circuit

- circuit()

circuit(body: `none` `array` `element`, length: `length` `ratio`) -> `none`

Draws a block circuit diagram

This function is also available as `circuiteria.circuit()`

Parameters:

`body` (`none` or `array` or `element`) – A code block in which draw functions have been called

`length` (`length` or `ratio` = `2em`) – Optional base unit

util

- lpad()
- opposite-anchor()
- rotate-anchor()

Variables:

- colors

lpad

Pads a string on the left with 0s to the given length

```
#util.lpad("0100", 8)
```

```
00000100
```

Parameters

```
lpad(
  string: str,
  len: int
) -> str
```

string `str`

The string to pad

len `int`

The target length

opposite-anchor

Returns the anchor on the opposite side of the given one

```
#util.opposite-anchor("west")
```

```
east
```

Parameters

```
opposite-anchor(anchor: str) -> str
```

anchor `str`

The input anchor

rotate-anchor

Returns the anchor rotated 90 degrees clockwise relative to the given one

```
#util.rotate-anchor("west")
```

```
north
```

Parameters

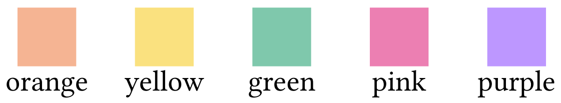
```
rotate-anchor(anchor: str) -> str
```

anchor `str`

The anchor to rotate

colors

Predefined color palette



wire

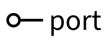
- stub()
- wire()

Variables:

- wire-styles

stub

Draws a wire stub (useful for unlinked ports)



Parameters

```
stub(
  port-id: str,
  side: str,
  name: none str,
  vertical: bool,
  length: number
)
```

port-id `str`

The port anchor

side `str`

The side on which the port is (one of "north", "east", "south", "west")

name `none` or `str`

Optional name displayed at the end of the stub

Default: `none`

vertical `bool`

Whether the name should be displayed vertically

Default: `false`

length `number`

The length of the stub

Default: `1em`

wire

Draws a wire between two points

Parameters

```
wire(
  id: str,
  pts: array,
  bus: bool,
  name: none str array,
  name-pos: str,
  slice: none array,
  color: color,
  dashed: bool,
  style: str,
  reverse: bool,
  zigzag-ratio: ratio,
  dodge-y: number,
  dodge-sides: array,
  dodge-margins: array
)
```

id `str`

The wire's id, for future reference (anchors)

pts `array`

The two points (as CeTZ compatible coordinates, i.e. XY, relative positions, ids, etc.)

bus `bool`

Whether the wire is a bus (multiple bits) or a simple signal (single bit)

Default: `false`

name `none` or `str` or `array`

Optional name of the wire. If it is an array, the first name will be put at the start of the wire, and the second at the end

Default: `none`

name-pos `str`

Position of the name. One of: "middle", "start" or "end"

Default: `"middle"`

slice `none` or `array`

Optional bits slice (start and end bit indices). If set, it will be displayed at the start of the wire

Default: `none`

color `color`

The stroke color

Default: `black`

dashed `bool`

Whether the stroke is dashed or not

Default: `false`

style `str`

The wire's style (see `wire-styles` for possible values)

Default: `"direct"`

reverse `bool`

If true, the start and end points will be swapped (useful in cases where the start point depends on the end point, for example with perpendiculars)

Default: `false`

zigzag-ratio `ratio`

Position of the zigzag vertical relative to the horizontal span (only with style "zigzag")

Default: `50%`

dodge-y `number`

Y position to dodge the wire to (only with style "dodge")

Default: `0`

dodge-sides `array`

The start and end sides (going out of the connected element) of the wire (only with style "dodge")

Default: `("east", "west")`

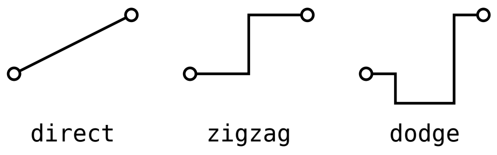
dodge-margins `array`

The start and end margins (i.e. space before dodging) of the wire (only with style "dodge")

Default: `(5%, 5%)`

wire-styles

List of valid wire styles



element

- elmt()
- alu()
- block()
- extender()
- multiplexer()

elmt

Draws an element

Parameters

```
elmt(
  draw-shape: function,
  x: number dictionary,
  y: number dictionary,
  w: number,
  h: number,
  name: none str,
  name-anchor: str,
  ports: dictionary,
  ports-margins: dictionary,
  fill: none color,
  stroke: stroke,
  id: str,
  auto-ports: bool,
  ports-y: array,
  debug: dictionary
)
```

draw-shape `function`

Draw function

Default: `default-draw-shape`

x `number` or `dictionary`

The x position (bottom-left corner).

If it is a dictionary, it should be in the format `(rel: number, to: str)`, where `rel` is the offset and `to` the base anchor

Default: `none`

y `number` or `dictionary`

The y position (bottom-left corner).

