetermined period of time. due to slip, etc. • After picking up, if the feed sensor is not on, re-pick up. After re-picking up, if the feed sensor is not on after certain time, it is JAM 0. • Even though the paper reaches to the feed sensor, the feed sensor doesn't be ON.
JAM 1	<ul style="list-style-type: none"> • After the leading edge of the paper passes the feed sensor, the trailing edge of the paper cannot pass the feed sensor after predetermined period of time. • After the leading edge of the paper passes the feed sensor, the paper cannot reach the exit sensor after predetermined period of time. <p>* The paper exists between the feed sensor and the exit sensor.</p>
JAM 2	After the trailing edge of the paper passes the feed sensor, the paper cannot pass the exit sensor 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). The each output voltage is changeable due to the PWM duty. The transfer voltage admitted when the paper passes the transfer roller is decided by environment conditions. The resistance value of the transfer roller is changed due to the surrounding environment or the environment of the set, and the voltage value, which changes due to the environments, is changed through AD converter. The voltage value for impressing 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 the 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 while controlling the fusing, the error stated in the below table occurs.

- 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 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.

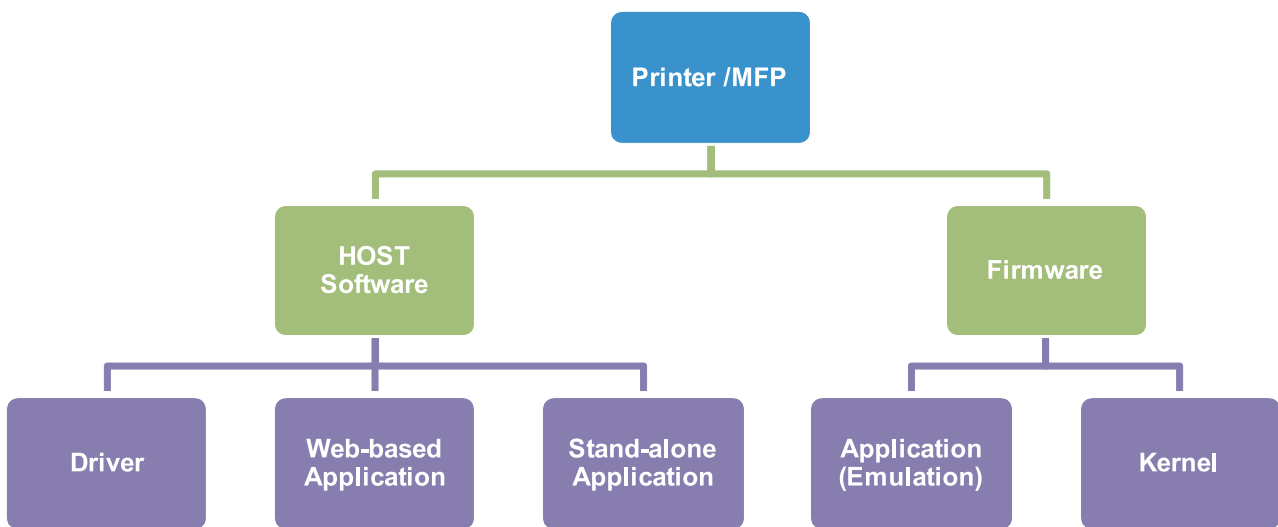
2.2.7. Software Descriptions

2.2.7.1. Software system overview

The software system of this model is constructed with

- 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



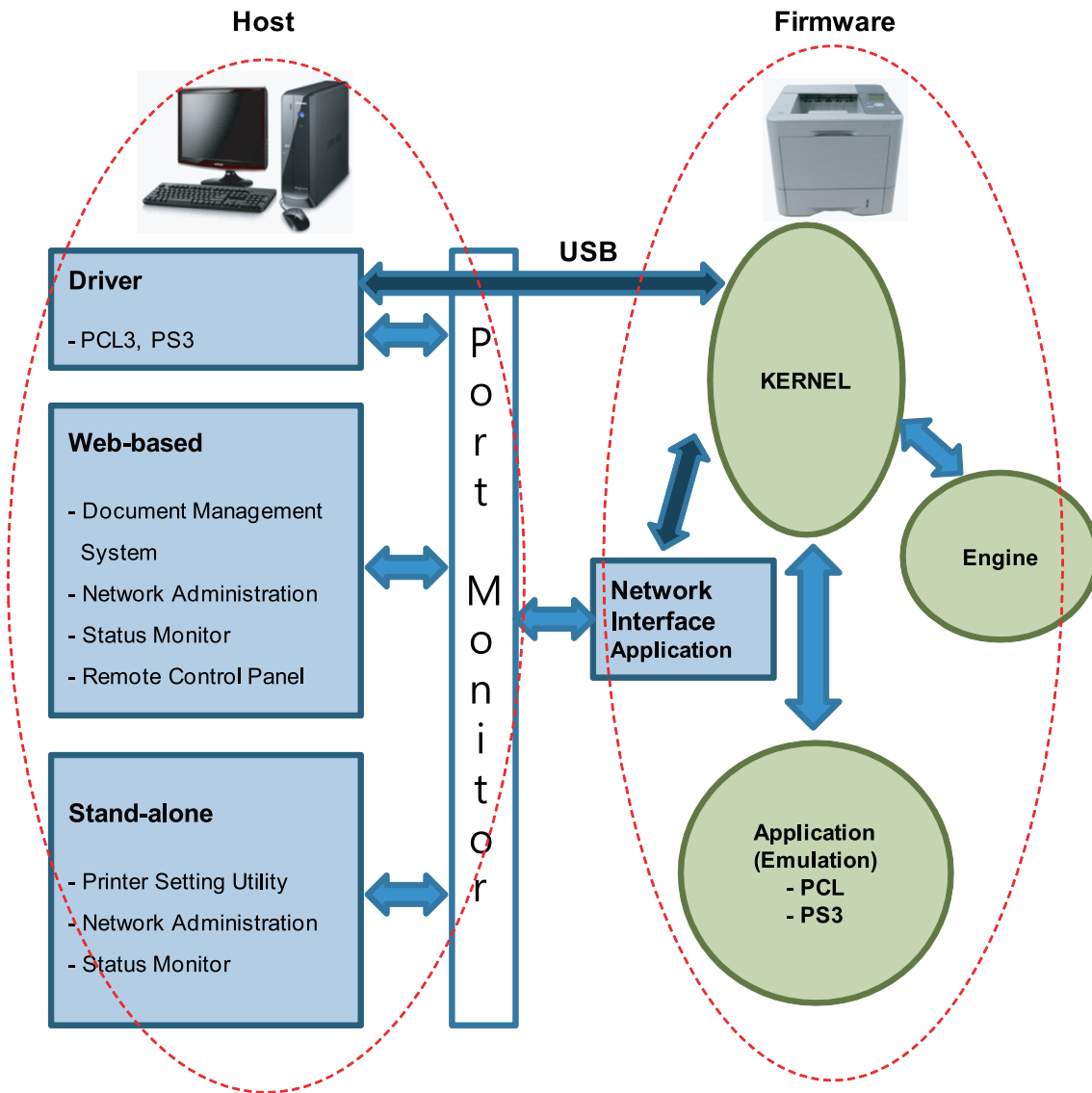
Host Software is made up of

- 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) Application (Emulation) that is a interpreter translates data received from Host to a printing language (PCL, PS, GDI, etc.) to be able to make the user to take same output as originally one what composed in Host.
- 2) Kernel controls and manage the whole procedure including Control flow and Printing Job before transferring to Engine system.

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) Port Monitor that manages the network communication between spooler and Network Interface Card, or various additional application and Network Interface Card,(this is, at first, make communication logical port, manage the data, transfer them from spooler to network port, and offer the result of printing).

Firmware Side is made up of

- 1) Network Interface Card is that relay the communication between Host and kernel using various network protocol.
- 2) Kernel is that manages the flow control of emulation procedure, receiving data from Host or Network card and printing with engine & rendering job.

- 3) Emulation is that interprets the various output data from selected emulation.
- 4) Engine is that prints 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.

In Printing, the two procedures are

1) Case of using USB Port

- After user start to print the wanted document to PCL string or compressed GDI bit-map data, 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.
- 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).
- Engine print the received data to required paper with the sequential developing process.

2) Case of using Network

- After user start to print the wanted document to PCL string or compressed GDI bit-map data, Driver translate the all graphic data of it and send data to host spooler.
- If so, Port monitor managing network port receives data from spooler and sends a data stream to the main board.
- Network interface card receives it and send to Kernel part.
- 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).
- 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

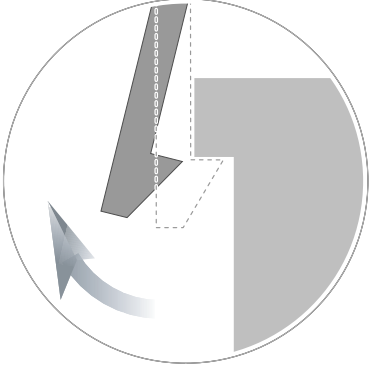
Static electricity can damage a PBA, always use approved anti-static precautions when handling or storing a PBA.

- **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 CLP-365W. 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	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_FRON	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-FRONT	SCREW-TAPTYPE;PWH,+ ,B,M3,L10,NI PLT,SWRCH18A	5
6003-000196	COVER-REAR	SCREW-TAPTYPE;PWH,+ ,B,M3,L10,NI PLT,SWRCH18A	2
6003-000264	COVER-TOP	SCREW-TAPTYPE;PWH,+ ,-,B,M3,L6,ZPC(WHT),SWRCH18A,-	2
6003-000196	ETC	SCREW-TAPTYPE;PWH,+ ,B,M3,L10,NI PLT,SWRCH18A	4
6003-000269	COVER-TOP	SCREW-TAPTYPE;BH,+ ,-,S,M3,L6,ZPC(WHT),SWRCH18A,-	2
6003-000269	COVER-REAR	SCREW-TAPTYPE;BH,+ ,-,S,M3,L6,ZPC(WHT),SWRCH18A,-	4

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.



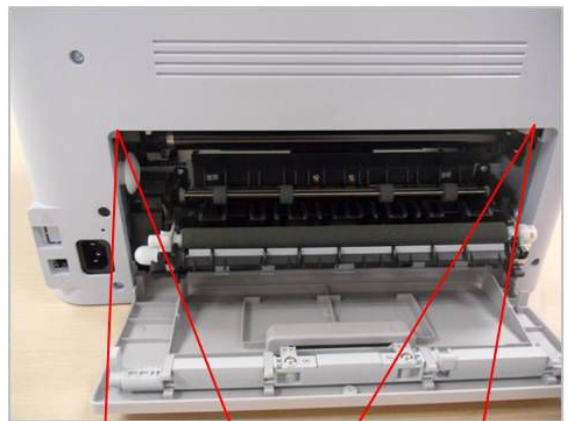
4. Unplug the ITB connector from the top-right.



