# ZD411 Printer Specifications

Specifications are provided for reference and are based on printer tests using Zebra brand supplies. 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

- 6 ips maximum print speed
- ZPL II® and EPL2™ programming languages
- Connectivity: USB 2.0, USB Host
- Printer setup mobile app for Android™ and iOS via Bluetooth® Low Energy (BLE) connection
  - BLE is best used for printer setup and light data transfer events. For best performance when printing, use a printer with Bluetooth Classic.
  - For additional information see the application notes
- OpenACCESS™ design for easy media loading
- Real Time Clock (RTC)
- 203 dpi print resolution (8 dots/mm)
- 2.2 in./56 mm max print width (203 dpi)
- Direct thermal and thermal transfer printing of barcodes, text and graphics
- 512 MB of Flash memory
- 256 MB DDR3 SDRAM
- Head-up sensor
- Multi-position transmissive and full-width reflective sensor
- 5 in./127 mm max outside diameter media capability
- Fan-fold media feed slot
- Link-OS® printer operating system
- Print Touch enabled via NFC
- Unicode compliant for multi-language printing
- 16 resident expandable ZPL II bitmap fonts
- Two resident scalable ZPL fonts
- Multiple DOS and Windows® codepage support



- Windows drivers
- Printer utilities
- Linear and 2-D barcode symbologies
- PDF Direct
- ENERGY STAR® certified, meets Energy Efficiency Level VI
- Two-year standard warranty

## Healthcare Models—Standard Features

- Healthcare-preferred white color scheme
- Healthcare-compliant power supply, IEC 60601-1 certified
- Disinfectant-ready, easy-to-clean plastics with sealed button interface
- UV-resistant housing supports UV cleaning protocols

## Optional Features

- Healthcare model–direct thermal only
- 300 dpi print resolution (12 dots per mm)
- Field-installable cutter
  - Continuous paper, linered label and tag stock (Note: Cutting through labels and liner is not supported)
  - Maximum thickness 0.0075 in./0.1905 mm
- Field-installable peeler (dispenser)–label peel and present with label taken sensor with cutter, direct thermal model only

## Connectivity Options

- Factory installed: dual radio Wi-Fi™ 6 (802.11ax) and Bluetooth 5.3 (MIMO)
- Field installable: dual radio Wi-Fi 6 (802.11ax) and Bluetooth 5.3 (SISO)
- Factory installed or field installable: dual radio Wi-Fi 5 (802.11ac) and Bluetooth 4.2
- Field installable: 10/100 Ethernet
- Field installable: Serial RS-232 auto-sensing

## Accessories

- ZKDU–Zebra keyboard display unit for standalone printing solution
- ZD-Series Battery (2750 mAh) for cordless operation
- Mounting adapter bracket–enables printer to be mounted in same location as LP/TLP2824 Plus printer
- Media core adapters to accommodate 1.5 in., ID core sizes

## ZBI 2.0

- Field installed via activation key

## Software

- Zebra DNA™ software–includes a full suite of applications, utilities and developer tools. For more information, visit www.zebra.com/zebradna

## Programming Languages

- Set-Get-Do commands to set and get printer configuration details
- ZPL II–Universal language for Zebra printers. Simplifies label formatting and enables format compatibility with existing systems that run Zebra printers
- EPL2–Eltron Programming Language simplifies label formatting and enables format compatibility with legacy applications
- EPL1–Line Mode available on direct thermal, 203 dpi model only
- Web View–Connect and control Zebra barcode printers via the printer's web interface using a common Web browser (ZPL mode)
- XML-Enabled Printing–allows XML communications for barcode label printing, eliminating license fees and printer service hardware while lowering customization and programming costs

## Printer Specifications

| Parameter | 203 dpi resolution (8 dots/mm) | 300 dpi resolution (12 dots/mm) |
|---|---|---|
| **Speed in./Sec–ips (mm/sec)** | Programmable 2, 3, 4, 5 or 6 max. (51, 76, 102, 127 with max. 152) | Programmable 2, 3 or 4 max. (51, 76, with max. 102) |
| **Dot Pitch** | 0.0049 in./0.125 mm | 0.0033 in./0.0847 mm |
| **Min. Print Length** | One Dot | One Dot |
| **Max. Print Length** | 39.0 in./991 mm | 39.0 in./991 mm |
| **Min. Print Width** | One Dot | One Dot |
| **Max. Print Width** | 2.2 in./56 mm | 2.13 in./54 mm |

## ZPL Programming Language (ZPL/ZPL II)

- Communicates in printable ASCII characters
- Compatible with mainframe, mini and PC hosts
- Downloadable objects include graphics and bitmap fonts, label templates and formats
- 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
- Status messages to host upon request

## Ribbon Specifications

| | ZD411 thermal transfer only |
|---|---|
| **Ribbon Outside Diameter** | 1.34 in./34 mm |
| **Ribbon Standard Length** | 243 ft./74 m |
| **Ribbon Ratio** | 1:1 media to ribbon |
| **Ribbon Width** | 1.3-2.24 in./33-58 mm |
| **Ribbon Core I.D.** | 0.5 in./12.7 mm |