If it is a dictionary, it should be in the format `(from: str, to: str)`, where `from` is the base anchor and `to` is the id of the port to align with the anchor

Default: `none`

w `number`

Width of the element

Default: `none`

h `number`

Height of the element

Default: `none`

name `none` or `str`

Optional name of the block

Default: `none`

name-anchor `str`

Anchor for the optional name

Default: `"center"`

ports `dictionary`

Dictionary of ports. The keys are cardinal directions (“north”, “east”, “south” and/or “west”). The values are arrays of ports (dictionaries) with the following fields:
- `id` (`str`): (Required) Port id
- `name` (`str`): Optional name displayed **in** the block
- `clock` (`bool`): Whether it is a clock port (triangle symbol)
- `vertical` (`bool`): Whether the name should be drawn vertically

Default: `()`

ports-margins `dictionary`

Dictionary of ports margins (used with automatic port placement). They keys are cardinal directions (“north”, “east”, “south”, “west”). The values are tuples of (,) margins (numbers)

Default: `()`

fill `none` or `color`

Fill color

Default: `none`

stroke `stroke`

Border stroke

Default: `black + 1pt`

id `str`

The block id (for future reference)

Default: `""`

auto-ports `bool`

Whether to use auto port placements or not. If false, `draw-shape` is responsible for adding the appropiate ports

Default: `true`

ports-y `array`

Array of the ports y offsets (used with `auto-ports: false`)

Default: `()`

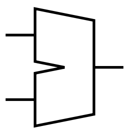
debug `dictionary`

Dictionary of debug options.

Supported fields include:
- `ports`: if true, shows dots on all ports of the element

Default:
```
(
    ports: false
  )
```

alu
Draws an ALU with two inputs



Parameters

```
alu(
  x: number dictionary,
  y: number dictionary,
  w: number,
  h: number,
  name: none str,
  name-anchor: str,
  fill: none color,
  stroke: stroke,
  id: str,
  debug: dictionary
)
```

x `number` or `dictionary`

see `elmt()`

Default: `none`

y `number` or `dictionary`

see `elmt()`

Default: `none`

w `number`

see `elmt()`

Default: `none`

h `number`

see `elmt()`

Default: `none`

name `none` or `str`

see `elmt()`

Default: `none`

name-anchor `str`

see `elmt()`

Default: `"center"`

fill `none` or `color`

see `elmt()`

Default: `none`

stroke `stroke`

see `elmt()`

Default: `black + 1pt`

id `str`

see `elmt()`

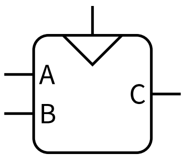
Default: `""`

debug `dictionary`

see `elmt()`

Default:
```
(
  ports: false
)
```

block
Draws a block element



Parameters

```
block(
  x: number dictionary,
  y: number dictionary,
  w: number,
  h: number,
  name: none str,
  name-anchor: str,
  ports,
  ports-margins,
  fill: none color,
  stroke: stroke,
  id: str,
  debug: dictionary
)
```

x `number` or `dictionary`

see `elmt()`

Default: `none`

y `number` or `dictionary`

see `elmt()`

Default: `none`

w `number`

see `elmt()`

Default: `none`

h `number`

see `elmt()`

Default: `none`

name `none` or `str`

see `elmt()`

Default: `none`

name-anchor `str`

see `elmt()`
- ports: (dictionary): see `elmt()`
- ports-margins: (dictionary): see `elmt()`

Default: `"center"`

fill `none` or `color`

see `elmt()`

Default: `none`

stroke `stroke`

see `elmt()`

Default: `black + 1pt`

id `str`

see `elmt()`

Default: `""`

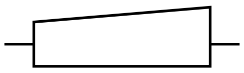
debug `dictionary`

see `elmt()`

Default:
```
(
    ports: false
  )
```

extender

Draws a bit extender



Parameters

```
extender(
  x: number dictionary,
  y: number dictionary,
  w: number,
  h: number,
  name: none str,
  name-anchor: str,
  fill: none color,
  stroke: stroke,
  id: str,
  debug: dictionary
)
```

x `number` or `dictionary`

see `elmt()`

Default: `none`

y `number` or `dictionary`

see `elmt()`

Default: `none`

w `number`

see `elmt()`

Default: `none`

h `number`

see `elmt()`

Default: `none`

name `none` or `str`

see `elmt()`

Default: `none`

name-anchor `str`

see `elmt()`

Default: `"center"`

fill `none` or `color`

see `elmt()`

Default: `none`

stroke `stroke`

see `elmt()`

Default: `black + 1pt`

id `str`

see `elmt()`

Default: `""`

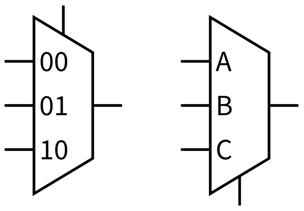
debug `dictionary`

see `elmt()`

Default:
```
(
    ports: false
  )
```

multiplexer

Draws a multiplexer



Parameters

```
multiplexer(
  x: number dictionary,
  y: number dictionary,
  w: number,
  h: number,
  name: none str,
  name-anchor: str,
  entries: int array,
  fill: none color,
  stroke: stroke,
  id: str,
  debug: dictionary
)
```

x `number` or `dictionary`

see `elmt()`

Default: `none`

y `number` or `dictionary`

see `elmt()`

Default: `none`

w `number`

see `elmt()`

Default: `none`

h `number`

see `elmt()`

Default: `none`

name `none` or `str`

see `elmt()`

Default: `none`

name-anchor `str`

see `elmt()`

Default: `"center"`

entries `int` or `array`

If it is an integer, it defines the number of input ports (automatically named with their binary index). If it is an array of string, it defines the name of each input.

Default: `2`

fill `none` or `color`

see `elmt()`

Default: `none`

stroke `stroke`

see `elmt()`

Default: `black + 1pt`

id `str`

see `elmt()`

Default: `""`

debug `dictionary`

see `elmt()`

Default:
```
(
    ports: false
  )
```