

UPC-E barcode

Fact Sheet

The UPC-E barcode is used to encode a zero-suppressed GTIN-12 and is intended for scanning in a retail Point-of-Sale (POS) environment only. Note that GS1 US is no longer allocating GTIN-12s that are able to be zero-suppressed.

Figure 1: UPC-E barcode at nominal size (100%)



Note: Figure is not to scale. Measurements are in millimetres.

Magnification (X-dimension)

The x-dimension is the specified width of the narrowest element of a barcode. The element refers to the barcode's bars and spaces. The x-dimension is not a set size and instead can range between a minimum and maximum value, and a target x-dimension.

The specified magnification (X-dimension) range for a UPC-E Barcode being scanned at retail POS is between 80% and 200% (X-dimension 0.26mm - 0.66mm). An allowable minimum magnification of 75% (X-dimension 0.25mm) is applicable only to on demand (e.g. thermal) print processes given the following qualifications:

- The bar height shall never be truncated below the minimum height for an 80% magnification barcode.
- When printing a minimum symbol with any method of printing, the area provided for printing the symbol and the required Quiet Zone should never be less than the area required for an 80 percent magnification barcode (area = (symbol length + Quiet Zone) x height).

Human Readable Interpretation

The Human Readable Interpretation should be printed beneath the barcode and must show all digits encoded in the barcode. A clearly legible font such as OCR-B or sans serif font types such as Arial are preferred. Bold, italics, light or narrow versions of a font SHOULD NOT be used. The font size SHOULD be at least 2mm in height.

The U.P.C. Prefix and Check Digit, encoded by variable parity, are shown outside the guard bar patterns, to the left and right respectively, and within the Quiet Zones. These two human readable digits are aligned with the other six digits. The U.P.C. Prefix and the Check Digit are reduced in size to a maximum width of four modules (=1.32mm at nominal size) with a proportional height.

The U.P.C. Prefix should be five module widths (1.65mm, at nominal size) to the left of the left guard bar pattern, and the Check Digit a minimum of three module widths (0.99mm at nominal size) to the right of the right guard bar pattern.

Previous specifications have suggested that the U.P.C. Prefix and Check Digits be shown in Human Readable Interpretation halfway up the barcode to the left and right, or that the Check Digit be omitted altogether. While not the current recommendation, UPC-E barcodes based on this format may continue to appear.

Symbol Height

The dark bars forming the left, centre and right Guard Bar Patterns shall be extended downward by 5X (1.65mm at nominal size). See Table 1 for height of bars at various X-dimensions.

Currently the retail industry is undergoing a worldwide transition to next generation 2D barcodes. For more information please refer to - <https://www.gs1au.org/standards/2d-barcodes>

Table 1: UPC-E barcode dimensions

Magnification	X-dimension	Width	Bar Height**	Left Quiet Zone	Right Quiet Zone
80%	0.26	13.47	18.28	2.38	1.85
85%	0.28	14.31	19.42	2.52	1.96
90%	0.30	15.15	20.57	2.67	2.08
95%	0.31	15.99	21.71	2.82	2.19
100%	0.33	16.83	22.85	2.97	2.31
105%	0.35	17.67	23.99	3.12	2.43
110%	0.36	15.51	25.14	3.27	2.54
115%	0.38	19.36	26.28	3.42	2.66
120%	0.40	20.20	27.42	3.56	2.77
125%	0.41	21.04	28.56	3.71	2.89
130%	0.43	21.88	29.71	3.86	3.00
135%	0.45	22.72	30.85	4.01	3.12
140%	0.46	23.56	31.99	4.16	3.23
145%	0.48	24.40	33.13	4.31	3.35
150%	0.50	25.25	34.28	4.46	3.47
155%	0.51	26.09	35.42	4.60	3.58
160%	0.53	26.93	36.56	4.75	3.70
165%	0.54	27.77	37.70	4.90	3.81
170%	0.56	28.61	38.85	5.05	3.93
175%	0.58	29.45	39.99	5.20	4.04
180%	0.59	30.29	41.13	5.35	4.16
185%	0.61	31.14	42.27	5.49	4.27
190%	0.63	31.98	43.42	5.64	4.39
195%	0.64	32.82	44.56	5.79	4.50
200%	0.66	33.66	45.70	5.94	4.62

Notes:

- Width = width of barcode excluding Quiet Zones.
- Bar Height = bar height excluding guard bar patterns.
- To allow for possible ink spread, allow slightly more than the minimum required Quiet Zone.
- All measurements are in millimetres.

** For trade items scanned at general retail POS (but not in general distribution), bar height may be truncated to suit packaging constraints. However, the symbol height SHALL NOT be reduced below 60% of the minimum height specified for the applicable X-dimension. Excessive truncation can adversely affect omnidirectional scanning performance, especially at retail point of sale. For example, a UPC-E with a 100% magnification which requires a height of 22.85mm can be truncated upto 60% of the height but, still needs to have a minimum of 9.14mm height which is 40% of the full height.