

Monitor documentation

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1 Possibilities

With a monitor, you can see the positions, velocities, forces of chosen particles directly in the GUI or save it into files (readable with Gnuplot)
(See **Figure 1** and **Figure 2** to look at a monitor in action)

2 How to add a monitor to your scene

1. In a XML file :

Simply write “Monitor” for the *type* field; type “ExportPositions”, “ExportVelocities” or “ExportForces” to true if you want to export positions, velocities or forces in files (Can also be done after in the GUI). Finally, to tell which particle(s) you want to monitor, type “MonitoredParticles” followed by :

P “*number of positions to monitor, 0 if none*” [“*indices of the particles*”]
V “*number of velocities to monitor, 0 if none*” [“*indices of the particles*”]
F “*number of forces to monitor, 0 if none*” [“*indices of the particles*”]

For example : P3 [12 4 0] V0 [] F5 [1 2 3 4 5]

You can also see the “Monitor.scn” file for an example (located in the *examples/Components/monitor* directory)

2. In a c++ file :

Include first the Monitor header located in *sofa/component/misc/*. You must then define three vectors which will contain the indices :

```
sofa::helper::vector<int> posIndices;  
sofa::helper::vector<int> velsIndices;  
sofa::helper::vector<int> forcesIndices;
```

then add to the vectors the indices of particles you want to monitor (with the *push_back* function)

Finally, give those vectors to the monitor with the following member functions :

```
void setIndPos (sofa::helper::vector<int>);  
void setIndVels (sofa::helper::vector<int>);  
void setIndForces (sofa::helper::vector<int>);
```

3 Interact with the monitor

Once the scene launched, if you click on the monitor node in the graph, you should have something like :

The screenshot shows a window titled "Monitor moniteur" with tabs for "Properties 1/3", "Properties 2/3", "Properties 3/3", and "Infos". The "Properties 1/3" tab is active. It contains several sections with checkboxes and data tables.

name
object name:

listening
if true, handle the events, otherwise ignore the events ☐

printLog
if true, print logs at run-time ☐

ExportPositions
export monitored positions as gnuplot file ☐

ExportVelocities
export monitored velocities as gnuplot file ☐

ExportForces
export monitored forces as gnuplot file ☐

MonitoredParticles
monitoring of desired particles

Positions 3

	particle Indi	X	Y	Z
1	8	-3.5	3.5	45.5
2	16	0	3.5	42
3	24	3.5	3.5	38.5

Velocities 3

	particle Indi	X	Y	Z
1	2	0	0	0
2	11	0	0	0
3	20	0	0	0

Forces 0

	particle Indi	X	Y	Z

Update OK Cancel

Figure 1: Example of monitoring tab

By clicking on one of the *particle Indices* boxes, you can change the number of the particle monitored. With the *spinBox* on the left, you can add or remove particles to monitor.

You can also edit the graphical proprieties, with for example :

- show velocities, forces, positions.
- define the color of these attributes.
- keep the trace of positions.

The image shows a software window titled "Monitor moniteur" with a standard Windows-style title bar (minimize, maximize, close buttons). The window contains a tabbed interface with four tabs: "Properties 1/3", "Properties 2/3" (which is selected), "Properties 3/3", and "Infos". The "Properties 2/3" tab is active and displays several configuration options for monitoring graphical data:

- ShowPositions**: A section header followed by the text "see the monitored positions" and an unchecked checkbox.
- PositionsColor**: A section header followed by the text "define the color of positions" and three input fields containing the values "1", "1", and "0".
- ShowVelocities**: A section header followed by the text "see the monitored velocities" and a checked checkbox.
- VelocitiesColor**: A section header followed by the text "define the color of velocities" and three input fields containing the values "1", "1", and "0".
- ShowForces**: A section header followed by the text "see the monitored forces" and an unchecked checkbox.
- ForcesColor**: A section header followed by the text "define the color of forces" and three input fields containing the values "1", "1", and "0".
- ShowMinThreshold**: A section header followed by the text "under this value, vectors are not represented" and an input field containing the value "0.01".
- ShowTrajectories**: A section header followed by the text "print the trajectory of monitored particles" and a checked checkbox.
- TrajectoriesPrecision**: A section header followed by the text "set the dt between to save of positions" and an input field containing the value "0.1".

At the bottom of the window, there is a large empty rectangular area. Below this area, there are three buttons: "Update", "OK", and "Cancel".

Figure 2: Graphical proprieties