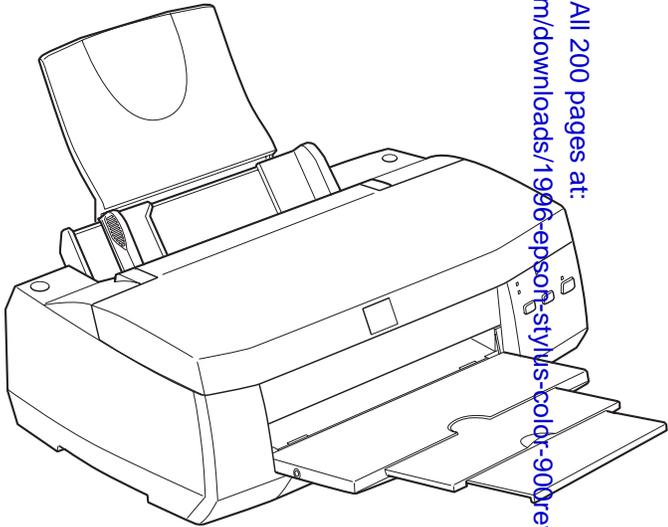


# SERVICE MANUAL



Color ink jet printer

**EPSON Stylus Color 900 (Revision C)**



**EPSON®**

Product: 1996 EPSON Stylus Color 900/Revision C Color Ink Jet Printer Service Repair Workshop Manual  
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# 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. NOWORK 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 EPSON WARRANTY.

# PREFACE

This manual describes basic functions, theory of electrical and mechanical operations, maintenance and repair procedures of Stylus Color 900. 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. The chapters are organized as follows:

## **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

## Revision Status

Revision	Issued Date	Description
A	January 06, 1999	First Release
B	February 15, 1999	<p>The following items have been revised:</p> <p>&lt;Chapter 4&gt;</p> <ul style="list-style-type: none"> <li>• Page 105/Table 4-1: Some contents have been changed.</li> <li>• Figure 4-4, Figure 4-17: Contents of the figures have been corrected.</li> <li>• Figure 4-13, 4-15, 4-16, 4-24, 4-25, 4-39, 4-40, 4-41: Figure titles have been corrected.</li> <li>• Figure 4-14: Figure title and the contents of the figure have been corrected.</li> </ul> <p>&lt;Chapter 5&gt;</p> <p>Pages from 140 through 145: Head Angular Adjustment procedure has been changed due to overall review of the section.</p>
C	March 4, 1999	<p>The whole book is revised. The actual change is made on the following points:</p> <ul style="list-style-type: none"> <li>• Chapter 4 / Page 115 / Figure 4-18 and step 3</li> <li>• Chapter 5 / Page 135 to 141 and Page 148. The rest of the pages in this chapter only changed in page numbers.</li> <li>• Chapter 6 and 7 changed in page numbers only.</li> </ul>

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**CHAPTER**

**1**

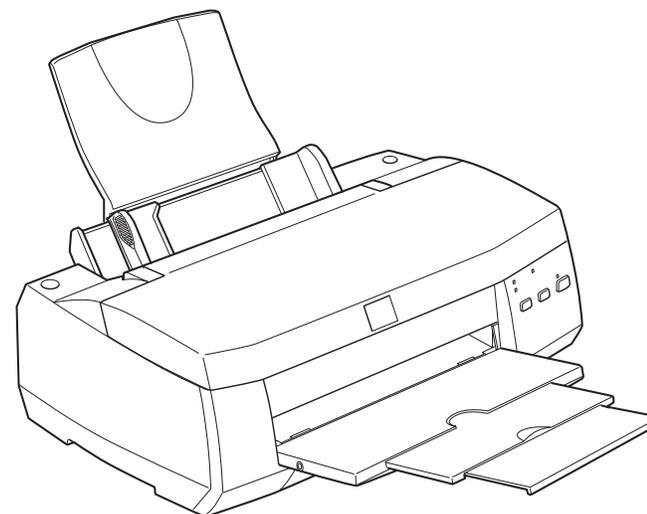
**PRODUCT DESCRIPTION**

## 1.1 FEATURES

---

The Stylus COLOR 900 is the latest in EPSON's advanced lines of ink jet printers and offering the following features.

- High color print quality:
  - 1440 (H) x720 (V) dpi printing
  - Printing with 4 color inks (YMCK)
  - Traditional and New Microweave
  - Improvement in color rendering using variable dot
- Built-in auto sheet feeder:
  - Holds 100 cut-sheets (64 g/m<sup>2</sup>)
  - Holds 10 envelopes
  - Holds 30 transparency films
- Built-in 3 I/F and 1 optional I/F card slot
  - Mac serial I/F (up to approximately 1.8 Mbps)
  - Bi-directional parallel I/F (IEEE-1284 level 1 device)
  - USB
  - Optional Type-B level 2 I/F card slot
- 4 scaleable fonts, 5 LQ fonts
- 13 character tables (Standard version)
- 37 character tables (NLSP version)



**Figure 1-1. Stylus Color 900**

## 1.2 Specifications

### 1.2.1 Printing Specifications

- Print method: On demand ink jet
- Nozzle configuration: Monochrome=192 nozzles (96 x 2 staggered)  
Color=96 nozzles x 3 (Cyan, Magenta, Yellow)  
(See Figure 1-2 for the nozzle configuration.)

