# Quickstart guide to the Movie Creator

A new feature of Enterprise Dynamics (ED) is the MovieCreator. The MovieCreator is an atom that allows the user to make 2D and 3D movies quick and easy. This quick start will show how to create movies using the MovieCreator. For a complete overview of all functionality that can be found in the movie creator also check the Help file of the MovieCreator atom.

## Type of movies that can be created

Movies can be made in both 2D and 3D. Furthermore it is possible to create a Static or a Dynamic movie.

For a Static movie there are two options:

Fixed    The camera has one position and viewing direction during the recording, unless by interference of the user.

Shadow   The camera has one position but the viewing direction will change to ensure that the shadowed atom will stay in the center of the screen.

For a Dynamic movie there are two options:

Shadow   The camera hovers behind an atom and changes the viewing direction to ensure that the shadowed atom stays in view according to the user settings.

Path     The user can create a path that the camera will follow. The start and end point of the path are so-called key points, but more key points can be inserted along the path. For each key points the user defines the position and direction of the camera.

## How to record a movie

### Step 1: Movie Creator Control

- Drag the MovieCreator (▧) into the model.

The atom can be found in group Visualization of the library. It doesn't matter where the atom is placed in the model. The atom has no input and no output channels and works completely independent of other atoms. When the model is not running, the icon of the movie creator can be seen. Once the model runs, the icon will disappear.

- Double click on the MovieCreator atom, the Movie Creator Control panel will appear, see Picture 1.
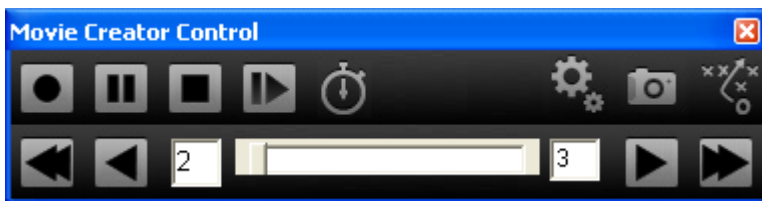


Picture 1: Movie Creator Control

This is the main control for the movie creator. Here it is possible to directly start ▣ a recording, once started the button will color red 🔴 to indicate that it's recording. Pausing the recording ⏸ will pause the simulation as well. It can be started again by pressing the pause ⏸ button. When you want to change or stop the recording, press the stop button ▢. This will end the current recording and allows you to adjust settings for the next recording.

The three buttons in the upper right corner give access to respectively the recording settings ⚙, the camera settings 📷 and the path manipulation settings ⤬. The path settings button ⤬ will only show when appropriate, in other cases it will be hidden.

### Step 2: Recording settings

- Press the recording settings button ⚙, the movie creator control panel will slide out, see Picture 2.
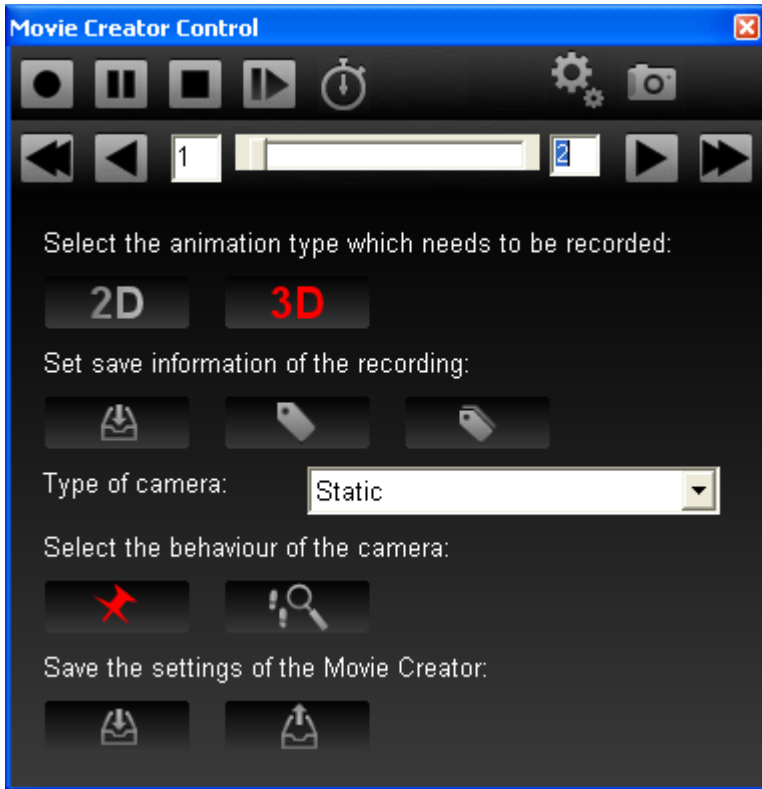


