

# tiaoma

A barcode generator for typst that provides type safe API bindings for [Zint](#) ([GitHub](#)) library through a WASM [plugin](#).

See [official Zint manual](#) for a more in-depth description of supported functionality.

## API

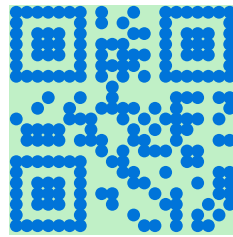
Some generators require additional configuration (such as composite codes), this can be achieved by passing [options](#) to Zint.

## barcode

Draw a barcode SVG of any supported symbology.

### Example:

```
tiaoma.barcode("12345678", "QRCode", options: (  
  scale: 2.0,  
  fg-color: blue,  
  bg-color: green.lighten(70%),  
  output-options: (  
    barcode-dotty-mode: true  
  ),  
  dot-size: 1.2,  
))
```



## Parameters

```
barcode(  
  data: str,  
  symbology: str,  
  options: dictionary,  
  ..args: any  
) -> content
```

**data**    `str`

Data to encode in the

**symbology**    `str`

Symbology type name; must be one of [supported types](#).

Example values: "Code11", "C25Standard", ...

**options**    `dictionary`

Additional options to pass to Zint.

See the [configuration section](#) for details on available options and how to use them.

Default: ( : )

**..args**    `any`

Any additional arguments to forward to `image.decode` function.

## dm-size

Returns `int` option value for given Data Matrix *width* and *height*.

Zint allows square and rectangular values to be enforced with DM\_SQUARE and DM\_DMRE Option 3 values.

Parameters

```
dm-size(  
  height: int,  
  width: int  
) -> int
```

**height**    `int`  
Data Matrix height

**width**     `int`  
Data Matrix width

Shortcut functions

Most barcodes are supported through shortcut functions. They accept the same arguments as barcode function but don’t require symbology to be specified.

Zint configuration

All exported functions support optionally providing the options dictionary which is passed to Zint. This provides means to fully configure generated images.

The following values are valid for the options dictionary:

Field	Type	Description	Default
height	<code>float</code>	Barcode height in X-dimensions (ignored for fixed-width barcodes)	<code>none</code>
scale	<code>float</code>	Scale factor when printing barcode, i.e. adjusts X-dimension	<code>1.0</code>
whitespace-width	<code>int</code>	Width in X-dimensions of whitespace to left & right of barcode	<code>0</code>
whitespace-height	<code>int</code>	Height in X-dimensions of whitespace above & below the barcode	<code>0</code>
border-width	<code>int</code>	Size of border in X-dimensions	<code>0</code>
<u>output-options</u>	<code>int</code> or <code>array</code> or <code>dictionary</code>	Various output parameters (bind, box etc, see below)	<code>0</code>
fg-color	<code>color</code>	foreground color	<code>black</code>
bg-color	<code>color</code>	background color	<code>white</code>
primary	<code>str</code>	Primary message data (MaxiCode, Composite)	<code>""</code>
option-1	<code>int</code>	Symbol-specific options (see <u>manual</u> )	<code>-1</code>
option-2	<code>int</code>	Symbol-specific options (see <u>manual</u> )	<code>0</code>
<u>option-3</u>	<code>int</code> or <code>str</code>	Symbol-specific options (see <u>manual</u> )	<code>0</code>
show-hrt	<code>bool</code>	Whether to show Human Readable Text (HRT)	<code>true</code>
<u>input-mode</u>	<code>int</code> or <code>string</code> or <code>array</code> or <code>dictionary</code>	Encoding of input data	<code>0</code>
eci	<code>int</code>	Extended Channel Interpretation.	<code>0</code>
dot-size	<code>float</code>	Size of dots used in BARCODE_DOTTY_MODE.	<code>4.0 / 5.0</code>
text-gap	<code>float</code>	Gap between barcode and text (HRT) in X-dimensions.	<code>1.0</code>
guard-descent	<code>float</code>	Height in X-dimensions that EAN/UPC guard bars descend.	<code>5.0</code>

Input Mode

Input mode options allow specifying how Zint should handle input data. Zint uses `int` bitflags for these, but `tiaoma` allows you to specify them using several other formats as documented below.