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

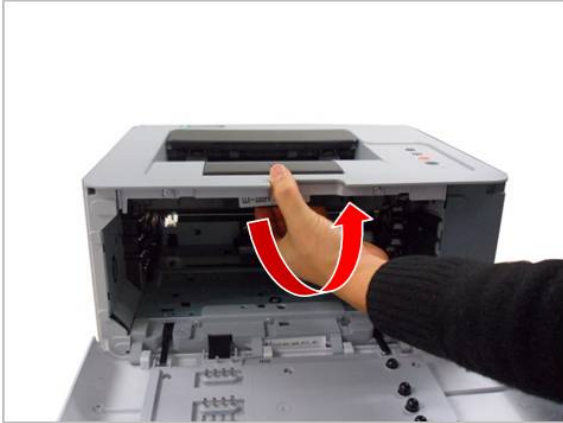


6. Pull down the both levers.



3. Disassembly and Reassembly

7. Remove the ITB Unit while holding its handle, and pulling in direction of arrow.



3.3.2. Fuser Unit

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



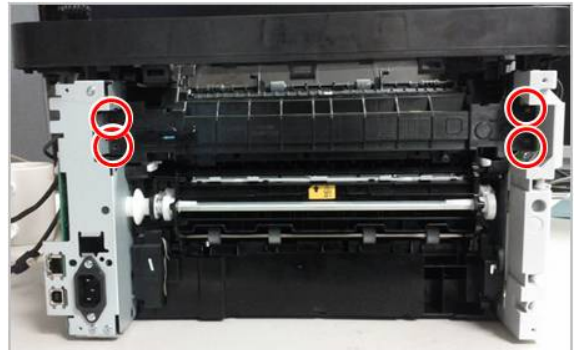
3. Remove the right cover.



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



5. Remove 4 screws. And then remove the fuser unit.

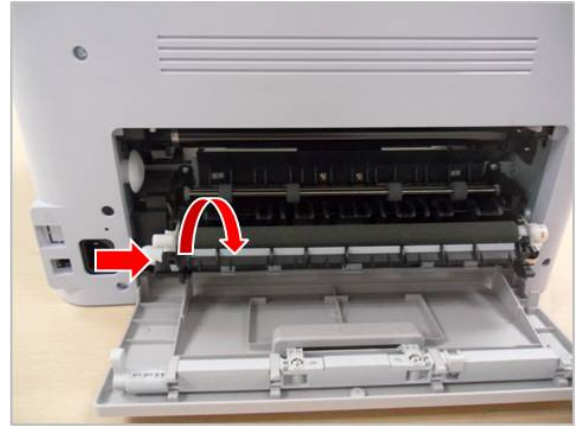


3.3.3. Transfer(T2) roller

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

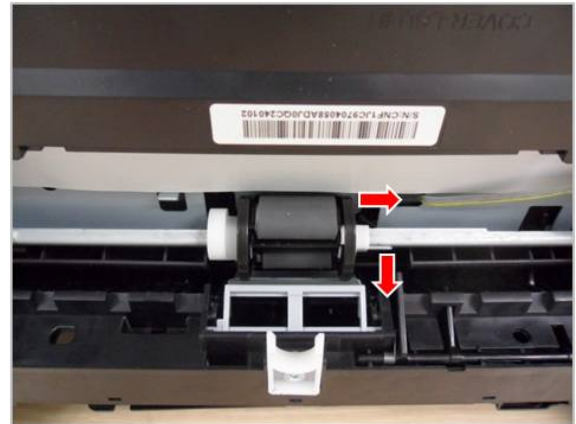


2. Push and release the FRAME-TRANSFER.



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 cover after removing 4 screws.



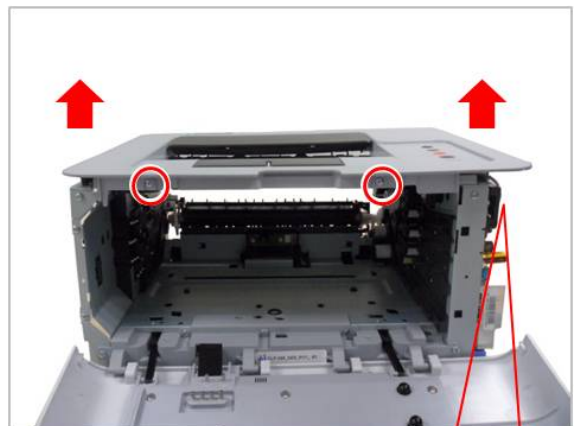
3. Release the right cover.



4. Release the left cover.

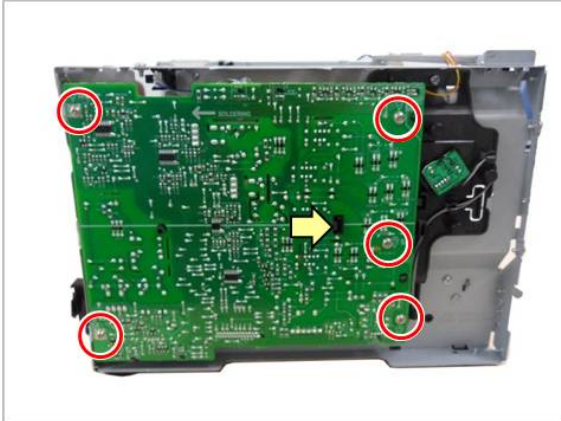


5. Unplug the OPE connector from the main board. Remove 2 screws. And lift up the top cover.



3.4.2. 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.



3.4.3. LSU

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



3.4.4. FRAME BASE-PAPER PATH

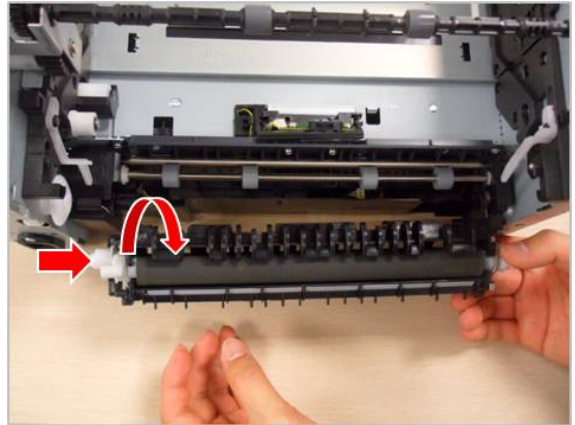
1. Remove the right cover.
2. Unplug the connector from the PBA-CONNECTOR. Remove the main board after removing 4 screws and connectors.



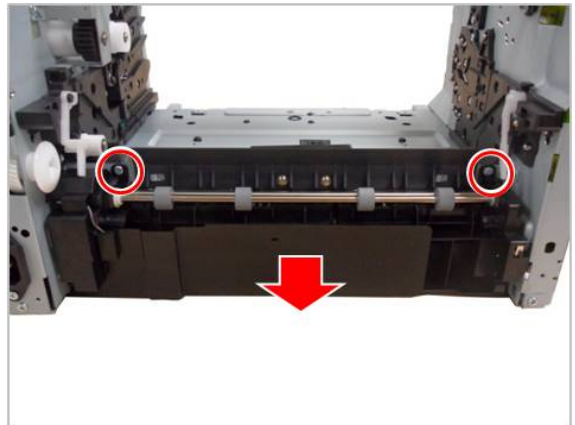
3. Remove 4 screw from the bottom of the machine.



4. Remove the FRAME-TRANSFER.

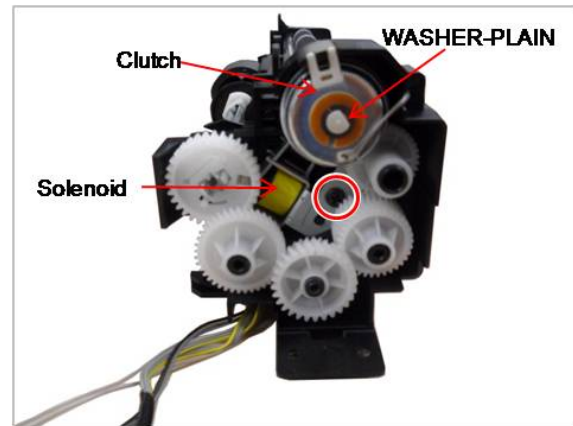


5. Remove the FRAME BASE-PAPER PATH after removing 2 screws.



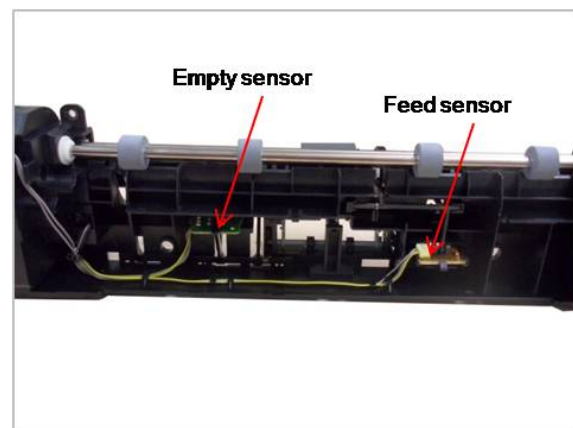
3.4.5. Regi clutch and Pick up solenoid

1. Remove the FRAME BASE-PAPER PATH. (Refer to 3.4.4)
2. Release the regi. clutch after removing the WASHER-PLAIN.
3. Remove 4 gears.
4. Release the pick up solenoid after removing 1 screw.



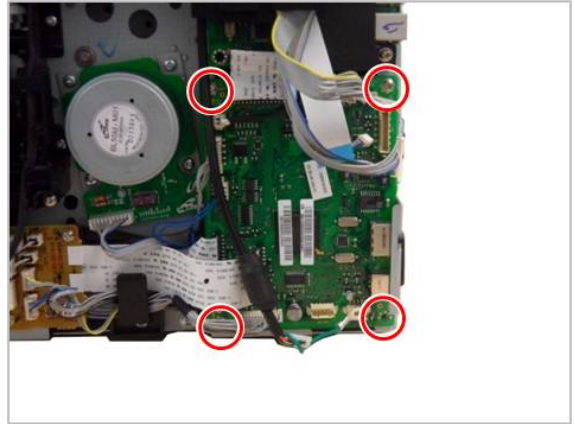
3.4.6. Feed sensor and Empty sensor

1. Remove the FRAME BASE-PAPER PATH. (Refer to 3.4.4)
2. Remove the COVER-PICK UP.
3. Release the Empty sensor and Feed sensor.



