# {TikZ-trackschematic}

**A TikZ library for track schematics**

Martin Scheidt

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## Contents

# 1. Introduction

## 1.1. About tikz-trackschematic

The Ti*k*Z-*trackschematic* library is a toolbox of symbols geared primarily towards creating track schematic for either research or educational purposes. It provides a Ti*k*Z frontend to some of the symbols which maybe needed to describe situations and layouts in railway operation. The library is divided into four sublibraries: `topology`, `trafficcontrol`, `vehicles`, `constructions`, and `messures`.

## 1.2. Acknowledgement

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 826347.

## 1.3. Requirements

The library uses Ti*k*Z and it is based the following packages: `tikz`, `lmodern`, `xcolor`, and `etoolbox`. Further more it uses the following Ti*k*Z libraries: `calc`, `intersections`, `patterns`, and `arrows.meta`.

## 1.4. License



## 1.5. Alternatives

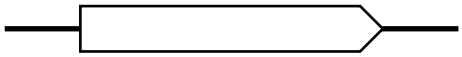
Apart from this library, there is also a Signalschablone with german (Deutsche Bahn) symbols for MS Visio.

# 2. Usage

## 2.1. A complete minimal example

The command `\usetikzlibrary{trackschematic}` will load the library; place it somewhere in your preamble. Here is a complete working minimal example which will produce a single PDF file with the figure on the right:

```
\documentclass[tikz]{standalone}

% loading the library
\usetikzlibrary{trackschematic}

\begin{document}
  \begin{tikzpicture}

    % draw a track
    \maintrack (0,0) -- (6,0);

    % place a train on the track
    \train[forward] at (5,0) label ();

  \end{tikzpicture}
\end{document}
```



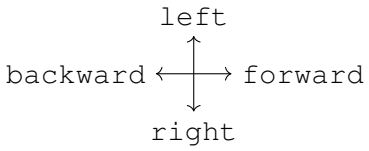
## 2.2. Placement

To place symbols in a track schematic, they need to placed and oriented correctly. The placement ist done through the given Ti*k*Z coordinate. There are a few assumaptions made about the placement:

1. Parallel tracks are drawn at a distance of 1 cm (which is the base unit of Ti*k*Z).
2. Tracks are only drawn at an angle of $n \cdot 45°$.

## 2.3. Orientation system

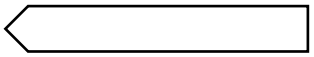
The orientation is controlled via given Ti*k*Z options or pgfkey. The orientation options/pgfkeys are named in relation to orientation-based coordinates, which inhibate thier meaning from reading left to right beeing `forward` and relate `left`/`right` to that movement.




The main option/pgfkey is the `face` option to control in which direction an object will face. The key can take one of the following two values: `forward`, and `backward`.

```
\train[face=forward ] at (coordinate) label ();
```

```
\train[face=backward] at (coordinate) label ();
```



As a shortcut you may also just give the option `forward` or `backward` without the `face=` in front of it.
If you have objects which branch either to the left or the right you have to give the `branch` option which takes one of the following two values: `left`, and `right`.

```
\turnout[forward ,branch=left ] at (coordinate) label ();
```

```
\turnout[forward ,branch=right] at (coordinate) label ();
```

```
\turnout[backward,branch=left ] at (coordinate) label ();
```

```
\turnout[backward,branch=right] at (coordinate) label ();
```

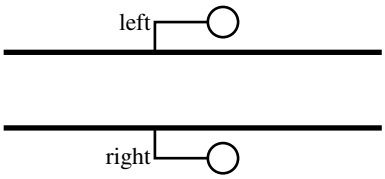
There is no shortcut and the key `branch=` must be given contrary to the key `face=`.

