

^BQ – QR Code Bar Code

Description The ^BQ command produces a matrix symbology consisting of an array of nominally square modules arranged in an overall square pattern. A unique pattern at three of the symbol's four corners assists in determining bar code size, position, and inclination.

A wide range of symbol sizes is possible, along with four levels of error correction. User-specified module dimensions provide a wide variety of symbol production techniques.

QR Code Model 1 is the original specification, while QR Code Model 2 is an enhanced form of the symbology. Model 2 provides additional features and can be automatically differentiated from Model 1.

Model 2 is the recommended model and should normally be used.

This bar code is printed using field data specified in a subsequent ^FD string.

Encodable character sets include numeric data, alphanumeric data, 8-bit byte data, and Kanji characters.

Format ^BQa,b,c,d,e




Important • If additional information about the QR Code bar code is required, go to www.aimglobal.org.

Parameters	Details
a = field orientation	<i>Fixed Value:</i> normal (^FW has no effect on rotation)
b = model	<i>Accepted Values:</i> 1 (original) and 2 (enhanced – recommended) <i>Default Value:</i> 2
c = magnification factor	<i>Accepted Values:</i> 1 to 10 <i>Default Value:</i> 1 on 150 dpi printers 2 on 200 dpi printers 3 on 300 dpi printers 6 on 600 dpi printers
d = error correction	<i>Accepted Values:</i> H = ultra-high reliability level Q = high reliability level M = standard level L = high density level <i>Default Value:</i> Q = if empty M = invalid values
e = mask value	<i>Accepted Values:</i> 0 - 7 <i>Default Value:</i> 7



Example 1 • This is an example of a QR Code bar code:

ZPL II CODE	QR CODE BAR CODE
<pre>^XA ^FO100,100 ^BQN,2,10 ^FDMM,AAC-42^FS ^XZ</pre>	

On the pages that follow are specific commands for formatting the ^BQ command with the ^FD statements that contain the information to be coded.

Considerations for ^FD When Using the QR Code:

QR Switches (formatted into the ^FD field data)

mixed mode <D>

D = allows mixing of different types of character modes in one code.

code No. <01 16>

Value = subtracted from the Nth number of the divided code (must be two digits).

No. of divisions <02 16>

Number of divisions (must be two digits).

parity data <1 byte>

Parity data value is obtained by calculating at the input data (the original input data before divided byte-by-byte through the EX-OR operation).

error correction level <H, Q, M, L>

H = ultra-high reliability level

Q = high reliability level

M = standard level (default)

L = high density level

character Mode <N, A, B, K>

N = numeric

A = alphanumeric

Bxxxx = 8-bit byte mode. This handles the 8-bit Latin/Kana character set in accordance with JIS X 0201 (character values 0x00 to 0xFF).

xxxx = number of data characters is represented by two bytes of BCD code.

K = Kanji — handles only Kanji characters in accordance with the Shift JIS system based on JIS X 0208. This means that all parameters after the character mode K should be 16-bit characters. If there are any 8-bit characters (such as ASCII code), an error occurs.

data character string <Data>

Follows character mode or it is the last switch in the ^FD statement.

data input <A, M>

A = Automatic Input (default). Data character string JIS8 unit, Shift JIS. When the input mode is Automatic Input, the binary codes of 0x80 to 0x9F and 0xE0 to 0xFF cannot be set.

M = Manual Input

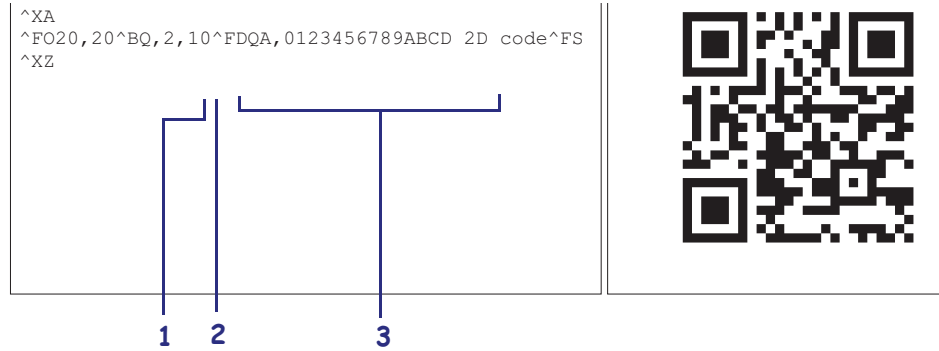
Two types of data input mode exist: Automatic (A) and Manual (M). If A is specified, the character mode does not need to be specified. If M is specified, the character mode must be specified.