Picture 2: Movie Creator Control panel - Recording settings

- Set which type of visualization you want to record, **2D** or **3D**. Again the selected option will turn red.
- Press ⬇ and select the directory in which the recording(s) will be saved.
- Press 🏷, a window will appear in which you set the name that will be given to the movie.

In many cases you want to make several movies and don't want to be bothered with changing the name constantly. For this a suffix is used which will be automatically increased every time you start recording a movie. When you start the next day with a fresh instance of ED, the suffix counter starts at the value of the suffix property which is by default equal to 1. If you already have made several recordings, you can adjust the suffix with which the naming sequence will start, so you can continue where you left off earlier. Do this by pressing the Set suffix button 🏷.

**Step 3: Setting the camera type**

- Use the Type of camera combo box to select Static or Dynamic.

*Static Camera:*

When using a static camera there are a few options:

| Button | Affects | Description |
|---|---|---|
| 📌 | 2D & 3D | Static. The camera is set at one point and views a certain direction. During the recording this will not change, unless by interference of the user. |
| 🔍 | 3D | The camera is set at one point, but will follow a predefined object within the simulation model. When the objects moves, the camera rotates to ensure that the object stays in the center of the screen. Its position is, as said, static. |
|  |  | When pressing this button the "Select object to follow" window will |

appear.

***Dynamic Camera:***

When using a dynamic camera there are a few options:

| Button | Affects | Description |
|--------|---------|-------------|
|  | 2D & 3D | The camera is set at one point relative to the object selected to follow. When the object moves, the camera will follow the object by moving along with it.<br><br>When pressing this button the "Select object to follow" window will appear. |
|  | 2D & 3D | The camera follows a path, moving in a straight trajectory from defined key point to key point. |
|  | 2D & 3D | The camera follows a path, moving in a curved trajectory from defined key point to key point. The curves of the path can be adjusted in the 2D animation window using the handles. |

If you have selected shadow object  you should read the section *Select Object to follow 2D and 3D*, if you have selected Dynamic camera and chosen a straight or curved path then read section *Setting up a path*. If you chose a Static camera  you can skip these sections and go to step 4.

### Select Object to follow 2D and 3D

To follow an object, it is necessary to define which object needs to be followed. For that purpose a window will pop up once this option is selected. This window is shown below in its most extensive form. Depending on the type of recording (2D/3D or other behavior) some of the options may be hidden.
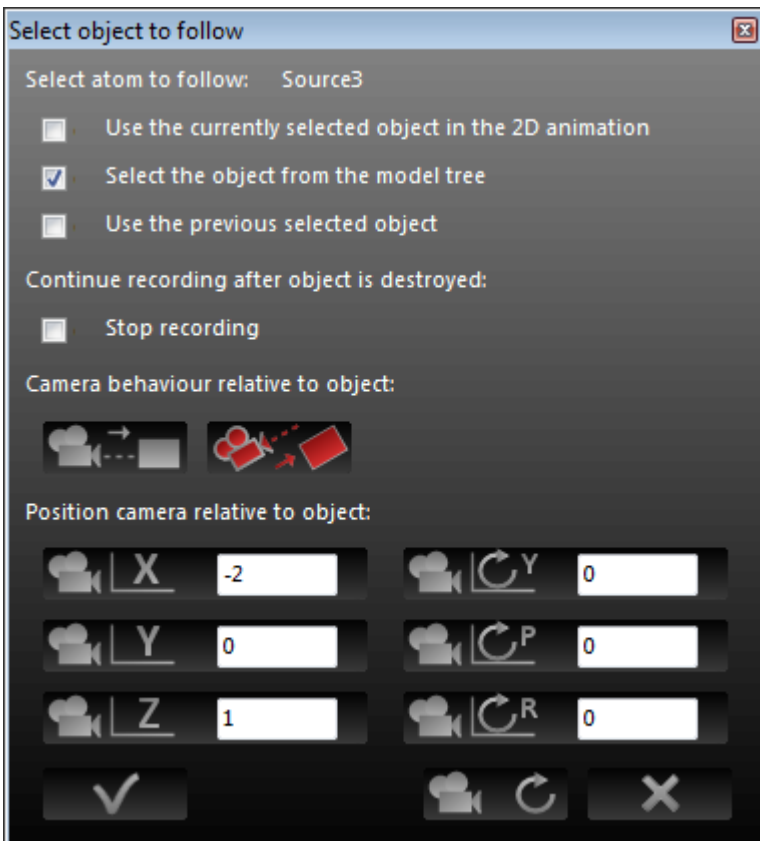