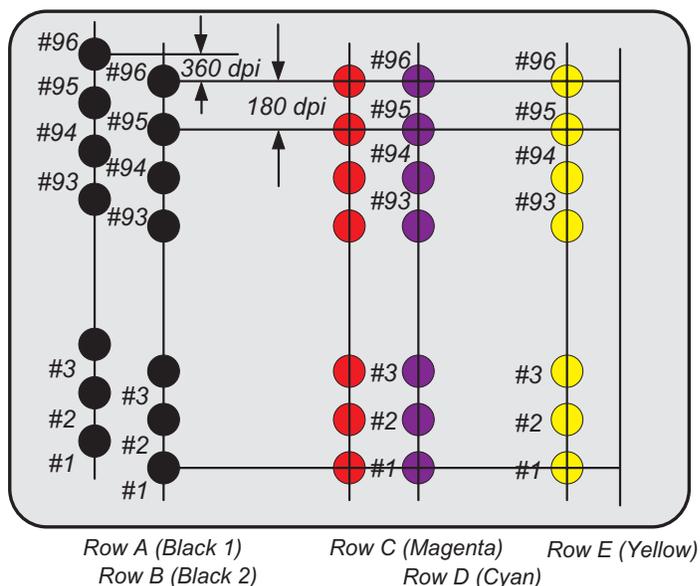


Figure 1-2. Nozzle configuration

- Print direction: Bi-direction with logic seeking
- Print speed and Printable columns

Table 1-1.  
Print Speed and Printable Columns for Character Mode

Character pitch	Printable columns	LQ speed
10 CPI (Pica)	80	285 CPS
12 CPI (Elite)	96	342 CPS
15 CPI	120	428 CPS
17 CPI (Pica condensed)	137	487 CPS
20 CPI (Elite condensed)	160	570 CPS

Table 1-2.  
Print Speed and Printable columns for Raster Graphics Mode

Horizontal resolution	Printable area	Available dot	CRS
180 dpi	8.26 inch	1488	28.5 IPS
360 dpi	8.26 inch	2976	28.5 IPS
720 dpi	8.26 inch	5952	20 IPS

- Control code: ESC/P2 and expanded raster graphics code  
EPSON Remote command  
IBM X24E emulation

□ Character tables: Legal and 14 international character sets

Standard version: (13 character tables)

Italic table	PC 860 (Portuguese)
PC 850 (Multilingual)	PC 437(US, Standard Europe)
PC 861 (Icelandic)	PC 863(Canadian-French)
PC 865(Nordic)	Abicomp
BRASCII	Roman 8
ISO Latin 1	PC 858
ISO 8859-15	

NLSP version: (36 character tables)

Italic table	PC437	PC437 Greek
PC850	PC852	PC853
PC855	PC857	PC860
PC861	PC865	PC866
PC869	MAZOWIA	Code MJK
ISO 8859-7	ISO Latin 1T	Bulgaria
PC774	Estonia	ISO 8859-2
PC866 LAT	PC866 UKR	PC AR864
PC APTEC	PC708	PC720
Hebrew7*	Hebrew8*	PC862*
Abicomp	BRASCII	Roman 8
ISO Latin 1	PC 858	ISO 8859-15

\* These character tables can not be selected in the Default setting mode.

□ Typeface

Bit map LQ font:

EPSON Roman	10 CPI, 12 CPI, 15CPI, Proportional
EPSON Sans Serif	10 CPI, 12 CPI, 15CPI, Proportional
EPSON Courier	10 CPI, 12 CPI, 15CPI
EPSON Prestige	10 CPI, 12 CPI, 15CPI
EPSON Script	10 CPI, 12 CPI, 15CPI

Scaleable font

EPSON Roman	10.5 pt., 8 pt., - 32 pt. (every 2 pt.)
EPSON Sans Serif	10.5 pt., 8 pt., - 32 pt. (every 2 pt.)
EPSON Roman T	10.5 pt., 8 pt., - 32 pt. (every 2 pt.)
EPSON Sans Serif H	10.5 pt., 8 pt., - 32 pt. (every 2 pt.)

\* Each Typeface has 4 variations as the following example of EPSON Roman.

*EPSON Roman normal*  
*EPSON Roman bold*  
*EPSON Roman italic*  
*EPSON Roman bold italic*

See Table 1-3 which lists the character tables and available typefaces.

- Feeding method: Friction feed with ASF
- Line spacing: 1/6 inch, 1/8 inch or programable at 1/360 inch
- Paper path: Cut-sheet ASF (Top entry, Front out)
- Feed speed: 192/360 inch feed = 116 ms  
 Continuous feed = 176.3 mm/second (6.94 inch/second)
- Input data buffer: 256 KB

**Table 1-3. Character Tables and Available Typefaces**

	Character Tables		Bit map font	Scaleable font		
Standard version	Italic table	PC 437 (US Standard Europe)	EPSON Roman EPSON Sans Serif EPSON Courier EPSON Prestige EPSON Script	EPSON Roman EPSON Sans Serif EPSON Roman T EPSON Sans Serif H		
	PC 860 (Portuguese)	PC 850 (Multilingual)				
NLSP version	PC 861 (Icelandic)	PC 863 (Canadian-French)	EPSON Roman EPSON Sans Serif EPSON Courier EPSON Prestige EPSON Script	EPSON Roman EPSON Sans Serif EPSON Roman T EPSON Sans Serif H		
	PC 865 (Nordic)	BRASCII				
	Abicomp	Roman 8				
	ISO Latin1	PC 858				
	ISO 8859-15					
	Italic table	PC 437(US Standard Europe)			EPSON Roman EPSON Sans Serif EPSON Courier EPSON Prestige EPSON Script	EPSON Roman EPSON Sans Serif
	PC 850 (Multilingual)	PC 860(Portuguese)				
	PC 861 (Icelandic)	PC 865(Nordic)BRASCII				
	Abicomp	Roman8				
	ISOLatin1	PC 858				
ISO 8859-15						
PC437Greek	PC 852 (East Europe)	EPSON Roman EPSON Sans Serif EPSON Courier EPSON Prestige EPSON Script	EPSON Roman EPSON Sans Serif			
PC 853 (Turkish)	PC 855 (Cyrillic)					
PC 857 (Turkish)	PC 866 (Russian)					
PC 869 (Greek)	MAZOWIA (Poland)					
Code MJK (CSFR)	ISO 8859-7 (Latin/Greek)					
ISO Latin 1T (Turkish)	Bulgaria (Bulgarian)					
PC7 74	Estonia					
1SO 8859-2 (ISO Latin 2)	PC 866 LAT					
PC 866 UKR						
PC APTEC (Arabic)	PC 708 (Arabic)			EPSON Roman EPSON Sans Serif	Not supported	
PC 720 (Arabic)	PC AR864 (Arabic)					
Hebrew7*		EPSON Roman EPSON Courier	Not supported			
Hebrew 8*						
PC862 (Hebrew)*						

\* Not mentioned in the User's Guide. These character tables can not select in the default setting mode.