## Media Specifications

- Media Width: 0.585–2.36 in./6.4–60mm
  - – Label Length:
    - Minimum 0.25 in./6.4 mm (tear)
    - Minimum 0.5 in./12.7 mm (with cutter)
    - Minimum 0.5 in./12.7 mm (with peeler)
    - Maximum 39 in./991 mm

    Core inner diameter:
    - Standard–0.5 in./12.7 mm, 1.0 in./25.4 mm
    - With optional adaptor kit–1.5 in./38.1 mm, 2.0 in./50.8 mm, 3.0 in./76.2 mm
- Max Roll Outer Diameter: 5.00 in./127 mm
- Media Thickness: 0.0024 in./0.06 mm min, 0.0075 in./0.1905 mm max (tear off mode only)
- Media Sensing: black line, gap, notch
- Media Type:
  - – Roll-fed or fan-fold
  - – Label stock (die cut or continuous, direct thermal or thermal transfer)
  - – Tag stock (die cut or continuous, direct thermal or thermal transfer)
  - – Receipt paper (continuous, direct thermal)
  - – Wristband stock (direct thermal or thermal transfer)

## Font Specifications: 203 DPI (8 Dots/mm)

| Font | Matrix (in dots) (H × W) | Type† | Minimum Character Size (H x W) in. | Max CPI |
|---|---|---|---|---|
| **A** | 9 × 5 | U-L-D | .044 x .030 | 33.3 |
| **B** | 11 × 7 | U | .054 × .044 | 22.7 |
| **C, D** | 18 × 10 | U-L-D | .088 × .059 | 16.9 |
| **E** | 28 × 15 | OCR-B | .138 × .098 | 10.2 |
| **F** | 26 × 13 | U-L-D | .128 × .079 | 12.7 |
| **G** | 60 × 40 | U-L-D | .295 × .236 | 4.2 |
| **H** | 21 × 13 | OCR-A | .103 × .093 | 10.8 |
| **GS** | 24 × 24 | SYMBOL | .118 × .118 | 8.5 |
| **P-V** | 20 × 18 | U-L-D | Backward compatible with S-300 Scalable (Smooth) Font | |
| **Ø** | 15 × 12 | U-L-D | | |

†U—Uppercase L—Lowercase D—Descenders

## Font Specifications: 300 DPI (12 Dots/mm)

| Font | Matrix (in dots) (H × W) | Type† | Minimum Character Size (H x W) in. | Max CPI |
|---|---|---|---|---|
| **A** | 9 × 5 | U-L-D | .030 x .020 | 50.8 |
| **B** | 11 × 7 | U | .037 × .030 | 33.8 |
| **C, D** | 18 × 10 | U-L-D | .060 × .040 | 25.4 |
| **E** | 41 × 20 | OCR-B | .138 × .085 | 11.5 |
| **F** | 26 × 13 | U-L-D | .085 × .053 | 19.06 |
| **G** | 60 × 40 | U-L-D | .200 × .160 | 6.36 |
| **H** | 30 × 19 | OCR-A | .100 × .098 | 10.02 |
| **GS** | 24 × 24 | SYMBOL | .80 × .80 | 12.7 |
| **P-V** | 20 × 18 | U-L-D | Scalable (Smooth) Font | |
| **Ø** | 15 × 12 | U-L-D | | |

†U—Uppercase L—Lowercase D—Descenders

## Font Specifications

- Character Fonts: Standard bitmapped Zebra fonts: A, B, C, D, E (OCR-B), F, G, H, (OCR-A), GS, P, Q, R, S, T, U, V and Ø Smooth font (CG Triumvirate™ Bold Condensed*)
- Supports user-defined fonts and graphics, including custom logos
- Bitmap fonts are expandable up to 10 times, height and width independent. Fonts E and H (OCR-B and OCR-A), however, are not considered in spec when expanded
- Smooth scalable font Ø (CG Triumvirate Bold Condensed*) is expandable dot-by-dot, height and width independent, while maintaining edges to a max. 1500 × 1500 dots
- Printers sold in China include the Simplified Chinese SimSun font pre-installed
- 64 MB user available non-volatile memory storage for downloadable objects
- 8 MB user available SDRAM

* Contains UFST® from Agfa Monotype Corporation

## ZPL Barcode Symbologies

- Barcode ratios: 2:1 (non-rotated) and 3:1
- Linear barcodes: Code 11, Code 39, Code 93, Code 128, UPC-A, UPC-E, EAN-8, EAN-13, EAN-14, UPC-A and UPC-E with EAN 2 or 5 digit extensions, Plessey, POSTNET, Standard 2 of 5, Industrial 2 of 5, Interleaved 2 of 5, LOGMARS, MSI, Codabar, and GS1 DataBar (formerly RSS)
- 2-dimensional barcodes: PDF417, MicroPDF-417, Code 49, Maxicode, Codablock, Data Matrix, QR code, and Aztec

