

# The **visualcounter** module

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```
\usemodule[visualcounter]
```

- /// Find T<sub>E</sub>X documents to be too boring?
- /// Make your presentations stand out.
- /// Voilà, the **visualcounter** module!
- /// Turn any counter into a picture.



The above effect was achieved by first defining a `visualitem` counter and a symbol `visual` that uses that counter:

```
\definevisualcounter
[visualitem]
[scratchmarks]
[ counter=\getvalue{v_strc_itemgroups_counter},
width=1.5bp,
height=1.2ExHeight,
distance=3bp]

\definesymbol[visual][\usevisualcounter{visualitem}]
```

and then using the symbol `visual` in an itemization:

```
\startitemize[visual, ...]
  \item ...
  \item ...
\stopitemize
```



Notice the counter used for page numbering? That was achieved by first defining a `visualpage` counter:

```
\definevisualcounter  
  [visualpage]  
  [mayanumbers]  
  [  
    counter=userpage,  
    maxwidth=\textwidth,  
  ]
```

and setting it as the footer text:

```
\setupfootertexts[\usevisualcounter{visualpage}]
```



The above examples show the basic usage of the modules. The module provides two commands: `\definevisualcounter` to define a visual counter

```
\definevisualcounter  
  [...]      % name of the counter  
  [...]      % optional name of the parent counter  
  [  
    ...=..., % key-value settings  
  ]
```

and `\usevisualcounter` to use an already defined counter

```
\usevisualcounter  
  [...=...] % key-value settings  
  {...}     % name of the counter
```



## 1 So, how do I use this?

Visual counters are defined and used in two ways:

- // Using a low level interface that explicitly sets the current values of the counter, last count, the METAPOST graphic that draws the counter, and the color palette.
- // Using higher-level interfaces built on top of the low-level interface that allows you to specify a *structure counter* like those used for page numbering, itemizations, descriptions, etc.



## 1.1 The low-level interface

To begin with, let's not worry about how to define METAPOST graphics that draw the counter. The module provides a predefined set of `visualcounters`, and, for now, we'll just use those: the `scratchmarks` counter. Details on defining new counters are explained later.

Suppose that I want to show that I am on page 6 out of 12 pages:



which uses a predefined counter `scratchmarks` and was typed as follows:

```
\usevisualcounter[n=6, last=12]{scratchmarks}
```

The counter may be made smaller



or may use a different color palette



These settings are changed using `\setupvisualcounter`. In particular, to get a small counter, use:

```
\setupvisualcounter[scratchmarks]
                        [width=1pt, height=8pt, distance=2pt]
```

and to change the color palette, use:

```
\setupvisualcounter[scratchmarks][palette=brightred]
```

where the brightred palette was defined as

```
\definecolor[bright-red] [h=DE1B1B]
\definecolor[dull-black] [h=2B2B2B]
\definecolor[dull-yellow] [h=E9E581]

\definepalet
  [brightred]
  [past=dull-black, active=bright-red, future=dull-yellow]
```



## 1.2 The high-level interface

The high level interface is useful to display a ConT<sub>E</sub>Xt counter. Rather than manually setting the value of `n`, `last`, `text`, and `maxtext` (the last two are used only by a few counters), simply set the value of a `counter` and the other values are automatically generated. As an example, recall the set up for displaying the page numbers in the footer:

```
\definevisualcounter
[visualpage]
[mayanumbers]
[
  counter=userpage,
  maxwidth=\textwidth,
]
```

In the above example, `userpage` is the name of the counter that keeps track of the user page number.





A list of some commonly used ConT<sub>E</sub>Xt counters is given below:

Page numbers	<code>userpage</code>
Item group numbers	<code>\v_strc_itemgroups_counter</code> <sup>1</sup>
Enumeration number	name of the enumeration

---

<sup>1</sup> Macros names with underscore are internal ConT<sub>E</sub>Xt macros, and generally are not meant to be used in user code. The easiest way to set the value of `counter` to `\v_strc_itemgroups_counter` is to use:

```
counter=\getvalue{v_strc_itemgroups_counter},
```



## 2 Changing the color of counters

All counters use three colors: **past** to display past counters, **active** to display current counter, and **future** to display future counters. To change the color scheme, first define a new color palette (which is misspelled in ConT<sub>E</sub>Xt is **colorpalet**):

