ZEBRA® QLn220™ AND QLn320™ HEALTHCARE PRINTER SPECIFICATIONS

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

Standard Features

- Includes disinfectant-ready plastics in a lighter healthcare color scheme
- Apple® iOS, Android™, Windows® Mobile and BlackBerry® connectivity
- Direct thermal printing of barcodes, text and graphics
- 203 dpi resolution (8 dots per mm)
- Print speed per second up to 4″/102 mm per second
- CPCL, EPL™ and ZPL® programming languages
- XML support
- Resident fixed and scalable fonts
- 400 MHz 32-bit ARM processor with 128 MB RAM (8MB available for user applications)
- 256 MB Flash supports downloadable programs, receipt formats, fonts and graphics (64 MB available for user storage)
- Serial and USB ports (both support strain relief)
- 2450 mAh (nominal) removable Li-Ion smart battery
- Built-in battery charger
- IEC 60601-certified AC adapter for medical environments
- Belt clip for unobtrusive and convenient printing (not compatible with extended capacity battery)
- Black mark and gap media sensing using fixed center-position sensors
- Easy-to-use peel and present mode
- Label present sensor for issuing labels one at a time
- Tear bar for easy media dispensing
- Supports vertical and horizontal printing
- Printer can be used in any orientation
- Center-loading media locking for variable roll widths
- "Clamshell" design for easy media loading
- Management: Mirror, SNMP, Web server, Profile Manager, AirWatch® and Wavelink Avalanche®
- Large, easy-to-read LCD control panel (240 x 128 pixels)
- LCD can be customized using WML (text and icons)
- Five-way navigation buttons, two software defined keys
- Printer alerts on the display, help menus
- Tolerance of multiple drops from 5′ (1.52 m) to concrete
- Label odometer
- Real-time clock
- QR barcode links to web-based help pages
- Zebra Print Touch™ simplifies Bluetooth® pairing and launches web-based help pages with Near Field Communication (NFC) enabled devices

Charging Options

- Charge the battery inside the printer using:
  - AC adapter – IEC 60601-certified for medical environments
  - Single cradle
  - Quad cradle
- Charge the battery outside the printer using:
  - Single smart charger
  - Quad charger (same as QL Plus™ series)

Optional Features

- ZebraNet® 802.11n option – provides 802.11a/b/g/n WLAN support with:
  - WEP (PSK only), TKIP and AES encryption
  - WPA and WPA2
  - 802.1x (with WPA or WPA2 only)
    - EAP-FAST, EAP-TTLS, EAP-TLS, PEAP, LEAP
  - 802.11d and 802.11i
  - Simultaneous Bluetooth 3.0 dual radio
  - Wi-Fi® Certification
  - Fast roaming using PMK caching, CCKM or Fast Session resumption

- Bluetooth 3.0 radio
  - Security modes 1 – 4
  - "Made for iPod®/iPhone®/iPad®" certified
  - Key Bonding
- 10/100 Ethernet support (via docking cradle)
- Linerless printing (with silicone platen roller only)
- ZBI 2.x™ powerful programming language that lets printers run standalone applications, connect to peripherals and much more
- 4300 mAh (nominal) removable extended capacity Li-Ion battery (4-cell bump-out pack)

Accessories

- Spare batteries
- AC adapter – IEC 60601-certified for medical environments
- SC2 smart battery single charger
- Quad battery charger (same as QL Plus series)
- QLn-EC – single-bay Ethernet and charging cradle
- QLn-EC4 – quad-bay Ethernet and charging cradle with internal switch and stacking port
- Vehicle charger with cigarette lighter adapter
- Shoulder strap
- Hand strap
- Printer stand for tabletop mounting
- Soft case (IP54 rating when used)
- Serial and USB cables with strain relief

LINK-OS® Software Solutions

Profile Manager – Advanced, server-based device management for networked printers, operates via a web browser interface
Cloud Connect – Secure, direct, encrypted and authenticated connections to the web for printing and device management
Virtual Devices – Use legacy and non-Zebra command languages to print labels and tags

Zebra Utilities – Print from iOS, Android and Windows Mobile devices
Print Station – Driverless printing from Android devices
AirWatch Connector – Manage from within the AirWatch environment
Mulitplatform Software Development Kit – Simplifies printing application development with support for BlackBerry, Apple, Android, WinCE®, WinMobile®, Windows desktop and Linux/Unix platforms

