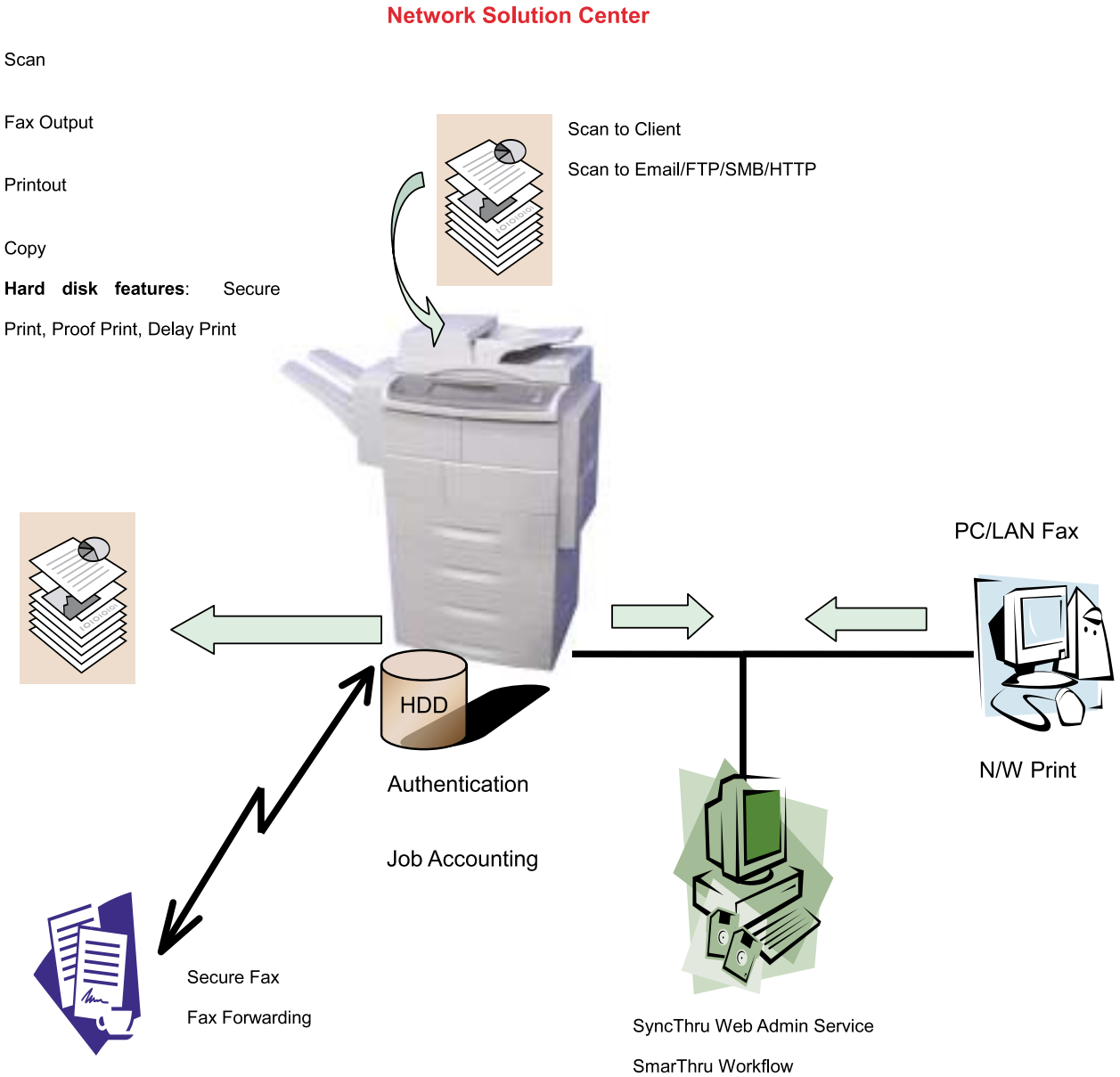
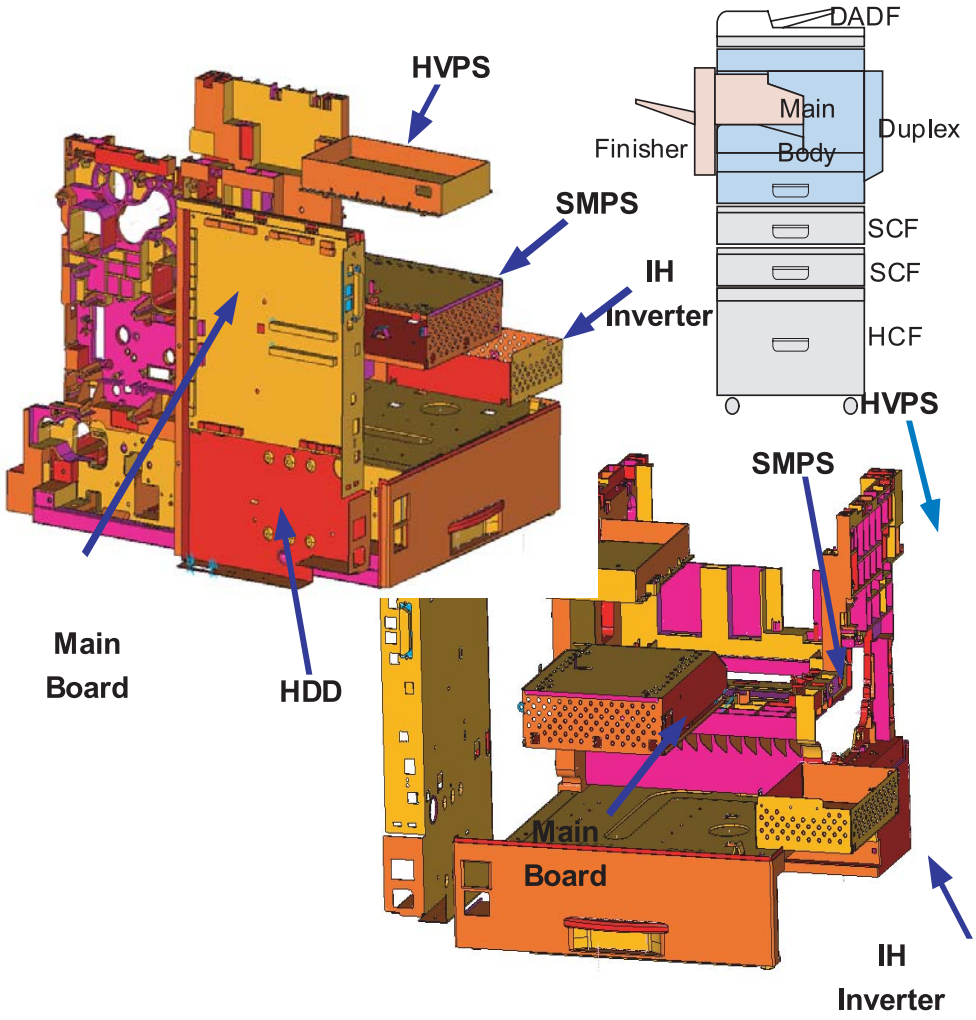
3. System Overview

The SCX-6345 Series is a networked Multi-Function Peripheral (MFP) integrating a plain fax, a B/W laser printer, a color flatbed scanner, and a B/W copier, and a Scan-To-Email sender (5-in-1 with DADF). The Jungfrau series can be expanded to support non-scan and FAX functions such as Copy ?only or Copy and printer functions(2-in-1 with DADF). Jungfrau is developed for workgroup office customers. The main product concept is "High Speed and High Quality". This model has 45 ppm letter print-speed, 3 sec transmission-speed for fax, 33.6kbps fax-transfer rate, optical 600 dpi color scanner, and 1200 dpi printer.



