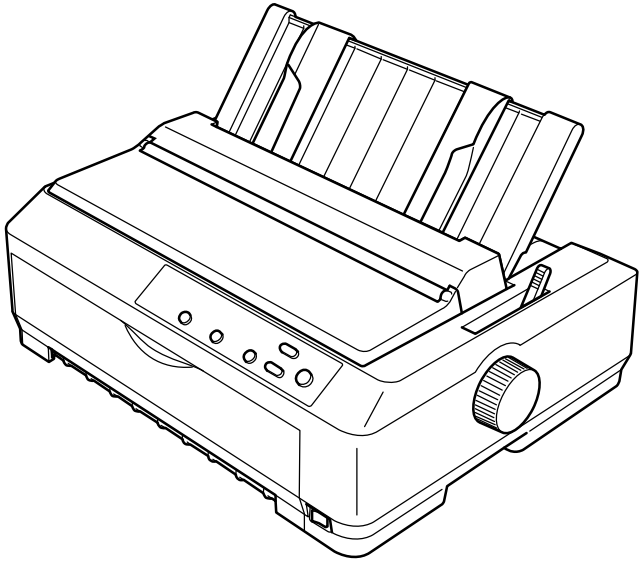
# SERVICE MANUAL



Serial Impact Dot Matrix Printer

## EPSON FX-890/2190

COLOR IMAGING EPSON

EPSON®

# Notice


- All effort have been made to ensure the accuracy of the contents of this manual. However, should any errors be detected, SEIKO EPSON would greatly appreciate being informed of them.
- The contents of this manual are subject to change without notice.
- The above not withstanding SEIKO EPSON CORPORATION can assume no responsibility for any errors in this manual or the consequences thereof.

# 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.
4. When disassembling or assembling a product, be sure to wear gloves to avoid injuries from metal parts with sharp edges.

## ***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. DO NOT REPLACE IMPERFECTLY FUNCTIONING COMPONENTS WITH COMPONENTS WHICH ARE NOT MANUFACTURED BY EPSON. IF SECOND SOURCE IF'S OR OTHER COMPONENTS WHICH HAVE NOT BEEN APPROVED ARE USED, THEY COULD CAUSE DAMAGE TO THE EPSON PRODUCT, OR COULD VOID THE WARRANTY OFFERED BY EPSON.

# About This Manual

This manual describes basic functions, theory of electrical and mechanical operations, maintenance and repair procedures of the printer. 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.

## *Manual Configuration*

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**
Describes the step-by-step procedures for the troubleshooting.

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

**CHAPTER 5. ADJUSTMENT**
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
- Electrical circuit boards schematics
- Exploded diagram & Parts List

## *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 NOTE, CAUTION, or WARNING messages.

Indicates an operating or maintenance procedure, practice or condition that is necessary to keep the product's quality.


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

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.

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


Indicates that a particular task must be carried out according to a certain standard after disassembly and before re-assembly, otherwise the quality of the components in question may be adversely affected.

# Revision Status

| Revision | Date of Issue | Description |
|---|---|---|
| A | June 20, 2003 | Formal first release |
| B | August 21, 2003 | Revision up:<br>Chapter-3: Error Correction ("3.2.12 Fatal Error" on page 63)<br>Chapter-4: Error Correction ("4.2.3 C524MAIN Board" on page 74)<br>Appendix: The part list and the exploded diagram for the FX-2190 are added.<br>("7.3 Exploded Diagrams" on page 114, "7.4 Parts List" on page 122) |
| | | |
| | | |

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## Chapter 1 PRODUCT DESCRIPTIONS



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CHAPTER

1

# PRODUCT DESCRIPTIONS

# 1.1 Features

EPSON FX-890/2190 is a small-foot 18-pin serial impact dot matrix printer.

## HARDWARE SPECIFICATIONS

- ☐ Print method : Impact Dot Matrix
- ☐ Number of pins : 18 pins
- ☐ Print pin arrangement : 9 pins x 2 files
- ☐ Print pin diameter : 0.29 mm (0.0114 inch)
- ☐ Color : Black ink ribbon
- ☐ Print Direction : Bi-direction with logic seeking

## RESOLUTION

**Table 1-1. Resolution ( dpi )**

| Printing Mode | Horizontal Density | Vertical Density | Adjacent Dot Print |
|---|---|---|---|
| Ultra Speed Draft 10 cpi | 80 dpi | 72 dpi | No |
| Ultra Speed Draft 12 cpi | 84 dpi | 72 dpi | No |
| High Speed Draft 10 cpi | 90 dpi | 72 dpi | No |
| High Speed Draft 12 cpi | 96 dpi | 72 dpi | No |
| Draft | 120 dpi | 72 dpi | No |
| Draft Condensed | 240 dpi | 72 dpi | No |
| Draft Emphasized | 120 dpi | 72 dpi | Yes |
| NLQ | 240 dpi | 144 dpi | No |
| Bit Image | 60, 72, 80, 90 or 120 dpi | 72 dpi | Yes |
| | 120 or 240 dpi | 72 dpi | No |

## PRINTING SPEED

**Table 1-2. Printing Speed (cps) and Printable Columns**

| Printing Mode | Character Pitch | Printable Columns | | Printing Speed | |
|---|---|---|---|---|---|
| | | FX-890 | FX-2190 | Normal | Copy |
| Ultra Speed Draft | 10 cpi | 80 | 136 | 566 | 489 |
| | 12 cpi | 96 | 163 | 680 | 571 |
| High Speed Draft | 10 cpi | 80 | 136 | 559 | 476 |
| | 12 cpi | 96 | 163 | 627 | 539 |
| | 15 cpi | 120 | 204 | 629 | 520 |
| High Speed Draft Condensed | 17 cpi | 137 | 233 | 595 | 463 |
| | 20 cpi | 160 | 272 | 541 | 419 |
| Draft | 10 cpi | 80 | 136 | 419 | 347 |
| | 12 cpi | 96 | 163 | 503 | 416 |
| | 15 cpi | 120 | 204 | 405 | 314 |
| Draft Condensed | 17 cpi | 137 | 233 | 359 | 300 |
| | 20 cpi | 160 | 272 | 419 | 350 |
| Draft Emphasized | 10 cpi | 80 | 136 | 209 | 173 |
| NLQ | 10 cpi | 80 | 136 | 104.6 | 87.5 |
| | 12 cpi | 96 | 163 | 125.9 | 105.0 |
| | 15 cpi | 120 | 204 | 100.8 | 78.5 |
| | 17 cpi | 137 | 233 | 89.7 | 38.5 |
| | 20 cpi | 160 | 272 | 104.6 | 44.9 |

Note 1: When the power supply voltage drops to the lower limit, the printer stops printing and then starts printing remains on that line again more slowly than before.

2: When the head temperature rises to the upper limit, the printer stops printing. When the head temperature falls to the normal level, the printer starts printing again more slowly than before.