```
\definecolorpalet  
  [...], % Name of the color palette  
  [  
    past=..., % any previously defined \CONTEXT{} color  
    active=..., % any previously defined \CONTEXT{} color  
    future=..., % any previously defined \CONTEXT{} color  
  ]
```



and then set the color palette of a particular counter either using

```
\definevisualcounter  
  [...]      % name of the counter  
  [...]      % optional name of the parent counter  
  [  
    ...,  
    palette=..., % name of a previously defined colorpalet  
    ...  
  ]
```

or using

```
\setupvisualcounter  
  [...]      % name of the counter  
  [  
    ...,  
    palette=..., % name of a previously defined colorpalet  
    ...  
  ]
```



### 3 Changing the size of the counters

All predefined counters have tunable parameters (such as `width`, `height`, and `distance`) that change the size of the counter. The default sizes are given in terms of `EmWidth` or `ExHeight`; so they adapt to the size of the surrounding text.



## 4 Changing the style of text displayed in the counters

Some visual counters (currently, only the `countdown` counter) also display text. The style of this text may be set using:

```
\setupvisualcounter
  [...]      % name of the counter
  [
    ...,
    style=..., %any valid \CONTEXT{} style
    color=..., %any valid \CONTEXT{} color
    ...
  ]
```

Note that changing the font size in the `style` affects the value of `EmWidth` and `ExHeight` and therefore also scales the counter appropriately. If this is not desirable, then you also need to set the size of the counter in dimensions that are independent of body-fontsize.



## 5 Predefined counters

The `visualcounter` module provides the following predefined counters:

The `scratchmarks` counter

The `mayanumbers` counter

The `countdown` counter

The `markers` counter

The `progressbar` counter

The `pulseline` counter





## 5.1 The `scratchmarks` counter

The `scratchmarks` counter is inspired by the `fuzzycount` counter that is part of the ConTeXt's metapost library `txt`. The output looks as follows:



3 out of 12



4 out of 12



5 out of 12



6 out of 12

The `scratchmarks` counter has the following tunable parameters:

- `width` (default `3bp`): the width of each stroke
- `height` (default `3ExHeight`): the length of the marker (and strictly speaking, not the height; the real height is  $\text{height} \times \sin(\text{angle})$ ).
- `distance` (default `0.5EmWidth`): the distance between two successive markers. The distance is measured from the middle of one marker to the middle of the other (that is, it does not take the width of the stroke into account).
- `angle` (default `75`): the angle of the forward markers. The angle of the backward marker is `-angle`. Only angles between `-90` and `90` give proper output.



For example, the output with `width=1.5bp`, `angle=45` is:



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An angle less than  $0$  changes the direction of the stroke. For example the output with `width=1.5bp`, `angle=-45` is:



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## 5.2 The `mayanumbers` counter

The `mayanumbers` counter is inspired by the Mayan numbering system that I saw in the documentary “Breaking the Maya code”. Its counter does not strictly follow the Mayan numbering system. The Mayan numbering system is written vertically; the output of this counter is horizontal which makes it more useful for displaying page numbers in presentations.



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The shape of the small and the large markers is as follows:



The shape of the small marker



The shape of the large marker



The `scratchmarks` counter has the following tunable parameters:

- `width` (default value `1EmWidth`): The width of the small marker.
- `height` (default value `1ExHeight`): The height of the markers.
- `distance` (default value `width/4`): The distance between two small markers. The distance between each group of four small counters is  $2 * \text{distance}$ .

For example, to get an output that is half the default size, use the options

`width=0.5EmWidth, height=0.5ExHeight`.



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## The **countdown** counter

This counter is inspired by the spinning wheel on the iPhone and on Google images.



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The **countdown** counter may also be used with a text display of the counter.



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The example below shows how the counter changes when the number of steps are increased.



13 out of 24



14 out of 36



25 out of 48



36 out of 60



The `countdown` counter has the following tunable parameters:

- `width` (default value `1EmWidth`) and `height` (default value `1ExHeight`): The maximum of these two determine the difference between the inner and outer diameter of the ring.
- `text` (not set by default): The text to be displayed in the middle of the counter.
- `maxtext` (not set by default): The diameter of the inner circle is equal to `1.5` times the maximum of the width and the height of `maxtext`.
- `distance` (default value `3EmWidth`): The distance between the consecutive markers along the circumference of the outer circle is equal to `distance/last`.

For example, to get a continuous circle set `distance=0pt`:



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14 out of 36



25 out of 48



36 out of 60

When the high level interface is used, i.e., when the option `counter=...` is set, the value of `text` is the converted value of the counter, and the value of `maxtext` is the converted value of last counter.





## The `markers` counter

The `markers` counter is inspired by the section markers displayed by the `LATEX beamer` package. This module comes in two shapes: the default shape is circle



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The alternative shape is a square, which is selected using

