# Positioning

## Contents



## Coordinate positioning

*?Main Article: Coordinate positioning*

## Linear Positioning / referencing

*?Main Article: Linear Positioning / referencing*

# RailTopoModel® structure

As the railways world uses the most suited LR method according to the case, and that the aim of RailTopoModel® is to design a universal way of describing railways, it was chosen to split the reference system into two kinds:

- The NetElement?s internal way of measuring is a normalized absolute LRS. The NetElement with its own internal LRS (which we called ?Intrinsic Positioning System? as it is proper to the NetElement, created and destroyed with it) becomes a ?PositioningNetElement?
- External linear referencing systems (such as the line/milepost) may be attached to the PositioningNetElement by linking a set of external LRS coordinates to the corresponding intrinsic coordinates.

Choosing a universal LRS allows designing location algorithms independently from the field situation which would decide the most practical LR method for a specific segment.

## Intrinsic positioning / referencing

*?Main Article: Intrinsic positioning / referencing*

As said above, each NetElement forming the network has its own linear referencing system, which is created at the same time as the NetElement and destroyed with it. The purpose of this referencing system is double:

- It ensures that every NetElement has a reference system allowing to locate events on it; small track elements (e.g. work reservations or side tracks) are often not linked to any ?major? linear systems such as lines)
- It ensures that every NetElement has an orientation and a length. This allows to locate other NetElements relatively to it (e.g. this switch is at the beginning of this track element)

The reason why it was decided to use a normalized absolute LRS is that the normalized expression allows designing algorithms which are disconnected from the unit system. Some distances may be expressed in kilometres, miles, centimetres or feet. The normalized notation (0?1) allows to deal separately with the unit conversions.
Also, as it is applied to the smallest element of the network (at a given level), it can be used for locating objects in any path drawn on the network topology, whatever its length or its links with external referencing systems are (path crossing two lines).
Although very difficult to interpret in human interaction, it is perfectly adapted for computer calculations.

## Track-referred positioning

*?Main Article: Track-referred positioning*

As the intrinsic coordinate system is difficult to use in human exchanges, field workers often use the classical linear referencing with line number, kilometre reference and distance from the post when dealing with long axis or metres from the start when dealing with short axis.
Those referencing systems can be linked with any relevant PositioningNetElement, ensuring the ability to translate the coordinates into an intrinsic coordinate and back. Any number of external reference systems can be linked to an element and an external reference system may of course be linked with several elements.

**What you should have learned**

Please, enter a summary!

**Navigation**