## FEEDING METHOD

- ☐ Friction feed : Front, Rear
- ☐ Push tractor feed : Front, Rear
- ☐ Push & Pull tractor feed : Front, Rear
- ☐ Pull tractor feed : Front, Rear, Bottom

## FEED SPEED

- ☐ Normal mode 4.23 mm (1/6 inch feed) 62 msec
  Continuous feed 0.127 MPS (m/sec)
  [5.0 IPS (inches/sec)]
- ☐ Copy mode 4.23 mm (1/6 inch feed) 83 msec
  Continuous feed 0.078 MPS (m/sec)
  [3.1 IPS (inches/sec)]

## FEEDER

- ☐ Front push tractor
- ☐ Rear push tractor
- ☐ CSF Bin 1 / Bin 2 (Option)
- ☐ Pull tractor ( Option )
- ☐ Roll paper holder (Option)

## PAPER SPECIFICATIONS

**Table 1-3. Cut Sheet (Single sheet, Not multi part) FX-890**

| FX-890 | | Front Entry | | Rear Entry | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Manual | | Manual | | High-Capacity CSF | | Single-Bin CSF | |
| | | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. |
| Width | (inch) | (3.9) | (10.1) | (3.9) | (10.1) | (3.9) | (8.5) | (7.2) | (8.5) |
| | (mm) | 100 | 257 | 100 | 257 | 100 | 216 | 182 | 216 |
| Length | (inch) | (3.9) | (14.3) | (3.9) | (14.3) | (3.9) | (14.3) | (8.3) | (14.3) |
| | (mm) | 100 | 364 | 100 | 364 | 100 | 364 | 210 | 364 |
| Thickness | (inch) | (0.0025) | (0.0055) | (0.0025) | (0.0055) | (0.0028) | (0.0055) | (0.0028) | (0.0055) |
| | (mm) | 0.065 | 0.14 | 0.065 | 0.14 | 0.07 | 0.14 | 0.07 | 0.14 |
| Weight | ($g/m^2$) | 52 | 90 | 52 | 90 | 64 | 90 | 64 | 90 |
| | (lb) | (14) | (24) | (14) | (24) | (18) | (24) | (18) | (24) |
| CSF Capacity | | --- | | --- | | 185 sheets with the form 64 $g/m^2$ (17lb) *1 | | 60 sheets with the form 64 $g/m^2$ (17lb) *2 | |
| | | | | | | 150 sheets with the form 82 $g/m^2$ (22lb) *1 | | 50 sheets with the form 82 $g/m^2$ (22lb) *2 | |
| Quality | | Plain paper, Reclaimed paper | | | | | | | |
| | | Not curled, not folded, not crumpled | | | | | | | |

Note : Printing on reclaimed paper is available only under normal temperature and humidity conditions.

Note "*1": When using High-Capacity CSF, paper total thickness is below 15 mm.

"*2" : When using Single-Bin CSF, paper total thickness is below 5 mm.

**Table 1-4. Cut Sheet (Single sheet, Not multi part) FX-2190**

| FX-2190 | | Front Entry | | Rear Entry | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Manual | | Manual | | High-Capacity CSF | | Single-Bin CSF | |
| | | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. |
| Width | (inch) | (3.9) | (16.5) | (3.9) | (16.5) | (3.9) | (16.5) | (7.2) | (16.5) |
| | (mm) | 100 | 420 | 100 | 420 | 100 | 420 | 182 | 420 |
| Length | (inch) | (3.9) | (16.5) | (3.9) | (16.5) | (3.9) | (16.5) | (8.3) | (14.3) |
| | (mm) | 100 | 420 | 100 | 420 | 100 | 420 | 210 | 364 |
| Thickness | (inch) | (0.0025) | (0.0055) | (0.0025) | (0.0055) | (0.0028) | (0.0055) | (0.0028) | (0.0055) |
| | (mm) | 0.065 | 0.14 | 0.065 | 0.14 | 0.07 | 0.14 | 0.07 | 0.14 |
| Weight | ($g/m^2$) | 52 | 90 | 52 | 90 | 64 | 90 | 64 | 90 |
| | (lb) | (14) | (24) | (14) | (24) | (18) | (24) | (18) | (24) |
| CSF Capacity | | --- | | --- | | 185 sheets with the form 64 $g/m^2$ (17lb) *1 | | 60 sheets with the form 64 $g/m^2$ (17lb) *2 | |
| | | | | | | 150 sheets with the form 82 $g/m^2$ (22lb) *1 | | 50 sheets with the form 82 $g/m^2$ (22lb) *2 | |
| Quality | | Plain paper, Reclaimed paper<br>Not curled, not folded, not crumpled | | | | | | | |

Note : Printing on reclaimed paper is available only under normal temperature and humidity conditions

Note "*1": When using High-Capacity CSF, paper total thickness is below 15 mm.

"*2" : When using Single-Bin CSF, paper total thickness is below 5 mm.

**Table 1-5. Cut Sheet (Multi part) FX-890**

| FX-890 | | Front Entry | | Rear Entry | |
|---|---|---|---|---|---|
| | | Manual | | Manual / High-Capacity CSF / Single-Bin CSF | |
| | | Minimum | Maximum | Minimum | Maximum |
| Width | (inch) | (3.9) | (10.1) | ----- | ----- |
| | (mm) | 100 | 257 | | |
| Length | (inch) | (3.9) | (14.3) | ----- | ----- |
| | (mm) | 100 | 364 | | |
| Copies | | 1 original + 5 copies | | ----- | |
| Total thickness | (inch) | (0.0047) | (0.018) | ----- | ----- |
| | (mm) | 0.12 | 0.46 | | |
| Weight (one sheet of multi part) | ($g/m^2$) | 40 | 58 | ----- | ----- |
| | (lb) | (12) | (15) | | |
| Quality | | Plain paper, Reclaimed paper<br>Not curled, not folded, not crumpled | | ----- | |
| Jointing | | Line glue at the top side of form | | ----- | ----- |

Note 1: Type of paper of multi-part forms should be Carbonless. Don't use Carbon-backed and Carbon-interleaved.

2: Type of paper of line glue at the top should be set jointing side of paper horizontally.

### Table 1-6. Cut Sheet (Multi part) FX-2190

| FX-2190 | | Front Entry | | Rear Entry | |
|---|---|---|---|---|---|
| | | Manual | | Manual / High-Capacity CSF / Single-Bin CSF | |
| | | Minimum | Maximum | Minimum | Maximum |
| Width | (inch)<br>(mm) | (3.9)<br>100 | (16.5)<br>420 | ----- | ----- |
| Length | (inch)<br>(mm) | (3.9)<br>100 | (16.5)<br>420 | ----- | ----- |
| Copies | | 1 original + 5 copies | | ----- | |
| Total thickness | (inch)<br>(mm) | (0.0047)<br>0.12 | (0.018)<br>0.46 | ----- | ----- |
| Weight<br>(one sheet of multi part) | ($g/m^2$)<br>(lb) | 40<br>(12) | 58<br>(15) | ----- | ----- |
| Quality | | Plain paper, Reclaimed paper<br>Not curled, not folded, not crumpled | | ----- | |
| Jointing | | Line glue at the top side of form | | ----- | ----- |

Note 1: Type of paper of multi-part forms should be Crbonless. Don't use Carbon-backed and Carbon-interleaved.

2: Type of paper of line glue at the top should be set jointing side of paper horizontally.

### Table 1-7. Card

| FX-890 & FX-2190 | | Front Entry | | Rear Entry | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Manual | | Manual | | High-Capacity CSF | | Single-Bin CSF | |
| | | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. |
| Width | (inch)<br>(mm) | (3.9)<br>100 | (5.8)<br>148 | (3.9)<br>100 | (5.8)<br>148 | (3.9)<br>100 | (5.8)<br>148 | --- | --- |
| Length | (inch)<br>(mm) | (5.8)<br>148 | | (3.9)<br>100 | (5.8)<br>148 | (3.9)<br>100 | (5.8)<br>148 | --- | --- |
| Thickness | (inch)<br>(mm) | (0.0087)<br>0.22 | | (0.0087)<br>0.22 | | (0.0087)<br>0.22 | | --- | --- |
| Weight | ($g/m^2$)<br>(lb) | 192<br>(51) | | 192<br>(51) | | 192<br>(51) | | --- | --- |
| Quality | | Plain paper, Reclaimed paper<br>Not curled, not folded, not crumpled | | | | | | | |

Note 1: Printing on card is available only under normal temperature and humidity conditions

2: When setting cards, be sure to align their left edge with the matchmark of the sheet guide.

3: When Paper size is A6 and the sheet is to be set horizontal, it should be inserted from rear entrance only.

4: When using card, set up card mode.