^FD Field Data (Normal Mode)

Automatic Data Input (A) with Switches

```
^FD
<error correction level>A,
<data character string>
^FS
```

➔ **Example 1 • QR Code, normal mode with automatic data input.**



1	Q = error correction level
2	A, = automatic setting
3	data string character

Manual Data Input (M) with Switches

```
^FD
<error correction level>M,
<character mode><data character string>
^FS
```

➔ **Example 2 • QR Code, normal mode with manual data input:**

ZPL II CODE	GENERATED LABEL
<pre> ^XA ^FO20,20^BQ,2,10 ^FDHM,N123456789012345^FS ^XZ </pre>	

1	H = error correction level (ultra-high reliability level)
2	M, = input mode (manual input)
3	N = character mode (numeric data)
4	data character string

➔ **Example 3 • QR Code, normal mode with standard reliability and manual data input:**

ZPL II CODE	GENERATED LABEL
<pre> ^XA ^FO20,20^BQ,2,10^FDMM,AAC-42^FS ^XZ </pre>	

1	M = error correction level (standard-high reliability level)
2	M, = manual input
3	A = alphanumeric data
4	AC-42 = data character string

^FD Field Data (Mixed Mode – requires more switches)**Automatic Data Input (A) with Switches**

```
^FD
<D><code No.> <No. of divisions> <parity data>,
<error correction level> A,
<data character string>,
<data character string>,
< : >,
<data character string n**>
^FS
```

Manual Data Input (M) with Switches

```
^FD
<code No.> <No. of divisions> <parity data>,
<error correction level> M,
<character mode 1> <data character string 1>,
<character mode 2> <data character string 2>,
< : > < : >,
<character mode n> <data character string n**>
^FS
```

n** up to 200 in mixed mode



Example • QR Code, mixed mode with manual data input:

ZPL II CODE	GENERATED LABEL
<pre> ^XA ^FO,20,20^BQ,2,10 ^FDD03048F,LM,N0123456789,A12AABB,B0006qrcode^FS ^XZ </pre>	

<mixed mode identifier>	D	(mixed)
<code No.>	M	(code number)
<No. of divisions>	D	(divisions)
<parity data>	M	(0x0C)
	.	
<error correction level>	L	(high-density level)
<input mode>	M	(manual input)
	.	
<character mode>	N	(numeric data)
<data character string>		0123456789
	.	
<character mode>	A	(alphanumeric data)
<data character string>		12AABB
	.	
<character mode>	B	(8-bit byte data)
	0006	(number of bytes)
<data character string>		qrcode



Example • This is an example of QR Code, mixed mode with automatic data input:

```

^XA
^FO20,20^BQ,2,10
^FDD03040C,LA,012345678912AABBqrcode^FS
^XZ
    
```

<mixed mode identifier>	D	D (mixed)
<code No.>	M	03 (code number)
<No. of divisions>	D	04 (divisions)
<parity data>	M	0C (0x0C)
<error correction level>	L	L (high-density level)
<input mode>	A	A (automatic input)
<data character string>		012345678912AABBqrcode



For proper functionality, when encoding Kanji characters in ^CI28-30 (Unicode) be sure the JIS.DAT table is loaded on the printer and specified.



Example • This is a Unicode example:

ZPL II CODE	GENERATED LABEL
<pre> ^XA^SEE:JIS.DAT^CI28 ^FO20,20^BQ,2,10^FDLM,年月^FS ^XZ </pre>	