## 1.2.2 Options and Consumable Products

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

**NOTE:** The availability of special media varies by country.

**Table 1-4. Options Available for Stylus Color 900**

Items	Codes
32KB Serial I/F card	C82307* / C82308*
32KB Parallel Interface Card	C80310*
Coax I/F card	C82314*
Twin-ax I/F card	C82315*
LocalTalk Interface Card	C82312*
Type B Ethernet Interface Card	C82362* / C82363* / C82364*
Type B Bi-directional Parallel Interface Card	C82345*
Parallel Interface Cable (shielded) from D-SUB 25-pin (computer) to 36-pin Amphenol 57 Series (printer)	C83602*
Serial Interface Cable from D-SUB 25-pin (computer) to D-SUB 25-pin (printer)	C83603* / C83604*
Serial Interface Cable from D-SUB 9-pin (computer) to D-SUB 25-pin (printer)	C83605* / C83606*
USB Interface Cable (shielded) from Series A 4-pin (computer) to Series B 4-pin (printer) (This cable is not supplied in all locations.)	C83623*

**Table 1-5. Ink Cartridge Available for Stylus Color 900**

Items	Codes
Black Ink Cartridge	T003
Color Ink Cartridge	T005

**Table 1-6. EPSON Special Media**

Items	Codes
EPSON 360 dpi Ink Jet Paper (A4)	S041059 / S041025
EPSON 360 dpi Ink Jet Paper (Letter)	S041060 / S041028
EPSON Photo Quality Ink Jet Paper (A4)	S041061 / S041026
EPSON Photo Quality Ink Jet Paper (Letter)	S041062 / S041029
EPSON Photo Quality Ink Jet Paper (Legal)	S041067 / S041048
EPSON Photo Quality Ink Jet Card (A6)	S041054
EPSON Photo Quality Ink Jet Card (5 x 8")	S041121
EPSON Photo Quality Ink Jet Card (8 x 10")	S041122
EPSON Photo Quality Self Adhesive Sheet (A4)	S041106
EPSON Ink Jet Note Card (A6) (with envelopes)	S041147
EPSON Ink Jet Greeting Cards (5 x 8") (with envelopes)	S041148
EPSON Ink Jet Greeting Cards (8 x 10") (with envelopes)	S041149
EPSON Photo Quality Glossy Film (A4)	S041071
EPSON Photo Quality Glossy Film (Letter)	S041172
EPSON Photo Quality Glossy Film (A6)	S041107
EPSON Ink Jet Transparencies (A4)	S041063
EPSON Ink Jet Transparencies (Letter)	S041064
EPSON Photo Paper (A4)	S041140
EPSON Photo Paper (Letter)	S041141
EPSON Photo Paper (4 x 6")	S041134
EPSON Photo Paper Cards (A4)	S041177
EPSON Photo Stickers 16 (A6)	S041144
EPSON Photo Stickers 4 (A6)	S041176
EPSON Panoramic Photo Paper (210 x 594 mm)	S041145
EPSON Iron-On Cool Peel Transfer Paper (A4)	S041154
EPSON Iron-On Cool Peel Transfer Paper (Letter)	S041153 / S041155

### 1.2.3 Paper Specifications

This section describes paper specifications including paper handling and printable area.

- Paper Handling: Do not feed paper in reverse more than 9.5 mm (0.38").

#### 1.2.3.1 Cut Sheet

- Size:
  - A4: [Width 210 mm (8.3") x Length 297 mm (11.7")]
  - A5: [Width 148 mm (5.8") x Length 210 mm (8.3")]
  - Letter: [Width 216 mm (8.5") x Length 279 mm (11.0")]
  - B5: [Width 182 mm (7.2") x Length 257 mm (10.1")]
  - Legal: [Width 216 mm (8.5") x Length 356 mm (14.0")]
  - Half Letter: [Width 139.7 mm (5.5") x Length 215.9 mm (8.5")]
  - Executive: [Width 184.2 mm (7.25") x Length 266.7mm(10.5")]
- Thickness: 0.08 mm (0.003") - 0.11 mm (0.004")
- Weight: 64g/m<sup>2</sup> (17lb.) - 90g/m<sup>2</sup> (24lb.)
- Paper Types: Bond paper, Plain paper, EPSON special media

#### 1.2.3.2 Transparency, Glossy Paper

- Size
  - A4: [Width 210 mm (8.3") x Length 297 mm (11.7")]
  - Letter: [Width 216 mm (8.5") x Length 279 mm (11.0")]
  - A6: [Width 105 mm (4.1") x Length 148 mm (5.8")]
- Thickness: 0.075 mm (0.003") - 0.085 mm (0.0033")
- Paper Types: EPSON special media

**NOTE:** Print on transparency at normal temperatures only.

#### 1.2.3.3 Envelope

- Thickness: 0.08 mm (0.003") - 0.11 mm (0.004")
- Size:
  - No.10: [Width 241 mm (9 1/2") x Length 104.8 mm (4 1/8")]
  - DL: [Width 220 mm (8.7") x Length 110 mm (4.3")]
  - C6: [Width 162 mm (6.4") x Length 114 mm (4.5")]
  - 5 x 8": [Width 220 mm (8.7") x Length 132 mm (5.2")]
- Thickness: 0.16 mm (0.006") - 0.52 mm (0.02")
- Weight: 45g/m<sup>2</sup> (12lb.) - 75g/m<sup>2</sup> (20lb.)
- Quality: Bond paper, Plain paper, Airmail