### Table 1-8. Envelope

| FX-890 & FX-2190 | | | Front Entry | | Rear Entry | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Manual | | Manual | | High-Capacity CSF | | Single-Bin CSF | |
| | | | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. |
| Envelope (No.6) | Width | (inch) (mm) | ----- | | (6.5) 165 | | | | ----- | |
| | Length | (inch) (mm) | ----- | | (3.6) 92 | | | | ----- | |
| Envelope (No.10) | Width | (inch) (mm) | ----- | | (9.5) 241 | | | | ----- | |
| | Length | (inch) (mm) | ----- | | (4.1) 105 | | | | ----- | |
| Total Thickness | | (inch) (mm) | ----- | | (0.0063) 0.16 | (0.0205) 0.52 | (0.0063) 0.16 | (0.0205) 0.52 | ----- | |
| | | | ----- | | The difference of thickness at the printable area is within 0.25 mm (0.0098 inch) | | | | ----- | |
| Weight | | ($g/m^2$) | ----- | | 45 | 90 | 45 | 90 | ----- | |
| | | (lb) | | | (12) | (24) | (12) | (24) | | |
| CSF capacity | | | ----- | | ----- | | 25 sheets (24lb) | | ---- | |
| | | | | | | | 30 sheets (12lb) | | ---- | |
| Quality | | | ----- | | BOND paper, PLAIN paper or AIR MAIL<br>No glue at a flap<br>Not curled, not folded, not crumpled | | | | ----- | |

Note 1: Printing on envelope is available only under normal temperature and humidity conditions

2: Set the longer side of envelope horizontally.

3: When setting envelopes of No. 6 paper size, be sure to align their left edge with the matchmark of the sheet guide.

4: Envelope should be inserted from rear entrance only.

5: Except for AIRMAIL, the sheets stacked must not exceed 4 sheets.

6: Printing is allowed only on the front side; printing on the back side is impossible.

### Table 1-9. Handling possible cut sheets of fixed forms (single sheet/multi-part) with FX-890

| Direction \ Size | | A3 | B4 | A4 | B5 | A5 | A6 | Envelope |
|---|---|---|---|---|---|---|---|---|
| Rear Entry (manual) | Vertical | ---/--- | O/--- | O/--- | O/--- | O/--- | O/--- | --- |
| | Horizontal | ---/--- | ---/--- | ---/--- | O/--- | O/--- | O/--- | O |
| Front Entry (manual) | Vertical | ---/--- | O/O | O/O | O/O | O/O | O/O | --- |
| | Horizontal | ---/--- | ---/--- | ---/--- | O/O | O/O | O/O | --- |
| High-Capacity CSF | Vertical | ---/--- | ---/--- | O/--- | O/--- | O/--- | O/--- | --- |
| | Horizontal | ---/--- | ---/--- | ---/--- | O/--- | O/--- | O/--- | O |
| Single-Bin CSF | Vertical | ---/--- | ---/--- | O/--- | O/--- | --- | --- | --- |
| | Horizontal | ---/--- | ---/--- | ---/--- | ---/--- | --- | --- | --- |

### Table 1-10. Handling possible cut sheets of fixed forms (single sheet/multi-part) with FX-2190

| Direction \ Size | | A3 | B4 | A4 | B5 | A5 | A6 | Envelope |
|---|---|---|---|---|---|---|---|---|
| Rear Entry (manual) | Vertical | O/--- | O/--- | O/--- | O/--- | O/--- | O/--- | --- |
| | Horizontal | O/--- | O/--- | O/--- | O/--- | O/--- | O/--- | O |
| Front Entry (manual) | Vertical | O/O | O/O | O/O | O/O | O/O | O/O | --- |
| | Horizontal | O/O | O/O | O/O | O/O | O/O | O/O | --- |
| High-Capacity CSF | Vertical | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| | Horizontal | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| Single-Bin CSF | Vertical | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| | Horizontal | TBD | TBD | TBD | TBD | TBD | TBD | TBD |

**Table 1-11. Continuous paper (Single sheet and Multi Part) FX-890**

| FX-890 | | Bottom/Front/Rear Entry | |
|---|---|---|---|
| | | Minimum | Maximum |
| Width | (inch)<br>(mm) | (4)<br>101.6 | (10)<br>254 |
| Length (one page) | (inch)<br>(mm) | (4)<br>101.6 | (22)<br>558.8 |
| Copies | | 1 original + 5 copies * | |
| Total thickness | (inch)<br>(mm) | (0.0025)<br>0.065 | (0.018)<br>0.46 |
| Weight<br>(not multi part) | ($g/m^2$)<br>(lb) | 52<br>(14) | 82<br>(22) |
| Weight<br>(one sheet of multi part) | ($g/m^2$)<br>(lb) | 40<br>(12) | 58<br>(15) |
| Quality | | Plain paper, Reclaimed paper<br>Carbonless multi part paper<br>Not break, without wrinkle, without tear, without turn over | |
| Jointing | | Point glue or paper staple(both side) | |

Note "*" : When pull tractor is used, 1 original + 6 copies are available only under normal temperature and humidity conditions.

**Table 1-12. Continuous paper (Single sheet and Multi Part) FX-1190**

| FX-2190 | | Bottom/Front/Rear Entry | |
|---|---|---|---|
| | | Minimum | Maximum |
| Width | (inch)<br>(mm) | (4)<br>101.6 | (16)<br>406.4 |
| Length (one page) | (inch)<br>(mm) | (4)<br>101.6 | (22)<br>558.8 |
| Copies | | 1 original + 5 copies * | |
| Total thickness | (inch)<br>(mm) | (0.0025)<br>0.065 | (0.018)<br>0.46 |
| Weight<br>(not multi part) | ($g/m^2$)<br>(lb) | 52<br>(14) | 82<br>(22) |
| Weight<br>(one sheet of multi part) | ($g/m^2$)<br>(lb) | 40<br>(12) | 58<br>(15) |
| Quality | | Plain paper, Reclaimed paper<br>Carbonless multi part paper<br>Not break, without wrinkle, without tear, without turn over | |
| Jointing | | Point glue or paper staple(both side) | |

Note "*" : When pull tractor is used, 1 original + 6 copies are available only under normal temperature and humidity conditions.

### Table 1-13. Labels (FX-890)

| FX-890 | | Bottom/Front Entry | | Rear Entry | |
|---|---|---|---|---|---|
| | | Minimum | Maximum | Minimum | Maximum |
| Label size | | See Figure 1-1 below. | | ----- | |
| Base sheet width | (inch)<br>(mm) | (4)<br>101.6 | (10)<br>254 | ----- | ----- |
| Base sheet length (one page) | (inch)<br>(mm) | (4)<br>101.6 | (22)<br>558.8 | ----- | ----- |
| Base sheet Thickness | (inch)<br>(mm) | (0.0028)<br>0.07 | (0.0035)<br>0.09 | ----- | ----- |
| Total thickness | (inch)<br>(mm) | (0.0063)<br>0.16 | (0.0075)<br>0.19 | ----- | ----- |
| Label weight | ($g/m^2$)<br>(lb) | 64<br>(17) | | ----- | |
| Quality | | Plain paper or the same quality labels | | ----- | |

Note 1: Printing on labels is available only under normal temperature and humidity conditions.

2: The base sheet of labels must be continuous paper.

3: Labels should be inserted from bottom or front entrance.

4: Do not pull out paper from backward.

5: No label paper should be left on the printer when the printer is not used.

6: Do not print on the base sheet of labels.

7: Do not use cut sheet labels.

### Table 1-14. Labels (FX-2190)

| FX-2190 | | Bottom/Front Entry | | Rear Entry | |
|---|---|---|---|---|---|
| | | Minimum | Maximum | Minimum | Maximum |
| Label size | | See Figure 1-1 below. | | ----- | |
| Base sheet width | (inch)<br>(mm) | (4)<br>101.6 | (16)<br>406.4 | ----- | ----- |
| Base sheet length (one page) | (inch)<br>(mm) | (4)<br>101.6 | (22)<br>558.8 | ----- | ----- |
| Base sheet Thickness | (inch)<br>(mm) | (0.0028)<br>0.07 | (0.0035)<br>0.09 | ----- | ----- |
| Total thickness | (inch)<br>(mm) | (0.0063)<br>0.16 | (0.0075)<br>0.19 | ----- | ----- |
| Label weight | ($g/m^2$)<br>(lb) | 64<br>(17) | | ----- | |
| Quality | | Plain paper or the same quality labels | | ----- | |

Note 1: Printing on labels is available only under normal temperature and humidity conditions.

