Zebra Technologies International, LLC
333 Corporate Woods Parkway
Vernon Hills, Illinois 60061.3109 U.S.A.
Telephone +1.847.793.2600
Facsimile +1.847.913.8766
www.zebra.com

ZEBRA *S*4M™ PRINTER SPECIFICATIONS

Specifications are provided for reference and are based on printer tests using Zebra brand ribbons and labels. Results may vary in actual application settings or when using other than recommended Zebra supplies. Zebra recommends always qualifying any application with thorough testing.

Standard Features

- 203 dpi print resolution (8 dots/mm)
- Thin film print head with E$^{3®}$ Element Energy Control
- Direct thermal printing of bar codes, text, and graphics
- ZPL® or ZPL II® programming language, selectable through software or front panel
- 32 bit high speed processor
- 8MB DRAM memory
- 4MB Flash memory (2 MB User Available)
- Parallel, USB 1.1 and RS-232 Serial Ports
- Transmissive and reflective sensing technology
- Sleek personality / durable metal design:
  - ⇒ Metal media cover with enlarged clear window: easy to view supplies
  - ⇒ Die-cast print mechanism with head open lock withstands general wear & tear and facilitates media loading.
- Standard LCD control panel: Back-lit, 2 line, 14 characters w/ full menu to change set-up options

Optional Features

- Thermal Transfer Ribbon Handling System
- Print head 300 dpi (12 dots/mm) (ZPL Only)
- A front mount, passive peel option, w/ no take-up spindle
- Factory Installed 64 MB (61MB user available) Flash Memory option
- Additional scalable and smooth bitmapped fonts available
- ZebraNet Wireless Print Server—provides an internally integrated 802.11b wireless option and supports Symbol and Cisco radio cards. (ZPL only)
- Internal and External ZebraNet 10/100 Print Server option — supports 10Base-T, 100Base-TX, and fast Ethernet 10/100 auto-switching networks and enables the use of ZebraLink Webview and Alert features.
- External ZebraNet PrintServer II option – provides cost effective Ethernet connectivity to 10Base-T networks and enables the use of ZebraLink Webview and alert features.
- Keyboard Display Unit (KDU) option – Enter variable data and retrieve stored forms for standalone applications (requires null modem adapter with DB9 serial cable. EPL only).
- Real Time Clock (RTC) –date/time for standalone applications
- APL-I firmware – allows a 203 dpi (8 dots /mm) Zebra printer to parse and print IPL code intended for an Intermec 3400D, or 88XX printer. (With APL-I firmware installed, ZPL programming language is not recognized, and ZPL specific features are not available.)
- APL-D firmware – allows 203 dpi (8 dots /mm) Zebra printer to parse and print DPL code intended for a Datamax Prodigy Plus, Prodigy, or Allegro printers. (With APL-D firmware installed, ZPL programming language is not recognized, and ZPL specific features are not available.)

ZebraLink Solutions

Software

ZebraDesigner Pro – An intuitive, easy-to-use software program for creating complex label designs (option).
ZebraDesigner – Offers basic features for simple label design
ZebraNet Bridge Enterprise – Centrally manage Zebra printers from a single PC screen anywhere on your global network.
ZebraNet Utilities v 7.0 – Provides enhanced printing, conversion, and administration capabilities; message management; and more.
Zebra Universal Driver – The most powerful driver available from Zebra

Networking Options

ZebraNet Wireless PrintServer (internal) (ZPL Only)
ZebraNet 10/100 PrintServer (internal or external)
ZebraNet PrintServer II (external)

Firmware

ZPL II – Universal language for Zebra printers. Simplifies label formatting and enables format compatibility with existing systems that run Zebra printers.

- **Global Printing** - Unicode™ compliant for fast multi-language, on-demand thermal printing right out of the box.
- **Web View** – Connect and control Zebra bar code printers via the printer's Web interface using a common Web browser.
- **Alert** – Printers equipped with ZebraNet print servers provide alerts via any email-enabled, wired, or wireless device to minimize downtime.