```
\setupvisualcounter
  [...]   % name of the counter
  [
    ...
    mpsetups=visualcounter::markers:square,
    ...
  ]
```



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The `visualcounter::markers:square` is a predefined alternative shape. Before discussing how to define a new shape, let's look at the tunable parameters of the `markers` counter:

- `width` (default value `1EmWidth`): The width of the each marker.
- `distance` (default value `width/4`): The edge to edge distance between successive markers.
- `mpsetups` (default value `visualcounter::markers:circle`): A `useMPgraphic` that determines the shape and the display of the markers. The module comes with three predefined shapes, `visualcounter::markers:circle`, `visualcounter::markers:square`, and `visualcounter::markers:star`.

To define a new shape, you have to create a `useMPgraphic` that defines three METAPOST macros:

- `show_past_marker(expr shift)`
- `show_active_marker(expr shift)`
- `show_future_marker(expr shift)`

The argument to these macros is the shift calculated based on their position. The macros are responsible for using the shift amount either for horizontal shift or for vertical shift, and coloring the markers with appropriate colors. The three colors from the color palette are available as `past_color`, `active_color`, `future_color`.



As an example, lets consider a new visual counter that displays a “star rating”:



1 out of 5



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For better visual effect, I have also changed the color palette to one that uses same color for `past` and `current` markers. Note that the above alternative is available as the `visualcounter::markers:star` option to `mpsetups`. The following description is just to explain how to define a new marker.





To create such a counter, first create a `useMPgraphic` as follows (I could have used any name instead of `visualcounter::markers:star`):

```
\startuseMPgraphic{visualcounter::markers:star}
% Copied from http://tug.org/pracjourn/2012-1/hefferon.html
def fullstar =
  hide (
    z0 = origin;
    z1 = (x0, 0.5);
    z2 = ((z1 - z0) rotated ( 360/5)) + z0 ;
    z3 = ((z1 - z0) rotated (2*360/5)) + z0 ;
    z4 = ((z1 - z0) rotated (3*360/5)) + z0 ;
    z5 = ((z1 - z0) rotated (4*360/5)) + z0 ;
    z6 = whatever[z1, z3] = whatever[z2, z5];
    z7 = whatever[z1, z3] = whatever[z2, z4];
    z8 = whatever[z2, z4] = whatever[z3, z5];
    z9 = whatever[z1, z4] = whatever[z3, z5];
    z10 = whatever[z1, z4] = whatever[z2, z5];
  )
  (z1 -- z6 -- z2 -- z7 -- z3 -- z8 -- z4
   -- z9 -- z5 -- z10 -- cycle)
enddef;
```



```
def show_star(expr shift, fill_color) =
  newpath p;
  p := fullstar xyscaled(width, width) shifted (shift, 0);

  fill p withcolor fill_color;
  draw p withcolor 0.5*fill_color;
enddef;

def show_past_marker(expr shift) =
  show_star(shift, past_color);
enddef;

def show_active_marker(expr shift) =
  show_star(shift, active_color);
enddef;

def show_future_marker(expr shift) =
  show_star(shift, future_color);
enddef;
\stopuseMPgraphic
```



Next, define a new `visaulcounter` that inherits from `markers` but uses a different `mpsetups`:

```
\definevisualcounter
[stars]
[markers]
[mpsetups=visualcounter::markers:star, % use "star" marker
width=1.5EmWidth,
distance=0.25EmWidth,
palette=star-colors, % defined elsewhere
last=5, % rating out of 5
]
```

To use this counter, type:

```
\usevisualcounter[n=4]{stars}
```

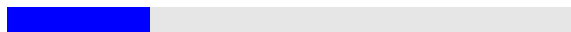
which gives: ★★★★★



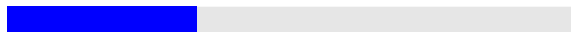


## The `progressbar` counter

The `progressbar` counter is based on a question on TeX.SE. This counter is not yet finalized. I am still working on the interface to change the shape of the progress bar, and perhaps add some shading.



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## The **pulse**line counter

The **pulse**line counter is based on the heart pulses shown in a heart rate measurement device. This counter is not yet finalized.



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