3.1 System Lay-out



3.2 System Description

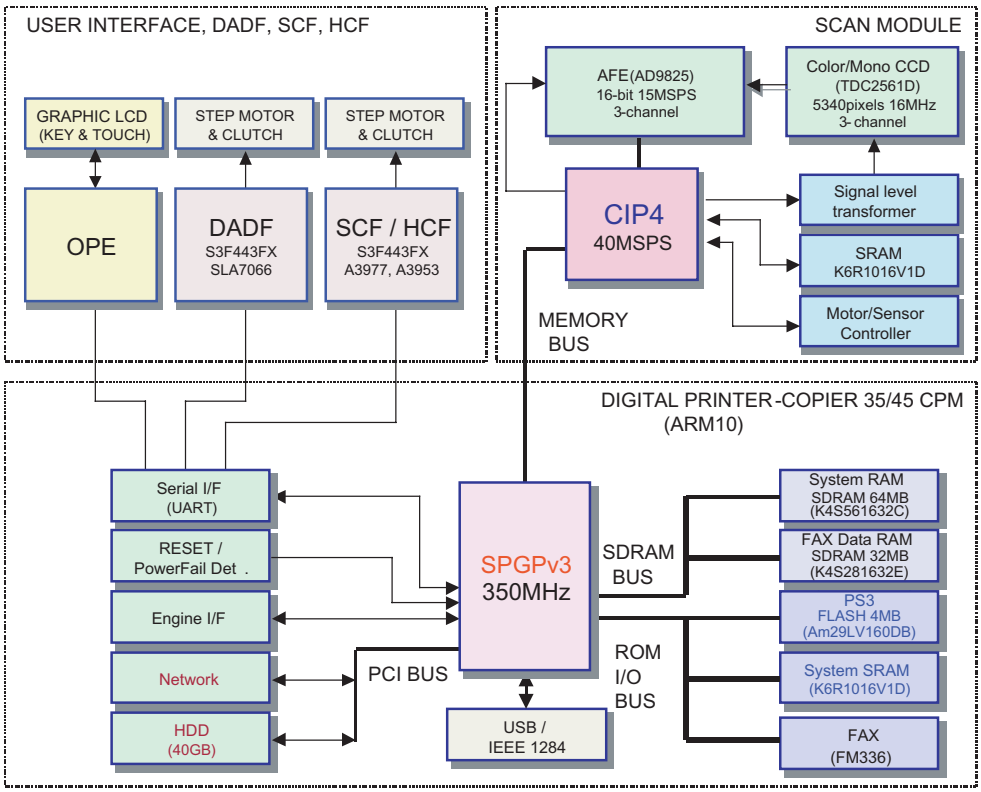
3.2.1 System controller architecture

Largely, SCX-6345N consists of Main Control Part, Operation Panel Part, Scanner Part, Line Interface Part, Power Part and Network Interface Card, Optional DIMM(Dual-In-Memory Module) for Scan-To-Email.

Main Controller is commonly applied in all products, Jungfrau Series, and in case of necessary a part of components or Module is selectively adopted in accordance with required feature of each model.

Each Part is designed with emphasis on Common-Use/Standardization with other models as independent module.

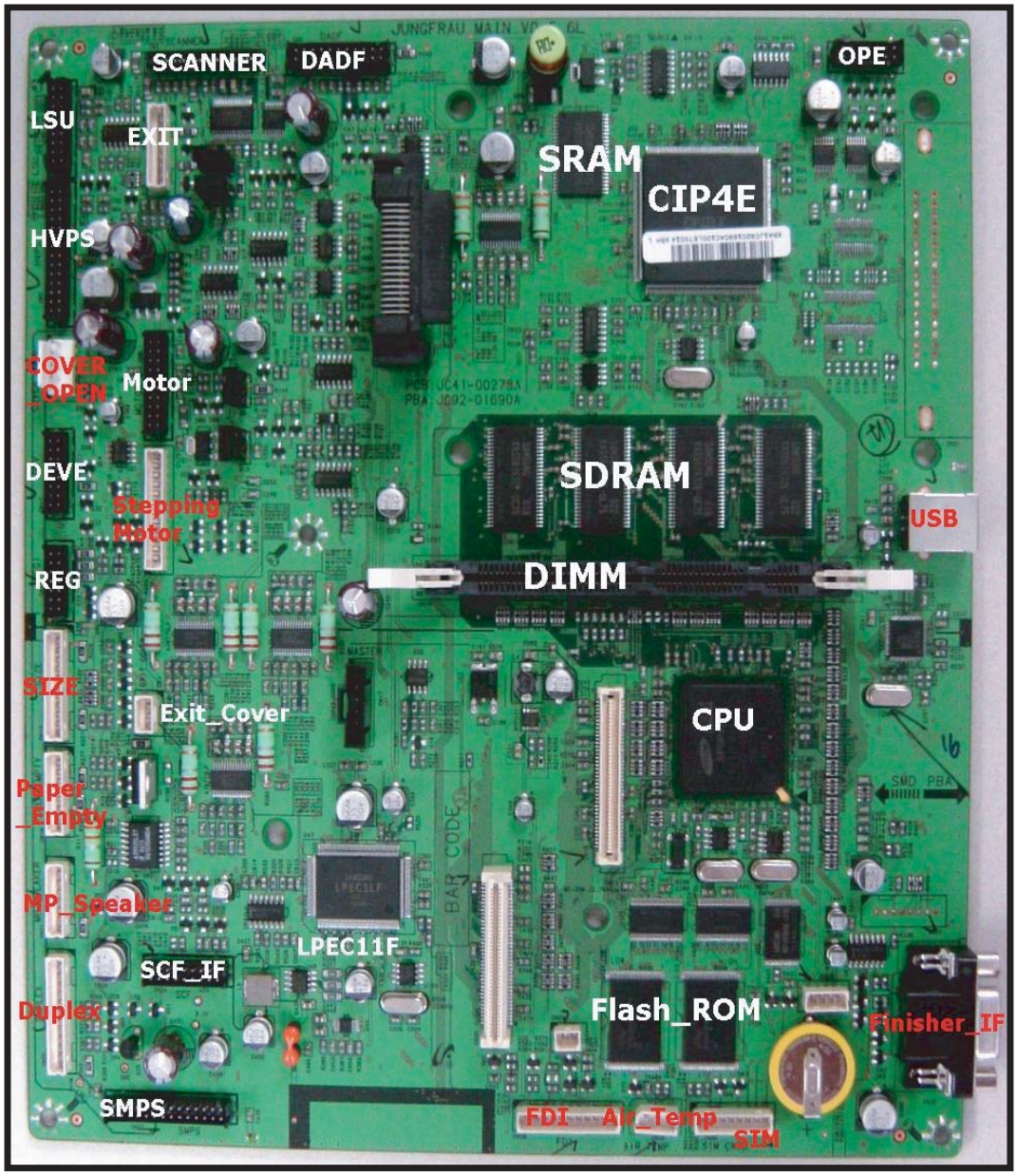
· System Block Diagram



(note) This System Block diagram only for reference (will be updated with next version)

3.2.2 Main Controller

The Main Control Part comprises 1 CPU and 1 B' D by adopting the dedicated Controller for Fax & LBP.
The Scanner Part comprises ADF& CCD and connected with Main through Harness.



1) CPU (SPGPV3)

It uses the ARM 1020E, 32Bit RISC Processor, which is dedicated Controller for Printer & Fax function and drives the each internal Operation Block by system program of Flash Memory and thereby controlling the whole System.

- Main Function Block : Completely Integrated System for Embedded Applications,
  - ▶ 32 Bit RISC Architecture, Efficient and Powerful ARM 1020E Core.
  - ▶ LSU Interface Module for Interfacing PVC or HPVC with LSU
  - ▶ 4 Channel General Purpose DMA Controller for High Speed I/O
  - ▶ Dual Memory Bus Architecture
    - Operation Frequency : AHB Bus: 100MHz, Internal System Bus: 120MHz
    - Operation Power : 3.3V/1.3V(core)
    - POWER ON RESET TIME : 5.6ms or less

2) Flash Memory

It stores system program, Fonts data(PCL, PS/3), and can download the system program through PC Interface or Network.

It is used as Journal List for FAX and One Touch Dial & Speed Dial List..

- Capacity : 16M Byte, Access Time : 80 nsec

3) System Memory (SDRAM)

It is used as Swatch Buffer for Printing, Scan Buffer for Scanning and System Working Memory Area.

