

MAGNIFICATION

Barcodes in the retail sector are sometimes measured in terms of their magnification factor based on a starting point of 100%. The dimensions for a 100% magnification factor barcode are shown in the table below for each of the symbologies, including light margins and human readables unless stated otherwise. (note. bearer bars and H guages have not been accounted for).

Symbology	Nominal Bar (X Dimension)	Width	Height
EAN13	330	37.29	25.91
EAN8	330	26.73	21.31
UPC-A	330	37.29	25.91
UPC-E	330	22.11	25.91
ITF14	1016	142.82	31.75 (bars only)
EAN128	1016	Variable	31.75 (bars only)

HUMAN READABLES

Human Readables are shown as a visual guide to the content of the barcode, should the need arise to key the code in manually. They are generally located to the bottom of the code.

LIGHT MARGINS

Light Margins (Quiet Zones) are the areas to each side of the code that must be kept clear. Light Margins are measured in terms of 'n' times the nominal bar size. The light margins required for a barcode vary, depending on the barcode type and even depending on the size of the barcode. For example an EAN13 at 100% has a nominal bar size of 330 microns, and the right hand margin should be 7 times this, so: $7 \times 0.33 = 2.31\text{mm}$ for the RH Light Margin of an EAN13 at 100%.

Light Margins are sometimes protected by a human readable character or Light Margin Indicators (< >) can be used.

Symbology	Left Hand Margin modules/mm @ 100%	Right Hand Margin modules/mm @ 100%
EAN13	11 / 3.63	7 / 2.31
EAN8	7 / 2.31	7 / 2.31
UPC-A	9 / 2.97	9 / 2.97
UPC-E	9 / 2.97	7 / 2.31
ITF14	10 / 10.2	10 / 10.2
EAN128	10 / 10.2	10 / 10.2

RECOMMENDED APERTURE SIZES

The measuring aperture of a bar code scanner/verifier should ideally be matched to the nominal bar size, as follows:

- 5mil - >330 microns
- 10mil - 330>635 microns
- 20mil - <635 microns

[For all UPC and EAN retail codes both the UCC and EAN International specify that a 150micron (6mil) aperture should be used, and for UCC-EAN128 barcodes a 250micron (10mil) aperture should be used regardless of the size of the barcode.]