SERVICE MANUAL

A4 Network Laser Printer

EPSON EPL-N1600

COLOR IMAGING EPSON

EPSON®

4009770

Notice

PRECAUTIONS

Precautionary notations throughout the text are categorized relative to 1)Personal injury and 2) damage to equipment.

DANGER   Signals a precaution which, if ignored, could result in serious or fatal personal injury. Great caution should be exercised in performing procedures preceded by DANGER Headings.

WARNING   Signals a precaution which, if ignored, could result in damage to equipment.

The precautionary measures itemized below should always be observed when performing repair/maintenance procedures.

DANGER

1. ALWAYS DISCONNECT THE PRODUCT FROM THE POWER SOURCE AND PERIPHERAL DEVICES PERFORMING ANY MAINTENANCE OR REPAIR PROCEDURES.
2. NO WORK SHOULD BE PERFORMED ON THE UNIT BY PERSONS UNFAMILIAR WITH BASIC SAFETY MEASURES AS DICTATED FOR ALL ELECTRONICS TECHNICIANS IN THEIR LINE OF WORK.
3. WHEN PERFORMING TESTING AS DICTATED WITHIN THIS MANUAL, DO NOT CONNECT THE UNIT TO A POWER SOURCE UNTIL INSTRUCTED TO DO SO. WHEN THE POWER SUPPLY CABLE MUST BE CONNECTED, USE EXTREME CAUTION IN WORKING ON POWER SUPPLY AND OTHER ELECTRONIC COMPONENTS.

WARNING

1. REPAIRS ON EPSON PRODUCT SHOULD BE PERFORMED ONLY BY AN EPSON CERTIFIED REPAIR TECHNICIAN.
2. MAKE CERTAIN THAT THE SOURCE VOLTAGES IS THE SAME AS THE RATED VOLTAGE, LISTED ON THE SERIAL NUMBER/ RATING PLATE. IF THE EPSON PRODUCT HAS A PRIMARY AC RATING DIFFERENT FROM AVAILABLE POWER SOURCE, DO NOT CONNECT IT TO THE POWER SOURCE.
3. ALWAYS VERIFY THAT THE EPSON PRODUCT HAS BEEN DISCONNECTED FROM THE POWER SOURCE BEFORE REMOVING OR REPLACING PRINTED CIRCUIT BOARDS AND/OR INDIVIDUAL CHIPS.
4. IN ORDER TO PROTECT SENSITIVE MICROPROCESSORS AND CIRCUITRY, USE STATIC DISCHARGE EQUIPMENT, SUCH AS ANTI-STATIC WRIST STRAPS, WHEN ACCESSING INTERNAL COMPONENTS.
5. REPLACE MALFUNCTIONING COMPONENTS ONLY WITH THOSE COMPONENTS BY THE MANUFACTURE; INTRODUCTION OF SECOND-SOURCE ICs OR OTHER NONAPPROVED COMPONENTS MAY DAMAGE THE PRODUCT AND VOID ANY APPLICABLE
1. EPSON WARRANTY.

About This Manual

This manual describes basic functions, theory of electrical and mechanical operations, maintenance and repair procedures of EPL-N1600. The instructions and procedures included herein are intended for the experienced repair technicians, and attention should be given to the precautions on the preceding page.

Contents

This manual consists of six chapters and Appendix.

CHAPTER 1. PRODUCT DESCRIPTIONS
> Provides a general overview and specifications of the product.

CHAPTER 2. OPERATING PRINCIPLES
> Describes the theory of electrical and mechanical operations of the product.

CHAPTER 3. TROUBLESHOOTING
> Provides the step-by-step procedures for troubleshooting.

CHAPTER 4. DISASSEMBLY AND ASSEMBLY
> Describes the step-by-step procedures for disassembling and assembling the product.

CHAPTER 5. ADJUSTMENTS
> Provides Epson-approved methods for adjustment.

CHAPTER 6. MAINTENANCE
> Provides preventive maintenance procedures and the lists of Epson-approved lubricants and adhesives required for servicing the product.

APPENDIX Provides the following additional information for reference:
- Connector pin assignments
- Electric circuit boards components layout
- Exploded diagram
- Electrical circuit boards schematics

Symbols Used in This Manual

Various symbols are used throughout this manual either to provide additional information on a specific topic or to warn of possible danger present during a procedure or an action. Be aware of all symbols when they are used, and always read WARNING, CAUTION or NOTE messages.

WARNING Indicates an operating or maintenance procedure, practice or condition that, if not strictly observed, could result in injury or loss of life.

CAUTION Indicates an operating or maintenance procedure, practice, or condition that, if not strictly observed, could result in damage to, or destruction of, equipment.

CHECK POINT May indicate an operating or maintenance procedure, practice or condition that is necessary to accomplish a task efficiently. It may also provide additional information that is related to a specific subject, or comment on the results achieved through a previous action.

Safety Information

To prevent accidents during a maintenance procedure, strictly observe the Warnings and Cautions. Do not do anything that is dangerous or not within the scope of this document.

Do not do anything that is dangerous even if not specifically described in this manual. In addition to the descriptions below and those given in this manual, there are many situations and circumstances that are dangerous. Be aware of these when you are working with the printer.

Safety Precautions

POWER SUPPLY AND ELECTRICAL COMPONENTS

Before starting any service procedure, turn off the printer and unplug the power cord from the wall outlet. If you must service the printer when the power is applied, be aware of the potential for electrical shock and do all tasks by following the procedures in this manual.

WARNING

Do not touch electrical components on the HPS unless you are instructed to do so by a service procedure.

Controller Assembly SEC   PWBA Hotaru

Power Cord

HPS

FAN IOT
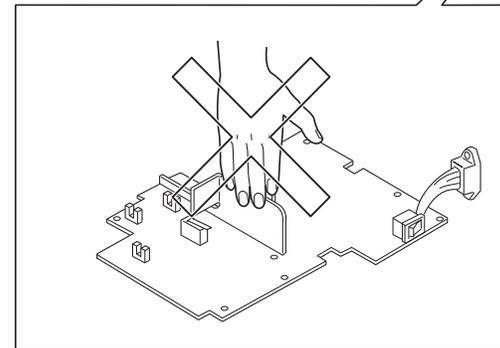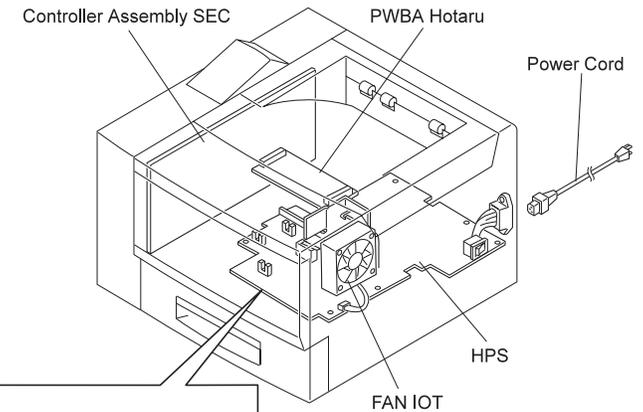
MECHANICAL COMPONENTS

If you service a driving assembly (e.g., gears), first turn off the power and unplug the power cord. Then manually rotate the assembly.