## 2.4. Left- and right-hand traffic

The traffic practice to divide bidirectional traffic has impact mostly on traffic control. The default traffic practice for this library ist right-hand traffic. You can change it either globally or locally with

the key `traffic practice=left`. There is also the alias `position` for single local entries.

```
\documentclass[tikz]{standalone}

% load the library
\usetikzlibrary{trackschematic}

\begin{document}
 \begin{tikzpicture}
   % set the traffic practice
   \tikzset{traffic practice=left}

   \maintrack (0,1) -- (5,1);
   \maintrack (0,0) -- (5,0);
   \routesignal[forward] at (2,1) label (left);
   \routesignal[forward,position=right] at (2,0) label (right);
 \end{tikzpicture}
\end{document}
```




### 2.5. Colors: background and foreground

The two main colors `white` and `black` are set for the `background` and `foreground` keys by default. If you want to change them, provide a new value for the keys. For example like this:

```
\documentclass[tikz]{standalone}

% load the library
\usetikzlibrary{trackschematic}

\begin{document}
 \begin{tikzpicture}
   % set the colors
   \tikzset{background=lightgray,foreground=violet}

   \maintrack (0,0) -- (6,0);
   \train[forward] at (5,0) label (grey train);
 \end{tikzpicture}
\end{document}
```


## 3. Provided Symbols and their commands

Each sublibrary provides different symbols. The following section will go through each symbol their command and options.

### 3.1. Topology

#### 3.1.1. Tracks

Drawing a track follows the same pricipal as drawing a line in Ti*k*Z. There are two generell optionss of track with different commands: `main tracks`, and `secondary tracks`.

► **Main track**

---

```
\maintrack (coord1) -- (coord2);
\maintrack (coord1) -- (coord2) -- (coord3) -- etc.;
```

No `options` available.
This command is equivalent to:

```
\path[draw=foreground,line width=2pt] (coord1) -- (coord2);
```

Beware of the placement assumption by the library (see Section 2.2).

### Secondary track



```
\secondarytrack (coord1) -- (coord2);
\secondarytrack (coord1) -- (coord2) -- (coord3) -- etc.;
```

For the secondary track you may also use the following alias:

```
\sidetrack (coord1) -- (coord2);
```

No `options` available.
The command is equivalent to:

```
\path[draw=foreground,line width=0.7pt] (coord1) -- (coord2);
```

Beware of the placement assumption by the library (see Section 2.2).

### Track number or track label




```
\tracklabel at (coord) label (number);
```

No `options` available.
This command is equivalent to:

```
\node[fill=background,text=foreground] at (coord) {number};
```

### Buffer stops

```
\bufferstop[options] at (coord);
```

values for `options` (comma seperated):

`forward` or `backward` (mandatory)

`friction=`*`length unit`* (optional)

`foreground=`*`color`* (optional, default: `black`)

### Track closures



```
\trackclosure at (coord);
```

No `options` available.

### 3.1.2. Turnouts and similar

### Turnouts

```
\turnout[options] at (coord) label (name);
```

values for `options` (comma seperated):

`forward` or `backward` (mandatory)

`branch=left` or `branch=right` (mandatory)

`operation=manual` (optional)

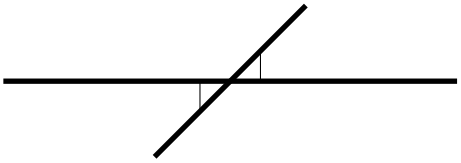
`fouling point` (optional)

`points=left` or `points=right` (optional)

`shift label={`*`(label-coord)`*`}` (optional, default: (0,0))

`foreground=`*`color`* (optional, default: `black`)

### Diamond crossings



```
\crossing[options] at (coord) label (name);
```

values for `options` (comma seperated):

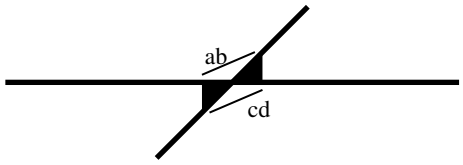
`branch=left` or `branch=right` (mandatory)

`fouling point` (optional)

`shift label={`*`(label-coord)`*`}` (optional, default: (0,0))

`foreground=`*`color`* (optional, default: `black`)

### Slip switchs or slip turnouts




```
\slipturnout[options] at (coord) label (name1)(name2);
```

values for `options` (comma seperated):

`branch=left` or `branch=right` (mandatory)

`slip=double` (default), `slip=none`, `slip=left` or `slip=right` (mandatory)

`operation=manual` (optional)

`fouling point` (optional)

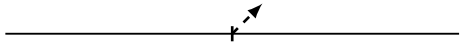
`forward points=left` or `forward points=right` (optional)