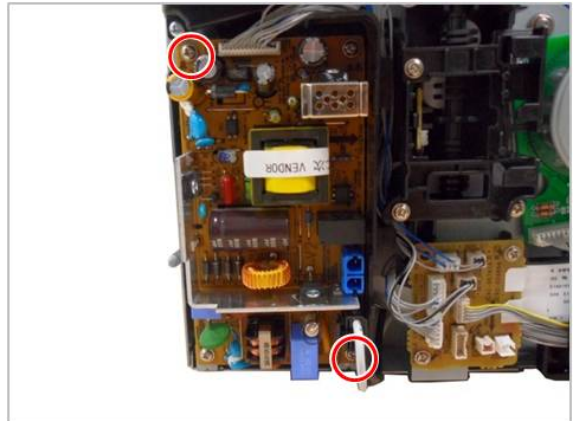
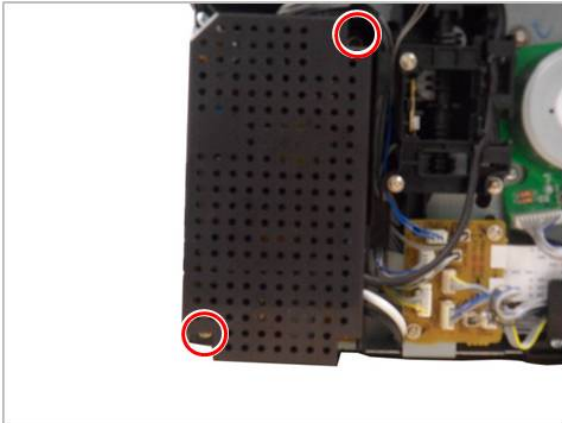
3.4.7. Main board

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



3.4.8. 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.

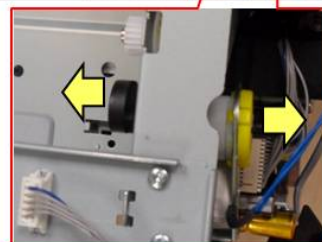
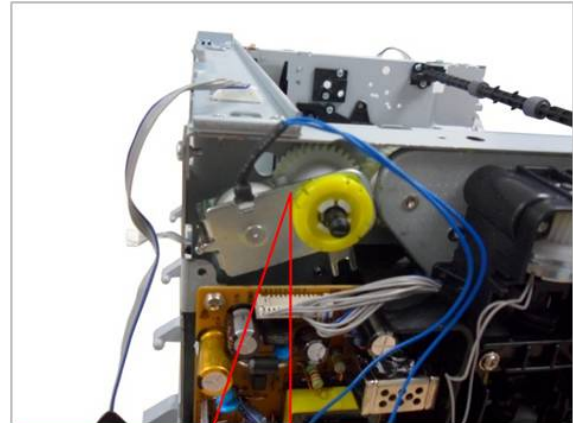


3.4.9. Cam Solenoid

1. Remove the right and top cover. (Refer to 3.4.1)
2. Remove the Cam Solenoid cover after removing 1 screw.

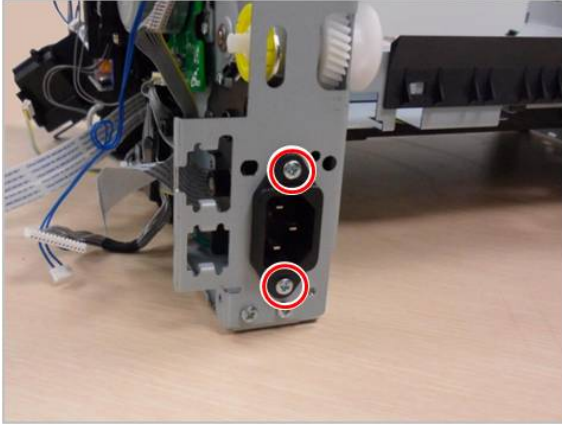


3. Release the Cam Solenoid.

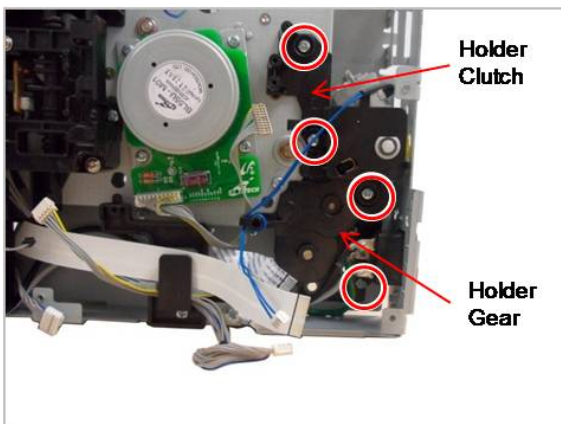


3.4.10. Main Drive Unit

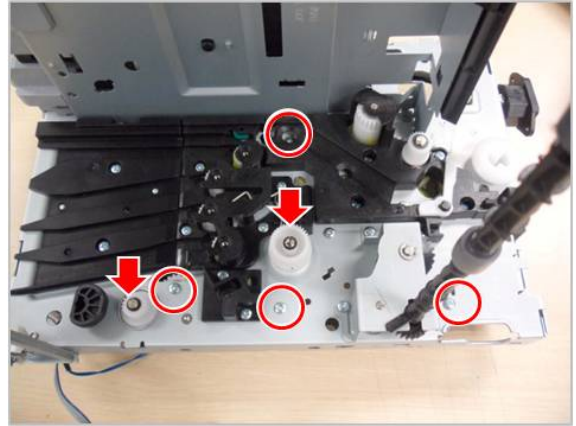
1. Remove the right cover. (Refer to 3.4.1)
2. Remove the main board. (Refer to 3.4.7)
3. Remove 2 screws.



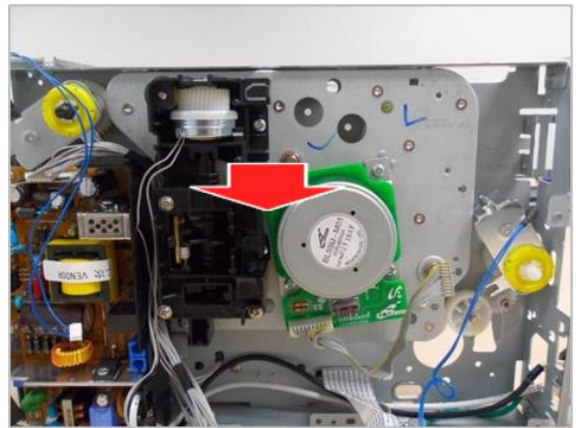
4. Remove the Holder-Clutch and Holder-Gear after removing 4 screws.



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



6. Release the Main Drive Unit.



4. Alignment and Troubleshooting

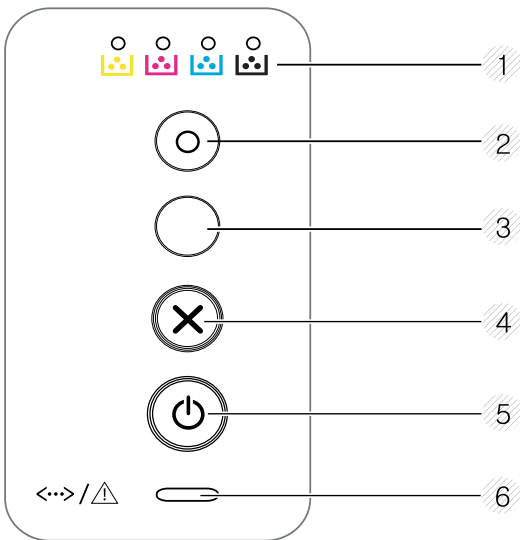
4.1. Alignment and Adjustments

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

- This control panel may differ from your machine depending on its model. There are various types of control panels.



1	Toner LED	Shows the status of the toner.
2	Eco	Turn into eco mode to reduce toner consumption and paper usage when pc-printing only.
3	WPS (CLP-36xW only)	Configures the wireless network connection easily without a computer. <ul style="list-style-type: none"> Manual print <ul style="list-style-type: none"> Press this button each time you load a sheet of paper in the tray if you have selected Manual Feeder for Source in your printer driver.

3	Print screen (CLP-36x only)	<ul style="list-style-type: none"> • Prints the screen <ul style="list-style-type: none"> • Press this button and the green LED will start blinking. If you want to print only the active screen, release the button when the green LED stops blinking. If you want to print the whole screen, release the button while it's blinking. • Manual print <ul style="list-style-type: none"> - Press this button each time you load a sheet of paper in the tray if you have selected Manual Feeder for Source in your printer driver. <div style="background-color: #e0e0e0; padding: 5px; margin-top: 10px;"> <p> NOTE</p> <ul style="list-style-type: none"> - Print Screen can only be used in the Windows and Macintosh operating systems. - You can only use this function with USB-connected machine. - When printing the active window/whole monitor screen using the print screen button, the machine may use more toner depending on what is being printed. - You can only use this function if the machine's Easy Printer Manager program is installed if you are a macintosh OS user, you need to enable Screen Print Settings from the Easy Printer Manager to use the Print Screen feature. </div>
4	Cancel	<p>You can stop an operation at any time. You also can do the following functions.</p> <ul style="list-style-type: none"> • Configuration sheet <ul style="list-style-type: none"> • Press and hold this button for about 2 seconds until the green LED blinks slowly, and release. • Prints event log report / usage counter <ul style="list-style-type: none"> • Press and hold this button for about 4 seconds until the green LED blinks quickly, and release. • Prints supplies info report <ul style="list-style-type: none"> • Press and hold this button for about 6 seconds until the green LED on, and release.
5	Power/Wake Up	<p>You can turn the power off or wake the machine up from the sleep mode with this button.</p>
6	Status LED	<p>Shows the status of your machine</p>

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 or save mode.	
	Green	Blinking	<ul style="list-style-type: none"> • The machine is receiving data from the computer. • The machine is printing data.
		On	<ul style="list-style-type: none"> • The machine is on-line and can be used.
	Red	Blinking	The machine is on manual printing or manual duplex printing.
		On	<ul style="list-style-type: none"> • The cover is opened. Close the cover. • There is no paper in the tray when receiving or printing data. Load paper in the tray. • The machine has stopped due to a major error.
	Orange	Blinking	Upgrading firmware.
		On	A paper jam has occurred.
	Toner LED	Orange	Blinking
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 toner cartridge is not installed or the wrong toner cartridge is installed.
Off		All toner cartridges are at normal capacity.	
WPS LED	Blue	Blinking	The machine is connecting to a wireless network.
		On	The machine is connected to a wireless network.
		Off	The machine is disconnected from a wireless network.
Power LED	Blue	On	The machine is in power save mode.
		Off	The machine is in ready mode or the machine's power is off.
Eco	Green	On	Eco mode is on.
		Off	Eco mode is off.

* 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.

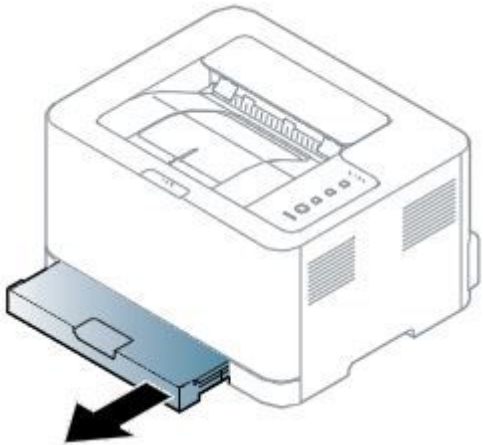
4.1.3. Clearing paper jams

NOTE

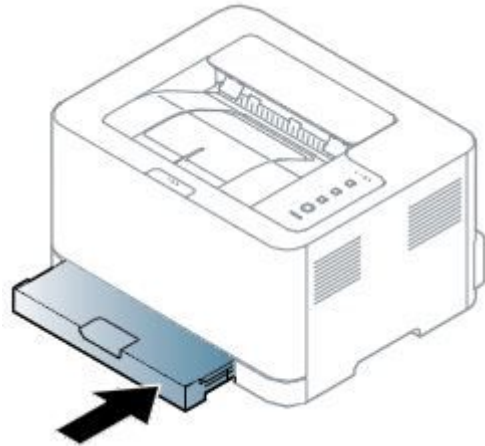
To avoid tearing the paper, pull the jammed paper out slowly and gently.