> **WARNING**
>
> **Do not touch the driving part (e.g., gears) while the assembly (printer) is being driven.**
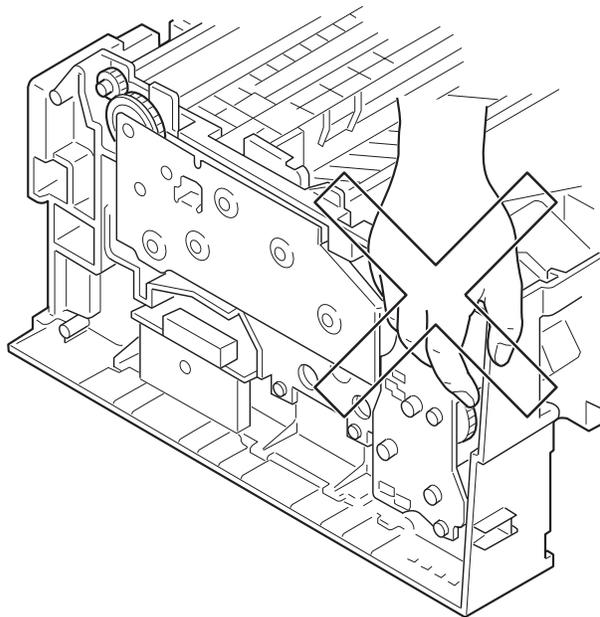
Safety Components

The printer is equipped with safety components (e.g., interlock switches, fuses, thermostat) and safety switches for protecting users and service personnel from injury and the equipment from damage.

☐ Interlock Switch
  The interlock switch opens to interrupt +24VDC and +5V-LD (Laser diode drive) from the power supply circuit (HPS) to the controller circuit (C258MAIN) when the Cover Assy. Exit is open.
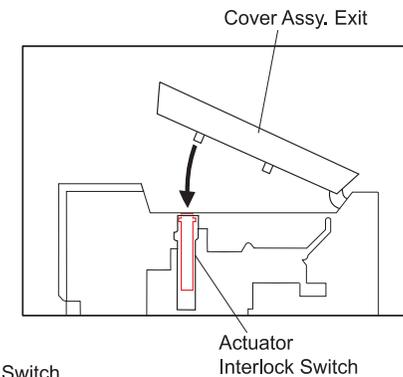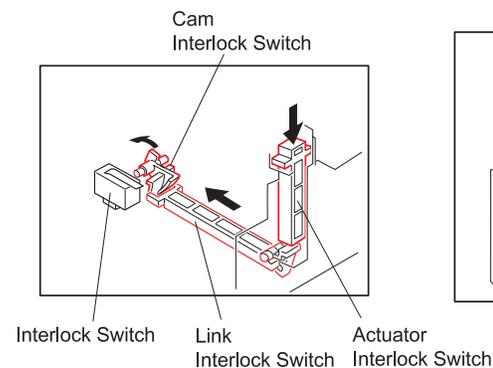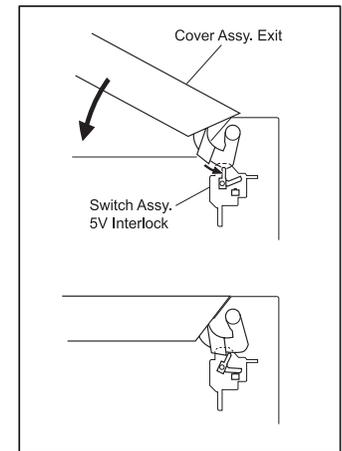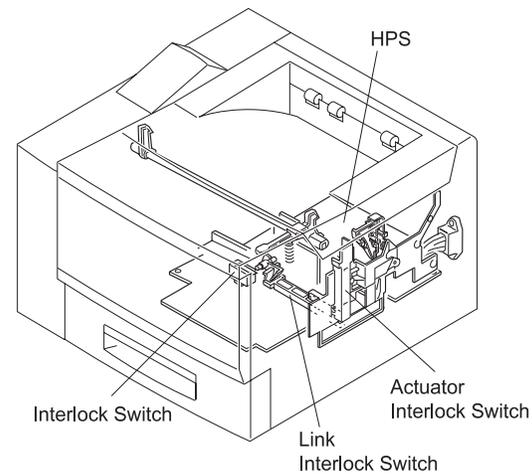
Warning/Caution Labels

WARNING and CAUTION labels are stuck on dangerous parts in the printer to make you aware of the potential dangers that are present when you are working with those parts.

ROS ASSY.

The laser beam used in this printer is invisible and it has a narrower frequency band and more coherent phases than any other light (sunlight, electric light). It has excellent monochromaticity and convergence. A thin laser beam reaches long distances. Because of its convergence characteristic, the laser beam converges into one point, causing high density and high temperature. A laser beam is harmful to the human body.

WARNING

- ■ **Do not expose yourself to the laser beam to prevent injury (blindness).**
- ■ **Do not open the cover that has the laser beam warning label.**
- ■ **If you disassemble or assemble the printer, turn off the power.**
- ■ **If you need to work on the printer with power applied, strictly follow the instructions in this manual.**
- ■ **Understand how the laser beam functions and take maximum precautions not to injure yourself or anyone around you.**

CAUTION! HIGH TEMPERATURE   VORSICHT! HEIZUNGSROLLEN SEHR HEISS   高温注意
ATTENTION! TEMPERATURE ELEVEE   ADVERTENCIA! TEMPERATURA ELEVADA

CLASS 3B
780nm
5mWmax

注意　開いたりインターロックを無効にすると不可視のレーザー放射を受けます。
直接放射や散乱放射に目や皮膚が曝されないこと。

CAUTION   INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCKS DEFEATED.
AVOID EXPOSURE TO BEAM.

PRECAUCIÓN   RADIACIÓN LASÉRICA INVISIBLE CUANDO SE ABRA Y ANULE EL INTERBLOQUEO.
EVITE LA EXPOSICIÓN DIRECTA AL HAZ.

VARNING   OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD OCH
SPÄRREN ÄR URKOPPLAD. STRÅLEN ÄR FARLIG.

ADVARSEL   USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES OG SIKKERHEDSLÅS BRYTES, UNNGÅ
EKSPONERING FOR STRÅLEN.

ADVARSEL   USYNLIG LASERSTRÅLING VED ÅBNING, NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION.
UNDGÅ UDSÆTTELSE FOR STRÅLING.

VARO!   NÄKYMÄTÖN AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA.
NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.

VORSICHT!   UNSICHTBARE LASERSTRAHLUNG, WENN ABDECKUNG GEÖFFNET UND
SICHERHEITSVERRIEGELUNG ÜBERBRÜCKT. NICHT IN DER STRAHL BLICKEN.

ATTENTION   EMISSION DE RADIATION LASER INVISIBLE QUAND L'APPAREIL EST OUVERT ET LORSQUE LA
SÉCURITÉ EST NEUTRALISÉE. ÉVITER DE S'EXPOSER AU RAYON LASER.

FUSER ASSY.