`backward points=left` or `backward points=right` (optional)

`shift label={`*`(label-coord)`*`}` (optional, default: (0,0))

`foreground=`*`color`* (optional, default: `black`)

### Derailers



```
\derailer[options] at (coord) label (name);
```

values for `options` (comma seperated):

`forward` or `backward` (mandatory)

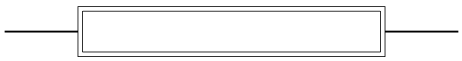
`branch=left` or `branch=right` (mandatory)

`shift label={`*`(label-coord)`*`}` (optional, default: (0,0))

`foreground=`*`color`* (optional, default: `black`)

## 3.2. Vehicles

### Parked vehicles



```
\parkedvehicles[options] at (coord) label (name);
```

values for `options` (comma seperated):

`length=`*`length unit`* (optional, default 4cm)

`label at={(label-coord)}` (optional, default: *center*)

`label align=left` or `label align=right` (optional, default: center)

`foreground=color` (optional, default: `black`)

`background=color` (optional, default: `white`)

The value for *(label-coord)* is relative to *(coord)*. An absolute *(label-coord)* can be specified with the Ti*k*Z \coordinate command.

### Shunting movements

```
\shunting[options] at (coord) label (name);
```

values for `options` (comma seperated):

`movement` (optional)

`forward` or `backward` (mandatory)

`length=length unit` (optional, default 4cm)

`operation=manual` or `operation=automatic` (optional)

`bend left at={(bend-coord)}` (optional, default: *none*)

`bend right at={(bend-coord)}` (optional, default: *none*)

`label at={(label-coord)}` (optional, default: *center*)

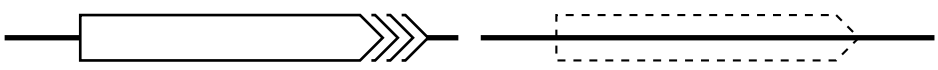
`label align=left` or `label align=right` (optional, default: center)

`foreground=color` (optional, default: `black`)

`background=color` (optional, default: `white`)

The value for *(label-coord)* and *(bend-coord)* is relative to *(coord)*. An absolute *(label-coord)* or *(bend-coord)* can be specified with the Ti*k*Z \coordinate command.

### Train runs



```
\train[options] at (coord) label (name);
```

values for `options` (comma seperated):

`run=slow`, `run=normal` or `run=fast` (optional)

`forward` or `backward` (mandatory)

`length=`*`length unit`* (optional, default 4cm)

`operation=manual` or `operation=automatic` (optional)

`ghost` (optional)

`bend left at={`*`(bend-coord)`*`}` (optional, default: *none*)

`bend right at={`*`(bend-coord)`*`}` (optional, default: *none*)

`shift label={`*`(label-coord)`*`}` (optional, default: (0,0))

`label align=left` or `label align=right` (optional, default: center)

`foreground=`*`color`* (optional, default: `black`)

`background=`*`color`* (optional, default: `white`)

The value for *(label-coord)* and *(bend-coord)* is relative to *(coord)*. An absolute *(label-coord)* or *(bend-coord)* can be specified with the Ti*k*Z \coordinate command.

## 3.3. Traffic control

### 3.3.1. Stationary signals

#### Generic signal command

```
\signal[options] at (coord) label (name);
```

values for `options` (comma seperated):

at least one of the following: `distant`, `speed type`, `block`, `route`, `shunt limit`, `shunting` and/or `berth`

`forward` or `backward` (mandatory)

`speed=`*`value`* (optional)

`distant speed=`*`value`* (optional)

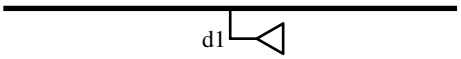
`locked=false` (default) or `locked=true` (optional)

`position=left` or `position=right` (optional, default: *traffic practice*)

`shift label={`*`(label-coord)`*`}` (optional, default: (0,0))

`foreground=`*`color`* (optional, default: `black`)

#### Distant signal




```
\distantsignal[options] at (coord) label (name);
```

values for `options` (comma seperated):

`forward` or `backward` (mandatory)

`distant speed=`*`value`* (optional)

`position=left` or `position=right` (optional, default: *traffic practice*)