Picture 3: Movie creator panel to select object to follow.

The first thing to do is to select the object which needs to be followed.

- Select the object to follow in the 2D animation screen, then press the follow object button ![icon] so you get this screen, and select the first option.

The next step is only required if you are recording a 3D movie.

- Set the camera behavior relative to object to either ![icon] or ![icon]. The table below gives an explanation of the two options.

| Button | Description |
|---|---|
| ![icon] | The camera is positioned with an X, Y and Z distance relatively to the center of the selected object. The camera is focused on the object and will keep it in the center of the animation window. |
| ![icon] | The camera is positioned relative to the object to follow. Since the rotations of the camera can also be set, it is possible to have, for instance, a camera looking over the shoulder of the operator or another atom in the simulation. |
| | The camera will get a X, Y and Z distance to the center of the object and a rotation for the Yaw, Pitch and Roll. |

- Set the position of the camera relative to the atom and if required also the direction of the camera. If you are creating a 3D movie open the 3D window. When you edit the camera position and direction you will see the result immediately. Press the reload button ![icon] to retrieve the original settings. In Picture 4 the camera behavior related to Yaw, Pitch and Roll is depicted.
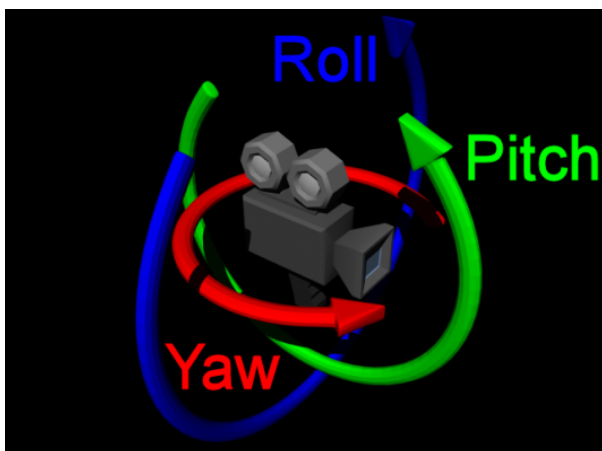


Picture 4: Camera behavior related to Yaw, Pitch and Roll.