To prevent you from becoming injured or burned, do the following before working with a high temperature Assembly (e.g., Fuser Assembly):

☐ turn off the printer.

☐ Unplug the power cord.

☐ Wait until it cools down.

WARNING

The high temperature Assembly is very hot immediately after any printer operations. Wait at least 40 minutes before you start working on the printer.

Fuser Assembly
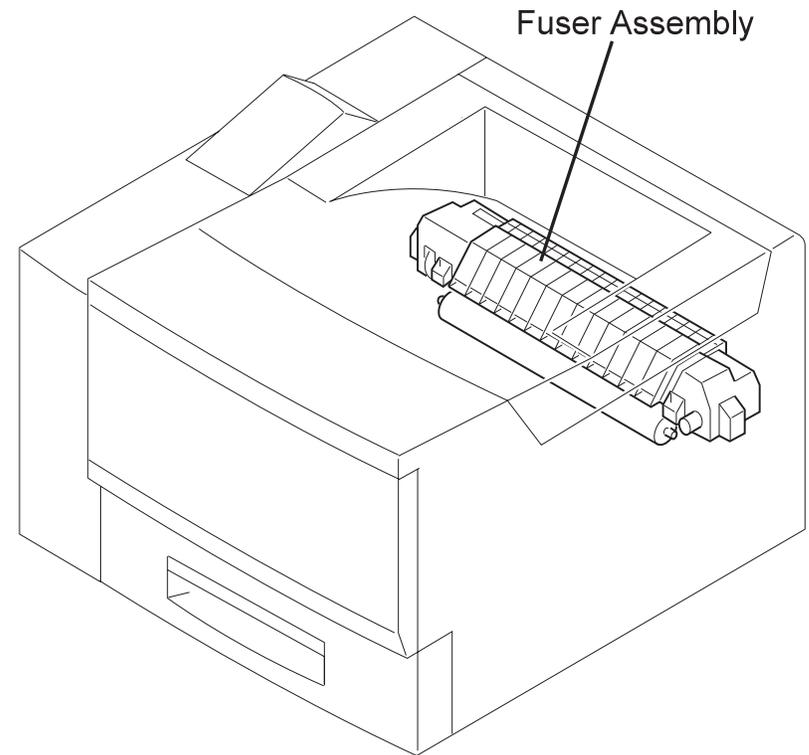
General Cautions

☐ Some materials (e.g., Developer or Fuser Oil) may cause bodily injury. Do not swallow or inhale these materials or allow them to come in contact with the eyes.

☐ Help to protect those around you and follow the prohibitions against swallowing or inhaling those materials. Be careful to protect the eyes at all times.

☐ Place a sheet under the printer so that the floor or workbench is protected.

Revision Status

Revision	Issued Date	Description
Rev. 0	August 17, 1998	Preliminary release. (intended for service training purpose only)
Rev. A	October 30, 1998	First issue.

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Adjustment

Maintenance

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PRODUCT DESCRIPTION

1.1 OVERVIEW

The EPL-N1600 is the latest in EPSON's advanced lines of laser printers and offering the following features.

☐ High-speed printing
Prints 16 pages per minute on A4 paper.

☐ High resolution
Prints at 600dpi, with further enhancement provided by RITech (Resolution Improvement Technology) and Enh. MG (Enhance MicroGray).

☐ Rapid processing of print data
The printer is equipped with a 150MHz RISC-CPU (VR4310) for faster data processing.

☐ Host can monitor printer status (by bidirectional interface)
Supports IEEE-1284 nibble and ECP modes in Windows 95/98.

☐ High-capacity paper sources
The printer comes standards with a 80-sheet MP tray and a 250-sheet universal cassette. (Maximum total load is 830 sheets with optional lower paper cassette unit.)

1.1.1 CONSUMABLES AND OPTIONS

The following table lists the EPL-N1600's consumables and supported options.

Table 1-1. Consumables and Options

Item	Code	Note
Imaging Cartridge	S051056	Life: 8500 pages
500 Sheet Lower Paper Cassette Unit (Universal)	C81290*	Supported paper size: A4, Letter, Legal, B5, Executive
Face Up Tray	C81294*	Eject capacity: 40 sheets
Duplex Unit	C81293*	Supported paper size: A4, Letter, Legal
Ethernet Card	C82357* C82362* C82363* C82364*	Type-B Optional I/F Card
32KB Serial Interface Card	C82307*	
32KB Parallel Interface Card	C82310*	
Coax Interface Card	C82314*	
Twinax Interface Card	C82315*	
GPIB Interface Card	C82313*	
AppleTalk Interface Card	C82312*	Use with EPSONScript Level 2 package (C83229*)
EPSONScript Level 2 Package	C83229*	• Emulates PostScript Level2 • ROM module

*:   The asterisk (*) is a substitute for the last digit of the product code, which varies by country.

1.2 SPECIFICATIONS

This section describes the basic specifications of the EPL-N1600.

1.2.1 ENGINE SPECIFICATIONS

Printing method: Electro-photographic printing, utilizing
                          semiconductor laser beam scan and single-
                          component magnetic toner

Resolution: 600DPI

Printing speed: <From Standard cassette>
                          15.7 PPM (A4)
                          16.6 PPM (Letter)
                          <From MP Tray>
                          11.3 PPM (A4)
                          11.7 PPM (Letter)
                          <From Lower Paper Cassette Unit>
                          15.2 PPM (A4)
                          16.0 PPM (Letter)

Time to print first sheet: <From standard cassette>
                          14.4 sec (A4)
                          14.2 sec (Letter)
                          <From <MP Tray>
                          13.3 sec (A4)
                          13.1 sec (Letter)
                          <From Lower Paper Cassette Unit>
                          15.5 sec (A4)
                          15.3 sec (Letter)

Warm-up time: Within 45 seconds
                          (at 22°C / 55% RH / rated voltage)

Paper Supply: <Standard>
                          Multi Purpose (MP) Feed Tray
                          (Capacity: 80 sheets)
                          Universal Lower Paper Cassette
                          (Capacity: 250 sheets)
                          <Optional>
                          500-sheets Lower Paper Cassette Unit
                          (Capacity: 500 sheets)

Table 1-2. Paper Supply / Paper Size / Capacity

Paper Supply	Capacity	Paper Size	Paper Thickness
MP Tray	80 sheets *1	• Standard size paper 90 x 148 - 215.9 x 355.6mm (A4, JIS-B5, A5, Letter, G-Letter, Executive, Legal, G-Legal, F4, Half-Letter) • Custom size paper Any size of paper within the range of 90 x 148 - 215.9 x 355.6mm	Normal paper: 60 - 105g/m² (16 - 28lb)
	10 sheets	Envelopes (Monarch, C10, DL, C5, C6, International-B5)	Special paper: 190g/m² Normal paper: 60 - 105g/m² (16 - 28lb)
	40 sheets	Labels / OHP sheet	Special paper
Standard Paper Cassette *2	250 sheets *1	A4, Letter, G-Legal, Legal, JIS-B5	Normal paper: 60 - 105g/m² (16 - 28lb)
Lower Paper Cassette Unit *2	500 sheets *1	A4, Letter, G-Legal, Legal	Normal paper: 60 - 105g/m² (16 - 28lb)

*1: With 20lb (70g/m²) paper.