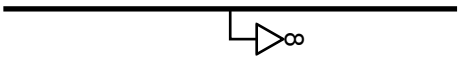
`shift label={`*`(label-coord)`*`}` (optional, default: (0,0))

`foreground=`*`color`* (optional, default: `black`)

This command is equivalent to:

```
\signal[distant,options] at (coord) label (name);
```

### Speed signal/sign



```
\speedsignal[options] at (coord) label (name);
```

For the speed signal you may also use the following alias:

```
\speedsign[options] at (coord) label (name);
```

values for `options` (comma seperated):

`forward` or `backward` (mandatory)

`speed=`*`value`* (optional)

`position=left` or `position=right` (optional, default: *traffic practice*)

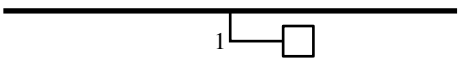
`shift label={`*`(label-coord)`*`}` (optional, default: (0,0))

`foreground=`*`color`* (optional, default: `black`)

This command is equivalent to:

```
\signal[speed type,options] at (coord) label (name);
```

### Block signal




```
\blocksignal[options] at (coord) label (name);
```

values for `options` (comma seperated):

`forward` or `backward` (mandatory)

`speed=`*`value`* (optional)

`position=left` or `position=right` (optional, default: *traffic practice*)

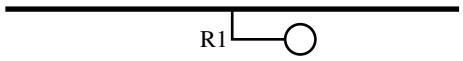
`shift label={(label-coord)}` (optional, default: (0,0))

`foreground=color` (optional, default: `black`)

This command is equivalent to:

```
\signal[block,options] at (coord) label (name);
```

### Route signal




```
\routesignal[options] at (coord) label (name);
```

values for `options` (comma seperated):

`forward` or `backward` (mandatory)

`speed=value` (optional)

`locked=false` (default) or `locked=true` (optional)

`position=left` or `position=right` (optional, default: *traffic practice*)

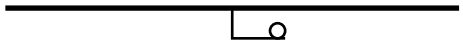
`shift label={(label-coord)}` (optional, default: (0,0))

`foreground=color` (optional, default: `black`)

This command is equivalent to:

```
\signal[route,options] at (coord) label (name);
```

### Shunting signal



```
\shuntsignal[options] at (coord) label (name);
```

values for `options` (comma seperated):

`forward` or `backward` (mandatory)

`locked=false` (default) or `locked=true` (optional)

`position=left` or `position=right` (optional, default: *traffic practice*)

`shift label={(label-coord)}` (optional, default: (0,0))

`foreground=color` (optional, default: `black`)

This command is equivalent to:

```
\signal[shunting,options] at (coord) label (name);
```

### ► Shunt limit

```
\shuntlimit[options] at (coord) label (name);
```

values for `options` (comma seperated):

`forward` or `backward` (mandatory)

`position=left` or `position=right` (optional, default: *traffic practice*)

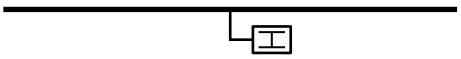
`shift label={`*`(label-coord)`*`}` (optional, default: (0,0))

`foreground=`*`color`* (optional, default: `black`)

This command is equivalent to:

```
\signal[shunt limit,options] at (coord) label (name);
```

### ► Berth signal/sign



```
\berthsignal[options] at (coord) label (name);
```

For the speed signal you may also use the following alias:

```
\berthsign[options] at (coord) label (name);
```

values for `options` (comma seperated):

`forward` or `backward` (mandatory)

`position=left` or `position=right` (optional, default: *traffic practice*)

`shift label={`*`(label-coord)`*`}` (optional, default: (0,0))

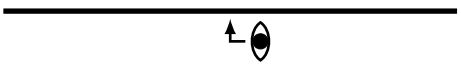
`foreground=`*`color`* (optional, default: `black`)

This command is equivalent to:

```
\signal[berth,options] at (coord) label (name);
```

## 3.3.2. Non-stationary points

### ► View point



```
\viewpoint[options] at (coord);
```

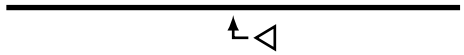
values for `options` (comma seperated):

`forward` or `backward` (mandatory)

`position=left` or `position=right` (optional, default: *traffic practice*)

