



## ZE500 Print Engine

Specifications are provided for reference and are based on testing the ZE500™ print engine using genuine 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

- Available in right and left hand configurations  
Available in 203 dpi (8 dots / mm) or 300 dpi (12 dots / mm)
- ZebraNet™ 10/100 Print Server (Internal)
- Rotatable front panel display (0, 180)
- Embedded ZebraLink™ Web View and Alert features
- Real Time Clock
- Applicator interface — provides status and control signals for applicators
- Communications via serial RS-232, IEEE 1284 bidirectional parallel interface with auto detect, and USB 2.0 port
- Full function graphic front panel and large multilingual back-lit LCD display with user programmable password protection
- Thin film printhead with E3™ Element Energy™ Equalizer
- Dual media sensors, transmissive and reflective, selectable through software or front panel
- ZPL® or ZPL II® programming language, selectable through software or front panel
- XML-Enabled Printing — allows XML communications from today's enterprise systems for barcode label printing
- 32 bit 133 MHz RISC processor
- 16MB SDRAM memory, 64MB Flash Memory
- Zebra printer driver for Windows® 7, XP, Vista®, 2008, and 2003 operating systems
- Advanced media counters



### OPTIONAL FEATURES

- ZebraNet 10/100 External Print Server — Class B digital device, approved for residential, commercial, or light industrial environment use only. Degradation in performance could occur if used in a heavy industrial environment.
- ZebraNet b/g PrintServer — Supports advanced wireless securities through an internal integrated radio card.
- Additional fonts available
- Detachable display
- UNICODE
- WGL4 through Swiss 721
- Firmware Support for Downloadable TrueType Fonts



## OPTIONAL RFID FOR ZE500-4

- Factory installed or field installed kit
- Fully integrated ThingMagic® UHF EPC Gen 2 V2.0/ISO 18000-63 RFID Reader / Encoder
- Prints and encodes short pitch item level tags
- Variable RFID power settings to support the widest range of tags
- RFID job monitoring tools track RFID performance
- RFID ZPL commands provide compatibility with existing Zebra RFID printers
- Support for industry multi-vendor chip-based serialization (MCS)
- Supports block permalocking of user memory compatible with ATA Spec 2000

## 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

**ZebraDesigner for XML** — Easy-to-use label design software that enables printing on XML enabled printers

**ZebraNet Bridge Enterprise** — Centrally manage Zebra printers from a single PC screen anywhere on your global network.

**ZebraDesigner Driver** — A powerful printer driver compatible with Windows: XP, Vista, 2003, 2008, 7

**Zebra Setup Utility** — An easy to use, Wizard driven printer configuration tool.

**ZBI 2.0™** — An optional, powerful programming language that lets printers run stand-alone applications, connect to peripherals, and much more.

**ZBI-Developer™** — Programming utility makes it dramatically easier for programmers to create and test complex ZBI 2.0 programs and distribute them to the printer.

## ZEBRALINK SOLUTIONS NETWORKING

- ZebraNet b/g PrintServer
- ZebraNet 10/100 PrintServer (external)

## ZEBRALINK SOLUTIONS FIRMWARE

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

**XML-Enabled printing** — Direct connect integration for barcode label printing, eliminates license fees and print server hardware and lowers customization and programming costs.

**Web View** — Connect and control Zebra barcode 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.

## ZE500 SERIES SPECIFICATIONS

### Printing Specifications

- 203 dpi resolution (8 dots / mm), Dot size (W x L): 0.0049" x 0.0052" (0.125 mm x 0.132 mm), Pitch: 8.0 dots / mm
- 300 dpi resolution (12 dots / mm), Dot size (W x L): 0.0033" x 0.0043" (0.084 mm x 0.110 mm), Pitch: 11.8 dots / mm
- First dot location measured from media edge: 0.093" ±0.035" (2.4 mm ±0.89 mm)
- Distance from mounting side of mainframe to media edge: 0.914" (23.2 mm)
- Maximum non-continuous media print length\*
  - 203 dpi = 39" (990 mm)
  - 300 dpi = 39" (990 mm)
- Maximum continuous media print length\*
  - 203 dpi = 150" (3810 mm)
  - 300 dpi = 100" (2540 mm)
- Media registration tolerance:\*
  - Vertical = <±0.040" (±1.0 mm)
  - On concurrent labels in "Applicator" mode
  - Horizontal = <±0.040" (±1.0 mm)



## ZE500 SERIES SPECIFICATIONS

(continued)

### Ribbon Specifications

- Maximum Length: 1970' (600m)
- Maximum ribbon roll size: 4.0" (101.6mm) O.D on a 1.0" (25.4 mm) I.D. core