- System memory : 64 MB Capacity
- Data memory (for Fax data and Scan-To-Email, Network Scan memory) ; 64MB
- Max Frequency : 100 MHz
- It preserves the Fax Receive Memory by using Battery.

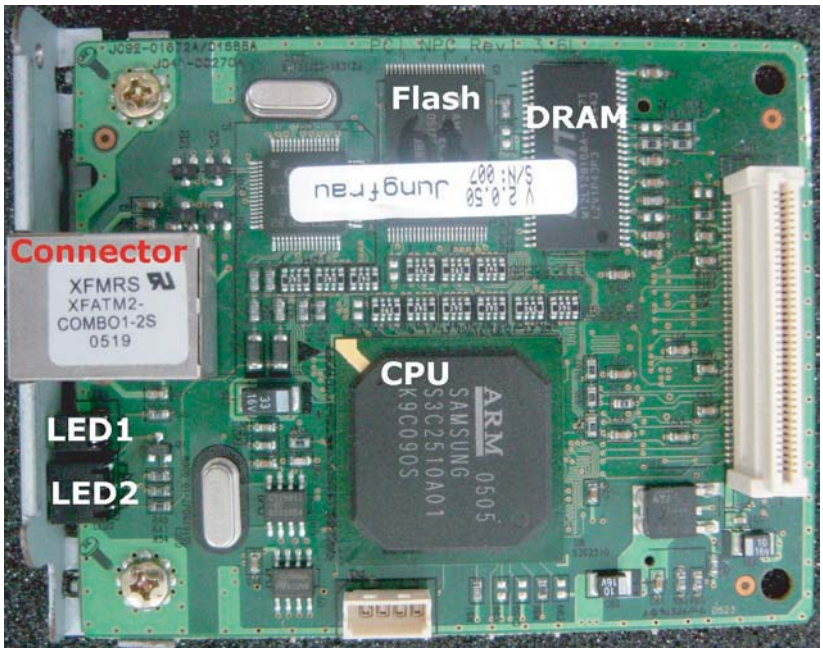
4) System Data Memory (SRAM)

This memory, which is for storing the operation variable & the setting parameter of SCX-6345N, keeps the information with using Backup Battery even in case of Power-off.

3.2.3 Network Interface Card (NIC) Block Diagram - Option

This device is necessary to provide users with Network Printing, Network Scanning, Scan-To-Email function and helps manage Jungfrau machine efficiently in Network environment with Embedded Web Service when installing this device.

This device, which comprising Network Printer Card-related circuit is designed for providing users with easy-install through screwing with Main Control Board by 80 pin connector.



1) CPU (ARM7 based S3C2510)

This device includes IEEE802.3 MAC Core as 32Bit RISC Controller only for Network Control having ARM9 Core. It converts/uses 10MHz input clock into 33MHz System clock by using internal PLL.

The communication between Main PBA and CPU enables the high-speed/high-efficiency transmission through 33MHz PCI Bus

2) ROM (Flash Memory)

Jungfrau uses 2MB Flash Memory for operating System Program.

This Flash Memory stores software for NIC Firmware which controls entire Network Protocol and software for Embedded Web Service & Network Management.

Flash Memory Size needs to be extended or reduced in case Embedded Web Service requires like Embedded Web Pages & MIB besides Network Printing and Scan-To Email function.

This Flash Memory can be upgraded through Network by using EWS or MIB.

3) RAM

16MB SDRAM is used as System Program buffer or Network Data buffer.

4) PHY ; STE100P PHY chip

Converting Network signal into Digital signal, it supports MII and requires 10MHz clock input.

5) RJ-45

6) LEDs

Comprising 2 LEDs, it functions as displaying the Network Link status and System Operation status.

7) Clock

System clock which is needed in Network Card operation, it needs the precision of 10MHz ±50PPM.
X-tal application

8)EEPROM

Non-volatile memory for storing Network setting parameters, it stores the various parameters like TCP/IP and Netware.

9) 80 pin Connector

This device is Connector for interfacing with Main Controller B'd ; PCI Bus, Power 3.3V

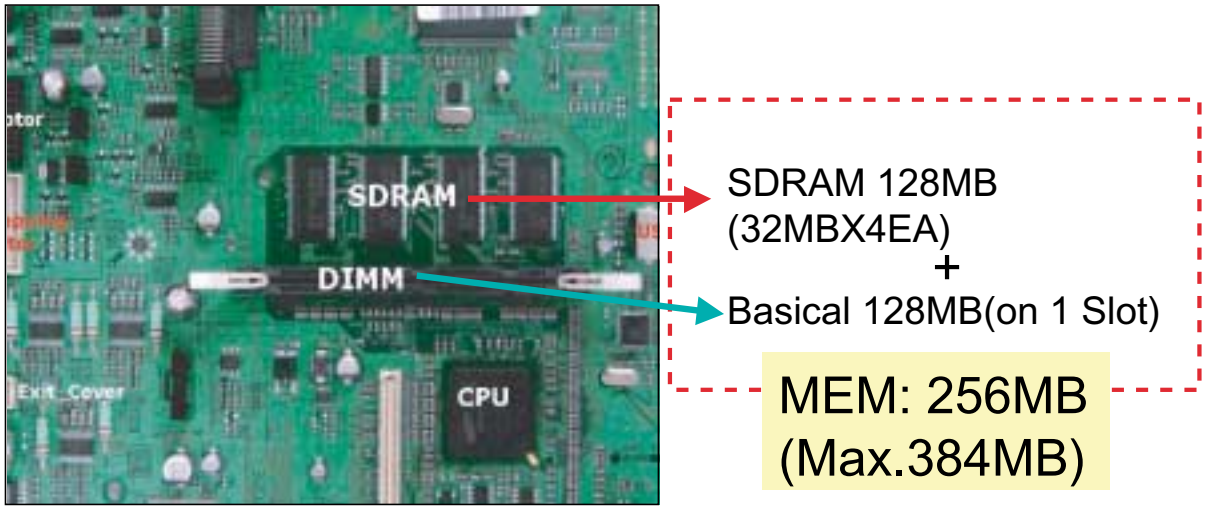
3.2.4 Option Memory (DIMM)

■ SCX-6345N provides one (1) Extension Slots for extending Memory. The RAM Extension Slot can be used for:

· General Memory Extension
128 MB Optional Memory is available.

■ System standard 256M: Buffer for printing, scan and system working memory area.
Primarily used for system memory(240MB) and FAX Data storage(16MB).

■ DIMM : available 128MB (System memory : Max 384MB)



※ **Note:** This machine comes with 128 MB of on-board memory and a 128 MB DIMM.
To expand the memory of your machine, you must remove the existing DIMM and purchase a larger one.

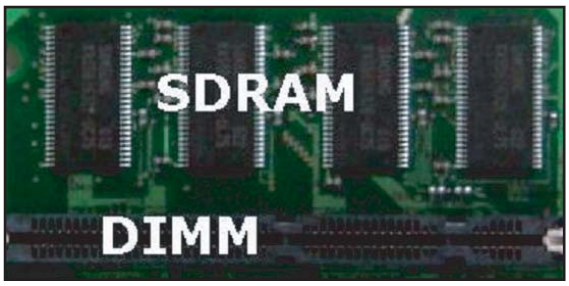
3.2.5 SDRAM

■ Memory Size

- SDRAM: 240MB for Data and 16MB for FAX
- DIMM: STD 128MB, MAX. 256MB for Data

■ Used as buffer and system
- working memory area in printing, copying, scanning, and facsimileing.