2: The base sheet of labels must be continuous paper.

3: Labels should be inserted from bottom or front entrance.

4: Don’t pull out paper from backward.

5: No label paper should be left on the printer when the printer is not used.

6: Don’t print on the base sheet of labels.

7: Don't use cut sheet labels.

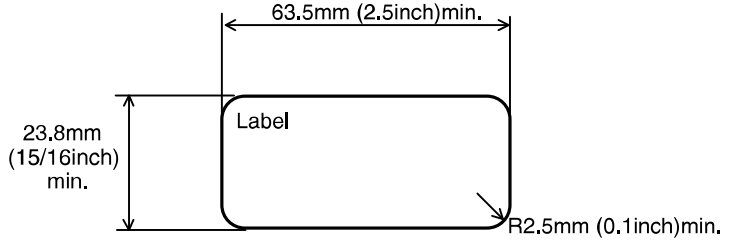


**Figure 1-1. Label Size**

**Table 1-15. Roll Paper**

| FX-890& FX-2190 | | Bottom/Front Entry | | Rear Entry | |
|---|---|---|---|---|---|
| | | Minimum | Maximum | Minimum | Maximum |
| Width | (inch)<br>(mm) | ----- | | (8.5)<br>216 | |
| Length | (inch)<br>(mm) | ----- | | ----- | |
| Diameter | (inch)<br>(mm) | ----- | | (5)<br>ϕ127 mm | |
| Thickness | (inch)<br>(mm) | ----- | | (0.0028)<br>0.07 | (0.0035)<br>0.09 |
| Weight | ($g/m^2$)<br>(lb) | ----- | | 52<br>(14) | 82<br>(22) |
| Quality | | ----- | | Plain paper, not curled, not folded, not crumpled | |

Note 1: Roll paper must be set on the roll paper holder (option).

2: Roll paper should be inserted from rear entrance only.

3: Release lever position should be friction.

## TYPEFACE

- Bit map font
  - EPSON Draft : 10 cpi, 12 cpi, 15 cpi
  - EPSON Roman : 10 cpi, 12 cpi, 15 cpi, Proportional
  - EPSON Sans Serif : 10 cpi, 12 cpi, 15 cpi, Proportional
  - EPSON OCR-B : 10 cpi *
- Bar code fonts:
  EAN-13, EAN-8, Interleaved 2 of 5, UPC-A, UPC-E, Code 39, Code 128, POSTNET, Coda bar (NW-7)*, Industrial 2 of 5*, Matrix 2 of 5*

***NOTE:*** *"*": These fonts are not described in user's manual.*

## CHARACTER TABLES

Standard version : 13 tables

NLSP version : 42 tables

International character sets : 13 countries

## INPUT BUFFER

128 Kbyte

## ELECTRICAL SPECIFICATION

### Table 1-16. 120V Version

| | |
|---|---|
| Rated voltage | AC 120 V |
| Input voltage range | AC 103.5 to 132 V |
| Rated frequency range | 50 to 60 Hz |
| Input frequency range | 49.5 to 60.5 Hz |
| Rated current | 1.1 A (Max. 2.5 A) |
| Power consumption | Approx.53 W (ISO/IEC 10561 Letter pattern)<br>Approx. 3.5 W in sleep mode *<br>0 W in power off mode<br>Energy Star compliant |
| Insulation resistance | 10 MΩ min. (between AC line and chassis, DC 500 V) |
| Dielectric strength | AC 1000 V rms. 1 min. or AC 1200 V rms. 1 sec. (between AC line and chassis) |

### Table 1-17. 230V Version

| | |
|---|---|
| Rated voltage range | AC 220 to 240 V |
| Input voltage range | AC 198 to 264 V |
| Rated frequency range | 50 to 60 Hz |
| Input frequency range | 49.5 to 60.5 Hz |
| Rated current | 0.6 A (Max. 1.3A) |
| Power consumption | Approx. 53 W (ISO/IEC 10561 Letter pattern)<br>Approx. 3.5 W in sleep mode *<br>0 W in power off mode<br>Energy Star compliant |
| Insulation resistance | 10 MΩ min. (between AC line and chassis, DC 500 V) |
| Dielectric strength | AC 1500 V rms. 1 min. (between AC line and chassis) |

### Table 1-18. UPS Version

| | |
|---|---|
| Rated voltage range | AC 100 to AC240V |
| Input voltage range | AC 90 to 264V |
| Rated frequency range | 50 to 60 Hz |
| Input frequency range | 49.5 to 60.5 Hz |
| Rated current | 1.1 A (Max. 3.0 A) |
| Power consumption | Approx.56 W (ISO/IEC 10561 Letter pattern)<br>Approx. 4.0 W in sleep mode *<br>0 W in power off mode<br>Energy Star compliant |
| Insulation resistance | 10 MΩ min. (between AC line and chassis, DC 500 V) |
| Dielectric strength | AC 1500 V rms. 1 min. ( between AC line and chassis) |

Note "*" : Upon a lapse of 5 minutes under the following conditions, the printer enters sleep mode:

- Not in Pause, not in error status
- There is no data in input buffer.

## ACOUSTIC NOISE

| | |
|---|---|
| Level: | 55 dB(A) (ISO 7779 pattern) |

## ENVIRONMENTAL CONDITIONS

| | |
|---|---|
| Temperature : | 5 to 35°C (operating, *1) |
| | 15 to 25°C (operating, *1,*2) |
| | -30 to 60°C (non-operating) |
| Humidity : | 10 to 80 % RH (operating, *1) |
| | 30 to 60 % RH (operating, *1,*2) |
| | 0 to 85 % RH (non-operating) |
| Resistance to shock : | 1 G, within 1ms (operating) |
| | 2 G, within 2ms (non-operating) |
| Resistance to vibration : | 0.25 G, 10 to 55 Hz (operating) |
| | 0.50 G, 10 to 55 Hz (non-operating) |

*1: without condensation

*2: during printing on reclaimed paper, multi part paper, envelope, label or roll paper

## RELIABILITY

| | |
|---|---|
| Total print volume (MVBF) | 52 million lines (except print head) |
| MTBF | 20000 POH (25% Duty) |
| Print head life | 400 million strokes/wire<br>(Approx. 400 million characters (Draft 10 cpi, 14 dots/ character)) |

## RIBBON CARTRIDGE

**<FX-890>**

| | |
|---|---|
| Type | Fabric |
| Color | Black |
| Ribbon dimensions | 13 mm (W) x 17 M (L) Endless |
| Ribbon life | Approximately 7.5 million characters<br>(Draft 10 cpi, 14 dots / character) |
| Cartridge dimensions | 287 mm (W) x 30 mm (H) x 77 mm (D) |

**<FX-2190>**

| | |
|---|---|
| Type | Fabric |
| Color | Black |
| Ribbon dimensions | 13 mm (W) x 19 M (L) Endless |
| Ribbon life | Approximately 12 million characters<br>(Draft 10 cpi, 14 dots / character) |
| Cartridge dimensions | 468.5 mm (W) x 34 mm (H) x 78 mm (D) |

## SAFETY APPROVALS

☐ 120 V version

- ■ Safety standards: UL 1950, CSA C22.2 No. 950
- ■ EMI: FCC part 15 subpart B class B, CSA C108.8 class B

☐ 230 V version

- ■ Safety standards: EN60950
- ■ EMI: EN55022 ( CISRP pub.22 ) class B<br>AS/NZS.3548 class B

☐ UPS Version

- ■ Safety standards: UL 1950, CSA C22.2 No. 950<br>EN60950
- ■ EMI: FCC part 15 subpart B class B, CSA C108.8 class B<br>EN55022 (CISPR pub. 22) class B<br>AS/NZS 3548 class B

## CE MARKING

☐ 230 V version & UPS version

- Low Voltage Directive 73/23/EEC: EN60950
- EMC Directive 89/336/EEC: EN55022 class B
  EN61000-3-2
  EN61000-3-3
  EN55024

## INTERFACE

- Bi-directional parallel interface (IEEE-1284 nibble mode supported)
- USB (ver1.1) I/F
- Type-B I/F level 2 (Option)