#### NOTES:

1. Print on envelope at normal temperatures only.
2. Place the longer side of the envelope horizontal.

#### 1.2.3.4 Index Card

- Size:
  - A6 Index card: [Width 105 mm (4.1") x Length 148 mm (5.8")]
  - 5 x 8" Index card: [Width 127 mm (5.0") x Length 203 mm (8.0")]
  - 10 x 8" Index card:[Width 127 mm (5.0") x Length 203 mm (8.0")]
- Thickness: Less than 0.23 mm (0.0091")
- Paper Types: EPSON special media

#### 1.2.3.5 Self Adhesive Sheets

- Size
  - A4: [Width 210 mm (8.3") x Length 297 mm (11.7")]
- Paper Types: EPSON special media

### 1.2.3.6 Photo Paper

- Size:
  - A4: [Width 210 mm (8.3") x Length 297 mm (11.7")]
  - Letter: [Width 216 mm (8.5") x Length 279 mm (11.0")]
  - 4 x 6": [Width 102 mm (4") x Length 152 mm (6")]
  - Panoramic: [Width 210 mm (8.3") x Length 594 mm (23.4")]
- Paper Types: EPSON special media

### 1.2.3.7 Photo Stickers

- Size:
  - A6 with 4 or 16 frames:
    - [Width 105 mm (4.1") x Length 148 mm (5.8")]
- Paper Types: EPSON special media

### 1.2.4 Printable Area

□ Cut Sheet

See Figure 1-3 and Table 1-7 for the printable area for cut sheets.

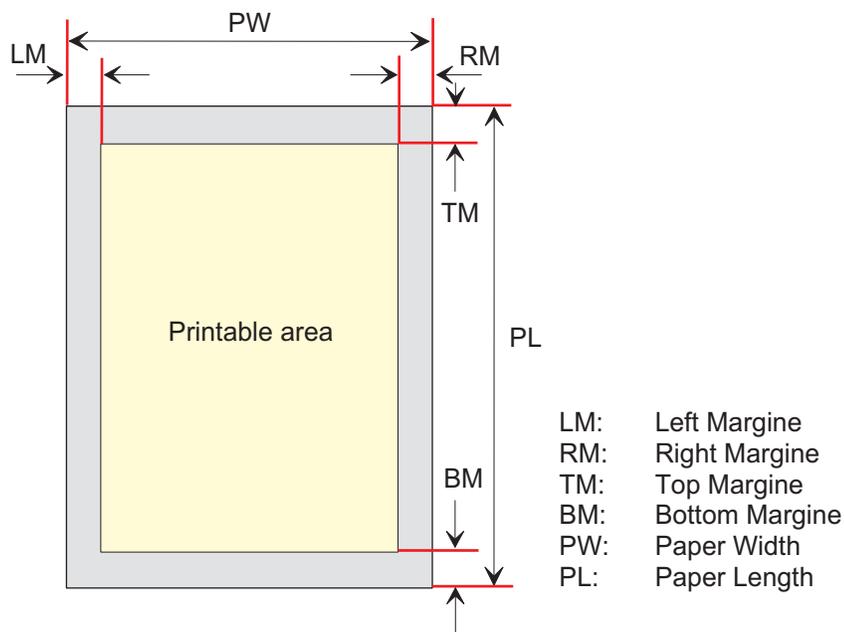


Figure 1-3. Printable Area for Cut Sheets

Table 1-7.  
 Minimum margin for Raster Graphics Mode / Character Mode

Paper Size	Left Margin (Minimum)	Right Margin (Minimum)	Top Margin (Minimum)	Bottom Margin (Minimum)
A4	3 mm (0.12")	3 mm (0.12")	3 mm (0.12")	14 mm (0.54") 3 mm (0.12") *3
A5	3 mm (0.12")	3 mm (0.12")	3 mm (0.12")	14 mm (0.54") 3 mm (0.12") *3
Letter	3 mm (0.12")	3 mm (0.12")*1 9 mm (0.35")*2	3 mm (0.12")	14 mm (0.54") 3 mm (0.12") *3
B5	3 mm (0.12")	3 mm (0.12")	3 mm (0.12")	14 mm (0.54") 3 mm (0.12") *3
Legal	3 mm (0.12")	3 mm (0.12")*1 9 mm (0.35")*2	3 mm (0.12")	14 mm (0.54") 3 mm (0.12") *3
Half Letter	3 mm (0.12")	3 mm (0.12")	3 mm (0.12")	14 mm (0.54") 3 mm (0.12") *3
Executive	3 mm (0.12")	3 mm (0.12")	3 mm (0.12")	14 mm (0.54") 3 mm (0.12") *3

\*1: For Raster Graphics mode

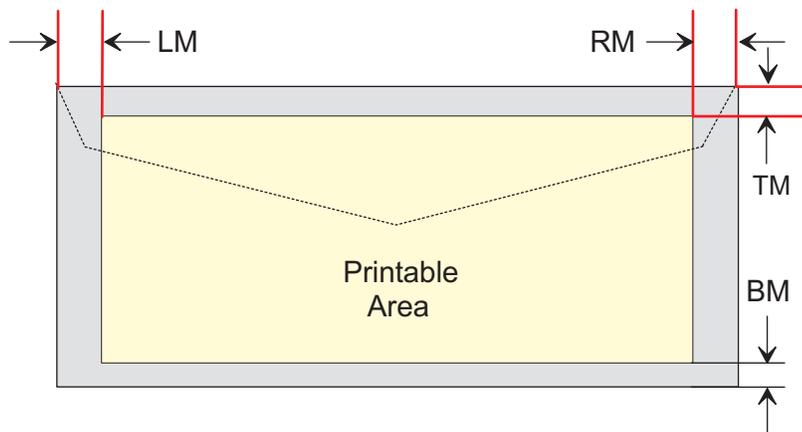
\*2: For Character mode

\*3: The minimum bottom margin is reduced to 3 mm when paper dimension is defined by using the command. Otherwise, the minimum bottom margin remains 14 mm. Note the extra printing area with the bottom margin of 3 mm is not a guaranteed area.

- Envelope See Table 1-8 and Figure 1-4 which show the minimum margin and printable area for envelopes, respectively.