**Setting up a path**

In the steps before we already talked several times about the camera following a path. Now we're going to show you how to set up a path. When you select either the curved or straight path in the Recording Settings screen, you will see in the 2D animation window a few points appear, similar to the ones shown in Picture 5.
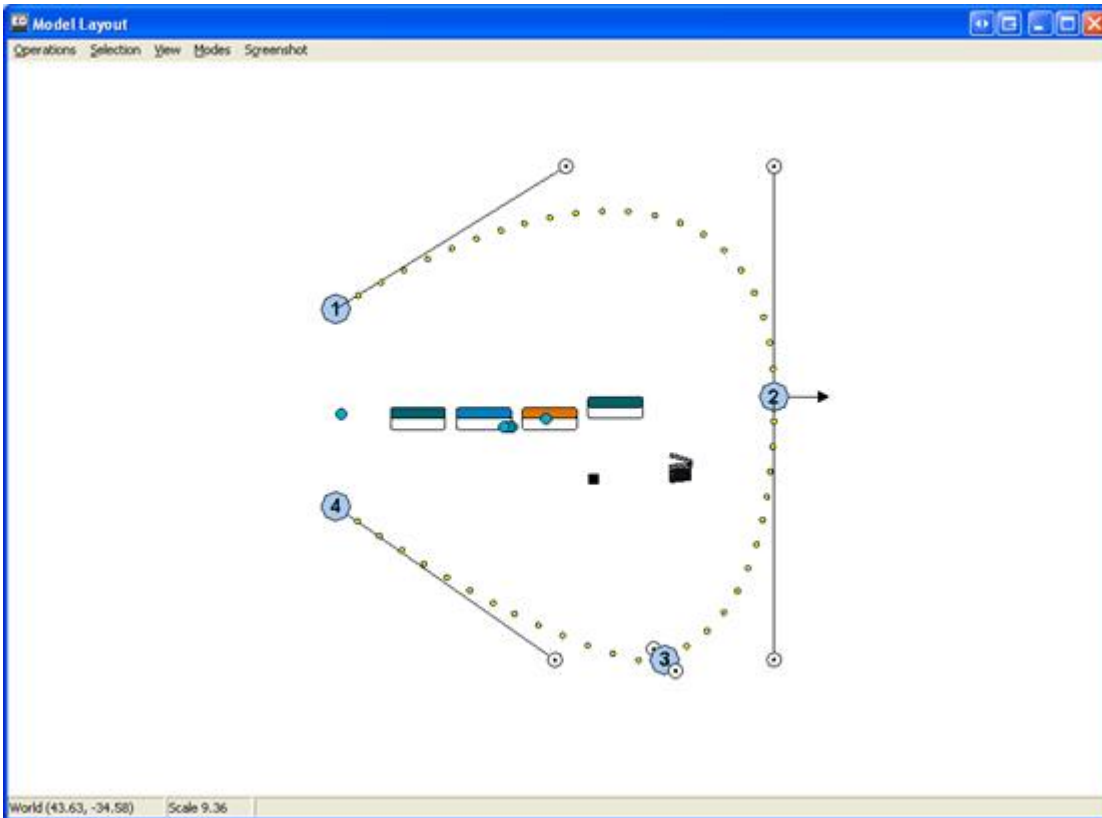
Picture 5: Model Layout showing a camera path

The blue, numbered points are the key points in the path. The camera will travel from point to point. The small yellow dots are an indication of the path the camera will follow. The white circles with the dot in the middle, that are connected to the key points via a line are the handles for the Bezier curves. The handles are only shown when the camera travels via a curved path.

By selecting a key point or a handle and dragging it, the path can be adjusted to your own needs.

To add an extra key point to the path, you can double click on the last key point. A new key point will be placed close by, including its handles. Double clicking on a point half way will open the Movie Creator Control panel.

Another option to manipulate or adjust your path is by moving the camera in the 3D animation window and updating the key points. When pressing the path ⬚ button on the Movie Creator Control panel, additional buttons will appear that give you more control over your path, see Picture 6.
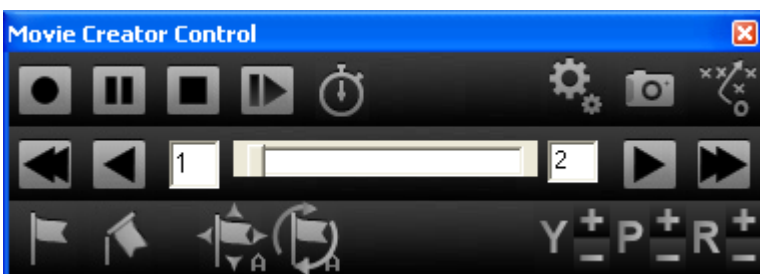


Picture 6: Movie Control Panel

The buttons in the second row of the Movie Creator Control panel can be used to switch between key point of the camera path. It's only possible to move between two subsequent points. Using the slider in the middle, one can move the camera by hand over the defined path. By pressing the button next key point ▶, previous key point ◀, or when the path exists out of many points, the last ⏭ or the first ⏮ key point. When you know exactly to which point you want to go, you can also alter the values given in the edit boxes.

In 3D this will show by the changing viewpoint of the camera. In 2D it is shown by the arrow that moves over the camera path. The direction that the arrow is pointing indicates the rotation that the camera will follow.

When creating a camera path for a 3D movie. The first ⚑ button allows you to insert a key point in between the key points you are currently editing. By selecting a point in the 2D animation screen and pressing the remove key point 🏴 button, a key point from your path can be removed. When you are moving your camera in the 3D animation space and found a better position, you can update it with the update position 🖼 button.

> 📝 Be aware that the movie creator will update the position of the key that is selected in the 2D animation window. In case no key point is selected, the key point closest to which the slider is positioned will be updated. In this case it would update key point 2.