The following options are supported:

Input format (mutually exclusive)			
Constant	int	str	Description
DATA_MODE	0	"data"	Use full 8-bit range interpreted as binary data.
UNICODE_MODE	1	"unicode"	Use UTF-8 input.
GS1_MODE	2	"gs1"	Encode GS1 data using FNC1 characters.

Behavior customization			
Constant	int	str	Description
ESCAPE_MODE	8	"escape"	Process input data for escape sequences.
GS1PARENS_MODE	16	"gs1-parentheses"	Parentheses (round brackets) used in GS1 data instead of square brackets to delimit Application Identifiers (parentheses must not otherwise occur in the data).
GS1NOCHECK_MODE	32	"gs1-no-check"	Do not check GS1 data for validity, i.e. suppress checks for valid AIs and data lengths. Invalid characters (e.g. control characters, extended ASCII characters) are still checked for.
HEIGHTPERROW_MODE	64	"height-per-row"	Interpret the height variable as per-row rather than as overall height.
FAST_MODE	128	"fast"	Use faster if less optimal encodation for symbologies that support it (currently Data Matrix only).
EXTRA_ESCAPE_MODE	256	"extra-escape"	Undocumented.

String Value

`input_mode` of `str` type is assumed to be a *input format* value from the first table.

Array Value

`input_mode` of `array` type is assumed to be a list of `str` values from the above tables; individual constants will be converted to `int`s and unioned together.

Dictionary Value

`input_mode` of `dictionary` type is assumed to be `str-bool` pairs where keys are constants from the above table. Additionally, *input format* can be specified as a `str` value paired to `"format"` key.

In other words, columns of the following table are equivalent:

dictionary	array	str	int
<code>{"format": "data"}</code>	<code>("data")</code>	<code>"data"</code>	0
<code>{"unicode": true}</code>	<code>("unicode")</code>	<code>"unicode"</code>	1
<code>{"gs1": true, "gs1-no-check": true}</code>	<code>("gs1", "gs1-no-check")</code>	N/A	34

Output Options

Output options allow specifying how Zint should generate the barcode/symbol.

Constant	int	str	Description
BARCODE_BIND_TOP	1	"barcode-bind-top"	Boundary bar <i>above</i> the symbol and between rows if stacking multiple symbols.
BARCODE_BIND	2	"barcode-bind"	Boundary bars <i>above</i> and <i>below</i> the symbol and between rows if stacking multiple symbols.

BARCODE_BOX	4	"barcode-box"	Add a box surrounding the symbol and whitespace.
SMALL_TEXT	32	"small-text"	Use a smaller font for the Human Readable Text.
BOLD_TEXT	64	"bold-text"	Embolden the Human Readable Text.
CMYK_COLOUR	128	"cmyk-color"	Select the CMYK colour space option for Encapsulated PostScript and TIF files.
BARCODE_DOTTY_MODE	256	"barcode-dotty-mode"	Plot a matrix symbol using dots rather than squares.
GS1_GS_SEPARATOR	512	"gs1-gs-separator"	Use GS instead of FNC1 as GS1 separator (Data Matrix only).
BARCODE_QUIET_ZONES	2048	"barcode-quiet-zones"	Add compliant quiet zones (additional to any specified whitespace).
BARCODE_NO_QUIET_ZONES	4096	"barcode-no-quiet-zones"	Disable quiet zones, notably those with defaults.
COMPLIANT_HEIGHT	8192	"compliant-height"	Warn if height not compliant and use standard height (if any) as default.
EANUPC_GUARD_WHITESPACE	16384	"ean-upc-guard-whitespace"	Add quiet zone indicators (“<” / “>”) to HRT whitespace (EAN/UPC)
EMBED_VECTOR_FONT	32768	"embed-vector-font"	Embed font in vector output.

### Array Value

output\_options of `array` type assumed to be `str` values from the above table.

### Dictionary Value

output\_options of `dictionary` type assumed to be `str-bool` pairs where keys are constants from the above table.

### Option 3

As there’s constants associated with option\_3 values, this package allows specifying the value as either an `int` or a `str`.