**Table 1-8. Minimum Margin for Envelopes**

Paper Size	Left Margin (Minimum)	Right Margin (Minimum)	Top Margin (Minimum)	Bottom Margin (Minimum)
#10	3 mm (0.12")	28 mm (1.10")	3 mm (0.12")	14 mm (0.54")
DL	3 mm (0.12")	7 mm (0.28")	3 mm (0.12")	14 mm (0.54")
C6	3 mm (0.12")	3 mm (0.12")	3 mm (0.12")	14 mm (0.54")
5 x 8	3 mm (0.12")	7 mm (0.28")	3 mm (0.12")	14 mm (0.54")



**Figure 1-4. Printable Area for Envelopes**

## 1.2.5 Ink Cartridge Specifications

### 1.2.5.1 Black Ink Cartridge

- Type: Exclusive ink cartridge
- Color: Black
- Print Capacity: 1200 pages / A4 (ISO/IEC 10561 Letter Pattern at 360 dpi)
- Ink life: 2 years from indicated production date
- Storage temperature:
  - Storage: -20°C ~ 40°C (within a month at 40 °C)
  - Packing storage: -30°C ~ 40°C (within a month at 40 °C)
  - Transit: -30°C ~ 60°C (within 120 hours at 60°C and within a month at 40°C)
- Dimensions: 28.9 mm (W) x 67.4 mm (D) x 41.8 mm (H)

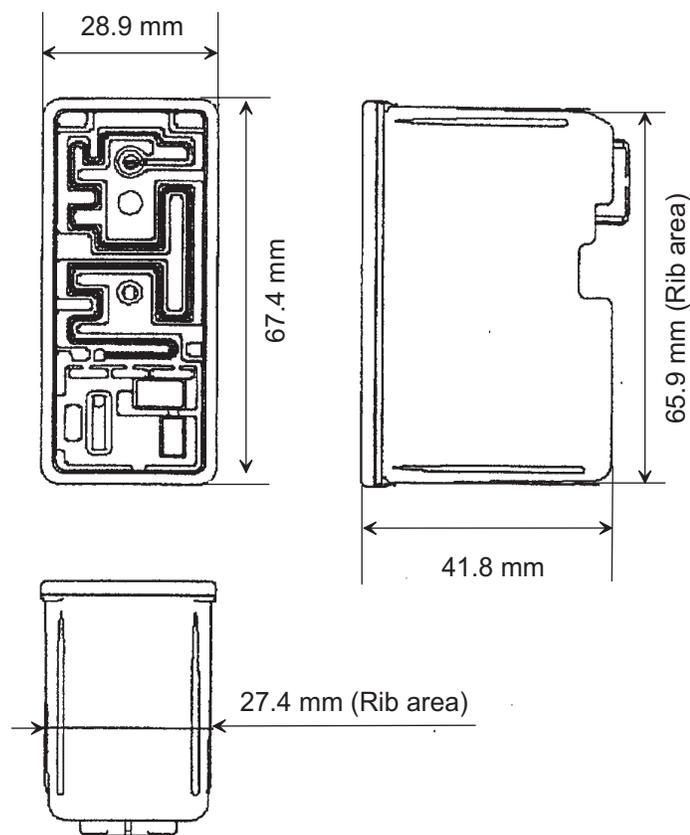


Figure 1-5. Black Ink Cartridge Appearance

### 1.2.5.2 Color Ink Cartridge

- Type: Exclusive ink cartridge
- Color: Magenta, Cyan, Yellow
- Print Capacity: 530 pages / A4 (at 360 dpi, 5 X duty each color)
- Ink life: 2 years from indicated production date
- Storage temperature:
  - Storage: -20°C ~ 40°C (within a month at 40 °C)
  - Packing storage: -30°C ~ 40°C (within a month at 40 °C)
  - Transit: -30°C ~ 60°C (within 120 hours at 60°C and within a month at 40°C)
- Dimensions: 54.0 mm (W) x 67.4 mm (D) x 41.8 mm (H)

#### NOTES

1. Do not refill the cartridge. It is a consumable item.
2. Do not use the ink cartridge whose ink life has expired.
3. Ink will be frozen below -4 °C. To use ink that is frozen, let it defrost for at least 3 hours at room temperature.