## EPL Programming Language (EPL2)

- ASCII EPL2 programming language (Page Mode)
- Field rotations
- Variable field support (up to 100)
- Counter support (up to 10)
- Variable field addition and subtraction
- Status reporting
- Form, fonts and graphics storage
- Simple set of formatting commands
- Support of selected barcode

## EPL Barcode Symbologies

- Linear barcodes: Code 39, Code 128A, B and C (User selectable/Auto), UCC/EAN-128, Code 93, Codabar, Interleaved 2 of 5, UPC-A, UPC-E, UPC-A with 2 and 5 add on, UPC-E with 2 and 5 add on, EAN 13, EAN 8, EAN 13 with 2 and 5 add on, EAN 8 with 2 and 5 add on, Postnet (5, 9, 11, and 13 digit) Japanese Postnet, Plessey (MSI-1), MSI-3, German Post Code, RSS-14 (limited, truncated, stacked)
- 2-dimensional barcodes: Maxicode (modes 2,3,4,6), PDF417 (MicroPDF417 and MacroPDF417), Data Matrix

## Code Pages Supported

- DOS: 437, 850, 851, 852, 855, 857, 860, 861, 862, 863, 865, 866, 869, 737, Big 5, GB2312, GB18030
- Windows: 1250, 1251, 1252, 1253, 1254, 1255, 1256, 1257

## Electrical Specifications

- Auto-ranging external power supply with C13 type connector
- Output Voltage/Current: 24V, 2.08A
- Input: 100-240 VAC, 50-60 Hz
- ENERGY STAR certified; Energy Efficiency Level VI certified
- Healthcare models include IEC 60601-1 certified power supply

## Font Specifications

| Type | Width | Height | SP | CPI | Chars |
|---|---|---|---|---|---|
| **Font1** | 8 | 12 | 2 | 20.3 | 160 |
| **Font2** | 10 | 16 | 2 | 16.9 | 160 |
| **Font3** | 12 | 20 | 2 | 4.5 | 160 |
| **Font4** | 14 | 24 | 2 | 12.7 | 160 |
| **Font5** | 32 | 48 | 4 | 5.6 | 80 |

## Interface/Connectivity Types

- Auto-sensing Serial–RS232 field-installable option:
  - – Software selectable
    - Baud rate (default 9600)
    - Parity (default none)
    - Data length (default 8)
    - Stop bit (default 1)
  - – Flow control–hardware and software
  - – Connector: DB-9 Type: 9 pin D Sub connector female (standard)
  - – Includes +5 VDC- 160 mA power output capability
- Wireless–factory or field-installable option
  - – Dual radio Wi-Fi 6 (802.11ax) and Bluetooth 5.3
  - – Dual radio Wi-Fi 5 (802.11ac) and Bluetooth 4.2
- USB:
  - – Version 2.0 full speed, bi-directional
  - – Connector–Type B Female
- Internal 10/100 Ethernet-field installable option

## Agency approvals

- IEC 60950-1, EN55022 Class B, EN55024, EN61000-3-2, EN61000-3-3, FCC Class B, ICES-003, FCC 15.209; 15.247(d), IC RSS 247, EN 300 328, EN 301 893, EN 62311, cTUVus
- CE Marking, VCCI, C-Tick, S-Mark, CCC, CU, BSMI, KCC, SABS, IN-Metro, BIS, NOM

## Physical Specifications

| ZD411 | |
|---|---|
| **Dimensions** | **ZD411 thermal transfer model**<br>• 9.56 in. L x 5.46 in. W x 6.66 in. H<br>• 242.9 mm L x 138.7 mm W x 169.2 mm H<br>**ZD411 direct thermal model**<br>• 8.6 in. L x 4.5 in. W x 6.0 in. H<br>• 220 mm L x 115 mm W x 151 mm H |
| **Weight** | **ZD411 thermal transfer model**<br>• 3.59 lbs./1.629 kg<br>**ZD411 direct thermal model**<br>• 2.2 lbs./1.0 kg |

## Operating Environment

| ZD411 | |
|---|---|
| **Operational Temperature** | 40° to 105°F (4.4° to 41°C) |
| **Non-Operational Temperature** | -40° to 140°F (-40° to 60°C) |
| **Operational Humidity** | 10 to 90% non-condensing |
| **Non-Operational Humidity** | 5 to 95% non-condensing |

## Preventative Maintenance

Zebra recommends cleaning the printer on a regular basis using standard Zebra cleaning supplies. Refer to the User's Guide for more details.

## Cleaning

The exterior is cleaned with a lint-free cloth, and if necessary, a mild detergent solution or desktop cleaner can be used. Interior components (printhead, platen, media path and dispenser bar) are cleaned with alcohol or blown air.

For cleaning healthcare models refer to: zebra.com/DeviceDisinfection

## Media Registration

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

**For more information, visit www.zebra.com/zd411**

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