### Media Specifications

- Media type: continuous, die-cut, or black mark\*
- Media Unwind Force:
  - In Peel Mode (with liner drawn by the peel roller): Applicator media supply steady state tension must be uniform and not exceed 2.0 lbs. Start / Stop tension transients must not exceed 4.0 lbs.
  - In Tear Mode (media feed without peeling): Media tension must not exceed 350g (0.75 lb)
- Media Rewind Force:
  - In Peel Mode (with liner drawn by the peel roller): Applicator media take-up pull tension must be uniform between 1 – 4 lbs.
- Transmissive (gap) sensing standards:
  - Inter label gap: 2 – 4mm, preferably 3 mm
  - Sensing notch: 0.25" W (6 mm) x 0.12" L (3 mm)
  - Sensing hole: 0.125" (3 mm) diameter
- Reflective (black mark) sensing standards:
  - Black mark length (parallel to inside media edge): 0.12" – 0.43" (3 – 11mm)
  - Black mark width (perpendicular to inside media edge): 0.43" (>11mm)
  - 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

## ZE500-4 SPECIFICATIONS

### Printing Specifications

- Maximum print width 203 and 300 dpi: 4.1" (104mm)
- Programmable print speeds:
  - 203 dpi — 2.0" (50.8 mm) through 12" (305 mm) per second in 1" increments
  - 300 dpi — 2.0" (50.8 mm) through 12" (305 mm) per second in 1" increments

## Media and Ribbon Specifications

- Media width (label and liner): 0.625" (16 mm) to 4.5" (114 mm)
- Minimum label length:
  - Applicator mode, backfeed on: 0.50" (12.7 mm)
  - Applicator mode, backfeed off: 0.25" (6.4 mm)
  - Stream mode: 0.25" (6.4 mm)
  - Rewind mode: 0.25" (6.4 mm) "loose loop"
  - Tear-off mode, backfeed on: 0.50" (12.7 mm)
  - Tear-off mode, backfeed off: 0.25" (6.4 mm)
- Media thickness (label and liner): 0.0053" (0.135 mm) to 0.010" (0.254 mm)
- Ribbon width: 1.0" (25 mm) to 4.2" (107 mm)

### Physical Specifications

- Height: 11.8" (300 mm)
- Width: 9.6" (245 mm)
- Depth: 14.95" (380 mm)
- Weight: 34 lbs. (15.4 kg)

## ZE500-6 SPECIFICATIONS

### Printing Specifications

- Maximum print width 203 and 300 dpi: 6.6" (168 mm)
- Programmable print speeds:
  - 203 dpi — 2.0" (50.8 mm) through 12" (305 mm) per second in 1" increments
  - 300 dpi — 2.0" (50.8 mm) through 10" (203 mm) per second in 1" increments

## Media and Ribbon Specifications

- Media width (label and liner): 3.0" (76 mm) to 7.1" (180 mm)
- Minimum label length:
  - Applicator mode, backfeed on: 3.0" (76.2 mm)
  - Applicator mode, backfeed off: 1.0" (25.4 mm)
  - Rewind mode: 1.0" (25.4 mm) "loose loop"
  - Tear-off mode, backfeed on: 3.0" (76.2 mm)
  - Tear-off mode, backfeed off: 1.0" (25.4 mm)
- Media thickness (label and liner): 0.003" (0.076 mm) to 0.012" (0.305 mm)
- Ribbon width: 3.0" (76 mm) to 7.1" (180 mm)

### Physical Specifications

- Height: 11.8" (300 mm)
- Width: 9.6" (245 mm)
- Depth: 17.23" (438 mm)
- Weight: 38 lbs (17.3 kg)

\* Maximum label lengths are affected by option selections and firmware overhead. 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.



## ZEBRA PROGRAMMING LANGUAGE (ZPL AND ZPL II)

- Stream mode for faster label throughput  
Communicates in printable ASCII characters
- Unicode™-Compliant
- Compatible with mainframe, mini, and PC hosts
- Downloadable objects include graphics, scalable and bitmap fonts, label templates, and formats
- Object copying between memory areas (RAM, Onboard Flash memory locations)
- 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 (0°, 90°, 180°, 270°)
- Slew command
- Programmable label quantities with print, pause, cut control
- User-programmable password
- Status messages to host on request

## BARCODE SYMBOLOGIES

- Barcode Ratios: 2:1, 7:3, 5:2, and 3:1
- Linear Barcodes: Code 11, Code 39, Code 93, Code 128 with subsets A / B / C and UCC Case Codes, ISBT-128, UPC-A, UPC-E, EAN-8, EAN-13, UPC and EAN 2-or 5-digit extensions, Plessey, Postnet, Standard 2-of-5, Industrial 2-of-5, Interleaved 2-of-5, Logmars, MSI, Codabar and Planet Code
- 2D Barcodes: Codablock, PDF417, Code 49, DataMatrix, MaxiCode, QR Code, TLC 39, MicroPDF, RSS-14 (and composite), Aztec