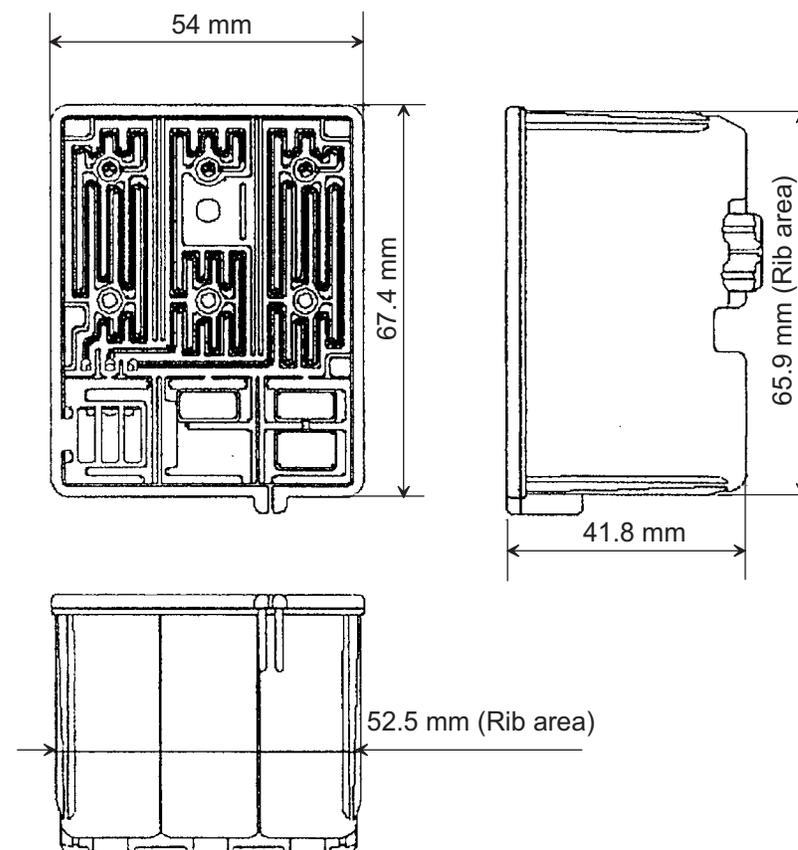


Figure 1-6. Color Ink Cartridge

### 1.2.6 Electrical Specifications

**[120V version]**

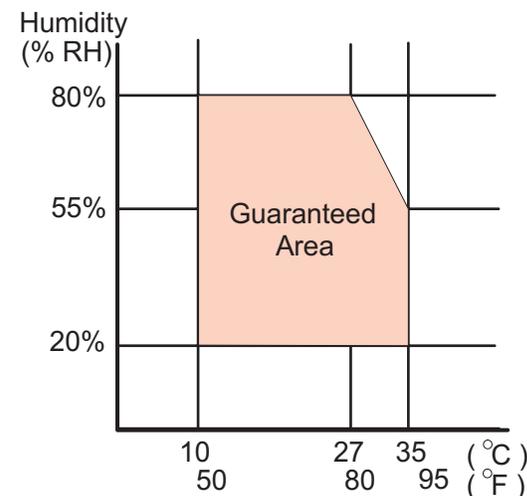
- Rated voltage: AC120V
- Input voltage range: AC99 ~132V
- Rated frequency range: 50 ~ 60 Hz
- Input frequency range: 49.5 ~ 60.5 Hz
- Rated current: 0.4A (Maximum 0.5A)
- Power consumption: Approx.18W (ISO/IEC 10561 Letter pattern)  
Energy Star compliant
- Insulation Resistance: 10 M ohms min.  
(between AC line and chassis, DC 500 V)
- Dielectric strength: AC1000 V rms. 1 minute or AC1200 Vrms.  
1 second (between AC line and chassis)

**[220~240V version]**

- Rated voltage: AC220V ~ 240V
- Input voltage range: AC198 ~ 264V
- Rated frequency range: 50 ~ 60Hz
- Input frequency range: 49.5 ~ 60.5Hz
- Rated current: 0.2 A (Maximum 0.3A)
- Power consumption: Approx.18W (ISO/IEC 10561 Letter pattern)  
Energy Star compliant
- Insulation Resistance: 10M ohms min.  
(between AC line and chassis, DC500V)
- Dielectric strength: AC1500 V rms.  
1 minute (between AC line and chassis)

### 1.2.7 Environmental Condition

- Temperature: Operating = 10 to 35 °C (See Figure 1-7.)  
Non-operating = -20 to 60 °C \*2  
1 month at 40 °C  
120 hours at 60 °C
- Humidity: Operating = 20% ~ 80% RH \*2  
(See Figure 1-7.)  
Non-operating = 5% ~ 85% RH \*1 \*2



**Figure 1-7. Temperature / Humidity of Range**

- Resistance to shock: Operating = 1G, within 1 ms  
Non-operating = 2G, within 2 ms \*1
- Resistance to vibration: Operating = 0.15G (Operating)  
Non-operating = 0.50G \*1

\*1: With a shipment container

\*2: Without condensation

## 1.2.8 Reliability

- Total print volume: 75,000 pages (A4, Letter)
- Printhead life: 4000 million dots/nozzle

## 1.2.9 Safety Approvals

### [120V version]

- Safety standard: UL1950  
CSA22.2 No.950
- EMI: FCC part 15 subpart B class B  
CSA C108.8 class B

### [220~240V version]

- Safety standard: EN 60950 (VDE)
- EMI: EN55022 (CISPR Pub.22) class B  
AS/NZS 3548 class B

## 1.2.10 Acoustic Noise

- Level: Approximately 47 dB (A) (According to ISO 7779)

## 1.2.11 CE Marking (220 ~ 240 V version)

- Low Voltage Directive 73/23/EEC: EN60950
- EMC Directive 89/336/EEC: EN55022 Class B  
EN61000-3-2  
EN61000-3-3  
EN50082-1  
IEC801-2  
IEC801-3  
IEC801-4

## 1.2.12 Physical Specifications

- Weight: 8.4 Kg
- Dimensions: 647 mm (W) x 296 mm (D) x 325 mm (H)

## 1.3 Interface

The EPSON Stylus Color 900 is equipped with USB, bi-directional 8-bit parallel interface, serial interface and a card slot for an optional Type-B interface.

### 1.3.1 Parallel Interface (Forward Channel)

- Transmission mode: 8 bit parallel, IEEE-1284 compatibility mode
- Synchronization: By /STROBE pulse
- Handshaking: BY BUSY and /ACKLG signal
- Signal level: TTL compatible level
- Adaptable connector: 57-30360 (amphenol) or equivalent

The BUSY signal is set high before setting either /ERROR low or PE high, and held high until all these signals return to an inactive state.

The BUSY signal is HIGH:

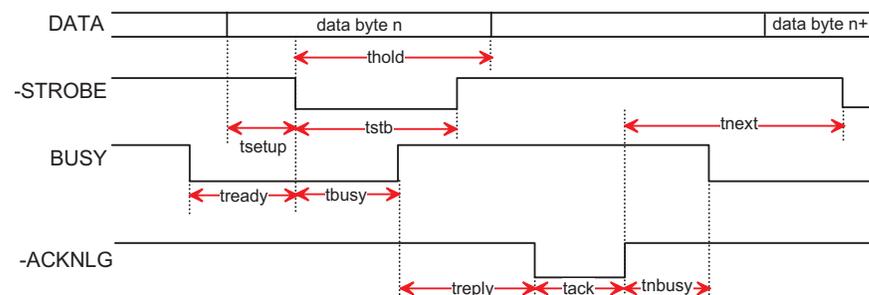
- During data entry (see Data transmission timing)
- When the input data buffer is full
- While /INIT signal is at LOW level or during hardware initialization.
- During a printer error condition (See /ERROR signal).
- When the parallel interface is not selected.