■ External voltage from the battery is used to store the received fax data when the main power is off for 72Hrs. (self-refresh)

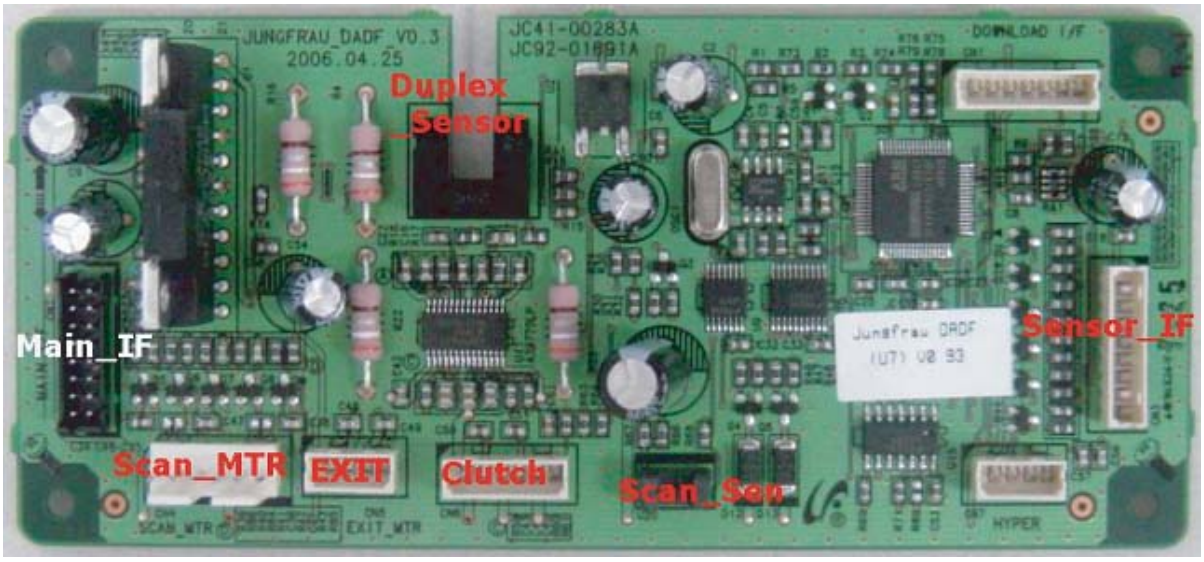


3.2.6 DADF Board

■ Duplex Automatic Document Feeder

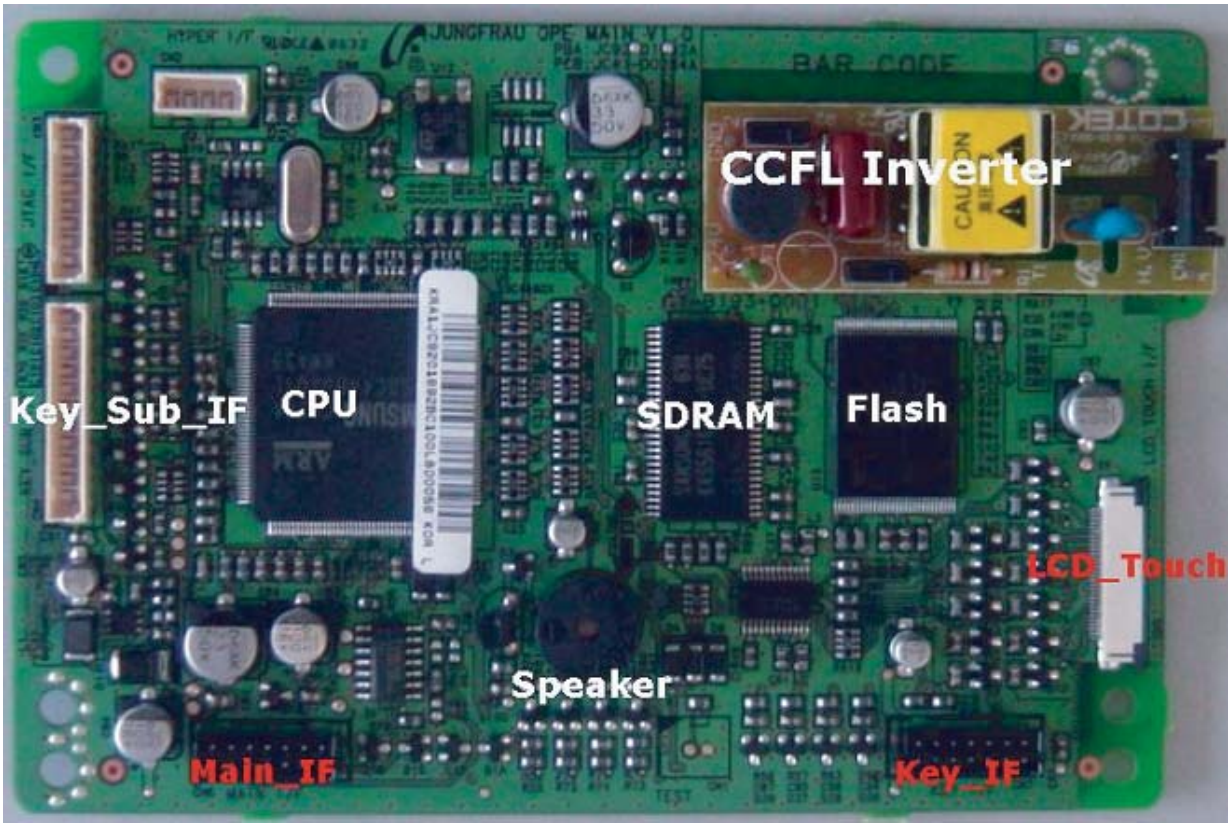
Descriptions
A DADF board controls 2 stepping motors, 2 clutches, 8 sensors By using CPU(S3F443FX) having 80MHz Core Frequency. A DADF board supports customer to copy Max 50 sheets of documents automatically. In this reason, SCX-6345N series has a DADF module in standard option.

· MPU: S3F443FX (Refer to the next page)
· Motor Drive Block
- Unipolar Motor Driver IC(SLA7066M): Most rollers are controlled by a SLA7066M motor drive.
- Bipolar Motor Driver IC(A3977): For Exit motor
· Clock Generator(CY25814): SSCG converts crystal 12Mhz to 48MHz clock for MPU main clock.



3.2.7 OPE Board

- 640x240 Graphic LCD
- CPU(S3C44B0): ARM7 Based 32bit RISC Processor.
- Flash ROM(16MB): OP Operating program F/W
- SDRAM(32MB): System Program and Data Buffer
- CCFL Inverter: 24V input -> 400Vrms output to power LCD Back Light



3.2.8 SMPS PBA

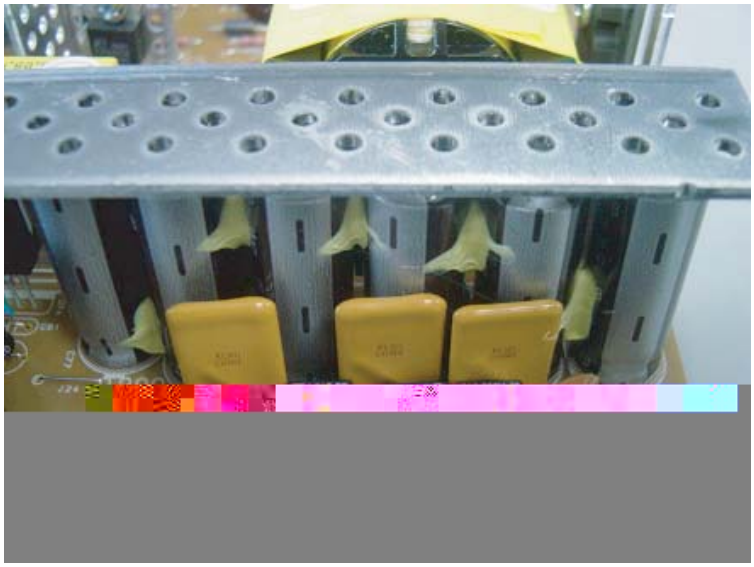
Descriptions

It supplies electric power to a Main Board and other boards through a Main Controller by +5V,+24V from 110V/220V power input. It has safety protection modes for over current and load.