*2: Universal cassette.

1.2.2 PAPER SPECIFICATIONS

Paper sources and size : As shown in the table below.

Table 1-3. Supported Paper and Supply Source

Type	Size mm (inch)	MP Tray	STD CST *1	Lower CST *2	Duplex *3
A4	210 x 297	Yes	Yes	Yes	Yes
A5	148 x 210	Yes	No	No	No
JIS-B5	182 x 257	Yes	Yes	No	No
LT	215.9 x 279.4 (8.5 x 11")	Yes	Yes	Yes	Yes
HLT	139.7 x 215.9 (5.5 x 8.5")	Yes	No	No	No
LGL	215.9 x 355.6 (8.5 x 14")	Yes	Yes	Yes	Yes
EXE	184.15 x 266.7 (7.25 x 10.5")	Yes	Yes	No	No
GLG	215.9 x 330.2 (8.5 x 13")	Yes	Yes	Yes	Yes
GLT	203.2 x 266.7 (8 x 10.5")	Yes	No	No	No
F4	210 x 360	Yes	No	No	No
MON	98.43 x 190.5 (37/8 x 7½")	Yes	No	No	No
C10	104.78 x 241.3 (41/8 x 9½")	Yes	No	No	No
DL	110 x 220	Yes	No	No	No
C5	162 x 229	Yes	No	No	No
C6	114 x 162	Yes	No	No	No
I-B5	176 x 250	Yes	No	No	No
16MO	198 x 275	Yes	No	No	No

*1: Universal Lower Paper Cassette

*2: Optional 500-sheets lower paper cassette unit

*3: Duplex printing is available only with a sheet fed from the cassette unit (standard or optional).

Supported paper sizes: Width= 90 to 216 mm (3.5 to 8.5 ")
                          Length=148 to 355.6mm (5.8 to 14 ")

Paper feed alignmnent: Left alignmnent for all paper size

Guaranteed print area: Entire paper area, excluding 4.0 mm from each edge of the paper.

NOTE: *In case of duplex printing, the printable area is limited to 6.0 mm from the bottom edge.*

Supported paper types: <Standard paper>
                          Xerox 4024 DP Paper 20lb (75 g/m²)
                          <Plain paper>
                          Weight=60 to 150 g/m² (16 to 28 lbs)
                          Standard copy paper, recycled paper

                          <Special paper>
                          Label sheets
                          Transparency film (for laser printer)
                          Colored paper
                          Thick paper (105 to 157 g/m²)
                          DTP paper
                          Letter head

NOTE: *Before purchasing paper in large quantities, check that sheets are fed correctly.*
Special paper, such as thick paper must be fed from the paper tray (do not feed from cassettes).

Prohibited paper types: The following paper types should never be used. Attempts to feed these paper types may result in inferior print quality, paper jams, and damage to the printer.

*Carbon paper, "non-carbon" paper
*Thermal paper, pressure-sensitive paper
*Acidic paper
*Inkjet-dedicated paper
*Paper or postcard already printed on by thermal-transfer printer or inkjet printer
*Thin or thick paper (exceeding the specification)
*Damp paper
*Paper with coated or processed color surface
*Paper with extra smooth or extra rough surface
*Paper whose rear side has very inconsistent smoothness
*Perforated paper
*Folded, curled, or torn paper
*Paper of irregular shape
*Paper cut at off-angle
*Label sheets that peel too easily
*Paper with clips, staples, glue, etc.
*Transparency film designed for color copy or page printer

Paper Ejection: Face-down or Face-up (option)

Ejection capacity: <Face-down>
250 sheets (Xerox 4024 paper (75 g/m²))
<Face-up> (with optional face-up tray)
40 sheets (Xerox 4024 paper (75 g/m²))

1.2.3 CONTROLLER SPECIFICATIONS

CPU: RISC-CPU (VR4300 / 150MHz)

RAM: <Standard>   8MB EDO RAM
<Optional>   1 EDO-RAM SIMM slot
(Accepts 4MB to 32MB EDO-RAM SIMM)
Maximum memory is 40MB

ROM: Font: 2MB (on-board)
Program: 4MB (on ROM-DIMM module)
(Installed in ROM-DIMM socket)

Expansion ROM: 2 ROM-DIMM slots (A/B slots)
A slot=For C83229* (EPSONScript) module
B slot=For local-font ROM module only

Interfaces: <Standard>
*Bidirectional parallel I/F (B type connector)
(IEEE-1284 compliant / Compatibility, Nibble and ECP mode)
*RS-232C serial I/F (D-SUB 25pin)

<Optional>
*Type-B interface slot (1 slot)

Control Panel: *8 push-button switches and 6 LED lamps.
*LCD Panel (1-line 20-column)

Software: *PCL5e emulation mode
*FX, ESC/P2, I239X emulation mode
*ESC/Page mode
*GL/2 mode

Other Feature: Built-in engine controller

1.2.4 ELECTRICAL SPECIFICATIONS

Power Requirements: See table below.

Table 1-4. Power Supply Specification

Item	100V Model	200V Model
Input Voltage	120V ±10% (90 to 132V)	220 - 240V ±10% (198 to 264V)
Rated Frequency	50 - 60Hz ±3Hz	50 - 60Hz ±3Hz
Rated Current	6.5A	3.5A
Power Consumption	• Maximum: 700W • Continuous printing: 350W • Stand-by (Heater ON): 70W • Stand-by (Heater OFF): 30W	

AC Line Noise: Pulse width=   50 to 1000 ns
                         Pulse polarity=+ / -
                         Repetition=   Asynchronous
                         Modes=   Common / Normal
                         Voltage=   1KV
                         (Parts must be able to withstand 2KV without
                         damage)

Transient Outage: DIP 100% (at rated voltage - 10%) 1 cycle

Electrostatic Tolerance: <upto 10KV>
                         No hard error, no user-nonrecoverable
                         software error
                         <upto 15KV>
                         No damage to parts

Surge Current: 1/2-cycle / Not above 50A

Insulation Resistance: 10Mohm or more

Dielectric Strength: Insulation shall not break down when the
                         following voltage is applied between primary
                         circuit and chassis for 1 minute:
                         *100V model: AC1000V
                         *200V model: AC1500V

Leakage Current: 3.5mA or less

1.2.5 CONSUMABLES

This printer's only consumable part is the Imaging Cartridge.

Table 1-5. Imaging Cartridge

Name	Components	Life	Weight
Imaging Cartridge S051056	• Development unit • Toner • OPC Drum • Charging Roller • Waste Toner Box • Cleaner Blade	Average: 8500 pages *	Approx. 1.3Kg

*: Toner life is estimated based on continuous printing on A4 size paper with 5% print
    coverage. Toner life will vary according to print coverage and printing method
    (continuous or intermittent, print density, toner-save mode, etc.).

1.2.6 OTHER SPECIFICATIONS

Printer life: 300,000 sheets or 5 years in use

Noise: Stand-by: Approx. 32.0dB(A)
                         Operating: Approx. 50.0dB(A)

Ozone Density: Less than 0.02 ppm

Toxicity: OPC, toner, and plastic materials are all
                         nontoxic.

