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**Zebra Technologies
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ZEBRA MOBILE *QLn* SERIES PRINTER SPECIFICATIONS

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

- Direct thermal printing of bar codes, text and graphics
- 203 dpi resolution (8 dots/mm)
- Print speed: up to 4 ips (100 mm/s)
- CPCL and ZPL [Future] programming languages
- Resident fixed and scalable fonts
- 400 MHz 32-bit ARM processor with 128 MB RAM
- 256 MB Flash supports downloadable programs, receipt formats, fonts, and graphics
- Serial and USB ports (both support strain relief)
- 2.45 AH removable Li-Ion smart battery
- Built in battery charger
- 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 receipt 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 (with customizable HTML pages), Wavelink Avalanche[®] [Future firmware update]
- Large, easy to read LCD control panel 240 x 128 pixels
- LCD can be customized using WML (text and icons)
- 5-way navigation buttons, two software defined keys
- Printer alerts on the display, help menus
- Tolerance of multiple drops from 5' (1.52m) to concrete
- Label odometer
- Real Time Clock

Charging Options

- Charge the battery inside the printer using:
 - AC adapter
 - Single cradle
 - Quad cradle
- Charge the battery outside the printer using:
 - Single charger
 - Quad charger (same as QL Plus)

Optional Features

- 802.11b/g radio with support for:
 - WEP, TKIP, and AES encryption
 - EAP-FAST, EAP-TTLS, EAP-TLS, PEAP, LEAP
 - 802.1x
 - WPA and WPA2
 - 802.11d and 802.11i
- Bluetooth[™] 2.1 radio
 - Security modes 1 - 4
- 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 [Future firmware update]

Accessories

- Spare batteries
- AC Adapter
- SC2 smart battery single charger
- Quad battery charger (same as QL Plus)
- QLn-EC – single bay Ethernet and charging cradle[®] [Future]
- QLn-EC4 – quad bay Ethernet and charging cradle, with internal switch and stacking port [Future]
- Shoulder strap
- Hand strap
- Soft case (IP54 rating when used)
- Serial and USB cables with strain relief

ZebraLink Software Solutions

ZebraDesigner Pro – An intuitive, easy-to-use software program for creating complex label designs

ZebraDesigner – Basic features for simple label design

ZebraNet Bridge Enterprise – Centrally manage Zebra printers anywhere on your global network.

ZebraDesigner Driver – Zebra driver compliant with Windows 95/98/2000/2003/ME/NT/XP, Vista, Win7

Zebra Setup Utility – Single printer configuration utility
Multplatform Software Development Kit – Simplifies printing application development with support for

Blackberry[®], Apple[®], Android[®], WinCE[®], and WinMobile[®] platforms.

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 [Future]

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 print head temperature compensation
- Format inversion (white on black)
- Four position field rotation (0°, 90°, 180°, 270°)
- 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), 24x24 (simplified); Japanese 16x16, 24x24; Korean Mincho, Meong; Russian
- Scalable text feature
- Standard resident fonts can be rotated in 90° increments
- Supports user defined fonts and 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 Bar Code Symbolologies

- Bar Code Ratios: 1.5:1, 2:1, 2.5:1, 3:1, 3.5:1
- Linear Bar Codes: 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

- 2-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 [Future firmware update]

- Supports version X.16 (and onwards)
- 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 (0°, 90°, 180°, 270°)
- 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 C.P.I.
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 available

ZPL Bar Code Symbolologies

- Bar Code Ratios: 2:1, 3:1, 5:2, 7:3
- Linear Bar Codes: 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 2 or 5 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)
- 2-Dimensional: PDF417, MicroPDF-417, Code 49, TLC39, Maxicode, Codablock, Data Matrix, QR code, Aztec

ZPL Graphics

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

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 / 5.5 mil	2.3 mil / 6.5 mil
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)

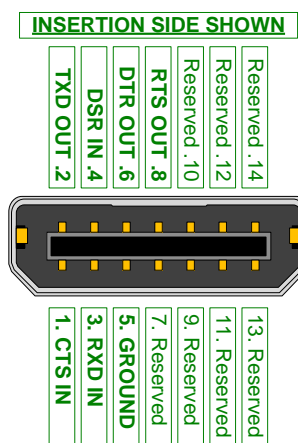
- UDP / TCP
- DHCP / BootP
- FTP / Mirror
- HTTP
- SMTP / POP3
- Telnet
- LPD
- SNMP

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



Electrical Specifications

- Smart Battery:
 - ⇒ 7.4 V, 2.45 AH 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: 2,000 inches / day (50,800 mm / day)
- DC charging input: 12 VDC \pm 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: -4°F (-20°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)

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.

• 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 or ZPL programming manual for configuration details. Zebra recommends always qualifying any application with thorough testing.