In tray1

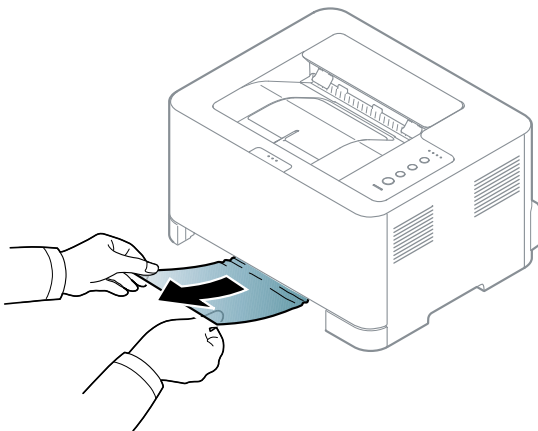
1) Take off the cassette.



3) Reinstall the cassette.



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



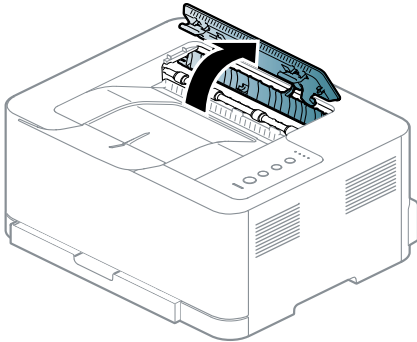
Inside the machine



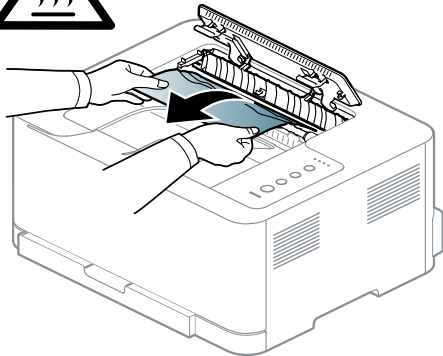
CAUTION

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

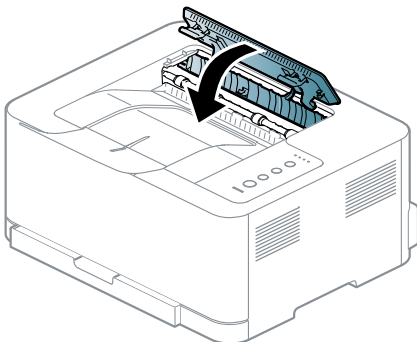
- 1) Open the exit top cover.



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

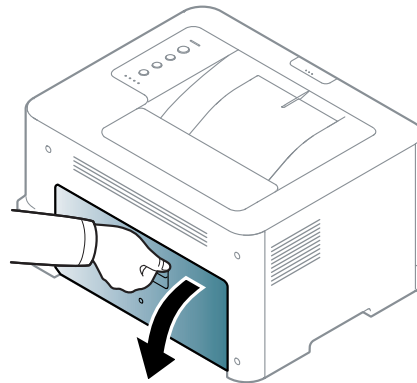


- 3) Close the exit top cover.

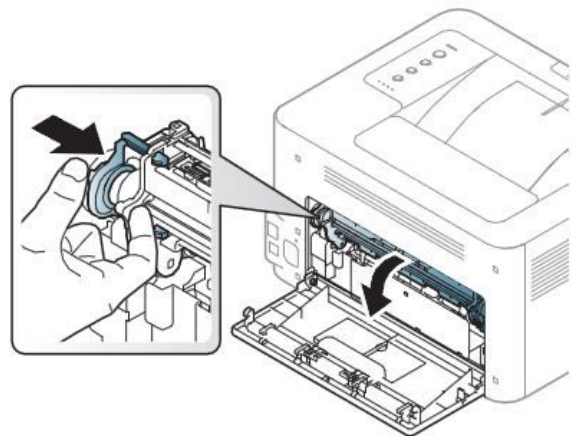


If you do not see the paper in this area, stop and go to next step:

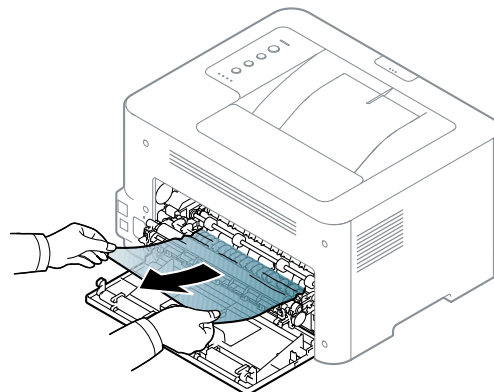
- 4) Open the rear cover door.



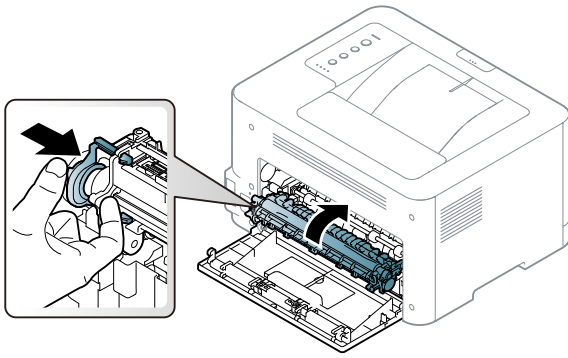
- 5) Open the FRAME-TRANSFER.



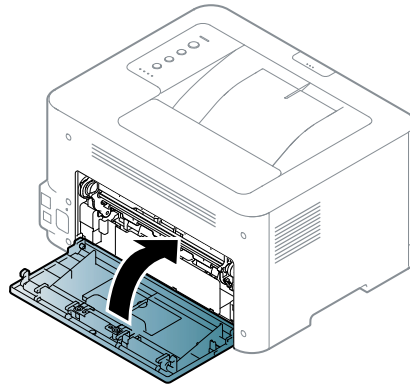
- 6) Remove the jammed paper by gently pulling it straight out.



7) Close the FRAME-TRANSFER.



8) Close the rear cover door.

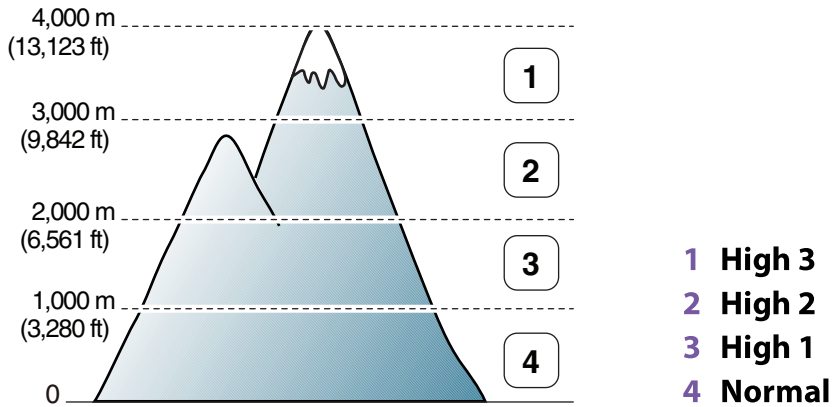


4.1.4. Useful menu item for service

1) 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.**

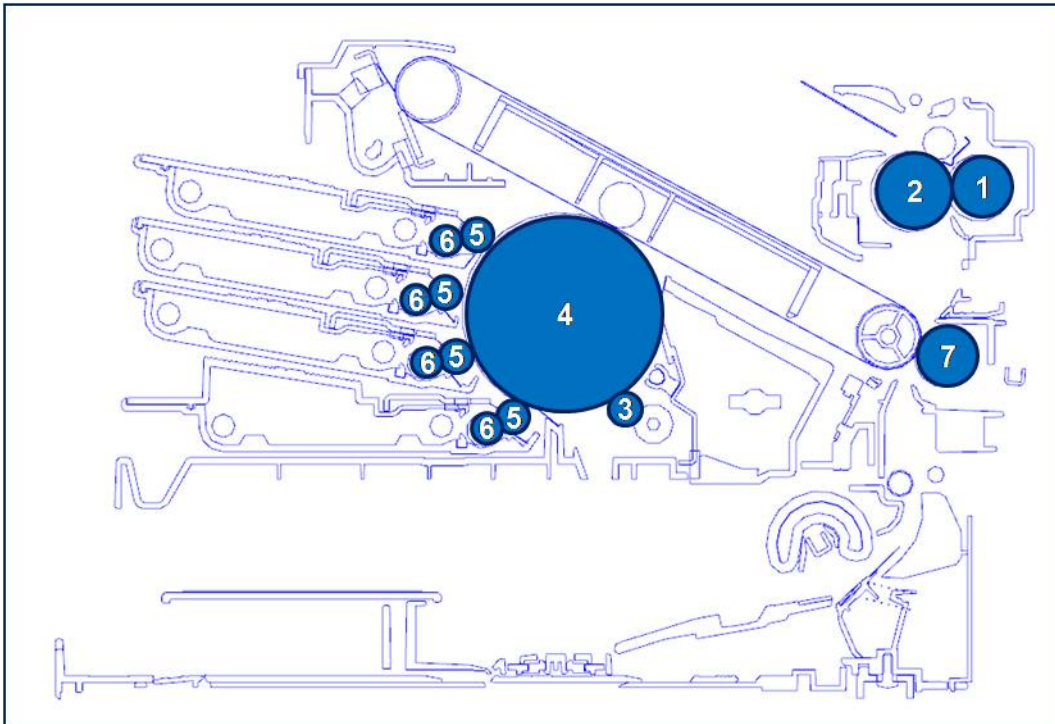


NOTE

- If your machine is connected to the network, you can set the altitude via SyncThru™ Web Service.

4.1.5. Periodic Defective Image

If an image defects appears at regular intervals on the printed-paper, it is 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	50.3mm	Background	Fuser Unit
2	Heat Roller	86.4mm	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. Using Samsung Easy Printer Manager (Windows and Macintosh only)

NOTE

- This feature may not be available depending on model or optional goods.
- Available for Windows or Macintosh OS users only.
- For Windows, Internet Explorer 6.0 or higher is the minimum requirement for 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.