1.2.7 ENVIRONMENTAL SPECIFICATIONS

MAIN UNIT AND CONSUMABLES

Temperature and humidity: See table below.

(The conditions below are applicable for both the main unit and consumables.)

Table 1-6. Environmental Conditions - Main Unit

Item		Conditions
Temperature — Normal		0 to 35°C
Temperature — Extreme (within 1 month)	High temperature	35 to 40°C
	Low temperature	-20 to 0°C
Humidity — Normal		20 to 80%RH
Humidity — Extreme (within 1 month)	High humidity	80 to 95%RH
	Low humidity	10 to 20%RH
Storage		Within 24 months from the production

Air Pressure (Altitude):   460 to 760hPa (Max. 2500 meters)

Drop Tolerance: No damage when tested in accordance with JIS Z0200-1987 level 1
Direction=1 corner, 6 sides, 3 edge

Vibration Tolerance:
Vibration=   5 to 100Hz / 100 to 5Hz
Acceleration= 0.7G
Sweep time= 10 minutes (one way)
Direction=   Three directions (X/Y/Z)
Time=   50 minutes in each direction

CONSUMABLES

Table 1-7. Environmental Conditions - Consumables

Item		Conditions
Temperature — Normal		0 to 35°C
Temperature — Extreme (within 1 month)	High temperature	35 to 40°C
	Low temperature	-20 to 0°C
Humidity — Normal		20 to 80%RH
Humidity — Extreme (within 1 month)	High humidity	80 to 95%RH
	Low humidity	10 to 20%RH
Air Pressure		460 to 760hPa
Storage		Within 24 months from the production

1.2.8 OPERATING CONDITIONS

Temperature: 10 to 32°C

Humidity: 20 to 80%RH (without condensation)

Air Pressure (Altitude):   760hPa or more (below 2500m)

Tilt: 5° or less

Ambient Illumination: 3000 lux or less
                            (Must avoid direct sunlight.)

Space Requirement: To ensure proper operation of the printer, sufficient open space must be left around printer, as indicated in the illustration below.

☐ At least 400mm free space must be left at top of printer to allow for opening of the cover and replacement of the Imaging Cartridge.

☐ Remember that the printer becomes higher when a lower feed unit is installed. Maximum printer height (with large-capacity feeder installed) is 453mm.
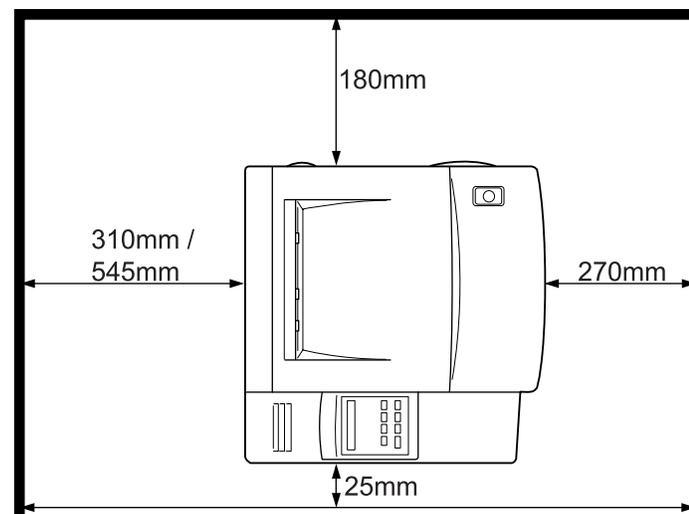
Figure 1-1. Space Requirement (1)
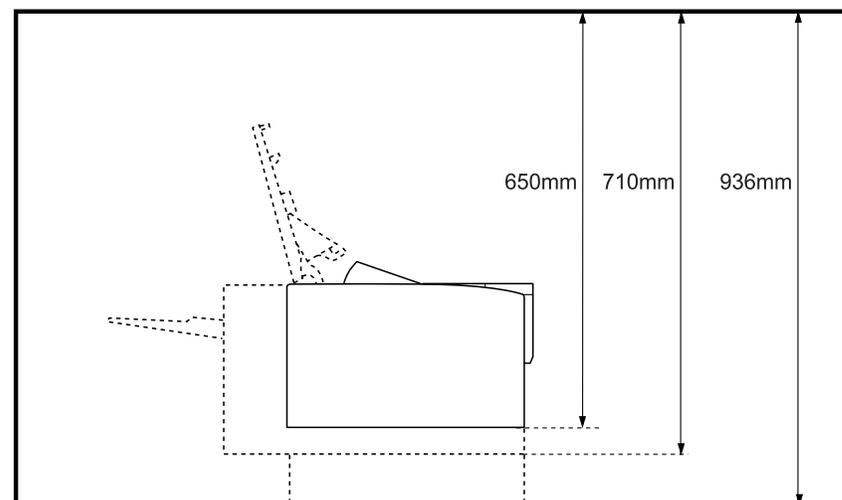
Figure 1-2. Space Requirement (2)

1.2.9 SAFETY APPROVAL

☐ Safety Regulation

Model	Applicable Standard
100V Model	• UL 1950 • CSA 22.2 No.950
200V Model	• TUV-GS (EN60950)

☐ Safety Regulation (Laser Radiation)

Model	Applicable Standard
100V Model	FDA (NCDRH) Class 1
200V Model	TUV-GS (EN60825)

☐ EMC

Model	Applicable Standard
100V Model	• CNS 13438 • CISPR22 (for Taiwan) • FCC Part15 Subpart B Class B / CSA C108.8 Class B
200V Model	• EC EMC directive 89/336/PEC EN55022 Class B EN61000-3-2 EN61000-3-3 EN50082-1 • AS 3548 (for Australia)

Power consumption: In compliance with International Energy Star program

Others: <Toner>
No effect on human health.
(In compliance with OSHA, TSCA, EINECS, woker safety laws and CSCL)

<OPC>
No effect on human health.
(In compliance with OSHA)
<Ozone>
In compliance with UL478 5th Edition
<Materials>
In compliance with Swiss environment protection law (no CdS content)

1.2.10 RELIABILITY, DURABILITY AND MAINTENABILITY

MPBF: 120,000 sheets
                            (Average number of sheets printed between failures, where "failure" indicates a condition that requires part replacement or that cannot be corrected by user.)

Life: 300,000 sheets or 5 years in use
                            (whichever comes first)

MTTR: 30 minutes
                            (Average time to complete and confirm repair after ascertaining the site of the failure.)

Jam Rate: As indicated in the table below.

Table 1-8. Paper Feed Reliability

	Cassette		MP Tray	
	Single-side Print	Duplex Print	Single-side Print	Special Paper
Jam Rate	1/3000 or less	1/2000	1/600	1/100
Mis-feed rate	1/800 or less	-	1/300	1/25

*: Above figures are based on uncurled paper used immediately after removal from package.

*: The above figures include jams caused by misfeeds, multiple feeds, etc.

*: The above figures do no cover feeding at interface between paper stacks loaded at different times.