SPECIFICATION

· General Input/Output Voltage

1) AC 110V (90V ~ 135V)
2) AC 220V (180V ~ 270V)
3) Input Current: 3.2 [Arms]
4) Output Power: 192W / Max. 270W
   DC 5V: 24W ~ 30W (0.6A ~ 6.0A)
   DC 24V: 168W ~ 240W (0A ~ 10A)



3.2.9 IH PBA

■ IH (Induction Heating)

Descriptions

Induction heating is a method of providing fast, consistent heat for fuser heat roller. The IH inverter has improved Heating Efficiency up to 35-40% over e-Coil System.

SPECIFICATION

· General Input / Output Voltage
1) AC 110V (90V ~ 135V)
2) AC 220V (180V ~ 270V)
3) Input Current: 14 [Arms]
4) Output Power: 1300 [W]
(1300[W] / 90V ~ 135V = 9A ~ 12A)
(1300[W] / 180V ~ 270V = 4.5A ~ 7A)

3.2.10 HVPS PBA

■ HVPS (High Voltage Power Supply)

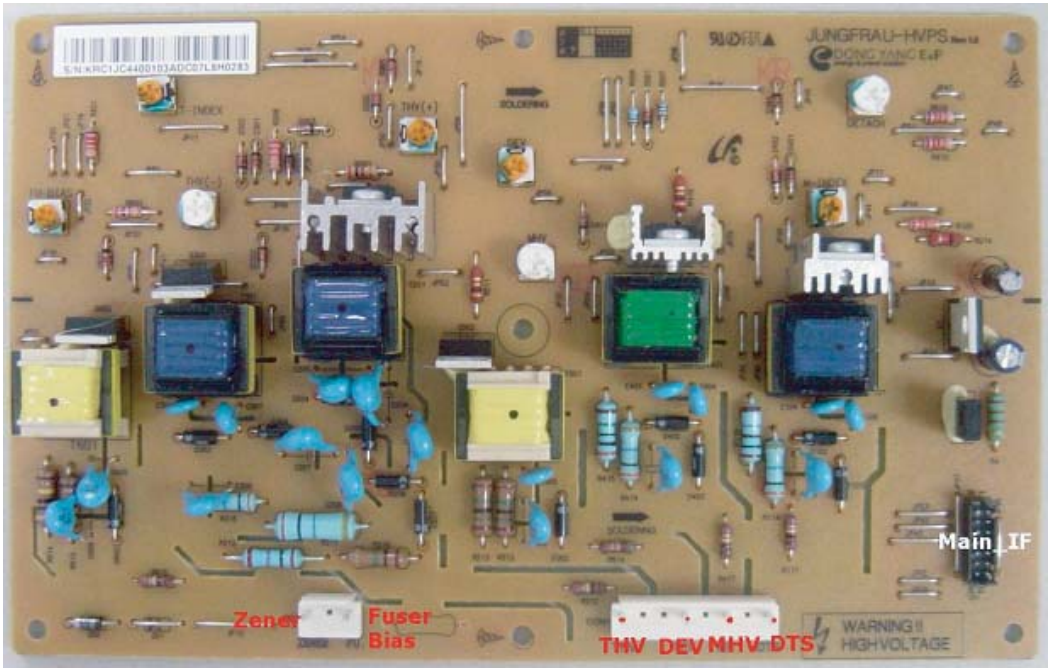
Descriptions

HVPS Part outputs the high voltage for THV(+),(-)/MHV/DEV/DTS/FU-BIAS by DC 24V input and the output high voltage is provided into OPC Cartridge and Transfer Roller. It helps transfer toner to media well.

SPECIFICATION

· General Input Voltage
1) DC 5V (4.75 ~ 5.25V)
2) DC 24V(21.6V ~27.6V)

· General Output Voltage
1) MHV: -1200V ±3%
2) Fu-Bias: 80V ±5%
3) DEV: -500V ±3%
4) THV(+): 1800V ±3%
5) THV(-): -1100V ±20%
6) DTS: -1800V ±3%

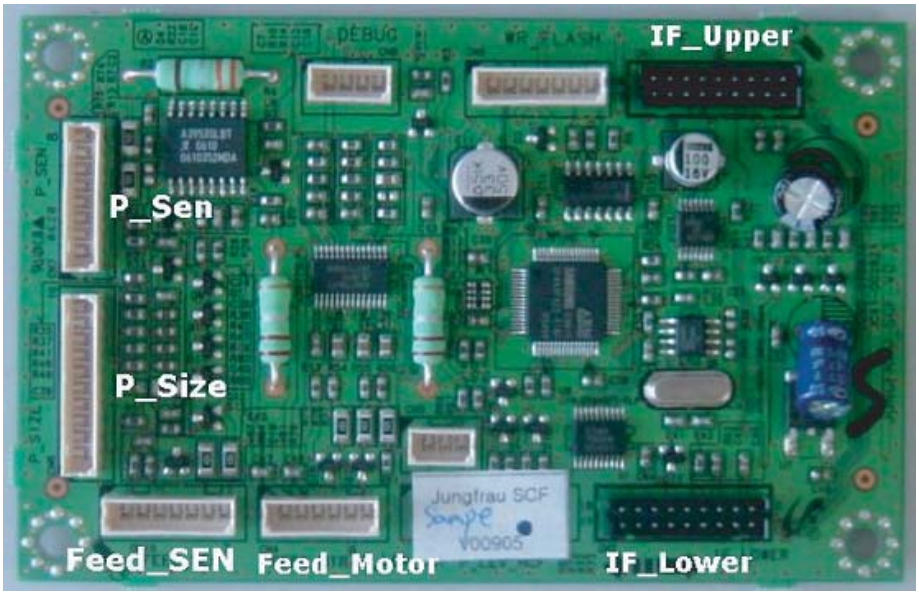


3.2.11 SCF PBA

Descriptions

A SCF PBA is a option cassette controlling in SCX-6345N. Max. 3 cassettes are connected on a purpose of feeding paper. It consists one controller(S3F443FX) and two motor drive IC to control feeding timing through Uart communication with a Main controller.

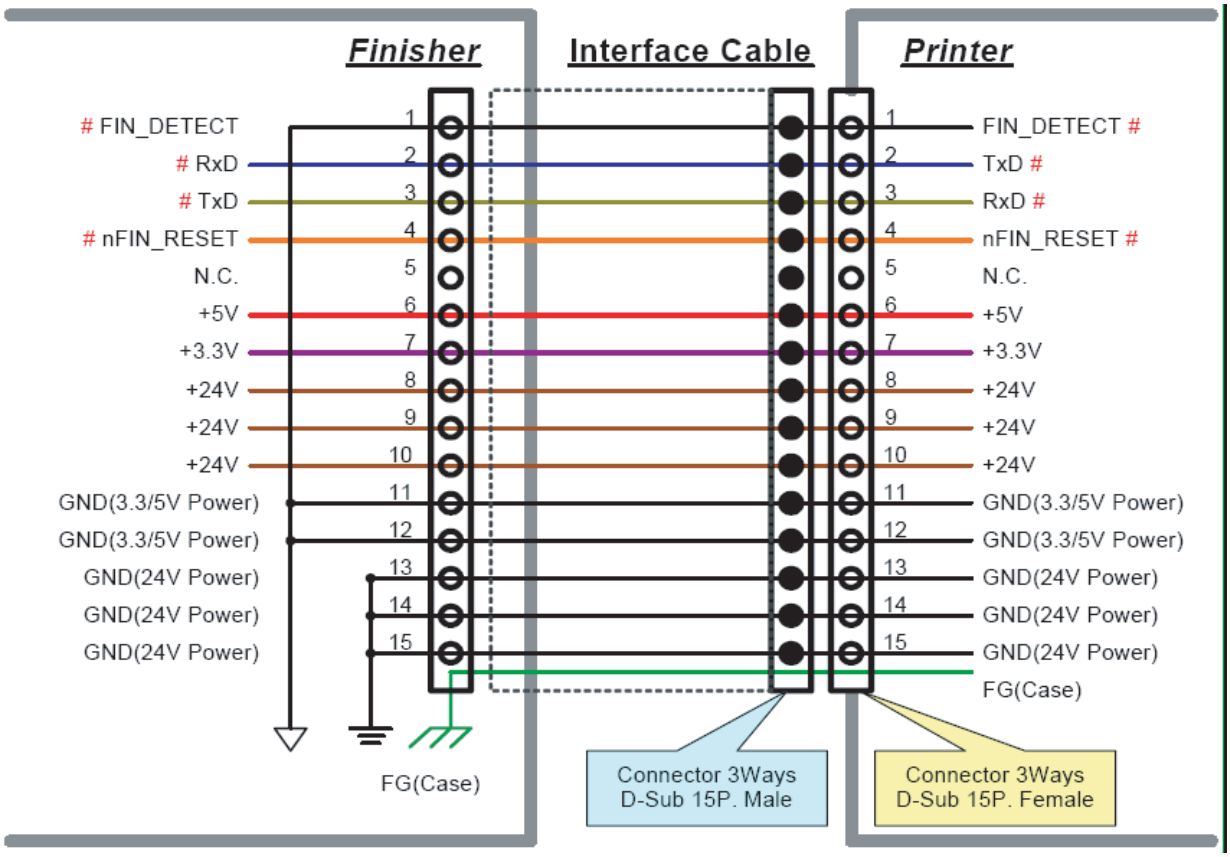
No.	Signal Name	Direction	Active Level	Description	Remarks
1	24V	POWER	-	+24V Power	
2	3.3V	POWER	-	+3.3V Power	
3	GND	POWER	-	Signal Ground	
4	TxD	OUT	-	Data Transmission	
5	RxD	IN	-	Data Receive	
6	nBUSY	OUT	LOW	SCF TxD Line Busy	
7	nCMDREQ	OUT	LOW	Command Request	
8	Reserved1	I/O	LOW	Reserved	
9	Reserved2	I/O	LOW	Reserved	