## CONTROL CODE

- ESC/P
- IBM PPDS emulation

## EXPENDABLES & OPTIONS

**Table 1-19. Expendables & Option**

| Expendables | Code No. | |
|---|---|---|
| | FX-890 | FX-2190 |
| Ribbon cartridge (Black) | S015329 | S015327 |
| **Options** | | |
| High capacity cut sheet feeder (Bin 1) | C80638* | C80640* |
| Single bin cut sheet feeder (Bin 2) | C80637* | C80639* |
| Pull tractor unit | C80020* | C80021* |
| Roll paper holder | #8310 | #8310 |
| Front sheet guide | C81400* | C81401* |
| Front paper guide | C81402* | C81403* |
| Serial Interface card | C82305* / C82306* | C82305* / C82306* |
| 32KB intelligent serial Interface card | C82307* / C82308* | C82307* / C82308* |
| Local Talk I/F card | C82312* | C82312* |
| 32KB IEEE-488 I/F card | C82313* | C82313* |
| Coax I/F card | C82314* | C82314* |
| Twinax I/F card | C82315* | C82315* |
| IEEE-1284 parallel I/F card | C82345* | C82345* |
| EpsonNet 10 Base 2/T Int. Print Server | C82362* | C82362* |
| EpsonNet 10/100 Base Tx Int. Print Server | C82363* *1/C82364* | C82363* *1/C82364* |
| EpsonNet 10/100 Base Tx Int. Print Server | C82384* | C82384* |
| EpsonNet 10/100 Base Tx Int. Print Server 2 | C82391* | C82391* |
| EpsonNet 802.11b Wireless Ext. Print Server | C12C82396* | C12C82396* |

Note "*1": When you use Ethernet interface card C82363*, you need to attach the optional interface adapter (C82525*) to the interface card.

## PRINTABLE AREA

☐ Cut sheets

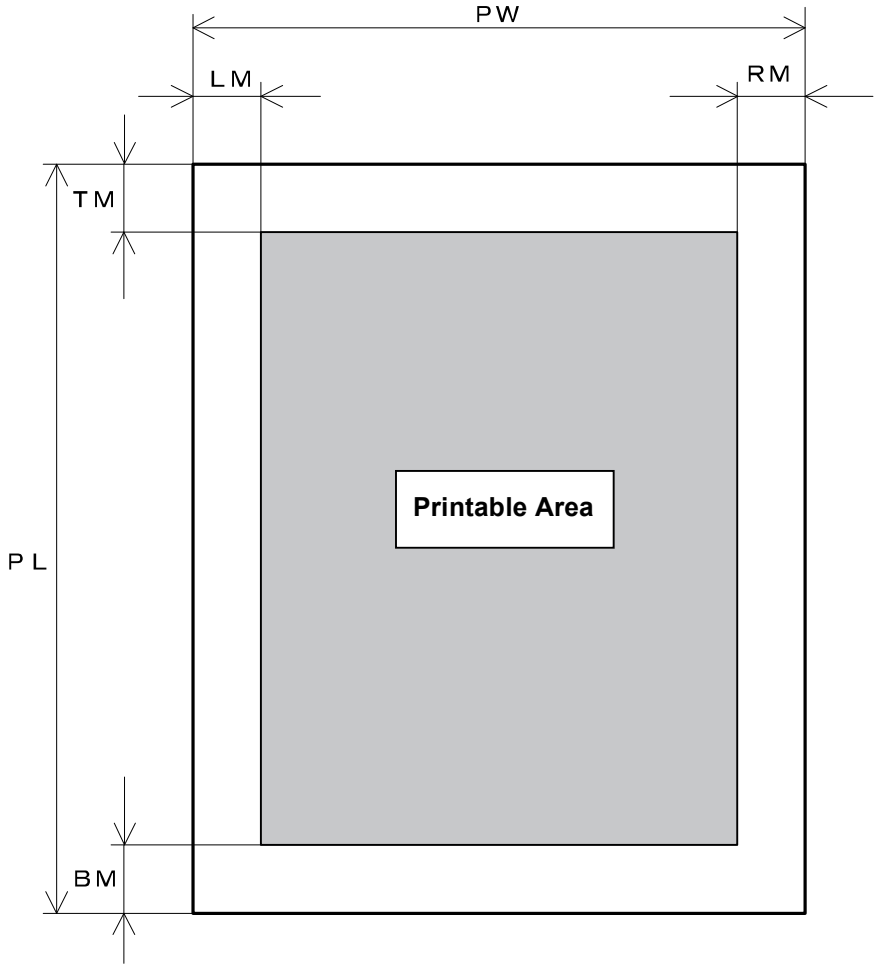


**Figure 1-2. Printable Area for Cut Sheet**

**Table 1-20. Printable Area for Cut Sheet**

| | Single Sheet / Multi Part | |
|---|---|---|
| | FX-890 | FX-2190 |
| PW (Width) | Refer to "PAPER SPECIFICATIONS" Table 1-3 on page 10 for single sheet or Table 1-5 on page 11 for multi part | Refer to "PAPER SPECIFICATIONS" Table 1-4 on page 11 for single sheet or Table 1-6 on page 12 for multi part |
| PL (Length) | | |
| LM (Left Margin) | 3 mm or more (PW<=209.2 mm)<br>26.9 mm or more (PW=257 mm) | 3 mm or more (PW<=351.4 mm)<br>37.3 mm or more (PW=420 mm) |
| RM (Right Margin) | | |
| TM (Top Margin) | 4.2 mm or more | |
| BM (Bottom Margin) | | |

Note : The maximum horizontal printable area is 203.2 mm (8 inch) for FX-890 or 345.4 mm (13.6 inch) for FX-2190.

☐ Envelope

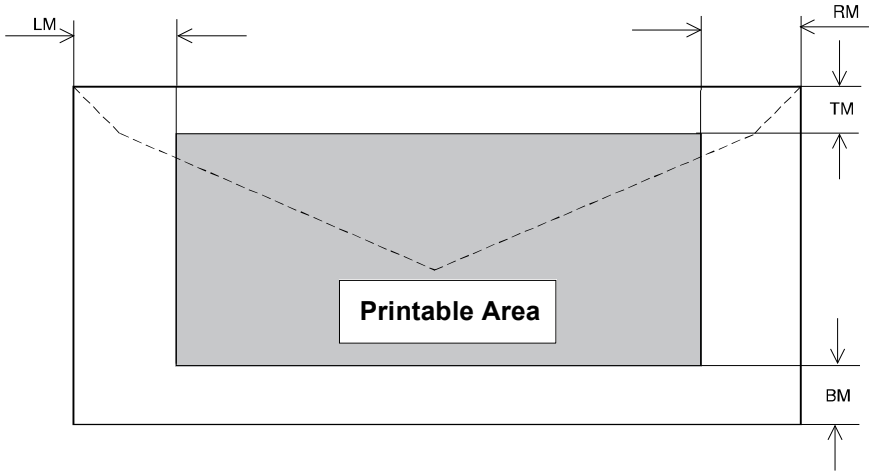


**Figure 1-3. Printable Area for Envelope**

**Table 1-21. Printable Area for Envelope**

| | Envelope Printable Area |
|---|---|
| PW (Width) | Refer to "PAPER SPECIFICATIONS" Table 1-8 on page 13 |
| PL (Length) | |
| LM (Left Margin) | 3 mm or more |
| RM (Right Margin) | |
| TM (Top Margin) | 4.2 mm or more |
| BM (Bottom Margin) | |

