

K. ISSN With 2 Digit Add-On:

ISSN 0123-4560



International Standard Serial Number (ISSN) – A unique eight-digit number or code used internationally to identify periodical or serial publications, including electronic serials. It can be used wherever information on serials needs to be recorded or communicated. A **serial** is defined as any publication issued in successive parts, usually bearing numerical or chronological designations and intended to be continued indefinitely. Serials include periodicals, year-books and monographic series.

The ISSN barcode format is an example of a previously established numbering system being linked to a barcode symbology. In this case, it is linked to the International Article Number Association's (EAN) barcode system administered by **EAN International**. The worldwide database of ISSN numbers is managed by a network of 75 National Centres coordinated by the **ISSN International Centre** based in Paris, backed by Unesco and the French Government.

The ISSN numbering system has been established internationally over a number of years as a method of identifying serial publications, such as magazines, newspapers, periodicals or journals. The adoption of the EAN number allows each individual title to be scanned through stores under the same symbology as that used for general goods. This number is represented by the **EAN-13** barcode symbol.

Also refer [A. EAN-13](#).

Publishers of serials or other interested parties eg. Libraries, subscription agents, researchers or documentation centres may request the assignment of an ISSN to a given periodical from the ISSN International Centre, Paris or in Australia from the **Australian ISSN Agency, National Library of Australia**.

The ISSN system provides booksellers, publishers, researchers and librarians with a simple and accurate method of identifying a particular serial, even where there is more than one serial with the same or similar title. The ISSN may also be used as an identifying number in stock control systems for the wholesale and retail trade.

The ISSN number consists of two groups of 4 digit digits, separated by a hyphen and is preceded by the letters ISSN. There is no other reason for this structure than to make the number easy to read. The first seven digits forming a unique title number followed by a check digit. The check digit is calculated from the other seven digits and is an efficient system for trapping errors made in copying out the numbers. To calculate the ISSN check digit, refer section 'Calculating the ISSN Check Digit' below.

The ISSN/EAN-13 barcode has the following components:

1. **The ISSN number:** The 8-digit ISSN number is positioned above the barcode in the OCR-A font.
2. **ISSN prefix:** The EAN●UCC prefix '977' is reserved within the EAN●UCC numbering system to signify an ISSN code. Begin every ISSN number converted into an EAN/UCC-13 number with 977.
3. **ISSN number:** Only the first seven digits of the ISSN number appear in the barcode. The ISSN check digit is not represented.
4. **Variant:** A two-digit number to indicate changes in the publication. Also known as the 'Sequence Variant'. It can be used to signify a change of price. It can also be used to signify a permanent change or a 'special' issue at a different price from the regular issue. This helps to guard against price confusion at POS.
5. **EAN check digit:** Validates the accuracy of the entire number. The check digit is calculated using the preceding twelve digits, ie. 977+ISSN (without ISSN check digit)+Variant based on the Modulo-10 algorithm. (See *Calculating the EAN Check Digit* below).

Types of serials

A serial is a publication made up of a number of parts issued in sequence and linked by a common title. Usually each part bears an issue number and/or date. Serials are intended to continue indefinitely and include periodicals, newspapers, newsletters, annual reports, yearbooks, directories and journals.

Monographs in series are also a type of serial. These are books which have their own titles as well as a collective or series title (eg. Working paper). Normally all books in the series will be issued by the same publisher in a uniform style and usually in a numerical sequence. The series title of the monographic series will have an ISSN.

Formats of serials

Serials can be published in printed form, or in a range of alternative formats including microfiche, microfilm, CD-ROM and online. Serials in all formats are eligible for the allocation of an ISSN. Where a serial is published in more than one medium, a separate ISSN is required for each format.

What is not a serial?

Multi-volume books are not considered to be serials since they are planned to be published in a limited number of volumes, even if all volumes are not issued simultaneously. Series which are intended to comprise a definite number of individual

parts and loose-leaf publications intended for updating with replacement pages are also excluded.

OCR-A

The ISSN number string must always be presented on a single line and positioned above the barcode symbol. A recommended font for the ISSN number string is the OCR-A.

1 2 3 4 5 6 7 8 9 0

The OCR-A font

OCR-B

The Human Readable Characters (HRC) are positioned at the base of the barcode. A recommended font for the HRC is the OCR-B.

1 2 3 4 5 6 7 8 9 0

The OCR-B font

Magnification Factor

The ISSN/EAN-13 symbol is described by the *Magnification Factor*. The allowable limits being 80% to 200%. For each magnification there is a recommended (or nominal) height. This *height* is recommended to ensure symbol readability when read by a multi-directional scanner, therefore any reduction in height (or truncation) should only be attempted if absolutely necessary. Refer EAN•UCC-13 barcode size charts.

ISSN/EAN-13 has a set of allowed tolerances for the quality of the printed code. These measurements relate to the maximum variation in the width of a single bar or space and vary according to magnification factor:

Magnification Factor	Tolerance u (microns)
80%	+/-35u
85%	+/-53u
90%	+/-68u
95%	+/-86u
100%	+/-101u
105%	+/-109u

110%	+/-116u
115%	+/-124u
120%	+/-132u
125%	+/-139u
130%	+/-147u
135%	+/-154u
140%	+/-162u
150%	+/-177u
160%	+/-193u
170%	+/-208u
180%	+/-223u
190%	+/-238u
200%	+/-256u

As the above table shows, the tolerances allowed reduce rapidly for magnification factors below 100%. For this reason, the final print method should be considered carefully when choosing a magnification factor. For example, some printing presses are too variable to consistently print small (eg. 80%) ISSN/EAN-13 codes.