EPL II – Eltron Programming Language is an optional firmware version that provides backwards compatibility with many desktop printers as well as the Zebra 2746e Thermal Transfer Printer.
APL – Zebra's Alternative Programming Language allows integration into mixed printer environments without re-programming formats.

Printing Specifications

- 203 dpi resolution (8 dots/mm)
  - Dot size (W x L):
  0.0049" x 0.0049" (0.125mm x 0.125mm)
- 300 dpi resolution (12 dots/mm)
  - Dot size (W x L):
  0.0033" x 0.0039" (0.084mm x 0.099mm)
- First dot location measured from inside media backing edge: 0.10" ±.04" (2.5mm, not to exceed -.5mm +1.0mm)
- Maximum print width: 4.09" (104mm)
- Maximum continuous media print length:

203 dpi	300 dpi
157" 3988mm	73" 1854mm

- Media registration tolerance:
- Vertical = ≤ ±0.039" (±1.0mm) on non-continuous media
  Horizontal = ≤ ±0.039" (±1.0mm) within a roll of media

- Programmable print speeds:
  - 203 dpi models = 2.0" (51mm) through 6" (152 mm) per second in 1" increments
  - 300 dpi model = 2.0" (51mm) through 6" (152mm) per second in 1" increments

Media Specifications

- Maximum non-continuous label length: 39" (991mm)
- Media type: continuous, die-cut, tags, black-mark
- Media web width (label and liner):
  0.75" (19.4mm) to 4.50" (114mm)
- Minimum label length:
  - Tear-off mode: 0.7" (17.8mm)
  - Peel mode: 0.5" (12.7mm)
- Media thickness (label and liner):
  0.003" (0.076mm) to 0.010" (0.25mm)
- Maximum media roll size:
  8.0" (203mm) O.D. on a 3" (76mm) I.D. core
  6.0" (152mm) O.D. on a 1" (25mm) I.D. core
- Maximum fan-fold pack size:
  8.0"L (203mm) x 4.5"W (114mm) x 6.2"H (157mm)
- Gap and notch sensing standards:
  - Inter-label gap: 2 - 4mm, preferably 3mm
  - Sensing notch: 0.25"W (6mm) x 0.12"L (3mm)
  - Sensing hole: 0.125" (3mm) diameter
  * Note: Notch & Hole Position centered from 0.15" to 2.25" from media inner edge
- Fixed transmissive sensor location: 7/16" from media inner edge
- Black mark sensing standards:
  - Black mark length (parallel to inside media edge):
  0.098" - 0.453" (2.5mm - 11.5mm)
  - Black mark width (perpendicular to inside media edge):
  ≥ 0.37" (≥ 9.5mm)
  - Black mark location: within 0.040" (1mm) of inside media edge
  - Black mark density: > 1.0 Optical Density Units (ODU)
  - Maximum media density: 0.5 ODU

Ribbon Specifications (Thermal Transfer Option Only)

- Ribbon width: 1.57" (40mm) to 4.33" (110mm)
- Standard Lengths: 984' (300m) or 1476' (450m)
- Maximum ribbon roll size:
  3.2" (81.3mm) O.D. on a 1.0" (25.4mm) I.D. core
- Ribbon wound ink-side out

Standard Printer Fonts (ZPL firmware Only)

Fonts A, B, C, D, E, F, G, H, and GS are expandable up to 10 times, height and width independently. However, fonts E and H (OCR-A and OCR-B) are not considered "in-spec" when expanded. The scalable smooth font 0 (CG Triumvirate™ Bold Condensed) is expandable on a dot-by-dot basis, height and width independent, while maintaining smooth edges. Maximum character size depends on available memory.
IBM Code Page 850 international character sets are available in the fonts A, B, C, D, E, F, G, and 0 through software control.