The /ERROR signal is LOW when one of the following error has occurred:

- Printer hardware error (fatal error)
- Paper Out error
- Paper Jam error
- Ink Out error

The PE signal is at a high level during Paper Out error.

See Figure 1-8 and Table 1-9 which show the data transmission timing.



**Figure 1-8. Data Transmission Timing**

**Table 1-9. Data Transmission Timing**

Parameter	Minimum	Maximum
tsetup	500ns	---
thold	500ns	---
tstb	500ns	---
tready	0	---
tbusy	---	500ns
tt-out*	---	120ns
tt-in**	---	200ns
treply	0	---
tack	500ns	10us
tnbusy	0	---
tnext	0	---

**NOTE:** *tt-out* shows the rise and fall time of every output signal.  
*tt-in* shows the rise and fall time of every input signal.  
 Typical time of *tack* is shown in Table 1-10.

**Table 1-10. Typical Time of Tack**

Parallel Interface Mode	Typical Time of Tack
High speed	1 us
Normal speed	3 us

**Table 1-11. Signal level for TTL Compatible  
(IEEE-1284 level 1 device)**

Parameters	Minimum	Maximum	COndition
VOH*	---	5.5V	
VOL*	-0.5V	---	
IOH*	---	0.32mA	VOH = 2.4V
IOL	---	12mA	VOL = 0.4V
CO	---	50pF	
VIH	---	2.0V	
VIL	0.8V	---	
IIH	---	0.32mA	VIH = 2.0V
IIL	---	12mA	VIL = 0.8V
CI	---	50pF	

\* A LOW logic level on the Logic H signal is as follows:  
 2.0 V or less when the printer is turned off.  
 3.0 V or more when the printer is turned on.  
 The receiver provides an impedance equivalent to 7.5 KΩ to ground.

See Table 1-12 which shows the connector pin assignment and signals for the forward channel of the parallel interface.

Table 1-12. Parallel I/F Forward Channel

Pin No.	Signal Name	Return GND Pin	In/Out	Functional Description
1	/STROBE	19	I	The strobe pulse. Read-in of data is performed at the falling edge of this pulse.
2	DATA0	20	I	The DATA0 through DATA7 signals represent data bits 0 to 7, respectively. Each signal is at high level when data is logical 1 and low level when data is logical 0.
3	DATA1	21		
4	DATA2	22		
5	DATA3	23		
6	DATA4	24		
7	DATA5	25		
8	DATA6	26		
9	DATA7	27		
10	/ACKNLG	28	O	This signal is a negative pulse indicating that the printer can again accept data.
11	BUSY	29	O	A high signal indicates that the printer cannot receive data.
12	PE	28	O	A high signal indicates paper-out error.
13	SLCT	28	O	Always at high level when the printer is powered on.
14	/AFXT	30	I	Not used.
31	/INIT	30	I	The falling edge of a negative pulse or a low signal on this line causes the printer to initialize. Minimum 50 us pulse is necessary.
32	/ERROR	29	O	A low signal indicates printer error condition.
36	/SLIN	30	I	Not used.
18	Logic H	----	O	Pulled up to +5V via 3.9K ohm resistor.
35	+5V	----	O	Pulled up to +5V via 3.9K ohm resistor.
17	Chassis GND	----	---	Chassis GND.
16,33, 19-30	GND	----	---	Signal GND.
15,34	NC	----	---	Not connected.

\*: In and Out refers to the direction of the signal as viewed from the printer.

### 1.3.2 Parallel Interface (Reverse Channel)

- Transmission mode: IEEE-1284 nibble mode
- Adaptable connector: See the forward channel.
- Synchronization: Refer to the IEEE-1284 specification
- Handshaking: Refer to the IEEE-1284 specification
- Data trans. timing: Refer to the IEEE-1284 specification
- Signal level: IEEE-1284 level 1 device  
(See forward channel.)

- Extensibility request:  
The printer responds affirmatively when the extensibility request values are 00H or 04H, as follows;

00H: Request Nibble Mode Reverse Channel Transfer.

04H: Request device ID using Nibble Mode Rev Channel Transfer.

- Device ID:  
The printer sends following device ID string upon request.

When IEEE1284.4 is enabled;

[00H] [60H]

MFG:EPSON;

CMD:ESCPL2,PRPXL,BDC,D4;

MDL:Stylus[SP]COLOR[SP]900;

CLS:PRINTER;

DES:EPSON[SP]Stylus[SP]COLOR[SP]900;

When IEEE1284.4 is disabled;

[00H] [5DH]

MFG:EPSON;

CMD:ESCPL2,PRPXL,BDC;

MDL:Stylus[SP]COLOR[SP]900;

CLS:PRINTER;

DES:EPSON[SP]Stylus[SP]COLOR[SP]900;

#### NOTES:

1. [00H] denotes a hexadecimal value of zero.
2. MDL value and DES value depend on the EEPROM setting.
3. CMD value depends on the IEEE1284.4 setting.

See Table 1-13 which shows pin assignment for reverse channel

Table 1-13. Pin Assignment For Reverse Channel

Pin No.	Signal Name	Return GND Pin	In/Out	Functional Description
1	HostClk	19	I	Host clock signal.
2-9	Data0-7	20-27	I	The DATA0 through DATA7 signals represent data bits 0 to7, respectively. Each signal is at high level when data is logical 1 and low level when data is logical 0. These signals are used to transfer the 1284 extensibility request values to the printer.
10	PrtClk	28	O	Printer clock signal.
11	PtrBusy, Data Bit-3,7	29	O	Printer busy signal and reverse channel transfer data bit 3 or 7.
12	AckData Req, DataBit-2,6	28	O	Acknowledge data request signal and reverse channel transfer data bit 2 or 6.
13	Xflag, DataBit-1,5	28	O	X-flag signal and reverse channel transfer data bit 1 or 5.
14	HostBusy	30	I	Host busy signal.
31	/INIT	30	I	Not used.
32	/DataAvail, DataBit-0,4	29	O	Data available signal and reverse channel transfer data bit 0 or 4.
36	1284-Active	30	I	1284 Active Signal
18	Logic-H	----	O	Pulled up to +5V via 3.9K ohm resister.
35	+5V	----	O	Pulled up to +5V via 3.3K ohm resister.
17	Chassis GND	----	---	Chassis GND.
16,33, 9-30	GND	----	---	Signal GND.
15,34	NC	----	---	Not connected.