Print Start Position: Using standard paper from paper tray or cassette;
                            <Main scan direction>
                            Target position (c) ±2.5mm
                            <Subscan direction>
                            Target position (a) ±2.0mm

Skew: Using standard A4 paper from paper tray or cassette;

                            <Main scan direction>|c - d | ±2.0mm
                            <Sub scan direciton> | a - b | ±1.5mm

Ejection Curl: 20mm or less
                            (after 5 minutes from ejection)
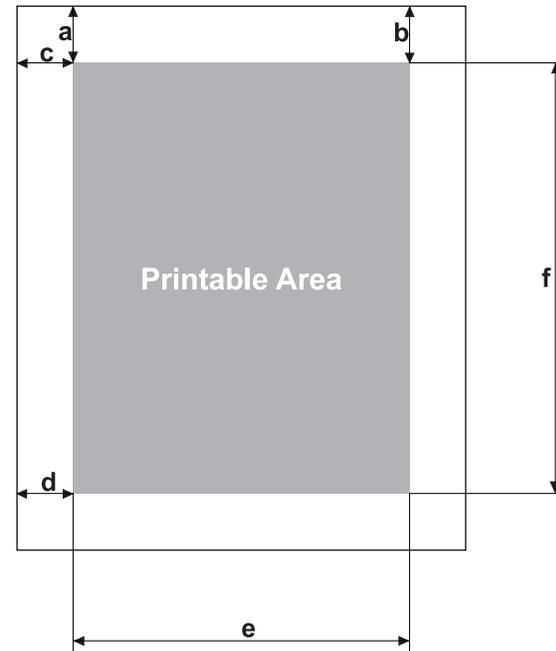
Figure 1-3. Printing Accuracy

1.2.11 EXTERNAL DIMENSIONS AND WEIGHT

Dimensions: See table below and illustration on right.

Table 1-9. Dimensions

Item	Width (mm)	Depth (mm)	Height (mm)
EPL-N1600(Main unit)	421	420	264
Lower Paper Cassette Unit (C812902)	396	389	114
(With main unit)	421	420	379
Duplex Unit (C812932)	396	517	254
(With main unit)	421	542	325
Full option	421	542	441

Weight: Approx. 13Kg
                           (excluding consumables and options)
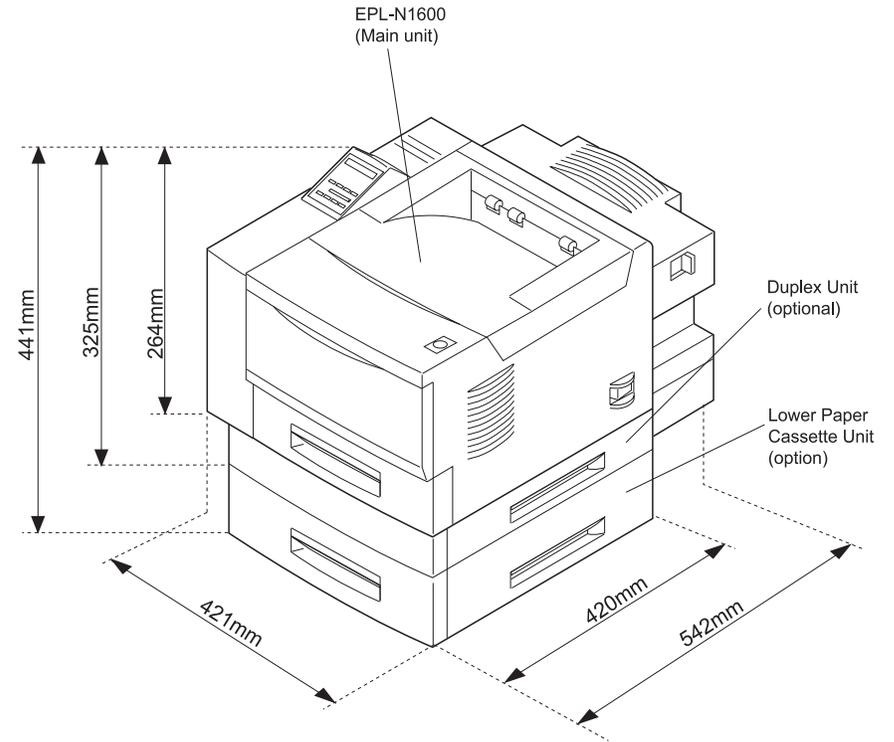
Figure 1-4. Dimensions

1.3 INTERFACE SPECIFICATIONS

The EPL-N1600 supports the following interfaces.

☐ Bidirectional parallel I/F (standard)

☐ RS-232C serial (standard)

☐ Type-B interface slot (1 slot for optional interface card)

1.3.1 Bidirectional Parallel Interface

The printer's built-in parallel interface complies with IEEE-1284, and supports Compatibility, Nibble and ECP modes.

Transmission: 8-bit parallel (IEEE-1284 compliant)

Synchronization: By externally supplied STROBE signal
                           (STRBX)

Handshaking: By ACKX or BUSY

Logic Level: TTL level

Connector: IEEE-1284-B connector (36pin)
                           (57RE-40360-830B(D7A) DDK or equivalent)

Mode: Compatibility, Nibble and ECP mode

Pin Assignment::   See the table on right.

Table 1-10. Bidirectional Parallel I/F Pin Assignment

Pin	I/O	IEEE 1284-B Connector		
	*1	Compatibility	Nibble	ECP
1	In	nStrobe	HostClk	
2-9	In/Out	DATA1 - 8		
10	Out	nACK	PtrClk	PeriphClk
11	Out	Busy	PrtBusy	PeriphAck
12	Out	PError	AckDataReq	nAckReverse
13	Out	Select	Xflag	
14	In	nAutoFd	HostBusy	HostAck
15	-	NC		
16	-	GND		
17	-	CG		
18	Out	PeripheralLogic High		
19-30	-	GND		
31	In	nInit		nReverseRequest
32	Out	nFault	nDataAvail	nPeriphRequest
33	-	GND		
34	-	NC		
35	Out	+5V		
36	In	nSelectin	IEEE1284 Active	

*1: "I/O" indicates a signal direction viewed from the printer.

1.3.2 Serial Interface

Type: RS-232C (conforms to EIA)

Transmission: Full duplex

Synchronization: Asynchronous

Transmission rates: 300 to 57600 bps

Parity bit: Even, Odd or NONE

Start bit: 1

Stop bit: 1 / 2

Data length: 7 or 8 bits

Protocols: •XON/XOFF control (software control)
                         (Robust mode is supported)
                         •DTR control (hardware control)

Connector: D-SUB 25pin
                         (17LE-13250-27(D57)

Pin Assignment: See the table on right.