Understanding Samsung Easy Printer Manager

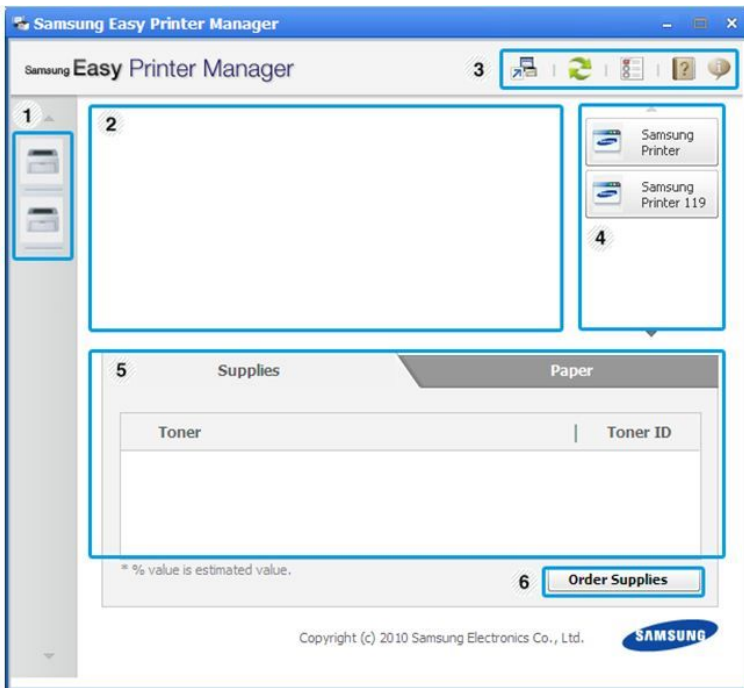
To open the program:


- For Windows, Select Start > Programs or All Programs > Samsung Printers > Samsung Easy Printer Manager > Samsung Easy Printer Manager.
- For Macintosh, Open the Applications folder > Samsung folder > Samsung Easy Printer Manager.

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.



No	Area	Description
1	Printer List	The printer list displays the installed printer icons on your computer.
2	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 style="background-color: #e0e0e0; padding: 5px;">  NOTE Troubleshooting button: This button opens Troubleshooting Guide when an error occurs. You can directly open the necessary section in the user's guide. </div>
3	Application Information	Includes links for changing to the advanced settings, preference, help, and about.
4	Quick links	Displays Quick links to machine specific functions. This section also includes links to applications in the advanced settings.
5	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.
6	Order Supplies	Click on the Order button from the supply ordering window. You can order replacement toner cartridge(s) from online.

Advanced settings user interface overview

The advanced user interface is intended to be used by the person responsible for managing the network and machines.

- **Device Settings**

You can configure various machine settings such as machine setup, paper, layout, emulation, network, and print information.

- **Alert Settings**

This menu includes settings related to error alerting.

- **Printer Alert** : Provides settings related to when alerts will be received.
- **Email Alert** : Provides options relating to receiving alerts via email.
- **History Alert** : Provides a history of device and toner related alerts.

- **Job Accounting**

Provides querying of quota information of the specified job accounting user. This quota information can be created and applied to devices by job accounting software such as SyncThru™ or CounThru™ admin software.

4.1.6.2. Using Samsung Printer Status (Windows only)

The Samsung Printer Status is a program that monitors and informs you of the machine status.

NOTE




- The Samsung Printer Status window and its contents shown in this user’s guide may differ depending on the machine or operating system in use.
- Check the operating system(s) that are compatible with your machine.

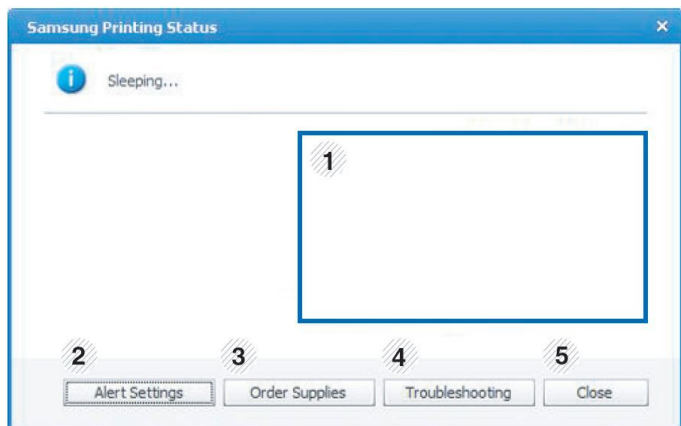
Samsung Printer Status overview

If an error occurs while operating, you can check the error from the Samsung Printer Status. Samsung Printer Status is installed automatically when you install the machine software.

You can also launch Samsung Printer Status manually. Go to the **Printing Preferences** , click the **Basic** tab > **Printer Status** button.

These icons appear on the Windows task bar:

Icon	Mean	Description
	Normal	The machine is in ready mode and experiencing no errors or warnings.
	Warning	The machine is in a state where a soft error has occurred. For example, a toner low status, which may lead to toner empty status.
	Error	The machine has at least one hard error, such as out of paper, fuser error, etc. Machine does not have ability to come to ready without customer intervention.



1	Toner Level	You can view the level of toner remaining in each toner cartridge. The machine and the number of toner cartridge(s) shown in the above window may differ depending on the machine in use. Some machines do not have this feature.
2	Alert Settings	Select the settings you want from the options window.
3	Order Supplies	You can order replacement toner cartridge(s) from online.
4	Troubleshooting	You can directly open the troubleshooting section in the user’s guide.
5	Close	Close the window.

4.1.6.3. Using SyncThru Web Service (SWS)

SWS is an embedded web server in the machine. This web server informs you of machine configuration, version, status and allows you to customize the machine's settings. You can contact this server via wired and wireless network using your web browser in the remote place.

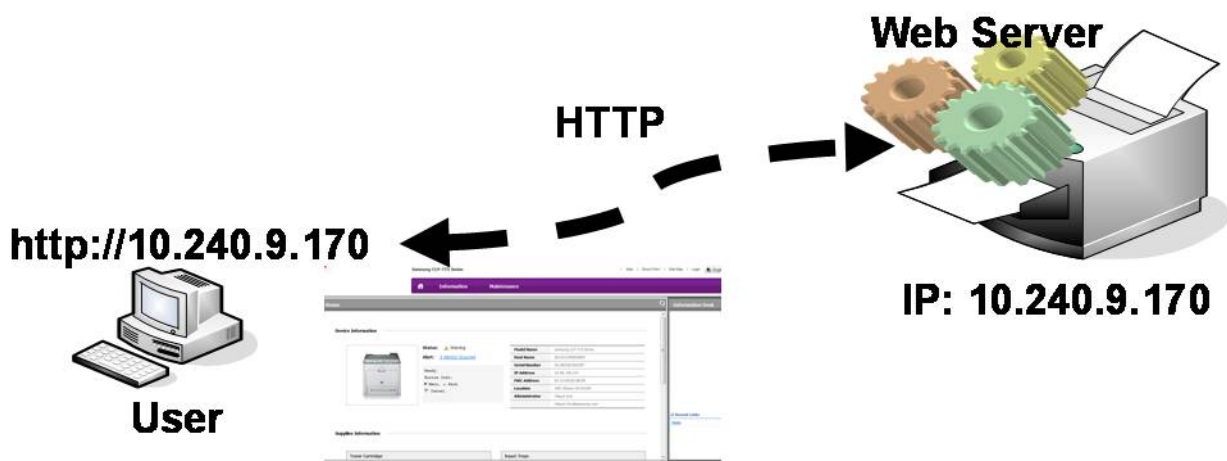
Connecting preparations

- Wired or Wireless Network connection is established.
- Browser (Ex> Internet Explorer) Program on your PC network connected

SWS overview

SyncThru Web Service (SWS)

- accepts HTTP request via port 80 as normal web servers.
- provides interface to users information of networked printers and allow to configure the setting of printers.
- is able to provide more complicated options than Local UI for printer configuration.



Connection 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 pages to check the configuration and customize the settings.



CAUTION

Please, change SWS Default ID and Password for system security in case of your first connection.

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.

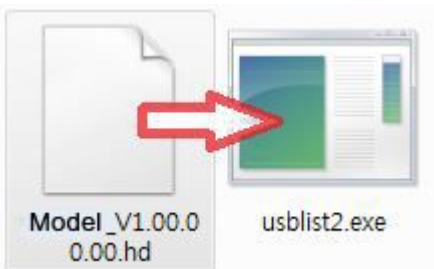
4.1.7.1. Update the firmware by using the USB port

Upgrading preparations

- usblast2.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 usblast2.exe.
- 5) Drag the firmware file and drop down on the usblast2.exe.



And then firmware update will be started automatically.

- 6) When upgrading is completed, machine is automatically re-booting.

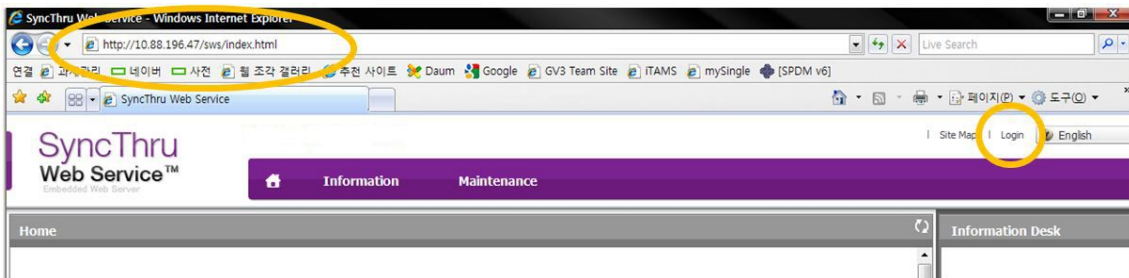
4.1.7.2. Update the firmware by using the network (CLP-36xW only)

Upgrading preparations

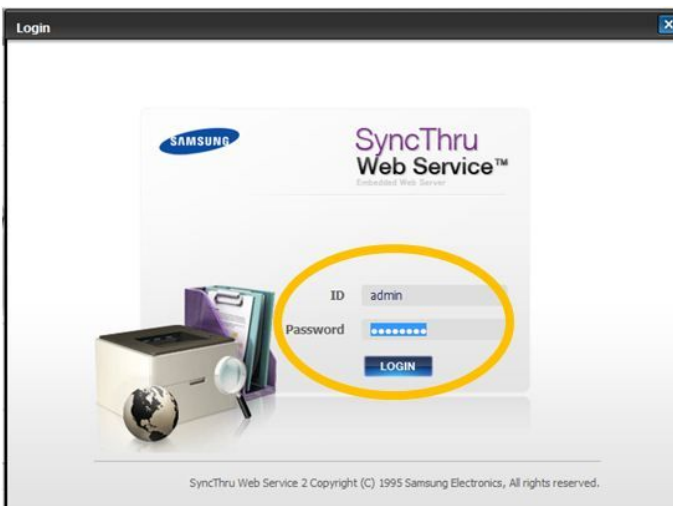
- Wired or Wireless Network connection is established.
- Firmware file to update

Upgrade Procedure

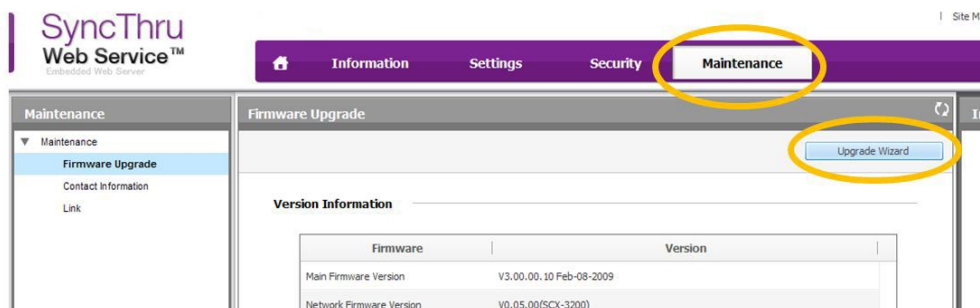
- 1) Open the Web-browser and input IP address of machine. Click “Login”.