☐ Continuous paper

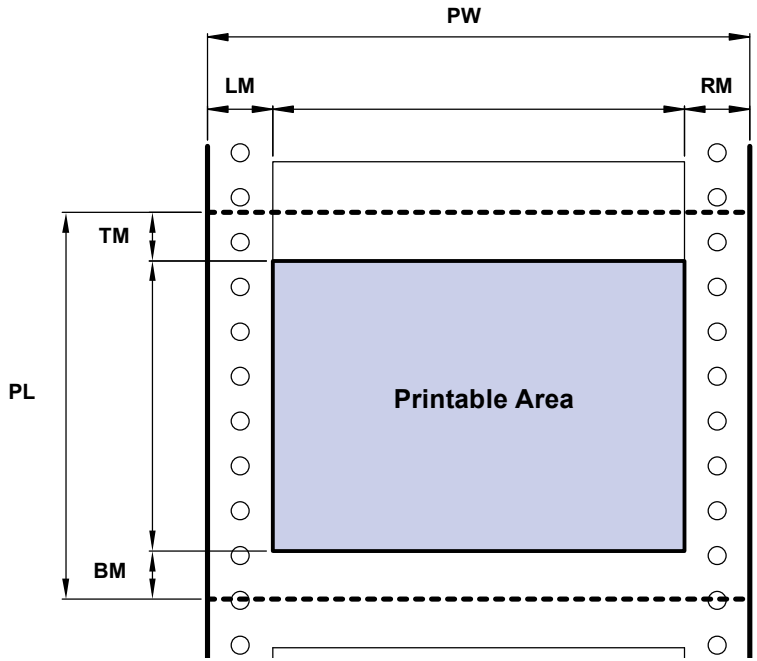


**Figure 1-4. Printable Area for Continuous Paper**

**Table 1-22. Printable Area for Continuous Paper**

| | Continuous Paper | |
|---|---|---|
| | FX-890 | FX-2190 |
| PW (Width) | Refer to "PAPER SPECIFICATIONS" Table 1-11 on page 14 | Refer to "PAPER SPECIFICATIONS" Table 1-12 on page 14 |
| PL (Length) | | |
| LM (Left Margin) | 13 mm or more (PW<=241.3mm, 9.5 inches) | 13 mm or more (PW<=377.8mm, 14.875 inches) |
| RM (Right Margin) | 26 mm or more (PW=254 mm, 10 inches) | 26 mm or more (PW=406.4 mm, 16 inches) |
| TM (Top Margin) | 4.2 mm or more | |
| BM (Bottom Margin) | | |

☐ Label

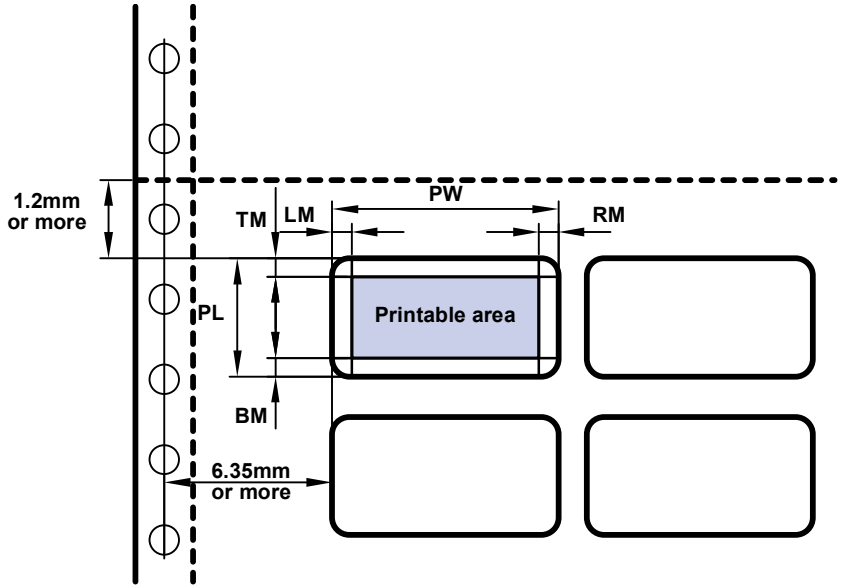


**Figure 1-5. Printable Area for Label**

**Table 1-23. Printable Area for Label**

| | Continuous Paper | |
|---|---|---|
| | FX-890 | FX-2190 |
| PW (Width) | Refer to "PAPER SPECIFICATIONS" Table 1-13 on page 15 | Refer to "PAPER SPECIFICATIONS" Table 1-14 on page 15 |
| PL (Length) | | |
| LM (Left Margin) | 3 mm or more | |
| RM (Right Margin) | | |
| TM (Top Margin) | | |
| BM (Bottom Margin) | | |

☐ Roll paper

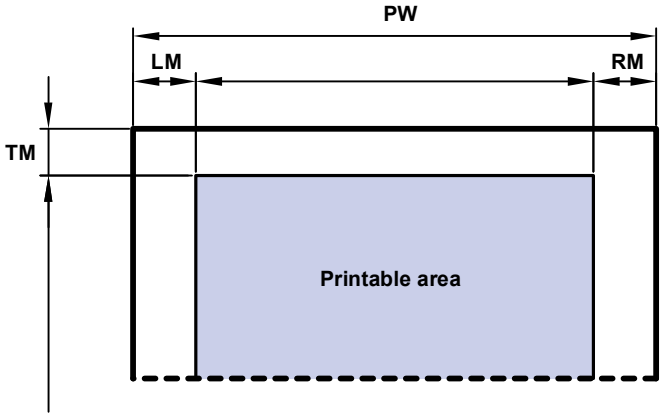


**Figure 1-6. Printable Area for Roll Paper**

**Table 1-24. Printable Area for Roll Paper**

| | Roll Paper |
|---|---|
| PW (Width) | Refer to "PAPER SPECIFICATIONS" Table 1-15 on page 16 |
| PL (Length) | ----- |
| LM (Left Margin) | 3 mm or more |
| RM (Right Margin) | 3 mm or more |
| TM (Top Margin) | 4.2 mm or more |
| BM (Bottom Margin) | ----- |

# 1.2 Interface

This printer provides bi-directional 8-bit parallel interface, USB interface and Type-B optional interface slot as standard.

## 1.2.1 Parallel interface (Forward channel)

☐ Specifications

- Transmission mode: 8 bit parallel, IEEE-1284 compatibility mode
- Adaptable connector: 57-30360 (Amphenol) or equivalent
- Synchronization: -STROBE pulse
- Handshaking : BUSY and -ACKNLG signals
- Signal level: TTL compatible (IEEE-1284 level 1 device)

**Table 1-25. Connector pin assignment (Forward channel)**

| Pin No. | Signal Name | Return GND Pin | IN/ Out* | Function description |
|---|---|---|---|---|
| 1 | -STROBE | 19 | In | Strobe pulse. Input data is latched at falling edge of the signal. |
| 2 | DATA1 | 20 | In | Parallel input data to the printer. bit 0: LSB |
| 3 | DATA2 | 21 | In | bit 1 |
| 4 | DATA3 | 22 | In | bit 2 |
| 5 | DATA4 | 23 | In | bit 3 |
| 6 | DATA5 | 24 | In | bit 4 |
| 7 | DATA6 | 25 | In | bit 5 |
| 8 | DATA7 | 26 | In | bit 6 |
| 9 | DATA8 | 27 | In | bit 7: MSB |
| 10 | -ACKNLG | 28 | Out | This signal (negative pulse) indicates that the printer has received data and is ready to accept next one. |
| 11 | BUSY | 29 | Out | This signal's high level means that the printer is not ready to accept data. |

**Table 1-25. Connector pin assignment (Forward channel) *(continued)***

| Pin No. | Signal Name | Return GND Pin | IN/ Out* | Function description |
|---|---|---|---|---|
| 12 | PE | 28 | Out | This signal's high level means that the printer is in a state of paper-out error. |
| 13 | SLCT | 28 | Out | Always at high level when the power to the printer is on. |
| 14 | -AFXT | 30 | In | Not used. |
| 31 | -INIT | 30 | In | This signal's negative pulse initializes printer. |
| 32 | -ERROR | 29 | Out | This signal's low level means the printer is in a state of error. |
| 36 | -SLIN | 30 | In | Not used. |
| 18 | Logic H | - | Out | This line is pulled up to +5 V through 3.9 kΩ resistor. |
| 35 | +5 V | - | Out | This line is pulled up to +5 V through 1.0 kΩ resistor. |
| 17 | Chassis | - | - | Chassis GND. |
| 16, 33 19-30 | GND | - | - | Signal GND. |
| 15, 34 | NC | - | - | Not connected. |

Note : In/Out shows the direction of signal flow from the printer's point of view.

