



AN-09 (Easy Print)

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HOW TO SELECT BAR CODES IN EASY PRINT MODE

All bar codes in O'Neil thermal printers are resident in the printer and do not need to be downloaded. Bar Codes are selected when you create a field entry for an Easy Print print job. In each field entry you need to specify the bar code you want to print. To print using Easy Print, the command is PRINT and the DATA is a succession of descriptors for each field, or "thing" to be printed (whether the "thing" is text, bar code, or graphic). Optional global parameters affect the entire print job.

```
{PRINT<,GLOBALPARAMETERS>:
[FIELD 1]
.
[FIELD n]
}
```

Each field, regardless of what is to be printed is virtually identical. If a field is to contain a bar code, then the bar code must be selected for that field. Each FIELD has the form:

```
@ROW,COL:NAME<FIELD PARAMETERS>|DATA|
```

Begins with an "@" (0x40)

Is followed by WHERE the data is to be printed (ROW,COL). The row and column are always followed by a colon ":" (0x3A)

That is followed by HOW is to be printed. In this case, since we are printing bar code we must include the Easy Print name for that bar code (from the documentation as well as printed on the self test)

That is followed by WHAT is to be printed which is the DATA to be printed. Data is always delimited by a vertical bar (0x7C) before and after the data. Optionally, a comma "," (0x2C) can follow HOW to be printed for modifiers (or "field parameters") for that FIELD. Although optional and a bar code will print even without field parameters, to get the bar code to look the way you need it to look, you will probably need to use field parameters.

The Easy Print name for the bar codes that are present in the printer are shown on the self test. The exact list of bar codes may vary from version to version of printer:

Available Bar Codes:

*---DESCRIPTION----	*---NAMES----
INTLV 2of5 ratio 2:1	BCI25 (8CH)
CODE 128 (AUTO A-C)	BC128 (91H)
EAN-128 (AUTO A-C)	EA128 (92H)
.	
.	
PDF-417 CLUSTERS 036	PD417 (99H)
CODE 93 BAR CODE 2:1	BC093 (82H)



NAME	BAR CODE TYPE	RATIO	VALID CHARS	COMMENTS
BCI25	Interleaved 2 of 5	2:1	0-9	Needs an even number of digits – if not even, a leading zero is inserted
BC128	Code 128	2:1	All lower case, upper case, punctuation, numbers, and control codes in ASCII 0x00 through 0x7F	Escape Easy Print “ ” (end of data) with leading “/”; to print “/” use “//”. Function characters 1-4 are /1 - /4
EN128	EAN-128	2:1	All lower case, upper case, punctuation, numbers, and control codes in ASCII 0x00 through 0x7F	Escape Easy Print “ ” (end of data) with leading “/”; to print “/” use “//”. Function characters 1-4 are /1 - /4
BC39N	Code 39	2:1	Space \$ % + - . / 0-9 A-Z	Printer inserts leading and trailing “*” if not sent in data
BC39W	Code 39	3:1	Space \$ % + - . / 0-9 A-Z	Printer inserts leading and trailing “*” if not sent in data
COBAR	Codabar	2:1	\$ + - . / 0-9 ABCD	Guard bars are sent as part of data
I2OF5	Interleaved 2 of 5	2.5:1	0-9	Needs an even number of digits – if not even, a leading zero is inserted
EAN08	8 Digit EAN	2:1	0-9	Send 7 digits – printer calcs chksum (8 th char)
EAN13	13 Digit EAN	2:1	0-9	Send 12 digits – printer calcs chksum (13 th char)
UPC-A	UPC A	2:1	0-9	Send 11 digits – printer calcs chksum (12 th char)
UPC-E	UPC E	2:1	0-9	Send 7 digits – printer calcs chksum (8 th char)
PD417	PDF-417	Set by User	Any byte value 0-255	Text and Binary modes supported. Large numeric sequences are not compressed to the maximum extent, but will print
BC093	Code 93	2:1	All lower case, upper case, punctuation, numbers, and control codes in ASCII 0x00 through 0x7F. Some are combinations (e.g. A=A but a=+A)	Printer calculates check digits



Although a bar code will print without using any field parameters, to get the size and density of bar code desired, you will probably need to use some field parameters. The following table shows the valid field parameters for bar codes (more information can be found in AN-10 for printing PDF-417):