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

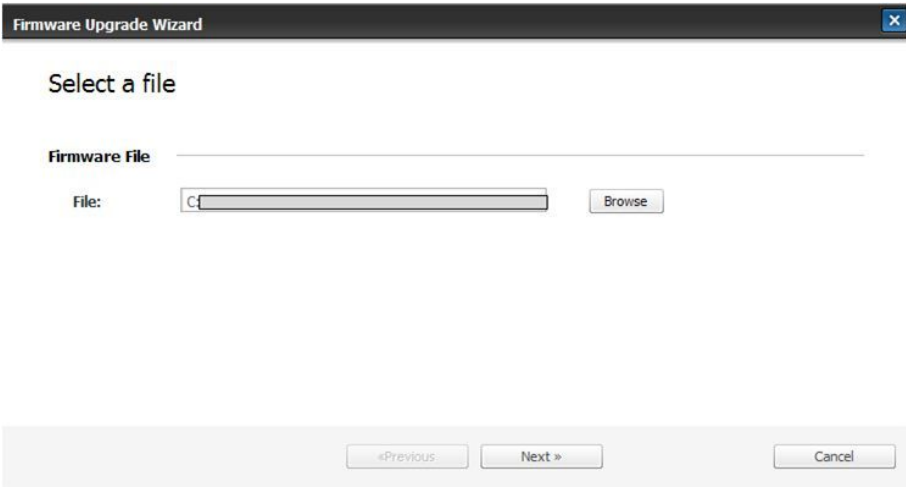


- 3) Select Maintenance menu and click “upgrade wizard”

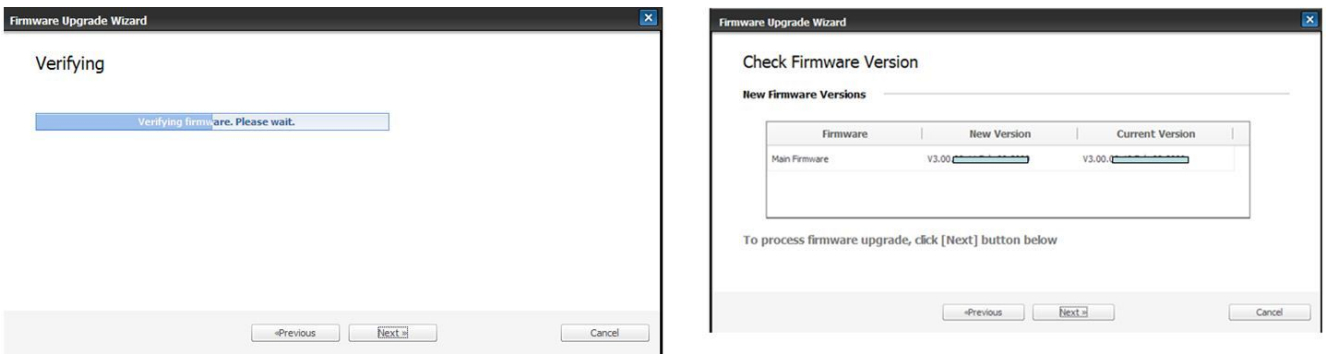


4. Alignment and Troubleshooting

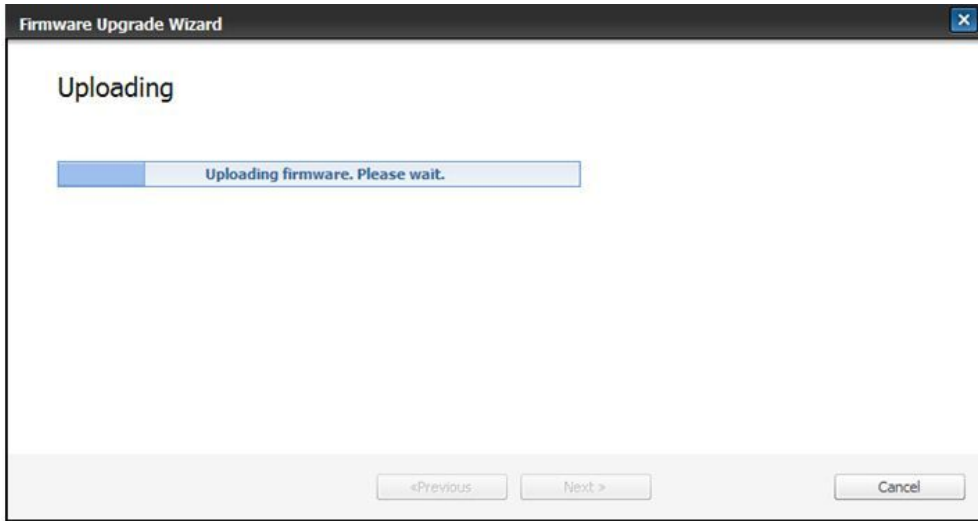
- 4) Select firmware file using “browser” button and press next button.



- 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.

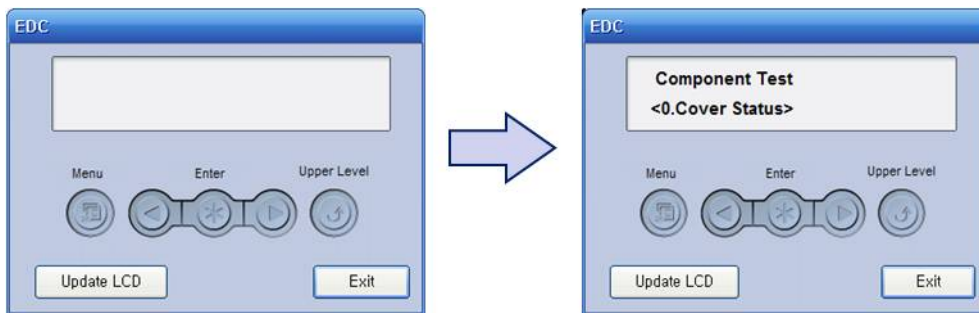


4.1.8. EDC program

The EDC program can check the machine status and perform various test to isolate the cause of a malfunction.

1) How to use the EDC program

- 1) Download the EDC program in your PC.
- 2) Connect the printer to the computer using USB cable.
- 3) Turn on the printer and wait for the printer to finish initializing.
- 4) Start EDC program. Press the “Menu” Button



- 5) To exit the EDC Mode, press the “Exit” button.

EDC mode menu (Engine Diagnostic Test)

Code-Sec	Displayed Name	Meaning
100-0000	Main BLDC Motor	Main BLDC Motor is On/Off
100-0001	Main BLDC Motor Slow	Main BLDC Motor Slow(50% speed) On/Off
100-0010	Main BLDC Motor Ready	Detect if Main BLDC Motor runs at normal speed
100-0241	Waste Toner Led	Waste Toner Led On/Off
100-0250	Waste Toner Full Sensor	Detect if the waste toner is full or not. Display Waste Tank Full adc
101-0010	T1 Pick-Up Clutch	Engages drive to pick up a paper from tray1.
101-0050	Registration Clutch	Engages drive to registartion rolls.
101-0201	Dev Cam Clutch	Rotate Deve cam
101-0202	Dev Relay1	Turn on the deve relay1
101-0203	Dev Relay2	Turn on the deve relay2
101-0204	Dev Relay3	Turn on the deve relay3
101-0205	Dev Relay4	Turn on the deve relay4
101-0210	ITB Clutch	Engages drive to ITB Cleaning Blade
101-0231	T2 Nip Release	T2 Nip Release
101-0260	Cover Open Sensor	Check if the set main cover is open or not
102-0010	T1 Paper Empty Sensor	Detect when paper is in Tray1.
102-0360	Regi. Sensor	Detect when a paper is at Regi. sensor.
102-0370	Exit Sensor	Detect when a paper is at Exit. sensor.
105-0032	MHV Bias	MHV bias voltage on at normal drive level
106-0037	Dev Bias	Dev bias voltage on at normal drive level
106-0038	Dev AC Bias	Dev bias AC voltage on at normal drive level

Code-Sec	Displayed Name	Meaning
107-0032	THV Bias	THV plus bias voltage on at normal drive level
107-0033	THV(-) Bias	THV minus bias voltage on at normal drive level
107-0080	iTHV(+) Bias	iTHV plus bias voltage on at normal drive level
107-0160	Erase Lamp1	Erase Lamp 1
109-0000	Fuser Temperature A	Detects what the temperature A is on fuser.
110-0000	LSU Motor1 Run Ready	Detects if LSU motor1 runs at normal speed.
110-0060	LSU Motor1 Run	LSU Motor1 On/Off
110-0111	LSU LD Power	LSU LD Power On/Off with normal LD Power
111-0080	ID Sensor	Start ID sensor sensing On/Off
111-0090	ID Sensor Check	Display ID sensor reading value