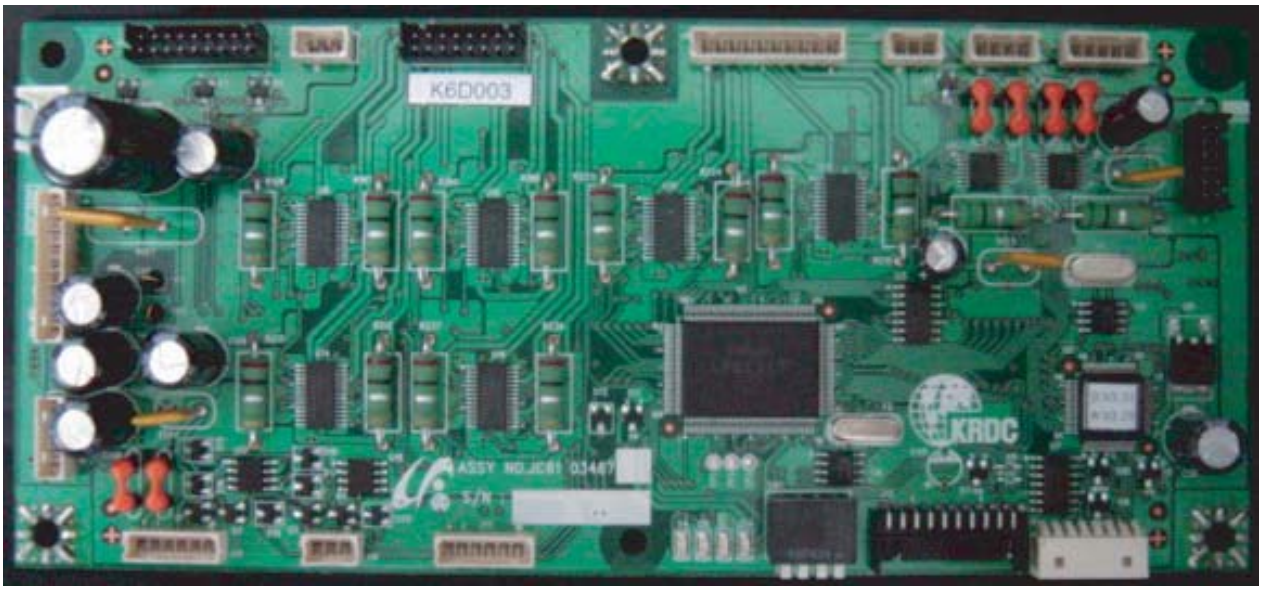


3.2.12 Finisher PBA

Descriptions

A Finisher PBA is a Finisher controlling in SCX-6345N for option. It also consists one controller(S3F443FX), two motor drive IC and LPEC1 for expandable I/O IC to control a finisher through Uart communication with a Main controller.





3.3 Engine Section

It is used as recording device when copying/printing or Fax receiving and designed as detachable unit type with system.

It adopts Electro-photography system with using LSU when recording, and uses non-magnetic 1 component developing system.

It consists of Frame unit, Feed unit, Transfer unit, Driving unit, Imaging, Cartridge, Fuser unit and High pressure member.

3.3.1 Engine Hardware Configurations

1) Main PBA

It comprises integrated single unit with Engine Board and Controller Board.

It manages Electro-photography system, which sends the Video Data of current image from Main Board to LSU and conducts printing.

And also it consists of Motor (paper transmission & exit)Driving, Pre-transfer Lamp Driving, Current Driving, Fan Driving Circuit.

The detection signal of Paper Feed Jam Sensor and Paper Empty Sensor is directly input into Main Board.

2) HVPS(High Voltage Power Supply)

HVPS Part outputs the generated high voltage for THV/MHV/BIAS/DETACH/FUSER BIAS by inputting 24V, and the output high voltage is provided into OPC Cartridge and Transfer Roller.

3) SMPS(Switching Mode Power Supply)

SMPS supplies DC voltage to System.

It supplies electric power to Main Board/ADF Board1 by outputting +5V,+24V after 110V/220Vpower input.

4) CRU (Customer Replacement Unit)

It is consisted of Drum Cartridge and Toner Cartridge.

5) LSU (Laser Scanning Unit)

It scans high-convergency Laser Beam into rotating Polygon Mirror, and linearly scans through f-θ Lens with constant speed. Then it forms the latent image by exposing the image data into OPC Drum.

6) Transfer Unit

TRANSFER Roller bears and carries the toner of OPC Drum into recording medium.

7) Fuser

Consisted of IH Heater, Heat Roller, Pressurizing Roller, Thermistor and Thermostat, it fixes toner into recording medium.

3.4 Communication Specifications

This section defines the electrical specifications for the SCX-6345N phone line interface.
Please refer to the FAX Behavior Specifications for user interface implementation.

1) Modem Section

▶ LINE CONNECTION: PSTN or PABX (RJ-11)
ITU COMPATIBILITY: Group 3/ECM

▶ MODEM

· Speed - Standard	33,600 BPS
· Error Correction Method	ITU T.30
· Automatic Train down	Yes
· ITU Compliance	V.34
· Forced 9600 BPS	No

▶ COMMUNICATIONS

· Initial Setting:	-12dBm

2) Line Interface Section

SCX-6345N Line Interface will be accomplished with DAA technology. This new technology will enable one single interface option that satisfies communication requirements for all OpCo's

· Modular Plug: RJ-11C
- Out Band Signal Level : Guaranteed North American and Europe PTT standard
- DP Dial Mode (direct current 30mA) : 50~300 Ω
- DTMF Dial Mode (direct current 20mA) : 50~540 Ω

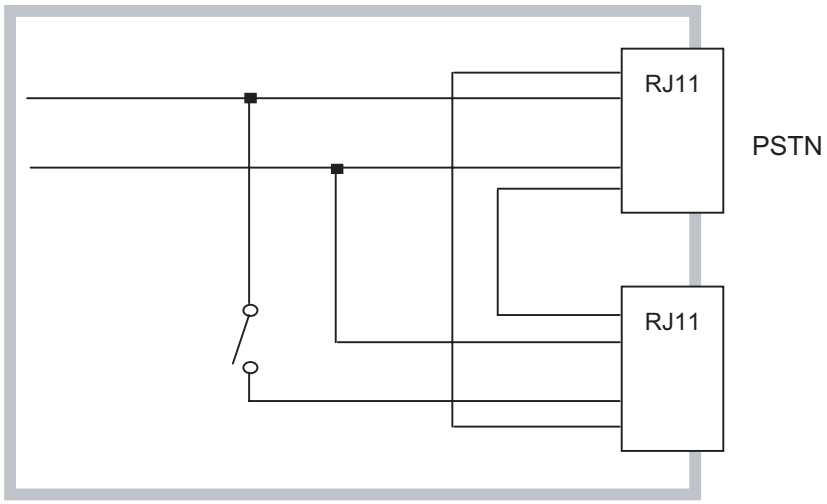
This is a usual connection in U.S.A. and normally middle 2 wires (pin no. 3 and 4 of modular jack/plug) are used for Tip and Ring.