ZebraLink Software Solutions

- **ZebraDesigner Pro** – An intuitive, easy-to-use software program for creating complex label designs
- **ZebraNet Bridge Enterprise** – Centrally manage Zebra printers anywhere on your global network
- **ZebraDesigner Driver** – Zebra driver certified for use with Windows 2003/2008/XP, Windows Vista®, Windows 7, Windows 8
- **Zebra Setup Utility** – Single printer configuration utility
- **ZBI-Developer** – Programming utility makes it dramatically easier to create and test complex ZBI 2.x programs and distribute them to the printer

Zebra-validated solutions can be found at
http://www.zebra.com/validation

CPCL Programming Language

- Communicates in printable ASCII characters
- Compatible with servers, PCs, mobile terminals and smartphone hosts
- Downloadable objects include graphics, bitmap fonts, label templates and formats
- Automatic memory allocation for format while printing
- Automatic serialization of fields
- Automatic printhead temperature compensation
- Format inversion (white on black)
- Four-position field rotation (0º, 90º, 180º, 270º)
- Programmable label odometer
- Monitor and report battery voltage and temperature
- Easy network and security configuration

CPCL Font Specifications:
203 dpi (8 dots/mm)

Fonts	Matrix (in dots) (H x W)	Minimum Char. Size (H x W)	Maximum CPI
0 (Standard)	9 x 8	.044" x .039"	25.4
1 (min. width)	48 x 13	.236" x .064"	15.6
1 (max. width)	48 x 39	.236" x .192"	5.2
2 (OCR-A)	12 x 20	.059" x .099"	10.2
4 Size 0 (min. width)	47 x 11	.232" x .054"	18.5
4 Size 0 (max. width)	47 x 43	.232" x .212"	4.7
5 Size 0 (min. width)	24 x 7	.118" x .034"	29
5 Size 0 (max. width)	24 x 23	.118" x .113"	8.8
6 (MICR)	27 x 28	.133" x .138"	7.3
7	24 x 12	.118" x .059"	16.9

- Standard Fonts: 25 bitmapped, 1 smooth, scalable (CG Triumvirate Bold Condensed*)
- Optional Fonts: downloadable bitmapped/scalable fonts
- International Character Sets (optional): Chinese 16x16 (traditional), 16x16 (simplified); Japanese 16x16, 24x24; Korean Mincho
- Scalable text feature
- Standard resident fonts can be rotated in 90° increments
- Supports user-defined fonts, graphics and logos
- Text concatenation to assign different character styles
- Allows text magnification 1-16 times the original size
- Proportional and fixed-width fonts
  Contains UFST® from Agfa Monotype Corporation

CPCL Barcode Symbologies

- Barcode Ratios: 1.5:1, 2:1, 2.5:1, 3:1, 3.5:1
- Linear Barcodes: Code 39, Code 93, UCC/EAN128, Code 128, Codabar (NW-7), Interleaved 2-of-5, UPC-A, UPC-E, 2 and 5 digit add-on, EAN-8, EAN-13, 2 and 5 digit add-on
- Two-Dimensional: PDF417, MicroPDF417, MaxiCode, QR Code, GS1 / DataBar™ (RSS) family, Aztec, MSI/Plessey, FIM Postnet, Data Matrix, TLC39

CPCL Graphics

- Lines, boxes and patterns
- PCX images

ZPL Programming Language

- Supports version X.16 (and onward)
- Communicates in printable ASCII characters
- Compatible with servers, PCs, mobile terminals and smartphone 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 (0º, 90º, 180º, 270º)
- Programmable label odometer
- Slew command
- Programmable label quantities with print, pause
- Status messages to host upon request

ZPL Font Specifications:
203 dpi (8 dots/mm)