When you move the slider after you moved your camera, but before updating, you will lose the adjustments that you've made to the camera position. Because moving the slider means that you want to move the camera along the path between the two key points. So remember to first set the slider, before changing the camera position, or to check if the correct key point is selected.

Sometimes the computer is so busy it will miss that you clicked on the update position button. To indicate that the values are being updating, the button will light up green 🟩 for a second. The same procedure goes for the update rotation 🖼 button, which also will light up green 🟩 when clicked.

When you set the rotations of your camera, you have to consider the behavior of the camera between those points. After all there are two directions over which the camera can reach its next rotation. By clicking on the ➕ or ➖ one can change the direction the camera rotates over. Again the buttons will glow in green ( ➕ and ➖ ) when they were activated. This can be set for each of the three defined rotations, Yaw, Pitch and Roll.

A relatively quick way of setting up your path is to use the 3D view in combination with F8 (which opens the Position Camera window). Here you can easily adjust the rotation and position of the camera. By pressing the OK button once you're done and single clicking in the 3D view (this to update the status bar), the camera moves to the defined position and rotation. Then using the update position and rotation buttons, allows you to quickly set up the path of your liking.
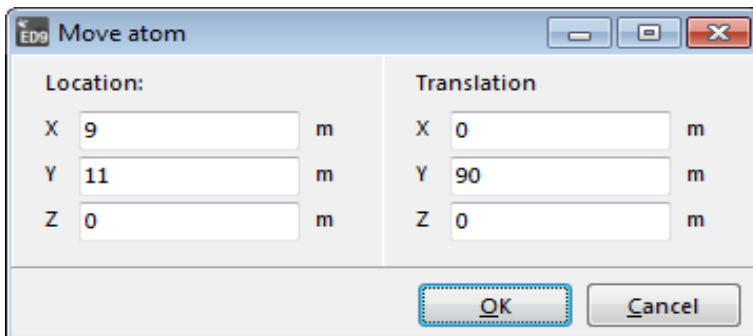


Picture 7: Move atom window

> 📝 When moving the camera by hand it can occur that the rotation of the camera is internally set by ED to 360, instead of 0. This will result in the camera making a complete rotation around its axis. This can of course be what you wish, but otherwise make sure that a 0 is followed by a 0!

> 💡 When you already know your path, consider to only create the key points in your model, save the settings to an Excel file. Press the 💾 button on the bottom of the Movie Creator Control Recording settings window to save the settings to an Excel file.
>
> Since the path data is saved in an Excel file, it is possible to adjust the points in this file by hand. This can be faster and also an easy way to combine 2 paths. It is however important to keep in mind to update the Nr of rows correctly, otherwise not the entire file will be loaded to the MovieCreator.
>
> Note that the rows in the Excel file describing the points of the path describe a key point followed by two handles and then follows the next key point etc.

When setting up a path for a 2D movie the idea is the same. However since there are so many less degrees of freedom, we also have much less buttons left:
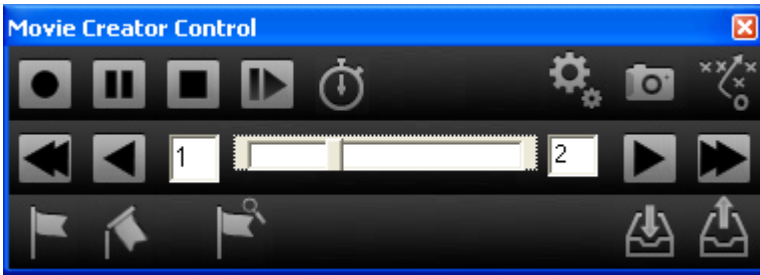
Picture 8: Movie creator control panel

The buttons behave here the same as in 3D. The only new button is to set the zoom level of the 2D animation . This will also be set to the key point to which the slider is closest.

> 💡 The play path  button of the Movie Creator Control panel can be used to test your completed camera path. Since recording the whole movie is a relatively slow process, it allows you to play through the simulation, while the 2D or 3D animation screen is displaying exactly what will be recorded, but then without actually recording it. However with the speed you normally would have during simulating.