4 wires connection is also used in the field.
There is no special mechanical structure or switch in a wall jack.
The 1' st wall jack , the 1' st device/phone plugged , is just connected in parallel with another wall jack, the 2' nd phone coupled in another room.
When users pick up each handset at the same time, they can hear what they are saying each other.
An user normally use a telephone or TAD device connected into Ext. Jack of the fax machine.

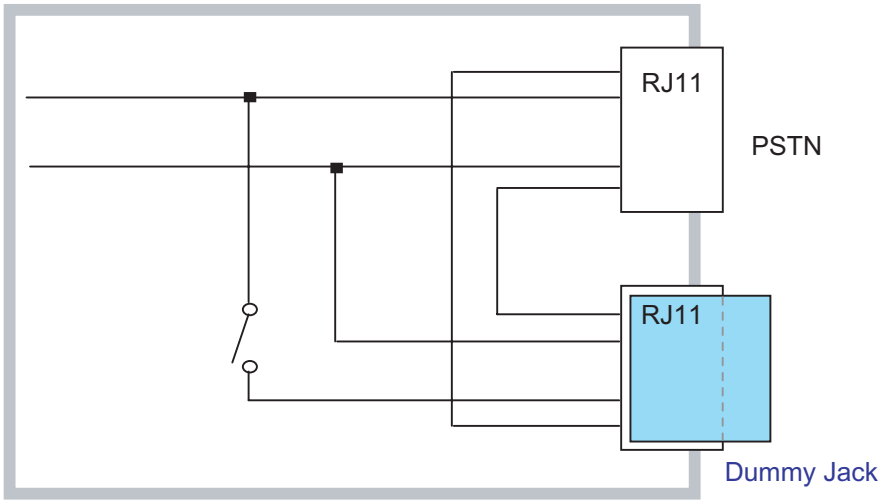
This is another normal connection in certain countries like Germany, Italy, France, Sweden, etc. and 4 wires are used.
They call them wire a for Tip, wire b for Ring and wire a", wire b" to pass the line path to the next priority phone.
There is a special mechanical structure or switch in a wall jack.

A 2 wall jack , the 2’nd device/phone plugged, is always connected in serial behind the 1’st wall jack.
When an user pick up the handset of 1’st device, the 2’nd Device and 3’rd phone is disconnected simultaneously.
In the countries they do not connect an external telephone or TAD into Ext. Jack of the fax machine.
The 1’st Device has to have 4 wires of a, b, a”, b” connection.

The circuit below is the line connection section of Jungfrau fax module for worldwide

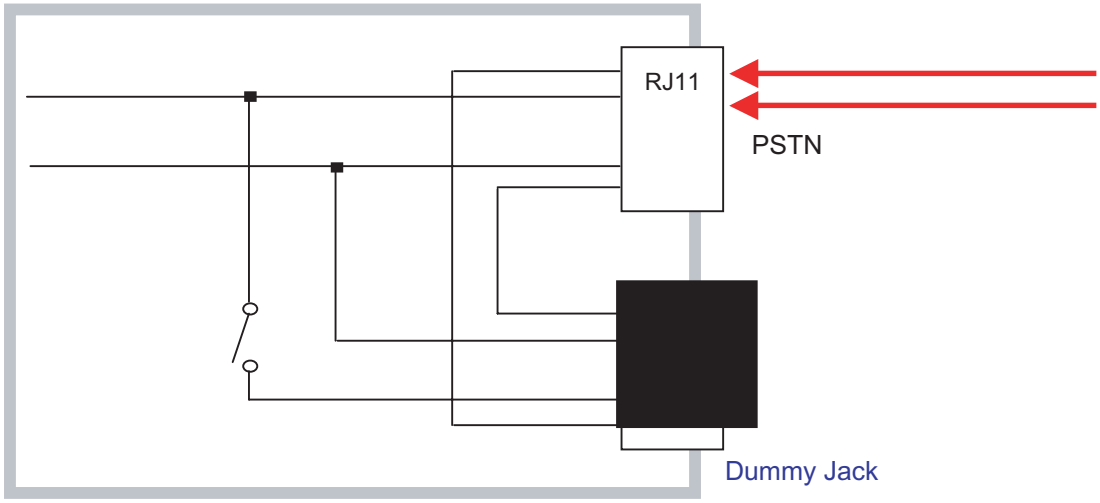


Factory Default of Parallel Connection
(A Dummy Jack will be inserted into the Ext RJ11.)

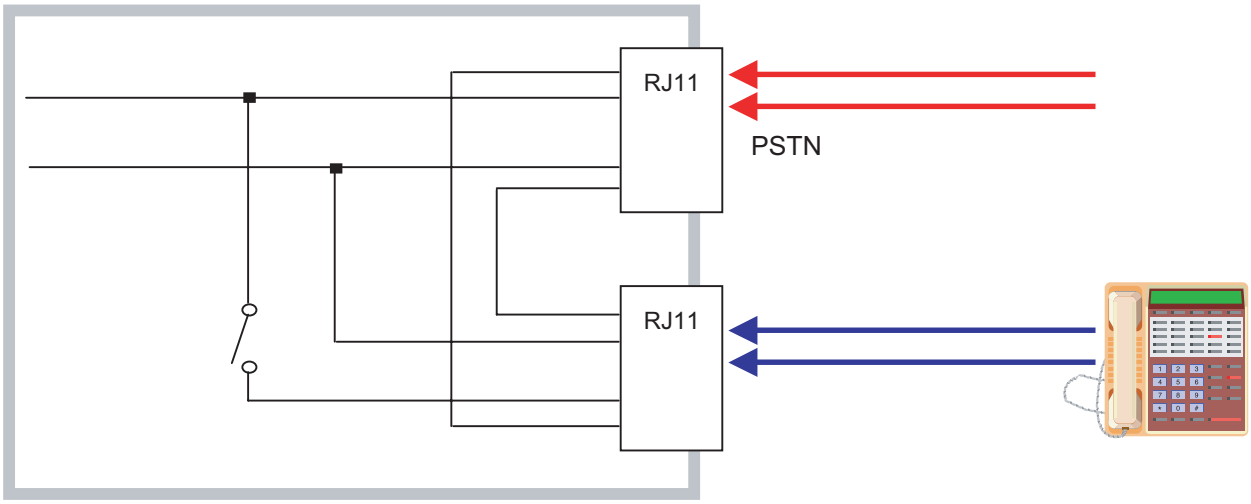


How to use in the field

(Users can use fax just by connecting line cord into Line RJ11.)



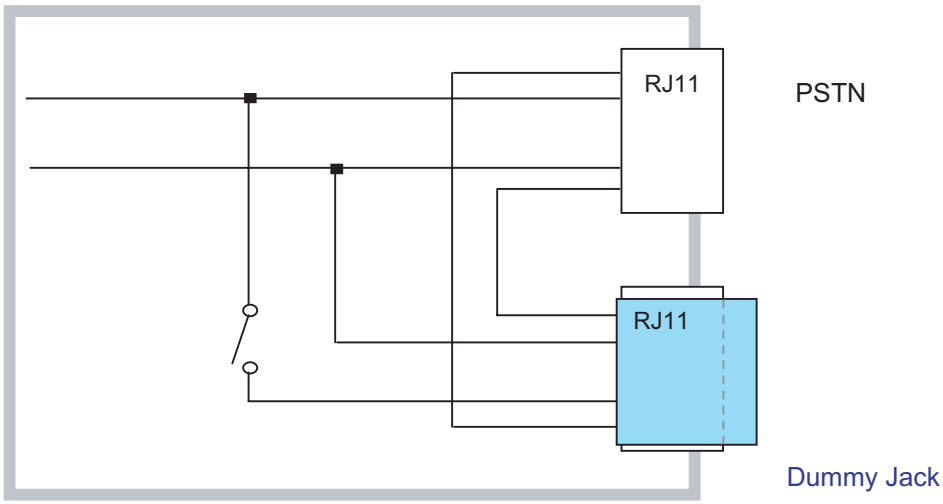
If an user want to use a 2' nd phone, he/she has to remove the dummy jack and connect the phone.

