

Bar Coding for Books

A GUIDE FOR PUBLISHERS

Why publishers should use bar codes

Bar code scanning is the fastest and most accurate way for retailers to collect the information they need about the products they are selling. All major bookshops operate electronic point of sale (EPOS) systems which enable them to maximise sales and reduce stocks using the sales information they have collected. To enable full use of this equipment, it is essential for publishers to follow the required trade standards for the use of bar codes on books.

Publishers who do not bar code their titles may well find retailers refusing to accept their publications.

Publishers of all sizes will get direct or indirect benefits from bar coding:

- The bar codes can be scanned during distribution to ensure accurate servicing to booksellers.
- Retail scanning allows retailers to re-order stock so that a title can be readily on display.

What is a bar code?

A bar code is a rectangular block of parallel bars and light spaces, arranged in a particular format, to meet specific requirements. It is a conversion of eye readable information into machine readable form.

Within the book industry, a bar code contains a book's International Standard Book Number (ISBN), which since 1 January 2007 comprises 13 digits (12 digits plus a check digit), with the option of including one other piece of supplementary information such as the price or stock code for in-house use.

The machine readable code is a structured symbol containing three main elements. The EAN13 bar code forms the main part, with, below the code, an eye readable version of the 13-digit number. Publishers may also wish to print, above the code, an eye readable version of the ISBN retaining the hyphenation structure of the number.

A publisher using a third party distributor should consult the distributor when selecting the most suitable version of the bar code.

Recommended bar code symbols

1. Version NR

The basic symbol includes the ISBN in EAN bar code form and in eye readable font above the code. This version provides all the information needed by UK retailers and is generally recommended for use in the UK book trade.

Magnification Factor	Overall Symbol Size width x height
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0.90	34 x 29mm
0.95	36 x 30mm
1.00	38 x 31mm
1.05	40 x 33mm
1.10	42 x 34mm



2. Version NK (with price add-on)

The expanded symbol includes the ISBN in EAN bar code and encodes the price in a supplementary bar code. UK publishers are recommended to use this version with the US price if they are selling a book into the US market. In the UK, booksellers use the basic symbol to look up on their EPOS systems the price relating to the encoded ISBN, whereas in the US an encoded price is required by some retailers. The presence of a US price is not an impediment to the correct reading of the bar code by UK retailers.

Magnification Factor	Overall Symbol Size Width x height
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0.90	50 x 29mm
0.95	53 x 30mm
1.00	56 x 31mm
1.05	58 x 33mm
1.10	61 x 34mm



The currency of the price is identified by the initial digit of the add-on code. The 5 digit supplementary, shown in the example, enables prices between 1p (00001) and £99.99 (09999) to be machine readable. The current allocations of currency prefix digits for English language publishing is as follows:

0	UK £ price to £99.99
5	US \$ price to \$99.99
6	Canadian \$ price to \$99.99

Prefixes 1, 2, 3 and 4 are also reserved for use in the USA for books at higher prices.

3. Version NF

ISBN/EAN symbol with 5 digit supplementary for publisher's own in-house use. (These supplementary codes always start with 9 within the range 90000-98999).

Magnification Factor	Overall Symbol Size Width x height
0.90	50 x 29mm
0.95	53 x 30mm
1.00	56 x 31mm
1.05	58 x 33mm
1.10	61 x 34mm



What is an ISBN?

The International Standard Book Number system is used world-wide to give a book, and any specifically related material, its own unique number to facilitate bibliographical recording and prevent errors in ordering.

Publishers can only obtain ISBNs from an ISBN agency. For publishers in the UK and Ireland, the Standard Book Numbering Agency, Midas House, 62 Goldsworth Road, Woking, Surrey GU21 6LQ (telephone 0870-777 8712, e-mail isbn@nielsenbookdata.co.uk) is the only body authorised to allocate UK ISBNs and should be contacted by publishing companies before publishing any titles.