`foreground=color` (optional, default: `black`)

### Braking point



```
\brakingpoint[options] at (coord) label (name);
```

values for `options` (comma seperated):

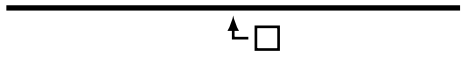
`forward`, `backward` or `bidirectional` (mandatory)

`position=left` or `position=right` (optional, default: *traffic practice*)

`shift label={(label-coord)}` (optional, default: (0,0))

`foreground=color` (optional, default: `black`)

### End of movement authority



```
\movementauthority[options] at (coord) label (name);
```

values for `options` (comma seperated):

`forward`, `backward` or `bidirectional` (mandatory)

`position=left` or `position=right` (optional, default: *traffic practice*)

`shift label={(label-coord)}` (optional, default: (0,0))

`foreground=color` (optional, default: `black`)

### Danger point

```
\dangerpoint[options] at (coord) label (name);
```

values for `options` (comma seperated):

`forward`, `backward` or `bidirectional` (mandatory)

`position=left` or `position=right` (optional, default: *traffic practice*)

`shift label={`*`(label-coord)`*`}` (optional, default: (0,0))

`foreground=`*`color`* (optional, default: `black`)

### 3.3.3. Clearing points

#### Generic clearing point

```
\clearingpoint[options] at (coord) label (name);
```

values for `options` (comma seperated):

at least one of the following: `standard`, `block` and/or `route`

`forward` (default) or `backward` (optional)

`position=left` or `position=right` (optional, default: *traffic practice*)

`shift label={`*`(label-coord)`*`}` (optional, default: (0,0))

`foreground=`*`color`* (optional, default: `black`)

#### Standard clearing point

```
\standardclearing[options] at (coord) label (name);
```

values for `options` (comma seperated):

`forward` (default) or `backward` (optional)

`position=left` or `position=right` (optional, default: *traffic practice*)

`shift label={`*`(label-coord)`*`}` (optional, default: (0,0))

`foreground=`*`color`* (optional, default: `black`)

This command is equivalent to:

```
\clearingpoint[standard,options] at (coord) label (name);
```

#### Block clearing point

```
\blockclearing[options] at (coord) label (name);
```

values for `options` (comma seperated):

`forward` (default) or `backward` (optional)

`position=left` or `position=right` (optional, default: *traffic practice*)

`shift label={`*`(label-coord)`*`}` (optional, default: (0,0))

`foreground=`*`color`* (optional, default: `black`)

This command is equivalent to:

```
\clearingpoint[block,options] at (coord) label (name);
```

#### Route clearing point

```
\routeclearing[options] at (coord) label (name);
```

values for `options` (comma seperated):

`forward` (default) or `backward` (optional)

`position=left` or `position=right` (optional, default: *traffic practice*)

`shift label={`*`(label-coord)`*`}` (optional, default: (0,0))

`foreground=`*`color`* (optional, default: `black`)

This command is equivalent to:

```
\clearingpoint[route,options] at (coord) label (name);
```

### 3.3.4. Transmitters

#### Generic transmitter command

```
\transmitter[options] at (coord) label (name);
```

values for `options` (comma seperated):

`type=balise` or `type=loop` (mandatory)

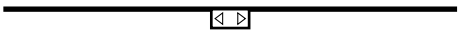
`forward`, `backward` or `bidirectional` (optional)

`position=left` or `position=right` (optional, default: *traffic practice*)

`shift label={`*`(label-coord)`*`}` (optional, default: (0,0))

`foreground=`*`color`* (optional, default: `black`)

### ► Balise



```
\balise[options] at (coord) label (name);
```

values for `options` (comma seperated):

`forward`, `backward` or `bidirectional` (optional)

`position=left` or `position=right` (optional, default: *traffic practice*)

`shift label={`*`(label-coord)`*`}` (optional, default: (0,0))

`foreground=`*`color`* (optional, default: `black`)

This command is equivalent to:

```
\transmitter[type=balise,options] at (coord) label (name);
```

### ► Loop

```
\trackloop[options] at (coord) label (name);
```

values for `options` (comma seperated):

`position=left` or `position=right` (optional, default: *traffic practice*)