Calculating the ISSN Check Digit

The purpose of the check digit is to provide an arithmetic check of a string of numbers in order to detect the common errors usually associated with handling numbers. This operation is generally known as a check digit validation. These errors include transcription, transposition, 'shift' (usually adding or omitting a zero in a string of numbers) and random errors.

Modulo-11 algorithm

The ISSN check digit differs from the EAN check digit as it is a **Modulo-11** number. (The numerals are 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 and the letter X).

The seven digits of the ISSN number (ie. without the check digit) are multiplied by a weighting factor. The weighting factor varies according to the position of the digit and is 8 for the first digit, 7 for the second, 6 for the third, 5 for the fourth, 4 for the fifth, 3 for the sixth and 2 for the seventh digit. The results of the above seven multiplications are added together.

The result is divided by 11 and the remainder is used to find the check digit according to the following table:

Remainder	Check Digit
0	0
1	X
2	9
3	8
4	7

5	6
6	5
7	4
8	3
9	2
10	1

The following example shows how the calculation works for the ISSN number 0123456.

Step 1 Enter the basic digits of the ISSN (ie. the first seven without the check digit):

0 1 2 3 4 5 6

Step 2 Enter the constant weighting factors associated with each position of the ISSN:

8 7 6 5 4 3 2

Step 3 Multiply each digit by its associated weighting factor:

0 7 12 15 16 15 12

Step 4 Sum the products of the multiplication:

0 + 7 + 12 + 15 + 16 + 15 + 12

Total = **77**

Step 5 Divide the sum by the modulo number (11) to find the remainder:

77 divided by 11 = 7 remainder 0

Step 6 Look up the appropriate check digit for the particular remainder in the table above.

Remainder 0 on the above table gives 0 as the check digit. Therefore, the full ISSN number is **ISSN 0123-4560**.

Note: The ISSN number consists of two groups of 4 digit digits, separated by a hyphen and is preceded by the letters ISSN.

Converting ISSN to EAN

The EAN-13 number is derived from the ISSN number in the following manner:

- Remove the hyphen and the ISSN check digit (the last digit in the ISSN number)

- Add the EAN Prefix **977** to the number
- Allocate a 2-digit variant number, eg. 00
- Calculate the EAN-13 check digit using *Modulo-10* (refer *Calculating the EAN Check Digit* below)

Calculating the EAN Check Digit

In common with most other barcode implementations, ISSN/EAN-13 symbols also have a check digit which is the last number on the right. It is used to check for an error in scanning or data entry. The most common error found with the transcribing or keying of data is that of transposition (reversing the order of two digits). Therefore, the following mathematical formula (*Modulo-10*) is used:

Modulo-10 algorithm

ISSN/EAN-13 without check digit: 9 7 7 0 1 2 3 4 5 6 0 0

Step 1 Starting with the first number on the right, add all the alternate numbers. Multiply the result by three.

$$0 + 6 + 4 + 2 + 0 + 7 = 19 \times 3 = \mathbf{57}$$

Step 2 Starting with the second number on the right, add all the alternate numbers.

$$0 + 5 + 3 + 1 + 7 + 9 = \mathbf{25}$$

Step 3 Add the results of steps 1 and 2.

$$\text{Total} = \mathbf{82}$$

Step 4 The check digit is the smallest number which when added to the total in Step 3, produces an exact multiple of ten.

In this example, $82 + 8 = 90$, therefore the check digit is **8**.

ISSN/EAN-13 with check digit: 9 7 7 0 1 2 3 4 5 6 0 0 **8**

Note: If the result of Step 3 is an exact multiple of 10, then the check digit is 0 (not 10).

ISSN Versions

There are 3 versions of the ISSN/EAN barcode:



The *ISSN+2* and *ISSN+5* variants have an add-on code which is used to carry in-house supplementary information.

Light Margins

All barcode types require a certain amount of light space (or quiet zone) to the left and right of the code. This enables the scanner to differentiate between the barcode and surrounding graphics. Should the wrong type of graphic image or colour intrude on the light margin, there is a risk that the barcode will not decode, or worse, will decode incorrectly.

Minimum Light Margins (ISSN/EAN-13):

Left Light Margin (minimum)	Magnification Factor	Right Light Margin (minimum)
2.91mm	80%	1.85mm
3.09mm	85%	1.97mm
3.27mm	90%	2.08mm
3.45mm	95%	2.20mm
3.63mm	100%	2.31mm
3.82mm	105%	2.43mm
4.00mm	110%	2.55mm
4.18mm	115%	2.66mm
4.36mm	120%	2.78mm
4.54mm	125%	2.89mm
4.72mm	130%	3.01mm
4.91mm	135%	3.12mm
5.09mm	140%	3.24mm
5.45mm	150%	3.47mm
5.81mm	160%	3.70mm
6.18mm	170%	3.93mm
6.54mm	180%	4.16mm
6.90mm	190%	4.39mm
7.26mm	200%	4.62mm

EAN Member Organisations and other relevant Organisations

The Australian ISSN Agency National Library of Australia

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Canberra ACT 2600

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URL <http://www.nla.gov.au>

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