Table 1-11. Serial I/F (RS-232C) Pin Assignment

Pin	Signal	I/O *1	Description
2	TXD	Out	Transmits data. This pin transmits serial data from the printer to the computer.
3	RXD	In	Received data. This pin transmits data from the computer to the printer.
5	CTS	In	Always ignored.
17		Out	Transmits data. This pin transmits serial data from the printer to the computer.
20	DTR	Out	Data terminal ready. This pin indicates whether or not the printer is ready to receive data. If the printer ready protocol is not selected, the printer is always ready to receive data (this pin is always HIGH). If the printer ready protocol is selected, the printer can accept data when the pin level is HIGH and cannot accept data when the pin level is LOW. When the DTR signal goes LOW, the host computer must stop sedning data within 256 characters. This function can be set on or off with the default-setting mode of the printer.
23			Received data. This pin transmits data from the computer to the printer.
24			Transmits data. This pin transmits serial data from the printer to the computer.
25		In	Received data. This pin transmits data from the computer to the printer.

*1: "I/O" indicates a signal direction viewed from the printer.

1.4 OPERATING SPECIFICATIONS

The control panel of the EPL-N1600 includes a variety of buttons and indicator lamps, together with an LCD. The user can use the panel to select the printer's operating mode, to set the various printer functions, and to view settings and status information.
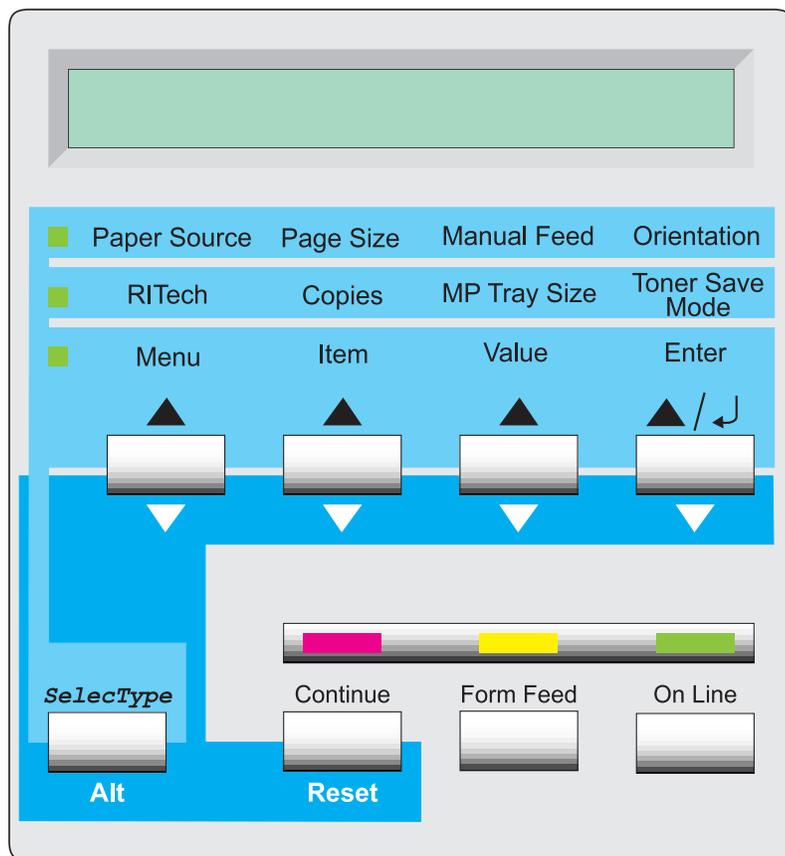

Figure 1-5. EPL-N1600 - Control Panel

LCD PANEL

1-line by 20 column LCD display equipped with backlight, and it is used for displaying printer status and setup menus

LED LAMPS

There are 6 LED lamps and a function of each one of these LED lamps are as below.

☐ On Line LED
    ON: Printer is ready to receive data and print.
    OFF: Printer is not for receiving print data.

☐ Form Feed LED
    ON: Printer contains data that has not yet been processed.
                (If data is not effective print data, light will not be on.)
    OFF: Printer has finished processing all print data.
                (If control code is not terminated, however, this lamp will be ON.)
    Brinking: Printer is currently processing data.

☐ Continue LED
    Brinking: Printer is in error state. User can clear the error by pressing the Clear Error button.

☐ One-Touch Mode 1 / 2 LED
    Indicate that panel is either in One-Touch mode 1.or One-Touch mode 2.

☐ SelecType
    Indicates that printer is in SelecType setting mode.

BUTTONS

□ OnLine button
Toggles printer ONLINE state on and off. (If printer is in one of the setup modes, this switch releases the mode and sets the printer to ONLINE state.)

□ Form Feed button
If the printer contains data but is not enabled for printing (if Form Feed lamp is on), this switch causes printer to output printing results and eject the paper. (This button does not cause ejection if Form Feed lamp is off.)

□ Continue button
Clears error (if pressed while Continue LED is blinking). When printer is in ONLINE state, this button will also clear any warning display that may appear on the LCD.

□ SelecType / ALT button
Selects the panel setting mode: OneTouch Mode 1, OneTouch Mode 2, or SelecType Mode. Also operates as a ALT key. Panel button operations vary according to the currently selected panel setting mode.

□ MENU button
Selects the corresponding OneTouch mode setting listed above this button, or selects the SelecType menu if in SelecType mode. Press this button whe the printer is online to enter SelecType mode.

□ ITEM button
Selects the corresponding OneTouch mode option listed above this button, or selects the fucntion available within the current menu, after entering the SelecType mode.

□ VALUE button
Selects the corresponding OneTouch mode option listed above this button, or selects the parameter available within the current item, after entering the Item of the SelecType mode.

□ ENTER button / Status Sheet print
Selects the corresponding OneTouch mode option listed above this button, or accepts the setting curretnly shown on the LCD as a new setting when in SelecType mode.
Press this button twice when the printer is online to print the status sheet.

□ RESET (ALT + Conitnue)
Pressing the Continue button while holding down the ALT button will reset the printer. The LCD will display the message RESET. To generate a complete reset (warm boot), continue to hold down these buttons for approximately five seconds after the RESET message appears; the message will then change to RESET ALL and the printer will start warm-up processing.

1.4.1 Panel Settings

This section explains the printer's three panel-setting modes.

1.4.1.1 OneTouch Mode

The printer offers two quick-set modes: OneTouch mode 1 and OneTouch mode 2. You can select either of these modes by pressing the SelecType button as necessary. The following table shows the settings that can be made from each of these modes.

Table 1-12. OneTouch Mode Menu

Button	OneTouch Mode 1	OneTouch Mode 2
MENU	Paper Source (Selects source for paper feed)	RITech (On / Off)
ITEM	Paper Size (Use to display or select the paper size)	Copies (Selects number of copies to be printed.)
VALUE	Manual Feed	MP Tray Size (Selects size of paper in MP tray.)
ENTER	Orientation (Selects vertical or horizontal image direction.)	Toner-Save Mode (Sets Toner-Save mode ON or OFF.)

1.4.1.2 SelecType Mode

SeleType mode presents a variety of menus. Table below shows the mode's switch operations and available settings.