**Step 4: Camera settings**

- Press the camera settings button on the upper right of the Movie Creator Control panel. A window will appear, see Picture 9.
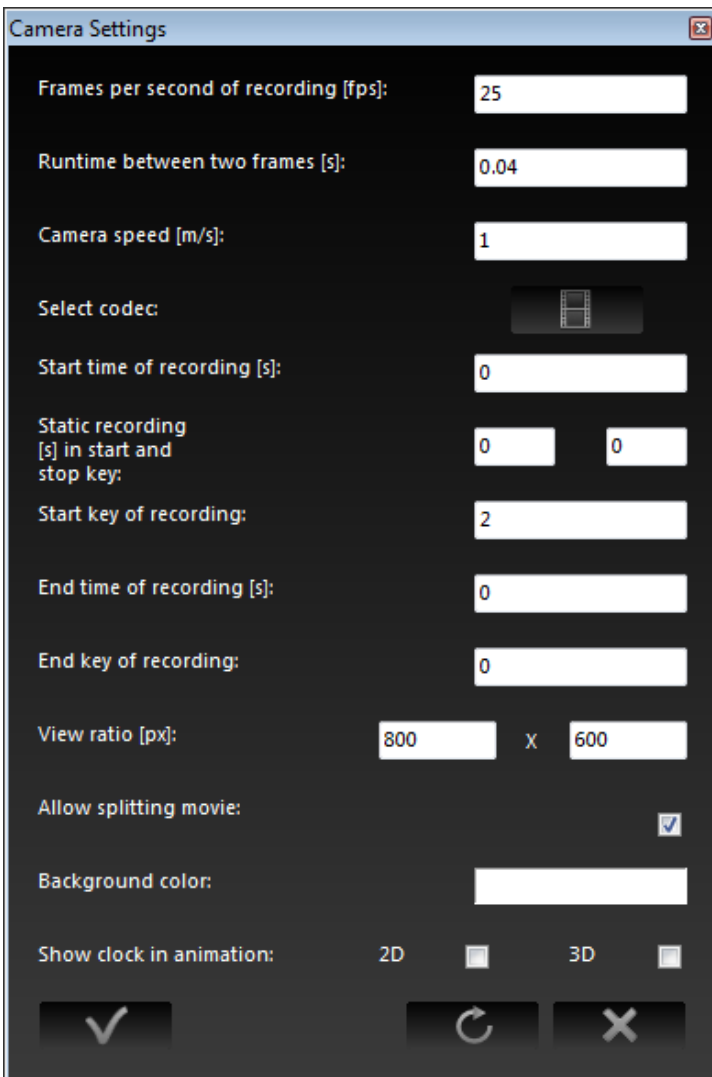


Picture 9: Movie Creator - Camera settings panel

The most important camera setting is the Codec. A Codec is a program to encoding a digital data stream. The list of Codec's available will be dependent on the Codec's installed on the computer. And not all Codec's will give the preferred end result. Also the settings of the Codec themselves can have a large influence upon the end result.

- Press the select codec ![button] button and select the way the movie will be saved. You can also select the option Full frames (Uncompressed) and compress the movies at a later time. Note that the movie files will be large but the recording speed will increase.

## Step 5: Record the movie

*Recording a Static movie*

- Set Camera in position.
  Depending on the type of movie you are creating open the 2D or 3D Builder or Viewer and make sure the view is as how you want to record it.
- Start the simulation.
  Press the start button of the Run Control
- Start Recording.
  Press the Record button ![button] of the Movie Creator Control panel the moment you want to start the recording.
- Optional press pause ![button] in the Movie Creator Control panel and change camera position. Press pause again to resume the recording.
- Stop recording.
  Press stop ![button] in the Movie Creator Control panel.

*Record using a timer*

When you have a very large model in which you know that after 1 hour real time an interesting period is coming, you might want to have the option to record this during the night. The timer functionality of the MovieCreator allows you to start or end the recording at a user defined time or moment in the simulation.

- Open the camera settings as in step 4 and set the properties start time and end time of recording.
- Click the timer start recording ![button] button of the Movie Creator Control panel. It will light up green.
- Start the simulation.
  Press the start button of the Run Control.

The simulation is now running and the recording is started automatically and will stop either when the end of the path is reached, or, in case of a static recording, when the end time is reached.

You can start a timer recording at every moment you want, as long as the "start recording time" is in the future. When not, a warning will be shown and the timer will only start when you reset the simulation. Once you set a timer, it will stay active until you either unselect the timer, or a timer recording is ended.