The following table documents supported values and their `str` representations:

Constant	int	str	Description
DM_SQUARE	100	"square"	Only consider square versions on automatic symbol size selection
DM_DMRE	101	"rect"	Consider DMRE versions on automatic symbol size selection
DM_ISO_144	128	"iso-144"	Use ISO instead of “de facto” format for 144x144 (i.e. don’t skew ECC)
ZINT_FULL_MULTIBYTE	200	"full-multibyte"	Enable Kanji/Hanzi compression for Latin-1 & binary data
ULTRA_COMPRESSION	128	"compression"	Enable Ultracode compression ( <b>experimental</b> )

# Examples

## EAN (European Article Number)

### EANX

#### Example:

```
#eanx("1234567890")
```

#### Result:

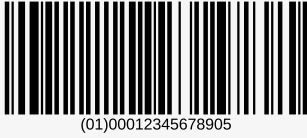


### EAN-14

#### Example:

```
#ean14("1234567890")
```

#### Result:



### EAN-13

#### Example:

```
#eanx("6975004310001")
```

#### Result:



### EAN-8

#### Example:

```
#eanx("12345564")
```

#### Result:



### EAN-5

#### Example:

```
#eanx("12345")
```

#### Result:



### EAN-2

#### Example:

```
#eanx("12")
```

#### Result:



# PDF417

## Micro PDF417

Example:

```
#micro-pdf417("1234567890")
```

Result:



## Compact PDF417

Example:

```
#pdf417-comp("1234567890")
```

Result:



## PDF417

Example:

```
#pdf417("1234567890")
```

Result:



# GS1

## GS1-128

Example:

```
#gs1-128("0198898765432106")
```

Result:



## GS1 DataBar Omnidirectional

Example:

```
#dbar-omn("98898765432106")
```

Result:



## GS1 DataBar Limited

Example:

```
#dbar-ltd("988987654321")
```

Result:



## GS1 DataBar Expanded

Example:

```
#dbar-exp("0198898765432106")
```

Result:

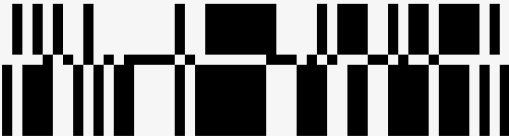


## GS1 DataBar Stacked

Example:

```
#dbar-stk("1234567890")
```

Result:



## GS1 DataBar Stacked Omnidirectional

Example:

```
#dbar-omn-stk("1234567890")
```

Result:



Zint supports Omnidirectional, Limited, Expanded, Stacked and Composite Code variants of GS1. See [configuration](#) section for information on how to use them.

# C25

## Standard

### Example:

```
#c25-standard("123")
```

### Result:



## Interleaved

### Example:

```
#c25-inter("1234567890")
```

### Result:



## IATA

### Example:

```
#c25-iata("1234567890")
```

### Result:



## Data Logic

### Example:

```
#c25-logic("1234567890")
```

### Result:



## Industrial

### Example:

```
#c25-ind("1234567890")
```

### Result:





# UPC (Universal Product Code)

## UPC-A

Example:

```
#upca("012345000006")
```

Result:



## UPC-A w/ Check Digit

Example:

```
#upca-chk("0123450000065")
```

Result:



## UPC-E

Example:

```
#upce("123456")
```

Result:



## UPC-E w/ Check Digit

Example:

```
#upce-chk("12345670")
```

Result:



# HIBC (Health Industry Barcodes)

## Code 128

Example:

```
#hbc-128("1234567890")
```

Result:

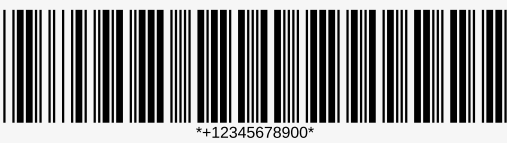


## Code 39

Example:

```
#hbc-39("1234567890")
```

Result:



## Data Matrix

Example:

```
#hbc-dm("1234567890")
```

Result:



## QR

Example:

```
#hbc-qr("1234567890")
```

Result:



## PDF417

Example:

```
#hbc-pdf("1234567890")
```

Result:



## Micro PDF417

Example:

```
#hbc-mic-pdf("1234567890")
```

Result:

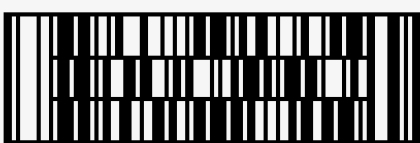


## Codablock-F

Example:

```
#hbc-codablock-f("1234567890")
```

Result:



## Aztec

Example:

```
#hbc-aztec("1234567890")
```

Result:



Postal

Australia Post Redirection

Example:

```
#aus-redirect("12345678")
```

Result:



Australia Post Reply Paid

Example:

```
#aus-reply("12345678")
```

Result:



Australia Post Routing

Example:

```
#aus-route("12345678")
```

Result:



Australia Post Standard Customer

Example:

```
#aus-post("12345678")
```

Result:



Brazilian CEPNet Postal Code

Example:

```
#cepnet("1234567890")
```

Result:



DAFT Code

Example:

```
#daft("DAFTFDATATFDTFAD")
```

Result:



Deutsche Post Identcode

Example:

```
#dp-ident("1234567890")
```

Result:



Deutsche Post Leitcode

Example:

```
#dp-leitcode("1234567890")
```

Result:



Deutsher Paket Dienst

Example:

```
#dpd("0123456789012345678901234567")
```

Result:



Dutch Post KIX Code

Example:

```
#kix("1234567890")
```

Result:



Japanese Postal Code

Korea Post

POSTNET

Example:

```
#postnet("1234567890")
```

Result:



Royal Mail 4-State Customer Code

Example:

```
#rm4scc("1234567890")
```

Result:



Universal Postal Union S10

Example:

```
#upus10("RR072705659PL")
```

Result:



USPS Intelligent Mail

Example:

```
#usps-imal("01300123456123456789")
```

Result:



Royal Mail 2D Mailmark (CMDM)

Example:

```
#mailmark-2d(  
  32, 32,  
  "JGB 011123456712345678CW14NJ1T 0EC2M2QS  
  REFERENCE1234567890QWERTYUIOPASDFGHJKLZXCVBNM"  
)
```

Result:



Royal Mail 4-State Mailmark

Example:

```
#mailmark-4s("21B2254800659JW509QA6Y")
```

Result:



UPNQR (Univerzalnega Plačilnega Naloga QR)

Example:

```
#upnqr("1234567890")
```

Result:



# Other Generic Codes

## Aztec Code

Example:

```
#aztec("1234567890")
```

Result:

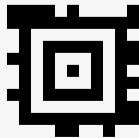


## Aztec Rune

Example:

```
#azrune("122")
```

Result:



## Channel Code

Example:

```
#channel("123456")
```

Result:



## Codabar

Example:

```
#codabar("A123456789B")
```

Result:

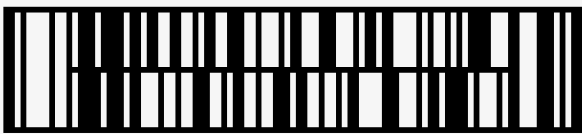


## Codablock-F

Example:

```
#codablock-f("1234567890")
```

Result:



## Code 11

Example:

```
#code11("0123452")
```

Result:

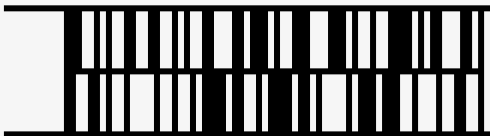


## Code 16k

Example:

```
#code16k("1234567890")
```

Result:



## Code 32

Example:

```
#code32("12345678")
```

Result:



## Code 39

Example:

```
#code39("1234567890")
```

Result:



## Code 49

Example:

```
#code49("1234567890")
```

Result:



## Code 128

## Code 128 (AB)

Code One

Example:

```
#code-one("1234567890")
```

Result:



DotCode

Example:

```
#dotcode("1234567890")
```

Result:



Grid Matrix

Example:

```
#grid-matrix("1234567890")
```

Result:



IBM BC412 (SEMI T1-95)

Example:

```
#bc412("1234567890")
```

Result:

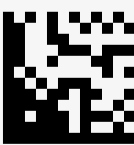


Data Matrix (ECC200)

Example:

```
#data-matrix("1234567890")
```

Result:



Extended Code 39

Example:

```
#ex-code39("1234567890")
```

Result:



Han Xin (Chinese Sensible)

Example:

```
#hanxin("abc123 全 ħ 全 灌")
```

Result:



ISBN

Example:

```
#isbnx("9789861817286")
```

Result:



ITF-14

Example:

```
#itf14("1234567890")
```

Result:



00012345678905

LOGMARS

Example:

```
#logmars("1234567890")
```

Result:



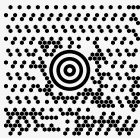
1234567890

MaxiCode

Example:

```
#maxicode("1234567890")
```

Result:



Micro QR

Example:

```
#micro-qr("1234567890")
```

Result:



MSI Plessey

Example:

```
#msi-plessey("1234567890")
```

Result:



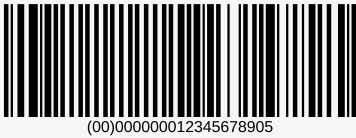
1234567890

NVE-18 (SSCC-18)

Example:

```
#nve18("1234567890")
```

Result:



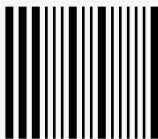
(00)000000012345678905

Pharmacode One-Track

Example:

```
#pharma("123456")
```

Result:



Pharmacode Two-Track

Example:

```
#pharma-two("12345678")
```

Result:



Pharmazentralnummer

Example:

```
#pzn("12345678")
```

Result:



PZN - 12345678

Planet

Example:

```
#planet("1234567890")
```

Result:



**Plessey**  
**Example:**

```
#plessey("1234567890")
```

**Result:**



**QR Code**  
**Example:**

```
#qrcode("1234567890")
```

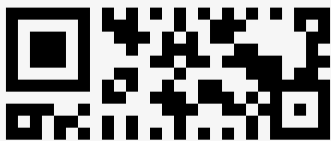
**Result:**



**Rectangular Micro QR Code (rMQR)**  
**Example:**

```
#rmqr("1234567890")
```

**Result:**



**Telepen Numeric**  
**Example:**

```
#telepen-num("1234567890")
```

**Result:**



**Telepen**  
**Example:**

```
#telepen("ABCD12345")
```

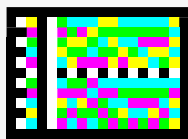
**Result:**



**Ultracode**  
**Example:**

```
#ultra("1234567890")
```

**Result:**



**Vehicle Identification Number**  
**Example:**

```
#vin("2GNFLGE30D6201432")
```

**Result:**



**Facing Identification Mark**  
**Example:**

```
#fim("A")
```

**Result:**



**Fluttermarken**  
Used for marking book covers to indicate volume order.

**Example:**

```
#flat("123")
```

**Result:**





# Symbology Values

Following symbology values are supported:

"Code11"	"C25Standard"	"C25Inter"	"C25IATA"	"C25Logic"	"C25Ind"
"Code39"	"ExCode39"	"EANX"	"EANXChk"	"GS1128"	"Codabar"
"Code128"	"DPLEIT"	"DPIDENT"	"Code16k"	"Code49"	"Code93"
"Flat"	"DBarOmn"	"DBarLtd"	"DBarExp"	"Telepen"	"UPCA"
"UPCACHk"	"UPCE"	"UPCEChk"	"Postnet"	"MSIPlessey"	"FIM"
"Logmars"	"Pharma"	"PZN"	"PharmaTwo"	"CEPNet"	"PDF417"
"PDF417Comp"	"MaxiCode"	"QRCode"	"Code128AB"	"AusPost"	"AusReply"
"AusRoute"	"AusRedirect"	"ISBNX"	"RM4SCC"	"DataMatrix"	"EAN14"
"VIN"	"CodablockF"	"NVE18"	"JapanPost"	"KoreaPost"	"DBarStk"
"DBarOmnStk"	"DBarExpStk"	"Planet"	"MicroPDF417"	"USPSIMail"	"Plessey"
"TelepenNum"	"ITF14"	"KIX"	"Aztec"	"DAFT"	"DPD"
"MicroQR"	"HIBC128"	"HIBC39"	"HIBCDM"	"HIBCQR"	"HIBCPDF"
"HIBCMicPDF"	"HIBCCodablockF"	"HIBCAztec"	"DotCode"	"HanXin"	"Mailmark2D"
"UPUS10"	"Mailmark4S"	"AzRune"	"Code32"	"EANXCC"	"GS1128CC"
"DBarOmnCC"	"DBarLtdCC"	"DBarExpCC"	"UPCACC"	"UPCECC"	"DBarStkCC"
"DBarOmnStkCC"	"DBarExpStkCC"	"Channel"	"CodeOne"	"GridMatrix"	"UPNQR"
"Ultra"	"RMQR"	"BC412"			