Font	Matrix			Type*	Character Size					
					Inches			Millimeters		
	Height	Width	Inter-character Gap		Height	Width	Char/inch	Height	Width	Char/inch
A	9	5	1	U-L-D	0.044	0.029	33.90	1.13	0.75	1.33
B	11	7	2	U	0.054	0.044	22.60	1.38	1.13	0.89
C,D	18	10	2	U-L-D	0.088	0.059	16.95	2.25	1.50	0.67
E	28	15	5	OCR-B	0.138	0.098	10.17	3.50	2.50	0.40
F	26	13	3	U-L-D	0.128	0.079	12.71	3.25	2.00	0.50
G	60	40	8	U-L-D	0.295	0.236	4.24	7.50	6.00	0.17
H	21	13	6	OCR-A	0.103	0.093	10.71	2.63	2.38	0.42
GS	24	24	0	SYMBOL	0.118	0.118	8.48	3.00	3.00	0.33
P	20	18	N/A	U-L-D	.098	.089	N/A	2.49	2.26	N/A
Q	28	24	N/A	U-L-D	.138	.118	N/A	3.51	2.99	N/A
R	35	31	N/A	U-L-D	.172	.153	N/A	4.37	3.89	N/A
S	40	35	N/A	U-L-D	.197	.172	N/A	5.00	4.37	N/A
T	48	42	N/A	U-L-D	.236	.207	N/A	5.99	5.26	N/A
U	59	53	N/A	U-L-D	.290	.261	N/A	7.37	6.63	N/A
V	80	71	N/A	U-L-D	.394	.349	N/A	10.0	8.86	N/A
0	Default: 15 x 12			U-L-D	Scalable					
*U = Uppercase, L = Lowercase, D = Descenders										

Font Matrices for 8 dot/mm (203 DPI) Print heads

Font	Matrix			Type*	Character Size					
					Inches			Millimeters		
	Height	Width	Inter-character Gap		Height	Width	Char/inch	Height	Width	Char/inch
A	9	5	1	U-L-D	.030	0.020	50.00	0.76	0.51	1.97
B	11	7	2	U	.037	0.030	33.33	0.93	0.76	1.31
C,D	18	10	2	U-L-D	.060	0.040	25.00	1.53	1.02	0.98
E	41	20	6	OCR-B	.137	0.087	11.54	3.47	2.20	0.45
F	26	13	3	U-L-D	.087	0.053	18.75	2.20	1.36	0.74
G	60	40	8	U-L-D	.200	0.160	6.25	5.08	4.07	0.25
H	30	19	9	OCR-A	.100	0.093	10.71	2.54	2.37	0.42
GS	24	24	0	SYMBOL	.080	0.080	12.50	2.03	2.03	0.49
P	20	18	N/A	U-L-D	.098	.089	N/A	2.49	2.26	N/A
Q	28	24	N/A	U-L-D	.138	.118	N/A	3.51	2.99	N/A
R	35	31	N/A	U-L-D	.172	.153	N/A	4.37	3.89	N/A
S	40	35	N/A	U-L-D	.197	.172	N/A	5.00	4.37	N/A
T	48	42	N/A	U-L-D	.236	.207	N/A	5.99	5.26	N/A
U	59	53	N/A	U-L-D	.290	.261	N/A	7.37	6.63	N/A
V	80	71	N/A	U-L-D	.394	.349	N/A	10.0	8.86	N/A
0	Default: 15 x 12			U-L-D	Scalable					
*U = Uppercase, L = Lowercase, D = Descenders										

Font Matrices for 12 dot/mm (300 DPI) Print heads

Bar Code Symbologies & Specifications

(ZPL Only, Other Firmware Languages may vary)

