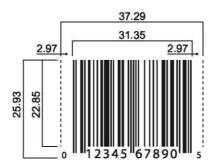# UPC-A barcode
Fact Sheet

The UPC-A barcode is used to encode a GTIN-12 and can be scanned in both a retail Point-of-Sale (POS) and a General Distribution Scanning environment.

Figure 1: UPC-A 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-A 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 required 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 X-dimension of 0.26 millimetres. This area is derived from the total width of an 80 percent symbol times its height.

Where an item may also be scanned in a General Distribution Scanning environment the allowable magnification range is 150% to 200% (X-dimension 0.50mm – 0.66mm).

Human Readable Interpretation

The Human Readable Interpretation should be printed beneath the barcode and must show all digits encoded in the barcode and only those twelve digits.

A clearly legible font such as OCR-B or sans serif font types such as Arial are preferred. Bold, italics or narrow versions of a font should not be used, and the minimum font height is 2 mm.

The first and last human readable digits are smaller than the other digits. Reduce the first digit and the Check Digit (last digit) to a maximum character width of four module widths (1.32mm at nominal size), and a height that is proportional to the modified width.

Locate the first human readable digit five module widths (1.65mm at nominal size) to the left of the left guard bar pattern. Locate the Check Digit five module widths (1.65mm at nominal size), to the right of the right guard bar pattern.

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). This shall also apply to the bars of the first and last symbol characters. See Table 1 for heights of the 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-A barcode dimensions

Magnification	X-dimension	Width	Bar Height	Left Quiet Zone	Right Quiet Zone
80%	0.26	25.08	18.28	2.38	2.38
85%	0.28	26.65	19.42	2.52	2.52
90%	0.30	28.22	20.57	2.67	2.67
95%	0.31	29.78	21.71	2.82	2.82
100%	0.33	31.35	22.85	2.97	2.97
105%	0.36	32.92	23.99	3.12	3.12
110%	0.36	34.49	25.14	3.27	3.27
115%	0.38	36.05	26.28	3.42	3.42
120%	0.40	37.62	27.42	3.56	3.56
125%	0.41	39.19	28.56	3.71	3.71
130%	0.43	40.76	29.71	3.86	3.86
135%	0.45	42.32	30.85	4.01	4.01
140%	0.46	43.89	31.99	4.16	4.16
145%	0.48	45.46	33.13	4.31	4.31
150%	0.50	47.03	34.28	4.46	4.46
155%	0.51	48.59	35.42	4.60	4.60
160%	0.53	50.16	36.56	4.75	4.75
165%	0.54	51.73	37.70	4.90	4.90
170%	0.56	53.30	38.85	5.05	5.05
175%	0.58	54.86	39.99	5.20	5.20
180%	0.59	56.43	41.13	5.35	5.35
185%	0.61	58.00	42.27	5.49	5.49
190%	0.63	59.57	43.42	5.64	5.64
195%	0.64	61.13	44.56	5.79	5.79
200%	0.66	62.70	45.70	5.94	5.94

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.