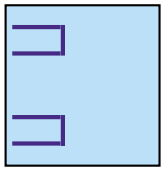


Pictures

How to use for the Countries of Serial Connection
(Factory Default)

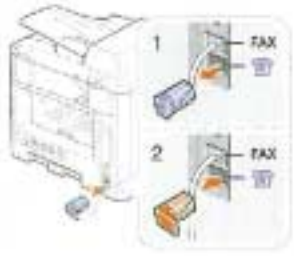
1) A Dummy Jack will be inserted into the Ext RJ11.
2) Additional information sheet and a terminator will be supplied.





Terminator

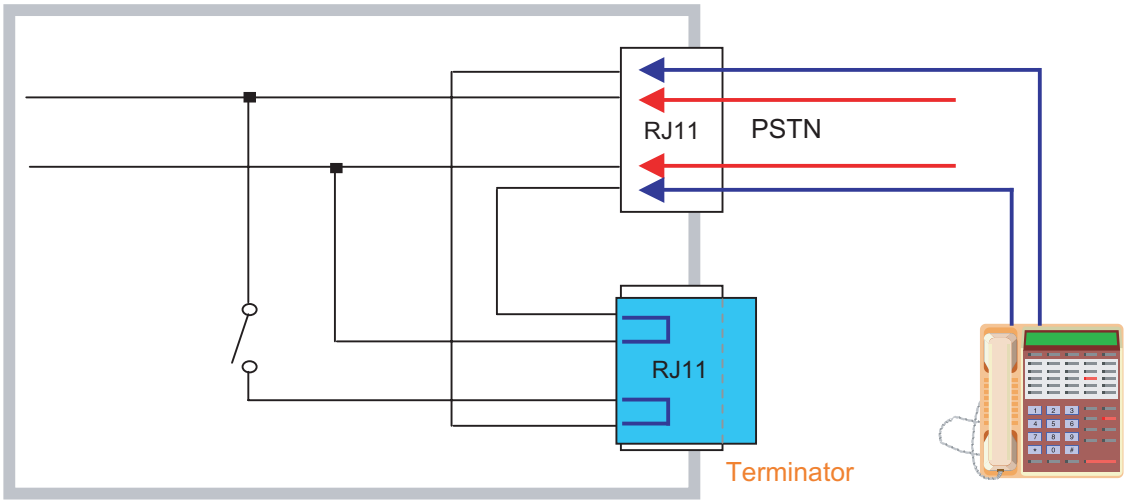
A information sheet to instruct how to use it.

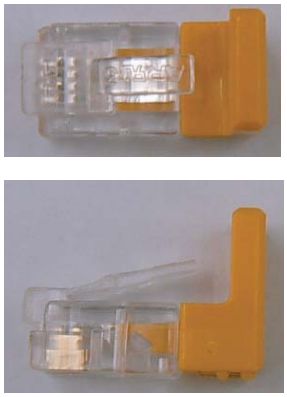


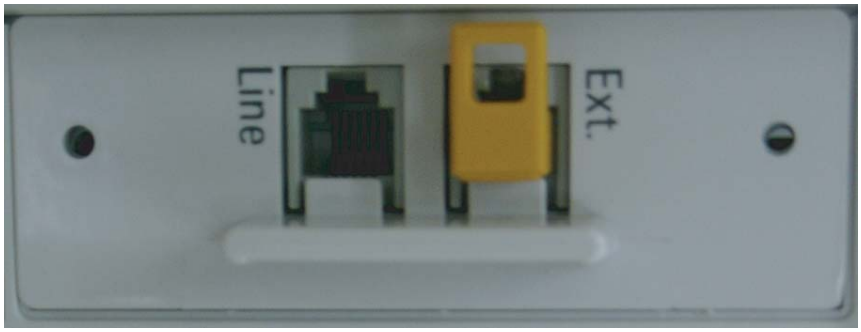
If the phone communication is serial in your country (such as Germany, sweden, Denmark, Austria, Belgium, Italy, France and Switzerland), you must remove the "blue" plug from the bottom connector (☎) and insert the supplied "orange" terminator.

How to use in the field

(Users have to replace the dummy jack by the terminator and connect line can into Line RJ11.)







Note) The terminator has inner connection to path the line to the 2' nd phone
The dummy jack has no inner connection and it just for block Ext RJ11.

3) Dialing Characteristics

- Dial Pulse: Tech Mode Option Feature
- Make / Brake Ratio: 40msec/60msec or 33msec/66msec
- Pulse Speed: 10 ± 1 PPS
- Minimum Pause: above 30msec

3.5 Scanning Section

1) Color Separation : Single-Pass color separation

Color separation is done with transmissive color filters put over the CCD elements themselves as part of CCD manufacturing process. The CCD used in Jungfrau has three rows of imaging elements. Each row has a color filter directly over the CCD elements, one row red, one green, and one blue.

2) Optical System: Lens Reduction type All-In-One (Scanning Lamp + Lens + CCD Image sensor).

3) Light Source:Cold Cathode Fluorescent

4) Scanning method:

- ▶ Platen : Optical Moving
- ▶ DADF : Document Moving

5) Scanning Area

1) Maximum Document Width : 216mm
2) Effective Scanning Width : 208mm

6) Source Document Specification (DADF)

- DADF capacity: 50 sheets of 20lbs /80gsm paper
- Features

Document Size Sensing	Yes	Extendible tray for long documents	Yes
Adjustable Paper Guide	Yes	DADF Ready Indicator	None
Labels w/graphics	None	Book copying with DADF open	Yes
Wear out items (rolls) easily replaceable w/o tools	No	Wear out items (rolls) should be serviced.	DADF Pad & Feed Roller

3.6 Paper Feeding

- JAM: Additional work is required to correct problems in feeding/outlet.
- Improper Feeding: Meandering, Improper initial print location, Folded corners, double feeding, Miss feeding, etc.

To enhance paper feeding reliability, paper should be fed so that printing may begin on the better side when printing on both sides. The better side is defined as the manufacturer specified side or "watermarked" side.

- Shut Down: Machine stops functioning in the middle of a job (any mode). Fault code is displayed on the message display (LCD). Customer must take action to complete the job.
  - · Paper jam
  - · Miss-feed

- Non-Shutdown:

Machine does not stop during are job (any mode), however, there is a paper feeding quality problem with the output of the job.

  - · Folded corner on output (Dog ears)
  - · Multiple sheets feed through without separation

- Power-Off / Power - On:

During a job, there is a problem with the machine that requires Power Off to recover back to operational mode.

  - · Machine is "locked-up" and not responding to control panel
  - · Machine is continually printing blank pages.
  - · Control panel is blank and not responding.

3.7 Toner Cartridge Specification

Toner CRU will have a CRUM to differentiate Samsung and SEC versions as well as detect CRU presence.

■ CRUM : Yes (Type IV RFID in Toner/OPC Cartridge)

■ Life(Service) Time:
The service life of a cartridge is based on an estimates printings with ISO 19752 Std. coverage on one A4 or Letter page at the default density setting performed on the machine. Here is an estimate of the service life of the toner cartridge based on B5 criteria.

▶ (Starter) : 20K Pages, A4 or Letter page, ISO 19752 Standard.

▶ (Sailes) : 20K Pages, A4 or Letter page, ISO 19752 Standard.