The ISBN is a 13 digit number which consists of five standard elements;

1. The EAN prefix allocated to the ISBN, currently always 978 but in due course to be supplemented by 979 (apart from 979-0 which is used for sheet music) and other as yet unspecified prefixes.
2. Group identifier between 1 and 4 digits long: identifies the national, language, geographic or other area in which the book concerned was published. Titles published in the United Kingdom and bearing the 878 prefix carry an English Language Group identifier of 0 or 1;
2. Publisher identifier: between 2 and 7 digits long, allocated to the publisher;
3. Title identifier: can be between 1 and 6 digits long, allocated to the particular title;
4. The check digit is the final digit and is generated by a modulus 10 algorithm which confirms the validity of the ISBN.

A hyphen separates each part of the ISBN.

Converting ISBNs to EANs

Since 1 January 2007 the ISBN has been identical to the EAN, except that in its eye readable form the ISBN retains the hyphenation structure described above.

Prior to 2007, the ISBN consisted of ten digits and was converted into an EAN13 number for bar coding purposes. Those publishers who hold stocks of 10 digit ISBNs should have converted them to the 13 digit format. In the majority of cases, the final check digit will have changed. There is a useful converter available at <http://www.isbn-international.org/converter/converter.html>.

Size and location of bar codes

The size of the ISBN/EAN bar code is dependent upon the version used and magnification. The nominal magnification is referred to as 100%. Most good quality print techniques may produce sufficiently consistent symbols to allow for the symbol magnification to be below 100%. The smallest allowable size is 80% magnification but this greatly reduces the print tolerances available and should only be considered where space is at a high premium.

Flexography and silk screen processes may require symbols to be magnified greater than 100%. The maximum size symbol is at 200% magnification.

The height of the bar code is an essential aspect to ensure that it can be scanned first time on all types of scanner. Truncation - shortening of the height of the bar code - should be avoided. If there is a real need to truncate the symbol, this should be kept to a minimum.

The preferred position for the ISBN/EAN13 symbol is the bottom right-hand corner of the back of the book cover or jacket. The same ruling also applies to slip cases, boxed sets, paperbacks, books with printed covers and directly printed labels.

The preferred position assists speedy operational use in bookshops or warehouses since staff can rely on finding symbols in one standard position.

As the symbol must be situated on a smooth surface, it is recommended that no part of the symbol and light margins should be closer than 6mm to the edge of the wrapper/cover, or the crease where the cover is shaped over the spine.

The light margins to the left and right of the symbol (a space of approximately 2.5mm at nominal size) are vital to ensure that the bar code is scannable.

Additionally, the printed symbol must not be obscured by, for example, the use of promotional bands wrapped round the jacket. If the symbol has been manufactured to the approved standards, shrink-wrapping does not normally present problems when being scanned.

Useful sources for technical advice on print quality are film master suppliers and experienced printers.

How to obtain a bar code

Bar codes must be printed to the standards specified to ensure that they read properly the first time they are scanned.

The ISBN/EAN symbol can be printed by any of the conventional printing methods, provided that the requirements of the printing process selected are allowed for in the manufacture of the symbol.

The most satisfactory way for a publisher to obtain a good clean image for printing a bar code is to use a computer-generated master of the ISBN/EAN symbol for a particular title, which can be incorporated into the assembly for the cover or jacket. This will generally be available either as a computer file or on film and can be obtained from specialist companies using high-precision equipment. There is a list of some of these companies at the end of this document.

Low-cost or even free bar code software is widely available on the World Wide Web. However, publishers who wish to be confident that the bar codes on their books are correct and will scan properly may well prefer to deal with companies who understand the demands put on bar codes both in the production and retail environments. For example, printing processes cannot produce perfect and identical impressions. In relation to bar code printing there is a tendency for lines to be printed slightly wider than shown on the original and for the width of the bars to vary between successive impressions, but bar width reduction can be applied to the bars during the process of creating the bar code to compensate for print gain so that the printed symbol achieves ideal dimensions. Magnification of the symbol increases the print tolerances available and can therefore ensure that the range of variability in a print run is within the print tolerance.

An experienced bar code supplier can provide useful assistance to publishers embarking on the production of their first symbol, or technical help to an experienced publisher, needing, for example, to assess the suitability of a particular colour of ink.

Ordering a bar code

To order a bar code master the supplier will need the following information: the ISBN for the title, which should be given in full, using the hyphenated form; which of the three versions illustrated above is required, together with any supplementary information required to be encoded in the add-on codes; and any exceptional printing requirements.