FIELD PARAMETERS	
WIDE nn (W nn)	The WIDE parameter is used to change the density of the bar code. By default and unless otherwise specified, the narrow element is .005". The WIDE parameter is similar to HMULT in that it can multiply that width by nn times horizontally. If nn = 2, then all horizontal dimensions of the bar code are increased by 2x and the narrow bar is .010". If bb=3 all horizontal dimensions increase by a factor of 3 etc.
HIGH nn (H nn)	The HIGH parameter is used to change the height of the bar code. By default, bar codes are 5 dotlines or .025" high. The HIGH parameter is similar to VMULT in that it can multiply that height by nn times vertically. If nn = 2, then the bar code is .050" high. If nn = 20, then the bar code is 0.5" high. If nn = 40 the bar code is 1" high.
PDF417 BAR CODE	
COLUMNS	Use this parameter to override the default fit of 2 columns for the PDF-417 bar code to specify the actual number of data columns being printed across any given line of the bar code. The number of columns that will fit across a page is dependent upon the page width as well as the X and Y dimensions of each block (see XDIM and YDIM)
SECURITY n	Use this parameter to override the default security settings (defaults are 1-40 characters -> level 2; 40-160 characters -> level 3; 161-320 characters -> level 4 and 321-863 characters -> level 5. By specifying the value of n, you can change the number of codewords used to protect the data: n = 1 -> Level 1 adds 4 codewords n = 2 -> Level 2 adds 8 codewords n = 3 -> Level 3 adds 16 codewords n = 4 -> Level 4 adds 32 codewords n = 5 -> Level 5 adds 64 codewords n = 6 -> Level 6 adds 128 codewords n = 7 -> Level 7 adds 256 codewords n = 8 -> Level 8 adds 512 codewords
XDIM n	By default, the X dimension is 1 dot at .005" per dot. The value of n can be used to increase this to .010" (n = 2), .015" (n = 3) etc. A commonly used value for the XDIM is 2, with the YDIM being 3 times that set for X
YDIM n	By default, the Y dimension is 1 dot at .005" per dot. The value of n can be used to increase this to .010" (n = 2), .015" (n = 3) etc. A commonly used value for the YDIM is 6, with the XDIM being 1/3 that set for Y

To print a bar code with the letters A-H at Row 10, Column 10, the field description line in the Easy Print job would look like (where NAME would be replaced by the name of the font you wish to use – note that not all bar codes can print the alphabet):

```
@35,50:NAME|ABCDEFGH|
```

To print that bar code using Code 39, simply replace the NAME with the name BC39N

```
@35,50:BC39N|ABCDEFGH|
```

To use a different bar code simply call out a different name. Replacing NAME with BC128 instead would print that same line using the code 128 bar code:

```
@35,50:BC128|ABCDEFGH|
```

Although the preceding two examples print bar codes, they probably do not look the way we want them to look. The bar codes are only about 1/32" high, and the narrowest element is .005" which is close to the limit of some older scanners. It might be more reasonable to increase the height to 1/2" and use a narrow bar of .010". This is done with the high and wide field parameters:

```
@35,50:BC128, HIGH 20, WIDE 2|ABCDEFGH|
```



-TWO DIMENSIONAL BAR CODES - PDF 417 BAR CODE

Printing a bar code using PDF-417 bar code is almost identical to printing any other bar code, except there are a few additional field parameters and general precautions. As with any bar code that can encode control characters such as Carriage Return and Line Feed – DO NOT put CR/LF in the data unless you want the CR/LF to be printed in the bar code.

PDF-417 has several field parameters that may be specified:

1. COLUMNS will specify the number of columns of DATA printed in each row of the bar code. If not specified, the default value of 2 columns is used. Note that the actual number of columns is 4 greater than the number of data columns (there are 2 guard columns and 2 row indicator columns).
2. SECURITY specifies the level of error detection and correction codes, from 1 through 8. If not specified, the default value for the number of data characters to be printed is used:
 - 1-40 characters level 2
 - 40-160 characters level 3
 - 161-320 characters level 4
 - 321-863 characters level 5
3. YDIM specifies the height of each element, in units of .005 inches. Default is 1
4. XDIM specifies the width of each element, in units of .005 inches. Default is 1

PDF-417 symbols contains:

1. A maximum of 1848 text characters (fewer if mixed with arbitrary bytes)
2. A minimum of 3 rows and a maximum of 30 rows
3. A minimum of 1 column and a maximum of 30 columns
4. Error detection and correction characters vary with different security levels:
 - Level 1 adds 4 codewords
 - Level 2 adds 8 codewords
 - Level 3 adds 16 codewords
 - Level 4 adds 32 codewords
 - Level 5 adds 64 codewords
 - Level 6 adds 128 codewords
 - Level 7 adds 256 codewords
 - Level 8 adds 512 codewords

EXAMPLE :

```
{PRINT:
@75,10:PD417,YDIM 6,XDIM 2,COLUMNS 2, SECURITY 3|ABCDEFGHijkl|
}
```

Will print a PDF-417 bar code containing ABCDEFGHIJKL with each element .010" wide and .030" high, with each row containing 2 data bytes and using a error detection and correction level of 3, which adds 16 error correction code words to the bar code.

You can print any characters using the O'Neil PDF-417. It is optimized for the most common printing of a mixture of numbers, text, and control characters.