NOTE

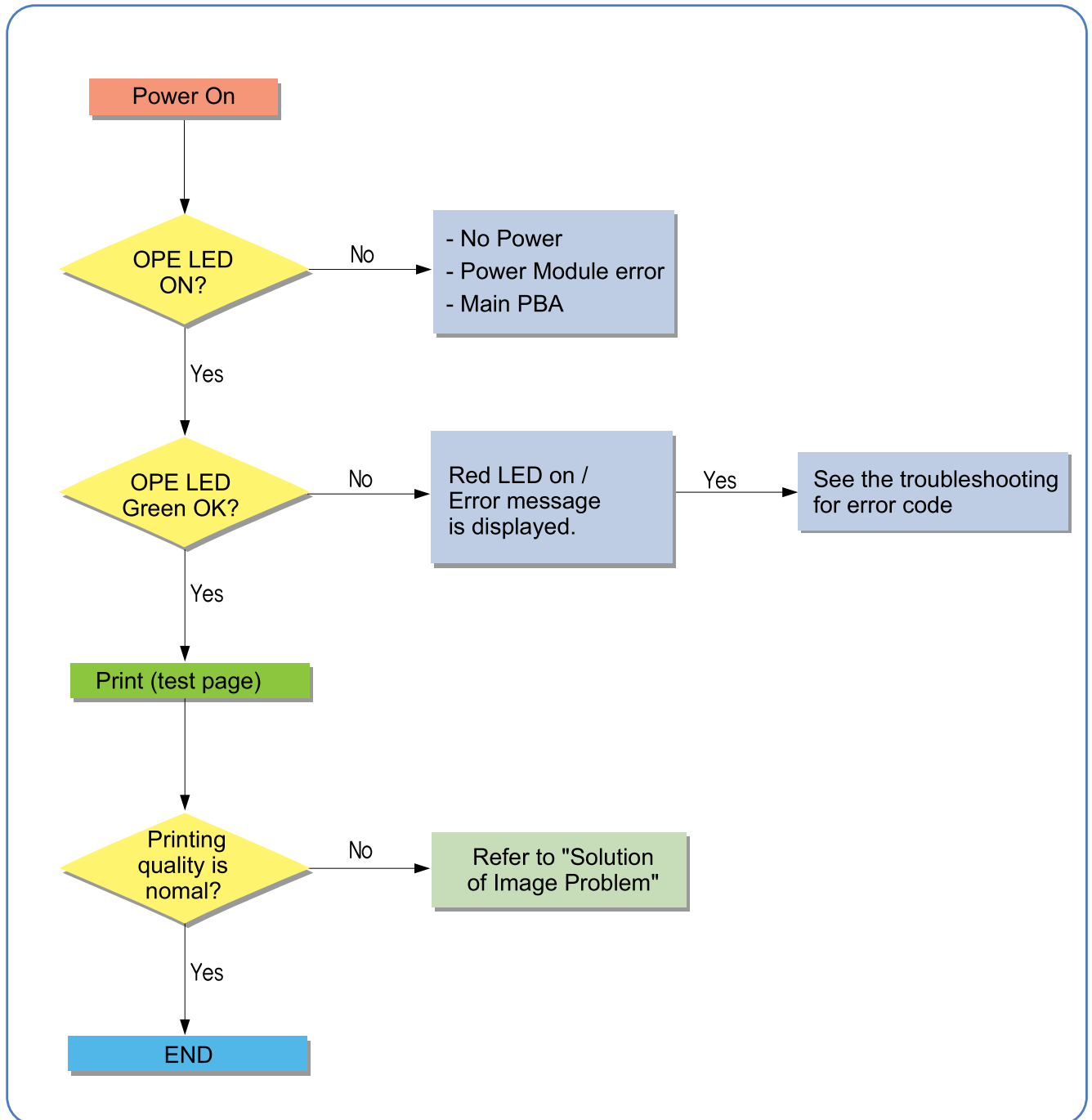
Acronyms and Abbreviations

- DEV Bias- Developing High Voltage Bias
- EDC - Embedded Diagnostic Control
- LD – Laser Diode
- LSU – Laser Scanning Unit
- MHV - Main High Voltage (Charge Voltage)
- THV - Transfer High Voltage

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 abnormal Lamp?
 - › 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
A1-1110	Error #A1-1110 Turn off then on	Page 4-21
A3-2210	Error #A3-2210 Call for service	Page 4-21
A3-3312	Error #A3-3312 Call for service	Page 4-22
A3-6110	Deve Home Sensor Error	Page 4-23
C1-2110	Prepare Toner	Page 4-24
C1-2120	Replace Toner	Page 4-24
C1-2411	Install toner	Page 4-24
C1-2512	Not compatible Yellow toner	Page 4-25
C1-2514	Not compatible Yellow toner	Page 4-25
C1-2711	Error: #C1-2711 Call for Service	Page 4-25
C1-2712	Error: #C1-2712 Call for Service	Page 4-25
C1-3110	Prepare Toner	Page 4-24
C1-3120	Replace Toner	Page 4-24
C1-3411	Install Toner	Page 4-24
C1-3512	Not compatible Magenta toner	Page 4-25
C1-3514	Not Compatible Magenta toner	Page 4-25
C1-3711	Error: #C1-3711 Call for Service	Page 4-25
C1-3712	Error: #C1-3712 Call for Service	Page 4-25
C1-4110	Prepare Toner	Page 4-24
C1-4120	Replace Toner	Page 4-24
C1-4411	Install Toner	Page 4-24
C1-4512	Not compatible Cyan toner	Page 4-25
C1-4514	Not compatible Cyan toner	Page 4-25
C1-4711	Error: #C1-4711 Call for Service	Page 4-25
C1-4712	Error: #C1-4712 Call for Service	Page 4-25
C1-5110	Prepare Toner	Page 4-24
C1-5120	Replace Toner	Page 4-24
C1-5411	Install Toner	Page 4-24
C1-5512	Not compatible Black toner	Page 4-25
C1-5514	Not compatible Black toner	Page 4-25
C1-5711	Error: #C1-5711 Call for Service	Page 4-25
C1-5712	Error: #C1-5712 Call for Service	Page 4-25
C3-6110	Prepare new Imaging unit	Page 4-26

4. Alignment and Troubleshooting

Error Code	Error Message	Troubleshooting Page
C3-6120	Replace new Imaging unit	Page 4-26
C3-6410	Install Imaging unit	Page 4-26
C3-6520	Error: #C3-6520 Door open/close	Page 4-26
C5-1110	Prepare new Transfer belt	Page 4-27
C5-1120	Replace new Transfer belt	Page 4-27
C5-1710	Transfer Belt Error	Page 4-27
C5-3110	Prepare new Transfer roller	Page 4-27
C5-3120	Replace new Transfer roller	Page 4-27
C6-1110	Replace Fuser Soon	Page 4-28
C6-1120	Replace new Fuser unit	Page 4-28
C7-1131	Replace/Install Waste Toner Tank	Page 4-28
M1-1013	Paper Jam in Tray1	Page 4-29
M1-5012	Paper Empty in Tray	Page 4-30
M2-1210	Paper Jam inside machine	Page 4-29
M3-1110	Paper jam in exit area	Page 4-30
M3-2130	Output bin full Remove paper	Page 4-31
S1-5221	Wireless Network Error	Page 4-31
S2-4110	Door open Close it	Page 4-32
S2-4611	Top door Open or Exit JAM	Page 4-32
S6-3123	Network Problem:IP Conflict	Page 4-32
U1-2320	Error #U1-2320 Turn off then on	Page 4-33
U1-2330	Error #U1-2330 Turn off then on	Page 4-33
U1-2332	Error #U1-2332 Turn off then on	Page 4-33
U1-2340	Error #U1-2340 Turn off then on	Page 4-33
U2-6120	Error #U2-6120 Turn off then on	Page 4-34
U2-6140	Error #U2-6140 Turn off then on	Page 4-34

▶ **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.



- 4) If the connection is OK, replace the main motor.
- 5) If the problem persists, replace the main board.

▶ **Error Code**

A3-2210

▶ **Error message**

Error #A3-2210 Call for service

▶ **Symptom**

The CTD sensor has a problem.

▶ **Troubleshooting method**

- 1) Turn the machine off then on. If the error persists, turn the machine off again.
- 2) Check the CTD sensor connector. If the connection is OK, replace the CTD sensor board.



▶ **Error Code**

A3-3312

▶ **Error message**

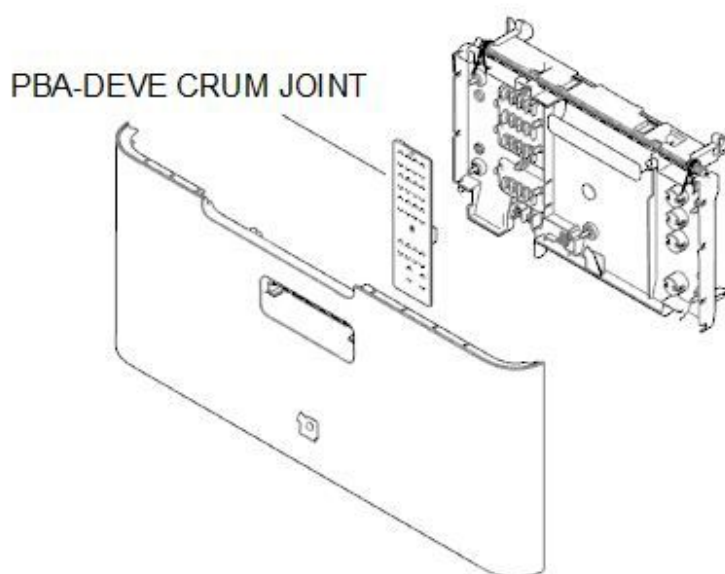
Error #A3-3312 Call for service

▶ **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) Disassemble the front cover and replace the PBA-DEVE CRUM JOINT that includes the outer temperature sensor.



▶ Error Code

A3-6110

▶ Error message

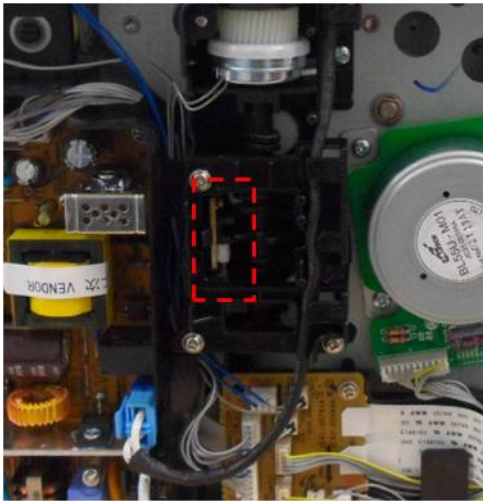
Deve Home Sensor Error

▶ 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 the connection between the deve home sensor and connection board.



- 4) If the connection is OK, replace the deve home sensor.

▶ **Error Code**

C1-2110

C1-3110

C1-4110

C1-5110

▶ **Error message**

Prepare Toner

▶ **Symptom**

The remaining toner cartridge is less than 10%

▶ **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

C1-3120

C1-4120

C1-5120

▶ **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

C1-2514

C1-3512

C1-3514

C1-4512

C1-4514

C1-5512

C1-5514

▶ 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 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

▶ **Error message**

Prepare new Imaging unit

Replace new Imaging unit

▶ **Symptom**

The imaging unit is at the end of its life.

▶ **Troubleshooting method**

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

▶ **Error Code**

C3-6410

C3-6520

▶ **Error message**

Install Imaging unit

Error: #C3-6520 Door open/close

▶ **Symptom**

The imaging unit is not installed.

▶ **Troubleshooting method**

- 1) Open the front cover. Remove YMCK toner cartridges.
- 2) Check if the imaging unit is installed. Remove and reinstall it.
- 3) If the problem persists, replace the imaging unit.

▶ Error Code

C5-1110

C5-1120

▶ Error message

Prepare new transfer belt unit.

Replace new transfer belt unit.

▶ Symptom

The ITB Unit is 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

ITB home sensor is defective.

▶ Troubleshooting method

- 1) Turn the machine off then on.
- 2) If the problem persists, turn the machine off. Remove and reinstall the ITB unit.
- 3) If the problem persists, replace the ITB unit with new one.

▶ 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 tray 1.