Bar code labels

Where books have already been produced – or have been produced with an incorrect bar code – it is possible to sticker the book with an adhesive label. Specialist bar code label printers can be readily found, or labels can be sourced through the bar code suppliers listed at the end.

For the best results, the symbol on the label should be printed from a bar code master file or film. Providing care has been taken in ordering from a recommended supplier, the results should be effective.

The adhesive specification used for labels must also meet a publisher's requirements. For example, some publishing houses may require permanent labels for their books while others may need peelable labels e.g. for gift books.

If an EAN bar code on an adhesive label is being used to cover an existing bar code, the old bar code must be completely obliterated to avoid show-through causing problems when the new bar code is scanned.

Directly printed labels can be produced in a variety of layouts and presentations including the production of sheets and reels, special cartridges to fit applicator tools, or even as part of a production line combined printer/application system.

Ultimately, however, it is what is printed on the label that is crucial, and quality controlled origination processes are therefore vital to ensure that the label is scannable.

The rules for content and presentation applying to bar codes printed directly onto the book or book cover should also be followed when labels are used.

In house generation of bar codes

Software for generating bar codes in house is readily available (two suppliers are listed at the end of this document) but publishers should be cautious about some aspects of using such software, especially for in house printing. Most dot matrix printers are not suitable for printing bar codes. The techniques most likely to meet the exacting requirements for the ISBN/EAN-13 symbol will be thermal transfer and laser printing.

Durability of the image also needs to be considered. The symbol should be capable of lasting for approximately two years and be able to withstand up to 10 scans. Some direct printing processes may not be able to offer these standards, while others may be affected by handling and exposure to ultra-violet light and by electronic scanning equipment.

Colour guidelines

All scanning of printed images, including human vision, works by light being absorbed and reflected by the colours in that printed image. The first point to appreciate with bar code scanning is that the scanner perceives colours differently from the way that they are seen by the human eye.

EAN bar codes are scanned in the orange-red area of the light spectrum, and the bar codes must have sufficient contrast at this wavelength. This means that colours which are perceived as dark to the human eye can be light to a scanner and vice versa.

For absolute precision, there is no alternative but to carry out reflectance and print contrast measurements under the EAN specification. However some simple guidelines can be stated:

1. **Black bars on white backgrounds.** This is the ideal.
2. **Coloured bars on white backgrounds.** It is relatively easy for a film master supplier or printer to assess the suitability of an ink colour on a white substrate.
3. **Black bars on a coloured background.** Yellows and reds are acceptable background colours. Other colours should be tested. It is possible to select coloured substrates or to use a substrate with a yellow or red printed background.
4. **Colour on colour** is the most complex combination because the printing of one colour over the other may itself create a different contrast than from the two individual colours.

Generally the 'warm' colours (yellow, orange, red) are suitable for the background spaces; while the cold colours (blue and green) are suitable for printing the bars. Browns, purples and mauves which contain a mixture of blue/black as well as yellow/red should be tested for their reflectance values under the EAN specification.

Pale greens and blues are also a problem because of their yellow/white content. Film master manufacturers may be able to help with advice on colour selection.

5. Metallic colours such as gold and silver should not be used for the bars or background colour because they can reflect the scanning beam at unpredictable angles.
6. Embossed cover/jacket material should also be avoided as a substrate. If embossing is used, it should not impinge within 1 cm of the bar code symbol.

Suppliers of bar code masters

Axicon Auto ID

Church Road
Weston on the Green
Bicester
Oxon OX6 8QP
Tel: 01869-351155
Fax: 01869-351205
sales@axicon.com

Bar Code Services

Bedford House
Main Street
Cotesbach
Lutterworth,
Leics LE17 4XH
Tel: 01455-552005
Fax: 01455-550981
sales@barcode-services.demon.co.uk

Software suppliers

Agamik Ltd

163 Cathlaw House
Torphichen
West Lothian EH48 4NW
Tel: 01506-650163
Fax: 01506-630216
www.agamik.co.uk

Computalabel International Ltd

53a London Road
Leicester LE2 0PD
Tel: 0116-255 7898
Fax: 0116-255 7899
www.computalabel.com