`shift label={`*`(label-coord)`*`}` (optional, default: (0,0))

`foreground=`*`color`* (optional, default: `black`)

This command is equivalent to:

```
\transmitter[type=loop,options] at (coord) label (name);
```

## 3.3.5. Miscellaneous

### ► Route

```
\route[options] at (coord);
```

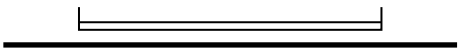
values for `options` (comma seperated):

`forward` or `backward` (mandatory)

`foreground=`*`color`* (optional, default: `black`)

## 3.4. Constructions

### Platform



```
\platform[options] at (coord);
```

values for `options` (comma seperated):

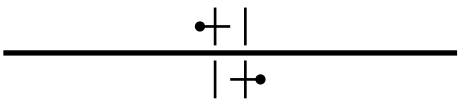
`side=left`, `side=right` or `side=both` (mandatory)

`length=`*`length unit`* (optional, default 4cm)

`width=`*`length unit`* (optional, default 0.5cm)

`foreground=`*`color`* (optional, default: `black`)

### Level crossings



```
\levelcrossing[options] at (coord);
```

values for `options` (comma seperated):

`barrier=none` (default), `barrier=semi` or `barrier=full` (optional)

`side=both` (default), `side=left` or `side=right` (optional)

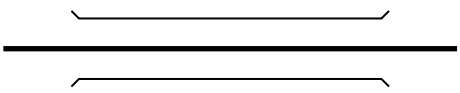
`road width=`*`length unit`* (optional, default 0.4cm)

`width=`*`length unit`* (optional, default 0.5cm)

`no road` (optional)

`foreground=`*`color`* (optional, default: `black`)

### Bridge



```
\bridge[options] at (coord);
```

values for `options` (comma seperated):

`length=`*`length unit`* (optional, default 4cm)

`width=`*`length unit`* (optional, default 0.5cm)

`shift left=`*`length unit`* (optional, default 0cm)

`shift right=`*`length unit`* (optional, default 0cm)

`side=both` (default), `side=left` or `side=right` (optional)

`foreground=`*`color`* (optional, default: `black`)

`background=`*`color`* (optional, default: `white`)

`no background` (optional)

### Interlocking

```
\interlocking at (coord);
```

No `options` available.

### Hump

```
\hump at (coord);
```

No `options` available.

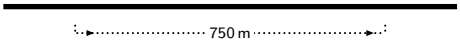
## 3.5. Messures

### Track distance


```
\trackdistance between (coord1) and (coord2) distance (value);
```

No `options` available.

### Train berth




```
\berth[options] at (coord) length (value);
```

values for `options` (comma seperated):

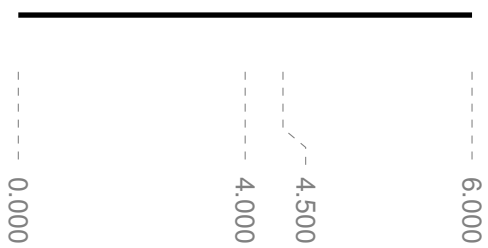
`forward`, `backward` or `bidirectional` (mandatory)

`length=`*`length unit`* (optional, default 4cm)

`position=left` or `position=right` (optional, default: *traffic practice*)

`foreground=`*`color`* (optional, default: `black`)

### ► Hectometer




```
\hectometer[options] at (coord) mileage (name);
```

values for `options` (comma seperated):

`hectometer base={`*`(base-coord)`*`}` (mandatory)

`orientation=left` or `orientation=right` (mandatory)

`shift label={`*`(label-coord)`*`}` (optional, default: (0,0))

`hectometer color=`*`color`* (optional, default: `foreground!50!background`)

The value for *(base-coord)* and *(label-coord)* is relative to *(coord)*. An absolute *(base-coord)* or *(label-coord)* can be specified with the Ti*k*Z \coordinate command. Specify a commen hectometer base and orientation if you have to place multipile hectometers, i.e. with: `\tikzset{hectometer base={(base-coord)},orientation=right};`.