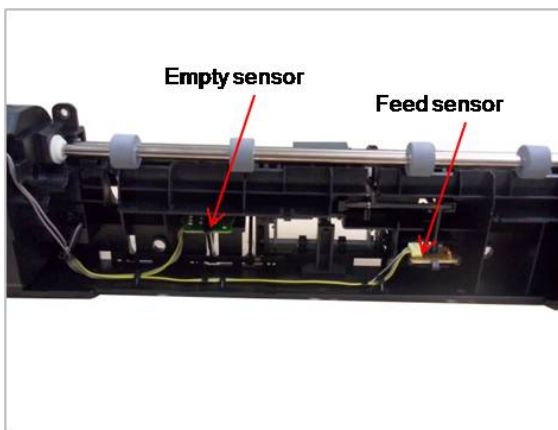
Paper Jam inside machine

► Symptom

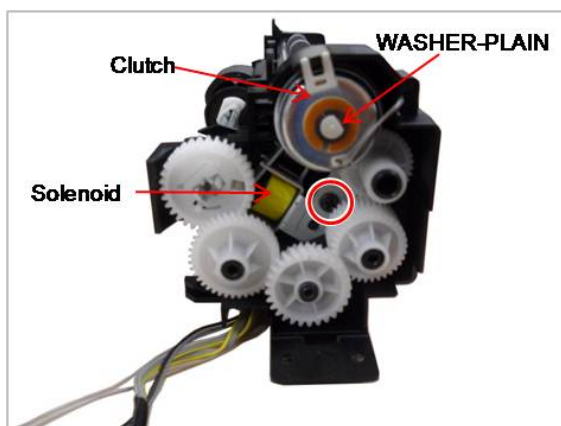
The jammed paper has occurred in the tray1 or inside the machine.

► 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

▶ **Error message**

Paper Empty in Tray

▶ **Symptom**

Paper is empty in tray.

▶ **Troubleshooting method**

- 1) Remove the cassette. Check if the paper is loaded.
- 2) If the problem persists, replace the paper empty sensor.

▶ **Error Code**

M3-1110

▶ **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 paper is full on the exit tray.

▶ Troubleshooting method

- 1) Remove the paper.
- 2) If the problem persists, remove the top cover.
- 3) Check if the bin full sensor connector is connected properly.
- 4) If the connection is OK, replace the bin full sensor.

▶ Error Code

S1-5221

▶ Error message

Wireless Network Error

▶ Symptom

The communication error between the main board and WLAN board has occurred.

▶ Troubleshooting method

- 1) Turn the machine off then on. If the problem persists, turn the machine off.
- 2) Remove the right cover. Check the connection between the main board and WLAN board.
- 3) If the connection is OK, replace the WLAN board.

▶ **Error Code**

S2-4110

▶ **Error message**

Door is open. Close it.

▶ **Symptom**

Door is opened 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**

S2-4611

▶ **Error message**

Top door Open or Exit JAM

▶ **Symptom**

Top door is opened or the paper jam has occurred in exit area.

▶ **Troubleshooting method**

- 1) Open and close the top door.
- 2) If there is a jammed paper, remove it.
- 3) Open and close the top door again.

▶ **Error Code**

S6-3123

▶ **Error message**

Network Problem:IP Conflict

▶ **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

U1-2320

U1-2330

U1-2332

U1-2340

► Error message

Error #U1-2320 Turn off then on

Error #U1-2330 Turn off then on

Error #U1-2332 Turn off then on

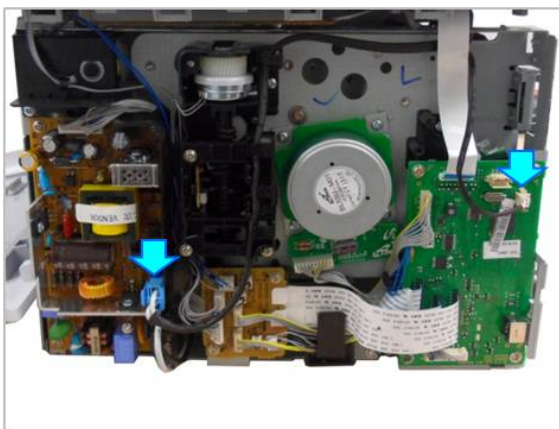
Error #U1-2340 Turn off then on

► Symptom

The temperature control of fuser unit is abnormal.

► Troubleshooting method

- 1) Check if the input voltage is normal.
- 2) Turn the machine off. Remove and reinstall the fuser unit. Be careful when connecting the AC-connector and Thermistor connector.
- 3) Turn the machine on. Is the error message is disappeared?
- 4) Check the followings. If the fuser unit has any problem, replace it.
 - a) Check if the fuser connector is connected properly.



- b) Check if the halogen lamp voltage is normal.
 - c) Check if the thermistor is contaminated or twisted.
- 5) If the problem persists, replace the main board or SMPS board.

▶ **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.

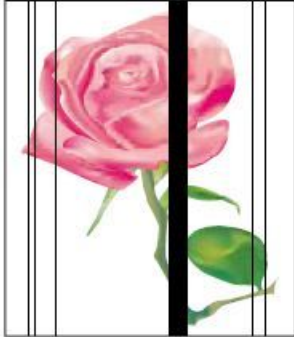


- 5) If the problem persists after replacing LSU, replace the main board.

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

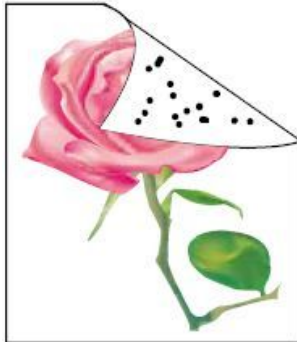
- Description : White vertical voids in the image.



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 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

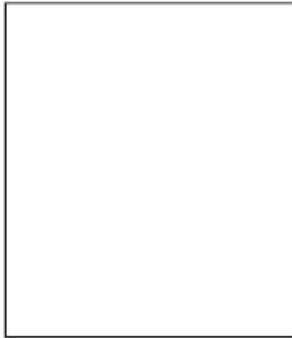
- Description : The black page is printed out.



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

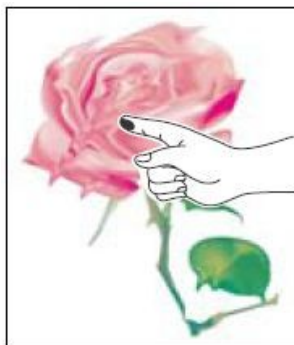
- Description : Dark or white horizontal stripes appear in the page. (These may occur at regular intervals down the page.)



Cause and Check Point	Solution
The developing roller, OPC drum or other rollers in the toner cartridge may be contaminated or deformed.	Replace the 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

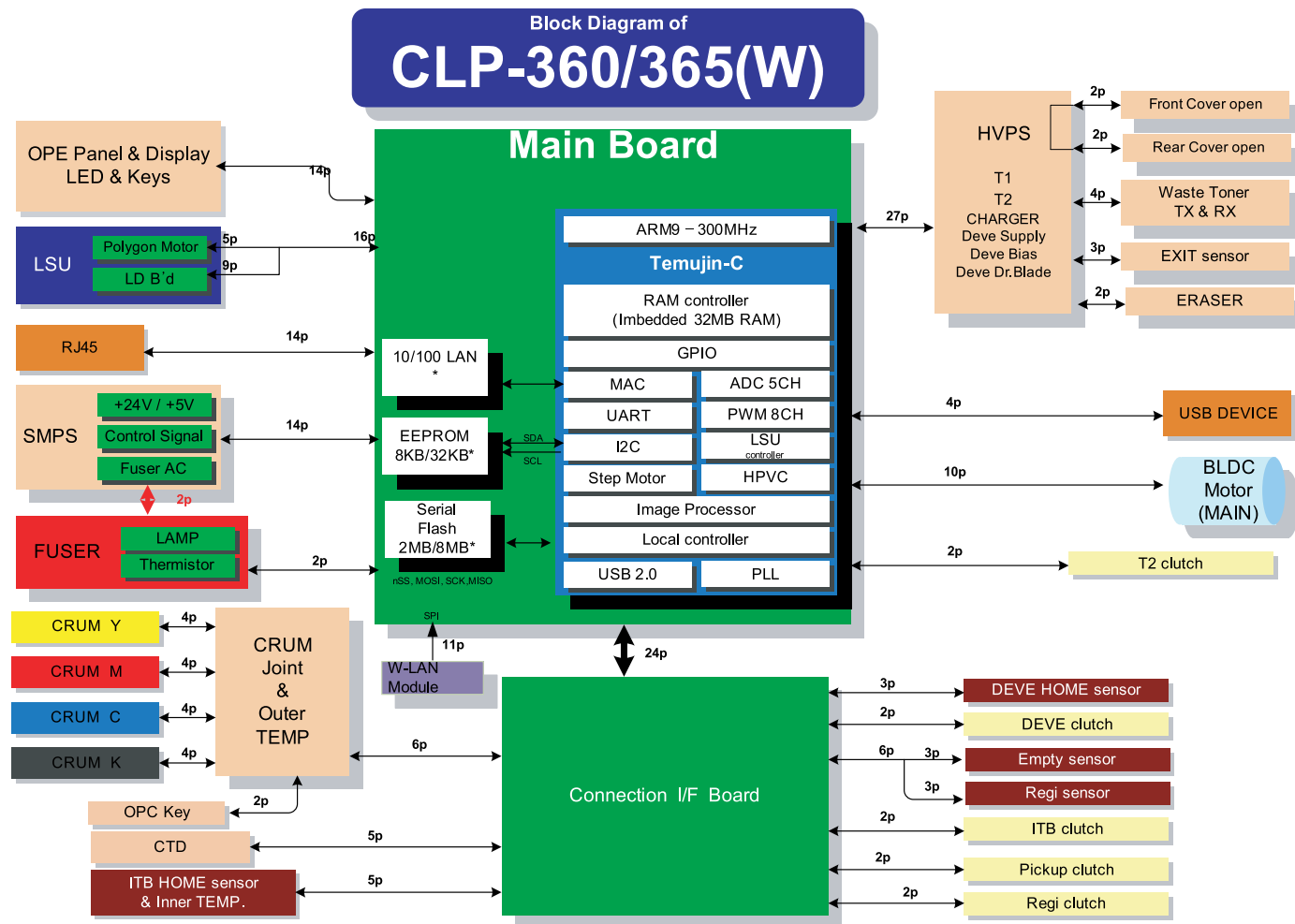
- Description : Toner is not properly fixed on paper.



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

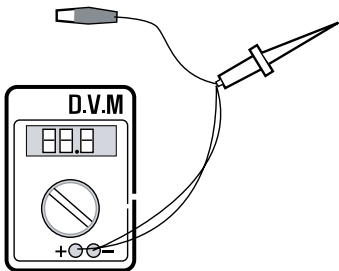
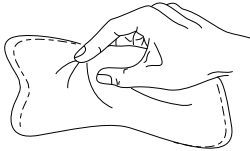
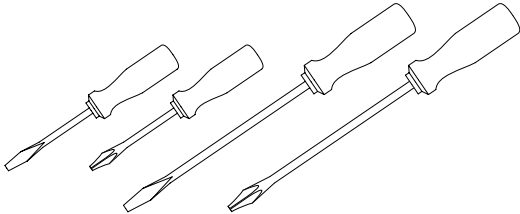
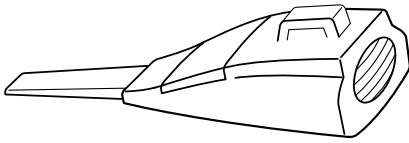



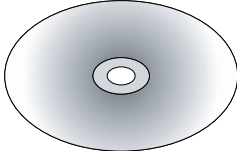


6. Reference Information

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	03/May/2012	-	Release
1.01	14/Aug/2014	P.6-8	Add Document Revision List.



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
N.America, S.America	https://gspn3.samsungcsportal.com

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