Alver Valley Software

20 Fieldhouse Drive
Lee on the Solent
Hants PO13 9DE
Email: info@alvervalleysoftware.com
www.alvervalleysoftware.com

Label suppliers

The Labelstore (UK) Ltd

Millennium House
Deans Park
Borwick Drive
Beverley
East Yorkshire HU17 OHQ
Tel. 01482 887744
Fax 01482 880111
www.labelstore.co.uk

AC Labels (2010) Ltd

14 Parker Centre
Mansfield Road
Derby DE21 4SZ
Tel. 01332 890602
Email: enquiries@aclabels.co.uk
www.aclabels.co.uk

Label and software suppliers

Weber Marking Systems Limited

Macmerry Industrial Estate
Tranent
East Lothian EH33 1HD
Tel. 01875 611111
Email sales@weber.co.uk
www.weber.co.uk

Further information

AIM UK

The Old Vicarage, All Souls Road, Halifax, West Yorkshire HX3 6DR
Telephone 01422 368368 Fax 01422 355604

www.aimuk.org

The UK branch of a global affiliation of trade associates of Automatic Identification Manufacturers.

BOOK INDUSTRY COMMUNICATION (BIC)

39/41 North Road, London N7 9DP

Telephone/fax 020 7607 9021

www.bic.org.uk

Sponsored by the Publishers Association, the Booksellers Association, CILIP and the British Library to develop and promote standards for information communication throughout the book industry, BIC is responsible for promoting bar code and other auto ID standards to the UK book trade and providing assistance to publishers with information on the use of machine readable codes.

THE BOOKSELLERS ASSOCIATION OF GREAT BRITAIN AND IRELAND

Minster House, 272 Vauxhall Bridge Road, London SW1V 1BA

Telephone 020 7802 0802 Fax 020 7802 0803

www.booksellers.org.uk

Through its various committees and working parties monitors developments in Auto ID in book retailing.

THE BRITISH PHONOGRAPHIC INDUSTRY (BPI)

Riverside Building, County Hall, Westminster Bridge Road, London SE1 7JA

Telephone 020 7803 1300 Fax 020 7803 1310

www.bpi.co.uk

Controls and advises on the use of bar codes on audio-visual products.

THE BRITISH PRINTING INDUSTRIES FEDERATION (BPIF)

Farringdon Point, 29/35 Farringdon Road, London EC1M 3JF

Telephone 020 7915 8300 Fax 020 7405 7784

www.bpif.org.uk

Trade association for the UK printing industry.

GS1 UK

Staple Court, 11 Staple Inn Buildings, London WC1V 7QH

Telephone 020 7092 3500 Fax 020 7681 2290

www.gs1uk.org

GS1 UK is responsible for all article numbering outside the book industry.

PERIODICAL PUBLISHERS ASSOCIATION (PPA)

Queens House, 28 Kingsway, London WC2B 6JR

Telephone 020 7404 4166 Fax 020 7404 4167

www.ppa.co.uk

Association for magazine publishers. Monitors the use of ISSNs (International Standard Serial Numbers), the basis for EAN bar codes used in magazines, periodicals and journals.

THE PUBLISHERS ASSOCIATION (PA)

29B Montague Street, London WC1B 5BW
Telephone 020 7691 9191 Fax 020 7961 9199
www.publishers.org.uk

Represents the interests of UK publishers of books, related materials and journals.

UK ISBN AGENCY

Midas House, 62 Goldsworth Road, Woking, Surrey GU21 6LQ
Telephone 0870 777 8712 Fax 0870 777 8714
www.isbn.nielsenbookdata.co.uk

Responsible for allocating International Standard Book Numbers (ISBNs) in the UK and Ireland. Provides general information about ISBNs and is responsible for monitoring the ISBN system in Great Britain.

UK NATIONAL SERIALS DATA CENTRE

The British Library, Boston Spa, Wetherby, West Yorkshire LS23 7BQ
Telephone 01937 546959
www.bl.uk/services/bibliographic/issn.html

Responsible for issuing ISSNs for use on newspapers, magazines, periodicals and journals.