Font	Matrix (in dots) (H x W)	Type*	Minimum Char Size (H x W)	Maximum CPI
A	9 x 5	U-L-D	.044" x .030"	33.3
B	11 x 7	U	.054" x .044"	22.7
C,D	18 x 10	U-L-D	.089" x .059"	16.9
E	28 x 15	OCR-B	.138" x .098"	10.2
F	26 x 13	U-L-D	.128" x .079"	12.7
G	60 x 40	U-L-D	.295" x .236"	4.2
H	21 x 13	OCR-A	.103" x .093"	10.8
GS	24 x 24	SYMBOL	.118" x .118"	8.5
P	20 x 18	U-L-D	0.098 x 0.089	N/A
Q	28 x 24	U-L-D	0.138 x 0.118	N/A
R	35 x 31	U-L-D	0.172 x 0.153	N/A
S	40 x 35	U-L-D	0.197 x 0.172	N/A
T	48 x 42	U-L-D	0.236 x 0.207	N/A
U	59 x 53	U-L-D	0.290 x 0.261	N/A
V	80 x 71	U-L-D	0.394 x 0.349	N/A
Ø	15 x 12	U-L-D	Scalable (Smooth) Font	

U = upper case, L = lower case, D = descenders

- 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 & Ø Smooth font (CG Triumvirate Bold Condensed).
- Supports Unicode UTF-8, UTF-16, and several other single- and multi-byte international character sets (see ZPL programming guide for more details)
- 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.
- Unicode Swiss 721 font included

ZPL Barcode Symbologies

- Barcode Ratios: 2:1, 3:1, 5:2, 7:3
- Linear Barcodes: Code 11, Code 39, Code 93, Code 128, ISBT-128, UPC-A, UPC-E, EAN-8, EAN-13, UPC-A and UPC-E with EAN two- or five-digit extensions, Planet Code, Plessey, POSTNET, Standard 2 of 5, Industrial 2 of 5, Interleaved 2 of 5, LOGMARS, MSI, Codabar and GS1 DataBar (RSS)
- Two-Dimensional: PDF417, MicroPDF-417, Code 49, TLC39, Maxicode, Codablock, Data Matrix, QR code and Aztec

ZPL Graphics

- Lines, boxes (with optional rounded corners)
- Circles, ellipses
- Images (several different formats, see ZPL manual)
- Compressed images

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
- Form, fonts and graphics storage
- Simple set of formatting commands

EPL Font Specifications:
203 dpi (8 dots/mm)

Font	Width (dot)	Height (dot)	CPI
1	8	12	20.3
2	10	16	16.9
3	12	20	4.5
4	14	24	12.7
5	32	48	5.6

EPL Barcode Symbologies

- Linear Barcodes: Code 39, Code 128A, B & 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, & 13 digit)

  Japanese Postnet, Plessey (MSI-1), MSI-3, German Post Code and GS1 DataBar (formerly RSS)

- Two-Dimensional: Maxicode (modes 2,3,4,6), PDF417, MacroPDF417, QR Code, Data Matrix, and Aztec

Media Specifications

NOTE: For optimum print quality and printer performance, use of Genuine Zebra supplies is recommended

	QLn220	QLn320
Min/Max Media Width	0.63″ (16mm) / 2.18″ (55.4mm)	1.0″ (25mm) / 3.125″ (79mm)
Max Print Width	1.9″ (48mm)	2.9″ (72mm)
Min/Max Media Thickness	2.3 mil (0.058mm) / 6.5 mil (0.165mm) label stock 5.5 mil (0.140mm) tag stock	2.3 mil (0.058mm) / 6.5 mil (0.165mm) label stock 5.5 mil (0.140mm) tag stock
Min/Max Label Length	0.5″ (12.7mm) / 32″ (813mm)	0.5″ (12.7mm) / 32″ (813mm)
Media Roll ID	0.75″ (19mm) or 1.375″ (34.9mm)	0.75″ (19mm) or 1.375″ (34.9mm)
Media Roll OD	2.2″ (55.9mm)	2.6″ (66mm)

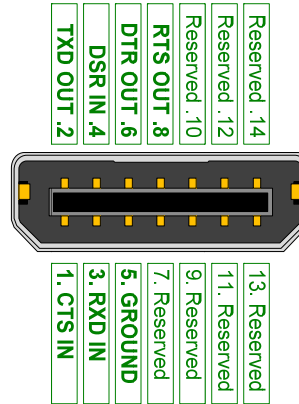## Internet Protocols (over 802.11 or Ethernet)

- UDP / TCP
- DHCP / BootP
- FTP / Mirror
- HTTP
- SMTP / POP3
- Telnet
- LPD
- SNMP