- Bar code modulus "X" dimension:
  - Picket fence (non-rotated) orientation:
    203 dpi = 4.9 mil to 49 mil
    300 dpi = 3.3 mil to 33 mil
  - Ladder (rotated) orientation:
    203 dpi = 4.9 mil to 49 mil
    300 dpi = 3.9 mil to 39 mil
- Bar code ratios – 2:1, 7:3, 5:2, & 3:1
- Aztec
- Codabar (supports ratios of 2:1 to 3:1)
- CODABLOCK
- Code 11
- Code 39 (supports ratios of 2:1 to 3:1)
- Code 49 (2-D)
- Code 93
- Code 128 (subsets A, B, C, and UCC case C codes)
- Data Matrix
- EAN-8, EAN-13, EAN extensions
- Interleaved 2 of 5 (supports ratios 2:1 to 3:1, modulous10 check digit)
- Planet Code
- ISBT-128
- Logmars
- MaxiCode (2-D)
- PDF417 (2-D)
- Micro PDF (2-D)
- Plessy
- Postnet
- QR-Code
- MSI
- Standard 2 of 5
- Industrial 2 of 5
- UPC-A, UPC-E, UPC extensions
- RSS

Zebra Programming Language (ZPL/ZPL II)®

- Compatible with mainframe, mini, and PC hosts
- Downloadable objects include graphics, scalable and bitmap fonts, label templates and formats
- Adjustable print cache
- Data compression
- Automatic memory allocation for format while printing
- Automatic serialization of fields
- Format inversion (white on black)
- Mirror-image printing
- Four position field rotation (0º, 90º, 180º, 270º)
- Slew command
- Programmable label quantities with print, pause, cut control
- Status messages to host upon request

Eltron Programming Language® (EPL II®)

- Compatible with mainframe, mini, and PC hosts
- Four position field rotation (0º, 90º, 180º, 270º)
- Variable field support (00 to 99)
- Counter support (up to 10)
- Variable field addition and subtraction
- Status reporting
- Form storage
- Metered print odometer

Communications Specifications

- USB 1.1
- High-speed serial interfaces
  - RS-232C, with DB9F connector
  - Configurable baud rate (600 – 115,200kB), parity, and data bits. Stop bits at 1 or 2.
  - Software (XON/XOFF), hardware (DTR/DSR, or RTS/CTS) communication handshake protocols
- Bi-directional parallel interface
- ZebraNet® Wireless Print Server – 802.11b-compliant wireless print server (ZPL Only)
- ZebraNet® 10/100 Print Server - Ethernet network print server (10BASE-T, 100BASE-TX)
- ZebraNet® Print Server II - Ethernet network print server (10BASE-T)

Electrical Specifications

- Auto-detectable 90-265VAC, 48-62 Hz, 5A fused power supply
- Agency approvals: IEC 60950, EN 55022 Class B, EN55024, EN 61000-3-2, EN 61000-3-3.
- Product Markings: cULus, CE Marking, FCC-B, ICES-003, VCCI, C-Tick, NOM, IRAM, CCC, GOST-R, BSMI

Physical Specifications

- **Height:** 11.7" (295 mm)
- **Width:** 10.7" (272mm)
- **Depth:** 18.8" (477mm)
- **Weight:** 27.2 lbs (12.4 kg)
- **Shipping Weight:** 33.5 lbs (15.2 kg)

Environmental Specifications

- Operating environment:
  Thermal transfer = 40º to 104ºF (5º to 40ºC)
  Thermal direct = 32º to 104ºF (0º to 40ºC)
  20% to 85% non-condensing R.H.
- Storage/Transportation environment:
  -40º to 140ºF (-40º to 60ºC)
  5% to 85% non-condensing R.H.

Preventative Maintenance

Zebra recommends cleaning the printer on a regular basis using standard Zebra printer parts and cleaning supplies. Consult your *User's Guide* for further details.

- **Cleaning:**
  The exterior is cleaned with a lint-free cloth, and if necessary, a mild detergent solution or desktop cleaner. Interior components (print head, platen roller, media sensor, peel bar, ribbon and media paths) are cleaned with alcohol or blown air to remove any particles.

- **Lubrication:**
  All mechanical parts are self-lubricating and do not require additional lubrication.

- **Print Registration:**

Media registration and minimum label length are affected by media type and width, ribbon type and print speed. Performance improves as these factors are optimized. Zebra recommends always qualifying any application with thorough testing.