## ZPL FONT MATRICES: 203 DPI (8 DOTS / MM) PRINTHEADS

Fonts	Matrix (in dots) (H × W)	Type†	Minimum Character Size (H × W)	Maximum CPI
<b>A</b>	9 × 5	U-L-D	0.044" × 0.029"	33.3
<b>B</b>	11 × 7	U	0.054" × 0.044"	22.7
<b>C, D</b>	18 × 10	U-L-D	0.088" × 0.059"	16.9
<b>E</b>	28 × 15	OCR-B	0.138" × 0.098"	10.2
<b>F</b>	26 × 13	U-L-D	0.128" × 0.079"	12.7
<b>G</b>	60 × 40	U-L-D	0.295" × 0.236"	4.2
<b>H</b>	21 × 13	OCR-A	0.103" × 0.093"	10.8
<b>GS</b>	24 × 24	SYMBOL	0.118" × 0.118"	8.5
<b>P</b>	20 × 18	U-L-D	0.098" × 0.089"	N / A
<b>Q</b>	28 × 24	U-L-D	0.138" × 0.113"	N / A
<b>R</b>	35 × 31	U-L-D	0.172" × 0.153"	N / A
<b>S</b>	40 × 35	U-L-D	0.197" × 0.172"	N / A
<b>T</b>	48 × 42	U-L-D	0.236" × 0.207"	N / A
<b>U</b>	59 × 53	U-L-D	0.290" × 0.261"	N / A
<b>V</b>	80 × 71	U-L-D	0.394" × 0.349"	N / A
<b>Ø</b>	variable	U-L-D	variable	N / A

† U = Uppercase L = Lowercase D = Descenders

## FONT SPECIFICATIONS

Fonts A through V are Expandable up to 10 times, height and width independently. Fonts E and H, however are not considered "in-spec" (OCR-A and OCR-B) when expanded.

The scalable smooth font Ø 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 fonts A through G, and Ø through software control.

- Bitmap fonts A through V and GS symbols are expandable up to 10 times, height and width independent
- Smooth scalable font Ø (CG Triumvirate™ Bold Condensed\*) is expandable dot-by-dot, height and width independent
- IBM Code Page 850 International Characters

\*Contains UFST® from Agfa Monotype Corporation



## COMMUNICATIONS SPECIFICATIONS

- High-speed bi-directional parallel interface, IEEE 1284: Compatibility mode, EPC, Nibble mode
- High-speed serial interfaces:
  - RS-232C with DB9F connector
  - Configurable baud rate (300-115,200), parity, data bits, and stop bits
  - Software (XON/XOFF) or hardware (DTR/DSR) communication handshake protocols
- USB 2.0
- ZebraNet 10/100 Print Server
- ZebraNet b/g Print Server
- Applicator interface with DB15F connector
  - +5V I/O and +24V to +28V I/O versions available

## ENVIRONMENTAL SPECIFICATIONS

- Operating environment:
  - Thermal transfer = 40° to 104°F (5° to 40°C)
  - Direct Thermal = 32° to 104°F (0° to 40°C)
  - 20% to 85% non-condensing relative humidity
- Storage / Transportation environment:
  - -40° to 160°F (-40° to 71°C)
  - 5% to 95% non-condensing Relative Humidity

## ELECTRICAL SPECIFICATIONS

- Universal power supply with power-factor correction 90 – 264 VAC, 47 – 63 Hz
- Standards approvals — IEC 60950-1; EN55022, Class A; EN55024; EN61000-3-2, 3-3
- Product markings — NRTL; CE; FCC A; ICES-003; VCCI; C-Tick; CCC; NOM; Gost-R; S- Mark; KCC; BSMI

## ZPL FONT MATRICES: 300 DPI (12 DOTS / MM) PRINTHEADS

Fonts	Matrix (in dots) (H x W)	Type <sup>†</sup>	Minimum Character Size (H x W)	Maximum CPI
<b>A</b>	9 x 5	U-L-D	0.030" x 0.020"	50.0
<b>B</b>	11 x 7	U	0.037" x 0.030"	33.3
<b>C, D</b>	18 x 10	U-L-D	0.060" x 0.040"	25.0
<b>E</b>	28 x 15	OCR-B	0.137" x 0.087"	11.5
<b>F</b>	26 x 13	U-L-D	0.087" x 0.053"	18.8
<b>G</b>	60 x 40	U-L-D	0.200" x 0.160"	6.3
<b>H</b>	21 x 13	OCR-A	0.100" x 0.093"	10.7
<b>GS</b>	24 x 24	SYMBOL	0.080" x 0.080"	12.5
<b>P</b>	20 x 18	U-L-D	0.067" x 0.060"	N / A
<b>Q</b>	28 x 24	U-L-D	0.093" x 0.080"	N / A
<b>R</b>	35 x 31	U-L-D	0.117" x 0.103"	N / A
<b>S</b>	40 x 35	U-L-D	0.133" x 0.117"	N / A
<b>T</b>	48 x 42	U-L-D	0.160" x 0.140"	N / A
<b>U</b>	59 x 53	U-L-D	0.197" x 0.177"	N / A
<b>V</b>	80 x 71	U-L-D	0.267" x 0.237"	N / A
<b>Ø</b>	variable	U-L-D	variable	N / A

<sup>†</sup> U = Uppercase L = Lowercase D = Descenders

For more information, visit [www.zebra.com/ze500](http://www.zebra.com/ze500)



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