Table 1-13. SelecType Mode Menu

MENU Button	ITEM Button	VALUE Button
Test Menu	Status Sheet LJ4 Font Sample ESCP2 Font Sample FX Font Sample I239X Font Sample PS Status Sheet*1 PS Font Sample*1 PS Fact Sheet*1	
Emulation Menu	Parallel / Serial / AUX*2	Auto / LJ4 / ESCP2 / FX / I239X / PS*1 / GL2
Printing Menu	Paper Source	Auto / MP / LC1 / LC2*3
	Page Size	A4 *4 / A5 / / B5 / LT / HLT / LGL / GLT / GLG / EXE / F4 / MON / C10 / DL / C5 / C6 / IB5 / CTM
	Wide A4	OFF / ON
	Orientation	Port / Land
	Copies	1 - 999
	Manual Feed	OFF / ON
	Resolution	600 / 300
	Skip Blank Page	OFF / ON*6
	Duplex*5	OFF / ON
	Binding*5	Long Edge / Short Edge
	Start Page*5	Front / Back
Tray Size Menu	MP Tray Size*7	A4 *4 / A5 / / B5 / LT / HLT / LGL / GLT / GLG / EXE / F4 / MON / C10 / DL / C5 / C6 / IB5 / CTM
	LC1 Size*8	A4 / LT / LGL / GLG / B5 / EXE
	LC2 SIze*3	A4 / LT / LGL / GLG

MENU Button	ITEM Button	VALUE Button
Config Menu	RITech	ON / OFF
	Toner Save	OFF / ON
	Density	1 / 2 / 3 / 4 / 5
	Top Offset	-9.0 - 0.0 - 99.0 (step: 0.5mm)
	Left Offset	-9.0 - 0.0 - 99.0 (step: 0.5mm)
	Size Ignore	OFF / ON
	Auto Cont	OFF / ON
	Page Protect	Auto / ON
	Image Optimum	Auto / OFF / ON
Setup Menu	Interface	Auto / Parallel / Serial / AUX*2
	Time Out	0, 5 - 60 - 300
	Standby*24	Enable / Disable
	Lang	English / Français / Deutsch / ITALIANO / ESPANOL / SVENSKA / Dansk / Nerderl. / SUOMI / Português
	Printer Name	OFF / ON
	Toner	E****F
	Toner Counter Clear	
	MP Init. Paper*12	100% / 75% / 50% / 25%
	LC1 Init. Paper*12	100% / 75% / 50% / 25%
	LC2 Init. Paper*3 *12	100% / 75% / 50% / 25%
	Page Count	0 - 99999999
	SelecType Init	
Parallel Menu	Speed	Fast / Normal
	Bi-D	Nibble / ECP / OFF
	Buffer Size	Normal / Maximum / Minimum
Serial Menu	Word Length	8 / 7
	Baud Rate	9600 / 19200 / 38400 / 57600 / 300 / 600 / 1200 / 2400 / 4800
	Parity	None / Even / Odd
	Stop Bit	1 / 2
	DTR	ON / OFF
	Xon/Xoff	ON / OFF / Robust
	Buffer Size	Normal / Maximum / Minimum

MENU Button	ITEM Button	VALUE Button
AUX Menu*2	Buffer Size	Normal / Maximum / Minimum
LJ4 Menu	FontSorce	Resident / DIMM / Download
	Font Number	0 - available (max. 65535)
	Pitch*9	0.44 - 10.00 - 99.99 (step:0.1cpi)
	Height*9	4.00 - 12.00 - 999.75 (step:0.25pt)
	SymSet*10	IBM-US / Roman-8 / ECM94-1 / 8859-2 ISO / 8859-9 ISO / IBM-DM / PcMultiling / PcE.Europe / PcTk437 WiAnsi / WiE.Europe / WiTurkish / DeskTop / PsText / VeInternati / VeUS / MsPublishin / Math-8 / PsMath / VeMath / PiFont / Legal / ANSI ASCII / Swedish2 / Italian / Spanish / German / Norweg1 / French2 / Windows
	Form	5 - 64*4 - 128
	Source Symset	0 - 277 - 3199
	Dest Symset	0 - 277 - 3199
GL/2 Menu	GL-Mode	GLlike / LJ4GL
	Scale	OFF / A0 / A1 / A2 / A3
	Origin	Corner / Center
	Pen	Pen0 / 1 / 2 - 6*11
	End	Butt / Square / Triangular / Round
	Join	Mitered / Miteredveveled / Triangular / Round / Beveled / None
	Pen0/1/2 - 6*11	0.05 - 0.35 - 5.00 (step:0.05mm)

MENU Button	ITEM Button	VALUE Button
PS Menu*1	Err Sheet	<u>OFF</u> / ON
	MicroGray	<u>ON</u> / OFF
	Protect Level	<u>1</u> - 5
ESCP2 Menu FX Menu	Font	<u>Courier</u> / Prestige / Roman / Sans serif / Roman T / Orator S / Sans H / Script / OCR A / OCR B
	Pitch	<u>10cpi</u> / 12cpi / 15cpi / Prop.
	Condensed	<u>OFF</u> / ON
	T.Margin	0.40 - <u>0.5</u> - 1.50 (step:0.05")
	Text	1 - <u>66</u>*4 - available (max 81)
	CGTable	<u>PcUSA</u> / Italic / PcMultilin / PcPortugue / PcCanFrenc / PcNordic / PcTurkish2 / PcE.Europe BpBRASCII / BpAbicomp
	Country	<u>USA</u> / French / Germany / UK / Denmark / Sweden / Italy / Spain1 / Japan / Norway / Denmark2 / Spain2 / LatinAmeric / Korea / Legal
	Auto CR	<u>ON</u> / OFF
	Auto LF	<u>OFF</u> / ON
	Bit Image	<u>Dark</u> / Light / BarCode
	ZeroChar	<u>0</u> / 0 (slashed)
I239X Menu	Font	<u>Courier</u> / Prestige / Gothic / Orator / Script / Presentor / Sans serif
	Pitch	<u>10cpi</u> / 12cpi / 15cpi / 17cpi / 20cpi / 24cpi / Prop.
	Code Page	<u>437</u> / 850 / 860 / 863 / 865
	T.Margin	0.30 - <u>0.40</u> - 1.50 (step:0.05")
	Text	1 - <u>67</u>*4 - available (max 81)
	Auto CR	<u>OFF</u> / ON
	Auto LF	<u>OFF</u> / ON
	Alt. Graphic	<u>OFF</u> / ON
	Bit Image	<u>Dark</u> / Light
	ZeroChar	<u>0</u> / 0 (slashed)
	CharacterSet*4	1 / 2

NOTE:

**1:　Can be selected only if an optional EPSONScript Level2 package
　　　(C83229*) is installed.*

*2:　Can be selected only when an optional Type-B interface card is installed.

**3:　Can be selected only if the optional lower cassette unit (C812902) is
　　　installed.*

*4:　Factory default varies depending on the destination.

*5:　Can be selected only if an optional Duplex unit (C812932) is installed.

*6:　Applicable only for LJ4 and ESC/Page mode.

*7:　Do not change automatically after printing.

*8:　Display only and cannot select the size.

**9:　Either "Pitch" or "Height" is displayed depending on the selected pitch.
　　　Fixed pitch="Height", Proportional pitch="Pitch"*

**10:　Additional symbol sets will be displayed if an optional font ROM is
　　　installed.*

*11:　Can be selected only in GL/Like mode.

*12:　"100%" capacity:MP=80 sheets, LC1=250 sheets, LC2=500sheets.