### ► Messure line

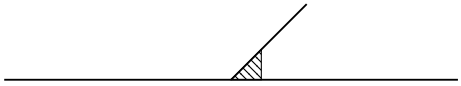


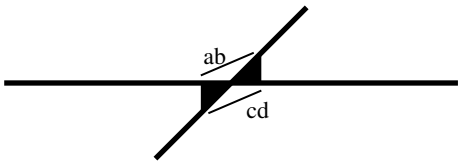
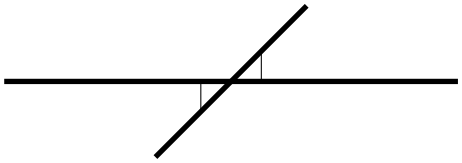
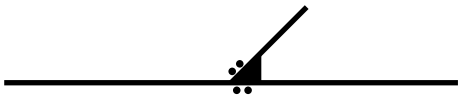
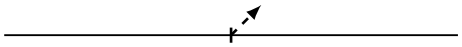
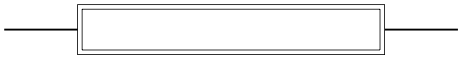
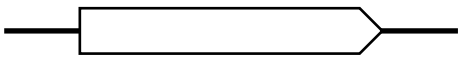
```
\messureline (coord1) -- (coord2);
\messureline (coord1) -- (coord2) -- (coord3) -- etc.;
```

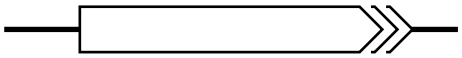
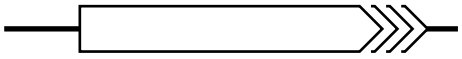
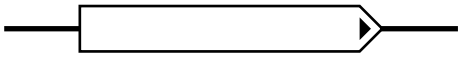
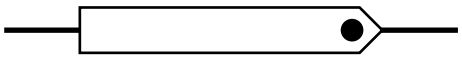
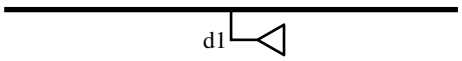
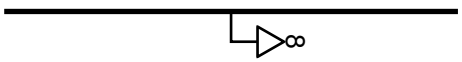
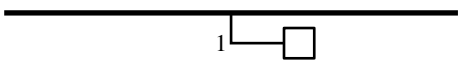
No `options` available.
This command is equivalent to:

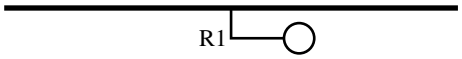
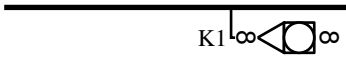
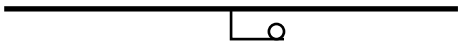
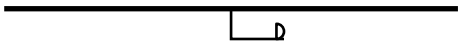
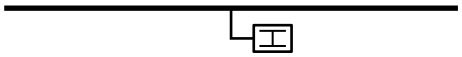
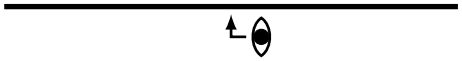
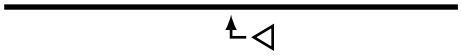
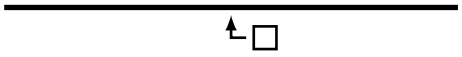
```
\path[draw=foreground!50!background,dashed,shorten <=0.75cm,shorten >=0.75cm] (coord1) -- (coord2);
```

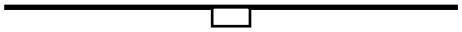
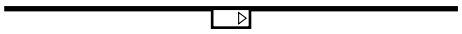
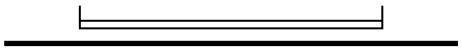
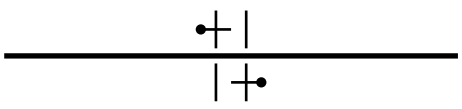
# A. Symbology