\* In/Out refers to the direction of signal flow from the printer's point of view.

### 1.3.3 Mac Serial Interface

- Standard: Based on RS-423
- Synchronization: Synchronous
- Bit Rate: Approximately 1.8 Mbps
- Handshaking: X-ON/X-OFF, DTR Protocol
- Word Format: Start Bit = 1 bit  
Data Bit = 8 bit  
Parity Bit = No parity bit  
Stop Bit = 1 bit
- Adaptable Connector: 8-pin mini circular connector
- Recommended Cable: Apple System Peripheral-8 Cable
- Connector pin assignment and signal: See Table 1-14.

**Table 1-14. Pin Assignment**

Pin No.	Signal Name	I/O	Description
1	SCLK	O	Synchronous clock signal
2	CTS	I	Clear To Send
3	TXD-	O	Transmit Data (-)
4	SG	I	(Signal Ground)
5	RXD-	I	Receive Data (-)
6	TXD+	O	Balanced Transmit Data (+)
7	DTR	O	Data Terminal Ready
8	RXD+	I	Balanced Receive Data (+)

- X-ON/X-OFF, DTR protocol: See Table 1-15.

**Table 1-15. X-On/X-Off and DTR Protocol**

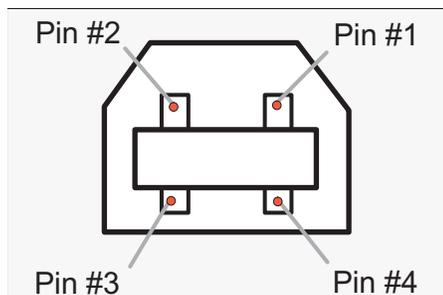
State	Buffer Space	X-ON/X-OFF	DTR
Busy	Less than 3072 bytes	Send X-OFF code	OFF
Ready	More than 5120 bytes	Send X-ON code	ON

### 1.3.4 USB Interface

- Standard: Based on the following:  
Universal Serial Bus Specifications Rev. 1.0  
Universal Serial Bus Device Class Definition for Printing Device Version 1.0
- Bit Rate: 12 M bps
- Data Encoding: NRZI
- Adaptable Connector: USB Series B
- Recommended Cable Length: 2 meters

**Table 1-16. Pin Assignment and Signal of the USB I/F**

Pin No.	Signal Name	I/O	Description
1	Vcc	---	Cable power, Maxi. power consumption is 100 mA
2	-Data	Bi-D	Data
3	+Data	Bi-D	Data, pull up to +3.3 V via 1.5 K ohms resistor
4	Ground	---	Cable Ground



**Figure 1-9. USB Pin Assignment**

### 1.3.5 Printer Language and Emulation

- Printer language: ESC/P2  
IBM X24E emulation  
EPSON Remote

### 1.3.6 Prevention Hosts from Data Transfer time-out

Generally, hosts abandon data transfer to peripherals when a peripheral is in the busy state for dozens of seconds continuously. To prevent hosts from this kind of time-out, the printer receives data very slowly, several bytes per minute, even if the printer is in busy state. This slowdown is started when the rest of the input buffer becomes several hundreds of bytes. Finally, the printer is in the busy state continuously when the input buffer is full.

### 1.3.7 Auto Interface Selection

The EPSON Stylus Color 900 has four types of interfaces: USB, parallel interface, Mac serial interface and optional Type-B interface. Each interface can be selected manually in default setting mode or automatically.

- Manual Selection:  
One of four interfaces can be selected in default setting mode.
- Automatic Selection:  
The automatic interface selection is enabled by the default setting mode. In this automatic interface selection mode, the printer is initialized to the idle state scanning for which interface is to receive data when it is powered on. The interface that receives data first is selected. When the host stops data transfer and the printer is in the stand-by state for a number of seconds, the printer returns to the idle state. As long as the host sends data or the printer interface is busy state, the selected interface is let as it is.

- <https://www.epson.com/epson-stylus-color-900revision-c-color-ink-jet-printer-service-repair-workshop-manual>
- Interface state and interface selection
    - When an interface other than parallel interface is selected, the parallel interface goes into the BUSY state.
    - When an interface other than serial interface is selected, the serial interface sets the DTR signal to MARK.
    - When an interface other than optional interface is selected, the printer sets “OFF LINE” bit of MNSTS register to the optional interface.
    - When the printer is initialized or returned to the idle state, the parallel interface enters ready state and the serial interface sets the DTR signal SPACE and the printer resets “OFF LINE” bit of MNSTS register to the optional.

**NOTE:** An interrupt signal, such as /INTR on the parallel interface is not effective while that interface is not selected.

### 1.3.7.1 IEEE 1284.4 Protocol

The packet protocol described by IEEE1284.4 standard allows a device to carry on multiple exchanges or conversations which contain data and/or control information with another device at the same time across a single point-to-point link. The protocol is not, however, a device control language. It does provide basic transport-level flow control and multiplexing services. The multiplexed logical channels are independent of each other and blocking of one has no effect on the others. The protocol operates over IEEE1284.

- Automatic selection:
  - An initial state is compatible interface and starts IEEE1284.4 communication when magic strings (1284.4 synchronous commands) are received.
- ON:
  - IEEE1284.4 is enabled as initial state. Data sent before the magic string (1284.4 synchronous commands) is discarded.
- OFF:
  - IEEE1484.4 is disabled and IEEE1484.4 synchronous commands are ignored. Compatible interface is the initial state.