☐ Data transmission timing

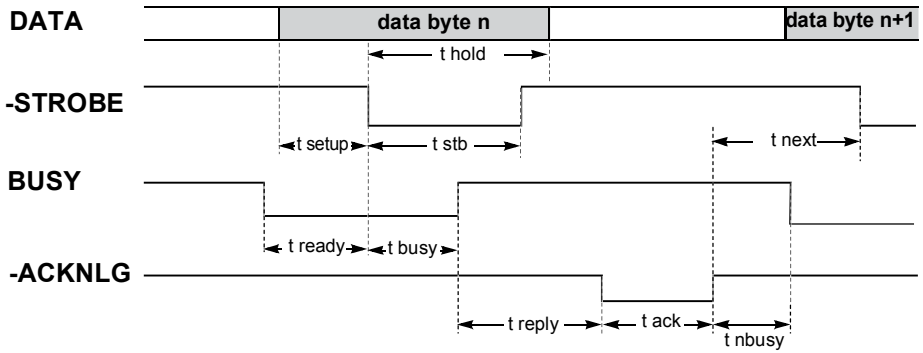


**Figure 1-7. Data transmission timing**

**Table 1-26. Parameters**

| Parameter | Minimum | Maximum |
|---|---|---|
| t setup | 500 nsec | _ |
| t hold | 500 nsec | _ |
| t stb | 500 nsec | _ |
| t ready | 0 | _ |
| t busy | _ | 500 nsec |
| t reply | _ | _ |
| t ack | 500 nsec | 10 us |
| t nbusy | 0 | _ |
| t next | 0 | _ |
| t tout*1 | _ | 120 nsec |
| t tin*2 | _ | 200 nsec |

Note "*1": Rise and fall time of output signals

"*2" : Rise and fall time of input signals

☐ BUSY signal is active (high level) under any of the following conditions:

- ■ In the process of receiving data
- ■ Input buffer full
- ■ -INT signal active (low level)
- ■ During hardware initialization
- ■ -ERROR or PE signal active (low level or high level, respectively)
- ■ In the self test mode
- ■ In the adjustment mode
- ■ In the default-setting mode

☐ -ERROR signal is active (low level) under any of the following conditions:

- ■ In the condition of the printer hardware error (fatal error)
- ■ In the condition of the paper-out error
- ■ In the condition of the release lever error
- ■ In the condition of the cover open error
- ■ In the condition of the paper eject error

☐ PE signal is active (high level) under the following condition:

- ■ In the condition of paper-out error

## 1.2.2 Parallel interface (Reverse channel)

☐ Specifications

- Transmission mode : IEEE-1284 nibble mode
- Adaptable connector: 57-30360 (Amphenol) or equivalent
- Synchronization : Refer to the IEEE-1284 specification
- Handshaking : Refer to the IEEE-1284 specification
- Signal level: TTL compatible (IEEE-1284 level 1 device)
- Data transmission timing : Refer to the IEEE-1284 specification
- Extensibility request : The printer responds to the extensibility request in the affirmative, when the request is 00H or 04H, which mean;

  00H : Request nibble mode of reverse channel transfer
  04H : Request device ID in nibble mode of reverse channel transfer

☐ Device ID: The printer sends the following device ID string when it is requested

- FX-890

When IEEE1284.4 is enabled,

```
[00H][4CH]
MFG:EPSON;
CMD:ESCP9,PRPII9,BDC,D4;
MDL:FX-890;
CLS:PRINTER;
DES:EPSON[SP]FX-890;
```

When IEEE1284.4 is disabled,

```
[00H][49H]
MFG:EPSON;
CMD:ESCP9,PRPII9,BDC;
MDL:FX-890;
CLS:PRINTER;
DES:EPSON[SP]FX-890;
```

- FX-2190

When IEEE1284.4 is enabled,

```
[00H][4EH]
MFG:EPSON;
CMD:ESCP9,PRPII9,BDC,D4;
MDL:FX-2190;
CLS:PRINTER;
DES:EPSON[SP]FX-2190;
```

When IEEE1284.4 is disabled,

```
[00H][4BH]
MFG:EPSON;
CMD:ESCP9,PRPII9,BDC;
MDL:FX-2190;
CLS:PRINTER;
DES:EPSON[SP]FX-2190;
```

**Table 1-27. Connector pin assignment (Reverse channel)**

| Pin No. | Signal Name | Return GND Pin | IN/ Out* | Function description |
|---|---|---|---|---|
| 1 | HostClk | 19 | In | Host clock signal. |
| 2 | DATA1 | 20 | In | Parallel input data to the printer. bit 0: LSB |
| 3 | DATA2 | 21 | In | bit 1 |
| 4 | DATA3 | 22 | In | bit 2 |
| 5 | DATA4 | 23 | In | bit 3 |
| 6 | DATA5 | 24 | In | bit 4 |
| 7 | DATA6 | 25 | In | bit 5 |
| 8 | DATA7 | 26 | In | bit 6 |
| 9 | DATA8 | 27 | In | bit 7: MSB |
| 10 | PtrClk | 28 | Out | Printer clock signal. |
| 11 | PtrBusy / DataBit-3,7 | 29 | Out | Printer busy signal and reverse channel transfer data bit 3 or 7. |
| 12 | AckDataReq / DataBit-2,6 | 28 | Out | Acknowledge data request signal and reverse channel transfer data bit 2 or 6. |
| 13 | Xflag / DataBit-1,5 | 28 | Out | X-flag signal and reverse channel transfer data bit 1 or 5. |
| 14 | HostBusy | 30 | In | Host Busy signal. |
| 31 | -INIT | 30 | In | Not used. |
| 32 | -DataAvail / DataBit-0,4 | 29 | Out | Data Available signal and reverse channel transfer data bit 0 or 4. |
| 36 | 1284-Active | 30 | In | 1284 active signal. |
| 18 | Logic-H | - | Out | This line is pulled up to +5 V through 3.9 kΩ resistor. |
| 35 | +5 V | - | Out | This line is pulled up to +5 V through 1.0 kΩ resistor. |
| 17 | Chassis | - | - | Chassis GND. |
| 16, 33 19-30 | GND | - | - | Signal GND. |
| 15, 34 | NC | - | - | Not connected. |

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

## 1.2.3 USB Interface

☐ Specifications

- ■ Standard: Based on "Universal Serial Bus Specifications Revision 1.1" "Universal Serial Bus Device Class Definition for Printing Devices Version 1.1"
- ■ Bit rate : 12 Mbps (Full Speed Device)
- ■ Data encording : NRZI
- ■ Adaptable connector : USB Series B
- ■ Recommended cable length : 2 meters

☐ Connector pin assignment and signals :

**Table 1-28. Connector pin assignment**

| Pin No. | Signal name | In/Out | Function description |
|---|---|---|---|
| 1 | VCC | - | Cable power. Maximum power consumption is 100mA |
| 2 | -Data | Bi-directional | Data |
| 3 | +Data | Bi-directional | Data, pull up to +3.3V via 1.5K Ω resistor |
| 4 | Ground | - | Cable ground |

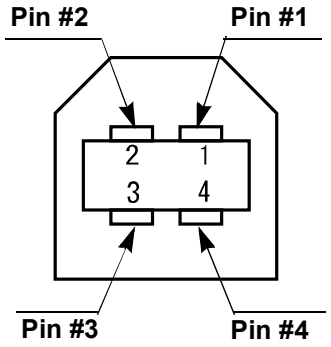


**Figure 1-8. USB Interface connector pin assignment**

## 1.2.4 Optional Interface

Type-B optional interface cards are available.