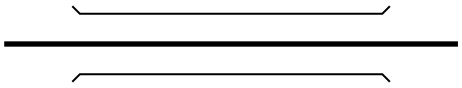
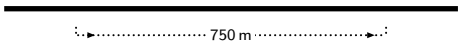
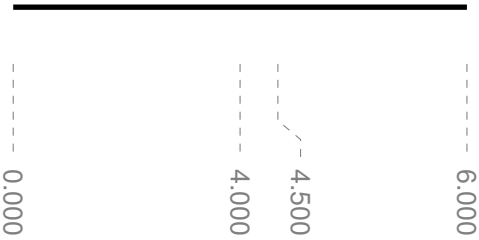
| No. | Name | Symbol | See section |
|---|---|---|---|
| 1 | main track |  | 3.1.1 |
| 2 | secondary track |  | 3.1.1 |
| 3 | track number |  | 3.1.1 |
| 4 | bufferstop |  | 3.1.1 |
| 5 | friction bufferstop |  | 3.1.1 |
| 6 | track closure |  | 3.1.1 |
| 7 | turnout |  | 3.1.2 |
| 8 | turnout<br>with fouling point indicator |  | 3.1.2 |
| 9 | turnout<br>operated manually |  | 3.1.2 |

| No. | Name | Symbol | See section |
|---|---|---|---|
| 10 | double-slip turnout |  | 3.1.2 |
| 11 | diamond crossing |  | 3.1.2 |
| 12 | turnout<br>with points in right position |  | 3.1.2 |
| 13 | turnout<br>with points in left position |  | 3.1.2 |
| 14 | turnout<br>with moving points |  | 3.1.2 |
| 15 | derailer |  | 3.1.2 |
| 16 | parked vehicles |  | 3.2 |
| 17 | train in shunting mode |  | 3.2 |
| 18 | train shunting |  | 3.2 |
| 19 | train |  | 3.2 |

| No. | Name | Symbol | See section |
|---|---|---|---|
| 20 | train moving slow |  | 3.2 |
| 21 | train moving |  | 3.2 |
| 22 | train moving fast |  | 3.2 |
| 23 | train ghost |  | 3.2 |
| 24 | train operated automatic |  | 3.2 |
| 25 | train operated by human |  | 3.2 |
| 26 | distant signal |  | 3.3.1 |
| 27 | distant signal<br>with speed indicator |  | 3.3.1 |
| 28 | speed signal |  | 3.3.1 |
| 29 | block signal |  | 3.3.1 |

| No. | Name | Symbol | See section |
|---|---|---|---|
| 30 | route signal |  | 3.3.1 |
| 31 | combined signal (distant, block and route signal) |  | 3.3.1 |
| 32 | shunt signal |  | 3.3.1 |
| 33 | shunt signal locked |  | 3.3.1 |
| 34 | shunt limit |  | 3.3.1 |
| 35 | train berth sign |  | 3.3.1 |
| 36 | view point |  | 3.3.2 |
| 37 | braking point |  | 3.3.2 |
| 38 | end of movement authority |  | 3.3.2 |
| 39 | danger point |  | 3.3.2 |

| No. | Name | Symbol | See section |
|---|---|---|---|
| 40 | clearing point |  | 3.3.3 |
| 41 | block clearing point |  | 3.3.3 |
| 42 | route clearing point |  | 3.3.3 |
| 43 | transmitter |  | 3.3.4 |
| 44 | transmitter effective forward |  | 3.3.4 |
| 45 | transmitter bidirectional |  | 3.3.4 |
| 46 | loop transmitter |  | 3.3.4 |
| 47 | route |  | 3.3.5 |
| 48 | platform |  | 3.4 |
| 49 | level crossing |  | 3.4 |

| No. | Name | Symbol | See section |
|---|---|---|---|
| 50 | bridge |  | 3.4 |
| 51 | hump |  | 3.4 |
| 52 | interlocking |  | 3.4 |
| 53 | track distance (in m) |  | 3.5 |
| 54 | train berth shape |  | 3.5 |
| 55 | hectometer |  | 3.5 |
| 56 | Messure line |  | 3.5 |

## B. Revision History

| Revision | Date | Author(s) | Description |
|---|---|---|---|
| 0.1 | 2018-09-14 | MS | Basic concept of a library with railway topology symbols and some examples. |
| 0.2 | 2018-12-19 | MS | Added transmitters and minor improvements. |
| 0.3 | 2019-04-04 | MS | Moved snippet folder to root folder and defined and used color foreground and background. |
| 0.4 | 2019-07-21 | MS | Reworked library for common tikz library layout. |
| 0.5 | 2020-01-14 | MS | Introducing new syntax and providing a documentation. |

Martin Scheidt (MS)