Cabled Communications Specifications

- USB 2.0 Full-speed Interface (12 Mbps)
  - Mini-B connector with optional strain relief
- Serial Interface: 14-pin RS-232C port for communication to terminal or other host up to 115.2 Kbps
  - Default Parameters: Baud Rate-19,200; Parity-None; Data Bits-8; Stop Bits-1; Handshaking RTS/CTS
  - Software (XON/XOFF) or hardware (RTS/CTS) communication handshake protocols
  - Serial Port Pin definitions

Pin Number	Signal Name	Signal Type	Description
3	RXD	Input	Receive Data
2	TXD	Output	Transmit Data
6	DTR	Output	Data-terminal ready. Set high when printer is on. Provides +5VDC @ 300 mA max.
5	GND		Ground
4	DSR	Input	Data-set ready. Low-to-high transition turns printer on. High-to-low transition turns printer off (if enabled).
8	RTS	Output	Request to Send
1	CTS	Input	Clear to Send
7, 10 - 14			Reserved

INSERTION SIDE SHOWN

TXD OUT .2 | DSR IN .4 | DTR OUT .6 | RTS OUT .8 | Reserved .10 | Reserved .12 | Reserved .14

1. CTS IN | 3. RXD IN | 5. GROUND | 7. Reserved | 9. Reserved | 11. Reserved | 13. Reserved

Electrical Specifications

- Smart battery:
  - 7.4 V, 2450 mAh (nominal) 18.1 Wh removable, rechargeable Li-Ion
  - Life: 300 cycles (full charge and discharge) recommended, 600 cycles maximum
  - Available status via front panel or remotely: Health, cycle count, date first used, serial number
  - Max. charge time: 4 hours
- Print duty cycle: 3,000 inches/day (76,200 mm/day)
- DC charging input: 12 VDC ± 10% at 2A maximum

Physical Specifications

	QLn220	QLn320
Height	2.75″ (70mm)	3.3″ (84mm)
Width	3.5″ (89mm)	4.6″ (117mm)
Depth	6.5″ (165mm)	6.8″ (173mm)
Weight (w/battery)	1.25 lbs (0.57 kg)	1.6 lbs (0.72 kg)

QLn220 is 9% smaller by volume than the QL220
QLn320 is 23% smaller by volume than the QL320

Environmental Specifications

- Operating Temperature
    - Healthcare models: 32°F (0°C) to 122°F (50°C)
- Charging Temperature: 32°F (0°C) to 104°F (40°C)
- Cradle Temperature: 32°F (0°C) to 122°F (50°C)
- Storage Temperature: -13°F (-25°C) to 158°F (65°C)
- Relative Humidity:
    - Operation: 10% to 90% non-condensing
    - Storage: 10% to 90% non-condensing
- IP Rating: 43 (IP54 with soft case)

Healthcare Features (Healthcare models only)

- Disinfectant-ready plastics
- Approved cleaning agent ingredients (see separate "Guide to Disinfecting and Cleaning Zebra Healthcare Printers" for more details):
    - Isopropyl and Ethyl alcohol (including wipes)
    - Ammonium
    - Hydrogen peroxide
    - Phosphoric acid
    - Bleach/sodium hypochlorite
    - Mild dish soap
- QLn420 / ZT200-style menu system with password protection
- Allows front-panel configuration of:
    - ZPL label length
    - Black bar or gap sensor selection
    - Inactivity timeout
    - Serial port baud rate
- IEC 60601-certified AC adapter for medical environments

Agency Approvals

- **Emissions**: FCC Part 15, Subpart B, EN55022 Class-B, EN60950, EN55024 and VCCI class B
- **Susceptibility**: EN55024, EN61000-4-2, EN61000-4-3, EN61000-4-4, and EN61000-4-5
- **Safety**: CE, UL, TUV, CSA

Preventative Maintenance

Zebra recommends cleaning the QLn series printers 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 are cleaned with 70% isopropyl alcohol (IPA) or blown air to remove any particles. (For Healthcare models see separate "Guide to Disinfecting and Cleaning Zebra Healthcare Printers")
- **Battery:** It is recommended that the battery be fully discharged several times by cycling it to maximize performance.

Application Flexibility

QLn printers are designed to support a wide variety of applications and media types. Please consult the CPCL, ZPL or EPL programming manuals for configuration details. Zebra recommends qualifying any application with thorough testing.

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