**Table 1-29. FX-890**

| Reply message | ESC/P | IBM PPDS |
|---|---|---|
| Main-Type | MT9p, PW80c110cpi, PRG(Wxxxxx)rev, AP500ma | MT9p, PW80c110cpi, PRG(Wxxxxx)rev, AP500ma |
| Product-Name | FX-890 | FX-890 |
| Emulation-Type | ESCP9, PRPII9, BDC | ESCP9, PRPII9, BDC |
| Entity-Type | EPSONFX | EPSONPRPII9 |

**Table 1-30. FX-2190**

| Reply message | ESC/P | IBM PPDS |
|---|---|---|
| Main-Type | MT9p, PW136c110cpi, PRG(Wxxxxx)rev, AP500ma | MT9p, PW136c110cpi, PRG(Wxxxxx)rev, AP500ma |
| Product-Name | FX-2190 | FX-2190 |
| Emulation-Type | ESCP9, PRPII9, BDC | ESCP9, PRPII9, BDC |
| Entity-Type | EPSONFX | EPSONPRPII9 |

## 1.2.5 Type-B Interface communication specification

☐ Reply for Optional command
(*: Reply for Type-B I/F Level 2 device: *not described in user's manual*)

**Table 1-31. Reply for Optional command**

| Option command number | Command name | Reply-A | Reply-B |
|---|---|---|---|
| 00h | No-operation | ----- | ----- |
| 01h | Start Hardware Reset | Accept* | Execute OK* |
| 02h | Start Software Reset | Reject | ----- |
| 03h | Send Main System Type | Accept | Execute OK |
| 04h | Send Name Data | Reject | ----- |
| 05h | Inquire Name Data | Accept | Execute OK |
| 06h | Send Product Name | Accept | Execute OK |
| 07h | Send Software Emulation Type | Accept | Execute OK |
| 08h | Complete Buffered Data | Accept | Execute OK |
| 09h | Stop Procedure | Reject | ----- |
| 0Ah | Return Buffered Data | Reject | ----- |
| 0Bh | Send Entity Type | Accept | Execute OK |
| 0Ch | Send Status | Accept | Execute OK |
| 0Dh | Quit Procedure | Reject | ----- |
| 0Eh | Inquire ASCII Message | Reject | ----- |
| 0Fh | Send ASCII Message | Accept | Execute OK |
| 10h | (Reserved) | Unknown | ----- |
| 11h | Send All Entity Type | Reject | ----- |
| 12h | Inquire Protocol | Reject | ----- |
| 13h | (Reserved) | Unknown | ----- |
| 14h | Inquire Emergency Message | Accept | Execute OK |
| 15h | Send Emergency Reply | Accept | Execute OK |
| 16h-17h | (Reserved) | Unknown | ----- |

☐ Main command

**Table 1-32. Main command**

| Option command number | Command name | Sending Timing |
|---|---|---|
| 01h | Start Software Reset | • Init signal on the std. parallel<br>• Type-B I/F Option command : 01h<br>• Panel Reset<br>• Cold start |
| 02h | Send Option Type | • Deciding the level of Type-B I/F after power on |
| 04h | Send Name Data | • Type-B I/F Option command: 05h |
| 07h | Inquire Software Emulation Type | • Changing control language |
| 0Eh | Inquire ASCII Message | • Writing to DBIN-register |
| 14h | Inquire Emergency Reply | • Reply for Back Ground Job command response |
| 15h | Send Emergency Message | • Receive back Ground Job command |

☐ Back Ground Job command: Response

"0x00": get device ID Normal response
"0x01": get all status Normal response
"0x02"~"0x3F" Processing impossible response

☐ A bit rate available by Serial I/F card :

19200bps, 9600bps, 4800bps, 2400bps, 1200bps, 600bps, 300bps

## 1.2.6 Interface selection

The printer has 3 interfaces; the parallel interface, USB interface and Type-B optional interface. These interfaces are selected manually by Default Setting or selected automatically.

☐ Manual selection

One of the three interfaces can be selected by Default Setting.

☐ Automatic selection

The automatic interface selection is enabled by Default Setting. In this automatic interface selection mode, the printer is initialized to the idle state scanning which interface receives data at power-on. Then the interface that receives data first is selected. When the host stops data transfer and the printer is in the stand-by state for the period of seconds specified by Default Setting, the printer is returned to the idle state. As long as the host sends data or the printer interface is the busy state, the selected interface is let as it is.

☐ Interface state and interface selection

When the parallel interface is not selected, the interface gets info a busy state. When the Type-B serial interface card is installed and it is not selected, the interface sends XOFF and sets the DTR signal MARK. When the optional interface is not selected, the printer sets "OFFLINE" bit of MNSTS register to the optional interface. When the printer is initialized or returned to the idle state, the parallel interface got into a ready state, the serial interface sends XON and sets the DTR SPACE and the printer resets "OFFLINE" bit of MNSTS register to the optional interface. Note that the interrupt signal such as a -INIT signal on the parallel interface is not effective while that interface is not selected.

☐ Preventing Hosts from Data Transfer Timeout

Generally, hosts abandons data transfer to peripherals when a peripheral is in the busy state for dozens of seconds continuously. To prevent hosts from this kind of timeout, the printer receives data very slowly, several bytes per minute, even if the printer is in the busy state. This slowdown is started when the rest of the input buffer becomes several thousands of bytes. At last, when the input buffer is full, the printer is in the busy state continuously.
IEEE1284.4 on the parallel interface and on the USB interface do not require this function.

## 1.2.7 IEEE1284.4 protocol

The packet protocol described by IEEE1284.4 is supported on the parallel I/F. Two function modes of IEEE1284.4 protocol, “Off” and “Auto”, are available and one of them is selected according to the value of Default setting. (See Section 1.3.5. Default Setting).

***NOTE:*** *Packet protocol option “Off” &“Auto” in Default setting mode are effective in not only parallel I/F but also USB I/F.*

Auto: Communication is carried out in the convetional mode until a magic string (1284.4 synchronous commands) is received. By receiving a magic string, communication in IEEE1284.4 packet mode is started.

Off: Communication is carried out in the convetional mode.

***NOTE:*** *The packet protocol of IEEE1284.4 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.*

# 1.3 Operation

This section describes the operations on this printer.

## 1.3.1 Control panel

The control panel of this printer is equipped with 6 switches and 10 LEDs, which are located as shown below.

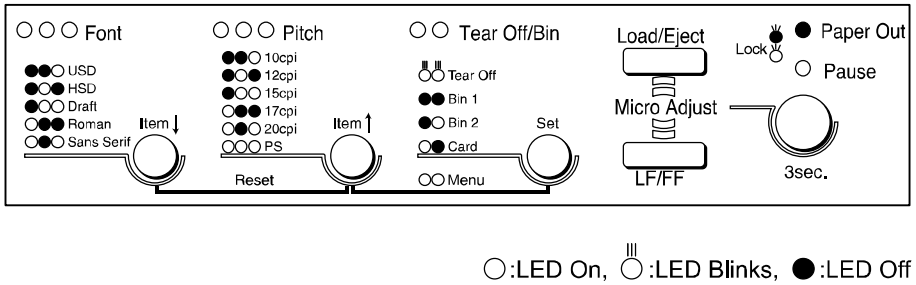


**Figure 1-9. Control Panel**

## 1.3.2 Switches

### 1.3.2.1 Operation in Normal Mode

In the normal mode, pressing panel switches executes the following functions.

**Table 1-33. Normal Mode**

| Switch | Function |
|---|---|
| Pause | • Alternates printing and no-printing status.<br>• Enables Micro Adjust function, holding it down for 3 seconds. |
| Load/Eject | • Loads or ejects the paper.<br>• Executes micro feed forward, when this function is enabled. |
| LF/FF | • Executes line feed, pressing it shortly.<br>• Executes form feed, holding it down for a few seconds.<br>• Executes micro feed backward, when this function is enabled. |
| Tear Off/Bin | • Advances continuous paper to the Tear-Off position.<br>• Selects CSF bin 1/2 or Card mode in friction mode. |
| Font | • Selects font and draft quality. |
| Pitch | • Selects pitch. |
| Reset (Font & Pitch) | • Resets the printer. |
| Menu (Pitch & Tear Off/Bin) | • Enter or exit the default setting mode. |